



ANALYTICAL REPORT

PREPARED FOR

Attn: Chelsey Little
Montague WPCF
34 Greenfield Road
Montague Massachusetts 01351

Generated 11/22/2022 2:18:59 PM

JOB DESCRIPTION

PFAS, MassDEP Biosolids

JOB NUMBER

320-93817-1

Table of Contents

Cover Page	1
Table of Contents	2
Definitions/Glossary	3
Case Narrative	4
Detection Summary	5
Client Sample Results	6
Isotope Dilution Summary	8
QC Sample Results	9
QC Association Summary	13
Lab Chronicle	14
Certification Summary	15
Method Summary	16
Sample Summary	17
Chain of Custody	18
Receipt Checklists	19
Appendix	20



Definitions/Glossary

Client: Montague WPCF
Project/Site: PFAS, MassDEP Biosolids

Job ID: 320-93817-1

Qualifiers

LCMS

Qualifier	Qualifier Description
*5-	Isotope dilution analyte is outside acceptance limits, low biased.
B	Compound was found in the blank and sample.
I	Value is EMPC (estimated maximum possible concentration).
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

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

Case Narrative

Client: Montague WPCF
Project/Site: PFAS, MassDEP Biosolids

Job ID: 320-93817-1

Job ID: 320-93817-1

Laboratory: Eurofins Sacramento

Narrative

Receipt

The samples were received on 11/1/2022 9:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 5.1° C.

Receipt Exceptions

Per project manager instruction, one of the two sample containers was randomly chosen and assigned a sample ID of Cake duplicate (320-93817-2).

LCMS

Method 537 (modified): The transition mass ratio was outside of the established ratio limit for Perfluoroundecanoic acid (PFUnA) in (CCVL 320-630600/2) associated to this data set. This is indicated by the "R" flag in the raw data. As the flagged data is in control in the CCVL, there is no adverse impact to the data.

Method 537 (modified): The Isotope Dilution Analyte (IDA) recovery associated with the following samples is below the method recommended limit: Cake (320-93817-1) and Cake duplicate (320-93817-2). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the sample(s).

Method 537 (modified): The "I" qualifier means the transition mass ratio for the indicated analyte was above the established ratio limits. The qualitative identification of the analyte has some degree of uncertainty, and the reported value may have some high bias. However, analyst judgment was used to positively identify the analyte.

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

General Chemistry

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

Organic Prep

Method SHAKE: Due to the matrix, the initial volumes used for the following samples deviated from the standard procedure: Cake (320-93817-1) and Cake duplicate (320-93817-2). Samples were prepped at 0.5 grams. The reporting limits (RLs) have been adjusted proportionately.

preparation batch 320-630200

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

Detection Summary

Client: Montague WPCF
Project/Site: PFAS, MassDEP Biosolids

Job ID: 320-93817-1

Client Sample ID: Cake

Lab Sample ID: 320-93817-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	6.4	J B	8.8	2.0	ng/g	1	✧	537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	1.7	J I	8.8	1.4	ng/g	1	✧	537 (modified)	Total/NA

Client Sample ID: Cake duplicate

Lab Sample ID: 320-93817-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	4.3	J B	9.4	2.2	ng/g	1	✧	537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	2.0	J	9.4	1.5	ng/g	1	✧	537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Sacramento

