nature geoscience

Article https://doi.org/10.1038/s41561-024-01402-8

Underestimated burden of per- and polyfluoroalkyl substances in global surface waters and groundwaters

In the format provided by the authors and unedited

List of Tables

List of Figures

Table S1. Common PFAS precursors in consumer products and the PFAS of concern they transform into.

Consumer Product PFAS	Terminal PFAS	% yield	Time	Lifetime	Pathway	Source
4:2 Fluorotelomer alcohol (FTOH)	PFBA, PFPeA	~ 1.5% ea.	15 min	Atmos. 20d; $t_{1/2}$ soil < 7 d	smog chamber	Ellis et al., (2004) [1]
6:2 FTOH	PFHxA, PFHpA	~ 1.5% ea.	15 min		smog chamber	Ellis et al., (2004) [1]
	PFPeA, PFHxA	30, 8.1	180 d		aerobic soil	Butt et al (2014) [2]
8:2 FTOH	PFOA, PFNA	~ 1.5% ea.	15 min		smog chamber	Ellis et al., (2004) [1]
	PFOA	25%	4 mo		aerobic soil	Wang et al. (2009) [3]
10:2 FTOH	PFDA	50%	30 d	$t_{1/2}$ ~ 10 d	soil	Zhao and Zhu (2017) [4]
12:2 FTOH	PFDoA, PFTrA	6%, 8.5%	2 y	n.d.	atmospheric	Thackray (2020) [5]
4:2 fluorotelomer sulfonate (FTS)	PFBA	n.d.	n.d.	n.d.		Butt et al (2014) [2]
6:2 FTS	PFPeA, PFHxA	21, 20%	90 d	$t_{1/2}$ < 5 d	aerob. sediment	Zhang et al., (2016) [6]
8:2 FTS	PFOA	1.7%	80 d	$t_{1/2}$ < 10 d	aerobic soil	Dasu et al., (2012) [7]
4:2 Fluorotelomer acylate (FTA)	PFBA	Up to 10%	10 d	~ 1 d	atmospheric	Butt et al. (2009) [8]
8:2 FTA	PFOA	Up to 10%	10 d	~ 1 d	fish	Butt et al. (2010) [9]
8:2 Fluorotelomer methylacrylate (FTMA)	PFOA	10.3%	105 d	$t_{1/2}$ = 15 d	aerobic soil	Royer et al., (2015) [10]
8:2 FTCA	PFOA	30%	50 d	~ 7 d	aerobic sediment	Myers & Mabury (2010) [11]
10:2 FTCA	PFDA	11 %	50 d	~ 7 d		
6:2 diPAP	PFPeA, PFHxA	6.4, 6%	112 d	$t_{1/2}$ = 12 d	aerobic soil	Liu et al., (2016) [12]
8:2 diPAP	PFOA	10%	108 d	>108 d	soil/compost	Bizkarguenaga et al., (2016) [13]
6:2 monoPAP*	PFHxA	~ 1%	92 d	~ 1 d	aerobic sewage	Lee et al., (2010) [14]
8:2 monoPAP*	8:2 FTOH	~ 30%	92 d	~ 1 d	aerobic sewage	Lee et al., (2010) [14]
4:2 Fluorotelomer thioetheramidosulfonate (FtTAoS)	PFBA	~ 1.5%	60 d	18 d	aerobic soil	Harding-Marjanovic et al., (2015) [15]
6:2 FtTAoS**	PFPeA, PFHxA	~ 1.5%	60 d	18 d	aerobic soil	
8:2 FtTAoS	PFHpA, PFOA	~ 1.5%	60 d	18 d	aerobic soil	
perfluorooctane sulfonamide (FOSA)	PFOS	31 %	10 d	$t_{1/2}$ = 6 d	activated sludge	Rhoads et al., (2008) [16]
Perfluorooctane sulfonamidoacetic acid (FOSAA)	PFOS	15.3%	10 d	$t_{1/2}$ = 2 d		
Ethyl FOSA (Et-FOSA)	PFOS	31%	10 d	~ 6 d		
perfluorooctane sulfonate (PFOSI)	PFOS	85%	10 d	~ 6 d		
N-Ethyl FOSA acetic acid (N-EtFOSAA)	PFOS	6.7%	10 d	$t_{1/2}$ = 6.7d		
ethyl perfluorooctane sulfonamidoethanol (Et-FOSE)	PFOS	7.9%	10 d	~ 10 d		
Methyl-FOSE (Me-FOSE)	PFOS	15%	28 d	$t_{1/2}$ = 6.7d	aerob. sediment	Motegi et al., (2013) [17]
Me-perfluorobutane sulfonamidoethanol (MeFBSE)	PFBA	~ 5%	7 min	2 d	smog chamber	D'eon et al., (2006) [18]
EtFOSE phosphate diester (SAmPAP diester)	-	No significant degradation noted				

*Undergoes rapid hydrolysis to form FTOH [12]

** Most abundant FtTAoS compound. FtTAoS are present in several widely used AFFF formulations made by Ansul, Chemguard, and Angus amongst others [15]

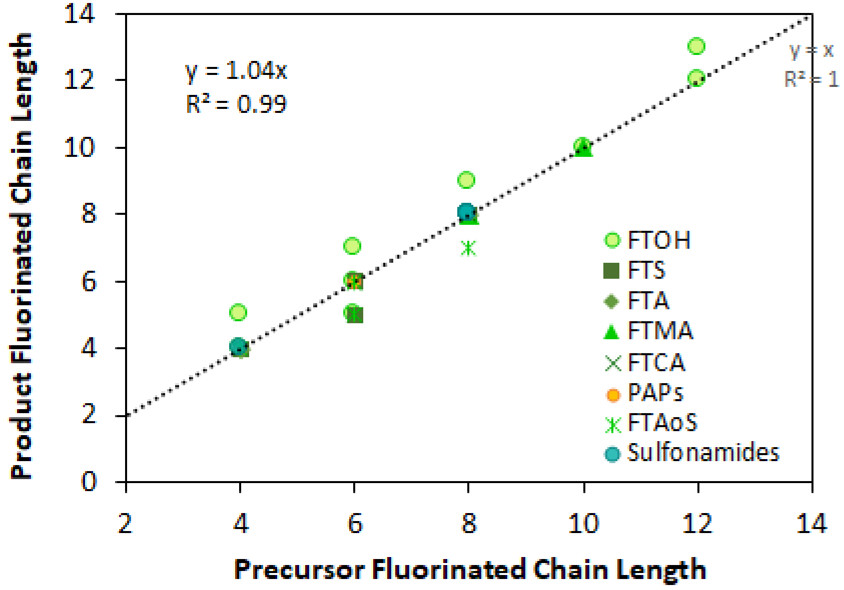

Figure S1. Common PFAS precursors in consumer products and the PFAS of concern they transform into.

Table S2.Common terminal PFAS of concern and their reported rates of degradation in the environment.

Chemical	Lifetime or $t_{1/2}$	Degradation Medium	References
Gen X	NO INFORMATION AVAILABLE AS YET although PFECAs are highly resistant to oxidative degradation [19-21]		
ADONA	98% ± 19% after TOP Assay	TOP Assay	Zhang et al. (2019) [20]
F53B (6:2 Cl PFESA)	100% de-chlorination only	Anearobic enrichment culture	Yi et al., (2022) [22]
6:2Cl & 8:2Cl PFOS	$t_{1/2}$ (1st order) > 110d	Aerobic loam soil	Chen et al., (2018) [23]
PFBA	$t_{1/2}$ (1st order)= 383-387d	Biosolid/soil mix	Venkatasan & Halden (2014) [24], Huang & Jaffe (2019) [25], Lyu et al., (2015) [26], Wang et al., (2017) [27]
PFPeA	$t_{1/2}$ (1st order)= 396 - 410d	Biosolid/soil mix	
PFHxA	$t_{1/2}$ (1st order)= 387-495d	Biosolid/soil mix	
PFHpA	$t_{1/2}$ (1st order)= 825-990d	Biosolid/soil mix	
PFOA	$t_{1/2}$ (1st order)= 592-770d, ~50% reduction in 100d $t_{1/2}$ (1st order)= 4 days	Biosolid/soil mix, Anearobic enrichment culture 254nm UV light	
PFNA & PFUnDA	$t_{1/2}$ (1st order)= >1200d	Biosolid/soil mix	
PFBS	No degradation over 3 years No degradation over 40 weeks	Anerobic & Aerobic sludge reactors	Ochoa-Herrera et al. (2016) [28]
PFHxS	16 ± 2% after 5 days incubation	Pseudomonas sp. isolated from PFAS contaminated site	Presentato et al., (2020) [29]
PFOS	$t_{1/2}$ (1st order) >1200d, ~50% reduction in 100d, $t_{1/2}$ (1st order)= 4 days	Biosolid/soil mix, Enriched anaerobic microbial culture. 254nm UV light	Wang et al., (2017) [27]
PFOA (most promising biodegradation results	~47% reduction in 100 d	Pseudomonas parafulva Strain (aerobic)	Yi et al., (2016) [30]
PFOS (most promising biodegradation results	~67% reduction in 12 h, 100% in 5 days	Pseudomonas aeruginosa culture, Pseudomonas plecoglossicida 2.4-D culture	Kwon et al., (2014) [31], Chetverikov et al., (2017) [32]
TCE	$t_{1/2}$ = months to years $t_{1/2}$ = 3-14 d	Various soils, In the atmosphere	Shukla et al., (2014) [33]
2378-TCDD (Dioxin)	$t_{1/2}$ = ~ 2100 d 87.9% reduction in 6 d	Sediment Penicillium sp. enrichment culture	DTSC 1994 [34], Qiu et al. (2021) [35]

