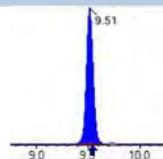
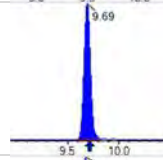
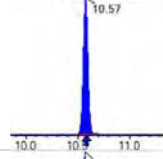
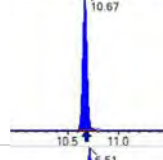
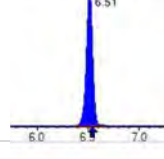


Analyte	(Q1 / Q3) Area Counts*min	R.T. (R.T [min], R.R.T.) (Δ RT-I[μ min], Δ RT- CV[μ min], Δ RT ion[s])	S / N	Ion Ratio IR Vs MP% IR Vs CV%	Concentration [True] ng/mL	Q.C. Rec. {Area%CV}	Primary Transition	Confirmation Transition	Flag
D3_MeFOSAA_EIS	(573.0 / 419.0) 313624	(9.51, N/A) (N/A, -0.03, N/A)	496.6	N/A	3.7456 [4.0000]	93.6% { 104.9% }			
D5_EtFOSAA_EIS	(589.0 / 419.0) 341589	(9.69, N/A) (N/A, -0.02, N/A)	393.3	N/A	4.9086 [4.0000]	122.7% { 125.9% }			
D7_NMeFOSE_EIS	(623.2 / 58.9) 324719	(10.57, N/A) (N/A, -0.01, N/A)	917.5	N/A	13.0438 [20.0000]	65.2% { 64.7% }			
D9_NEtFOSE_EIS	(639.2 / 58.9) 179964	(10.67, N/A) (N/A, -0.01, N/A)	1511.0	N/A	13.4245 [20.0000]	67.1% { 64.6% }			
13C3_HFPODA_EIS	(287.0 / 169.0) 804080	(6.51, N/A) (N/A, -0.03, N/A)	984.8	N/A	7.6620 [8.0000]	95.8% { 101.4% }			

ANALYSIS DATA SHEET

Blanka

Laboratory:a	APPL, LLCa	Work Order:a	22L0004a
Client:a	Tidewater, Inc.a	Project:a	NASA JPL Sla
M trix:a	Watera	Laboratory ID:a	BBL0371-BLK1a
Sampled:a		Prepared:a	12/19/22 12:17a
Solids:a		Preparation:a	Table B-15a
Batch:a	BBL0371a	Sequence:a	SB04003a
Column:a	1a	Calibration:a	2253011a
			Instrument:a Saphira
			File ID:a S2022-12-29C (7)a
			Analyzed:a 12/30/22 05:19a
			Dilution:a 1a

COMPOUNDL	CONC. (ng/L)L	OQL	OD	DL	QL
PFBAa	0.20 Ua	3.2a	0.20a	0.050a	Ua
PFPEAa	0.20 Ua	1.6a	0.20a	0.062a	Ua
PFHXAa	0.20 Ua	0.80a	0.20a	0.064a	Ua
PFHPAa	0.20 Ua	0.80a	0.20a	0.050a	Ua
PFOAa	0.20 Ua	0.80a	0.20a	0.082a	Ua
PFNAa	0.20 Ua	0.80a	0.20a	0.050a	Ua
PFDAa	0.20 Ua	0.80a	0.20a	0.050a	Ua
PFUnAa	0.20 Ua	0.80a	0.20a	0.080a	Ua
PFDOAa	0.20 Ua	0.80a	0.20a	0.050a	Ua
PFTRDAa	0.20 Ua	0.80a	0.20a	0.058a	Ua
PFTEDAa	0.20 Ua	0.80a	0.20a	0.086a	Ua
PFBSa	0.20 Ua	0.80a	0.20a	0.050a	Ua
PFPESa	0.20 Ua	0.80a	0.20a	0.058a	Ua
PFHXSa	0.20 Ua	0.80a	0.20a	0.050a	Ua
PFHPSa	0.20 Ua	0.80a	0.20a	0.056a	Ua
PFOSa	0.20 Ua	0.80a	0.20a	0.050a	Ua
PFNSa	0.40 Ua	0.80a	0.40a	0.25a	Ua
PFDSa	0.20 Ua	0.80a	0.20a	0.064a	Ua
4:2FTSa	0.40 Ua	3.2a	0.40a	0.11a	Ua
6:2FTSa	0.20 Ua	3.2a	0.20a	0.090a	Ua
8:2FTSa	0.60 Ua	3.2a	0.60a	0.20a	Ua
PFOSAa	0.20 Ua	3.2a	0.20a	0.050a	Ua
NMeFOSAa	2.0 Ua	3.2a	2.0a	0.99a	Ua
NEtFOSAa	2.0 Ua	3.2a	2.0a	0.98a	Ua
NMeFOSAAa	0.20 Ua	0.80a	0.20a	0.072a	Ua
NEtFOSAAa	0.20 Ua	0.80a	0.20a	0.050a	Ua
NMeFOSEa	1.2 Ua	3.2a	1.2a	0.60a	Ua
NEtFOSEa	1.2 Ua	3.2a	1.2a	0.60a	Ua
HFPO-DAa	1.0 Ua	1.6a	1.0a	0.49a	Ua
ADONa	0.60 Ua	1.6a	0.60a	0.38a	Ua

ANALYSIS DATA SHEET

Blanka

Laboratory:a	APPL, LLCa	Work Order:a	22L0004a
Client:a	Tidewater, Inc.a	Project:a	NASA JPL Sla
Matrix:a	Watera	Laboratory ID:a	BBL0371-BLK1a
Sampled:a		File ID:a	S2022-12-29C (7)a
Solids:a		Prepared:a	12/19/22 12:17a
Batch:a	BBL0371a	Analyzed:a	12/30/22 05:19a
Column:a	1a	Preparation:a	Table B-15a
		Dilution:a	1a
		Calibration:a	2253011a
		Instrument:a	Saphira
		Sequence:a	SB04003a

COMPOUNDL	CONC. (ng/L)L	OQL	OD	D	QL
9CL-PF3ONSa	0.60 Ua	1.6a	0.60a	0.24	Ua
11CL-PF3OUDSa	0.60 Ua	1.6a	0.60a	0.24	Ua



Chemist: HGH
 Instrument: Saphira
 Type: Sciex Q3 5500

Sample I.D.: BBL0371-BLK1
 DF, IV: 1, 10.0µL
 Acquisition Method: 1633 2022-12-27.dam

Quant Method: 1633 - S2022-12-29A
 Path: S2022-12-30A (7)
 Acquired: 2022/12/30 - 05:19

Analyte	(Q1 / Q3) Area Counts*min	R.T. (R.T [min], R.R.T.) (ΔRT-[min], ΔRT-CV[min], ΔRT ion[s])	S / N	Ion Ratio IR Vs MP% IR Vs CV%	Concentration [True] ng/mL	Q.C. Rec. {Area%CV}	Primary Transition	Confirmation Transition	Flag
PFBA	(213.0 / 169.0) N/A	(N/A, N/A) (N/A, N/A, N/A)	N/A	N/A 0.0 0.0	0.0000	N/A			
PFPeA	(263.0 / 219.0) N/A (263.0 / 69.0) N/A	(N/A, N/A) (N/A, N/A, N/A)	N/A N/A	N/A 0.0 0.0	0.0000	N/A			
PFHxA	(313.0 / 269.0) N/A (313.0 / 119.0) N/A	(N/A, N/A) (N/A, N/A, N/A)	N/A N/A	N/A 0.0 0.0	0.0000	N/A			
PFHpA	(363.0 / 319.0) N/A (363.0 / 169.0) N/A	(N/A, N/A) (N/A, N/A, N/A)	N/A N/A	N/A 0.0 0.0	0.0000	N/A			
PFOA	(413.0 / 369.0) N/A (413.0 / 169.0) N/A	(N/A, N/A) (N/A, N/A, N/A)	N/A N/A	N/A 0.0 0.0	0.0000	N/A			
PFNA	(463.0 / 419.0) N/A (463.0 / 169.0) N/A	(N/A, N/A) (N/A, N/A, N/A)	N/A N/A	N/A 0.0 0.0	0.0000	N/A			
PFDA	(513.0 / 469.0) N/A (513.0 / 169.0) N/A	(N/A, N/A) (N/A, N/A, N/A)	N/A N/A	N/A 0.0 0.0	0.0000	N/A			
PFUnA	(563.0 / 519.0) N/A (563.0 / 169.0) N/A	(N/A, N/A) (N/A, N/A, N/A)	N/A N/A	N/A 0.0 0.0	0.0000	N/A			
PFDoA	(613.0 / 569.0) N/A (613.0 / 169.0) N/A	(N/A, N/A) (N/A, N/A, N/A)	N/A N/A	N/A 0.0 0.0	0.0000	N/A			
PFTrDA	(663.0 / 619.0) N/A (663.0 / 169.0) N/A	(N/A, N/A) (N/A, N/A, N/A)	N/A N/A	N/A 0.0 0.0	0.0000	N/A			
PFTeDA	(713.0 / 669.0) N/A (713.0 / 169.0) N/A	(N/A, N/A) (N/A, N/A, N/A)	N/A N/A	N/A 0.0 0.0	0.0000	N/A			



Chemist: HGH
 Instrument: Saphira
 Type: Sciex Q3 5500

Sample I.D.: BBL0371-BLK1
 DF, IV: 1, 10.0µL
 Acquisition Method: 1633 2022-12-27.dam

Quant Method: 1633 - S2022-12-29A
 Path: S2022-12-30A (7)
 Acquired: 2022/12/30 - 05:19

Analyte	(Q1 / Q3) Area Counts*min	R.T. (R.T [min], R.R.T.) (ΔRT-I[min], ΔRT-CV[min], ΔRT ion[s])	S / N	Ion Ratio IR Vs MP% IR Vs CV%	Concentration [True] ng/mL	Q.C. Rec. {Area%CV}	Primary Transition	Confirmation Transition	Flag
PFBS	(299.0 / 80.0) N/A (299.0 / 99.0) N/A	(N/A , N/A) (N/A , N/A , N/A)	N/A N/A	N/A 0.0 0.0	0.0000	N/A			
PFPeS	(349.0 / 80.0) N/A (349.0 / 99.0) N/A	(N/A , N/A) (N/A , N/A , N/A)	N/A N/A	N/A 0.0 0.0	0.0000	N/A			
PFHxS	(399.0 / 80.0) N/A (399.0 / 99.0) N/A	(N/A , N/A) (N/A , N/A , N/A)	N/A N/A	N/A 0.0 0.0	0.0000	N/A			
PFHpS	(449.0 / 80.0) N/A (449.0 / 99.0) N/A	(N/A , N/A) (N/A , N/A , N/A)	N/A N/A	N/A 0.0 0.0	0.0000	N/A			
PFOS	(499.0 / 80.0) N/A (499.0 / 99.0) N/A	(N/A , N/A) (N/A , N/A , N/A)	N/A N/A	N/A 0.0 0.0	0.0000	N/A			
PFNS	(549.0 / 80.0) N/A (549.0 / 99.0) N/A	(N/A , N/A) (N/A , N/A , N/A)	N/A N/A	N/A 0.0 0.0	0.0000	N/A			
PFDS	(599.0 / 80.0) N/A (599.0 / 99.0) N/A	(N/A , N/A) (N/A , N/A , N/A)	N/A N/A	N/A 0.0 0.0	0.0000	N/A			
PFDoS	(699.0 / 80.0) N/A (699.0 / 99.0) N/A	(N/A , N/A) (N/A , N/A , N/A)	N/A N/A	N/A 0.0 0.0	0.0000	N/A			
4:2FTS	(327.0 / 307.0) N/A (327.0 / 81.0) N/A	(N/A , N/A) (N/A , N/A , N/A)	N/A N/A	N/A 0.0 0.0	0.0000	N/A			
6:2FTS	(427.0 / 407.0) N/A (427.0 / 81.0) N/A	(N/A , N/A) (N/A , N/A , N/A)	N/A N/A	N/A 0.0 0.0	0.0000	N/A			
8:2FTS	(527.0 / 507.0) N/A (527.0 / 81.0) N/A	(N/A , N/A) (N/A , N/A , N/A)	N/A N/A	N/A 0.0 0.0	0.0000	N/A			



Chemist: HGH
 Instrument: Saphira
 Type: Sciex Q3 5500

Sample I.D.: BBL0371-BLK1
 DF, IV: 1, 10.0µL
 Acquisition Method: 1633 2022-12-27.dam

Quant Method: 1633 - S2022-12-29A
 Path: S2022-12-30A (7)
 Acquired: 2022/12/30 - 05:19

Analyte	(Q1 / Q3) Area Counts*min	R.T. (R.T [min], R.R.T.) (ΔRT-I[min], ΔRT-CV[min], ΔRT ion[s])	S / N	Ion Ratio IR Vs MP% IR Vs CV%	Concentration [True] ng/mL	Q.C. Rec. {Area%CV}	Primary Transition	Confirmation Transition	Flag
PFOSA	(498.0 / 78.0) N/A (498.0 / 478.0) N/A	(N/A, N/A) (N/A, N/A, N/A)	N/A N/A	N/A 0.0 0.0	0.0000	N/A			
NMeFOSA	(512.0 / 219.0) N/A (512.0 / 169.0) N/A	(N/A, N/A) (N/A, N/A, N/A)	N/A N/A	N/A 0.0 0.0	0.0000	N/A			
NEtFOSA	(526.0 / 219.0) N/A (526.0 / 169.0) N/A	(N/A, N/A) (N/A, N/A, N/A)	N/A N/A	N/A 0.0 0.0	0.0000	N/A			
NMeFOSAA	(570.0 / 419.0) N/A (570.0 / 483.0) N/A	(N/A, N/A) (N/A, N/A, N/A)	N/A N/A	N/A 0.0 0.0	0.0000	N/A			
NEtFOSAA	(584.0 / 419.0) N/A (584.0 / 526.0) N/A	(N/A, N/A) (N/A, N/A, N/A)	N/A N/A	N/A 0.0 0.0	0.0000	N/A			
NMeFOSE	(616.0 / 59.0) N/A	(N/A, N/A) (N/A, N/A, N/A)	N/A	N/A 0.0 0.0	0.0000	N/A			
NEtFOSE	(630.0 / 59.0) N/A	(N/A, N/A) (N/A, N/A, N/A)	N/A	N/A 0.0 0.0	0.0000	N/A			
HFPO-DA	(285.0 / 169.0) N/A (285.0 / 185.0) N/A	(N/A, N/A) (N/A, N/A, N/A)	N/A N/A	N/A 0.0 0.0	0.0000	N/A			
ADONA	(377.0 / 85.0) N/A (377.0 / 251.0) N/A	(N/A, N/A) (N/A, N/A, N/A)	N/A N/A	N/A 0.0 0.0	0.0000	N/A			
9Cl-Pf3ONS	(531.0 / 351.0) N/A (533.0 / 353.0) N/A	(N/A, N/A) (N/A, N/A, N/A)	N/A N/A	N/A 0.0 0.0	0.0000	N/A			
11Cl-Pf3OUDS	(631.0 / 451.0) N/A (633.0 / 453.0) N/A	(N/A, N/A) (N/A, N/A, N/A)	N/A N/A	N/A 0.0 0.0	0.0000	N/A			

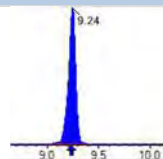
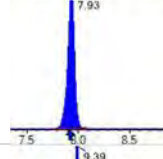
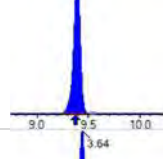
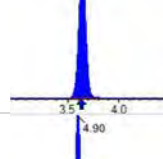
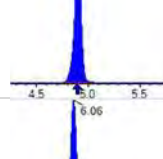
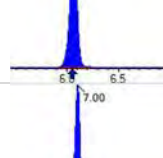
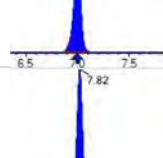
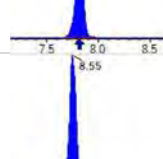
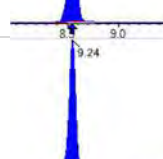
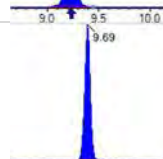
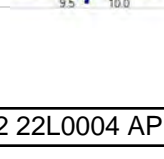


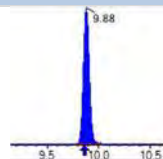
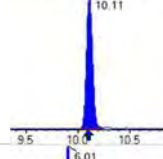
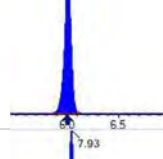
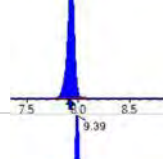
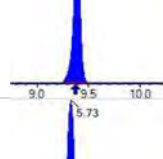
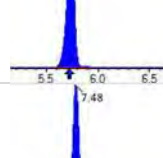
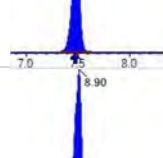
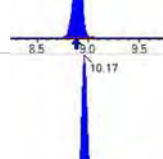
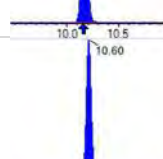
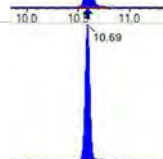
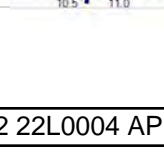
Chemist: HGH
 Instrument: Saphira
 Type: Sciex Q3 5500

Sample I.D.: BBL0371-BLK1
 DF, IV: 1, 10.0µL
 Acquisition Method: 1633 2022-12-27.dam

Quant Method: 1633 - S2022-12-29A
 Path: S2022-12-30A (7)
 Acquired: 2022/12/30 - 05:19

Analyte	(Q1 / Q3) Area Counts*min	R.T. (R.T [min], R.R.T.) (ΔRT-I[min], ΔRT-CV[min], ΔRT ion[s])	S / N	Ion Ratio IR Vs MP% IR Vs CV%	Concentration [True] ng/mL	Q.C. Rec. {Area%CV}	Primary Transition	Confirmation Transition	Flag
3:3FTCA	(241.0 / 177.0) N/A (241.0 / 117.0) N/A	(N/A, N/A) (N/A, N/A, N/A)	N/A N/A	N/A 0.0 0.0	0.0000	N/A			
5:3FTCA	(341.0 / 236.7) N/A (341.0 / 217.0) N/A	(N/A, N/A) (N/A, N/A, N/A)	N/A N/A	N/A 0.0 0.0	0.0000	N/A			
7:3FTCA	(441.0 / 317.0) N/A (441.0 / 337.0) N/A	(N/A, N/A) (N/A, N/A, N/A)	N/A N/A	N/A 0.0 0.0	0.0000	N/A			
PFEESA	(315.0 / 135.0) N/A (315.0 / 83.0) N/A	(N/A, N/A) (N/A, N/A, N/A)	N/A N/A	N/A 0.0 0.0	0.0000	N/A			
PFMPA	(229.0 / 85.0) N/A	(N/A, N/A) (N/A, N/A, N/A)	N/A	N/A 0.0 0.0	0.0000	N/A			
PFMBA	(279.0 / 85.0) N/A	(N/A, N/A) (N/A, N/A, N/A)	N/A	N/A 0.0 0.0	0.0000	N/A			
NFDHA	(295.0 / 201.0) N/A (295.0 / 85.0) N/A	(N/A, N/A) (N/A, N/A, N/A)	N/A N/A	N/A 0.0 0.0	0.0000	N/A			
13C3_PFBA_IIS	(216.0 / 172.0) 302617	(3.64, N/A) (N/A, 0.02, N/A)	740.7	N/A	1.4052 [1.0000]	140.5% { 128.3% }			
13C2_PFHxA_IIS	(315.0 / 270.0) 572416	(6.06, N/A) (N/A, 0.01, N/A)	551.4	N/A	1.5079 [1.0000]	150.8% { 138.6% }			
13C4_PFOA_IIS	(417.0 / 372.0) 508864	(7.82, N/A) (N/A, 0.01, N/A)	754.3	N/A	1.4097 [1.0000]	141.0% { 129.4% }			
13C5_PFNA_IIS	(468.0 / 423.0) 406940	(8.56, N/A) (N/A, 0.01, N/A)	353.6	N/A	1.3839 [1.0000]	138.4% { 126.9% }			

Analyte	(Q1 / Q3) Area Counts*min	R.T. (R.T [min], R.R.T.) (Δ RT-[min], Δ RT- CV[min], Δ RT ion[s])	S / N	Ion Ratio IR Vs MP% IR Vs CV%	Concentration [True] ng/mL	Q.C. Rec. {Area%CV}	Primary Transition	Confirmation Transition	Flag
13C2_PFDA_IIS	(515.0 / 470.1) 503252	(9.24, N/A) (N/A, 0.02, N/A)	369.6	N/A	1.4773 [1.0000]	147.7% { 142.8% }			
18O2_PFHxS_IIS	(403.0 / 83.9) 819867	(7.93, N/A) (N/A, 0.01, N/A)	602.6	N/A	1.3550 [1.0000]	135.5% { 130.2% }			
13C4_PFOS_IIS	(503.0 / 79.9) 959884	(9.39, N/A) (N/A, 0.01, N/A)	399.1	N/A	1.4886 [1.0000]	148.9% { 146.8% }			
13C4_PFBA_EIS	(217.0 / 172.0) 2201536	(3.64, N/A) (N/A, 0.02, N/A)	839.4	N/A	7.2462 [8.0000]	90.6% { 118.3% }			
13C5_PFPeA_EIS	(268.0 / 223.0) 1600335	(4.90, N/A) (N/A, 0.01, N/A)	641.0	N/A	3.7057 [4.0000]	92.6% { 122.8% }			
13C5_PFHxA_EIS	(318.0 / 273.0) 1007995	(6.06, N/A) (N/A, 0.01, N/A)	522.6	N/A	1.7208 [2.0000]	86.0% { 124.3% }			
13C4_PFHpA_EIS	(367.0 / 322.0) 961082	(7.00, N/A) (N/A, 0.01, N/A)	656.9	N/A	1.8887 [2.0000]	94.4% { 128.8% }			
13C8_PFOA_EIS	(421.0 / 376.0) 859465	(7.82, N/A) (N/A, 0.01, N/A)	835.8	N/A	1.6508 [2.0000]	82.5% { 108.7% }			
13C9_PFNA_EIS	(472.0 / 427.0) 369850	(8.55, N/A) (N/A, 0.00, N/A)	477.9	N/A	0.8747 [1.0000]	87.5% { 112.7% }			
13C6_PFDA_EIS	(519.0 / 474.0) 518104	(9.24, N/A) (N/A, 0.02, N/A)	398.6	N/A	0.8523 [1.0000]	85.2% { 116.7% }			
13C7_PFUnA_EIS	(570.0 / 525.0) 656729	(9.69, N/A) (N/A, 0.01, N/A)	529.4	N/A	0.8785 [1.0000]	87.8% { 136.5% }			

Analyte	(Q1 / Q3) Area Counts*min	R.T. (R.T [min], R.R.T.) (Δ RT-[min], Δ RT- CV[min], Δ RT ion[s])	S / N	Ion Ratio IR Vs MP% IR Vs CV%	Concentration [True] ng/mL	Q.C. Rec. {Area%CV}	Primary Transition	Confirmation Transition	Flag
13C2_PFDa_EIS	(615.0 / 570.0) 656113	(9.88, N/A) (N/A, 0.01, N/A)	675.5	N/A	0.8795 [1.0000]	87.9% { 114.1% }			
13C2_PFTeDA_EIS	(715.0 / 670.0) 397759	(10.11, N/A) (N/A, 0.01, N/A)	708.8	N/A	0.8415 [1.0000]	84.1% { 97.7% }			
13C3_PFBs_EIS	(302.0 / 80.0) 2410120	(6.01, N/A) (N/A, 0.01, N/A)	600.9	N/A	1.9423 [2.0000]	97.1% { 118.6% }			
13C3_PFHxS_EIS	(402.0 / 80.0) 1184915	(7.93, N/A) (N/A, 0.01, N/A)	700.3	N/A	1.7636 [2.0000]	88.2% { 119.1% }			
13C8_PFOS_EIS	(507.0 / 80.0) 2021546	(9.39, N/A) (N/A, 0.01, N/A)	480.2	N/A	1.7476 [2.0000]	87.4% { 134.1% }			
13C2_4:2FTS_EIS	(329.0 / 81.0) 726624	(5.73, N/A) (N/A, 0.01, N/A)	491.1	N/A	5.1832 [4.0000]	129.6% { 139.9% }			
13C2_6:2FTS_EIS	(429.0 / 81.0) 830024	(7.48, N/A) (N/A, 0.01, N/A)	679.7	N/A	4.4749 [4.0000]	111.9% { 116.9% }			
13C2_8:2FTS_EIS	(529.0 / 81.0) 811762	(8.90, N/A) (N/A, 0.01, N/A)	424.9	N/A	3.4718 [4.0000]	86.8% { 132.6% }			
13C8_PFOsa_EIS	(506.0 / 78.0) 2406913	(10.17, N/A) (N/A, 0.01, N/A)	972.4	N/A	1.7827 [2.0000]	89.1% { 117.5% }			
D3_NMeFOSA_EIS	(515.0 / 169.0) 162130	(10.60, N/A) (N/A, 0.01, N/A)	538.5	N/A	0.6350 [2.0000]	31.8% { 40.8% }			
D5_NEtFOSA_EIS	(531.0 / 169.0) 124627	(10.69, N/A) (N/A, 0.01, N/A)	791.7	N/A	0.5329 [2.0000]	26.6% { 33.8% }			



Chemist: HGH
 Instrument: Saphira
 Type: Sciex Q3 5500

Sample I.D.: BBL0371-BLK1
 DF, IV: 1, 10.0µL
 Acquisition Method: 1633 2022-12-27.dam

Quant Method: 1633 - S2022-12-29A
 Path: S2022-12-30A (7)
 Acquired: 2022/12/30 - 05:19

Analyte	(Q1 / Q3) Area Counts*min	R.T. (R.T [min], R.R.T.) (Δ RT-I[μ min], Δ RT- CV[μ min], Δ RT ion[s])	S / N	Ion Ratio IR Vs MP% IR Vs CV%	Concentration [True] ng/mL	Q.C. Rec. {Area%CV}	Primary Transition	Confirmation Transition	Flag
D3_MeFOSAA_EIS	(573.0 / 419.0) 1062493	(9.45, N/A) (N/A, 0.01, N/A)	227.2	N/A	2.9193 [4.0000]	73.0% { 106.5% }			
D5_EtFOSAA_EIS	(589.0 / 419.0) 852023	(9.65, N/A) (N/A, 0.01, N/A)	108.4	N/A	2.9443 [4.0000]	73.6% { 98.7% }			
D7_NMeFOSE_EIS	(623.0 / 58.9) 732994	(10.57, N/A) (N/A, 0.01, N/A)	1022.7	N/A	13.1406 [20.0000]	65.7% { 79.8% }			
D9_NEtFOSE_EIS	(639.0 / 58.9) 332663	(10.67, N/A) (N/A, 0.01, N/A)	940.0	N/A	12.9329 [20.0000]	64.7% { 69.9% }			
13C3_HFPODA_EIS	(287.0 / 169.0) 2357889	(6.41, N/A) (N/A, 0.01, N/A)	700.8	N/A	7.1956 [8.0000]	89.9% { 129.4% }			

ANALYSIS DATA SHEET

LCSa

Laboratory:a	APPL, LLCa	Work Order:a	22L0004a
Client:a	Tidewater, Inc.a	Project:a	NASA JPL Sl
M trix:a	Watera	Laboratory ID:a	BBL0371-BS1a
Sampled:a		Prepared:a	12/19/22 12:17a
Solids:a		Preparation:a	Table B-15a
Batch:a	BBL0371a	Sequence:a	SB04003a
Column:a	1a	Calibration:a	2253011a
			Instrument:a Saphira
			File ID:a S2022-12-29C (8)a
			Analyzed:a 12/30/22 05:32a
			Dilution:a 1a

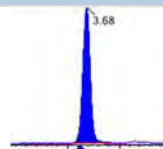
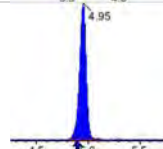
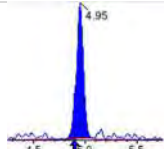
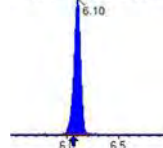
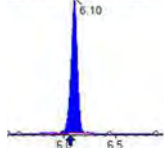
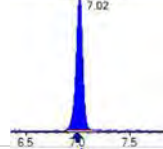
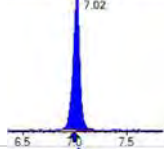
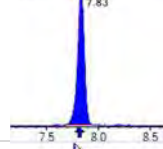
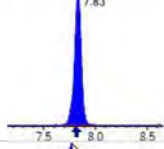
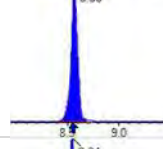
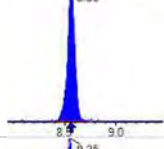
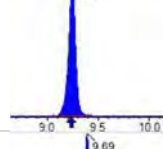
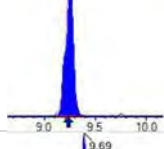
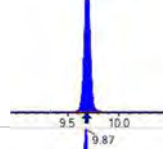
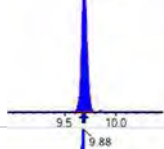
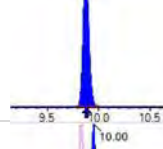
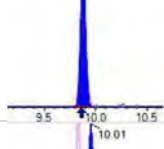
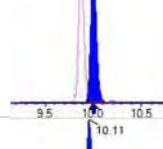
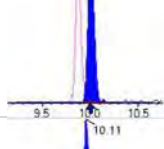
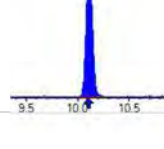
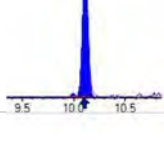
COMPOUNDL	CONC. (ng/L)L	OQL	DL	QL
PFBAa	27.3a	3.2a	0.050a	
PFPEAa	13.4a	1.6a	0.062a	
PFHXAa	6.42a	0.80a	0.064a	
PFHPAa	6.63a	0.80a	0.050a	
PFOAa	6.88a	0.80a	0.082a	
PFNAa	7.58a	0.80a	0.050a	
PFDAa	7.54a	0.80a	0.050a	
PFUnAa	5.73a	0.80a	0.080a	
PFDOAa	6.76a	0.80a	0.050a	
PFTRDAa	5.48a	0.80a	0.058a	
PFTEDAa	6.16a	0.80a	0.086a	
PFBSa	5.96a	0.80a	0.050a	
PFPESa	6.52a	0.80a	0.058a	
PFHXSa	6.16a	0.80a	0.050a	
PFHPSa	6.08a	0.80a	0.056a	
PFOSa	6.89a	0.80a	0.050a	
PFNSa	6.66a	0.80a	0.25a	
PFDSa	6.45a	0.80a	0.064a	
4:2FTSa	26.7a	3.2a	0.11a	
6:2FTSa	27.9a	3.2a	0.090a	
8:2FTSa	25.0a	3.2a	0.20a	
PFOSAa	6.50a	3.2a	0.050a	
NMeFOSAa	31.1a	3.2a	0.99a	
NEtFOSAa	28.6a	3.2a	0.98a	
NMeFOSAAa	6.87a	0.80a	0.072a	
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NMeFOSEa	28.6a	3.2a	0.60a	
NEtFOSEa	30.0a	3.2a	0.60a	
HFPO-DAa	14.0a	1.6a	0.49a	
ADONa	13.3a	1.6a	0.38a	

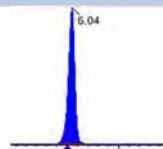
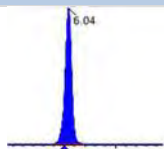
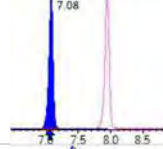
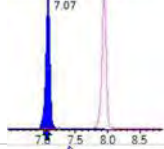
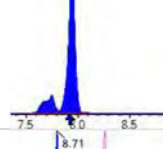
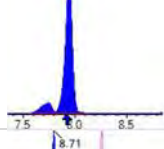
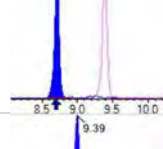
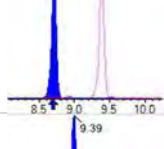
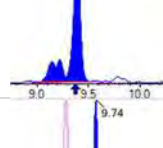
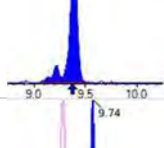
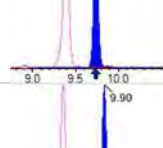
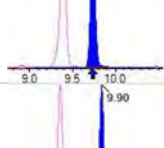
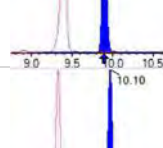
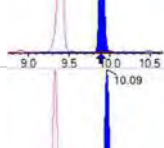
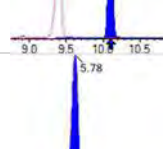
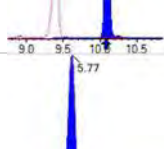
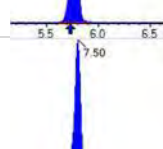
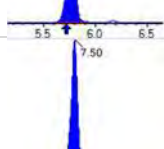
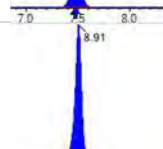
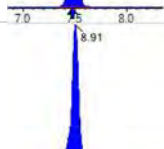
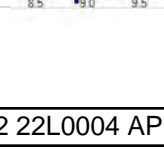
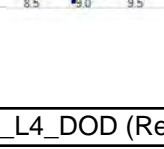
ANALYSIS DATA SHEET

LCSa

Laboratory:a	APPL, LLCa	Work Order:a	22L0004a
Client:a	Tidewater, Inc.a	Project:a	NASA JPL Sla
Matrix:a	Watera	Laboratory ID:a	BBL0371-BS1a
Sampled:a		Prepared:a	12/19/22 12:17a
Solids:a		Preparation:a	Table B-15a
Batch:a	BBL0371a	Sequence:a	SB04003a
Column:a	1a	Calibration:a	2253011a
			Instrument:a Saphira
			File ID:a S2022-12-29C (8)a
			Analyzed:a 12/30/22 05:32a
			Dilution:a 1a

COMPOUNDL	CONC. (ng/L)L	OQL	DL	QL
9CL-PF3ONSa	13.2a	1.6a	0.24a	
11CL-PF3OUDSa	14.3a	1.6a	0.24a	

Analyte	(Q1 / Q3) Area Counts*min	R.T. (R.T [min], R.R.T.) (Δ RT-[min], Δ RT- CV[min], Δ RT ion[s])	S / N	Ion Ratio IR Vs MP% IR Vs CV%	Concentration [True] ng/mL	Q.C. Rec. {Area%CV}	Primary Transition	Confirmation Transition	Flag
PFBA	(213.0 / 169.0) 847947	(3.68, 1.00) (0.00, N/A, 0.0)	403.7	N/A 0.0 0.0	3.4174 [4.0000]	85.4%			
PFPeA	(263.0 / 219.0) 604848 (263.0 / 69.0) 6575	(4.95, 1.00) (0.00, N/A, -0.1)	530.0 84.1	0.0109 105.2 94.0	1.6782 [2.0000]	83.9%			
PFHxA	(313.0 / 269.0) 403227 (313.0 / 119.0) 36959	(6.10, 1.00) (0.00, N/A, 0.1)	438.0 184.3	0.0917 94.2 101.2	0.8026 [1.0000]	80.3%			
PFHpA	(363.0 / 319.0) 369575 (363.0 / 169.0) 105077	(7.02, 1.00) (0.00, N/A, -0.1)	387.2 268.6	0.2843 99.4 104.1	0.8284 [1.0000]	82.8%			
PFOA	(413.0 / 369.0) 401625 (413.0 / 169.0) 136166	(7.83, 1.00) (0.00, N/A, 0.1)	477.1 385.3	0.3390 111.7 111.0	0.8604 [1.0000]	86.0%			
PFNA	(463.0 / 419.0) 318535 (463.0 / 169.0) 70849	(8.56, 1.00) (0.00, N/A, 0.0)	499.9 310.8	0.2224 105.1 104.2	0.9477 [1.0000]	94.8%			
PFDA	(513.0 / 469.0) 474500 (513.0 / 169.0) 37723	(9.24, 1.00) (0.00, N/A, -0.6)	472.8 402.2	0.0795 86.2 83.4	0.9425 [1.0000]	94.3%			
PFUnA	(563.0 / 519.0) 443070 (563.0 / 169.0) 47991	(9.69, 1.00) (0.00, N/A, 0.1)	515.8 1198.5	0.1083 140.8 112.7	0.7168 [1.0000]	71.7%			
PFDoA	(613.0 / 569.0) 544107 (613.0 / 169.0) 87623	(9.87, 1.00) (0.00, N/A, -0.1)	857.6 297.2	0.1610 119.6 125.9	0.8449 [1.0000]	84.5%			
PFTrDA	(663.0 / 619.0) 384711 (663.0 / 169.0) 95524	(10.00, 1.01) (N/A, 0.00, -0.4)	344.0 266.8	0.2483 114.0 136.0	0.6846 [1.0000]	68.5%			QC,
PFTeDA	(713.0 / 669.0) 314315 (713.0 / 169.0) 53039	(10.11, 1.00) (0.00, N/A, 0.1)	357.3 157.0	0.1687 85.5 70.9	0.7697 [1.0000]	77.0%			

Analyte	(Q1 / Q3) Area Counts*min	R.T. (R.T [min], R.R.T.) (Δ RT-[min], Δ RT- CV[min], Δ RT ion[s])	S / N	Ion Ratio IR Vs MP% IR Vs CV%	Concentration [True] ng/mL	Q.C. Rec. {Area%CV}	Primary Transition	Confirmation Transition	Flag
PFBS	(299.0 / 80.0) 581492 (299.0 / 99.0) 381519	(6.04, 1.00) (0.00, N/A, 0.2)	745.6 672.2	0.6561 99.8 102.3	0.7445 [0.8847]	84.2%			
PFPeS	(349.0 / 80.0) 932938 (349.0 / 99.0) 336452	(7.08, 0.89) (N/A, 0.03, 0.1)	720.0 576.0	0.3606 97.3 101.6	0.8151 [0.9384]	86.9%			
PFHxS	(399.0 / 80.0) 776787 (399.0 / 99.0) 252013	(7.94, 1.00) (0.00, N/A, -0.1)	675.9 666.9	0.3244 99.5 101.3	0.7705 [0.9110]	84.6%			
PFHpS	(449.0 / 80.0) 686226 (449.0 / 99.0) 191515	(8.71, 0.93) (N/A, 0.01, 0.0)	334.3 426.0	0.2791 107.1 98.7	0.7598 [0.9514]	79.9%			
PFOS	(499.0 / 80.0) 894773 (499.0 / 99.0) 186919	(9.39, 1.00) (0.00, N/A, 0.2)	168.2 348.9	0.2089 100.4 91.6	0.8608 [0.9275]	92.8%			
PFNS	(549.0 / 80.0) 981435 (549.0 / 99.0) 256907	(9.74, 1.04) (N/A, 0.01, 0.1)	485.3 399.6	0.2618 110.0 113.1	0.8329 [0.9599]	86.8%			
PFDS	(599.0 / 80.0) 1149326 (599.0 / 99.0) 272241	(9.90, 1.05) (N/A, 0.01, -0.3)	1057.6 361.6	0.2369 90.0 125.1	0.8067 [0.9631]	83.8%			
PFDoS	(699.0 / 80.0) 689146 (699.0 / 99.0) 135849	(10.10, 1.08) (N/A, 0.01, 0.2)	974.2 379.1	0.1971 100.5 109.1	1.0271 [0.9696]	105.9%			
4:2FTS	(327.0 / 307.0) 1896821 (327.0 / 81.0) 962991	(5.78, 1.00) (0.00, N/A, 0.2)	674.0 350.8	0.5077 70.9 81.4	3.3393 [3.7381]	89.3%			
6:2FTS	(427.0 / 407.0) 1047016 (427.0 / 81.0) 736670	(7.50, 1.00) (0.00, N/A, 0.1)	631.4 616.6	0.7036 95.2 101.2	3.4909 [3.7962]	92.0%			
8:2FTS	(527.0 / 507.0) 968695 (527.0 / 81.0) 670014	(8.91, 1.00) (0.00, N/A, 0.1)	498.6 484.9	0.6917 113.1 92.1	3.1275 [3.8332]	81.6%			

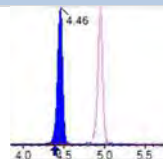
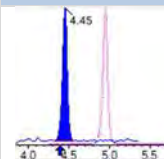
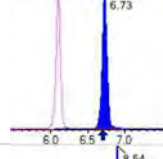
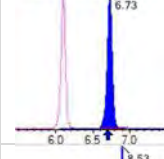
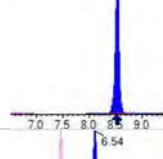
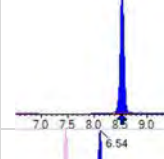
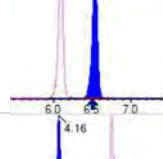
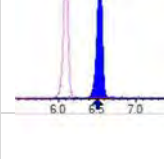
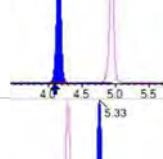
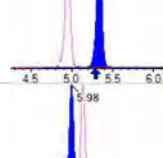
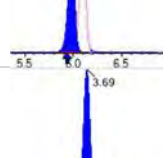
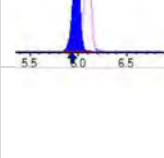
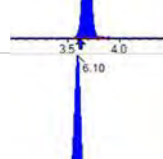
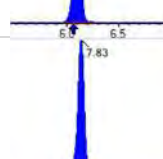
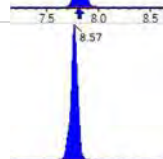
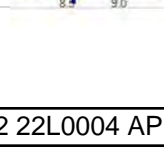


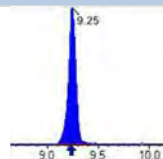
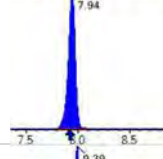
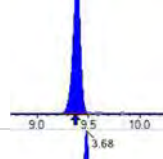
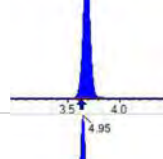
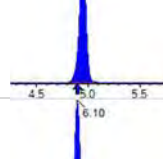
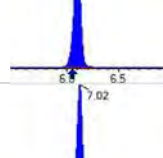
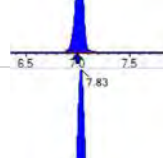
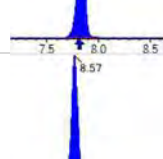
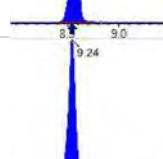
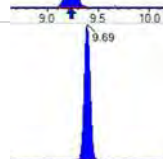
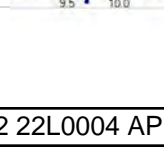
Chemist: HGH
 Instrument: Saphira
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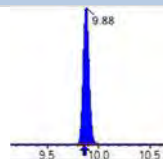
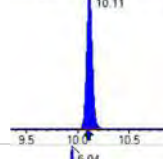
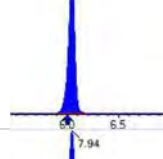
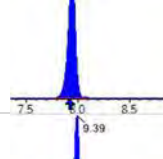
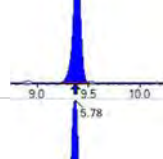
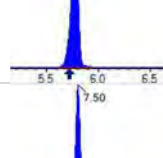
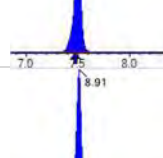
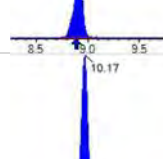
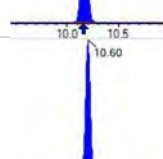
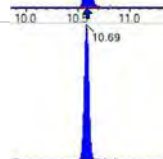
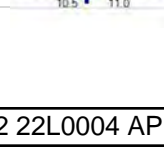
Sample I.D.: BBL0371-BS1
 DF, IV: 1, 10.0µL
 Acquisition Method: 1633 2022-12-27.dam

Quant Method: 1633 - S2022-12-29A
 Path: S2022-12-30A (8)
 Acquired: 2022/12/30 - 05:32

Analyte	(Q1 / Q3) Area Counts*min	R.T. (R.T [min], R.R.T.) (Δ RT-[min], Δ RT- CV[min], Δ RT ion[s])	S / N	Ion Ratio IR Vs MP% IR Vs CV%	Concentration [True] ng/mL	Q.C. Rec. {Area%CV}	Primary Transition	Confirmation Transition	Flag
PFOSA	(498.0 / 78.0) 1051852 (498.0 / 478.0) 21170	(10.16, 1.00) (0.00, N/A, -0.2)	773.2 157.9	0.0201 96.4 97.6	0.8126 [1.0000]	81.3%			
NMeFOSA	(512.0 / 219.0) 286522 (512.0 / 169.0) 193193	(10.60, 1.00) (0.00, N/A, 0.1)	857.5 645.0	0.6743 97.4 100.8	3.8918 [4.0000]	97.3%			
NEIFOSA	(526.0 / 219.0) 225548 (526.0 / 169.0) 236874	(10.69, 1.00) (0.00, N/A, 0.0)	795.1 622.9	1.0591 106.7 98.1	3.5703 [4.0000]	89.3%			
NMeFOSAA	(570.0 / 419.0) 202883 (570.0 / 483.0) 104790	(9.45, 1.00) (0.00, N/A, 0.0)	200.3 228.6	0.5165 92.8 97.8	0.8589 [1.0000]	85.9%			
NEIFOSAA	(584.0 / 419.0) 173326 (584.0 / 526.0) 111531	(9.65, 1.00) (0.00, N/A, -0.2)	380.9 229.6	0.6435 108.5 97.7	0.6673 [1.0000]	66.7%			QC,
NMeFOSE	(616.0 / 59.0) 182833	(10.57, 1.00) (0.01, N/A, 0.0)	477.5	N/A 0.0 0.0	3.5700 [4.0000]	89.3%			
NEtFOSE	(630.0 / 59.0) 39329	(10.67, 1.00) (0.01, N/A, 0.0)	507.2	N/A 0.0 0.0	3.7487 [4.0000]	93.7%			
HFPO-DA	(285.0 / 169.0) 315540 (285.0 / 185.0) 805457	(6.44, 1.00) (0.00, N/A, -0.1)	624.3 674.2	2.5526 99.6 102.8	1.7528 [2.0000]	87.6%			
ADONA	(377.0 / 85.0) 1196987 (377.0 / 251.0) 139480	(7.33, 1.14) (N/A, 0.02, 0.1)	663.7 309.4	0.1165 94.7 108.4	1.6685 [1.8854]	88.5%			
9CI-Pf3ONS	(531.0 / 351.0) 3227468 (533.0 / 353.0) 1017790	(9.69, 1.50) (N/A, 0.01, 0.2)	675.5 598.6	0.3154 99.8 105.8	1.6472 [1.8665]	88.3%			
11CI-PF3OUDS	(631.0 / 451.0) 1984205 (633.0 / 453.0) 566382	(9.98, 1.55) (N/A, 0.00, -0.1)	1092.8 874.2	0.2854 92.2 89.8	1.7893 [1.8864]	94.9%			

Analyte	(Q1 / Q3) Area Counts*min	R.T. (R.T [min], R.R.T.) (Δ RT-[min], Δ RT- CV[min], Δ RT ion[s])	S / N	Ion Ratio IR Vs MP% IR Vs CV%	Concentration [True] ng/mL	Q.C. Rec. {Area%CV}	Primary Transition	Confirmation Transition	Flag
3:3FTCA	(241.0 / 177.0) 37862 (241.0 / 117.0) 53286	(4.46, 0.90) (N/A, 0.06, 0.2)	478.6 203.1	1.4074 107.0 106.6	3.0563 [4.0000]	76.4%			
5:3FTCA	(341.0 / 236.7) 227712 (341.0 / 217.0) 382146	(6.73, 1.10) (N/A, 0.03, -0.1)	426.8 459.1	1.6782 93.5 108.3	2.9611 [4.0000]	74.0%			
7:3FTCA	(441.0 / 317.0) 296403 (441.0 / 337.0) 243159	(8.54, 1.40) (N/A, 0.02, 0.2)	440.6 373.2	0.8204 99.5 96.9	2.9589 [4.0000]	74.0%			
PFEESA	(315.0 / 135.0) 684100 (315.0 / 83.0) 197761	(6.54, 1.07) (N/A, 0.04, 0.1)	611.6 370.2	0.2891 94.8 103.6	1.4830 [1.7849]	83.1%			
PFMPA	(229.0 / 85.0) 177432	(4.16, 0.84) (N/A, 0.06, 0.0)	813.3	N/A 0.0 0.0	1.6857 [2.0000]	84.3%			
PFMBA	(279.0 / 85.0) 475960	(5.33, 1.08) (N/A, 0.06, 0.0)	785.3	N/A 0.0 0.0	1.5856 [2.0000]	79.3%			
NFDHA	(295.0 / 201.0) 392822 (295.0 / 85.0) 373305	(5.98, 0.98) (N/A, 0.05, 0.0)	511.5 471.9	0.9503 110.6 103.5	1.5929 [2.0000]	79.6%			
13C3_PFBA_IIS	(216.0 / 172.0) 283066	(3.69, N/A) (N/A, 0.07, N/A)	692.0	N/A	1.3144 [1.0000]	131.4% {120.0%}			
13C2_PFHxA_IIS	(315.0 / 270.0) 556774	(6.10, N/A) (N/A, 0.04, N/A)	516.8	N/A	1.4667 [1.0000]	146.7% {134.9%}			
13C4_PFOA_IIS	(417.0 / 372.0) 508963	(7.83, N/A) (N/A, 0.02, N/A)	619.4	N/A	1.4100 [1.0000]	141.0% {129.4%}			
13C5_PFNA_IIS	(468.0 / 423.0) 413699	(8.57, N/A) (N/A, 0.01, N/A)	505.2	N/A	1.4068 [1.0000]	140.7% {129.0%}			

Analyte	(Q1 / Q3) Area Counts*min	R.T. (R.T [min], R.R.T.) (Δ RT-[min], Δ RT- CV[min], Δ RT ion[s])	S / N	Ion Ratio IR Vs MP% IR Vs CV%	Concentration [True] ng/mL	Q.C. Rec. {Area%CV}	Primary Transition	Confirmation Transition	Flag
13C2_PFDA_IIS	(515.0 / 470.1) 459129	(9.25, N/A) (N/A, 0.02, N/A)	353.3	N/A	1.3478 [1.0000]	134.8% { 130.3% }			
18O2_PFHxS_IIS	(403.0 / 83.9) 821838	(7.94, N/A) (N/A, 0.02, N/A)	776.8	N/A	1.3582 [1.0000]	135.8% { 130.5% }			
13C4_PFOS_IIS	(503.0 / 79.9) 804236	(9.39, N/A) (N/A, 0.01, N/A)	351.8	N/A	1.2472 [1.0000]	124.7% { 123.0% }			
13C4_PFBA_EIS	(217.0 / 172.0) 2124540	(3.68, N/A) (N/A, 0.06, N/A)	878.5	N/A	7.4757 [8.0000]	93.4% { 114.1% }			
13C5_PFPeA_EIS	(268.0 / 223.0) 1518299	(4.95, N/A) (N/A, 0.06, N/A)	628.9	N/A	3.6145 [4.0000]	90.4% { 116.5% }			
13C5_PFHxA_EIS	(318.0 / 273.0) 1012599	(6.10, N/A) (N/A, 0.05, N/A)	505.6	N/A	1.7773 [2.0000]	88.9% { 124.9% }			
13C4_PFHpA_EIS	(367.0 / 322.0) 851487	(7.02, N/A) (N/A, 0.03, N/A)	490.3	N/A	1.7204 [2.0000]	86.0% { 114.1% }			
13C8_PFOA_EIS	(421.0 / 376.0) 876333	(7.83, N/A) (N/A, 0.02, N/A)	637.4	N/A	1.6828 [2.0000]	84.1% { 110.8% }			
13C9_PFNA_EIS	(472.0 / 427.0) 348267	(8.57, N/A) (N/A, 0.02, N/A)	522.2	N/A	0.8102 [1.0000]	81.0% { 106.1% }			
13C6_PFDA_EIS	(519.0 / 474.0) 507660	(9.24, N/A) (N/A, 0.02, N/A)	465.6	N/A	0.9154 [1.0000]	91.5% { 114.4% }			
13C7_PFUnA_EIS	(570.0 / 525.0) 677353	(9.69, N/A) (N/A, 0.01, N/A)	629.8	N/A	0.9931 [1.0000]	99.3% { 140.8% }			

Analyte	(Q1 / Q3) Area Counts*min	R.T. (R.T [min], R.R.T.) (Δ RT-[min], Δ RT- CV[min], Δ RT ion[s])	S / N	Ion Ratio IR Vs MP% IR Vs CV%	Concentration [True] ng/mL	Q.C. Rec. {Area%CV}	Primary Transition	Confirmation Transition	Flag
13C2_PFDa_EIS	(615.0 / 570.0) 671993	(9.88, N/A) (N/A, 0.01, N/A)	735.0	N/A	0.9873 [1.0000]	98.7% { 116.9% }			
13C2_PFTeDA_EIS	(715.0 / 670.0) 403709	(10.11, N/A) (N/A, 0.01, N/A)	805.7	N/A	0.9361 [1.0000]	93.6% { 99.1% }			
13C3_PFBs_EIS	(302.0 / 80.0) 2448582	(6.04, N/A) (N/A, 0.05, N/A)	566.0	N/A	1.9686 [2.0000]	98.4% { 120.5% }			
13C3_PFHxS_EIS	(402.0 / 80.0) 1164043	(7.94, N/A) (N/A, 0.02, N/A)	645.8	N/A	1.7284 [2.0000]	86.4% { 117.0% }			
13C8_PFOS_EIS	(507.0 / 80.0) 1785396	(9.39, N/A) (N/A, 0.01, N/A)	343.3	N/A	1.8422 [2.0000]	92.1% { 118.5% }			
13C2_4:2FTS_EIS	(329.0 / 81.0) 668182	(5.78, N/A) (N/A, 0.05, N/A)	594.6	N/A	4.7549 [4.0000]	118.9% { 128.6% }			
13C2_6:2FTS_EIS	(429.0 / 81.0) 747246	(7.50, N/A) (N/A, 0.03, N/A)	658.3	N/A	4.0189 [4.0000]	100.5% { 105.2% }			
13C2_8:2FTS_EIS	(529.0 / 81.0) 794261	(8.91, N/A) (N/A, 0.02, N/A)	525.8	N/A	3.3888 [4.0000]	84.7% { 129.8% }			
13C8_PFOA_EIS	(506.0 / 78.0) 2232210	(10.17, N/A) (N/A, 0.01, N/A)	737.6	N/A	1.9733 [2.0000]	98.7% { 109.0% }			
D3_NMeFOSA_EIS	(515.0 / 169.0) 151578	(10.60, N/A) (N/A, 0.01, N/A)	816.3	N/A	0.7086 [2.0000]	35.4% { 38.1% }			
D5_NEtFOSA_EIS	(531.0 / 169.0) 127381	(10.69, N/A) (N/A, 0.00, N/A)	583.6	N/A	0.6501 [2.0000]	32.5% { 34.5% }			



Chemist: HGH
 Instrument: Saphira
 Type: Sciex Q3 5500

Sample I.D.: BBL0371-BS1
 DF, IV: 1, 10.0µL
 Acquisition Method: 1633 2022-12-27.dam

Quant Method: 1633 - S2022-12-29A
 Path: S2022-12-30A (8)
 Acquired: 2022/12/30 - 05:32

Analyte	(Q1 / Q3) Area Counts*min	R.T. (R.T [min], R.R.T.) (Δ RT-I[μ min], Δ RT- CV[μ min], Δ RT ion[s])	S / N	Ion Ratio IR Vs MP% IR Vs CV%	Concentration [True] ng/mL	Q.C. Rec. {Area%CV}	Primary Transition	Confirmation Transition	Flag
D3_MeFOSAA_EIS	(573.0 / 419.0) 1041263	(9.45, N/A) (N/A, 0.02, N/A)	339.3	N/A	3.4146 [4.0000]	85.4% { 104.4% }			
D5_EtFOSAA_EIS	(589.0 / 419.0) 1053980	(9.65, N/A) (N/A, 0.01, N/A)	111.0	N/A	4.3471 [4.0000]	108.7% { 122.1% }			
D7_NMeFOSE_EIS	(623.0 / 58.9) 838928	(10.57, N/A) (N/A, 0.01, N/A)	1168.2	N/A	17.9504 [20.0000]	89.8% { 91.3% }			
D9_NEtFOSE_EIS	(639.0 / 58.9) 395201	(10.66, N/A) (N/A, 0.00, N/A)	1521.0	N/A	18.3376 [20.0000]	91.7% { 83.0% }			
13C3_HFPODA_EIS	(287.0 / 169.0) 2074722	(6.44, N/A) (N/A, 0.04, N/A)	732.3	N/A	6.5094 [8.0000]	81.4% { 113.9% }			

ANALYSIS DATA SHEET

LCS Dupa

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Client:a	Tidewater, Inc.a	Project:a	NASA JPL Sla
Matrix:a	Watera	Laboratory ID:a	BBL0371-BSD1a
Sampled:a		File ID:a	S2022-12-29C (9)a
Solids:a		Prepared:a	12/19/22 12:17a
Batch:a	BBL0371a	Analyzed:a	12/30/22 05:45a
Column:a	1a	Preparation:a	Table B-15a
		Dilution:a	1a
		Calibration:a	2253011a
		Instrument:a	Saphira
		Sequence:a	SB04003a

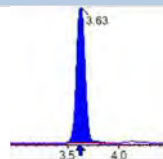
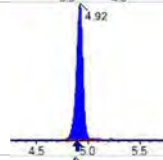
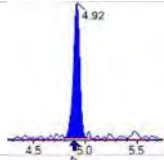
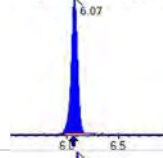
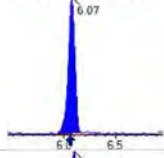
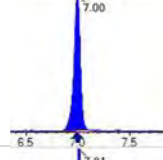
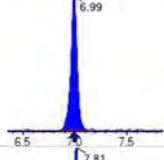
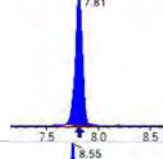
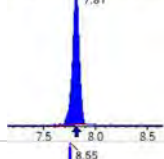
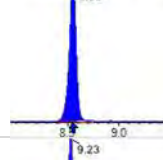
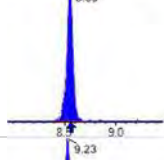
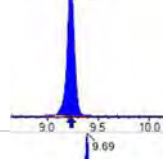
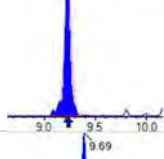
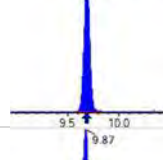
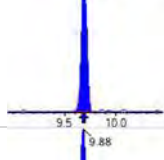
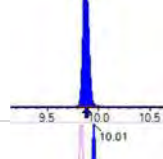
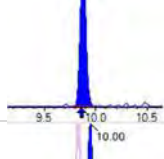
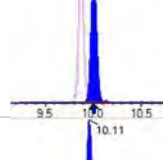
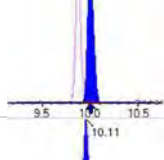
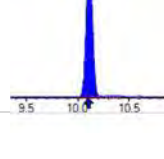
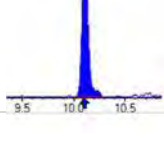
COMPOUNDL	CONC. (ng/L)L	OQL	DL	QL
PFBAa	29.4a	3.2a	0.050 a	
PFPEAa	14.4a	1.6a	0.062 a	
PFHXAa	6.75a	0.80a	0.064 a	
PFHPAa	6.93a	0.80a	0.050 a	
PFOAa	6.94a	0.80a	0.082 a	
PFNAa	7.74a	0.80a	0.050 a	
PFDAa	7.03a	0.80a	0.050 a	
PFUnAa	7.10a	0.80a	0.080 a	
PFDOAa	7.00a	0.80a	0.050 a	
PFTRDAa	5.74a	0.80a	0.058 a	
PFTEDAa	8.88a	0.80a	0.086a	BS3 a
PFBSa	6.25a	0.80a	0.050 a	
PFPESa	7.19a	0.80a	0.058 a	
PFHXSa	6.43a	0.80a	0.050 a	
PFHPSa	6.71a	0.80a	0.056 a	
PFOSa	6.59a	0.80a	0.050 a	
PFNSa	7.14a	0.80a	0.25 a	
PFDSa	7.12a	0.80a	0.064 a	
4:2FTSa	26.0a	3.2a	0.11 a	
6:2FTSa	26.0a	3.2a	0.090 a	
8:2FTSa	26.8a	3.2a	0.20 a	
PFOSAa	7.21a	3.2a	0.050 a	
NMeFOSAa	27.2a	3.2a	0.99 a	
NEtFOSAa	29.2a	3.2a	0.98 a	
NMeFOSAAa	6.77a	0.80a	0.072 a	
NEtFOSAAa	6.60a	0.80a	0.050 a	
NMeFOSEa	27.8a	3.2a	0.60 a	
NEtFOSEa	32.6a	3.2a	0.60 a	
HFPO-DAa	13.2a	1.6a	0.49 a	
ADONa	14.1a	1.6a	0.38 a	

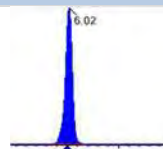
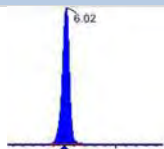
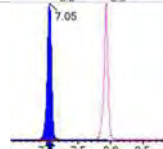
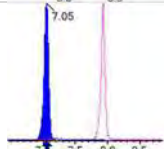
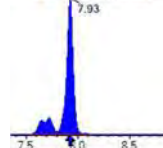
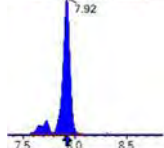
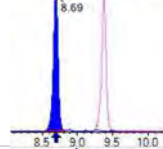
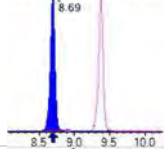
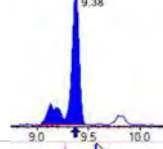
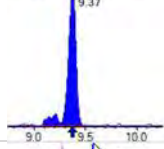
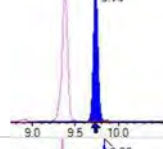
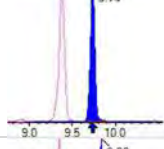
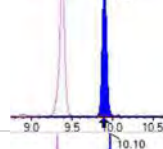
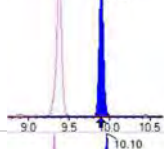
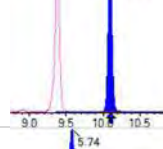
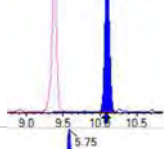
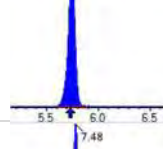
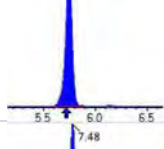
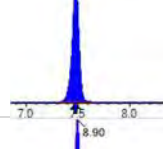
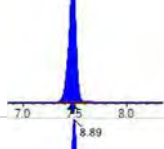
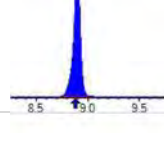
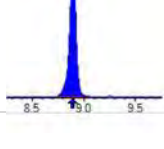
ANALYSIS DATA SHEET

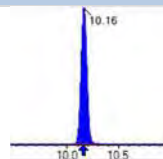
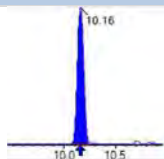
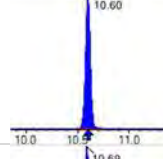
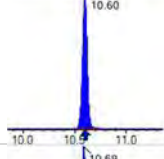
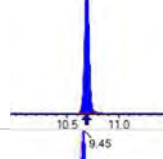
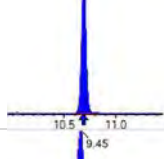
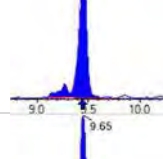
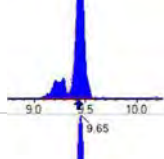
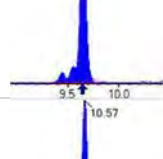
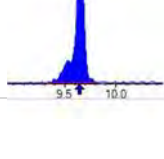
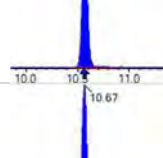
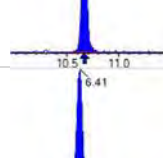
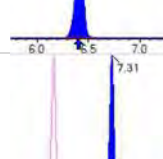
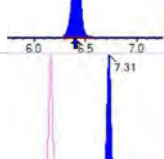
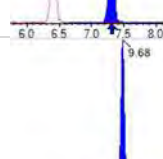
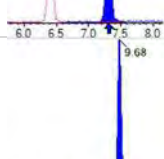
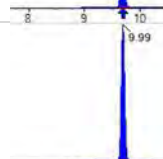
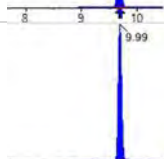
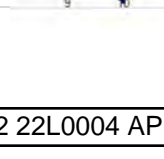
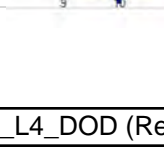
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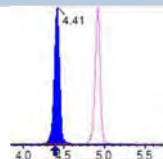
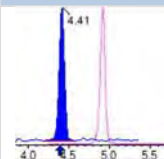
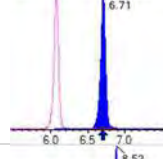
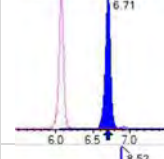
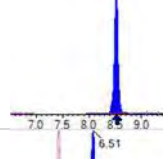
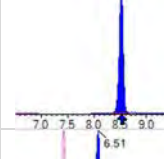
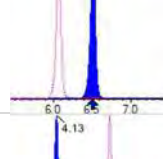
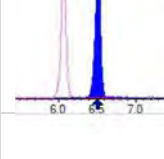
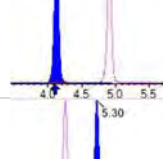
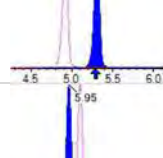
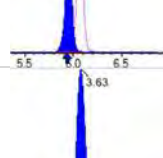
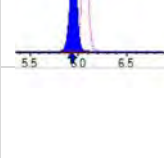
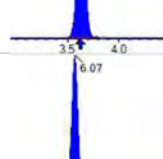
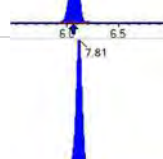
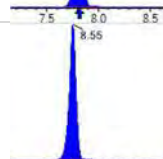
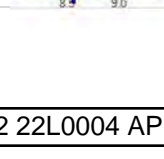
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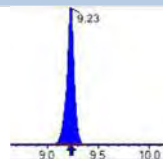
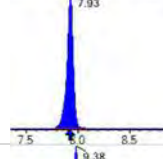
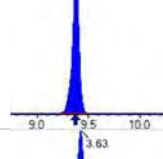
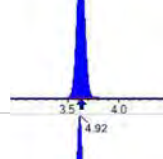
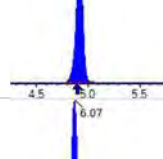
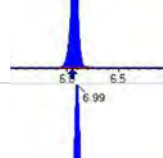
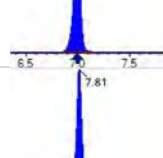
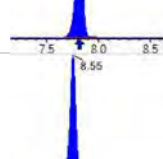
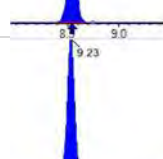
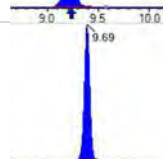
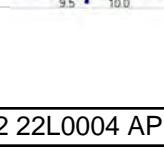
COMPOUNDL	CONC. (ng/L)L	OQL	DL	QL
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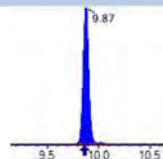
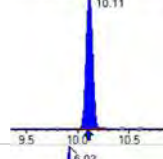
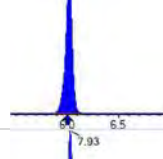
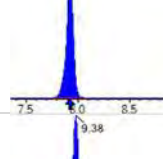
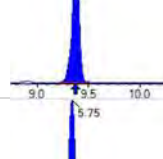
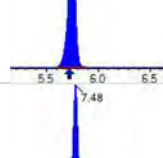
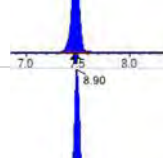
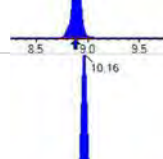
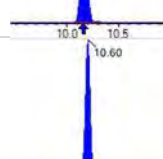
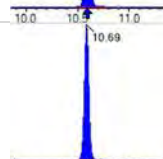
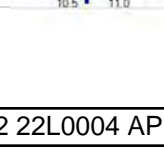
Analyte	(Q1 / Q3) Area Counts*min	R.T. (R.T [min], R.R.T.) (Δ RT-[min], Δ RT- CV[min], Δ RT ion[s])	S / N	Ion Ratio IR Vs MP% IR Vs CV%	Concentration [True] ng/mL	Q.C. Rec. {Area%CV}	Primary Transition	Confirmation Transition	Flag
PFBA	(213.0 / 169.0) 884081	(3.63, 1.00) (0.00, N/A, 0.0)	428.8	N/A 0.0 0.0	3.6731 [4.0000]	91.8%			
PFPeA	(263.0 / 219.0) 663340 (263.0 / 69.0) 7343	(4.92, 1.00) (0.00, N/A, 0.0)	686.5 94.7	0.0111 107.1 95.7	1.8036 [2.0000]	90.2%			
PFHxA	(313.0 / 269.0) 409208 (313.0 / 119.0) 42732	(6.07, 1.00) (0.00, N/A, -0.2)	441.2 258.4	0.1044 107.3 115.3	0.8440 [1.0000]	84.4%			
PFHpA	(363.0 / 319.0) 411089 (363.0 / 169.0) 112624	(7.00, 1.00) (0.00, N/A, 0.2)	364.5 310.7	0.2740 95.8 100.3	0.8661 [1.0000]	86.6%			
PFOA	(413.0 / 369.0) 441539 (413.0 / 169.0) 145174	(7.81, 1.00) (0.00, N/A, 0.0)	367.0 421.2	0.3288 108.3 107.7	0.8674 [1.0000]	86.7%			
PFNA	(463.0 / 419.0) 357051 (463.0 / 169.0) 72710	(8.55, 1.00) (0.00, N/A, -0.1)	414.8 371.3	0.2036 96.2 95.4	0.9681 [1.0000]	96.8%			
PFDA	(513.0 / 469.0) 432258 (513.0 / 169.0) 32635	(9.23, 1.00) (0.00, N/A, 0.2)	377.9 123.8	0.0755 81.9 79.2	0.8783 [1.0000]	87.8%			
PFUnA	(563.0 / 519.0) 540568 (563.0 / 169.0) 51508	(9.69, 1.00) (0.00, N/A, -0.1)	490.6 221.0	0.0953 123.9 99.2	0.8873 [1.0000]	88.7%			
PFDoA	(613.0 / 569.0) 666852 (613.0 / 169.0) 84093	(9.87, 1.00) (0.00, N/A, -0.2)	735.8 145.9	0.1261 93.6 98.6	0.8751 [1.0000]	87.5%			
PFTrDA	(663.0 / 619.0) 477265 (663.0 / 169.0) 95158	(10.01, 1.01) (N/A, 0.01, 0.3)	610.4 314.3	0.1994 91.5 109.2	0.7178 [1.0000]	71.8%			
PFTeDA	(713.0 / 669.0) 379819 (713.0 / 169.0) 66060	(10.11, 1.00) (0.00, N/A, 0.3)	358.5 206.3	0.1739 88.1 73.1	1.1097 [1.0000]	111.0%			