Client Sample Results

Client: Montague WPCF
Project/Site: PFAS, MassDEP Biosolids

Job ID: 320-93817-1

Client Sample ID: Cake

Lab Sample ID: 320-93817-1

Date Collected: 10/31/22 08:30

Matrix: Solid

Date Received: 11/01/22 09:00

Percent Solids: 19.2

Method: EPA 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	6.4	J B	8.8	2.0	ng/g	✱	11/03/22 19:40	11/05/22 21:37	1
Perfluoropentanoic acid (PFPeA)	ND		8.8	1.8	ng/g	✱	11/03/22 19:40	11/05/22 21:37	1
Perfluorohexanoic acid (PFHxA)	1.7	J I	8.8	1.4	ng/g	✱	11/03/22 19:40	11/05/22 21:37	1
Perfluoroheptanoic acid (PFHpA)	ND		8.8	1.7	ng/g	✱	11/03/22 19:40	11/05/22 21:37	1
Perfluorooctanoic acid (PFOA)	ND		8.8	2.3	ng/g	✱	11/03/22 19:40	11/05/22 21:37	1
Perfluorononanoic acid (PFNA)	ND		8.8	0.97	ng/g	✱	11/03/22 19:40	11/05/22 21:37	1
Perfluorodecanoic acid (PFDA)	ND		8.8	2.1	ng/g	✱	11/03/22 19:40	11/05/22 21:37	1
Perfluoroundecanoic acid (PFUnA)	ND		8.8	1.9	ng/g	✱	11/03/22 19:40	11/05/22 21:37	1
Perfluorododecanoic acid (PFDoA)	ND		8.8	1.3	ng/g	✱	11/03/22 19:40	11/05/22 21:37	1
Perfluorotridecanoic acid (PFTriA)	ND		8.8	0.93	ng/g	✱	11/03/22 19:40	11/05/22 21:37	1
Perfluorobutanesulfonic acid (PFBS)	ND		8.8	1.7	ng/g	✱	11/03/22 19:40	11/05/22 21:37	1
Perfluoropentanesulfonic acid (PFPeS)	ND		8.8	1.6	ng/g	✱	11/03/22 19:40	11/05/22 21:37	1
Perfluorohexanesulfonic acid (PFHxS)	ND		8.8	1.3	ng/g	✱	11/03/22 19:40	11/05/22 21:37	1
Perfluorooctanesulfonic acid (PFOS)	ND		8.8	1.9	ng/g	✱	11/03/22 19:40	11/05/22 21:37	1
Perfluorononanesulfonic acid (PFNS)	ND		8.8	1.3	ng/g	✱	11/03/22 19:40	11/05/22 21:37	1
Perfluorodecanesulfonic acid (PFDS)	ND		8.8	2.3	ng/g	✱	11/03/22 19:40	11/05/22 21:37	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	16	*5-	25 - 150				11/03/22 19:40	11/05/22 21:37	1
13C5 PFPeA	70		25 - 150				11/03/22 19:40	11/05/22 21:37	1
13C2 PFHxA	90		25 - 150				11/03/22 19:40	11/05/22 21:37	1
13C4 PFHpA	96		25 - 150				11/03/22 19:40	11/05/22 21:37	1
13C4 PFOA	92		25 - 150				11/03/22 19:40	11/05/22 21:37	1
13C5 PFNA	96		25 - 150				11/03/22 19:40	11/05/22 21:37	1
13C2 PFDA	102		25 - 150				11/03/22 19:40	11/05/22 21:37	1
13C2 PFUnA	107		25 - 150				11/03/22 19:40	11/05/22 21:37	1
13C2 PFDoA	99		25 - 150				11/03/22 19:40	11/05/22 21:37	1
13C2 PFTeDA	65		25 - 150				11/03/22 19:40	11/05/22 21:37	1
13C3 PFBS	99		25 - 150				11/03/22 19:40	11/05/22 21:37	1
18O2 PFHxS	99		25 - 150				11/03/22 19:40	11/05/22 21:37	1
13C4 PFOS	90		25 - 150				11/03/22 19:40	11/05/22 21:37	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture (ASTM D 2216)	80.8		0.1	0.1	%			11/02/22 12:08	1
Percent Solids (ASTM D 2216)	19.2		0.1	0.1	%			11/02/22 12:08	1

Client Sample ID: Cake duplicate

Lab Sample ID: 320-93817-2

Date Collected: 10/31/22 08:30

Matrix: Solid

Date Received: 11/01/22 09:00

Percent Solids: 19.0

Method: EPA 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	4.3	J B	9.4	2.2	ng/g	✱	11/03/22 19:40	11/05/22 21:47	1
Perfluoropentanoic acid (PFPeA)	ND		9.4	1.9	ng/g	✱	11/03/22 19:40	11/05/22 21:47	1
Perfluorohexanoic acid (PFHxA)	2.0	J	9.4	1.5	ng/g	✱	11/03/22 19:40	11/05/22 21:47	1
Perfluoroheptanoic acid (PFHpA)	ND		9.4	1.8	ng/g	✱	11/03/22 19:40	11/05/22 21:47	1
Perfluorooctanoic acid (PFOA)	ND		9.4	2.5	ng/g	✱	11/03/22 19:40	11/05/22 21:47	1
Perfluorononanoic acid (PFNA)	ND		9.4	1.0	ng/g	✱	11/03/22 19:40	11/05/22 21:47	1
Perfluorodecanoic acid (PFDA)	ND		9.4	2.3	ng/g	✱	11/03/22 19:40	11/05/22 21:47	1