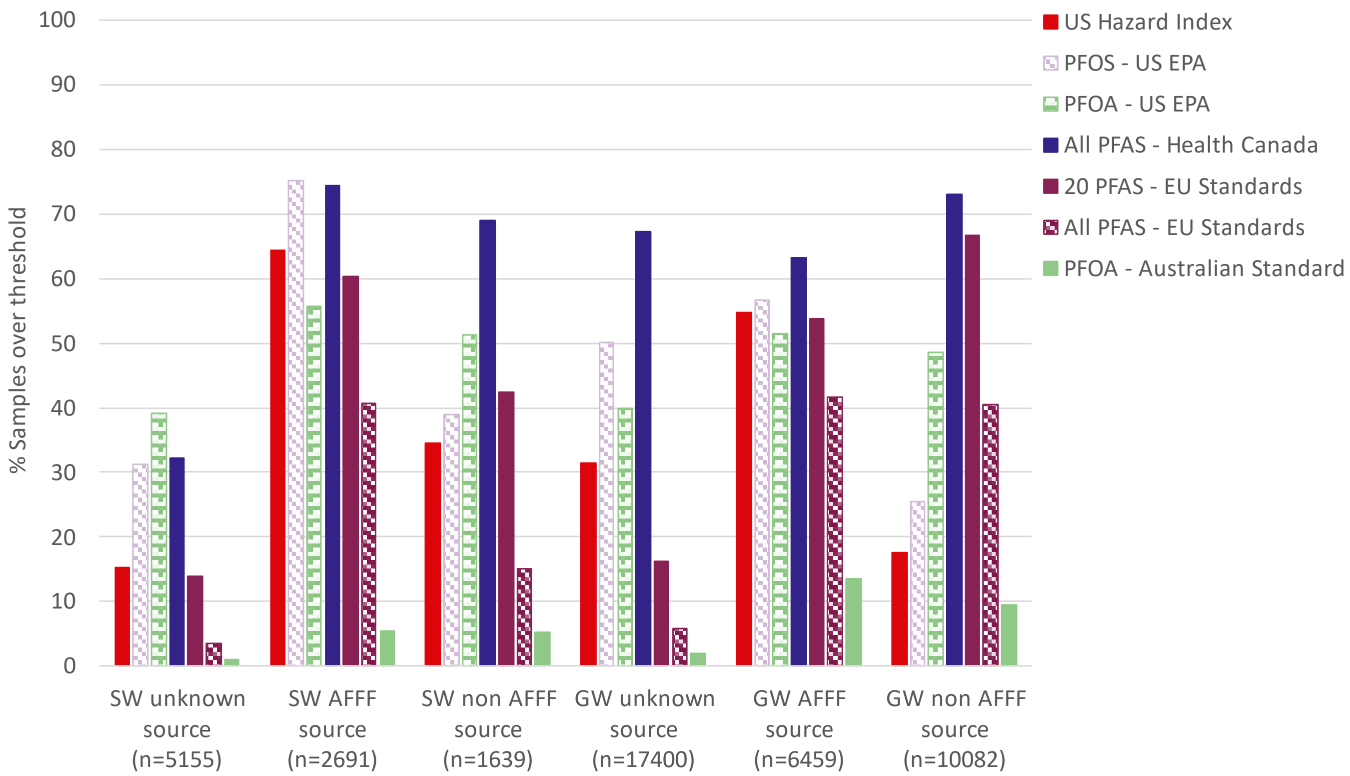

Figure S2. Incidence of exceedance of PFAS regulatory standards or advisories. For samples where PFAS concentrations were below detection limits a PFAS concentration was set to zero.

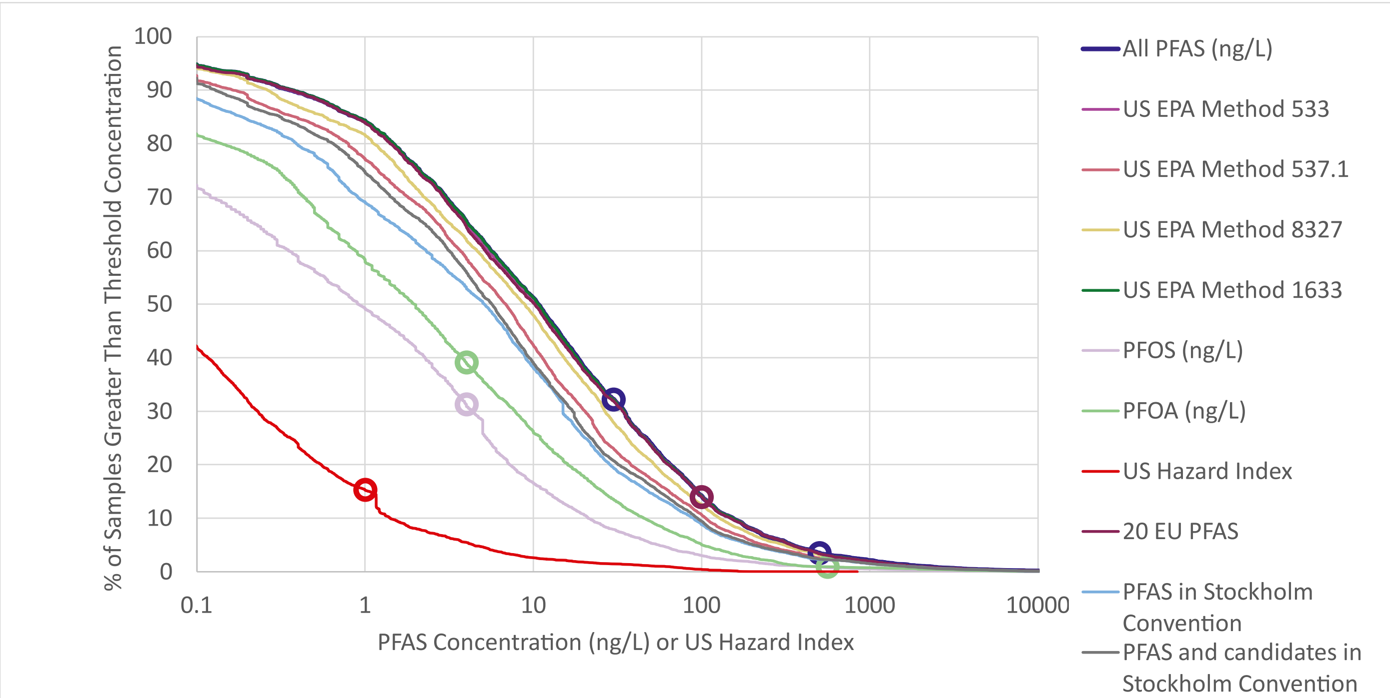

Figure S3. Cumulative distribution of surface water samples from an unknown source that exceed a given PFAS concentration. Circles indicate relevant PFAS drinking water guidance values. For samples where PFAS concentrations were below detection limits a PFAS concentration was set to zero.