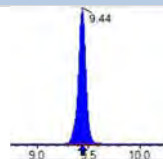
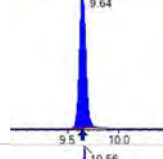
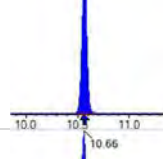
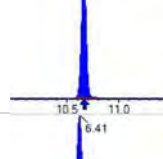
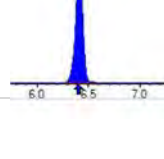
Analyte	(Q1 / Q3) Area Counts*min	R.T. (R.T [min], R.R.T.) (Δ RT-[min], Δ RT- CV[min], Δ RT ion[s])	S / N	Ion Ratio IR Vs MP% IR Vs CV%	Concentration [True] ng/mL	Q.C. Rec. {Area%CV}	Primary Transition	Confirmation Transition	Flag
PFBS	(299.0 / 80.0) 549804 (299.0 / 99.0) 345463	(6.02, 1.00) (0.00, N/A, 0.0)	706.5 461.0	0.6283 95.6 98.0	0.7818 [0.8847]	88.4%			
PFPeS	(349.0 / 80.0) 1041939 (349.0 / 99.0) 328558	(7.05, 0.89) (N/A, 0.01, 0.0)	600.3 483.2	0.3153 85.1 88.9	0.8992 [0.9384]	95.8%			
PFHxS	(399.0 / 80.0) 820504 (399.0 / 99.0) 259990	(7.93, 1.00) (0.00, N/A, 0.2)	803.9 621.5	0.3169 97.2 98.9	0.8039 [0.9110]	88.2%			
PFHpS	(449.0 / 80.0) 772376 (449.0 / 99.0) 198770	(8.69, 0.93) (N/A, 0.00, 0.1)	431.4 472.9	0.2573 98.7 91.0	0.8384 [0.9514]	88.1%			
PFOS	(499.0 / 80.0) 872946 (499.0 / 99.0) 184728	(9.38, 1.00) (0.00, N/A, 0.1)	181.9 406.7	0.2116 101.7 92.8	0.8233 [0.9275]	88.8%			
PFNS	(549.0 / 80.0) 1072437 (549.0 / 99.0) 254597	(9.74, 1.04) (N/A, 0.01, 0.0)	519.4 454.3	0.2374 99.7 102.6	0.8923 [0.9599]	93.0%			
PFDS	(599.0 / 80.0) 1292597 (599.0 / 99.0) 290043	(9.90, 1.06) (N/A, 0.01, 0.1)	681.1 409.9	0.2244 85.3 118.5	0.8895 [0.9631]	92.4%			
PFDoS	(699.0 / 80.0) 632874 (699.0 / 99.0) 143324	(10.10, 1.08) (N/A, 0.00, 0.0)	487.5 245.3	0.2265 115.5 125.3	0.9248 [0.9696]	95.4%			
4:2FTS	(327.0 / 307.0) 1907839 (327.0 / 81.0) 1185078	(5.74, 1.00) (0.00, N/A, -0.1)	604.7 453.3	0.6212 86.8 99.6	3.2491 [3.7381]	86.9%			
6:2FTS	(427.0 / 407.0) 1033486 (427.0 / 81.0) 721800	(7.48, 1.00) (0.00, N/A, 0.0)	642.3 638.6	0.6984 94.5 100.4	3.2445 [3.7962]	85.5%			
8:2FTS	(527.0 / 507.0) 1032302 (527.0 / 81.0) 703828	(8.90, 1.00) (0.00, N/A, 0.2)	472.9 533.0	0.6818 111.4 90.8	3.3450 [3.8332]	87.3%			

Analyte	(Q1 / Q3) Area Counts*min	R.T. (R.T [min], R.R.T.) (Δ RT-[min], Δ RT- CV[min], Δ RT ion[s])	S / N	Ion Ratio IR Vs MP% IR Vs CV%	Concentration [True] ng/mL	Q.C. Rec. {Area%CV}	Primary Transition	Confirmation Transition	Flag
PFOSA	(498.0 / 78.0) 1201164 (498.0 / 478.0) 27590	(10.16, 1.00) (0.00, N/A, 0.3)	715.8 422.8	0.0230 110.0 111.4	0.9018 [1.0000]	90.2%			
NMeFOSA	(512.0 / 219.0) 351718 (512.0 / 169.0) 268530	(10.60, 1.00) (0.00, N/A, 0.0)	888.5 708.1	0.7635 110.3 114.2	3.4011 [4.0000]	85.0%			
NEIFOSA	(526.0 / 219.0) 295585 (526.0 / 169.0) 307296	(10.69, 1.00) (0.00, N/A, 0.0)	644.0 567.0	1.0396 104.7 96.3	3.6461 [4.0000]	91.2%			
NMeFOSAA	(570.0 / 419.0) 206196 (570.0 / 483.0) 115455	(9.45, 1.00) (0.01, N/A, -0.1)	212.7 567.0	0.5599 100.6 106.0	0.8458 [1.0000]	84.6%			
NEIFOSAA	(584.0 / 419.0) 193457 (584.0 / 526.0) 131490	(9.65, 1.00) (0.01, N/A, -0.2)	519.8 284.9	0.6797 114.6 103.2	0.8252 [1.0000]	82.5%			
NMeFOSE	(616.0 / 59.0) 145478	(10.57, 1.00) (0.00, N/A, 0.0)	515.9	N/A 0.0 0.0	3.4757 [4.0000]	86.9%			
NEtFOSE	(630.0 / 59.0) 32992	(10.67, 1.00) (0.01, N/A, 0.0)	366.2	N/A 0.0 0.0	4.0749 [4.0000]	101.9%			
HFPO-DA	(285.0 / 169.0) 313288 (285.0 / 185.0) 854961	(6.41, 1.00) (0.00, N/A, 0.1)	611.9 699.7	2.7290 106.5 109.9	1.6477 [2.0000]	82.4%			
ADONA	(377.0 / 85.0) 1332878 (377.0 / 251.0) 156994	(7.31, 1.14) (N/A, 0.00, -0.1)	619.3 349.4	0.1178 95.7 109.6	1.7591 [1.8854]	93.3%			
9CI-Pf3ONS	(531.0 / 351.0) 3368288 (533.0 / 353.0) 1116127	(9.68, 1.51) (N/A, 0.01, 0.2)	676.7 639.4	0.3314 104.9 111.2	1.6277 [1.8665]	87.2%			
11CI-PF3OUDS	(631.0 / 451.0) 2333458 (633.0 / 453.0) 656095	(9.99, 1.56) (N/A, 0.01, 0.1)	725.1 765.9	0.2812 90.8 88.4	1.9923 [1.8864]	105.6%			

Analyte	(Q1 / Q3) Area Counts*min	R.T. (R.T [min], R.R.T.) (Δ RT-[min], Δ RT- CV[min], Δ RT ion[s])	S / N	Ion Ratio IR Vs MP% IR Vs CV%	Concentration [True] ng/mL	Q.C. Rec. {Area%CV}	Primary Transition	Confirmation Transition	Flag
3:3FTCA	(241.0 / 177.0) 40608 (241.0 / 117.0) 54793	(4.41, 0.90) (N/A, 0.02, 0.1)	564.1 196.1	1.3493 102.6 102.2	3.2123 [4.0000]	80.3%			
5:3FTCA	(341.0 / 236.7) 266110 (341.0 / 217.0) 423711	(6.71, 1.11) (N/A, 0.01, 0.2)	361.9 384.2	1.5922 88.7 102.8	3.5857 [4.0000]	89.6%			
7:3FTCA	(441.0 / 317.0) 309024 (441.0 / 337.0) 266592	(8.52, 1.40) (N/A, 0.00, 0.0)	359.1 384.2	0.8627 104.6 101.9	3.1965 [4.0000]	79.9%			
PFEESA	(315.0 / 135.0) 652913 (315.0 / 83.0) 202347	(6.51, 1.07) (N/A, 0.01, 0.0)	677.3 335.0	0.3099 101.6 111.0	1.4666 [1.7849]	82.2%			
PFMPA	(229.0 / 85.0) 172465	(4.13, 0.84) (N/A, 0.02, 0.0)	876.2	N/A 0.0 0.0	1.6056 [2.0000]	80.3%			
PFMBA	(279.0 / 85.0) 517851	(5.30, 1.08) (N/A, 0.03, 0.0)	871.3	N/A 0.0 0.0	1.6906 [2.0000]	84.5%			
NFDHA	(295.0 / 201.0) 438898 (295.0 / 85.0) 373573	(5.95, 0.98) (N/A, 0.02, 0.2)	729.7 498.3	0.8512 99.1 92.7	1.8442 [2.0000]	92.2%			
13C3_PFBa_IIS	(216.0 / 172.0) 297143	(3.63, N/A) (N/A, 0.01, N/A)	801.2	N/A	1.3798 [1.0000]	138.0% {126.0%}			
13C2_PFHxA_IIS	(315.0 / 270.0) 539122	(6.07, N/A) (N/A, 0.02, N/A)	506.3	N/A	1.4202 [1.0000]	142.0% {130.6%}			
13C4_PFOA_IIS	(417.0 / 372.0) 505604	(7.81, N/A) (N/A, 0.00, N/A)	641.8	N/A	1.4007 [1.0000]	140.1% {128.6%}			
13C5_PFNxA_IIS	(468.0 / 423.0) 449957	(8.55, N/A) (N/A, 0.00, N/A)	384.0	N/A	1.5301 [1.0000]	153.0% {140.3%}			

Analyte	(Q1 / Q3) Area Counts*min	R.T. (R.T [min], R.R.T.) (Δ RT-[min], Δ RT- CV[min], Δ RT ion[s])	S / N	Ion Ratio IR Vs MP% IR Vs CV%	Concentration [True] ng/mL	Q.C. Rec. {Area%CV}	Primary Transition	Confirmation Transition	Flag
13C2_PFDA_IIS	(515.0 / 470.1) 459178	(9.23, N/A) (N/A, 0.00, N/A)	524.9	N/A	1.3480 [1.0000]	134.8% { 130.3% }			
18O2_PFHxS_IIS	(403.0 / 83.9) 825502	(7.93, N/A) (N/A, 0.00, N/A)	691.4	N/A	1.3643 [1.0000]	136.4% { 131.1% }			
13C4_PFOS_IIS	(503.0 / 79.9) 855561	(9.38, N/A) (N/A, 0.00, N/A)	515.9	N/A	1.3268 [1.0000]	132.7% { 130.8% }			
13C4_PFBA_EIS	(217.0 / 172.0) 2060878	(3.63, N/A) (N/A, 0.01, N/A)	752.7	N/A	6.9082 [8.0000]	86.4% { 110.7% }			
13C5_PFPeA_EIS	(268.0 / 223.0) 1549365	(4.92, N/A) (N/A, 0.03, N/A)	636.7	N/A	3.8093 [4.0000]	95.2% { 118.9% }			
13C5_PFHxA_EIS	(318.0 / 273.0) 977234	(6.07, N/A) (N/A, 0.02, N/A)	475.5	N/A	1.7714 [2.0000]	88.6% { 120.6% }			
13C4_PFHpA_EIS	(367.0 / 322.0) 905864	(6.99, N/A) (N/A, 0.00, N/A)	633.2	N/A	1.8901 [2.0000]	94.5% { 121.4% }			
13C8_PFOA_EIS	(421.0 / 376.0) 955683	(7.81, N/A) (N/A, 0.00, N/A)	635.3	N/A	1.8474 [2.0000]	92.4% { 120.8% }			
13C9_PFNA_EIS	(472.0 / 427.0) 382151	(8.55, N/A) (N/A, 0.00, N/A)	502.5	N/A	0.8174 [1.0000]	81.7% { 116.4% }			
13C6_PFDA_EIS	(519.0 / 474.0) 496302	(9.23, N/A) (N/A, 0.01, N/A)	378.6	N/A	0.8948 [1.0000]	89.5% { 111.8% }			
13C7_PFUnA_EIS	(570.0 / 525.0) 667589	(9.69, N/A) (N/A, 0.01, N/A)	622.3	N/A	0.9787 [1.0000]	97.9% { 138.8% }			

Analyte	(Q1 / Q3) Area Counts*min	R.T. (R.T [min], R.R.T.) (Δ RT-[min], Δ RT- CV[min], Δ RT ion[s])	S / N	Ion Ratio IR Vs MP% IR Vs CV%	Concentration [True] ng/mL	Q.C. Rec. {Area%CV}	Primary Transition	Confirmation Transition	Flag
13C2_PFDa_EIS	(615.0 / 570.0) 795187	(9.87, N/A) (N/A, 0.01, N/A)	555.6	N/A	1.1682 [1.0000]	116.8% { 138.3% }			
13C2_PFTeDA_EIS	(715.0 / 670.0) 338352	(10.11, N/A) (N/A, 0.01, N/A)	807.8	N/A	0.7845 [1.0000]	78.4% { 83.1% }			
13C3_PFBs_EIS	(302.0 / 80.0) 2204611	(6.02, N/A) (N/A, 0.02, N/A)	767.1	N/A	1.7646 [2.0000]	88.2% { 108.5% }			
13C3_PFHxS_EIS	(402.0 / 80.0) 1178503	(7.93, N/A) (N/A, 0.00, N/A)	713.4	N/A	1.7421 [2.0000]	87.1% { 118.4% }			
13C8_PFOS_EIS	(507.0 / 80.0) 1821094	(9.38, N/A) (N/A, 0.00, N/A)	288.8	N/A	1.7663 [2.0000]	88.3% { 120.8% }			
13C2_4:2FTS_EIS	(329.0 / 81.0) 690715	(5.75, N/A) (N/A, 0.02, N/A)	664.1	N/A	4.8935 [4.0000]	122.3% { 133.0% }			
13C2_6:2FTS_EIS	(429.0 / 81.0) 793593	(7.48, N/A) (N/A, 0.00, N/A)	636.8	N/A	4.2493 [4.0000]	106.2% { 111.7% }			
13C2_8:2FTS_EIS	(529.0 / 81.0) 791382	(8.90, N/A) (N/A, 0.01, N/A)	474.3	N/A	3.3616 [4.0000]	84.0% { 129.3% }			
13C8_PFOsa_EIS	(506.0 / 78.0) 2297173	(10.16, N/A) (N/A, 0.01, N/A)	573.3	N/A	1.9089 [2.0000]	95.4% { 112.2% }			
D3_NMeFOSA_EIS	(515.0 / 169.0) 212916	(10.60, N/A) (N/A, 0.00, N/A)	574.0	N/A	0.9356 [2.0000]	46.8% { 53.6% }			
D5_NeIFOSA_EIS	(531.0 / 169.0) 163461	(10.69, N/A) (N/A, 0.00, N/A)	795.1	N/A	0.7842 [2.0000]	39.2% { 44.3% }			

Analyte	(Q1 / Q3) Area Counts*min	R.T. (R.T [min], R.R.T.) (Δ RT-I[μ min], Δ RT- CV[μ min], Δ RT ion[s])	S / N	Ion Ratio IR Vs MP% IR Vs CV%	Concentration [True] ng/mL	Q.C. Rec. {Area%CV}	Primary Transition	Confirmation Transition	Flag
D3_MeFOSAA_EIS	(573.0 / 419.0) 1074630	(9.44, N/A) (N/A, 0.00, N/A)	337.9	N/A	3.3126 [4.0000]	82.8% { 107.8% }			
D5_EtFOSAA_EIS	(589.0 / 419.0) 951303	(9.64, N/A) (N/A, 0.01, N/A)	101.6	N/A	3.6882 [4.0000]	92.2% { 110.2% }			
D7_NMeFOSE_EIS	(623.0 / 58.9) 685639	(10.56, N/A) (N/A, 0.00, N/A)	1121.1	N/A	13.7904 [20.0000]	69.0% { 74.6% }			
D9_NEtFOSE_EIS	(639.0 / 58.9) 304423	(10.66, N/A) (N/A, 0.00, N/A)	1126.2	N/A	13.2781 [20.0000]	66.4% { 63.9% }			
13C3_HFPODA_EIS	(287.0 / 169.0) 2191243	(6.41, N/A) (N/A, 0.01, N/A)	686.2	N/A	7.1000 [8.0000]	88.8% { 120.3% }			

ANALYSIS DATA SHEET**MRL Checka**

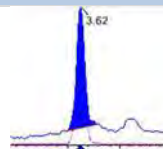
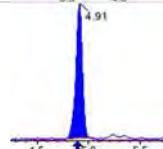
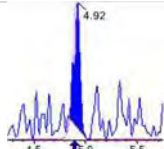
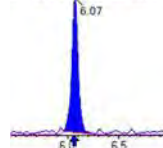
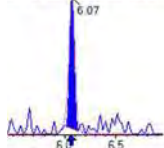
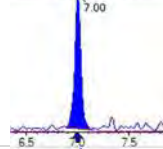
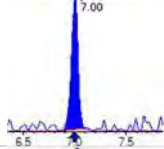
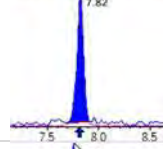
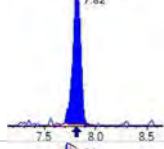
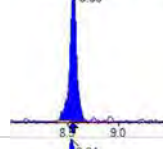
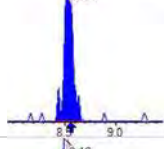
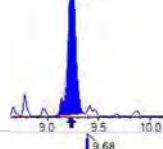
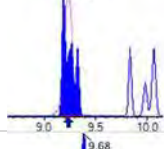
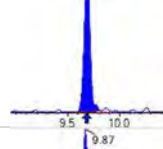
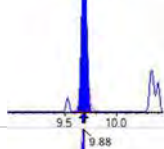
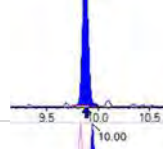
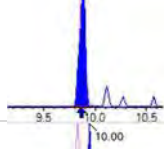
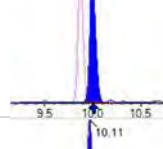
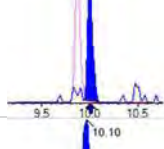
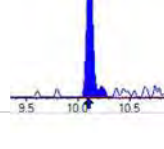
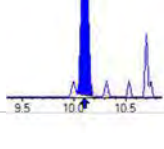
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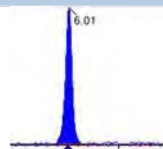
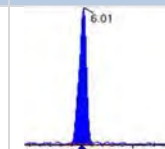
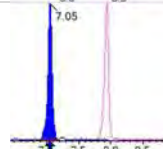
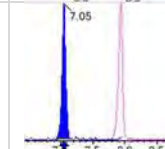
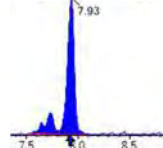
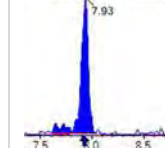
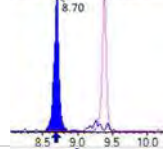
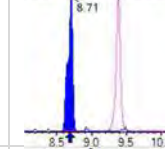
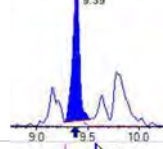
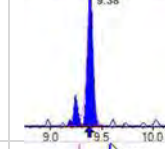
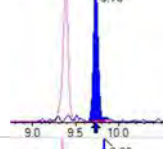
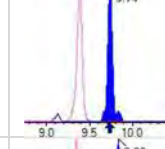
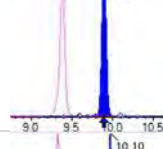
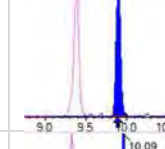
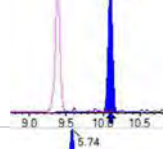
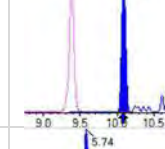
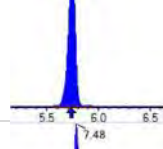
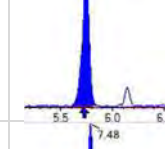
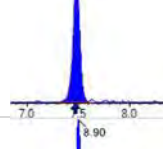
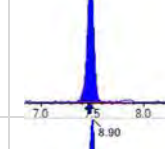
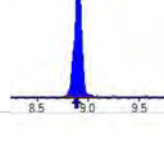
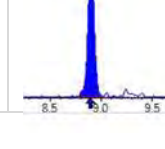
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PFBAa	2.63a	3.2a	0.050a	Ja
PFPEAa	1.31a	1.6a	0.062a	Ja
PFHXAa	0.651a	0.80a	0.064a	Ja
PFHPAa	0.725a	0.80a	0.050a	Ja
PFOAa	0.743a	0.80a	0.082a	Ja
PFNAa	0.651a	0.80a	0.050a	Ja
PFDAa	0.713a	0.80a	0.050a	Ja
PFUnAa	0.805a	0.80a	0.080a	
PFDOAa	0.622a	0.80a	0.050a	Ja
PFTRDAa	0.676a	0.80a	0.058a	Ja
PFTEDAa	0.497a	0.80a	0.086a	BS1, Ja
PFBSa	0.573a	0.80a	0.050a	Ja
PFPEsa	0.598a	0.80a	0.058a	Ja
PFHXsa	0.607a	0.80a	0.050a	Ja
PFHPSa	0.577a	0.80a	0.056a	Ja
PFOSa	0.526a	0.80a	0.050a	IR2, Ja
PFNSa	0.552a	0.80a	0.25a	Ja
PFDSa	0.538a	0.80a	0.064a	Ja
4:2FTSa	2.61a	3.2a	0.11a	Ja
6:2FTSa	2.55a	3.2a	0.090a	Ja
8:2FTSa	2.37a	3.2a	0.20a	Ja
PFOSAa	0.655a	3.2a	0.050a	Ja
NMeFOSAa	2.69a	3.2a	0.99a	Ja
NEtFOSAa	2.93a	3.2a	0.98a	Ja
NMeFOSAAa	0.642a	0.80a	0.072a	Ja
NEtFOSAAa	0.596a	0.80a	0.050a	Ja
NMeFOSEa	2.05a	3.2a	0.60a	BS1, Ja
NEtFOSEa	4.21a	3.2a	0.60a	BS2a
HFPO-DAa	1.25a	1.6a	0.49a	Ja
ADONa	1.20a	1.6a	0.38a	Ja

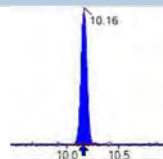
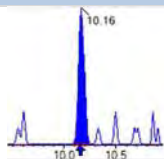
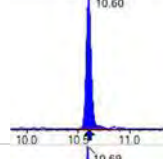
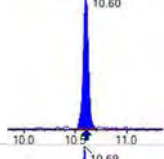
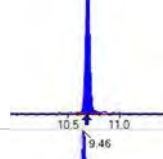
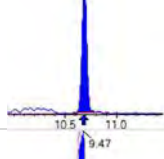
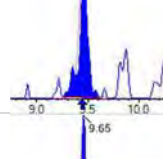
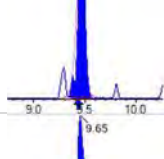
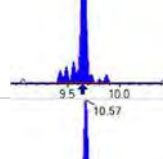
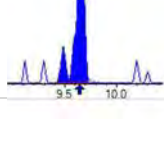
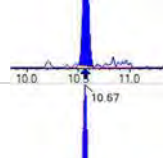
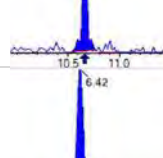
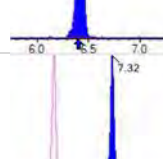
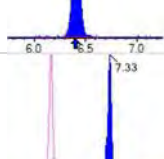
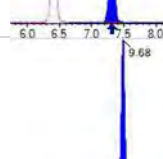
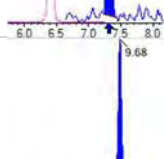
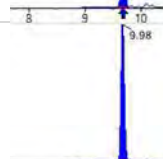
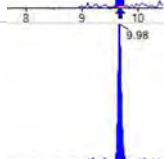
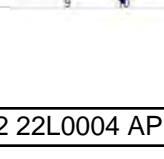
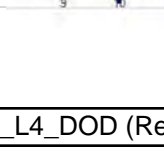
ANALYSIS DATA SHEETL**MRL Checka**

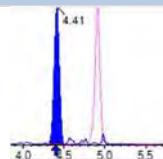
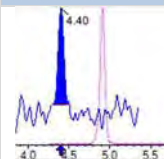
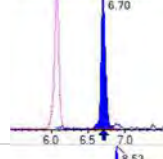
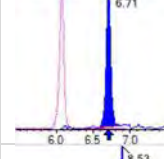
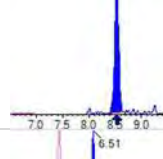
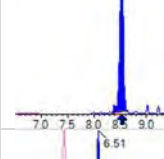
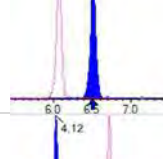
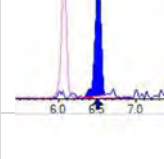
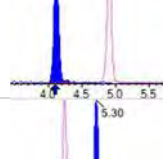
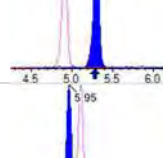
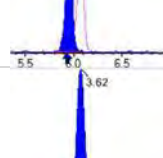
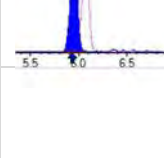
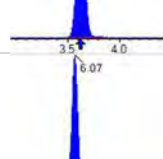
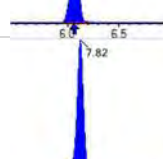
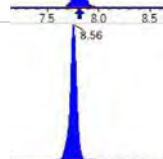
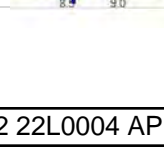
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Client:a	Tidewater, Inc.a	Project:a	NASA JPL Sla
Matrix:a	Watera	Laboratory ID:a	BBL0371-MRL1a
Sampled:a		File ID:a	S2022-12-29C (10)a
Solids:a		Prepared:a	12/19/22 12:17a
Batch:a	BBL0371a	Analyzed:a	12/30/22 05:58a
Column:a	1a	Preparation:a	Table B-15a
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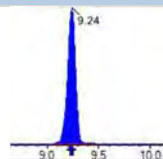
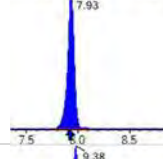
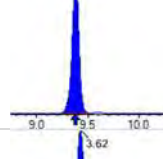
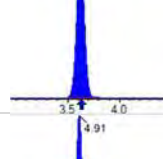
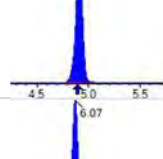
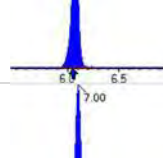
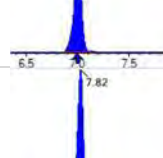
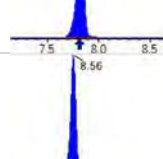
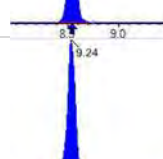
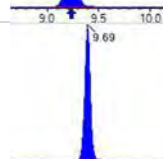
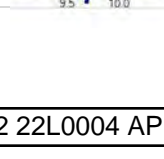
COMPOUNDL	CONC. (ng/L)L	OQL	DL	QL
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11CL-PF3OUDSa	1.30a	1.6a	0.24a	Ja

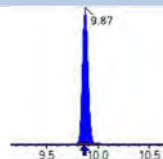
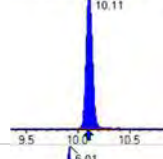
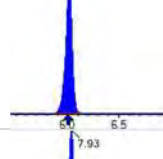
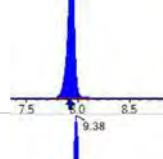
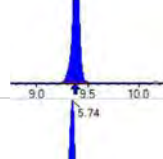
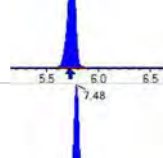
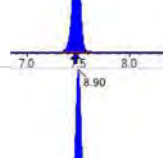
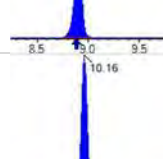
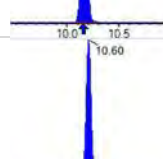
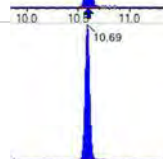
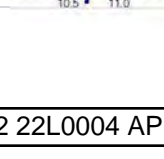
Analyte	(Q1 / Q3) Area Counts*min	R.T. (R.T [min], R.R.T.) (Δ RT-[min], Δ RT- CV[min], Δ RT ion[s])	S / N	Ion Ratio IR Vs MP% IR Vs CV%	Concentration [True] ng/mL	Q.C. Rec. {Area%CV}	Primary Transition	Confirmation Transition	Flag
PFBA	(213.0 / 169.0) 77889	(3.62, 1.00) (0.00, N/A, 0.0)	124.2	N/A 0.0 0.0	0.3293 [0.4000]	82.3%			
PFPeA	(263.0 / 219.0) 59134 (263.0 / 69.0) 704	(4.91, 1.00) (0.00, N/A, -0.8)	192.4 13.4	0.0119 115.2 103.0	0.1637 [0.2000]	81.8%			
PFHxA	(313.0 / 269.0) 40442 (313.0 / 119.0) 3057	(6.07, 1.00) (0.00, N/A, 0.1)	121.1 30.1	0.0756 77.7 83.4	0.0813 [0.1000]	81.3%			
PFHpA	(363.0 / 319.0) 36943 (363.0 / 169.0) 10648	(7.00, 1.00) (0.00, N/A, 0.1)	74.7 46.5	0.2882 100.7 105.6	0.0907 [0.1000]	90.7%			
PFOA	(413.0 / 369.0) 42344 (413.0 / 169.0) 14072	(7.82, 1.00) (0.00, N/A, 0.2)	111.9 133.2	0.3323 109.4 108.8	0.0929 [0.1000]	92.9%			
PFNA	(463.0 / 419.0) 28269 (463.0 / 169.0) 5280	(8.56, 1.00) (0.00, N/A, 1.2)	134.6 79.5	0.1868 88.2 87.5	0.0814 [0.1000]	81.4%			
PFDA	(513.0 / 469.0) 36964 (513.0 / 169.0) 2683	(9.24, 1.00) (0.00, N/A, 2.8)	56.3 25.3	0.0726 78.7 76.2	0.0891 [0.1000]	89.1%			
PFUnA	(563.0 / 519.0) 59141 (563.0 / 169.0) 4559	(9.68, 1.00) (-0.01, N/A, 0.0)	141.9 59.7	0.0771 100.2 80.2	0.1006 [0.1000]	100.6%			
PFDoA	(613.0 / 569.0) 50961 (613.0 / 169.0) 6234	(9.87, 1.00) (0.00, N/A, -0.4)	144.1 110.8	0.1223 90.8 95.6	0.0778 [0.1000]	77.8%			
PFTrDA	(663.0 / 619.0) 48271 (663.0 / 169.0) 8490	(10.00, 1.01) (N/A, 0.00, -0.1)	288.1 47.1	0.1759 80.7 96.3	0.0844 [0.1000]	84.4%			
PFTeDA	(713.0 / 669.0) 22872 (713.0 / 169.0) 5548	(10.11, 1.00) (0.00, N/A, 0.5)	51.6 33.5	0.2425 122.9 101.9	0.0621 [0.1000]	62.1%			QC,

Analyte	(Q1 / Q3) Area Counts*min	R.T. (R.T [min], R.R.T.) (Δ RT-[min], Δ RT- CV[min], Δ RT ion[s])	S / N	Ion Ratio IR Vs MP% IR Vs CV%	Concentration [True] ng/mL	Q.C. Rec. {Area%CV}	Primary Transition	Confirmation Transition	Flag
PFBS	(299.0 / 80.0) 53945 (299.0 / 99.0) 36476	(6.01, 1.00) (0.00, N/A, -0.2)	216.5 237.2	0.6762 102.9 105.5	0.0716 [0.0885]	81.0%			
PFPeS	(349.0 / 80.0) 84779 (349.0 / 99.0) 30553	(7.05, 0.89) (N/A, 0.01, 0.1)	257.7 197.0	0.3604 97.2 101.6	0.0747 [0.0938]	79.6%			
PFHxS	(399.0 / 80.0) 75759 (399.0 / 99.0) 23884	(7.93, 1.00) (0.00, N/A, 0.0)	221.7 138.9	0.3153 96.7 98.4	0.0758 [0.0911]	83.2%			
PFHpS	(449.0 / 80.0) 66425 (449.0 / 99.0) 18597	(8.70, 0.93) (N/A, 0.00, -0.3)	104.6 192.0	0.2800 107.4 99.0	0.0721 [0.0951]	75.8%			
PFOS	(499.0 / 80.0) 69647 (499.0 / 99.0) 22796	(9.39, 1.00) (0.00, N/A, 0.1)	45.4 217.9	0.3273 157.3 143.5	0.0657 [0.0927]	70.8%			IR2,
PFNS	(549.0 / 80.0) 82894 (549.0 / 99.0) 19595	(9.73, 1.04) (N/A, 0.00, -0.1)	90.3 84.7	0.2364 99.3 102.2	0.0690 [0.0960]	71.9%			
PFDS	(599.0 / 80.0) 97701 (599.0 / 99.0) 26803	(9.90, 1.05) (N/A, 0.01, -0.2)	236.9 171.5	0.2743 104.3 144.9	0.0672 [0.0963]	69.8%			QC,
PFDoS	(699.0 / 80.0) 56282 (699.0 / 99.0) 12361	(10.10, 1.08) (N/A, 0.01, 0.5)	173.5 43.9	0.2196 112.0 121.5	0.0822 [0.0970]	84.8%			
4:2FTS	(327.0 / 307.0) 182273 (327.0 / 81.0) 111898	(5.74, 1.00) (0.00, N/A, 0.0)	490.6 181.3	0.6139 85.8 98.4	0.3263 [0.3738]	87.3%			
6:2FTS	(427.0 / 407.0) 98010 (427.0 / 81.0) 77652	(7.48, 1.00) (0.00, N/A, -0.1)	262.2 255.8	0.7923 107.2 113.9	0.3185 [0.3796]	83.9%			
8:2FTS	(527.0 / 507.0) 88742 (527.0 / 81.0) 58472	(8.90, 1.00) (0.00, N/A, 0.1)	332.1 151.2	0.6589 107.7 87.7	0.2960 [0.3833]	77.2%			

Analyte	(Q1 / Q3) Area Counts*min	R.T. (R.T [min], R.R.T.) (Δ RT-[min], Δ RT- CV[min], Δ RT ion[s])	S / N	Ion Ratio IR Vs MP% IR Vs CV%	Concentration [True] ng/mL	Q.C. Rec. {Area%CV}	Primary Transition	Confirmation Transition	Flag
PFOSA	(498.0 / 78.0) 107367 (498.0 / 478.0) 3541	(10.16, 1.00) (0.00, N/A, -0.2)	367.9 32.9	0.0330 158.0 159.9	0.0819 [0.1000]	81.9%			
NMeFOSA	(512.0 / 219.0) 30745 (512.0 / 169.0) 24248	(10.60, 1.00) (0.00, N/A, -0.1)	263.2 201.7	0.7887 114.0 117.9	0.3359 [0.4000]	84.0%			
NEIFOSA	(526.0 / 219.0) 33457 (526.0 / 169.0) 30226	(10.69, 1.00) (0.00, N/A, 0.2)	365.6 181.1	0.9035 91.0 83.7	0.3666 [0.4000]	91.7%			
NMeFOSAA	(570.0 / 419.0) 20089 (570.0 / 483.0) 12852	(9.46, 1.00) (0.01, N/A, -0.5)	51.9 23664.1	0.6397 114.9 121.1	0.0803 [0.1000]	80.3%			
NEIFOSAA	(584.0 / 419.0) 18435 (584.0 / 526.0) 9726	(9.65, 1.00) (0.00, N/A, -0.1)	194.5 255.8	0.5276 88.9 80.1	0.0746 [0.1000]	74.6%			
NMeFOSE	(616.0 / 59.0) 11198	(10.57, 1.00) (0.01, N/A, 0.0)	97.6	N/A 0.0 0.0	0.2560 [0.4000]	64.0%			QC,
NEtFOSE	(630.0 / 59.0) 3730	(10.67, 1.00) (0.01, N/A, 0.0)	83.0	N/A 0.0 0.0	0.5257 [0.4000]	131.4%			QC,
HFPO-DA	(285.0 / 169.0) 28358 (285.0 / 185.0) 79783	(6.42, 1.00) (0.01, N/A, 0.4)	355.9 335.7	2.8134 109.7 113.3	0.1563 [0.2000]	78.1%			
ADONA	(377.0 / 85.0) 108813 (377.0 / 251.0) 11969	(7.32, 1.14) (N/A, 0.01, -0.5)	509.5 56.0	0.1100 89.4 102.3	0.1505 [0.1885]	79.8%			
9CI-Pf3ONS	(531.0 / 351.0) 285653 (533.0 / 353.0) 96313	(9.68, 1.51) (N/A, 0.01, 0.1)	181.0 109.8	0.3372 106.7 113.1	0.1446 [0.1867]	77.5%			
11CI-PF3OUDS	(631.0 / 451.0) 182031 (633.0 / 453.0) 55643	(9.98, 1.56) (N/A, 0.00, 0.1)	490.4 189.9	0.3057 98.7 96.1	0.1628 [0.1886]	86.3%			

Analyte	(Q1 / Q3) Area Counts*min	R.T. (R.T [min], R.R.T.) (Δ RT-[min], Δ RT- CV[min], Δ RT ion[s])	S / N	Ion Ratio IR Vs MP% IR Vs CV%	Concentration [True] ng/mL	Q.C. Rec. {Area%CV}	Primary Transition	Confirmation Transition	Flag
3:3FTCA	(241.0 / 177.0) 3276 (241.0 / 117.0) 4512	(4.41, 0.90) (N/A, 0.01, 0.5)	132.0 20.8	1.3776 104.7 104.4	0.2638 [0.4000]	65.9%			QC,
5:3FTCA	(341.0 / 236.7) 25790 (341.0 / 217.0) 37546	(6.70, 1.10) (N/A, 0.00, -0.3)	139.8 126.0	1.4559 81.1 94.0	0.3389 [0.4000]	84.7%			
7:3FTCA	(441.0 / 317.0) 30240 (441.0 / 337.0) 21902	(8.53, 1.40) (N/A, 0.01, 0.0)	94.5 93.3	0.7243 87.8 85.6	0.3051 [0.4000]	76.3%			
PFEESA	(315.0 / 135.0) 65804 (315.0 / 83.0) 18063	(6.51, 1.07) (N/A, 0.01, 0.0)	317.6 69.2	0.2745 90.0 98.3	0.1442 [0.1785]	80.8%			
PFMPA	(229.0 / 85.0) 15799	(4.12, 0.84) (N/A, 0.02, 0.0)	260.3	N/A 0.0 0.0	0.1497 [0.2000]	74.9%			
PFMBA	(279.0 / 85.0) 44845	(5.30, 1.08) (N/A, 0.02, 0.0)	447.9	N/A 0.0 0.0	0.1490 [0.2000]	74.5%			
NFDHA	(295.0 / 201.0) 37533 (295.0 / 85.0) 36010	(5.95, 0.98) (N/A, 0.02, 0.1)	263.0 188.7	0.9594 111.7 104.5	0.1538 [0.2000]	76.9%			
13C3_PFBa_IIS	(216.0 / 172.0) 294995	(3.62, N/A) (N/A, 0.01, N/A)	705.0	N/A	1.3698 [1.0000]	137.0% {125.1%}			
13C2_PFHxA_IIS	(315.0 / 270.0) 545711	(6.07, N/A) (N/A, 0.01, N/A)	523.2	N/A	1.4375 [1.0000]	143.8% {132.2%}			
13C4_PFOA_IIS	(417.0 / 372.0) 501545	(7.82, N/A) (N/A, 0.01, N/A)	508.1	N/A	1.3894 [1.0000]	138.9% {127.5%}			
13C5_PFNAl_IIS	(468.0 / 423.0) 375959	(8.56, N/A) (N/A, 0.01, N/A)	465.3	N/A	1.2785 [1.0000]	127.9% {117.2%}			

Analyte	(Q1 / Q3) Area Counts*min	R.T. (R.T [min], R.R.T.) (Δ RT-[min], Δ RT- CV[min], Δ RT ion[s])	S / N	Ion Ratio IR Vs MP% IR Vs CV%	Concentration [True] ng/mL	Q.C. Rec. {Area%CV}	Primary Transition	Confirmation Transition	Flag
13C2_PFDA_IIS	(515.0 / 470.1) 446770	(9.24, N/A) (N/A, 0.01, N/A)	296.6	N/A	1.3115 [1.0000]	131.2% { 126.8% }			
18O2_PFHxS_IIS	(403.0 / 83.9) 783622	(7.93, N/A) (N/A, 0.01, N/A)	613.4	N/A	1.2951 [1.0000]	129.5% { 124.4% }			
13C4_PFOS_IIS	(503.0 / 79.9) 751267	(9.38, N/A) (N/A, 0.00, N/A)	446.6	N/A	1.1651 [1.0000]	116.5% { 114.9% }			
13C4_PFBA_EIS	(217.0 / 172.0) 2025217	(3.62, N/A) (N/A, 0.00, N/A)	747.4	N/A	6.8381 [8.0000]	85.5% { 108.8% }			
13C5_PFPeA_EIS	(268.0 / 223.0) 1521910	(4.91, N/A) (N/A, 0.02, N/A)	665.5	N/A	3.6966 [4.0000]	92.4% { 116.8% }			
13C5_PFHxA_EIS	(318.0 / 273.0) 1002040	(6.07, N/A) (N/A, 0.02, N/A)	576.0	N/A	1.7944 [2.0000]	89.7% { 123.6% }			
13C4_PFHpA_EIS	(367.0 / 322.0) 777648	(7.00, N/A) (N/A, 0.01, N/A)	436.5	N/A	1.6030 [2.0000]	80.2% { 104.2% }			
13C8_PFOA_EIS	(421.0 / 376.0) 855718	(7.82, N/A) (N/A, 0.01, N/A)	634.9	N/A	1.6676 [2.0000]	83.4% { 108.2% }			
13C9_PFNA_EIS	(472.0 / 427.0) 360024	(8.56, N/A) (N/A, 0.01, N/A)	532.2	N/A	0.9216 [1.0000]	92.2% { 109.7% }			
13C6_PFDA_EIS	(519.0 / 474.0) 418336	(9.24, N/A) (N/A, 0.01, N/A)	307.3	N/A	0.7752 [1.0000]	77.5% { 94.3% }			
13C7_PFUnA_EIS	(570.0 / 525.0) 643902	(9.69, N/A) (N/A, 0.01, N/A)	543.7	N/A	0.9702 [1.0000]	97.0% { 133.9% }			

Analyte	(Q1 / Q3) Area Counts*min	R.T. (R.T [min], R.R.T.) (Δ RT-[min], Δ RT- CV[min], Δ RT ion[s])	S / N	Ion Ratio IR Vs MP% IR Vs CV%	Concentration [True] ng/mL	Q.C. Rec. {Area%CV}	Primary Transition	Confirmation Transition	Flag
13C2_PFDa_EIS	(615.0 / 570.0) 683594	(9.87, N/A) (N/A, 0.00, N/A)	926.5	N/A	1.0322 [1.0000]	103.2% { 118.9% }			
13C2_PFTeDA_EIS	(715.0 / 670.0) 364315	(10.11, N/A) (N/A, 0.00, N/A)	894.7	N/A	0.8681 [1.0000]	86.8% { 89.5% }			
13C3_PFBs_EIS	(302.0 / 80.0) 2360328	(6.01, N/A) (N/A, 0.02, N/A)	624.6	N/A	1.9902 [2.0000]	99.5% { 116.1% }			
13C3_PFHxS_EIS	(402.0 / 80.0) 1153858	(7.93, N/A) (N/A, 0.01, N/A)	576.2	N/A	1.7968 [2.0000]	89.8% { 115.9% }			
13C8_PFOS_EIS	(507.0 / 80.0) 1821040	(9.38, N/A) (N/A, 0.01, N/A)	486.6	N/A	2.0114 [2.0000]	100.6% { 120.8% }			
13C2_4:2FTS_EIS	(329.0 / 81.0) 657139	(5.74, N/A) (N/A, 0.02, N/A)	676.4	N/A	4.9044 [4.0000]	122.6% { 126.5% }			
13C2_6:2FTS_EIS	(429.0 / 81.0) 766730	(7.48, N/A) (N/A, 0.01, N/A)	666.1	N/A	4.3248 [4.0000]	108.1% { 107.9% }			
13C2_8:2FTS_EIS	(529.0 / 81.0) 768879	(8.90, N/A) (N/A, 0.01, N/A)	781.1	N/A	3.4405 [4.0000]	86.0% { 125.6% }			
13C8_PFOsa_EIS	(506.0 / 78.0) 2259813	(10.16, N/A) (N/A, 0.01, N/A)	921.7	N/A	2.1385 [2.0000]	106.9% { 110.3% }			
D3_NMeFOSA_EIS	(515.0 / 169.0) 188461	(10.60, N/A) (N/A, 0.01, N/A)	605.6	N/A	0.9431 [2.0000]	47.2% { 47.4% }			
D5_NEtFOSA_EIS	(531.0 / 169.0) 183999	(10.69, N/A) (N/A, 0.00, N/A)	884.7	N/A	1.0053 [2.0000]	50.3% { 49.8% }			



Chemist: HGH
 Instrument: Saphira
 Type: Sciex Q3 5500

Sample I.D.: BBL0371-MRL1
 DF, IV: 1, 10.0µL
 Acquisition Method: 1633 2022-12-27.dam

Quant Method: 1633 - S2022-12-29A
 Path: S2022-12-30A (10)
 Acquired: 2022/12/30 - 05:58

Analyte	(Q1 / Q3) Area Counts*min	R.T. (R.T [min], R.R.T.) (Δ RT-I[μ min], Δ RT-CV[μ min], Δ RT ion[s])	S / N	Ion Ratio IR Vs MP% IR Vs CV%	Concentration [True] ng/mL	Q.C. Rec. {Area%CV}	Primary Transition	Confirmation Transition	Flag
D3_MeFOSAA_EIS	(573.0 / 419.0) 1102903	(9.45, N/A) (N/A, 0.01, N/A)	417.6	N/A	3.8718 [4.0000]	96.8% { 110.6% }			
D5_EtFOSAA_EIS	(589.0 / 419.0) 1003321	(9.65, N/A) (N/A, 0.01, N/A)	122.2	N/A	4.4299 [4.0000]	110.7% { 116.3% }			
D7_NMeFOSE_EIS	(623.0 / 58.9) 716654	(10.56, N/A) (N/A, 0.00, N/A)	1031.6	N/A	16.4152 [20.0000]	82.1% { 78.0% }			
D9_NEtFOSE_EIS	(639.0 / 58.9) 309347	(10.66, N/A) (N/A, 0.01, N/A)	1089.5	N/A	15.3660 [20.0000]	76.8% { 65.0% }			
13C3_HFPODA_EIS	(287.0 / 169.0) 2091445	(6.41, N/A) (N/A, 0.01, N/A)	725.0	N/A	6.6949 [8.0000]	83.7% { 114.8% }			

PREPARATION BATCH SUMMARYb

Table B-15b

Laboratory:b APPL, LLCb Work Order:b 22L0004b
 Client:b Tidewater, Inc.b Project:b NASA JPL Sib
 Batch:b BBL0076b Batch Matrix:b Waterb Preparation:b Table B-15b

SAMPLE NAMEb	LAB SAMPLE IDb	DATE PREPAREDb	INITIAL VOL./WEIGHTb mLb	FINAL VOL.b mLb
MW-24-S5-112922-	22L0004-01-	12/05/22 07:17-	282.67-	2.00-
MW-24-S5-112922-	22L0004-01RE1-	12/05/22 07:17-	282.67-	2.00-
MW-24-S4-112922-	22L0004-02-	12/05/22 07:17-	290.48	2.00-
MW-24-S4-112922-	22L0004-02RE1-	12/05/22 07:17-	290.48	2.00-
MW-24-S3-112922-	22L0004-03-	12/05/22 07:17-	293.05-	2.00-
MW-24-S3-112922-	22L0004-03RE1-	12/05/22 07:17-	293.05-	2.00-
MW-24-S2-112922-	22L0004-04-	12/05/22 07:17-	294.04-	2.00-
MW-24-S2-112922-	22L0004-04RE1-	12/05/22 07:17-	294.04-	2.00-
DUP-2-112922-	22L0004-05-	12/05/22 07:17-	297.09-	2.00-
DUP-2-112922-	22L0004-05RE1-	12/05/22 07:17-	297.09-	2.00-
MW-17-S5-112922-	22L0004-06-	12/05/22 07:17-	288.05-	2.00-
MW-17-S5-112922-	22L0004-06RE1-	12/05/22 07:17-	288.05-	2.00-
MW-17-S4-112922-	22L0004-07-	12/05/22 07:17-	280.65-	2.00-
MW-17-S4-112922-	22L0004-07RE1-	12/05/22 07:17-	280.65-	2.00-
MW-17-S3-112922-	22L0004-08	12/05/22 07:17-	278.97-	2.00-
MW-17-S3-112922-	22L0004-08RE1-	12/05/22 07:17-	278.97-	2.00-
DUP-3-112922-	22L0004-09-	12/05/22 07:17-	284.45-	2.00-
DUP-3-112922-	22L0004-09RE1-	12/05/22 07:17-	284.45-	2.00-
MW-17-S2-112922-	22L0004-10-	12/05/22 07:17-	279.70-	2.00-
SB-2-112922-	22L0004-11-	12/05/22 07:17-	283.97-	2.00-
SB-2-112922-	22L0004-11RE1-	12/05/22 07:17-	283.97-	2.00-
MW-4-S5-112822-	22L0004-12-	12/05/22 07:17-	268.31-	2.00-
MW-4-S5-112822-	22L0004-12RE1-	12/05/22 07:17-	268.31-	2.00-
DUP-1-112822-	22L0004-13-	12/05/22 07:17-	284.32-	2.00-
DUP-1-112822-	22L0004-13RE1-	12/05/22 07:17-	284.32-	2.00-
MW-4-S4-112822-	22L0004-14-	12/05/22 07:17-	274.47-	2.00-
MW-4-S4-112822-	22L0004-14RE1-	12/05/22 07:17-	274.47-	2.00-
MW-4-S2-112822-	22L0004-15-	12/05/22 07:17-	276.85-	2.00-
MW-4-S2-112822-	22L0004-15RE1-	12/05/22 07:17-	276.85-	2.00-
MW-12-S5-112822-	22L0004-16-	12/05/22 07:17-	280.28	2.00-
MW-12-S5-112822-	22L0004-16RE1-	12/05/22 07:17-	280.28	2.00-
MW-12-S4-112822-	22L0004-17-	12/05/22 07:17-	268.18	2.00-
MW-12-S4-112822-	22L0004-17RE1-	12/05/22 07:17-	268.18	2.00-
MW-12-S3-112822-	22L0004-18	12/05/22 07:17-	270.87-	2.00-
MW-12-S3-112822-	22L0004-18RE1-	12/05/22 07:17-	270.87-	2.00-

PREPARATION BATCH SUMMARY^b

Table B-15^b

Laboratory: ^b	APPL, LLC ^b	Work Order: ^b	22L0004 ^b
Client: ^b	Tidewater, Inc. ^b	Project: ^b	NASA JPL Sib
Batch: ^b	BBL0076 ^b	Batch Matrix: ^b	Water ^b
		Preparation: ^b	Table B-15 ^b

SAMPLE NAME^b	LAB SAMPLE ID^b	DATE PREPARED^b	INITIAL VOL./WEIGHT^b mL^b	FINAL VOL.^b mL^b
MW-12-S2-112822-	22L0004-19-	12/05/22 07:17-	273.34-	2.00-
MW-12-S2-112822-	22L0004-19RE1-	12/05/22 07:17-	273.34-	2.00-
SB-1-112822-	22L0004-20-	12/05/22 07:17-	270.33-	2.00-
SB-1-112822-	22L0004-20RE1-	12/05/22 07:17-	270.33-	2.00-
Blank-	BBL0076-BLK1-	12/05/22 07:17-	250.00-	2.00-
LCS-	BBL0076-BS1-	12/05/22 07:17-	250.00-	2.00-
LCS Dup-	BBL0076-BSD1-	12/05/22 07:17-	250.00-	2.00-
MRL Check-	BBL0076-MRL1-	12/05/22 07:17-	250.00-	2.00-
MW-4-S2-112822-	BBL0076-MS1-	12/05/22 07:17-	275.86-	2.00-
MW-4-S2-112822-	BBL0076-MSD1-	12/05/22 07:17-	278.78	2.00-

PREPARATION BENCH SHEETE

Organics

BBL0 76 0

Ma rix: Watert

Prepared using: PFAS - Table B-15

Analyses	Spiking Solution(s)		Surrogate Solution(s)		Date Due	Extract by	Preparedt	Initial (mL)t	Final (mL)t	ul Spiket	ul Surrogatet	Extraction Comments
B-15 DOD	22K0039i	PFAS - MIX 1633 10ng/mLi	22L0020i	MPFAC-HIF-ES 20.0ng/mLi								
22L0004-01i	MW-24-S5-112922i	12/14/2021	12/27/2022	12/5/2022 7:17:00AM	282.67i	2i	200					
22L0004-01REli	MW-24-S5-112922i	12/14/2021	12/27/2022	12/5/2022 7:17:00AM	282.67i	2i	200i				Added 12/9/2022 by DAG	
22L0004-02i	MW-24-S4-112922i	12/14/2021	12/27/2022	12/5/2022 7:17:00AM	290.48i	2i	200					
22L0004-02REli	MW-24-S4-112922i	12/14/2021	12/27/2022	12/5/2022 7:17:00AM	290.48i	2i	200i				Added 12/9/2022 by DAG	
22L0004-03i	MW-24-S3-112922i	12/14/2021	12/27/2022	12/5/2022 7:17:00AM	293.05	2i	200					
22L0004-03REli	MW-24-S3-112922i	12/14/2021	12/27/2022	12/5/2022 7:17:00AM	293.05	2i	200i				Added 12/9/2022 by DAG	
22L0004-04i	MW-24-S2-112922i	12/14/2021	12/27/2022	12/5/2022 7:17:00AM	294.04i	2i	200					
22L0004-04REli	MW-24-S2-112922i	12/14/2021	12/27/2022	12/5/2022 7:17:00AM	294.04i	2i	200i				Added 12/9/2022 by DAG	
22L0004-05	DUP-2-112922i	12/14/2021	12/27/2022	12/5/2022 7:17:00AM	297.09i	2i	200					
22L0004-05REli	DUP-2-112922i	12/14/2021	12/27/2022	12/5/2022 7:17:00AM	297.09i	2i	200i				Added 12/9/2022 by DAG	
22L0004-06i	MW-17-S5-112922i	12/14/2021	12/27/2022	12/5/2022 7:17:00AM	288.05	2i	200					
22L0004-06REli	MW-17-S5-112922i	12/14/2021	12/27/2022	12/5/2022 7:17:00AM	288.05	2i	200i				Added 12/9/2022 by DAG	
22L0004-07i	MW-17-S4-112922i	12/14/2021	12/27/2022	12/5/2022 7:17:00AM	280.65	2i	200					
22L0004-07REli	MW-17-S4-112922i	12/14/2021	12/27/2022	12/5/2022 7:17:00AM	280.65	2i	200i				Added 12/9/2022 by DAG	
22L0004-08i	MW-17-S3-112922i	12/14/2021	12/27/2022	12/5/2022 7:17:00AM	278.97i	2i	200					
22L0004-08REli	MW-17-S3-112922i	12/14/2021	12/27/2022	12/5/2022 7:17:00AM	278.97i	2i	200i				Added 12/9/2022 by DAG	
22L0004-09i	DUP-3-112922i	12/14/2021	12/27/2022	12/5/2022 7:17:00AM	284.45	2i	200					
22L0004-09REli	DUP-3-112922i	12/14/2021	12/27/2022	12/5/2022 7:17:00AM	284.45	2i	200i				Added 12/9/2022 by DAG	
22L0004-10i	MW-17-S2-112922i	12/14/2021	12/27/2022	12/5/2022 7:17:00AM	279.7i	2i	200					
22L0004-10REli	MW-17-S2-112922i	12/14/2021	12/27/2022	12/5/2022 7:17:00AM	279.7i	2i	200i				Added 12/9/2022 by DAG	
22L0004-11i	SB-2-112922i	12/14/2021	12/27/2022	12/5/2022 7:17:00AM	283.97i	2i	200					
22L0004-11REli	SB-2-112922i	12/14/2021	12/27/2022	12/5/2022 7:17:00AM	283.97i	2i	200i				Added 12/9/2022 by DAG	

Spiking Witnessed By

Date i

Preparation Reviewed Byi

Date i

Extracts Received Byi

Date

PREPARATION BENCH SHEETE

Organics

BBL0 76

(Continued)E

Matrix: Watert

Prepared using: PFAS - Table B-15

Analyses		Spiking Solution(s)				Surrogate Solution(s)			
B-15 DOD		22K0039i	PFAS - MIX 1633 10ng/mLi			22L0020i	MPFAC-HIF-ES 20.0ng/mL		
22L0004-12i	MW-4-S5-112822i	12/26/2022	12/5/2022 7:17:00AM	2i	268.31i	200			
22L0004-12RE1i	MW-4-S5-112822i	12/26/2022	12/5/2022 7:17:00AM	2i	268.31i	200i	Added 12/9/2022 by DAG		
22L0004-13i	DUP-1-112822i	12/26/2022	12/5/2022 7:17:00AM	2i	284.32i	200			
22L0004-13RE1i	DUP-1-112822i	12/26/2022	12/5/2022 7:17:00AM	2i	284.32i	200i	Added 12/9/2022 by DAG		
22L0004-14i	MW-4-S4-112822i	12/26/2022	12/5/2022 7:17:00AM	2i	274.47i	200			
22L0004-14RE1i	MW-4-S4-112822i	12/26/2022	12/5/2022 7:17:00AM	2i	274.47i	200i	Added 12/9/2022 by DAG		
22L0004-15	MW-4-S2-112822i	12/26/2022	12/5/2022 7:17:00AM	2i	276.85	200			
22L0004-15RE1i	MW-4-S2-112822i	12/26/2022	12/5/2022 7:17:00AM	2i	276.85	200i	Added 12/9/2022 by DAG		
22L0004-16i	MW-12-S5-112822i	12/26/2022	12/5/2022 7:17:00AM	2i	280.28i	200			
22L0004-16RE1i	MW-12-S5-112822i	12/26/2022	12/5/2022 7:17:00AM	2i	280.28i	200i	Added 12/9/2022 by DAG		
22L0004-17i	MW-12-S4-112822i	12/26/2022	12/5/2022 7:17:00AM	2i	268.18i	200			
22L0004-17RE1i	MW-12-S4-112822i	12/26/2022	12/5/2022 7:17:00AM	2i	268.18i	200i	Added 12/9/2022 by DAG		
22L0004-18i	MW-12-S3-112822i	12/26/2022	12/5/2022 7:17:00AM	2i	270.87i	200			
22L0004-18RE1i	MW-12-S3-112822i	12/26/2022	12/5/2022 7:17:00AM	2i	270.87i	200i	Added 12/9/2022 by DAG		
22L0004-19i	MW-12-S2-112822i	12/26/2022	12/5/2022 7:17:00AM	2i	273.34i	200			
22L0004-19RE1i	MW-12-S2-112822i	12/26/2022	12/5/2022 7:17:00AM	2i	273.34i	200i	Added 12/9/2022 by DAG		
22L0004-20i	SB-1-112822i	12/26/2022	12/5/2022 7:17:00AM	2i	270.33i	200			
22L0004-20RE1i	SB-1-112822i	12/26/2022	12/5/2022 7:17:00AM	2i	270.33i	200i	Added 12/9/2022 by DAG		
BBL0076-BLK1i	Blanki		12/5/2022 7:17:00AM	2i	250i	0i			
BBL0076-BS1i	LCSI		12/5/2022 7:17:00AM	2i	250i	200i			
BBL0076-BSD1i	LCS Dupi		12/5/2022 7:17:00AM	2i	250i	200i			
BBL0076-MRL1i	MRL Checki		12/5/2022 7:17:00AM	2i	250i	200i			
BBL0076-MS1i	Matrix Spike [22L0004-15]i		12/5/2022 7:17:00AM	2i	275.86i	200i			
BBL0076-MSD1i	Matrix Spike Dup [22L0004-15]i		12/5/2022 7:17:00AM	2i	278.78i	200i			

PREPARATION BENCH SHEETE

Organics

BBL0 76

(Continued)E

Print Date/Time: 01/05/2023 2:03 pm

Matrix: Watert

Prepared using: PFAS - Table B-15

Analyses
B-15 DOD

Spiking Solution(s)
22K0039i PFAS - MIX 1633 10ng/mLi

Surrogate Solution(s)
22L0020i MPFAC-HIF-ES 20.0ng/mLi

Start Date/Time _____

StopDate/Time _____

Standardt	Description	LotNumt
22C0296i	Envi-carbi	122395
22I0138i	Reagent -0.3M Formic Acidi	SHBK7097i
22K0185	Reagent - 0.05MFA wash	xi
22K0203i	Am. Ac. preservativei	W28E034i
22K0510i	Reagent - 1.0% Ammonia Hydroxidei	219481i

Batch Comments:

Spiked by: LYA 12/5/22 8:01

Balance #: WB2

Cartridge: biotage 614-0-0-02

Concentration: 12/6/22 6:37-11:35

Spiking Witnessed By

Date i

Preparation Reviewed Byi

Date i

Extracts Received Byi

Date

PREPARATION BATCH SUMMARYb

Table B-15b

Laboratory:b	APPL, LLCb	Work Order:b	22L0004b
Client:b	Tidewater, Inc.b	Project:b	NASA JPL Sib
Batch:b	BBL0249b	Batch Matrix:b	Waterb
		Preparation:b	Table B-15b

SAMPLE NAMEb	LAB SAMPLE IDb	DATE PREPAREDb	INITIAL VOL./WEIGHTb mLb	FINAL VOL.b mLb
FB-1-112822-	22L0004-21-	12/13/22 09:44-	51.52-	2.00-
FB-2-112922-	22L0004-24-	12/13/22 09:44-	47.64-	2.00-
FB-3-113022-	22L0004-28-	12/13/22 09:44-	48.85-	2.00-
FB-3-113022-	22L0004-28RE1-	12/13/22 09:44-	48.85-	2.00-
Blank-	BBL0249-BLK1-	12/13/22 09:44-	50.00-	2.00-
LCS-	BBL0249-BS1-	12/13/22 09:44-	50.00-	2.00-
LCS Dup-	BBL0249-BSD1-	12/13/22 09:44-	50.00-	2.00-
MRL Check-	BBL0249-MRL1-	12/13/22 09:44-	50.00-	2.00-

PREPARATION BENCH SHEETE

Organics

BBL0249 0

Ma rix: Watert

Prepared using: PFAS - Table B-15

Analyses	Spiking Solution(s)	Surrogate Solution(s)	Preparation Details									
B-15 DOD	22K0039i PFAS - MIX 1633 10ng/mLi	22L0117i MPFAC-HIF-ES 20.0ng/mLi	Lab Number	Sample and Source IDT	Date Due	Extract by	Prepared	Initial (mL)t	Final (mL)t	ul Spiket	ul Surrogatet	Extraction Comments
22L0003-04i	Field Blank-LAWCI		12/14/2021	12/28/2022	12/13/2022 9:44:00AM	53.25i	2i			200		
22L0003-04RE1i	Field Blank-LAWCI		12/14/2021	12/28/2022	12/13/2022 9:44:00AM	53.25i	2i			200		Added 12/15/2022 by ABK
22L0004-21i	FB-1-112822i		12/14/2021	12/26/2022	12/13/2022 9:44:00AM	51.52i	2i			200		
22L0004-21RE1i	FB-1-112822i		12/14/2021	12/26/2022	12/13/2022 9:44:00AM	51.52i	2i			200		Added 12/15/2022 by ABK
22L0004-24i	FB-2-112922i		12/14/2021	12/27/2022	12/13/2022 9:44:00AM	47.64i	2i			200		
22L0004-24RE1i	FB-2-112922i		12/14/2021	12/27/2022	12/13/2022 9:44:00AM	47.64i	2i			200		Added 12/15/2022 by ABK
22L0004-28i	FB-3-113022i		12/14/2021	12/28/2022	12/13/2022 9:44:00AM	48.85i	2i			200		
22L0004-28RE1i	FB-3-113022i		12/14/2021	12/28/2022	12/13/2022 9:44:00AM	48.85i	2i			200		Added 12/15/2022 by ABK
22L0005-15i	Field Blanki		12/14/2021	12/28/2022	12/13/2022 9:44:00AM	47.29i	2i			200		
22L0005-15RE1i	Field Blanki		12/14/2021	12/28/2022	12/13/2022 9:44:00AM	47.29i	2i			200		Added 12/15/2022 by ABK
22L0068-04i	FB2-120522i		12/22/2021	01/02/2023	12/13/2022 9:44:00AM	44.96i	2i			200		
22L0068-04RE1i	FB2-120522i		12/22/2021	01/02/2023	12/13/2022 9:44:00AM	44.96i	2i			200		Added 12/15/2022 by ABK
22L0068-12i	FB1-120622i		12/22/2021	01/03/2023	12/13/2022 9:44:00AM	47.91i	2i			200		
22L0068-12RE1i	FB1-120622i		12/22/2021	01/03/2023	12/13/2022 9:44:00AM	47.91i	2i			200		Added 12/15/2022 by ABK
22L0068-17i	FB-4-120722i		12/22/2021	01/04/2023	12/13/2022 9:44:00AM	46.5i	2i			200		
22L0068-17RE1i	FB-4-120722i		12/22/2021	01/04/2023	12/13/2022 9:44:00AM	46.5i	2i			200		Added 12/15/2022 by ABK
22L0068-23i	FB-3-120822i		12/22/2021	01/05/2023	12/13/2022 9:44:00AM	47.74i	2i			200		
22L0068-23RE1i	FB-3-120822i		12/22/2021	01/05/2023	12/13/2022 9:44:00AM	47.74i	2i			200		Added 12/15/2022 by ABK
BBL0249-BLK1i	Blanki				12/13/2022 9:44:00AM	50	2i			0		
BBL0249-BS1i	LCSI				12/13/2022 9:44:00AM	50	2i			200		
BBL0249-BSD1i	LCS Dupi				12/13/2022 9:44:00AM	50	2i			200		
BBL0249-MRL1i	MRL Checki				12/13/2022 9:44:00AMi	50	2i			20		

Spiking Witnessed By _____ Date i _____ Preparation Reviewed By _____ Date i _____ Extracts Received By _____ Date _____

PREPARATION BENCH SHEETE

Organics

Print Date/Time: 12/22/2022 12:47 pm

BBL0249

(Continued)E

Maix: Watert

Prepared using: PFAS - Table B-15

Analyses
B-15 DOD

Spiking Solution(s)
22K0039i PFAS - MIX 1633 10ng/mLi

Surrogate Solution(s)
22L0117i MPFAC-HIF-ES 20.0ng/mLi

Start Date/Time _____

Stop Date/Time _____

Standardt	Description	LotNumt
22C0296i	Envi-carbi	122395i
22K0511i	Reagent -0.3M Formic Acidi	M13H051i
22L0094i	Reagent - 0.05MFA wash	xi
22L0175i	Reagent - 1.0% Ammonia Hydroxide	219481i
22L0224i	Am. Ac. preservativei	P28T056i

Batch Comments:

Spiked by: HH 12/13/22 9:00

Balance #: WB2

Concentration: 12/14/22 9:15-10:02

Cartridge: N/A

Spiking Witnessed Byi

Date i

Preparation Reviewed Byi

Date i

Extracts Received Byi

Date

PREPARATION BATCH SUMMARY^b

Table B-15^b

Laboratory: ^b	APPL, LLC ^b	Work Order: ^b	22L0004 ^b
Client: ^b	Tidewater, Inc. ^b	Project: ^b	NASA JPL Sib
Batch: ^b	BBL0296 ^b	Batch Matrix: ^b	Water ^b
		Preparation: ^b	Table B-15 ^b

SAMPLE NAME^b	LAB SAMPLE ID^b	DATE PREPARED^b	INITIAL VOL./WEIGHT^b mL^b	FINAL VOL.^b mL^b
EQP-1-112822P	22L0004-22P	12/14/22 08:57P	276.59P	2.00P
EQP-1-112822P	22L0004-22RE1P	12/14/22 08:57P	276.59P	2.00P
EQP-2-112922P	22L0004-23P	12/14/22 08:57P	271.99P	2.00P
MW-15-113022P	22L0004-25P	12/14/22 08:57P	292.87P	2.00P
MW-15-113022P	22L0004-25RE1P	12/14/22 08:57P	292.87P	2.00P
EQP-3-113022P	22L0004-27P	12/14/22 08:57P	274.31P	2.00P
BlankP	BBL0296-BLK1P	12/14/22 08:57P	250.00P	2.00P
LCSP	BBL0296-BS1P	12/14/22 08:57P	250.00P	2.00P
LCS DupP	BBL0296-BSD1P	12/14/22 08:57P	250.00P	2.00P
MRL CheckP	BBL0296-MRL1P	12/14/22 08:57P	250.00P	2.00P

PREPARATION BENCH SHEETE

Organics

BBL0296 0

Ma rix: Watert

Prepared using: PFAS - Table B-15

Analyses		Spiking Solution(s)			Surrogate Solution(s)				
B-15 DOD		22L0269	PFAS - MIX 1633 10ng/mLi	22L01171	MPFAC-HIF-ES 20.0ng/mLi				
Lab Number	Sample and Source IDT	Date Due	Extract by	Preparedt	Initial (mL)t	Final (mL)t	ul Spiket	ul Surrogatet	Extraction Comments
22L0003-01i	LAWC#6i	12/14/2021	12/28/2022	12/14/2022 8:57:00AM	313i	2i		200	
22L0003-01REli	LAWC#6i	12/14/2021	12/28/2022	12/14/2022 8:57:00AM	313i	2i		200i	Added 12/15/2022 by DAG
22L0003-02i	DUP-1-113022i	12/14/2021	12/28/2022	12/14/2022 8:57:00AM	319.14i	2i		200	
22L0003-02REli	DUP-1-113022i	12/14/2021	12/28/2022	12/14/2022 8:57:00AM	319.14i	2i		200i	Added 12/15/2022 by DAG
22L0003-03i	LAWC#5	12/14/2021	12/28/2022	12/14/2022 8:57:00AM	309.12i	2i		200	
22L0003-03REli	LAWC#5	12/14/2021	12/28/2022	12/14/2022 8:57:00AM	309.12i	2i		200i	Added 12/15/2022 by DAG
22L0004-22i	EQP-1-112822i	12/14/2021	12/26/2022	12/14/2022 8:57:00AM	276.59i	2i		200	
22L0004-22REli	EQP-1-112822i	12/14/2021	12/26/2022	12/14/2022 8:57:00AM	276.59i	2i		200i	Added 12/15/2022 by DAG
22L0004-23i	EQP-2-112922i	12/14/2021	12/27/2022	12/14/2022 8:57:00AM	271.99i	2i		200	
22L0004-23REli	EQP-2-112922i	12/14/2021	12/27/2022	12/14/2022 8:57:00AM	271.99i	2i		200i	Added 12/15/2022 by DAG
22L0004-25	MW-15-113022i	12/14/2021	12/28/2022	12/14/2022 8:57:00AM	292.87i	2i		200	
22L0004-25REli	MW-15-113022i	12/14/2021	12/28/2022	12/14/2022 8:57:00AM	292.87i	2i		200i	Added 12/15/2022 by DAG
22L0004-26i	SB-3-113022i	12/14/2021	12/28/2022	12/14/2022 8:57:00AM	292.33i	2i		200	
22L0004-26REli	SB-3-113022i	12/14/2021	12/28/2022	12/14/2022 8:57:00AM	292.33i	2i		200i	Added 12/15/2022 by DAG
22L0004-27i	EQP-3-113022i	12/14/2021	12/28/2022	12/14/2022 8:57:00AM	274.31i	2i		200	
22L0004-27REli	EQP-3-113022i	12/14/2021	12/28/2022	12/14/2022 8:57:00AM	274.31i	2i		200i	Added 12/15/2022 by DAG
22L0005-16i	EQP-1-SO1i	12/14/2021	12/28/2022	12/14/2022 8:57:00AM	312.36i	2i		200	
22L0005-16REli	EQP-1-SO1i	12/14/2021	12/28/2022	12/14/2022 8:57:00AM	312.36i	2i		200i	Added 12/15/2022 by DAG
22L0082-01i	BASIN-121122i	12/16/2021	01/08/2023	12/14/2022 8:57:00AM	301.99i	2i		200	
22L0082-01REli	BASIN-121122i	12/16/2021	01/08/2023	12/14/2022 8:57:00AM	301.99i	2i		200i	Added 12/15/2022 by DAG
22L0082-02i	BASIN-121122i	12/16/2021	01/08/2023	12/14/2022 8:57:00AM	312.67i	2i		200	
22L0082-02REli	BASIN-121122i	12/16/2021	01/08/2023	12/14/2022 8:57:00AMi	312.67i	2i		200i	Added 12/15/2022 by DAG

Spiking Witnessed By _____

Date _____

Preparation Reviewed By _____

Date _____

Extracts Received By _____

Date _____

PREPARATION BENCH SHEETE

Organics

BBL0296

(Continued)E

Print Date/Time: 01/05/2023 4:54 pm

Matrix: Watert

Prepared using: PFAS - Table B-15

Analyses		Spiking Solution(s)				Surrogate Solution(s)	
B-15 DOD	22L0082-03i	22L0269	01/09/2023	12/14/2022 8:57:00AM	272.15	2i	22L0117i
	BASIN-121222i						MPFAC-HIF-ES 20.0ng/mL
	22L0082-03RE1i		01/09/2023	12/14/2022 8:57:00AM	272.15	2i	
	22L0082-04i		01/08/2023	12/14/2022 8:57:00AM	301.52i	2i	
	22L0082-04RE1i		01/08/2023	12/14/2022 8:57:00AM	301.52i	2i	
	BBL0296-BLK1i			12/14/2022 8:57:00AM	250i	2i	
	BBL0296-BS1i			12/14/2022 8:57:00AM	250i	2i	
	BBL0296-BSD1i			12/14/2022 8:57:00AM	250i	2i	
	BBL0296-MRL1i			12/14/2022 8:57:00AMi	250i	2i	

Start Date/Time _____

Stop Date/Time _____

Batch Comments:
 Spiked by: ABK 12:00
 Balance #: WB2
 Concentration: 12/15/22 9:28-1:40
 Cartridge: Biotagei

Reagents	Standard	Description	Lot/Numt
	22C0296	Envi-carbi	122395
	22K0511	Reagent -0.3M Formic Acid	M13H051i
	22L0094	Reagent - 0.05MFA wash	xi
	22L0175	Reagent - 1.0% Ammonia Hydroxide	219481i
	22L0224i	Am. Ac. preservative	P281056i

