ANALYTICAL SUMMARY REPORT

December 02, 2022

City of Missoula
435 Ryman St
Missoula, MT 59802-4207

Work Order: B22111082

Project Name: PFAS

Energy Laboratories Inc Billings MT received the following 5 samples for City of Missoula on 11/11/2022 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B22111082-001	Landfill Leachate	11/09/22 9:40	11/11/22	Aqueous	PFAS Compounds in Aqueous Matrices PFAS 537 Modified Extraction
B22111082-002	Influent, WW	11/09/22 7:40	11/11/22	Aqueous	Same As Above
B22111082-003	Effluent, WW	11/09/22 7:40	11/11/22	Aqueous	Same As Above
B22111082-005	Compost, Finished	11/09/22 12:00	11/11/22	Soil	Moisture Moisture Prep SW3550C PFAS Compounds in Soil PFAS 537 Modified Extraction
B22111082-006	Field Blank	11/09/22 7:40	11/11/22	Aqueous	PFAS Compounds in Aqueous Matrices PFAS 537 Modified Extraction

The analyses presented in this report were performed by Energy Laboratories, Inc., 1120 S 27th St., Billings, MT 59101, unless otherwise noted. Any exceptions or problems with the analyses are noted in the report package. Any issues encountered during sample receipt are documented in the Work Order Receipt Checklist.

The results as reported relate only to the item(s) submitted for testing. This report shall be used or copied only in its entirety. Energy Laboratories, Inc. is not responsible for the consequences arising from the use of a partial report.

If you have any questions regarding these test results, please contact your Project Manager.

Report Approved By: William T Brown Director

Digitally signed by
Bill Brown
Date: 2022.12.02 15:25:23 -07:00

CLIENT: City of Missoula
Project: PFAS
Work Order: B22111082

Report Date: 12/02/22

CASE NARRATIVE

PFAS Analyte Translation

Analyte Acronym	Analyte Name
PFBA	Perfluorobutanoic Acid
PFPeA	Perfluoropentanoic Acid
PFHxA	Perfluorohexanoic Acid
PFHpA	Perfluoroheptanoic Acid
PFOA	Perfluorooctanoic Acid
PFNA	Perfluorononanoic Acid
PFDA	Perfluorodecanoic Acid
PFUnA	Perfluoroundecanoic Acid
PFDoA	Perfluorododecanoic Acid
PFTrDA	Perfluorotridecanoic Acid
PFTA	Perfluorotetradecanoic Acid
PFBS	Perfluorobutanesulfonic Acid
PFPeS	Perfluoropentanesulfonic Acid
PFHxS	Perfluorohexanesulfonic Acid
PFHpS	Perfluoroheptanesulfonic Acid
PFOS	Perfluorooctanesulfonic Acid
PFNS	Perfluorononanesulfonic Acid
PFDS	Perfluorodecanesulfonic Acid
FOSA	Perfluorooctanesulfonamide
NEtFOSAA	N-ethylPerfluoroctanesulfonamidoacetic Acid
NMeFOSAA	N-methylPerfluorooctanesulfonamidoacetic Acid
8:2 FTS	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid
4:2 FTS	1H, 1H, 2H, 2H-perfluorohexane sulfonic acid
6:2 FTS	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid
11Cl-PF3OUdS	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic Acid
ADONA	4,8-dioxa-3H-perfluorononanoic Acid
9Cl-PF3ONS	9-chlorohexadecafluoro-3-oxanone-1-sulfonic Acid
HFPO-DA	Hexafluoropropylene Oxide Dimer Acid

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: City of Missoula
Project: PFAS
Lab ID: B22111082-001
Client Sample ID: Landfill Leachate

Report Date: 12/02/22
Collection Date: 11/09/22 09:40
DateReceived: 11/11/22
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PFAS COMPOUNDS IN AQUEOUS MATRICES							
PFBA	486	ng/L		9.0		E537M	11/18/22 14:39 / mkb
PFPeA	253	ng/L		9.0		E537M	11/18/22 14:39 / mkb
PFHxA	750	ng/L		9.0		E537M	11/18/22 14:39 / mkb
PFHpA	171	ng/L		9.0		E537M	11/18/22 14:39 / mkb
PFOA	270	ng/L		9.0		E537M	11/18/22 14:39 / mkb
PFNA	15	ng/L		2.0		E537M	11/17/22 19:08 / mkb
PFDA	8.9	ng/L		2.0		E537M	11/17/22 19:08 / mkb
PFUnA	1.3	ng/L	J	2.0		E537M	11/17/22 19:08 / mkb
PFDoA	ND	ng/L		2.0		E537M	11/17/22 19:08 / mkb
PFTrDA	ND	ng/L		2.0		E537M	11/17/22 19:08 / mkb
PFTA	ND	ng/L		2.0		E537M	11/17/22 19:08 / mkb
PFBS	40	ng/L		2.0		E537M	11/17/22 19:08 / mkb
PFPeS	7.6	ng/L		2.0		E537M	11/17/22 19:08 / mkb
PFHxS	158	ng/L		2.0		E537M	11/17/22 19:08 / mkb
PFHpS	ND	ng/L		2.0		E537M	11/17/22 19:08 / mkb
PFOS	15	ng/L		2.0		E537M	11/17/22 19:08 / mkb
PFNS	ND	ng/L		2.0		E537M	11/17/22 19:08 / mkb
PFDS	ND	ng/L		2.0		E537M	11/17/22 19:08 / mkb
FOSA	1.8	ng/L	J	2.0		E537M	11/17/22 19:08 / mkb
NEtFOSAA	22	ng/L		3.0		E537M	11/17/22 19:08 / mkb
NMeFOSAA	82	ng/L		2.0		E537M	11/17/22 19:08 / mkb
8:2 FTS	3.7	ng/L		3.0		E537M	11/28/22 23:05 / mkb
4:2 FTS	5.0	ng/L		2.0		E537M	11/17/22 19:08 / mkb
6:2 FTS	61	ng/L		8.0		E537M	11/17/22 19:08 / mkb
11Cl-PF3OUdS	ND	ng/L		2.0		E537M	11/17/22 19:08 / mkb
ADONA	ND	ng/L		2.0		E537M	11/17/22 19:08 / mkb
9Cl-PF3ONS	ND	ng/L		2.0		E537M	11/17/22 19:08 / mkb
HFPO-DA	ND	ng/L		3.0		E537M	11/28/22 23:05 / mkb
IS: M4PFBA	1.00	%REC	S	50-150		E537M	11/18/22 14:39 / mkb
IS: M3PFHxS	66.0	%REC		50-150		E537M	11/17/22 19:08 / mkb
IS: M4PFHpA	19.0	%REC	S	50-150		E537M	11/18/22 14:39 / mkb
IS: M8PFOA	19.0	%REC	S	50-150		E537M	11/18/22 14:39 / mkb
IS: M9PFNA	84.0	%REC		50-150		E537M	11/17/22 19:08 / mkb
IS: M6PFDA	74.0	%REC		50-150		E537M	11/17/22 19:08 / mkb
IS: M7PFUnA	94.0	%REC		50-150		E537M	11/17/22 19:08 / mkb
IS: M2PFDoA	73.0	%REC		50-150		E537M	11/17/22 19:08 / mkb
IS: M2PFTeDA	41.0	%REC	S	50-150		E537M	11/17/22 19:08 / mkb
IS: M3PFBS	49.0	%REC	S	50-150		E537M	11/17/22 19:08 / mkb
IS: M5PFPeA	7.00	%REC	S	50-150		E537M	11/18/22 14:39 / mkb
IS: M5PFHxA	11.0	%REC	S	50-150		E537M	11/18/22 14:39 / mkb
IS: M8PFOS	85.0	%REC		50-150		E537M	11/17/22 19:08 / mkb
IS: M8FOSA	71.0	%REC		50-150		E537M	11/17/22 19:08 / mkb
IS: d5-N-EtFOSAA	68.0	%REC		50-150		E537M	11/17/22 19:08 / mkb

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)
S - Spike recovery outside of advisory limits

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: City of Missoula
Project: PFAS
Lab ID: B22111082-001
Client Sample ID: Landfill Leachate

Report Date: 12/02/22
Collection Date: 11/09/22 09:40
DateReceived: 11/11/22
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PFAS COMPOUNDS IN AQUEOUS MATRICES							
IS: d3-N-MeFOSAA	77.0	%REC		50-150		E537M	11/17/22 19:08 / mkb
IS: M2-8:2FTS	105	%REC		50-150		E537M	11/28/22 23:05 / mkb
IS: M2-4:2FTS	65.0	%REC		50-150		E537M	11/17/22 19:08 / mkb
IS: M2-6:2FTS	88.0	%REC		50-150		E537M	11/17/22 19:08 / mkb
IS: M3HFPO-DA	27.0	%REC	S	50-150		E537M	11/28/22 23:05 / mkb

-The mass labeled isotope dilution standards that are outside of quality control limits are attributed to the sample matrix. Repeat extraction and analysis produced similar results.