Eurofins Sacramento

Client Sample Results

Client: Montague WPCF
Project/Site: PFAS, MassDEP Biosolids

Job ID: 320-93817-1

Client Sample ID: Cake duplicate

Lab Sample ID: 320-93817-2

Date Collected: 10/31/22 08:30

Matrix: Solid

Date Received: 11/01/22 09:00

Percent Solids: 19.0

Method: EPA 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroundecanoic acid (PFUnA)	ND		9.4	2.0	ng/g	✱	11/03/22 19:40	11/05/22 21:47	1
Perfluorododecanoic acid (PFDoA)	ND		9.4	1.4	ng/g	✱	11/03/22 19:40	11/05/22 21:47	1
Perfluorotridecanoic acid (PFTrIA)	ND		9.4	0.99	ng/g	✱	11/03/22 19:40	11/05/22 21:47	1
Perfluorobutanesulfonic acid (PFBS)	ND		9.4	1.8	ng/g	✱	11/03/22 19:40	11/05/22 21:47	1
Perfluoropentanesulfonic acid (PFPeS)	ND		9.4	1.7	ng/g	✱	11/03/22 19:40	11/05/22 21:47	1
Perfluorohexanesulfonic acid (PFHxS)	ND		9.4	1.4	ng/g	✱	11/03/22 19:40	11/05/22 21:47	1
Perfluorooctanesulfonic acid (PFOS)	ND		9.4	2.0	ng/g	✱	11/03/22 19:40	11/05/22 21:47	1
Perfluorononanesulfonic acid (PFNS)	ND		9.4	1.4	ng/g	✱	11/03/22 19:40	11/05/22 21:47	1
Perfluorodecanesulfonic acid (PFDS)	ND		9.4	2.4	ng/g	✱	11/03/22 19:40	11/05/22 21:47	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	16	*5-	25 - 150	11/03/22 19:40	11/05/22 21:47	1
13C5 PFPeA	68		25 - 150	11/03/22 19:40	11/05/22 21:47	1
13C2 PFHxA	88		25 - 150	11/03/22 19:40	11/05/22 21:47	1
13C4 PFHpA	92		25 - 150	11/03/22 19:40	11/05/22 21:47	1
13C4 PFOA	93		25 - 150	11/03/22 19:40	11/05/22 21:47	1
13C5 PFNA	94		25 - 150	11/03/22 19:40	11/05/22 21:47	1
13C2 PFDA	106		25 - 150	11/03/22 19:40	11/05/22 21:47	1
13C2 PFUnA	101		25 - 150	11/03/22 19:40	11/05/22 21:47	1
13C2 PFDoA	94		25 - 150	11/03/22 19:40	11/05/22 21:47	1
13C2 PFTeDA	63		25 - 150	11/03/22 19:40	11/05/22 21:47	1
13C3 PFBS	90		25 - 150	11/03/22 19:40	11/05/22 21:47	1
18O2 PFHxS	91		25 - 150	11/03/22 19:40	11/05/22 21:47	1
13C4 PFOS	91		25 - 150	11/03/22 19:40	11/05/22 21:47	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture (ASTM D 2216)	81.0		0.1	0.1	%			11/02/22 12:08	1
Percent Solids (ASTM D 2216)	19.0		0.1	0.1	%			11/02/22 12:08	1

Isotope Dilution Summary

Client: Montague WPCF
Project/Site: PFAS, MassDEP Biosolids

Job ID: 320-93817-1

Method: 537 (modified) - Fluorinated Alkyl Substances

Matrix: Solid

Prep Type: Total/NA

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	PFBA (25-150)	PFPeA (25-150)	PFHxA (25-150)	C4PFHA (25-150)	PFOA (25-150)	PFNA (25-150)	PFDA (25-150)	PFUnA (25-150)
320-93714-A-1-B MS	Matrix Spike	40	72	78	74	79	79	87	89
320-93714-A-1-C MSD	Matrix Spike Duplicate	35	71	81	77	80	81	87	88
320-93817-1	Cake	16 *5-	70	90	96	92	96	102	107
320-93817-2	Cake duplicate	16 *5-	68	88	92	93	94	106	101
LCS 320-630200/2-A	Lab Control Sample	46	88	86	85	84	85	81	85
MB 320-630200/1-A	Method Blank	67	88	87	87	85	84	83	86