Spiking Witnessed By _____

Date _____

Preparation Reviewed By _____

Date _____

Extracts Received By _____

Date _____

PREPARATION BATCH SUMMARY^b

Table B-15^b

Laboratory: ^b	APPL, LLC ^b	Work Order: ^b	22L0004 ^b
Client: ^b	Tidewater, Inc. ^b	Project: ^b	NASA JPL Sib
Batch: ^b	BBL0371 ^b	Batch Matrix: ^b	Water ^b
		Preparation: ^b	Table B-15 ^b

SAMPLE NAME^b	LAB SAMPLE ID^b	DATE PREPARED^b	INITIAL VOL./WEIGHT^b mL^b	FINAL VOL.^b mL^b
SB-3-113022-	22L0004-26RE2-	12/19/22 12:17-	289.55-	2.00-
Blank-	BBL0371-BLK1-	12/19/22 12:17-	250.00-	2.00-
LCS-	BBL0371-BS1-	12/19/22 12:17-	250.00-	2.00-
LCS Dup-	BBL0371-BSD1-	12/19/22 12:17-	250.00-	2.00-
MRL Check-	BBL0371-MRL1-	12/19/22 12:17-	250.00-	2.00-

PREPARATION BENCH SHEETE

Organics

BBL0371 0

Ma rix: Watert

Prepared using: PFAS - Table B-15

Analyses B-15 DOD		Spiking Solution(s) 22L0269i PFAS - MIX 1633 10ng/mLi		Surrogate Solution(s) 22L0272i MPFAC-HIF-ES 20.0ng/mLi					
Lab Number	Sample and Source IDT	Date Due	Extract by	Preparedt	Initial (mL)t	Final (mL)t	ul Spiket	ul Surrogatet	Extraction Comments
22L0004-26RE2i	SB-3-113022i	12/14/2022i	12/28/2022	12/19/2022 12:17:00PM	289.55	2i		200i	Re-extract added 12/16/2022 by HGH
22L0004-26RE3i	SB-3-113022i	12/14/2022i	12/28/2022	12/19/2022 12:17:00PM	289.55	2i		200i	Re-extract added 12/16/2022 by HGH
22L0005-16RE2i	EQP-1-SO1i	12/14/2022i	12/28/2022	12/19/2022 12:17:00PM	311.42i	2i		200i	Re-extract added 12/16/2022 by HGH
22L0005-16RE3i	EQP-1-SO1i	12/14/2022i	12/28/2022	12/19/2022 12:17:00PM	311.42i	2i		200i	Re-extract added 12/16/2022 by HGH
22L0050-02i	CL5	12/20/2022i	01/02/2023	12/19/2022 12:17:00PM	196.87i	2i		200	
22L0050-02RE1i	CL5	12/20/2022i	01/02/2023	12/19/2022 12:17:00PM	196.87i	2i		200i	Added 12/28/2022 by DAG
22L0050-03i	CL6i	12/20/2022i	01/02/2023	12/19/2022 12:17:00PM	217.3i	2i		200	
22L0050-03RE1i	CL6i	12/20/2022i	01/02/2023	12/19/2022 12:17:00PM	217.3i	2i		200i	Added 12/28/2022 by DAG
22L0050-03RE2i	CL6i	12/20/2022i	01/02/2023	12/19/2022 12:17:00PM	217.3i	2i		200i	Added 1/4/2023 by DAG
22L0050-04i	CL7i	12/20/2022i	01/02/2023	12/19/2022 12:17:00PM	259.88i	2i		200	
22L0050-04RE1i	CL7i	12/20/2022i	01/02/2023	12/19/2022 12:17:00PM	259.88i	2i		200i	Added 12/28/2022 by DAG
22L0050-05	CL8i	12/20/2022i	01/02/2023	12/19/2022 12:17:00PM	206.59i	2i		200	
22L0050-05RE1i	CL8i	12/20/2022i	01/02/2023	12/19/2022 12:17:00PM	206.59i	2i		200i	Added 12/28/2022 by DAG
22L0050-05RE2i	CL8i	12/20/2022i	01/02/2023	12/19/2022 12:17:00PM	206.59i	2i		200i	Added 1/4/2023 by DAG
22L0068-21i	EP-3i	12/22/2022i	01/05/2023	12/19/2022 12:17:00PM	309.36i	2i		200	
22L0068-21RE1i	EP-3i	12/22/2022i	01/05/2023	12/19/2022 12:17:00PM	309.36i	2i		200i	Added 12/28/2022 by DAG
22L0068-22i	EQP-3-120822i	12/22/2022i	01/05/2023	12/19/2022 12:17:00PM	305.1i	2i		200	
22L0068-22RE1i	EQP-3-120822i	12/22/2022i	01/05/2023	12/19/2022 12:17:00PM	305.1i	2i		200i	Added 12/28/2022 by DAG
22L0080-01i	SS596P-76-MW54_1222i	12/27/2022i	01/03/2023	12/19/2022 12:17:00PM	311.75	2i		200i	Include all EIS in dilutions
22L0080-01RE1i	SS596P-76-MW54_1222i	12/27/2022i	01/03/2023	12/19/2022 12:17:00PM	311.75	2i		200i	Include all EIS in dilutions
22L0080-02i	SS596P-86-MW05_1222i	12/27/2022i	01/03/2023	12/19/2022 12:17:00PM	271.8i	2i		200i	Include all EIS in dilutions
22L0080-02RE1i	SS596P-86-MW05_1222i	12/27/2022i	01/03/2023	12/19/2022 12:17:00PM	271.8i	2i		200i	Include all EIS in dilutions

Spiking Witnessed By

Date i

Preparation Reviewed By

Date i

Extracts Received By

Date

PREPARATION BENCH SHEETE

Organics

BBL0371

(Continued)E

Ma rix: Watert

Prepared using: PFAS - Table B-15

Analyses		Spiking Solution(s)				Surrogate Solution(s)			
B-15 DOD	22L0269i	PFAS - MIX 1633 10ng/mL	2i	267.48i	2i	22L0272i	MPFAC-HIF-ES 20.0ng/mL	200i	Include all EIS in dilutions
22L0080-03i	SS596P-86-MW13_1222i	12/27/2021	12/19/2022 12:17:00PM	267.48i	2i		200i		Include all EIS in dilutions
22L0080-03REli	SS596P-86-MW13_1222i	12/27/2021	12/19/2022 12:17:00PM	267.48i	2i		200i		Include all EIS in dilutions
22L0080-04i	SS596P-76-MW49_1222i	12/27/2021	12/19/2022 12:17:00PM	275.3i	2i		200i		Include all EIS in dilutions
22L0080-04REli	SS596P-76-MW49_1222i	12/27/2021	12/19/2022 12:17:00PM	275.3i	2i		200i		Include all EIS in dilutions
22L0080-05	SS596P-76-MW50_1222i	12/27/2021	12/19/2022 12:17:00PM	294.18i	2i		200i		Include all EIS in dilutions
22L0080-05REli	SS596P-76-MW50_1222i	12/27/2021	12/19/2022 12:17:00PM	294.18i	2i		200i		Include all EIS in dilutions
22L0080-06i	SS596P-86-MW33_1222i	12/27/2021	12/19/2022 12:17:00PM	277.96i	2i		200i		Include all EIS in dilutions
22L0080-06REli	SS596P-86-MW33_1222i	12/27/2021	12/19/2022 12:17:00PM	277.96i	2i		200i		Include all EIS in dilutions
22L0080-06RE2i	SS596P-86-MW33_1222i	12/27/2021	12/19/2022 12:17:00PM	277.96i	2i		200i		Include all EIS in dilutions
22L0080-07i	SS596P-76-MW10_1222i	12/27/2021	12/19/2022 12:17:00PM	297.75	2i		200i		Include all EIS in dilutions
22L0080-07REli	SS596P-76-MW10_1222i	12/27/2021	12/19/2022 12:17:00PM	297.75	2i		200i		Include all EIS in dilutions
22L0080-08i	SS593P-5/14-MW170_1222i	12/27/2021	12/19/2022 12:17:00PM	309.24i	2i		200i		Include all EIS in dilutions
22L0080-08REli	SS593P-5/14-MW170_1222i	12/27/2021	12/19/2022 12:17:00PM	309.24i	2i		200i		Include all EIS in dilutions
22L0080-09i	SS593P-5/14-MW001_1222i	12/27/2021	12/19/2022 12:17:00PM	2991.58i	2i		200i		Include all EIS in dilutions
22L0080-09REli	SS593P-5/14-MW001_1222i	12/27/2021	12/19/2022 12:17:00PM	2991.58i	2i		200i		Include all EIS in dilutions
22L0080-10i	SS593P-5/14-MW001A1_1222i	12/27/2021	12/19/2022 12:17:00PM	301.73i	2i		200i		Include all EIS in dilutions
22L0080-10REli	SS593P-5/14-MW001A1_1222i	12/27/2021	12/19/2022 12:17:00PM	301.73i	2i		200i		Include all EIS in dilutions
22L0080-11i	SS593P-15-MW10_1222i	12/27/2021	12/19/2022 12:17:00PM	314.28i	2i		200i		Include all EIS in dilutions
22L0080-11REli	SS593P-15-MW10_1222i	12/27/2021	12/19/2022 12:17:00PM	314.28i	2i		200i		Include all EIS in dilutions
22L0080-15	WP112P-110-MW01_1222i	12/27/2021	12/19/2022 12:17:00PM	293.93i	2i		200i		Include all EIS in dilutions
22L0080-15REli	WP112P-110-MW01_1222i	12/27/2021	12/19/2022 12:17:00PM	293.93i	2i		200i		Include all EIS in dilutions
BBL0371-BLK1i	Blanki		12/19/2022 12:17:00PM	250i	2i	0i	200		
BBL0371-BSIi	LCSI		12/19/2022 12:17:00PM	250i	2i	200i	200		
BBL0371-BSD1i	LCS Dupi		12/19/2022 12:17:00PM	250i	2i	200i	200		

Spiking Witnessed By _____ Date i _____ Preparation Reviewed By _____ Date i _____ Extracts Received By _____ Date _____

PREPARATION BENCH SHEETE

Organics

Print Date/Time: 01/05/2023 4:54 pm

BBL0371

(Continued)E

Marix: Watert

Prepared using: PFAS - Table B-15

Analyses		Spiking Solution(s)			Surrogate Solution(s)		
B-15 DOD		22L0269i	PFAS - MIX 1633 10ng/mL		22L0272i	MPFAC-HIF-ES 20.0ng/mL	
BBL0371-MRL1i	MRL Checki	12/19/2022 12:17:00PM	250i	2i	20i	200	
BBL0371-MS1 i	Matrix Spike [22L0080-15]i	12/19/2022 12:17:00PM	250i	2i	200i	200	
BBL0371-MSD1 i	Matrix Spike Dup [22L0080-15]i	12/19/2022 12:17:00PM	250i	2i	200i	200	

Start Date/Time _____

Stop Date/Time _____

Standardt	Description	LotNumt
22K0511i	Reagent -0.3M Formic Acidi	M13H051i
22L0094i	Reagent - 0.05MFA wash	xi
22L0224i	Am. Ac. preservativei	P28I056i
22L0369i	Reagent - 1.0% Ammonia Hydroxidei	219481i

Batch Comments:

Spiked by: DAG 12/19/22 3:30

Balance #: WB2

Cartridge: Phenomenex 8B-S038-FB]
concentration:12/21/22 9:00-3:35, 12/22/22/ 10:41-4:00i

Spiking Witnessed By _____

Date i _____

Preparation Reviewed By _____

Date i _____

Extracts Received By _____

Date _____

PREPARATION BENCH SHEETE

Organics

BBL0371 0

Ma rix: Watert

Prepared using: PFAS - Table B-15

Analyses B-15 DOD	Spiking Solution(s)t
Surrogate Solution(s) 22L0272i MPFAC-HIF-ES 20.0ng/mLi	

Lab Number	Sample and Source IDT	Date Due	Extract by	Preparedt	Initial (mL)t	Final (mL)t	ul Spiket	ul Surrogatet	Extraction Comments
22L0004-26RE2i	SB-3-113022i	12/14/2022i	12/28/2022	12/19/2022 12:17:00PM	50i	2i		200i	Re-extract added 12/16/2022 by HGH
22L0005-16RE2i	EQP-1-SO1I	12/14/2022i	12/28/2022	12/19/2022 12:17:00PM	50i	2i		200i	Re-extract added 12/16/2022 by HGH
22L0050-02i	CL5	12/20/2022i	01/02/2023	12/19/2022 12:17:00PM	50i	2i		200	
22L0050-03i	CL6i	12/20/2022i	01/02/2023	12/19/2022 12:17:00PM	50i	2i		200	
22L0050-04i	CL7i	12/20/2022i	01/02/2023	12/19/2022 12:17:00PM	50i	2i		200	
22L0050-05	CL8i	12/20/2022i	01/02/2023	12/19/2022 12:17:00PM	50i	2i		200	
22L0068-21i	EP-3i	12/22/2022i	01/05/2023	12/19/2022 12:17:00PM	50i	2i		200	
22L0068-22i	EQP-3-120822i	12/22/2022i	01/05/2023	12/19/2022 12:17:00PM	50i	2i		200	
22L0080-01i	SS596P-76-MW54_1222i	12/27/2022i	01/03/2023	12/19/2022 12:17:00PM	50i	2i		200i	Include all EIS in dilutions
22L0080-02i	SS596P-86-MW05_1222i	12/27/2022i	01/03/2023	12/19/2022 12:17:00PM	50i	2i		200i	Include all EIS in dilutions
22L0080-03i	SS596P-86-MW13_1222i	12/27/2022i	01/03/2023	12/19/2022 12:17:00PM	50i	2i		200i	Include all EIS in dilutions
22L0080-04i	SS596P-76-MW49_1222i	12/27/2022i	01/04/2023	12/19/2022 12:17:00PM	50i	2i		200i	Include all EIS in dilutions
22L0080-05	SS596P-76-MW50_1222i	12/27/2022i	01/04/2023	12/19/2022 12:17:00PM	50i	2i		200i	Include all EIS in dilutions
22L0080-06i	SS596P-86-MW33_1222i	12/27/2022i	01/04/2023	12/19/2022 12:17:00PM	50i	2i		200i	Include all EIS in dilutions
22L0080-07i	SS596P-76-MW10_1222i	12/27/2022i	01/04/2023	12/19/2022 12:17:00PM	50i	2i		200i	Include all EIS in dilutions
22L0080-08i	SS593P-5/14-MW170_1222i	12/27/2022i	01/04/2023	12/19/2022 12:17:00PM	50i	2i		200i	Include all EIS in dilutions
22L0080-09i	SS593P-5/14-MW001_1222i	12/27/2022i	01/04/2023	12/19/2022 12:17:00PM	50i	2i		200i	Include all EIS in dilutions
22L0080-10i	SS593P-5/14-MW001A1_1222i	12/27/2022i	01/04/2023	12/19/2022 12:17:00PM	50i	2i		200i	Include all EIS in dilutions
22L0080-11i	SS593P-15-MW10_1222i	12/27/2022i	01/04/2023	12/19/2022 12:17:00PM	50i	2i		200i	Include all EIS in dilutions
22L0080-15	WP112P-110-MW01_1222i	12/27/2022i	01/05/2023	12/19/2022 12:17:00PM	50i	2i		200i	Include all EIS in dilutions
BBL0371-BLK1i	Blanki			12/19/2022 12:17:00PM	50i	2i		200	
BBL0371-BS1i	LCSI			12/19/2022 12:17:00PMi	50i	2i		200	

Spiking Witnessed By	Date i	Preparation Reviewed Byi	Date i
Extracts Received Byi	Date		Date

PREPARATION BENCH SHEETE

Organics

Print Date/Time: 12/19/2022 12:29 pm

BBL0371

(Continued)E

Matrix: Watert

Prepared using: PFAS - Table B-15

Analyses	Spiking Solution(s)t				Surrogate Solution(s)
BBL0371-BSD1i	LCS Dupi	12/19/2022 12:17:00PM	50i	2i	22L0272i MPFAC-HIF-ES 20.0ng/mL
BBL0371-MRL1i	MRL Checki	12/19/2022 12:17:00PM	50i	2i	200
BBL0371-MS1i	Matrix Spike [22L0080-15]j	12/19/2022 12:17:00PM	50i	2i	200
BBL0371-MSD1i	Matrix Spike Dup [22L0080-15]j	12/19/2022 12:17:00PM	50i	2i	200

Reagents	Standardt	Description	LotNum t

Start Date/Time _____
 Stop Date/Time _____

INJECTION LOG - ANALYSIS SEQUENCE SUMMARYb

Table B-15b

Laboratory:b	APPL, LLCb	SDG:b	
Client:b	Tidewater, Inc.b	Project:b	NASA JPL S1b
Sequence:b	SB03724b	Instrument:b	Saphirab
Calibration:b	2250016b		

Sample Nameb	Lab Sample IDb	Lab File IDb	Analysis Date/Timeb
Cal StandardI	SB03724-CAL1b	S2022-12-07A (1)b	12/07/22 14:12b
Cal StandardI	SB03724-CAL2b	S2022-12-07A (2)b	12/07/22 14:24b
Cal StandardI	SB03724-CAL3b	S2022-12-07A (3)b	12/07/22 14:37b
Cal StandardI	SB03724-CAL4b	S2022-12-07A (4)b	12/07/22 14:50b
Cal StandardI	SB03724-CAL5b	S2022-12-07A (5)b	12/07/22 15:03b
Cal StandardI	SB03724-CAL6b	S2022-12-07A (6)b	12/07/22 15:15b
Cal StandardI	SB03724-CAL7b	S2022-12-07A (7)b	12/07/22 15:28b
Cal StandardI	SB03724-CAL8b	S2022-12-07A (8)b	12/07/22 15:41b
Initial Cal BlankI	SB03724-ICB1b	S2022-12-07A (9)b	12/07/22 15:53b
Secondary Cal CheckI	SB03724-SCV1b	S2022-12-07A (10)b	12/07/22 16:06b

INJECTION LOG - ANALYSIS SEQUENCE SUMMARYb

Table B-15b

Laboratory:b	APPL, LLCb	SDG:b	
Client:b	Tidewater, Inc.b	Project:b	NASA JPL Slb
Sequence:b	SB03769b	Instrument:b	Saphirab
Calibration:b	2250016b		

Sample Nameb	Lab Sample IDb	Lab File IDb	Analysis Date/Timeb
Calibration Blankl	SB03769-CCB1b	S2022-12-09B (1)b	12/09/22 22:28b
Low Cal Checkl	SB03769-LCV1b	S2022-12-09B (2)b	12/09/22 22:41b
Calibration Checkl	SB03769-CCV1b	S2022-12-09B (3)b	12/09/22 22:54b
Calibration Blankl	SB03769-CCB2b	S2022-12-09B (4)b	12/09/22 23:32b
Blankl	BBL0076-BLK1b	S2022-12-09B (8)b	12/10/22 00:23b
LCSI	BBL0076-BS1b	S2022-12-09B (9)b	12/10/22 00:35b
LCS Dupl	BBL0076-BSD1b	S2022-12-09B (10)b	12/10/22 00:48b
MRL Checkl	BBL0076-MRL1b	S2022-12-09B (11)b	12/10/22 01:01b
MW-4-S2-112822l	BBL0076-MS1b	S2022-12-09B (12)b	12/10/22 01:13b
MW-4-S2-112822l	BBL0076-MSD1b	S2022-12-09B (13)b	12/10/22 01:26b
Calibration Checkl	SB03769-CCV2b	S2022-12-09B (14)b	12/10/22 01:39b
Calibration Blankl	SB03769-CCB3b	S2022-12-09B (15)b	12/10/22 01:52b
MW-24-S5-112922l	22L0004-01b	S2022-12-09B (16)b	12/10/22 02:04b
MW-24-S5-112922l	22L0004-01RE1b	S2022-12-09B (17)b	12/10/22 02:17b
MW-24-S4-112922l	22L0004-02b	S2022-12-09B (18)b	12/10/22 02:30b
MW-24-S4-112922l	22L0004-02RE1b	S2022-12-09B (19)b	12/10/22 02:42b
MW-24-S3-112922l	22L0004-03b	S2022-12-09B (20)b	12/10/22 02:55b
MW-24-S3-112922l	22L0004-03RE1b	S2022-12-09B (21)b	12/10/22 03:08b
MW-24-S2-112922l	22L0004-04b	S2022-12-09B (22)b	12/10/22 03:21b
MW-24-S2-112922l	22L0004-04RE1b	S2022-12-09B (23)b	12/10/22 03:33b
DUP-2-112922l	22L0004-05b	S2022-12-09B (24)b	12/10/22 03:46b
DUP-2-112922l	22L0004-05RE1b	S2022-12-09B (25)b	12/10/22 03:59b
MW-17-S5-112922l	22L0004-06b	S2022-12-09B (26)b	12/10/22 04:11b
MW-17-S5-112922l	22L0004-06RE1b	S2022-12-09B (27)b	12/10/22 04:24b
MW-17-S4-112922l	22L0004-07b	S2022-12-09B (28)b	12/10/22 04:37b
MW-17-S4-112922l	22L0004-07RE1b	S2022-12-09B (29)b	12/10/22 04:49b
MW-17-S3-112922l	22L0004-08b	S2022-12-09B (30)b	12/10/22 05:02b
MW-17-S3-112922l	22L0004-08RE1b	S2022-12-09B (31)b	12/10/22 05:15b

INJECTION LOG - ANALYSIS SEQUENCE SUMMARYb

Table B-15b

Laboratory:b	APPL, LLCb	SDG:b	
Client:b	Tidewater, Inc.b	Project:b	NASA JPLb
Sequence:b	SB03769b	Instrument:b	Saphirab
Calibration:b	2250016b		

Sample Nameb	Lab Sample IDb	Lab File IDb	Analysis Date/Timeb
DUP-3-112922I	22L0004-09b	S2022-12-09B (32)b	12/10/22 05:28b
DUP-3-112922I	22L0004-09RE1b	S2022-12-09B (33)b	12/10/22 05:40b
MW-17-S2-112922I	22L0004-10b	S2022-12-09B (34)b	12/10/22 05:53b
Calibration CheckI	SB03769-CCV3b	S2022-12-09B (36)b	12/10/22 06:18b
Calibration BlankI	SB03769-CCB4b	S2022-12-09B (37)b	12/10/22 06:31b
SB-2-112922I	22L0004-11b	S2022-12-09B (38)b	12/10/22 06:44b
SB-2-112922I	22L0004-11RE1b	S2022-12-09B (39)b	12/10/22 06:56b
MW-4-S5-112822I	22L0004-12b	S2022-12-09B (40)b	12/10/22 07:09b
MW-4-S5-112822I	22L0004-12RE1b	S2022-12-09B (41)b	12/10/22 07:22b
DUP-1-112822I	22L0004-13b	S2022-12-09B (42)b	12/10/22 07:35b
DUP-1-112822I	22L0004-13RE1b	S2022-12-09B (43)b	12/10/22 07:47b
MW-4-S4-112822I	22L0004-14b	S2022-12-09B (44)b	12/10/22 08:00b
MW-4-S4-112822I	22L0004-14RE1b	S2022-12-09B (45)b	12/10/22 08:13b
MW-4-S2-112822I	22L0004-15b	S2022-12-09B (46)b	12/10/22 08:25b
MW-4-S2-112822I	22L0004-15RE1b	S2022-12-09B (47)b	12/10/22 08:38b
MW-12-S5-112822I	22L0004-16b	S2022-12-09B (48)b	12/10/22 08:51b
MW-12-S5-112822I	22L0004-16RE1b	S2022-12-09B (49)b	12/10/22 09:03b
MW-12-S4-112822I	22L0004-17b	S2022-12-09B (50)b	12/10/22 09:16b
MW-12-S4-112822I	22L0004-17RE1b	S2022-12-09B (51)b	12/10/22 09:29b
MW-12-S3-112822I	22L0004-18b	S2022-12-09B (52)b	12/10/22 09:42b
MW-12-S3-112822I	22L0004-18RE1b	S2022-12-09B (53)b	12/10/22 09:54b
MW-12-S2-112822I	22L0004-19b	S2022-12-09B (54)b	12/10/22 10:07b
MW-12-S2-112822I	22L0004-19RE1b	S2022-12-09B (55)b	12/10/22 10:20b
SB-1-112822I	22L0004-20b	S2022-12-09B (56)b	12/10/22 10:32b
SB-1-112822I	22L0004-20RE1b	S2022-12-09B (57)b	12/10/22 10:45b
Calibration CheckI	SB03769-CCV4b	S2022-12-09B (58)b	12/10/22 10:58b
Calibration BlankI	SB03769-CCB5b	S2022-12-09B (59)b	12/10/22 11:11b

INJECTION LOG - ANALYSIS SEQUENCE SUMMARYb

Table B-15b

Laboratory:b	APPL, LLCb	SDG:b	
Client:b	Tidewater, Inc.b	Project:b	NASA JPL S1b
Sequence:b	SB03856b	Instrument:b	Saphirab
Calibration:b	2251019b		

Sample Nameb	Lab Sample IDb	Lab File IDb	Analysis Date/Timeb
Cal StandardI	SB03856-CAL1b	S2022-12-15A (1)b	12/15/22 12:33b
Cal StandardI	SB03856-CAL2b	S2022-12-15A (2)b	12/15/22 12:46b
Cal StandardI	SB03856-CAL3b	S2022-12-15A (3)b	12/15/22 12:59b
Cal StandardI	SB03856-CAL4b	S2022-12-15A (4)b	12/15/22 13:11b
Cal StandardI	SB03856-CAL5b	S2022-12-15A (5)b	12/15/22 13:24b
Cal StandardI	SB03856-CAL6b	S2022-12-15A (6)b	12/15/22 13:37b
Cal StandardI	SB03856-CAL7b	S2022-12-15A (7)b	12/15/22 13:50b
Cal StandardI	SB03856-CAL8b	S2022-12-15A (8)b	12/15/22 14:02b
Initial Cal BlankI	SB03856-ICB1b	S2022-12-15A (9)b	12/15/22 14:15b
Secondary Cal CheckI	SB03856-SCV1b	S2022-12-15A (10)b	12/15/22 14:28b

INJECTION LOG - ANALYSIS SEQUENCE SUMMARYb

Table B-15b

Laboratory:b	APPL, LLCb	SDG:b	
Client:b	Tidewater, Inc.b	Project:b	NASA JPL SIb
Sequence:b	SB03858b	Instrument:b	Saphirab
Calibration:b	2251019b		

Sample Nameb	Lab Sample IDb	Lab File IDb	Analysis Date/Timeb
Calibration Blankl	SB03858-CCB1b	S2022-12-15B (1)b	12/15/22 14:53b
Low Cal Checkl	SB03858-LCV1b	S2022-12-15B (2)b	12/15/22 15:06b
Calibration Checkl	SB03858-CCV1b	S2022-12-15B (3)b	12/15/22 15:19b
Calibration Blankl	SB03858-CCB2b	S2022-12-15B (4)b	12/15/22 15:57b
Blankl	BBL0296-BLK1b	S2022-12-15B (5)b	12/15/22 16:10b
LCSI	BBL0296-BS1b	S2022-12-15B (6)b	12/15/22 16:22b
LCS Dupl	BBL0296-BSD1b	S2022-12-15B (7)b	12/15/22 16:35b
MRL Checkl	BBL0296-MRL1b	S2022-12-15B (8)b	12/15/22 16:48b
Calibration Checkl	SB03858-CCV2b	S2022-12-15B (25)b	12/15/22 20:24b
Calibration Blankl	SB03858-CCB3b	S2022-12-15B (26)b	12/15/22 20:36b
EQP-1-112822l	22L0004-22b	S2022-12-15B (27)b	12/15/22 20:49b
EQP-1-112822l	22L0004-22RE1b	S2022-12-15B (28)b	12/15/22 21:02b
EQP-2-112922l	22L0004-23b	S2022-12-15B (29)b	12/15/22 21:14b
MW-15-113022l	22L0004-25b	S2022-12-15B (31)b	12/15/22 21:40b
MW-15-113022l	22L0004-25RE1b	S2022-12-15B (32)b	12/15/22 21:53b
EQP-3-113022l	22L0004-27b	S2022-12-15B (35)b	12/15/22 22:31b
Calibration Checkl	SB03858-CCV3b	S2022-12-15B (37)b	12/15/22 22:56b
Calibration Blankl	SB03858-CCB4b	S2022-12-15B (38)b	12/15/22 23:09b

INJECTION LOG - ANALYSIS SEQUENCE SUMMARYb

Table B-15b

Laboratory:b	APPL, LLCb	SDG:b	
Client:b	Tidewater, Inc.b	Project:b	NASA JPL Slb
Sequence:b	SB03860b	Instrument:b	Saphirab
Calibration:b	2251019b		

Sample Nameb	Lab Sample IDb	Lab File IDb	Analysis Date/Timeb
Calibration Blankl	SB03860-CCB1b	S2022-12-15C (1)b	12/15/22 23:34b
Low Cal Checkl	SB03860-LCV1b	S2022-12-15C (2)b	12/15/22 23:47b
Calibration Checkl	SB03860-CCV1b	S2022-12-15C (3)b	12/16/22 00:00b
Calibration Blankl	SB03860-CCB2b	S2022-12-15C (4)b	12/16/22 00:38b
Blankl	BBL0249-BLK1b	S2022-12-15C (5)b	12/16/22 00:51b
LCSI	BBL0249-BS1b	S2022-12-15C (6)b	12/16/22 01:03b
LCS Dupl	BBL0249-BSD1b	S2022-12-15C (7)b	12/16/22 01:16b
MRL Checkl	BBL0249-MRL1b	S2022-12-15C (8)b	12/16/22 01:29b
FB-1-112822l	22L0004-21b	S2022-12-15C (11)b	12/16/22 02:07b
FB-2-112922l	22L0004-24b	S2022-12-15C (13)b	12/16/22 02:33b
FB-3-113022l	22L0004-28b	S2022-12-15C (15)b	12/16/22 02:58b
FB-3-113022l	22L0004-28RE1b	S2022-12-15C (16)b	12/16/22 03:11b
Calibration Checkl	SB03860-CCV2b	S2022-12-15C (27)b	12/16/22 05:30b
Calibration Blankl	SB03860-CCB3b	S2022-12-15C (28)b	12/16/22 05:43b

INJECTION LOG - ANALYSIS SEQUENCE SUMMARYb

Table B-15b

Laboratory:b	APPL, LLCb	SDG:b	
Client:b	Tidewater, Inc.b	Project:b	NASA JPL S1b
Sequence:b	SB04003b	Instrument:b	Saphirab
Calibration:b	2253011b		

Sample Nameb	Lab Sample IDb	Lab File IDb	Analysis Date/Timeb
Calibration Blankl	SB04003-CCB1b	S2022-12-29C (1)b	12/30/22 04:02b
Low Cal Checkl	SB04003-LCV1b	S2022-12-29C (2)b	12/30/22 04:15b
Calibration Checkl	SB04003-CCV1b	S2022-12-29C (3)b	12/30/22 04:28b
Resolution Checkl	SB04003-RES1b	S2022-12-29C (4)b	12/30/22 04:41b
Calibration Blankl	SB04003-CCB2b	S2022-12-29C (6)b	12/30/22 05:07b
Blankl	BBL0371-BLK1b	S2022-12-29C (7)b	12/30/22 05:19b
LCSI	BBL0371-BS1b	S2022-12-29C (8)b	12/30/22 05:32b
LCS Dupl	BBL0371-BSD1b	S2022-12-29C (9)b	12/30/22 05:45b
MRL Checkl	BBL0371-MRL1b	S2022-12-29C (10)b	12/30/22 05:58b
SB-3-113022l	22L0004-26RE2b	S2022-12-29C (13)b	12/30/22 06:37b
Calibration Checkl	SB04003-CCV2b	S2022-12-29C (33)b	12/30/22 10:54b
Calibration Blankl	SB04003-CCB3b	S2022-12-29C (34)b	12/30/22 11:07b
Calibration Checkl	SB04003-CCV3b	S2022-12-29C (55)b	12/30/22 15:38b
Calibration Blankl	SB04003-CCB4b	S2022-12-29C (56)b	12/30/22 15:51b

INJECTION LOG - ANALYSIS SEQUENCE SUMMARY^bTable B-15^b

Laboratory: ^b	APPL, LLC ^b	SDG: ^b	
Client: ^b	Tidewater, Inc. ^b	Project: ^b	NASA JPL S1 ^b
Sequence: ^b	SB04012 ^b	Instrument: ^b	Saphirab
Calibration: ^b	2253011 ^b		

Sample Name ^b	Lab Sample ID ^b	Lab File ID ^b	Analysis Date/Time ^b
Cal StandardI	SB04012-CAL1 ^b	S2022-12-29A (1) ^b	12/29/22 12:08 ^b
Cal StandardI	SB04012-CAL2 ^b	S2022-12-29A (2) ^b	12/29/22 12:20 ^b
Cal StandardI	SB04012-CAL3 ^b	S2022-12-29A (3) ^b	12/29/22 12:33 ^b
Cal StandardI	SB04012-CAL4 ^b	S2022-12-29A (4) ^b	12/29/22 12:46 ^b
Cal StandardI	SB04012-CAL5 ^b	S2022-12-29A (5) ^b	12/29/22 12:59 ^b
Cal StandardI	SB04012-CAL6 ^b	S2022-12-29A (6) ^b	12/29/22 13:12 ^b
Cal StandardI	SB04012-CAL7 ^b	S2022-12-29A (7) ^b	12/29/22 13:25 ^b
Cal StandardI	SB04012-CAL8 ^b	S2022-12-29A (8) ^b	12/29/22 13:38 ^b
Initial Cal BlankI	SB04012-ICB1 ^b	S2022-12-29A (9) ^b	12/29/22 13:51 ^b
Secondary Cal CheckI	SB04012-SCV1 ^b	S2022-12-29A (10) ^b	12/29/22 14:03 ^b

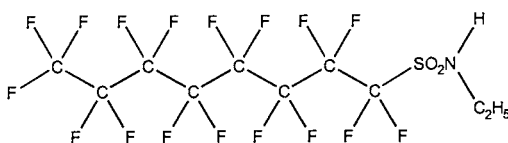


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: N-EtFOSA-M **LOT NUMBER:** NEtFOSA0821M
COMPOUND: N-ethylperfluoro-1-octanesulfonamide

STRUCTURE: **CAS #:** 4151-50-2



MOLECULAR FORMULA: $C_{10}H_6F_{17}NO_2S$ **MOLECULAR WEIGHT:** 527.20
CONCENTRATION: $50.0 \pm 2.5 \mu\text{g/mL}$ **SOLVENT(S):** Methanol
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 08/12/2021
EXPIRY DATE: (mm/dd/yyyy) 08/12/2026
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
 Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: 
 B.G. Chittim, General Manager

Date: 08/16/2021
 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
 519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters

x_1, x_2, \dots, x_n on which it depends is:

$$u_c(y(x_1, x_2, \dots, x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

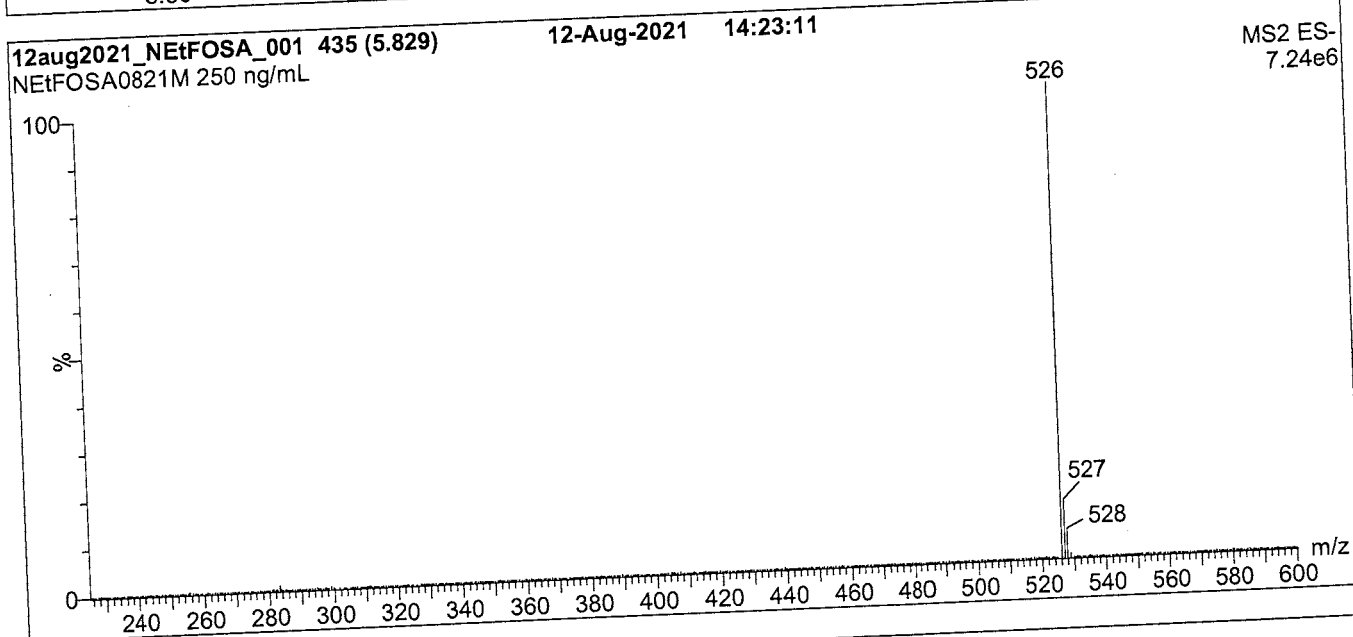
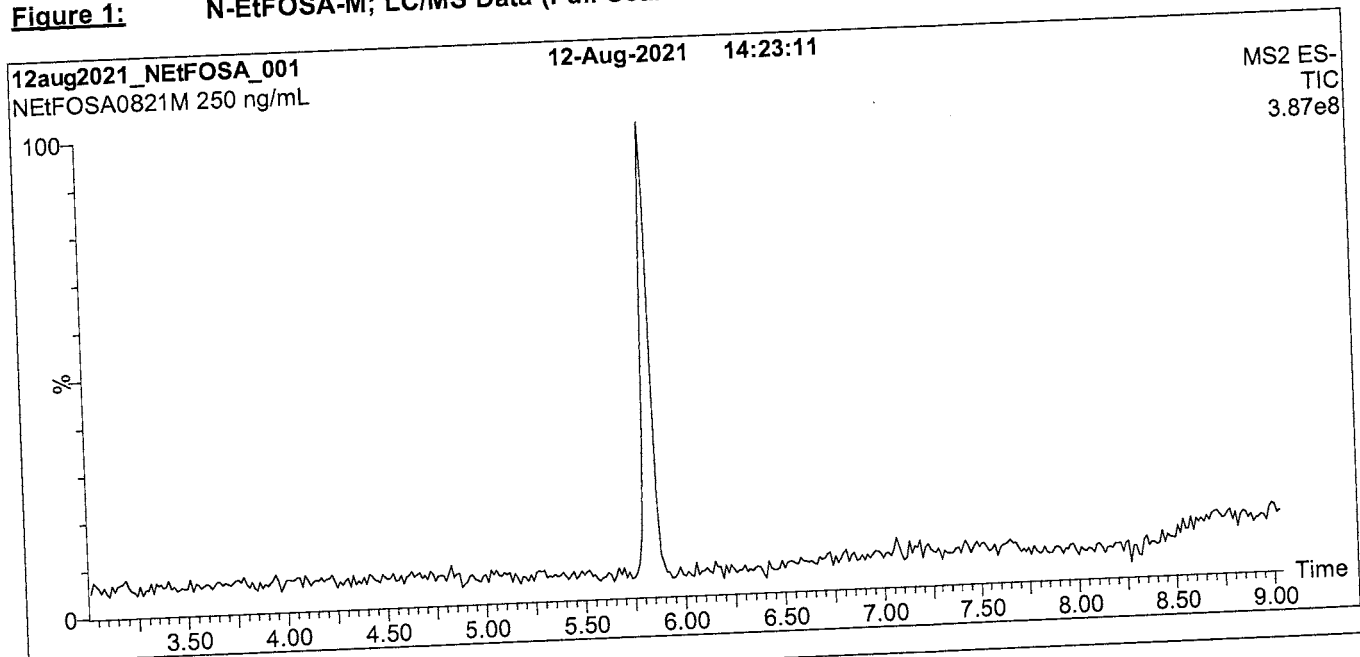
QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A1226), and ISO 17034 by ANSI National Accreditation Board (ANAB; AR-1523).



For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: N-EtFOSA-M; LC/MS Data (Full Scan and Mass Spectrum)



Conditions for Figure 1:

Waters Acquity Ultra Performance LC
Waters Xevo TQ-S micro MS

Chromatographic Conditions:

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 30% H₂O / 70% (80:20 MeOH:ACN)
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 8 min and hold for
2 min before returning to initial conditions in 0.75 min.
Time: 12 min

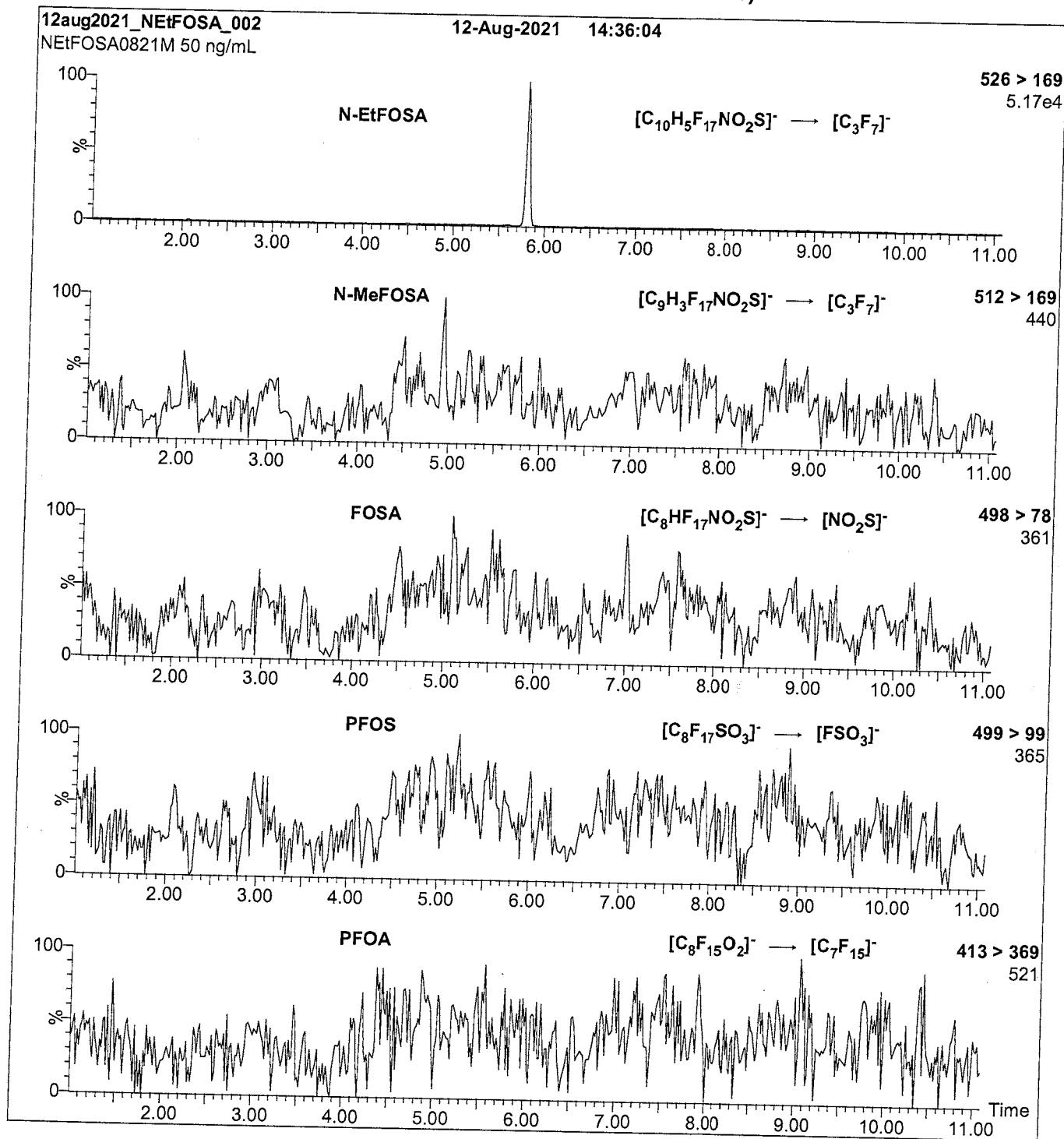
Flow: 300 μ L/min

MS Parameters:

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 1.00
Cone Voltage (V) = 44.00
Desolvation Temperature ($^{\circ}$ C) = 500
Desolvation Gas Flow (L/hr) = 1000

NEtFOSA0821M (3 of 4)
rev0

Figure 2: N-EtFOSA-M; LC/MS/MS Data (Selected MRM Transitions)**Conditions for Figure 2:**

Injection: On-column (N-EtFOSA-M)

Mobile phase: Same as Figure 1

Flow: 300 μ L/min**MS Parameters:**

Collision Gas (mbar) = 3.29e-3

Collision Energy (eV) = 24

Analytical Standard Record

21J0007J

Description:s	PFAS - SAS N-EtFOSA 50ug/mLs	Expires:s	08/12/2026s
Standard Type:s	Analyte Spikes	Prepared:s	08/12/2021s
Solvent:s	MeOHs	Prepared By:s	Wellington Laboratories (Lot#: PFAS)
Final Volume (mL)s:	1s	Department:s	PFAS0821M)s
Vials:s	1s	Last Edit:s	12/07/2021 16:05 by HGHS

AnalyteJ	ParentJ	CAS NumberJ	Concentration J	UnitsJ
N-ETFOSAs		4151-50-2s	50s	ug/mLs

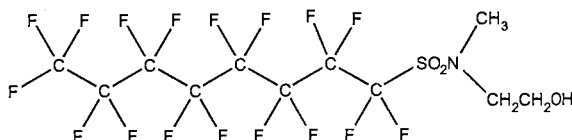


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: N-MeFOSE-M **LOT NUMBER:** NMeFOSE0921M
COMPOUND: 2-(N-methylperfluoro-1-octanesulfonamido)-ethanol

STRUCTURE: **CAS #:** 24448-09-7



MOLECULAR FORMULA: $C_{11}H_8F_{17}NO_3S$ **MOLECULAR WEIGHT:** 557.22
CONCENTRATION: $50.0 \pm 2.5 \mu\text{g/mL}$ **SOLVENT(S):** Methanol
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 09/22/2021 (HRGC/LRMS)
 09/23/2021 (LC/MS)
EXPIRY DATE: (mm/dd/yyyy) 09/23/2026
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

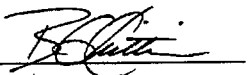
Figure 1: HRGC/LRMS Data (Full Scan and Mass Spectrum)
 Figure 2: LC/MS Data (Full Scan and Mass Spectrum)
 Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- In order to see the molecular ion (adduct free), the LC mobile phase should be free of ammonium acetate buffer.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:


 B.G. Chittim, General Manager

Date: 09/28/2021
 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
 519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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where x is expressed as a relative standard uncertainty of the individual parameter.

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

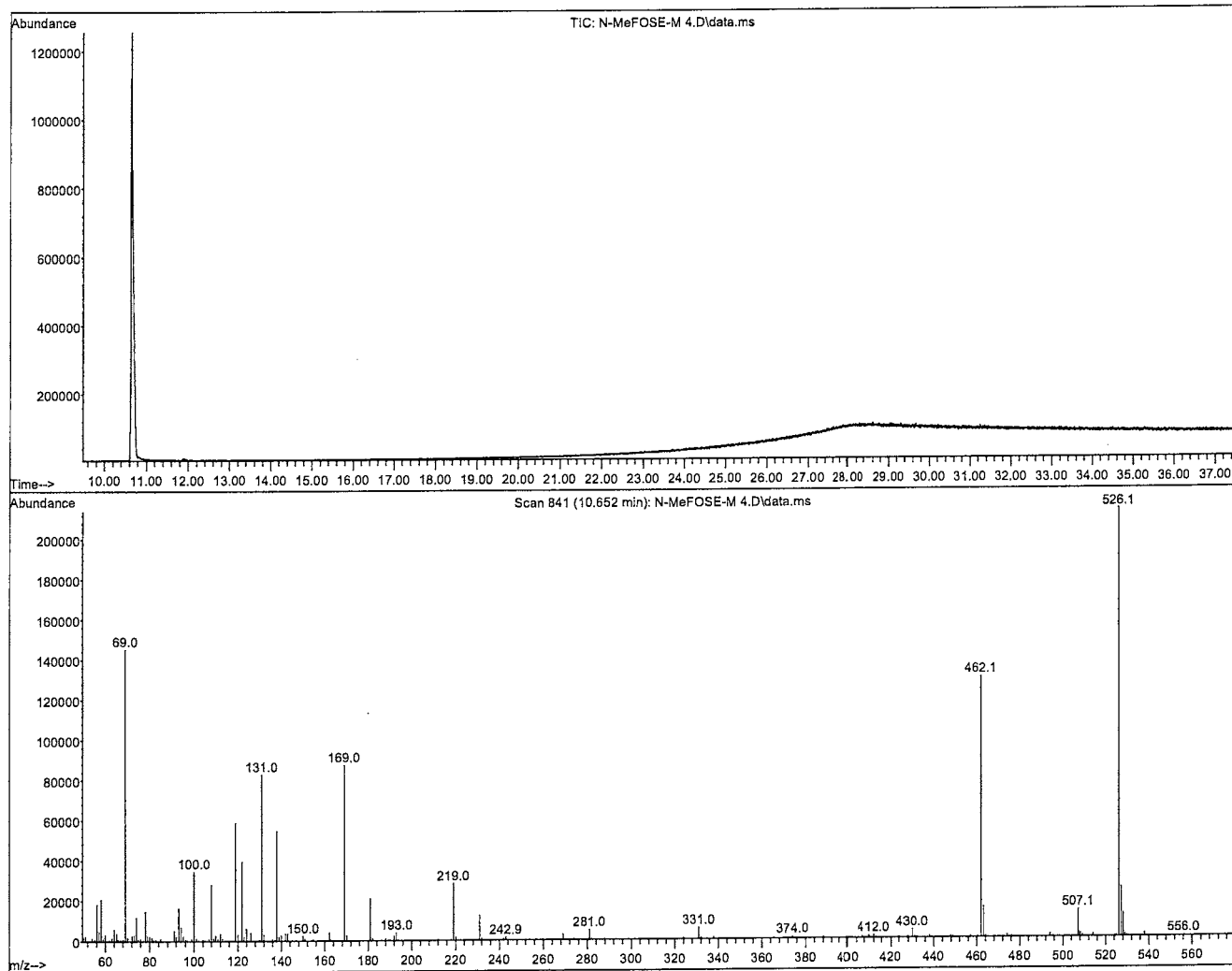
At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A1226), and ISO 17034 by ANSI National Accreditation Board (ANAB; AR-1523).



For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: N-MeFOSE-M; HRGC/LRMS Data (Full Scan and Mass Spectrum)**Conditions for Figure 1:**

Agilent 7890A HRGC
 Agilent 5975C MSD

Chromatographic Conditions:

Column: 30 m DB-5 (0.25 mm id, 0.25 μ m film thickness) Agilent J&W

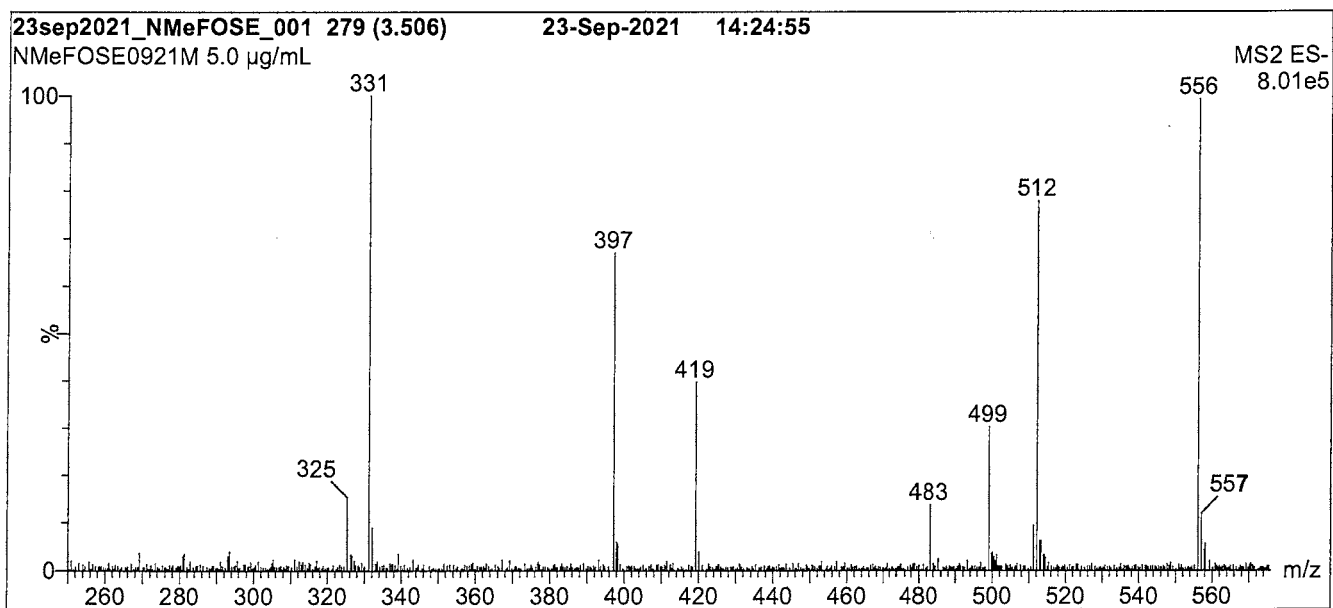
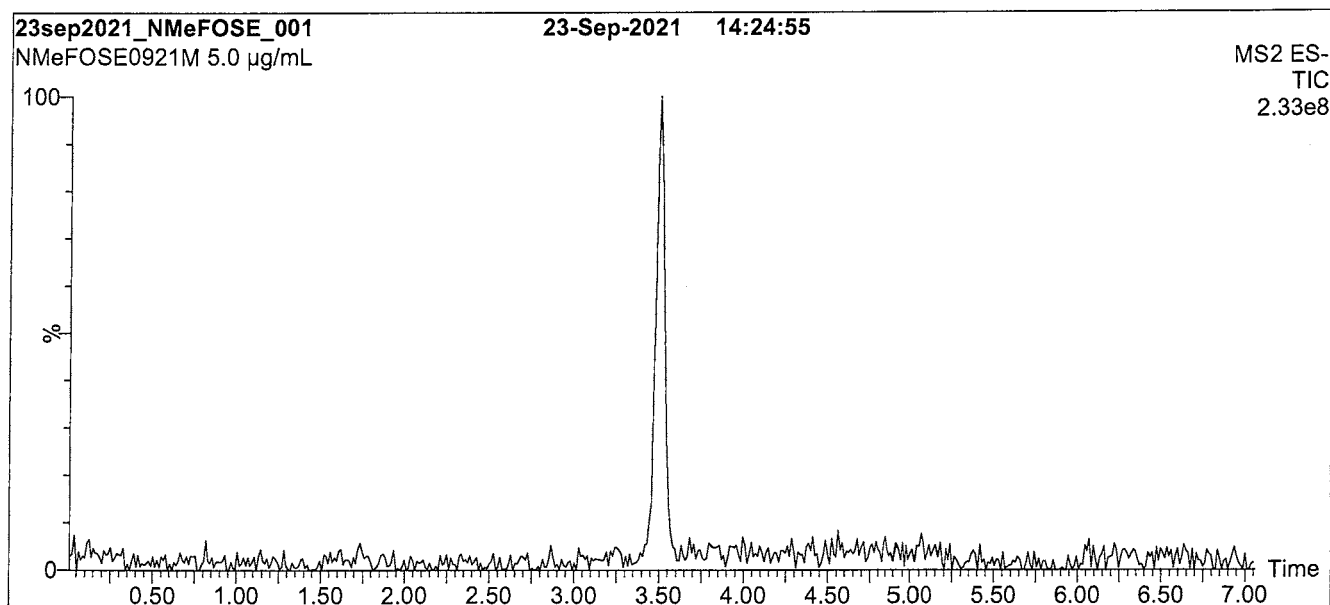
Flow: Constant at 1 mL/min

Injector: 250°C (Splitless Injection)

Oven: 100°C (5 min)
 10°C/min to 310°C
 310°C (10 min)

Ionization: EI+

Detector: 230°C
 Full Scan (50-1000 amu)

Figure 2: N-MeFOSE-M; LC/MS Data (Full Scan and Mass Spectrum)**Conditions for Figure 2:**

Waters Acquity Ultra Performance LC
Waters Xevo TQ-S micro MS

Chromatographic Conditions:

Column: Acquity UPLC BEH Shield RP₁₈
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient

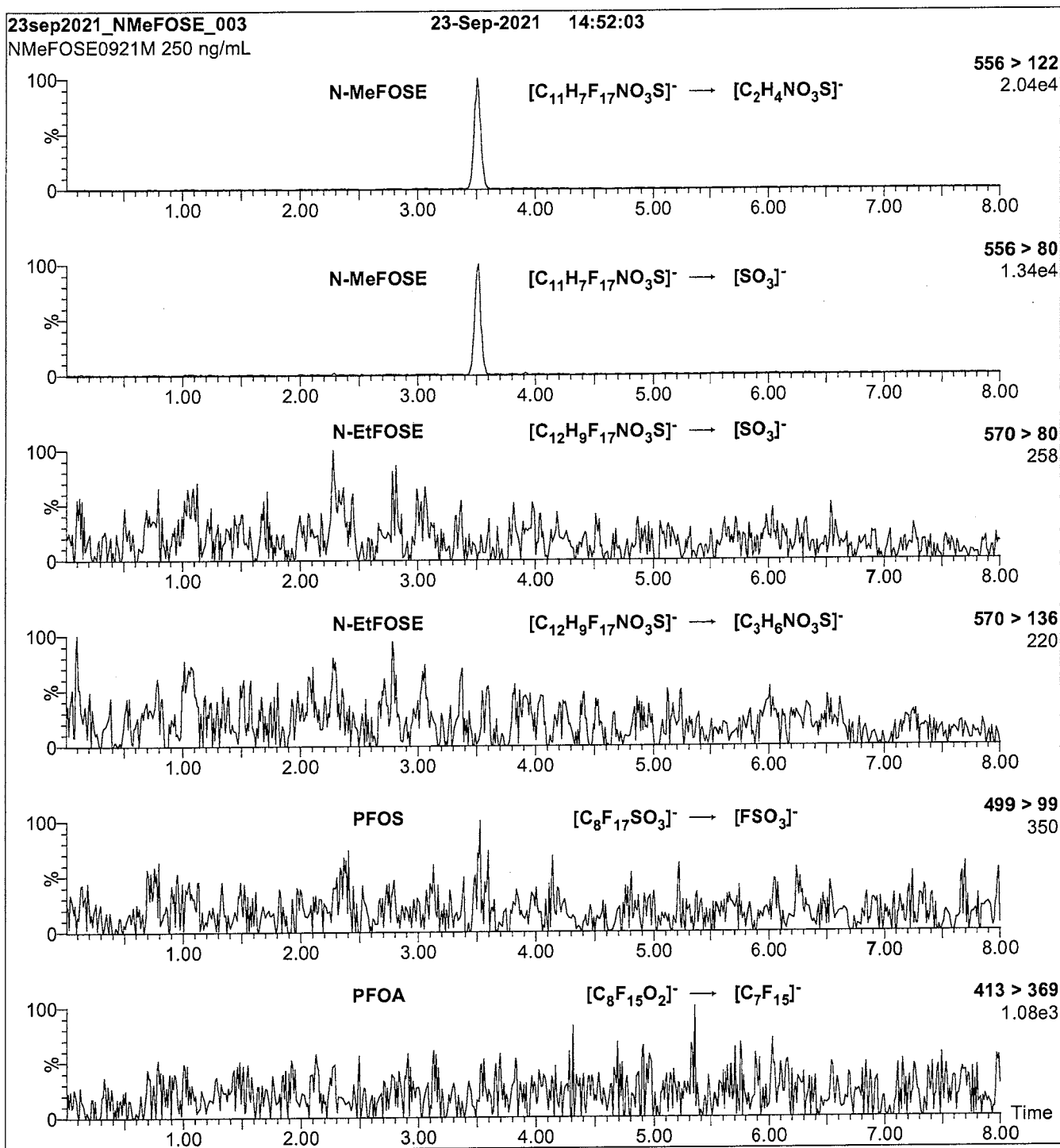
Start: 30% H₂O / 70% MeOH
Ramp to 90% organic over 8 min and hold for
1.5 min before returning to initial conditions in 1 min.
Time: 12 min

Flow: 300 µL/min

MS Parameters:

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 65.00
Desolvation Temperature (°C) = 450
Desolvation Gas Flow (L/hr) = 1000

Figure 3: N-MeFOSE-M; LC/MS/MS Data (Selected MRM Transitions)**Conditions for Figure 3:**

Injection: On-column (N-MeFOSE-M)

MS Parameters:

Mobile phase: Same as Figure 2

Collision Gas (mbar) = 3.14e-3

Collision Energy (eV) = 36

Flow: 300 μ L/min

2
3
4

Analytical Standard Record

21J0014J

Description:s	PFAS - SAS N-MeFOSE 50ug/mLs	Expires:s	09/23/2026s
Standard Type:s	Analyte Spikes	Prepared:s	09/22/2021s
Solvent:s	MeOHs	Prepared By:s	Wellington Laboratories (Lot#: N-MEFOSE0921M)s
Final Volume (mL)s:	1.2s	Department:s	PFAS
Vials:s	1s	Last Edit:s	12/07/2021 16:06 by HGHS

AnalyteJ	ParentJ	CAS NumberJ	Concentration J	UnitsJ
N-MEFOSEs		24448-09-7s	50s	ug/mLs

Analytical Standard Record

21J0014J

Description:s	PFAS - SAS N-MeFOSE 50ug/mLs	Expires:s	09/23/2026s
Standard Type:s	Analyte Spikes	Prepared:s	09/22/2021s
Solvent:s	MeOHs	Prepared By:s	Wellington Laboratories (Lot#: N-MEFOSE0921M)s
Final Volume (mL)s:	1.2s	Department:s	PFAS
Vials:s	1s	Last Edit:s	12/07/2021 16:06 by HGHS

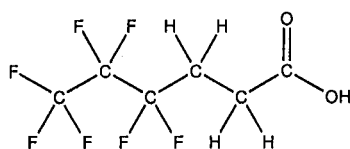
AnalyteJ	ParentJ	CAS NumberJ	Concentration J	UnitsJ
N-MEFOSEs		24448-09-7s	50s	ug/mLs



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: FPrPA **LOT NUMBER:** FPrPA1020
COMPOUND: 3-Perfluoropropyl propanoic acid
STRUCTURE: **CAS #:** 356-02-5



MOLECULAR FORMULA: $C_8H_5F_7O_2$ **MOLECULAR WEIGHT:** 242.09
CONCENTRATION: $50.0 \pm 2.5 \mu\text{g/mL}$ **SOLVENT(S):** Methanol
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 11/12/2020
EXPIRY DATE: (mm/dd/yyyy) 11/12/2025
RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
 Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains <1% of the unsaturated 3:3 telomer acid ($C_8H_3F_7O_2$) as an impurity determined by ^{19}F NMR.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: 
 B.G. Chittim, General Manager

Date: 11/27/2020
 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
 519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HANDLING:

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HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

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x_1, x_2, \dots, x_n on which it depends is:

$$u_c(y(x_1, x_2, \dots, x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

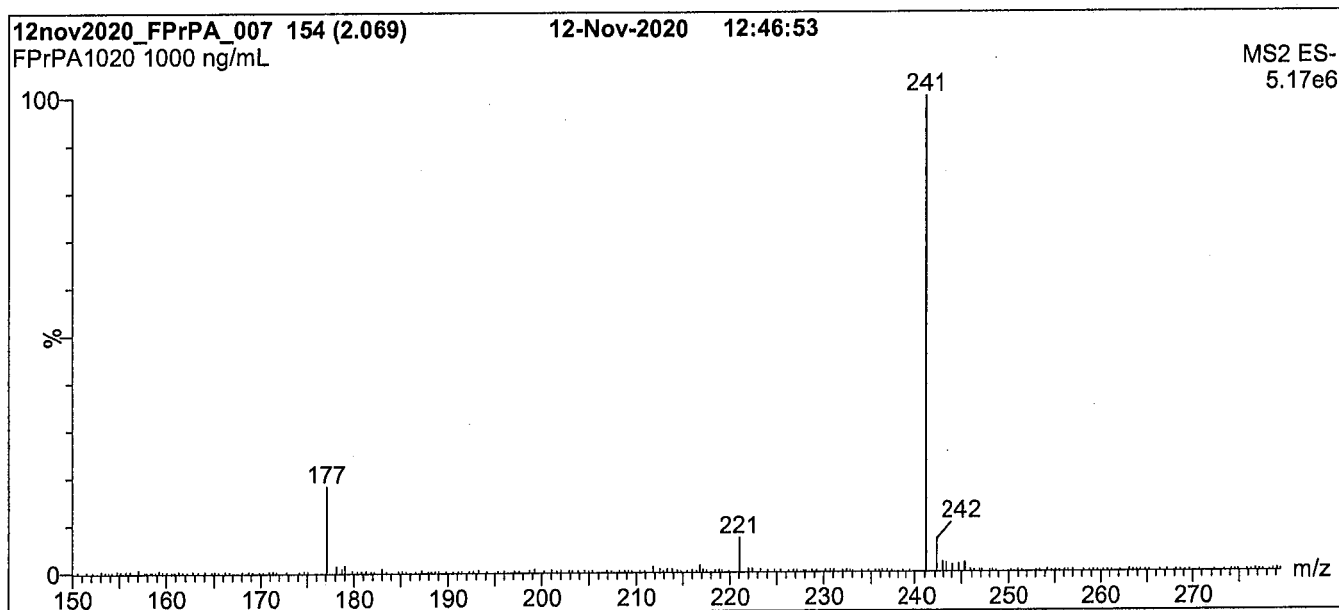
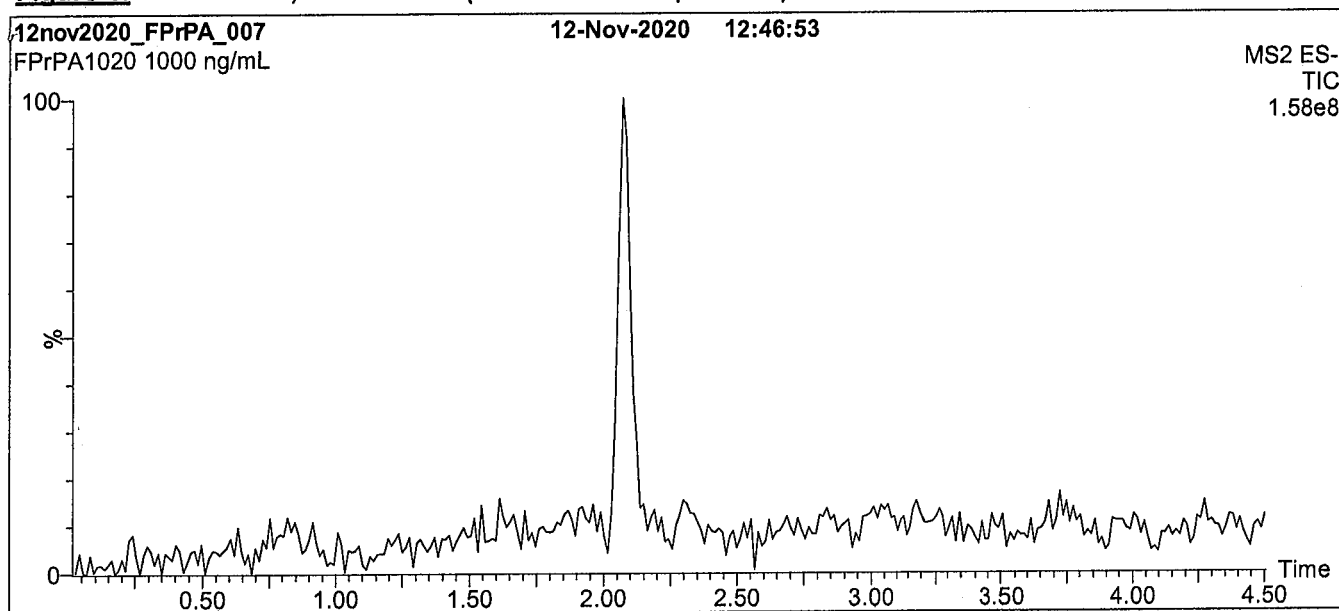
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Figure 1: FPrPA; LC/MS Data (TIC and Mass Spectrum)**Conditions for Figure 1:**

Waters Acquity Ultra Performance LC
Waters Xevo TQ-S micro MS

Chromatographic Conditions:

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient

Start: 60% H₂O / 40% (80:20 MeOH:ACN)
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 8 min and hold for 2 min
before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 μ L/min

MS Parameters:

Experiment: Full Scan (150 - 850 amu)

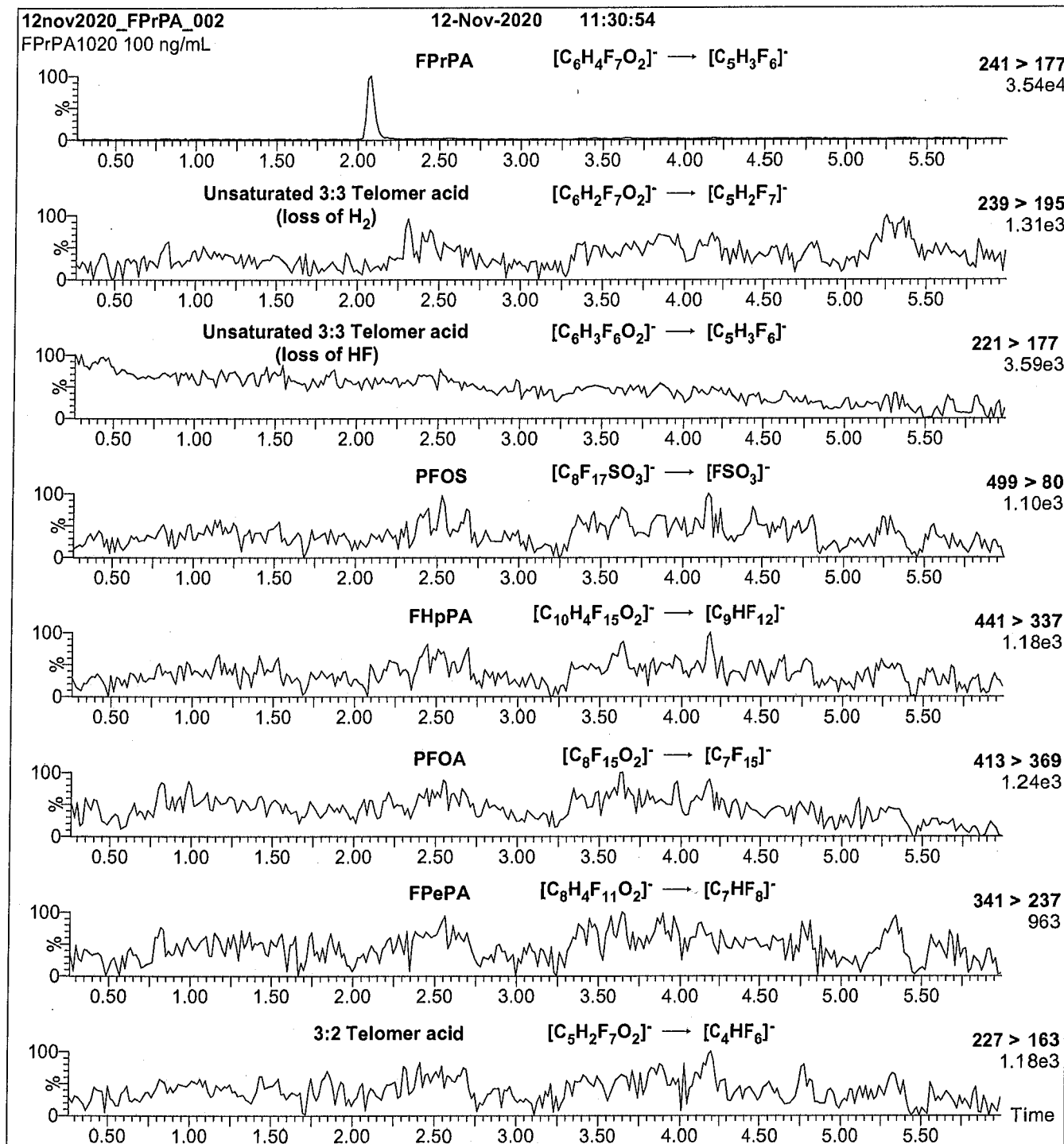
Source: Electrospray (negative)