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
S - Spike recovery outside of advisory limits
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: City of Missoula
Project: PFAS
Lab ID: B22111082-002
Client Sample ID: Influent, WW

Report Date: 12/02/22
Collection Date: 11/09/22 07:40
DateReceived: 11/11/22
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PFAS COMPOUNDS IN AQUEOUS MATRICES							
PFBA	1.5	ng/L	J	5.0		E537M	11/17/22 19:27 / mkb
PFPeA	2.3	ng/L		2.0		E537M	11/17/22 19:27 / mkb
PFHxA	3.1	ng/L		2.0		E537M	11/17/22 19:27 / mkb
PFHpA	ND	ng/L		2.0		E537M	11/17/22 19:27 / mkb
PFOA	1.9	ng/L	J	2.0		E537M	11/17/22 19:27 / mkb
PFNA	ND	ng/L		2.0		E537M	11/17/22 19:27 / mkb
PFDA	ND	ng/L		2.0		E537M	11/17/22 19:27 / mkb
PFUnA	ND	ng/L		2.0		E537M	11/17/22 19:27 / mkb
PFDoA	ND	ng/L		2.0		E537M	11/17/22 19:27 / mkb
PFTrDA	ND	ng/L		2.0		E537M	11/17/22 19:27 / mkb
PFTA	ND	ng/L		2.0		E537M	11/17/22 19:27 / mkb
PFBS	1.8	ng/L	J	2.0		E537M	11/17/22 19:27 / mkb
PFPeS	ND	ng/L		2.0		E537M	11/17/22 19:27 / mkb
PFHxS	1.5	ng/L	J	2.0		E537M	11/17/22 19:27 / mkb
PFHpS	ND	ng/L		2.0		E537M	11/17/22 19:27 / mkb
PFOS	3.8	ng/L		2.0		E537M	11/17/22 19:27 / mkb
PFNS	ND	ng/L		2.0		E537M	11/17/22 19:27 / mkb
PFDS	ND	ng/L		2.0		E537M	11/17/22 19:27 / mkb
FOSA	ND	ng/L		2.0		E537M	11/17/22 19:27 / mkb
NEtFOSAA	ND	ng/L		3.0		E537M	11/17/22 19:27 / mkb
NMeFOSAA	ND	ng/L		2.0		E537M	11/17/22 19:27 / mkb
8:2 FTS	ND	ng/L		3.0		E537M	11/28/22 21:14 / mkb
4:2 FTS	ND	ng/L		2.0		E537M	11/17/22 19:27 / mkb
6:2 FTS	ND	ng/L		8.0		E537M	11/17/22 19:27 / mkb
11Cl-PF3OUdS	ND	ng/L		2.0		E537M	11/17/22 19:27 / mkb
ADONA	ND	ng/L		2.0		E537M	11/17/22 19:27 / mkb
9Cl-PF3ONS	ND	ng/L		2.0		E537M	11/17/22 19:27 / mkb
HFPO-DA	ND	ng/L		3.0		E537M	11/28/22 21:14 / mkb
IS: M4PFBA	47.0	%REC	S	50-150		E537M	11/17/22 19:27 / mkb
IS: M3PFHxS	59.0	%REC		50-150		E537M	11/17/22 19:27 / mkb
IS: M4PFHpA	44.0	%REC	S	50-150		E537M	11/17/22 19:27 / mkb
IS: M8PFOA	73.0	%REC		50-150		E537M	11/17/22 19:27 / mkb
IS: M9PFNA	77.0	%REC		50-150		E537M	11/17/22 19:27 / mkb
IS: M6PFDA	32.0	%REC	S	50-150		E537M	11/17/22 19:27 / mkb
IS: M7PFUnA	24.0	%REC	S	50-150		E537M	11/17/22 19:27 / mkb
IS: M2PFDoA	22.0	%REC	S	50-150		E537M	11/17/22 19:27 / mkb
IS: M2PFTeDA	13.0	%REC	S	50-150		E537M	11/17/22 19:27 / mkb
IS: M3PFBS	71.0	%REC		50-150		E537M	11/17/22 19:27 / mkb
IS: M5PFPeA	44.0	%REC	S	50-150		E537M	11/17/22 19:27 / mkb
IS: M5PFHxA	51.0	%REC		50-150		E537M	11/17/22 19:27 / mkb
IS: M8PFOS	43.0	%REC	S	50-150		E537M	11/17/22 19:27 / mkb
IS: M8FOSA	27.0	%REC	S	50-150		E537M	11/17/22 19:27 / mkb
IS: d5-N-EtFOSAA	19.0	%REC	S	50-150		E537M	11/17/22 19:27 / mkb

Report Definitions:
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MCL - Maximum Contaminant Level
QCL - Quality Control Limit
ND - Not detected at the Reporting Limit (RL)
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
S - Spike recovery outside of advisory limits

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: City of Missoula
Project: PFAS
Lab ID: B22111082-002
Client Sample ID: Influent, WW

Report Date: 12/02/22
Collection Date: 11/09/22 07:40
DateReceived: 11/11/22
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PFAS COMPOUNDS IN AQUEOUS MATRICES							
IS: d3-N-MeFOSAA	20.0	%REC	S	50-150		E537M	11/17/22 19:27 / mkb
IS: M2-8:2FTS	42.0	%REC	S	50-150		E537M	11/28/22 21:14 / mkb
IS: M2-4:2FTS	97.0	%REC		50-150		E537M	11/17/22 19:27 / mkb
IS: M2-6:2FTS	117	%REC		50-150		E537M	11/17/22 19:27 / mkb
IS: M3HFPO-DA	36.0	%REC	S	50-150		E537M	11/28/22 21:14 / mkb

-The mass labeled isotope dilution standards that are outside of quality control limits are attributed to the sample matrix. Repeat extraction and analysis produced similar results.

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
S - Spike recovery outside of advisory limits
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: City of Missoula
Project: PFAS
Lab ID: B22111082-003
Client Sample ID: Effluent, WW

