verdantas

To: All Plan Holders of Record

From: Verdantas

For the Owner

Re: ***Addendum No. 1***
Anaerobic Digester Cleaning, Inspection, Repair, and Valve Replacement
City of Wheeling

Date: August 1, 2025

This Addendum forms a part of the contract documents and modifies the original bidding documents dated July 2025 and all previous addenda, if any. Acknowledge receipt of this addendum in the space provided in the bid forms. Failure to do so may subject the bidder to disqualification.

Sealed bids will be received by the City of Wheeling, WV at the office of the City Manager, 1500 Chapline Street, Wheeling, WV 26003 until 2:30 p.m. on August 7th, 2025 and will be opened and read immediately thereafter.

PRE-BID CONFERENCE

Attached are the Meeting Agenda / Minutes and Sign-In Sheet.

INSTRUCTIONS TO BIDDERS

REPLACE Part 1.9 and Part 9.2 with the following:

1.9 After the opening of bids, no Bidder may withdraw their bid for a period of 60 days.

9.2 The Owner shall execute the Contract within 60 days after the day of the bid opening. When necessary and by mutual consent between the Owner and the Successful Bidder, this 60-day period may be extended.

SPECIFICATIONS

SPEC SECTION 011419 SITE FACILITIES:

- **CLARIFICATION**: The restroom located in the Methane room has been designated as an appropriate facility. It is the responsibility of the contractor to maintain its cleanliness through the duration of the contract.

SPEC SECTION 017800 FINAL COMPLIANCE AND SUBMITTALS:

- **REMOVE** SECTION 1.1.A.3. from this Specification Section.

SPEC SECTION 331216.02 – PLUG VALVES:

- **CLARIFICATION**: Valves do not have to meet Build America Buy America (BABA) Requirements but shall still adhere to all language in specifications.

SPEC SECTION 402336 - PIPES AND PIPE FITTINGS:

- **CLARIFICATION**: Existing flanges are assumed to be ANSI Class 125/150. Field Verification is required.
- **CLARIFICATION**: Onsite fabrication or Prefabricated Stainless Steel pipe is acceptable for piping per 402336 2.2.G. Standard submittal processes still apply.
- **ADD** LANGUAGE: When connecting Staineless Steel to Ductile Iron, a Flange Isolation Kit is required. Flange Isolation Kit shall be manufactured by Advanced Products & Systems, LLC or approved equal.

SPEC SECTION 467345 - ANAEROBIC SLUDGE DIGESTERS: CLEANING, INSPECTION AND REPAIR:

- **REPLACE** SECTION 1.02.C.1 WITH: Removal, processing (dewatering), and disposal (of the dewatered solids) of approximately 1.95 million gallons (total) equivalent to an estimated ~~**335**~~ **350** dry tons of sludge contained within the primary and secondary anaerobic digesters and including the sludge feeder piping.
- **REPLACE** SECTION 1.05.A WITH: Contractor shall ~~**be completely responsible**~~ **use best practices** for preventing, minimizing, treating and/or capturing the release of any unreasonable odor and other emissions into the surrounding environment during the emptying, sludge dewatering and disposal and cleaning operations.
- **REMOVE** SECTION 1.04.A.4 – Note: Refer to SPEC 011419 Site Facilities Clarification above.
- **REPLACE** SECTION 1.10.A WITH: The work for both Contracts shall be substantially complete within the Completion Date, as defined from the notice to proceed order from the WPCD. The Contract A and Contract B Contractors shall be solely responsible for coordinating their individual schedules to accommodate the overall project requirements for Substantial Completion.
- **ADD** LANGUAGE 2.02.D – Contractor shall be liable monetarily or otherwise for any uncontained spills due to his operations. Such spills shall be reported promptly to Owner and Engineer and will then be reported to DEP.

SUPPLEMENTAL CONDITIONS

- **REPLACE** SC-2.03 (A) with the following:

SC 2.03 (A) In the last sentence of 2.03A, change "sixtieth day" to "ninetieth day."

- **DELETE** SC-2.03 (B)

SPECIFIC PROJECT REQUIREMENTS

Item 3 WORKING HOURS:

- **REPLACE** 3.1 with the following: Typical working hours are 7:30 a.m. through 7:30 p.m. Monday through Friday excluding legal holidays. Contractors may work outside of typical working hours upon coordination and approval from owner and engineer. Contractors shall still adhere to all sections of SPEC 467345.

DRAWINGS

SHEET 10 OF 12 –

- **CLARIFICATION**: Proposed valve number 10, is noted to be 20" Plug Valve in the Valve Schedule. This will replace an existing 16" Butterfly Valve. The Contractor will be responsible for all piping modifications to accommodate the change in valve size, which may include the replacement of the pipe thru the Primary Digester sidewall and associated link seal.

QUESTIONS & ANSWERS

- Q1 - Please confirm that the Contractor is responsible for providing all of its own electrical power and that there is not spare plant electrical power available at no cost to the contractor? If the plant does have spare 3-phase, 480-volt power available at no charge to the contractor please indicate where this power is and how many amps are available for contractor use?
- A1 - Yes, the Contractor is responsible for obtaining power by whatever means and methods deemed appropriate for their respective needs; i.e. Generators, Temporary Power Connections to AEP Lines, etc.

- Q2 - Performance and Payment Bond requires a warranty period for 1-year after final acceptance. Contract A is not for any new construction, and is only for the cleaning of the digester tank. Please clarify what work will require a 1-year warranty on Contract A?
- A2 - A 1-year warranty will NOT be required for the current scope of work related to Contract A. However, if a change of scope is introduced during the project, this requirement may be reinstated as part of said changes.

- Q3 - The project documents state the Contractor shall achieve a 20% minimum solids concentration prior to hauling and disposing of dewatered sludge. This 20% minimum solids concentrations is mentioned in several other areas of the specifications as well. During the pre-bid walkthrough it was mentioned that the digester tanks have largely sat idle over the last two years. With sludge sitting that long there is a chance it has started to go septic which makes it much more difficult to dewater. Although many sludges can be dewatered to 20% solids or better some sludges cannot be. Please consider revising this statement to all sludge must pass paint-filter test (landfill requirement for disposal) prior to hauling and disposal?

- A3 - For clarification, the digesters have not say idle for the last two years. However, the primary digester mixing system has been inoperable for an extended period of time, but the digesters have been on-line and active, with sludge flowing through the tanks as part of Plant de-watering operations. The minimum 20% solids concentration is a NPDES permit requirement for the landfill, and will NOT be altered as a requirement for this project.

- Q4 - The project documents state the Contractor must provide testing for each truckload demonstrating a minimum solids concentration of 20% and submit these test results to the owner. Additionally, Contractor shall submit testing once per week from a verified third-party testing firm. The owner reserves the right to pull a sample at any point and perform independent testing for quality assurance. Please expand on the third-party testing requirement. Is the contractor to save samples from all loads through the week and submit all samples for the week to the 3rd party for testing, or is the contractor just to pick one load throughout the week to have tested by a 3rd party to compare 3rd party test results with contractor's for that single load? Please also confirm that these solids test results along with landfill scale weight tickets will be used to calculate dry tons for payment purposes.
- A4 -Correct, the results of the solids tests and the landfill scale weight tickets will be used to calculate dry tons, for determination of processing pay applications and quantities. The 3rd party testing is also for Quality Assurance purposes. This is to be a single, random sample, pulled once a week, from one load.

- Q5 - The project documents requires the contractor to drain and flush clean all connected sludge process piping. Can you please expand on what specific sludge process piping?
- A5 -This refers to the existing, permanent piping that constitutes interconnections between and the recirculation lines within the Primary and/or Secondary Digesters.

- Q6 - The project documents that the Wheeling WPCD will turn over to the Contractor the two (2) anaerobic digesters "AS IS" to the Contractor who shall be responsible for successfully completing all tasks required under this Contract. Can you clarify this note?
- A6 - Plant Operations will take the down the digesters, coordinate isolation and take the lead on proper venting prior to the commencement of cleaning operations. However, the Contractor(s) will be expected to complete their work regardless of any condition or operational issues ancillary digester components; i.e. valves, access hatches, etc.

- Q7 - The project documents requires that all trucks be equipped with a 3 MIL Black Roll Off Liner System. If Contractor can comply with all transport laws without the use of a liner system can the requirements for a liner system in each load be deleted?
- A7 - No, the liner system is needed to comply with City requirements for the transportation of sludge within the City limits. Additionally, the Landfill requires a liner system for sludge hauling. The noted liner system in the specifications in the liner WPCD utilizes within City trucks.

DB/LS:mep

Enclosures
H:\2021\210395\SPEC\06R Digester Cleaning & Valve Repl\Addenda\Addendum 01\Addendum 01.Docx

Anaerobic Digester Cleaning, Inspection, Repair, and Valve Replacement Pre-Bid Meeting Minutes

To: **Attendees**

Subject: ***City of Wheeling Anaerobic Digester Cleaning, Inspection, Repair, and Valve Replacement***

Date: **July 28, 2025**

The agenda for the Pre-bid Conference scheduled for July 28, 2025 at 10:00 a.m. at the City of Wheeling WPCD Conference Room is as follows:

- Sign-In Sheet (attached)
- Introductions
- Introduction of the Project
- Question and Answers – **Note all answers to question are only made final when documented by addendum.**
- Site Walkthrough

Project Overview: The project is a set of two projects executed through two separate contracts for Anaerobic Digester Cleaning, Inspection, Repair, and Valve Replacement

Sealed bids will be received by the City of Wheeling, WV at the office of the City Manager, 1500 Chapline Street, Wheeling, WV 26003 until **2:30 p.m. on August 7, 2025** and will be opened and read immediately thereafter.

Project includes but is not limited to:

Contract A: Anaerobic Digester Cleaning – Entails all work related to Draining, Cleaning, Dewatering, Hauling, and Disposing of biosolids from two Anaerobic Digesters with a combined Volume of 1.95 million Gallons. The estimated amount of Biosolids in the tank is 350 Dry Tons.

Contract B: Anaerobic Digester Repairs and Valve Replacement – This work entails the installation of 2 - 6” Insertion Valves, 1 - 24” Insertion Valve, 34 Plug Valves (4”-24”), 2 - 6” Check Valves, associated Piping Modifications, and the rehabilitation of 2 heat exchange pumps. In addition, there is a $400,000 allowance for Digester repairs. The extent of repairs is unknown

until each tank has been cleaned and inspected. Upon which a report of recommended repairs will be given and a RFQ will be issued.

Contract Coordination: Refer to Spec 011100 1.2.C Sequence of Work.

Discussion:

NOTE: Final questions are due no later than Close of business the Monday before the Bid Opening as to officially document in an addendum.

CLARIFICATION: Project is locally funded. No prevailing wages or otherwise are necessary.

CLARIFICATION: There is no limit on how much dewatered solids is permitted at the landfill each day. However, coordination with the Landfill as described in SPEC 467345 is still required.

Q1: Have the materials specified for removal been tested at any time over the previous 10 years for PFAS / PFOA or other harmful chemical Components? If so, would the City be willing to share the results of these test results?

A1: PFAS/PFOA results are attached.

Q2: Does the City have any plans to test the materials specified in the agreement to be removed for PFAS /PFOA or other harmful chemicals during the duration of the contractual agreement term?

A2: WPCD has scheduled testing every 6 months for PFAS/PFOA. Scheduled testing may take place during the contract period.

Q3: Is more information available regarding the location and size of access hatches through the Primary and Secondary Digester covers?

A3: Historic roof plans and details are attached for reference.

Q4: Will the Contractor be required to maintain an Office Trailer at the project site, per Specification Section 015213?

A4: No, it is at the Contractor's discretion whether they maintain an Office Trailer, and if the Office Trailer is located at the project site. However, the Contractor will be expected to maintain and protect a set of Contract Documents, and related documents, at the project site.

Q5: Will the Contractor have access to City water for use during the project to support construction activities?

A5: Yes, City water is available from a hydrant designated by the City. The Contractor will be required to contact the City Billing Department to set-up an account. Once an account is established, the City will place a temporary meter set at the designated location. There will be a $50.00 for the temporary meter, and the Contractor will be charged the regular City of Wheeling Tariff Rate for water usage.

MEETING SIGN-IN: 210395 06R – ANAEROBIC DIGESTER CLEANING, INSPECTION, REPAIR, AND VALVE REPLACEMENT

DATE: Julu 28, 2025

NAME	COMPANY (REPRESENTING)	ADDRESS	CITY	ZIP	EMAIL ADDRESS
Lucas Skelly	Verdantas	2001 Main Street Suite 202	Wheeling, WV	26003	Lskelly@Verdantas.com
Eric Fallon	Verdantas	2001 Main Street Suite 202	Wheeling, WV	26003	Efallon@verdantas.com
Andy Harris	Wheeling WPCD	2516 Main Street	Wheeling, WV	26003	AHarris@wheelingwv.gov
Mike Chiazza	Wheeling WPCD	2516 Main Street	Wheeling, WV	26003	MChiazza@wheelingwv.gov
Pete Wiggins	Wheeling WPCD	2516 Main Street	Wheeling, WV	26003	Pete.Wiggins@wheelingwv.gov
Ryan Wenger	Synagro	PO Box 230	Fredericktown, OH	43019	RWenger@synagro.com
Bryan Burch	Synagro	PO Box 230	Fredericktown, OH	43019	BBurch@synagro.com
Chip Rosemberg	MSS/Grade8	1505 Berlin Plank Rd	Somerset, PA	15501	Info@MSolidss.com
Melanie Robert	American Process Group	1201 Pacific Ave	Tacoma, WA	98402	Mrobert@amprocessgroup.com
Lucas Elliott	TS Elliott Contracting	392 Pettit Heights	Wellsburg, WV	26070	Lucas.elliott96@gmail.com
Jordan Gard	Merrell Bros	8811 W 500 N	Kokomo, IN	46901	Jordan.Gard@MerrellBros.com
Scott Antonik	Grae-Con Construction	880 Kingsdale Rd	Stuebenville, OH	43952	SAntonik@graecon.com
Michael Gianni	James White Construction Company	4156 Freedom Way	Weirton, WV	26062	MGianni@jameswhiteconstruction.com

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

July 31, 2024

David Watkins
Wheeling Water Treatment
1551 Richland Avenue
Wheeling, WV 26003

Project Location: 2516 Main St
Client Job Number:
Project Number: [none]
Laboratory Work Order Number: 24G1301

Enclosed are results of analyses for samples as received by the laboratory on July 10, 2024. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

William A. Scott
Project Manager

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Wheeling Water Treatment
1551 Richland Avenue
Wheeling, WV 26003
ATTN: David Watkins

REPORT DATE: 7/31/2024

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 24G1301

The results of analyses performed on the following samples submitted to CON-TEST, a Pace Analytical Laboratory, are found in this report.

PROJECT LOCATION: 2516 Main St

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
WPCD Biosolids	24G1301-01	Biosolids		Draft Method 1633 SM 2540G	
WPCD Influent	24G1301-02	Waste Water		Draft Method 1633	

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CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Draft Method 1633

Qualifications:

D-03

Sample diluted pre-extraction due to elevated TSS pre-analysis result.

Analyte & Samples(s) Qualified:

24G1301-02RE1[WPCD Influent]

L-01

Laboratory fortified blank/laboratory control sample recovery outside of control limits. Data validation is not affected since all results are "not detected" for all samples in this batch for this compound and bias is on the high side.

Analyte & Samples(s) Qualified:

4,8-Dioxa-3H-perfluorononanoic acid (ADONA)
B380846-BS1

Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)
B380846-BS1

L-05

Laboratory fortified blank/laboratory control sample recovery is outside of control limits. Reported value for this compound is likely to be biased on the high side.

Analyte & Samples(s) Qualified:

N-MeFOSAA (NMeFOSAA)
24G1301-02RE1[WPCD Influent], B380846-MRL1

PF-17

Extracted Internal Standard recovery is outside of control limits. Data is not significantly affected since associated analyte is not detected and bias is on the high side.

Analyte & Samples(s) Qualified:

D7-NMeFOSE
S107997-CCB2

D9-NEtFOSE
S107997-CCB2

N-ethylperfluorooctanesulfonamidoethanol (NEtFO
S107997-CCB2

N-methylperfluorooctanesulfonamidoethanol(NMeF
S107997-CCB2

PF-17C

Extracted internal standard is outside of control limits. Analyte is a known difficult compound.

Analyte & Samples(s) Qualified:

13C2-4:2FTS
B381163-BLK1

1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2FT
B381163-BLK1

PF-18

Re-analysis confirmed Extracted Internal Standard failure due to matrix effects.

Analyte & Samples(s) Qualified:

13C4-PFBA
24G1301-01[WPCD Biosolids]

D5-NEtFOSA
24G1301-01[WPCD Biosolids]

N-ethyl perfluorooctanesulfonamide (NEtFOSA)
24G1301-01[WPCD Biosolids]

Perfluorobutanoic acid (PFBA)
24G1301-01[WPCD Biosolids]

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

PF-22

Qualifier ion ratio >150% of associated calibration. Detection is suspect.

Analyte & Samples(s) Qualified:

Perfluorohexanoic acid (PFHxA)
24G1301-01[WPCD Biosolids]

Perfluoropentanoic acid (PFPeA)
24G1301-02RE1[WPCD Influent]

Perfluorotridecanoic acid (PFTrDA)
24G1301-01[WPCD Biosolids]

PF-23

Qualifier ion ratio <50% of associated calibration. Detection is suspect.

Analyte & Samples(s) Qualified:

Perfluorononanoic acid (PFNA)
24G1301-02RE1[WPCD Influent]

Perfluoropentanesulfonic acid (PFPeS)
24G1301-01[WPCD Biosolids]

S-29

Extracted Internal Standard is outside of control limits.

Analyte & Samples(s) Qualified:

D7-NMeFOSE
S107997-CCV2, S107997-CCV3

D9-NEtFOSE
24G1301-01[WPCD Biosolids], S107997-CCV2, S107997-CCV3, S108220-CCV3

N-ethylperfluorooctanesulfonamidoethanol (NEtFO
24G1301-01[WPCD Biosolids], S107997-CCV2, S107997-CCV3

N-methylperfluorooctanesulfonamidoethanol(NMeF
S107997-CCV2, S107997-CCV3

V-20

Continuing calibration verification (CCV) did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

Analyte & Samples(s) Qualified:

11Cl-PF3OUdS (F53B Major)
S107997-CCV2, S107997-CCV3

SM 2540G

Qualifications:

H-06

Sample was extracted past the recommended holding time.

Analyte & Samples(s) Qualified:

% Solids
24G1301-01[WPCD Biosolids]

The results of analyses reported only relate to samples submitted to Con-Test, a Pace Analytical Laboratory, for testing.
I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

Lisa A. Worthington
Technical Representative

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: 2516 Main St | Sample Description: | Work Order: 24G1301

Date Received: 7/10/2024

Field Sample #: WPCD Biosolids | Sampled: 7/9/2024 14:05

Sample ID: 24G1301-01

Sample Matrix: Biosolids

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	ND	7.8	3.1	µg/kg dry	1	PF-18	Draft Method 1633	7/23/24	7/25/24 6:03	AMS
Perfluoropentanoic acid (PFPeA)	ND	3.9	0.44	µg/kg dry	1		Draft Method 1633	7/23/24	7/25/24 6:03	AMS
Perfluorohexanoic acid (PFHxA)	0.36	1.9	0.32	µg/kg dry	1	PF-22, J	Draft Method 1633	7/23/24	7/25/24 6:03	AMS
Perfluoroheptanoic acid (PFHpA)	ND	1.9	0.14	µg/kg dry	1		Draft Method 1633	7/23/24	7/25/24 6:03	AMS
Perfluorooctanoic acid (PFOA)	0.57	1.9	0.30	µg/kg dry	1	J	Draft Method 1633	7/23/24	7/25/24 6:03	AMS
Perfluorononanoic acid (PFNA)	ND	1.9	0.13	µg/kg dry	1		Draft Method 1633	7/23/24	7/25/24 6:03	AMS
Perfluorodecanoic acid (PFDA)	0.91	1.9	0.17	µg/kg dry	1	J	Draft Method 1633	7/23/24	7/25/24 6:03	AMS
Perfluoroundecanoic acid (PFUnA)	ND	1.9	0.23	µg/kg dry	1		Draft Method 1633	7/23/24	7/25/24 6:03	AMS
Perfluorododecanoic acid (PFDoA)	1.0	1.9	0.21	µg/kg dry	1	J	Draft Method 1633	7/23/24	7/25/24 6:03	AMS
Perfluorotridecanoic acid (PFTrDA)	0.33	1.9	0.21	µg/kg dry	1	PF-22, J	Draft Method 1633	7/23/24	7/25/24 6:03	AMS
Perfluorotetradecanoic acid (PFTeDA)	0.41	1.9	0.20	µg/kg dry	1	J	Draft Method 1633	7/23/24	7/25/24 6:03	AMS
Perfluorobutanesulfonic acid (PFBS)	ND	1.9	0.20	µg/kg dry	1		Draft Method 1633	7/23/24	7/25/24 6:03	AMS
Perfluoropentanesulfonic acid (PFPeS)	1.0	1.9	0.25	µg/kg dry	1	PF-23, J	Draft Method 1633	7/23/24	7/25/24 6:03	AMS
Perfluorohexanesulfonic acid (PFHxS)	ND	1.9	0.76	µg/kg dry	1		Draft Method 1633	7/23/24	7/25/24 6:03	AMS
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.9	0.21	µg/kg dry	1		Draft Method 1633	7/23/24	7/25/24 6:03	AMS
Perfluorooctanesulfonic acid (PFOS)	ND	1.9	0.31	µg/kg dry	1		Draft Method 1633	7/23/24	7/25/24 6:03	AMS
Perfluorononanesulfonic acid (PFNS)	ND	1.9	0.21	µg/kg dry	1		Draft Method 1633	7/23/24	7/25/24 6:03	AMS
Perfluorodecanesulfonic acid (PFDS)	ND	1.9	0.31	µg/kg dry	1		Draft Method 1633	7/23/24	7/25/24 6:03	AMS
Perfluorododecanesulfonic acid (PFDoS)	ND	1.9	0.30	µg/kg dry	1		Draft Method 1633	7/23/24	7/25/24 6:03	AMS
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2FTS)	ND	7.8	0.68	µg/kg dry	1		Draft Method 1633	7/23/24	7/25/24 6:03	AMS
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2FTS)	ND	7.8	4.9	µg/kg dry	1		Draft Method 1633	7/23/24	7/25/24 6:03	AMS
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2FTS)	ND	7.8	0.90	µg/kg dry	1		Draft Method 1633	7/23/24	7/25/24 6:03	AMS
Perfluorooctanesulfonamide (PFOSA)	0.79	1.9	0.30	µg/kg dry	1	J	Draft Method 1633	7/23/24	7/25/24 6:03	AMS
N-methyl perfluoroocatnesulfonamide (NMeFOSA)	ND	1.9	0.24	µg/kg dry	1		Draft Method 1633	7/23/24	7/25/24 6:03	AMS
N-ethyl perfluorooctanesulfonamide (NEtFOSA)	ND	1.9	0.23	µg/kg dry	1	PF-18	Draft Method 1633	7/23/24	7/25/24 6:03	AMS
N-MeFOSAA (NMeFOSAA)	4.4	1.9	0.35	µg/kg dry	1		Draft Method 1633	7/23/24	7/25/24 6:03	AMS
N-EtFOSAA (NEtFOSAA)	3.0	1.9	0.29	µg/kg dry	1		Draft Method 1633	7/23/24	7/25/24 6:03	AMS
N-methylperfluorooctanesulfonamidoethanol(NMeFOSE)	7.9	19	2.1	µg/kg dry	1	J	Draft Method 1633	7/23/24	7/25/24 6:03	AMS
N-ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	ND	19	2.1	µg/kg dry	1	S-29	Draft Method 1633	7/23/24	7/25/24 6:03	AMS
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	7.8	0.50	µg/kg dry	1		Draft Method 1633	7/23/24	7/25/24 6:03	AMS
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	7.8	0.58	µg/kg dry	1		Draft Method 1633	7/23/24	7/25/24 6:03	AMS
9Cl-PF3ONS (F53B Minor)	ND	7.8	0.56	µg/kg dry	1		Draft Method 1633	7/23/24	7/25/24 6:03	AMS
11Cl-PF3OUdS (F53B Major)	ND	7.8	0.86	µg/kg dry	1		Draft Method 1633	7/23/24	7/25/24 6:03	AMS
3-Perfluoropropyl propanoic acid (FPrPA) (3:3FTCA)	ND	19	1.8	µg/kg dry	1		Draft Method 1633	7/23/24	7/25/24 6:03	AMS
2H,2H,3H,3H-Perfluorooctanoic acid(FPePA)(5:3FTCA)	15	97	13	µg/kg dry	1	J	Draft Method 1633	7/23/24	7/25/24 6:03	AMS
3-Perfluoroheptyl propanoic acid (FHpPA) (7:3FTCA)	ND	97	15	µg/kg dry	1		Draft Method 1633	7/23/24	7/25/24 6:03	AMS
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	ND	3.9	0.31	µg/kg dry	1		Draft Method 1633	7/23/24	7/25/24 6:03	AMS
Perfluoro-3-methoxypropanoic acid (PFMPA)	ND	3.9	0.32	µg/kg dry	1		Draft Method 1633	7/23/24	7/25/24 6:03	AMS

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Project Location: 2516 Main St | Sample Description: | Work Order: 24G1301

Date Received: 7/10/2024

Field Sample #: WPCD Biosolids | Sampled: 7/9/2024 14:05

Sample ID: 24G1301-01

Sample Matrix: Biosolids

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluoro-4-methoxybutanoic acid (PFMBA)	ND	3.9	0.32	µg/kg dry	1		Draft Method 1633	7/23/24	7/25/24 6:03	AMS
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	3.9	0.59	µg/kg dry	1		Draft Method 1633	7/23/24	7/25/24 6:03	AMS

Surrogates	% Recovery		Recovery Limits	Flag/Qual	
13C4-PFBA	**2.25**	*	10-130	PF-18	7/25/24 6:03
13C5-PFPeA	40.5		35-150		7/25/24 6:03
13C5-PFHxA	68.5		55-150		7/25/24 6:03
13C4-PFHpA	74.7		55-150		7/25/24 6:03
13C8-PFOA	72.9		60-140		7/25/24 6:03
13C9-PFNA	70.7		55-140		7/25/24 6:03
13C6-PFDA	75.1		50-140		7/25/24 6:03
13C7-PFUnA	59.7		30-140		7/25/24 6:03
13C2-PFDoA	75.5		10-150		7/25/24 6:03
13C2-PFTeDA	75.5		10-130		7/25/24 6:03
13C3-PFBS	71.1		55-150		7/25/24 6:03
13C3-PFHxS	72.6		55-150		7/25/24 6:03
13C8-PFOS	71.1		45-150		7/25/24 6:03
13C2-4:2FTS	86.5		60-200		7/25/24 6:03
13C2-6:2FTS	143		60-200		7/25/24 6:03
13C2-8:2FTS	152		50-200		7/25/24 6:03
13C8-PFOSA	74.6		30-130		7/25/24 6:03
D3-NMeFOSA	15.8		15-130		7/25/24 6:03
D5-NEtFOSA	**6.67**	*	10-130	PF-18	7/25/24 6:03
D3-NMeFOSAA	57.4		45-200		7/25/24 6:03
D5-NEtFOSAA	34.0		10-200		7/25/24 6:03
D7-NMeFOSE	13.9		10-150		7/25/24 6:03
D9-NEtFOSE	**8.00**	*	10-150	S-29	7/25/24 6:03
13C3-HFPO-DA	67.4		25-160		7/25/24 6:03

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Project Location: 2516 Main St | Sample Description: | Work Order: 24G1301

Date Received: 7/10/2024

Field Sample #: WPCD Biosolids | Sampled: 7/9/2024 14:05

Sample ID: 24G1301-01

Sample Matrix: Biosolids

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	27.5		% Wt	1	H-06	SM 2540G	7/19/24	7/19/24 11:06	DML

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Project Location: 2516 Main St | Sample Description: | Work Order: 24G1301

Date Received: 7/10/2024

Field Sample #: WPCD Influent | Sampled: 7/9/2024 12:45

Sample ID: 24G1301-02

Sample Matrix: Waste Water

Sample Flags: D-03

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	ND	40	22	ng/L	1		Draft Method 1633	7/30/24	7/30/24 19:48	AB
Perfluoropentanoic acid (PFPeA)	12	20	4.3	ng/L	1	PF-22, J	Draft Method 1633	7/30/24	7/30/24 19:48	AB
Perfluorohexanoic acid (PFHxA)	27	10	2.4	ng/L	1		Draft Method 1633	7/30/24	7/30/24 19:48	AB
Perfluoroheptanoic acid (PFHpA)	4.0	10	2.7	ng/L	1	J	Draft Method 1633	7/30/24	7/30/24 19:48	AB
Perfluorooctanoic acid (PFOA)	9.4	10	2.6	ng/L	1	J	Draft Method 1633	7/30/24	7/30/24 19:48	AB
Perfluorononanoic acid (PFNA)	3.0	10	1.9	ng/L	1	PF-23, J	Draft Method 1633	7/30/24	7/30/24 19:48	AB
Perfluorodecanoic acid (PFDA)	ND	10	2.1	ng/L	1		Draft Method 1633	7/30/24	7/30/24 19:48	AB
Perfluoroundecanoic acid (PFUnA)	ND	10	2.0	ng/L	1		Draft Method 1633	7/30/24	7/30/24 19:48	AB
Perfluorododecanoic acid (PFDoA)	ND	10	2.0	ng/L	1		Draft Method 1633	7/30/24	7/30/24 19:48	AB
Perfluorotridecanoic acid (PFTrDA)	ND	10	3.0	ng/L	1		Draft Method 1633	7/30/24	7/30/24 19:48	AB
Perfluorotetradecanoic acid (PFTeDA)	ND	10	2.6	ng/L	1		Draft Method 1633	7/30/24	7/30/24 19:48	AB
Perfluorobutanesulfonic acid (PFBS)	31	10	2.1	ng/L	1		Draft Method 1633	7/30/24	7/30/24 19:48	AB
Perfluoropentanesulfonic acid (PFPeS)	ND	10	2.6	ng/L	1		Draft Method 1633	7/30/24	7/30/24 19:48	AB
Perfluorohexanesulfonic acid (PFHxS)	10	10	2.8	ng/L	1		Draft Method 1633	7/30/24	7/30/24 19:48	AB
Perfluoroheptanesulfonic acid (PFHpS)	ND	10	3.3	ng/L	1		Draft Method 1633	7/30/24	7/30/24 19:48	AB
Perfluorooctanesulfonic acid (PFOS)	6.1	10	3.8	ng/L	1	J	Draft Method 1633	7/30/24	7/30/24 19:48	AB
Perfluorononanesulfonic acid (PFNS)	ND	10	2.5	ng/L	1		Draft Method 1633	7/30/24	7/30/24 19:48	AB
Perfluorodecanesulfonic acid (PFDS)	ND	10	2.9	ng/L	1		Draft Method 1633	7/30/24	7/30/24 19:48	AB
Perfluorododecanesulfonic acid (PFDoS)	ND	10	2.9	ng/L	1		Draft Method 1633	7/30/24	7/30/24 19:48	AB
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2FTS)	ND	40	7.5	ng/L	1		Draft Method 1633	7/30/24	7/30/24 19:48	AB
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2FTS)	ND	40	30	ng/L	1		Draft Method 1633	7/30/24	7/30/24 19:48	AB
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2FTS)	ND	40	11	ng/L	1		Draft Method 1633	7/30/24	7/30/24 19:48	AB
Perfluorooctanesulfonamide (PFOSA)	ND	10	2.3	ng/L	1		Draft Method 1633	7/30/24	7/30/24 19:48	AB
N-methyl perfluoroocatnesulfonamide (NMeFOSA)	ND	10	3.3	ng/L	1		Draft Method 1633	7/30/24	7/30/24 19:48	AB
N-ethyl perfluorooctanesulfonamide (NEtFOSA)	ND	10	3.4	ng/L	1		Draft Method 1633	7/30/24	7/30/24 19:48	AB
N-MeFOSAA (NMeFOSAA)	3.9	10	3.6	ng/L	1	L-05, J	Draft Method 1633	7/30/24	7/30/24 19:48	AB
N-EtFOSAA (NEtFOSAA)	ND	10	4.0	ng/L	1		Draft Method 1633	7/30/24	7/30/24 19:48	AB
N-methylperfluorooctanesulfonamidoethanol(NMeFOSE)	ND	100	27	ng/L	1		Draft Method 1633	7/30/24	7/30/24 19:48	AB
N-ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	ND	100	27	ng/L	1		Draft Method 1633	7/30/24	7/30/24 19:48	AB
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	40	10	ng/L	1		Draft Method 1633	7/30/24	7/30/24 19:48	AB
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	40	8.2	ng/L	1		Draft Method 1633	7/30/24	7/30/24 19:48	AB
9Cl-PF3ONS (F53B Minor)	ND	40	9.6	ng/L	1		Draft Method 1633	7/30/24	7/30/24 19:48	AB
11Cl-PF3OUdS (F53B Major)	ND	40	11	ng/L	1		Draft Method 1633	7/30/24	7/30/24 19:48	AB
3-Perfluoropropyl propanoic acid (FPrPA) (3:3FTCA)	ND	100	22	ng/L	1		Draft Method 1633	7/30/24	7/30/24 19:48	AB
2H,2H,3H,3H-Perfluorooctanoic acid(FPePA)(5:3FTCA)	ND	500	110	ng/L	1		Draft Method 1633	7/30/24	7/30/24 19:48	AB
3-Perfluoroheptyl propanoic acid (FHpPA) (7:3FTCA)	ND	500	95	ng/L	1		Draft Method 1633	7/30/24	7/30/24 19:48	AB
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	ND	20	3.5	ng/L	1		Draft Method 1633	7/30/24	7/30/24 19:48	AB
Perfluoro-3-methoxypropanoic acid (PFMPA)	ND	20	5.6	ng/L	1		Draft Method 1633	7/30/24	7/30/24 19:48	AB

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Project Location: 2516 Main St | Sample Description: | Work Order: 24G1301

Date Received: 7/10/2024

Field Sample #: WPCD Influent | Sampled: 7/9/2024 12:45

Sample ID: 24G1301-02

Sample Matrix: Waste Water

Sample Flags: D-03

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluoro-4-methoxybutanoic acid (PFMBA)	ND	20	5.4	ng/L	1		Draft Method 1633	7/30/24	7/30/24 19:48	AB
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	20	5.5	ng/L	1		Draft Method 1633	7/30/24	7/30/24 19:48	AB

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
13C4-PFBA	69.3	10-130		7/30/24 19:48
13C5-PFPeA	75.0	35-150		7/30/24 19:48
13C5-PFHxA	68.8	55-150		7/30/24 19:48
13C4-PFHpA	75.6	55-150		7/30/24 19:48
13C8-PFOA	71.4	60-140		7/30/24 19:48
13C9-PFNA	69.0	55-140		7/30/24 19:48
13C6-PFDA	63.7	50-140		7/30/24 19:48
13C7-PFUnA	59.4	30-140		7/30/24 19:48
13C2-PFDoA	54.0	10-150		7/30/24 19:48
13C2-PFTeDA	38.9	10-130		7/30/24 19:48
13C3-PFBS	66.7	55-150		7/30/24 19:48
13C3-PFHxS	68.8	55-150		7/30/24 19:48
13C8-PFOS	66.9	45-140		7/30/24 19:48
13C2-4:2FTS	188	60-200		7/30/24 19:48
13C2-6:2FTS	181	60-200		7/30/24 19:48
13C2-8:2FTS	121	50-200		7/30/24 19:48
13C8-PFOSA	63.4	30-130		7/30/24 19:48
D3-NMeFOSA	42.3	15-130		7/30/24 19:48
D5-NEtFOSA	41.1	10-130		7/30/24 19:48
D3-NMeFOSAA	59.1	45-200		7/30/24 19:48
D5-NEtFOSAA	61.4	10-200		7/30/24 19:48
D7-NMeFOSE	33.8	10-150		7/30/24 19:48
D9-NEtFOSE	23.2	10-150		7/30/24 19:48
13C3-HFPO-DA	54.8	25-160		7/30/24 19:48

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Project Location: 2516 Main St | Sample Description: | Work Order: 24G1301

Date Received: 7/10/2024

Field Sample #: WPCD Influent | Sampled: 7/9/2024 12:45

Sample ID: 24G1301-02

Sample Matrix: Waste Water

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Total Suspended Solids	590	10	mg/L	1		Draft Method 1633	7/11/24	7/11/24 13:17	LL

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Sample Extraction Data

Prep Method:Draft Method 1633 **Analytical Method:Draft Method 1633**

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
24G1301-01 [WPCD Biosolids]	B380245	1.87	5.00	07/23/24

Draft Method 1633

Lab Number [Field ID]	Batch	Initial [mL]	Date
24G1301-02 [WPCD Influent]	B379734	50.0	07/11/24

Prep Method:Draft Method 1633 **Analytical Method:Draft Method 1633** **Leachates were extracted on 7/11/2024 per NO PREP in Batch B379734**

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
24G1301-02RE1 [WPCD Influent]	B380846	50.0	5.00	07/30/24