Capillary Voltage (kV) = 0.50

Cone Voltage (V) = 18.50

Desolvation Temperature ($^{\circ}$ C) = 500

Desolvation Gas Flow (L/hr) = 1000

Figure 2: FPrPA; LC/MS/MS Data (Selected MRM Transitions)**Conditions for Figure 2:**

Injection: On-column (FPrPA)

Mobile phase: Same as Figure 1

Flow: 300 μ L/min**MS Parameters:**

Collision Gas (mbar) = 3.49e-3

Collision Energy (eV) = 10

Analytical Standard Record

21L0004L

Description:s	PFAS - SAS 3:3FTA 50ug/mLs	Expires:s	06/05/2022s
Standard Type:s	Analyte Spikes	Prepared:s	12/07/2021s
Solvent:s	MeOHs	Prepared By:s	Hart Hedgpeths
Final Volume (mL)s:	1s	Department:s	PFASs
Vials:s	1s	Last Edit:s	12/07/2021 16:03 by HGHS
Comments:	3:3 FTCA 50.0ug/mL		

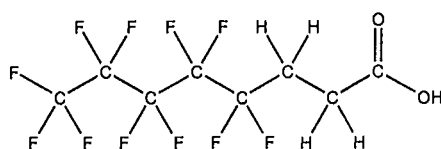
AnalyteL	ParentL	CAS NumberL	Concentration L	UnitsL
3:3 FTAs		113507-82-7s	50s	ug/mLs



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: FPePA **LOT NUMBER:** FPePA1120
COMPOUND: 3-Perfluoropentyl propanoic acid
STRUCTURE: **CAS #:** 914637-49-3



MOLECULAR FORMULA: $C_8H_5F_{11}O_2$ **MOLECULAR WEIGHT:** 342.11
CONCENTRATION: $50.0 \pm 2.5 \mu\text{g/mL}$ **SOLVENT(S):** Methanol
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 11/11/2020
EXPIRY DATE: (mm/dd/yyyy) 11/11/2025
RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
 Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains <1% of the unsaturated 5:3 telomer acid ($C_8H_3F_{11}O_2$) as an impurity determined by ^{19}F NMR.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: 
 B.G. Chittim, General Manager **Date:** 11/27/2020
 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
 519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

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HANDLING:

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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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$$u_c(y(x_1, x_2, \dots, x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

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EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

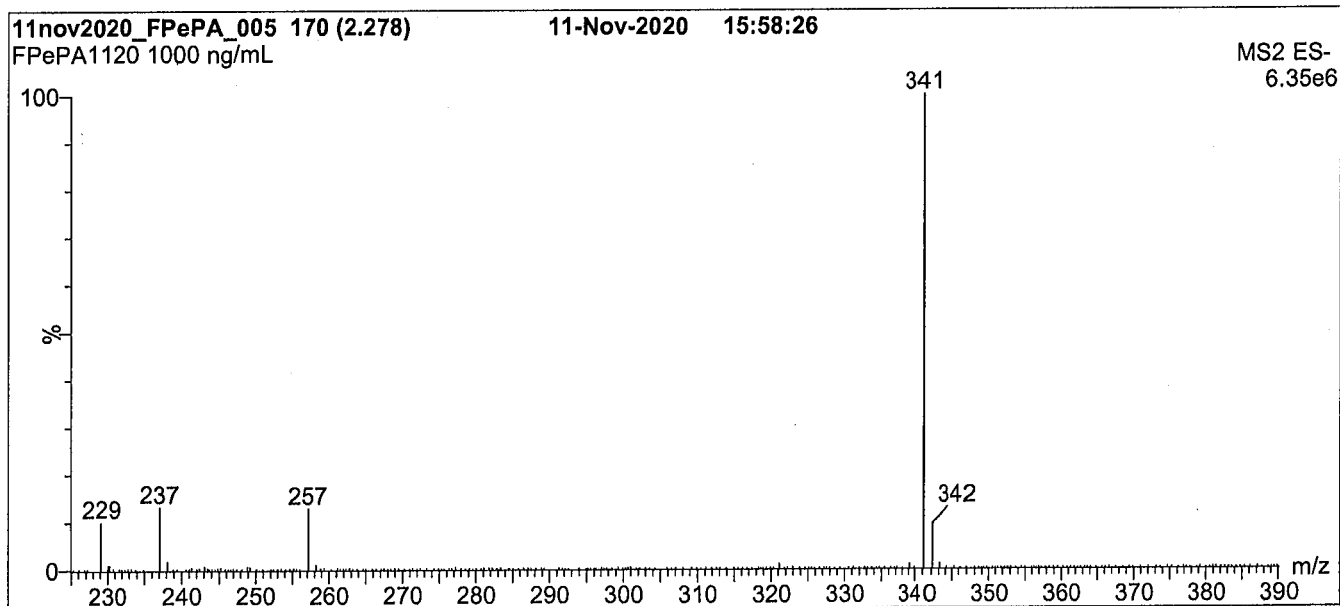
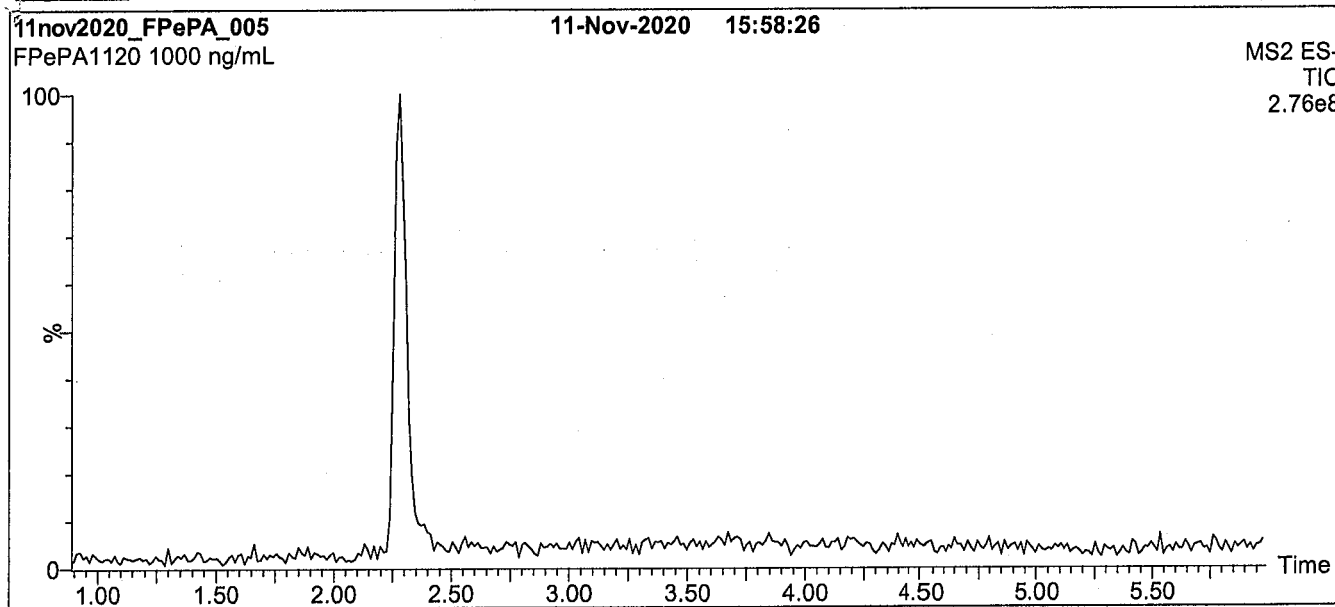
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Figure 1: FPePA; LC/MS Data (TIC and Mass Spectrum)**Conditions for Figure 1:**

Waters Acquity Ultra Performance LC
Waters Xevo TQ-S micro MS

Chromatographic Conditions:

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

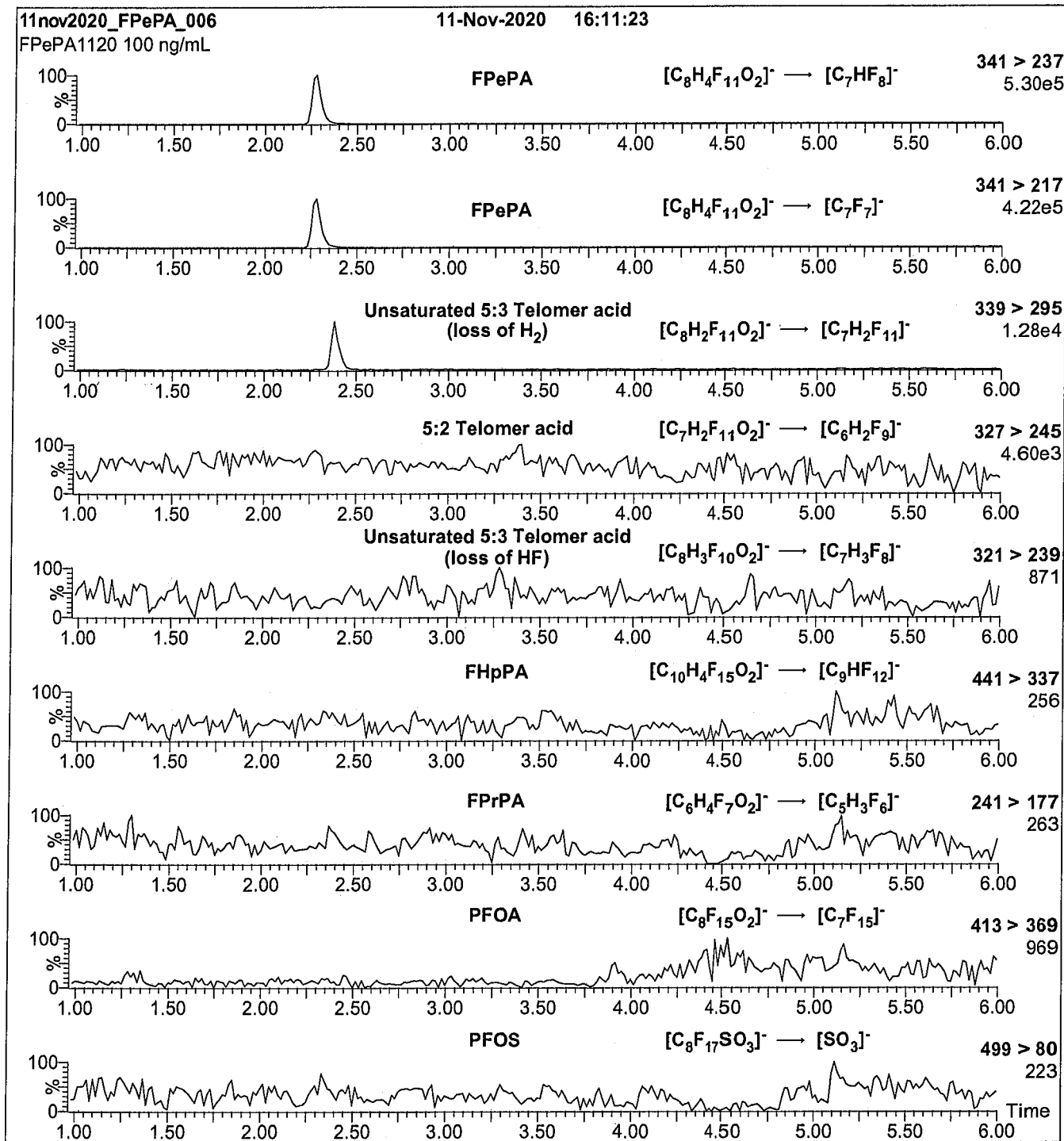
Mobile phase: Gradient
Start: 45% H₂O / 55% (80:20 MeOH:ACN)
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 8 min and hold for
2 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 μ L/min

MS Parameters:

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 18.50
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (L/hr) = 1000

Figure 2: FPePA; LC/MS/MS Data (Selected MRM Transitions)**Conditions for Figure 2:**

Injection: On-column (FPePA)

Mobile phase: Same as Figure 1

Flow: 300 μ L/min**MS Parameters:**

Collision Gas (mbar) = 3.24e-3

Collision Energy (eV) = 10

Analytical Standard Record

21L0005L

Description:s	PFAS - SAS 5:3FTA 50ug/mLs	Expires:	06/05/2022s
Standard Type:s	Analyte Spikes	Prepared:s	12/07/2021s
Solvent:s	MeOHs	Prepared By:	Hart Hedgpeths
Final Volume (mL)s:	1.2s	Department:s	PFASs
Vials:s	1s	Last Edit:s	12/07/2021 16:03 by HGHS
Comments:	5:3 FTCA 50.0ug/mL		

AnalyteL	ParentL	CAS NumberL	Concentration L	UnitsL
5:3 FTAs		914637-49-3s	50s	ug/mLs

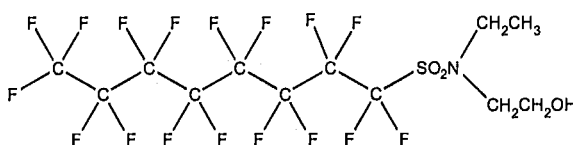


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: N-EtFOSE-M **LOT NUMBER:** NEtFOSE0921M
COMPOUND: 2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol

STRUCTURE: **CAS #:** 1691-99-2



MOLECULAR FORMULA: C₁₂H₁₀F₁₇NO₃S **MOLECULAR WEIGHT:** 571.25
CONCENTRATION: 50.0 ± 2.5 µg/mL **SOLVENT(S):** Methanol
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 09/22/2021 (HRGC/LRMS)
 09/23/2021 (LC/MS)
EXPIRY DATE: (mm/dd/yyyy) 09/23/2026
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

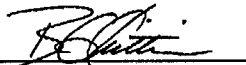
DOCUMENTATION/ DATA ATTACHED:

Figure 1: HRGC/LRMS Data (Full Scan and Mass Spectrum)
 Figure 2: LC/MS Data (Full Scan and Mass Spectrum)
 Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- In order to see the molecular ion (adduct free), the LC mobile phase should be free of ammonium acetate buffer.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: 
 B.G. Chittim, General Manager **Date:** 10/20/2021
 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
 519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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LIMITED WARRANTY:

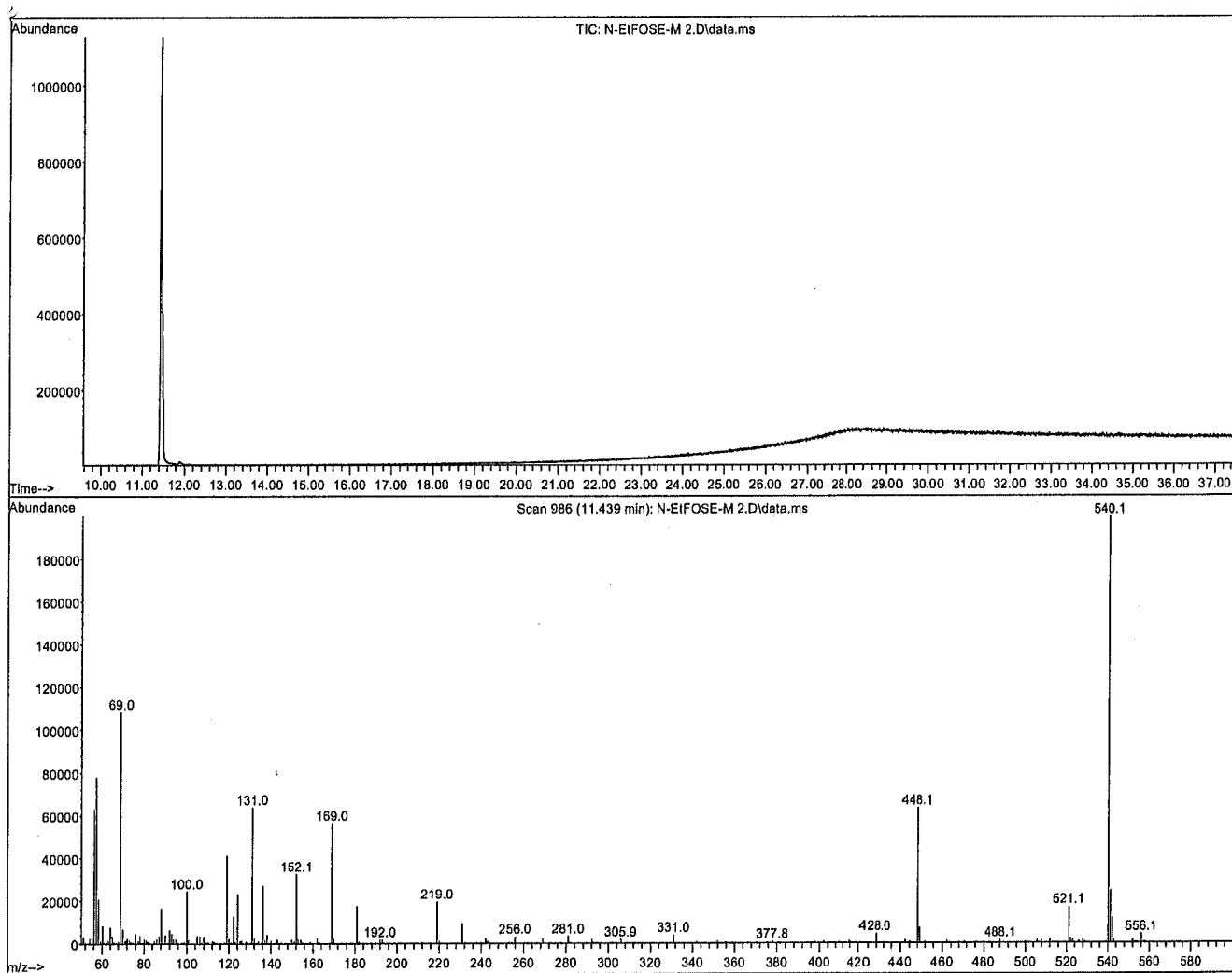
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Figure 1: N-EtFOSE-M; HRGC/LRMS Data (Full Scan and Mass Spectrum)**Conditions for Figure 1:**

Agilent 7890A HRGC
 Agilent 5975C MSD

Chromatographic Conditions:

Column: 30 m DB-5 (0.25 mm id, 0.25 μ m film thickness) Agilent J&W

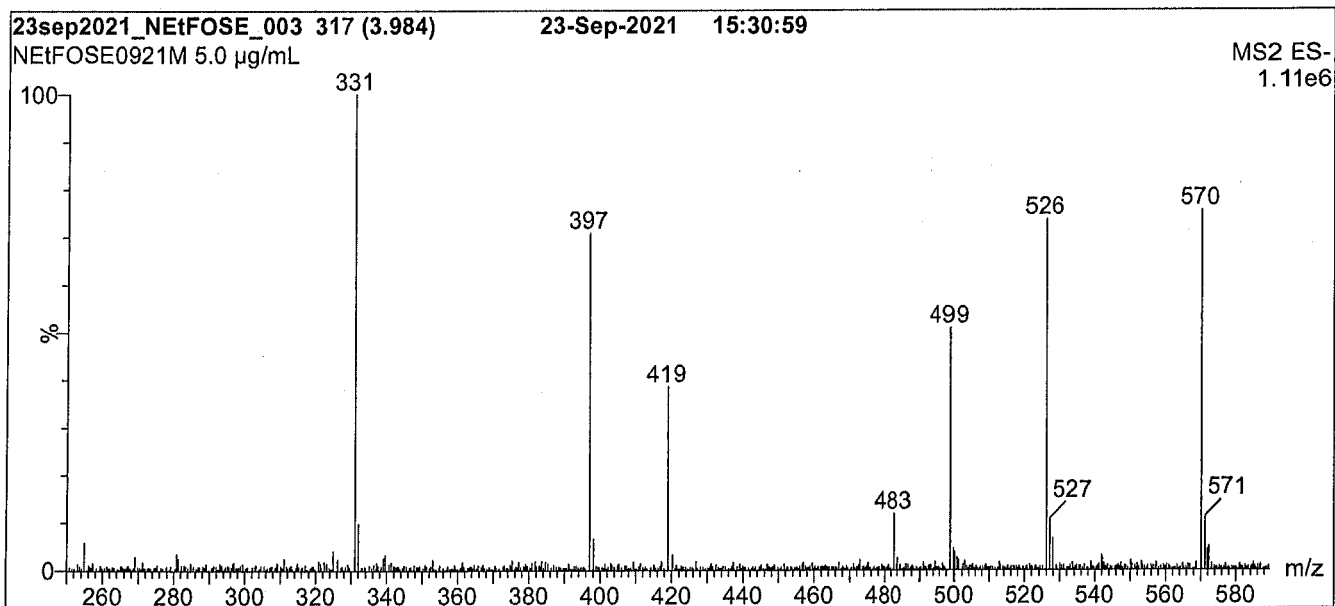
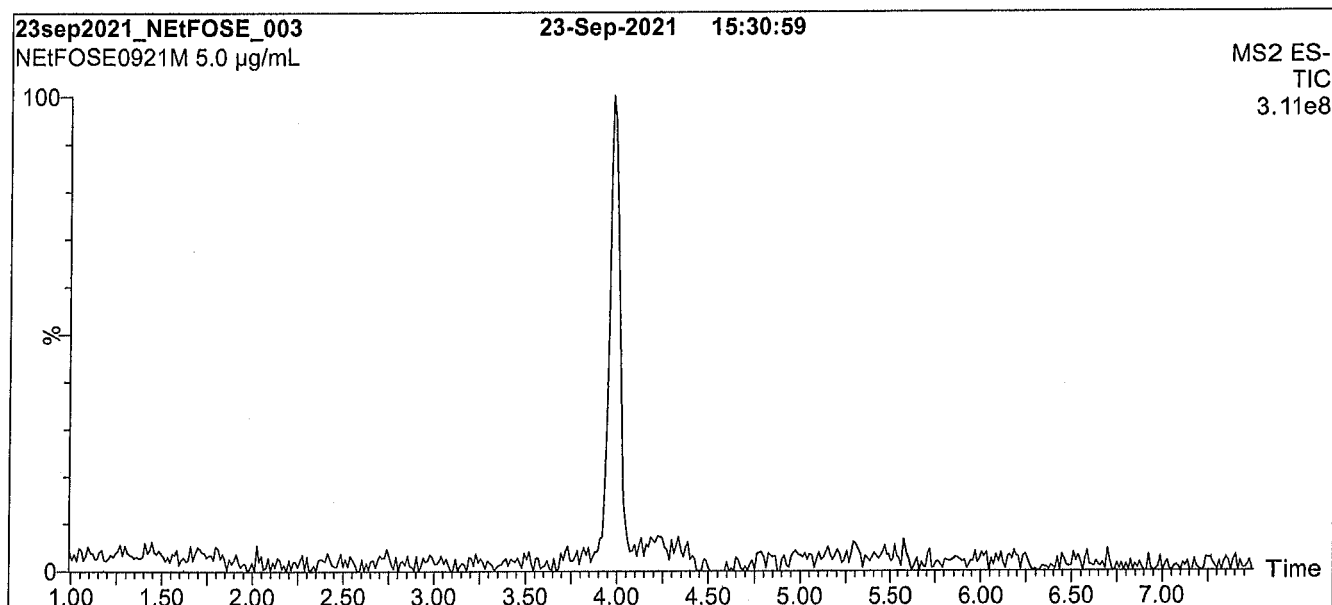
Flow: Constant at 1 mL/min

Injector: 250°C (Splitless Injection)

Oven: 100°C (5 min)
 10°C/min to 325°C
 325°C (10 min)

Ionization: EI+

Detector: 230°C
 Full Scan (50-1000 amu)

Figure 2: N-EtFOSE-M; LC/MS Data (Full Scan and Mass Spectrum)**Conditions for Figure 2:**

Waters Acquity Ultra Performance LC
Waters Xevo TQ-S micro MS

Chromatographic Conditions:

Column: Acquity UPLC BEH Shield RP₁₈
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient

Start: 30% H₂O / 70% MeOH

Ramp to 90% organic over 8 min and hold for
1.5 min before returning to initial conditions in 1 min.

Time: 12 min

Flow: 300 µL/min

MS Parameters:

Experiment: Full Scan (250 - 850 amu)

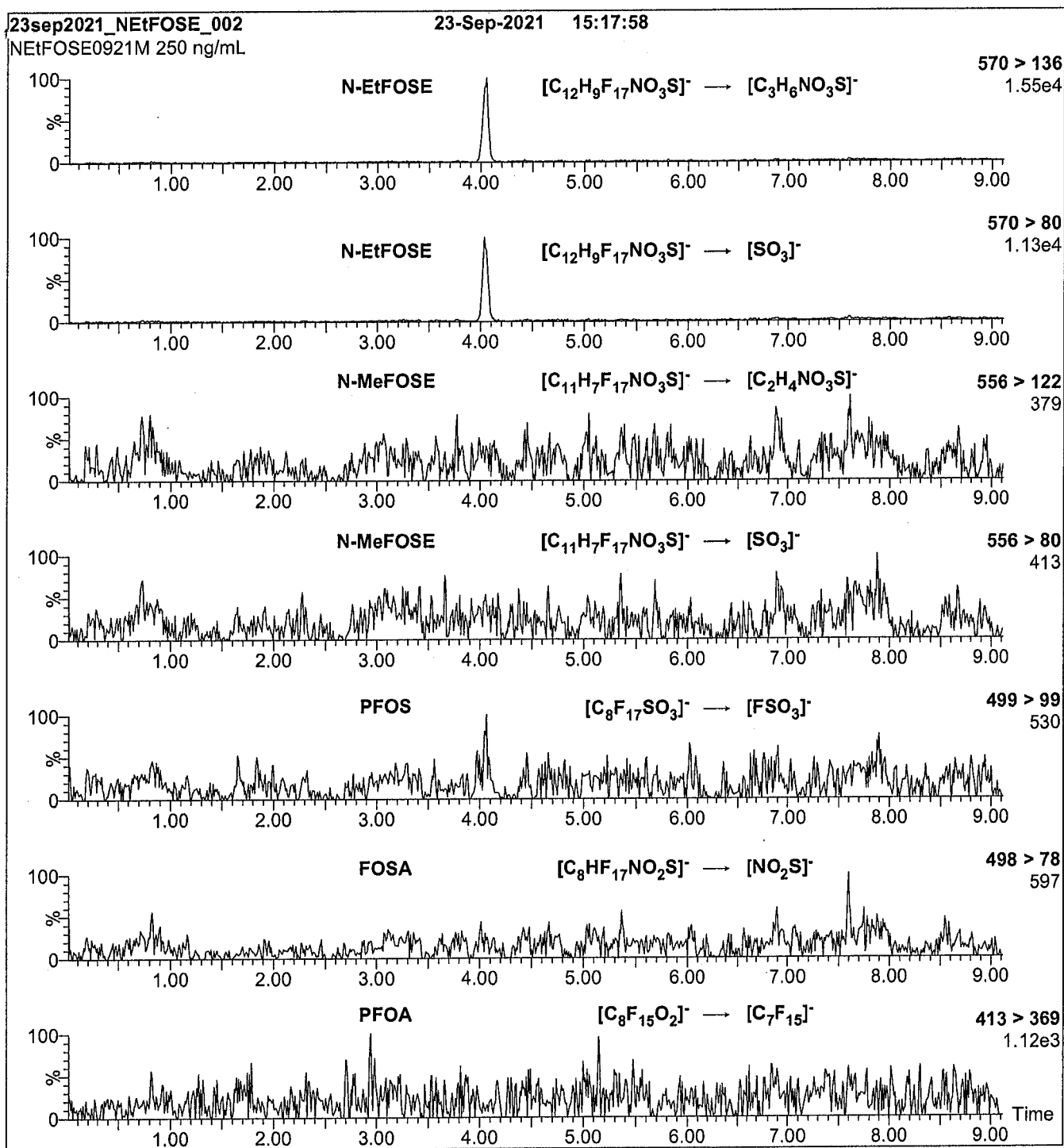
Source: Electrospray (negative)

Capillary Voltage (kV) = 2.00

Cone Voltage (V) = 65.00

Desolvation Temperature (°C) = 450

Desolvation Gas Flow (L/hr) = 1000

Figure 3: N-EtFOSE-M; LC/MS/MS Data (Selected MRM Transitions)**Conditions for Figure 3:**

Injection: On-column (N-EtFOSE-M)

Mobile phase: Same as Figure 2

Flow: 300 μ L/min**MS Parameters:**

Collision Gas (mbar) = 3.14e-3

Collision Energy (eV) = 32

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Analytical Standard Record

21L0006L

Description:s	PFAS - SAS EtFOSE 50ug/mLs	Expires:	06/05/2022s
Standard Type:s	Analyte Spikes	Prepared:s	12/07/2021s
Solvent:s	MeOHs	Prepared By:	Hart Hedgpeths
Final Volume (mL)s:	1.2s	Department:s	PFASs
Vials:s	1s	Last Edit:s	12/07/2021 17:22 by HGHS
Comments:	5:3 FTCA 50.0ug/mL		

AnalyteL	ParentL	CAS NumberL	Concentration L	UnitsL
N-ETFOSE		1691-99-2	50s	ug/mLs

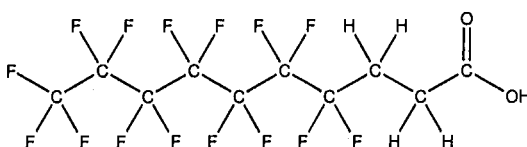


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: FHpPA **LOT NUMBER:** FHpPA1020
COMPOUND: 3-Perfluoroheptyl propanoic acid

STRUCTURE: **CAS #:** 812-70-4



MOLECULAR FORMULA: $C_{10}H_6F_{15}O_2$ **MOLECULAR WEIGHT:** 442.12
CONCENTRATION: $50.0 \pm 2.5 \mu\text{g/mL}$ **SOLVENT(S):** Methanol
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 11/12/2020
EXPIRY DATE: (mm/dd/yyyy) 11/12/2025
RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
 Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: 
 B.G. Chittim, General Manager

Date: 11/27/2020
 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
 519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

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HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

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The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters x_1, x_2, \dots, x_n on which it depends is:

$$u_c(y(x_1, x_2, \dots, x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

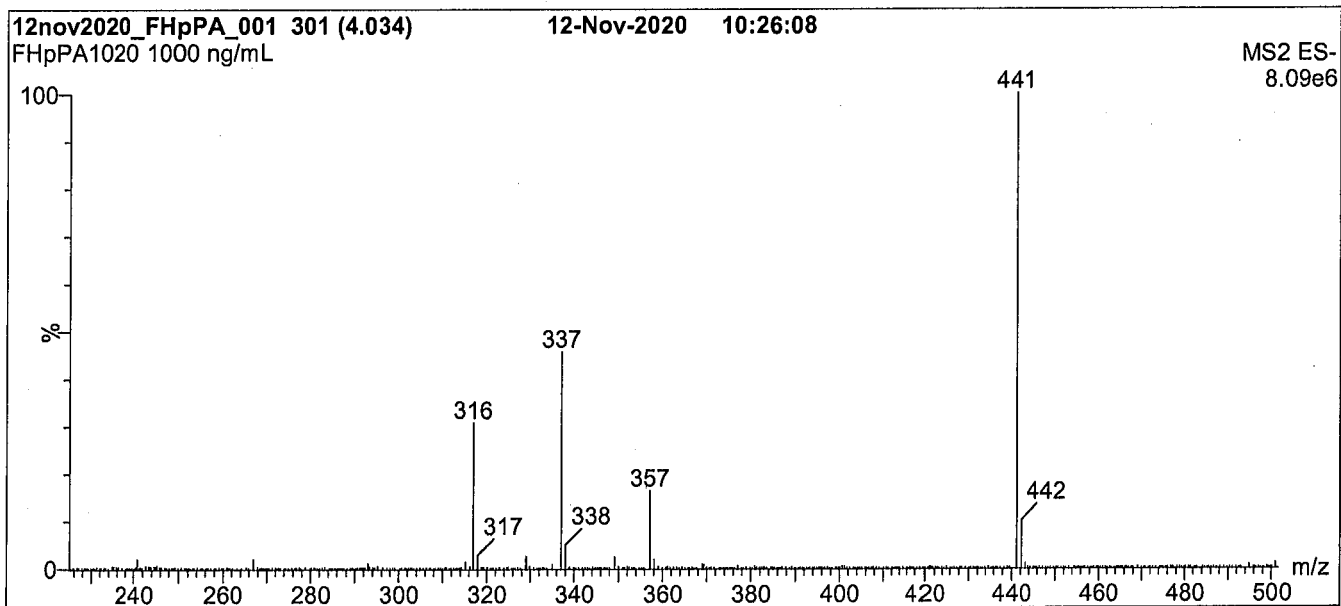
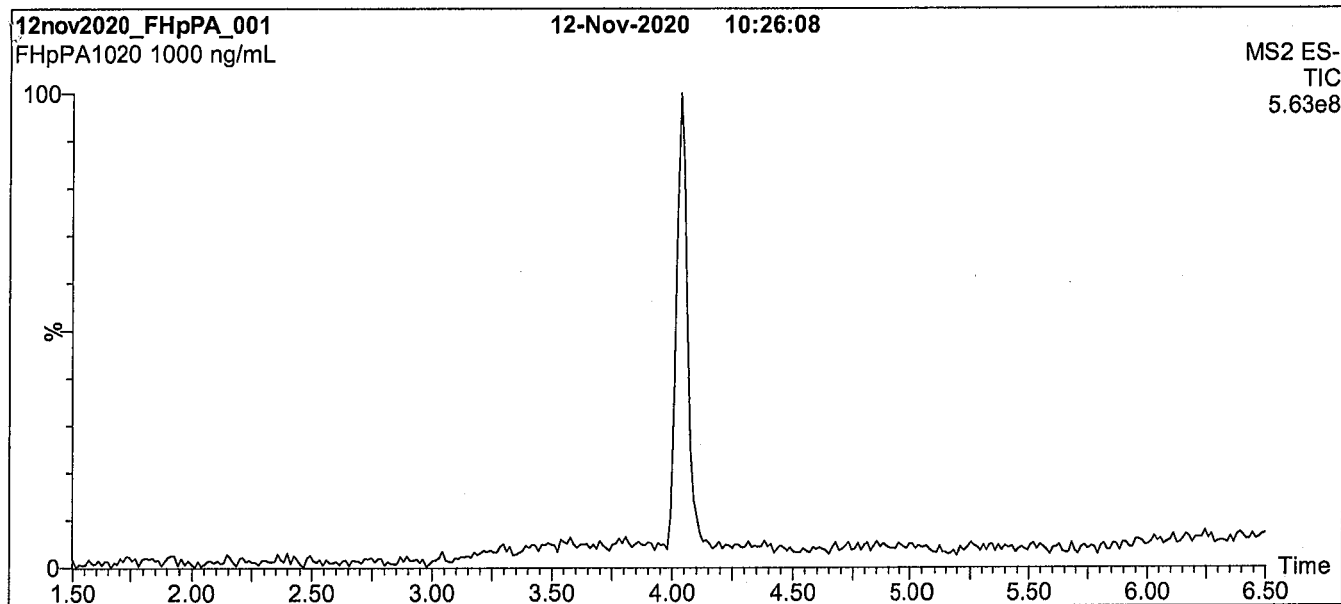
At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).



For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: FHpPA; LC/MS Data (TIC and Mass Spectrum)**Conditions for Figure 1:**

Waters Acquity Ultra Performance LC
Waters Xevo TQ-S micro MS

Chromatographic Conditions:

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

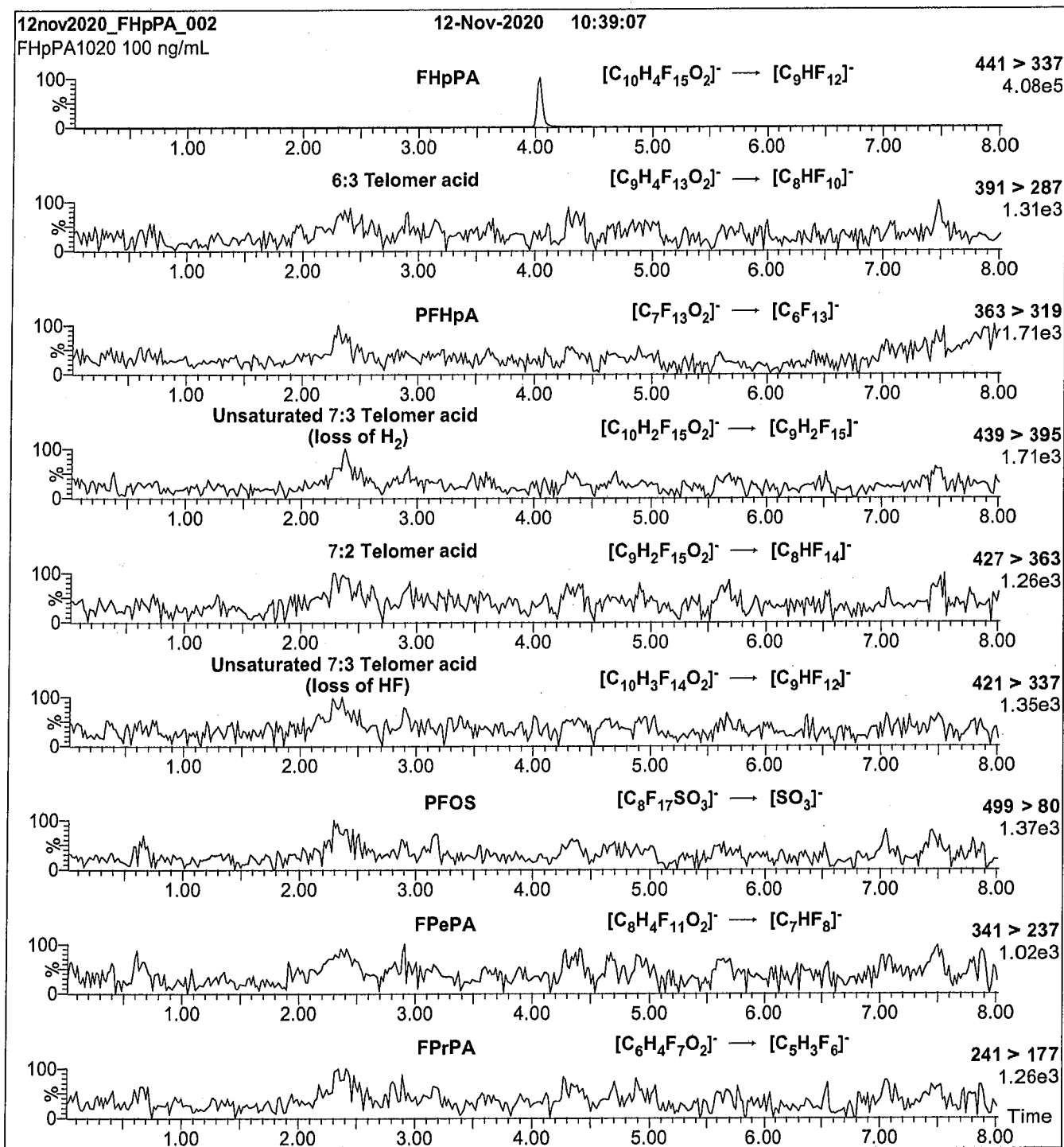
Mobile phase: Gradient
Start: 45% H₂O / 55% (80:20 MeOH:ACN)
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 8 min and hold for
2 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 μ L/min

MS Parameters:

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 28.50
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (L/hr) = 1000

Figure 2: FHpPA; LC/MS/MS Data (Selected MRM Transitions)**Conditions for Figure 2:**

Injection: On-column (FHpPA)

Mobile phase: Same as Figure 1

Flow: 300 μ L/min**MS Parameters:**

Collision Gas (mbar) = 3.41e-3

Collision Energy (eV) = 8

Analytical Standard Record

21L0007L

Description:s	PFAS - SAS 7:3FTA 50ug/mLs	Expires:	06/05/2022s
Standard Type:s	Analyte Spikes	Prepared:s	12/07/2021s
Solvent:s	MeOHs	Prepared By:	Hart Hedgpeths
Final Volume (mL):s	1.2s	Department:s	PFASs
Vials:s	1s	Last Edit:s	12/07/2021 16:16 by HGHS
Comments:3	7:3 FTCA 50.0ug/mL		

AnalyteL	ParentL	CAS NumberL	Concentration L	UnitsL
7:3 FTAs		812-70-4	50s	ug/mLs



WELLINGTON LABORATORIES

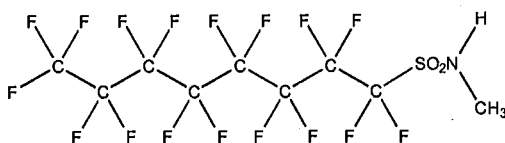
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: N-MeFOSA-M
COMPOUND: N-methylperfluoro-1-octanesulfonamide

LOT NUMBER: NMeFOSA0721M

STRUCTURE:

CAS #: 31506-32-8



MOLECULAR FORMULA: C₉H₄F₁₇NO₂S
CONCENTRATION: 50.0 ± 2.5 µg/mL
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 08/03/2021
EXPIRY DATE: (mm/dd/yyyy) 08/03/2026
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

MOLECULAR WEIGHT: 513.17
SOLVENT(S): Methanol

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: 
B.G. Chittim, General Manager

Date: 08/04/2021
(mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

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$$u_c(y(x_1, x_2, \dots, x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

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EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

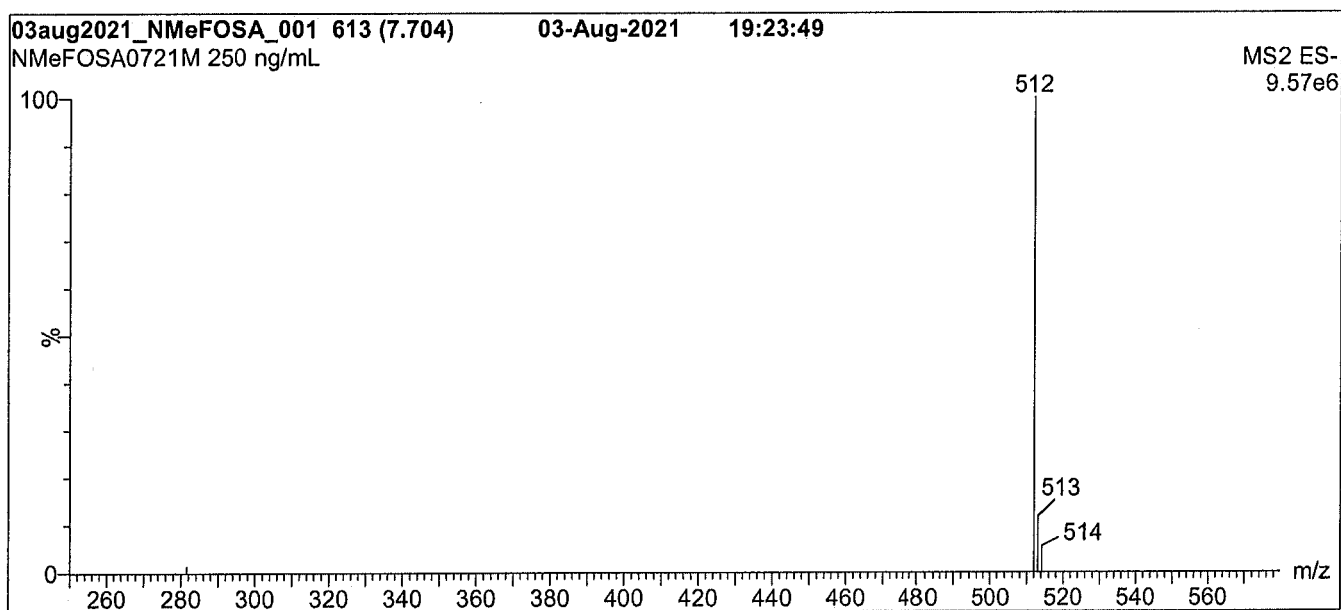
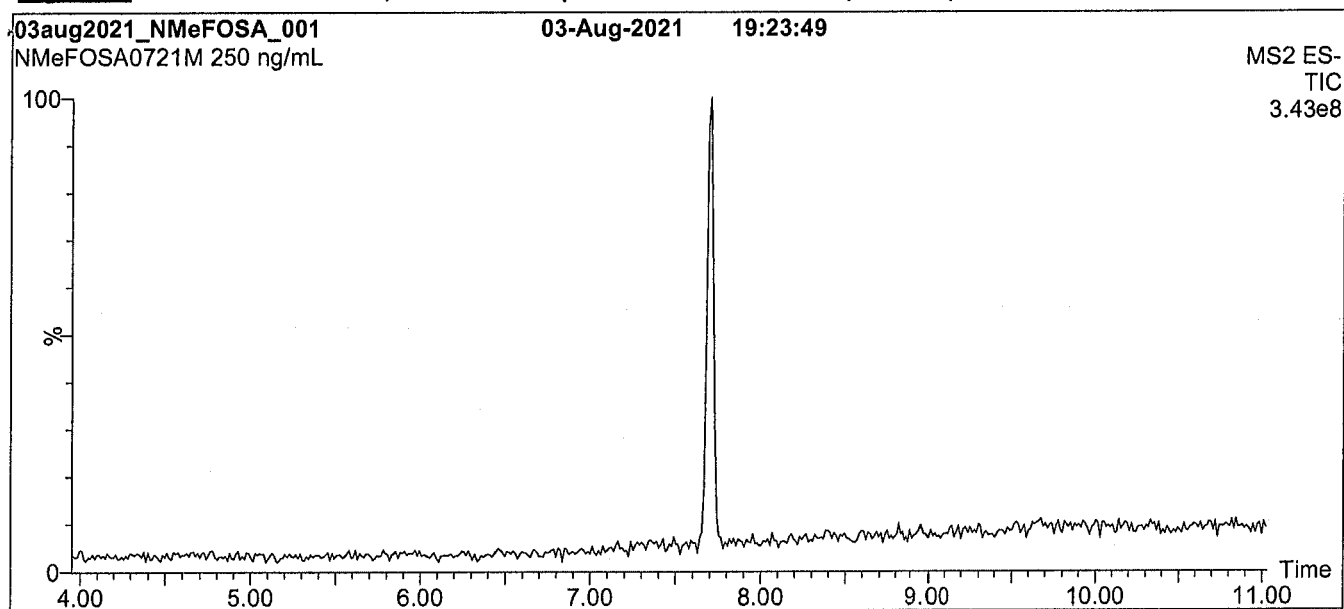
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QUALITY MANAGEMENT:

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Figure 1: N-MeFOSA-M; LC/MS Data (Full Scan and Mass Spectrum)**Conditions for Figure 1:**

Waters Acquity Ultra Performance LC
Waters Xevo TQ-S micro MS

Chromatographic Conditions:

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

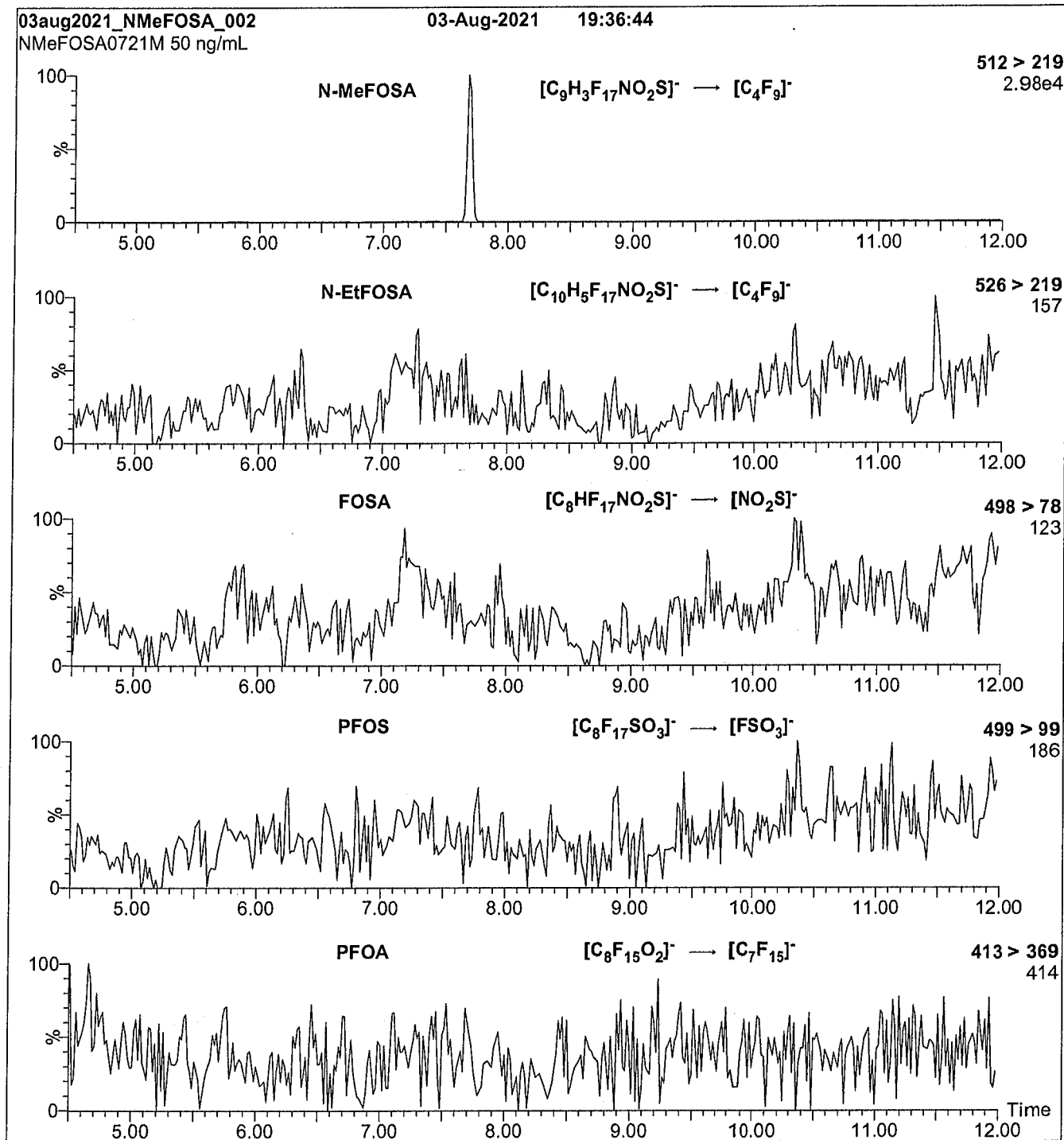
Mobile phase: Gradient
Start: 40% H₂O / 60% (80:20 MeOH:ACN)
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 8 min and hold for
2 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 μ L/min

MS Parameters:

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 1.00
Cone Voltage (V) = 44.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (L/hr) = 1000

Figure 2: N-MeFOSA-M; LC/MS/MS Data (Selected MRM Transitions)**Conditions for Figure 2:**

Injection: On-column (N-MeFOSA-M)

Mobile phase: Same as Figure 1

Flow: 300 μ L/min**MS Parameters:**

Collision Gas (mbar) = 3.41e-3

Collision Energy (eV) = 24

Analytical Standard Record

21L0008L

Description:s	PFAS - SAS N-MeFOSA 50ug/mL	Expires:s	06/05/2022s
Standard Type:s	Analyte Spikes	Prepared:s	12/07/2021s
Solvent:s	MeOHs	Prepared By:s	Hart Hedgpeths
Final Volume (mls):s	1s	Department:s	PFASs
Vials:s	1s	Last Edit:s	12/07/2021 16:18 by HGHS

AnalyteL	ParentL	CAS NumberL	Concentration L	UnitsL
N-MEFOSAs		31506-32-8s	50s	ug/mLs

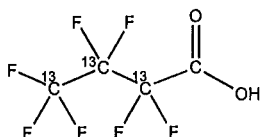


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M3PFBA **LOT NUMBER:** M3PFBA0721
COMPOUND: Perfluoro-n-(2,3,4-¹³C₃)butanoic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₃¹²CHF₇O₂ **MOLECULAR WEIGHT:** 217.02
CONCENTRATION: 50.0 ± 2.5 µg/mL **SOLVENT(S):** Methanol
 Water (<1%)
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99%¹³C
 (2,3,4-¹³C₃)
LAST TESTED: (mm/dd/yyyy) 08/19/2021
EXPIRY DATE: (mm/dd/yyyy) 08/19/2026
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
 Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~0.2% of perfluoro-n-(¹³C₃)propanoic acid and also contains ~1.0% of perfluoro-n-(1,2,3,4-¹³C₄)butanoic acid due to the naturally occurring isotopic abundance of ¹³C in the unlabelled carbon atom.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: 
 B.G. Chittim, General Manager

Date: 08/25/2021
 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
 519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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LIMITED WARRANTY:

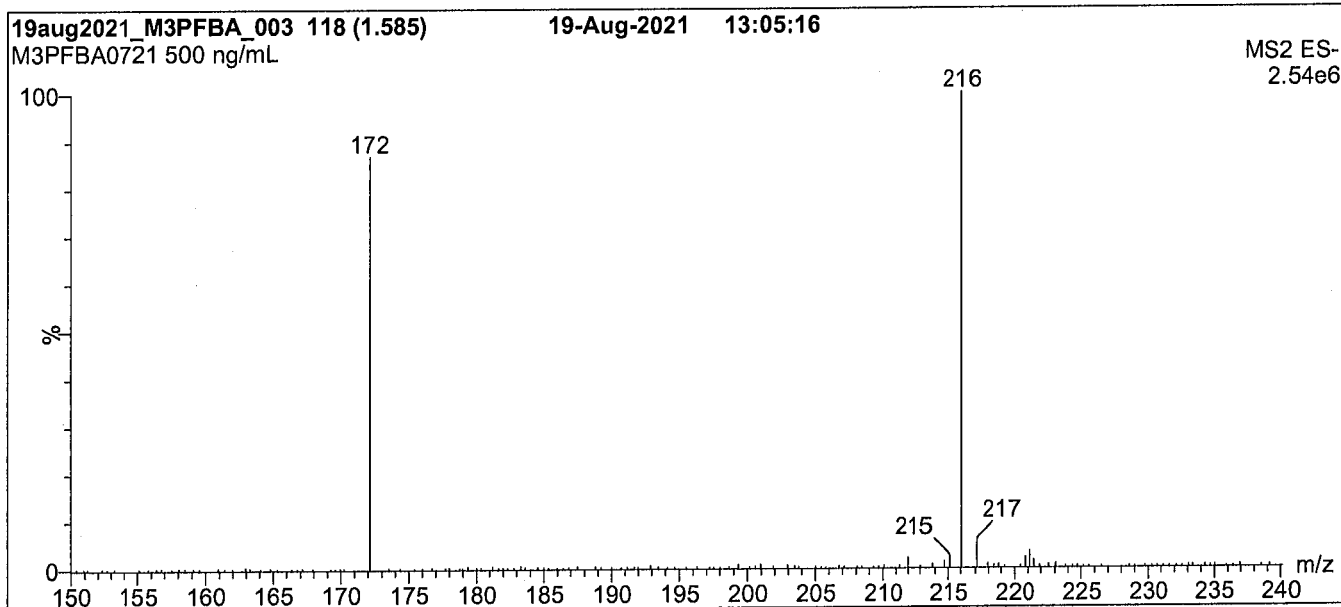
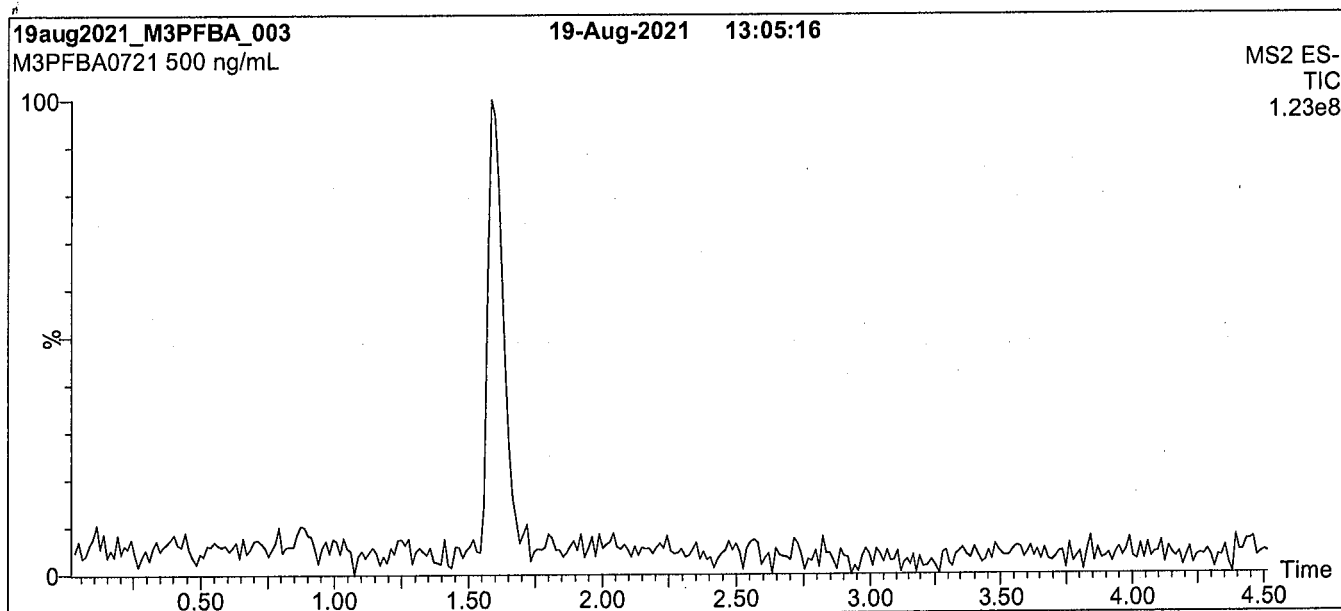
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Figure 1: M3PFBA; LC/MS Data (Full Scan and Mass Spectrum)**Conditions for Figure 1:**

Waters Acquity Ultra Performance LC
Waters Xevo TQ-S micro MS

Chromatographic Conditions:

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

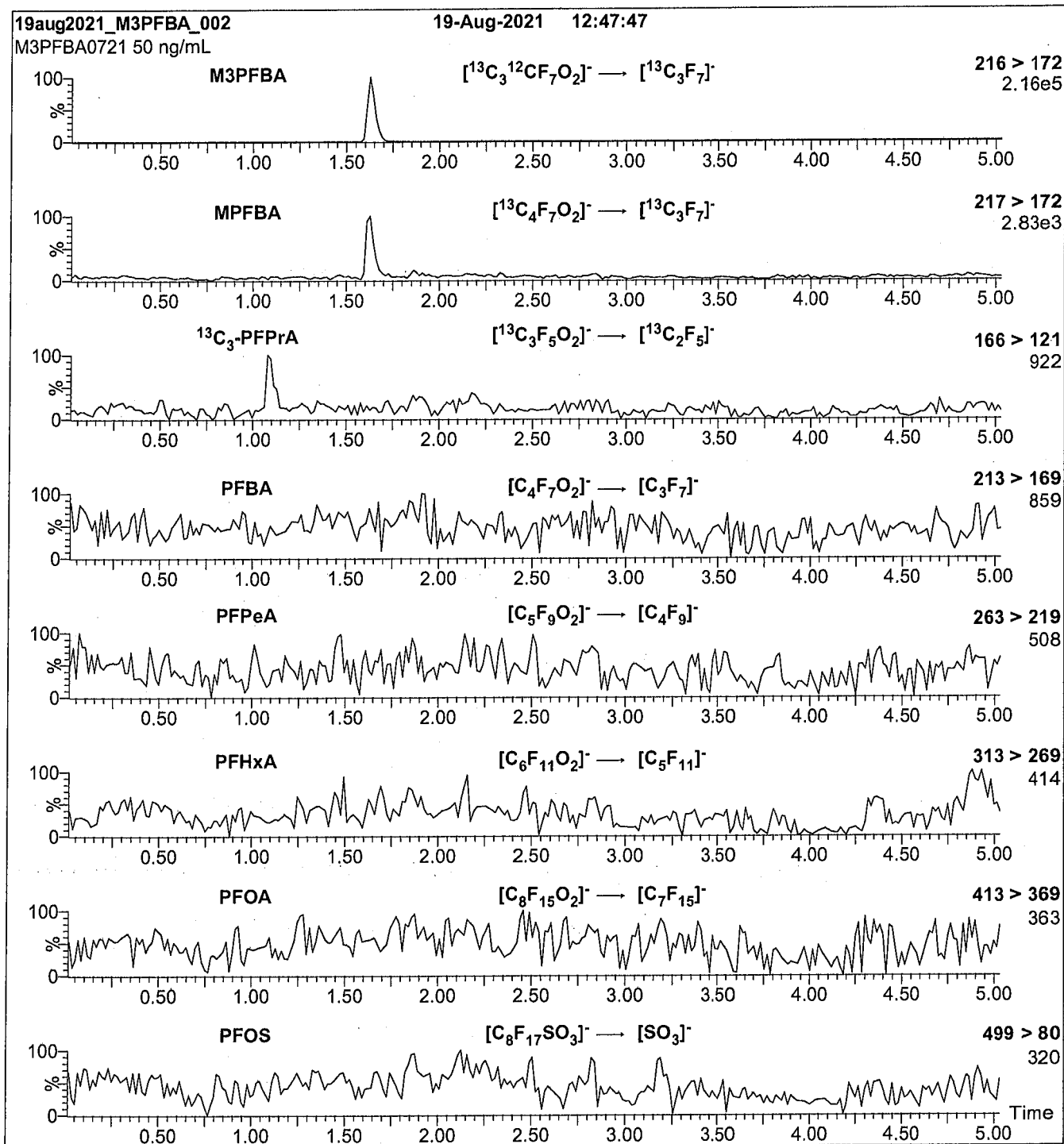
Mobile phase: Gradient
Start: 60% H₂O / 40% (80:20 MeOH:ACN)
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 8 min and hold for
2 min before returning to initial conditions in 0.5 min.
Time: 12 min

Flow: 300 μ L/min

MS Parameters:

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 10.00
Desolvation Temperature ($^{\circ}$ C) = 500
Desolvation Gas Flow (L/hr) = 1000

Figure 2: M3PFBA; LC/MS/MS Data (Selected MRM Transitions)**Conditions for Figure 2:**

Injection: On-column (M3PFBA)

Mobile phase: Same as Figure 1

Flow: 300 $\mu\text{L}/\text{min}$ **MS Parameters:**

Collision Gas (mbar) = 3.45e-3

Collision Energy (eV) = 8

Analytical Standard Record

22A0116L

Description:s	PFAS - IIS M3PFBA 50ug/mLs	Expires:s	08/19/2026s
Standard Type:s	Analyte Spikes	Prepared:s	08/19/2021s
Solvent:s	MeOHs	Prepared By:s	Dipti Gokals
Final Volume (mL)s:	1.2s	Department:s	PFASs
Vials:s	1s	Last Edit:s	01/20/2022 15:48 by HGHS

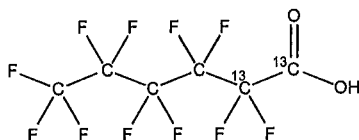
AnalyteL	ParentL	CAS NumberL	Concentration L	UnitsL
13C3-PFBAs		13C3-PFBAs	50s	ug/mLs



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFHxA **LOT NUMBER:** MPFHxA0921
COMPOUND: Perfluoro-n-(1,2-¹³C₂)hexanoic acid
STRUCTURE: **CAS #:** 960315-47-3



MOLECULAR FORMULA: ¹³C₂¹²C₄HF₁₁O₂ **MOLECULAR WEIGHT:** 316.04
CONCENTRATION: 50.0 ± 2.5 µg/mL **SOLVENT(S):** Methanol
 Water (<1%)
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ¹³C
 (1,2-¹³C₂)
LAST TESTED: (mm/dd/yyyy) 10/04/2021
EXPIRY DATE: (mm/dd/yyyy) 10/04/2026
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

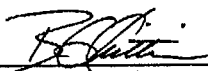
Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
 Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:


 B.G. Chittim, General Manager

Date: 10/22/2021
 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
 519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

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Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters x_1, x_2, \dots, x_n on which it depends is:

$$u_c(y(x_1, x_2, \dots, x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

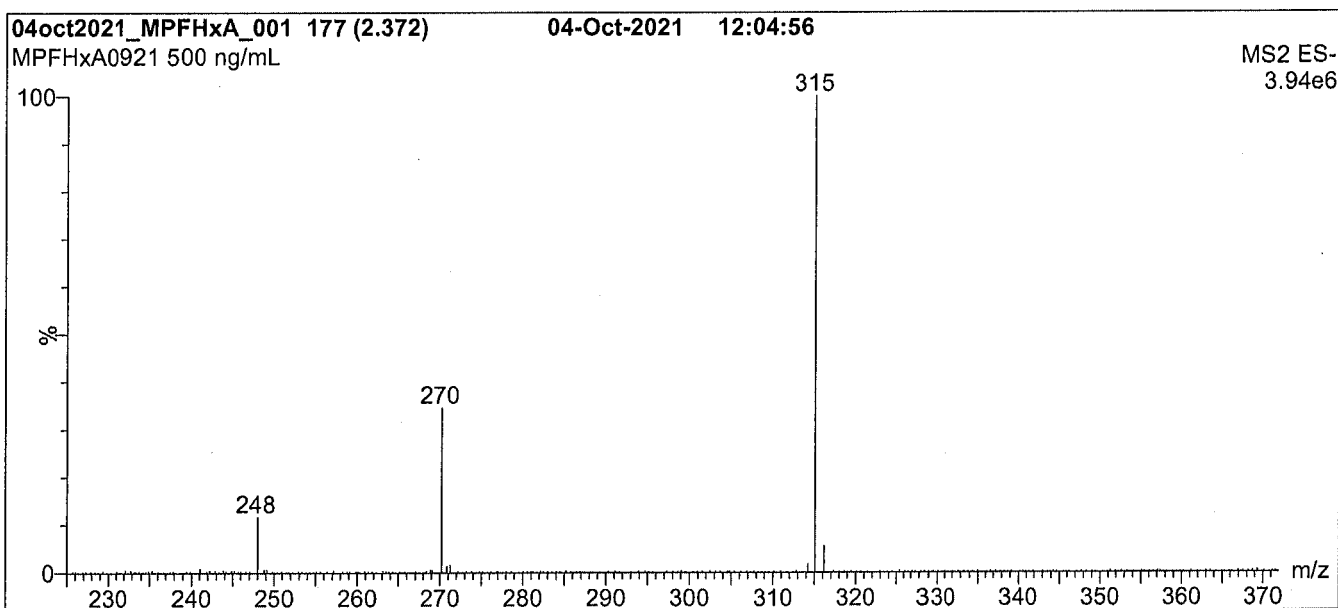
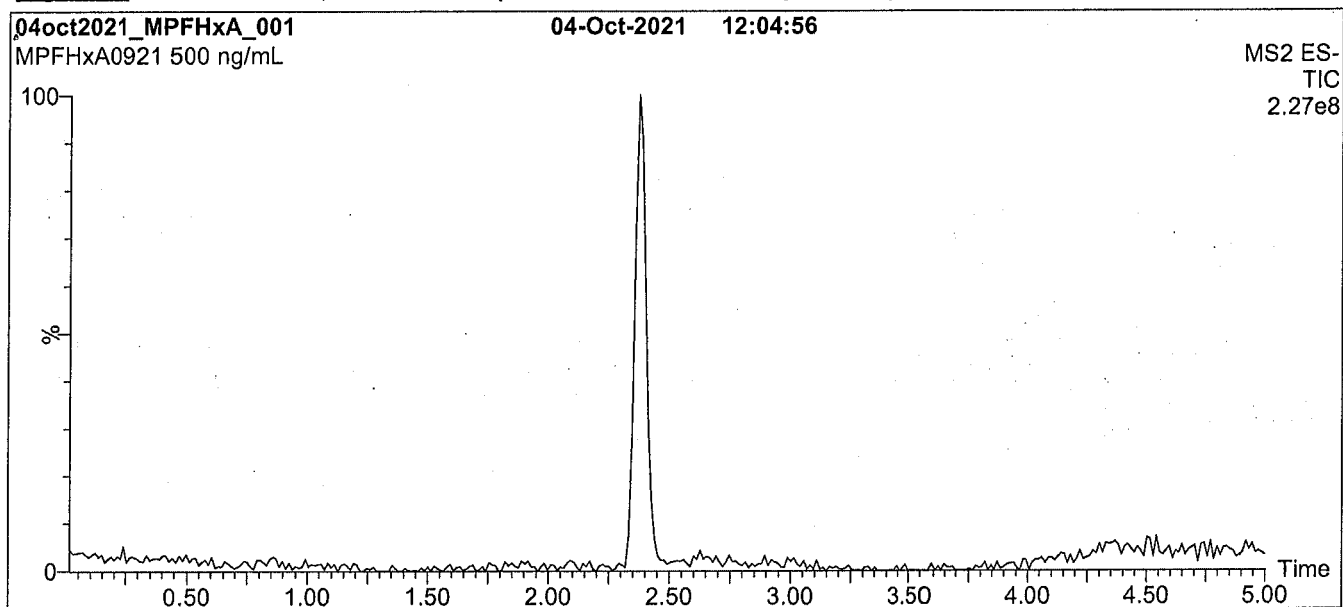
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QUALITY MANAGEMENT:

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Figure 1: MPFHxA; LC/MS Data (Full Scan and Mass Spectrum)**Conditions for Figure 1:**

Waters Acquity Ultra Performance LC
Waters Xevo TQ-S micro MS

Chromatographic Conditions:

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

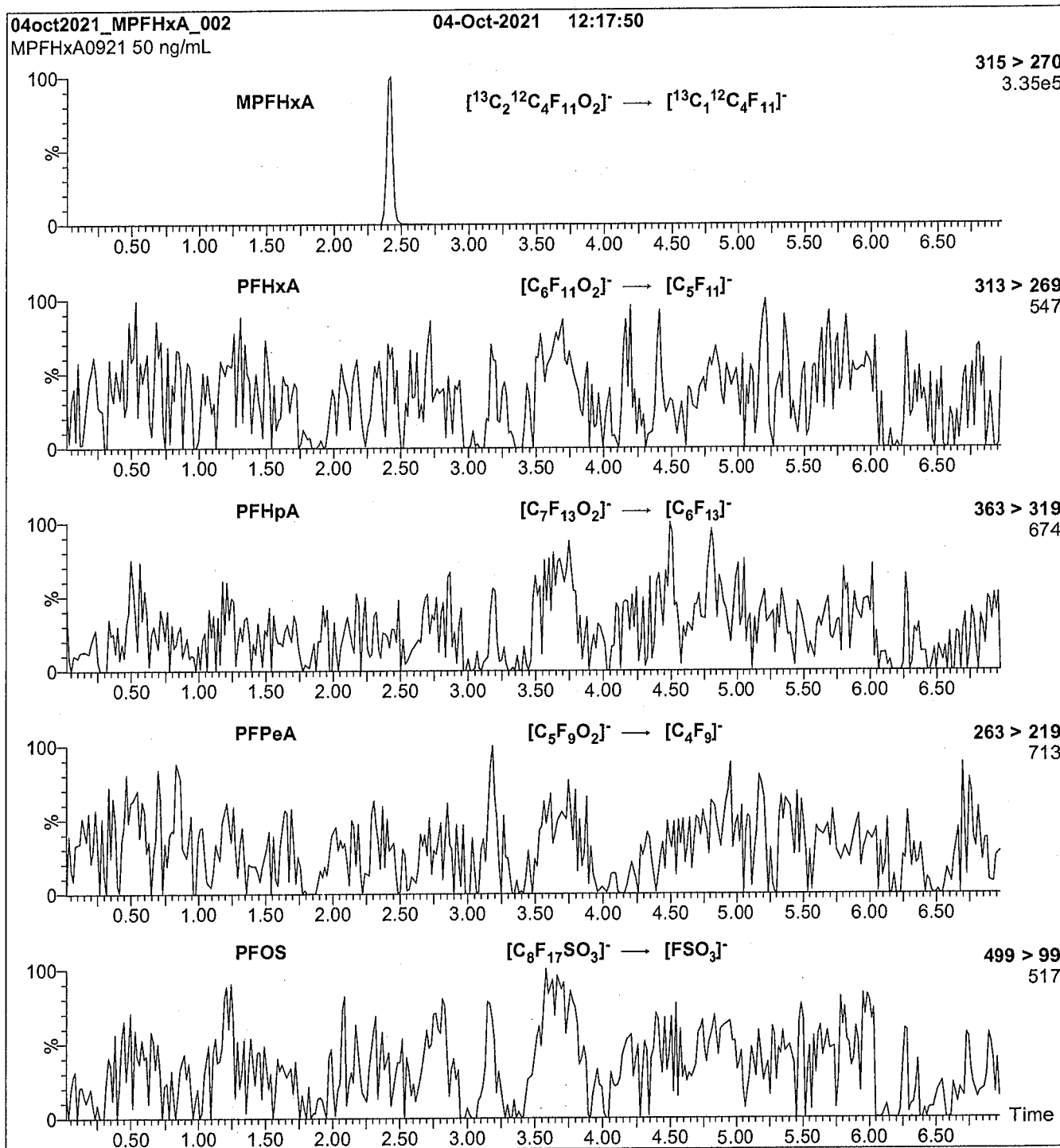
Mobile phase: Gradient
Start: 50% H₂O / 50% (80:20 MeOH:ACN)
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 1 min.
Time: 12 min