Report Date: 12/02/22
Collection Date: 11/09/22 07:40
DateReceived: 11/11/22
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PFAS COMPOUNDS IN AQUEOUS MATRICES							
PFBA	2.1	ng/L	J	5.0		E537M	11/17/22 19:45 / mkb
PFPeA	9.6	ng/L		2.0		E537M	11/17/22 19:45 / mkb
PFHxA	14	ng/L		2.0		E537M	11/17/22 19:45 / mkb
PFHpA	1.1	ng/L	J	2.0		E537M	11/17/22 19:45 / mkb
PFOA	6.2	ng/L		2.0		E537M	11/17/22 19:45 / mkb
PFNA	ND	ng/L		2.0		E537M	11/17/22 19:45 / mkb
PFDA	2.4	ng/L		2.0		E537M	11/17/22 19:45 / mkb
PFUnA	ND	ng/L		2.0		E537M	11/17/22 19:45 / mkb
PFDoA	ND	ng/L		2.0		E537M	11/17/22 19:45 / mkb
PFTrDA	ND	ng/L		2.0		E537M	11/17/22 19:45 / mkb
PFTA	ND	ng/L		2.0		E537M	11/17/22 19:45 / mkb
PFBS	2.0	ng/L	J	2.0		E537M	11/17/22 19:45 / mkb
PFPeS	ND	ng/L		2.0		E537M	11/17/22 19:45 / mkb
PFHxS	1.6	ng/L	J	2.0		E537M	11/17/22 19:45 / mkb
PFHpS	ND	ng/L		2.0		E537M	11/17/22 19:45 / mkb
PFOS	2.6	ng/L		2.0		E537M	11/17/22 19:45 / mkb
PFNS	ND	ng/L		2.0		E537M	11/17/22 19:45 / mkb
PFDS	ND	ng/L		2.0		E537M	11/17/22 19:45 / mkb
FOSA	ND	ng/L		2.0		E537M	11/17/22 19:45 / mkb
NEtFOSAA	ND	ng/L		3.0		E537M	11/17/22 19:45 / mkb
NMeFOSAA	0.86	ng/L	J	2.0		E537M	11/17/22 19:45 / mkb
8:2 FTS	ND	ng/L		3.0		E537M	11/28/22 21:33 / mkb
4:2 FTS	ND	ng/L		2.0		E537M	11/17/22 19:45 / mkb
6:2 FTS	ND	ng/L		8.0		E537M	11/17/22 19:45 / mkb
11Cl-PF3OUdS	ND	ng/L		2.0		E537M	11/17/22 19:45 / mkb
ADONA	ND	ng/L		2.0		E537M	11/17/22 19:45 / mkb
9Cl-PF3ONS	ND	ng/L		2.0		E537M	11/17/22 19:45 / mkb
HFPO-DA	ND	ng/L		3.0		E537M	11/28/22 21:33 / mkb
IS: M4PFBA	59.0	%REC		50-150		E537M	11/17/22 19:45 / mkb
IS: M3PFHxS	95.0	%REC		50-150		E537M	11/17/22 19:45 / mkb
IS: M4PFHpA	98.0	%REC		50-150		E537M	11/17/22 19:45 / mkb
IS: M8PFOA	101	%REC		50-150		E537M	11/17/22 19:45 / mkb
IS: M9PFNA	105	%REC		50-150		E537M	11/17/22 19:45 / mkb
IS: M6PFDA	88.0	%REC		50-150		E537M	11/17/22 19:45 / mkb
IS: M7PFUnA	75.0	%REC		50-150		E537M	11/17/22 19:45 / mkb
IS: M2PFDoA	61.0	%REC		50-150		E537M	11/17/22 19:45 / mkb
IS: M2PFTeDA	30.0	%REC	S	50-150		E537M	11/17/22 19:45 / mkb
IS: M3PFBS	100	%REC		50-150		E537M	11/17/22 19:45 / mkb
IS: M5PFPeA	76.0	%REC		50-150		E537M	11/17/22 19:45 / mkb
IS: M5PFHxA	85.0	%REC		50-150		E537M	11/17/22 19:45 / mkb
IS: M8PFOS	93.0	%REC		50-150		E537M	11/17/22 19:45 / mkb
IS: M8FOSA	34.0	%REC	S	50-150		E537M	11/17/22 19:45 / mkb
IS: d5-N-EtFOSAA	66.0	%REC		50-150		E537M	11/17/22 19:45 / mkb

Report Definitions:
RL - Analyte Reporting Limit
MCL - Maximum Contaminant Level
QCL - Quality Control Limit
ND - Not detected at the Reporting Limit (RL)
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
S - Spike recovery outside of advisory limits

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: City of Missoula
Project: PFAS
Lab ID: B22111082-003
Client Sample ID: Effluent, WW

Report Date: 12/02/22
Collection Date: 11/09/22 07:40
DateReceived: 11/11/22
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PFAS COMPOUNDS IN AQUEOUS MATRICES							
IS: d3-N-MeFOSAA	83.0	%REC		50-150		E537M	11/17/22 19:45 / mkb
IS: M2-8:2FTS	44.0	%REC	S	50-150		E537M	11/28/22 21:33 / mkb
IS: M2-4:2FTS	151	%REC	S	50-150		E537M	11/17/22 19:45 / mkb
IS: M2-6:2FTS	136	%REC		50-150		E537M	11/17/22 19:45 / mkb
IS: M3HFPO-DA	92.0	%REC		50-150		E537M	11/28/22 21:33 / mkb

-The mass labeled isotope dilution standards that are outside of quality control limits are attributed to the sample matrix. Repeat extraction and analysis produced similar results.

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
S - Spike recovery outside of advisory limits
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: City of Missoula
Project: PFAS
Lab ID: B22111082-005
Client Sample ID: Compost, Finished

Report Date: 12/02/22
Collection Date: 11/09/22 12:00
DateReceived: 11/11/22
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture	30	wt%		0.2		SW3550C	11/16/22 11:13 / amn
PFAS COMPOUNDS IN SOIL MATRICES							
PFBA	3.6	ng/g		1.0		E537M	11/17/22 16:59 / jem
PFPeA	4.8	ng/g		1.0		E537M	11/17/22 16:59 / jem
PFHxA	28	ng/g		1.0		E537M	11/17/22 16:59 / jem
PFHpA	1.7	ng/g		1.0		E537M	11/17/22 16:59 / jem
PFOA	10	ng/g		1.0		E537M	11/17/22 16:59 / jem
PFNA	1.3	ng/g		1.0		E537M	11/17/22 16:59 / jem
PFDA	4.6	ng/g		1.0		E537M	11/17/22 16:59 / jem
PFUnA	0.75	ng/g	J	1.0		E537M	11/17/22 16:59 / jem
PFDoA	1.4	ng/g		1.0		E537M	11/17/22 16:59 / jem
PFTrDA	ND	ng/g		1.0		E537M	11/17/22 16:59 / jem
PFTA	0.47	ng/g	J	1.0		E537M	11/17/22 16:59 / jem
PFBS	8.3	ng/g		1.0		E537M	11/17/22 16:59 / jem
PFPeS	ND	ng/g		1.0		E537M	11/17/22 16:59 / jem
PFHxS	ND	ng/g		1.0		E537M	11/17/22 16:59 / jem
PFHpS	ND	ng/g		1.0		E537M	11/17/22 16:59 / jem
PFOS	6.5	ng/g		1.0		E537M	11/17/22 16:59 / jem
PFNS	ND	ng/g		1.0		E537M	11/17/22 16:59 / jem
PFDS	0.61	ng/g	J	1.0		E537M	11/17/22 16:59 / jem
FOSA	ND	ng/g		1.0		E537M	11/17/22 16:59 / jem
NEtFOSAA	1.9	ng/g		1.0		E537M	11/17/22 16:59 / jem
NMeFOSAA	3.0	ng/g		1.0		E537M	11/17/22 16:59 / jem
8:2 FTS	0.95	ng/g	J	1.0		E537M	11/17/22 16:59 / jem
4:2 FTS	ND	ng/g		1.0		E537M	11/17/22 16:59 / jem
6:2 FTS	1.5	ng/g		1.0		E537M	11/17/22 16:59 / jem
11Cl-PF3OUdS	ND	ng/g		1.0		E537M	11/17/22 16:59 / jem
ADONA	ND	ng/g		1.0		E537M	11/17/22 16:59 / jem
9Cl-PF3ONS	ND	ng/g		1.0		E537M	11/17/22 16:59 / jem
HFPO-DA	ND	ng/g		1.0		E537M	11/17/22 16:59 / jem
IS: M4PFBA	65.0	%REC		50-150		E537M	11/17/22 16:59 / jem
IS: M3PFHxS	75.0	%REC		50-150		E537M	11/17/22 16:59 / jem
IS: M4PFHpA	75.0	%REC		50-150		E537M	11/17/22 16:59 / jem
IS: M8PFOA	70.0	%REC		50-150		E537M	11/17/22 16:59 / jem
IS: M9PFNA	81.0	%REC		50-150		E537M	11/17/22 16:59 / jem
IS: M6PFDA	72.0	%REC		50-150		E537M	11/17/22 16:59 / jem
IS: M7PFUnA	73.0	%REC		50-150		E537M	11/17/22 16:59 / jem
IS: M2PFDoA	78.0	%REC		50-150		E537M	11/17/22 16:59 / jem
IS: M2PFTeDA	71.0	%REC		50-150		E537M	11/17/22 16:59 / jem
IS: M3PFBS	78.0	%REC		50-150		E537M	11/17/22 16:59 / jem
IS: M5PFPeA	69.0	%REC		50-150		E537M	11/17/22 16:59 / jem
IS: M5PFHxA	63.0	%REC		50-150		E537M	11/17/22 16:59 / jem

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: City of Missoula
Project: PFAS
Lab ID: B22111082-005
Client Sample ID: Compost, Finished