Prep Method:% Solids **Analytical Method:SM 2540G**

Lab Number [Field ID]	Batch	Date
24G1301-01 [WPCD Biosolids]	B380561	07/19/24

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QUALITY CONTROL

Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B380115 - Draft Method 1633										
Blank (B380115-BLK1)				Prepared & Analyzed: 07/22/24						
Perfluorobutanoic acid (PFBA)	ND	3.9	ng/L							
Perfluoropentanoic acid (PFPeA)	ND	2.0	ng/L							
Perfluorohexanoic acid (PFHxA)	ND	0.98	ng/L							
Perfluoroheptanoic acid (PFHpA)	ND	0.98	ng/L							
Perfluorooctanoic acid (PFOA)	ND	0.98	ng/L							
Perfluorononanoic acid (PFNA)	ND	0.98	ng/L							
Perfluorodecanoic acid (PFDA)	ND	0.98	ng/L							
Perfluoroundecanoic acid (PFUnA)	ND	0.98	ng/L							
Perfluorododecanoic acid (PFDoA)	ND	0.98	ng/L							
Perfluorotridecanoic acid (PFTrDA)	ND	0.98	ng/L							
Perfluorotetradecanoic acid (PFTeDA)	ND	0.98	ng/L							
Perfluorobutanesulfonic acid (PFBS)	ND	0.98	ng/L							
Perfluoropentanesulfonic acid (PFPeS)	ND	0.98	ng/L							
Perfluorohexanesulfonic acid (PFHxS)	ND	0.98	ng/L							
Perfluoroheptanesulfonic acid (PFHpS)	ND	0.98	ng/L							
Perfluorooctanesulfonic acid (PFOS)	ND	0.98	ng/L							
Perfluorononanesulfonic acid (PFNS)	ND	0.98	ng/L							
Perfluorodecanesulfonic acid (PFDS)	ND	0.98	ng/L							
Perfluorododecanesulfonic acid (PFDoS)	ND	0.98	ng/L							
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2FTS)	ND	3.9	ng/L							
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2FTS)	ND	3.9	ng/L							
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2FTS)	ND	3.9	ng/L							
Perfluorooctanesulfonamide (PFOSA)	ND	0.98	ng/L							
N-methyl perfluoroocatnesulfonamide (NMeFOSA)	ND	0.98	ng/L							
N-ethyl perfluorooctanesulfonamide (NEtFOSA)	ND	0.98	ng/L							
N-MeFOSAA (NMeFOSAA)	ND	0.98	ng/L							
N-EtFOSAA (NEtFOSAA)	ND	0.98	ng/L							
N-methylperfluorooctanesulfonamidoethanol(NMeFOSE)	ND	9.8	ng/L							
N-ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	ND	9.8	ng/L							
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	3.9	ng/L							
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	3.9	ng/L							
9Cl-PF3ONS (F53B Minor)	ND	3.9	ng/L							
11Cl-PF3OUdS (F53B Major)	ND	3.9	ng/L							
3-Perfluoropropyl propanoic acid (FPrPA) (3:3FTCA)	ND	9.8	ng/L							
2H,2H,3H,3H-Perfluorooctanoic acid(FPePA)(5:3FTCA)	ND	49	ng/L							
3-Perfluoroheptyl propanoic acid (FHpPA) (7:3FTCA)	ND	49	ng/L							
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	ND	2.0	ng/L							
Perfluoro-3-methoxypropanoic acid (PFMPA)	ND	2.0	ng/L							
Perfluoro-4-methoxybutanoic acid (PFMBA)	ND	2.0	ng/L							
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	2.0	ng/L							
Surrogate: 13C4-PFBA	*69.7*		ng/L	97.5		71.5	10-130			

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QUALITY CONTROL

Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B380115 - Draft Method 1633										
Blank (B380115-BLK1)				Prepared & Analyzed: 07/22/24						
Surrogate: 13C5-PFPeA	*34.3*		ng/L	48.8		70.2	35-150			
Surrogate: 13C5-PFHxA	*17.3*		ng/L	24.4		70.8	55-150			
Surrogate: 13C4-PFHpA	*18.0*		ng/L	24.4		73.8	55-150			
Surrogate: 13C8-PFOA	*17.7*		ng/L	24.4		72.6	60-140			
Surrogate: 13C9-PFNA	*8.44*		ng/L	12.2		69.2	55-140			
Surrogate: 13C6-PFDA	*8.68*		ng/L	12.2		71.2	50-140			
Surrogate: 13C7-PFUnA	*8.06*		ng/L	12.2		66.1	30-140			
Surrogate: 13C2-PFDoA	*8.35*		ng/L	12.2		68.5	10-150			
Surrogate: 13C2-PFTeDA	*7.87*		ng/L	12.2		64.5	10-130			
Surrogate: 13C3-PFBS	*17.8*		ng/L	24.4		72.9	55-150			
Surrogate: 13C3-PFHxS	*16.9*		ng/L	24.4		69.4	55-150			
Surrogate: 13C8-PFOS	*17.5*		ng/L	24.4		71.7	45-140			
Surrogate: 13C2-4:2FTS	*32.4*		ng/L	48.8		66.5	60-200			
Surrogate: 13C2-6:2FTS	*32.9*		ng/L	48.8		67.4	60-200			
Surrogate: 13C2-8:2FTS	*32.0*		ng/L	48.8		65.6	50-200			
Surrogate: 13C8-PFOSA	*17.4*		ng/L	24.4		71.3	30-130			
Surrogate: D3-NMeFOSA	*14.3*		ng/L	24.4		58.7	15-130			
Surrogate: D5-NEtFOSA	*15.4*		ng/L	24.4		63.0	10-130			
Surrogate: D3-NMeFOSAA	*31.9*		ng/L	48.8		65.5	45-200			
Surrogate: D5-NEtFOSAA	*33.3*		ng/L	48.8		68.3	10-200			
Surrogate: D7-NMeFOSE	*165*		ng/L	244		67.6	10-150			
Surrogate: D9-NEtFOSE	*167*		ng/L	244		68.5	10-150			
Surrogate: 13C3-HFPO-DA	*62.6*		ng/L	97.5		64.2	25-160			
LCS (B380115-BS1)				Prepared & Analyzed: 07/22/24						
Perfluorobutanoic acid (PFBA)	104	3.9	ng/L	94.8		109	58-148			
Perfluoropentanoic acid (PFPeA)	52.6	2.0	ng/L	47.4		111	54-152			
Perfluorohexanoic acid (PFHxA)	26.0	0.99	ng/L	23.7		110	55-152			
Perfluoroheptanoic acid (PFHpA)	25.0	0.99	ng/L	23.7		106	54-154			
Perfluorooctanoic acid (PFOA)	24.1	0.99	ng/L	23.7		102	52-161			
Perfluorononanoic acid (PFNA)	25.2	0.99	ng/L	23.7		106	59-149			
Perfluorodecanoic acid (PFDA)	25.9	0.99	ng/L	23.7		109	52-147			
Perfluoroundecanoic acid (PFUnA)	26.4	0.99	ng/L	23.7		111	48-159			
Perfluorododecanoic acid (PFDoA)	26.3	0.99	ng/L	23.7		111	64-142			
Perfluorotridecanoic acid (PFTrDA)	26.2	0.99	ng/L	23.7		111	49-148			
Perfluorotetradecanoic acid (PFTeDA)	26.8	0.99	ng/L	23.7		113	47-161			
Perfluorobutanesulfonic acid (PFBS)	23.1	0.99	ng/L	21.0		110	62-144			
Perfluoropentanesulfonic acid (PFPeS)	23.6	0.99	ng/L	22.3		106	59-151			
Perfluorohexanesulfonic acid (PFHxS)	23.2	0.99	ng/L	21.7		107	57-146			
Perfluoroheptanesulfonic acid (PFHpS)	24.2	0.99	ng/L	22.6		107	55-152			
Perfluorooctanesulfonic acid (PFOS)	22.7	0.99	ng/L	22.0		103	58-149			
Perfluorononanesulfonic acid (PFNS)	24.7	0.99	ng/L	22.8		108	52-148			
Perfluorodecanesulfonic acid (PFDS)	24.2	0.99	ng/L	22.9		106	51-147			
Perfluorododecanesulfonic acid (PFDoS)	23.4	0.99	ng/L	23.0		102	36-145			
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2FTS)	98.7	3.9	ng/L	88.9		111	67-146			
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2FTS)	108	3.9	ng/L	90.1		119	61-151			
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2FTS)	99.9	3.9	ng/L	91.2		109	63-152			
Perfluorooctanesulfonamide (PFOSA)	25.8	0.99	ng/L	23.7		109	61-148			
N-methyl perfluoroocatnesulfonamide (NMeFOSA)	25.7	0.99	ng/L	23.7		108	63-145			

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QUALITY CONTROL

Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B380115 - Draft Method 1633										
LCS (B380115-BS1)				Prepared & Analyzed: 07/22/24						
N-ethyl perfluorooctanesulfonamide (NEtFOSA)	25.3	0.99	ng/L	23.7		107	65-139			
N-MeFOSAA (NMeFOSAA)	24.3	0.99	ng/L	23.7		103	58-144			
N-EtFOSAA (NEtFOSAA)	25.3	0.99	ng/L	23.7		107	59-146			
N-methylperfluorooctanesulfonamidoethanol(NMeFOSE)	256	9.9	ng/L	237		108	71-136			
N-ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	260	9.9	ng/L	237		110	69-137			
Hexafluoropropylene oxide dimer acid (HFPO-DA)	97.4	3.9	ng/L	94.8		103	63-144			
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	99.5	3.9	ng/L	89.5		111	68-146			
9Cl-PF3ONS (F53B Minor)	102	3.9	ng/L	88.9		115	56-156			
11Cl-PF3OUdS (F53B Major)	100	3.9	ng/L	89.5		112	46-156			
3-Perfluoropropyl propanoic acid (FPrPA) (3:3FTCA)	257	9.9	ng/L	237		108	62-129			
2H,2H,3H,3H-Perfluorooctanoic acid(FPePA)(5:3FTCA)	1190	49	ng/L	1180		101	63-134			
3-Perfluoroheptyl propanoic acid (FHpPA) (7:3FTCA)	1190	49	ng/L	1180		100	50-138			
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	48.6	2.0	ng/L	42.2		115	56-151			
Perfluoro-3-methoxypropanoic acid (PFMPA)	52.5	2.0	ng/L	47.4		111	51-145			
Perfluoro-4-methoxybutanoic acid (PFMBA)	54.6	2.0	ng/L	47.4		115	55-148			
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	50.1	2.0	ng/L	47.4		106	48-161			
Surrogate: 13C4-PFBA	*66.7*		ng/L	98.7		67.6	10-130			
Surrogate: 13C5-PFPeA	*32.2*		ng/L	49.4		65.2	35-150			
Surrogate: 13C5-PFHxA	*16.5*		ng/L	24.7		66.7	55-150			
Surrogate: 13C4-PFHpA	*17.2*		ng/L	24.7		69.5	55-150			
Surrogate: 13C8-PFOA	*17.5*		ng/L	24.7		71.0	60-140			
Surrogate: 13C9-PFNA	*8.37*		ng/L	12.3		67.8	55-140			
Surrogate: 13C6-PFDA	*8.17*		ng/L	12.3		66.2	50-140			
Surrogate: 13C7-PFUnA	*7.91*		ng/L	12.3		64.1	30-140			
Surrogate: 13C2-PFDoA	*7.54*		ng/L	12.3		61.1	10-150			
Surrogate: 13C2-PFTeDA	*7.40*		ng/L	12.3		59.9	10-130			
Surrogate: 13C3-PFBS	*17.3*		ng/L	24.7		70.0	55-150			
Surrogate: 13C3-PFHxS	*16.7*		ng/L	24.7		67.5	55-150			
Surrogate: 13C8-PFOS	*17.1*		ng/L	24.7		69.3	45-140			
Surrogate: 13C2-4:2FTS	*33.8*		ng/L	49.4		68.4	60-200			
Surrogate: 13C2-6:2FTS	*33.4*		ng/L	49.4		67.7	60-200			
Surrogate: 13C2-8:2FTS	*33.0*		ng/L	49.4		66.9	50-200			
Surrogate: 13C8-PFOSA	*16.2*		ng/L	24.7		65.8	30-130			
Surrogate: D3-NMeFOSA	*14.2*		ng/L	24.7		57.7	15-130			
Surrogate: D5-NEtFOSA	*15.8*		ng/L	24.7		64.0	10-130			
Surrogate: D3-NMeFOSAA	*34.1*		ng/L	49.4		69.2	45-200			
Surrogate: D5-NEtFOSAA	*32.3*		ng/L	49.4		65.5	10-200			
Surrogate: D7-NMeFOSE	*160*		ng/L	247		64.9	10-150			
Surrogate: D9-NEtFOSE	*161*		ng/L	247		65.2	10-150			
Surrogate: 13C3-HFPO-DA	*63.4*		ng/L	98.7		64.2	25-160			
MRL Check (B380115-MRL1)				Prepared & Analyzed: 07/22/24						
Perfluorobutanoic acid (PFBA)	8.93	3.9	ng/L	7.84		114	44-157			
Perfluoropentanoic acid (PFPeA)	4.59	2.0	ng/L	3.92		117	57-148			

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QUALITY CONTROL

Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B380115 - Draft Method 1633										
MRL Check (B380115-MRL1)				Prepared & Analyzed: 07/22/24						
Perfluorohexanoic acid (PFHxA)	2.29	0.98	ng/L	1.96		117	62-149			
Perfluoroheptanoic acid (PFHpA)	2.19	0.98	ng/L	1.96		112	56-150			
Perfluorooctanoic acid (PFOA)	2.26	0.98	ng/L	1.96		115	57-161			
Perfluorononanoic acid (PFNA)	2.21	0.98	ng/L	1.96		113	53-157			
Perfluorodecanoic acid (PFDA)	2.20	0.98	ng/L	1.96		113	43-158			
Perfluoroundecanoic acid (PFUnA)	2.18	0.98	ng/L	1.96		111	50-155			
Perfluorododecanoic acid (PFDoA)	2.27	0.98	ng/L	1.96		116	60-141			
Perfluorotridecanoic acid (PFTrDA)	2.11	0.98	ng/L	1.96		108	52-140			
Perfluorotetradecanoic acid (PFTeDA)	2.26	0.98	ng/L	1.96		115	52-156			
Perfluorobutanesulfonic acid (PFBS)	2.10	0.98	ng/L	1.74		121	63-145			
Perfluoropentanesulfonic acid (PFPeS)	2.12	0.98	ng/L	1.84		115	58-144			
Perfluorohexanesulfonic acid (PFHxS)	2.39	0.98	ng/L	1.79		133	44-158			
Perfluoroheptanesulfonic acid (PFHpS)	2.22	0.98	ng/L	1.87		119	51-150			
Perfluorooctanesulfonic acid (PFOS)	2.13	0.98	ng/L	1.82		117	43-162			
Perfluorononanesulfonic acid (PFNS)	2.32	0.98	ng/L	1.89		123	46-151			
Perfluorodecanesulfonic acid (PFDS)	2.23	0.98	ng/L	1.89		118	50-144			
Perfluorododecanesulfonic acid (PFDoS)	2.07	0.98	ng/L	1.90		109	30-138			
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2FTS)	8.72	3.9	ng/L	7.35		119	52-158			
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2FTS)	9.03	3.9	ng/L	7.44		121	48-158			
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2FTS)	8.92	3.9	ng/L	7.54		118	46-165			
Perfluorooctanesulfonamide (PFOSA)	2.24	0.98	ng/L	1.96		114	47-163			
N-methyl perfluoroocatnesulfonamide (NMeFOSA)	2.43	0.98	ng/L	1.96		124	54-155			
N-ethyl perfluorooctanesulfonamide (NEtFOSA)	2.36	0.98	ng/L	1.96		121	49-156			
N-MeFOSAA (NMeFOSAA)	2.33	0.98	ng/L	1.96		119	32-160			
N-EtFOSAA (NEtFOSAA)	2.11	0.98	ng/L	1.96		108	51-154			
N-methylperfluorooctanesulfonamidoethanol(NMeFOSE)	22.1	9.8	ng/L	19.6		113	56-151			
N-ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	22.7	9.8	ng/L	19.6		116	60-147			
Hexafluoropropylene oxide dimer acid (HFPO-DA)	7.96	3.9	ng/L	7.84		102	58-154			
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	8.20	3.9	ng/L	7.40		111	61-148			
9Cl-PF3ONS (F53B Minor)	8.64	3.9	ng/L	7.35		118	44-167			
11Cl-PF3OUdS (F53B Major)	8.34	3.9	ng/L	7.40		113	36-158			
3-Perfluoropropyl propanoic acid (FPrPA) (3:3FTCA)	19.6	9.8	ng/L	19.6		100	32-161			
2H,2H,3H,3H-Perfluorooctanoic acid(FPePA)(5:3FTCA)	90.7	49	ng/L	97.9		92.6	39-156			
3-Perfluoroheptyl propanoic acid (FHpPA) (7:3FTCA)	89.6	49	ng/L	97.9		91.5	36-149			
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	3.82	2.0	ng/L	3.49		110	56-144			
Perfluoro-3-methoxypropanoic acid (PFMPA)	3.84	2.0	ng/L	3.92		97.9	48-150			
Perfluoro-4-methoxybutanoic acid (PFMBA)	4.01	2.0	ng/L	3.92		102	49-154			
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	3.81	2.0	ng/L	3.92		97.2	47-160			
Surrogate: 13C4-PFBA	*68.6*		ng/L	97.9		70.0	10-130			
Surrogate: 13C5-PFPeA	*33.6*		ng/L	49.0		68.6	35-150			
Surrogate: 13C5-PFHxA	*17.0*		ng/L	24.5		69.3	55-150			

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QUALITY CONTROL

Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B380115 - Draft Method 1633										
MRL Check (B380115-MRL1)				Prepared & Analyzed: 07/22/24						
Surrogate: 13C4-PFHpA	*17.5*		ng/L	24.5		71.5	55-150			
Surrogate: 13C8-PFOA	*18.3*		ng/L	24.5		74.5	60-140			
Surrogate: 13C9-PFNA	*8.29*		ng/L	12.2		67.7	55-140			
Surrogate: 13C6-PFDA	*8.53*		ng/L	12.2		69.6	50-140			
Surrogate: 13C7-PFUnA	*8.31*		ng/L	12.2		67.8	30-140			
Surrogate: 13C2-PFDoA	*8.50*		ng/L	12.2		69.4	10-150			
Surrogate: 13C2-PFTeDA	*7.91*		ng/L	12.2		64.6	10-130			
Surrogate: 13C3-PFBS	*17.3*		ng/L	24.5		70.6	55-150			
Surrogate: 13C3-PFHxS	*16.4*		ng/L	24.5		67.1	55-150			
Surrogate: 13C8-PFOS	*16.3*		ng/L	24.5		66.6	45-140			
Surrogate: 13C2-4:2FTS	*33.2*		ng/L	49.0		67.9	60-200			
Surrogate: 13C2-6:2FTS	*34.9*		ng/L	49.0		71.2	60-200			
Surrogate: 13C2-8:2FTS	*33.3*		ng/L	49.0		67.9	50-200			
Surrogate: 13C8-PFOSA	*15.8*		ng/L	24.5		64.5	30-130			
Surrogate: D3-NMeFOSA	*13.7*		ng/L	24.5		55.8	15-130			
Surrogate: D5-NEtFOSA	*14.5*		ng/L	24.5		59.4	10-130			
Surrogate: D3-NMeFOSAA	*31.2*		ng/L	49.0		63.8	45-200			
Surrogate: D5-NEtFOSAA	*32.3*		ng/L	49.0		66.0	10-200			
Surrogate: D7-NMeFOSE	*149*		ng/L	245		60.7	10-150			
Surrogate: D9-NEtFOSE	*150*		ng/L	245		61.2	10-150			
Surrogate: 13C3-HFPO-DA	*61.8*		ng/L	97.9		63.1	25-160			
Batch B380245 - Draft Method 1633										
Blank (B380245-BLK1)				Prepared: 07/23/24 Analyzed: 07/25/24						
Perfluorobutanoic acid (PFBA)	ND	5.9	µg/kg wet							
Perfluoropentanoic acid (PFPeA)	ND	2.9	µg/kg wet							
Perfluorohexanoic acid (PFHxA)	ND	1.5	µg/kg wet							
Perfluoroheptanoic acid (PFHpA)	ND	1.5	µg/kg wet							
Perfluorooctanoic acid (PFOA)	ND	1.5	µg/kg wet							
Perfluorononanoic acid (PFNA)	ND	1.5	µg/kg wet							
Perfluorodecanoic acid (PFDA)	ND	1.5	µg/kg wet							
Perfluoroundecanoic acid (PFUnA)	ND	1.5	µg/kg wet							
Perfluorododecanoic acid (PFDoA)	ND	1.5	µg/kg wet							
Perfluorotridecanoic acid (PFTrDA)	ND	1.5	µg/kg wet							
Perfluorotetradecanoic acid (PFTeDA)	ND	1.5	µg/kg wet							
Perfluorobutanesulfonic acid (PFBS)	ND	1.5	µg/kg wet							
Perfluoropentanesulfonic acid (PFPeS)	ND	1.5	µg/kg wet							
Perfluorohexanesulfonic acid (PFHxS)	ND	1.5	µg/kg wet							
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.5	µg/kg wet							
Perfluorooctanesulfonic acid (PFOS)	ND	1.5	µg/kg wet							
Perfluorononanesulfonic acid (PFNS)	ND	1.5	µg/kg wet							
Perfluorodecanesulfonic acid (PFDS)	ND	1.5	µg/kg wet							
Perfluorododecanesulfonic acid (PFDoS)	ND	1.5	µg/kg wet							
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2FTS)	ND	5.9	µg/kg wet							
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2FTS)	ND	5.9	µg/kg wet							
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2FTS)	ND	5.9	µg/kg wet							
Perfluorooctanesulfonamide (PFOSA)	ND	1.5	µg/kg wet							
N-methyl perfluoroocatnesulfonamide (NMeFOSA)	ND	1.5	µg/kg wet							

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QUALITY CONTROL

Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B380245 - Draft Method 1633										
Blank (B380245-BLK1)				Prepared: 07/23/24 Analyzed: 07/25/24						
N-ethyl perfluorooctanesulfonamide (NEtFOSA)	ND	1.5	µg/kg wet							
N-MeFOSAA (NMeFOSAA)	ND	1.5	µg/kg wet							
N-EtFOSAA (NEtFOSAA)	ND	1.5	µg/kg wet							
N-methylperfluorooctanesulfonamidoethanol(NMeFOSE)	ND	15	µg/kg wet							
N-ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	ND	15	µg/kg wet							
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	5.9	µg/kg wet							
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	5.9	µg/kg wet							
9Cl-PF3ONS (F53B Minor)	ND	5.9	µg/kg wet							
11Cl-PF3OUdS (F53B Major)	ND	5.9	µg/kg wet							
3-Perfluoropropyl propanoic acid (FPrPA) (3:3FTCA)	ND	15	µg/kg wet							
2H,2H,3H,3H-Perfluorooctanoic acid(FPePA)(5:3FTCA)	ND	74	µg/kg wet							
3-Perfluoroheptyl propanoic acid (FHpPA) (7:3FTCA)	ND	74	µg/kg wet							
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	ND	2.9	µg/kg wet							
Perfluoro-3-methoxypropanoic acid (PFMPA)	ND	2.9	µg/kg wet							
Perfluoro-4-methoxybutanoic acid (PFMBA)	ND	2.9	µg/kg wet							
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	2.9	µg/kg wet							
Surrogate: 13C4-PFBA	*62.3*		µg/kg wet	73.6		84.6	10-130			
Surrogate: 13C5-PFPeA	*33.2*		µg/kg wet	36.8		90.1	35-150			
Surrogate: 13C5-PFHxA	*16.0*		µg/kg wet	18.4		86.7	55-150			
Surrogate: 13C4-PFHpA	*16.1*		µg/kg wet	18.4		87.6	55-150			
Surrogate: 13C8-PFOA	*16.2*		µg/kg wet	18.4		87.9	60-140			
Surrogate: 13C9-PFNA	*7.58*		µg/kg wet	9.20		82.4	55-140			
Surrogate: 13C6-PFDA	*7.88*		µg/kg wet	9.20		85.6	50-140			
Surrogate: 13C7-PFUnA	*7.53*		µg/kg wet	9.20		81.8	30-140			
Surrogate: 13C2-PFDoA	*8.03*		µg/kg wet	9.20		87.3	10-150			
Surrogate: 13C2-PFTeDA	*7.38*		µg/kg wet	9.20		80.2	10-130			
Surrogate: 13C3-PFBS	*16.3*		µg/kg wet	18.4		88.8	55-150			
Surrogate: 13C3-PFHxS	*16.1*		µg/kg wet	18.4		87.5	55-150			
Surrogate: 13C8-PFOS	*15.9*		µg/kg wet	18.4		86.2	45-150			
Surrogate: 13C2-4:2FTS	*28.5*		µg/kg wet	36.8		77.3	60-200			
Surrogate: 13C2-6:2FTS	*27.9*		µg/kg wet	36.8		75.8	60-200			
Surrogate: 13C2-8:2FTS	*28.0*		µg/kg wet	36.8		76.1	50-200			
Surrogate: 13C8-PFOSA	*15.8*		µg/kg wet	18.4		85.9	30-130			
Surrogate: D3-NMeFOSA	*11.7*		µg/kg wet	18.4		63.7	15-130			
Surrogate: D5-NEtFOSA	*11.2*		µg/kg wet	18.4		60.7	10-130			
Surrogate: D3-NMeFOSAA	*33.1*		µg/kg wet	36.8		89.9	45-200			
Surrogate: D5-NEtFOSAA	*30.6*		µg/kg wet	36.8		83.1	10-200			
Surrogate: D7-NMeFOSE	*185*		µg/kg wet	184		101	10-150			
Surrogate: D9-NEtFOSE	*206*		µg/kg wet	184		112	10-150			
Surrogate: 13C3-HFPO-DA	*55.8*		µg/kg wet	73.6		75.8	25-160			
LCS (B380245-BS1)				Prepared: 07/23/24 Analyzed: 07/25/24						
Perfluorobutanoic acid (PFBA)	99.3	7.7	µg/kg wet	92.3		108	58-148			
Perfluoropentanoic acid (PFPeA)	51.2	3.8	µg/kg wet	46.2		111	54-152			

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QUALITY CONTROL

Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B380245 - Draft Method 1633										
LCS (B380245-BS1)				Prepared: 07/23/24 Analyzed: 07/25/24						
Perfluorohexanoic acid (PFHxA)	25.2	1.9	µg/kg wet	23.1		109	55-152			
Perfluoroheptanoic acid (PFHpA)	23.9	1.9	µg/kg wet	23.1		104	54-154			
Perfluorooctanoic acid (PFOA)	23.9	1.9	µg/kg wet	23.1		104	52-161			
Perfluorononanoic acid (PFNA)	25.7	1.9	µg/kg wet	23.1		111	59-149			
Perfluorodecanoic acid (PFDA)	26.4	1.9	µg/kg wet	23.1		114	52-147			
Perfluoroundecanoic acid (PFUnA)	24.6	1.9	µg/kg wet	23.1		106	48-159			
Perfluorododecanoic acid (PFDoA)	24.6	1.9	µg/kg wet	23.1		106	64-142			
Perfluorotridecanoic acid (PFTrDA)	22.0	1.9	µg/kg wet	23.1		95.4	49-148			
Perfluorotetradecanoic acid (PFTeDA)	25.5	1.9	µg/kg wet	23.1		111	47-161			
Perfluorobutanesulfonic acid (PFBS)	22.0	1.9	µg/kg wet	20.5		107	62-144			
Perfluoropentanesulfonic acid (PFPeS)	24.1	1.9	µg/kg wet	21.7		111	59-151			
Perfluorohexanesulfonic acid (PFHxS)	22.4	1.9	µg/kg wet	21.1		106	57-146			
Perfluoroheptanesulfonic acid (PFHpS)	23.6	1.9	µg/kg wet	22.0		107	55-152			
Perfluorooctanesulfonic acid (PFOS)	23.4	1.9	µg/kg wet	21.4		109	58-149			
Perfluorononanesulfonic acid (PFNS)	25.0	1.9	µg/kg wet	22.2		113	52-148			
Perfluorodecanesulfonic acid (PFDS)	25.2	1.9	µg/kg wet	22.3		113	51-147			
Perfluorododecanesulfonic acid (PFDoS)	24.3	1.9	µg/kg wet	22.4		109	36-145			
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2FTS)	95.4	7.7	µg/kg wet	86.5		110	67-146			
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2FTS)	95.3	7.7	µg/kg wet	87.7		109	61-151			
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2FTS)	92.5	7.7	µg/kg wet	88.8		104	63-152			
Perfluorooctanesulfonamide (PFOSA)	24.2	1.9	µg/kg wet	23.1		105	61-148			
N-methyl perfluoroocatnesulfonamide (NMeFOSA)	23.7	1.9	µg/kg wet	23.1		103	63-145			
N-ethyl perfluorooctanesulfonamide (NEtFOSA)	25.5	1.9	µg/kg wet	23.1		110	65-139			
N-MeFOSAA (NMeFOSAA)	24.3	1.9	µg/kg wet	23.1		105	58-144			
N-EtFOSAA (NEtFOSAA)	22.6	1.9	µg/kg wet	23.1		98.1	59-146			
N-methylperfluorooctanesulfonamidoethanol(NMeFOSE)	247	19	µg/kg wet	231		107	71-136			
N-ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	253	19	µg/kg wet	231		110	69-137			
Hexafluoropropylene oxide dimer acid (HFPO-DA)	97.9	7.7	µg/kg wet	92.3		106	63-144			
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	105	7.7	µg/kg wet	87.1		121	68-146			
9Cl-PF3ONS (F53B Minor)	107	7.7	µg/kg wet	86.5		123	56-156			
11Cl-PF3OUdS (F53B Major)	105	7.7	µg/kg wet	87.1		121	46-156			
3-Perfluoropropyl propanoic acid (FPrPA) (3:3FTCA)	237	19	µg/kg wet	231		103	62-129			
2H,2H,3H,3H-Perfluorooctanoic acid(FPePA)(5:3FTCA)	1250	96	µg/kg wet	1150		108	63-134			
3-Perfluoroheptyl propanoic acid (FHpPA) (7:3FTCA)	1230	96	µg/kg wet	1150		106	50-138			
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	47.5	3.8	µg/kg wet	41.1		116	56-151			
Perfluoro-3-methoxypropanoic acid (PFMPA)	44.5	3.8	µg/kg wet	46.2		96.5	51-145			
Perfluoro-4-methoxybutanoic acid (PFMBA)	45.8	3.8	µg/kg wet	46.2		99.2	55-148			
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	51.9	3.8	µg/kg wet	46.2		112	48-161			
Surrogate: 13C4-PFBA	*76.6*		µg/kg wet	96.2		79.7	10-130			
Surrogate: 13C5-PFPeA	*40.8*		µg/kg wet	48.1		84.9	35-150			
Surrogate: 13C5-PFHxA	*19.2*		µg/kg wet	24.0		79.8	55-150			

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QUALITY CONTROL

Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B380245 - Draft Method 1633										
LCS (B380245-BS1)				Prepared: 07/23/24 Analyzed: 07/25/24						
Surrogate: 13C4-PFHpA	*20.0*		µg/kg wet	24.0		83.3	55-150			
Surrogate: 13C8-PFOA	*20.3*		µg/kg wet	24.0		84.6	60-140			
Surrogate: 13C9-PFNA	*9.82*		µg/kg wet	12.0		81.7	55-140			
Surrogate: 13C6-PFDA	*9.15*		µg/kg wet	12.0		76.1	50-140			
Surrogate: 13C7-PFUnA	*9.37*		µg/kg wet	12.0		78.0	30-140			
Surrogate: 13C2-PFDoA	*9.64*		µg/kg wet	12.0		80.2	10-150			
Surrogate: 13C2-PFTeDA	*8.50*		µg/kg wet	12.0		70.7	10-130			
Surrogate: 13C3-PFBS	*19.3*		µg/kg wet	24.0		80.3	55-150			
Surrogate: 13C3-PFHxS	*18.9*		µg/kg wet	24.0		78.6	55-150			
Surrogate: 13C8-PFOS	*18.5*		µg/kg wet	24.0		76.9	45-150			
Surrogate: 13C2-4:2FTS	*35.3*		µg/kg wet	48.1		73.5	60-200			
Surrogate: 13C2-6:2FTS	*35.4*		µg/kg wet	48.1		73.7	60-200			
Surrogate: 13C2-8:2FTS	*34.5*		µg/kg wet	48.1		71.8	50-200			
Surrogate: 13C8-PFOSA	*19.2*		µg/kg wet	24.0		80.1	30-130			
Surrogate: D3-NMeFOSA	*14.2*		µg/kg wet	24.0		59.2	15-130			
Surrogate: D5-NEtFOSA	*13.6*		µg/kg wet	24.0		56.6	10-130			
Surrogate: D3-NMeFOSAA	*39.4*		µg/kg wet	48.1		82.0	45-200			
Surrogate: D5-NEtFOSAA	*38.7*		µg/kg wet	48.1		80.4	10-200			
Surrogate: D7-NMeFOSE	*190*		µg/kg wet	240		79.1	10-150			
Surrogate: D9-NEtFOSE	*215*		µg/kg wet	240		89.4	10-150			
Surrogate: 13C3-HFPO-DA	*69.5*		µg/kg wet	96.2		72.2	25-160			
MRL Check (B380245-MRL1)				Prepared: 07/23/24 Analyzed: 07/25/24						
Perfluorobutanoic acid (PFBA)	7.05	6.0	µg/kg wet	5.98		118	44-157			
Perfluoropentanoic acid (PFPeA)	3.60	3.0	µg/kg wet	2.99		121	57-148			
Perfluorohexanoic acid (PFHxA)	1.75	1.5	µg/kg wet	1.49		117	62-149			
Perfluoroheptanoic acid (PFHpA)	1.69	1.5	µg/kg wet	1.49		113	56-150			
Perfluorooctanoic acid (PFOA)	1.80	1.5	µg/kg wet	1.49		120	57-161			
Perfluorononanoic acid (PFNA)	1.57	1.5	µg/kg wet	1.49		105	53-157			
Perfluorodecanoic acid (PFDA)	1.65	1.5	µg/kg wet	1.49		110	43-158			
Perfluoroundecanoic acid (PFUnA)	1.68	1.5	µg/kg wet	1.49		112	50-155			
Perfluorododecanoic acid (PFDoA)	1.65	1.5	µg/kg wet	1.49		110	60-141			
Perfluorotridecanoic acid (PFTrDA)	1.58	1.5	µg/kg wet	1.49		106	52-140			
Perfluorotetradecanoic acid (PFTeDA)	1.76	1.5	µg/kg wet	1.49		118	52-156			
Perfluorobutanesulfonic acid (PFBS)	1.47	1.5	µg/kg wet	1.33		111	63-145			J
Perfluoropentanesulfonic acid (PFPeS)	1.71	1.5	µg/kg wet	1.41		122	58-144			
Perfluorohexanesulfonic acid (PFHxS)	1.60	1.5	µg/kg wet	1.37		117	44-158			
Perfluoroheptanesulfonic acid (PFHpS)	1.55	1.5	µg/kg wet	1.42		109	51-150			
Perfluorooctanesulfonic acid (PFOS)	1.51	1.5	µg/kg wet	1.39		109	43-162			
Perfluorononanesulfonic acid (PFNS)	1.67	1.5	µg/kg wet	1.44		116	46-151			
Perfluorodecanesulfonic acid (PFDS)	1.82	1.5	µg/kg wet	1.44		126	50-144			
Perfluorododecanesulfonic acid (PFDoS)	1.74	1.5	µg/kg wet	1.45		120	30-138			
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2FTS)	6.68	6.0	µg/kg wet	5.61		119	52-158			
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2FTS)	6.87	6.0	µg/kg wet	5.68		121	48-158			
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2FTS)	7.38	6.0	µg/kg wet	5.75		128	46-165			
Perfluorooctanesulfonamide (PFOSA)	1.77	1.5	µg/kg wet	1.49		118	47-163			
N-methyl perfluoroocatnesulfonamide (NMeFOSA)	1.66	1.5	µg/kg wet	1.49		111	54-155			
N-ethyl perfluorooctanesulfonamide (NEtFOSA)	1.78	1.5	µg/kg wet	1.49		119	49-156			
N-MeFOSAA (NMeFOSAA)	1.94	1.5	µg/kg wet	1.49		130	32-160			