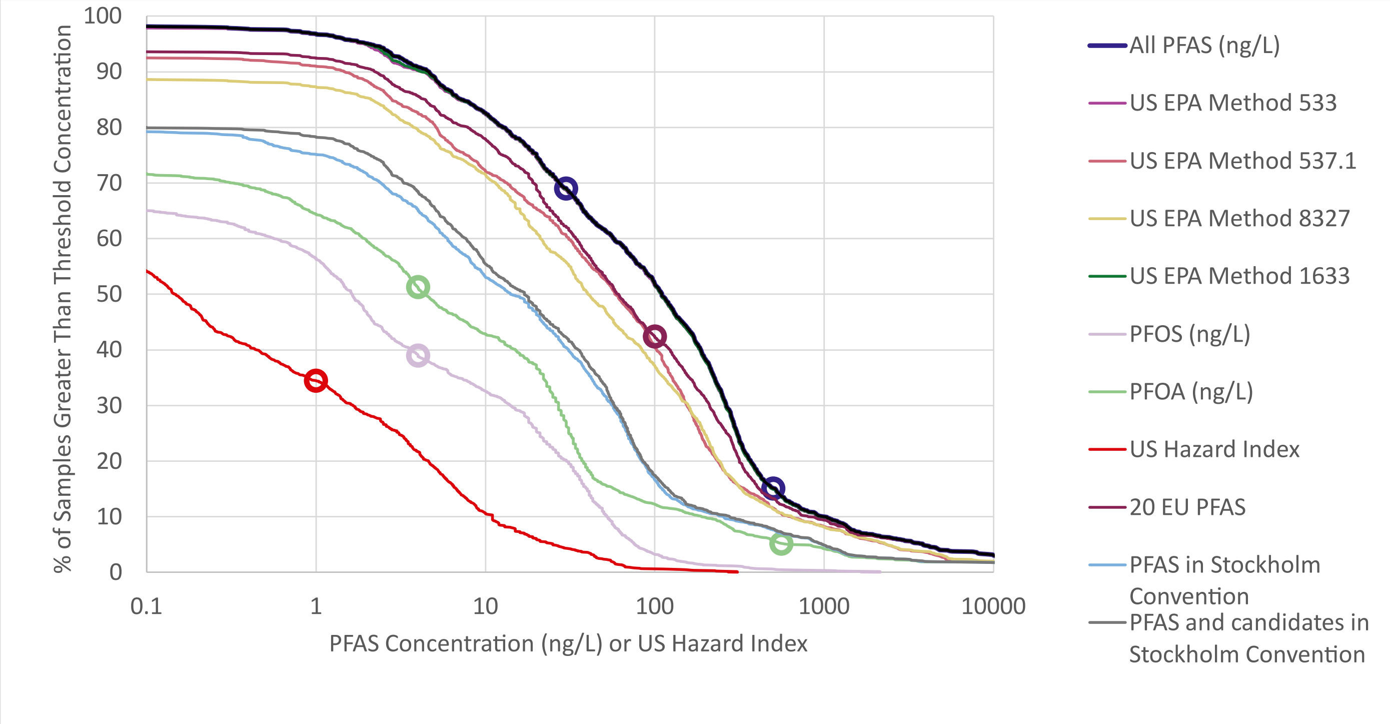

Figure S4. Cumulative distribution of surface water samples from a known non AFFF source that exceed a given PFAS concentration. Circles indicate relevant PFAS drinking water guidance values. For samples where PFAS concentrations were below detection limits a PFAS concentration was set to zero.

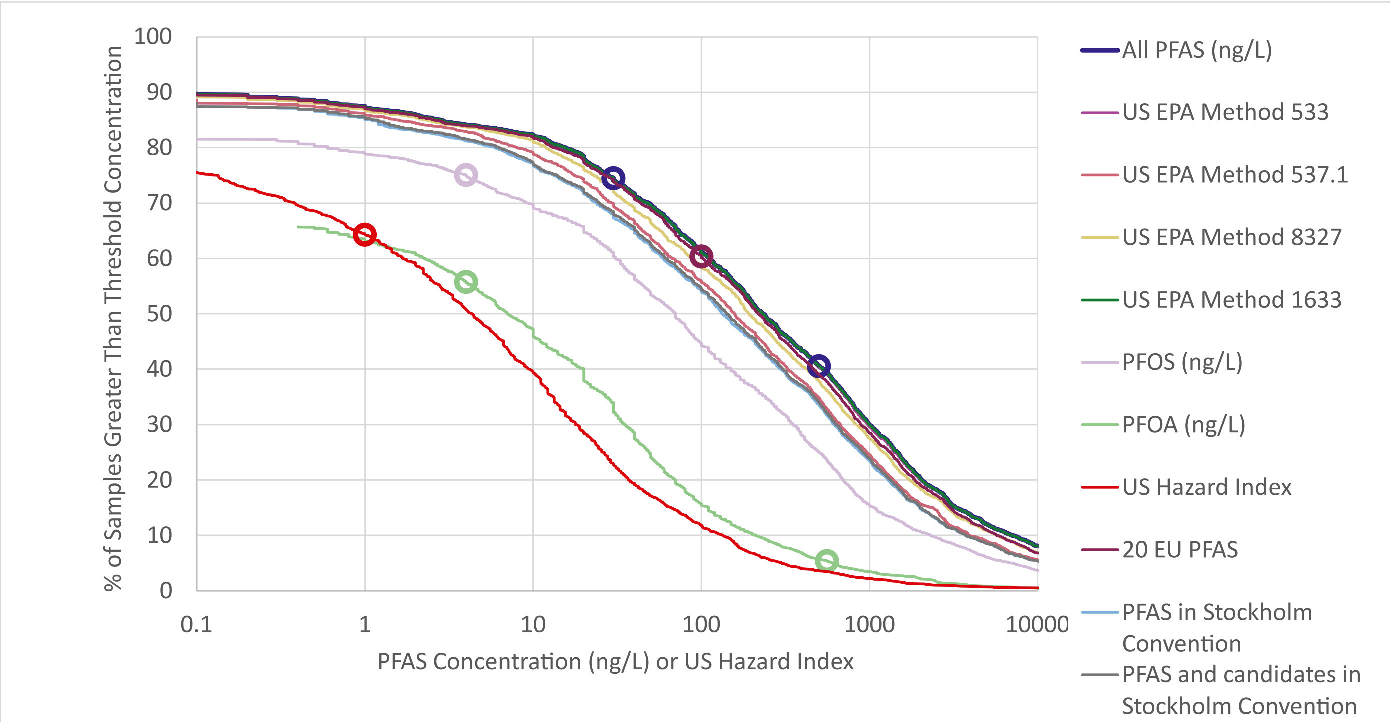

Figure S5. Cumulative distribution of surface water samples from a known AFFF source that exceed a given PFAS concentration. Circles indicate relevant PFAS drinking water guidance values. For samples where PFAS concentrations were below detection limits a PFAS concentration was set to zero.

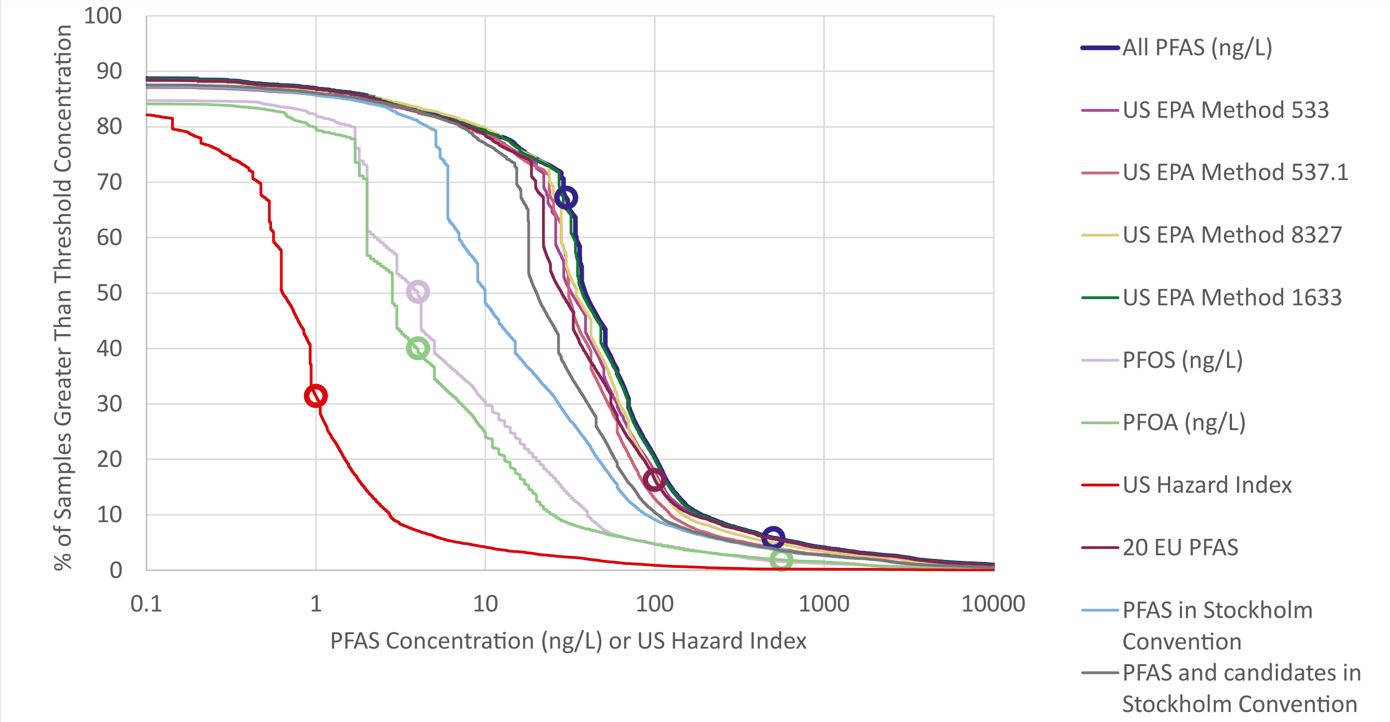

Figure S6. Cumulative distribution of groundwater samples from an unknown source that exceed a given PFAS concentration. Circles indicate relevant PFAS drinking water guidance values. For samples where PFAS concentrations were below detection limits a PFAS concentration was set to zero.