Report Date: 12/02/22
Collection Date: 11/09/22 12:00
DateReceived: 11/11/22
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PFAS COMPOUNDS IN SOIL MATRICES							
IS: M8PFOS	72.0	%REC		50-150		E537M	11/17/22 16:59 / jem
IS: M8FOSA	76.0	%REC		50-150		E537M	11/17/22 16:59 / jem
IS: d5-N-EtFOSAA	64.0	%REC		50-150		E537M	11/17/22 16:59 / jem
IS: d3-N-MeFOSAA	70.0	%REC		50-150		E537M	11/17/22 16:59 / jem
IS: M2-8:2FTS	76.0	%REC		50-150		E537M	11/17/22 16:59 / jem
IS: M2-4:2FTS	90.0	%REC		50-150		E537M	11/17/22 16:59 / jem
IS: M2-6:2FTS	77.0	%REC		50-150		E537M	11/17/22 16:59 / jem
IS: M3HFPO-DA	96.0	%REC		50-150		E537M	11/17/22 16:59 / jem

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: City of Missoula
Project: PFAS
Lab ID: B22111082-006
Client Sample ID: Field Blank

Report Date: 12/02/22
Collection Date: 11/09/22 07:40
DateReceived: 11/11/22
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PFAS COMPOUNDS IN AQUEOUS MATRICES							
PFBA	ND	ng/L		5.0		E537M	11/17/22 20:41 / mkb
PFPeA	ND	ng/L		2.0		E537M	11/17/22 20:41 / mkb
PFHxA	ND	ng/L		2.0		E537M	11/17/22 20:41 / mkb
PFHpA	ND	ng/L		2.0		E537M	11/17/22 20:41 / mkb
PFOA	ND	ng/L		2.0		E537M	11/17/22 20:41 / mkb
PFNA	ND	ng/L		2.0		E537M	11/17/22 20:41 / mkb
PFDA	ND	ng/L		2.0		E537M	11/17/22 20:41 / mkb
PFUnA	ND	ng/L		2.0		E537M	11/17/22 20:41 / mkb
PFDoA	ND	ng/L		2.0		E537M	11/17/22 20:41 / mkb
PFTrDA	ND	ng/L		2.0		E537M	11/17/22 20:41 / mkb
PFTA	ND	ng/L		2.0		E537M	11/17/22 20:41 / mkb
PFBS	ND	ng/L		2.0		E537M	11/17/22 20:41 / mkb
PFPeS	ND	ng/L		2.0		E537M	11/17/22 20:41 / mkb
PFHxS	ND	ng/L		2.0		E537M	11/17/22 20:41 / mkb
PFHpS	ND	ng/L		2.0		E537M	11/17/22 20:41 / mkb
PFOS	ND	ng/L		2.0		E537M	11/17/22 20:41 / mkb
PFNS	ND	ng/L		2.0		E537M	11/17/22 20:41 / mkb
PFDS	ND	ng/L		2.0		E537M	11/17/22 20:41 / mkb
FOSA	ND	ng/L		2.0		E537M	11/17/22 20:41 / mkb
NEtFOSAA	ND	ng/L		3.0		E537M	11/17/22 20:41 / mkb
NMeFOSAA	ND	ng/L		2.0		E537M	11/17/22 20:41 / mkb
8:2 FTS	ND	ng/L		3.0		E537M	11/28/22 22:28 / mkb
4:2 FTS	ND	ng/L		2.0		E537M	11/17/22 20:41 / mkb
6:2 FTS	ND	ng/L		8.0		E537M	11/17/22 20:41 / mkb
11Cl-PF3OUdS	ND	ng/L		2.0		E537M	11/17/22 20:41 / mkb
ADONA	ND	ng/L		2.0		E537M	11/17/22 20:41 / mkb
9Cl-PF3ONS	ND	ng/L		2.0		E537M	11/17/22 20:41 / mkb
HFPO-DA	ND	ng/L		3.0		E537M	11/28/22 22:28 / mkb
IS: M4PFBA	101	%REC		50-150		E537M	11/17/22 20:41 / mkb
IS: M3PFHxS	90.0	%REC		50-150		E537M	11/17/22 20:41 / mkb
IS: M4PFHpA	87.0	%REC		50-150		E537M	11/17/22 20:41 / mkb
IS: M8PFOA	87.0	%REC		50-150		E537M	11/17/22 20:41 / mkb
IS: M9PFNA	96.0	%REC		50-150		E537M	11/17/22 20:41 / mkb
IS: M6PFDA	86.0	%REC		50-150		E537M	11/17/22 20:41 / mkb
IS: M7PFUnA	91.0	%REC		50-150		E537M	11/17/22 20:41 / mkb
IS: M2PFDoA	86.0	%REC		50-150		E537M	11/17/22 20:41 / mkb
IS: M2PFTeDA	73.0	%REC		50-150		E537M	11/17/22 20:41 / mkb
IS: M3PFBS	104	%REC		50-150		E537M	11/17/22 20:41 / mkb
IS: M5PFPeA	94.0	%REC		50-150		E537M	11/17/22 20:41 / mkb
IS: M5PFHxA	101	%REC		50-150		E537M	11/17/22 20:41 / mkb
IS: M8PFOS	97.0	%REC		50-150		E537M	11/17/22 20:41 / mkb
IS: M8FOSA	90.0	%REC		50-150		E537M	11/17/22 20:41 / mkb
IS: d5-N-EtFOSAA	79.0	%REC		50-150		E537M	11/17/22 20:41 / mkb

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: City of Missoula
Project: PFAS
Lab ID: B22111082-006
Client Sample ID: Field Blank

Report Date: 12/02/22
Collection Date: 11/09/22 07:40
DateReceived: 11/11/22
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PFAS COMPOUNDS IN AQUEOUS MATRICES							
IS: d3-N-MeFOSAA	84.0	%REC		50-150		E537M	11/17/22 20:41 / mkb
IS: M2-8:2FTS	65.0	%REC		50-150		E537M	11/28/22 22:28 / mkb
IS: M2-4:2FTS	83.0	%REC		50-150		E537M	11/17/22 20:41 / mkb
IS: M2-6:2FTS	67.0	%REC		50-150		E537M	11/17/22 20:41 / mkb
IS: M3HFPO-DA	110	%REC		50-150		E537M	11/28/22 22:28 / mkb

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: City of Missoula **Work Order:** B22111082 **Report Date:** 12/02/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **E537M**										Batch: 172602
Lab ID: **LCS-172602**	28	Laboratory Control Sample				Run: SCIEX 4500_221117A				11/17/22 16:22
PFBA		43	ng/g	1.0	108	71	135			
PFPeA		42	ng/g	1.0	105	69	132			
PFHxA		43	ng/g	1.0	107	70	132			
PFHpA		42	ng/g	1.0	106	71	131			
PFOA		40	ng/g	1.0	99	69	133			
PFNA		40	ng/g	1.0	100	72	129			
PFDA		47	ng/g	1.0	118	69	133			
PFUnA		38	ng/g	1.0	96	64	136			
PFDoA		41	ng/g	1.0	103	69	135			
PFTrDA		43	ng/g	1.0	108	66	139			
PFTA		45	ng/g	1.0	111	69	133			
PFBS		40	ng/g	1.0	113	72	128			
PFPeS		35	ng/g	1.0	92	73	123			
PFHxS		34	ng/g	1.0	92	67	130			
PFHpS		40	ng/g	1.0	105	70	132			
PFOS		39	ng/g	1.0	105	68	136			
PFNS		39	ng/g	1.0	103	69	125			
PFDS		40	ng/g	1.0	104	59	134			
FOSA		40	ng/g	1.0	101	67	137			
NEtFOSAA		39	ng/g	1.0	99	61	139			
NMeFOSAA		38	ng/g	1.0	95	63	144			
8:2 FTS		42	ng/g	1.0	110	65	137			
4:2 FTS		38	ng/g	1.0	102	62	145			
6:2 FTS		45	ng/g	1.0	117	64	140			
11Cl-PF3OUdS		40	ng/g	1.0	105	70	130			
ADONA		41	ng/g	1.0	109	70	130			
9Cl-PF3ONS		41	ng/g	1.0	110	70	130			
HFPO-DA		38	ng/g	1.0	96	70	130			
Lab ID: **MB-172602**	28	Method Blank				Run: SCIEX 4500_221117A				11/17/22 16:40
PFBA		ND	ng/g	1.0						
PFPeA		ND	ng/g	1.0						
PFHxA		ND	ng/g	1.0						
PFHpA		ND	ng/g	1.0						
PFOA		ND	ng/g	1.0						
PFNA		ND	ng/g	1.0						
PFDA		ND	ng/g	1.0						
PFUnA		ND	ng/g	1.0						
PFDoA		ND	ng/g	1.0						
PFTrDA		ND	ng/g	1.0						
PFTA		ND	ng/g	1.0						
PFBS		ND	ng/g	1.0						
PFPeS		ND	ng/g	1.0						
PFHxS		ND	ng/g	1.0						
PFHpS		ND	ng/g	1.0						