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QUALITY CONTROL

Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B380245 - Draft Method 1633										
MRL Check (B380245-MRL1)				Prepared: 07/23/24 Analyzed: 07/25/24						
N-EtFOSAA (NEtFOSAA)	1.66	1.5	µg/kg wet	1.49		111	51-154			
N-methylperfluorooctanesulfonamidoethanol(NMeFOSE)	17.3	15	µg/kg wet	14.9		116	56-151			
N-ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	17.3	15	µg/kg wet	14.9		116	60-147			
Hexafluoropropylene oxide dimer acid (HFPO-DA)	6.18	6.0	µg/kg wet	5.98		103	58-154			
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	6.89	6.0	µg/kg wet	5.64		122	61-148			
9Cl-PF3ONS (F53B Minor)	6.85	6.0	µg/kg wet	5.61		122	44-167			
11Cl-PF3OUdS (F53B Major)	6.90	6.0	µg/kg wet	5.64		122	36-158			
3-Perfluoropropyl propanoic acid (FPrPA) (3:3FTCA)	14.2	15	µg/kg wet	14.9		94.7	32-161			J
2H,2H,3H,3H-Perfluorooctanoic acid(FPePA)(5:3FTCA)	70.9	75	µg/kg wet	74.7		94.9	39-156			J
3-Perfluoroheptyl propanoic acid (FHpPA) (7:3FTCA)	70.2	75	µg/kg wet	74.7		93.9	36-149			J
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	3.24	3.0	µg/kg wet	2.66		122	56-144			
Perfluoro-3-methoxypropanoic acid (PFMPA)	3.12	3.0	µg/kg wet	2.99		105	48-150			
Perfluoro-4-methoxybutanoic acid (PFMBA)	3.02	3.0	µg/kg wet	2.99		101	49-154			
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	3.43	3.0	µg/kg wet	2.99		115	47-160			
Surrogate: 13C4-PFBA	*54.6*		µg/kg wet	74.7		73.0	10-130			
Surrogate: 13C5-PFPeA	*29.9*		µg/kg wet	37.4		79.9	35-150			
Surrogate: 13C5-PFHxA	*14.0*		µg/kg wet	18.7		75.1	55-150			
Surrogate: 13C4-PFHpA	*14.4*		µg/kg wet	18.7		77.0	55-150			
Surrogate: 13C8-PFOA	*14.6*		µg/kg wet	18.7		78.1	60-140			
Surrogate: 13C9-PFNA	*6.85*		µg/kg wet	9.34		73.4	55-140			
Surrogate: 13C6-PFDA	*6.96*		µg/kg wet	9.34		74.6	50-140			
Surrogate: 13C7-PFUnA	*6.87*		µg/kg wet	9.34		73.6	30-140			
Surrogate: 13C2-PFDoA	*7.26*		µg/kg wet	9.34		77.7	10-150			
Surrogate: 13C2-PFTeDA	*6.48*		µg/kg wet	9.34		69.4	10-130			
Surrogate: 13C3-PFBS	*14.3*		µg/kg wet	18.7		76.4	55-150			
Surrogate: 13C3-PFHxS	*13.5*		µg/kg wet	18.7		72.1	55-150			
Surrogate: 13C8-PFOS	*14.1*		µg/kg wet	18.7		75.3	45-150			
Surrogate: 13C2-4:2FTS	*24.3*		µg/kg wet	37.4		65.1	60-200			
Surrogate: 13C2-6:2FTS	*24.2*		µg/kg wet	37.4		64.8	60-200			
Surrogate: 13C2-8:2FTS	*21.8*		µg/kg wet	37.4		58.4	50-200			
Surrogate: 13C8-PFOSA	*13.7*		µg/kg wet	18.7		73.4	30-130			
Surrogate: D3-NMeFOSA	*9.97*		µg/kg wet	18.7		53.4	15-130			
Surrogate: D5-NEtFOSA	*9.93*		µg/kg wet	18.7		53.1	10-130			
Surrogate: D3-NMeFOSAA	*29.4*		µg/kg wet	37.4		78.6	45-200			
Surrogate: D5-NEtFOSAA	*27.6*		µg/kg wet	37.4		73.9	10-200			
Surrogate: D7-NMeFOSE	*149*		µg/kg wet	187		79.5	10-150			
Surrogate: D9-NEtFOSE	*170*		µg/kg wet	187		91.2	10-150			
Surrogate: 13C3-HFPO-DA	*50.3*		µg/kg wet	74.7		67.3	25-160			
Batch B380846 - Draft Method 1633										
Blank (B380846-BLK1)				Prepared & Analyzed: 07/30/24						
Perfluorobutanoic acid (PFBA)	ND	3.9	ng/L							
Perfluoropentanoic acid (PFPeA)	ND	2.0	ng/L							
Perfluorohexanoic acid (PFHxA)	ND	0.98	ng/L							

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QUALITY CONTROL

Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B380846 - Draft Method 1633										
Blank (B380846-BLK1)				Prepared & Analyzed: 07/30/24						
Perfluoroheptanoic acid (PFHpA)	ND	0.98	ng/L							
Perfluorooctanoic acid (PFOA)	ND	0.98	ng/L							
Perfluorononanoic acid (PFNA)	ND	0.98	ng/L							
Perfluorodecanoic acid (PFDA)	ND	0.98	ng/L							
Perfluoroundecanoic acid (PFUnA)	ND	0.98	ng/L							
Perfluorododecanoic acid (PFDoA)	ND	0.98	ng/L							
Perfluorotridecanoic acid (PFTrDA)	ND	0.98	ng/L							
Perfluorotetradecanoic acid (PFTeDA)	ND	0.98	ng/L							
Perfluorobutanesulfonic acid (PFBS)	ND	0.98	ng/L							
Perfluoropentanesulfonic acid (PFPeS)	ND	0.98	ng/L							
Perfluorohexanesulfonic acid (PFHxS)	ND	0.98	ng/L							
Perfluoroheptanesulfonic acid (PFHpS)	ND	0.98	ng/L							
Perfluorooctanesulfonic acid (PFOS)	ND	0.98	ng/L							
Perfluorononanesulfonic acid (PFNS)	ND	0.98	ng/L							
Perfluorodecanesulfonic acid (PFDS)	ND	0.98	ng/L							
Perfluorododecanesulfonic acid (PFDoS)	ND	0.98	ng/L							
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2FTS)	ND	3.9	ng/L							
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2FTS)	ND	3.9	ng/L							
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2FTS)	ND	3.9	ng/L							
Perfluorooctanesulfonamide (PFOSA)	ND	0.98	ng/L							
N-methyl perfluoroocatnesulfonamide (NMeFOSA)	ND	0.98	ng/L							
N-ethyl perfluorooctanesulfonamide (NEtFOSA)	ND	0.98	ng/L							
N-MeFOSAA (NMeFOSAA)	ND	0.98	ng/L							
N-EtFOSAA (NEtFOSAA)	ND	0.98	ng/L							
N-methylperfluorooctanesulfonamidoethanol(NMeFOSE)	ND	9.8	ng/L							
N-ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	ND	9.8	ng/L							
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	3.9	ng/L							
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	3.9	ng/L							
9Cl-PF3ONS (F53B Minor)	ND	3.9	ng/L							
11Cl-PF3OUdS (F53B Major)	ND	3.9	ng/L							
3-Perfluoropropyl propanoic acid (FPrPA) (3:3FTCA)	ND	9.8	ng/L							
2H,2H,3H,3H-Perfluorooctanoic acid(FPePA)(5:3FTCA)	ND	49	ng/L							
3-Perfluoroheptyl propanoic acid (FHpPA) (7:3FTCA)	ND	49	ng/L							
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	ND	2.0	ng/L							
Perfluoro-3-methoxypropanoic acid (PFMPA)	ND	2.0	ng/L							
Perfluoro-4-methoxybutanoic acid (PFMBA)	ND	2.0	ng/L							
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	2.0	ng/L							
Surrogate: 13C4-PFBA	*70.6*		ng/L	97.8		72.2	10-130			
Surrogate: 13C5-PFPeA	*37.0*		ng/L	48.9		75.7	35-150			
Surrogate: 13C5-PFHxA	*17.7*		ng/L	24.4		72.4	55-150			
Surrogate: 13C4-PFHpA	*17.4*		ng/L	24.4		71.0	55-150			

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QUALITY CONTROL

Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B380846 - Draft Method 1633										
Blank (B380846-BLK1)				Prepared & Analyzed: 07/30/24						
Surrogate: 13C8-PFOA	*17.4*		ng/L	24.4		71.1	60-140			
Surrogate: 13C9-PFNA	*8.46*		ng/L	12.2		69.2	55-140			
Surrogate: 13C6-PFDA	*8.44*		ng/L	12.2		69.0	50-140			
Surrogate: 13C7-PFUnA	*8.04*		ng/L	12.2		65.7	30-140			
Surrogate: 13C2-PFDoA	*8.34*		ng/L	12.2		68.2	10-150			
Surrogate: 13C2-PFTeDA	*7.53*		ng/L	12.2		61.6	10-130			
Surrogate: 13C3-PFBS	*18.2*		ng/L	24.4		74.3	55-150			
Surrogate: 13C3-PFHxS	*18.0*		ng/L	24.4		73.5	55-150			
Surrogate: 13C8-PFOS	*17.0*		ng/L	24.4		69.6	45-140			
Surrogate: 13C2-4:2FTS	*34.5*		ng/L	48.9		70.6	60-200			
Surrogate: 13C2-6:2FTS	*36.1*		ng/L	48.9		73.8	60-200			
Surrogate: 13C2-8:2FTS	*33.7*		ng/L	48.9		68.8	50-200			
Surrogate: 13C8-PFOSA	*16.7*		ng/L	24.4		68.3	30-130			
Surrogate: D3-NMeFOSA	*12.7*		ng/L	24.4		51.9	15-130			
Surrogate: D5-NEtFOSA	*13.5*		ng/L	24.4		55.4	10-130			
Surrogate: D3-NMeFOSAA	*36.4*		ng/L	48.9		74.4	45-200			
Surrogate: D5-NEtFOSAA	*35.4*		ng/L	48.9		72.4	10-200			
Surrogate: D7-NMeFOSE	*156*		ng/L	244		63.7	10-150			
Surrogate: D9-NEtFOSE	*154*		ng/L	244		63.0	10-150			
Surrogate: 13C3-HFPO-DA	*58.0*		ng/L	97.8		59.3	25-160			
LCS (B380846-BS1)				Prepared & Analyzed: 07/30/24						
Perfluorobutanoic acid (PFBA)	97.7	3.9	ng/L	78.2		125	58-148			
Perfluoropentanoic acid (PFPeA)	50.0	2.0	ng/L	39.1		128	54-152			
Perfluorohexanoic acid (PFHxA)	24.0	0.98	ng/L	19.5		123	55-152			
Perfluoroheptanoic acid (PFHpA)	23.3	0.98	ng/L	19.5		119	54-154			
Perfluorooctanoic acid (PFOA)	23.5	0.98	ng/L	19.5		120	52-161			
Perfluorononanoic acid (PFNA)	24.6	0.98	ng/L	19.5		126	59-149			
Perfluorodecanoic acid (PFDA)	24.2	0.98	ng/L	19.5		124	52-147			
Perfluoroundecanoic acid (PFUnA)	25.5	0.98	ng/L	19.5		130	48-159			
Perfluorododecanoic acid (PFDoA)	24.1	0.98	ng/L	19.5		123	64-142			
Perfluorotridecanoic acid (PFTrDA)	22.2	0.98	ng/L	19.5		114	49-148			
Perfluorotetradecanoic acid (PFTeDA)	24.4	0.98	ng/L	19.5		125	47-161			
Perfluorobutanesulfonic acid (PFBS)	21.0	0.98	ng/L	17.3		121	62-144			
Perfluoropentanesulfonic acid (PFPeS)	21.4	0.98	ng/L	18.4		116	59-151			
Perfluorohexanesulfonic acid (PFHxS)	20.9	0.98	ng/L	17.9		117	57-146			
Perfluoroheptanesulfonic acid (PFHpS)	23.0	0.98	ng/L	18.6		124	55-152			
Perfluorooctanesulfonic acid (PFOS)	22.1	0.98	ng/L	18.1		122	58-149			
Perfluorononanesulfonic acid (PFNS)	22.6	0.98	ng/L	18.8		120	52-148			
Perfluorodecanesulfonic acid (PFDS)	23.0	0.98	ng/L	18.9		122	51-147			
Perfluorododecanesulfonic acid (PFDoS)	22.1	0.98	ng/L	19.0		117	36-145			
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2FTS)	92.6	3.9	ng/L	73.3		126	67-146			
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2FTS)	93.9	3.9	ng/L	74.3		126	61-151			
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2FTS)	95.2	3.9	ng/L	75.3		127	63-152			
Perfluorooctanesulfonamide (PFOSA)	23.1	0.98	ng/L	19.5		118	61-148			
N-methyl perfluoroocatnesulfonamide (NMeFOSA)	25.1	0.98	ng/L	19.5		128	63-145			
N-ethyl perfluorooctanesulfonamide (NEtFOSA)	24.4	0.98	ng/L	19.5		125	65-139			
N-MeFOSAA (NMeFOSAA)	25.0	0.98	ng/L	19.5		128	58-144			
N-EtFOSAA (NEtFOSAA)	22.9	0.98	ng/L	19.5		117	59-146			

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QUALITY CONTROL

Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B380846 - Draft Method 1633											
LCS (B380846-BS1)				Prepared & Analyzed: 07/30/24							
N-methylperfluorooctanesulfonamidoethanol(NMeFOSE)	240	9.8	ng/L	195		123		71-136			
N-ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	235	9.8	ng/L	195		120		69-137			
Hexafluoropropylene oxide dimer acid (HFPO-DA)	101	3.9	ng/L	78.2		129		63-144			
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	114	3.9	ng/L	73.8		**155**	*	68-146			L-01
9Cl-PF3ONS (F53B Minor)	109	3.9	ng/L	73.3		149		56-156			
11Cl-PF3OUdS (F53B Major)	110	3.9	ng/L	73.8		149		46-156			
3-Perfluoropropyl propanoic acid (FPrPA) (3:3FTCA)	247	9.8	ng/L	195		127		62-129			
2H,2H,3H,3H-Perfluorooctanoic acid(FPePA)(5:3FTCA)	1240	49	ng/L	977		127		63-134			
3-Perfluoroheptyl propanoic acid (FHpPA) (7:3FTCA)	1210	49	ng/L	977		123		50-138			
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	53.7	2.0	ng/L	34.8		**154**	*	56-151			L-01
Perfluoro-3-methoxypropanoic acid (PFMPA)	53.7	2.0	ng/L	39.1		137		51-145			
Perfluoro-4-methoxybutanoic acid (PFMBA)	53.8	2.0	ng/L	39.1		138		55-148			
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	55.2	2.0	ng/L	39.1		141		48-161			
Surrogate: 13C4-PFBA	*71.9*		ng/L	97.7		73.6		10-130			
Surrogate: 13C5-PFPeA	*38.0*		ng/L	48.9		77.8		35-150			
Surrogate: 13C5-PFHxA	*17.9*		ng/L	24.4		73.4		55-150			
Surrogate: 13C4-PFHpA	*18.5*		ng/L	24.4		75.8		55-150			
Surrogate: 13C8-PFOA	*17.8*		ng/L	24.4		73.0		60-140			
Surrogate: 13C9-PFNA	*8.49*		ng/L	12.2		69.5		55-140			
Surrogate: 13C6-PFDA	*9.16*		ng/L	12.2		75.0		50-140			
Surrogate: 13C7-PFUnA	*8.48*		ng/L	12.2		69.4		30-140			
Surrogate: 13C2-PFDoA	*8.86*		ng/L	12.2		72.5		10-150			
Surrogate: 13C2-PFTeDA	*7.79*		ng/L	12.2		63.8		10-130			
Surrogate: 13C3-PFBS	*17.1*		ng/L	24.4		70.1		55-150			
Surrogate: 13C3-PFHxS	*18.0*		ng/L	24.4		73.5		55-150			
Surrogate: 13C8-PFOS	*17.3*		ng/L	24.4		70.8		45-140			
Surrogate: 13C2-4:2FTS	*35.0*		ng/L	48.9		71.6		60-200			
Surrogate: 13C2-6:2FTS	*35.8*		ng/L	48.9		73.3		60-200			
Surrogate: 13C2-8:2FTS	*35.0*		ng/L	48.9		71.6		50-200			
Surrogate: 13C8-PFOSA	*16.8*		ng/L	24.4		68.8		30-130			
Surrogate: D3-NMeFOSA	*13.6*		ng/L	24.4		55.9		15-130			
Surrogate: D5-NEtFOSA	*14.9*		ng/L	24.4		61.2		10-130			
Surrogate: D3-NMeFOSAA	*36.3*		ng/L	48.9		74.3		45-200			
Surrogate: D5-NEtFOSAA	*35.2*		ng/L	48.9		72.0		10-200			
Surrogate: D7-NMeFOSE	*158*		ng/L	244		64.7		10-150			
Surrogate: D9-NEtFOSE	*164*		ng/L	244		67.1		10-150			
Surrogate: 13C3-HFPO-DA	*58.6*		ng/L	97.7		59.9		25-160			
MRL Check (B380846-MRL1)				Prepared & Analyzed: 07/30/24							
Perfluorobutanoic acid (PFBA)	10.1	3.9	ng/L	7.82		129		44-157			
Perfluoropentanoic acid (PFPeA)	5.23	2.0	ng/L	3.91		134		57-148			
Perfluorohexanoic acid (PFHxA)	2.43	0.98	ng/L	1.95		124		62-149			
Perfluoroheptanoic acid (PFHpA)	2.32	0.98	ng/L	1.95		119		56-150			
Perfluorooctanoic acid (PFOA)	2.49	0.98	ng/L	1.95		127		57-161			
Perfluorononanoic acid (PFNA)	2.59	0.98	ng/L	1.95		133		53-157			

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QUALITY CONTROL

Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B380846 - Draft Method 1633											
MRL Check (B380846-MRL1)				Prepared & Analyzed: 07/30/24							
Perfluorodecanoic acid (PFDA)	2.57	0.98	ng/L	1.95		132		43-158			
Perfluoroundecanoic acid (PFUnA)	2.42	0.98	ng/L	1.95		124		50-155			
Perfluorododecanoic acid (PFDoA)	2.43	0.98	ng/L	1.95		125		60-141			
Perfluorotridecanoic acid (PFTrDA)	2.34	0.98	ng/L	1.95		120		52-140			
Perfluorotetradecanoic acid (PFTeDA)	2.46	0.98	ng/L	1.95		126		52-156			
Perfluorobutanesulfonic acid (PFBS)	2.14	0.98	ng/L	1.73		123		63-145			
Perfluoropentanesulfonic acid (PFPeS)	2.41	0.98	ng/L	1.84		131		58-144			
Perfluorohexanesulfonic acid (PFHxS)	2.30	0.98	ng/L	1.79		129		44-158			
Perfluoroheptanesulfonic acid (PFHpS)	2.48	0.98	ng/L	1.86		133		51-150			
Perfluorooctanesulfonic acid (PFOS)	2.59	0.98	ng/L	1.81		143		43-162			
Perfluorononanesulfonic acid (PFNS)	2.54	0.98	ng/L	1.88		135		46-151			
Perfluorodecanesulfonic acid (PFDS)	2.51	0.98	ng/L	1.89		133		50-144			
Perfluorododecanesulfonic acid (PFDoS)	2.44	0.98	ng/L	1.90		129		30-138			
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2FTS)	9.45	3.9	ng/L	7.33		129		52-158			
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2FTS)	9.81	3.9	ng/L	7.43		132		48-158			
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2FTS)	10.1	3.9	ng/L	7.52		134		46-165			
Perfluorooctanesulfonamide (PFOSA)	2.56	0.98	ng/L	1.95		131		47-163			
N-methyl perfluoroocatnesulfonamide (NMeFOSA)	2.73	0.98	ng/L	1.95		140		54-155			
N-ethyl perfluorooctanesulfonamide (NEtFOSA)	2.53	0.98	ng/L	1.95		129		49-156			
N-MeFOSAA (NMeFOSAA)	3.15	0.98	ng/L	1.95		**161**	*	32-160			L-05
N-EtFOSAA (NEtFOSAA)	2.35	0.98	ng/L	1.95		120		51-154			
N-methylperfluorooctanesulfonamidoethanol(NMeFOSE)	24.1	9.8	ng/L	19.5		123		56-151			
N-ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	24.1	9.8	ng/L	19.5		123		60-147			
Hexafluoropropylene oxide dimer acid (HFPO-DA)	8.07	3.9	ng/L	7.82		103		58-154			
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	9.04	3.9	ng/L	7.38		123		61-148			
9Cl-PF3ONS (F53B Minor)	8.51	3.9	ng/L	7.33		116		44-167			
11Cl-PF3OUdS (F53B Major)	8.25	3.9	ng/L	7.38		112		36-158			
3-Perfluoropropyl propanoic acid (FPrPA) (3:3FTCA)	21.9	9.8	ng/L	19.5		112		32-161			
2H,2H,3H,3H-Perfluorooctanoic acid(FPePA)(5:3FTCA)	111	49	ng/L	97.7		113		39-156			
3-Perfluoroheptyl propanoic acid (FHpPA) (7:3FTCA)	106	49	ng/L	97.7		108		36-149			
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	4.32	2.0	ng/L	3.48		124		56-144			
Perfluoro-3-methoxypropanoic acid (PFMPA)	4.54	2.0	ng/L	3.91		116		48-150			
Perfluoro-4-methoxybutanoic acid (PFMBA)	4.13	2.0	ng/L	3.91		106		49-154			
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	4.54	2.0	ng/L	3.91		116		47-160			
Surrogate: 13C4-PFBA	*72.5*		ng/L	97.7		74.2		10-130			
Surrogate: 13C5-PFPeA	*39.5*		ng/L	48.9		80.8		35-150			
Surrogate: 13C5-PFHxA	*18.2*		ng/L	24.4		74.6		55-150			
Surrogate: 13C4-PFHpA	*18.7*		ng/L	24.4		76.6		55-150			
Surrogate: 13C8-PFOA	*18.4*		ng/L	24.4		75.4		60-140			
Surrogate: 13C9-PFNA	*8.77*		ng/L	12.2		71.8		55-140			
Surrogate: 13C6-PFDA	*8.71*		ng/L	12.2		71.3		50-140			

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QUALITY CONTROL

Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B380846 - Draft Method 1633										
MRL Check (B380846-MRL1)				Prepared & Analyzed: 07/30/24						
Surrogate: 13C7-PFUnA	*9.04*		ng/L	12.2		74.0	30-140			
Surrogate: 13C2-PFDoA	*8.72*		ng/L	12.2		71.4	10-150			
Surrogate: 13C2-PFTeDA	*7.45*		ng/L	12.2		61.0	10-130			
Surrogate: 13C3-PFBS	*18.3*		ng/L	24.4		74.9	55-150			
Surrogate: 13C3-PFHxS	*18.2*		ng/L	24.4		74.6	55-150			
Surrogate: 13C8-PFOS	*16.9*		ng/L	24.4		69.2	45-140			
Surrogate: 13C2-4:2FTS	*35.5*		ng/L	48.9		72.7	60-200			
Surrogate: 13C2-6:2FTS	*37.2*		ng/L	48.9		76.1	60-200			
Surrogate: 13C2-8:2FTS	*33.0*		ng/L	48.9		67.6	50-200			
Surrogate: 13C8-PFOSA	*16.6*		ng/L	24.4		68.0	30-130			
Surrogate: D3-NMeFOSA	*13.5*		ng/L	24.4		55.3	15-130			
Surrogate: D5-NEtFOSA	*14.2*		ng/L	24.4		58.1	10-130			
Surrogate: D3-NMeFOSAA	*34.1*		ng/L	48.9		69.8	45-200			
Surrogate: D5-NEtFOSAA	*34.4*		ng/L	48.9		70.4	10-200			
Surrogate: D7-NMeFOSE	*158*		ng/L	244		64.6	10-150			
Surrogate: D9-NEtFOSE	*156*		ng/L	244		64.0	10-150			
Surrogate: 13C3-HFPO-DA	*61.5*		ng/L	97.7		62.9	25-160			
Batch B381163 - Draft Method 1633										
Blank (B381163-BLK1)				Prepared: 07/26/24 Analyzed: 07/29/24						
Perfluorobutanoic acid (PFBA)	ND	7.0	µg/kg wet							
Perfluoropentanoic acid (PFPeA)	ND	3.5	µg/kg wet							
Perfluorohexanoic acid (PFHxA)	ND	1.8	µg/kg wet							
Perfluoroheptanoic acid (PFHpA)	ND	1.8	µg/kg wet							
Perfluorooctanoic acid (PFOA)	ND	1.8	µg/kg wet							
Perfluorononanoic acid (PFNA)	ND	1.8	µg/kg wet							
Perfluorodecanoic acid (PFDA)	ND	1.8	µg/kg wet							
Perfluoroundecanoic acid (PFUnA)	ND	1.8	µg/kg wet							
Perfluorododecanoic acid (PFDoA)	ND	1.8	µg/kg wet							
Perfluorotridecanoic acid (PFTrDA)	ND	1.8	µg/kg wet							
Perfluorotetradecanoic acid (PFTeDA)	ND	1.8	µg/kg wet							
Perfluorobutanesulfonic acid (PFBS)	ND	1.8	µg/kg wet							
Perfluoropentanesulfonic acid (PFPeS)	ND	1.8	µg/kg wet							
Perfluorohexanesulfonic acid (PFHxS)	ND	1.8	µg/kg wet							
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.8	µg/kg wet							
Perfluorooctanesulfonic acid (PFOS)	ND	1.8	µg/kg wet							
Perfluorononanesulfonic acid (PFNS)	ND	1.8	µg/kg wet							
Perfluorodecanesulfonic acid (PFDS)	ND	1.8	µg/kg wet							
Perfluorododecanesulfonic acid (PFDoS)	ND	1.8	µg/kg wet							
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2FTS)	ND	7.0	µg/kg wet							PF-17C
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2FTS)	ND	7.0	µg/kg wet							
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2FTS)	ND	7.0	µg/kg wet							
Perfluorooctanesulfonamide (PFOSA)	ND	1.8	µg/kg wet							
N-methyl perfluoroocatnesulfonamide (NMeFOSA)	ND	1.8	µg/kg wet							
N-ethyl perfluorooctanesulfonamide (NEtFOSA)	ND	1.8	µg/kg wet							
N-MeFOSAA (NMeFOSAA)	ND	1.8	µg/kg wet							
N-EtFOSAA (NEtFOSAA)	ND	1.8	µg/kg wet							
N-methylperfluorooctanesulfonamidoethanol(NMeFOSE)	ND	18	µg/kg wet							

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QUALITY CONTROL

Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B381163 - Draft Method 1633											
Blank (B381163-BLK1)				Prepared: 07/26/24 Analyzed: 07/29/24							
N-ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	ND	18	µg/kg wet								
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	7.0	µg/kg wet								
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	7.0	µg/kg wet								
9Cl-PF3ONS (F53B Minor)	ND	7.0	µg/kg wet								
11Cl-PF3OUdS (F53B Major)	ND	7.0	µg/kg wet								
3-Perfluoropropyl propanoic acid (FPrPA) (3:3FTCA)	ND	18	µg/kg wet								
2H,2H,3H,3H-Perfluorooctanoic acid(FPePA)(5:3FTCA)	ND	88	µg/kg wet								
3-Perfluoroheptyl propanoic acid (FHpPA) (7:3FTCA)	ND	88	µg/kg wet								
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	ND	3.5	µg/kg wet								
Perfluoro-3-methoxypropanoic acid (PFMPA)	ND	3.5	µg/kg wet								
Perfluoro-4-methoxybutanoic acid (PFMBA)	ND	3.5	µg/kg wet								
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	3.5	µg/kg wet								
Surrogate: 13C4-PFBA	*57.0*		µg/kg wet	88.0		64.7		10-130			
Surrogate: 13C5-PFPeA	*32.4*		µg/kg wet	44.0		73.7		35-150			
Surrogate: 13C5-PFHxA	*14.9*		µg/kg wet	22.0		67.7		55-150			
Surrogate: 13C4-PFHpA	*15.7*		µg/kg wet	22.0		71.2		55-150			
Surrogate: 13C8-PFOA	*14.7*		µg/kg wet	22.0		66.6		60-140			
Surrogate: 13C9-PFNA	*7.12*		µg/kg wet	11.0		64.7		55-140			
Surrogate: 13C6-PFDA	*7.12*		µg/kg wet	11.0		64.8		50-140			
Surrogate: 13C7-PFUnA	*6.97*		µg/kg wet	11.0		63.4		30-140			
Surrogate: 13C2-PFDoA	*6.76*		µg/kg wet	11.0		61.4		10-150			
Surrogate: 13C2-PFTeDA	*6.44*		µg/kg wet	11.0		58.5		10-130			
Surrogate: 13C3-PFBS	*15.2*		µg/kg wet	22.0		69.3		55-150			
Surrogate: 13C3-PFHxS	*13.9*		µg/kg wet	22.0		63.2		55-150			
Surrogate: 13C8-PFOS	*14.3*		µg/kg wet	22.0		65.2		45-150			
Surrogate: 13C2-4:2FTS	*26.2*		µg/kg wet	44.0		**59.6**	*	60-200			PF-17C
Surrogate: 13C2-6:2FTS	*27.6*		µg/kg wet	44.0		62.7		60-200			
Surrogate: 13C2-8:2FTS	*26.4*		µg/kg wet	44.0		59.9		50-200			
Surrogate: 13C8-PFOSA	*14.3*		µg/kg wet	22.0		64.8		30-130			
Surrogate: D3-NMeFOSA	*10.9*		µg/kg wet	22.0		49.6		15-130			
Surrogate: D5-NEtFOSA	*11.0*		µg/kg wet	22.0		50.1		10-130			
Surrogate: D3-NMeFOSAA	*30.2*		µg/kg wet	44.0		68.7		45-200			
Surrogate: D5-NEtFOSAA	*34.5*		µg/kg wet	44.0		78.4		10-200			
Surrogate: D7-NMeFOSE	*121*		µg/kg wet	220		54.9		10-150			
Surrogate: D9-NEtFOSE	*123*		µg/kg wet	220		55.7		10-150			
Surrogate: 13C3-HFPO-DA	*57.7*		µg/kg wet	88.0		65.5		25-160			
LCS (B381163-BS1)				Prepared: 07/26/24 Analyzed: 07/29/24							
Perfluorobutanoic acid (PFBA)	83.4	7.3	µg/kg wet	87.8		95.1		58-148			
Perfluoropentanoic acid (PFPeA)	41.7	3.7	µg/kg wet	43.9		95.1		54-152			
Perfluorohexanoic acid (PFHxA)	20.5	1.8	µg/kg wet	21.9		93.5		55-152			
Perfluoroheptanoic acid (PFHpA)	20.1	1.8	µg/kg wet	21.9		91.7		54-154			
Perfluorooctanoic acid (PFOA)	20.0	1.8	µg/kg wet	21.9		91.0		52-161			
Perfluorononanoic acid (PFNA)	20.8	1.8	µg/kg wet	21.9		94.9		59-149			
Perfluorodecanoic acid (PFDA)	20.9	1.8	µg/kg wet	21.9		95.3		52-147			
Perfluoroundecanoic acid (PFUnA)	20.5	1.8	µg/kg wet	21.9		93.4		48-159			

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QUALITY CONTROL

Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B381163 - Draft Method 1633										
LCS (B381163-BS1)				Prepared: 07/26/24 Analyzed: 07/29/24						
Perfluorododecanoic acid (PFDoA)	21.2	1.8	µg/kg wet	21.9		96.5	64-142			
Perfluorotridecanoic acid (PFTrDA)	22.3	1.8	µg/kg wet	21.9		102	49-148			
Perfluorotetradecanoic acid (PFTeDA)	21.4	1.8	µg/kg wet	21.9		97.6	47-161			
Perfluorobutanesulfonic acid (PFBS)	19.0	1.8	µg/kg wet	19.5		97.4	62-144			
Perfluoropentanesulfonic acid (PFPeS)	19.2	1.8	µg/kg wet	20.6		93.2	59-151			
Perfluorohexanesulfonic acid (PFHxS)	19.3	1.8	µg/kg wet	20.1		95.9	57-146			
Perfluoroheptanesulfonic acid (PFHpS)	18.4	1.8	µg/kg wet	20.9		88.2	55-152			
Perfluorooctanesulfonic acid (PFOS)	18.8	1.8	µg/kg wet	20.3		92.3	58-149			
Perfluorononanesulfonic acid (PFNS)	19.9	1.8	µg/kg wet	21.1		94.2	52-148			
Perfluorodecanesulfonic acid (PFDS)	20.0	1.8	µg/kg wet	21.2		94.7	51-147			
Perfluorododecanesulfonic acid (PFDoS)	19.4	1.8	µg/kg wet	21.3		91.2	36-145			
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2FTS)	77.7	7.3	µg/kg wet	82.3		94.5	67-146			
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2FTS)	81.4	7.3	µg/kg wet	83.4		97.6	61-151			
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2FTS)	78.7	7.3	µg/kg wet	84.5		93.2	63-152			
Perfluorooctanesulfonamide (PFOSA)	20.1	1.8	µg/kg wet	21.9		91.6	61-148			
N-methyl perfluoroocatnesulfonamide (NMeFOSA)	20.5	1.8	µg/kg wet	21.9		93.5	63-145			
N-ethyl perfluorooctanesulfonamide (NEtFOSA)	20.0	1.8	µg/kg wet	21.9		91.2	65-139			
N-MeFOSAA (NMeFOSAA)	19.7	1.8	µg/kg wet	21.9		89.9	58-144			
N-EtFOSAA (NEtFOSAA)	20.5	1.8	µg/kg wet	21.9		93.5	59-146			
N-methylperfluorooctanesulfonamidoethanol(NMeFOSE)	203	18	µg/kg wet	219		92.5	71-136			
N-ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	201	18	µg/kg wet	219		91.8	69-137			
Hexafluoropropylene oxide dimer acid (HFPO-DA)	94.6	7.3	µg/kg wet	87.8		108	63-144			
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	94.4	7.3	µg/kg wet	82.8		114	68-146			
9Cl-PF3ONS (F53B Minor)	91.9	7.3	µg/kg wet	82.3		112	56-156			
11Cl-PF3OUdS (F53B Major)	93.5	7.3	µg/kg wet	82.8		113	46-156			
3-Perfluoropropyl propanoic acid (FPrPA) (3:3FTCA)	203	18	µg/kg wet	219		92.4	62-129			
2H,2H,3H,3H-Perfluorooctanoic acid(FPePA)(5:3FTCA)	1010	91	µg/kg wet	1100		91.9	63-134			
3-Perfluoroheptyl propanoic acid (FHpPA) (7:3FTCA)	1020	91	µg/kg wet	1100		93.1	50-138			
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	40.6	3.7	µg/kg wet	39.0		104	56-151			
Perfluoro-3-methoxypropanoic acid (PFMPA)	43.2	3.7	µg/kg wet	43.9		98.5	51-145			
Perfluoro-4-methoxybutanoic acid (PFMBA)	43.0	3.7	µg/kg wet	43.9		97.9	55-148			
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	47.3	3.7	µg/kg wet	43.9		108	48-161			
Surrogate: 13C4-PFBA	*71.4*		µg/kg wet	91.4		78.1	10-130			
Surrogate: 13C5-PFPeA	*38.3*		µg/kg wet	45.7		83.7	35-150			
Surrogate: 13C5-PFHxA	*18.2*		µg/kg wet	22.9		79.6	55-150			
Surrogate: 13C4-PFHpA	*18.9*		µg/kg wet	22.9		82.8	55-150			
Surrogate: 13C8-PFOA	*17.8*		µg/kg wet	22.9		78.1	60-140			
Surrogate: 13C9-PFNA	*8.83*		µg/kg wet	11.4		77.3	55-140			
Surrogate: 13C6-PFDA	*9.09*		µg/kg wet	11.4		79.6	50-140			
Surrogate: 13C7-PFUnA	*8.83*		µg/kg wet	11.4		77.3	30-140			
Surrogate: 13C2-PFDoA	*8.31*		µg/kg wet	11.4		72.8	10-150			