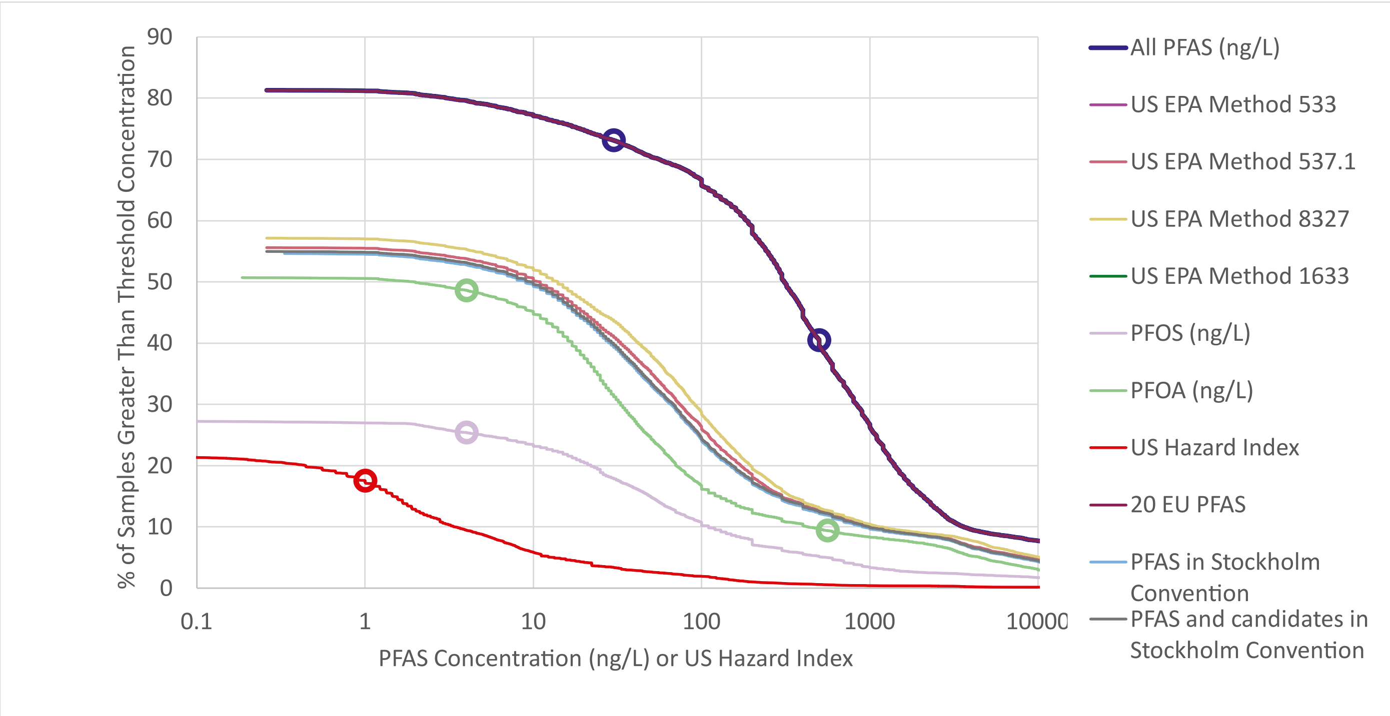

Figure S7. Cumulative distribution of groundwater samples from a known non AFFF source that exceed a given PFAS concentration. Circles indicate relevant PFAS drinking water guidance values. For samples where PFAS concentrations were below detection limits a PFAS concentration was set to zero.

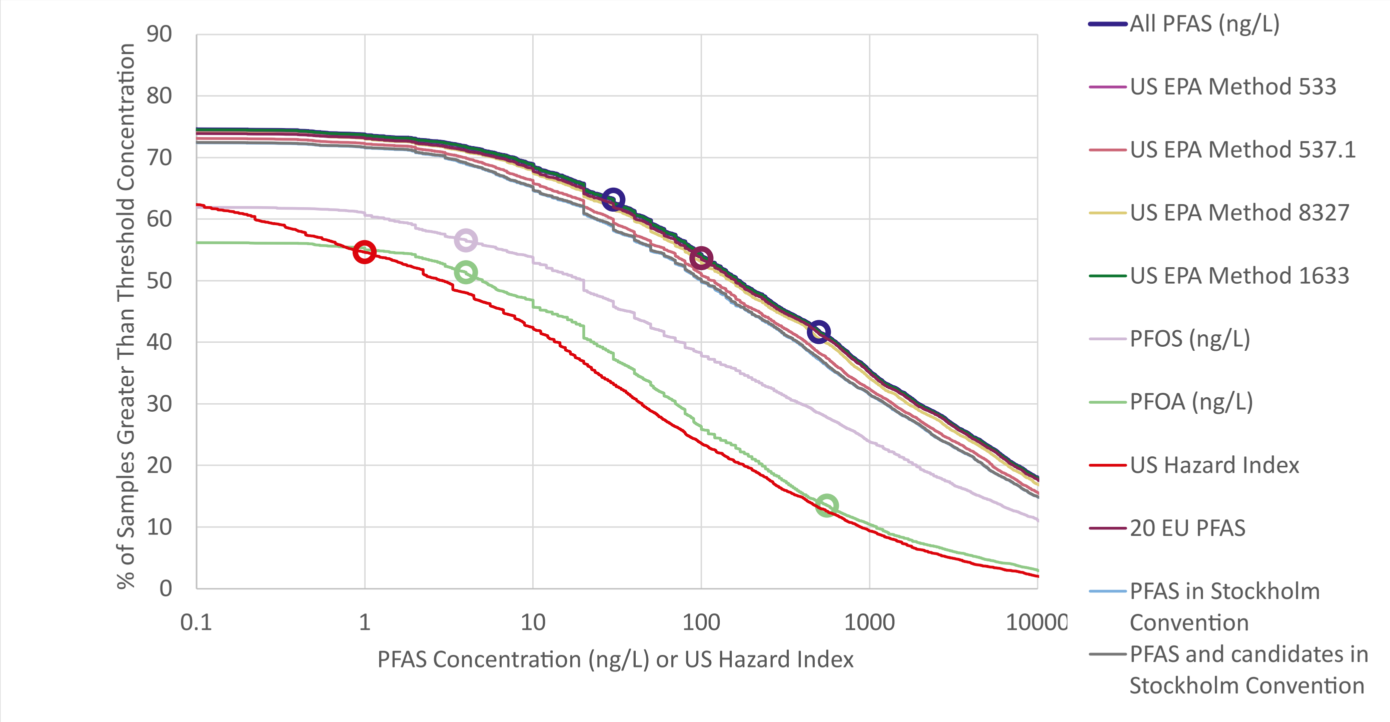

Figure S8. Cumulative distribution of groundwater samples from a known AFFF source that exceed a given PFAS concentration. Circles indicate relevant PFAS drinking water guidance values. For samples where PFAS concentrations were below detection limits a PFAS concentration was set to zero.

Table S3. Percentage of precursors, PFSAs, and PFCAs in various AFFF formulations manufacture between 1986 – 2010 based on measured concentrations by Houtz et al. (2013).

Formulation and Year	Precursors	PFSA	PFCA
3M 1988	3%	93%	4%
3M 1989	9%	85%	6%
3M 1992	62%	36%	3%
3M 1993	63%	34%	3%
3M 1998	56%	41%	3%
3M 1998	61%	35%	4%
3M 1999	66%	33%	2%
3M 2001	61%	36%	3%
Chemguard 2008	100%	0%	0%
Chemguard 2010	100%	0%	0%
Ansul 1986	100%	0%	0%
Ansul 1987	100%	0%	0%
Ansul 2009	100%	0%	0%
Ansul 2010	100%	0%	0%
Buckeye 2009	100%	0%	0%
National Foam 2005	100%	0%	0%
National Foam 2005	100%	0%	0%
National Foam 2008	100%	0%	0%

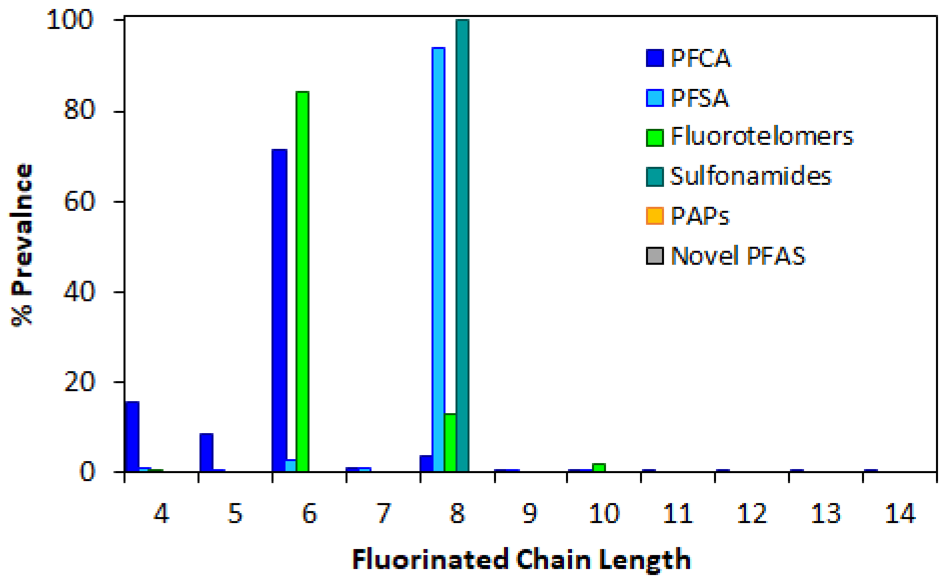

Figure S9. **The % prevalence of each fluorinated chain length within each PFAS class as determined from averaged concentration data for all AFFF products sample.**

Table S4. Summary table of the data sources used in this paper including URL, compartment, likely origin, subtype, number of samples, non-detected samples, sum of total PFAS, and concentration range per study. Aqueous concentrations are in ng/L and mass concentrations in product in μg/kg.