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	PFDaA (25-150)	PFTDA (25-150)	C3PFBS (25-150)	PFHxS (25-150)	PFOS (25-150)			
320-93714-A-1-B MS	Matrix Spike	86	74	80	81	78			
320-93714-A-1-C MSD	Matrix Spike Duplicate	81	78	79	79	78			
320-93817-1	Cake	99	65	99	99	90			
320-93817-2	Cake duplicate	94	63	90	91	91			
LCS 320-630200/2-A	Lab Control Sample	86	83	90	90	80			
MB 320-630200/1-A	Method Blank	91	85	95	89	80			

Surrogate Legend

PFBA = 13C4 PFBA
PFPeA = 13C5 PFPeA
PFHxA = 13C2 PFHxA
C4PFHA = 13C4 PFHpA
PFOA = 13C4 PFOA
PFNA = 13C5 PFNA
PFDA = 13C2 PFDA
PFUnA = 13C2 PFUnA
PFDaA = 13C2 PFDaA
PFTDA = 13C2 PFTeDA
C3PFBS = 13C3 PFBS
PFHxS = 18O2 PFHxS
PFOS = 13C4 PFOS

Eurofins Sacramento

QC Sample Results

Client: Montague WPCF
Project/Site: PFAS, MassDEP Biosolids

Job ID: 320-93817-1

Method: 537 (modified) - Fluorinated Alkyl Substances

Lab Sample ID: MB 320-630200/1-A

Matrix: Solid

Analysis Batch: 630600

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 630200

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	0.130	J	0.20	0.046	ng/g		11/03/22 19:40	11/05/22 18:34	1
Perfluoropentanoic acid (PFPeA)	ND		0.20	0.041	ng/g		11/03/22 19:40	11/05/22 18:34	1
Perfluorohexanoic acid (PFHxA)	ND		0.20	0.031	ng/g		11/03/22 19:40	11/05/22 18:34	1
Perfluoroheptanoic acid (PFHpA)	ND		0.20	0.038	ng/g		11/03/22 19:40	11/05/22 18:34	1
Perfluorooctanoic acid (PFOA)	ND		0.20	0.053	ng/g		11/03/22 19:40	11/05/22 18:34	1
Perfluorononanoic acid (PFNA)	ND		0.20	0.022	ng/g		11/03/22 19:40	11/05/22 18:34	1
Perfluorodecanoic acid (PFDA)	ND		0.20	0.048	ng/g		11/03/22 19:40	11/05/22 18:34	1
Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.042	ng/g		11/03/22 19:40	11/05/22 18:34	1
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.030	ng/g		11/03/22 19:40	11/05/22 18:34	1
Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.021	ng/g		11/03/22 19:40	11/05/22 18:34	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.038	ng/g		11/03/22 19:40	11/05/22 18:34	1
Perfluoropentanesulfonic acid (PFPeS)	ND		0.20	0.037	ng/g		11/03/22 19:40	11/05/22 18:34	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.20	0.029	ng/g		11/03/22 19:40	11/05/22 18:34	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.20	0.043	ng/g		11/03/22 19:40	11/05/22 18:34	1
Perfluorononanesulfonic acid (PFNS)	ND		0.20	0.029	ng/g		11/03/22 19:40	11/05/22 18:34	1
Perfluorodecanesulfonic acid (PFDS)	ND		0.20	0.052	ng/g		11/03/22 19:40	11/05/22 18:34	1

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	67		25 - 150	11/03/22 19:40	11/05/22 18:34	1
13C5 PFPeA	88		25 - 150	11/03/22 19:40	11/05/22 18:34	1
13C2 PFHxA	87		25 - 150	11/03/22 19:40	11/05/22 18:34	1
13C4 PFHpA	87		25 - 150	11/03/22 19:40	11/05/22 18:34	1
13C4 PFOA	85		25 - 150	11/03/22 19:40	11/05/22 18:34	1
13C5 PFNA	84		25 - 150	11/03/22 19:40	11/05/22 18:34	1
13C2 PFDA	83		25 - 150	11/03/22 19:40	11/05/22 18:34	1
13C2 PFUnA	86		25 - 150	11/03/22 19:40	11/05/22 18:34	1
13C2 PFDoA	91		25 - 150	11/03/22 19:40	11/05/22 18:34	1
13C2 PFTeDA	85		25 - 150	11/03/22 19:40	11/05/22 18:34	1
13C3 PFBS	95		25 - 150	11/03/22 19:40	11/05/22 18:34	1
18O2 PFHxS	89		25 - 150	11/03/22 19:40	11/05/22 18:34	1
13C4 PFOS	80		25 - 150	11/03/22 19:40	11/05/22 18:34	1