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QUALITY CONTROL

Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B381163 - Draft Method 1633										
LCS (B381163-BS1)				Prepared: 07/26/24 Analyzed: 07/29/24						
Surrogate: 13C2-PFTeDA	*8.02*		µg/kg wet	11.4		70.2	10-130			
Surrogate: 13C3-PFBS	*17.9*		µg/kg wet	22.9		78.4	55-150			
Surrogate: 13C3-PFHxS	*17.6*		µg/kg wet	22.9		77.0	55-150			
Surrogate: 13C8-PFOS	*18.2*		µg/kg wet	22.9		79.5	45-150			
Surrogate: 13C2-4:2FTS	*34.3*		µg/kg wet	45.7		75.0	60-200			
Surrogate: 13C2-6:2FTS	*35.8*		µg/kg wet	45.7		78.4	60-200			
Surrogate: 13C2-8:2FTS	*34.4*		µg/kg wet	45.7		75.3	50-200			
Surrogate: 13C8-PFOSA	*18.0*		µg/kg wet	22.9		78.6	30-130			
Surrogate: D3-NMeFOSA	*14.2*		µg/kg wet	22.9		62.2	15-130			
Surrogate: D5-NEtFOSA	*15.4*		µg/kg wet	22.9		67.5	10-130			
Surrogate: D3-NMeFOSAA	*37.3*		µg/kg wet	45.7		81.6	45-200			
Surrogate: D5-NEtFOSAA	*44.8*		µg/kg wet	45.7		98.1	10-200			
Surrogate: D7-NMeFOSE	*153*		µg/kg wet	229		67.0	10-150			
Surrogate: D9-NEtFOSE	*154*		µg/kg wet	229		67.4	10-150			
Surrogate: 13C3-HFPO-DA	*68.2*		µg/kg wet	91.4		74.6	25-160			
MRL Check (B381163-MRL1)				Prepared: 07/26/24 Analyzed: 07/29/24						
Perfluorobutanoic acid (PFBA)	8.90	7.2	µg/kg wet	7.19		124	44-157			
Perfluoropentanoic acid (PFPeA)	4.21	3.6	µg/kg wet	3.60		117	57-148			
Perfluorohexanoic acid (PFHxA)	2.11	1.8	µg/kg wet	1.80		117	62-149			
Perfluoroheptanoic acid (PFHpA)	2.02	1.8	µg/kg wet	1.80		112	56-150			
Perfluorooctanoic acid (PFOA)	2.16	1.8	µg/kg wet	1.80		120	57-161			
Perfluorononanoic acid (PFNA)	2.15	1.8	µg/kg wet	1.80		120	53-157			
Perfluorodecanoic acid (PFDA)	2.15	1.8	µg/kg wet	1.80		120	43-158			
Perfluoroundecanoic acid (PFUnA)	1.93	1.8	µg/kg wet	1.80		107	50-155			
Perfluorododecanoic acid (PFDoA)	2.16	1.8	µg/kg wet	1.80		120	60-141			
Perfluorotridecanoic acid (PFTrDA)	2.27	1.8	µg/kg wet	1.80		126	52-140			
Perfluorotetradecanoic acid (PFTeDA)	2.11	1.8	µg/kg wet	1.80		117	52-156			
Perfluorobutanesulfonic acid (PFBS)	2.05	1.8	µg/kg wet	1.60		128	63-145			
Perfluoropentanesulfonic acid (PFPeS)	2.09	1.8	µg/kg wet	1.69		123	58-144			
Perfluorohexanesulfonic acid (PFHxS)	2.24	1.8	µg/kg wet	1.65		136	44-158			
Perfluoroheptanesulfonic acid (PFHpS)	2.00	1.8	µg/kg wet	1.71		117	51-150			
Perfluorooctanesulfonic acid (PFOS)	1.93	1.8	µg/kg wet	1.67		115	43-162			
Perfluorononanesulfonic acid (PFNS)	1.96	1.8	µg/kg wet	1.73		113	46-151			
Perfluorodecanesulfonic acid (PFDS)	2.25	1.8	µg/kg wet	1.74		130	50-144			
Perfluorododecanesulfonic acid (PFDoS)	1.99	1.8	µg/kg wet	1.74		114	30-138			
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2FTS)	7.91	7.2	µg/kg wet	6.74		117	52-158			
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2FTS)	8.04	7.2	µg/kg wet	6.83		118	48-158			
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2FTS)	7.67	7.2	µg/kg wet	6.92		111	46-165			
Perfluorooctanesulfonamide (PFOSA)	2.08	1.8	µg/kg wet	1.80		116	47-163			
N-methyl perfluoroocatnesulfonamide (NMeFOSA)	2.10	1.8	µg/kg wet	1.80		117	54-155			
N-ethyl perfluorooctanesulfonamide (NEtFOSA)	2.02	1.8	µg/kg wet	1.80		112	49-156			
N-MeFOSAA (NMeFOSAA)	1.80	1.8	µg/kg wet	1.80		100	32-160			
N-EtFOSAA (NEtFOSAA)	1.84	1.8	µg/kg wet	1.80		102	51-154			
N-methylperfluorooctanesulfonamidoethanol(NMeFOSE)	20.0	18	µg/kg wet	18.0		111	56-151			
N-ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	20.2	18	µg/kg wet	18.0		113	60-147			
Hexafluoropropylene oxide dimer acid (HFPO-DA)	6.79	7.2	µg/kg wet	7.19		94.4	58-154			J

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QUALITY CONTROL

Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B381163 - Draft Method 1633										
MRL Check (B381163-MRL1)				Prepared: 07/26/24 Analyzed: 07/29/24						
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	6.73	7.2	µg/kg wet	6.79		99.1	61-148			J
9Cl-PF3ONS (F53B Minor)	6.66	7.2	µg/kg wet	6.74		98.8	44-167			J
11Cl-PF3OUdS (F53B Major)	6.84	7.2	µg/kg wet	6.79		101	36-158			J
3-Perfluoropropyl propanoic acid (FPrPA) (3:3FTCA)	17.1	18	µg/kg wet	18.0		95.2	32-161			J
2H,2H,3H,3H-Perfluorooctanoic acid(FPePA)(5:3FTCA)	83.9	90	µg/kg wet	89.9		93.3	39-156			J
3-Perfluoroheptyl propanoic acid (FHpPA) (7:3FTCA)	88.5	90	µg/kg wet	89.9		98.4	36-149			J
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	3.27	3.6	µg/kg wet	3.20		102	56-144			J
Perfluoro-3-methoxypropanoic acid (PFMPA)	3.57	3.6	µg/kg wet	3.60		99.1	48-150			J
Perfluoro-4-methoxybutanoic acid (PFMBA)	3.20	3.6	µg/kg wet	3.60		89.0	49-154			J
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	4.34	3.6	µg/kg wet	3.60		121	47-160			
Surrogate: 13C4-PFBA	*71.0*		µg/kg wet	89.9		79.0	10-130			
Surrogate: 13C5-PFPeA	*38.6*		µg/kg wet	45.0		85.9	35-150			
Surrogate: 13C5-PFHxA	*17.9*		µg/kg wet	22.5		79.7	55-150			
Surrogate: 13C4-PFHpA	*19.0*		µg/kg wet	22.5		84.7	55-150			
Surrogate: 13C8-PFOA	*17.9*		µg/kg wet	22.5		79.7	60-140			
Surrogate: 13C9-PFNA	*8.91*		µg/kg wet	11.2		79.3	55-140			
Surrogate: 13C6-PFDA	*8.92*		µg/kg wet	11.2		79.3	50-140			
Surrogate: 13C7-PFUnA	*8.75*		µg/kg wet	11.2		77.8	30-140			
Surrogate: 13C2-PFDoA	*8.31*		µg/kg wet	11.2		73.9	10-150			
Surrogate: 13C2-PFTeDA	*8.06*		µg/kg wet	11.2		71.7	10-130			
Surrogate: 13C3-PFBS	*17.9*		µg/kg wet	22.5		79.8	55-150			
Surrogate: 13C3-PFHxS	*17.0*		µg/kg wet	22.5		75.5	55-150			
Surrogate: 13C8-PFOS	*17.1*		µg/kg wet	22.5		76.2	45-150			
Surrogate: 13C2-4:2FTS	*32.4*		µg/kg wet	45.0		72.1	60-200			
Surrogate: 13C2-6:2FTS	*33.8*		µg/kg wet	45.0		75.1	60-200			
Surrogate: 13C2-8:2FTS	*33.2*		µg/kg wet	45.0		73.9	50-200			
Surrogate: 13C8-PFOSA	*17.0*		µg/kg wet	22.5		75.5	30-130			
Surrogate: D3-NMeFOSA	*14.2*		µg/kg wet	22.5		63.3	15-130			
Surrogate: D5-NEtFOSA	*14.9*		µg/kg wet	22.5		66.3	10-130			
Surrogate: D3-NMeFOSAA	*36.3*		µg/kg wet	45.0		80.7	45-200			
Surrogate: D5-NEtFOSAA	*42.8*		µg/kg wet	45.0		95.2	10-200			
Surrogate: D7-NMeFOSE	*151*		µg/kg wet	225		67.1	10-150			
Surrogate: D9-NEtFOSE	*153*		µg/kg wet	225		67.9	10-150			
Surrogate: 13C3-HFPO-DA	*69.5*		µg/kg wet	89.9		77.3	25-160			

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QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B379734 - Draft Method 1633										
Blank (B379734-BLK1)				Prepared & Analyzed: 07/11/24						
Total Suspended Solids	ND	5.0	mg/L							
LCS (B379734-BS1)				Prepared & Analyzed: 07/11/24						
Total Suspended Solids	149	5.0	mg/L	200		74.5	51.5-130			

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FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
ND	Not Detected
RL	Reporting Limit is at the level of quantitation (LOQ)
DL	Detection Limit is the lower limit of detection determined by the MDL study
MCL	Maximum Contaminant Level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.
D-03	Sample diluted pre-extraction due to elevated TSS pre-analysis result.
H-06	Sample was extracted past the recommended holding time.
J	Detected but below the Reporting Limit (lowest calibration standard); therefore, result is an estimated concentration (CLP J-Flag).
L-01	Laboratory fortified blank/laboratory control sample recovery outside of control limits. Data validation is not affected since all results are "not detected" for all samples in this batch for this compound and bias is on the high side.
L-05	Laboratory fortified blank/laboratory control sample recovery is outside of control limits. Reported value for this compound is likely to be biased on the high side.
PF-17	Extracted Internal Standard recovery is outside of control limits. Data is not significantly affected since associated analyte is not detected and bias is on the high side.
PF-17C	Extracted internal standard is outside of control limits. Analyte is a known difficult compound.
PF-18	Re-analysis confirmed Extracted Internal Standard failure due to matrix effects.
PF-22	Qualifier ion ratio >150% of associated calibration. Detection is suspect.
PF-23	Qualifier ion ratio <50% of associated calibration. Detection is suspect.
S-29	Extracted Internal Standard is outside of control limits.
V-20	Continuing calibration verification (CCV) did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
Draft Method 1633 in Water	
Total Suspended Solids	CT,MA,NH,NY,RI,NC,ME,VA
Perfluorobutanoic acid (PFBA)	NH-P,NY,PA,WV,CT
Perfluoropentanoic acid (PFPeA)	NH-P,NY,PA,WV,CT
Perfluorohexanoic acid (PFHxA)	NH-P,NY,PA,WV,CT
Perfluoroheptanoic acid (PFHpA)	NH-P,NY,PA,WV,CT
Perfluorooctanoic acid (PFOA)	NH-P,NY,PA,WV,CT
Perfluorononanoic acid (PFNA)	NH-P,NY,PA,WV,CT
Perfluorodecanoic acid (PFDA)	NH-P,NY,PA,WV,CT
Perfluoroundecanoic acid (PFUnA)	NH-P,NY,PA,WV,CT
Perfluorododecanoic acid (PFDoA)	NH-P,NY,PA,WV,CT
Perfluorotridecanoic acid (PFTrDA)	NH-P,NY,PA,WV,CT
Perfluorotetradecanoic acid (PFTeDA)	NH-P,NY,PA,WV,CT
Perfluorobutanesulfonic acid (PFBS)	NH-P,NY,PA,WV,CT
Perfluoropentanesulfonic acid (PFPeS)	NH-P,NY,PA,WV,CT
Perfluorohexanesulfonic acid (PFHxS)	NH-P,NY,PA,WV,CT
Perfluoroheptanesulfonic acid (PFHpS)	NH-P,NY,PA,WV,CT
Perfluorooctanesulfonic acid (PFOS)	NH-P,NY,PA,WV,CT
Perfluorononanesulfonic acid (PFNS)	NH-P,PA,WV,CT
Perfluorodecanesulfonic acid (PFDS)	NH-P,PA,WV,CT
Perfluorododecanesulfonic acid (PFDoS)	NH-P,PA,WV,CT
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2FTS)	NH-P,PA,WV,CT
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2FTS)	NH-P,NY,PA,WV,CT
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2FTS)	NH-P,NY,PA,WV,CT
Perfluorooctanesulfonamide (PFOSA)	NH-P,PA,WV,CT
N-methyl perfluoroocatnesulfonamide (NMeFOSA)	NH-P,PA,WV,CT
N-ethyl perfluorooctanesulfonamide (NEtFOSA)	NH-P,PA,WV,CT
N-MeFOSAA (NMeFOSAA)	NH-P,NY,PA,WV,CT
N-EtFOSAA (NEtFOSAA)	NH-P,NY,PA,WV,CT
N-methylperfluorooctanesulfonamidoethanol(NMeFOSE)	NH-P,PA,WV,CT
N-ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	NH-P,PA,WV,CT
Hexafluoropropylene oxide dimer acid (HFPO-DA)	NH-P,NY,PA,WV,CT
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	NH-P,NY,PA,WV,CT
9Cl-PF3ONS (F53B Minor)	NH-P,NY,PA,WV,CT
11Cl-PF3OUdS (F53B Major)	NH-P,NY,PA,WV,CT
3-Perfluoropropyl propanoic acid (FPrPA)(3:3FTCA)	NH-P,PA,WV,CT
2H,2H,3H,3H-Perfluorooctanoic acid(FPePA)(5:3FTCA)	NH-P,PA,WV,CT
3-Perfluoroheptyl propanoic acid (FHpPA)(7:3FTCA)	NH-P,PA,WV,CT
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	NH-P,NY,PA,WV,CT
Perfluoro-3-methoxypropanoic acid (PFMPA)	NH-P,NY,PA,WV,CT
Perfluoro-4-methoxybutanoic acid (PFMBA)	NH-P,PA,WV,CT
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	NH-P,PA,WV,CT

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Con-Test, a Pace Environmental Laboratory, operates under the following certifications and accreditations:

Code	Description	Number	Expires
MA	Massachusetts DEP	M-MA100	06/30/2025
CT	Connecticut Department of Public Health	PH-0821	12/31/2024
NY	New York State Department of Health	10899 NELAP	04/1/2025
NH	New Hampshire Environmental Lab	2516 NELAP	02/5/2025
RI	Rhode Island Department of Health	LAO00373	12/30/2024
NC	North Carolina Div. of Water Quality	652	12/31/2024
ME	State of Maine	MA00100	06/9/2025
VA	Commonwealth of Virginia	460217	12/14/2024
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2024
PA	Commonwealth of Pennsylvania DEP	68-05812	06/30/2025
WV	West Virginia DEP Division of Water and Waste Management	419	08/31/2024

2461301

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CHAIN OF CUSTODY RECORD

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East Longmeadow, MA 01028

Doc # 381 Rev 5_07/13/2021

Page ____ of ____

Company Name:	Wheeling Water Pollution Cont.
Address:	1516 Main St. Wheeling, WV 26003
Phone:	(304) 234-3834
Project Name:	WPCD PFAS
Project Location:	1516 Main St.
Project Number:	
Project Manager:	David Watkins
Pace Quote Name/Number:	
Invoice Recipient:	Mike Chiazza
Sampled By:	David Watkins

Requested Turnaround Time
7-Day ☐ 10-Day ☐
PFAS 10-Day (std) ☑ Due Date:

Rush-Approval Required
1-Day ☐ 3-Day ☐
2-Day ☐ 4-Day ☐

Data Delivery
Format: PDF ☑ EXCEL ☐
Other:
CLP Like Data Pkg Required: ☐
Email To: david.watkins@wheelingwv.gov
Fax To #:

Dissolved Metals Samples
○ Field Filtered
○ Lab to Filter

Orthophosphate Samples
○ Field Filtered
○ Lab to Filter

PCB ONLY
SOXHLET ☐
NON SOXHLET ☐

ANALYSIS REQUESTED

Pace Work Order#	Client Sample ID / Description	Beginning Date/Time	Ending Date/Time	COMP/GRAB	[1] Matrix Code	Conc Code	VIALS	GLASS	PLASTIC	BACTERIA	ENCORE	EPA 1633 PFAS (40 targeted)	EPA 1633 PFAS (Biosolids)	EPA 1633 - TSS
1	WPCD Biosolids	7/9/24	2:05	Grab	SOL	U			X				X	X
2	WPCD Influent	7/9/24	12:45	Grab	WW	U			X			X		
3	WPCD Influent	7/9/24	12:45	Grab	WW	U			X			X		
4	WPCD Influent	7/9/24	12:45	Grab	WW	U			X				X	

[2] Preservation Code

Courier Use Only
Total Number Of:
VIALS_____
GLASS_____
PLASTIC_____
BACTERIA_____
ENCORE_____

Glassware in the fridge? Y / N
Glassware in freezer? Y / N
Prepackaged Cooler? Y / N

*Pace Analytical is not responsible for missing samples from prepacked coolers

[1] **Matrix Codes:**
GW = Ground Water
WW = Waste Water
DW = Drinking Water
A = Air
S = Soil
SL = Sludge
SOL = Solid
O = Other (please define)

[2] **Preservation Codes:**
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium Bisulfate
X = Sodium Hydroxide
T = Sodium Thiosulfate
O = Other (please define)

Relinquished by: (signature)	Date/Time: 7/9/24 2:40	Client Comments: 74.3°F Flow – 7.66 MGD
Received by: (signature)	Date/Time: 7/10/24 9:30	
Relinquished by: (signature)	Date/Time:	
Received by: (signature)	Date/Time:	
Relinquished by: (signature)	Date/Time:	
Received by: (signature)	Date/Time:	
Relinquished by: (signature)	Date/Time:	
Received by: (signature)	Date/Time:	

Detection Limit Requirements
MA
CT
Other:

Special Requirements
MA MCP Required ☐
MCP Certification Form Required
CT RCP Required ☐
RCP Certification Form Required
MA State DW Required ☐
PWSID #

Please use the following codes to indicate possible sample concentration within the Conc Code column above:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

NELAC and AIHA-LAP, LLC Accredited

Project Entity
Government ☐ Municipality ☑ MWRA ☐ WRTA ☐
Federal ☐ 21 J ☐ School ☐
City ☐ Brownfield ☐ MBTA ☐

Other
☐ Chromatogram
☐ *AIHA-LAP,LLC*

Comments:

Disclaimer: Pace Analytical is not responsible for any omitted information on the Chain of Custody. The Chain of Custody is a legal document that must be complete and accurate and is used to determine what analyses the laboratory will perform. Any missing information is not the laboratory's responsibility. Pace Analytical values your partnership on each project and will try to assist with missing information, but will not be held accountable.

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FedEx

Learn about the FedEx services impacted by Hurricane Beryl.

FedEx™ Tracking

DELIVERED

Wednesday

7/10/24 at 9:30 AM

Signed for by: A.ARROYO

Obtain proof of delivery

DELIVERY STATUS

Delivered

Report missing package

TRACKING ID

791456893555

FROM
WHEELING, WV US

Label Created
5/17/24 10:00 AM

WHEELING, WV
7/9/24 2:49 PM

ON THE WAY
WINDSOR LOCKS, CT
7/10/24 8:00 AM

OUT FOR DELIVERY
WINDSOR LOCKS, CT
7/10/24 8:17 AM

DELIVERED
East Longmeadow, MA US

Delivered
7/10/24 at 9:30 AM

View travel history

Want updates on this shipment? Enter your email and we will do the rest!

Your email

SUBMIT

✖ Your email is a required field.

MORE OPTIONS

Pace ANALYTICAL SERVICES	DC#_Title: ENV-FRM-ELON-0001 v08_Sample Receiving Checklist
	Effective Date: 06/11/2024

Log In Back-Sheet

Client Wheeling Water Pollution Cont

Project WPCP RFAS

MCP/RCP Required MA

Deliverable Package Requirement MA

Location 2516 Main St

PWSID# (When Applicable) NA

Arrival Method:

Courier ☐ Fed Ex ☑ Walk In ☐ Other ☐

Received By / Date / Time ER 7/9/24 930

Back-Sheet By / Date / Time LA 7/9/24 1208

Temperature Method Gun # 6

WV samples: Yes (see note*) / (No) (follow normal procedure)

Temp < 6° C Actual Temperature 1.9

Rush Samples: Yes (No) Notify

Short Hold: Yes / (No) Notify

Notes regarding Samples/COC outside of SOP:

Received With Melted Ice Pulp

Login Sample Receipt Checklist – (Rejection Criteria Listing – Using Acceptance Policy) Any False statement will be brought to the attention of the Client – True or False

	True	False
Received on Ice	☑	☐
Received in Cooler	☑	☐
Custody Seal: DATE TIME	☑	☐
COC Relinquished	☑	☐
COC/Samples Labels Agree	☑	☐
All Samples in Good Condition	☑	☐
Samples Received within Holding Time	☑	☐
Is there enough Volume	☑	☐
Proper Media/Container Used	☑	☐
Splitting Samples Required	☐	☑
MS/MSD	☐	☑
Trip Blanks	☐	☑
Lab to Filters	☐	☑
COC Legible	☑	☐

COC Included: (Check all included)

Client ☑ Analysis ☑ Sampler Name ☑

Project ☑ IDs ☑ Collection Date/Time ☑

All Samples Proper pH: (N/A) ☐ ☐

Additional Container Notes

**Note: West Virginia requires all samples to have their temperature taken. Note any outliers.*

Qualtrax ID: 120836

Pace ANALYTICAL SERVICES	DC#_Title: ENV-FRM-ELON-0001 v08_Sample Receiving Checklist
	Effective Date: 06/11/2024

Sample			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
16oz Amb/Clear	(Circle Amb/Clear)	Soils Jars																				
8oz Amb/Clear																						
4oz Amb/Clear																						
2oz Amb/Clear																						
Unpreserved	1 Liter	Ambers																				
HCL																						
Sulfuric																						
Sulfuric	250ml																					
Phosphoric																						
HCl																						
Unpreserved	100ml																					
Unpreserved	1 Liter	Plastics																				
Sulfuric																						
Unpreserved	500ml			2																		
Sulfuric																						
Unpreserved	250ml		1																			
Trizma																						
Sulfuric																						
Nitric																						
NaOH																						
Ammonium Acetate																						
NaOH/Zinc																						
Unpreserved		VOA Vials																				
HCl																						
MeOH																						
D.I. Water																						
BiSulfate																						
Col/Bact		Other / Fill in																				
Other				1																		

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

April 20, 2023

Dave Watkins
City of Wheeling Water Pollution Control
2516 Main Street
Wheeling, WV 26003

Project Location: Wheeling WWTP
Client Job Number:
Project Number: [none]
Laboratory Work Order Number: 23C0262

Enclosed are results of analyses for samples as received by the laboratory on March 2, 2023. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Karriem G. Marius
Project Manager

Table of Contents

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

City of Wheeling Water Pollution Control
2516 Main Street
Wheeling, WV 26003
ATTN: Dave Watkins

REPORT DATE: 4/20/2023

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 23C0262

The results of analyses performed on the following samples submitted to CON-TEST, a Pace Analytical Laboratory, are found in this report.

PROJECT LOCATION: Wheeling WWTP

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
WPCD Cake	23C0262-01	Soil		Draft Method 1633	
				SM 2540G	
				SOP-466 PFAS	
WPCD Influent	23C0262-02	Waste Water		Draft Method 1633	
WPCD Blank	23C0262-03	Water		Draft Method 1633	

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CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

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Draft Method 1633

Qualifications:

H-01

Recommended sample holding time was exceeded, but analysis was performed before 2X the allowable holding time.

Analyte & Samples(s) Qualified:

Total Suspended Solids
23C0262-02[WPCD Influent], B333870-DUP1

PF-17

Extracted Internal Standard recovery is outside of control limits. Data is not significantly affected since associated analyte is not detected and bias is on the high side.

Analyte & Samples(s) Qualified:

13C2-6:2FTS
23C0262-01[WPCD Cake]

13C2-8:2FTS
23C0262-01[WPCD Cake]

1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2FTS
23C0262-01[WPCD Cake]

1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2FTS
23C0262-01[WPCD Cake]

PF-22B

Qualifier ion ratio >150% of associated calibration. Detection is estimated.

Analyte & Samples(s) Qualified:

Perfluoropentanoic acid (PFPeA)
23C0262-02[WPCD Influent]

S-29

Extracted Internal Standard is outside of control limits.

Analyte & Samples(s) Qualified:

D5-NEtFOSA
23C0262-01[WPCD Cake]

D9-NEtFOSE
23C0262-01[WPCD Cake], S086142-CCV2

N-ethyl perfluorooctanesulfonamide (NEtFOSA)
23C0262-01[WPCD Cake]

N-ethylperfluorooctanesulfonamidoethanol (NEtFO
23C0262-01[WPCD Cake]

V-20

Continuing calibration verification (CCV) did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

Analyte & Samples(s) Qualified:

Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)
S084731-CCV3

SOP-466 PFAS

Qualifications:

MS-09

Matrix spike recovery and/or matrix spike duplicate recovery outside of control limits. Possibility of sample matrix effects that lead to a low bias for reported result or non-homogeneous sample aliquots cannot be eliminated.

Analyte & Samples(s) Qualified:

Perfluorooctanesulfonic acid (PFOS)
B333335-MS1, B333335-MSD1

MS-11

Matrix spike recovery outside of control limits. Possibility of sample matrix effects that lead to a high bias for reported result or non-homogeneous sample aliquots cannot be eliminated.

Analyte & Samples(s) Qualified:

Perfluorodecanesulfonic acid (PFDS)
B333335-MS1

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MS-23

Either matrix spike or MS duplicate is outside of control limits, but the other is within limits. RPD between the two MS/MSD results is outside of the method specified criteria. Reduced precision anticipated for any reported result for this compound.

Analyte & Samples(s) Qualified:

9Cl-PF3ONS (F53B Minor)
B333335-MSD1

Perfluoroheptanesulfonic acid (PFHpS)
B333335-MSD1

Perfluorononanesulfonic acid (PFNS)
23C0262-01[WPCD Cake], B333335-MS1, B333335-MSD1

PF-18

Duplicate analysis confirmed Extracted Internal Standard failure due to matrix effects.

Analyte & Samples(s) Qualified:

M2-8:2FTS
23C0262-01[WPCD Cake], B333335-MS1

M2PFTA
B333335-MSD1

M8FOSA
23C0262-01[WPCD Cake], B333335-MS1, B333335-MSD1

M8PFOS
23C0262-01[WPCD Cake], B333335-MS1

R-06

Matrix spike duplicate RPD is outside of control limits. Reduced precision is anticipated for reported result for this compound in this sample.

Analyte & Samples(s) Qualified:

11Cl-PF3OUdS (F53B Major)
B333335-MSD1

Hexafluoropropylene oxide dimer acid (HFPO-DA)
B333335-MSD1

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

S-29

Extracted Internal Standard is outside of control limits.

Analyte & Samples(s) Qualified:

D3-NMeFOSAA
B333335-MSD1

D5-NEtFOSAA
B333335-MSD1

M2-4:2FTS
B333335-MSD1

M2-6:2FTS
B333335-MSD1, S084581-CCV1

M2-8:2FTS
S084581-CCV1

M3HFPO-DA
B333335-MSD1

M3PFBS
B333335-MSD1

M3PFHxS
B333335-MSD1

M4PFHpA
B333335-MSD1

M5PFHxA
B333335-MSD1

M5PFPeA
B333335-MSD1

M6PFDA
B333335-MSD1

M7PFUnA
B333335-MSD1

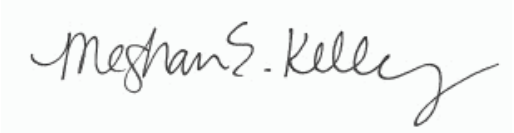
M8PFOA
B333335-MSD1

M9PFNA
B333335-MSD1

MPFBA
B333335-MSD1

MPFDoA
B333335-MSD1

The results of analyses reported only relate to samples submitted to Con-Test, a Pace Analytical Laboratory, for testing.
I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Meghan E. Kelley
Reporting Specialist

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Wheeling WWTP | Sample Description: | Work Order: 23C0262

Date Received: 3/2/2023

Field Sample #: WPCD Cake | Sampled: 3/1/2023 06:00

Sample ID: 23C0262-01

Sample Matrix: Soil

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	ND	2.2	µg/kg dry	1		SOP-466 PFAS	3/7/23	3/14/23 1:55	RRB
Perfluorobutanesulfonic acid (PFBS)	ND	2.2	µg/kg dry	1		SOP-466 PFAS	3/7/23	3/14/23 1:55	RRB
Perfluorobutanoic acid (PFBA)	ND	7.5	µg/kg dry	1		Draft Method 1633	3/31/23	4/3/23 13:14	AMS
Perfluoropentanoic acid (PFPeA)	ND	2.2	µg/kg dry	1		SOP-466 PFAS	3/7/23	3/14/23 1:55	RRB
Perfluoropentanoic acid (PFPeA)	ND	3.7	µg/kg dry	1		Draft Method 1633	3/31/23	4/3/23 13:14	AMS
Perfluorohexanoic acid (PFHxA)	ND	2.2	µg/kg dry	1		SOP-466 PFAS	3/7/23	3/14/23 1:55	RRB
Perfluorohexanoic acid (PFHxA)	ND	1.9	µg/kg dry	1		Draft Method 1633	3/31/23	4/3/23 13:14	AMS
11Cl-PF3OUdS (F53B Major)	ND	2.2	µg/kg dry	1		SOP-466 PFAS	3/7/23	3/14/23 1:55	RRB
Perfluoroheptanoic acid (PFHpA)	ND	1.9	µg/kg dry	1		Draft Method 1633	3/31/23	4/3/23 13:14	AMS
9Cl-PF3ONS (F53B Minor)	ND	2.2	µg/kg dry	1		SOP-466 PFAS	3/7/23	3/14/23 1:55	RRB
Perfluorooctanoic acid (PFOA)	ND	1.9	µg/kg dry	1		Draft Method 1633	3/31/23	4/3/23 13:14	AMS
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	2.2	µg/kg dry	1		SOP-466 PFAS	3/7/23	3/14/23 1:55	RRB
Perfluorononanoic acid (PFNA)	ND	1.9	µg/kg dry	1		Draft Method 1633	3/31/23	4/3/23 13:14	AMS
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	2.2	µg/kg dry	1		SOP-466 PFAS	3/7/23	3/14/23 1:55	RRB
Perfluorodecanoic acid (PFDA)	ND	1.9	µg/kg dry	1		Draft Method 1633	3/31/23	4/3/23 13:14	AMS
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	2.2	µg/kg dry	1		SOP-466 PFAS	3/7/23	3/14/23 1:55	RRB
Perfluoroundecanoic acid (PFUnA)	ND	1.9	µg/kg dry	1		Draft Method 1633	3/31/23	4/3/23 13:14	AMS
Perfluorodecanoic acid (PFDA)	ND	2.2	µg/kg dry	1		SOP-466 PFAS	3/7/23	3/14/23 1:55	RRB
Perfluorododecanoic acid (PFDoA)	ND	1.9	µg/kg dry	1		Draft Method 1633	3/31/23	4/3/23 13:14	AMS
Perfluorododecanoic acid (PFDoA)	ND	2.2	µg/kg dry	1		SOP-466 PFAS	3/7/23	3/14/23 1:55	RRB
Perfluorotridecanoic acid (PFTrDA)	ND	1.9	µg/kg dry	1		Draft Method 1633	3/31/23	4/3/23 13:14	AMS
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	ND	2.2	µg/kg dry	1		SOP-466 PFAS	3/7/23	3/14/23 1:55	RRB
Perfluorotetradecanoic acid (PFTeDA)	ND	1.9	µg/kg dry	1		Draft Method 1633	3/31/23	4/3/23 13:14	AMS
Perfluorobutanesulfonic acid (PFBS)	ND	1.9	µg/kg dry	1		Draft Method 1633	3/31/23	4/3/23 13:14	AMS
Perfluoroheptanesulfonic acid (PFHpS)	ND	2.2	µg/kg dry	1		SOP-466 PFAS	3/7/23	3/14/23 1:55	RRB
N-EtFOSAA (NEtFOSAA)	ND	2.2	µg/kg dry	1		SOP-466 PFAS	3/7/23	3/14/23 1:55	RRB
N-MeFOSAA (NMeFOSAA)	ND	2.2	µg/kg dry	1		SOP-466 PFAS	3/7/23	3/14/23 1:55	RRB
Perfluorotetradecanoic acid (PFTA)	ND	2.2	µg/kg dry	1		SOP-466 PFAS	3/7/23	3/14/23 1:55	RRB
Perfluorotridecanoic acid (PFTrDA)	ND	2.2	µg/kg dry	1		SOP-466 PFAS	3/7/23	3/14/23 1:55	RRB
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	2.2	µg/kg dry	1		SOP-466 PFAS	3/7/23	3/14/23 1:55	RRB
Perfluorodecanesulfonic acid (PFDS)	ND	2.2	µg/kg dry	1		SOP-466 PFAS	3/7/23	3/14/23 1:55	RRB
Perfluoropetanesulfonic acid (PFPeS)	ND	1.9	µg/kg dry	1		Draft Method 1633	3/31/23	4/3/23 13:14	AMS
Perfluorooctanesulfonamide (FOSA)	ND	2.2	µg/kg dry	1		SOP-466 PFAS	3/7/23	3/14/23 1:55	RRB
Perfluorononanesulfonic acid (PFNS)	3.0	2.2	µg/kg dry	1	MS-23	SOP-466 PFAS	3/7/23	3/14/23 1:55	RRB
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	2.2	µg/kg dry	1		SOP-466 PFAS	3/7/23	3/14/23 1:55	RRB
Perfluoro-1-butanesulfonamide (FBSA)	ND	2.2	µg/kg dry	1		SOP-466 PFAS	3/7/23	3/14/23 1:55	RRB
Perfluorohexanesulfonic acid (PFHxS)	ND	2.2	µg/kg dry	1		SOP-466 PFAS	3/7/23	3/14/23 1:55	RRB
Perfluorohexanesulfonic acid (PFHxS)	ND	1.9	µg/kg dry	1		Draft Method 1633	3/31/23	4/3/23 13:14	AMS
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	2.2	µg/kg dry	1		SOP-466 PFAS	3/7/23	3/14/23 1:55	RRB
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.9	µg/kg dry	1		Draft Method 1633	3/31/23	4/3/23 13:14	AMS
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	2.2	µg/kg dry	1		SOP-466 PFAS	3/7/23	3/14/23 1:55	RRB
Perfluorooctanesulfonic acid (PFOS)	4.3	1.9	µg/kg dry	1		Draft Method 1633	3/31/23	4/3/23 13:14	AMS

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Wheeling WWTP | Sample Description: | Work Order: 23C0262

Date Received: 3/2/2023

Field Sample #: WPCD Cake | Sampled: 3/1/2023 06:00

Sample ID: 23C0262-01

Sample Matrix: Soil

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	2.2	µg/kg dry	1		SOP-466 PFAS	3/7/23	3/14/23 1:55	RRB
Perfluorononanesulfonic acid (PFNS)	ND	1.9	µg/kg dry	1		Draft Method 1633	3/31/23	4/3/23 13:14	AMS
Perfluorodecanesulfonic acid (PFDS)	ND	1.9	µg/kg dry	1		Draft Method 1633	3/31/23	4/3/23 13:14	AMS
Perfluoropetanesulfonic acid (PFPeS)	ND	2.2	µg/kg dry	1		SOP-466 PFAS	3/7/23	3/14/23 1:55	RRB
Perfluorododecanesulfonic acid (PFDoS)	ND	1.9	µg/kg dry	1		Draft Method 1633	3/31/23	4/3/23 13:14	AMS
Perfluoroundecanoic acid (PFUnA)	ND	2.2	µg/kg dry	1		SOP-466 PFAS	3/7/23	3/14/23 1:55	RRB
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2FTS)	ND	7.5	µg/kg dry	1		Draft Method 1633	3/31/23	4/3/23 13:14	AMS
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	2.2	µg/kg dry	1		SOP-466 PFAS	3/7/23	3/14/23 1:55	RRB
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2FTS)	ND	7.5	µg/kg dry	1	PF-17	Draft Method 1633	3/31/23	4/3/23 13:14	AMS
Perfluoroheptanoic acid (PFHpA)	ND	2.2	µg/kg dry	1		SOP-466 PFAS	3/7/23	3/14/23 1:55	RRB
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2FTS)	ND	7.5	µg/kg dry	1	PF-17	Draft Method 1633	3/31/23	4/3/23 13:14	AMS
Perfluorooctanoic acid (PFOA)	ND	2.2	µg/kg dry	1		SOP-466 PFAS	3/7/23	3/14/23 1:55	RRB
Perfluorooctanesulfonamide (PFOSA)	ND	1.9	µg/kg dry	1		Draft Method 1633	3/31/23	4/3/23 13:14	AMS
Perfluorooctanesulfonic acid (PFOS)	ND	2.2	µg/kg dry	1		SOP-466 PFAS	3/7/23	3/14/23 1:55	RRB
N-methyl perfluoroocatnesulfonamide (NMeFOSA)	ND	1.9	µg/kg dry	1		Draft Method 1633	3/31/23	4/3/23 13:14	AMS
Perfluorononanoic acid (PFNA)	ND	2.2	µg/kg dry	1		SOP-466 PFAS	3/7/23	3/14/23 1:55	RRB
N-ethyl perfluorooctanesulfonamide (NEtFOSA)	ND	1.9	µg/kg dry	1	S-29	Draft Method 1633	3/31/23	4/3/23 13:14	AMS
N-MeFOSAA (NMeFOSAA)	4.9	1.9	µg/kg dry	1		Draft Method 1633	3/31/23	4/3/23 13:14	AMS
N-EtFOSAA (NEtFOSAA)	ND	1.9	µg/kg dry	1		Draft Method 1633	3/31/23	4/3/23 13:14	AMS
N-methylperfluorooctanesulfonamidoethanol(NMeFOSE)	ND	19	µg/kg dry	1		Draft Method 1633	3/31/23	4/3/23 13:14	AMS
N-ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	ND	19	µg/kg dry	1	S-29	Draft Method 1633	3/31/23	4/3/23 13:14	AMS
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	7.5	µg/kg dry	1		Draft Method 1633	3/31/23	4/3/23 13:14	AMS
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	7.5	µg/kg dry	1		Draft Method 1633	3/31/23	4/3/23 13:14	AMS
9Cl-PF3ONS (F53B Minor)	ND	7.5	µg/kg dry	1		Draft Method 1633	3/31/23	4/3/23 13:14	AMS
11Cl-PF3OUdS (F53B Major)	ND	7.5	µg/kg dry	1		Draft Method 1633	3/31/23	4/3/23 13:14	AMS
3-Perfluoropropyl propanoic acid (FPrPA) (3:3FTCA)	ND	19	µg/kg dry	1		Draft Method 1633	3/31/23	4/3/23 13:14	AMS
2H,2H,3H,3H-Perfluorooctanoic acid(FPePA)(5:3FTCA)	ND	93	µg/kg dry	1		Draft Method 1633	3/31/23	4/3/23 13:14	AMS
3-Perfluoroheptyl propanoic acid (FHpPA) (7:3FTCA)	ND	93	µg/kg dry	1		Draft Method 1633	3/31/23	4/3/23 13:14	AMS
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	ND	3.7	µg/kg dry	1		Draft Method 1633	3/31/23	4/3/23 13:14	AMS
Perfluoro-3-methoxypropanoic acid (PFMPA)	ND	3.7	µg/kg dry	1		Draft Method 1633	3/31/23	4/3/23 13:14	AMS
Perfluoro-4-methoxybutanoic acid (PFMBA)	ND	3.7	µg/kg dry	1		Draft Method 1633	3/31/23	4/3/23 13:14	AMS
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	3.7	µg/kg dry	1		Draft Method 1633	3/31/23	4/3/23 13:14	AMS