Flow: 300 μ L/min

MS Parameters:

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 10.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (L/hr) = 1000

Figure 2: MPFHxA; LC/MS/MS Data (Selected MRM Transitions)**Conditions for Figure 2:**

Injection: On-column (MPFHxA)

Mobile phase: Same as Figure 1

Flow: 300 $\mu\text{L}/\text{min}$ **MS Parameters:**

Collision Gas (mbar) = 3.31e-3

Collision Energy (eV) = 8

Analytical Standard Record

22A0117J

Description:s	PFAS - IIS MPFHxA 50ug/mLs	Expires:s	10/04/2026s
Standard Type:s	Analyte Spikes	Prepared:s	10/04/2021s
Solvent:s	MeOHs	Prepared By:s	Dipti Gokals
Final Volume (mLs):s	1.2s	Department:s	PFASs
Vials:s	1s	Last Edit:s	01/20/2022 15:48 by HGHS

AnalyteJ	ParentJ	CAS NumberJ	Concentration J	UnitsJ
13C2-PFHxA		13C2-PFHxAs	50s	ug/mLs

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22A0117J

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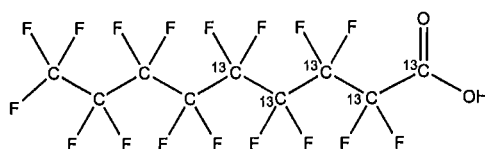
AnalyteJ	ParentJ	CAS NumberJ	Concentration J	UnitsJ
13C2-PFHxA		13C2-PFHxAs	50s	ug/mLs



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFNA **LOT NUMBER:** MPFNA1021
COMPOUND: Perfluoro-n-(1,2,3,4,5-¹³C₅)nonanoic acid
STRUCTURE: **CAS #:** 960315-49-5



MOLECULAR FORMULA: $^{13}\text{C}_5^{12}\text{C}_4\text{HF}_{17}\text{O}_2$ **MOLECULAR WEIGHT:** 469.04
CONCENTRATION: 50.0 ± 2.5 µg/mL **SOLVENT(S):** Methanol
 Water (<1%)
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ¹³C
 (1,2,3,4,5-¹³C₅)
LAST TESTED: (mm/dd/yyyy) 10/29/2021
EXPIRY DATE: (mm/dd/yyyy) 10/29/2026
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
 Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

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Certified By: 
 B.G. Chittim, General Manager

Date: 11/01/2021
 (mm/dd/yyyy)

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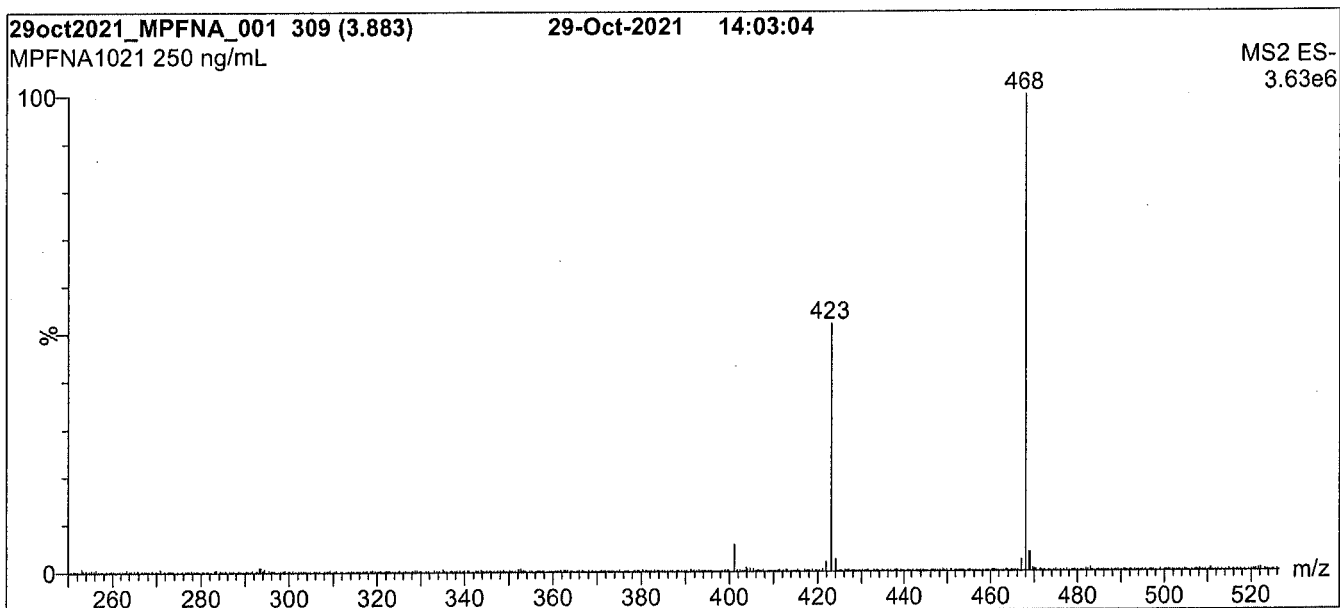
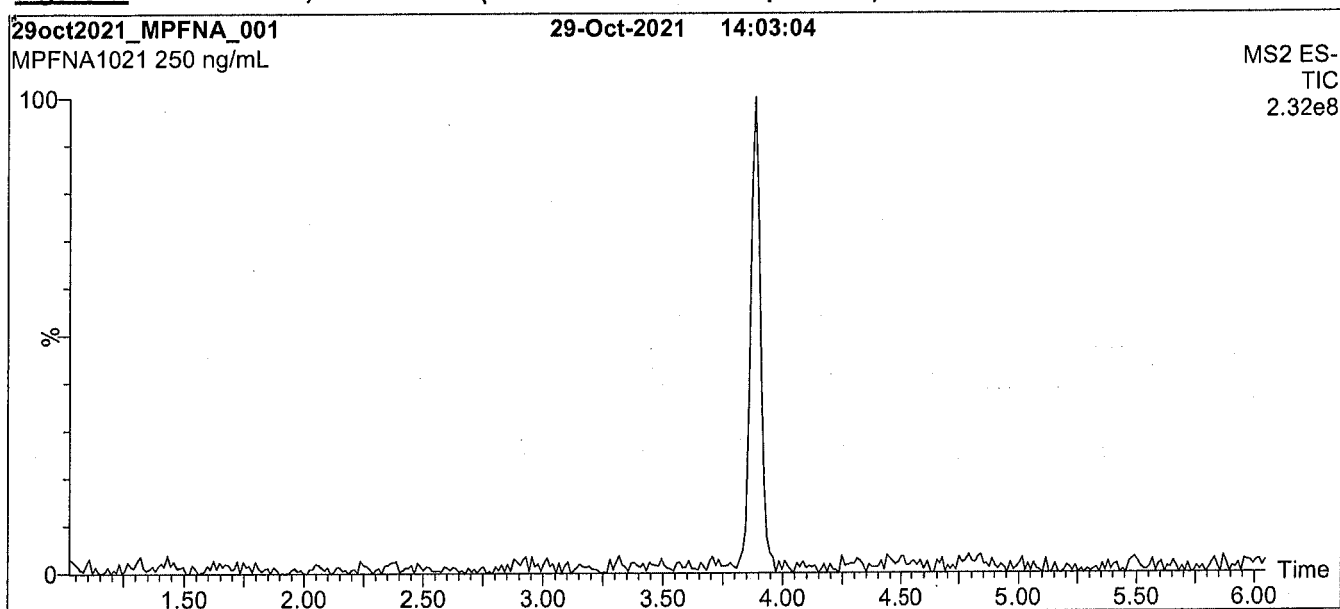
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Figure 1: MPFNA; LC/MS Data (Full Scan and Mass Spectrum)**Conditions for Figure 1:**

Waters Acquity Ultra Performance LC
Waters Xevo TQ-S micro MS

Chromatographic Conditions:

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

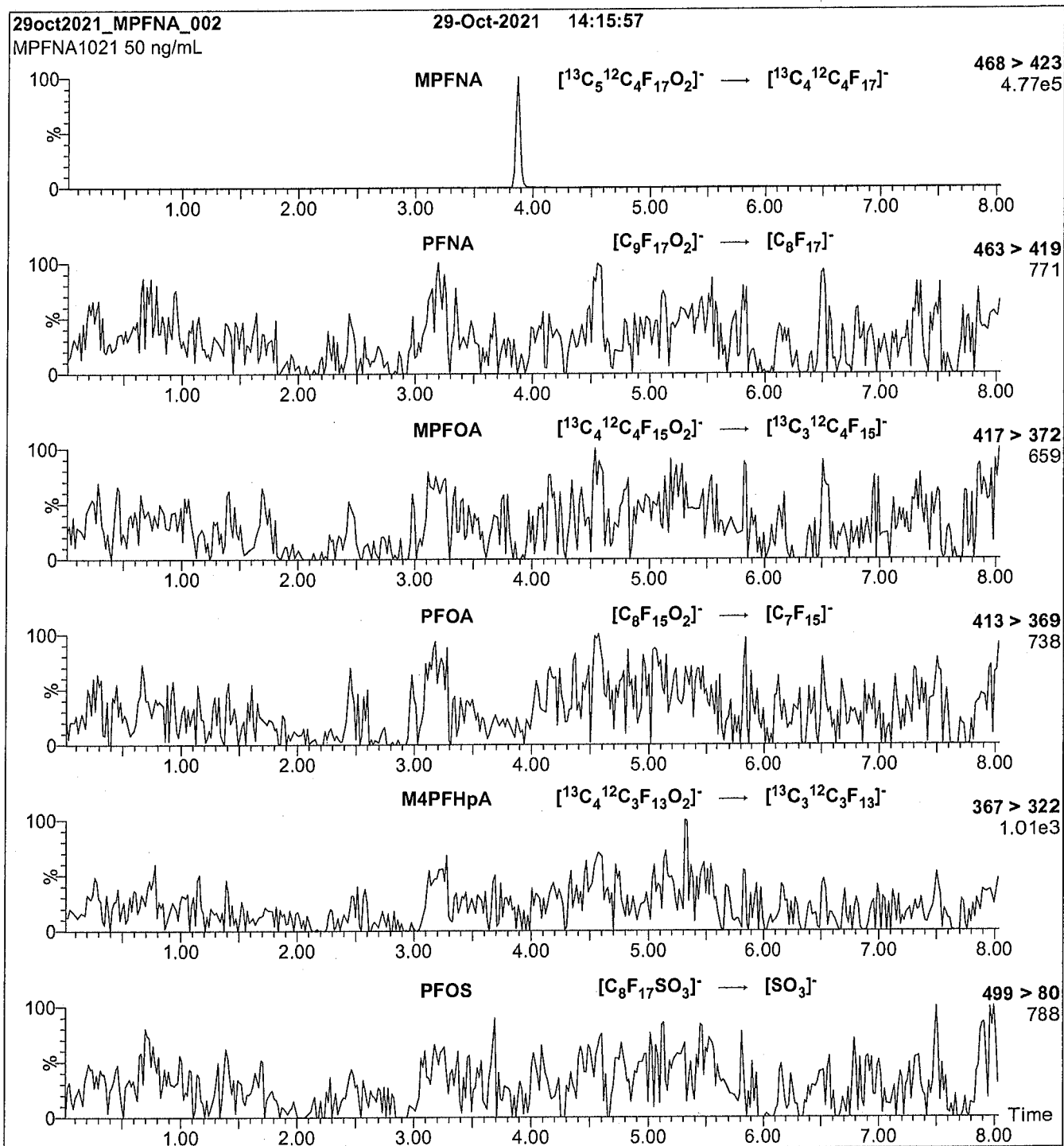
Mobile phase: Gradient
Start: 40% H₂O / 60% (80:20 MeOH:ACN)
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 8 min and hold for
2 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 μ L/min

MS Parameters:

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 10.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (L/hr) = 1000

Figure 2: MPFNA; LC/MS/MS Data (Selected MRM Transitions)**Conditions for Figure 2:**

Injection: On-column (MPFNA)

Mobile phase: Same as Figure 1

Flow: 300 $\mu\text{L}/\text{min}$ **MS Parameters:**

Collision Gas (mbar) = 3.16e-3

Collision Energy (eV) = 10

Analytical Standard Record

22A0118L

Description:s	PFAS - IIS MPFNA 50ug/mL	Expires:s	10/29/2026s
Standard Type:s	Analyte Spikes	Prepared:s	10/29/2021s
Solvent:s	MeOHs	Prepared By:s	Dipti Gokals
Final Volume (ml)s:s	1.2s	Department:s	PFASs
Vials:s	1s	Last Edit:s	01/20/2022 15:48 by HGHS

AnalyteL	ParentL	CAS NumberL	Concentration L	UnitsL
13C5-PFNA		13C5-PFNA	50s	ug/mLs

Analytical Standard Record

22A0118L

Description:s	PFAS - IIS MPFNA 50ug/mL	Expires:s	10/29/2026s
Standard Type:s	Analyte Spikes	Prepared:s	10/29/2021s
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Final Volume (ml)s:s	1.2s	Department:s	PFASs
Vials:s	1s	Last Edit:s	01/20/2022 15:48 by HGHS

AnalyteL	ParentL	CAS NumberL	Concentration L	UnitsL
13C5-PFNA		13C5-PFNA	50s	ug/mLs



WELLINGTON LABORATORIES

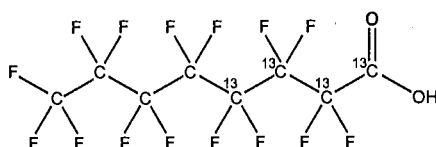
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFOA
COMPOUND: Perfluoro-n-(1,2,3,4-¹³C₄)octanoic acid

LOT NUMBER: MPFOA1121

STRUCTURE:

CAS #: 960315-48-4



MOLECULAR FORMULA: ¹³C₄¹²C₄HF₁₅O₂
CONCENTRATION: 50.0 ± 2.5 µg/mL

MOLECULAR WEIGHT: 418.04
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%

ISOTOPIC PURITY: ≥99% ¹³C
(1,2,3,4-¹³C₄)

LAST TESTED: (mm/dd/yyyy) 12/07/2021

EXPIRY DATE: (mm/dd/yyyy) 12/07/2026

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

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Certified By: 
B.G. Chittim, General Manager

Date: 12/20/2021
(mm/dd/yyyy)

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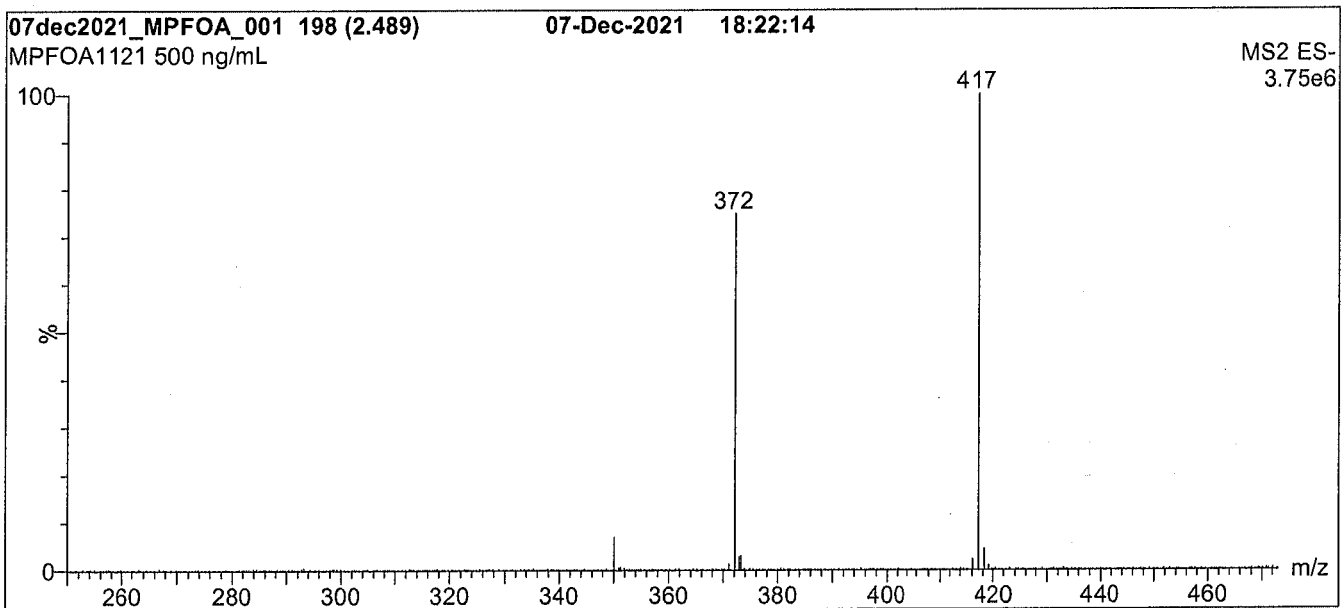
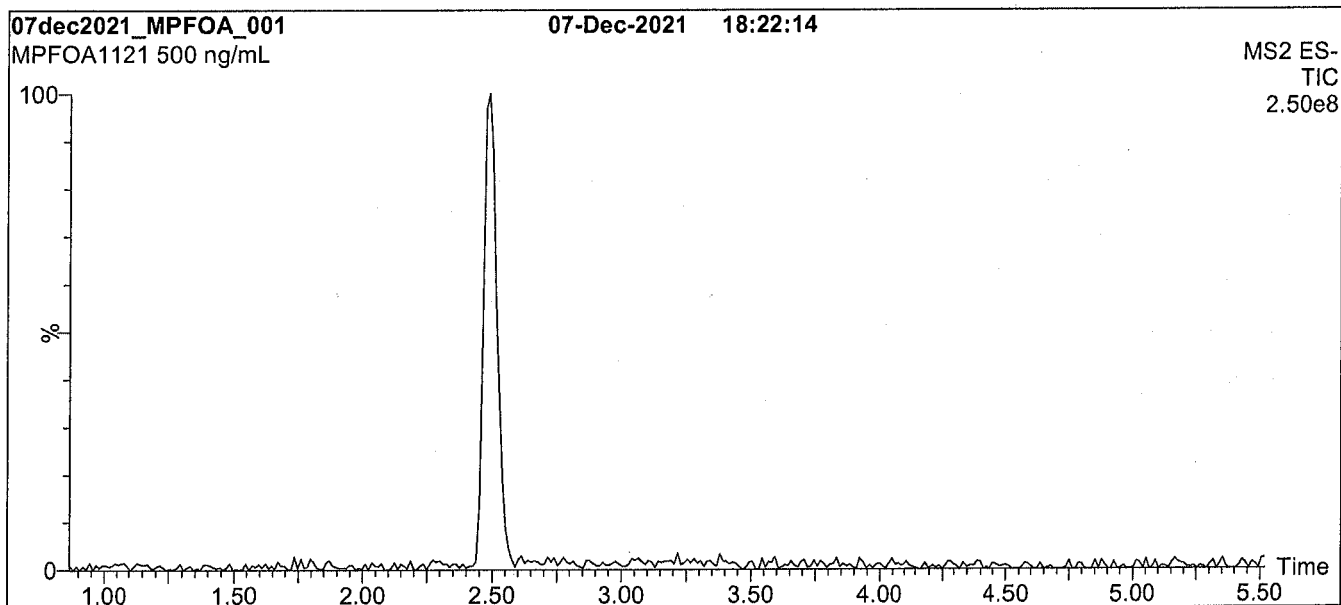
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Figure 1: MPFOA; LC/MS Data (Full Scan and Mass Spectrum)**Conditions for Figure 1:**

Waters Acquity Ultra Performance LC
Waters Xevo TQ-S micro MS

Chromatographic Conditions:

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

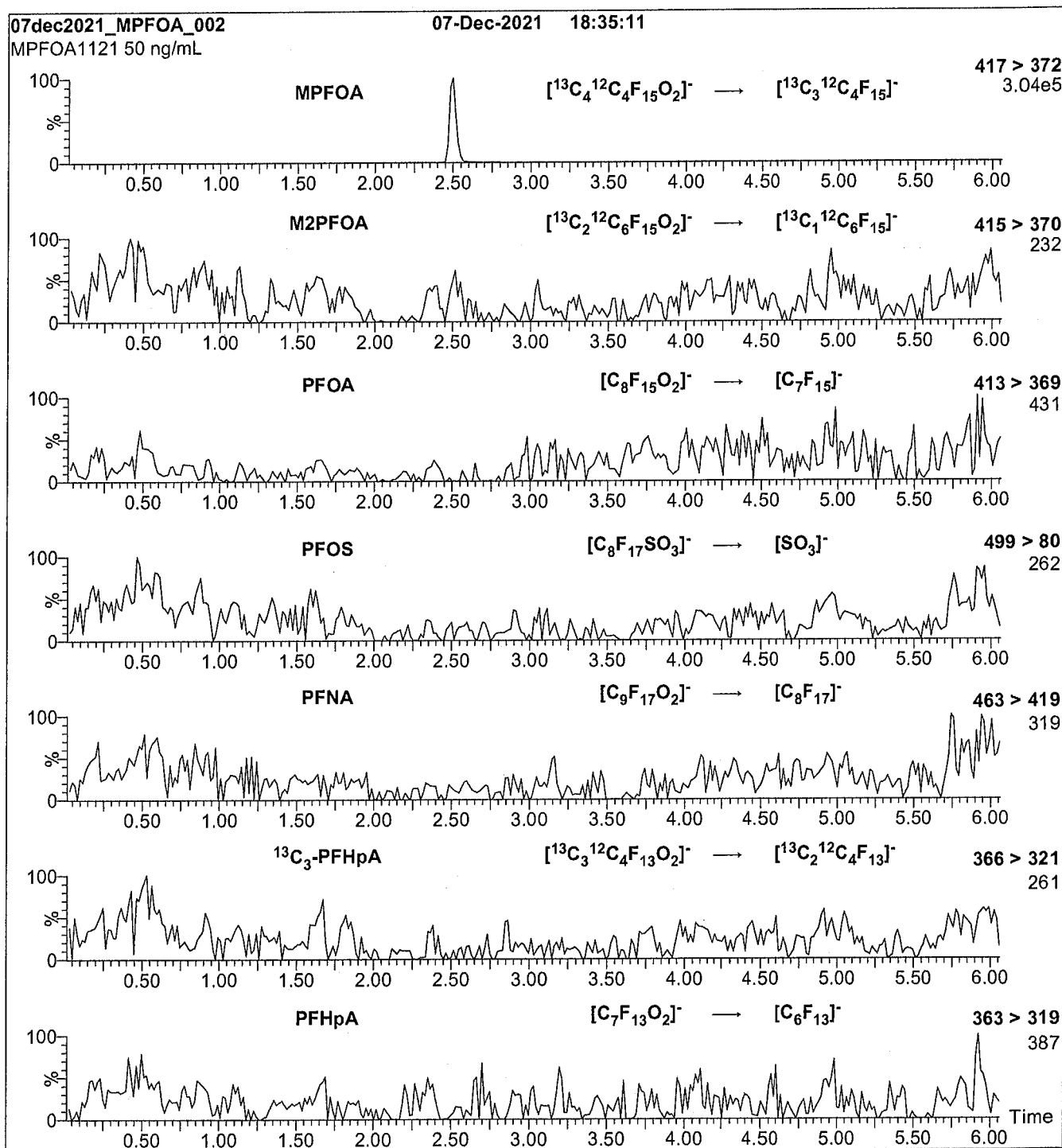
Mobile phase: Gradient
Start: 40% H₂O / 60% (80:20 MeOH:ACN)
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 8 min and hold for 2 min
before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 μ L/min

MS Parameters:

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 10.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (L/hr) = 1000

Figure 2: MPFOA; LC/MS/MS Data (Selected MRM Transitions)**Conditions for Figure 2:**

Injection: On-column (MPFOA)

Mobile phase: Same as Figure 1

Flow: 300 $\mu\text{L}/\text{min}$ **MS Parameters:**

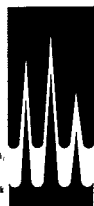
Collision Gas (mbar) = 3.39e-3

Collision Energy (eV) = 8

Analytical Standard Record0**22A01190**

Description:s	PFAS - IIS MPFOA 50ug/mLs	Expires:s	12/07/2026
Standard Type:s	Analyte Spikes	Prepared:s	12/07/2021
Solvent:s	MeOHs	Prepared By:s	Dipti Gokals
Final Volume (mL):s	1.2s	Department:s	PFASs
Vials:s	1s	Last Edit:s	01/20/2022 15:48 by HGHS

Analyte0	Parent0	CAS Number	Concentration 0	Units0
13C4-PFOAs		13C4-PFOAs	50s	ug/mLs

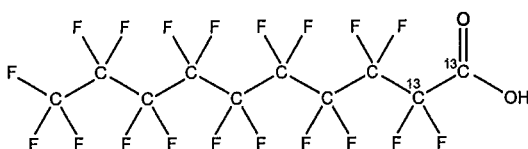


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFDA **LOT NUMBER:** MPFDA1221
COMPOUND: Perfluoro-n-(1,2-¹³C₂)decanoic acid

STRUCTURE: **CAS #:** 960315-50-8



MOLECULAR FORMULA: ¹³C₂¹²C₈HF₁₉O₂ **MOLECULAR WEIGHT:** 516.07
CONCENTRATION: 50.0 ± 2.5 µg/mL **SOLVENT(S):** Methanol
 Water (<1%)
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ¹³C
 (1,2-¹³C₂)
LAST TESTED: (mm/dd/yyyy) 12/08/2021
EXPIRY DATE: (mm/dd/yyyy) 12/08/2026
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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 Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
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$$u_c(y(x_1, x_2, \dots, x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

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LIMITED WARRANTY:

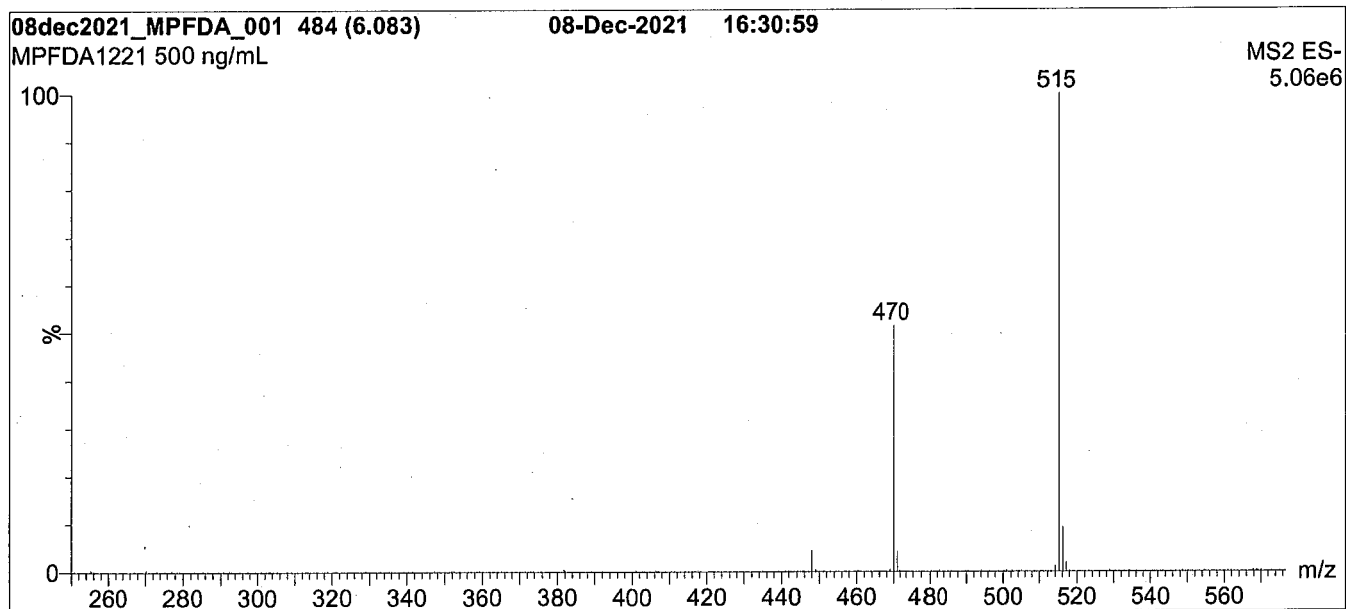
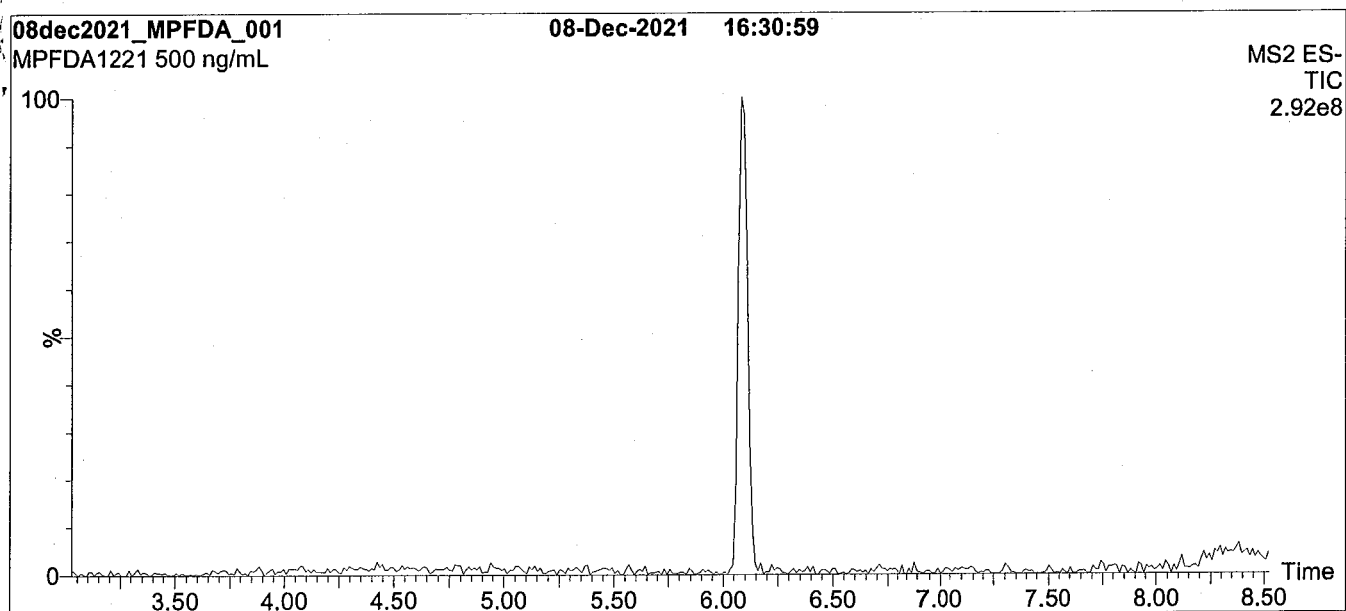
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QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A1226), and ISO 17034 by ANSI National Accreditation Board (ANAB; AR-1523).



For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: MPFDA; LC/MS Data (Full Scan and Mass Spectrum)**Conditions for Figure 1:**

Waters Acquity Ultra Performance LC
Waters Xevo TQ-S micro MS

Chromatographic Conditions:

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient

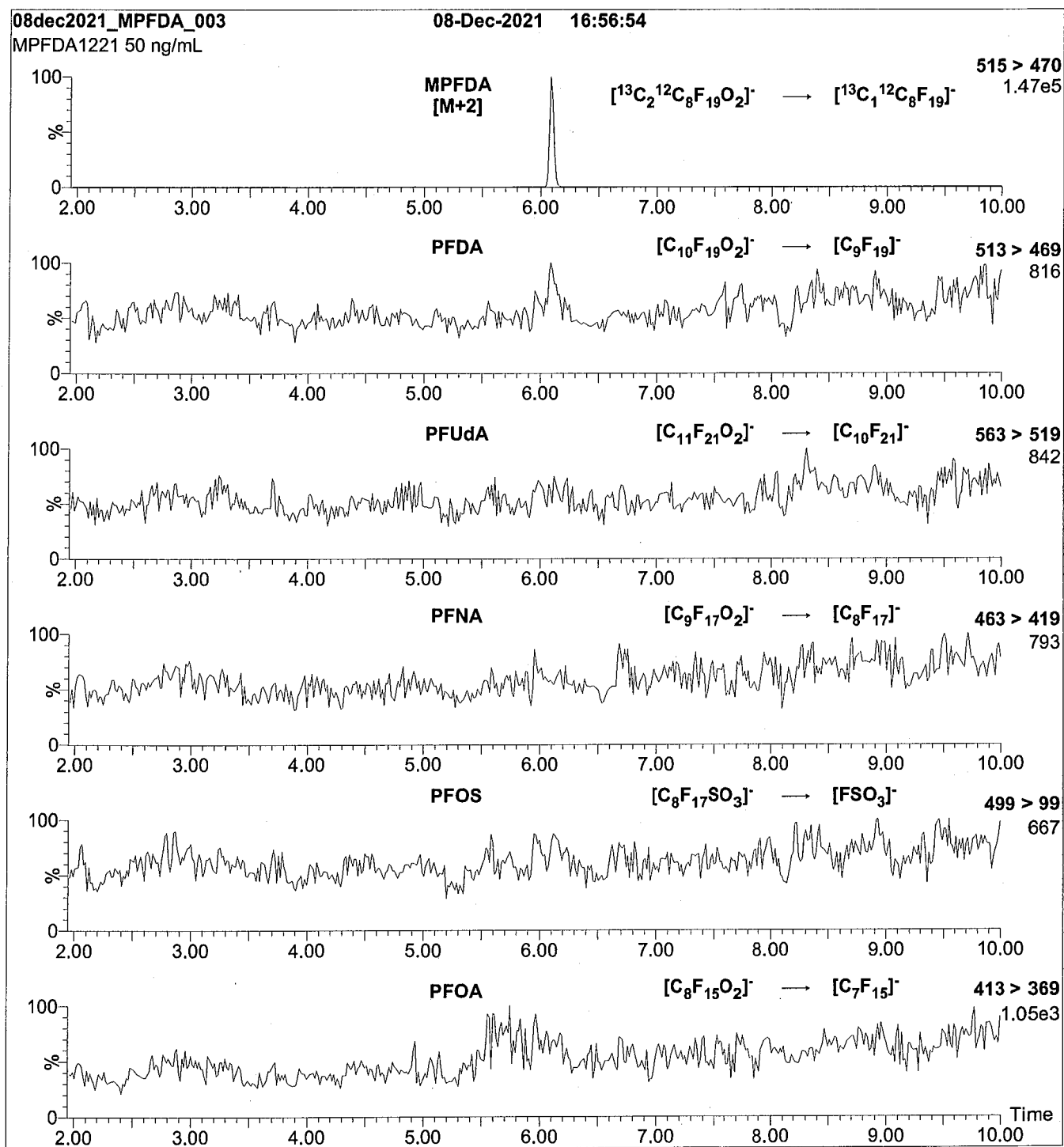
Start: 50% H₂O / 50% (80:20 MeOH:ACN)
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 9 min and hold for
1 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 μ L/min

MS Parameters:

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 10.00
Desolvation Temperature ($^{\circ}$ C) = 500
Desolvation Gas Flow (L/hr) = 1000

Figure 2: MPFDA; LC/MS/MS Data (Selected MRM Transitions)**Conditions for Figure 2:**

Injection: On-column (MPFDA)

Mobile phase: Same as Figure 1

Flow: 300 μ L/min**MS Parameters:**

Collision Gas (mbar) = 3.39e-3

Collision Energy (eV) = 10

Analytical Standard Record

22A0120L

Description:s	PFAS - IIS MPFDA 50ug/mLs	Expires:s	12/08/2026s
Standard Type:s	Analyte Spikes	Prepared:s	12/08/2021s
Solvent:s	MeOHs	Prepared By:s	Dipti Gokals
Final Volume (mL):s	1.2s	Department:s	PFASs
Vials:s	1s	Last Edit:s	01/20/2022 15:49 by HGHS

AnalyteL	ParentL	CAS NumberL	Concentration L	UnitsL
13C2-PFDAs		13C2-PFDAs	50s	ug/mLs

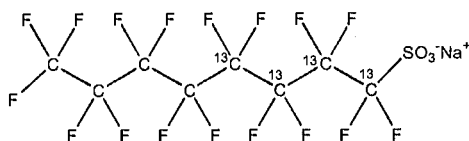


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFOS **LOT NUMBER:** MPFOS0821
COMPOUND: Sodium perfluoro-1-(1,2,3,4-¹³C₄)octanesulfonate

STRUCTURE: **CAS #:** 960315-53-1



MOLECULAR FORMULA: ¹³C₄¹²C₄F₁₇SO₃Na **MOLECULAR WEIGHT:** 526.08
CONCENTRATION: 50.0 ± 2.5 µg/mL (Na salt) **SOLVENT(S):** Methanol
 47.9 ± 2.4 µg/mL (MPFOS acid)
 47.8 ± 2.4 µg/mL (MPFOS anion)
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ¹³C
LAST TESTED: (mm/dd/yyyy) 08/18/2021 (1,2,3,4-¹³C₄)
EXPIRY DATE: (mm/dd/yyyy) 08/18/2026
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

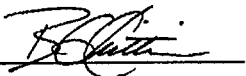
DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
 Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~0.4% sodium perfluoro-1-(¹³C₃)heptanesulfonate.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: 
 B.G. Chittim, General Manager **Date:** 08/19/2021
 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
 519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

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where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

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LIMITED WARRANTY:

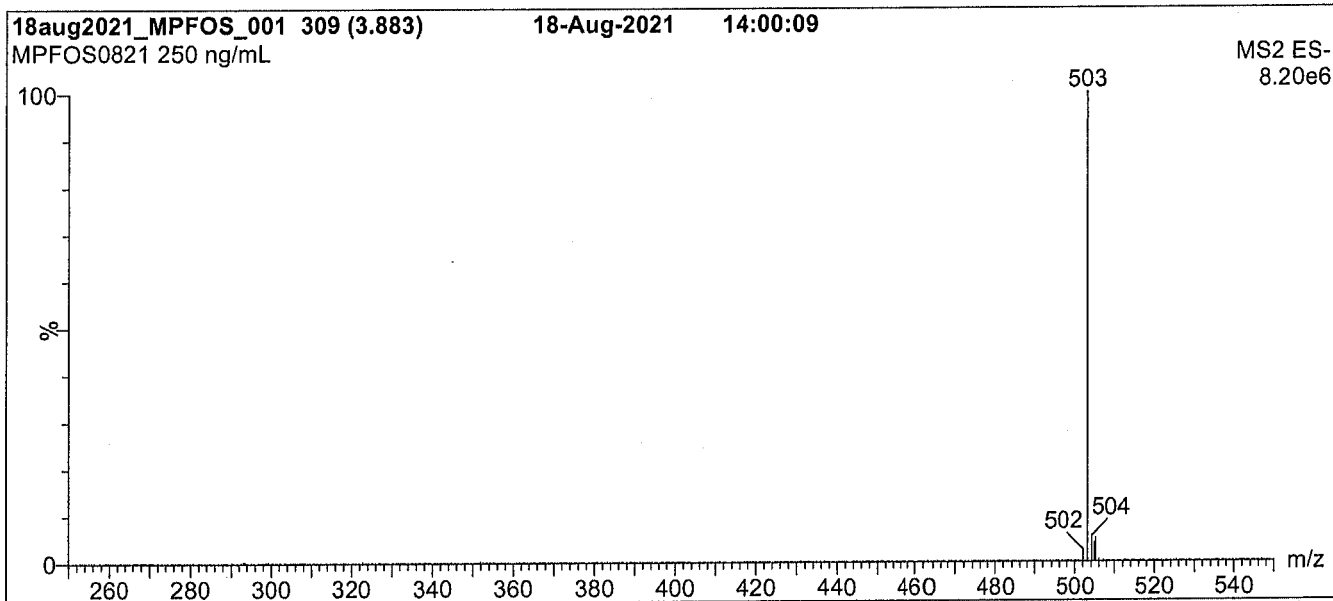
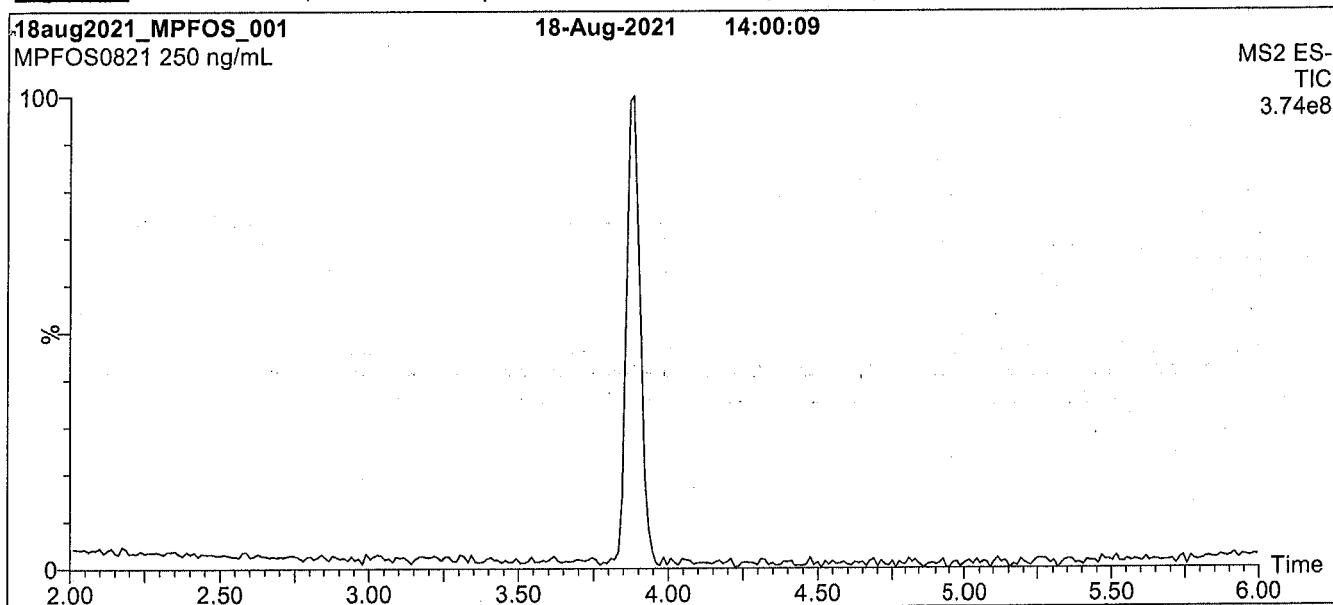
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QUALITY MANAGEMENT:

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Figure 1: MPFOS; LC/MS Data (Full Scan and Mass Spectrum)**Conditions for Figure 1:**

Waters Acquity Ultra Performance LC
Waters Xevo TQ-S micro MS

Chromatographic Conditions:

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

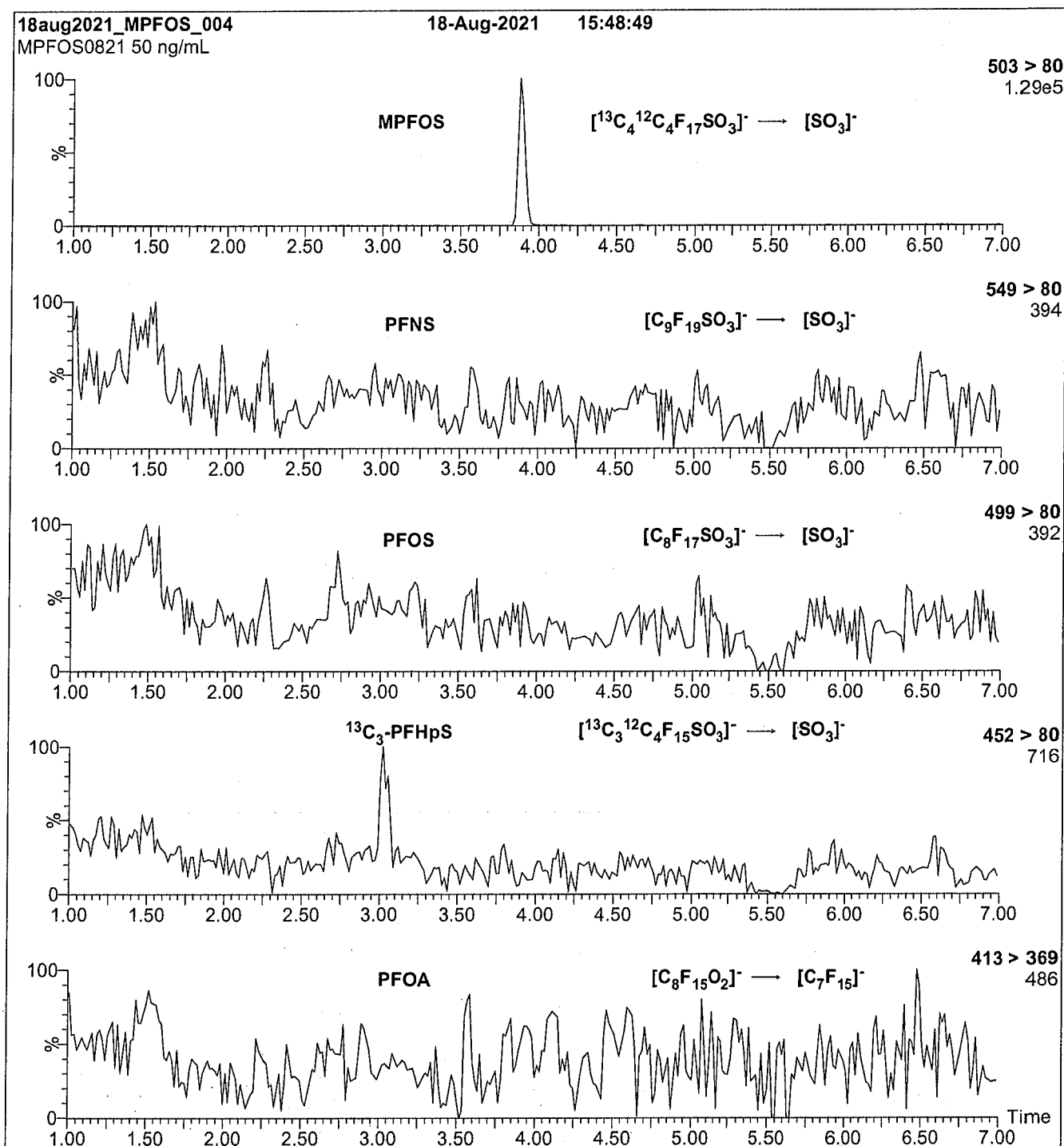
Mobile phase: Gradient
Start: 40% H₂O / 60% (80:20 MeOH:ACN)
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 8 min and hold for
2 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 μ L/min

MS Parameters:

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 10.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (L/hr) = 1000

Figure 2: MPFOS; LC/MS/MS Data (Selected MRM Transitions)**Conditions for Figure 2:**

Injection: On-column (MPFOS)

Mobile phase: Same as Figure 1

Flow: 300 $\mu\text{L}/\text{min}$ **MS Parameters:**

Collision Gas (mbar) = 3.39e-3

Collision Energy (eV) = 42

Analytical Standard Record

22A0121L

Description:s	PFAS - IIS MPFOS 50ug/mLs	Expires:s	08/18/2026s
Standard Type:s	Analyte Spikes	Prepared:s	08/18/2021s
Solvent:s	MeOHs	Prepared By:s	Dipti Gokals
Final Volume (mL):s	1.2s	Department:s	PFASs
Vials:s	1s	Last Edit:s	01/20/2022 15:49 by HGHS

AnalyteL	ParentL	CAS NumberL	Concentration L	UnitsL
13C4-PFOs		13C4-PFOs	50s	ug/mLs

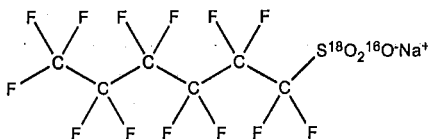


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFHxS **LOT NUMBER:** MPFHxS1021
COMPOUND: Sodium perfluoro-1-hexane(¹⁸O₂)sulfonate

STRUCTURE: **CAS #:** 1585941-14-5



MOLECULAR FORMULA: C₆F₁₃S¹⁸O₂¹⁶ONa **MOLECULAR WEIGHT:** 426.10
CONCENTRATION: 50.0 ± 2.5 µg/mL (Na salt) **SOLVENT(S):** Methanol
 47.4 ± 2.4 µg/mL (MPFHxS acid)
 47.3 ± 2.4 µg/mL (MPFHxS anion)
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** >94% (¹⁸O₂)
LAST TESTED: (mm/dd/yyyy) 10/29/2021
EXPIRY DATE: (mm/dd/yyyy) 10/29/2026
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- The response factor for MPFHxS (C₆F₁₃S¹⁸O₂¹⁶O) has been observed to be up to 10% lower than for PFHxS (C₆F₁₃S¹⁶O₃) when both compounds are injected together. This difference may vary between instruments.
- Contains ~0.6% of sodium perfluoro-1-octane(¹⁸O₂)sulfonate (¹⁸O₂-PFOS) and ~0.3% of sodium perfluoro-1-heptane(¹⁸O₂)sulfonate (¹⁸O₂-PFHpS).
- Due to the isotopic purity of the starting material (¹⁸O₂ >94%), MPFHxS contains ~0.3% of PFHxS. This value agrees with the theoretical percent relative abundance that is expected based on the stated isotopic purity.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: 
 B.G. Chittim, General Manager

Date: 11/05/2021
 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
 519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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where x is expressed as a relative standard uncertainty of the individual parameter.

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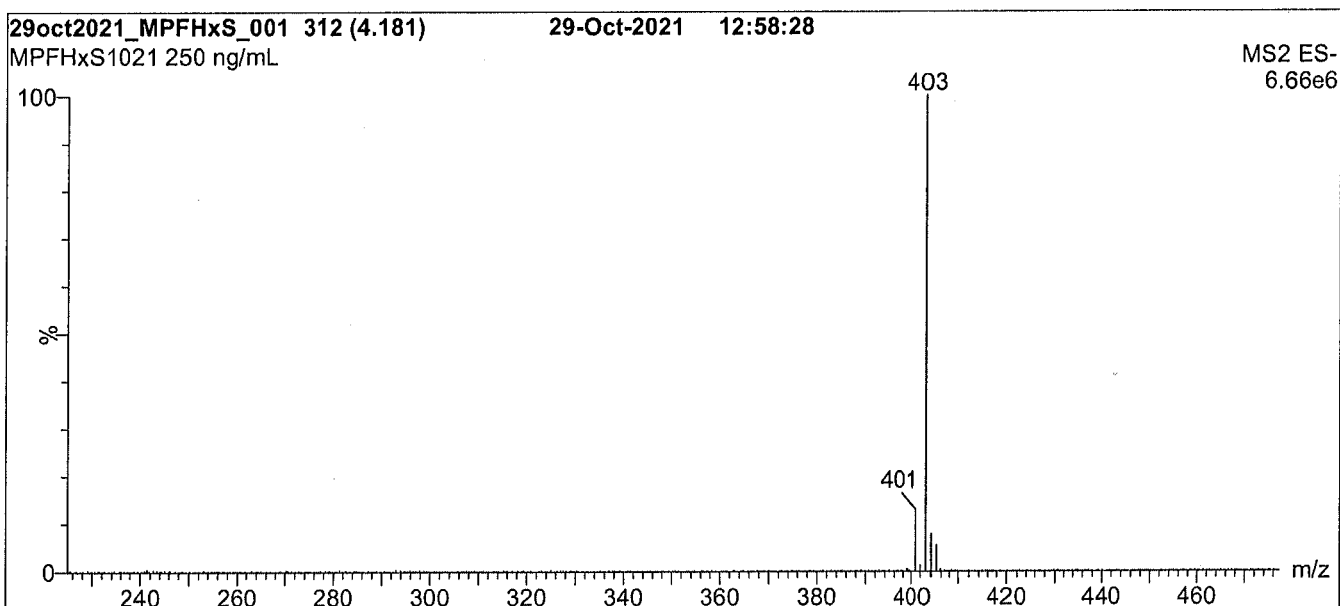
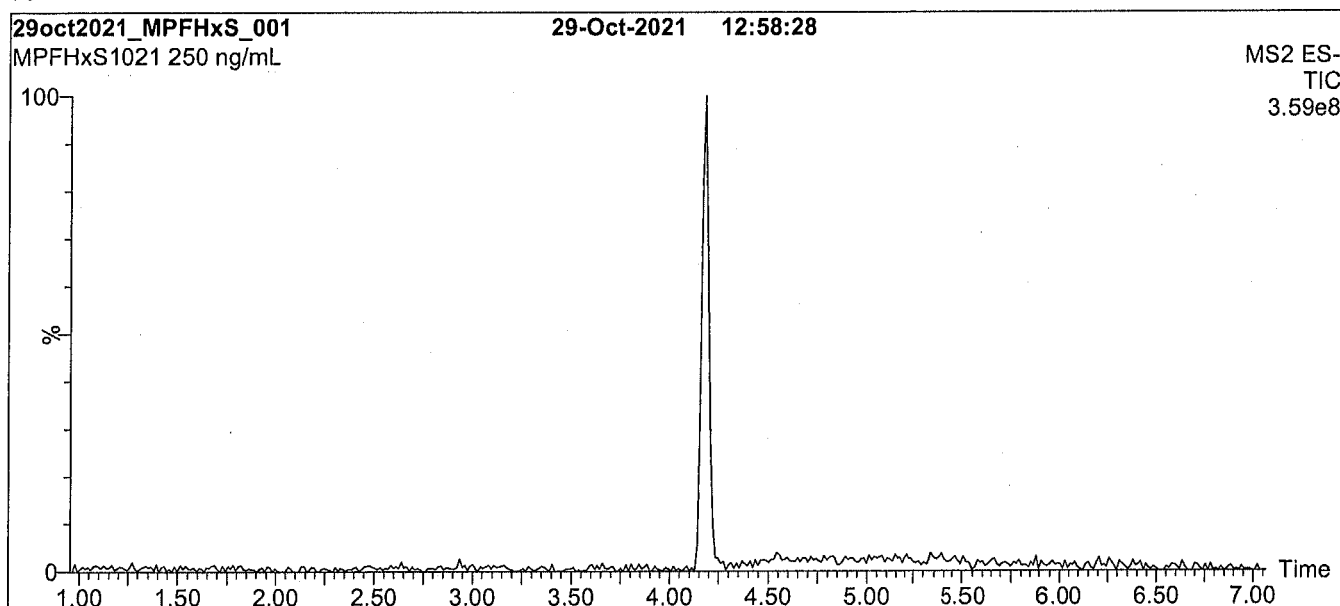
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Figure 1: MPFHxS; LC/MS Data (Full Scan and Mass Spectrum)**Conditions for Figure 1:**

Waters Acquity Ultra Performance LC
Waters Xevo TQ-S micro MS

Chromatographic Conditions:

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient

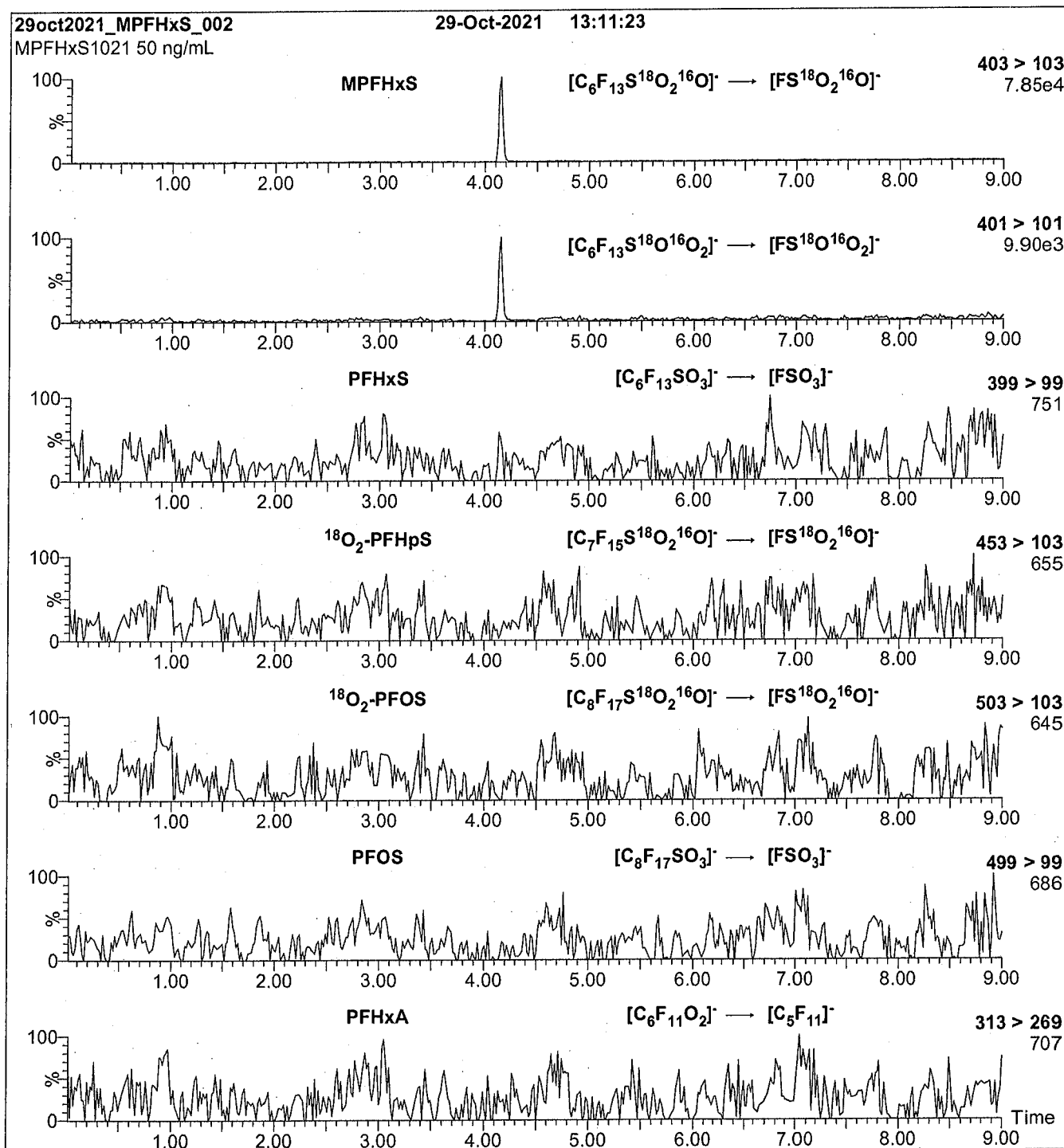
Start: 50% H₂O / 50% (80:20 MeOH:ACN)
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 9 min and hold for
1 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 μ L/min

MS Parameters:

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 10.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (L/hr) = 1000

Figure 2: MPFHxS; LC/MS/MS Data (Selected MRM Transitions)**Conditions for Figure 2:**

Injection: On-column (MPFHxS)

Mobile phase: Same as Figure 1

Flow: 300 μ L/min**MS Parameters:**

Collision Gas (mbar) = 3.16e-3

Collision Energy (eV) = 32

Analytical Standard Record

22A0122L

Description:s	PFAS - IIS MPFHxS 50ug/mLs	Expires:s	10/29/2026s
Standard Type:s	Analyte Spikes	Prepared:s	10/29/2021s
Solvent:s	MeOHs	Prepared By:s	Dipti Gokals
Final Volume (mL):s	1.2s	Department:s	PFASs
Vials:s	1s	Last Edit:s	01/20/2022 15:49 by HGHS

AnalyteL	ParentL	CAS NumberL	Concentration L	UnitsL
1802-PFHXS		1802-PFHXS	50s	ug/mLs

Analytical Standard Record

22A0122L

Description:s	PFAS - IIS MPFHxS 50ug/mLs	Expires:s	10/29/2026s
Standard Type:s	Analyte Spikes	Prepared:s	10/29/2021s
Solvent:s	MeOHs	Prepared By:s	Dipti Gokals
Final Volume (mL)s:	1.2s	Department:s	PFASs
Vials:s	1s	Last Edit:s	01/20/2022 15:49 by HGHS

AnalyteL	ParentL	CAS NumberL	Concentration L	UnitsL
1802-PFHXS		1802-PFHXS	50s	ug/mLs

Analytical Standard Record0

22A02340

Description:s	PFAS IIS 7C 5ug/mL	Expires:s	01/20/2023s
Standard Type:	Internal Standards	Prepared:s	01/20/2022s
Solvent:	MeOH/61252s	Prepared By:s	Dipti Gokals
Final Volume (mLs):	12s	Department:s	PFASs
Vials:s	1s	Last Edit:s	01/20/2022 15:49 by HGHS
Comments:f	mpfna had more left over than others.		

Analyte0	Parent0	CAS Number	Concentration 0	Units0
13C3-PFBAs	22A0116s	13C3-PFBAs	5s	ug/mLs
13C2-PFHxA	22A0117	13C2-PFHxAs	5s	ug/mLs
13C5-PFNA	22A0118s	13C5-PFNA	5s	ug/mLs
13C4-PFOAs	22A0119s	13C4-PFOAs	5s	ug/mLs
13C2-PFDAs	22A0120s	13C2-PFDAs	5s	ug/mLs
13C4-PFOSs	22A0121s	13C4-PFOSs	5s	ug/mLs
18O2-PFHXS	22A0122s	18O2-PFHXS	5s	ug/mLs

Parent Standards used: 0

Standard 0	Description0	Prepared0	Prepared By0	Lot Nbr	Expires0	Last Edit0	(mLs)0
22A0116s	PFAS - IIS M3PFBA 50ug/mLs	08/19/2021s	Wellington Laboratories	M3PFBA0721	08/19/2026s	01/20/2022 15:48s by HGHS	1.2s
22A0117	PFAS - IIS MPFHxA 50ug/mLs	10/04/2021s	Wellington Laboratories	MPFHxA0921s	10/04/2026s	01/20/2022 15:48s by HGHS	1.2s
22A0118s	PFAS - IIS MPFNA 50ug/mLs	10/29/2021s	Wellington Laboratories	MPFNA1021	10/29/2026s	01/20/2022 15:48s by HGHS	1.2s
22A0119s	PFAS - IIS MPFOA 50ug/mLs	12/07/2021	Wellington Laboratories	MPFOA1121s	12/07/2026	01/20/2022 15:48s by HGHS	1.2s
22A0120s	PFAS - IIS MPFDA 50ug/mLs	12/08/2021s	Wellington Laboratories	MPFDA1221s	12/08/2026s	01/20/2022 15:49s by HGHS	1.2s
22A0121s	PFAS - IIS MPFOS 50ug/mLs	08/18/2021s	Wellington Laboratories	MPFOS0821s	08/18/2026s	01/20/2022 15:49s by HGHS	1.2s
22A0122s	PFAS - IIS MPFHxS 50ug/mLs	10/29/2021s	Wellington Laboratories	MPFHxS1021s	10/29/2026s	01/20/2022 15:49s by HGHS	1.2s

Analytical Standard Record0

22A02340

Description:s	PFAS IIS 7C 5ug/mL	Expires:s	01/20/2023s
Standard Type:	Internal Standards	Prepared:s	01/20/2022s
Solvent:	MeOH/61252s	Prepared By:s	Dipti Gokals
Final Volume (mLs):	12s	Department:s	PFASs
Vials:s	1s	Last Edit:s	01/20/2022 15:49 by HGHS
Comments:f	mpfna had more left over than others.		

Analyte0	Parent0	CAS Number	Concentration 0	Units0
13C3-PFBAs	22A0116s	13C3-PFBAs	5s	ug/mLs
13C2-PFHxA	22A0117	13C2-PFHxAs	5s	ug/mLs
13C5-PFNA	22A0118s	13C5-PFNA	5s	ug/mLs
13C4-PFOAs	22A0119s	13C4-PFOAs	5s	ug/mLs
13C2-PFDAs	22A0120s	13C2-PFDAs	5s	ug/mLs
13C4-PFOSs	22A0121s	13C4-PFOSs	5s	ug/mLs
18O2-PFHXS	22A0122s	18O2-PFHXS	5s	ug/mLs

Parent Standards used: 0

Standard 0	Description0	Prepared0	Prepared By0	Lot Nbr	Expires0	Last Edit0	(mLs)0
22A0116s	PFAS - IIS M3PFBA 50ug/mLs	08/19/2021s	Wellington Laboratories	M3PFBA0721	08/19/2026s	01/20/2022 15:48s by HGHS	1.2s
22A0117	PFAS - IIS MPFHxA 50ug/mLs	10/04/2021s	Wellington Laboratories	MPFHxA0921s	10/04/2026s	01/20/2022 15:48s by HGHS	1.2s
22A0118s	PFAS - IIS MPFNA 50ug/mLs	10/29/2021s	Wellington Laboratories	MPFNA1021	10/29/2026s	01/20/2022 15:48s by HGHS	1.2s
22A0119s	PFAS - IIS MPFOA 50ug/mLs	12/07/2021	Wellington Laboratories	MPFOA1121s	12/07/2026	01/20/2022 15:48s by HGHS	1.2s
22A0120s	PFAS - IIS MPFDA 50ug/mLs	12/08/2021s	Wellington Laboratories	MPFDA1221s	12/08/2026s	01/20/2022 15:49s by HGHS	1.2s
22A0121s	PFAS - IIS MPFOS 50ug/mLs	08/18/2021s	Wellington Laboratories	MPFOS0821s	08/18/2026s	01/20/2022 15:49s by HGHS	1.2s
22A0122s	PFAS - IIS MPFHxS 50ug/mLs	10/29/2021s	Wellington Laboratories	MPFHxS1021s	10/29/2026s	01/20/2022 15:49s by HGHS	1.2s

Analytical Standard Record0

22A02340

Description:s	PFAS IIS 7C 5ug/mL	Expires:s	01/20/2023s
Standard Type:	Internal Standards	Prepared:s	01/20/2022s
Solvent:	MeOH/61252s	Prepared By:s	Dipti Gokals
Final Volume (mLs):	12s	Department:s	PFASs
Vials:s	1s	Last Edit:s	01/20/2022 15:49 by HGHS
Comments:f	mpfna had more left over than others.		

Analyte0	Parent0	CAS Number	Concentration 0	Units0
13C3-PFBAs	22A0116s	13C3-PFBAs	5s	ug/mLs
13C2-PFHxA	22A0117	13C2-PFHxAs	5s	ug/mLs
13C5-PFNA	22A0118s	13C5-PFNA	5s	ug/mLs
13C4-PFOAs	22A0119s	13C4-PFOAs	5s	ug/mLs
13C2-PFDAs	22A0120s	13C2-PFDAs	5s	ug/mLs
13C4-PFOSs	22A0121s	13C4-PFOSs	5s	ug/mLs
18O2-PFHXS	22A0122s	18O2-PFHXS	5s	ug/mLs

Parent Standards used: 0

Standard 0	Description0	Prepared0	Prepared By0	Lot Nbr	Expires0	Last Edit0	(mLs)0
22A0116s	PFAS - IIS M3PFBA 50ug/mLs	08/19/2021s	Wellington Laboratories	M3PFBA0721	08/19/2026s	01/20/2022 15:48s by HGHS	1.2s
22A0117	PFAS - IIS MPFHxA 50ug/mLs	10/04/2021s	Wellington Laboratories	MPFHxA0921s	10/04/2026s	01/20/2022 15:48s by HGHS	1.2s
22A0118s	PFAS - IIS MPFNA 50ug/mLs	10/29/2021s	Wellington Laboratories	MPFNA1021	10/29/2026s	01/20/2022 15:48s by HGHS	1.2s
22A0119s	PFAS - IIS MPFOA 50ug/mLs	12/07/2021	Wellington Laboratories	MPFOA1121s	12/07/2026	01/20/2022 15:48s by HGHS	1.2s
22A0120s	PFAS - IIS MPFDA 50ug/mLs	12/08/2021s	Wellington Laboratories	MPFDA1221s	12/08/2026s	01/20/2022 15:49s by HGHS	1.2s
22A0121s	PFAS - IIS MPFOS 50ug/mLs	08/18/2021s	Wellington Laboratories	MPFOS0821s	08/18/2026s	01/20/2022 15:49s by HGHS	1.2s
22A0122s	PFAS - IIS MPFHxS 50ug/mLs	10/29/2021s	Wellington Laboratories	MPFHxS1021s	10/29/2026s	01/20/2022 15:49s by HGHS	1.2s

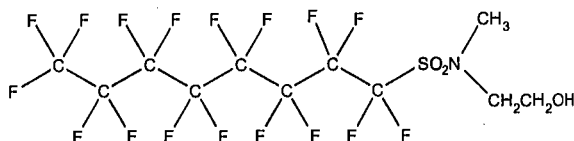


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: N-MeFOSE-M **LOT NUMBER:** NMeFOSE0921M
COMPOUND: 2-(N-methylperfluoro-1-octanesulfonamido)-ethanol **22C0307**

STRUCTURE: **CAS #:** 24448-09-7



MOLECULAR FORMULA: C₁₁H₈F₁₇NO₃S **MOLECULAR WEIGHT:** 557.22
CONCENTRATION: 50.0 ± 2.5 µg/mL **SOLVENT(S):** Methanol
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 09/22/2021 (HRGC/LRMS)
 09/23/2021 (LC/MS)
EXPIRY DATE: (mm/dd/yyyy) 09/23/2026
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: HRGC/LRMS Data (Full Scan and Mass Spectrum)
 Figure 2: LC/MS Data (Full Scan and Mass Spectrum)
 Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- In order to see the molecular ion (adduct free), the LC mobile phase should be free of ammonium acetate buffer.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: 
 B.G. Chittim, General Manager

Date: 09/28/2021
 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
 519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters

x_1, x_2, \dots, x_n on which it depends is:

$$u_c(y(x_1, x_2, \dots, x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

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EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

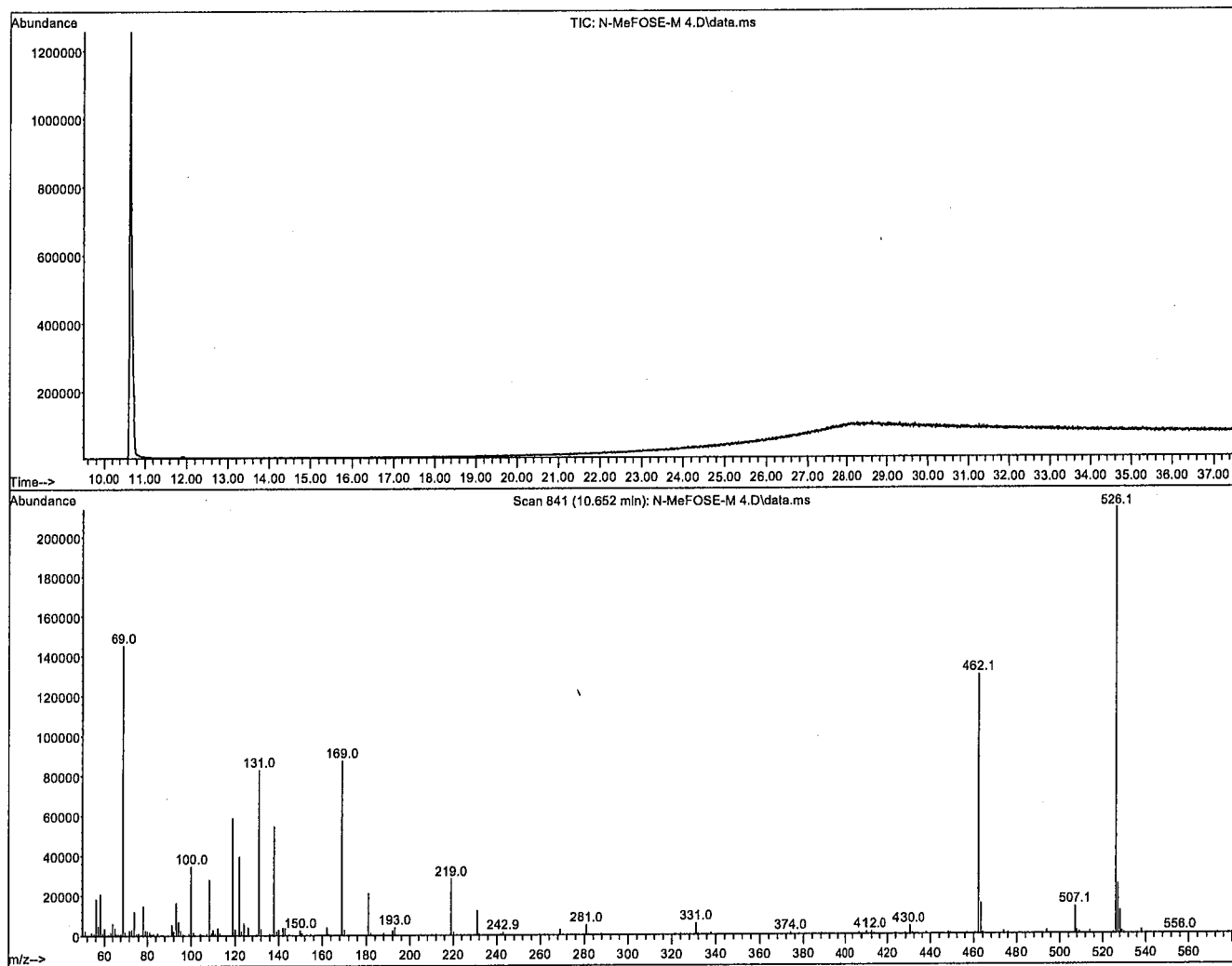
At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A1226), and ISO 17034 by ANSI National Accreditation Board (ANAB; AR-1523).