	Range PFAS Concentration									
Country	**File name**	**Compart-ment**	**Likely origin**	**Subtype**	**URL**	**No. of Samples**	**No. of non detects**	**Total PFAS (sum)**	**min**	**max**
AQ	LAKES-OF-LARSEMANN-HILLS	SW	UNK	UNK	http://doi.org/10.1016/j.scitotenv.2021.146747	21	0	2.48	0.05	0.21
AQ	SURFACE_WATER	SW	UNK	UNK	http://doi.org/10.1016/j.jhazmat.2012.01.030	14	0	55.08	0.58	15.41
AT	AUSTRIA_RIVERS_AND_LAKES	SW	UNK	UNK	http://doi.org/10.1016/j.watres.2009.08.004	9	0	303.16	17.84	49.73
AT	DRINKING-WATER	GW	UNK	UNK	http://doi.org/10.2478/boku-2018-0014	1	0	51	51	51
AT	DRINKING-WATER	SW	UNK	UNK	http://doi.org/10.2478/boku-2018-0014	1	0	8.4	8.4	8.4
AT	MICROWAVE-POPCORN-BAGS	PRODUCT_MASS	nonAFFF	PACKAGING	http://doi.org/10.1016/j.foodchem.2017.03.074	1	0	9.85	9.85	9.85
AU	ALBATROSS	GW	AFFF	3M	http://www.defence.gov.au/Environment/PFAS/docs/Albatross/Reports/20171116HMASAlbatrossDSIFullReport.pdf	152	0	2710636.7	118.37	697698.28
AU	ALBATROSS	LEACHATE	AFFF	3M	http://www.defence.gov.au/Environment/PFAS/docs/Albatross/Reports/20171116HMASAlbatrossDSIFullReport.pdf	286	19	2975.94	0	563.7
AU	AMBERLEY_OFFBASE	GW	AFFF	3M	http://www.defence.gov.au/Environment/PFAS/docs/Amberley/Reports/201811DSIReportBody.pdf	20	0	41452.16	1444.58	2796.43
AU	AMBERLEY_OFFBASE	SW	AFFF	3M	http://www.defence.gov.au/Environment/PFAS/docs/Amberley/Reports/201811DSIReportBody.pdf	112	0	446268.93	1092.51	41440.14
AU	AMBERLEY_ONBASE	GW	AFFF	3M	http://www.defence.gov.au/Environment/PFAS/docs/Amberley/Reports/201811DSIReportBody.pdf	113	0	2812861.2	1223.71	456744.45
AU	AMBERLEY_ONBASE	SW	AFFF	3M	http://www.defence.gov.au/Environment/PFAS/docs/Amberley/Reports/201811DSIReportBody.pdf	64	0	781584.24	1306.7	105821.35

AU	BANDIANA_OFF_BASE_TABLE_M	GW	AFFF	3M	http://www.defence.gov.au/environment/pfas/Bandiana/publications.asp	11	0	963.58	10.18	392.53
AU	BANDIANA_ON_BASE_TABLE_I	GW	AFFF	3M	http://www.defence.gov.au/environment/pfas/Bandiana/publications.asp	71	0	727775.46	614.36	172124.05
AU	BANDIANA_POINT_OF_USE_TABLE_Q	GW	AFFF	3M	http://www.defence.gov.au/environment/pfas/Bandiana/publications.asp	4	0	210.61	11.31	116.22
AU	BASEDARWIN	GW	AFFF	3M	http://www.defence.gov.au/environment/pfas/Darwin/publications.asp	278	0	5483526.6	3.19	929488.53
AU	BLAMEY	GW	AFFF	3M	http://www.defence.gov.au/Environment/PFAS/docs/Kapooka/Reports/201909BlameyBarracksKapookaDetailedSiteInvestigationReport.pdf	34	0	16556.58	351.18	1060.29
AU	CAIRNS	GW	AFFF	3M	http://www.defence.gov.au/Environment/PFAS/docs/Cairns/Reports/201912CairnsDetailedSiteInvestigationReportBody.pdf	110	0	1492990	28.09	127262.01
AU	CAIRNS	SW	AFFF	3M	http://www.defence.gov.au/Environment/PFAS/docs/Cairns/Reports/201912CairnsDetailedSiteInvestigationReportBody.pdf	22	0	4216.16	20.08	1781.72
AU	EASTSALE_OFFSITE	GW	AFFF	UNK	http://www.defence.gov.au/Environment/PFAS/docs/EastSale/Reports/RAAFEastSalePFASInvestigationDSIReportFull.pdf	45	0	13336.1	12.87	1743.04
AU	EASTSALE_ONSITE	GW	AFFF	UNK	http://www.defence.gov.au/Environment/PFAS/docs/EastSale/Reports/RAAFEastSalePFASInvestigationDSIReportFull.pdf	92	0	38759544	166.49	14243790
AU	HOLSWORTHY_OFFSITE	GW	AFFF	3M	http://www.defence.gov.au/Environment/PFAS/docs/Holsworthy/Reports/201811HolsworthyDSIFullReport.pdf	11	0	36216.7	267.95	32777.78
AU	HOLSWORTHY_ONSITE	GW	AFFF	3M	http://www.defence.gov.au/Environment/PFAS/docs/Holsworthy/Reports/201811HolsworthyDSIFullReport.pdf	46	0	1472087.3	187.71	663279.78
AU	JERVISBAY_CONCRETE	LEACHATE	AFFF	3M	http://www.defence.gov.au/Environment/PFAS/docs/JervisBay/Reports/201907.JBRF.DSI.pdf	15	0	326130.02	99.88	200957.9
AU	JERVISBAY	GW	AFFF	3M	http://www.defence.gov.au/Environment/PFAS/docs/JervisBay/Reports/201907.JBRF.DSI.pdf	127	0	1089836.2	8.64	433193.09
AU	JERVISBAY	SW	AFFF	3M	http://www.defence.gov.au/Environment/PFAS/docs/JervisBay/Reports/201907.JBRF.DSI.pdf	153	0	128478.33	7.23	14008.71
AU	LAVARACK_OFFSITE	GW	AFFF	3M	http://www.defence.gov.au/Environment/PFAS/docs/Lavarack/Reports/20191203LavarackBarracksDetailedSiteInvestigationReport.pdf	50	0	8291.6	9.15	1158.68
AU	LAVARACK_OFFSITE	SW	AFFF	3M	http://www.defence.gov.au/Environment/PFAS/docs/Lavarack/Reports/20191203LavarackBarracksDetailedSiteInvestigationReport.pdf	80	0	10245.18	9.82	1829.19

AU	LAVARACK_ONSITE	GW	AFFF	3M	http://www.defence.gov.au/Environment/PFAS/docs/Lavarack/Reports/20191203LavarackBarracksDetailedSiteInvestigationReport.pdf	64	0	2125058.1	13.07	804512.56
AU	LAVARACK_ONSITE	SW	AFFF	3M	http://www.defence.gov.au/Environment/PFAS/docs/Lavarack/Reports/20191203LavarackBarracksDetailedSiteInvestigationReport.pdf	42	0	80592.41	12.14	39913.48
AU	MCY	GW	AFFF	3M	http://www.airservicesaustralia.com/wp-content/uploads/255168_SU_Data.pdf	6	0	2783.47	405.89	526.42
AU	MCY	SW	AFFF	3M	http://www.airservicesaustralia.com/wp-content/uploads/255168_SU_Data.pdf	4	0	1950.58	448.84	541.14
AU	MELBOURNE	INFLUENT	UNK	UNK	http://doi.org/10.1007/s00216-019-01829-8	3	0	483.03	94.21	198.11
AU	MELBOURNE	SW	AFFF	UNK	http://doi.org/10.1007/s00216-019-01829-8	3	0	904.6	82.54	718.24
AU	OAKEY_OFFSITE	GW	AFFF	3M	http://www.defence.gov.au/Environment/PFAS/Docs/Oakey/Reports/201810OakeyGME.pdf	86	0	289674.66	375.06	59854.64
AU	OAKEY_ONSITE	GW	AFFF	3M	http://www.defence.gov.au/Environment/PFAS/Docs/Oakey/Reports/201810OakeyGME.pdf	82	0	9030149.2	365.66	2158310.8
AU	OAKEY	SW	AFFF	3M	http://www.defence.gov.au/Environment/PFAS/Docs/Oakey/Reports/201810OakeyGME.pdf	19	0	15650.16	4.49	4714.68
AU	PASSIVESAMPLING	GW	AFFF	UNK	http://doi.org/10.1016/j.jhazmat.2018.12.010	12	0	160866.09	0.42	127797.4
AU	PEARCE	GW	AFFF	3M	http://www.defence.gov.au/Environment/PFAS/docs/Pearce/Reports/RAAFBasePearceDetailedSiteInvestigationAppendixDtoF.pdf	96	0	6029348.3	269.5	2973924.4
AU	QH3	GW	AFFF	ANGUS	ERM (2017), Qantas Hanger 3, AFFF LOC Event, Brisbane Airport, Environmental Evaluation Notice, Response to EEN Final Report, Qantas Airways Ltd, July 2017	36	0	1258703.2	9.03	858545.74
AU	QH3	PRODUCT_AQ	AFFF	ANGUS	ERM (2017), Qantas Hanger 3, AFFF LOC Event, Brisbane Airport, Environmental Evaluation Notice, Response to EEN Final Report, Qantas Airways Ltd, July 2017	28	0	3.473E+09	809992.13	1.343E+09
AU	QH3	SW	AFFF	ANGUS	ERM (2017), Qantas Hanger 3, AFFF LOC Event, Brisbane Airport, Environmental Evaluation Notice, Response to EEN Final Report, Qantas Airways Ltd, July 2017	219	0	3807626.2	24.93	600939.55
AU	RICHMOND	GW	AFFF	3M	http://www.defence.gov.au/Environment/PFAS/docs/Richmond/Reports/201806DetailedSiteInvestigationReportBody.pdf	93	0	3161414	337.84	1044013.8
AU	ROBERTSON_DRY	GW	AFFF	3M	http://www.defence.gov.au/Environment/PFAS/docs/Robertson/Reports/201806DetailedSiteInvestigationReport.pdf	39	0	20660.68	416.11	1273.12