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
13C4-PFBA	27.6	20-150		4/3/23 13:14
13C5-PFPeA	63.5	20-150		4/3/23 13:14
13C5-PFHxA	71.3	20-150		4/3/23 13:14
13C4-PFHpA	73.3	20-150		4/3/23 13:14

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Project Location: Wheeling WWTP | Sample Description: | Work Order: 23C0262

Date Received: 3/2/2023

Field Sample #: WPCD Cake | Sampled: 3/1/2023 06:00

Sample ID: 23C0262-01

Sample Matrix: Soil

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL		Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Surrogates	**% Recovery**		**Recovery Limits**			**Flag/Qual**				
13C8-PFOA	73.4		20-150						4/3/23 13:14	
13C9-PFNA	75.1		20-150						4/3/23 13:14	
13C6-PFDA	76.8		20-150						4/3/23 13:14	
13C7-PFUnA	66.9		20-150						4/3/23 13:14	
13C2-PFDoA	63.5		20-150						4/3/23 13:14	
13C2-PFTeDA	36.4		20-150						4/3/23 13:14	
13C3-PFBS	65.5		20-150						4/3/23 13:14	
13C3-PFHxS	68.5		20-150						4/3/23 13:14	
13C8-PFOS	72.4		20-150						4/3/23 13:14	
13C2-4:2FTS	113		20-150						4/3/23 13:14	
13C2-6:2FTS	**158**	*	20-150			PF-17			4/3/23 13:14	
13C2-8:2FTS	**181**	*	20-150			PF-17			4/3/23 13:14	
13C8-PFOSA	90.6		20-150						4/3/23 13:14	
D3-NMeFOSA	22.1		20-150						4/3/23 13:14	
D5-NEtFOSA	**11.6**	*	20-150			S-29			4/3/23 13:14	
D3-NMeFOSAA	78.7		20-150						4/3/23 13:14	
D5-NEtFOSAA	25.8		20-150						4/3/23 13:14	
D7-NMeFOSE	22.1		20-150						4/3/23 13:14	
D9-NEtFOSE	**18.7**	*	20-150			S-29			4/3/23 13:14	
13C3-HFPO-DA	64.3		20-150						4/3/23 13:14	

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Project Location: Wheeling WWTP | Sample Description: | Work Order: 23C0262

Date Received: 3/2/2023

Field Sample #: WPCD Cake | Sampled: 3/1/2023 06:00

Sample ID: 23C0262-01

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	19.9		% Wt	1		SM 2540G	3/4/23	3/4/23 9:39	WDC

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Project Location: Wheeling WWTP | Sample Description: | Work Order: 23C0262

Date Received: 3/2/2023

Field Sample #: WPCD Influent | Sampled: 3/1/2023 08:00

Sample ID: 23C0262-02

Sample Matrix: Waste Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	9.1	8.2	ng/L	1		Draft Method 1633	3/15/23	3/17/23 8:49	QNW
Perfluoropentanoic acid (PFPeA)	6.3	4.1	ng/L	1	PF-22B	Draft Method 1633	3/15/23	3/17/23 8:49	QNW
Perfluorohexanoic acid (PFHxA)	13	2.1	ng/L	1		Draft Method 1633	3/15/23	3/17/23 8:49	QNW
Perfluoroheptanoic acid (PFHpA)	2.1	2.1	ng/L	1		Draft Method 1633	3/15/23	3/17/23 8:49	QNW
Perfluorooctanoic acid (PFOA)	5.5	2.1	ng/L	1		Draft Method 1633	3/15/23	3/17/23 8:49	QNW
Perfluorononanoic acid (PFNA)	ND	2.1	ng/L	1		Draft Method 1633	3/15/23	3/17/23 8:49	QNW
Perfluorodecanoic acid (PFDA)	ND	2.1	ng/L	1		Draft Method 1633	3/15/23	3/17/23 8:49	QNW
Perfluoroundecanoic acid (PFUnA)	ND	2.1	ng/L	1		Draft Method 1633	3/15/23	3/17/23 8:49	QNW
Perfluorododecanoic acid (PFDoA)	ND	2.1	ng/L	1		Draft Method 1633	3/15/23	3/17/23 8:49	QNW
Perfluorotridecanoic acid (PFTrDA)	ND	2.1	ng/L	1		Draft Method 1633	3/15/23	3/17/23 8:49	QNW
Perfluorotetradecanoic acid (PFTeDA)	ND	2.1	ng/L	1		Draft Method 1633	3/15/23	3/17/23 8:49	QNW
Perfluorobutanesulfonic acid (PFBS)	11	2.1	ng/L	1		Draft Method 1633	3/15/23	3/17/23 8:49	QNW
Perfluoropetanesulfonic acid (PFPeS)	ND	2.1	ng/L	1		Draft Method 1633	3/15/23	3/17/23 8:49	QNW
Perfluorohexanesulfonic acid (PFHxS)	4.0	2.1	ng/L	1		Draft Method 1633	3/15/23	3/17/23 8:49	QNW
Perfluoroheptanesulfonic acid (PFHpS)	ND	2.1	ng/L	1		Draft Method 1633	3/15/23	3/17/23 8:49	QNW
Perfluorooctanesulfonic acid (PFOS)	3.5	2.1	ng/L	1		Draft Method 1633	3/15/23	3/17/23 8:49	QNW
Perfluorononanesulfonic acid (PFNS)	ND	2.1	ng/L	1		Draft Method 1633	3/15/23	3/17/23 8:49	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	2.1	ng/L	1		Draft Method 1633	3/15/23	3/17/23 8:49	QNW
Perfluorododecanesulfonic acid (PFDoS)	ND	2.1	ng/L	1		Draft Method 1633	3/15/23	3/17/23 8:49	QNW
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2FTS)	ND	8.2	ng/L	1		Draft Method 1633	3/15/23	3/17/23 8:49	QNW
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2FTS)	ND	8.2	ng/L	1		Draft Method 1633	3/15/23	3/17/23 8:49	QNW
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2FTS)	ND	8.2	ng/L	1		Draft Method 1633	3/15/23	3/17/23 8:49	QNW
Perfluorooctanesulfonamide (PFOSA)	ND	2.1	ng/L	1		Draft Method 1633	3/15/23	3/17/23 8:49	QNW
N-methyl perfluoroocatnesulfonamide (NMeFOSA)	ND	2.1	ng/L	1		Draft Method 1633	3/15/23	3/17/23 8:49	QNW
N-ethyl perfluorooctanesulfonamide (NEtFOSA)	ND	2.1	ng/L	1		Draft Method 1633	3/15/23	3/17/23 8:49	QNW
N-MeFOSAA (NMeFOSAA)	ND	2.1	ng/L	1		Draft Method 1633	3/15/23	3/17/23 8:49	QNW
N-EtFOSAA (NEtFOSAA)	ND	2.1	ng/L	1		Draft Method 1633	3/15/23	3/17/23 8:49	QNW
N-methylperfluorooctanesulfonamidoethanol(NMeFOSE)	ND	21	ng/L	1		Draft Method 1633	3/15/23	3/17/23 8:49	QNW
N-ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	ND	21	ng/L	1		Draft Method 1633	3/15/23	3/17/23 8:49	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	8.2	ng/L	1		Draft Method 1633	3/15/23	3/17/23 8:49	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	8.2	ng/L	1		Draft Method 1633	3/15/23	3/17/23 8:49	QNW
9Cl-PF3ONS (F53B Minor)	ND	8.2	ng/L	1		Draft Method 1633	3/15/23	3/17/23 8:49	QNW
11Cl-PF3OUdS (F53B Major)	ND	8.2	ng/L	1		Draft Method 1633	3/15/23	3/17/23 8:49	QNW
3-Perfluoropropyl propanoic acid (FPrPA) (3:3FTCA)	ND	21	ng/L	1		Draft Method 1633	3/15/23	3/17/23 8:49	QNW
2H,2H,3H,3H-Perfluorooctanoic acid(FPePA)(5:3FTCA)	ND	100	ng/L	1		Draft Method 1633	3/15/23	3/17/23 8:49	QNW
3-Perfluoroheptyl propanoic acid (FHpPA) (7:3FTCA)	ND	100	ng/L	1		Draft Method 1633	3/15/23	3/17/23 8:49	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	ND	4.1	ng/L	1		Draft Method 1633	3/15/23	3/17/23 8:49	QNW
Perfluoro-3-methoxypropanoic acid (PFMPA)	ND	4.1	ng/L	1		Draft Method 1633	3/15/23	3/17/23 8:49	QNW

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Project Location: Wheeling WWTP | Sample Description: | Work Order: 23C0262

Date Received: 3/2/2023

Field Sample #: WPCD Influent | Sampled: 3/1/2023 08:00

Sample ID: 23C0262-02

Sample Matrix: Waste Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluoro-4-methoxybutanoic acid (PFMBA)	ND	4.1	ng/L	1		Draft Method 1633	3/15/23	3/17/23 8:49	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	4.1	ng/L	1		Draft Method 1633	3/15/23	3/17/23 8:49	QNW

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
13C4-PFBA	82.3	20-150		3/17/23 8:49
13C5-PFPeA	84.9	20-150		3/17/23 8:49
13C5-PFHxA	85.5	20-150		3/17/23 8:49
13C4-PFHpA	88.4	20-150		3/17/23 8:49
13C8-PFOA	84.3	20-150		3/17/23 8:49
13C9-PFNA	85.0	20-150		3/17/23 8:49
13C6-PFDA	86.8	20-150		3/17/23 8:49
13C7-PFUnA	79.6	20-150		3/17/23 8:49
13C2-PFDoA	71.6	20-150		3/17/23 8:49
13C2-PFTeDA	51.1	20-150		3/17/23 8:49
13C3-PFBS	80.3	20-150		3/17/23 8:49
13C3-PFHxS	85.9	20-150		3/17/23 8:49
13C8-PFOS	84.5	20-150		3/17/23 8:49
13C2-4:2FTS	137	20-150		3/17/23 8:49
13C2-6:2FTS	118	20-150		3/17/23 8:49
13C2-8:2FTS	133	20-150		3/17/23 8:49
13C8-PFOSA	72.3	20-150		3/17/23 8:49
D3-NMeFOSA	58.4	20-150		3/17/23 8:49
D5-NEtFOSA	60.3	20-150		3/17/23 8:49
D3-NMeFOSAA	80.9	20-150		3/17/23 8:49
D5-NEtFOSAA	82.7	20-150		3/17/23 8:49
D7-NMeFOSE	65.7	20-150		3/17/23 8:49
D9-NEtFOSE	60.4	20-150		3/17/23 8:49
13C3-HFPO-DA	92.2	20-150		3/17/23 8:49

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Project Location: Wheeling WWTP | Sample Description: | Work Order: 23C0262

Date Received: 3/2/2023

Field Sample #: WPCD Influent | Sampled: 3/1/2023 08:00

Sample ID: 23C0262-02

Sample Matrix: Waste Water

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Total Suspended Solids	34	10	mg/L	1	H-01	Draft Method 1633	3/10/23	3/10/23 13:56	ll

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Project Location: Wheeling WWTP | Sample Description: | Work Order: 23C0262

Date Received: 3/2/2023

Field Sample #: WPCD Blank | Sampled: 3/1/2023 08:00

Sample ID: 23C0262-03

Sample Matrix: Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanoic acid (PFBA)	ND	3.9	ng/L	1		Draft Method 1633	3/24/23	3/28/23 13:32	DRL
Perfluoropentanoic acid (PFPeA)	ND	1.9	ng/L	1		Draft Method 1633	3/24/23	3/28/23 13:32	DRL
Perfluorohexanoic acid (PFHxA)	ND	0.97	ng/L	1		Draft Method 1633	3/24/23	3/28/23 13:32	DRL
Perfluoroheptanoic acid (PFHpA)	ND	0.97	ng/L	1		Draft Method 1633	3/24/23	3/28/23 13:32	DRL
Perfluorooctanoic acid (PFOA)	ND	0.97	ng/L	1		Draft Method 1633	3/24/23	3/28/23 13:32	DRL
Perfluorononanoic acid (PFNA)	ND	0.97	ng/L	1		Draft Method 1633	3/24/23	3/28/23 13:32	DRL
Perfluorodecanoic acid (PFDA)	ND	0.97	ng/L	1		Draft Method 1633	3/24/23	3/28/23 13:32	DRL
Perfluoroundecanoic acid (PFUnA)	ND	0.97	ng/L	1		Draft Method 1633	3/24/23	3/28/23 13:32	DRL
Perfluorododecanoic acid (PFDoA)	ND	0.97	ng/L	1		Draft Method 1633	3/24/23	3/28/23 13:32	DRL
Perfluorotridecanoic acid (PFTrDA)	ND	0.97	ng/L	1		Draft Method 1633	3/24/23	3/28/23 13:32	DRL
Perfluorotetradecanoic acid (PFTeDA)	ND	0.97	ng/L	1		Draft Method 1633	3/24/23	3/28/23 13:32	DRL
Perfluorobutanesulfonic acid (PFBS)	ND	0.97	ng/L	1		Draft Method 1633	3/24/23	3/28/23 13:32	DRL
Perfluoropetanesulfonic acid (PFPeS)	ND	0.97	ng/L	1		Draft Method 1633	3/24/23	3/28/23 13:32	DRL
Perfluorohexanesulfonic acid (PFHxS)	ND	0.97	ng/L	1		Draft Method 1633	3/24/23	3/28/23 13:32	DRL
Perfluoroheptanesulfonic acid (PFHpS)	ND	0.97	ng/L	1		Draft Method 1633	3/24/23	3/28/23 13:32	DRL
Perfluorooctanesulfonic acid (PFOS)	ND	0.97	ng/L	1		Draft Method 1633	3/24/23	3/28/23 13:32	DRL
Perfluorononanesulfonic acid (PFNS)	ND	0.97	ng/L	1		Draft Method 1633	3/24/23	3/28/23 13:32	DRL
Perfluorodecanesulfonic acid (PFDS)	ND	0.97	ng/L	1		Draft Method 1633	3/24/23	3/28/23 13:32	DRL
Perfluorododecanesulfonic acid (PFDoS)	ND	0.97	ng/L	1		Draft Method 1633	3/24/23	3/28/23 13:32	DRL
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2FTS)	ND	3.9	ng/L	1		Draft Method 1633	3/24/23	3/28/23 13:32	DRL
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2FTS)	ND	3.9	ng/L	1		Draft Method 1633	3/24/23	3/28/23 13:32	DRL
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2FTS)	ND	3.9	ng/L	1		Draft Method 1633	3/24/23	3/28/23 13:32	DRL
Perfluorooctanesulfonamide (PFOSA)	ND	0.97	ng/L	1		Draft Method 1633	3/24/23	3/28/23 13:32	DRL
N-methyl perfluoroocatnesulfonamide (NMeFOSA)	ND	0.97	ng/L	1		Draft Method 1633	3/24/23	3/28/23 13:32	DRL
N-ethyl perfluorooctanesulfonamide (NEtFOSA)	ND	0.97	ng/L	1		Draft Method 1633	3/24/23	3/28/23 13:32	DRL
N-MeFOSAA (NMeFOSAA)	ND	0.97	ng/L	1		Draft Method 1633	3/24/23	3/28/23 13:32	DRL
N-EtFOSAA (NEtFOSAA)	ND	0.97	ng/L	1		Draft Method 1633	3/24/23	3/28/23 13:32	DRL
N-methylperfluorooctanesulfonamidoethanol(NMeFOSE)	ND	9.7	ng/L	1		Draft Method 1633	3/24/23	3/28/23 13:32	DRL
N-ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	ND	9.7	ng/L	1		Draft Method 1633	3/24/23	3/28/23 13:32	DRL
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	3.9	ng/L	1		Draft Method 1633	3/24/23	3/28/23 13:32	DRL
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	3.9	ng/L	1		Draft Method 1633	3/24/23	3/28/23 13:32	DRL
9Cl-PF3ONS (F53B Minor)	ND	3.9	ng/L	1		Draft Method 1633	3/24/23	3/28/23 13:32	DRL
11Cl-PF3OUdS (F53B Major)	ND	3.9	ng/L	1		Draft Method 1633	3/24/23	3/28/23 13:32	DRL
3-Perfluoropropyl propanoic acid (FPrPA) (3:3FTCA)	ND	9.7	ng/L	1		Draft Method 1633	3/24/23	3/28/23 13:32	DRL
2H,2H,3H,3H-Perfluorooctanoic acid(FPePA)(5:3FTCA)	ND	48	ng/L	1		Draft Method 1633	3/24/23	3/28/23 13:32	DRL
3-Perfluoroheptyl propanoic acid (FHpPA) (7:3FTCA)	ND	48	ng/L	1		Draft Method 1633	3/24/23	3/28/23 13:32	DRL
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	ND	1.9	ng/L	1		Draft Method 1633	3/24/23	3/28/23 13:32	DRL
Perfluoro-3-methoxypropanoic acid (PFMPA)	ND	1.9	ng/L	1		Draft Method 1633	3/24/23	3/28/23 13:32	DRL

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Project Location: Wheeling WWTP | Sample Description: | Work Order: 23C0262

Date Received: 3/2/2023

Field Sample #: WPCD Blank | Sampled: 3/1/2023 08:00

Sample ID: 23C0262-03

Sample Matrix: Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluoro-4-methoxybutanoic acid (PFMBA)	ND	1.9	ng/L	1		Draft Method 1633	3/24/23	3/28/23 13:32	DRL
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.9	ng/L	1		Draft Method 1633	3/24/23	3/28/23 13:32	DRL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
13C4-PFBA	82.8	20-150		3/28/23 13:32
13C5-PFPeA	86.6	20-150		3/28/23 13:32
13C5-PFHxA	86.3	20-150		3/28/23 13:32
13C4-PFHpA	87.3	20-150		3/28/23 13:32
13C8-PFOA	85.7	20-150		3/28/23 13:32
13C9-PFNA	87.8	20-150		3/28/23 13:32
13C6-PFDA	89.6	20-150		3/28/23 13:32
13C7-PFUnA	86.6	20-150		3/28/23 13:32
13C2-PFDoA	82.8	20-150		3/28/23 13:32
13C2-PFTeDA	86.8	20-150		3/28/23 13:32
13C3-PFBS	82.8	20-150		3/28/23 13:32
13C3-PFHxS	83.6	20-150		3/28/23 13:32
13C8-PFOS	83.3	20-150		3/28/23 13:32
13C2-4:2FTS	93.6	20-150		3/28/23 13:32
13C2-6:2FTS	75.1	20-150		3/28/23 13:32
13C2-8:2FTS	72.6	20-150		3/28/23 13:32
13C8-PFOSA	85.8	20-150		3/28/23 13:32
D3-NMeFOSA	70.5	20-150		3/28/23 13:32
D5-NEtFOSA	75.1	20-150		3/28/23 13:32
D3-NMeFOSAA	83.7	20-150		3/28/23 13:32
D5-NEtFOSAA	85.2	20-150		3/28/23 13:32
D7-NMeFOSE	80.3	20-150		3/28/23 13:32
D9-NEtFOSE	77.6	20-150		3/28/23 13:32
13C3-HFPO-DA	92.4	20-150		3/28/23 13:32

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Sample Extraction Data

Prep Method: Draft Method 1633 **Analytical Method: Draft Method 1633**

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
23C0262-01 [WPCD Cake]	B334653	2.69	5.00	03/31/23

Draft Method 1633

Lab Number [Field ID]	Batch	Initial [mL]	Date
23C0262-02 [WPCD Influent]	B333870	50.0	03/10/23

Prep Method: Draft Method 1633 **Analytical Method: Draft Method 1633 were extracted on 3/10/2023 per NO PREP in Batch B333870**

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
23C0262-02 [WPCD Influent]	B333940	243	5.00	03/15/23

Prep Method: Draft Method 1633 **Analytical Method: Draft Method 1633**

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
23C0262-03 [WPCD Blank]	B334428	517	5.00	03/24/23

Prep Method: % Solids **Analytical Method: SM 2540G**

Lab Number [Field ID]	Batch	Date
23C0262-01 [WPCD Cake]	B333238	03/04/23

Prep Method: SOP 465-PFAAS **Analytical Method: SOP-466 PFAS**

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
23C0262-01 [WPCD Cake]	B333335	5.59	5.00	03/07/23

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QUALITY CONTROL

Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B333335 - SOP 465-PFAAS										
Blank (B333335-BLK1)				Prepared: 03/07/23 Analyzed: 03/14/23						
Perfluorobutanoic acid (PFBA)	ND	0.43	µg/kg wet							
Perfluorobutanesulfonic acid (PFBS)	ND	0.43	µg/kg wet							
Perfluoropentanoic acid (PFPeA)	ND	0.43	µg/kg wet							
Perfluorohexanoic acid (PFHxA)	ND	0.43	µg/kg wet							
11Cl-PF3OUdS (F53B Major)	ND	0.43	µg/kg wet							
9Cl-PF3ONS (F53B Minor)	ND	0.43	µg/kg wet							
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	0.43	µg/kg wet							
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	0.43	µg/kg wet							
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	0.43	µg/kg wet							
Perfluorodecanoic acid (PFDA)	ND	0.43	µg/kg wet							
Perfluorododecanoic acid (PFDoA)	ND	0.43	µg/kg wet							
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	ND	0.43	µg/kg wet							
Perfluoroheptanesulfonic acid (PFHpS)	ND	0.43	µg/kg wet							
N-EtFOSAA (NEtFOSAA)	ND	0.43	µg/kg wet							
N-MeFOSAA (NMeFOSAA)	ND	0.43	µg/kg wet							
Perfluorotetradecanoic acid (PFTA)	ND	0.43	µg/kg wet							
Perfluorotridecanoic acid (PFTrDA)	ND	0.43	µg/kg wet							
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	0.43	µg/kg wet							
Perfluorodecanesulfonic acid (PFDS)	ND	0.43	µg/kg wet							
Perfluorooctanesulfonamide (FOSA)	ND	0.43	µg/kg wet							
Perfluorononanesulfonic acid (PFNS)	ND	0.43	µg/kg wet							
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	0.43	µg/kg wet							
Perfluoro-1-butanesulfonamide (FBSA)	ND	0.43	µg/kg wet							
Perfluorohexanesulfonic acid (PFHxS)	ND	0.43	µg/kg wet							
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	0.43	µg/kg wet							
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	0.43	µg/kg wet							
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	0.43	µg/kg wet							
Perfluoropetanesulfonic acid (PFPeS)	ND	0.43	µg/kg wet							
Perfluoroundecanoic acid (PFUnA)	ND	0.43	µg/kg wet							
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	0.43	µg/kg wet							
Perfluoroheptanoic acid (PFHpA)	ND	0.43	µg/kg wet							
Perfluorooctanoic acid (PFOA)	ND	0.43	µg/kg wet							
Perfluorooctanesulfonic acid (PFOS)	ND	0.43	µg/kg wet							
Perfluorononanoic acid (PFNA)	ND	0.43	µg/kg wet							
LCS (B333335-BS1)				Prepared: 03/07/23 Analyzed: 03/14/23						
Perfluorobutanoic acid (PFBA)	2.08	0.45	µg/kg wet	2.25		92.3	71-135			
Perfluorobutanesulfonic acid (PFBS)	1.84	0.45	µg/kg wet	1.99		92.3	72-128			
Perfluoropentanoic acid (PFPeA)	2.04	0.45	µg/kg wet	2.25		90.7	69-132			
Perfluorohexanoic acid (PFHxA)	2.13	0.45	µg/kg wet	2.25		94.4	70-132			
11Cl-PF3OUdS (F53B Major)	1.91	0.45	µg/kg wet	2.12		90.2	41.8-128			
9Cl-PF3ONS (F53B Minor)	1.79	0.45	µg/kg wet	2.10		85.2	51.1-141			
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	2.01	0.45	µg/kg wet	2.12		94.6	55.2-122			
Hexafluoropropylene oxide dimer acid (HFPO-DA)	1.76	0.45	µg/kg wet	2.25		78.0	27.6-137			
8:2 Fluorotelomersulfonic acid (8:2FTS A)	1.91	0.45	µg/kg wet	2.16		88.3	65-137			
Perfluorodecanoic acid (PFDA)	2.03	0.45	µg/kg wet	2.25		89.9	69-133			
Perfluorododecanoic acid (PFDoA)	1.84	0.45	µg/kg wet	2.25		81.6	69-135			
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	2.05	0.45	µg/kg wet	2.01		102	56.7-133			

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QUALITY CONTROL

Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B333335 - SOP 465-PFAAS											
LCS (B333335-BS1)				Prepared: 03/07/23 Analyzed: 03/14/23							
Perfluoroheptanesulfonic acid (PFHpS)	1.91	0.45	µg/kg wet	2.15		88.8		70-132			
N-EtFOSAA (NEtFOSAA)	1.97	0.45	µg/kg wet	2.25		87.4		61-139			
N-MeFOSAA (NMeFOSAA)	1.96	0.45	µg/kg wet	2.25		87.0		63-144			
Perfluorotetradecanoic acid (PFTA)	2.19	0.45	µg/kg wet	2.25		97.3		69-133			
Perfluorotridecanoic acid (PFTrDA)	2.08	0.45	µg/kg wet	2.25		92.2		66-139			
4:2 Fluorotelomersulfonic acid (4:2FTS A)	1.87	0.45	µg/kg wet	2.11		88.9		62-145			
Perfluorodecanesulfonic acid (PFDS)	1.77	0.45	µg/kg wet	2.17		81.7		59-134			
Perfluorooctanesulfonamide (FOSA)	2.00	0.45	µg/kg wet	2.25		88.8		67-137			
Perfluorononanesulfonic acid (PFNS)	1.83	0.45	µg/kg wet	2.16		84.5		69-125			
Perfluoro-1-hexanesulfonamide (FHxSA)	2.19	0.45	µg/kg wet	2.25		97.0		51.4-142			
Perfluoro-1-butanesulfonamide (FBSA)	2.17	0.45	µg/kg wet	2.25		96.2		53.5-129			
Perfluorohexanesulfonic acid (PFHxS)	1.82	0.45	µg/kg wet	2.06		88.4		67-130			
Perfluoro-4-oxapentanoic acid (PFMPA)	2.20	0.45	µg/kg wet	2.25		97.5		57.8-127			
Perfluoro-5-oxahexanoic acid (PFMBA)	2.35	0.45	µg/kg wet	2.25		104		56.5-132			
6:2 Fluorotelomersulfonic acid (6:2FTS A)	2.06	0.45	µg/kg wet	2.14		96.1		64-140			
Perfluoropetanesulfonic acid (PFPeS)	1.95	0.45	µg/kg wet	2.12		91.9		73-123			
Perfluoroundecanoic acid (PFUnA)	2.26	0.45	µg/kg wet	2.25		100		64-136			
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	2.47	0.45	µg/kg wet	2.25		110		54.5-128			
Perfluoroheptanoic acid (PFHpA)	2.17	0.45	µg/kg wet	2.25		96.3		71-131			
Perfluorooctanoic acid (PFOA)	1.97	0.45	µg/kg wet	2.25		87.5		69-133			
Perfluorooctanesulfonic acid (PFOS)	1.75	0.45	µg/kg wet	2.08		83.9		68-136			
Perfluorononanoic acid (PFNA)	2.10	0.45	µg/kg wet	2.25		93.2		72-129			
Matrix Spike (B333335-MS1)		**Source: 23C0262-01**		Prepared: 03/07/23 Analyzed: 03/14/23							
Perfluorobutanoic acid (PFBA)	10.9	2.1	µg/kg dry	10.5	ND	104		71-135			
Perfluorobutanesulfonic acid (PFBS)	8.87	2.1	µg/kg dry	9.27	ND	95.7		72-128			
Perfluoropentanoic acid (PFPeA)	9.85	2.1	µg/kg dry	10.5	ND	94.0		69-132			
Perfluorohexanoic acid (PFHxA)	10.3	2.1	µg/kg dry	10.5	ND	98.3		70-132			
11Cl-PF3OUdS (F53B Major)	7.97	2.1	µg/kg dry	9.87	ND	80.7		4.02-158			
9Cl-PF3ONS (F53B Minor)	7.59	2.1	µg/kg dry	9.77	ND	77.7		52.5-150			
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	9.33	2.1	µg/kg dry	9.87	ND	94.5		50.7-124			
Hexafluoropropylene oxide dimer acid (HFPO-DA)	8.21	2.1	µg/kg dry	10.5	ND	78.3		29.2-146			
8:2 Fluorotelomersulfonic acid (8:2FTS A)	10.7	2.1	µg/kg dry	10.1	ND	107		65-137			
Perfluorodecanoic acid (PFDA)	9.27	2.1	µg/kg dry	10.5	ND	88.5		69-133			
Perfluorododecanoic acid (PFDoA)	9.03	2.1	µg/kg dry	10.5	ND	86.1		69-135			
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	10.1	2.1	µg/kg dry	9.33	ND	108		60.7-135			
Perfluoroheptanesulfonic acid (PFHpS)	7.88	2.1	µg/kg dry	10.0	ND	78.6		70-132			
N-EtFOSAA (NEtFOSAA)	10.2	2.1	µg/kg dry	10.5	0.986	88.1		61-139			
N-MeFOSAA (NMeFOSAA)	11.1	2.1	µg/kg dry	10.5	1.27	93.8		63-144			
Perfluorotetradecanoic acid (PFTA)	9.39	2.1	µg/kg dry	10.5	ND	89.5		69-133			
Perfluorotridecanoic acid (PFTrDA)	8.12	2.1	µg/kg dry	10.5	ND	77.4		66-139			
4:2 Fluorotelomersulfonic acid (4:2FTS A)	9.54	2.1	µg/kg dry	9.81	ND	97.3		62-145			
Perfluorodecanesulfonic acid (PFDS)	14.0	2.1	µg/kg dry	10.1	ND	**139**	*	59-134			MS-11
Perfluorooctanesulfonamide (FOSA)	8.92	2.1	µg/kg dry	10.5	ND	85.1		67-137			
Perfluorononanesulfonic acid (PFNS)	9.16	2.1	µg/kg dry	10.1	2.99	**61.4**	*	69-125			MS-23
Perfluoro-1-hexanesulfonamide (FHxSA)	9.83	2.1	µg/kg dry	10.5	ND	93.8		18.9-162			
Perfluoro-1-butanesulfonamide (FBSA)	9.90	2.1	µg/kg dry	10.5	ND	94.5		49.8-135			
Perfluorohexanesulfonic acid (PFHxS)	7.99	2.1	µg/kg dry	9.60	ND	83.2		67-130			
Perfluoro-4-oxapentanoic acid (PFMPA)	10.4	2.1	µg/kg dry	10.5	ND	99.7		62-155			
Perfluoro-5-oxahexanoic acid (PFMBA)	11.6	2.1	µg/kg dry	10.5	ND	111		52.1-148			

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QUALITY CONTROL

Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD		RPD Limit	Notes
Batch B333335 - SOP 465-PFAAS												
Matrix Spike (B333335-MS1)	**Source: 23C0262-01**			Prepared: 03/07/23 Analyzed: 03/14/23								
6:2 Fluorotelomersulfonic acid (6:2FTS A)	9.86	2.1	µg/kg dry	9.96	ND	99.0		64-140				
Perfluoropetanesulfonic acid (PFPeS)	8.58	2.1	µg/kg dry	9.85	ND	87.1		73-123				
Perfluoroundecanoic acid (PFUnA)	10.1	2.1	µg/kg dry	10.5	ND	96.1		64-136				
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	12.1	2.1	µg/kg dry	10.5	ND	116		54.6-133				
Perfluoroheptanoic acid (PFHpA)	10.2	2.1	µg/kg dry	10.5	ND	97.0		71-131				
Perfluorooctanoic acid (PFOA)	9.11	2.1	µg/kg dry	10.5	ND	86.9		69-133				
Perfluorooctanesulfonic acid (PFOS)	7.64	2.1	µg/kg dry	9.68	1.73	**61.1**	*	68-136				MS-09
Perfluorononanoic acid (PFNA)	11.4	2.1	µg/kg dry	10.5	ND	109		72-129				
Matrix Spike Dup (B333335-MSD1)	**Source: 23C0262-01**			Prepared: 03/07/23 Analyzed: 03/14/23								
Perfluorobutanoic acid (PFBA)	10.7	2.2	µg/kg dry	11.3	ND	94.8		71-135	1.61		30	
Perfluorobutanesulfonic acid (PFBS)	7.75	2.2	µg/kg dry	9.98	ND	77.6		72-128	13.5		30	
Perfluoropentanoic acid (PFPeA)	10.9	2.2	µg/kg dry	11.3	ND	96.5		69-132	10.1		30	
Perfluorohexanoic acid (PFHxA)	10.8	2.2	µg/kg dry	11.3	ND	95.5		70-132	4.66		30	
11Cl-PF3OUdS (F53B Major)	5.57	2.2	µg/kg dry	10.6	ND	52.4		4.02-158	**35.4**	*	30	R-06
9Cl-PF3ONS (F53B Minor)	4.25	2.2	µg/kg dry	10.5	ND	**40.4**	*	52.5-150	**56.5**	*	30	MS-23
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	10.0	2.2	µg/kg dry	10.6	ND	94.1		50.7-124	7.07		30	
Hexafluoropropylene oxide dimer acid (HFPO-DA)	5.89	2.2	µg/kg dry	11.3	ND	52.1		29.2-146	**32.9**	*	30	R-06
8:2 Fluorotelomersulfonic acid (8:2FTS A)	9.35	2.2	µg/kg dry	10.8	ND	86.2		65-137	13.7		30	
Perfluorodecanoic acid (PFDA)	11.1	2.2	µg/kg dry	11.3	ND	98.1		69-133	17.8		30	
Perfluorododecanoic acid (PFDoA)	9.86	2.2	µg/kg dry	11.3	ND	87.3		69-135	8.77		30	
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	10.6	2.2	µg/kg dry	10.1	ND	106		60.7-135	5.39		30	
Perfluoroheptanesulfonic acid (PFHpS)	3.04	2.2	µg/kg dry	10.8	ND	**28.1**	*	70-132	**88.7**	*	30	MS-23
N-EtFOSAA (NEtFOSAA)	10.3	2.2	µg/kg dry	11.3	0.986	82.4		61-139	0.687		30	
N-MeFOSAA (NMeFOSAA)	12.6	2.2	µg/kg dry	11.3	1.27	100		63-144	12.3		30	
Perfluorotetradecanoic acid (PFTA)	10.9	2.2	µg/kg dry	11.3	ND	96.5		69-133	15.0		30	
Perfluorotridecanoic acid (PFTrDA)	8.63	2.2	µg/kg dry	11.3	ND	76.4		66-139	6.10		30	
4:2 Fluorotelomersulfonic acid (4:2FTS A)	10.1	2.2	µg/kg dry	10.6	ND	95.7		62-145	5.88		30	
Perfluorodecanesulfonic acid (PFDS)	14.3	2.2	µg/kg dry	10.9	ND	132		59-134	2.13		30	
Perfluorooctanesulfonamide (FOSA)	10.4	2.2	µg/kg dry	11.3	ND	92.5		67-137	15.8		30	
Perfluorononanesulfonic acid (PFNS)	13.0	2.2	µg/kg dry	10.8	2.99	92.7		69-125	**34.9**	*	30	MS-23
Perfluoro-1-hexanesulfonamide (FHxSA)	9.29	2.2	µg/kg dry	11.3	ND	82.2		18.9-162	5.70		30	
Perfluoro-1-butanesulfonamide (FBSA)	10.1	2.2	µg/kg dry	11.3	ND	89.5		49.8-135	2.07		30	
Perfluorohexanesulfonic acid (PFHxS)	9.60	2.2	µg/kg dry	10.3	ND	92.8		67-130	18.4		30	
Perfluoro-4-oxapentanoic acid (PFMPA)	11.1	2.2	µg/kg dry	11.3	ND	98.6		62-155	6.36		30	
Perfluoro-5-oxahexanoic acid (PFMBA)	12.1	2.2	µg/kg dry	11.3	ND	107		52.1-148	4.03		30	
6:2 Fluorotelomersulfonic acid (6:2FTS A)	12.5	2.2	µg/kg dry	10.7	ND	117		64-140	24.0		30	
Perfluoropetanesulfonic acid (PFPeS)	7.85	2.2	µg/kg dry	10.6	ND	73.9		73-123	8.88		30	
Perfluoroundecanoic acid (PFUnA)	11.0	2.2	µg/kg dry	11.3	ND	97.0		64-136	8.40		30	
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	12.2	2.2	µg/kg dry	11.3	ND	108		54.6-133	0.823		30	
Perfluoroheptanoic acid (PFHpA)	10.7	2.2	µg/kg dry	11.3	ND	94.9		71-131	5.25		30	
Perfluorooctanoic acid (PFOA)	10.7	2.2	µg/kg dry	11.3	ND	95.1		69-133	16.4		30	
Perfluorooctanesulfonic acid (PFOS)	6.75	2.2	µg/kg dry	10.4	1.73	**48.2**	*	68-136	12.4		30	MS-09
Perfluorononanoic acid (PFNA)	10.9	2.2	µg/kg dry	11.3	ND	96.1		72-129	5.06		30	