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: City of Missoula **Work Order:** B22111082 **Report Date:** 12/02/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E537M										Batch: 172602
Lab ID: MB-172602	28	Method Blank				Run: SCIEX 4500_221117A				11/17/22 16:40
PFOS		ND	ng/g	1.0						
PFNS		ND	ng/g	1.0						
PFDS		ND	ng/g	1.0						
FOSA		ND	ng/g	1.0						
NEtFOSAA		ND	ng/g	1.0						
NMeFOSAA		ND	ng/g	1.0						
8:2 FTS		ND	ng/g	1.0						
4:2 FTS		ND	ng/g	1.0						
6:2 FTS		ND	ng/g	1.0						
11Cl-PF3OUdS		ND	ng/g	1.0						
ADONA		ND	ng/g	1.0						
9Cl-PF3ONS		ND	ng/g	1.0						
HFPO-DA		ND	ng/g	1.0						
Lab ID: B22111082-005AMS	28	Sample Matrix Spike				Run: SCIEX 4500_221117A				11/17/22 17:17
PFBA		47	ng/g	1.0	112	71	135			
PFPeA		48	ng/g	1.0	110	69	132			
PFHxA		80	ng/g	1.0	133	70	132			S
PFHpA		43	ng/g	1.0	106	71	131			
PFOA		53	ng/g	1.0	110	69	133			
PFNA		42	ng/g	1.0	104	72	129			
PFDA		43	ng/g	1.0	99	69	133			
PFUnA		41	ng/g	1.0	102	64	136			
PFDoA		48	ng/g	1.0	119	69	135			
PFTrDA		39	ng/g	1.0	99	66	139			
PFTA		46	ng/g	1.0	116	69	133			
PFBS		46	ng/g	1.0	110	72	128			
PFPeS		37	ng/g	1.0	101	73	123			
PFHxS		38	ng/g	1.0	106	67	130			
PFHpS		40	ng/g	1.0	107	70	132			
PFOS		45	ng/g	1.0	107	68	136			
PFNS		41	ng/g	1.0	109	69	125			
PFDS		41	ng/g	1.0	108	59	134			
FOSA		43	ng/g	1.0	110	67	137			
NEtFOSAA		42	ng/g	1.0	102	61	139			
NMeFOSAA		42	ng/g	1.0	99	63	144			
8:2 FTS		38	ng/g	1.0	99	65	137			
4:2 FTS		37	ng/g	1.0	102	62	145			
6:2 FTS		45	ng/g	1.0	118	64	140			
11Cl-PF3OUdS		43	ng/g	1.0	117	70	130			
ADONA		36	ng/g	1.0	99	70	130			
9Cl-PF3ONS		39	ng/g	1.0	107	70	130			
HFPO-DA		43	ng/g	1.0	110	70	130			

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

S - Spike recovery outside of advisory limits

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: City of Missoula **Work Order:** B22111082 **Report Date:** 12/02/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **E537M**										Batch: 172602
Lab ID: **B22111082-005AMSD**	28	Sample Matrix Spike Duplicate				Run: SCIEX 4500_221117A				11/17/22 17:36
PFBA		45	ng/g	1.0	105	71	135	4.5	30	
PFPeA		47	ng/g	1.0	105	69	132	2.0	30	
PFHxA		69	ng/g	1.0	103	70	132	15	30	
PFHpA		46	ng/g	1.0	110	71	131	5.6	30	
PFOA		49	ng/g	1.0	96	69	133	8.8	30	
PFNA		42	ng/g	1.0	102	72	129	0	30	
PFDA		51	ng/g	1.0	116	69	133	17	30	
PFUnA		42	ng/g	1.0	104	64	136	3.8	30	
PFDoA		48	ng/g	1.0	117	69	135	0.2	30	
PFTrDA		41	ng/g	1.0	103	66	139	6.0	30	
PFTA		48	ng/g	1.0	119	69	133	4.7	30	
PFBS		44	ng/g	1.0	100	72	128	6.1	30	
PFPeS		37	ng/g	1.0	99	73	123	0.2	30	
PFHxS		36	ng/g	1.0	98	67	130	5.6	30	
PFHpS		37	ng/g	1.0	97	70	132	8.2	30	
PFOS		45	ng/g	1.0	103	68	136	1.8	30	
PFNS		38	ng/g	1.0	98	69	125	8.6	30	
PFDS		40	ng/g	1.0	102	59	134	3.1	30	
FOSA		42	ng/g	1.0	105	67	137	3.2	30	
NEtFOSAA		45	ng/g	1.0	108	61	139	6.8	30	
NMeFOSAA		43	ng/g	1.0	101	63	144	3.7	30	
8:2 FTS		35	ng/g	1.0	88	65	137	9.7	30	
4:2 FTS		36	ng/g	1.0	96	62	145	3.8	30	
6:2 FTS		42	ng/g	1.0	106	64	140	8.8	30	
11Cl-PF3OUdS		39	ng/g	1.0	105	70	130	9.1	30	
ADONA		38	ng/g	1.0	101	70	130	4.2	30	
9Cl-PF3ONS		38	ng/g	1.0	103	70	130	2.1	30	
HFPO-DA		40	ng/g	1.0	100	70	130	7.7	30	
Lab ID: **LCS-172602**	20	Laboratory Control Sample				Run: SCIEX 4500_221117A				11/17/22 16:22
IS: M4PFBA		0.92	%Recovery		92	50	150			
IS: M3PFHxS		0.93	%Recovery		93	50	150			
IS: M4PFHpA		0.87	%Recovery		87	50	150			
IS: M8PFOA		0.84	%Recovery		84	50	150			
IS: M9PFNA		0.95	%Recovery		95	50	150			
IS: M6PFDA		0.84	%Recovery		84	50	150			
IS: M7PFUnA		0.91	%Recovery		91	50	150			
IS: M2PFDoA		0.83	%Recovery		83	50	150			
IS: M2PFTeDA		0.88	%Recovery		88	50	150			
IS: M3PFBS		0.91	%Recovery		91	50	150			
IS: M5PFPeA		0.88	%Recovery		88	50	150			
IS: M5PFHxA		0.89	%Recovery		89	50	150			
IS: M8PFOS		0.88	%Recovery		88	50	150			
IS: M8FOSA		0.92	%Recovery		92	50	150			
IS: d5-N-EtFOSAA		0.85	%Recovery		85	50	150			