Lab Sample ID: LCS 320-630200/2-A

Matrix: Solid

Analysis Batch: 630600

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 630200

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorobutanoic acid (PFBA)	2.00	2.36		ng/g		118	76 - 136
Perfluoropentanoic acid (PFPeA)	2.00	2.05		ng/g		102	69 - 129
Perfluorohexanoic acid (PFHxA)	2.00	2.05		ng/g		102	71 - 131
Perfluoroheptanoic acid (PFHpA)	2.00	2.10		ng/g		105	71 - 131
Perfluorooctanoic acid (PFOA)	2.00	2.12		ng/g		106	72 - 132
Perfluorononanoic acid (PFNA)	2.00	2.13		ng/g		107	73 - 133
Perfluorodecanoic acid (PFDA)	2.00	2.16		ng/g		108	72 - 132
Perfluoroundecanoic acid (PFUnA)	2.00	2.03		ng/g		101	66 - 126
Perfluorododecanoic acid (PFDoA)	2.00	2.24		ng/g		112	71 - 131

Eurofins Sacramento

QC Sample Results

Client: Montague WPCF
Project/Site: PFAS, MassDEP Biosolids

Job ID: 320-93817-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-630200/2-A

Matrix: Solid

Analysis Batch: 630600

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 630200

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorotridecanoic acid (PFTriA)	2.00	2.28		ng/g		114	71 - 131
Perfluorobutanesulfonic acid (PFBS)	1.78	1.76		ng/g		99	69 - 129
Perfluoropentanesulfonic acid (PFPeS)	1.88	2.01		ng/g		107	66 - 126
Perfluorohexanesulfonic acid (PFHxS)	1.82	1.91		ng/g		105	62 - 122
Perfluorooctanesulfonic acid (PFOS)	1.86	2.01		ng/g		108	68 - 141
Perfluorononanesulfonic acid (PFNS)	1.92	2.14		ng/g		111	72 - 132
Perfluorodecanesulfonic acid (PFDS)	1.93	2.11		ng/g		109	71 - 131

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C4 PFBA	46		25 - 150
13C5 PFPeA	88		25 - 150
13C2 PFHxA	86		25 - 150
13C4 PFHpA	85		25 - 150
13C4 PFOA	84		25 - 150
13C5 PFNA	85		25 - 150
13C2 PFDA	81		25 - 150
13C2 PFUnA	85		25 - 150
13C2 PFDoA	86		25 - 150
13C2 PFTeDA	83		25 - 150
13C3 PFBS	90		25 - 150
18O2 PFHxS	90		25 - 150
13C4 PFOS	80		25 - 150

Lab Sample ID: 320-93714-A-1-B MS

Matrix: Solid

Analysis Batch: 630600

Client Sample ID: Matrix Spike

Prep Type: Total/NA

Prep Batch: 630200

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorobutanoic acid (PFBA)	0.23	J B	4.16	4.58		ng/g	✱	104	76 - 136
Perfluoropentanoic acid (PFPeA)	ND		4.16	4.63		ng/g	✱	111	69 - 129
Perfluorohexanoic acid (PFHxA)	0.29	J	4.16	4.23		ng/g	✱	94	71 - 131
Perfluoroheptanoic acid (PFHpA)	ND		4.16	4.45		ng/g	✱	107	71 - 131
Perfluorooctanoic acid (PFOA)	0.15	J	4.16	4.55		ng/g	✱	106	72 - 132
Perfluorononanoic acid (PFNA)	0.078	J	4.16	4.43		ng/g	✱	105	73 - 133
Perfluorodecanoic acid (PFDA)	0.26	J	4.16	5.40		ng/g	✱	124	72 - 132
Perfluoroundecanoic acid (PFUnA)	ND		4.16	4.56		ng/g	✱	110	66 - 126
Perfluorododecanoic acid (PFDoA)	0.11	J	4.16	4.32		ng/g	✱	101	71 - 131
Perfluorotridecanoic acid (PFTriA)	ND		4.16	4.43		ng/g	✱	106	71 - 131
Perfluorobutanesulfonic acid (PFBS)	ND		3.69	3.96		ng/g	✱	107	69 - 129
Perfluoropentanesulfonic acid (PFPeS)	ND		3.91	4.05		ng/g	✱	104	66 - 126