AU	ROBERTSON_WET	GW	AFFF	3M	http://www.defence.gov.au/Environment/PFAS/docs/Robertson/Reports/201806DetailedSiteInvestigationReport.pdf	44	0	26639.55	318.32	2519.03
AU	SINGLETON_OFFSITE	GW	AFFF	3M	http://www.defence.gov.au/Environment/PFAS/docs/Singleton/Reports/201912DetailedSiteInvestigationReport.pdf	26	0	13002.89	365.9	1498.13
AU	SINGLETON_ONSITE	GW	AFFF	3M	http://www.defence.gov.au/Environment/PFAS/docs/Singleton/Reports/201912DetailedSiteInvestigationReport.pdf	81	0	382879.47	30.08	167555.15
AU	STIRLING	GW	AFFF	3M	http://defence.gov.au/Environment/PFAS/docs/Stirling/Reports/1805StirlingDetailedSiteInvestigationReport.pdf	503	0	5832235.4	36.71	236452.31
AU	STIRLING	SW	AFFF	3M	http://defence.gov.au/Environment/PFAS/docs/Stirling/Reports/1805StirlingDetailedSiteInvestigationReport.pdf	34	0	1717.8	5.69	297.96
AU	TOWNSVILLE_OFFBASE1	GW	AFFF	3M	http://www.defence.gov.au/Environment/PFAS/docs/Townsville/Reports/201912EcologicalRiskAssessmentReport.pdf	169	0	268023.07	299.81	27187
AU	TOWNSVILLE_OFFBASE2	GW	AFFF	3M	http://www.defence.gov.au/Environment/PFAS/docs/Townsville/Reports/201912EcologicalRiskAssessmentReport.pdf;	27	0	8365.07	12.93	3535.54
AU	TOWNSVILLE_ONBASE	GW	AFFF	3M	http://www.defence.gov.au/Environment/PFAS/docs/Townsville/Reports/201912EcologicalRiskAssessmentReport.pdf;	194	0	92237076	409.44	19740059
AU	WAGGA	GW	AFFF	3M	http://www.defence.gov.au/Environment/PFAS/docs/wagga/Reports/DetailedSiteInvestigationReport.pdf	77	0	23486818	362.01	16201515
AU	WILLIAMTOWN	GW	AFFF	3M	http://www.defence.gov.au/Environment/PFAS/docs/Williamtown/Reports/201909WilliamtownInterimMonitoringEventReport.pdf	786	0	12576971	2.67	576488.61
AU	WILLIAMTOWN	SW	AFFF	3M	http://www.defence.gov.au/Environment/PFAS/docs/Williamtown/Reports/201909WilliamtownInterimMonitoringEventReport.pdf	388	0	1471401.1	15.3	97802.75
AU	16_WWTP	LEACHATE	UNK	UNK	http://doi.org/10.1016/j.jhazmat.2016.03.031	17	0	51723.42	105.21	14988.81
AU	2_LARGE_WWTP	INFLUENT	UNK	UNK	http://doi.org/10.1016/j.emcon.2019.05.006	18	0	1695.19	30.81	218.95
AU	BRISBANE-RIVER	SW	UNK	UNK	http://doi.org/10.1016/j.marpolbul.2014.02.014	11	0	162.86	0.8	73.98
AU	NEWCASTLE	SW	UNK	UNK	http://doi.org/10.1016/j.scitotenv.2016.12.116	4	0	1244.94	59.21	1012.43
AU	SYDNEYHARBOUR	SW	UNK	UNK	http://doi.org/10.1021/es300593a	4	0	136.72	29.49	38.14
AU	FISHERMANSBEND	GW	nonAFFF	UNK	http://doi.org/10.1016/j.envpol.2019.02.018	13	0	7284.47	26.09	5182.2

AU	GALLEN_2017_LANDFILL	LEACHATE	nonAFFF	UNK	http://doi.org/10.1016/j.jhazmat.2017.02.006	97	0	555097.22	215.55	45611.96
BD	BANGLADESH_BAY	SW	UNK	UNK	http://doi.org/10.1016/j.scitotenv.2016.07.104	28	0	638.07	10.72	46.81
BD	DHAKA_TEXTILES	SW	nonAFFF	UNK	http://doi.org/10.1002/etc.5255	8	0	276.27	20.85	51.63
BR	SURFACE_WATER	SW	UNK	UNK	http://doi.org/10.1016/j.chemosphere.2009.07.079	11	0	21.01	0.18	3.91
BR	BAHIA_AGRICULTURAL	GW	nonAFFF	na	http://doi.org/10.1016/j.envpol.2018.07.122	1	0	5.95	5.95	5.95
BR	BAHIA_AGRICULTURAL	GW	nonAFFF	na	http://doi.org/10.1016/j.envpol.2018.07.122	5	0	25.61	0.42	9
BR	BAHIA_AGRICULTURAL	SW	nonAFFF	na	http://doi.org/10.1016/j.envpol.2018.07.122	10	0	4.27	0.19	1.3
BR	MICROWAVE-POPCORN-BAGS	PRODUCT_MASS	nonAFFF	PACKAGING	http://doi.org/10.1016/j.foodchem.2017.03.074	4	0	183.69	2.95	109.39
CA	DND_Site-B	GW	AFFF	3M	http://doi.org/10.1016/j.scitotenv.2019.135994	101	0	9614188.9	168.71	3516677.5
CA	DND_Site-C	GW	AFFF	3M	na	57	0	4308704.6	17.8	358504.17
CA	DND_Site-C	SW	AFFF	3M	na	25	0	45958.33	6.63	11019.28
CA	DND_Site-E	GW	AFFF	UNK	na	182	0	2062020.9	109.9	373255.19
CA	DND_Site-E	SW	AFFF	UNK	na	8	0	17213.86	172.48	10853.94
CA	DND_Site-G	GW	AFFF	UNK	na	329	1	22918102	0	1404245.8
CA	DND_Site-G	SW	AFFF	UNK	na	407	0	2750768.8	3.4	240912.77
CA	DND_Site-H	GW	AFFF	UNK	na	217	0	795535.45	794.83	64787.33
CA	DND_Site-H	SW	AFFF	UNK	na	443	0	676154.36	430.1	6248.28
CA	DND_Site-I	GW	AFFF	UNK	na	122	0	29920972	113.11	2130112.4
CA	DND_Site-I	SW	AFFF	UNK	na	17	0	112199.82	430.36	10429.02
CA	ETOBICOKE-CREEK	SW	AFFF	UNK	http://doi.org/10.1021/ac0100648	9	0	3070022	11	2270900
CA	ETOBICOKE_CREEK	SW	AFFF	3M	http://doi.org/10.1021/es011001+	55	1	6214601.7	0	2270900
CA	FORMER_FIREFIGHTING_FACILITY	SW	AFFF	3M	http://doi.org/10.1016/j.envint.2016.05.023	28	0	345064.04	53.82	219605.15
CA	HAMILTON_AIRPORT	GW	AFFF	UNK	http://cdn.flyhamilton.ca/wp-content/uploads/2019/05/Initial-Subsurface-Investigation.pdf	6	0	453314.5	151.09	206880.12