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: City of Missoula **Work Order:** B22111082 **Report Date:** 12/02/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E537M										Batch: 172602
Lab ID: LCS-172602	20	Laboratory Control Sample				Run: SCIEX 4500_221117A				11/17/22 16:22
IS: d3-N-MeFOSAA		0.83	%Recovery		83	50	150			
IS: M2-8:2FTS		0.92	%Recovery		92	50	150			
IS: M2-4:2FTS		0.96	%Recovery		96	50	150			
IS: M2-6:2FTS		0.76	%Recovery		76	50	150			
IS: M3HFPO-DA		1.0	%Recovery		103	50	150			
Lab ID: MB-172602	20	Method Blank				Run: SCIEX 4500_221117A				11/17/22 16:40
IS: M4PFBA		0.93	%Recovery		93	50	150			
IS: M3PFHxS		0.88	%Recovery		88	50	150			
IS: M4PFHpA		0.90	%Recovery		90	50	150			
IS: M8PFOA		0.85	%Recovery		85	50	150			
IS: M9PFNA		0.91	%Recovery		91	50	150			
IS: M6PFDA		0.98	%Recovery		98	50	150			
IS: M7PFUnA		0.89	%Recovery		89	50	150			
IS: M2PFDoA		0.83	%Recovery		83	50	150			
IS: M2PFTeDA		0.83	%Recovery		83	50	150			
IS: M3PFBS		0.97	%Recovery		97	50	150			
IS: M5PFPeA		0.89	%Recovery		89	50	150			
IS: M5PFHxA		0.91	%Recovery		91	50	150			
IS: M8PFOS		0.87	%Recovery		87	50	150			
IS: M8FOSA		0.90	%Recovery		90	50	150			
IS: d5-N-EtFOSAA		0.85	%Recovery		85	50	150			
IS: d3-N-MeFOSAA		0.82	%Recovery		82	50	150			
IS: M2-8:2FTS		0.94	%Recovery		94	50	150			
IS: M2-4:2FTS		0.98	%Recovery		98	50	150			
IS: M2-6:2FTS		0.72	%Recovery		72	50	150			
IS: M3HFPO-DA		0.98	%Recovery		98	50	150			
Lab ID: B22111082-005AMS	20	Sample Matrix Spike				Run: SCIEX 4500_221117A				11/17/22 17:17
IS: M4PFBA		0.60	%Recovery		60	50	150			
IS: M3PFHxS		0.70	%Recovery		70	50	150			
IS: M4PFHpA		0.73	%Recovery		73	50	150			
IS: M8PFOA		0.65	%Recovery		65	50	150			
IS: M9PFNA		0.76	%Recovery		76	50	150			
IS: M6PFDA		0.70	%Recovery		70	50	150			
IS: M7PFUnA		0.76	%Recovery		76	50	150			
IS: M2PFDoA		0.66	%Recovery		66	50	150			
IS: M2PFTeDA		0.65	%Recovery		65	50	150			
IS: M3PFBS		0.76	%Recovery		76	50	150			
IS: M5PFPeA		0.67	%Recovery		67	50	150			
IS: M5PFHxA		0.60	%Recovery		60	50	150			
IS: M8PFOS		0.68	%Recovery		68	50	150			
IS: M8FOSA		0.71	%Recovery		71	50	150			
IS: d5-N-EtFOSAA		0.59	%Recovery		59	50	150			
IS: d3-N-MeFOSAA		0.60	%Recovery		60	50	150			

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: City of Missoula **Work Order:** B22111082 **Report Date:** 12/02/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E537M										Batch: 172602
Lab ID: B22111082-005AMS	20	Sample Matrix Spike				Run: SCIEX 4500_221117A				11/17/22 17:17
IS: M2-8:2FTS		0.75	%Recovery		75	50	150			
IS: M2-4:2FTS		0.91	%Recovery		91	50	150			
IS: M2-6:2FTS		0.66	%Recovery		66	50	150			
IS: M3HFPO-DA		0.77	%Recovery		77	50	150			
Lab ID: B22111082-005AMSD	20	Sample Matrix Spike Duplicate				Run: SCIEX 4500_221117A				11/17/22 17:36
IS: M4PFBA		0.61	%Recovery		61	50	150			
IS: M3PFHxS		0.72	%Recovery		72	50	150			
IS: M4PFHpA		0.72	%Recovery		72	50	150			
IS: M8PFOA		0.68	%Recovery		68	50	150			
IS: M9PFNA		0.75	%Recovery		75	50	150			
IS: M6PFDA		0.71	%Recovery		71	50	150			
IS: M7PFUnA		0.76	%Recovery		76	50	150			
IS: M2PFDoA		0.68	%Recovery		68	50	150			
IS: M2PFTeDA		0.67	%Recovery		67	50	150			
IS: M3PFBS		0.77	%Recovery		77	50	150			
IS: M5PFPeA		0.69	%Recovery		69	50	150			
IS: M5PFHxA		0.69	%Recovery		69	50	150			
IS: M8PFOS		0.71	%Recovery		71	50	150			
IS: M8FOSA		0.76	%Recovery		76	50	150			
IS: d5-N-EtFOSAA		0.57	%Recovery		57	50	150			
IS: d3-N-MeFOSAA		0.61	%Recovery		61	50	150			
IS: M2-8:2FTS		0.86	%Recovery		86	50	150			
IS: M2-4:2FTS		0.90	%Recovery		90	50	150			
IS: M2-6:2FTS		0.63	%Recovery		63	50	150			
IS: M3HFPO-DA		0.86	%Recovery		86	50	150			

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: City of Missoula **Work Order:** B22111082 **Report Date:** 12/02/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E537M										Batch: 172635
Lab ID: LCS-172635	26	Laboratory Control Sample				Run: SCIEX 4500_221117B				11/17/22 18:31
PFBA		33	ng/L	5.0	111	73	129			
PFPeA		34	ng/L	2.0	112	72	129			
PFHxA		29	ng/L	2.0	96	72	129			
PFHpA		37	ng/L	2.0	123	72	130			
PFOA		35	ng/L	2.0	116	71	133			
PFNA		34	ng/L	2.0	113	69	130			
PFDA		35	ng/L	2.0	116	71	129			
PFUnA		32	ng/L	2.0	105	69	133			
PFDoA		31	ng/L	2.0	103	72	134			
PFTrDA		30	ng/L	2.0	100	65	144			
PFTA		35	ng/L	2.0	117	71	132			
PFBS		26	ng/L	2.0	99	72	130			
PFPeS		28	ng/L	2.0	99	71	127			
PFHxS		28	ng/L	2.0	104	68	131			
PFHpS		30	ng/L	2.0	106	69	134			
PFOS		29	ng/L	2.0	105	65	140			
PFNS		30	ng/L	2.0	103	69	127			
PFDS		29	ng/L	2.0	100	53	142			
FOSA		32	ng/L	2.0	108	67	137			
NEtFOSAA		32	ng/L	3.0	106	61	135			
NMeFOSAA		26	ng/L	2.0	87	65	136			
4:2 FTS		37	ng/L	2.0	132	63	143			
6:2 FTS		31	ng/L	8.0	110	64	140			
11Cl-PF3OUdS		30	ng/L	2.0	107	70	130			
ADONA		34	ng/L	2.0	119	70	130			
9Cl-PF3ONS		28	ng/L	2.0	101	70	130			
Lab ID: MB-172635	26	Method Blank				Run: SCIEX 4500_221117B				11/17/22 18:50
PFBA		ND	ng/L	5.0						
PFPeA		ND	ng/L	2.0						
PFHxA		ND	ng/L	2.0						
PFHpA		ND	ng/L	2.0						
PFOA		ND	ng/L	2.0						
PFNA		ND	ng/L	2.0						
PFDA		ND	ng/L	2.0						
PFUnA		ND	ng/L	2.0						
PFDoA		ND	ng/L	2.0						
PFTrDA		ND	ng/L	2.0						
PFTA		ND	ng/L	2.0						
PFBS		ND	ng/L	2.0						
PFPeS		ND	ng/L	2.0						
PFHxS		ND	ng/L	2.0						
PFHpS		ND	ng/L	2.0						
PFOS		ND	ng/L	2.0						
PFNS		ND	ng/L	2.0						