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QUALITY CONTROL

Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B333940 - Draft Method 1633										
Blank (B333940-BLK1)				Prepared: 03/15/23 Analyzed: 03/17/23						
Perfluorobutanoic acid (PFBA)	ND	4.1	ng/L							
Perfluoropentanoic acid (PFPeA)	ND	2.0	ng/L							
Perfluorohexanoic acid (PFHxA)	ND	1.0	ng/L							
Perfluoroheptanoic acid (PFHpA)	ND	1.0	ng/L							
Perfluorooctanoic acid (PFOA)	ND	1.0	ng/L							
Perfluorononanoic acid (PFNA)	ND	1.0	ng/L							
Perfluorodecanoic acid (PFDA)	ND	1.0	ng/L							
Perfluoroundecanoic acid (PFUnA)	ND	1.0	ng/L							
Perfluorododecanoic acid (PFDoA)	ND	1.0	ng/L							
Perfluorotridecanoic acid (PFTrDA)	ND	1.0	ng/L							
Perfluorotetradecanoic acid (PFTeDA)	ND	1.0	ng/L							
Perfluorobutanesulfonic acid (PFBS)	ND	1.0	ng/L							
Perfluoropetanesulfonic acid (PFPeS)	ND	1.0	ng/L							
Perfluorohexanesulfonic acid (PFHxS)	ND	1.0	ng/L							
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.0	ng/L							
Perfluorooctanesulfonic acid (PFOS)	ND	1.0	ng/L							
Perfluorononanesulfonic acid (PFNS)	ND	1.0	ng/L							
Perfluorodecanesulfonic acid (PFDS)	ND	1.0	ng/L							
Perfluorododecanesulfonic acid (PFDoS)	ND	1.0	ng/L							
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2FTS)	ND	4.1	ng/L							
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2FTS)	ND	4.1	ng/L							
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2FTS)	ND	4.1	ng/L							
Perfluorooctanesulfonamide (PFOSA)	ND	1.0	ng/L							
N-methyl perfluoroocatnesulfonamide (NMeFOSA)	ND	1.0	ng/L							
N-ethyl perfluorooctanesulfonamide (NEtFOSA)	ND	1.0	ng/L							
N-MeFOSAA (NMeFOSAA)	ND	1.0	ng/L							
N-EtFOSAA (NEtFOSAA)	ND	1.0	ng/L							
N-methylperfluorooctanesulfonamidoethanol(NMeFOSE)	ND	10	ng/L							
N-ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	ND	10	ng/L							
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	4.1	ng/L							
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	4.1	ng/L							
9Cl-PF3ONS (F53B Minor)	ND	4.1	ng/L							
11Cl-PF3OUdS (F53B Major)	ND	4.1	ng/L							
3-Perfluoropropyl propanoic acid (FPrPA) (3:3FTCA)	ND	10	ng/L							
2H,2H,3H,3H-Perfluorooctanoic acid(FPePA)(5:3FTCA)	ND	51	ng/L							
3-Perfluoroheptyl propanoic acid (FHpPA) (7:3FTCA)	ND	51	ng/L							
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	ND	2.0	ng/L							
Perfluoro-3-methoxypropanoic acid (PFMPA)	ND	2.0	ng/L							
Perfluoro-4-methoxybutanoic acid (PFMBA)	ND	2.0	ng/L							
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	2.0	ng/L							
Surrogate: 13C4-PFBA	*84.1*		ng/L	101		82.9	20-150			

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QUALITY CONTROL

Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B333940 - Draft Method 1633										
Blank (B333940-BLK1)				Prepared: 03/15/23 Analyzed: 03/17/23						
Surrogate: 13C5-PFPeA	*44.4*		ng/L	50.7		87.5	20-150			
Surrogate: 13C5-PFHxA	*22.1*		ng/L	25.4		87.0	20-150			
Surrogate: 13C4-PFHpA	*22.5*		ng/L	25.4		88.8	20-150			
Surrogate: 13C8-PFOA	*21.6*		ng/L	25.4		85.2	20-150			
Surrogate: 13C9-PFNA	*11.0*		ng/L	12.7		86.9	20-150			
Surrogate: 13C6-PFDA	*11.1*		ng/L	12.7		87.4	20-150			
Surrogate: 13C7-PFUnA	*10.6*		ng/L	12.7		83.8	20-150			
Surrogate: 13C2-PFDoA	*9.30*		ng/L	12.7		73.4	20-150			
Surrogate: 13C2-PFTeDA	*9.30*		ng/L	12.7		73.4	20-150			
Surrogate: 13C3-PFBS	*21.7*		ng/L	25.4		85.6	20-150			
Surrogate: 13C3-PFHxS	*21.7*		ng/L	25.4		85.6	20-150			
Surrogate: 13C8-PFOS	*20.8*		ng/L	25.4		81.9	20-150			
Surrogate: 13C2-4:2FTS	*41.0*		ng/L	50.7		80.8	20-150			
Surrogate: 13C2-6:2FTS	*39.8*		ng/L	50.7		78.5	20-150			
Surrogate: 13C2-8:2FTS	*38.0*		ng/L	50.7		74.9	20-150			
Surrogate: 13C8-PFOSA	*18.3*		ng/L	25.4		72.1	20-150			
Surrogate: D3-NMeFOSA	*13.8*		ng/L	25.4		54.3	20-150			
Surrogate: D5-NEtFOSA	*14.4*		ng/L	25.4		56.8	20-150			
Surrogate: D3-NMeFOSAA	*40.6*		ng/L	50.7		80.0	20-150			
Surrogate: D5-NEtFOSAA	*39.7*		ng/L	50.7		78.3	20-150			
Surrogate: D7-NMeFOSE	*165*		ng/L	254		65.0	20-150			
Surrogate: D9-NEtFOSE	*158*		ng/L	254		62.3	20-150			
Surrogate: 13C3-HFPO-DA	*96.3*		ng/L	101		95.0	20-150			
LCS (B333940-BS1)				Prepared: 03/15/23 Analyzed: 03/17/23						
Perfluorobutanoic acid (PFBA)	9.23	4.1	ng/L	8.21		112	40-150			
Perfluoropentanoic acid (PFPeA)	4.10	2.1	ng/L	4.10		100	40-150			
Perfluorohexanoic acid (PFHxA)	2.12	1.0	ng/L	2.05		103	40-150			
Perfluoroheptanoic acid (PFHpA)	1.91	1.0	ng/L	2.05		93.1	40-150			
Perfluorooctanoic acid (PFOA)	2.07	1.0	ng/L	2.05		101	40-150			
Perfluorononanoic acid (PFNA)	1.91	1.0	ng/L	2.05		93.3	40-150			
Perfluorodecanoic acid (PFDA)	1.97	1.0	ng/L	2.05		96.1	40-150			
Perfluoroundecanoic acid (PFUnA)	1.93	1.0	ng/L	2.05		94.1	40-150			
Perfluorododecanoic acid (PFDoA)	2.02	1.0	ng/L	2.05		98.4	40-150			
Perfluorotridecanoic acid (PFTrDA)	2.14	1.0	ng/L	2.05		104	40-150			
Perfluorotetradecanoic acid (PFTeDA)	2.08	1.0	ng/L	2.05		101	40-150			
Perfluorobutanesulfonic acid (PFBS)	1.72	1.0	ng/L	1.82		94.2	40-150			
Perfluoropetanesulfonic acid (PFPeS)	1.99	1.0	ng/L	1.93		103	40-150			
Perfluorohexanesulfonic acid (PFHxS)	1.89	1.0	ng/L	1.88		101	40-150			
Perfluoroheptanesulfonic acid (PFHpS)	2.19	1.0	ng/L	1.95		112	40-150			
Perfluorooctanesulfonic acid (PFOS)	2.26	1.0	ng/L	1.90		119	40-150			
Perfluorononanesulfonic acid (PFNS)	1.88	1.0	ng/L	1.98		95.3	40-150			
Perfluorodecanesulfonic acid (PFDS)	2.01	1.0	ng/L	1.98		102	40-150			
Perfluorododecanesulfonic acid (PFDoS)	1.88	1.0	ng/L	1.99		94.4	40-150			
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2FTS)	8.29	4.1	ng/L	7.70		108	40-150			
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2FTS)	8.94	4.1	ng/L	7.80		115	40-150			
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2FTS)	9.22	4.1	ng/L	7.90		117	40-150			
Perfluorooctanesulfonamide (PFOSA)	1.95	1.0	ng/L	2.05		94.9	40-150			
N-methyl perfluoroocatnesulfonamide (NMeFOSA)	1.99	1.0	ng/L	2.05		96.9	40-150			

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QUALITY CONTROL

Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B333940 - Draft Method 1633										
LCS (B333940-BS1)				Prepared: 03/15/23 Analyzed: 03/17/23						
N-ethyl perfluorooctanesulfonamide (NEtFOSA)	1.88	1.0	ng/L	2.05		91.6	40-150			
N-MeFOSAA (NMeFOSAA)	2.06	1.0	ng/L	2.05		100	40-150			
N-EtFOSAA (NEtFOSAA)	2.18	1.0	ng/L	2.05		106	40-150			
N-methylperfluorooctanesulfonamidoethanol(NMeFOSE)	21.2	10	ng/L	20.5		103	40-150			
N-ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	21.0	10	ng/L	20.5		102	40-150			
Hexafluoropropylene oxide dimer acid (HFPO-DA)	7.53	4.1	ng/L	8.21		91.8	40-150			
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	7.00	4.1	ng/L	7.75		90.4	40-150			
9Cl-PF3ONS (F53B Minor)	6.72	4.1	ng/L	7.70		87.4	40-150			
11Cl-PF3OUdS (F53B Major)	6.27	4.1	ng/L	7.75		80.9	40-150			
3-Perfluoropropyl propanoic acid (FPrPA) (3:3FTCA)	17.0	10	ng/L	20.5		83.0	40-150			
2H,2H,3H,3H-Perfluorooctanoic acid(FPePA)(5:3FTCA)	81.4	51	ng/L	103		79.3	40-150			
3-Perfluoroheptyl propanoic acid (FHpPA) (7:3FTCA)	78.8	51	ng/L	103		76.8	40-150			
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	3.39	2.1	ng/L	3.65		92.9	40-150			
Perfluoro-3-methoxypropanoic acid (PFMPA)	4.18	2.1	ng/L	4.10		102	40-150			
Perfluoro-4-methoxybutanoic acid (PFMBA)	3.96	2.1	ng/L	4.10		96.5	40-150			
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	4.43	2.1	ng/L	4.10		108	40-150			
Surrogate: 13C4-PFBA	*81.7*		ng/L	103		79.6	20-150			
Surrogate: 13C5-PFPeA	*42.8*		ng/L	51.3		83.5	20-150			
Surrogate: 13C5-PFHxA	*21.3*		ng/L	25.7		82.9	20-150			
Surrogate: 13C4-PFHpA	*22.0*		ng/L	25.7		85.8	20-150			
Surrogate: 13C8-PFOA	*21.0*		ng/L	25.7		82.0	20-150			
Surrogate: 13C9-PFNA	*10.7*		ng/L	12.8		83.5	20-150			
Surrogate: 13C6-PFDA	*10.1*		ng/L	12.8		78.8	20-150			
Surrogate: 13C7-PFUnA	*9.86*		ng/L	12.8		76.9	20-150			
Surrogate: 13C2-PFDoA	*8.82*		ng/L	12.8		68.8	20-150			
Surrogate: 13C2-PFTeDA	*9.36*		ng/L	12.8		73.0	20-150			
Surrogate: 13C3-PFBS	*21.5*		ng/L	25.7		84.0	20-150			
Surrogate: 13C3-PFHxS	*20.8*		ng/L	25.7		80.9	20-150			
Surrogate: 13C8-PFOS	*19.9*		ng/L	25.7		77.5	20-150			
Surrogate: 13C2-4:2FTS	*47.8*		ng/L	51.3		93.3	20-150			
Surrogate: 13C2-6:2FTS	*40.8*		ng/L	51.3		79.6	20-150			
Surrogate: 13C2-8:2FTS	*37.9*		ng/L	51.3		73.8	20-150			
Surrogate: 13C8-PFOSA	*18.5*		ng/L	25.7		72.2	20-150			
Surrogate: D3-NMeFOSA	*15.4*		ng/L	25.7		60.0	20-150			
Surrogate: D5-NEtFOSA	*17.1*		ng/L	25.7		66.6	20-150			
Surrogate: D3-NMeFOSAA	*39.4*		ng/L	51.3		76.9	20-150			
Surrogate: D5-NEtFOSAA	*38.8*		ng/L	51.3		75.7	20-150			
Surrogate: D7-NMeFOSE	*176*		ng/L	257		68.7	20-150			
Surrogate: D9-NEtFOSE	*170*		ng/L	257		66.2	20-150			
Surrogate: 13C3-HFPO-DA	*96.0*		ng/L	103		93.6	20-150			
LCS (B333940-BS2)				Prepared: 03/15/23 Analyzed: 03/17/23						
Perfluorobutanoic acid (PFBA)	96.3	3.9	ng/L	93.0		104	40-150			
Perfluoropentanoic acid (PFPeA)	47.2	1.9	ng/L	46.5		101	40-150			

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QUALITY CONTROL

Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B333940 - Draft Method 1633										
LCS (B333940-BS2)				Prepared: 03/15/23 Analyzed: 03/17/23						
Perfluorohexanoic acid (PFHxA)	23.2	0.97	ng/L	23.3		99.7	40-150			
Perfluoroheptanoic acid (PFHpA)	23.8	0.97	ng/L	23.3		102	40-150			
Perfluorooctanoic acid (PFOA)	22.6	0.97	ng/L	23.3		97.3	40-150			
Perfluorononanoic acid (PFNA)	23.2	0.97	ng/L	23.3		99.6	40-150			
Perfluorodecanoic acid (PFDA)	23.7	0.97	ng/L	23.3		102	40-150			
Perfluoroundecanoic acid (PFUnA)	23.5	0.97	ng/L	23.3		101	40-150			
Perfluorododecanoic acid (PFDoA)	24.0	0.97	ng/L	23.3		103	40-150			
Perfluorotridecanoic acid (PFTrDA)	25.1	0.97	ng/L	23.3		108	40-150			
Perfluorotetradecanoic acid (PFTeDA)	23.4	0.97	ng/L	23.3		101	40-150			
Perfluorobutanesulfonic acid (PFBS)	21.7	0.97	ng/L	20.6		105	40-150			
Perfluoropetanesulfonic acid (PFPeS)	22.1	0.97	ng/L	21.9		101	40-150			
Perfluorohexanesulfonic acid (PFHxS)	20.5	0.97	ng/L	21.3		96.5	40-150			
Perfluoroheptanesulfonic acid (PFHpS)	21.9	0.97	ng/L	22.2		99.1	40-150			
Perfluorooctanesulfonic acid (PFOS)	20.8	0.97	ng/L	21.6		96.6	40-150			
Perfluorononanesulfonic acid (PFNS)	21.6	0.97	ng/L	22.4		96.4	40-150			
Perfluorodecanesulfonic acid (PFDS)	21.4	0.97	ng/L	22.4		95.3	40-150			
Perfluorododecanesulfonic acid (PFDoS)	21.7	0.97	ng/L	22.6		96.2	40-150			
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2FTS)	88.8	3.9	ng/L	87.2		102	40-150			
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2FTS)	88.3	3.9	ng/L	88.4		99.9	40-150			
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2FTS)	94.1	3.9	ng/L	89.5		105	40-150			
Perfluorooctanesulfonamide (PFOSA)	22.2	0.97	ng/L	23.3		95.5	40-150			
N-methyl perfluoroocatnesulfonamide (NMeFOSA)	22.9	0.97	ng/L	23.3		98.3	40-150			
N-ethyl perfluorooctanesulfonamide (NEtFOSA)	23.3	0.97	ng/L	23.3		100	40-150			
N-MeFOSAA (NMeFOSAA)	23.2	0.97	ng/L	23.3		99.8	40-150			
N-EtFOSAA (NEtFOSAA)	22.7	0.97	ng/L	23.3		97.5	40-150			
N-methylperfluorooctanesulfonamidoethanol(NMeFOSE)	251	9.7	ng/L	233		108	40-150			
N-ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	257	9.7	ng/L	233		111	40-150			
Hexafluoropropylene oxide dimer acid (HFPO-DA)	105	3.9	ng/L	93.0		113	40-150			
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	94.1	3.9	ng/L	87.8		107	40-150			
9Cl-PF3ONS (F53B Minor)	88.4	3.9	ng/L	87.2		101	40-150			
11Cl-PF3OUdS (F53B Major)	87.6	3.9	ng/L	87.8		99.7	40-150			
3-Perfluoropropyl propanoic acid (FPrPA) (3:3FTCA)	202	9.7	ng/L	233		86.9	40-150			
2H,2H,3H,3H-Perfluorooctanoic acid(FPePA)(5:3FTCA)	1080	48	ng/L	1160		92.5	40-150			
3-Perfluoroheptyl propanoic acid (FHpPA) (7:3FTCA)	1040	48	ng/L	1160		89.3	40-150			
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	44.6	1.9	ng/L	41.4		108	40-150			
Perfluoro-3-methoxypropanoic acid (PFMPA)	51.5	1.9	ng/L	46.5		111	40-150			
Perfluoro-4-methoxybutanoic acid (PFMBA)	51.2	1.9	ng/L	46.5		110	40-150			
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	58.4	1.9	ng/L	46.5		126	40-150			
Surrogate: 13C4-PFBA	*74.5*		ng/L	96.9		76.9	20-150			
Surrogate: 13C5-PFPeA	*39.7*		ng/L	48.4		81.9	20-150			
Surrogate: 13C5-PFHxA	*20.0*		ng/L	24.2		82.5	20-150			

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QUALITY CONTROL

Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B333940 - Draft Method 1633										
LCS (B333940-BS2)				Prepared: 03/15/23 Analyzed: 03/17/23						
Surrogate: 13C4-PFHpA	*19.8*		ng/L	24.2		81.8	20-150			
Surrogate: 13C8-PFOA	*19.4*		ng/L	24.2		80.2	20-150			
Surrogate: 13C9-PFNA	*9.98*		ng/L	12.1		82.4	20-150			
Surrogate: 13C6-PFDA	*9.86*		ng/L	12.1		81.4	20-150			
Surrogate: 13C7-PFUnA	*9.44*		ng/L	12.1		77.9	20-150			
Surrogate: 13C2-PFDoA	*8.68*		ng/L	12.1		71.7	20-150			
Surrogate: 13C2-PFTeDA	*9.25*		ng/L	12.1		76.4	20-150			
Surrogate: 13C3-PFBS	*19.0*		ng/L	24.2		78.3	20-150			
Surrogate: 13C3-PFHxS	*19.8*		ng/L	24.2		81.8	20-150			
Surrogate: 13C8-PFOS	*20.9*		ng/L	24.2		86.4	20-150			
Surrogate: 13C2-4:2FTS	*46.6*		ng/L	48.4		96.1	20-150			
Surrogate: 13C2-6:2FTS	*39.4*		ng/L	48.4		81.4	20-150			
Surrogate: 13C2-8:2FTS	*38.5*		ng/L	48.4		79.4	20-150			
Surrogate: 13C8-PFOSA	*19.4*		ng/L	24.2		80.3	20-150			
Surrogate: D3-NMeFOSA	*15.7*		ng/L	24.2		64.8	20-150			
Surrogate: D5-NEtFOSA	*16.1*		ng/L	24.2		66.6	20-150			
Surrogate: D3-NMeFOSAA	*40.0*		ng/L	48.4		82.6	20-150			
Surrogate: D5-NEtFOSAA	*41.0*		ng/L	48.4		84.7	20-150			
Surrogate: D7-NMeFOSE	*177*		ng/L	242		72.9	20-150			
Surrogate: D9-NEtFOSE	*171*		ng/L	242		70.6	20-150			
Surrogate: 13C3-HFPO-DA	*85.3*		ng/L	96.9		88.0	20-150			
Batch B334428 - Draft Method 1633										
Blank (B334428-BLK1)				Prepared: 03/24/23 Analyzed: 03/28/23						
Perfluorobutanoic acid (PFBA)	ND	3.9	ng/L							
Perfluoropentanoic acid (PFPeA)	ND	2.0	ng/L							
Perfluorohexanoic acid (PFHxA)	ND	0.98	ng/L							
Perfluoroheptanoic acid (PFHpA)	ND	0.98	ng/L							
Perfluorooctanoic acid (PFOA)	ND	0.98	ng/L							
Perfluorononanoic acid (PFNA)	ND	0.98	ng/L							
Perfluorodecanoic acid (PFDA)	ND	0.98	ng/L							
Perfluoroundecanoic acid (PFUnA)	ND	0.98	ng/L							
Perfluorododecanoic acid (PFDoA)	ND	0.98	ng/L							
Perfluorotridecanoic acid (PFTrDA)	ND	0.98	ng/L							
Perfluorotetradecanoic acid (PFTeDA)	ND	0.98	ng/L							
Perfluorobutanesulfonic acid (PFBS)	ND	0.98	ng/L							
Perfluoropetanesulfonic acid (PFPeS)	ND	0.98	ng/L							
Perfluorohexanesulfonic acid (PFHxS)	ND	0.98	ng/L							
Perfluoroheptanesulfonic acid (PFHpS)	ND	0.98	ng/L							
Perfluorooctanesulfonic acid (PFOS)	ND	0.98	ng/L							
Perfluorononanesulfonic acid (PFNS)	ND	0.98	ng/L							
Perfluorodecanesulfonic acid (PFDS)	ND	0.98	ng/L							
Perfluorododecanesulfonic acid (PFDoS)	ND	0.98	ng/L							
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2FTS)	ND	3.9	ng/L							
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2FTS)	ND	3.9	ng/L							
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2FTS)	ND	3.9	ng/L							
Perfluorooctanesulfonamide (PFOSA)	ND	0.98	ng/L							
N-methyl perfluoroocatnesulfonamide (NMeFOSA)	ND	0.98	ng/L							

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QUALITY CONTROL

Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B334428 - Draft Method 1633										
Blank (B334428-BLK1)				Prepared: 03/24/23 Analyzed: 03/28/23						
N-ethyl perfluorooctanesulfonamide (NEtFOSA)	ND	0.98	ng/L							
N-MeFOSAA (NMeFOSAA)	ND	0.98	ng/L							
N-EtFOSAA (NEtFOSAA)	ND	0.98	ng/L							
N-methylperfluorooctanesulfonamidoethanol(NMeFOSE)	ND	9.8	ng/L							
N-ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	ND	9.8	ng/L							
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	3.9	ng/L							
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	3.9	ng/L							
9Cl-PF3ONS (F53B Minor)	ND	3.9	ng/L							
11Cl-PF3OUdS (F53B Major)	ND	3.9	ng/L							
3-Perfluoropropyl propanoic acid (FPrPA) (3:3FTCA)	ND	9.8	ng/L							
2H,2H,3H,3H-Perfluorooctanoic acid(FPePA)(5:3FTCA)	ND	49	ng/L							
3-Perfluoroheptyl propanoic acid (FHpPA) (7:3FTCA)	ND	49	ng/L							
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	ND	2.0	ng/L							
Perfluoro-3-methoxypropanoic acid (PFMPA)	ND	2.0	ng/L							
Perfluoro-4-methoxybutanoic acid (PFMBA)	ND	2.0	ng/L							
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	2.0	ng/L							
Surrogate: 13C4-PFBA	*90.1*		ng/L	98.4		91.6	20-150			
Surrogate: 13C5-PFPeA	*48.8*		ng/L	49.2		99.1	20-150			
Surrogate: 13C5-PFHxA	*24.1*		ng/L	24.6		97.9	20-150			
Surrogate: 13C4-PFHpA	*24.6*		ng/L	24.6		99.8	20-150			
Surrogate: 13C8-PFOA	*24.2*		ng/L	24.6		98.3	20-150			
Surrogate: 13C9-PFNA	*11.9*		ng/L	12.3		96.6	20-150			
Surrogate: 13C6-PFDA	*12.2*		ng/L	12.3		98.8	20-150			
Surrogate: 13C7-PFUnA	*12.0*		ng/L	12.3		97.6	20-150			
Surrogate: 13C2-PFDoA	*11.1*		ng/L	12.3		90.2	20-150			
Surrogate: 13C2-PFTeDA	*11.2*		ng/L	12.3		90.9	20-150			
Surrogate: 13C3-PFBS	*24.4*		ng/L	24.6		99.2	20-150			
Surrogate: 13C3-PFHxS	*24.4*		ng/L	24.6		99.3	20-150			
Surrogate: 13C8-PFOS	*24.9*		ng/L	24.6		101	20-150			
Surrogate: 13C2-4:2FTS	*53.9*		ng/L	49.2		110	20-150			
Surrogate: 13C2-6:2FTS	*42.5*		ng/L	49.2		86.4	20-150			
Surrogate: 13C2-8:2FTS	*38.8*		ng/L	49.2		78.9	20-150			
Surrogate: 13C8-PFOSA	*23.7*		ng/L	24.6		96.4	20-150			
Surrogate: D3-NMeFOSA	*19.6*		ng/L	24.6		79.7	20-150			
Surrogate: D5-NEtFOSA	*20.9*		ng/L	24.6		84.8	20-150			
Surrogate: D3-NMeFOSAA	*44.2*		ng/L	49.2		89.7	20-150			
Surrogate: D5-NEtFOSAA	*45.0*		ng/L	49.2		91.4	20-150			
Surrogate: D7-NMeFOSE	*220*		ng/L	246		89.5	20-150			
Surrogate: D9-NEtFOSE	*218*		ng/L	246		88.7	20-150			
Surrogate: 13C3-HFPO-DA	*103*		ng/L	98.4		105	20-150			
LCS (B334428-BS1)				Prepared: 03/24/23 Analyzed: 03/28/23						
Perfluorobutanoic acid (PFBA)	8.76	3.9	ng/L	7.83		112	40-150			
Perfluoropentanoic acid (PFPeA)	3.99	2.0	ng/L	3.91		102	40-150			

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QUALITY CONTROL

Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B334428 - Draft Method 1633										
LCS (B334428-BS1)				Prepared: 03/24/23 Analyzed: 03/28/23						
Perfluorohexanoic acid (PFHxA)	1.98	0.98	ng/L	1.96		101	40-150			
Perfluoroheptanoic acid (PFHpA)	1.99	0.98	ng/L	1.96		102	40-150			
Perfluorooctanoic acid (PFOA)	2.05	0.98	ng/L	1.96		105	40-150			
Perfluorononanoic acid (PFNA)	1.86	0.98	ng/L	1.96		95.3	40-150			
Perfluorodecanoic acid (PFDA)	2.01	0.98	ng/L	1.96		103	40-150			
Perfluoroundecanoic acid (PFUnA)	1.96	0.98	ng/L	1.96		99.9	40-150			
Perfluorododecanoic acid (PFDoA)	2.08	0.98	ng/L	1.96		106	40-150			
Perfluorotridecanoic acid (PFTrDA)	1.82	0.98	ng/L	1.96		92.8	40-150			
Perfluorotetradecanoic acid (PFTeDA)	1.97	0.98	ng/L	1.96		100	40-150			
Perfluorobutanesulfonic acid (PFBS)	1.88	0.98	ng/L	1.74		108	40-150			
Perfluoropetanesulfonic acid (PFPeS)	1.87	0.98	ng/L	1.84		102	40-150			
Perfluorohexanesulfonic acid (PFHxS)	1.84	0.98	ng/L	1.79		103	40-150			
Perfluoroheptanesulfonic acid (PFHpS)	2.10	0.98	ng/L	1.86		113	40-150			
Perfluorooctanesulfonic acid (PFOS)	1.77	0.98	ng/L	1.81		97.4	40-150			
Perfluorononanesulfonic acid (PFNS)	1.98	0.98	ng/L	1.88		105	40-150			
Perfluorodecanesulfonic acid (PFDS)	1.86	0.98	ng/L	1.89		98.6	40-150			
Perfluorododecanesulfonic acid (PFDoS)	1.84	0.98	ng/L	1.90		96.8	40-150			
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2FTS)	8.20	3.9	ng/L	7.34		112	40-150			
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2FTS)	7.62	3.9	ng/L	7.43		103	40-150			
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2FTS)	8.93	3.9	ng/L	7.53		118	40-150			
Perfluorooctanesulfonamide (PFOSA)	1.90	0.98	ng/L	1.96		97.2	40-150			
N-methyl perfluoroocatnesulfonamide (NMeFOSA)	1.87	0.98	ng/L	1.96		95.6	40-150			
N-ethyl perfluorooctanesulfonamide (NEtFOSA)	1.87	0.98	ng/L	1.96		95.6	40-150			
N-MeFOSAA (NMeFOSAA)	2.53	0.98	ng/L	1.96		129	40-150			
N-EtFOSAA (NEtFOSAA)	1.82	0.98	ng/L	1.96		92.9	40-150			
N-methylperfluorooctanesulfonamidoethanol(NMeFOSE)	20.6	9.8	ng/L	19.6		105	40-150			
N-ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	20.2	9.8	ng/L	19.6		103	40-150			
Hexafluoropropylene oxide dimer acid (HFPO-DA)	7.81	3.9	ng/L	7.83		99.8	40-150			
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	7.37	3.9	ng/L	7.39		99.7	40-150			
9Cl-PF3ONS (F53B Minor)	7.43	3.9	ng/L	7.34		101	40-150			
11Cl-PF3OUdS (F53B Major)	6.81	3.9	ng/L	7.39		92.2	40-150			
3-Perfluoropropyl propanoic acid (FPrPA) (3:3FTCA)	17.6	9.8	ng/L	19.6		90.1	40-150			
2H,2H,3H,3H-Perfluorooctanoic acid(FPePA)(5:3FTCA)	89.7	49	ng/L	97.8		91.7	40-150			
3-Perfluoroheptyl propanoic acid (FHpPA) (7:3FTCA)	83.9	49	ng/L	97.8		85.8	40-150			
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	3.54	2.0	ng/L	3.48		102	40-150			
Perfluoro-3-methoxypropanoic acid (PFMPA)	3.88	2.0	ng/L	3.91		99.3	40-150			
Perfluoro-4-methoxybutanoic acid (PFMBA)	3.82	2.0	ng/L	3.91		97.5	40-150			
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	5.02	2.0	ng/L	3.91		128	40-150			
Surrogate: 13C4-PFBA	*81.0*		ng/L	97.8		82.8	20-150			
Surrogate: 13C5-PFPeA	*42.2*		ng/L	48.9		86.3	20-150			
Surrogate: 13C5-PFHxA	*21.1*		ng/L	24.5		86.1	20-150			

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QUALITY CONTROL

Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B334428 - Draft Method 1633										
LCS (B334428-BS1)				Prepared: 03/24/23 Analyzed: 03/28/23						
Surrogate: 13C4-PFHpA	*20.8*		ng/L	24.5		85.1	20-150			
Surrogate: 13C8-PFOA	*21.6*		ng/L	24.5		88.1	20-150			
Surrogate: 13C9-PFNA	*11.0*		ng/L	12.2		90.4	20-150			
Surrogate: 13C6-PFDA	*10.8*		ng/L	12.2		88.1	20-150			
Surrogate: 13C7-PFUnA	*10.5*		ng/L	12.2		85.8	20-150			
Surrogate: 13C2-PFDoA	*10.1*		ng/L	12.2		82.7	20-150			
Surrogate: 13C2-PFTeDA	*10.0*		ng/L	12.2		82.0	20-150			
Surrogate: 13C3-PFBS	*21.2*		ng/L	24.5		86.7	20-150			
Surrogate: 13C3-PFHxS	*21.0*		ng/L	24.5		85.8	20-150			
Surrogate: 13C8-PFOS	*21.6*		ng/L	24.5		88.2	20-150			
Surrogate: 13C2-4:2FTS	*47.4*		ng/L	48.9		96.9	20-150			
Surrogate: 13C2-6:2FTS	*37.9*		ng/L	48.9		77.4	20-150			
Surrogate: 13C2-8:2FTS	*36.7*		ng/L	48.9		74.9	20-150			
Surrogate: 13C8-PFOSA	*20.5*		ng/L	24.5		84.0	20-150			
Surrogate: D3-NMeFOSA	*17.0*		ng/L	24.5		69.6	20-150			
Surrogate: D5-NEtFOSA	*17.7*		ng/L	24.5		72.4	20-150			
Surrogate: D3-NMeFOSAA	*38.8*		ng/L	48.9		79.3	20-150			
Surrogate: D5-NEtFOSAA	*40.5*		ng/L	48.9		82.9	20-150			
Surrogate: D7-NMeFOSE	*194*		ng/L	245		79.3	20-150			
Surrogate: D9-NEtFOSE	*187*		ng/L	245		76.5	20-150			
Surrogate: 13C3-HFPO-DA	*93.0*		ng/L	97.8		95.1	20-150			
LCS (B334428-BS2)				Prepared: 03/24/23 Analyzed: 03/28/23						
Perfluorobutanoic acid (PFBA)	105	3.9	ng/L	93.7		112	40-150			
Perfluoropentanoic acid (PFPeA)	50.9	2.0	ng/L	46.9		109	40-150			
Perfluorohexanoic acid (PFHxA)	25.7	0.98	ng/L	23.4		110	40-150			
Perfluoroheptanoic acid (PFHpA)	25.3	0.98	ng/L	23.4		108	40-150			
Perfluorooctanoic acid (PFOA)	24.9	0.98	ng/L	23.4		106	40-150			
Perfluorononanoic acid (PFNA)	24.4	0.98	ng/L	23.4		104	40-150			
Perfluorodecanoic acid (PFDA)	26.0	0.98	ng/L	23.4		111	40-150			
Perfluoroundecanoic acid (PFUnA)	26.1	0.98	ng/L	23.4		111	40-150			
Perfluorododecanoic acid (PFDoA)	26.7	0.98	ng/L	23.4		114	40-150			
Perfluorotridecanoic acid (PFTrDA)	24.1	0.98	ng/L	23.4		103	40-150			
Perfluorotetradecanoic acid (PFTeDA)	25.9	0.98	ng/L	23.4		111	40-150			
Perfluorobutanesulfonic acid (PFBS)	23.8	0.98	ng/L	20.8		115	40-150			
Perfluoropetanesulfonic acid (PFPeS)	23.2	0.98	ng/L	22.0		105	40-150			
Perfluorohexanesulfonic acid (PFHxS)	21.6	0.98	ng/L	21.4		101	40-150			
Perfluoroheptanesulfonic acid (PFHpS)	23.6	0.98	ng/L	22.3		106	40-150			
Perfluorooctanesulfonic acid (PFOS)	22.3	0.98	ng/L	21.7		103	40-150			
Perfluorononanesulfonic acid (PFNS)	24.6	0.98	ng/L	22.5		109	40-150			
Perfluorodecanesulfonic acid (PFDS)	26.5	0.98	ng/L	22.6		117	40-150			
Perfluorododecanesulfonic acid (PFDoS)	24.8	0.98	ng/L	22.7		109	40-150			
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2FTS)	99.4	3.9	ng/L	87.9		113	40-150			
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2FTS)	94.0	3.9	ng/L	89.0		106	40-150			
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2FTS)	102	3.9	ng/L	90.2		113	40-150			
Perfluorooctanesulfonamide (PFOSA)	24.8	0.98	ng/L	23.4		106	40-150			
N-methyl perfluoroocatnesulfonamide (NMeFOSA)	26.1	0.98	ng/L	23.4		111	40-150			
N-ethyl perfluorooctanesulfonamide (NEtFOSA)	25.9	0.98	ng/L	23.4		111	40-150			
N-MeFOSAA (NMeFOSAA)	25.9	0.98	ng/L	23.4		110	40-150			