CA	HAMILTON_AIRPORT	SW	AFFF	UNK	http://cdn.flyhamilton.ca/wp-content/uploads/2019/05/Initial-Subsurface-Investigation.pdf	3	0	121058.69	5437.12	75662.46
CA	TORONTO_AIRPORT	SW	AFFF	3M	http://doi.org/10.1021/es2001985	30	3	4283.74	0	948.06
CA	WELLAND-RIVER	SW	AFFF	UNK	http://doi.org/10.1021/acs.est.7b03994	24	0	33930.67	7.95	6762.52
CA	ARCTIC_LAKES	SW	UNK	UNK	http://doi.org/10.1021/es062709x	27	0	2183.83	9.73	158.2
CA	DIPAPS	PRODUCT_MASS	nonAFFF	PAPER	http://doi.org/10.1021/es900100d	5	0	14108.55	547.62	5899.66
CA	HIGHLAND-CREEK	SW	UNK	UNK	http://doi.org/10.1021/es200106q	29	0	705.36	12.82	37.07
CA	LAKE-EERIE-ONTARIO	SW	UNK	UNK	http://doi.org/10.1021/es0496975	16	0	1394.76	30.16	193.41
CA	LAURENTIAN-GREAT-LAKES	SW	UNK	UNK	http://doi.org/10.1021/es200135c	32	0	442.43	1.14	33.26
CA	RIVERS_AND_LAKES	SW	UNK	UNK	http://doi.org/10.2166/wqrj.2009.028	68	0	456.69	0.09	74.49
CA	COMPOSITE_CARPETS	PRODUCT_MASS	nonAFFF	TEXTILES	http://doi.org/10.1021/es505333y	1	0	747	747	747
CA	COSMETIC	PRODUCT_MASS	nonAFFF	COSMETIC	http://doi.org/10.1021/acs.estlett.1c00240	17	0	14082.54	33.84	3812.81
CA	UNKNOWN_LANDFILL	LEACHATE	nonAFFF	UNK	http://doi.org/10.1021/es302471n	11	0	108400.23	2636.05	36208.13
CH	SWISS-LIQUID-COMMERCIAL	PRODUCT_MASS	AFFF	UNK	http://doi.org/10.1016/j.chemosphere.2016.11.127	62	0	52986500	33.81	8090699.7
CH	GLATT_VALLEY	INFLUENT	UNK	UNK	http://doi.org/10.1021/es703062f	7	0	1681.57	68.67	556.79
CH	GLATT_VALLEY	SW	UNK	UNK	http://doi.org/10.1021/es703062f	3	0	274.78	84.44	102.77
CH	SWISS-LIQUID-COMMERCIAL	PRODUCT_MASS	nonAFFF	COATINGS,CLEANING,LUBRICANT,UNK,PAINT,ELECTRONICS	http://doi.org/10.1016/j.chemosphere.2016.11.127	132	0	74749112	24.7	25788487
CL	PLASTIC_DEBRIS	PRODUCT_MASS	UNK	PACKAGING	http://doi.org/10.1016/j.marpolbul.2021.112818	6	0	4.75	0.29	1.26
CN	BEIJING_AIRPORT	SW	AFFF	3M	http://doi.org/10.1021/acs.est.6b01980	20	0	1645.79	22.37	183.05

CN	CHINA_FLUOROCARBON_SURFACTANTS	PRODUCT_AQ	AFFF	VATTEN	http://doi.org/10.1021/acs.estlett.9b00154	7	0	2.248E+11	4502535	1.058E+11
CN	AFFF_TOP-CHINA_FLUOROCARBON_SURFACTANTS	PRODUCT_AQ	AFFF_TOP	VATTEN	http://doi.org/10.1021/acs.estlett.9b00154	10	0	1.143E+11	149000759	3.534E+10
CN	MIXED-BEIJING_WWTPs	SW	UNK	UNK	http://doi.org/10.1007/s11426-010-4093-x	42	0	2162.22	3.29	498.63
CN	BAIYANGDIAN_LAKE_2018	SW	UNK	UNK	http://doi.org/10.1016/j.envpol.2018.05.099	41	0	54364.13	5.02	8475.86
CN	BAIYANGDIAN_LAKE	SW	UNK	UNK	http://doi.org/10.1039/C1EM10772K	18	0	396.27	3.98	80.14
CN	BEIBU_BAY	SW	UNK	UNK	http://doi.org/10.1016/j.scitotenv.2019.01.019	80	0	249.38	0.68	4.97
CN	BEIJING_URBAN	SW	UNK	UNK	http://doi.org/10.1016/j.scitotenv.2019.04.067	1	0	45.5	45.5	45.5
CN	BEIJING_WWTPs	SW	UNK	UNK	http://doi.org/10.1007/s11426-010-4093-x	21	0	1263.37	5.61	498.63
CN	BOHAISEA_AND_NEARBY_RIVERS	SW	UNK	UNK	http://doi.org/10.1016/j.envpol.2020.114391	86	0	37327.97	11.16	13537.19
CN	BOHAI_BAY	SW	UNK	UNK	http://doi.org/10.1016/j.envpol.2015.05.042	20	0	468.1	14	37.4
CN	BOHAI_SEA_AND_COASTAL_RIVERS	SW	UNK	UNK	http://doi.org/10.1016/j.envpol.2014.03.030	35	0	11193.47	2.73	5068.99
CN	BOHAI_SEA	SW	UNK	UNK	http://doi.org/10.1016/j.scitotenv.2017.04.147	17	0	521.12	3.93	117.4
CN	CENTRAL_EASTERN_CHINA	DW_RAW	UNK	UNK	http://doi.org/10.1007/s11356-018-1608-z	7	0	144.92	0.92	56.01
CN	CHAO_HU	SW	UNK	UNK	http://doi.org/10.3390/ijerph16101692	14	14	0	0	0
CN	CHENGDU	SW	UNK	UNK	http://doi.org/10.1080/10934529.2015.1079113	6	0	30.64	3.5	7.82
CN	CHINA_RIVERS	SW	UNK	UNK	http://doi.org/10.1021/acs.est.8b00829	7	0	586.27	21.95	273.04
CN	DALIAN_BAY	SW	UNK	UNK	http://doi.org/10.1016/j.chemosphere.2018.02.093	14	0	158.93	8.09	13.84
CN	DALIAN_COASTAL_WATER	SW	UNK	UNK	http://doi.org/10.1021/es703006d	24	0	77.19	0.27	38.51
CN	DONGGUAN_AND_HUIZHOU	SW	UNK	UNK	http://doi.org/10.1016/j.ecoenv.2014.05.031	11	0	809.33	2.23	320.85

CN	EASTERN_CHINA_RIVERS	SW	UNK	UNK	http://doi.org/10.1016/j.chemosphere.2014.08.045	39	0	2736.4	0.68	228.58
CN	EASTERN_CHINA_SEA	SW	UNK	UNK	http://doi.org/10.1016/j.chemosphere.2019.05.132	20	0	35.41	0.17	4.39
CN	EAST_CHINA_SEA	SW	UNK	UNK	http://doi.org/10.1016/j.envpol.2017.07.078	4	0	3.55	0.45	1.53
CN	GUANGZHOU_WWTPS	SW	UNK	UNK	http://doi.org/10.1016/j.watres.2016.10.045	3	0	244.9	9.91	211.86
CN	GUANTING_RESERVOIR	SW	UNK	UNK	http://doi.org/10.1016/j.envint.2019.105224	8	0	365.43	25.63	74.38
CN	HAI_RIVER_BASIN	SW	UNK	UNK	http://doi.org/10.1016/j.watres.2019.115145	40	0	935.62	0.88	169.92
CN	HUANGPU_RIVER	SW	UNK	UNK	http://doi.org/10.1016/j.chemosphere.2017.01.122	121	0	27392.34	41.5	596.13
CN	HUN_RIVER	SW	UNK	UNK	http://doi.org/10.1016/j.chemosphere.2011.02.075	12	0	476.8	2.82	88.71
CN	HUTUO_RIVER	GW	UNK	UNK	http://doi.org/10.3390/w11112316	4	0	9.4	1.3	3.3
CN	JIANGSU_PROVINCE	GW	UNK	UNK	http://doi.org/10.1016/j.chemosphere.2016.10.088	29	0	139.52	2.68	9.55
CN	JIANGSU_PROVINCE_NON_INDUSTRIAL_AREA	GW	UNK	UNK	http://doi.org/10.1016/j.ecoenv.2018.01.039	112	0	12574.84	3.71	1222.23
CN	JIANGSU_PROVINCE_NON_INDUSTRIAL_AREA	SW	UNK	UNK	http://doi.org/10.1016/j.ecoenv.2018.01.039	12	0	4190.35	10.9	588.61
CN	JIANGSU_PROVINCE	SW	UNK	UNK	http://doi.org/10.1016/j.chemosphere.2016.10.088	13	0	341.68	11.12	57.71
CN	JIANGSU_RURAL AREAS	SW	UNK	UNK	http://doi.org/10.1016/j.envpol.2015.12.024	34	0	4988.72	2.27	490.68
CN	JIANGSU_RURAL_AREAS	GW	UNK	UNK	http://doi.org/10.1016/j.envpol.2015.12.024	52	0	3995.24	1.68	615.45
CN	JIAOZHOU_BAY_2020	SW	UNK	UNK	http://doi.org/10.1016/j.envpol.2020.115011	9	0	811.24	36.38	206.8
CN	JIAOZHOU_BAY	SW	UNK	UNK	http://doi.org/10.1016/j.marpolbul.2018.09.045	2	0	63.5	20.65	42.86
CN	JIULONG_ESTUARY_XIAMEN_BAY	SW	UNK	UNK	http://doi.org/10.1016/j.chemosphere.2019.124578	37	0	891.46	0.36	91.14
CN	JIULONG_RIVER_ESTUARY	SW	UNK	UNK	http://doi.org/10.1016/j.scitotenv.2018.05.042	39	0	1231.89	0.06	110.41
CN	LAKE_CHAOHU	SW	UNK	UNK	http://doi.org/10.1016/j.envpol.2015.01.028	6	0	87.57	13.48	15.72