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: City of Missoula **Work Order:** B22111082 **Report Date:** 12/02/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E537M										Batch: 172635
Lab ID: MB-172635	26	Method Blank				Run: SCIEX 4500_221117B				11/17/22 18:50
PFDS		ND	ng/L	2.0						
FOSA		ND	ng/L	2.0						
NEtFOSAA		ND	ng/L	3.0						
NMeFOSAA		ND	ng/L	2.0						
4:2 FTS		ND	ng/L	2.0						
6:2 FTS		ND	ng/L	8.0						
11Cl-PF3OUdS		ND	ng/L	2.0						
ADONA		ND	ng/L	2.0						
9Cl-PF3ONS		ND	ng/L	2.0						
Lab ID: B22111082-003AMS	26	Sample Matrix Spike				Run: SCIEX 4500_221117B				11/17/22 20:04
PFBA		30	ng/L	5.0	105	73	129			
PFPeA		38	ng/L	2.0	105	72	129			
PFHxA		41	ng/L	2.0	100	72	129			
PFHpA		28	ng/L	2.0	100	72	130			
PFOA		32	ng/L	2.0	95	71	133			
PFNA		28	ng/L	2.0	105	69	130			
PFDA		31	ng/L	2.0	105	71	129			
PFUnA		29	ng/L	2.0	107	69	133			
PFDoA		28	ng/L	2.0	104	72	134			
PFTrDA		19	ng/L	2.0	71	65	144			
PFTA		27	ng/L	2.0	100	71	132			
PFBS		26	ng/L	2.0	100	72	130			
PFPeS		26	ng/L	2.0	103	71	127			
PFHxS		26	ng/L	2.0	101	68	131			
PFHpS		25	ng/L	2.0	97	69	134			
PFOS		27	ng/L	2.0	100	65	140			
PFNS		24	ng/L	2.0	94	69	127			
PFDS		22	ng/L	2.0	84	53	142			
FOSA		28	ng/L	2.0	104	67	137			
NEtFOSAA		30	ng/L	3.0	111	61	135			
NMeFOSAA		29	ng/L	2.0	104	65	136			
4:2 FTS		28	ng/L	2.0	110	63	143			
6:2 FTS		27	ng/L	8.0	106	64	140			
11Cl-PF3OUdS		23	ng/L	2.0	90	70	130			
ADONA		26	ng/L	2.0	101	70	130			
9Cl-PF3ONS		23	ng/L	2.0	93	70	130			
Lab ID: B22111082-003AMSD	26	Sample Matrix Spike Duplicate				Run: SCIEX 4500_221117B				11/17/22 20:22
PFBA		31	ng/L	5.0	107	73	129	1.5	30	
PFPeA		37	ng/L	2.0	103	72	129	1.9	30	
PFHxA		41	ng/L	2.0	105	72	129	2.1	30	
PFHpA		29	ng/L	2.0	107	72	130	5.8	30	
PFOA		32	ng/L	2.0	96	71	133	0.2	30	
PFNA		26	ng/L	2.0	98	69	130	8.2	30	

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: City of Missoula **Work Order:** B22111082 **Report Date:** 12/02/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E537M										Batch: 172635
Lab ID: B22111082-003AMSD	26	Sample Matrix Spike Duplicate				Run: SCIEX 4500_221117B				11/17/22 20:22
PFDA		33	ng/L	2.0	116	71	129	8.2	30	
PFUnA		27	ng/L	2.0	102	69	133	6.1	30	
PFDoA		31	ng/L	2.0	116	72	134	9.7	30	
PFTrDA		22	ng/L	2.0	85	65	144	16	30	
PFTA		27	ng/L	2.0	104	71	132	2.7	30	
PFBS		25	ng/L	2.0	99	72	130	2.1	30	
PFPeS		24	ng/L	2.0	97	71	127	6.3	30	
PFHxS		25	ng/L	2.0	99	68	131	3.5	30	
PFHpS		28	ng/L	2.0	110	69	134	11	30	
PFOS		28	ng/L	2.0	104	65	140	2.3	30	
PFNS		24	ng/L	2.0	96	69	127	1.3	30	
PFDS		24	ng/L	2.0	95	53	142	12	30	
FOSA		28	ng/L	2.0	105	67	137	1.0	30	
NEtFOSAA		30	ng/L	3.0	114	61	135	0.9	30	
NMeFOSAA		27	ng/L	2.0	100	65	136	4.2	30	
4:2 FTS		29	ng/L	2.0	116	63	143	4.0	30	
6:2 FTS		28	ng/L	8.0	111	64	140	3.5	30	
11Cl-PF3OUdS		24	ng/L	2.0	96	70	130	5.4	30	
ADONA		27	ng/L	2.0	110	70	130	7.0	30	
9Cl-PF3ONS		24	ng/L	2.0	96	70	130	1.6	30	
Lab ID: LCS-172635	2	Laboratory Control Sample				Run: SCIEX 4500_221117B				11/28/22 20:37
8:2 FTS		28	ng/L	3.0	96	67	138			
HFPO-DA		34	ng/L	3.0	113	70	130			
Lab ID: MB-172635	2	Method Blank				Run: SCIEX 4500_221117B				11/28/22 20:56
8:2 FTS		ND	ng/L	3.0						
HFPO-DA		ND	ng/L	3.0						
Lab ID: B22111082-003AMS	2	Sample Matrix Spike				Run: SCIEX 4500_221117B				11/28/22 21:51
8:2 FTS		29	ng/L	3.0	114	67	138			
HFPO-DA		28	ng/L	3.0	103	70	130			
Lab ID: B22111082-003AMSD	2	Sample Matrix Spike Duplicate				Run: SCIEX 4500_221117B				11/28/22 22:10
8:2 FTS		25	ng/L	3.0	97	67	138	17	30	
HFPO-DA		26	ng/L	3.0	97	70	130	7.7	30	
Lab ID: LCS-172635	18	Laboratory Control Sample				Run: SCIEX 4500_221117B				11/17/22 18:31
IS: M4PFBA		0.83	% Recovery		83	50	150			
IS: M3PFHxS		0.81	% Recovery		81	50	150			
IS: M4PFHpA		0.75	% Recovery		75	50	150			
IS: M8PFOA		0.71	% Recovery		71	50	150			
IS: M9PFNA		0.81	% Recovery		81	50	150			
IS: M6PFDA		0.77	% Recovery		77	50	150			
IS: M7PFUnA		0.75	% Recovery		75	50	150			
IS: M2PFDoA		0.71	% Recovery		71	50	150			
IS: M2PFTeDA		0.64	% Recovery		64	50	150			

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: City of Missoula **Work Order:** B22111082 **Report Date:** 12/02/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E537M										Batch: 172635
Lab ID: LCS-172635	18	Laboratory Control Sample				Run: SCIEX 4500_221117B				11/17/22 18:31
IS: M3PFBS		0.85	% Recovery		85	50	150			
IS: M5PFPeA		0.80	% Recovery		80	50	150			
IS: M5PFHxA		0.87	% Recovery		87	50	150			
IS: M8PFOS		0.84	% Recovery		84	50	150			
IS: M8FOSA		0.48	% Recovery		48	50	150			S
IS: d5-N-EtFOSAA		0.67	% Recovery		67	50	150			
IS: d3-N-MeFOSAA		0.74	% Recovery		74	50	150			
IS: M2-4:2FTS		0.66	% Recovery		66	50	150			
IS: M2-6:2FTS		0.62	% Recovery		62	50	150			
Lab ID: MB-172635	18	Method Blank				Run: SCIEX 4500_221117B				11/17/22 18:50
IS: M4PFBA		0.90	% Recovery		90	50	150			
IS: M3PFHxS		0.93	% Recovery		93	50	150			
IS: M4PFHpA		0.88	% Recovery		88	50	150			
IS: M8PFOA		0.87	% Recovery		87	50	150			
IS: M9PFNA		0.91	% Recovery		91	50	150			
IS: M6PFDA		0.87	% Recovery		87	50	150			
IS: M7PFUnA		0.89	% Recovery		89	50	150			
IS: M2PFDoA		0.80	% Recovery		80	50	150			
IS: M2PFTeDA		0.68	% Recovery		68	50	150			
IS: M3PFBS		0.86	% Recovery		86	50	150			
IS: M5PFPeA		0.88	% Recovery		88	50	150			
IS: M5PFHxA		0.89	% Recovery		89	50	150			
IS: M8PFOS		0.88	% Recovery		88	50	150			
IS: M8FOSA		0.54	% Recovery		54	50	150			
IS: d5-N-EtFOSAA		0.75	% Recovery		75	50	150			
IS: d3-N-MeFOSAA		0.81	% Recovery		81	50	150			
IS: M2-4:2FTS		0.84	% Recovery		84	50	150			
IS: M2-6:2FTS		0.73	% Recovery		73	50	150			
Lab ID: B22111082-003AMS	18	Sample Matrix Spike				Run: SCIEX 4500_221117B				11/17/22 20:04
IS: M4PFBA		0.60	% Recovery		60	50	150			
IS: M3PFHxS		0.85	% Recovery		85	50	150			
IS: M4PFHpA		0.97	% Recovery		97	50	150			
IS: M8PFOA		0.92	% Recovery		92	50	150			
IS: M9PFNA		1.0	% Recovery		100	50	150			
IS: M6PFDA		0.95	% Recovery		95	50	150			
IS: M7PFUnA		0.85	% Recovery		85	50	150			
IS: M2PFDoA		0.81	% Recovery		81	50	150			
IS: M2PFTeDA		0.52	% Recovery		52	50	150			
IS: M3PFBS		0.85	% Recovery		85	50	150			
IS: M5PFPeA		0.70	% Recovery		70	50	150			
IS: M5PFHxA		0.78	% Recovery		78	50	150			
IS: M8PFOS		0.97	% Recovery		97	50	150			
IS: M8FOSA		0.47	% Recovery		47	50	150			S