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Figure 1: N-MeFOSE-M; HRGC/LRMS Data (Full Scan and Mass Spectrum)**Conditions for Figure 1:**

Agilent 7890A HRGC
 Agilent 5975C MSD

Chromatographic Conditions:

Column: 30 m DB-5 (0.25 mm id, 0.25 μ m film thickness) Agilent J&W

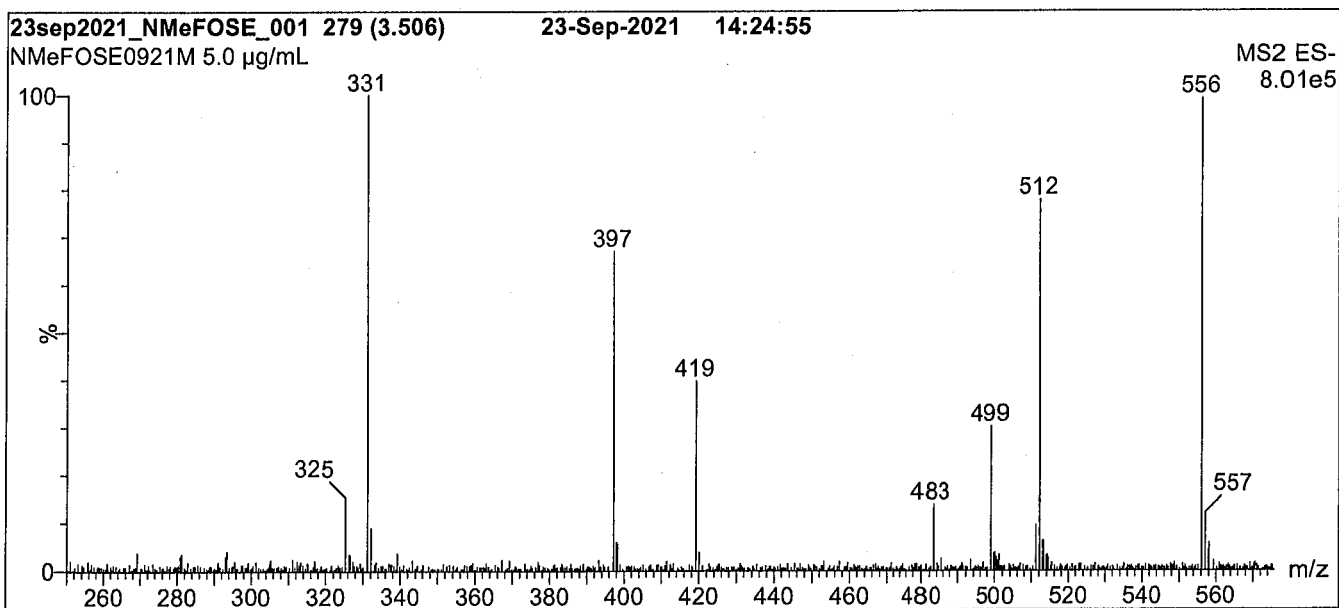
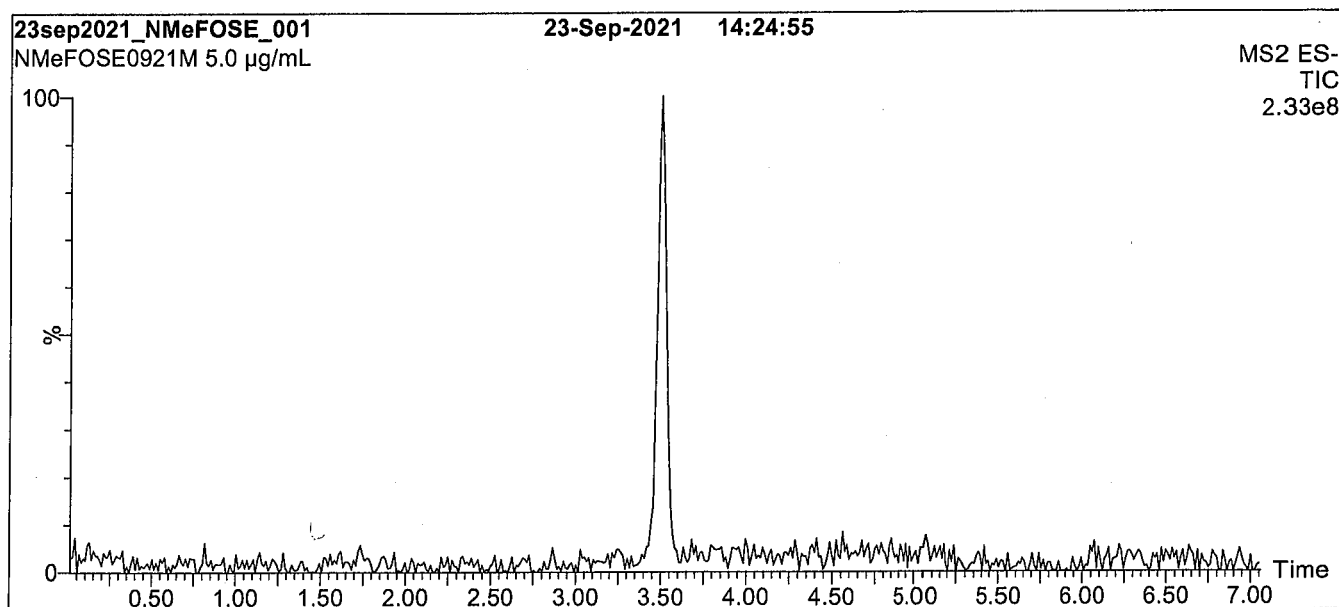
Flow: Constant at 1 mL/min

Injector: 250°C (Splitless Injection)

Oven: 100°C (5 min)
 10°C/min to 310°C
 310°C (10 min)

Ionization: EI+

Detector: 230°C
 Full Scan (50-1000 amu)

Figure 2: N-MeFOSE-M; LC/MS Data (Full Scan and Mass Spectrum)**Conditions for Figure 2:**

Waters Acquity Ultra Performance LC
Waters Xevo TQ-S micro MS

Chromatographic Conditions:

Column: Acquity UPLC BEH Shield RP₁₈
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient

Start: 30% H₂O / 70% MeOH

Ramp to 90% organic over 8 min and hold for
1.5 min before returning to initial conditions in 1 min.

Time: 12 min

Flow: 300 µL/min

MS Parameters:

Experiment: Full Scan (250 - 850 amu)

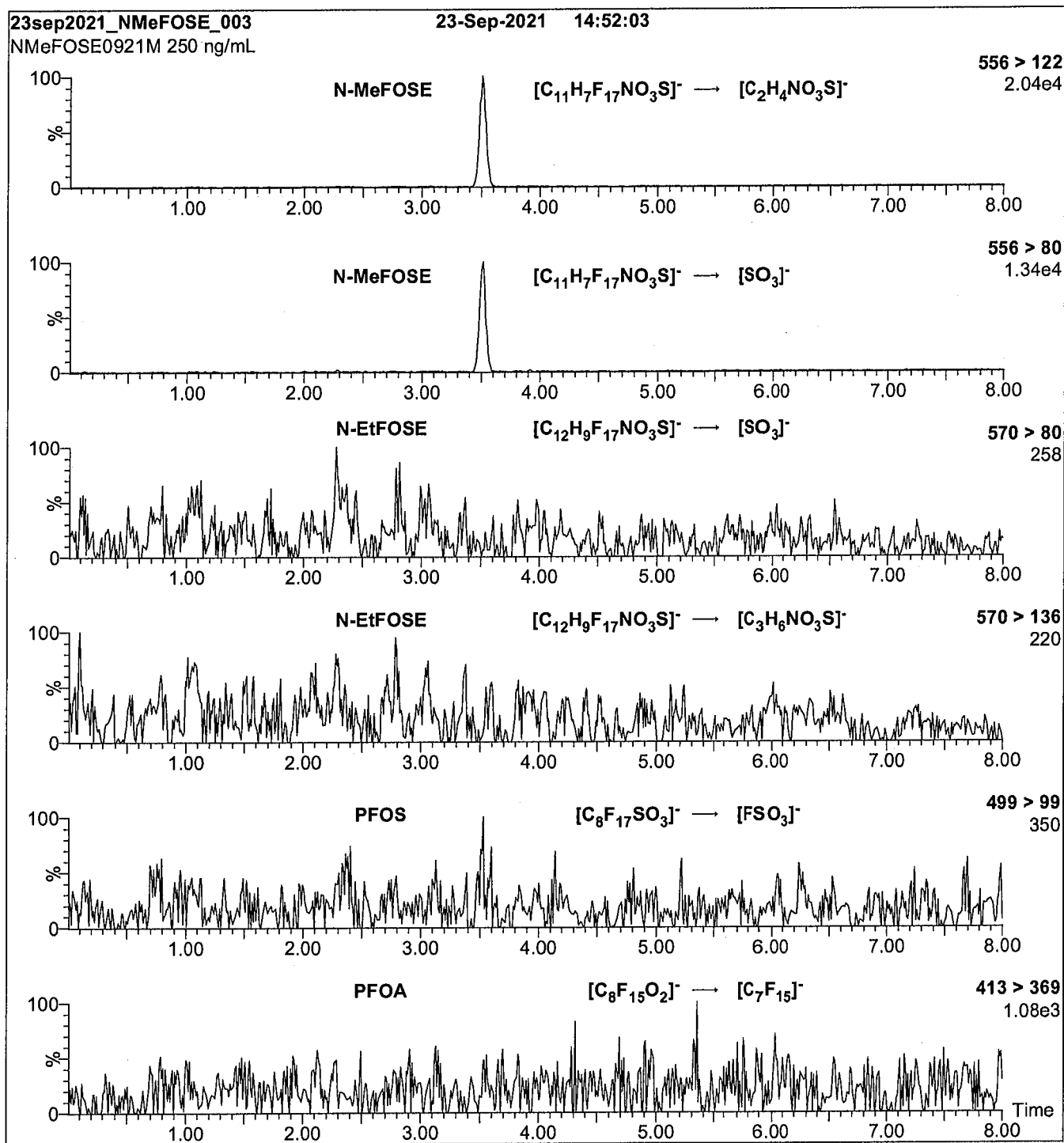
Source: Electrospray (negative)

Capillary Voltage (kV) = 2.00

Cone Voltage (V) = 65.00

Desolvation Temperature (°C) = 450

Desolvation Gas Flow (L/hr) = 1000

Figure 3: N-MeFOSE-M; LC/MS/MS Data (Selected MRM Transitions)**Conditions for Figure 3:**

Injection: On-column (N-MeFOSE-M)

Mobile phase: Same as Figure 2

Flow: 300 μ L/min**MS Parameters:**

Collision Gas (mbar) = 3.14e-3

Collision Energy (eV) = 36

8

4

Analytical Standard Record

22C03070

Description:s	PFAS - SAS N-MeFOSE 50ug/mLs	Expires:s	09/23/2026s
Standard Type:s	Analyte Spikes	Prepared:s	03/15/2022s
Solvent:s	Methanols	Prepared By:s	Wellington Laboratories (Lot#: NMeFOSE0921M)s
Final Volume (mL)s:	1s	Department:s	PFAS
Vials:s	1s	Last Edit:s	03/15/2022 15:59 by DAGs

Analyte0	Parent0	CAS Number0	Concentration 0	Units0
NMeFOSEs		24448-09-7s	50s	ug/mLs

INTENDED USE:

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HANDLING:

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UNCERTAINTY:

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where x is expressed as a relative standard uncertainty of the individual parameter.

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LIMITED WARRANTY:

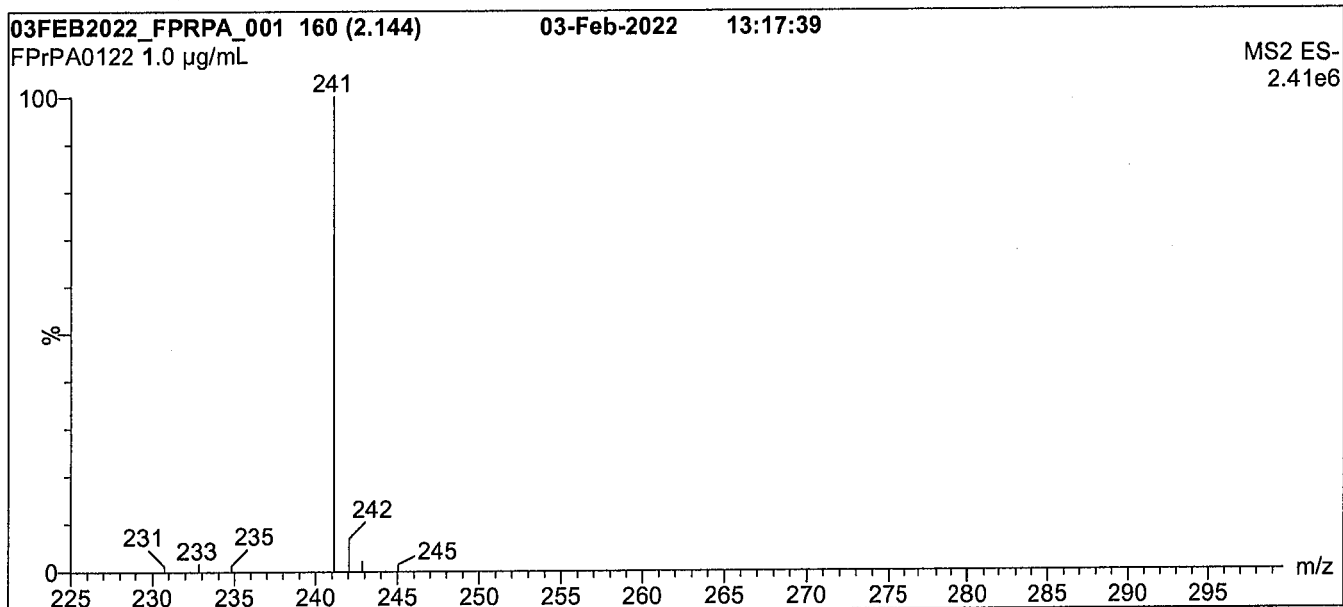
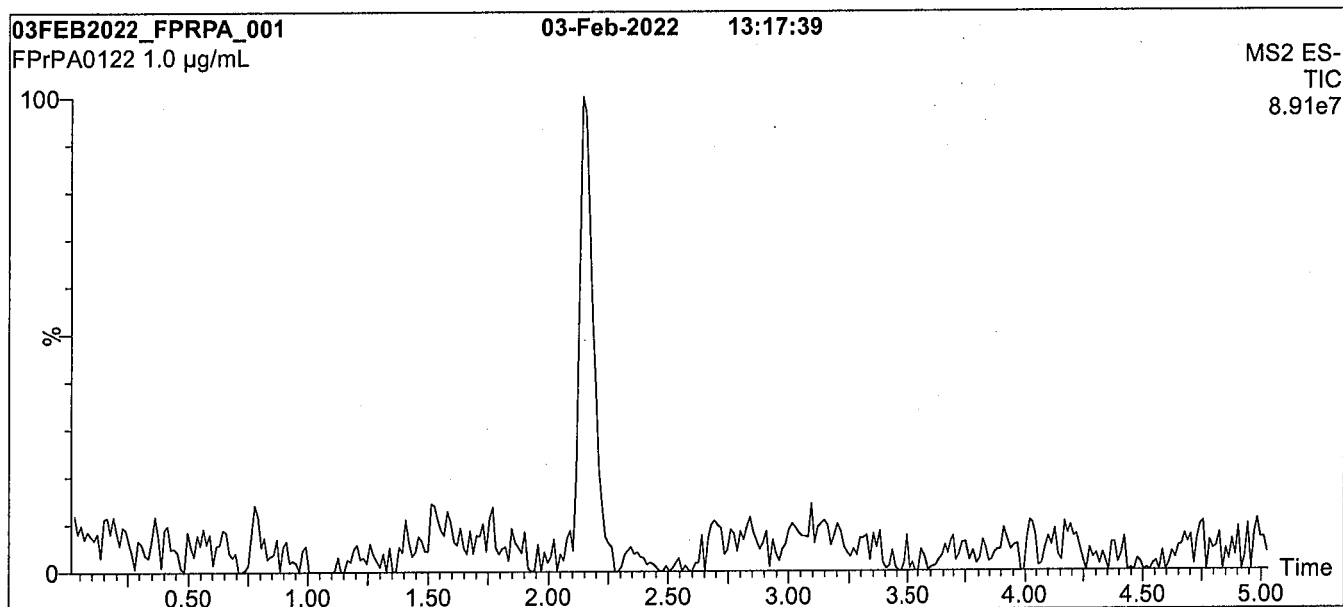
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QUALITY MANAGEMENT:

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Figure 1: FPrPA; LC/MS Data (Full Scan and Mass Spectrum)**Conditions for Figure 1:**

Waters Acquity Ultra Performance LC
Waters Xevo TQ-S micro MS

Chromatographic Conditions:

Column: Acquity UPLC BEH Shield RP₁₈
1.7 µm, 2.1 x 100 mm

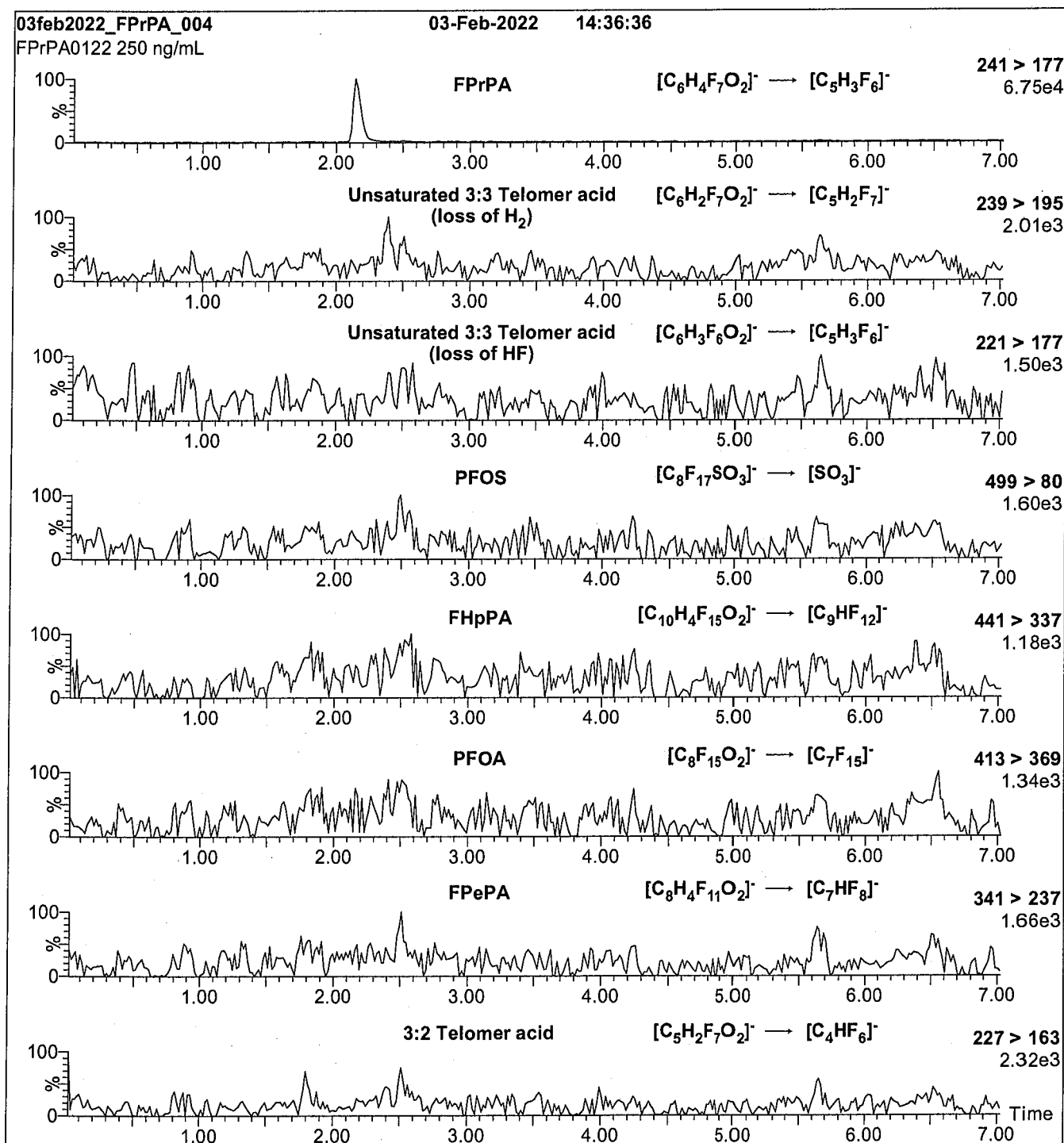
Mobile phase: Gradient
Start: 60% H₂O / 40% (80:20 MeOH:ACN)
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 8 min and hold for 2 min
before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µL/min

MS Parameters:

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 10.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (L/hr) = 1000

Figure 2: FPrPA; LC/MS/MS Data (Selected MRM Transitions)**Conditions for Figure 2:**

Injection: On-column (FPrPA)

Mobile phase: Same as Figure 1

Flow: 300 μ L/min**MS Parameters:**

Collision Gas (mbar) = 3.33e-3

Collision Energy (eV) = 10

Analytical Standard Record

22C03080

Description:s	PFAS - SAS FPrPA 50ug/mLs	Expires:s	02/03/2027s
Standard Type:s	Analyte Spikes	Prepared:s	03/15/2022s
Solvent:s	Methanols	Prepared By:s	Wellington Laboratories (Lot#: FPrPA0122)s
Final Volume (mL)s:	1s	Department:s	PFASs
Vials:s	1s	Last Edit:s	03/15/2022 15:59 by DAGs

Analyte0	Parent0	CAS Number0	Concentration 0	Units0
3:3FTCAs		113507-82-7	50s	ug/mLs

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LIMITED WARRANTY:

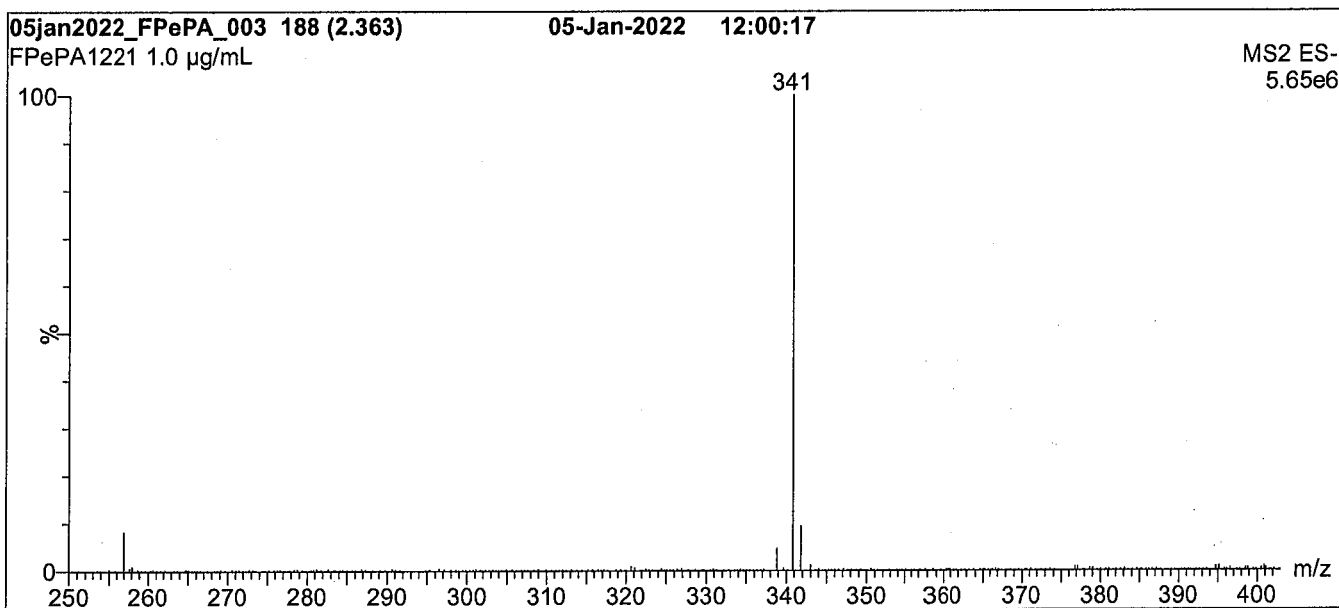
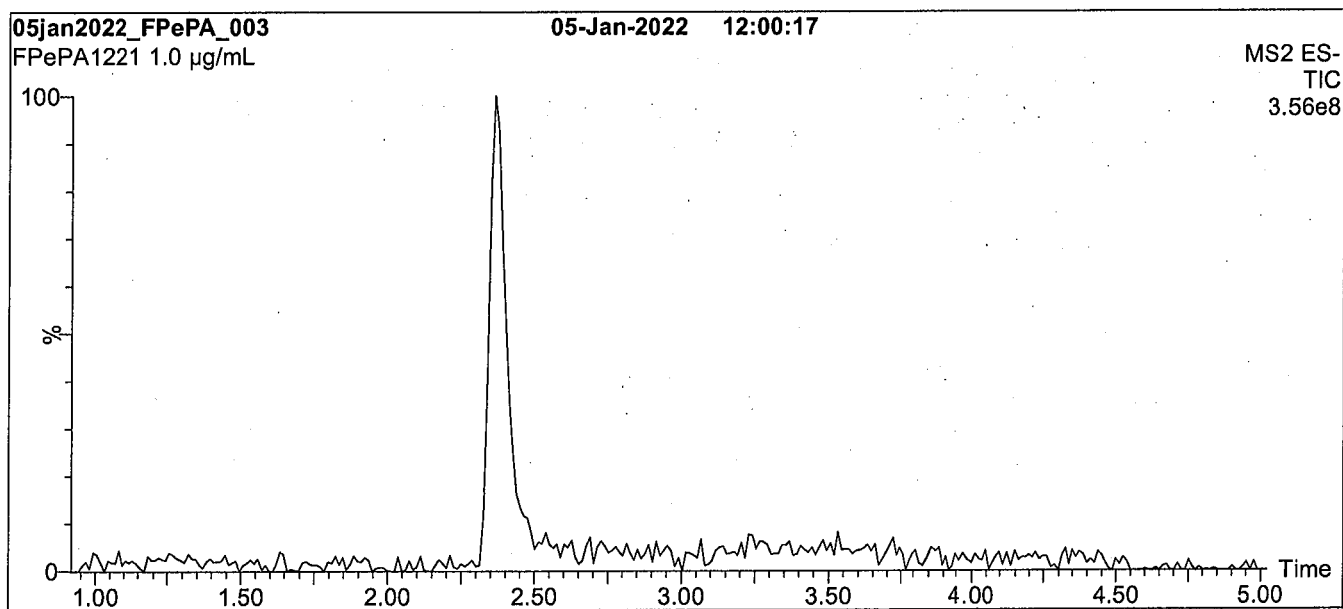
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Figure 1: FPePA; LC/MS Data (Full Scan and Mass Spectrum)**Conditions for Figure 1:**

Waters Acquity Ultra Performance LC
 Waters Xevo TQ-S micro MS

Chromatographic Conditions:

Column: Acquity UPLC BEH Shield RP₁₈
 1.7 µm, 2.1 x 100 mm

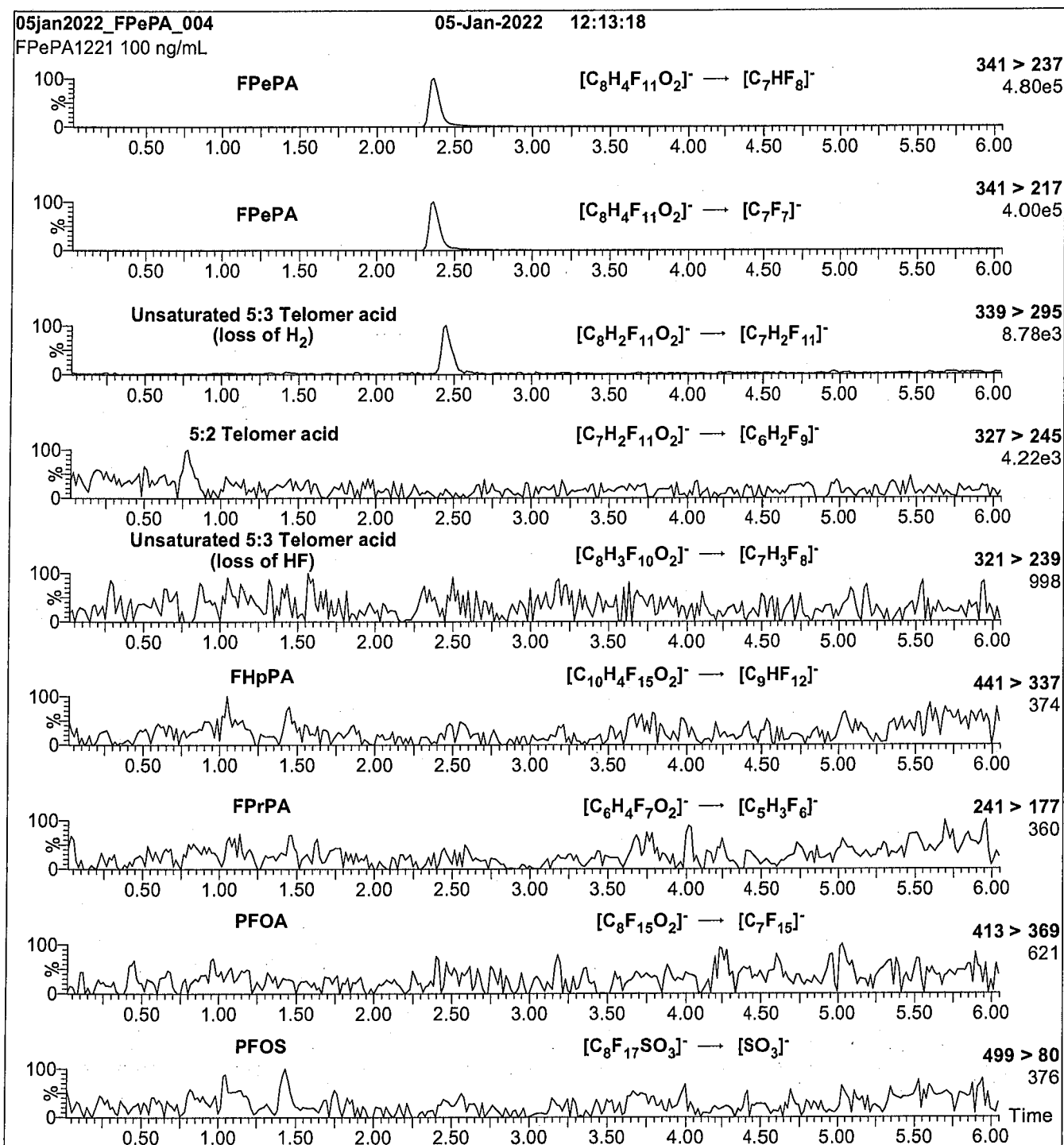
Mobile phase: Gradient
 Start: 45% H₂O / 55% (80:20 MeOH:ACN)
 (both with 10 mM NH₄OAc buffer)
 Ramp to 90% organic over 7 min and hold for
 3 min before returning to initial conditions in 0.75 min.
 Time: 12 min

Flow: 300 µL/min

MS Parameters:

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
 Capillary Voltage (kV) = 0.50
 Cone Voltage (V) = 18.50
 Desolvation Temperature (°C) = 500
 Desolvation Gas Flow (L/hr) = 1000

Figure 2: FPePA; LC/MS/MS Data (Selected MRM Transitions)**Conditions for Figure 2:**

Injection: On-column (FPePA)
 Mobile phase: Same as Figure 1
 Flow: 300 μ L/min

MS Parameters:

Collision Gas (mbar) = 3.09e-3
 Collision Energy (eV) = 10

Analytical Standard Record

22C03090

Description:s	PFAS - SAS FPePA 50ug/mLs	Expires:s	01/05/2027s
Standard Type:s	Analyte Spikes	Prepared:s	03/15/2022s
Solvent:s	Methanols	Prepared By:s	Wellington Laboratories (Lot#:
Final Volume (mL):s	1s	Department:s	PFAS1221)s
Vials:s	1s	Last Edit:s	03/15/2022 15:59 by DAGs

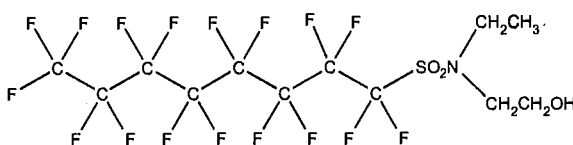
Analyte0	Parent0	CAS Number0	Concentration 0	Units0
5:3FTCAs		914637-49-3	50s	ug/mLs



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: N-EtFOSE-M **LOT NUMBER:** NEtFOSE0921M
COMPOUND: 2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol **22C0310**
STRUCTURE: **CAS #:** 1691-99-2



MOLECULAR FORMULA: C₁₂H₁₀F₁₇NO₃S **MOLECULAR WEIGHT:** 571.25
CONCENTRATION: 50.0 ± 2.5 µg/mL **SOLVENT(S):** Methanol
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 09/22/2021 (HRGC/LRMS)
 09/23/2021 (LC/MS)
EXPIRY DATE: (mm/dd/yyyy) 09/23/2026
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: HRGC/LRMS Data (Full Scan and Mass Spectrum)
 Figure 2: LC/MS Data (Full Scan and Mass Spectrum)
 Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- In order to see the molecular ion (adduct free), the LC mobile phase should be free of ammonium acetate buffer.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: 
 B.G. Chittim, General Manager

Date: 10/20/2021
 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
 519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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UNCERTAINTY:

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The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters x_1, x_2, \dots, x_n on which it depends is:

$$u_c(y(x_1, x_2, \dots, x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

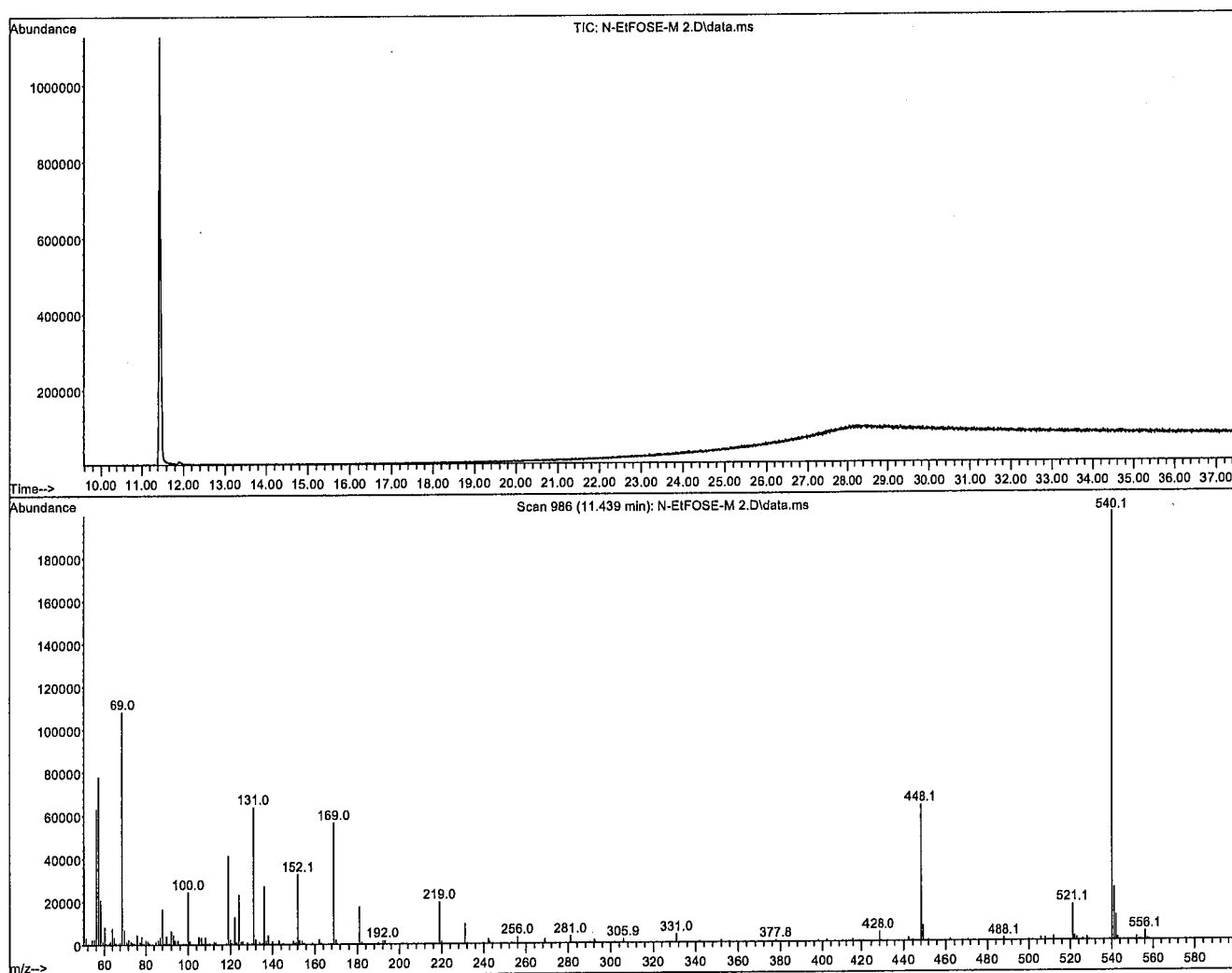
At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A1226), and ISO 17034 by ANSI National Accreditation Board (ANAB; AR-1523).



For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: N-EtFOSE-M; HRGC/LRMS Data (Full Scan and Mass Spectrum)**Conditions for Figure 1:**

Agilent 7890A HRGC
 Agilent 5975C MSD

Chromatographic Conditions:

Column: 30 m DB-5 (0.25 mm id, 0.25 μ m film thickness) Agilent J&W

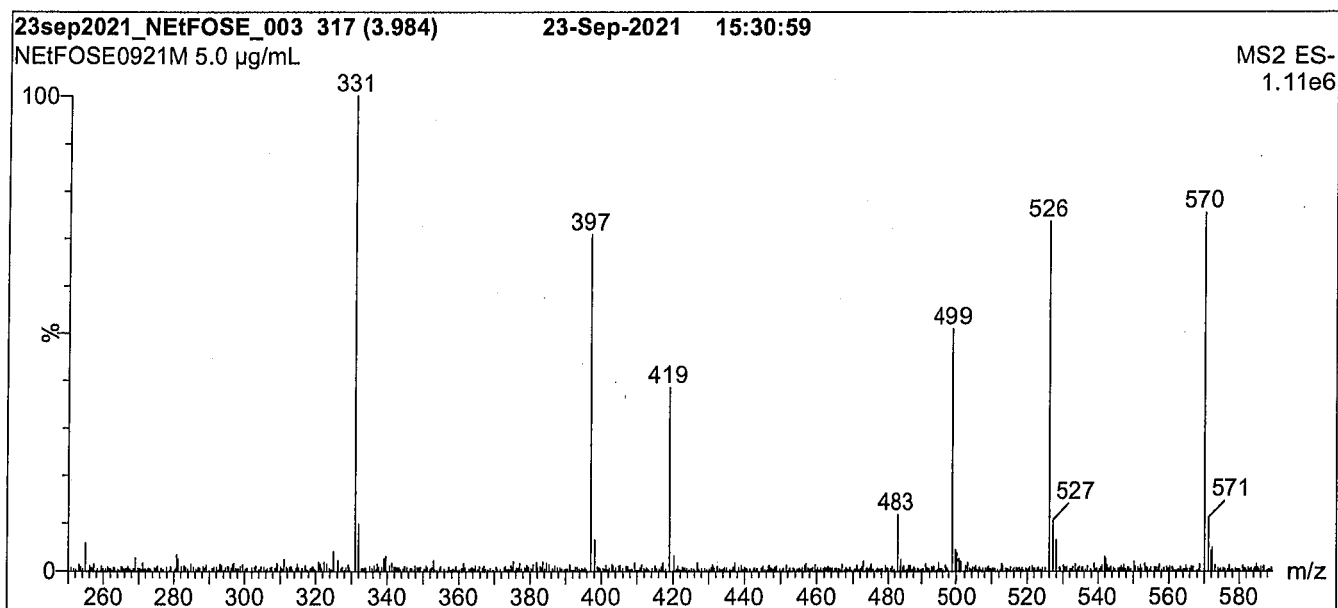
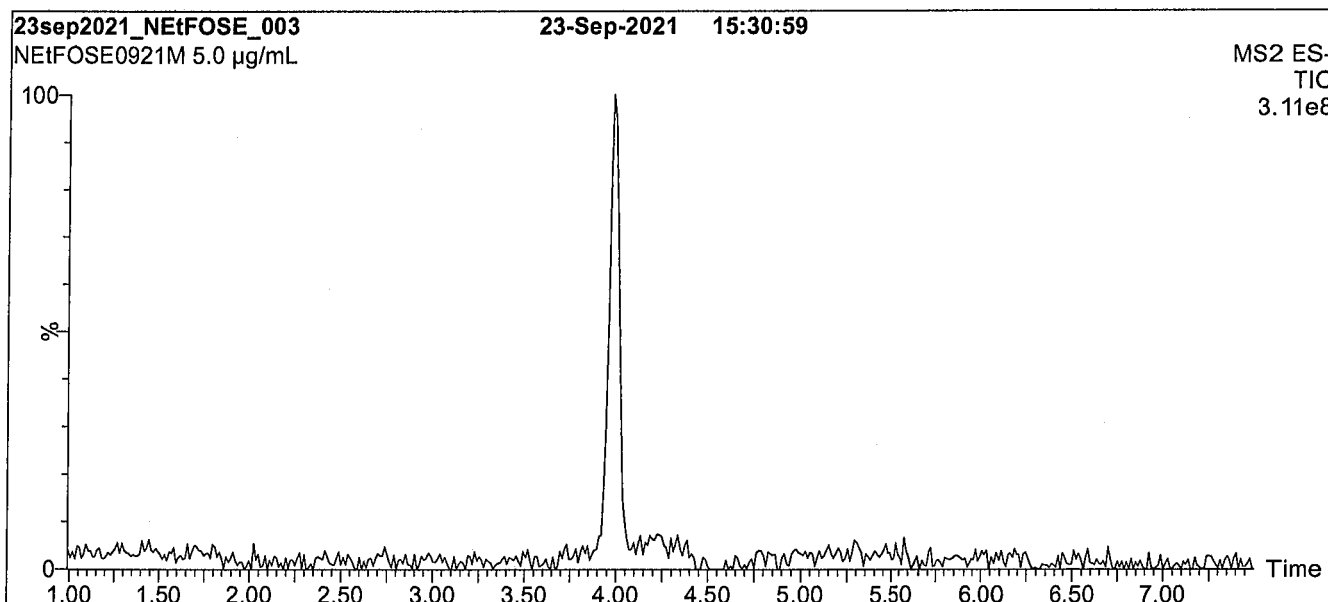
Flow: Constant at 1 mL/min

Injector: 250°C (Splitless Injection)

Oven: 100°C (5 min)
 10°C/min to 325°C
 325°C (10 min)

Ionization: EI+

Detector: 230°C
 Full Scan (50-1000 amu)

Figure 2: N-EtFOSE-M; LC/MS Data (Full Scan and Mass Spectrum)**Conditions for Figure 2:**

Waters Acquity Ultra Performance LC
Waters Xevo TQ-S micro MS

Chromatographic Conditions:

Column: Acquity UPLC BEH Shield RP₁₈
1.7 µm, 2.1 x 100 mm

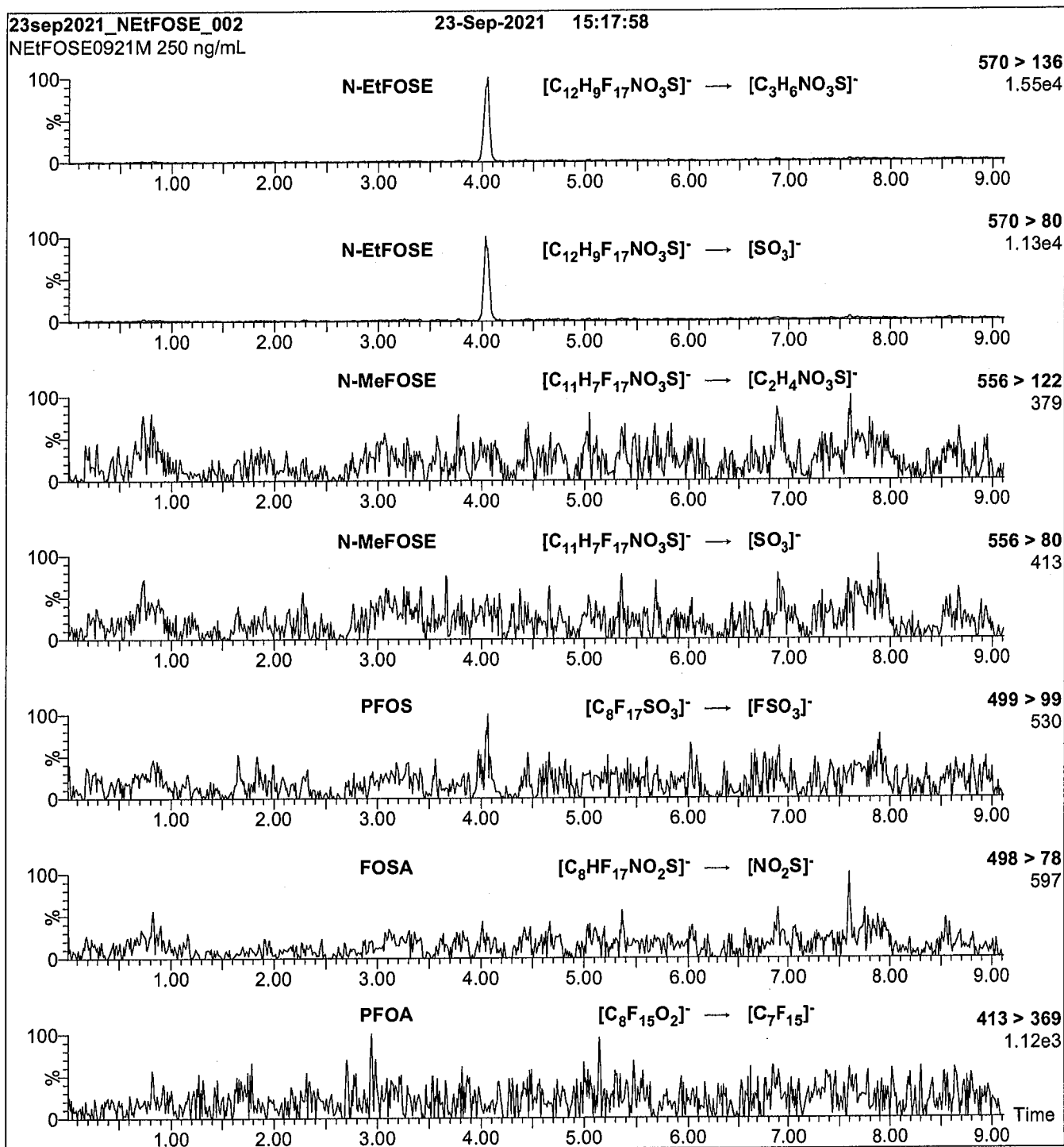
Mobile phase: Gradient
Start: 30% H₂O / 70% MeOH
Ramp to 90% organic over 8 min and hold for
1.5 min before returning to initial conditions in 1 min.
Time: 12 min

Flow: 300 µL/min

MS Parameters:

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 65.00
Desolvation Temperature (°C) = 450
Desolvation Gas Flow (L/hr) = 1000

Figure 3: N-EtFOSE-M; LC/MS/MS Data (Selected MRM Transitions)**Conditions for Figure 3:**

Injection: On-column (N-EtFOSE-M)

Mobile phase: Same as Figure 2

Flow: 300 μ L/min**MS Parameters:**

Collision Gas (mbar) = 3.14e-3

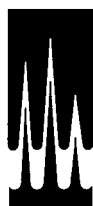
Collision Energy (eV) = 32

Analytical Standard Record

22C0310

Description:s	PFAS - SAS NEtFOSE 50ug/mLs	Expires:s	09/23/2026s
Standard Type:s	Analyte Spikes	Prepared:s	03/15/2022s
Solvent:s	Methanols	Prepared By:s	Wellington Laboratories (Lot#:
Final Volume (mL)s:	1s	Department:s	NEtFOSE0921M)s
Vials:s	1s	Last Edit:s	03/15/2022 15:59 by DAGs

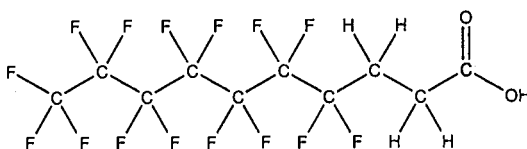
Analyte0	Parent0	CAS Number0	Concentration 0	Units0
NEtFOSEs		1691-99-2s	50s	ug/mLs



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: FHpPA **LOT NUMBER:** FHpPA1020
COMPOUND: 3-Perfluoroheptyl propanoic acid **22C0311**
STRUCTURE: **CAS #:** 812-70-4



MOLECULAR FORMULA: $C_{10}H_6F_{16}O_2$ **MOLECULAR WEIGHT:** 442.12
CONCENTRATION: $50.0 \pm 2.5 \mu\text{g/mL}$ **SOLVENT(S):** Methanol
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 11/12/2020
EXPIRY DATE: (mm/dd/yyyy) 11/12/2025
RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

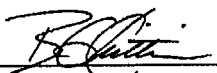
Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:


B.G. Chittim, General Manager

Date: 11/27/2020
(mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HANDLING:

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SYNTHESIS / CHARACTERIZATION:

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$$u_c(y(x_1, x_2, \dots, x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

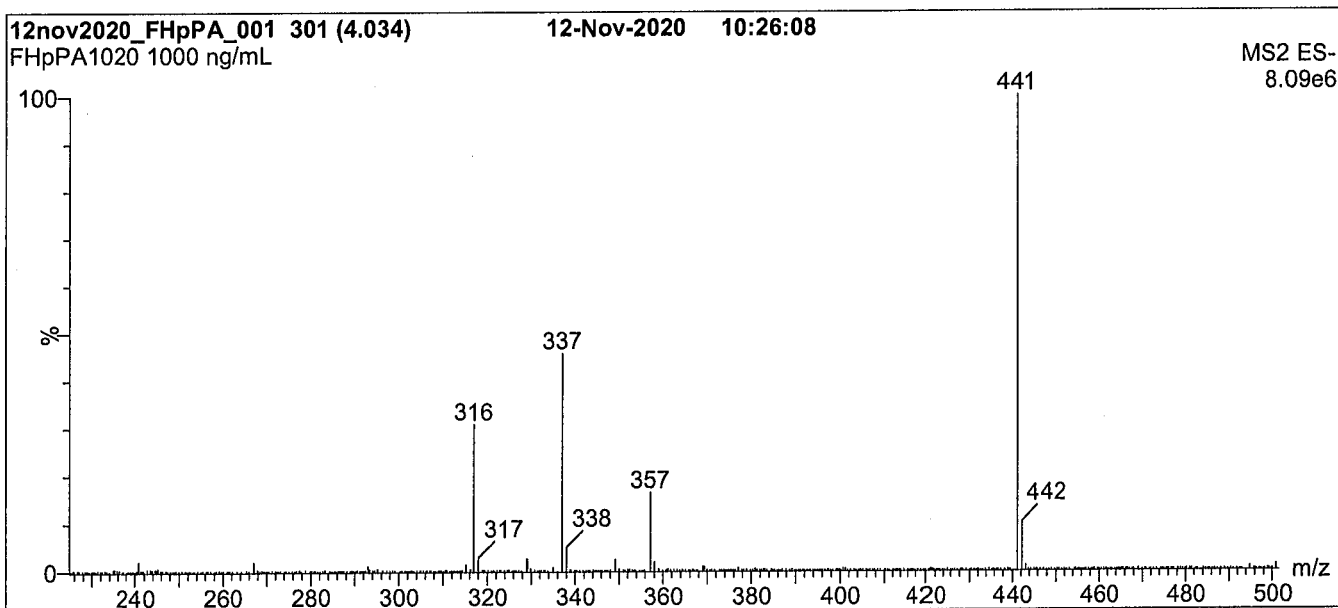
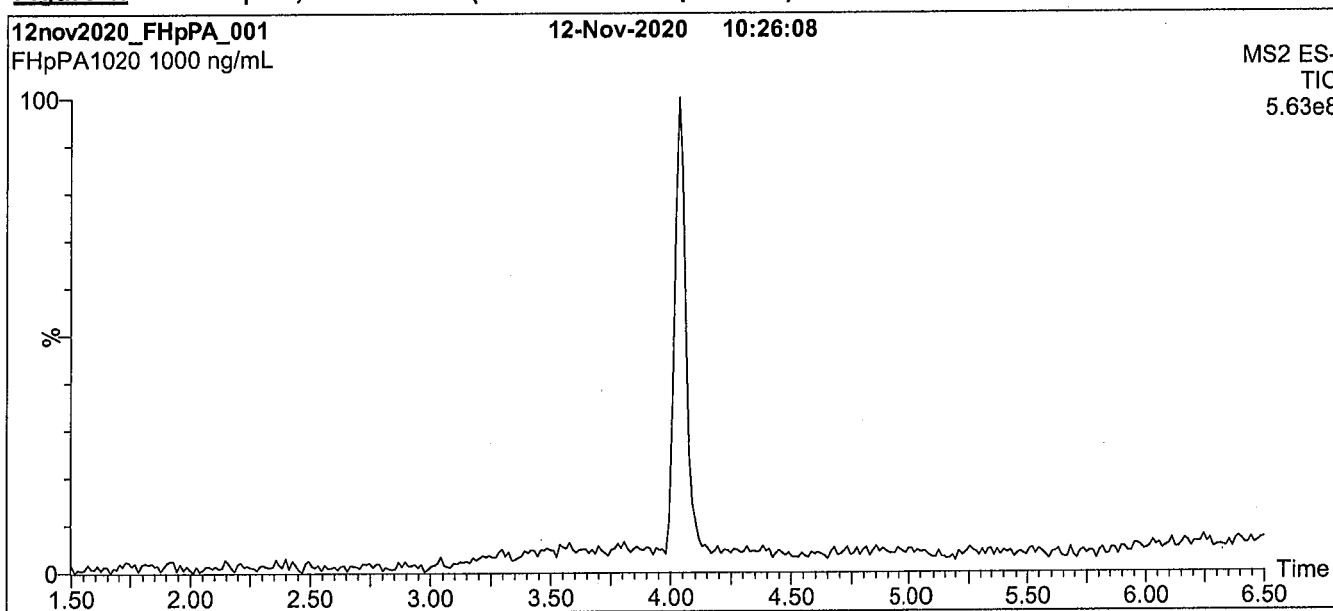
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Figure 1: FHpPA; LC/MS Data (TIC and Mass Spectrum)**Conditions for Figure 1:**

Waters Acquity Ultra Performance LC
Waters Xevo TQ-S micro MS

Chromatographic Conditions:

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient

Start: 45% H₂O / 55% (80:20 MeOH:ACN)
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 8 min and hold for
2 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 μ L/min

MS Parameters:

Experiment: Full Scan (225 - 850 amu)

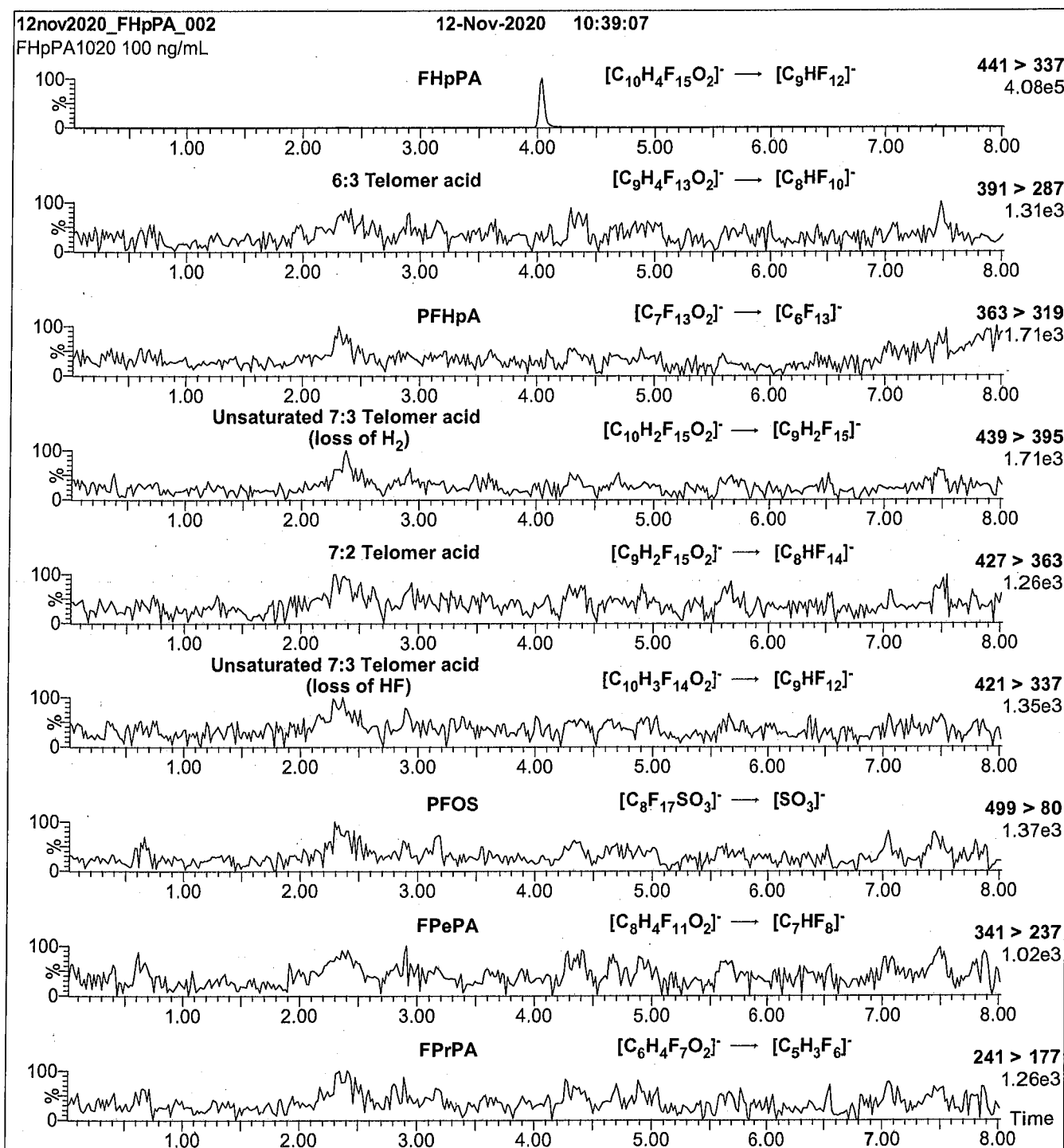
Source: Electrospray (negative)

Capillary Voltage (kV) = 0.50

Cone Voltage (V) = 28.50

Desolvation Temperature ($^{\circ}$ C) = 500

Desolvation Gas Flow (L/hr) = 1000

Figure 2: FHpPA; LC/MS/MS Data (Selected MRM Transitions)**Conditions for Figure 2:**

Injection: On-column (FHpPA)

Mobile phase: Same as Figure 1

Flow: 300 μ L/min**MS Parameters:**

Collision Gas (mbar) = 3.41e-3

Collision Energy (eV) = 8

Analytical Standard Record

22C03110

Description:s	PFAS - SAS FHpPA 50ug/mLs	Expires:s	11/12/2025s
Standard Type:s	Analyte Spikes	Prepared:s	03/15/2022s
Solvent:s	Methanols	Prepared By:s	Wellington Laboratories (Lot#: HFA1020)s
Final Volume (mL)s:	1s	Department:s	PFAS
Vials:s	1s	Last Edit:s	03/15/2022 16:00 by DAGs

Analyte0	Parent0	CAS Number0	Concentration 0	Units0
7:3FTCA		812-70-4	50s	ug/mLs

Analytical Standard Record

22C03110

Description:s	PFAS - SAS FHpPA 50ug/mLs	Expires:s	11/12/2025s
Standard Type:s	Analyte Spikes	Prepared:s	03/15/2022s
Solvent:s	Methanols	Prepared By:s	Wellington Laboratories (Lot#: HFA1020)s
Final Volume (mL)s:	1s	Department:s	PFAS
Vials:s	1s	Last Edit:s	03/15/2022 16:00 by DAGs

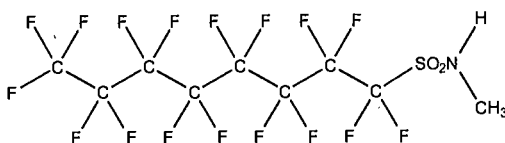
Analyte0	Parent0	CAS Number0	Concentration 0	Units0
7:3FTCA		812-70-4	50s	ug/mLs



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: N-MeFOSA-M **LOT NUMBER:** NMeFOSA0721M
COMPOUND: N-methylperfluoro-1-octanesulfonamide 22C0312
STRUCTURE: **CAS #:** 31506-32-8



MOLECULAR FORMULA: $C_9H_4F_{17}NO_2S$ **MOLECULAR WEIGHT:** 513.17
CONCENTRATION: $50.0 \pm 2.5 \mu\text{g/mL}$ **SOLVENT(S):** Methanol
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 08/03/2021
EXPIRY DATE: (mm/dd/yyyy) 08/03/2026
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
 Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:  **Date:** 08/04/2021
 B.G. Chittim, General Manager (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
 519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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EXPIRY DATE / PERIOD OF VALIDITY:

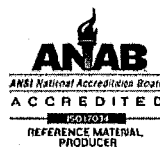
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LIMITED WARRANTY:

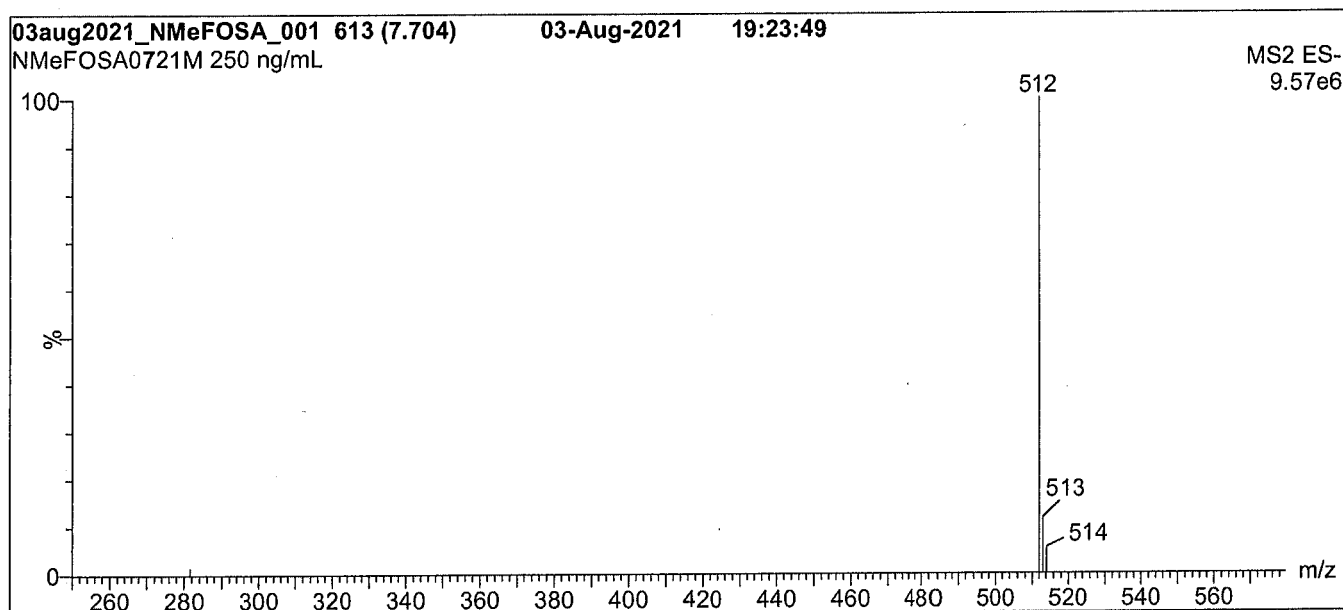
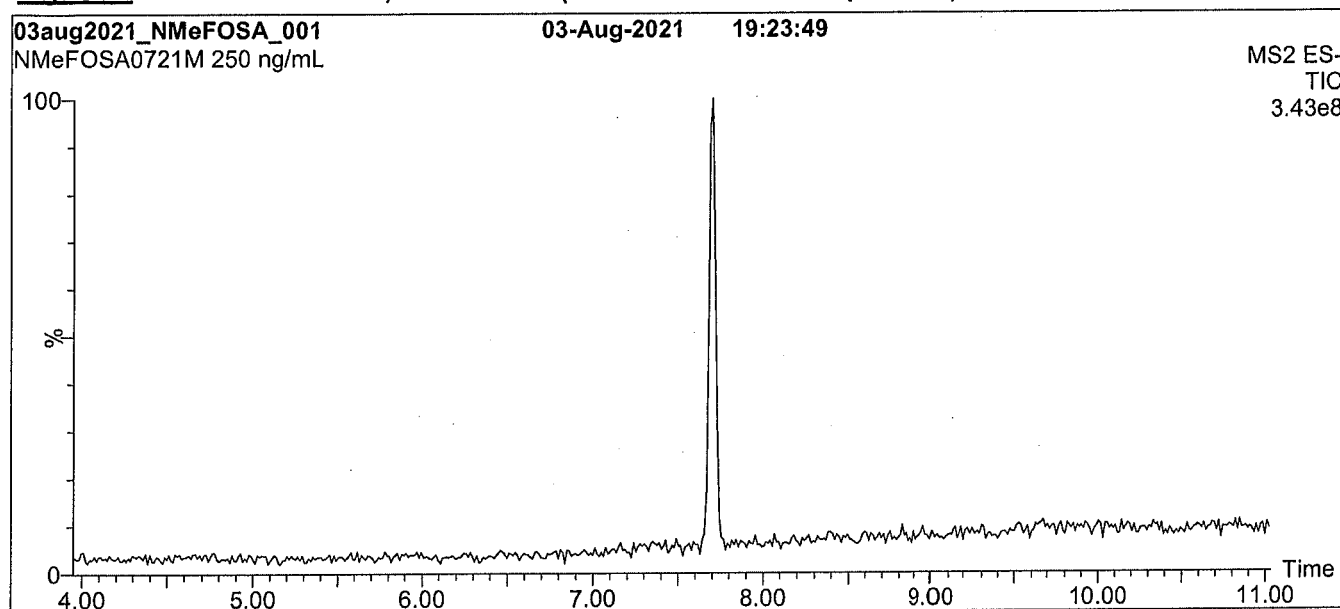
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Figure 1: N-MeFOSA-M; LC/MS Data (Full Scan and Mass Spectrum)**Conditions for Figure 1:**

Waters Acquity Ultra Performance LC
Waters Xevo TQ-S micro MS

Chromatographic Conditions:

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

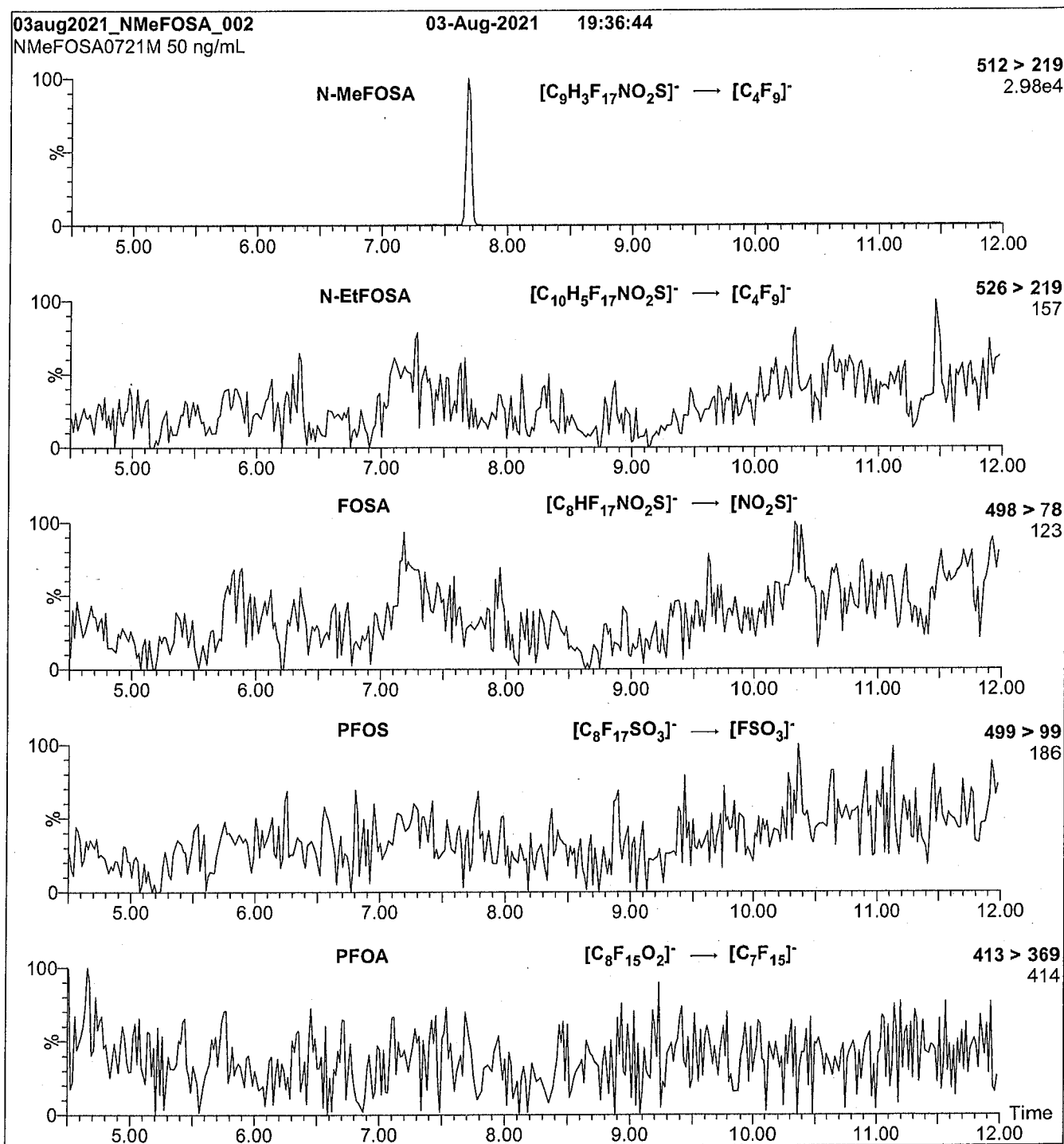
Mobile phase: Gradient
Start: 40% H₂O / 60% (80:20 MeOH:ACN)
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 8 min and hold for
2 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 μ L/min

MS Parameters:

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 1.00
Cone Voltage (V) = 44.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (L/hr) = 1000

Figure 2: N-MeFOSA-M; LC/MS/MS Data (Selected MRM Transitions)**Conditions for Figure 2:**

Injection: On-column (N-MeFOSA-M)

Mobile phase: Same as Figure 1

Flow: 300 μ L/min**MS Parameters:**

Collision Gas (mbar) = 3.41e-3

Collision Energy (eV) = 24

Analytical Standard Record

22C03120

Description:s	PFAS - SAS NMeFOSA 50ug/mLs	Expires:s	08/03/2026s
Standard Type:s	Analyte Spikes	Prepared:s	03/15/2022s
Solvent:s	Methanols	Prepared By:s	Dipti Gokals
Final Volume (mL):s	1s	Department:s	PFASs
Vials:s	1s	Last Edit:s	03/15/2022 16:00 by DAGs

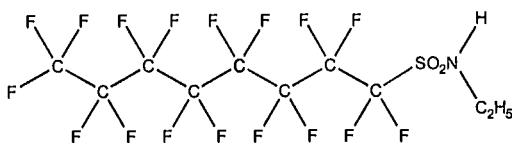
Analyte0	Parent0	CAS Number0	Concentration 0	Units0
NMeFOSAs		31506-32-8s	50s	ug/mLs



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: N-EtFOSA-M **LOT NUMBER:** NEtFOSA0821M
COMPOUND: N-ethylperfluoro-1-octanesulfonamide **22C0313**
STRUCTURE: **CAS #:** 4151-50-2



MOLECULAR FORMULA: $C_{10}H_6F_{17}NO_2S$ **MOLECULAR WEIGHT:** 527.20
CONCENTRATION: $50.0 \pm 2.5 \mu\text{g/mL}$ **SOLVENT(S):** Methanol
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 08/12/2021
EXPIRY DATE: (mm/dd/yyyy) 08/12/2026
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

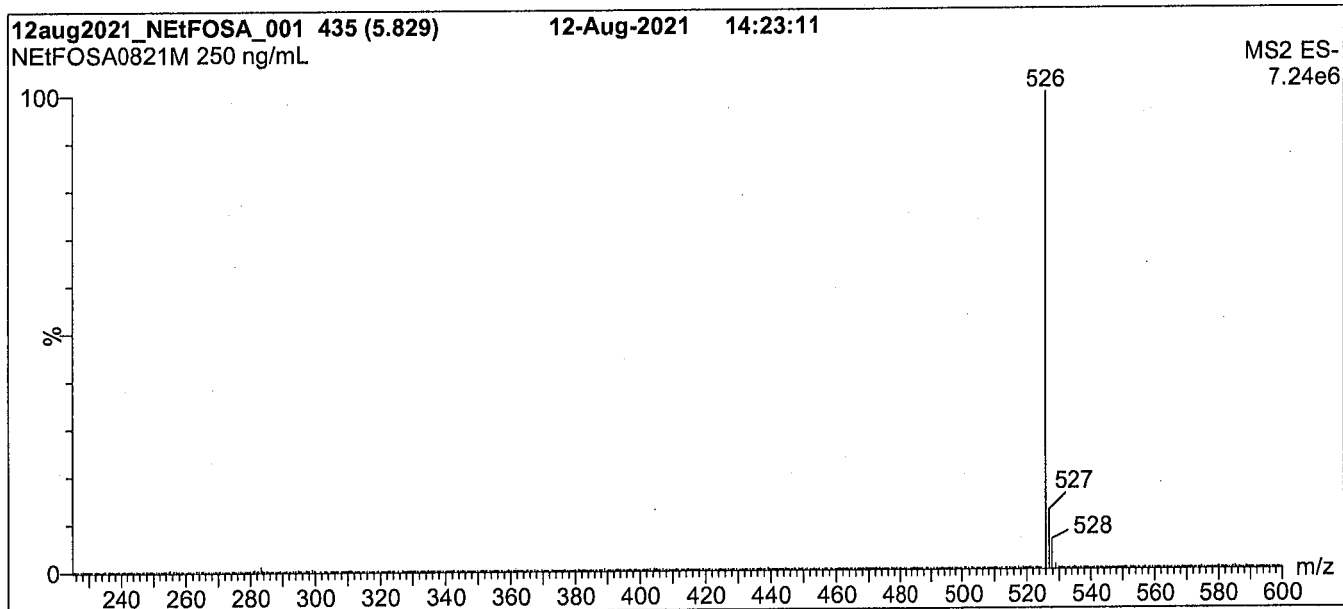
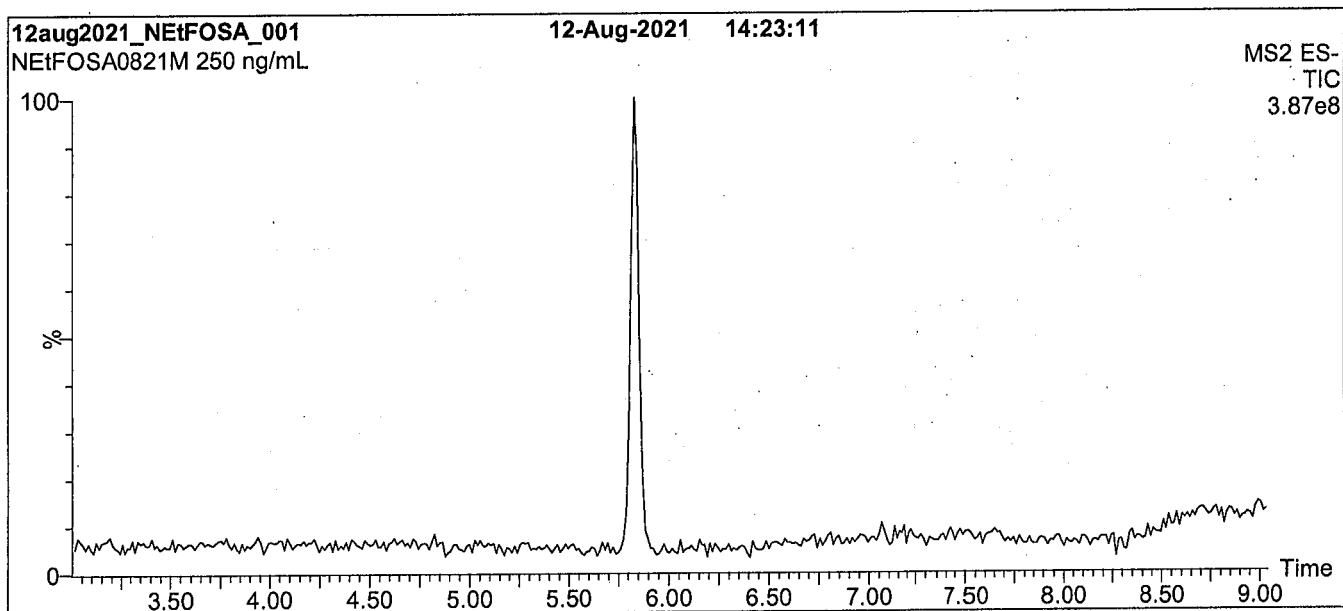
ADDITIONAL INFORMATION:

- See page 2 for further details.