Eurofins Sacramento

QC Sample Results

Client: Montague WPCF
Project/Site: PFAS, MassDEP Biosolids

Job ID: 320-93817-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: 320-93714-A-1-B MS

Matrix: Solid

Analysis Batch: 630600

Client Sample ID: Matrix Spike

Prep Type: Total/NA

Prep Batch: 630200

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorohexanesulfonic acid (PFHxS)	ND		3.79	3.70		ng/g	✱	98	62 - 122
Perfluorooctanesulfonic acid (PFOS)	0.83		3.87	4.96		ng/g	✱	107	68 - 141
Perfluorononanesulfonic acid (PFNS)	ND		4.00	4.23		ng/g	✱	106	72 - 132
Perfluorodecanesulfonic acid (PFDS)	ND		4.01	4.08		ng/g	✱	102	71 - 131
Isotope Dilution	MS %Recovery	MS Qualifier	MS Limits						
13C4 PFBA	40		25 - 150						
13C5 PFPeA	72		25 - 150						
13C2 PFHxA	78		25 - 150						
13C4 PFHpA	74		25 - 150						
13C4 PFOA	79		25 - 150						
13C5 PFNA	79		25 - 150						
13C2 PFDA	87		25 - 150						
13C2 PFUnA	89		25 - 150						
13C2 PFDoA	86		25 - 150						
13C2 PFTeDA	74		25 - 150						
13C3 PFBS	80		25 - 150						
18O2 PFHxS	81		25 - 150						
13C4 PFOS	78		25 - 150						

Lab Sample ID: 320-93714-A-1-C MSD

Matrix: Solid

Analysis Batch: 630600

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

Prep Batch: 630200

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Perfluorobutanoic acid (PFBA)	0.23	J B	4.03	4.57		ng/g	✱	108	76 - 136	0	30
Perfluoropentanoic acid (PFPeA)	ND		4.03	4.13		ng/g	✱	102	69 - 129	11	30
Perfluorohexanoic acid (PFHxA)	0.29	J	4.03	3.84		ng/g	✱	88	71 - 131	10	30
Perfluoroheptanoic acid (PFHpA)	ND		4.03	4.37		ng/g	✱	108	71 - 131	2	30
Perfluorooctanoic acid (PFOA)	0.15	J	4.03	4.35		ng/g	✱	104	72 - 132	5	30
Perfluorononanoic acid (PFNA)	0.078	J	4.03	4.29		ng/g	✱	104	73 - 133	3	30
Perfluorodecanoic acid (PFDA)	0.26	J	4.03	5.36		ng/g	✱	127	72 - 132	1	30
Perfluoroundecanoic acid (PFUnA)	ND		4.03	4.45		ng/g	✱	110	66 - 126	2	30
Perfluorododecanoic acid (PFDoA)	0.11	J	4.03	4.38		ng/g	✱	106	71 - 131	2	30
Perfluorotridecanoic acid (PFTriA)	ND		4.03	4.49		ng/g	✱	111	71 - 131	1	30
Perfluorobutanesulfonic acid (PFBS)	ND		3.58	3.57		ng/g	✱	100	69 - 129	10	30
Perfluoropentanesulfonic acid (PFPeS)	ND		3.79	4.01		ng/g	✱	106	66 - 126	1	30
Perfluorohexanesulfonic acid (PFHxS)	ND		3.68	3.70		ng/g	✱	101	62 - 122	0	30
Perfluorooctanesulfonic acid (PFOS)	0.83		3.75	4.95		ng/g	✱	110	68 - 141	0	30
Perfluorononanesulfonic acid (PFNS)	ND		3.88	3.96		ng/g	✱	102	72 - 132	7	30

Eurofins Sacramento

QC Sample Results

Client: Montague WPCF
Project/Site: PFAS, MassDEP Biosolids

Job ID: 320-93817-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: 320-93714-A-1-C MSD

Matrix: Solid

Analysis Batch: 630600

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

Prep Batch: 630200

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Perfluorodecanesulfonic acid (PFDS)	ND		3.89	4.48		ng/g	✱	115	71 - 131	9	30
Isotope Dilution											
	MSD %Recovery	MSD Qualifier	Limits								
13C4 PFBA	35		25 - 150								
13C5 PFPeA	71		25 - 150								
13C2 PFHxA	81		25 - 150								
13C4 PFHpA	77		25 - 150								
13C4 PFOA	80		25 - 150								
13C5 PFNA	81		25 - 150								
13C2 PFDA	87		25 - 150								
13C2 PFUnA	88		25 - 150								
13C2 PFDoA	81		25 - 150								
13C2 PFTeDA	78		25 - 150								
13C3 PFBS	79		25 - 150								
18O2 PFHxS	79		25 - 150								
13C4 PFOS	78		25 - 150								