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

S - Spike recovery outside of advisory limits

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: City of Missoula **Work Order:** B22111082 **Report Date:** 12/02/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E537M										Batch: 172635
Lab ID: B22111082-003AMS	18	Sample Matrix Spike				Run: SCIEX 4500_221117B				11/17/22 20:04
IS: d5-N-EtFOSAA		0.67	% Recovery		67	50	150			
IS: d3-N-MeFOSAA		0.78	% Recovery		78	50	150			
IS: M2-4:2FTS		1.5	% Recovery		150	50	150			
IS: M2-6:2FTS		1.2	% Recovery		116	50	150			
Lab ID: B22111082-003AMSD	18	Sample Matrix Spike Duplicate				Run: SCIEX 4500_221117B				11/17/22 20:22
IS: M4PFBA		0.61	% Recovery		61	50	150			
IS: M3PFHxS		0.88	% Recovery		88	50	150			
IS: M4PFHpA		0.92	% Recovery		92	50	150			
IS: M8PFOA		0.92	% Recovery		92	50	150			
IS: M9PFNA		1.1	% Recovery		108	50	150			
IS: M6PFDA		0.94	% Recovery		94	50	150			
IS: M7PFUnA		0.91	% Recovery		91	50	150			
IS: M2PFDoA		0.74	% Recovery		74	50	150			
IS: M2PFTeDA		0.49	% Recovery		49	50	150			S
IS: M3PFBS		0.88	% Recovery		88	50	150			
IS: M5PFPeA		0.71	% Recovery		71	50	150			
IS: M5PFHxA		0.80	% Recovery		80	50	150			
IS: M8PFOS		0.92	% Recovery		92	50	150			
IS: M8FOSA		0.85	% Recovery		85	50	150			
IS: d5-N-EtFOSAA		0.62	% Recovery		62	50	150			
IS: d3-N-MeFOSAA		0.82	% Recovery		82	50	150			
IS: M2-4:2FTS		1.4	% Recovery		139	50	150			
IS: M2-6:2FTS		1.2	% Recovery		116	50	150			
Lab ID: LCS-172635	2	Laboratory Control Sample				Run: SCIEX 4500_221117B				11/28/22 20:37
IS: M2-8:2FTS		0.63	% Recovery		63	50	150			
IS: M3HFPO-DA		0.85	% Recovery		85	50	150			
Lab ID: MB-172635	2	Method Blank				Run: SCIEX 4500_221117B				11/28/22 20:56
IS: M2-8:2FTS		0.80	% Recovery		80	50	150			
IS: M3HFPO-DA		1.1	% Recovery		115	50	150			
Lab ID: B22111082-003AMS	2	Sample Matrix Spike				Run: SCIEX 4500_221117B				11/28/22 21:51
IS: M2-8:2FTS		0.84	% Recovery		84	50	150			
IS: M3HFPO-DA		0.83	% Recovery		83	50	150			
Lab ID: B22111082-003AMSD	2	Sample Matrix Spike Duplicate				Run: SCIEX 4500_221117B				11/28/22 22:10
IS: M2-8:2FTS		0.81	% Recovery		81	50	150			
IS: M3HFPO-DA		0.89	% Recovery		89	50	150			

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

S - Spike recovery outside of advisory limits

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: City of Missoula **Work Order:** B22111082 **Report Date:** 12/02/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **E537M**										Analytical Run: R392085
Lab ID: **ICV**	2	Initial Calibration Verification Standard								11/28/22 20:00
8:2 FTS		15000	ng/L	3.0	99	70	130			
HFPO-DA		14000	ng/L	3.0	94	70	130			
Lab ID: **ICV**	2	Initial Calibration Verification Standard								11/28/22 20:00
IS: M2-8:2FTS		1.0	% Recovery		103	50	150			
IS: M3HFPO-DA		1.1	% Recovery		114	50	150			

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

Work Order Receipt Checklist

City of Missoula

B22111082

Login completed by: Dylan A. Chirrick
Date Received: 11/11/2022
Reviewed by: cindy
Received by: car
Reviewed Date: 11/16/2022
Carrier name: Return-FedEx Ground

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☐	No ☑	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☑	No ☐	Not Applicable ☐
Container/Temp Blank temperature:	0.4°C On Ice		
Containers requiring zero headspace have no headspace or bubble that is <6mm (1/4").	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Applicable ☑

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

The reference date for Radon analysis is the sample collection date. The reference date for all other Radiochemical analyses is the analysis date. Radiochemical precision results represent a 2-sigma Total Measurement Uncertainty.

Contact and Corrective Action Comments:

The sample identification indicated on the container label for sample Landfill Leachate is Republic Service and on the Chain of Custody it is Landfill Leachate. Proceeded with the sample identification as indicated on the Chain of Custody.

ENERGY LABORATORIES
Trust our People. Trust our Data.

Chain of Custody & Analytical Request Record

www.energylab.com

Account Information *(Billing information)*

Company/Name	City of Missoula Wastewater
Contact	Nate Gordon
Phone	(406) 552-6606
Mailing Address	435 Ryman
City, State, Zip	Missoula, MT, 59802
Email	gordonn@ci.missoula.mt.us
Receive Invoice	☐Hard Copy ☐Email
Receive Report	☐Hard Copy ☒Email
Purchase Order	
Quote	
Bottle Order	166061

Report Information *(if different than Account Information)*

Company/Name	City of Missoula WW
Contact	Nate Gordon
Phone	(406) 552-6606
Mailing Address	435 Ryman
City, State, Zip	Missoula, MT 59802
Email	gordonn@ci.missoula.mt.us
Receive Report	☐Hard Copy ☒Email
Special Report/Formats:	☐ LEVEL IV ☐ NELAC ☐ EDD/EDT *(contact laboratory)* ☐ Other_____

Comments

Please send a copy to : gordonn@ci.missoula.mt.us

Project Information

Project Name, PWSID, Permit, etc.	PFAS
Sampler Name	Nate Gordon
Sampler Phone	(406) 552-6606
Sample Origin State	Montana
EPA/State Compliance	☐ Yes ☒ No

MINING CLIENTS, please indicate sample type.
*If ore has been processed or refined, call before sending.
☐ Byproduct 11 (e)2 material ☐ Unprocessed ore (NOT ground or refined)*

Matrix Codes
A - Air
W - Water
S - Soils/Solids
V - Vegetation
B - Bioassay
O - Other
DW - Drinking Water

All turnaround times are standard unless marked as RUSH.
Energy Laboratories MUST be contacted prior to RUSH sample submittal for charges and scheduling – See Instructions Page

	Sample Identification *(Name, Location, Interval, etc.)*	Collection Date	Collection Time	Number of Containers	Matrix *(See Codes Above)*	PFAS Compounds	See Attached	RUSH TAT	ELI LAB ID *Laboratory Use Only*
1	Landfill leachate	11/9/22	9:40 am	3	W	✓			B22111082
2	Influent, WW	11/9/22	7:40 am	3	W	✓			
3	Effluent, WW	11/9/22	7:40 am	3	W	✓			
4	Compost, finished	11/9/22	12:00 pm	1	S	✓			
5	Field Blank								
6									
7									
8									
9									
10									

CAR

Custody Record MUST be signed	Relinquished by (print)	Date/Time	Signature	Received by (print)	Date/Time	Signature
	Nate Gordon	11/9/22 1:00pm				
	Relinquished by (print)	Date/Time	Signature	Received by Laboratory (print)	Date/Time	Signature
				Cindy Bauer	11/11/22 09:00	

LABORATORY USE ONLY

Shipped By	Cooler ID(s)	Custody Seals Y N C B	Intact Y N	Receipt Temp °C	Temp Blank Y N	On Ice Y N	Payment Type CC Cash Check_____	Amount $	Receipt Number *(cash/check only)*

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested. This serves as notice of this possibility. All subcontracted data will be clearly notated on your analytical report.