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Certified By:  **Date:** 08/16/2021
B.G. Chittim, General Manager (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

Figure 1: N-EtFOSA-M; LC/MS Data (Full Scan and Mass Spectrum)**Conditions for Figure 1:**

Waters Acquity Ultra Performance LC
Waters Xevo TQ-S micro MS

Chromatographic Conditions:

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 30% H₂O / 70% (80:20 MeOH:ACN)
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 8 min and hold for
2 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 μ L/min

MS Parameters:

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 1.00
Cone Voltage (V) = 44.00
Desolvation Temperature ($^{\circ}$ C) = 500
Desolvation Gas Flow (L/hr) = 1000

Analytical Standard Record

22C03130

Description:s	PFAS - SAS NETFOSA 50ug/mLs	Expires:s	08/12/2026s
Standard Type:s	Others	Prepared:s	03/15/2022s
Solvent:s	Methanols	Prepared By:s	Wellington Laboratories (Lot#: PFAS)
Final Volume (mL)s:	1s	Department:s	NETFOSA0821M)s
Vials:s	1s	Last Edit:s	08/17/2022 10:49 by LYA

Analyte0	Parent0	CAS Number0	Concentration 0	Units0
NETFOSA		4151-50-2s	50s	ug/mLs



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PFAC-MXF 22F0058

**Native Replacement PFAS
Solution/Mixture**

PRODUCT CODE: PFAC-MXF
LOT NUMBER: PFACMXF0122
SOLVENT(S): Methanol / Water (<1%)
DATE PREPARED: (mm/dd/yyyy) 01/10/2022
LAST TESTED: (mm/dd/yyyy) 01/11/2022
EXPIRY DATE: (mm/dd/yyyy) 01/11/2025
RECOMMENDED STORAGE: Refrigerate ampoule

DESCRIPTION:

PFAC-MXF is a solution/mixture of sodium dodecafluoro-3H-4,8-dioxanonanoate (NaDONA), the major and minor components of F-53B (9Cl-PF3ONS and 11Cl-PF3OUdS), and GenX (HFPO-DA). The components and their concentrations are given in Table A.

The individual native components of this mixture all have chemical purities of >98%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
 Figure 1: LC/MS Data (SIR)
 Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
 519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compounds it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products, as well as mixtures and calibration solutions, are compared to older lots in a similar manner. This further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters x_1, x_2, \dots, x_n on which it depends is:

$$u_c(y(x_1, x_2, \dots, x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

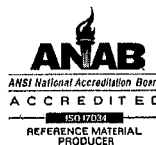
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A1226), and ISO 17034 by ANSI National Accreditation Board (ANAB; AR-1523).



For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Table A: PFAC-MXF; Components and Concentrations (ng/mL; \pm 5% in Methanol/Water (<1%))

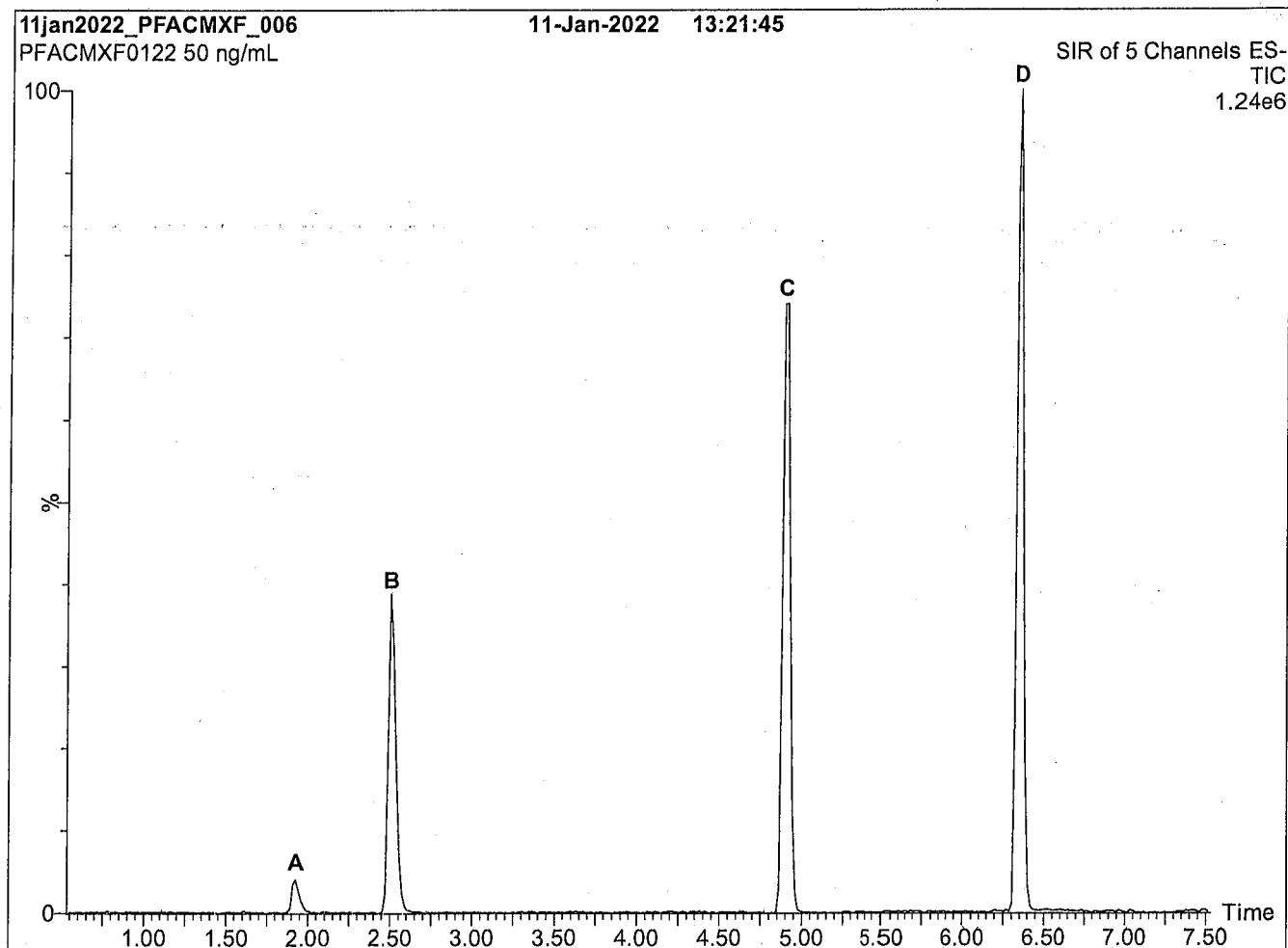
Compound	Acronym	Concentration* (ng/mL)		Peak Assignment in Figure 1
		as the salt	as the acid	
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid	HFPO-DA	2000		A
Sodium dodecafluoro-3H-4,8-dioxanonanoate	NaDONA	2000	1890	B
Potassium 9-chlorohexadecafluoro-3-oxanonane-1-sulfonate	9Cl-PF3ONS	2000	1870	C
Potassium 11-chloroeicosafluoro-3-oxaundecane-1-sulfonate	11Cl-PF3OUdS	2000	1890	D

* Concentrations have been rounded to three significant figures.

Certified By: 

B.G. Chittim, General Manager

Date: 01/12/2022
(mm/dd/yyyy)

Figure 1: PFAC-MXF; LC/MS Data (SIR)**Conditions for Figure 1:**

Waters Acquity Ultra Performance LC
Waters Xevo TQ-S micro MS

Chromatographic Conditions:

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

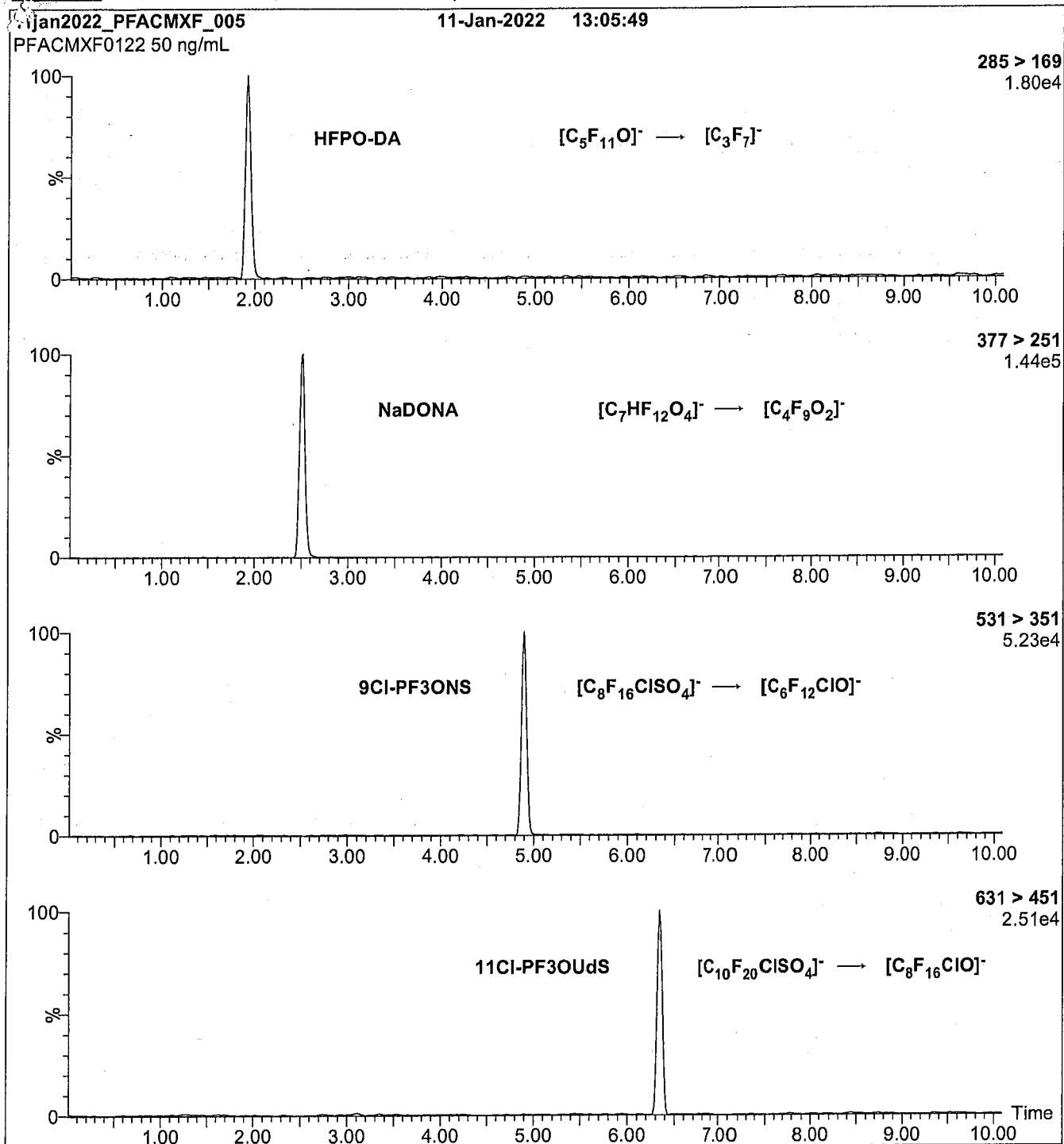
Mobile phase: Gradient
Start: 45% H₂O / 55% (80:20 MeOH:ACN)
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 8 min and hold for 2 min
before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 μ L/min

MS Parameters:

Experiment: SIR

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = variable (15-74)
Desolvation Temperature ($^{\circ}$ C) = 325
Desolvation Gas Flow (L/hr) = 1000

Figure 2: PFAC-MXF; LC/MS/MS Data (Selected MRM Transitions)**Conditions for Figure 2:**

Injection: On-column (PFAC-MXF)

Mobile phase: Same as Figure 1

Flow: 300 μ L/min**MS Parameters:**

Collision Gas (mbar) = 3.43e-3

Collision Energy (eV) = 6-60 (variable)

Analytical Standard Record

22F0 580

Description:s	PFAS - MIX MXF 2ug/mL	Expires:s	01/11/2025s
Standard Type:s	Others	Prepared:s	01/10/2022s
Solvent:s	MeOHs	Prepared By:s	Lizbeth Andres
Final Volume (mls):s	1.2s	Department:s	PFASs
Vials:s	1s	Last Edit:s	09/15/2022 09:32 by DAGs

Analyte0	Parent0	CAS Number0	Concentration 0	Units0
11CL-PF3OUDS		763051-92-9	1.89s	ug/mLs
9CL-PF3ONS		756426-58-1	1.87	ug/mLs
ADONA		919005-14-4s	1.89s	ug/mLs
HFPO-DAs		13252-13-6s	2s	ug/mLs



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PFAC-MXH 22F0059

**Native Per- and Poly-fluoroalkyl Substance
Solution/Mixture**

PRODUCT CODE: PFAC-MXH
LOT NUMBER: PFACMXH0921
SOLVENT(S): Methanol / Isopropanol (2%) / Water (<1%)
DATE PREPARED: (mm/dd/yyyy) 09/09/2021
LAST TESTED: (mm/dd/yyyy) 09/14/2021
EXPIRY DATE: (mm/dd/yyyy) 09/14/2026
RECOMMENDED STORAGE: Refrigerate ampoule

DESCRIPTION:

PFAC-MXH is a solution/mixture of eleven native linear perfluoroalkylcarboxylic acids (C₄-C₁₄), eight native perfluoroalkanesulfonates (C₄, C₅, C₇, C₉, C₁₀ and C₁₂ linear; C₆ and C₈ linear and branched), three native fluorotelomer sulfonates (4:2, 6:2, and 8:2), two native linear and branched perfluorooctanesulfonamidoacetic acids, and perfluoro-1-octanesulfonamide (FOSA). The components and their concentrations are given in Table A.

The individual components of this mixture all have chemical purities of >98%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
 Table B: Isomeric Components and Percent Composition of br-NMeFOSAA
 Table C: Isomeric Components and Percent Composition of br-NEtFOSAA
 Table D: Isomeric Components and Percent Composition of PFHxSK
 Table E: Isomeric Components and Percent Composition of PFOSK
 Figure 1: LC/MS Data (SIR)
 Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acids to their respective methyl esters.

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where x is expressed as a relative standard uncertainty of the individual parameter.

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Table A: PFAC-MXH; Components and Concentrations
($\mu\text{g/mL}$, $\pm 5\%$ in methanol / isopropanol (2%) / water (<1%))

Compound	Acronym	Concentration* ($\mu\text{g/mL}$)		Peak Assignment in Figure 1
		as the salt	as the acid	
Perfluoro-n-butanoic acid	PFBA	4.00		1
Perfluoro-n-pentanoic acid	PFPeA	2.00		2
Perfluoro-n-hexanoic acid	PFHxA	1.00		5
Perfluoro-n-heptanoic acid	PFHpA	1.00		7
Perfluoro-n-octanoic acid	PFOA	1.00		11
Perfluoro-n-nonanoic acid	PFNA	1.00		14
Perfluoro-n-decanoic acid	PFDA	1.00		18
Perfluoro-n-undecanoic acid	PFUdA	1.00		23
Perfluoro-n-dodecanoic acid	PFDoA	1.00		26
Perfluoro-n-tridecanoic acid	PFTTrDA	1.00		27
Perfluoro-n-tetradecanoic acid	PFTeDA	1.00		29
Perfluoro-1-octanesulfonamide	FOSA	1.00		25
N-methylperfluorooctanesulfonamidoacetic acid ^a	N-MeFOSAA: linear isomer	0.760		20
	N-MeFOSAA: Σ branched isomers	0.240		17
N-ethylperfluorooctanesulfonamidoacetic acid ^b	N-EtFOSAA: linear isomer	0.775		22
	N-EtFOSAA: Σ branched isomers	0.225		21
Compound	Acronym	Concentration* ($\mu\text{g/mL}$)		Peak Assignment in Figure 1
		as the salt	as the acid	
Potassium perfluoro-1-butanedisulfonate	L-PFBS	1.00	0.887	3
Sodium perfluoro-1-pentanesulfonate	L-PFPeS	1.00	0.941	6
Potassium perfluorohexanesulfonate ^c	PFHxSK: linear isomer	0.811	0.741	9
	PFHxSK: Σ branched isomers	0.189	0.173	8
Sodium perfluoro-1-heptanesulfonate	L-PFHpS	1.00	0.953	12
Potassium perfluorooctanesulfonate ^d	PFOSK: linear isomer	0.788	0.732	15
	PFOSK: Σ branched isomers	0.211	0.196	13
Sodium perfluoro-1-nonanesulfonate	L-PFNS	1.00	0.962	19
Sodium perfluoro-1-decanedisulfonate	L-PFDs	1.00	0.965	24
Sodium perfluoro-1-dodecanedisulfonate	L-PFDoS	1.00	0.970	28
Sodium 1H,1H,2H,2H-perfluorohexanesulfonate	4:2Fts	4.00	3.75	4
Sodium 1H,1H,2H,2H-perfluorooctanesulfonate	6:2Fts	4.00	3.80	10
Sodium 1H,1H,2H,2H-perfluorodecanedisulfonate	8:2Fts	4.00	3.84	16

^a See Table B for percent composition of linear and branched N-MeFOSAA isomers.

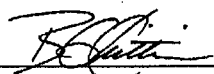
^b See Table C for percent composition of linear and branched N-EtFOSAA isomers.

^c See Table D for percent composition of linear and branched PFHxSK isomers.

^d See Table E for percent composition of linear and branched PFOSK isomers.

* Concentrations have been rounded to three significant figures.

Certified By: _____


B.G. Chittim, General Manager

Date: 09/23/2021

(mm/dd/yyyy)

Table B: br-NMeFOSAA; Isomeric Components and Percent Composition (by ¹⁹F-NMR)*

Isomer	Compound	Structure	Percent Composition by ¹⁹ F-NMR	
1	N-methylperfluoro-1-octanesulfonamidoacetic acid	$\text{CF}_3(\text{CF}_2)_7\text{SO}_2\text{NCH}_2\text{CO}_2\text{H}$	76.0	76.0
2	N-methylperfluoro-3-methylheptanesulfonamidoacetic acid	$\text{CF}_3(\text{CF}_2)_3\underset{\text{CF}_3}{\text{CF}}(\text{CF}_2)_2\text{SO}_2\text{NCH}_2\text{CO}_2\text{H}$	0.7	24.0
3	N-methylperfluoro-4-methylheptanesulfonamidoacetic acid	$\text{CF}_3(\text{CF}_2)_2\underset{\text{CF}_3}{\text{CF}}(\text{CF}_2)_3\text{SO}_2\text{NCH}_2\text{CO}_2\text{H}$	2.0	
4	N-methylperfluoro-5-methylheptanesulfonamidoacetic acid	$\text{CF}_3\text{CF}_2\underset{\text{CF}_3}{\text{CF}}(\text{CF}_2)_4\text{SO}_2\text{NCH}_2\text{CO}_2\text{H}$	6.0	
5	N-methylperfluoro-6-methylheptanesulfonamidoacetic acid	$\text{CF}_3\underset{\text{CF}_3}{\text{CF}}(\text{CF}_2)_5\text{SO}_2\text{NCH}_2\text{CO}_2\text{H}$	14.0	
6	N-methylperfluoro-5,5-dimethylhexanesulfonamidoacetic acid	$\begin{array}{c} \text{CF}_3 \\ \\ \text{CF}_3\text{C}(\text{CF}_2)_4\text{SO}_2\text{NCH}_2\text{CO}_2\text{H} \\ \\ \text{CF}_3 \end{array}$	0.2	
7	Other Unidentified Isomers		1.1	

* Percent of total N-methylperfluorooctanesulfonamidoacetic acid isomers only.

Table C: br-NEtFOSAA; Isomeric Components and Percent Composition (by ¹⁹F-NMR)*

Isomer	Compound	Structure	Percent Composition by ¹⁹ F-NMR	
1	N-ethylperfluoro-1-octanesulfonamidoacetic acid	$\text{CF}_3(\text{CF}_2)_7\text{SO}_2\text{NCH}_2\text{CO}_2\text{H}$ $\quad \quad \quad $ $\quad \quad \quad \text{C}_2\text{H}_5$	77.5	77.5
2	N-ethylperfluoro-3-methylheptanesulfonamidoacetic acid	$\text{CF}_3(\text{CF}_2)_3\text{CF}(\text{CF}_2)_2\text{SO}_2\text{NCH}_2\text{CO}_2\text{H}$ $\quad \quad \quad \quad \quad \quad $ $\quad \quad \quad \text{CF}_3 \quad \quad \quad \text{C}_2\text{H}_5$	2.3	22.5
3	N-ethylperfluoro-4-methylheptanesulfonamidoacetic acid	$\text{CF}_3(\text{CF}_2)_2\text{CF}(\text{CF}_2)_3\text{SO}_2\text{NCH}_2\text{CO}_2\text{H}$ $\quad \quad \quad \quad \quad \quad $ $\quad \quad \quad \text{CF}_3 \quad \quad \quad \text{C}_2\text{H}_5$	2.2	
4	N-ethylperfluoro-5-methylheptanesulfonamidoacetic acid	$\text{CF}_3\text{CF}_2\text{CF}(\text{CF}_2)_4\text{SO}_2\text{NCH}_2\text{CO}_2\text{H}$ $\quad \quad \quad \quad \quad \quad $ $\quad \quad \quad \text{CF}_3 \quad \quad \quad \text{C}_2\text{H}_5$	5.4	
5	N-ethylperfluoro-6-methylheptanesulfonamidoacetic acid	$\text{CF}_3\text{CF}(\text{CF}_2)_5\text{SO}_2\text{NCH}_2\text{CO}_2\text{H}$ $\quad \quad \quad \quad \quad \quad $ $\quad \quad \quad \text{CF}_3 \quad \quad \quad \text{C}_2\text{H}_5$	10.4	
6	N-ethylperfluoro-5,5-dimethylhexanesulfonamidoacetic acid	$\begin{array}{c} \text{CF}_3 \\ \\ \text{CF}_3\text{C}(\text{CF}_2)_4\text{SO}_2\text{NCH}_2\text{CO}_2\text{H} \\ \\ \text{CF}_3 \end{array}$ $\quad \quad \quad $ $\quad \quad \quad \text{C}_2\text{H}_5$	0.3	
7	N-ethylperfluoro-4,5-dimethylhexanesulfonamidoacetic acid	$\begin{array}{c} \text{CF}_3 \\ \\ \text{CF}_3\text{CFCF}(\text{CF}_2)_3\text{SO}_2\text{NCH}_2\text{CO}_2\text{H} \\ \\ \text{CF}_3 \end{array}$ $\quad \quad \quad $ $\quad \quad \quad \text{C}_2\text{H}_5$	0.3	
8	N-ethylperfluoro-3,5-dimethylhexanesulfonamidoacetic acid	$\begin{array}{c} \text{CF}_3 \\ \\ \text{CF}_3\text{CFCF}_2\text{CF}(\text{CF}_2)_2\text{SO}_2\text{NCH}_2\text{CO}_2\text{H} \\ \\ \text{CF}_3 \end{array}$ $\quad \quad \quad $ $\quad \quad \quad \text{C}_2\text{H}_5$	0.3	
9	Other Unidentified Isomers		1.3	

* Percent of total N-ethylperfluorooctanesulfonamidoacetic acid isomers only.

Table D: PFHxSK; Isomeric Components and Percent Composition (by ¹⁹F-NMR)*

Isomer	Compound	Structure	Percent Composition by ¹⁹ F-NMR	
1	Potassium perfluoro-1-hexanesulfonate	$\text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+$	81.1	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	$\begin{array}{c} \text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CFSO}_3^-\text{K}^+ \\ \\ \text{CF}_3 \end{array}$	2.9	18.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	$\begin{array}{c} \text{CF}_3\text{CF}_2\text{CF}_2\text{CFCF}_2\text{SO}_3^-\text{K}^+ \\ \\ \text{CF}_3 \end{array}$	1.4	
4	Potassium 3-trifluoromethylperfluoropentanesulfonate	$\begin{array}{c} \text{CF}_3\text{CF}_2\text{CFCF}_2\text{CF}_2\text{SO}_3^-\text{K}^+ \\ \\ \text{CF}_3 \end{array}$	5.0	
5	Potassium 4-trifluoromethylperfluoropentanesulfonate	$\begin{array}{c} \text{CF}_3\text{CFCF}_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+ \\ \\ \text{CF}_3 \end{array}$	8.9	
6	Potassium 3,3-di(trifluoromethyl)perfluorobutanesulfonate	$\begin{array}{c} \text{CF}_3 \\ \\ \text{CF}_3\text{CCF}_2\text{CF}_2\text{SO}_3^-\text{K}^+ \\ \\ \text{CF}_3 \end{array}$	0.2	
7	Other Unidentified Isomers		0.5	

* Percent of total perfluorohexanesulfonate isomers only.

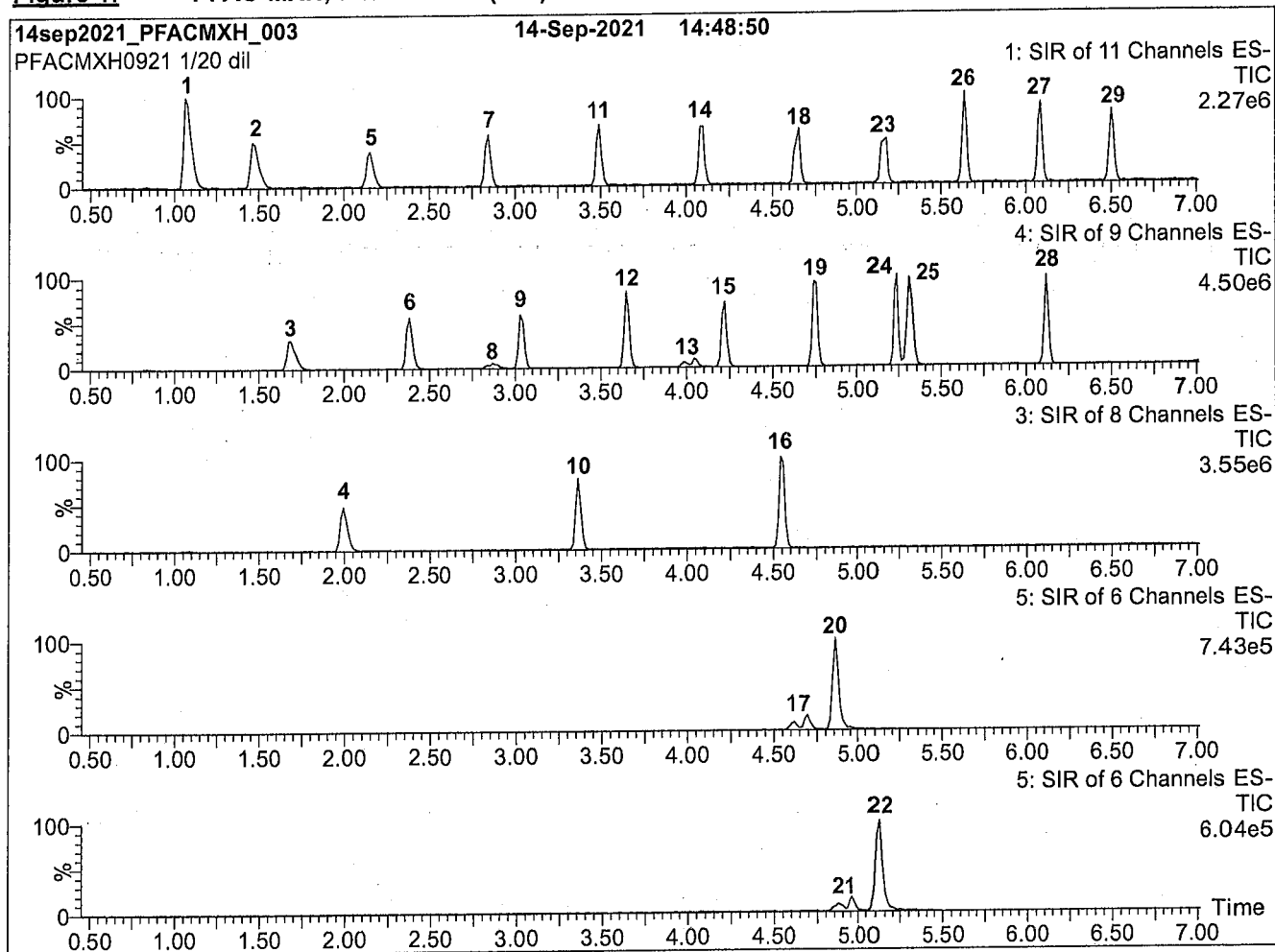
** Systematic Name: Potassium perfluorohexane-2-sulfonate.

Table E: PFOSK; Isomeric Components and Percent Composition (by ¹⁹F-NMR)*

Isomer	Compound	Structure	Percent Composition by ¹⁹ F-NMR	
1	Potassium perfluoro-1-octanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺	78.8	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ CF(SO ₃ ⁻)K ⁺ CF ₃	1.2	21.1
3	Potassium 2-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF(CF ₃)SO ₃ ⁻ K ⁺ CF ₃	0.6	
4	Potassium 3-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF(CF ₃)CF ₂ SO ₃ ⁻ K ⁺ CF ₃	1.9	
5	Potassium 4-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF(CF ₃)CF ₂ CF ₂ SO ₃ ⁻ K ⁺ CF ₃	2.2	
6	Potassium 5-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF(CF ₃)CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺ CF ₃	4.5	
7	Potassium 6-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF(CF ₃)CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺ CF ₃	10.0	
8	Potassium 5,5-di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ CF ₃ CCF ₂ CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺ CF ₃	0.2	
9	Potassium 4,4-di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ CF ₃ CF ₂ CCF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺ CF ₃	0.03	
10	Potassium 4,5-di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ CF ₃ CF(CF ₃)CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺ CF ₃	0.4	
11	Potassium 3,5-di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ CF ₃ CF(CF ₃)CF ₂ CF(CF ₃)CF ₂ SO ₃ ⁻ K ⁺ CF ₃	0.07	

* Percent of total perfluorooctanesulfonate isomers only.

** Systematic Name: Potassium perfluorooctane-2-sulfonate.

Figure 1: PFAC-MXH; LC/MS Data (SIR)**Conditions for Figure 1:**

Waters Acquity Ultra Performance LC
Waters Xevo TQ-S micro MS

Chromatographic Conditions:

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient

Start: 50% H₂O / 50% (80:20 MeOH:ACN)
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 9 min and hold for 2 min
before returning to initial conditions in 1 min.
Time: 15 min

Flow: 300 μ L/min

MS Parameters:

Experiment: SIR

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.50
Cone Voltage (V) = variable (2-74)
Desolvation Temperature (°C) = 350
Desolvation Gas Flow (L/hr) = 1000

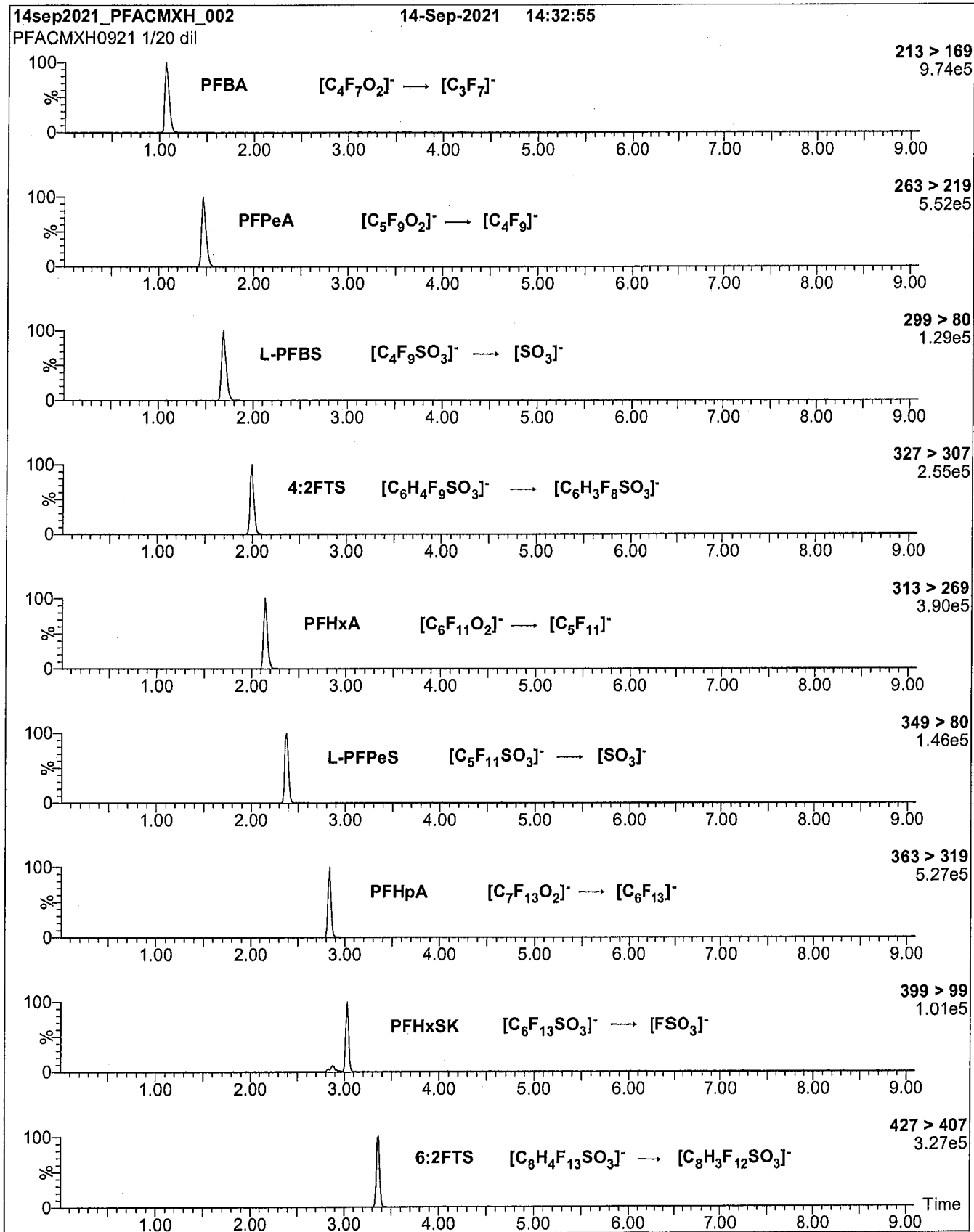
Figure 2: PFAC-MXH; LC/MS/MS Data (Selected MRM Transitions)

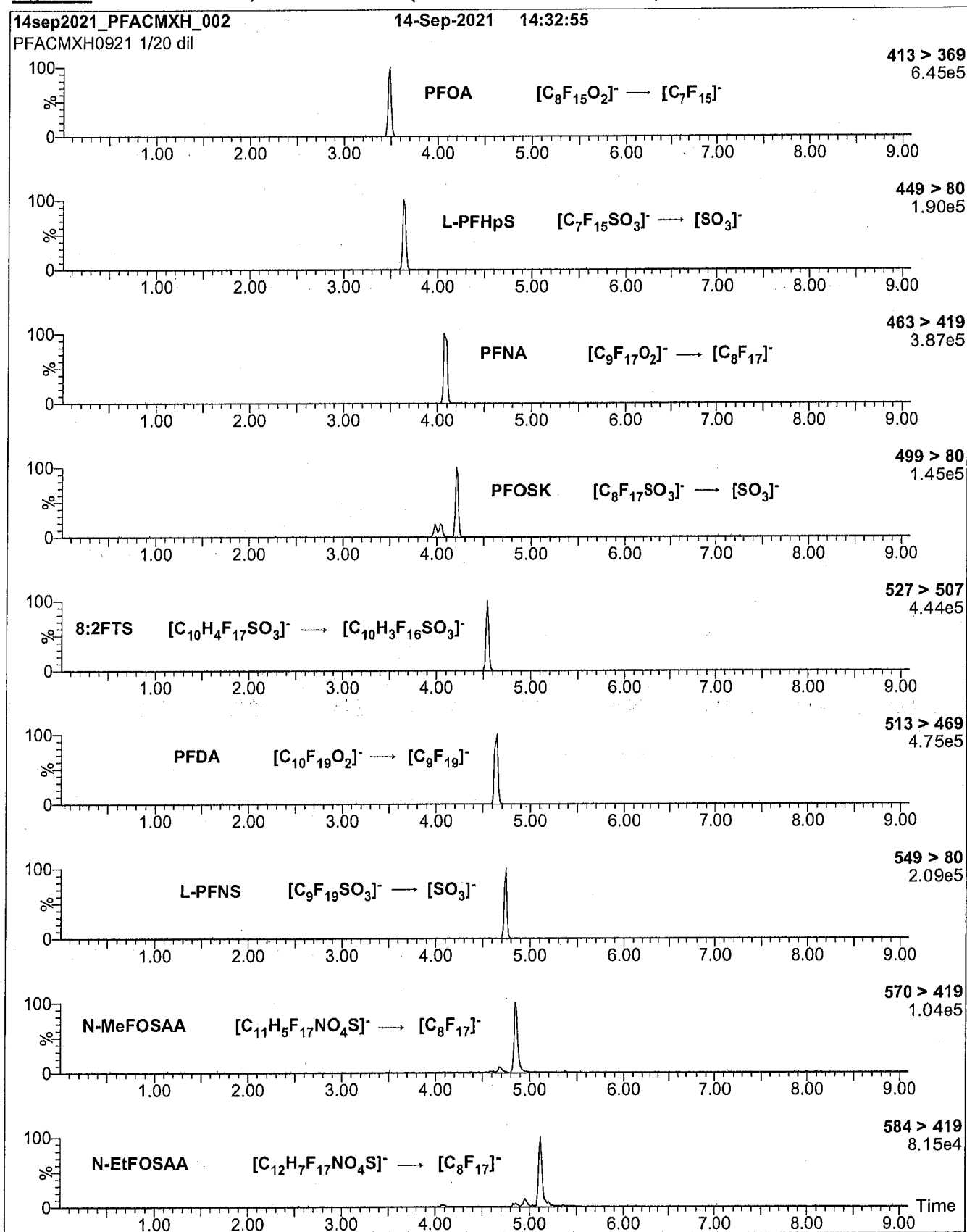
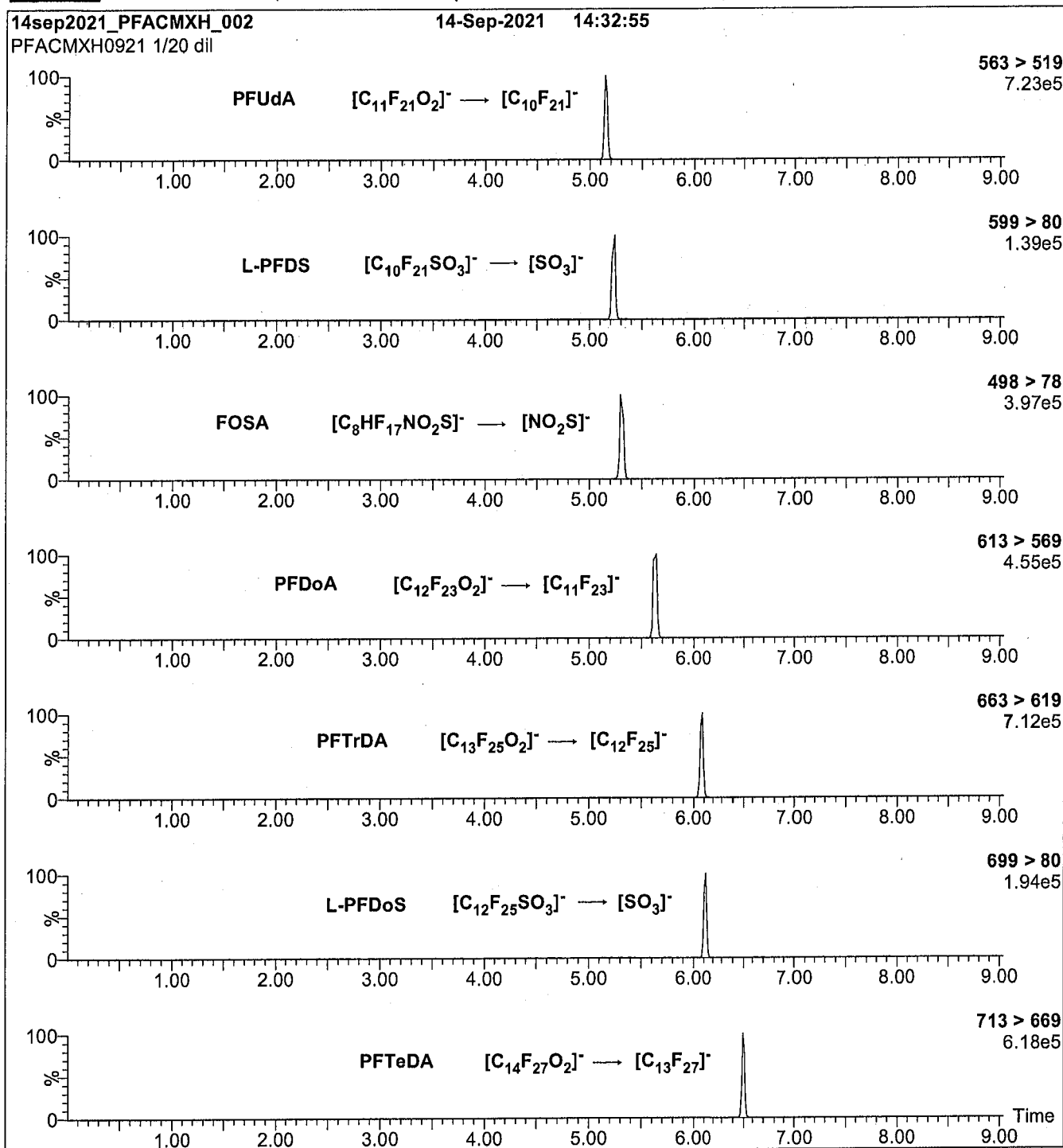
Figure 2: PFAC-MXH; LC/MS/MS Data (Selected MRM Transitions)

Figure 2: PFAC-MXH; LC/MS/MS Data (Selected MRM Transitions)**Conditions for Figure 2:**

Injection: On-column (PFAC-MXH)

Mobile phase: Same as Figure 1

Flow: 300 μ L/min**MS Parameters:**

Collision Gas (mbar) = 3.31e-3

Collision Energy (eV) = 6-60 (variable)

Analytical Standard Record

22F0 590

Description:s	PFAS - MIX MXH 2ug/mL	Expires:s	09/14/2026s
Standard Type:s	Others	Prepared:s	09/09/2021s
Solvent:s	MeOHs	Prepared By:s	Lizbeth Andres
Final Volume (mls):s	1.2s	Department:s	PFASs
Vials:s	1s	Last Edit:s	09/15/2022 09:33 by DAGs

Analyte0	Parent0	CAS Number0	Concentration 0	Units0
4:2FTSs		757124-72-4	3.75	ug/mLs
6:2FTSs		27619-97-2	3.8s	ug/mLs
8:2FTSs		39108-34-4s	3.84s	ug/mLs
NETFOSAA		2991-50-6s	1s	ug/mLs
NMeFOSAA		2355-31-9s	1s	ug/mLs
PFBA		375-22-4	4s	ug/mLs
PFBS		375-73-5	0.887	ug/mLs
PFDA		335-76-2	1s	ug/mLs
PFDOA		307-55-1	1s	ug/mLs
PFDOs		79780-39-5	0.97	ug/mLs
PFDS		335-77-3	0.965s	ug/mLs
PFHPA		375-85-9	1s	ug/mLs
PFHPS		375-92-8	0.953s	ug/mLs
PFHXA		307-24-4	1s	ug/mLs
PFHXS		355-46-4s	0.914s	ug/mLs
PFNA		375-95-1	1s	ug/mLs
PFNS		68259-12-1s	0.962s	ug/mLs
PFOA		335-67-1	1s	ug/mLs
PFOs		1763-23-1	0.928s	ug/mLs
PFOSA		754-91-6	1s	ug/mLs
PFPEA		2706-90-3	2s	ug/mLs
PFPEs		630402-22-1s	0.941s	ug/mLs
PFTEDA		376-06-7	1s	ug/mLs
PFTRDA		72629-94-8	1s	ug/mLs
PFUnA		2058-94-8s	1s	ug/mLs



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PFAC-MXG 22F0061

Native Perfluoroalkyl Ether Carboxylic Acids and Sulfonate Solution/Mixture

<u>PRODUCT CODE:</u>	PFAC-MXG
<u>LOT NUMBER:</u>	PFACMXG0222
<u>SOLVENT(S):</u>	Methanol/Water (<1%)
<u>DATE PREPARED:</u> (mm/dd/yyyy)	02/07/2022
<u>LAST TESTED:</u> (mm/dd/yyyy)	02/22/2022
<u>EXPIRY DATE:</u> (mm/dd/yyyy)	02/22/2027
<u>RECOMMENDED STORAGE:</u>	Store ampoule in a cool, dark place

DESCRIPTION:

PFAC-MXG is a solution/mixture of three native perfluoroalkyl ether carboxylic acids and a native perfluoroalkyl ether sulfonate. The components and their concentrations are given in Table A.

The individual components all have chemical purities of >98%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
Figure 1: LC/MS Data (SIR)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acids to their respective methyl esters.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compounds it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products, as well as mixtures and calibration solutions, are compared to older lots in a similar manner. This further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters x_1, x_2, \dots, x_n on which it depends is:

$$u_c(y(x_1, x_2, \dots, x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A1226), and ISO 17034 by ANSI National Accreditation Board (ANAB; AR-1523).



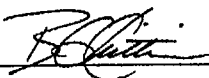
For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Table A: PFAC-MXG; Components and Concentrations (ng/mL; \pm 5% in methanol/water (<1%))

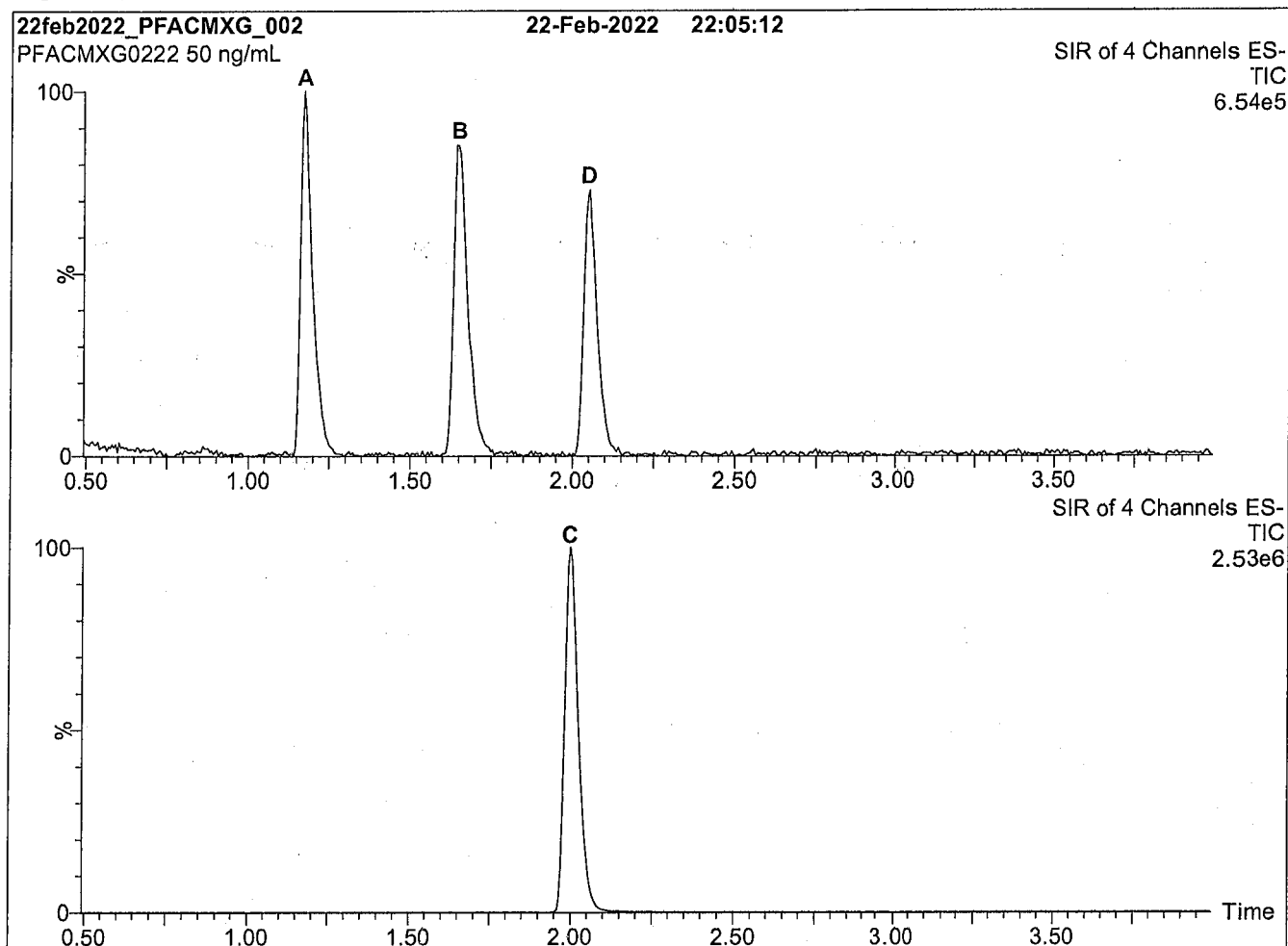
Compound	Acronym	Concentration (ng/mL)		Peak Assignment in Figure 1
		as the salt	as the acid	
Perfluoro-4-oxapentanoic acid	PF4OPeA	2000		A
Perfluoro-5-oxahexanoic acid	PF5OHxA	2000		B
Perfluoro-3,6-dioxaheptanoic acid	3,6-OPFHpA	2000		D
Compound	Acronym	Concentration* (ng/mL)		Peak Assignment in Figure 1
		as the salt	as the acid	
Potassium perfluoro(2-ethoxyethane)sulfonate	PFEESA	2000	1780	C

* Concentrations have been rounded to three significant figures.

Certified By: _____


B.G. Chittim, General Manager

Date: 03/03/2022
(mm/dd/yyyy)

Figure 1: PFAC-MXG; LC/MS Data (SIR)**Conditions for Figure 1:**

Waters Acquity Ultra Performance LC
Waters Xevo TQ-S micro MS

Chromatographic Conditions:

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

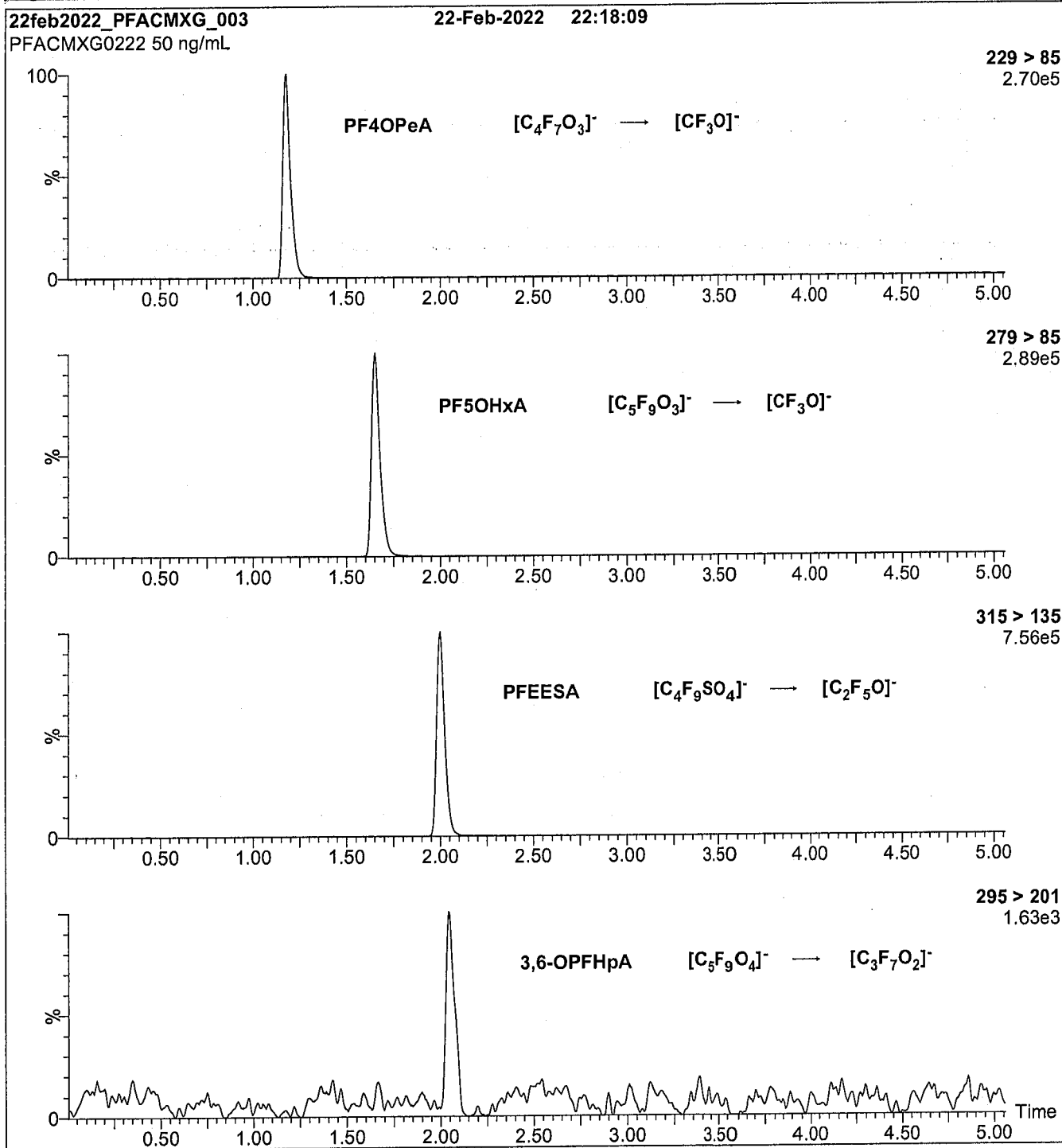
Mobile phase: Gradient
Start: 50% H₂O / 50% (80:20 MeOH:ACN)
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 8 min and hold for 2 min
before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 μ L/min

MS Parameters:

Experiment: SIR

Source: Electrospray (negative)
Capillary Voltage (kV) = 1.00
Cone Voltage (V) = variable (15-35)
Desolvation Temperature ($^{\circ}$ C) = 500
Desolvation Gas Flow (L/hr) = 1000

Figure 2: PFAC-MXG; LC/MS/MS Data (Selected MRM Transitions)**Conditions for Figure 2:**

Injection: On-column (PFAC-MXG)

Mobile phase: Same as Figure 1

Flow: 300 μ L/min**MS Parameters:**

Collision Gas (mbar) = 3.33e-3

Collision Energy (eV) = 8-48 (variable)

Analytical Standard Record

22F0 610

Description:s	PFAS - MIX MXG 2ug/mL	Expires:s	02/22/2027
Standard Type:s	Others	Prepared:s	02/07/2022
Solvent:s	MeOHs	Prepared By:s	Lizabeth Andres
Final Volume (mL):s	1s	Department:s	PFASs
Vials:s	1s	Last Edit:s	09/15/2022 09:34 by DAGs
Comments:n	contains NFDHA PFMBA PFMPA PFEESA @ 2ug/mLn		

Analyte0	Parent0	CAS Number0	Concentration 0	Units0
NFDHA		151772-58-6	2s	ug/mLs
PFEESAs		113507-82-7	1.78	ug/mLs
PFMBAs		863090-89-5s	2s	ug/mLs
PFMPAs		377-73-1	2s	ug/mLs

Analytical Standard Record0

22I01530

Description:s	PFAS - MIX 1633 200ng/mL	Expires:s	01/11/2025s
Standard Type:s	Analyte Spikes	Prepared:s	09/13/2022s
Solvent:s	MeOHs	Prepared By:s	Dipti Gokals
Final Volume (mls):s	6s	Department:s	PFASs
Vials:s	1s	Last Edit:s	09/15/2022 09:34 by DAGs

Analyte0	Parent0	CAS Number0	Concentration 0	Units0
NMeFOSE	22C0307	24448-09-7	0.8s	ug/mLs
3:3FTCAs	22C0308s	113507-82-7	0.8s	ug/mLs
5:3FTCAs	22C0309s	914637-49-3	0.8s	ug/mLs
NETFOSE	22C0310s	1691-99-2s	0.8s	ug/mLs
7:3FTCA	22C0311s	812-70-4	0.8s	ug/mLs
NMeFOSA	22C0312s	31506-32-8s	0.8s	ug/mLs
NETFOSA	22C0313s	4151-50-2s	0.8s	ug/mLs
11CL-PF3OUDS	22F0058s	763051-92-9	0.378	ug/mLs
9CL-PF3ONS	22F0058s	756426-58-1	0.374	ug/mLs
ADONA	22F0058s	919005-14-4s	0.378	ug/mLs
HFPO-DAs	22F0058s	13252-13-6s	0.4s	ug/mLs
4:2FTSs	22F0059s	757124-72-4	0.75	ug/mLs
6:2FTSs	22F0059s	27619-97-2	0.76	ug/mLs
8:2FTSs	22F0059s	39108-34-4s	0.768	ug/mLs
NETFOSAA	22F0059s	2991-50-6s	0.2s	ug/mLs
NMeFOSAA	22F0059s	2355-31-9s	0.2s	ug/mLs
PFBA	22F0059s	375-22-4	0.8s	ug/mLs
PFBS	22F0059s	375-73-5	0.177	ug/mLs
PFDA	22F0059s	335-76-2	0.2s	ug/mLs
PFDOAs	22F0059s	307-55-1	0.2s	ug/mLs
PFDOs	22F0059s	79780-39-5	0.194s	ug/mLs
PFDS	22F0059s	335-77-3	0.193s	ug/mLs
PFHPAs	22F0059s	375-85-9	0.2s	ug/mLs
PFHPs	22F0059s	375-92-8	0.191s	ug/mLs
PFHXA	22F0059s	307-24-4	0.2s	ug/mLs
PFHXS	22F0059s	355-46-4s	0.183s	ug/mLs
PFNA	22F0059s	375-95-1	0.2s	ug/mLs
PFNS	22F0059s	68259-12-1s	0.192s	ug/mLs
PFOAs	22F0059s	335-67-1	0.2s	ug/mLs
PFOSs	22F0059s	1763-23-1	0.186s	ug/mLs
PFOSAs	22F0059s	754-91-6	0.2s	ug/mLs
PFPEAs	22F0059s	2706-90-3	0.4s	ug/mLs
PFPEs	22F0059s	630402-22-1s	0.188s	ug/mLs
PFTEDAs	22F0059s	376-06-7	0.2s	ug/mLs
PFTRDA	22F0059s	72629-94-8	0.2s	ug/mLs
PFUnA	22F0059s	2058-94-8s	0.2s	ug/mLs
NFDHA	22F0061s	151772-58-6	0.4s	ug/mLs
PFEEsAs	22F0061s	113507-82-7	0.356s	ug/mLs
PFMBAs	22F0061s	863090-89-5s	0.4s	ug/mLs
PFMPAs	22F0061s	377-73-1	0.4s	ug/mLs

Analytical Standard Record0

22I0153 0

Parent Standards used: 0

Standard 0	Description0	Prepared0	Prepared By0	Lot Nbr0	Expires0	Last Edit0		(mls)0
22C0307	PFAS - SAS N-MeFOSE 50ug/mLs	03/15/2022s	Wellington Laboratories	NMeFOSE0921M	09/23/2026s	03/15/2022 15:59s	by DAGs	0.096s
22C0308s	PFAS - SAS FPrPA 50ug/mLs	03/15/2022s	Wellington Laboratories	FPrPA0122s	02/03/2027	03/15/2022 15:59s	by DAGs	0.096s
22C0309s	PFAS - SAS FPePA 50ug/mLs	03/15/2022s	Wellington Laboratories	FPePA1221s	01/05/2027	03/15/2022 15:59s	by DAGs	0.096s
22C0310s	PFAS - SAS NEtFOSE 50ug/mLs	03/15/2022s	Wellington Laboratories	NEtFOSE0921M	09/23/2026s	03/15/2022 15:59s	by DAGs	0.096s
22C0311s	PFAS - SAS FHpPA 50ug/mLs	03/15/2022s	Wellington Laboratories	HHpPA1020s	11/12/2025s	03/15/2022 16:00s	by DAGs	0.096s
22C0312s	PFAS - SAS NMeFOSA 50ug/mLs	03/15/2022s	Wellington Laboratories	NMeFOSA0721M	08/03/2026s	03/15/2022 16:00s	by DAGs	0.096s
22C0313s	PFAS - SAS NEtFOSA 50ug/mLs	03/15/2022s	Wellington Laboratories	NEtFOSA0821M	08/12/2026s	08/17/2022 10:49	by LYA	0.096s
22F0058s	PFAS - MIX MXF 2ug/mL	01/10/2022s	Wellington Laboratories	PFACMXF0122	01/11/2025s	09/15/2022 09:32s	by DAGs	1.2s
22F0059s	PFAS - MIX MXH 2ug/mL	09/09/2021s	Wellington Laboratories	PFACMXH0921	09/14/2026s	09/15/2022 09:33s	by DAGs	1.2s
22F0061s	PFAS - MIX MXG 2ug/mL	02/07/2022	Wellington Laboratories	PFACMXG0222	02/22/2027	09/15/2022 09:34s	by DAGs	1.2s



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PFAC-MXG

Native Perfluoroalkyl Ether Carboxylic Acids and Sulfonate Solution/Mixture

<u>PRODUCT CODE:</u>	PFAC-MXG
<u>LOT NUMBER:</u>	PFACMXG0222
<u>SOLVENT(S):</u>	Methanol/Water (<1%)
<u>DATE PREPARED:</u> (mm/dd/yyyy)	02/07/2022
<u>LAST TESTED:</u> (mm/dd/yyyy)	02/22/2022
<u>EXPIRY DATE:</u> (mm/dd/yyyy)	02/22/2027
<u>RECOMMENDED STORAGE:</u>	Store ampoule in a cool, dark place

DESCRIPTION:

PFAC-MXG is a solution/mixture of three native perfluoroalkyl ether carboxylic acids and a native perfluoroalkyl ether sulfonate. The components and their concentrations are given in Table A.

The individual components all have chemical purities of >98%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
 Figure 1: LC/MS Data (SIR)
 Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acids to their respective methyl esters.

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Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
 519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

Table A: PFAC-MXG; Components and Concentrations (ng/mL; \pm 5% in methanol/water (<1%))

Compound	Acronym	Concentration* (ng/mL)		Peak Assignment in Figure 1
		as the salt	as the acid	
Perfluoro-4-oxapentanoic acid	PF4OPeA	2000		A
Perfluoro-5-oxahexanoic acid	PF5OHxA	2000		B
Perfluoro-3,6-dioxaheptanoic acid	3,6-OPFHpA	2000		D
Compound	Acronym	Concentration* (ng/mL)		Peak Assignment in Figure 1
		as the salt	as the acid	
Potassium perfluoro(2-ethoxyethane)sulfonate	PFEESA	2000	1780	C

* Concentrations have been rounded to three significant figures.

Certified By: _____

B.G. Chittim, General Manager

Date: 03/03/2022

(mm/dd/yyyy)

Analytical Standard Record

22I03420

Description:s	PFAS - MIX MXG 2ug/mL	Expires:s	02/22/2027
Standard Type:s	Others	Prepared:s	02/07/2022
Solvent:s	MeOHs	Prepared By:s	Dipti Gokals
Final Volume (mls):s	1s	Department:s	PFASs
Vials:s	1s	Last Edit:s	09/26/2022 09:55 by DAGs
Comments:n	contains NFDHA PFMBA PFMPA PFEESA @ 2ug/mLn		

Analyte0	Parent0	CAS Number0	Concentration 0	Units0
NFDHA		151772-58-6	2s	ug/mLs
PFEESAs		113507-82-7	1.78	ug/mLs
PFMBAs		863090-89-5s	2s	ug/mLs
PFMPAs		377-73-1	2s	ug/mLs

Analytical Standard Record

22I03430

Description:s	PFAS - MIX MXF 2ug/mL	Expires:s	01/11/2025s
Standard Type:s	Others	Prepared:s	09/26/2022s
Solvent:s	MeOHs	Prepared By:s	Dipti Gokals
Final Volume (mls):s	1.2s	Department:s	PFASs
Vials:s	1s	Last Edit:s	09/26/2022 09:47 by DAG

Analyte0	Parent0	CAS Number0	Concentration 0	Units0
11CL-PF3OUDS		763051-92-9	1.89s	ug/mLs
9CL-PF3ONS		756426-58-1	1.87	ug/mLs
ADONA		919005-14-4s	1.89s	ug/mLs
HFPO-DAs		13252-13-6s	2s	ug/mLs



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PFAC-MXF

Native Replacement PFAS Solution/Mixture

<u>PRODUCT CODE:</u>	PFAC-MXF
<u>LOT NUMBER:</u>	PFACMXF0122
<u>SOLVENT(S):</u>	Methanol / Water (<1%)
<u>DATE PREPARED:</u> (mm/dd/yyyy)	01/10/2022
<u>LAST TESTED:</u> (mm/dd/yyyy)	01/11/2022
<u>EXPIRY DATE:</u> (mm/dd/yyyy)	01/11/2025
<u>RECOMMENDED STORAGE:</u>	Refrigerate ampoule

DESCRIPTION:

PFAC-MXF is a solution/mixture of sodium dodecafluoro-3H-4,8-dioxanonanoate (NaDONA), the major and minor components of F-53B (9Cl-PF3ONS and 11Cl-PF3OUdS), and GenX (HFPO-DA). The components and their concentrations are given in Table A.

The individual native components of this mixture all have chemical purities of >98%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
 Figure 1: LC/MS Data (SIR)
 Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

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Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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Table A: PFAC-MXF; Components and Concentrations (ng/mL; \pm 5% in Methanol/Water (<1%))

Compound	Acronym	Concentration* (ng/ml)		Peak Assignment in Figure 1
		as the salt	as the acid	
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid	HFPO-DA	2000		A
Sodium dodecafluoro-3H-4,8-dioxananoate	NaDONA	2000	1890	B
Potassium 9-chlorohexadecafluoro-3-oxanonane-1-sulfonate	9Cl-PF3ONS	2000	1870	C
Potassium 11-chloroeicosafluoro-3-oxaundecane-1-sulfonate	11Cl-PF3OUdS	2000	1890	D

* Concentrations have been rounded to three significant figures.

Certified By: 
B.G. Chittim, General Manager

Date: 01/12/2022
(mm/dd/yyyy)

Analytical Standard Record

22I03430

Description:s	PFAS - MIX MXF 2ug/mL	Expires:s	01/11/2025s
Standard Type:s	Others	Prepared:s	01/10/2022s
Solvent:s	MeOHs	Prepared By:s	Dipti Gokals
Final Volume (mls):s	1.2s	Department:s	PFASs
Vials:s	1s	Last Edit:s	09/26/2022 09:54 by DAGs

Analyte0	Parent0	CAS Number0	Concentration 0	Units0
11CL-PF3OUDS		763051-92-9	1.89s	ug/mLs
9CL-PF3ONS		756426-58-1	1.87	ug/mLs
ADONA		919005-14-4s	1.89s	ug/mLs
HFPO-DAs		13252-13-6s	2s	ug/mLs



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

APPL ID:2210334

PFAC-MXH

Native PFAS
Solution/Mixture

<u>PRODUCT CODE:</u>	PFAC-MXH
<u>LOT NUMBER:</u>	PFACMXH0822
<u>SOLVENT(S):</u>	Methanol/Isopropanol (2%)/Water (<1%)
<u>DATE PREPARED:</u> (mm/dd/yyyy)	08/05/2022
<u>LAST TESTED:</u> (mm/dd/yyyy)	08/08/2022
<u>EXPIRY DATE:</u> (mm/dd/yyyy)	08/08/2027
<u>RECOMMENDED STORAGE:</u>	Refrigerate ampoule

DESCRIPTION:

PFAC-MXH is a solution/mixture of 11 native linear perfluoroalkylcarboxylic acids (C₄-C₁₄), eight native perfluoroalkanesulfonates (C₄, C₅, C₇, C₉, C₁₀ and C₁₂ linear; C₆ and C₈ linear and branched), three native fluorotelomer sulfonates (4:2, 6:2, and 8:2), two native linear and branched perfluorooctanesulfonamidoacetic acids, and perfluoro-1-octanesulfonamide (FOSA). The components and their concentrations are given in Table A.