Method: D 2216 - Percent Moisture

Lab Sample ID: 320-93836-D-2 DU

Matrix: Solid

Analysis Batch: 629714

Client Sample ID: Duplicate

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Percent Moisture	31.4		28.6		%		9	20
Percent Solids	68.6		71.4		%		4	20

QC Association Summary

Client: Montague WPCF
Project/Site: PFAS, MassDEP Biosolids

Job ID: 320-93817-1

LCMS

Prep Batch: 630200

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-93817-1	Cake	Total/NA	Solid	SHAKE	
320-93817-2	Cake duplicate	Total/NA	Solid	SHAKE	
MB 320-630200/1-A	Method Blank	Total/NA	Solid	SHAKE	
LCS 320-630200/2-A	Lab Control Sample	Total/NA	Solid	SHAKE	
320-93714-A-1-B MS	Matrix Spike	Total/NA	Solid	SHAKE	
320-93714-A-1-C MSD	Matrix Spike Duplicate	Total/NA	Solid	SHAKE	

Analysis Batch: 630600

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-93817-1	Cake	Total/NA	Solid	537 (modified)	630200
320-93817-2	Cake duplicate	Total/NA	Solid	537 (modified)	630200
MB 320-630200/1-A	Method Blank	Total/NA	Solid	537 (modified)	630200
LCS 320-630200/2-A	Lab Control Sample	Total/NA	Solid	537 (modified)	630200
320-93714-A-1-B MS	Matrix Spike	Total/NA	Solid	537 (modified)	630200
320-93714-A-1-C MSD	Matrix Spike Duplicate	Total/NA	Solid	537 (modified)	630200

General Chemistry

Analysis Batch: 629714

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-93817-1	Cake	Total/NA	Solid	D 2216	
320-93817-2	Cake duplicate	Total/NA	Solid	D 2216	
320-93836-D-2 DU	Duplicate	Total/NA	Solid	D 2216	

Lab Chronicle

Client: Montague WPCF
Project/Site: PFAS, MassDEP Biosolids

Job ID: 320-93817-1

Client Sample ID: Cake

Date Collected: 10/31/22 08:30

Date Received: 11/01/22 09:00

Lab Sample ID: 320-93817-1

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			629714	11/02/22 12:08	TCS	EET SAC

Client Sample ID: Cake

Date Collected: 10/31/22 08:30

Date Received: 11/01/22 09:00

Lab Sample ID: 320-93817-1

Matrix: Solid

Percent Solids: 19.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			0.59 g	10.0 mL	630200	11/03/22 19:40	FX	EET SAC
Total/NA	Analysis	537 (modified)		1	1 mL	1 mL	630600	11/05/22 21:37	S1M	EET SAC

Client Sample ID: Cake duplicate

Date Collected: 10/31/22 08:30

Date Received: 11/01/22 09:00

Lab Sample ID: 320-93817-2

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			629714	11/02/22 12:08	TCS	EET SAC

Client Sample ID: Cake duplicate

Date Collected: 10/31/22 08:30

Date Received: 11/01/22 09:00

Lab Sample ID: 320-93817-2

Matrix: Solid

Percent Solids: 19.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			0.56 g	10.0 mL	630200	11/03/22 19:40	FX	EET SAC
Total/NA	Analysis	537 (modified)		1	1 mL	1 mL	630600	11/05/22 21:47	S1M	EET SAC

Laboratory References:

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

Accreditation/Certification Summary

Client: Montague WPCF
Project/Site: PFAS, MassDEP Biosolids

Job ID: 320-93817-1

Laboratory: Eurofins Sacramento

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	17-020	02-20-24
ANAB	Dept. of Defense ELAP	L2468	01-20-24
ANAB	Dept. of Energy	L2468.01	01-20-24
ANAB	ISO/IEC 17025	L2468	01-20-24
Arizona	State	AZ0708	08-11-23
Arkansas DEQ	State	88-0691	06-17-22 *
California	State	2897	01-31-23
Colorado	State	CA0004	08-31-23
Florida	NELAP	E87570	06-30-23
Georgia	State	4040	01-30-23
Hawaii	State	<cert No.>	01-29-23
Illinois	NELAP	200060	03-17-24
Kansas	NELAP	E-10375	10-31-23
Louisiana	NELAP	01944	06-30-23
Louisiana (All)	NELAP	01944	06-30-23
Maine	State	CA00004	04-14-24
Michigan	State	9947	01-31-23
Nevada	State	CA00044	07-31-23
New Hampshire	NELAP	2997	04-18-23
New Jersey	NELAP	CA005	06-30-23
New York	NELAP	11666	04-01-23
Ohio	State	41252	01-29-23
Oregon	NELAP	4040	01-29-23
Texas	NELAP	T104704399-19-13	05-31-23
US Fish & Wildlife	US Federal Programs	58448	04-30-23
USDA	US Federal Programs	P330-18-00239	01-23-23
Utah	NELAP	CA000442021-12	02-28-23
Virginia	NELAP	460278	03-14-23
Washington	State	C581	05-05-23
West Virginia (DW)	State	9930C	12-13-22
Wisconsin	State	998204680	08-31-23
Wyoming	State Program	8TMS-L	01-28-19 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Eurofins Sacramento

Method Summary

Client: Montague WPCF
Project/Site: PFAS, MassDEP Biosolids

Job ID: 320-93817-1

Method	Method Description	Protocol	Laboratory
537 (modified)	Fluorinated Alkyl Substances	EPA	EET SAC
D 2216	Percent Moisture	ASTM	EET SAC
SHAKE	Shake Extraction with Ultrasonic Bath Extraction	SW846	EET SAC

Protocol References:

ASTM = ASTM International

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

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

Sample Summary

Client: Montague WPCF
Project/Site: PFAS, MassDEP Biosolids

Job ID: 320-93817-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-93817-1	Cake	Solid	10/31/22 08:30	11/01/22 09:00
320-93817-2	Cake duplicate	Solid	10/31/22 08:30	11/01/22 09:00

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16

B2H Sample ID, Chosen out Random S₂ to 11-1-22
S₂ 11-1-22

Client Information		Lab PM Mason, Becky C		Carrier Tracking No(s): 620-6443-856, 1	
Client Contact Montague Tech		E-Mail Becky Mason@et.eurofinsus.com		Page Page 1 of 1	
Company Montague WPCF		PWSID		Job #	
Address 34 Greenfield Road		Due Date Requested:		Analysis Requested	
City Montague		TAT Requested (days):			
State, Zip MA, 01351		Compliance Project: ☐ Yes ☒ No			
Phone		Purchase Order not required			
Email wpcf.lab@montague-ma.gov		WO #			
Project Name PFAS Solid		Project # 62000756			
Site		SSOW#			
Sample Identification		Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=oil, A=air)
Cape	10-31-22	8:30	G	Solid	
Cape	10-31-22	8:30	G	Solid	
Special Instructions/Note:		Total Number of containers			
Preservation Codes:		M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2SO4 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Y - Trizma Z - other (specify)			
Other:					
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)		Return To Client ☐ Disposal By Lab ☐ Archive For ☐ Months			
Special Instructions/QC Requirements:		320-93817 Chain of Custody			
Possible Hazard Identification		Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological ☐			
Deliverable Requested: I, II, III, IV, Other (specify)					
Empty Kit Relinquished by:		Date:			
Relinquished by:		Date/Time:		Company	
Relinquished by:		Date/Time:		Company	
Relinquished by:		Date/Time:		Company	
Custody Seals Intact: ☒ Yes ☐ No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:	

Login Sample Receipt Checklist

Client: Montague WPCF

Job Number: 320-93817-1

Login Number: 93817

List Source: Eurofins Sacramento

List Number: 1

Creator: Oropeza, Salvador

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Eurofins Sacramento

Job Notes

This report is issued solely for the use of the person or company to whom it is addressed. Any use, copying or disclosure other than by the intended recipient is unauthorized. If you have received this report in error, please notify the sender and destroy this report immediately. This report shall not be reproduced except in full, without prior express written approval by the laboratory.

The data in the report relate to the field sample(s) as received by the laboratory and associated QC. All results have been reviewed and have been found to be compliant with laboratory and accreditation requirements, with the exception of the noted deviation(s). For questions, please contact the Project Manager.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Northern California, LLC Project Manager.

Authorization



Generated
11/22/2022 2:18:59 PM

Authorized for release by
Nathaniel Horner, Project Management Assistant I
Nathaniel.Horner@et.eurofinsus.com
(916)374-4306