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QUALITY CONTROL

Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B334428 - Draft Method 1633										
LCS (B334428-BS2)				Prepared: 03/24/23 Analyzed: 03/28/23						
N-EtFOSAA (NEtFOSAA)	26.2	0.98	ng/L	23.4		112	40-150			
N-methylperfluorooctanesulfonamidoethanol(NMeFOSE)	266	9.8	ng/L	234		114	40-150			
N-ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	271	9.8	ng/L	234		116	40-150			
Hexafluoropropylene oxide dimer acid (HFPO-DA)	98.0	3.9	ng/L	93.7		105	40-150			
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	94.2	3.9	ng/L	88.4		106	40-150			
9Cl-PF3ONS (F53B Minor)	91.8	3.9	ng/L	87.9		104	40-150			
11Cl-PF3OUdS (F53B Major)	91.0	3.9	ng/L	88.4		103	40-150			
3-Perfluoropropyl propanoic acid (FPrPA) (3:3FTCA)	229	9.8	ng/L	234		97.9	40-150			
2H,2H,3H,3H-Perfluorooctanoic acid(FPePA)(5:3FTCA)	1170	49	ng/L	1170		99.8	40-150			
3-Perfluoroheptyl propanoic acid (FHpPA) (7:3FTCA)	1120	49	ng/L	1170		95.6	40-150			
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	45.0	2.0	ng/L	41.7		108	40-150			
Perfluoro-3-methoxypropanoic acid (PFMPA)	47.8	2.0	ng/L	46.9		102	40-150			
Perfluoro-4-methoxybutanoic acid (PFMBA)	49.7	2.0	ng/L	46.9		106	40-150			
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	55.3	2.0	ng/L	46.9		118	40-150			
Surrogate: 13C4-PFBA	*83.2*		ng/L	97.6		85.3	20-150			
Surrogate: 13C5-PFPeA	*45.2*		ng/L	48.8		92.5	20-150			
Surrogate: 13C5-PFHxA	*22.3*		ng/L	24.4		91.3	20-150			
Surrogate: 13C4-PFHpA	*22.6*		ng/L	24.4		92.8	20-150			
Surrogate: 13C8-PFOA	*21.5*		ng/L	24.4		88.1	20-150			
Surrogate: 13C9-PFNA	*11.1*		ng/L	12.2		91.0	20-150			
Surrogate: 13C6-PFDA	*10.6*		ng/L	12.2		86.9	20-150			
Surrogate: 13C7-PFUnA	*10.5*		ng/L	12.2		85.7	20-150			
Surrogate: 13C2-PFDoA	*9.87*		ng/L	12.2		80.9	20-150			
Surrogate: 13C2-PFTeDA	*10.5*		ng/L	12.2		85.9	20-150			
Surrogate: 13C3-PFBS	*21.5*		ng/L	24.4		88.2	20-150			
Surrogate: 13C3-PFHxS	*22.0*		ng/L	24.4		90.2	20-150			
Surrogate: 13C8-PFOS	*21.3*		ng/L	24.4		87.2	20-150			
Surrogate: 13C2-4:2FTS	*52.5*		ng/L	48.8		107	20-150			
Surrogate: 13C2-6:2FTS	*40.5*		ng/L	48.8		82.9	20-150			
Surrogate: 13C2-8:2FTS	*40.9*		ng/L	48.8		83.7	20-150			
Surrogate: 13C8-PFOSA	*19.7*		ng/L	24.4		80.7	20-150			
Surrogate: D3-NMeFOSA	*16.7*		ng/L	24.4		68.3	20-150			
Surrogate: D5-NEtFOSA	*17.4*		ng/L	24.4		71.4	20-150			
Surrogate: D3-NMeFOSAA	*39.2*		ng/L	48.8		80.3	20-150			
Surrogate: D5-NEtFOSAA	*39.1*		ng/L	48.8		80.0	20-150			
Surrogate: D7-NMeFOSE	*192*		ng/L	244		78.6	20-150			
Surrogate: D9-NEtFOSE	*191*		ng/L	244		78.2	20-150			
Surrogate: 13C3-HFPO-DA	*99.0*		ng/L	97.6		101	20-150			
Batch B334653 - Draft Method 1633										
Blank (B334653-BLK1)				Prepared: 03/31/23 Analyzed: 04/03/23						
Perfluorobutanoic acid (PFBA)	ND	7.9	µg/kg wet							
Perfluoropentanoic acid (PFPeA)	ND	4.0	µg/kg wet							
Perfluorohexanoic acid (PFHxA)	ND	2.0	µg/kg wet							

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QUALITY CONTROL

Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B334653 - Draft Method 1633										
Blank (B334653-BLK1)				Prepared: 03/31/23 Analyzed: 04/03/23						
Perfluoroheptanoic acid (PFHpA)	ND	2.0	µg/kg wet							
Perfluorooctanoic acid (PFOA)	ND	2.0	µg/kg wet							
Perfluorononanoic acid (PFNA)	ND	2.0	µg/kg wet							
Perfluorodecanoic acid (PFDA)	ND	2.0	µg/kg wet							
Perfluoroundecanoic acid (PFUnA)	ND	2.0	µg/kg wet							
Perfluorododecanoic acid (PFDoA)	ND	2.0	µg/kg wet							
Perfluorotridecanoic acid (PFTrDA)	ND	2.0	µg/kg wet							
Perfluorotetradecanoic acid (PFTeDA)	ND	2.0	µg/kg wet							
Perfluorobutanesulfonic acid (PFBS)	ND	2.0	µg/kg wet							
Perfluoropetanesulfonic acid (PFPeS)	ND	2.0	µg/kg wet							
Perfluorohexanesulfonic acid (PFHxS)	ND	2.0	µg/kg wet							
Perfluoroheptanesulfonic acid (PFHpS)	ND	2.0	µg/kg wet							
Perfluorooctanesulfonic acid (PFOS)	ND	2.0	µg/kg wet							
Perfluorononanesulfonic acid (PFNS)	ND	2.0	µg/kg wet							
Perfluorodecanesulfonic acid (PFDS)	ND	2.0	µg/kg wet							
Perfluorododecanesulfonic acid (PFDoS)	ND	2.0	µg/kg wet							
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2FTS)	ND	7.9	µg/kg wet							
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2FTS)	ND	7.9	µg/kg wet							
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2FTS)	ND	7.9	µg/kg wet							
Perfluorooctanesulfonamide (PFOSA)	ND	2.0	µg/kg wet							
N-methyl perfluoroocatnesulfonamide (NMeFOSA)	ND	2.0	µg/kg wet							
N-ethyl perfluorooctanesulfonamide (NEtFOSA)	ND	2.0	µg/kg wet							
N-MeFOSAA (NMeFOSAA)	ND	2.0	µg/kg wet							
N-EtFOSAA (NEtFOSAA)	ND	2.0	µg/kg wet							
N-methylperfluorooctanesulfonamidoethanol(NMeFOSE)	ND	20	µg/kg wet							
N-ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	ND	20	µg/kg wet							
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	7.9	µg/kg wet							
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	7.9	µg/kg wet							
9Cl-PF3ONS (F53B Minor)	ND	7.9	µg/kg wet							
11Cl-PF3OUdS (F53B Major)	ND	7.9	µg/kg wet							
3-Perfluoropropyl propanoic acid (FPrPA) (3:3FTCA)	ND	20	µg/kg wet							
2H,2H,3H,3H-Perfluorooctanoic acid(FPePA)(5:3FTCA)	ND	99	µg/kg wet							
3-Perfluoroheptyl propanoic acid (FHpPA) (7:3FTCA)	ND	99	µg/kg wet							
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	ND	4.0	µg/kg wet							
Perfluoro-3-methoxypropanoic acid (PFMPA)	ND	4.0	µg/kg wet							
Perfluoro-4-methoxybutanoic acid (PFMBA)	ND	4.0	µg/kg wet							
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	4.0	µg/kg wet							
Surrogate: 13C4-PFBA	*76.2*		µg/kg wet	99.0		76.9	20-150			
Surrogate: 13C5-PFPeA	*47.4*		µg/kg wet	49.5		95.7	20-150			
Surrogate: 13C5-PFHxA	*20.3*		µg/kg wet	24.8		82.0	20-150			
Surrogate: 13C4-PFHpA	*20.9*		µg/kg wet	24.8		84.5	20-150			

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QUALITY CONTROL

Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B334653 - Draft Method 1633										
Blank (B334653-BLK1)				Prepared: 03/31/23 Analyzed: 04/03/23						
Surrogate: 13C8-PFOA	*19.7*		µg/kg wet	24.8		79.6	20-150			
Surrogate: 13C9-PFNA	*10.3*		µg/kg wet	12.4		83.4	20-150			
Surrogate: 13C6-PFDA	*10.7*		µg/kg wet	12.4		86.1	20-150			
Surrogate: 13C7-PFUnA	*10.8*		µg/kg wet	12.4		87.6	20-150			
Surrogate: 13C2-PFDoA	*10.4*		µg/kg wet	12.4		84.1	20-150			
Surrogate: 13C2-PFTeDA	*10.6*		µg/kg wet	12.4		85.9	20-150			
Surrogate: 13C3-PFBS	*17.8*		µg/kg wet	24.8		71.8	20-150			
Surrogate: 13C3-PFHxS	*19.6*		µg/kg wet	24.8		79.1	20-150			
Surrogate: 13C8-PFOS	*19.7*		µg/kg wet	24.8		79.7	20-150			
Surrogate: 13C2-4:2FTS	*33.1*		µg/kg wet	49.5		66.9	20-150			
Surrogate: 13C2-6:2FTS	*31.8*		µg/kg wet	49.5		64.3	20-150			
Surrogate: 13C2-8:2FTS	*34.5*		µg/kg wet	49.5		69.7	20-150			
Surrogate: 13C8-PFOSA	*18.8*		µg/kg wet	24.8		76.0	20-150			
Surrogate: D3-NMeFOSA	*13.7*		µg/kg wet	24.8		55.5	20-150			
Surrogate: D5-NEtFOSA	*13.5*		µg/kg wet	24.8		54.7	20-150			
Surrogate: D3-NMeFOSAA	*36.5*		µg/kg wet	49.5		73.7	20-150			
Surrogate: D5-NEtFOSAA	*37.0*		µg/kg wet	49.5		74.6	20-150			
Surrogate: D7-NMeFOSE	*190*		µg/kg wet	248		77.0	20-150			
Surrogate: D9-NEtFOSE	*181*		µg/kg wet	248		73.2	20-150			
Surrogate: 13C3-HFPO-DA	*79.1*		µg/kg wet	99.0		79.9	20-150			
LCS (B334653-BS1)				Prepared: 03/31/23 Analyzed: 04/03/23						
Perfluorobutanoic acid (PFBA)	8.22	8.0	µg/kg wet	7.95		103	40-150			
Perfluoropentanoic acid (PFPeA)	3.58	4.0	µg/kg wet	3.98		90.0	40-150			
Perfluorohexanoic acid (PFHxA)	1.73	2.0	µg/kg wet	1.99		87.0	40-150			
Perfluoroheptanoic acid (PFHpA)	1.77	2.0	µg/kg wet	1.99		89.2	40-150			
Perfluorooctanoic acid (PFOA)	1.66	2.0	µg/kg wet	1.99		83.7	40-150			
Perfluorononanoic acid (PFNA)	1.75	2.0	µg/kg wet	1.99		87.8	40-150			
Perfluorodecanoic acid (PFDA)	1.78	2.0	µg/kg wet	1.99		89.3	40-150			
Perfluoroundecanoic acid (PFUnA)	1.77	2.0	µg/kg wet	1.99		89.0	40-150			
Perfluorododecanoic acid (PFDoA)	1.88	2.0	µg/kg wet	1.99		94.4	40-150			
Perfluorotridecanoic acid (PFTrDA)	1.72	2.0	µg/kg wet	1.99		86.4	40-150			
Perfluorotetradecanoic acid (PFTeDA)	1.86	2.0	µg/kg wet	1.99		93.3	40-150			
Perfluorobutanesulfonic acid (PFBS)	1.61	2.0	µg/kg wet	1.76		91.4	40-150			
Perfluoropetanesulfonic acid (PFPeS)	1.54	2.0	µg/kg wet	1.87		82.3	40-150			
Perfluorohexanesulfonic acid (PFHxS)	1.81	2.0	µg/kg wet	1.82		99.6	40-150			
Perfluoroheptanesulfonic acid (PFHpS)	1.72	2.0	µg/kg wet	1.89		90.9	40-150			
Perfluorooctanesulfonic acid (PFOS)	1.53	2.0	µg/kg wet	1.84		83.0	40-150			
Perfluorononanesulfonic acid (PFNS)	1.78	2.0	µg/kg wet	1.91		92.8	40-150			
Perfluorodecanesulfonic acid (PFDS)	2.14	2.0	µg/kg wet	1.92		111	40-150			
Perfluorododecanesulfonic acid (PFDoS)	1.82	2.0	µg/kg wet	1.93		94.4	40-150			
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2FTS)	7.03	8.0	µg/kg wet	7.46		94.4	40-150			
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2FTS)	7.31	8.0	µg/kg wet	7.55		96.8	40-150			
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2FTS)	7.73	8.0	µg/kg wet	7.65		101	40-150			
Perfluorooctanesulfonamide (PFOSA)	1.63	2.0	µg/kg wet	1.99		82.2	40-150			
N-methyl perfluoroocatnesulfonamide (NMeFOSA)	1.61	2.0	µg/kg wet	1.99		81.0	40-150			
N-ethyl perfluorooctanesulfonamide (NEtFOSA)	1.57	2.0	µg/kg wet	1.99		79.2	40-150			
N-MeFOSAA (NMeFOSAA)	2.01	2.0	µg/kg wet	1.99		101	40-150			
N-EtFOSAA (NEtFOSAA)	1.89	2.0	µg/kg wet	1.99		95.0	40-150			

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QUALITY CONTROL

Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B334653 - Draft Method 1633										
LCS (B334653-BS1)				Prepared: 03/31/23 Analyzed: 04/03/23						
N-methylperfluorooctanesulfonamidoethanol(NMeFOSE)	17.6	20	µg/kg wet	19.9		88.7	40-150			
N-ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	18.0	20	µg/kg wet	19.9		90.5	40-150			
Hexafluoropropylene oxide dimer acid (HFPO-DA)	7.27	8.0	µg/kg wet	7.95		91.4	40-150			
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	7.31	8.0	µg/kg wet	7.50		97.5	40-150			
9Cl-PF3ONS (F53B Minor)	7.63	8.0	µg/kg wet	7.46		102	40-150			
11Cl-PF3OUdS (F53B Major)	7.48	8.0	µg/kg wet	7.50		99.6	40-150			
3-Perfluoropropyl propanoic acid (FPrPA) (3:3FTCA)	18.6	20	µg/kg wet	19.9		93.6	40-150			
2H,2H,3H,3H-Perfluorooctanoic acid(FPePA)(5:3FTCA)	100	99	µg/kg wet	99.4		101	40-150			
3-Perfluoroheptyl propanoic acid (FHpPA) (7:3FTCA)	98.5	99	µg/kg wet	99.4		99.1	40-150			
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	3.27	4.0	µg/kg wet	3.54		92.5	40-150			
Perfluoro-3-methoxypropanoic acid (PFMPA)	3.28	4.0	µg/kg wet	3.98		82.4	40-150			
Perfluoro-4-methoxybutanoic acid (PFMBA)	3.51	4.0	µg/kg wet	3.98		88.4	40-150			
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	4.24	4.0	µg/kg wet	3.98		107	40-150			
Surrogate: 13C4-PFBA	*77.7*		µg/kg wet	99.4		78.1	20-150			
Surrogate: 13C5-PFPeA	*41.6*		µg/kg wet	49.7		83.7	20-150			
Surrogate: 13C5-PFHxA	*20.0*		µg/kg wet	24.9		80.3	20-150			
Surrogate: 13C4-PFHpA	*20.5*		µg/kg wet	24.9		82.4	20-150			
Surrogate: 13C8-PFOA	*20.5*		µg/kg wet	24.9		82.3	20-150			
Surrogate: 13C9-PFNA	*10.2*		µg/kg wet	12.4		82.4	20-150			
Surrogate: 13C6-PFDA	*10.1*		µg/kg wet	12.4		81.6	20-150			
Surrogate: 13C7-PFUnA	*10.2*		µg/kg wet	12.4		82.1	20-150			
Surrogate: 13C2-PFDoA	*9.58*		µg/kg wet	12.4		77.1	20-150			
Surrogate: 13C2-PFTeDA	*10.4*		µg/kg wet	12.4		83.4	20-150			
Surrogate: 13C3-PFBS	*19.7*		µg/kg wet	24.9		79.1	20-150			
Surrogate: 13C3-PFHxS	*20.0*		µg/kg wet	24.9		80.4	20-150			
Surrogate: 13C8-PFOS	*19.9*		µg/kg wet	24.9		80.2	20-150			
Surrogate: 13C2-4:2FTS	*43.9*		µg/kg wet	49.7		88.3	20-150			
Surrogate: 13C2-6:2FTS	*32.7*		µg/kg wet	49.7		65.8	20-150			
Surrogate: 13C2-8:2FTS	*33.5*		µg/kg wet	49.7		67.5	20-150			
Surrogate: 13C8-PFOSA	*21.0*		µg/kg wet	24.9		84.5	20-150			
Surrogate: D3-NMeFOSA	*11.0*		µg/kg wet	24.9		44.4	20-150			
Surrogate: D5-NEtFOSA	*8.40*		µg/kg wet	24.9		33.8	20-150			
Surrogate: D3-NMeFOSAA	*35.6*		µg/kg wet	49.7		71.7	20-150			
Surrogate: D5-NEtFOSAA	*36.2*		µg/kg wet	49.7		72.8	20-150			
Surrogate: D7-NMeFOSE	*179*		µg/kg wet	249		72.1	20-150			
Surrogate: D9-NEtFOSE	*165*		µg/kg wet	249		66.5	20-150			
Surrogate: 13C3-HFPO-DA	*82.2*		µg/kg wet	99.4		82.7	20-150			
LCS (B334653-BS2)				Prepared: 03/31/23 Analyzed: 04/03/23						
Perfluorobutanoic acid (PFBA)	98.5	8.0	µg/kg wet	95.8		103	40-150			
Perfluoropentanoic acid (PFPeA)	49.1	4.0	µg/kg wet	47.9		102	40-150			
Perfluorohexanoic acid (PFHxA)	24.5	2.0	µg/kg wet	24.0		102	40-150			
Perfluoroheptanoic acid (PFHpA)	24.6	2.0	µg/kg wet	24.0		103	40-150			
Perfluorooctanoic acid (PFOA)	25.6	2.0	µg/kg wet	24.0		107	40-150			
Perfluorononanoic acid (PFNA)	24.0	2.0	µg/kg wet	24.0		100	40-150			

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QUALITY CONTROL

Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B334653 - Draft Method 1633										
LCS (B334653-BS2)				Prepared: 03/31/23 Analyzed: 04/03/23						
Perfluorodecanoic acid (PFDA)	26.0	2.0	µg/kg wet	24.0		109	40-150			
Perfluoroundecanoic acid (PFUnA)	25.5	2.0	µg/kg wet	24.0		106	40-150			
Perfluorododecanoic acid (PFDoA)	24.9	2.0	µg/kg wet	24.0		104	40-150			
Perfluorotridecanoic acid (PFTrDA)	23.2	2.0	µg/kg wet	24.0		96.8	40-150			
Perfluorotetradecanoic acid (PFTeDA)	24.4	2.0	µg/kg wet	24.0		102	40-150			
Perfluorobutanesulfonic acid (PFBS)	22.4	2.0	µg/kg wet	21.3		105	40-150			
Perfluoropetanesulfonic acid (PFPeS)	22.8	2.0	µg/kg wet	22.5		101	40-150			
Perfluorohexanesulfonic acid (PFHxS)	22.1	2.0	µg/kg wet	21.9		101	40-150			
Perfluoroheptanesulfonic acid (PFHpS)	24.4	2.0	µg/kg wet	22.8		107	40-150			
Perfluorooctanesulfonic acid (PFOS)	22.9	2.0	µg/kg wet	22.2		103	40-150			
Perfluorononanesulfonic acid (PFNS)	24.6	2.0	µg/kg wet	23.1		107	40-150			
Perfluorodecanesulfonic acid (PFDS)	27.4	2.0	µg/kg wet	23.1		119	40-150			
Perfluorododecanesulfonic acid (PFDoS)	24.9	2.0	µg/kg wet	23.2		107	40-150			
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2FTS)	95.9	8.0	µg/kg wet	89.8		107	40-150			
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2FTS)	89.4	8.0	µg/kg wet	91.0		98.2	40-150			
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2FTS)	100	8.0	µg/kg wet	92.2		109	40-150			
Perfluorooctanesulfonamide (PFOSA)	23.1	2.0	µg/kg wet	24.0		96.3	40-150			
N-methyl perfluoroocatnesulfonamide (NMeFOSA)	21.9	2.0	µg/kg wet	24.0		91.6	40-150			
N-ethyl perfluorooctanesulfonamide (NEtFOSA)	21.5	2.0	µg/kg wet	24.0		89.8	40-150			
N-MeFOSAA (NMeFOSAA)	24.6	2.0	µg/kg wet	24.0		103	40-150			
N-EtFOSAA (NEtFOSAA)	25.5	2.0	µg/kg wet	24.0		107	40-150			
N-methylperfluorooctanesulfonamidoethanol(NMeFOSE)	251	20	µg/kg wet	240		105	40-150			
N-ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	247	20	µg/kg wet	240		103	40-150			
Hexafluoropropylene oxide dimer acid (HFPO-DA)	104	8.0	µg/kg wet	95.8		108	40-150			
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	99.9	8.0	µg/kg wet	90.4		111	40-150			
9Cl-PF3ONS (F53B Minor)	104	8.0	µg/kg wet	89.8		115	40-150			
11Cl-PF3OUdS (F53B Major)	104	8.0	µg/kg wet	90.4		115	40-150			
3-Perfluoropropyl propanoic acid (FPrPA) (3:3FTCA)	213	20	µg/kg wet	240		88.7	40-150			
2H,2H,3H,3H-Perfluorooctanoic acid(FPePA)(5:3FTCA)	1130	100	µg/kg wet	1200		94.7	40-150			
3-Perfluoroheptyl propanoic acid (FHpPA) (7:3FTCA)	1120	100	µg/kg wet	1200		93.9	40-150			
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	44.6	4.0	µg/kg wet	42.6		105	40-150			
Perfluoro-3-methoxypropanoic acid (PFMPA)	48.0	4.0	µg/kg wet	47.9		100	40-150			
Perfluoro-4-methoxybutanoic acid (PFMBA)	49.4	4.0	µg/kg wet	47.9		103	40-150			
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	59.4	4.0	µg/kg wet	47.9		124	40-150			
Surrogate: 13C4-PFBA	*78.8*		µg/kg wet	99.8		79.0	20-150			
Surrogate: 13C5-PFPeA	*41.6*		µg/kg wet	49.9		83.4	20-150			
Surrogate: 13C5-PFHxA	*20.2*		µg/kg wet	25.0		80.8	20-150			
Surrogate: 13C4-PFHpA	*21.2*		µg/kg wet	25.0		85.0	20-150			
Surrogate: 13C8-PFOA	*19.5*		µg/kg wet	25.0		78.0	20-150			
Surrogate: 13C9-PFNA	*10.4*		µg/kg wet	12.5		83.2	20-150			
Surrogate: 13C6-PFDA	*9.69*		µg/kg wet	12.5		77.7	20-150			

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QUALITY CONTROL

Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B334653 - Draft Method 1633										
LCS (B334653-BS2)				Prepared: 03/31/23 Analyzed: 04/03/23						
Surrogate: 13C7-PFUnA	*9.67*		µg/kg wet	12.5		77.5	20-150			
Surrogate: 13C2-PFDoA	*9.56*		µg/kg wet	12.5		76.6	20-150			
Surrogate: 13C2-PFTeDA	*10.0*		µg/kg wet	12.5		80.4	20-150			
Surrogate: 13C3-PFBS	*19.1*		µg/kg wet	25.0		76.6	20-150			
Surrogate: 13C3-PFHxS	*19.8*		µg/kg wet	25.0		79.5	20-150			
Surrogate: 13C8-PFOS	*20.1*		µg/kg wet	25.0		80.6	20-150			
Surrogate: 13C2-4:2FTS	*46.2*		µg/kg wet	49.9		92.6	20-150			
Surrogate: 13C2-6:2FTS	*37.2*		µg/kg wet	49.9		74.5	20-150			
Surrogate: 13C2-8:2FTS	*37.7*		µg/kg wet	49.9		75.5	20-150			
Surrogate: 13C8-PFOSA	*20.6*		µg/kg wet	25.0		82.7	20-150			
Surrogate: D3-NMeFOSA	*15.5*		µg/kg wet	25.0		62.0	20-150			
Surrogate: D5-NEtFOSA	*15.0*		µg/kg wet	25.0		60.0	20-150			
Surrogate: D3-NMeFOSAA	*37.8*		µg/kg wet	49.9		75.8	20-150			
Surrogate: D5-NEtFOSAA	*38.5*		µg/kg wet	49.9		77.1	20-150			
Surrogate: D7-NMeFOSE	*186*		µg/kg wet	250		74.7	20-150			
Surrogate: D9-NEtFOSE	*182*		µg/kg wet	250		73.1	20-150			
Surrogate: 13C3-HFPO-DA	*82.1*		µg/kg wet	99.8		82.2	20-150			

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QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B333870 - Draft Method 1633										
Blank (B333870-BLK1)				Prepared & Analyzed: 03/10/23						
Total Suspended Solids	ND	5.0	mg/L							
LCS (B333870-BS1)				Prepared & Analyzed: 03/10/23						
Total Suspended Solids	199	5.0	mg/L	200		99.5	64.1-125			
Duplicate (B333870-DUP1)		**Source: 23C0262-02**		Prepared & Analyzed: 03/10/23						
Total Suspended Solids	32	10	mg/L		34			6.06	10	H-01

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FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
ND	Not Detected
RL	Reporting Limit is at the level of quantitation (LOQ)
DL	Detection Limit is the lower limit of detection determined by the MDL study
MCL	Maximum Contaminant Level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.

H-01	Recommended sample holding time was exceeded, but analysis was performed before 2X the allowable holding time.
MS-09	Matrix spike recovery and/or matrix spike duplicate recovery outside of control limits. Possibility of sample matrix effects that lead to a low bias for reported result or non-homogeneous sample aliquots cannot be eliminated.
MS-11	Matrix spike recovery outside of control limits. Possibility of sample matrix effects that lead to a high bias for reported result or non-homogeneous sample aliquots cannot be eliminated.
MS-23	Either matrix spike or MS duplicate is outside of control limits, but the other is within limits. RPD between the two MS/MSD results is outside of the method specified criteria. Reduced precision anticipated for any reported result for this compound.
PF-17	Extracted Internal Standard recovery is outside of control limits. Data is not significantly affected since associated analyte is not detected and bias is on the high side.
PF-18	Duplicate analysis confirmed Extracted Internal Standard failure due to matrix effects.
PF-22B	Qualifier ion ratio >150% of associated calibration. Detection is estimated.
R-06	Matrix spike duplicate RPD is outside of control limits. Reduced precision is anticipated for reported result for this compound in this sample.
S-29	Extracted Internal Standard is outside of control limits.
V-20	Continuing calibration verification (CCV) did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

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INTERNAL STANDARD AREA AND RT SUMMARY

SOP-466 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
WPCD Cake (23C0262-01)			Lab File ID: 23C0262-01.d			Analyzed: 03/14/23 01:55			
M8FOSA	56831.76	4.068517	277,886.00	4.068517	20	50 - 150	0.0000	+/-0.50	*
M2-4:2FTS	83366.56	2.636633	86,774.00	2.628217	96	50 - 150	0.0084	+/-0.50	
M2PFTA	451149.8	4.34595	579,909.00	4.362184	78	50 - 150	-0.0162	+/-0.50	
M2-8:2FTS	219936.9	3.842983	99,528.00	3.850933	221	50 - 150	-0.0080	+/-0.50	*
MPFBA	416401.5	1.12495	393,019.00	1.12495	106	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	83022.55	2.945967	82,921.00	2.945967	100	50 - 150	0.0000	+/-0.50	
M6PFDA	595406.6	3.835517	479,824.00	3.843467	124	50 - 150	-0.0080	+/-0.50	
M3PFBS	116330.3	2.019367	106,946.00	2.011067	109	50 - 150	0.0083	+/-0.50	
M7PFUnA	606297	3.970033	627,468.00	3.994	97	50 - 150	-0.0240	+/-0.50	
M2-6:2FTS	87005.41	3.501333	60,011.00	3.501333	145	50 - 150	0.0000	+/-0.50	
M5PFPeA	331506.1	1.824517	324,516.00	1.824517	102	50 - 150	0.0000	+/-0.50	
M5PFHxA	547801.4	2.722683	530,186.00	2.722683	103	50 - 150	0.0000	+/-0.50	
M3PFHxS	89349.45	3.284267	78,256.00	3.28425	114	50 - 150	0.0000	+/-0.50	
M4PFHpA	590122.2	3.251883	536,772.00	3.251867	110	50 - 150	0.0000	+/-0.50	
M8PFOA	554005.8	3.510167	465,508.00	3.510167	119	50 - 150	0.0000	+/-0.50	
M8PFOS	143906	3.6921	81,797.00	3.692083	176	50 - 150	0.0000	+/-0.50	*
M9PFNA	520768.2	3.693133	412,167.00	3.693117	126	50 - 150	0.0000	+/-0.50	
MPFDoA	463377.8	4.088666	566,016.00	4.1288	82	50 - 150	-0.0401	+/-0.50	
D5-NEtFOSAA	166851	3.9775	161,655.00	4.001467	103	50 - 150	-0.0240	+/-0.50	
D3-NMeFOSAA	238849.1	3.905917	191,638.00	3.9219	125	50 - 150	-0.0160	+/-0.50	
13C3-PFBA	65051.07	1.985967	63,506.00	2.085867	102	30 - 500	-0.0999	+/-0.50	
13C2-PFHxA	98224.66	4.723067	91,610.00	4.731233	107	30 - 500	-0.0082	+/-0.50	
13C4-PFOA	11687.42	5.908017	10,196.00	5.916217	115	30 - 500	-0.0082	+/-0.50	
13C5-PFNA	89347.34	6.34995	76,405.00	6.3581	117	30 - 500	-0.0082	+/-0.50	
13C2-PFDA	53303.91	6.70865	64,486.00	6.766284	83	30 - 500	-0.0576	+/-0.50	
18O2-PFHxS	17477.36	6.016833	14,482.00	6.025033	121	30 - 500	-0.0082	+/-0.50	
13C4-PFOS	12635.31	6.8577	15,193.00	6.93085	83	30 - 500	-0.0732	+/-0.50	
WPCD Influent (23C0262-02)			Lab File ID: 23C0262-02.d			Analyzed: 03/17/23 08:49			
13C3-PFBA	62479.23	2.002617	63,506.00	2.019267	98	30 - 500	-0.0167	+/-0.50	
13C2-PFHxA	87088.63	4.69855	91,610.00	4.69855	95	30 - 500	0.0000	+/-0.50	
13C4-PFOA	10812.28	5.891617	10,196.00	5.891617	106	30 - 500	0.0000	+/-0.50	
13C5-PFNA	85110.96	6.341784	76,405.00	6.3418	111	30 - 500	0.0000	+/-0.50	
13C2-PFDA	73300.02	6.74945	64,486.00	6.74945	114	30 - 500	0.0000	+/-0.50	
18O2-PFHxS	15378.7	6.000433	14,482.00	6.000433	106	30 - 500	0.0000	+/-0.50	
13C4-PFOS	16456.6	6.914583	15,193.00	6.9146	108	30 - 500	0.0000	+/-0.50	

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INTERNAL STANDARD AREA AND RT SUMMARY

Draft Method 1633

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
WPCD Blank (23C0262-03)			Lab File ID: 23C0262-03.d			Analyzed: 03/28/23 13:32			
13C3-PFBA	65038.62	2.035917	63,506.00	2.027583	102	30 - 500	0.0083	+/-0.50	
13C2-PFHxA	85988.55	4.69855	91,610.00	4.69855	94	30 - 500	0.0000	+/-0.50	
13C4-PFOA	10098.34	5.883417	10,196.00	5.875216	99	30 - 500	0.0082	+/-0.50	
13C5-PFNA	75250.36	6.333883	76,405.00	6.32575	98	30 - 500	0.0081	+/-0.50	
13C2-PFDA	59919.67	6.741283	64,486.00	6.733133	93	30 - 500	0.0082	+/-0.50	
18O2-PFHxS	14145.25	5.992233	14,482.00	5.984033	98	30 - 500	0.0082	+/-0.50	
13C4-PFOS	14449.68	6.906466	15,193.00	6.898334	95	30 - 500	0.0081	+/-0.50	
Blank (B333335-BLK1)			Lab File ID: B333335-BLK1.d			Analyzed: 03/14/23 01:11			
M8FOSA	149033.1	4.068517	277,886.00	4.068517	54	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	65481.32	2.628217	86,774.00	2.628217	75	50 - 150	0.0000	+/-0.50	
M2PFTA	431469.1	4.362184	579,909.00	4.362184	74	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	69728.98	3.850933	99,528.00	3.850933	70	50 - 150	0.0000	+/-0.50	
MPFBA	248001	1.12495	393,019.00	1.12495	63	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	57988.93	2.945967	82,921.00	2.945967	70	50 - 150	0.0000	+/-0.50	
M6PFDA	292797.2	3.843467	479,824.00	3.843467	61	50 - 150	0.0000	+/-0.50	
M3PFBS	66604.45	2.011067	106,946.00	2.011067	62	50 - 150	0.0000	+/-0.50	
M7PFUnA	351014.1	3.994	627,468.00	3.994	56	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	43216.57	3.501317	60,011.00	3.501333	72	50 - 150	0.0000	+/-0.50	
M5PFPeA	201909.9	1.824517	324,516.00	1.824517	62	50 - 150	0.0000	+/-0.50	
M5PFHxA	343635.9	2.722683	530,186.00	2.722683	65	50 - 150	0.0000	+/-0.50	
M3PFHxS	49488.41	3.28425	78,256.00	3.28425	63	50 - 150	0.0000	+/-0.50	
M4PFHpA	355843.6	3.251867	536,772.00	3.251867	66	50 - 150	0.0000	+/-0.50	
M8PFOA	330756.8	3.510167	465,508.00	3.510167	71	50 - 150	0.0000	+/-0.50	
M8PFOS	53822.29	3.692083	81,797.00	3.692083	66	50 - 150	0.0000	+/-0.50	
M9PFNA	272295.7	3.693117	412,167.00	3.693117	66	50 - 150	0.0000	+/-0.50	
MPFDoA	376268.2	4.1288	566,016.00	4.1288	66	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	113651.2	4.001467	161,655.00	4.001467	70	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	133405.4	3.921883	191,638.00	3.9219	70	50 - 150	0.0000	+/-0.50	

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INTERNAL STANDARD AREA AND RT SUMMARY

SOP-466 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
LCS (B333335-BS1)			Lab File ID: B333335-BS1.d			Analyzed: 03/14/23 01:04			
M8FOSA	288350	4.068517	277,886.00	4.068517	104	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	110961.6	2.636633	86,774.00	2.628217	128	50 - 150	0.0084	+/-0.50	
M2PFTA	724276.6	4.362184	579,909.00	4.362184	125	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	129012	3.85095	99,528.00	3.850933	130	50 - 150	0.0000	+/-0.50	
MPFBA	438329.7	1.12495	393,019.00	1.12495	112	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	93242.64	2.945983	82,921.00	2.945967	112	50 - 150	0.0000	+/-0.50	
M6PFDA	522334.2	3.843483	479,824.00	3.843467	109	50 - 150	0.0000	+/-0.50	
M3PFBS	120957.7	2.011083	106,946.00	2.011067	113	50 - 150	0.0000	+/-0.50	
M7PFUnA	659667.3	3.994017	627,468.00	3.994	105	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	75220.77	3.501333	60,011.00	3.501333	125	50 - 150	0.0000	+/-0.50	
M5PFPeA	358565.6	1.824533	324,516.00	1.824517	110	50 - 150	0.0000	+/-0.50	
M5PFHxA	601527.6	2.7227	530,186.00	2.722683	113	50 - 150	0.0000	+/-0.50	
M3PFHxS	93825.55	3.284267	78,256.00	3.28425	120	50 - 150	0.0000	+/-0.50	
M4PFHpA	636254.8	3.251883	536,772.00	3.251867	119	50 - 150	0.0000	+/-0.50	
M8PFOA	569596.3	3.510183	465,508.00	3.510167	122	50 - 150	0.0000	+/-0.50	
M8PFOS	100949.6	3.6921	81,797.00	3.692083	123	50 - 150	0.0000	+/-0.50	
M9PFNA	492764.8	3.693133	412,167.00	3.693117	120	50 - 150	0.0000	+/-0.50	
MPFDoA	663899.3	4.128817	566,016.00	4.1288	117	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	177822.8	4.001483	161,655.00	4.001467	110	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	223083.2	3.9219	191,638.00	3.9219	116	50 - 150	0.0000	+/-0.50	

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INTERNAL STANDARD AREA AND RT SUMMARY

SOP-466 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Matrix Spike (B333335-MS1)			Lab File ID: B333335-MS1.d			Analyzed: 03/14/23 01:18			
M8FOSA	78635.01	4.068517	277,886.00	4.068517	28	50 - 150	0.0000	+/-0.50	*
M2-4:2FTS	72553.43	2.636633	86,774.00	2.628217	84	50 - 150	0.0084	+/-0.50	
M2PFTA	516137.7	4.345933	579,909.00	4.362184	89	50 - 150	-0.0163	+/-0.50	
M2-8:2FTS	215285	3.842983	99,528.00	3.850933	216	50 - 150	-0.0080	+/-0.50	*
MPFBA	346436.6	1.12495	393,019.00	1.12495	88	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	69797.7	2.945967	82,921.00	2.945967	84	50 - 150	0.0000	+/-0.50	
M6PFDA	624935.6	3.843467	479,824.00	3.843467	130	50 - 150	0.0000	+/-0.50	
M3PFBS	95854.8	2.019367	106,946.00	2.011067	90	50 - 150	0.0083	+/-0.50	
M7PFUnA	668050.2	3.970017	627,468.00	3.994	106	50 - 150	-0.0240	+/-0.50	
M2-6:2FTS	72162.05	3.501333	60,011.00	3.501333	120	50 - 150	0.0000	+/-0.50	
M5PFPeA	275778.7	1.824517	324,516.00	1.824517	85	50 - 150	0.0000	+/-0.50	
M5PFHxA	467511.6	2.722683	530,186.00	2.722683	88	50 - 150	0.0000	+/-0.50	
M3PFHxS	84809.12	3.284267	78,256.00	3.28425	108	50 - 150	0.0000	+/-0.50	
M4PFHpA	531556.3	3.251867	536,772.00	3.251867	99	50 - 150	0.0000	+/-0.50	
M8PFOA	542239.9	3.510167	465,508.00	3.510167	116	50 - 150	0.0000	+/-0.50	
M8PFOS	134752.5	3.692083	81,797.00	3.692083	165	50 - 150	0.0000	+/-0.50	*
M9PFNA	507655.9	3.693133	412,167.00	3.693117	123	50 - 150	0.0000	+/-0.50	
MPFDoA	501384.8	4.09665	566,016.00	4.1288	89	50 - 150	-0.0321	+/-0.50	
D5-NEtFOSAA	204003.8	3.985483	161,655.00	4.001467	126	50 - 150	-0.0160	+/-0.50	
D3-NMeFOSAA	241057.7	3.905917	191,638.00	3.9219	126	50 - 150	-0.0160	+/-0.50	