The individual components of this mixture all have chemical purities of >98%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
 Table B: Isomeric Components and Percent Composition of N-MeFOSAA
 Table C: Isomeric Components and Percent Composition of N-EtFOSAA
 Table D: Isomeric Components and Percent Composition of PFHxSK
 Table E: Isomeric Components and Percent Composition of PFOSK
 Figure 1: LC/MS Data (SIR)
 Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acids to their respective methyl esters.

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Table A: PFAC-MXH; Components and Concentrations
(ng/mL, \pm 5% in methanol/isopropanol (2%)/water (<1%))

Compound	Acronym	Concentration* (ng/mL)		Peak Assignment in Figure 1
		as the salt	as the acid	
Perfluoro-n-butanoic acid	PFBA	4000		1
Perfluoro-n-pentanoic acid	PFPeA	2000		2
Perfluoro-n-hexanoic acid	PFHxA	1000		5
Perfluoro-n-heptanoic acid	PFHpA	1000		7
Perfluoro-n-octanoic acid	PFOA	1000		11
Perfluoro-n-nonanoic acid	PFNA	1000		14
Perfluoro-n-decanoic acid	PFDA	1000		18
Perfluoro-n-undecanoic acid	PFUdA	1000		24
Perfluoro-n-dodecanoic acid	PFDoA	1000		26
Perfluoro-n-tridecanoic acid	PFTrDA	1000		27
Perfluoro-n-tetradecanoic acid	PFTeDA	1000		29
Perfluoro-1-octanesulfonamide	FOSA	1000		23
N-methylperfluorooctanesulfonamidoacetic acid ^a	N-MeFOSAA: linear isomer	760		20
	N-MeFOSAA: Σ branched isomers	240		17
N-ethylperfluorooctanesulfonamidoacetic acid ^b	N-EtFOSAA: linear isomer	775		22
	N-EtFOSAA: Σ branched isomers	225		21
Compound	Acronym	Concentration* (ng/mL)		Peak Assignment in Figure 1
		as the salt	as the acid	
Potassium perfluoro-1-butanedisulfonate	L-PFBS	1000	887	3
Sodium perfluoro-1-pentadisulfonate	L-PFPeS	1000	941	6
Potassium perfluorohexadisulfonate ^c	PFHxSK: linear isomer	811	741	9
	PFHxSK: Σ branched isomers	189	173	8
Sodium perfluoro-1-heptadisulfonate	L-PFHpS	1000	953	12
Potassium perfluorooctadisulfonate ^d	PFOSK: linear isomer	788	732	15
	PFOSK: Σ branched isomers	211	196	13
Sodium perfluoro-1-nonadisulfonate	L-PFNS	1000	962	19
Sodium perfluoro-1-decadisulfonate	L-PFDS	1000	965	25
Sodium perfluoro-1-dodecadisulfonate	L-PFDoS	1000	970	28
Sodium 1H,1H,2H,2H-perfluorohexanesulfonate	4:2FTS	4000	3750	4
Sodium 1H,1H,2H,2H-perfluorooctanesulfonate	6:2FTS	4000	3800	10
Sodium 1H,1H,2H,2H-perfluorodecane sulfonate	8:2FTS	4000	3840	16

^a See Table B for percent composition of linear and branched N-MeFOSAA isomers.

^b See Table C for percent composition of linear and branched N-EtFOSAA isomers.

^c See Table D for percent composition of linear and branched PFHxSK isomers.

^d See Table E for percent composition of linear and branched PFOSK isomers.

* Concentrations have been rounded to three significant figures.

Certified By: 

B.G. Chittim, General Manager

Date: 08/09/2022

(mm/dd/yyyy)

Analytical Standard Record

22I03440

Description:s	PFAS - MIX MXH 1-4ug/mL	Expires:s	08/08/2027
Standard Type:s	Others	Prepared:s	08/05/2022s
Solvent:s	MeOHs	Prepared By:s	Dipti Gokals
Final Volume (ml)s:s	1.2s	Department:s	PFASs
Vials:s	1s	Last Edit:s	09/26/2022 09:59 by DAGs

Analyte0	Parent0	CAS Number0	Concentration 0	Units0
4:2FTSs		757124-72-4	3.75	ug/mLs
6:2FTSs		27619-97-2	3.8s	ug/mLs
8:2FTSs		39108-34-4s	3.84s	ug/mLs
NETFOSAA		2991-50-6s	1s	ug/mLs
NMeFOSAA		2355-31-9s	1s	ug/mLs
PFBA		375-22-4	4s	ug/mLs
PFBS		375-73-5	0.887	ug/mLs
PFDA		335-76-2	1s	ug/mLs
PFDOA		307-55-1	1s	ug/mLs
PFDOs		79780-39-5	0.97	ug/mLs
PFDS		335-77-3	0.965s	ug/mLs
PFHPA		375-85-9	1s	ug/mLs
PFHPS		375-92-8	0.953s	ug/mLs
PFHXA		307-24-4	1s	ug/mLs
PFHXS		355-46-4s	0.914s	ug/mLs
PFNA		375-95-1	1s	ug/mLs
PFNS		68259-12-1s	0.962s	ug/mLs
PFOA		335-67-1	1s	ug/mLs
PFOs		1763-23-1	0.928s	ug/mLs
PFOSA		754-91-6	1s	ug/mLs
PFPEA		2706-90-3	2s	ug/mLs
PFPEs		630402-22-1s	0.941s	ug/mLs
PFTEDA		376-06-7	1s	ug/mLs
PFTRDA		72629-94-8	1s	ug/mLs
PFUnA		2058-94-8s	1s	ug/mLs

Analytical Standard Record

22J04480

Description:s	PFAS - MIX 1633 20ng/mL	Expires:s	04/25/2023s
Standard Type:s	Analyte Spikes	Prepared:s	10/27/2022
Solvent:s	MeOHs	Prepared By:s	Dipti Gokals
Final Volume (ml)s:s	10s	Department:s	PFASs
Vials:s	1s	Last Edit:s	10/27/2022 08:51 by DAG

Analyte0	Parent0	CAS Number0	Concentration 0	Units0
11CL-PF3OUDS	22I0153s	763051-92-9	0.0378	ug/mLs
3:3FTCAs	22I0153s	113507-82-7	0.08s	ug/mLs
4:2FTSs	22I0153s	757124-72-4	0.075	ug/mLs
5:3FTCAs	22I0153s	914637-49-3	0.08s	ug/mLs
6:2FTSs	22I0153s	27619-97-2	0.076	ug/mLs
7:3FTCA	22I0153s	812-70-4	0.08s	ug/mLs
8:2FTSs	22I0153s	39108-34-4s	0.0768	ug/mLs
9CL-PF3ONS	22I0153s	756426-58-1	0.0374	ug/mLs
ADONA	22I0153s	919005-14-4s	0.0378	ug/mLs
HFPO-DAs	22I0153s	13252-13-6s	0.04s	ug/mLs
NETFOSA	22I0153s	4151-50-2s	0.08s	ug/mLs
NETFOSAA	22I0153s	2991-50-6s	0.02s	ug/mLs
NETFOSE	22I0153s	1691-99-2s	0.08s	ug/mLs
NFDHA	22I0153s	151772-58-6	0.04s	ug/mLs
NMeFOSA	22I0153s	31506-32-8s	0.08s	ug/mLs
NMeFOSAA	22I0153s	2355-31-9s	0.02s	ug/mLs
NMeFOSE	22I0153s	24448-09-7	0.08s	ug/mLs
PFBAAs	22I0153s	375-22-4	0.08s	ug/mLs
PFBSs	22I0153s	375-73-5	0.0177	ug/mLs
PFDAAs	22I0153s	335-76-2	0.02s	ug/mLs
PFDOAs	22I0153s	307-55-1	0.02s	ug/mLs
PFDOsS	22I0153s	79780-39-5	0.0194s	ug/mLs
PFDSs	22I0153s	335-77-3	0.0193s	ug/mLs
PFEESAs	22I0153s	113507-82-7	0.0356s	ug/mLs
PFHPAs	22I0153s	375-85-9	0.02s	ug/mLs
PFHPsS	22I0153s	375-92-8	0.0191s	ug/mLs
PFHXA	22I0153s	307-24-4	0.02s	ug/mLs
PFHXS	22I0153s	355-46-4s	0.0183s	ug/mLs
PFMBAs	22I0153s	863090-89-5s	0.04s	ug/mLs
PFMPAs	22I0153s	377-73-1	0.04s	ug/mLs
PFNA	22I0153s	375-95-1	0.02s	ug/mLs
PFNS	22I0153s	68259-12-1s	0.0192s	ug/mLs
PFOAs	22I0153s	335-67-1	0.02s	ug/mLs
PFOSs	22I0153s	1763-23-1	0.0186s	ug/mLs
PFOSAs	22I0153s	754-91-6	0.02s	ug/mLs
PFPEAs	22I0153s	2706-90-3	0.04s	ug/mLs
PFPEsS	22I0153s	630402-22-1s	0.0188s	ug/mLs
PFTEDAs	22I0153s	376-06-7	0.02s	ug/mLs
PFTRDA	22I0153s	72629-94-8	0.02s	ug/mLs
PFUnA	22I0153s	2058-94-8s	0.02s	ug/mLs

Analytical Standard Record

22J0448 0

Parent Standards used: 0

Standard 0	Description0	Prepared	Prepared By0	Lot Nbr0	Expires0	Last Edit0	(mls)0
22I0153s	PFAS - MIX 1633 200ng/mLs	09/13/2022s	In house	xs	01/11/2025s	09/15/2022 09:34s by DAGs	1s

Analytical Standard Record0

22J05520

Description:s	PFAS - MIX 1633 200ng/mL	Expires:s	01/11/2025s
Standard Type:s	Analyte Spikes	Prepared:s	10/31/2022s
Solvent:s	MeOH 62244s	Prepared By:s	Dipti Gokals
Final Volume (ml)s:s	6s	Department:s	PFASs
Vials:s	1s	Last Edit:s	10/31/2022 14:57 by DAG

Analyte0	Parent0	CAS Number	Concentration 0	Units0
NETFOSA	21J0007	4151-50-2s	0.8s	ug/mLs
NMeFOSE	21J0014	24448-09-7	0.8s	ug/mLs
3:3FTCAs	21L0004s	113507-82-7	0.8s	ug/mLs
5:3FTCAs	21L0005s	914637-49-3	0.8s	ug/mLs
NETFOSE	21L0006s	1691-99-2s	0.8s	ug/mLs
7:3FTCA	21L0007	812-70-4	0.8s	ug/mLs
NMeFOSA	21L0008s	31506-32-8s	0.8s	ug/mLs
NFDHA	22I0342s	151772-58-6	0.4s	ug/mLs
PFEESAs	22I0342s	113507-82-7	0.356s	ug/mLs
PFMBAs	22I0342s	863090-89-5s	0.4s	ug/mLs
PFMPAs	22I0342s	377-73-1	0.4s	ug/mLs
11CL-PF3OUDS	22I0343s	763051-92-9	0.378	ug/mLs
9CL-PF3ONS	22I0343s	756426-58-1	0.374	ug/mLs
ADONA	22I0343s	919005-14-4s	0.378	ug/mLs
HFPO-DAs	22I0343s	13252-13-6s	0.4s	ug/mLs
4:2FTSs	22I0344s	757124-72-4	0.75	ug/mLs
6:2FTSs	22I0344s	27619-97-2	0.76	ug/mLs
8:2FTSs	22I0344s	39108-34-4s	0.768	ug/mLs
NETFOSAA	22I0344s	2991-50-6s	0.2s	ug/mLs
NMeFOSAA	22I0344s	2355-31-9s	0.2s	ug/mLs
PFBAAs	22I0344s	375-22-4	0.8s	ug/mLs
PFBSs	22I0344s	375-73-5	0.177	ug/mLs
PFDAAs	22I0344s	335-76-2	0.2s	ug/mLs
PFDOAs	22I0344s	307-55-1	0.2s	ug/mLs
PFDOsS	22I0344s	79780-39-5	0.194s	ug/mLs
PFDSs	22I0344s	335-77-3	0.193s	ug/mLs
PFHPAs	22I0344s	375-85-9	0.2s	ug/mLs
PFHPsS	22I0344s	375-92-8	0.191s	ug/mLs
PFHXA	22I0344s	307-24-4	0.2s	ug/mLs
PFHXS	22I0344s	355-46-4s	0.183s	ug/mLs
PFNA	22I0344s	375-95-1	0.2s	ug/mLs
PFNS	22I0344s	68259-12-1s	0.192s	ug/mLs
PFOAs	22I0344s	335-67-1	0.2s	ug/mLs
PFOSs	22I0344s	1763-23-1	0.186s	ug/mLs
PFOSAs	22I0344s	754-91-6	0.2s	ug/mLs
PFPEAs	22I0344s	2706-90-3	0.4s	ug/mLs
PFPEsS	22I0344s	630402-22-1s	0.188s	ug/mLs
PFTEDAs	22I0344s	376-06-7	0.2s	ug/mLs
PFTRDA	22I0344s	72629-94-8	0.2s	ug/mLs
PFUnA	22I0344s	2058-94-8s	0.2s	ug/mLs

Analytical Standard Record0

22J0552 0

Parent Standards used: 0

Standard 0	Description0	Prepared0	Prepared By0	Lot Nbr	Expires0	Last Edit0		(mls)0
21J0007	PFAS - SAS N-EtFOSA 50ug/mLs	08/12/2021s	Wellington Laboratories	NEtFOSA0821M	08/12/2026s	10/31/2022 14:36s	by DAGs	0.096s
21J0014	PFAS - SAS N-MeFOSE 50ug/mLs	09/22/2021s	Wellington Laboratories	NMeFOSE0921M	09/23/2026s	10/31/2022 14:35s	by DAGs	0.096s
21L0004s	PFAS - SAS 3:3FTA 50ug/mLs	12/07/2021	Wellington Laboratories	FPrPA1020s	11/12/2025s	10/31/2022 14:39s	by DAGs	0.096s
21L0005s	PFAS - SAS 5:3FTA 50ug/mLs	12/07/2021	Wellington Laboratories	FPePA1120s	11/11/2025s	10/31/2022 14:41s	by DAGs	0.096s
21L0006s	PFAS - SAS EtFOSE 50ug/mLs	12/07/2021	Wellington Laboratories	FPePA1120s	09/23/2026s	10/31/2022 14:41s	by DAGs	0.096s
21L0007	PFAS - SAS 7:3FTA 50ug/mLs	12/07/2021	Wellington Laboratories	FHpPA1020s	11/12/2025s	10/31/2022 14:42s	by DAGs	0.096s
21L0008s	PFAS - SAS N-MeFOSA 50ug/mLs	12/07/2021	Wellington Laboratories	NMeFOSA0721M	08/03/2026s	10/31/2022 14:42s	by DAGs	0.096s
22I0342s	PFAS - MIX MXG 2ug/mL	02/07/2022	Wellington Laboratories	PFACMXG0222	02/22/2027	10/31/2022 14:48s	by DAGs	1.2s
22I0343s	PFAS - MIX MXF 2ug/mL	01/10/2022s	Wellington Laboratories	PFACMXF0122	01/11/2025s	10/31/2022 14:55s	by DAGs	1.2s
22I0344s	PFAS - MIX MXH 1-4ug/mLs	08/05/2022s	Wellington Laboratories	PFACMXH0822	08/08/2027	10/31/2022 14:56s	by DAGs	1.2s

Analytical Standard Record

22K0039 0

Description:s	PFAS - MIX 1633 10ng/mL	Expires:s	05/01/2023 s
Standard Type:s	Analyte Spikes	Prepared:s	11/02/2022 s
Solvent:s	MeOHs	Prepared By: s	Andonios Karas
Final Volume (ml)s:s	10s	Department:s	PFAS s
Vials:s	1s	Last Edit: s	11/02/2022 12:56 by ABK

Analyte0	Parent0	CAS Number0	Concentration 0	Units0
11CL-PF3OUDS	22J0552	763051-92-9	0.0189s	ug/mLs
3:3FTCAs	22J0552	113507-82-7	0.04s	ug/mLs
4:2FTSs	22J0552	757124-72-4	0.0375	ug/mLs
5:3FTCAs	22J0552	914637-49-3	0.04s	ug/mLs
6:2FTSs	22J0552	27619-97-2	0.038s	ug/mLs
7:3FTCA	22J0552	812-70-4	0.04s	ug/mLs
8:2FTSs	22J0552	39108-34-4s	0.0384s	ug/mLs
9CL-PF3ONS	22J0552	756426-58-1	0.0187	ug/mLs
ADONA	22J0552	919005-14-4s	0.0189s	ug/mLs
HFPO-DAs	22J0552	13252-13-6s	0.02s	ug/mLs
NETFOSA	22J0552	4151-50-2s	0.04s	ug/mLs
NETFOSAA	22J0552	2991-50-6s	0.01s	ug/mLs
NETFOSE	22J0552	1691-99-2s	0.04s	ug/mLs
NFDHA	22J0552	151772-58-6	0.02s	ug/mLs
NMeFOSA	22J0552	31506-32-8s	0.04s	ug/mLs
NMeFOSAA	22J0552	2355-31-9s	0.01s	ug/mLs
NMeFOSE	22J0552	24448-09-7	0.04s	ug/mLs
PFBAs	22J0552	375-22-4	0.04s	ug/mLs
PFBsS	22J0552	375-73-5	0.00885s	ug/mLs
PFDAs	22J0552	335-76-2	0.01s	ug/mLs
PFDAs	22J0552	307-55-1	0.01s	ug/mLs
PFDOSs	22J0552	79780-39-5	0.0097	ug/mLs
PFDsS	22J0552	335-77-3	0.00965s	ug/mLs
PFEESAs	22J0552	113507-82-7	0.0178	ug/mLs
PFHPAs	22J0552	375-85-9	0.01s	ug/mLs
PFHPsS	22J0552	375-92-8	0.00955s	ug/mLs
PFHXA	22J0552	307-24-4	0.01s	ug/mLs
PFHXS	22J0552	355-46-4s	0.00915s	ug/mLs
PFMBAs	22J0552	863090-89-5s	0.02s	ug/mLs
PFMPAs	22J0552	377-73-1	0.02s	ug/mLs
PFNA	22J0552	375-95-1	0.01s	ug/mLs
PFNS	22J0552	68259-12-1s	0.0096s	ug/mLs
PFOAs	22J0552	335-67-1	0.01s	ug/mLs
PFOSs	22J0552	1763-23-1	0.0093s	ug/mLs
PFOSAs	22J0552	754-91-6	0.01s	ug/mLs
PFPEAs	22J0552	2706-90-3	0.02s	ug/mLs
PFPEsS	22J0552	630402-22-1s	0.0094s	ug/mLs
PFTEDAs	22J0552	376-06-7	0.01s	ug/mLs
PFTRDA	22J0552	72629-94-8	0.01s	ug/mLs
PFUnA	22J0552	2058-94-8s	0.01s	ug/mLs

Analytical Standard Record

22K0039 0**Parent Standards used: 0**

Standard 0	Description0	Prepared	Prepared By0	Lot Nbr0	Expires0	Last Edit0	(mls)0
22J0552	PFAS - MIX 1633 200ng/mLs	10/31/2022s	In house	xs	01/11/2025s	10/31/2022 15:40s by DAGs	0.5s

Analytical Standard Record0

22K0055 0

Description:s	MPFAC-HIF-ES-EISs	Expires:s	08/02/2025s
Standard Type:s	Others	Prepared:s	11/02/2022s
Solvent:s	meoh	Prepared By:s	Dipti Gokals
Final Volume (mls):s	1.2s	Department:s	PFASs
Vials:s	1s	Last Edit:s	11/02/2022 15:37 by DAG

Analyte0	Parent0	CAS Number	Concentration 0	Units0
13C2-4:2FTSs		13C2-4:2FTSs	1s	ug/mLs
13C2-6:2FTSs		13C2-6:2FTSs	1s	ug/mLs
13C2-8:2FTSs		13C2-8:2FTSs	1s	ug/mLs
13C2-PFDOAs		13C2-PFDOAs	0.25s	ug/mLs
13C2-PFTEDAs		13C2-PFTEDAs	0.25s	ug/mLs
13C3-HFPO-DAs		13C3-HFPO-DAs	2s	ug/mLs
13C3-PFBSSs		13C3-PFBSSs	0.5s	ug/mLs
13C3-PFHXS		13C3-PFHXS	0.5s	ug/mLs
13C4-PFBAs		13C4-PFBAs	2s	ug/mLs
13C4-PFHPAs		13C4-PFHPAs	0.5s	ug/mLs
13C5-PFHXA		13C5-PFHXA	0.5s	ug/mLs
13C5-PFPEAs		13C5-PFPEAs	1s	ug/mLs
13C6-PFDAs		13C6-PFDAs	0.25s	ug/mLs
13C7-PFUnA		13C7-PFUDA	0.25s	ug/mLs
13C8-PFOAs		13C8-PFOAs	0.5s	ug/mLs
13C8-PFOSs		13C8-PFOSs	0.5s	ug/mLs
13C8-PFOSAs		13C8-PFOSAs	0.5s	ug/mLs
13C9-PFNA		13C9-PFNA	0.25s	ug/mLs
D3-NMEFOSA		D3-NMEFOSA	0.5s	ug/mLs
D3-NMEFOSAA		D3-NMEFOSAA	1s	ug/mLs
D5-NETFOSA		D5-NETFOSA	0.5s	ug/mLs
D5-NETFOSAA		D5-NETFOSAA	1s	ug/mLs
D7-NMEFOSE		D7-NMEFOSE	5s	ug/mLs
D9-NETFOSSE		D9-NETFOSSE	5s	ug/mLs

Analytical Standard Record0

22K0 550

Description:s	MPFAC-HIF-ES-EISs	Expires:s	08/02/2025s
Standard Type:s	Others	Prepared:s	07/20/2022
Solvent:s	meoh	Prepared By:s	Wellington Laboratories (Lot#: MPFACHIFES0822)s
Final Volume (mls):s	1.2s	Department:s	MPFAS
Vials:s	1s	Last Edit:s	11/04/2022 10:46 by DAGs

Analyte0	Parent0	CAS Number	Concentration 0	Units0
13C2-4:2FTSs		13C2-4:2FTSs	1s	ug/mLs
13C2-6:2FTSs		13C2-6:2FTSs	1s	ug/mLs
13C2-8:2FTSs		13C2-8:2FTSs	1s	ug/mLs
13C2-PFDOAs		13C2-PFDOAs	0.25s	ug/mLs
13C2-PFTEDAs		13C2-PFTEDAs	0.25s	ug/mLs
13C3-HFPO-DAs		13C3-HFPO-DAs	2s	ug/mLs
13C3-PFBSs		13C3-PFBSs	0.5s	ug/mLs
13C3-PFHXS		13C3-PFHXS	0.5s	ug/mLs
13C4-PFBAs		13C4-PFBAs	2s	ug/mLs
13C4-PFHPAs		13C4-PFHPAs	0.5s	ug/mLs
13C5-PFHXA		13C5-PFHXA	0.5s	ug/mLs
13C5-PFPEAs		13C5-PFPEAs	1s	ug/mLs
13C6-PFDAs		13C6-PFDAs	0.25s	ug/mLs
13C7-PFUnA		13C7-PFUDA	0.25s	ug/mLs
13C8-PFOAs		13C8-PFOAs	0.5s	ug/mLs
13C8-PFOSs		13C8-PFOSs	0.5s	ug/mLs
13C8-PFOSAs		13C8-PFOSAs	0.5s	ug/mLs
13C9-PFNA		13C9-PFNA	0.25s	ug/mLs
D3-NMEFOSA		D3-NMEFOSA	0.5s	ug/mLs
D3-NMEFOSAA		D3-NMEFOSAA	1s	ug/mLs
D5-NETFOSA		D5-NETFOSA	0.5s	ug/mLs
D5-NETFOSAA		D5-NETFOSAA	1s	ug/mLs
D7-NMEFOSE		D7-NMEFOSE	5s	ug/mLs
D9-NETFOSSE		D9-NETFOSSE	5s	ug/mLs



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

MPFAC-HIF-ES

Mass-Labelled PFAS Extraction Standard Solution/Mixture

<u>PRODUCT CODE:</u>	MPFAC-HIF-ES
<u>LOT NUMBER:</u>	MPFACHIFES0822
<u>SOLVENT(S):</u>	Methanol/Isopropanol (1%)/Water (<1%)
<u>DATE PREPARED:</u> (mm/dd/yyyy)	07/20/2022
<u>LAST TESTED:</u> (mm/dd/yyyy)	08/02/2022
<u>EXPIRY DATE:</u> (mm/dd/yyyy)	08/02/2025
<u>RECOMMENDED STORAGE:</u>	Refrigerate ampoule

DESCRIPTION:

MPFAC-HIF-ES is a solution/mixture of ten mass-labelled (^{13}C) perfluoroalkylcarboxylic acids (C_4 - C_{12} , C_{14}), three mass-labelled (^{13}C) perfluoroalkanesulfonates (C_4 , C_6 , and C_8), three mass-labelled (one ^{13}C and two ^2H) perfluoro-1-octanesulfonamides, three mass-labelled (^{13}C) fluorotelomer sulfonates (4:2, 6:2, and 8:2), two mass-labelled (^2H) perfluorooctanesulfonamidoacetic acids, two mass-labelled (^2H) perfluorooctanesulfonamidoethanols, and mass-labelled (^{13}C) hexafluoropropylene oxide dimer acid (GenX, M3HFPO-DA). The components and their concentrations are given in Table A.

The individual ^{13}C -labelled components all have chemical purities >98% and isotopic purities of $\geq 99\%$. The individual ^2H -labelled components all have chemical purities >98% and isotopic purities of $\geq 98\%$.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
Figure 1: LC/MS Data (SIR)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acids to their respective methyl esters.


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Table A: MPFAC-HIF-ES; Components and Concentrations
(ng/mL, ± 5% in methanol/isopropanol (1%)/water (<1%))

Compound	Acronym	Concentration (ng/mL)		Peak Assignment in Figure 1
		as the salt	as the acid	
Perfluoro-n-(¹³ C ₄)butanoic acid	MPFBA	2000		1
Perfluoro-n-(¹³ C ₅)pentanoic acid	M5PFPeA	1000		2
Perfluoro-n-(1,2,3,4,6- ¹³ C ₅)hexanoic acid	M5PFHxA	500		5
Perfluoro-n-(1,2,3,4- ¹³ C ₄)heptanoic acid	M4PFHpA	500		7
Perfluoro-n-(¹³ C ₈)octanoic acid	M8PFOA	500		10
Perfluoro-n-(¹³ C ₉)nonanoic acid	M9PFNA	250		11
Perfluoro-n-(1,2,3,4,5,6- ¹³ C ₆)decanoic acid	M6PFDA	250		14
Perfluoro-n-(1,2,3,4,5,6,7- ¹³ C ₇)undecanoic acid	M7PFUdA	250		17
Perfluoro-n-(1,2- ¹³ C ₂)dodecanoic acid	MPFD _o A	250		19
Perfluoro-n-(1,2- ¹³ C ₂)tetradecanoic acid	M2PFTeDA	250		23
Perfluoro-1-(¹³ C ₈)octanesulfonamide	M8FOSA	500		18
N-methyl-d ₃ -perfluoro-1-octanesulfonamide	d-N-MeFOSA	500		21
N-ethyl-d ₅ -perfluoro-1-octanesulfonamide	d-N-EtFOSA	500		24
N-methyl-d ₃ -perfluoro-1-octanesulfonamidoacetic acid	d3-N-MeFOSAA	1000		15
N-ethyl-d ₅ -perfluoro-1-octanesulfonamidoacetic acid	d5-N-EtFOSAA	1000		16
2-(N-methyl-d ₃ -perfluoro-1-octanesulfonamido)ethan-d ₄ -ol	d7-N-MeFOSE	5000		20
2-(N-ethyl-d ₅ -perfluoro-1-octanesulfonamido)ethan-d ₄ -ol	d9-N-EtFOSE	5000		22
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)(¹³ C ₃)propanoic acid	M3HFPO-DA	2000		6
Compound	Acronym	Concentration* (ng/mL)		Peak Assignment in Figure 1
		as the salt	as the acid	
Sodium perfluoro-1-(2,3,4- ¹³ C ₃)butanesulfonate	M3PFBS	500	466	3
Sodium perfluoro-1-(1,2,3- ¹³ C ₃)hexanesulfonate	M3PFHxS	500	474	8
Sodium perfluoro-1-(¹³ C ₈)octanesulfonate	M8PFOS	500	479	12
Sodium 1H,1H,2H,2H-perfluoro-(1,2- ¹³ C ₂)hexanesulfonate	M2-4:2FTS	1000	938	4
Sodium 1H,1H,2H,2H-perfluoro-(1,2- ¹³ C ₂)octanesulfonate	M2-6:2FTS	1000	951	9
Sodium 1H,1H,2H,2H-perfluoro-(1,2- ¹³ C ₂)decanesulfonate	M2-8:2FTS	1000	960	13

* Concentrations have been rounded to three significant figures.

Certified By: 
B.G. Chittim, General Manager

Date: 08/02/2022
(mm/dd/yyyy)



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

MPFAC-HIF-ES

Mass-Labelled PFAS Extraction Standard Solution/Mixture

<u>PRODUCT CODE:</u>	MPFAC-HIF-ES
<u>LOT NUMBER:</u>	MPFACHIFES0822
<u>SOLVENT(S):</u>	Methanol/Isopropanol (1%)/Water (<1%)
<u>DATE PREPARED:</u> (mm/dd/yyyy)	07/20/2022
<u>LAST TESTED:</u> (mm/dd/yyyy)	08/02/2022
<u>EXPIRY DATE:</u> (mm/dd/yyyy)	08/02/2025
<u>RECOMMENDED STORAGE:</u>	Refrigerate ampoule

DESCRIPTION:

MPFAC-HIF-ES is a solution/mixture of ten mass-labelled (^{13}C) perfluoroalkylcarboxylic acids (C_4 - C_{12} , C_{14}), three mass-labelled (^{13}C) perfluoroalkanesulfonates (C_4 , C_6 , and C_8), three mass-labelled (one ^{13}C and two ^2H) perfluoro-1-octanesulfonamides, three mass-labelled (^{13}C) fluorotelomer sulfonates (4:2, 6:2, and 8:2), two mass-labelled (^2H) perfluorooctanesulfonamidoacetic acids, two mass-labelled (^2H) perfluorooctanesulfonamidoethanols, and mass-labelled (^{13}C) hexafluoropropylene oxide dimer acid (GenX, M3HFPO-DA). The components and their concentrations are given in Table A.

The individual ^{13}C -labelled components all have chemical purities >98% and isotopic purities of $\geq 99\%$. The individual ^2H -labelled components all have chemical purities >98% and isotopic purities of $\geq 98\%$.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
Figure 1: LC/MS Data (SIR)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acids to their respective methyl esters.


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Table A: MPFAC-HIF-ES; Components and Concentrations
(ng/mL, ± 5% in methanol/isopropanol (1%)/water (<1%))

Compound	Acronym	Concentration (ng/mL)		Peak Assignment in Figure 1
		as the salt	as the acid	
Perfluoro-n-(¹³ C ₄)butanoic acid	MPFBA	2000		1
Perfluoro-n-(¹³ C ₅)pentanoic acid	M5PFPeA	1000		2
Perfluoro-n-(1,2,3,4,6- ¹³ C ₅)hexanoic acid	M5PFHxA	500		5
Perfluoro-n-(1,2,3,4- ¹³ C ₄)heptanoic acid	M4PFHpA	500		7
Perfluoro-n-(¹³ C ₈)octanoic acid	M8PFOA	500		10
Perfluoro-n-(¹³ C ₉)nonanoic acid	M9PFNA	250		11
Perfluoro-n-(1,2,3,4,5,6- ¹³ C ₆)decanoic acid	M6PFDA	250		14
Perfluoro-n-(1,2,3,4,5,6,7- ¹³ C ₇)undecanoic acid	M7PFUdA	250		17
Perfluoro-n-(1,2- ¹³ C ₂)dodecanoic acid	MPFD _o A	250		19
Perfluoro-n-(1,2- ¹³ C ₂)tetradecanoic acid	M2PFTeDA	250		23
Perfluoro-1-(¹³ C ₈)octanesulfonamide	M8FOSA	500		18
N-methyl-d ₃ -perfluoro-1-octanesulfonamide	d-N-MeFOSA	500		21
N-ethyl-d ₅ -perfluoro-1-octanesulfonamide	d-N-EtFOSA	500		24
N-methyl-d ₃ -perfluoro-1-octanesulfonamidoacetic acid	d3-N-MeFOSAA	1000		15
N-ethyl-d ₅ -perfluoro-1-octanesulfonamidoacetic acid	d5-N-EtFOSAA	1000		16
2-(N-methyl-d ₃ -perfluoro-1-octanesulfonamido)ethan-d ₄ -ol	d7-N-MeFOSE	5000		20
2-(N-ethyl-d ₅ -perfluoro-1-octanesulfonamido)ethan-d ₄ -ol	d9-N-EtFOSE	5000		22
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)(¹³ C ₃)propanoic acid	M3HFPO-DA	2000		6
Compound	Acronym	Concentration* (ng/mL)		Peak Assignment in Figure 1
		as the salt	as the acid	
Sodium perfluoro-1-(2,3,4- ¹³ C ₃)butanesulfonate	M3PFBS	500	466	3
Sodium perfluoro-1-(1,2,3- ¹³ C ₃)hexanesulfonate	M3PFHxS	500	474	8
Sodium perfluoro-1-(¹³ C ₈)octanesulfonate	M8PFOS	500	479	12
Sodium 1H,1H,2H,2H-perfluoro-(1,2- ¹³ C ₂)hexanesulfonate	M2-4:2FTS	1000	938	4
Sodium 1H,1H,2H,2H-perfluoro-(1,2- ¹³ C ₂)octanesulfonate	M2-6:2FTS	1000	951	9
Sodium 1H,1H,2H,2H-perfluoro-(1,2- ¹³ C ₂)decanesulfonate	M2-8:2FTS	1000	960	13

* Concentrations have been rounded to three significant figures.

Certified By: 
B.G. Chittim, General Manager

Date: 08/02/2022
(mm/dd/yyyy)



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

MPFAC-HIF-ES

Mass-Labelled PFAS Extraction Standard Solution/Mixture

<u>PRODUCT CODE:</u>	MPFAC-HIF-ES
<u>LOT NUMBER:</u>	MPFACHIFES0822
<u>SOLVENT(S):</u>	Methanol/Isopropanol (1%)/Water (<1%)
<u>DATE PREPARED:</u> (mm/dd/yyyy)	07/20/2022
<u>LAST TESTED:</u> (mm/dd/yyyy)	08/02/2022
<u>EXPIRY DATE:</u> (mm/dd/yyyy)	08/02/2025
<u>RECOMMENDED STORAGE:</u>	Refrigerate ampoule

DESCRIPTION:

MPFAC-HIF-ES is a solution/mixture of ten mass-labelled (^{13}C) perfluoroalkylcarboxylic acids (C_4 - C_{12} , C_{14}), three mass-labelled (^{13}C) perfluoroalkanesulfonates (C_4 , C_6 , and C_8), three mass-labelled (one ^{13}C and two ^2H) perfluoro-1-octanesulfonamides, three mass-labelled (^{13}C) fluorotelomer sulfonates (4:2, 6:2, and 8:2), two mass-labelled (^2H) perfluorooctanesulfonamidoacetic acids, two mass-labelled (^2H) perfluorooctanesulfonamidoethanols, and mass-labelled (^{13}C) hexafluoropropylene oxide dimer acid (GenX, M3HFPO-DA). The components and their concentrations are given in Table A.

The individual ^{13}C -labelled components all have chemical purities >98% and isotopic purities of $\geq 99\%$. The individual ^2H -labelled components all have chemical purities >98% and isotopic purities of $\geq 98\%$.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
Figure 1: LC/MS Data (SIR)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acids to their respective methyl esters.


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Table A: MPFAC-HIF-ES; Components and Concentrations
(ng/mL, ± 5% in methanol/isopropanol (1%)/water (<1%))

Compound	Acronym	Concentration (ng/mL)		Peak Assignment in Figure 1
		as the salt	as the acid	
Perfluoro-n-(¹³ C ₄)butanoic acid	MPFBA	2000		1
Perfluoro-n-(¹³ C ₅)pentanoic acid	M5PFPeA	1000		2
Perfluoro-n-(1,2,3,4,6- ¹³ C ₅)hexanoic acid	M5PFHxA	500		5
Perfluoro-n-(1,2,3,4- ¹³ C ₄)heptanoic acid	M4PFHpA	500		7
Perfluoro-n-(¹³ C ₈)octanoic acid	M8PFOA	500		10
Perfluoro-n-(¹³ C ₉)nonanoic acid	M9PFNA	250		11
Perfluoro-n-(1,2,3,4,5,6- ¹³ C ₆)decanoic acid	M6PFDA	250		14
Perfluoro-n-(1,2,3,4,5,6,7- ¹³ C ₇)undecanoic acid	M7PFUdA	250		17
Perfluoro-n-(1,2- ¹³ C ₂)dodecanoic acid	MPFD _o A	250		19
Perfluoro-n-(1,2- ¹³ C ₂)tetradecanoic acid	M2PFTeDA	250		23
Perfluoro-1-(¹³ C ₈)octanesulfonamide	M8FOSA	500		18
N-methyl-d ₃ -perfluoro-1-octanesulfonamide	d-N-MeFOSA	500		21
N-ethyl-d ₅ -perfluoro-1-octanesulfonamide	d-N-EtFOSA	500		24
N-methyl-d ₃ -perfluoro-1-octanesulfonamidoacetic acid	d3-N-MeFOSAA	1000		15
N-ethyl-d ₅ -perfluoro-1-octanesulfonamidoacetic acid	d5-N-EtFOSAA	1000		16
2-(N-methyl-d ₃ -perfluoro-1-octanesulfonamido)ethan-d ₄ -ol	d7-N-MeFOSE	5000		20
2-(N-ethyl-d ₅ -perfluoro-1-octanesulfonamido)ethan-d ₄ -ol	d9-N-EtFOSE	5000		22
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)(¹³ C ₃)propanoic acid	M3HFPO-DA	2000		6
Compound	Acronym	Concentration* (ng/mL)		Peak Assignment in Figure 1
		as the salt	as the acid	
Sodium perfluoro-1-(2,3,4- ¹³ C ₃)butanesulfonate	M3PFBS	500	466	3
Sodium perfluoro-1-(1,2,3- ¹³ C ₃)hexanesulfonate	M3PFHxS	500	474	8
Sodium perfluoro-1-(¹³ C ₈)octanesulfonate	M8PFOS	500	479	12
Sodium 1H,1H,2H,2H-perfluoro-(1,2- ¹³ C ₂)hexanesulfonate	M2-4:2FTS	1000	938	4
Sodium 1H,1H,2H,2H-perfluoro-(1,2- ¹³ C ₂)octanesulfonate	M2-6:2FTS	1000	951	9
Sodium 1H,1H,2H,2H-perfluoro-(1,2- ¹³ C ₂)decanesulfonate	M2-8:2FTS	1000	960	13

* Concentrations have been rounded to three significant figures.

Certified By: 
B.G. Chittim, General Manager

Date: 08/02/2022
(mm/dd/yyyy)

Analytical Standard Record

22K0097 0

Description:s	MPFAC-HIF-ES-EISs	Expires:s	08/02/2025 s
Standard Type:s	Others	Prepared: s	07/20/2022
Solvent: s	meoh	Prepared By:s	Wellington Laboratories (Lot#: MPFACHIFES0822)s
Final Volume (mls):s	1.2s	Department:s	MPFAS
Vials:s	1s	Last Edit:s	11/04/2022 10:47 by DAG

Analyte0	Parent0	CAS Number0	Concentration 0	Units0
13C2-4:2FTSs		13C2-4:2FTSs	1s	ug/mLs
13C2-6:2FTSs		13C2-6:2FTSs	1s	ug/mLs
13C2-8:2FTSs		13C2-8:2FTSs	1s	ug/mLs
13C2-PFDOAs		13C2-PFDOAs	0.25s	ug/mLs
13C2-PFTEDAs		13C2-PFTEDAs	0.25s	ug/mLs
13C3-HFPO-DAs		13C3-HFPO-DAs	2s	ug/mLs
13C3-PFBSs		13C3-PFBSs	0.5s	ug/mLs
13C3-PFHXS		13C3-PFHXS	0.5s	ug/mLs
13C4-PFBAs		13C4-PFBAs	2s	ug/mLs
13C4-PFHPAs		13C4-PFHPAs	0.5s	ug/mLs
13C5-PFHXA		13C5-PFHXA	0.5s	ug/mLs
13C5-PFPEAs		13C5-PFPEAs	1s	ug/mLs
13C6-PFDAs		13C6-PFDAs	0.25s	ug/mLs
13C7-PFUhA		13C7-PFUhA	0.25s	ug/mLs
13C8-PFOAs		13C8-PFOAs	0.5s	ug/mLs
13C8-PFOSs		13C8-PFOSs	0.5s	ug/mLs
13C8-PFOSAs		13C8-PFOSAs	0.5s	ug/mLs
13C9-PFNA		13C9-PFNA	0.25s	ug/mLs
D3-NMEFOSA		D3-NMEFOSA	0.5s	ug/mLs
D3-NMEFOSAA		D3-NMEFOSAA	1s	ug/mLs
D5-NETFOSA		D5-NETFOSA	0.5s	ug/mLs
D5-NETFOSAA		D5-NETFOSAA	1s	ug/mLs
D7-NMEFOSE		D7-NMEFOSE	5s	ug/mLs
D9-NETFOSSE		D9-NETFOSSE	5s	ug/mLs



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

MPFAC-HIF-ES

Mass-Labelled PFAS Extraction Standard Solution/Mixture

<u>PRODUCT CODE:</u>	MPFAC-HIF-ES
<u>LOT NUMBER:</u>	MPFACHIFES0822
<u>SOLVENT(S):</u>	Methanol/Isopropanol (1%)/Water (<1%)
<u>DATE PREPARED:</u> (mm/dd/yyyy)	07/20/2022
<u>LAST TESTED:</u> (mm/dd/yyyy)	08/02/2022
<u>EXPIRY DATE:</u> (mm/dd/yyyy)	08/02/2025
<u>RECOMMENDED STORAGE:</u>	Refrigerate ampoule

DESCRIPTION:

MPFAC-HIF-ES is a solution/mixture of ten mass-labelled (^{13}C) perfluoroalkylcarboxylic acids (C_4 - C_{12} , C_{14}), three mass-labelled (^{13}C) perfluoroalkanesulfonates (C_4 , C_6 , and C_8), three mass-labelled (one ^{13}C and two ^2H) perfluoro-1-octanesulfonamides, three mass-labelled (^{13}C) fluorotelomer sulfonates (4:2, 6:2, and 8:2), two mass-labelled (^2H) perfluorooctanesulfonamidoacetic acids, two mass-labelled (^2H) perfluorooctanesulfonamidoethanols, and mass-labelled (^{13}C) hexafluoropropylene oxide dimer acid (GenX, M3HFPO-DA). The components and their concentrations are given in Table A.

The individual ^{13}C -labelled components all have chemical purities >98% and isotopic purities of $\geq 99\%$. The individual ^2H -labelled components all have chemical purities >98% and isotopic purities of $\geq 98\%$.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
Figure 1: LC/MS Data (SIR)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acids to their respective methyl esters.


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Table A: MPFAC-HIF-ES; Components and Concentrations
(ng/mL, ± 5% in methanol/isopropanol (1%)/water (<1%))

Compound	Acronym	Concentration (ng/mL)		Peak Assignment in Figure 1
		as the salt	as the acid	
Perfluoro-n-(¹³ C ₄)butanoic acid	MPFBA	2000		1
Perfluoro-n-(¹³ C ₅)pentanoic acid	M5PFPeA	1000		2
Perfluoro-n-(1,2,3,4,6- ¹³ C ₅)hexanoic acid	M5PFHxA	500		5
Perfluoro-n-(1,2,3,4- ¹³ C ₄)heptanoic acid	M4PFHpA	500		7
Perfluoro-n-(¹³ C ₈)octanoic acid	M8PFOA	500		10
Perfluoro-n-(¹³ C ₉)nonanoic acid	M9PFNA	250		11
Perfluoro-n-(1,2,3,4,5,6- ¹³ C ₆)decanoic acid	M6PFDA	250		14
Perfluoro-n-(1,2,3,4,5,6,7- ¹³ C ₇)undecanoic acid	M7PFUdA	250		17
Perfluoro-n-(1,2- ¹³ C ₂)dodecanoic acid	MPFD _o A	250		19
Perfluoro-n-(1,2- ¹³ C ₂)tetradecanoic acid	M2PFTeDA	250		23
Perfluoro-1-(¹³ C ₈)octanesulfonamide	M8FOSA	500		18
N-methyl-d ₃ -perfluoro-1-octanesulfonamide	d-N-MeFOSA	500		21
N-ethyl-d ₅ -perfluoro-1-octanesulfonamide	d-N-EtFOSA	500		24
N-methyl-d ₃ -perfluoro-1-octanesulfonamidoacetic acid	d3-N-MeFOSAA	1000		15
N-ethyl-d ₅ -perfluoro-1-octanesulfonamidoacetic acid	d5-N-EtFOSAA	1000		16
2-(N-methyl-d ₃ -perfluoro-1-octanesulfonamido)ethan-d ₄ -ol	d7-N-MeFOSE	5000		20
2-(N-ethyl-d ₅ -perfluoro-1-octanesulfonamido)ethan-d ₄ -ol	d9-N-EtFOSE	5000		22
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)(¹³ C ₃)propanoic acid	M3HFPO-DA	2000		6
Compound	Acronym	Concentration* (ng/mL)		Peak Assignment in Figure 1
		as the salt	as the acid	
Sodium perfluoro-1-(2,3,4- ¹³ C ₃)butanesulfonate	M3PFBS	500	466	3
Sodium perfluoro-1-(1,2,3- ¹³ C ₃)hexanesulfonate	M3PFHxS	500	474	8
Sodium perfluoro-1-(¹³ C ₈)octanesulfonate	M8PFOS	500	479	12
Sodium 1H,1H,2H,2H-perfluoro-(1,2- ¹³ C ₂)hexanesulfonate	M2-4:2FTS	1000	938	4
Sodium 1H,1H,2H,2H-perfluoro-(1,2- ¹³ C ₂)octanesulfonate	M2-6:2FTS	1000	951	9
Sodium 1H,1H,2H,2H-perfluoro-(1,2- ¹³ C ₂)decanesulfonate	M2-8:2FTS	1000	960	13

* Concentrations have been rounded to three significant figures.

Certified By: 
B.G. Chittim, General Manager

Date: 08/02/2022
(mm/dd/yyyy)

Analytical Standard Record0

22K05020

Description:s	PFAS IIS 7C 40ng/mL	Expires:s	01/20/2023s
Standard Type:s	Internal Standards	Prepared:s	11/28/2022s
Solvent:	MeOH/62286s	Prepared By:s	Dipti Gokals
Final Volume (mls):	25s	Department:s	PFASs
Vials:s	1s	Last Edit:s	11/28/2022 15:10 by DAGs

Analyte0	Parent0	CAS Number	Concentration 0	Units0
13C2-PFDAs	22A0234s	13C2-PFDAs	0.04s	ug/mLs
13C2-PFHxA	22A0234s	13C2-PFHxAs	0.04s	ug/mLs
13C3-PFBAs	22A0234s	13C3-PFBAs	0.04s	ug/mLs
13C4-PFOAs	22A0234s	13C4-PFOAs	0.04s	ug/mLs
13C4-PFOSS	22A0234s	13C4-PFOSS	0.04s	ug/mLs
13C5-PFNA	22A0234s	13C5-PFNA	0.04s	ug/mLs
18O2-PFHXS	22A0234s	18O2-PFHXS	0.04s	ug/mLs

Parent Standards used: 0

Standard 0	Description0	Prepared	Prepared By0	Lot Nbr0	Expires0	Last Edit0	(mls)0
22A0234s	PFAS IIS 7C 5ug/mL	01/20/2022s	In house	*	01/20/2023s	01/20/2022 15:49s by HGHS	0.2s

Analytical Standard Record

22K05030

Description:s	1633- IIS Static 1ng/mLs	Expires:s	01/20/2023s
Standard Type:s	Internal Standards	Prepared:s	11/28/2022s
Solvent:	MeOH/62286s	Prepared By:s	Dipti Gokals
Final Volume (mLs):	2s	Department:s	PFASs
Vials:s	1s	Last Edit:s	11/28/2022 15:11 by DAGs

Analyte0	Parent0	CAS Number0	Concentration 0	Units0
13C2-PFDAs	22K0502	13C2-PFDAs	0.001s	ug/mLs
13C2-PFHxA	22K0502	13C2-PFHxAs	0.001s	ug/mLs
13C3-PFBAs	22K0502	13C3-PFBAs	0.001s	ug/mLs
13C4-PFOAs	22K0502	13C4-PFOAs	0.001s	ug/mLs
13C4-PFOSS	22K0502	13C4-PFOSS	0.001s	ug/mLs
13C5-PFNA	22K0502	13C5-PFNA	0.001s	ug/mLs
18O2-PFHXS	22K0502	18O2-PFHXS	0.001s	ug/mLs

Parent Standards used: 0

Standard 0	Description0	Prepared	Prepared By0	Lot Nbr0	Expires0	Last Edit0	(mLs)0
22K0502	PFAS IIS 7C 40ng/mL	11/28/2022s	In house	*	01/20/2023s	11/28/2022 15:10s by DAGs	0.05s

Analytical Standard Record

22L0020L

Description:s	MPFAC-HIF-ES 20.0ng/mLs	Expires:s	05/30/2023s
Standard Type:s	Surrogate Spikes	Prepared:s	12/01/2022s
Solvent:s	MeOH/62244s	Prepared By:s	Andonios Karas
Final Volume (mL)s:s	10s	Department:s	PFASs
Vials:s	1s	Last Edit:s	12/01/2022 17:40 by ABK
Comments:l	Half the concentration of previous EIS solution used for 1633/B-15.l Double the spiking volume from 100 uL to 200 uLl		

AnalyteL	ParentL	CAS NumberL	Concentration L	UnitsL
13C2-4:2FTSs	22K0055	13C2-4:2FTSs	0.04s	ug/mLs
13C2-6:2FTSs	22K0055	13C2-6:2FTSs	0.04s	ug/mLs
13C2-8:2FTSs	22K0055	13C2-8:2FTSs	0.04s	ug/mLs
13C2-PFDOAs	22K0055	13C2-PFDOAs	0.01s	ug/mLs
13C2-PFTEDAs	22K0055	13C2-PFTEDAs	0.01s	ug/mLs
13C3-HFPO-DAs	22K0055	13C3-HFPO-DAs	0.08s	ug/mLs
13C3-PFBSs	22K0055	13C3-PFBSs	0.02s	ug/mLs
13C3-PFHXS	22K0055	13C3-PFHXS	0.02s	ug/mLs
13C4-PFBAs	22K0055	13C4-PFBAs	0.08s	ug/mLs
13C4-PFHPAs	22K0055	13C4-PFHPAs	0.02s	ug/mLs
13C5-PFHXA	22K0055	13C5-PFHXA	0.02s	ug/mLs
13C5-PFPEAs	22K0055	13C5-PFPEAs	0.04s	ug/mLs
13C6-PFDAs	22K0055	13C6-PFDAs	0.01s	ug/mLs
13C7-PFUhA	22K0055	13C7-PFUJA	0.01s	ug/mLs
13C8-PFOAs	22K0055	13C8-PFOAs	0.02s	ug/mLs
13C8-PFOSs	22K0055	13C8-PFOSs	0.02s	ug/mLs
13C8-PFOSAs	22K0055	13C8-PFOSAs	0.02s	ug/mLs
13C9-PFNA	22K0055	13C9-PFNA	0.01s	ug/mLs
D3-NMEFOSA	22K0055	D3-NMEFOSA	0.02s	ug/mLs
D3-NMEFOSAA	22K0055	D3-NMEFOSAA	0.04s	ug/mLs
D5-NETFOSA	22K0055	D5-NETFOSA	0.02s	ug/mLs
D5-NETFOSAA	22K0055	D5-NETFOSAA	0.04s	ug/mLs
D7-NMEFOSE	22K0055	D7-NMEFOSE	0.2s	ug/mLs
D9-NETFOSSE	22K0055	D9-NETFOSSE	0.2s	ug/mLs

Parent Standards used: 0

Standard 0	Description0	Prepared	Prepared By0	Lot Nbr0	Expires0	Last Edit0	(mL)0
22K0055	MPFAC-HIF-ES-EISs	07/20/2022	Wellington Laboratories	MPFACHIFES0822s	08/02/2025s	11/04/2022 12:15s by DAGs	0.4s

Analytical Standard Record

22L0117L

Description:s	MPFAC-HIF-ES 20.0ng/mLs	Expires:s	06/05/2023s
Standard Type:s	Surrogate Spikes	Prepared:s	12/07/2022s
Solvent:s	MeOH/62244s	Prepared By:s	Dipti Gokals
Final Volume (ml)s:s	10s	Department:s	PFASs
Vials:s	3s	Last Edit:s	12/07/2022 10:55 by DAGs
Comments:l	Half the concentration of previous EIS solution used for 1633/B-15.l Double the spiking volume from 100 uL to 200 uLl		

AnalyteL	ParentL	CAS NumberL	Concentration L	UnitsL
13C2-4:2FTSs	22K0097s	13C2-4:2FTSs	0.04s	ug/mLs
13C2-6:2FTSs	22K0097s	13C2-6:2FTSs	0.04s	ug/mLs
13C2-8:2FTSs	22K0097s	13C2-8:2FTSs	0.04s	ug/mLs
13C2-PFDOAs	22K0097s	13C2-PFDOAs	0.01s	ug/mLs
13C2-PFTEDAs	22K0097s	13C2-PFTEDAs	0.01s	ug/mLs
13C3-HFPO-DAs	22K0097s	13C3-HFPO-DAs	0.08s	ug/mLs
13C3-PFBSs	22K0097s	13C3-PFBSs	0.02s	ug/mLs
13C3-PFHXSs	22K0097s	13C3-PFHXSs	0.02s	ug/mLs
13C4-PFBAs	22K0097s	13C4-PFBAs	0.08s	ug/mLs
13C4-PFHPAs	22K0097s	13C4-PFHPAs	0.02s	ug/mLs
13C5-PFHxAs	22K0097s	13C5-PFHxAs	0.02s	ug/mLs
13C5-PFPEAs	22K0097s	13C5-PFPEAs	0.04s	ug/mLs
13C6-PFDAs	22K0097s	13C6-PFDAs	0.01s	ug/mLs
13C7-PFUhAs	22K0097s	13C7-PFUhAs	0.01s	ug/mLs
13C8-PFOAs	22K0097s	13C8-PFOAs	0.02s	ug/mLs
13C8-PFOSs	22K0097s	13C8-PFOSs	0.02s	ug/mLs
13C8-PFOSAs	22K0097s	13C8-PFOSAs	0.02s	ug/mLs
13C9-PFNAs	22K0097s	13C9-PFNAs	0.01s	ug/mLs
D3-NMEFOSAs	22K0097s	D3-NMEFOSAs	0.02s	ug/mLs
D3-NMEFOSAAs	22K0097s	D3-NMEFOSAAs	0.04s	ug/mLs
D5-NETFOSAs	22K0097s	D5-NETFOSAs	0.02s	ug/mLs
D5-NETFOSAAs	22K0097s	D5-NETFOSAAs	0.04s	ug/mLs
D7-NMEFOSEs	22K0097s	D7-NMEFOSEs	0.2s	ug/mLs
D9-NETFOSSEs	22K0097s	D9-NETFOSSEs	0.2s	ug/mLs

Parent Standards used: 0

Standard 0	Description0	Prepared	Prepared By0	Lot Nbr0	Expires0	Last Edit0	(mls)0
22K0097s	MPFAC-HIF-ES-EISs	07/20/2022s	Wellington Laboratories	MPFACHIFES0822s	08/02/2025s	11/04/2022 12:17s by DAGs	0.4s

Analytical Standard Record

22L02690

Description:s	PFAS - MIX 1633 10ng/mLs	Expires:s	06/12/2023s
Standard Type:s	Analyte Spikes	Prepared:s	12/14/2022s
Solvent:s	MeOHs	Prepared By:s	Dipti Gokals
Final Volume (mls):s	10s	Department:s	PFASs
Vials:s	1s	Last Edit:s	12/14/2022 12:00 by DAGs

Analyte0	Parent0	CAS Number0	Concentration 0	Units0
11CL-PF3OUDSs	22J0552	763051-92-9s	0.0189s	ug/mLs
3:3FTCAs	22J0552	113507-82-7	0.04s	ug/mLs
4:2FTSs	22J0552	757124-72-4	0.0375	ug/mLs
5:3FTCAs	22J0552	914637-49-3	0.04s	ug/mLs
6:2FTSs	22J0552	27619-97-2	0.038s	ug/mLs
7:3FTCA	22J0552	812-70-4	0.04s	ug/mLs
8:2FTSs	22J0552	39108-34-4s	0.0384s	ug/mLs
9CL-PF3ONS	22J0552	756426-58-1	0.0187	ug/mLs
ADONA	22J0552	919005-14-4s	0.0189s	ug/mLs
HFPO-DAs	22J0552	13252-13-6s	0.02s	ug/mLs
NETFOSA	22J0552	4151-50-2s	0.04s	ug/mLs
NETFOSAA	22J0552	2991-50-6s	0.01s	ug/mLs
NETFOSE	22J0552	1691-99-2s	0.04s	ug/mLs
NFDHA	22J0552	151772-58-6	0.02s	ug/mLs
NMeFOSA	22J0552	31506-32-8s	0.04s	ug/mLs
NMeFOSAA	22J0552	2355-31-9s	0.01s	ug/mLs
NMeFOSE	22J0552	24448-09-7	0.04s	ug/mLs
PFBAAs	22J0552	375-22-4	0.04s	ug/mLs
PFBSs	22J0552	375-73-5	0.00885s	ug/mLs
PFDAAs	22J0552	335-76-2	0.01s	ug/mLs
PFDOAs	22J0552	307-55-1	0.01s	ug/mLs
PFDOsS	22J0552	79780-39-5	0.0097	ug/mLs
PFDSs	22J0552	335-77-3	0.00965s	ug/mLs
PFEESAs	22J0552	113507-82-7	0.0178	ug/mLs
PFHPAs	22J0552	375-85-9	0.01s	ug/mLs
PFHPsS	22J0552	375-92-8	0.00955s	ug/mLs
PFHXA	22J0552	307-24-4	0.01s	ug/mLs
PFHXS	22J0552	355-46-4s	0.00915s	ug/mLs
PFMBAs	22J0552	863090-89-5s	0.02s	ug/mLs
PFMPAs	22J0552	377-73-1	0.02s	ug/mLs
PFNA	22J0552	375-95-1	0.01s	ug/mLs
PFNS	22J0552	68259-12-1s	0.0096s	ug/mLs
PFOAs	22J0552	335-67-1	0.01s	ug/mLs
PFOSs	22J0552	1763-23-1	0.0093s	ug/mLs
PFOSAs	22J0552	754-91-6	0.01s	ug/mLs
PFPEAs	22J0552	2706-90-3	0.02s	ug/mLs
PFPEsS	22J0552	630402-22-1s	0.0094s	ug/mLs
PFTEDAs	22J0552	376-06-7	0.01s	ug/mLs
PFTRDA	22J0552	72629-94-8	0.01s	ug/mLs
PFUnA	22J0552	2058-94-8s	0.01s	ug/mLs

Analytical Standard Record

22L0269 0

Parent Standards used: 0

Standard 0	Description0	Prepared	Prepared By0	Lot Nbr0	Expires0	Last Edit0	(mls)0
22J0552	PFAS - MIX 1633 200ng/mLs	10/31/2022s	In house	xs	01/11/2025s	10/31/2022 15:40s by DAGs	0.5s

Analytical Standard Record

22L0272L

Description:s	MPFAC-HIF-ES 20.0ng/mLs	Expires:s	06/12/2023s
Standard Type:s	Surrogate Spikes	Prepared:s	12/14/2022s
Solvent:s	MeOH/62244s	Prepared By:s	Andonios Karas
Final Volume (mL)s:s	10s	Department:s	PFASs
Vials:s	3s	Last Edit:s	12/14/2022 13:55 by ABKs
Comments:l	Half the concentration of previous EIS solution used for 1633/B-15.l Double the spiking volume from 100 uL to 200 uLl		

AnalyteL	ParentL	CAS NumberL	Concentration L	UnitsL
13C2-4:2FTSs	22K0095s	13C2-4:2FTSs	0.04s	ug/mLs
13C2-6:2FTSs	22K0095s	13C2-6:2FTSs	0.04s	ug/mLs
13C2-8:2FTSs	22K0095s	13C2-8:2FTSs	0.04s	ug/mLs
13C2-PFDOAs	22K0095s	13C2-PFDOAs	0.01s	ug/mLs
13C2-PFTEDAs	22K0095s	13C2-PFTEDAs	0.01s	ug/mLs
13C3-HFPO-DAs	22K0095s	13C3-HFPO-DAs	0.08s	ug/mLs
13C3-PFBSs	22K0095s	13C3-PFBSs	0.02s	ug/mLs
13C3-PFHXSs	22K0095s	13C3-PFHXSs	0.02s	ug/mLs
13C4-PFBAs	22K0095s	13C4-PFBAs	0.08s	ug/mLs
13C4-PFHPAs	22K0095s	13C4-PFHPAs	0.02s	ug/mLs
13C5-PFHxAs	22K0095s	13C5-PFHxAs	0.02s	ug/mLs
13C5-PFPEAs	22K0095s	13C5-PFPEAs	0.04s	ug/mLs
13C6-PFDAs	22K0095s	13C6-PFDAs	0.01s	ug/mLs
13C7-PFUhAs	22K0095s	13C7-PFUdAs	0.01s	ug/mLs
13C8-PFOAs	22K0095s	13C8-PFOAs	0.02s	ug/mLs
13C8-PFOSs	22K0095s	13C8-PFOSs	0.02s	ug/mLs
13C8-PFOSAs	22K0095s	13C8-PFOSAs	0.02s	ug/mLs
13C9-PFNAs	22K0095s	13C9-PFNAs	0.01s	ug/mLs
D3-NMEFOSAs	22K0095s	D3-NMEFOSAs	0.02s	ug/mLs
D3-NMEFOSAAs	22K0095s	D3-NMEFOSAAs	0.04s	ug/mLs
D5-NETFOSAs	22K0095s	D5-NETFOSAs	0.02s	ug/mLs
D5-NETFOSAAs	22K0095s	D5-NETFOSAAs	0.04s	ug/mLs
D7-NMEFOSEs	22K0095s	D7-NMEFOSEs	0.2s	ug/mLs
D9-NETFOSSEs	22K0095s	D9-NETFOSSEs	0.2s	ug/mLs

Parent Standards used: 0

Standard 0	Description0	Prepared	Prepared By0	Lot Nbr0	Expires0	Last Edit0	(mL)0
22K0095s	MPFAC-HIF-ES-EISs	07/20/2022s	Wellington Laboratories	MPFACHIFES0822s	08/02/2025s	11/04/2022 12:16s by DAGs	0.4s

Analytical Standard Record0

22L04320

Description:s	PFAS IIS 7C 40ng/mLs	Expires:s	01/20/2023s
Standard Type:s	Internal Standards	Prepared:s	12/29/2022s
Solvent:s	MeOH/62286s	Prepared By:s	Dipti Gokals
Final Volume (mL)s:s	25s	Department:s	PFASs
Vials:s	1s	Last Edit:s	12/29/2022 09:09 by DAGs

Analyte0	Parent0	CAS Number	Concentration 0	Units0
13C2-PFDAs	22A0234s	13C2-PFDAs	0.04s	ug/mLs
13C2-PFHxAs	22A0234s	13C2-PFHxAs	0.04s	ug/mLs
13C3-PFBAs	22A0234s	13C3-PFBAs	0.04s	ug/mLs
13C4-PFOAs	22A0234s	13C4-PFOAs	0.04s	ug/mLs
13C4-PFOs	22A0234s	13C4-PFOs	0.04s	ug/mLs
13C5-PFNAs	22A0234s	13C5-PFNAs	0.04s	ug/mLs
18O2-PFHxSs	22A0234s	18O2-PFHxSs	0.04s	ug/mLs

Parent Standards used: 0

Standard 0	Description0	Prepared0	Prepared By0	Lot Nbr	Expires0	Last Edit0	(mLs)0
22A0234s	PFAS IIS 7C 5ug/mLs	01/20/2022s	In house	*	01/20/2023s	01/20/2022 15:49s by HGHS	0.2s

Analytical Standard Record

22L0442L

Description:s	PFAS - MIX 1633 10ng/mLs	Expires:s	06/27/2023s
Standard Type:s	Analyte Spikes	Prepared:s	12/29/2022s
Solvent:s	MeOHs	Prepared By:s	Dipti Gokals
Final Volume (mL)s:	10s	Department:s	PFASs
Vials:s	1s	Last Edit:s	12/29/2022 09:41 by DAGs

AnalyteL	ParentL	CAS NumberL	Concentration L	UnitsL
11CL-PF3OUDSs	22J0552	763051-92-9s	0.0189s	ug/mLs
3:3FTCAs	22J0552	113507-82-7	0.04s	ug/mLs
4:2FTSs	22J0552	757124-72-4	0.0375	ug/mLs
5:3FTCAs	22J0552	914637-49-3	0.04s	ug/mLs
6:2FTSs	22J0552	27619-97-2	0.038s	ug/mLs
7:3FTCA	22J0552	812-70-4	0.04s	ug/mLs
8:2FTSs	22J0552	39108-34-4s	0.0384s	ug/mLs
9CL-PF3ONS	22J0552	756426-58-1	0.0187	ug/mLs
ADONA	22J0552	919005-14-4s	0.0189s	ug/mLs
HFPO-DAs	22J0552	13252-13-6s	0.02s	ug/mLs
NETFOSA	22J0552	4151-50-2s	0.04s	ug/mLs
NETFOSAA	22J0552	2991-50-6s	0.01s	ug/mLs
NETFOSE	22J0552	1691-99-2s	0.04s	ug/mLs
NFDHA	22J0552	151772-58-6	0.02s	ug/mLs
NMeFOSA	22J0552	31506-32-8s	0.04s	ug/mLs
NMeFOSAA	22J0552	2355-31-9s	0.01s	ug/mLs
NMeFOSE	22J0552	24448-09-7	0.04s	ug/mLs
PFBAs	22J0552	375-22-4	0.04s	ug/mLs
PFBsS	22J0552	375-73-5	0.00885s	ug/mLs
PFDAs	22J0552	335-76-2	0.01s	ug/mLs
PFDAs	22J0552	307-55-1	0.01s	ug/mLs
PFDOSs	22J0552	79780-39-5	0.0097	ug/mLs
PFDsS	22J0552	335-77-3	0.00965s	ug/mLs
PFEESAs	22J0552	113507-82-7	0.0178	ug/mLs
PFHPAs	22J0552	375-85-9	0.01s	ug/mLs
PFHPsS	22J0552	375-92-8	0.00955s	ug/mLs
PFHXA	22J0552	307-24-4	0.01s	ug/mLs
PFHXS	22J0552	355-46-4s	0.00915s	ug/mLs
PFMBAs	22J0552	863090-89-5s	0.02s	ug/mLs
PFMPAs	22J0552	377-73-1	0.02s	ug/mLs
PFNA	22J0552	375-95-1	0.01s	ug/mLs
PFNS	22J0552	68259-12-1s	0.0096s	ug/mLs
PFOAs	22J0552	335-67-1	0.01s	ug/mLs
PFOSs	22J0552	1763-23-1	0.0093s	ug/mLs
PFOSAs	22J0552	754-91-6	0.01s	ug/mLs
PFPEAs	22J0552	2706-90-3	0.02s	ug/mLs
PFPEsS	22J0552	630402-22-1s	0.0094s	ug/mLs
PFTEDAs	22J0552	376-06-7	0.01s	ug/mLs
PFTRDA	22J0552	72629-94-8	0.01s	ug/mLs
PFUnA	22J0552	2058-94-8s	0.01s	ug/mLs

Analytical Standard Record

22L0442 L

Parent Standards used: 0

Standard 0	Description0	Prepared	Prepared By0	Lot Nbr0	Expires0	Last Edit0	(mls)0
22J0552	PFAS - MIX 1633 200ng/mLs	10/31/2022s	In house	xs	01/11/2025s	10/31/2022 15:40s by DAGs	0.5s



908 N. Temperance Ave., Clovis, CA 93611 - Phone 559-275-2175 - www.applinc.com

NELAP Certification Number: CA00046L
DoD-ELAP Certification Number 4064.01 L
State Certification Number: CA1312L

January 06, 2023 L

David Conner L
Tidewater, Inc. L
5835 Avenida Encinas, Suite 118 L
Carlsbad, CA 92208 L

RE: NASA JPL
22L0005L

Enclosed are the results of analyses for samples received by our laboratory on 12/1/2022. If you L have any questions concerning this report, please feel free to contact me.L

I certify that this data package is in compliance with the terms and conditions of the contract, both L technically and for completeness. These test results meet all requirements of NELAC and DoD QSM. L Release of the hard copy has been authorized by the Laboratory Manager or designee, as verified L by the following signature.L

Sincerely, n

Greg Salata For Gregory Salatan
Project Managemn

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Project: oNASA JPLo
Project Number: oNASA JPLo
Project Manager: oDavid Conner

Reported: 01/06/2023 15:49o

Data Validatable Report

Analysis Case Narrativen

n

PFAS: Manual integrations were performed for this method in accordance with APPL 's SOP. Chromatograms after manual t integration are enclosed for specific samples and analytes. Abbreviated flags for technical justification are listed on the t chromatogram. Some extracted internal standards recovered outside of control limits in some samples, these samples were t diluted and recovered in control, unless stated otherwise.t

The extracted internal standards D3-NMeFOSA, D5-NEtFOSA, and D7-NMeFOSE recovered below the lower control limit in t sample 01 - SB-1-0.5-113022.t

The extracted internal standards D3-NMeFOSA and D5-NEtFOSA recovered below the lower control limit in sample 13 - t DUP-2-113022. t

The analyte PFHpS recovered below the lower control limit in the BBL0032-MRL1. t

The analytes PFOS, PFNS 9CI-PF3ONS recovered above the upper control limit in the BBL0032-MS1 performed on sample 14 t – SB-6-2.0-113022. The analyte PFOS recovered below the lower control limit in the MSD. The analyte 9CI-PF3ONS recovered t above the upper control limit in the MSD. The analyte PFNS recovered with high RPD between the MS/MSD. t

The analytes PFNA PFUnA 8:2FTS and NMeFOSAA recovered above the upper control limit in the BBL0249-BS1. The t extracted internal standards D3-NMeFOSA and D5-NEtFOSA recovered below the lower control limit in the BBL0249-BSD1. t

The analytes PFDOA and PFOSA recovered above the upper control limit in the BBL0249-MRL1.t

The extracted internal standards D3-NMeFOSA and D5-NEtFOSA recovered below the lower control limit in the BBL0371-BLK1, the BBL0371-BS1, and the BBL0371-BSD1. The analyte PFTeDA recovered with high RPD between the BS/BSD.t

The analytes PFTeDA and NMeFOSE recovered below the lower control limit in the BBL0371-MRL1. The analyte NEtFOSE t recovered above the upper control limit. The extracted internal standard D3-NMeFOSA recovered below the lower control limit. t

The analytes PFDA. PFUnA, PFOS, and 8:2FTS recovered above the upper control limit in the SB03754-LCV1. t

The analyte PFUnA recovered above the upper control limit in the SB03858-LCV1. t

The analytes PFDA and HFPO-DA recovered above the upper control limit in the SB03860-LCV1. The analyte PFDoA recovered t below the lower control limit. t

The analyte PFUnA recovered above the upper control limit in the SB03860-CCV1. t

Samples in this Reportn

Lab IDn	Sample n	Matrixn	Date Sampledn	Date Receivedn
22L0005-01o	SB-1-0.5-113022o	Solido	11/30/2022 08:35o	12/01/2022o
22L0005-02o	SB-1-2.0-113022o	Solido	11/30/2022 08:44o	12/01/2022o
22L0005-03o	SB-2-0.5-113022o	Solido	11/30/2022 09:05o	12/01/2022o
22L0005-04o	SB-2-2.0-113022o	Solido	11/30/2022 09:05o	12/01/2022o