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INTERNAL STANDARD AREA AND RT SUMMARY

SOP-466 PFAS

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Matrix Spike Dup (B333335-MSD1)			Lab File ID: B333335-MSD1.d			Analyzed: 03/14/23 01:26			
M8FOSA	27591.44	4.068517	277,886.00	4.068517	10	50 - 150	0.0000	+/-0.50	*
M2-4:2FTS	22664.12	2.636633	86,774.00	2.628217	26	50 - 150	0.0084	+/-0.50	*
M2PFTA	229036.1	4.34595	579,909.00	4.362184	39	50 - 150	-0.0162	+/-0.50	*
M2-8:2FTS	57073.45	3.842983	99,528.00	3.850933	57	50 - 150	-0.0080	+/-0.50	
MPFBA	121268.1	1.12495	393,019.00	1.12495	31	50 - 150	0.0000	+/-0.50	*
M3HFPO-DA	35747.04	2.945967	82,921.00	2.945967	43	50 - 150	0.0000	+/-0.50	*
M6PFDA	181599.8	3.843483	479,824.00	3.843467	38	50 - 150	0.0000	+/-0.50	*
M3PFBS	35681.88	2.011067	106,946.00	2.011067	33	50 - 150	0.0000	+/-0.50	*
M7PFUnA	251084.9	3.978033	627,468.00	3.994	40	50 - 150	-0.0160	+/-0.50	*
M2-6:2FTS	19115.79	3.501317	60,011.00	3.501333	32	50 - 150	0.0000	+/-0.50	*
M5PFPeA	97961.49	1.824517	324,516.00	1.824517	30	50 - 150	0.0000	+/-0.50	*
M5PFHxA	169385.1	2.722683	530,186.00	2.722683	32	50 - 150	0.0000	+/-0.50	*
M3PFHxS	30815.05	3.28425	78,256.00	3.28425	39	50 - 150	0.0000	+/-0.50	*
M4PFHpA	188658.3	3.251867	536,772.00	3.251867	35	50 - 150	0.0000	+/-0.50	*
M8PFOA	177436.6	3.510167	465,508.00	3.510167	38	50 - 150	0.0000	+/-0.50	*
M8PFOS	73465.18	3.692083	81,797.00	3.692083	90	50 - 150	0.0000	+/-0.50	
M9PFNA	162249.4	3.693133	412,167.00	3.693117	39	50 - 150	0.0000	+/-0.50	*
MPFDoA	186427.3	4.104667	566,016.00	4.1288	33	50 - 150	-0.0241	+/-0.50	*
D5-NEtFOSAA	72957.98	3.9855	161,655.00	4.001467	45	50 - 150	-0.0160	+/-0.50	*
D3-NMeFOSAA	85090	3.913917	191,638.00	3.9219	44	50 - 150	-0.0080	+/-0.50	*
Blank (B333940-BLK1)			Lab File ID: B333940-BLK1.d			Analyzed: 03/17/23 06:59			
13C3-PFBA	67162.97	2.010933	63,506.00	2.019267	106	30 - 500	-0.0083	+/-0.50	
13C2-PFHxA	89426.07	4.69855	91,610.00	4.69855	98	30 - 500	0.0000	+/-0.50	
13C4-PFOA	10548.3	5.891617	10,196.00	5.891617	103	30 - 500	0.0000	+/-0.50	
13C5-PFNA	79134.02	6.341784	76,405.00	6.3418	104	30 - 500	0.0000	+/-0.50	
13C2-PFDA	62576.33	6.749434	64,486.00	6.74945	97	30 - 500	0.0000	+/-0.50	
18O2-PFHxS	14587.69	6.000433	14,482.00	6.000433	101	30 - 500	0.0000	+/-0.50	
13C4-PFOS	15744.37	6.914583	15,193.00	6.9146	104	30 - 500	0.0000	+/-0.50	
LCS (B333940-BS1)			Lab File ID: B333940-BS1.d			Analyzed: 03/17/23 07:15			
13C3-PFBA	71191.89	2.019267	63,506.00	2.019267	112	30 - 500	0.0000	+/-0.50	
13C2-PFHxA	95469.17	4.69855	91,610.00	4.69855	104	30 - 500	0.0000	+/-0.50	
13C4-PFOA	10998.07	5.891617	10,196.00	5.891617	108	30 - 500	0.0000	+/-0.50	
13C5-PFNA	82941.71	6.341784	76,405.00	6.3418	109	30 - 500	0.0000	+/-0.50	
13C2-PFDA	67707	6.749434	64,486.00	6.74945	105	30 - 500	0.0000	+/-0.50	
18O2-PFHxS	15013.4	6.000433	14,482.00	6.000433	104	30 - 500	0.0000	+/-0.50	
13C4-PFOS	16128.67	6.914583	15,193.00	6.9146	106	30 - 500	0.0000	+/-0.50	

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INTERNAL STANDARD AREA AND RT SUMMARY

Draft Method 1633

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
LCS (B333940-BS2)			Lab File ID: B333940-BS2.d			Analyzed: 03/17/23 07:30			
13C3-PFBA	75091.55	2.019267	63,506.00	2.019267	118	30 - 500	0.0000	+/-0.50	
13C2-PFHxA	92716.01	4.69855	91,610.00	4.69855	101	30 - 500	0.0000	+/-0.50	
13C4-PFOA	11269.76	5.883417	10,196.00	5.891617	111	30 - 500	-0.0082	+/-0.50	
13C5-PFNA	81652.11	6.333883	76,405.00	6.3418	107	30 - 500	-0.0079	+/-0.50	
13C2-PFDA	66827.84	6.74945	64,486.00	6.74945	104	30 - 500	0.0000	+/-0.50	
18O2-PFHxS	15259.02	6.000433	14,482.00	6.000433	105	30 - 500	0.0000	+/-0.50	
13C4-PFOS	15410.85	6.914583	15,193.00	6.9146	101	30 - 500	0.0000	+/-0.50	
Blank (B334428-BLK1)			Lab File ID: B334428-BLK1.d			Analyzed: 03/28/23 11:11			
13C3-PFBA	64001.98	2.035917	63,506.00	2.027583	101	30 - 500	0.0083	+/-0.50	
13C2-PFHxA	83135.32	4.69855	91,610.00	4.69855	91	30 - 500	0.0000	+/-0.50	
13C4-PFOA	9708.68	5.875216	10,196.00	5.875216	95	30 - 500	0.0000	+/-0.50	
13C5-PFNA	71753.73	6.325733	76,405.00	6.32575	94	30 - 500	0.0000	+/-0.50	
13C2-PFDA	58216.96	6.733133	64,486.00	6.733133	90	30 - 500	0.0000	+/-0.50	
18O2-PFHxS	13399.19	5.992233	14,482.00	5.984033	93	30 - 500	0.0082	+/-0.50	
13C4-PFOS	14176.37	6.898334	15,193.00	6.898334	93	30 - 500	0.0000	+/-0.50	
LCS (B334428-BS1)			Lab File ID: B334428-BS1.d			Analyzed: 03/28/23 11:27			
13C3-PFBA	70689.6	2.035917	63,506.00	2.027583	111	30 - 500	0.0083	+/-0.50	
13C2-PFHxA	94423.41	4.69855	91,610.00	4.69855	103	30 - 500	0.0000	+/-0.50	
13C4-PFOA	10663.32	5.883417	10,196.00	5.875216	105	30 - 500	0.0082	+/-0.50	
13C5-PFNA	79746.88	6.333883	76,405.00	6.32575	104	30 - 500	0.0081	+/-0.50	
13C2-PFDA	64358.22	6.741283	64,486.00	6.733133	100	30 - 500	0.0082	+/-0.50	
18O2-PFHxS	15362.41	5.992233	14,482.00	5.984033	106	30 - 500	0.0082	+/-0.50	
13C4-PFOS	15574.97	6.898334	15,193.00	6.898334	103	30 - 500	0.0000	+/-0.50	
LCS (B334428-BS2)			Lab File ID: B334428-BS2.d			Analyzed: 03/28/23 11:43			
13C3-PFBA	56540.48	2.035917	63,506.00	2.027583	89	30 - 500	0.0083	+/-0.50	
13C2-PFHxA	74377.6	4.69855	91,610.00	4.69855	81	30 - 500	0.0000	+/-0.50	
13C4-PFOA	8967.059	5.883417	10,196.00	5.875216	88	30 - 500	0.0082	+/-0.50	
13C5-PFNA	66734.43	6.325733	76,405.00	6.32575	87	30 - 500	0.0000	+/-0.50	
13C2-PFDA	54828.88	6.733133	64,486.00	6.733133	85	30 - 500	0.0000	+/-0.50	
18O2-PFHxS	12536.55	5.992233	14,482.00	5.984033	87	30 - 500	0.0082	+/-0.50	
13C4-PFOS	13562.67	6.906466	15,193.00	6.898334	89	30 - 500	0.0081	+/-0.50	

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INTERNAL STANDARD AREA AND RT SUMMARY

Draft Method 1633

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Blank (B334653-BLK1)			Lab File ID: B334653-BLK1.d			Analyzed: 04/03/23 11:40			
13C3-PFBA	59094.09	2.0609	63,506.00	2.085867	93	30 - 500	-0.0250	+/-0.50	
13C2-PFHxA	65607.87	4.7394	91,610.00	4.731233	72	30 - 500	0.0082	+/-0.50	
13C4-PFOA	8695.25	5.908017	10,196.00	5.916217	85	30 - 500	-0.0082	+/-0.50	
13C5-PFNA	66744.94	6.3581	76,405.00	6.3581	87	30 - 500	0.0000	+/-0.50	
13C2-PFDA	56703.14	6.766284	64,486.00	6.766284	88	30 - 500	0.0000	+/-0.50	
18O2-PFHxS	12832.08	6.025033	14,482.00	6.025033	89	30 - 500	0.0000	+/-0.50	
13C4-PFOS	14407.85	6.93085	15,193.00	6.93085	95	30 - 500	0.0000	+/-0.50	
LCS (B334653-BS1)			Lab File ID: B334653-BS1.d			Analyzed: 04/03/23 11:56			
13C3-PFBA	63887.53	2.044233	63,506.00	2.085867	101	30 - 500	-0.0416	+/-0.50	
13C2-PFHxA	85773.12	4.723067	91,610.00	4.731233	94	30 - 500	-0.0082	+/-0.50	
13C4-PFOA	9824.234	5.899817	10,196.00	5.916217	96	30 - 500	-0.0164	+/-0.50	
13C5-PFNA	72157.55	6.34995	76,405.00	6.3581	94	30 - 500	-0.0082	+/-0.50	
13C2-PFDA	58195.54	6.758133	64,486.00	6.766284	90	30 - 500	-0.0082	+/-0.50	
18O2-PFHxS	13915.24	6.016833	14,482.00	6.025033	96	30 - 500	-0.0082	+/-0.50	
13C4-PFOS	14608.58	6.922717	15,193.00	6.93085	96	30 - 500	-0.0081	+/-0.50	
LCS (B334653-BS2)			Lab File ID: B334653-BS2.d			Analyzed: 04/03/23 12:11			
13C3-PFBA	62485.64	2.002617	63,506.00	2.085867	98	30 - 500	-0.0833	+/-0.50	
13C2-PFHxA	87400.13	4.731233	91,610.00	4.731233	95	30 - 500	0.0000	+/-0.50	
13C4-PFOA	10429.41	5.908017	10,196.00	5.916217	102	30 - 500	-0.0082	+/-0.50	
13C5-PFNA	75312.51	6.3581	76,405.00	6.3581	99	30 - 500	0.0000	+/-0.50	
13C2-PFDA	63335.35	6.758133	64,486.00	6.766284	98	30 - 500	-0.0082	+/-0.50	
18O2-PFHxS	14912.19	6.016833	14,482.00	6.025033	103	30 - 500	-0.0082	+/-0.50	
13C4-PFOS	15155.08	6.922717	15,193.00	6.93085	100	30 - 500	-0.0081	+/-0.50	
Calibration Blank (S084731-CCB1)			Lab File ID: CCB1_1633_031623.d			Analyzed: 03/16/23 10:12			
13C3-PFBA	52211.84	2.035917	63,506.00	2.019267	82	30 - 500	0.0166	+/-0.50	
13C2-PFHxA	64397.5	4.69855	91,610.00	4.69855	70	30 - 500	0.0000	+/-0.50	
13C4-PFOA	7510.274	5.891617	10,196.00	5.883417	74	30 - 500	0.0082	+/-0.50	
13C5-PFNA	59516.6	6.341784	76,405.00	6.333883	78	30 - 500	0.0079	+/-0.50	
13C2-PFDA	50716.46	6.749434	64,486.00	6.749434	79	30 - 500	0.0000	+/-0.50	
18O2-PFHxS	11004.39	6.008633	14,482.00	6.000433	76	30 - 500	0.0082	+/-0.50	
13C4-PFOS	11685.31	6.914583	15,193.00	6.914583	77	30 - 500	0.0000	+/-0.50	

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INTERNAL STANDARD AREA AND RT SUMMARY

Draft Method 1633

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Blank (S084731-CCB2)			Lab File ID: CCB7_1633_031623.d			Analyzed: 03/17/23 05:40			
13C3-PFBA	52405.29	2.019267	63,506.00	2.019267	83	30 - 500	0.0000	+/-0.50	
13C2-PFHxA	68422.46	4.69855	91,610.00	4.69855	75	30 - 500	0.0000	+/-0.50	
13C4-PFOA	7954.412	5.891617	10,196.00	5.891617	78	30 - 500	0.0000	+/-0.50	
13C5-PFNA	63144.38	6.341784	76,405.00	6.3418	83	30 - 500	0.0000	+/-0.50	
13C2-PFDA	50730.99	6.749434	64,486.00	6.74945	79	30 - 500	0.0000	+/-0.50	
18O2-PFHxS	11717.29	6.000433	14,482.00	6.000433	81	30 - 500	0.0000	+/-0.50	
13C4-PFOS	12816.76	6.914583	15,193.00	6.9146	84	30 - 500	0.0000	+/-0.50	
Calibration Blank (S084731-CCB3)			Lab File ID: CCB8_1633_031623.d			Analyzed: 03/17/23 11:11			
13C3-PFBA	52867.35	2.027583	63,506.00	2.027583	83	30 - 500	0.0000	+/-0.50	
13C2-PFHxA	69974.62	4.69855	91,610.00	4.69855	76	30 - 500	0.0000	+/-0.50	
13C4-PFOA	8082.927	5.891617	10,196.00	5.883417	79	30 - 500	0.0082	+/-0.50	
13C5-PFNA	60192.85	6.341784	76,405.00	6.333883	79	30 - 500	0.0079	+/-0.50	
13C2-PFDA	50673.71	6.749434	64,486.00	6.74945	79	30 - 500	0.0000	+/-0.50	
18O2-PFHxS	11485.72	6.000433	14,482.00	6.000433	79	30 - 500	0.0000	+/-0.50	
13C4-PFOS	11916.47	6.914583	15,193.00	6.914583	78	30 - 500	0.0000	+/-0.50	
Calibration Blank (S085239-CCB1)			Lab File ID: CCB1_1633_032823.d			Analyzed: 03/28/23 10:06			
13C3-PFBA	55800.04	2.027583	63,506.00	2.027583	88	30 - 500	0.0000	+/-0.50	
13C2-PFHxA	73962.24	4.690383	91,610.00	4.69855	81	30 - 500	-0.0082	+/-0.50	
13C4-PFOA	8569.158	5.883417	10,196.00	5.875216	84	30 - 500	0.0082	+/-0.50	
13C5-PFNA	62391.37	6.333883	76,405.00	6.32575	82	30 - 500	0.0081	+/-0.50	
13C2-PFDA	51507.77	6.741283	64,486.00	6.733133	80	30 - 500	0.0082	+/-0.50	
18O2-PFHxS	11581.11	5.992233	14,482.00	5.984033	80	30 - 500	0.0082	+/-0.50	
13C4-PFOS	12759.26	6.906466	15,193.00	6.898334	84	30 - 500	0.0081	+/-0.50	
Calibration Blank (S085239-CCB2)			Lab File ID: CCB2_1633_032823.d			Analyzed: 03/28/23 14:51			
13C3-PFBA	56352.75	2.027583	63,506.00	2.019267	89	30 - 500	0.0083	+/-0.50	
13C2-PFHxA	73944.19	4.69855	91,610.00	4.69855	81	30 - 500	0.0000	+/-0.50	
13C4-PFOA	8808.49	5.883417	10,196.00	5.883417	86	30 - 500	0.0000	+/-0.50	
13C5-PFNA	66081.66	6.333883	76,405.00	6.333883	86	30 - 500	0.0000	+/-0.50	
13C2-PFDA	52804.68	6.741283	64,486.00	6.741283	82	30 - 500	0.0000	+/-0.50	
18O2-PFHxS	11946.16	5.992233	14,482.00	6.000433	82	30 - 500	-0.0082	+/-0.50	
13C4-PFOS	13142.09	6.906466	15,193.00	6.906466	87	30 - 500	0.0000	+/-0.50	

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INTERNAL STANDARD AREA AND RT SUMMARY

Draft Method 1633

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Blank (S086142-CCB1)			Lab File ID: CCB1_1633_033123.d			Analyzed: 04/03/23 10:11			
13C3-PFBA	50910.27	2.085867	63,506.00	2.085867	80	30 - 500	0.0000	+/-0.50	
13C2-PFHxA	62497.89	4.7394	91,610.00	4.731233	68	30 - 500	0.0082	+/-0.50	
13C4-PFOA	7494.769	5.916217	10,196.00	5.916217	74	30 - 500	0.0000	+/-0.50	
13C5-PFNA	60275.48	6.3581	76,405.00	6.3581	79	30 - 500	0.0000	+/-0.50	
13C2-PFDA	50564.48	6.766284	64,486.00	6.766284	78	30 - 500	0.0000	+/-0.50	
18O2-PFHxS	11204.49	6.025033	14,482.00	6.025033	77	30 - 500	0.0000	+/-0.50	
13C4-PFOS	11877.82	6.93085	15,193.00	6.93085	78	30 - 500	0.0000	+/-0.50	
Calibration Blank (S086142-CCB2)			Lab File ID: CCB2_1633_033123.d			Analyzed: 04/03/23 13:46			
13C3-PFBA	53530.44	2.0609	63,506.00	2.085867	84	30 - 500	-0.0250	+/-0.50	
13C2-PFHxA	69017.14	4.731233	91,610.00	4.731233	75	30 - 500	0.0000	+/-0.50	
13C4-PFOA	8503.223	5.908017	10,196.00	5.916217	83	30 - 500	-0.0082	+/-0.50	
13C5-PFNA	62899.14	6.3581	76,405.00	6.3581	82	30 - 500	0.0000	+/-0.50	
13C2-PFDA	54254.57	6.766284	64,486.00	6.766284	84	30 - 500	0.0000	+/-0.50	
18O2-PFHxS	12120.95	6.016833	14,482.00	6.025033	84	30 - 500	-0.0082	+/-0.50	
13C4-PFOS	12478.7	6.93085	15,193.00	6.93085	82	30 - 500	0.0000	+/-0.50	

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
Draft Method 1633 in Water	
Total Suspended Solids	CT,MA,NH,NY,RI,NC,ME,VA
Perfluorobutanoic acid (PFBA)	NY
Perfluoropentanoic acid (PFPeA)	NY
Perfluorohexanoic acid (PFHxA)	NY
Perfluoroheptanoic acid (PFHpA)	NY
Perfluorooctanoic acid (PFOA)	NY
Perfluorononanoic acid (PFNA)	NY
Perfluorodecanoic acid (PFDA)	NY
Perfluoroundecanoic acid (PFUnA)	NY
Perfluorododecanoic acid (PFDoA)	NY
Perfluorotridecanoic acid (PFTrDA)	NY
Perfluorotetradecanoic acid (PFTeDA)	NY
Perfluorobutanesulfonic acid (PFBS)	NY
Perfluoropetanesulfonic acid (PFPeS)	NY
Perfluorohexanesulfonic acid (PFHxS)	NY
Perfluoroheptanesulfonic acid (PFHpS)	NY
Perfluorooctanesulfonic acid (PFOS)	NY
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2FTS)	NY
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2FTS)	NY
N-MeFOSAA (NMeFOSAA)	NY
N-EtFOSAA (NEtFOSAA)	NY
Hexafluoropropylene oxide dimer acid (HFPO-DA)	NY
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	NY
9Cl-PF3ONS (F53B Minor)	NY
11Cl-PF3OUdS (F53B Major)	NY
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	NY
Perfluoro-3-methoxypropanoic acid (PFMPA)	NY
SOP-454 PFAS in Water	
Perfluorobutanoic acid (PFBA)	NH-P
Perfluorobutanesulfonic acid (PFBS)	NH-P
Perfluoropentanoic acid (PFPeA)	NH-P
Perfluorohexanoic acid (PFHxA)	NH-P
11Cl-PF3OUdS (F53B Major)	NH-P
9Cl-PF3ONS (F53B Minor)	NH-P
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	NH-P
Hexafluoropropylene oxide dimer acid (HFPO-DA)	NH-P
8:2 Fluorotelomersulfonic acid (8:2FTS A)	NH-P
Perfluorodecanoic acid (PFDA)	NH-P
Perfluorododecanoic acid (PFDoA)	NH-P
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	NH-P
Perfluoroheptanesulfonic acid (PFHpS)	NH-P
N-EtFOSAA (NEtFOSAA)	NH-P
N-MeFOSAA (NMeFOSAA)	NH-P
Perfluorotetradecanoic acid (PFTA)	NH-P
Perfluorotridecanoic acid (PFTrDA)	NH-P
4:2 Fluorotelomersulfonic acid (4:2FTS A)	NH-P

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SOP-454 PFAS in Water	
Perfluorodecanesulfonic acid (PFDS)	NH-P
Perfluorooctanesulfonamide (FOSA)	NH-P
Perfluorononanesulfonic acid (PFNS)	NH-P
Perfluoro-1-hexanesulfonamide (FHxSA)	NH-P
Perfluoro-1-butanesulfonamide (FBSA)	NH-P
Perfluorohexanesulfonic acid (PFHxS)	NH-P
Perfluoro-4-oxapentanoic acid (PFMPA)	NH-P
Perfluoro-5-oxahexanoic acid (PFMBA)	NH-P
6:2 Fluorotelomersulfonic acid (6:2FTS A)	NH-P
Perfluoropetanesulfonic acid (PFPeS)	NH-P
Perfluoroundecanoic acid (PFUnA)	NH-P
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	NH-P
Perfluoroheptanoic acid (PFHpA)	NH-P
Perfluorooctanoic acid (PFOA)	NH-P
Perfluorooctanesulfonic acid (PFOS)	NH-P
Perfluorononanoic acid (PFNA)	NH-P
SOP-466 PFAS in Soil	
Perfluorobutanoic acid (PFBA)	NH-P
Perfluorobutanesulfonic acid (PFBS)	NH-P
Perfluoropentanoic acid (PFPeA)	NH-P
Perfluorohexanoic acid (PFHxA)	NH-P
11Cl-PF3OUdS (F53B Major)	NH-P
9Cl-PF3ONS (F53B Minor)	NH-P
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	NH-P
Hexafluoropropylene oxide dimer acid (HFPO-DA)	NH-P
8:2 Fluorotelomersulfonic acid (8:2FTS A)	NH-P
Perfluorodecanoic acid (PFDA)	NH-P
Perfluorododecanoic acid (PFDoA)	NH-P
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	NH-P
Perfluoroheptanesulfonic acid (PFHpS)	NH-P
N-EtFOSAA (NEtFOSAA)	NH-P
N-MeFOSAA (NMeFOSAA)	NH-P
Perfluorotetradecanoic acid (PFTA)	NH-P
Perfluorotridecanoic acid (PFTrDA)	NH-P
4:2 Fluorotelomersulfonic acid (4:2FTS A)	NH-P
Perfluorodecanesulfonic acid (PFDS)	NH-P
Perfluorooctanesulfonamide (FOSA)	NH-P
Perfluorononanesulfonic acid (PFNS)	NH-P
Perfluoro-1-hexanesulfonamide (FHxSA)	NH-P
Perfluoro-1-butanesulfonamide (FBSA)	NH-P
Perfluorohexanesulfonic acid (PFHxS)	NH-P
Perfluoro-4-oxapentanoic acid (PFMPA)	NH-P
Perfluoro-5-oxahexanoic acid (PFMBA)	NH-P
6:2 Fluorotelomersulfonic acid (6:2FTS A)	NH-P
Perfluoropetanesulfonic acid (PFPeS)	NH-P
Perfluoroundecanoic acid (PFUnA)	NH-P

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SOP-466 PFAS in Soil	
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	NH-P
Perfluoroheptanoic acid (PFHpA)	NH-P
Perfluorooctanoic acid (PFOA)	NH-P
Perfluorooctanesulfonic acid (PFOS)	NH-P
Perfluorononanoic acid (PFNA)	NH-P

Con-Test, a Pace Environmental Laboratory, operates under the following certifications and accreditations:

Code	Description	Number	Expires
MA	Massachusetts DEP	M-MA100	06/30/2024
CT	Connecticut Department of Public Health	PH-0821	12/31/2024
NY	New York State Department of Health	10899 NELAP	04/1/2024
NH	New Hampshire Environmental Lab	2516 NELAP	02/5/2024
RI	Rhode Island Department of Health	LAO00373	12/30/2023
NC	North Carolina Div. of Water Quality	652	12/31/2023
ME	State of Maine	MA00100	06/9/2023
VA	Commonwealth of Virginia	460217	12/14/2023
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2023

23L0262

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CHAIN OF CUSTODY RECORD

39 Spruce Street
East Longmeadow, MA 01028

Doc # 381 Rev 5_07/13/2021

Page ____ of ____

Company Name: Wheeling Water Pollution Control
Address: 25 16 Main St. Wheeling, WV 26003
Phone: (304) 234-3874
Project Name: PFAS Quarterly
Project Location: Wheeling WWTP
Project Number:
Project Manager:
Pace Quote Name/Number:
Invoice Recipient: mchiazza@WheelingWV.gov
Sampled By: Dave Watkins

Requested Turnaround Time
7-Day ☐ 10-Day ☐
PFAS 10-Day (std) ☑ Due Date:

Rush-Approval Required
1-Day ☐ 3-Day ☐
2-Day ☐ 4-Day ☐

Data Delivery
Format: PDF ☑ EXCEL ☐
Other:
CLP Like Data Pkg Required: ☐
Email To: david.watkins@WheelingWV.gov
Fax To #:

Dissolved Metals Samples
○ Field Filtered
○ Lab to Filter

Orthophosphate Samples
○ Field Filtered
○ Lab to Filter

PCB ONLY
SOXHLET ☐
NON SOXHLET ☐

ANALYSIS REQUESTED

Pace Work Order#	Client Sample ID / Description	Beginning Date/Time	Ending Date/Time	COMP/GRAB	Matrix Code	Conc Code	VIALS	GLASS	PLASTIC	BACTERIA	ENCORE	PFAS (Targeted 40)	[2] Preservation Code
1	WPCO Cake		0600	Grab	SL				1			X	
2	WPCO Influent		0800	Grab	WW				2			X	
3	WPCO Blank		0800	Grab	O				1			X	

Courier Use Only
Total Number Of:
VIALS____
GLASS____
PLASTIC____
BACTERIA____
ENCORE____

Glassware in the fridge? Y / N
Glassware in freezer? Y / N
Prepackaged Cooler? Y / N
*Pace Analytical is not responsible for missing samples from prepacked coolers

[1] Matrix Codes:
GW = Ground Water
WW = Waste Water
DW = Drinking Water
A = Air
S = Soil
SL = Sludge
SOL = Solid
O = Other (please define) Blank (Field)

[2] Preservation Codes:
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium Bisulfate
X = Sodium Hydroxide
T = Sodium Thiosulfate
O = Other (please define)

Relinquished by: (signature)	Date/Time:
[signature]	3/1/23 0900
Received by: (signature)	Date/Time:
[signature] 5.0	3-2-23 9:48
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Client Comments:

Detection Limit Requirements
MA:
CT:
Other:

Special Requirements
☐ MA MCP Required
MCP Certification Form Required
☐ CT RCP Required
RCP Certification Form Required
☐ MA State DW Required
PWSID #

Please use the following codes to indicate possible sample concentration within the Conc Code column above:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

MCP and AIHA-LAP, LLC Accredited

Project Entity
Government ☐ Municipality ☑ MWRA ☐ WRTA ☐
Federal ☐ 21 J ☐ School ☐
City ☐ Brownfield ☐ MBTA ☐

Other
☐ Chromatogram
☐ *AIHA-LAP,LLC*

Lab Comments:

Disclaimer: Pace Analytical is not responsible for any omitted information on the Chain of Custody. The Chain of Custody is a legal document that must be complete and accurate and is used to determine what analyses the laboratory will perform. Any missing information is not the laboratory's responsibility. Pace Analytical values your partnership on each project and will try to assist with missing information, but will not be held accountable.

FedEx® Tracking

DELIVERED

Thursday

3/2/2023 at 9:48 am

Signed for by: C.HENRIQUEZ

Obtain Proof of delivery

How was your delivery?

DELIVERY STATUS

Delivered

TRACKING ID

791335514544

FROM
WHEELING, WV US

Label Created
2/14/2023 1:25 PM

PACKAGE RECEIVED BY FEDEX
WHEELING, WV
3/1/2023 9:24 AM

IN TRANSIT
WINDSOR LOCKS, CT
3/2/2023 8:00 AM

OUT FOR DELIVERY
WINDSOR LOCKS, CT
3/2/2023 8:09 AM

DELIVERED
East Longmeadow, MA US

Delivered
3/2/2023 at 9:48 AM

View travel history

Want updates on this shipment? Enter your email and we will do the rest!

YOUR EMAIL

SUBMIT

MORE OPTIONS

Manage Delivery

39 Spruce St.
East Longmeadow, MA. 01028
P: 413-525-2332
F:413-525-6405
www.pacelabs.com

Log In Back-Sheet

Login Sample Receipt Checklist – (Rejection Criteria Listing – Using Acceptance Policy) Any False statement will be brought to the attention of the Client – True or False

Pace® PEOPLE ADVANCING SCIENCE

Client Wheeling Water Pollution

Project PFAS Quarterly

MCP/RCP Required

Deliverable Package Req.

Location Wheeling WWTP

PWSID# (When Applicable)

Arrival Method:

Courier ☐ Fed Ex ☒ Walk In ☐ Other ☐

Received By / Date / Time CH 9:48 3-2-23

Back-Sheet By / Date / Time CH 10:46 3-2-23

Temperature Method Temp Blank # 282801

Temp ☒ < 6° C Actual Temperature 5.0

Rush Samples: Yes / No Notify

Short Hold: Yes / No Notify

	True	False
Received on Ice	☒	☐
Received in Cooler	☒	☐
Custody Seal: DATE TIME	☐	☒
COC Relinquished	☒	☐
COC/Samples Labels Agree	☒	☐
All Samples in Good Condition	☒	☐
Samples Received within Holding Time	☒	☐
Is there enough Volume	☒	☐
Proper Media/Container Used	☒	☐
Splitting Samples Required	☐	☒
MS/MSD	☐	☒
Trip Blanks	☐	☒
Lab to Filters	☐	☒
COC Legible	☒	☐

Notes regarding Samples/COC outside of SOP:

COC Included: (Check all included)

Client ☒ Analysis ☒ Sampler Name ☒

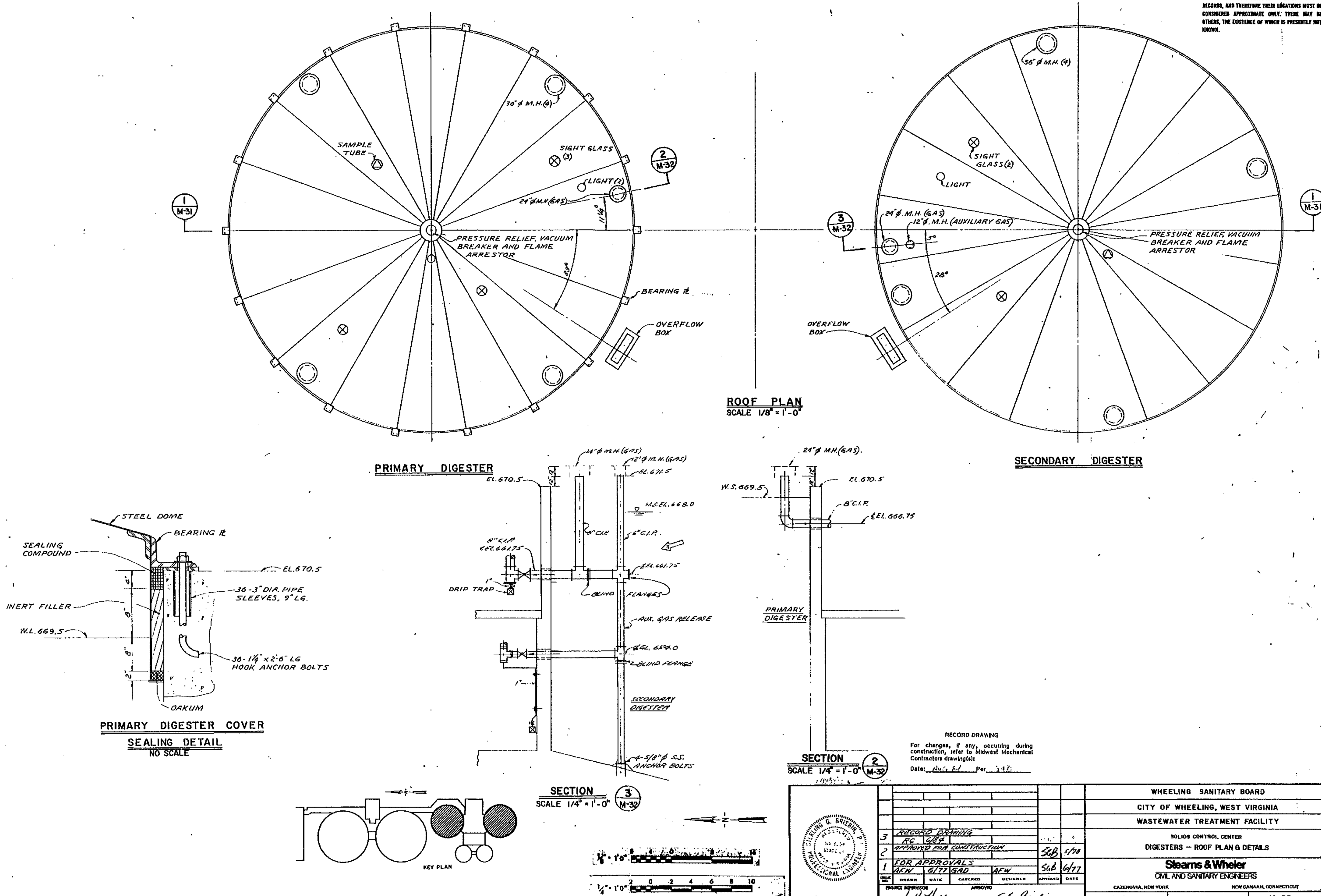
Project ☒ IDs ☒ Collection Date/Time ☒

All Samples Proper pH: N/A ☐ ☐

Container (Circle when applicable)	UnP	HCl	HNO3	H2SO4	NaOH	Trizma	NaS2O3	Other Preservative
1L Amber Plastic								
500 mL Amber (Plastic)	4							
250 mL Amber Plastic								
Other Amber Clear Plastic								
16oz Amber Clear								
8oz Amber Clear								
4oz Amber Clear								
2oz Amber Clear								
Col/Bacteria								
Flashpoint								
Plastic Bag								
SOC Kit								
Perchlorate								
Encore								
Frozen								

	Proper Headspace	UnP	HCl	MeOH	Bisulfate	DI	Thiosulfate	Sulfuric	Other
Vials									

NOTE:
UNDERGROUND FACILITIES, STRUCTURES AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS AND RECORDS, AND THEREFORE THEIR LOCATIONS MUST BE CONSIDERED APPROXIMATE ONLY. THERE MAY BE OTHERS, THE EXISTENCE OF WHICH IS PRESENTLY NOT KNOWN.



RECORD DRAWING

For changes, if any, occurring during construction, refer to Midwest Mechanical Contractors drawing(s):

Date: ______ Per ______

NO.	DESCRIPTION				APPROVED	DATE
3	RECORD DRAWING RC 6/84					
2	APPROVED FOR CONSTRUCTION				SGB	5/78
1	FOR APPROVALS AFW	6/77	GAD	AFW	SGB	6/77
	DRAWN	DATE	CHECKED	DESIGNER	APPROVED	DATE

PROJECT SUPERVISOR: W.R. Hall — APPROVED: S.G. Brisbin

WHEELING SANITARY BOARD
CITY OF WHEELING, WEST VIRGINIA
WASTEWATER TREATMENT FACILITY
SOLIDS CONTROL CENTER
DIGESTERS — ROOF PLAN & DETAILS

Stearns & Wheler
CIVIL AND SANITARY ENGINEERS
CAZENOVIA, NEW YORK — NEW CANAAN, CONNECTICUT

JOB NO. 686 | CONTRACT NO. 7 | SHEET M-32