CN	LIAO_RIVER	SW	UNK	UNK	http://doi.org/10.1016/j.chemosphere.2011.02.075	7	0	384.02	14.1	132.34
CN	NOTHERN_CHINA	SW	UNK	UNK	http://doi.org/10.1016/j.envint.2011.03.023	42	0	444.53	0.47	82.02
CN	PEARL-RIVER	SW	UNK	UNK	http://doi.org/10.1016/j.scitotenv.2015.04.004	67	0	513.76	1.61	33.59
CN	PEARL_RIVER	SW	UNK	UNK	http://doi.org/10.1016/j.chemosphere.2013.07.060	19	0	370.16	3.11	52.56
CN	QINZHOU_BAY	SW	UNK	UNK	http://doi.org/10.1016/j.jhazmat.2020.124681	4	0	11.6	2.23	3.47
CN	RIVERWATER	SW	UNK	UNK	http://doi.org/10.1016/j.chemosphere.2009.08.058	80	0	1157.75	0.06	304.4
CN	SHENYANG	SW	UNK	UNK	http://doi.org/10.1016/j.watres.2011.05.036	22	0	491.53	5.25	56.97
CN	SONGHUA_RIVER	SW	UNK	UNK	http://doi.org/10.1007/s00244-017-0474-x	17	0	16.99	0.41	1.64
CN	SOUTH_CHINA_SEA_AND_EAST_CHINA_SEA	SW	UNK	UNK	http://doi.org/10.1016/j.marpolbul.2017.08.009	42	0	23.1	0.1	2.66
CN	SOUTH_CHINA_SEA	SW	UNK	UNK	http://doi.org/10.1016/j.chemosphere.2019.05.162	90	0	46.59	0.03	1.55
CN	SOUTH_YELLOW_SEA	SW	UNK	UNK	http://doi.org/10.1016/j.jhazmat.2020.122124	30	0	1636.47	25.73	77.31
CN	TAIHU-LAKE	SW	UNK	UNK	http://doi.org/10.1016/j.scitotenv.2018.03.301	1	0	1.88	1.88	1.88
CN	TAIHU-LAKE	SW	UNK	UNK	http://doi.org/10.1016/j.scitotenv.2018.03.301	1	0	138.9	138.9	138.9
CN	TAIHU_LAKE_2010	SW	UNK	UNK	http://doi.org/10.1016/j.scitotenv.2013.11.100	12	0	2694.73	163.7	299.6
CN	TAIHU_LAKE_2014	SW	UNK	UNK	http://doi.org/10.1016/j.scitotenv.2017.08.235	31	0	3107	46.7	157.6
CN	TAIHU_LAKE_2015	SW	UNK	UNK	http://doi.org/10.1016/j.chemosphere.2015.01.053	30	0	1718.7	10.2	119.8
CN	TAIHU_LAKE	SW	UNK	UNK	http://doi.org/10.1016/j.chemosphere.2011.02.075	22	0	1187.64	18.91	449.09
CN	TAIWAN_STRAIT	SW	UNK	UNK	http://doi.org/10.1016/j.chemosphere.2021.129869	7	0	8.31	0.35	3.73
CN	THREE_GORGES_DAM	SW	UNK	UNK	http://doi.org/10.1016/j.jhazmat.2020.122523	2	0	109.76	19.2	90.56
CN	TIANJIN_COAST	SW	UNK	UNK	http://doi.org/ 10.1007/s10653-011-9422-2	8	0	103.47	5.47	24.24
CN	TIANJIN_RIVER_WATER	SW	UNK	UNK	http://doi.org/10.1007/s00128-011-0313-0	23	0	547.54	7.5	65.09
CN	TIBETAN_PLATEAU	SW	UNK	UNK	http://doi.org/10.1029/2019JD030566	96	0	111.86	0.35	2.42

CN	WASTE_INCINERATION_PLANT	LEACHATE	UNK	UNK	http://doi.org/10.1016/j.scitotenv.2021.148468	3	0	812461.75	126880.8	449918.74
CN	WWTP_WUXI	INFLUENT	UNK	UNK	http://doi.org/10.1021/acs.est.7b00315	1	0	184.6	184.6	184.6
CN	XIAMEN_BAY	SW	UNK	UNK	http://doi.org/10.1016/j.chemosphere.2019.124578	37	0	891.41	0.38	91.14
CN	XIAOQINGHE-RIVER	SW	UNK	UNK	http://doi.org/10.1016/j.talanta.2011.03.062	1	0	36.55	36.55	36.55
CN	YANGTZE_RIVER_ESTUARY	SW	UNK	UNK	http://doi.org/10.1016/j.scitotenv.2014.06.033	2	0	40.68	19.01	21.67
CN	YELLOW_RIVER	SW	UNK	UNK	http://doi.org/10.1016/j.scitotenv.2016.05.221	1	0	187.55	187.55	187.55
CN	YELLOW_SEA	SW	UNK	UNK	http://doi.org/10.1016/j.scitotenv.2017.04.147	44	0	238.87	1.63	16.67
CN	17_WWTPS	INFLUENT	nonAFFF	UNK	http://doi.org/10.1016/j.watres.2020.115989	17	0	39.16	0.22	10.47
CN	BEIJING_3_LANDFILLS	LEACHATE	nonAFFF	UNK	http://doi.org/10.14233/ajchem.2014.15963	3	0	14888.67	3275	6831.87
CN	CHANGSHU_INDUSTRIAL_PARK	SW	nonAFFF	UNK	http://doi.org/10.1021/acs.est.5b00212	33	0	199608.31	26.63	80942.52
CN	DALING_RIVER_BASIN_PW	SW	nonAFFF	UNK	http://doi.org/10.1016/j.scitotenv.2020.138753	18	0	76814.98	173.48	9952.98
CN	DALING_RIVER_BASIN	SW	nonAFFF	UNK	http://doi.org/10.1016/j.scitotenv.2020.138753	23	0	45226.42	48.21	4578.01
CN	DALING_RIVER_ESTUARY	SW	nonAFFF	UNK	http://doi.org/10.1007/s11356-015-4090-x	26	0	27092.17	1.33	4742.57
CN	ECOFRIENDLY_FOOD_CONTACT	PRODUCT_MASS	nonAFFF	PACKAGING	http://doi.org/10.1021/acs.est.5b03806	7	0	20893.91	1.86	17799.35
CN	FLUOROPOLYMER_RAW	PRODUCT_MASS	nonAFFF	TEXTILES,UNK,PACKAGING,CONSTRUCTION,ELECTRONICS,RAW	http://doi.org/10.1016/j.jes.2021.01.027	23	0	3275644.7	0.59	1100000.6
CN	FUSHUNFIP_OFFSITE	SW	nonAFFF	UNK	http://doi.org/10.1016/j.jhazmat.2020.122617	16	0	16341.43	16.73	3816.29
CN	FUXINFIP_OFFSITE_2019	GW	nonAFFF	UNK	http://doi.org/10.1016/j.ecoenv.2018.12.086	5	0	67721.71	217.25	26733.11

CN	FUXINFIP_OFFSITE	GW	nonAFFF	UNK	http://doi.org/10.1016/j.ecoenv.2018.12.086	5	0	67721.59	217.21	26733.04
CN	FUXIN_FLUOROCHEMICAL_INDUSTRIAL_PARK	GW	nonAFFF	UNK	http://doi.org/10.1016/j.envres.2020.109751	5	0	186778	37030	37642
CN	FUXIN_TWO_FIPs_OFFSITE	GW	nonAFFF	UNK	http://doi.org/10.1021/acs.est.8b00544	4	0	10218.97	18.11	7149.82
CN	FUXIN_TWO_FIPs_OFFSITE	SW	nonAFFF	UNK	http://doi.org/10.1021/acs.est.8b00544	17	0	57246.47	70.21	17518.5
CN	HANGZHOU_LANDFILL	SW	nonAFFF	UNK	http://doi.org/10.1016/j.scitotenv.2020.141767	15	0	377.57	4.86	67.32
CN	HANGZHOU_LANDFILL	SW	nonAFFF	UNK	http://doi.org/10.1016/j.scitotenv.2020.141767	19	0	2991.42	110.01	236.21
CN	HUANTAI_INDUSTRIAL_PARK	GW	nonAFFF	UNK	http://doi.org/10.1016/j.envint.2016.02.020	37	0	963912.42	1.69	273441.37
CN	HUANTAI_INDUSTRIAL_PARK	SW	nonAFFF	UNK	http://doi.org/10.1016/j.envint.2016.02.020	10	0	3092279.7	55.67	1859361.7
CN	LIAODONG-BAY-FIP	SW	nonAFFF	UNK	http://doi.org/10.1016/j.marpolbul.2015.10.024	34	0	207.1	2.65	37.34
CN	LIAODONG-BAY-FIP	SW	nonAFFF	UNK	http://doi.org/10.1016/j.marpolbul.2015.10.024	35	0	794.22	2.52	210.9
CN	MICROWAVE-POPCORN-BAGS	PRODUCT_MASS	nonAFFF	PACKAGING	http://doi.org/10.1016/j.foodchem.2017.03.074	2	0	283.25	139	144.26
CN	RIVER_ESTUARY_SYSTEMS	SW	nonAFFF	UNK	http://doi.org/10.1021/acs.est.5b01648	29	0	1553960	43.87	659888.24
CN	SHENYANG	INFLUENT	nonAFFF	UNK	http://doi.org/10.1016/j.watres.2011.05.036	4	0	379.68	72.07	121.76
CN	SKI_RESORT	PRODUCT_MASS	nonAFFF	COATINGS	http://doi.org/10.1016/j.jhazmat.2020.124400	4	0	1397.48	188.16	656.6
CN	TANGXUN_LAKE	SW	nonAFFF	UNK	http://doi.org/10.1021/es402120y	23	0	287164.42	4574.34	70467.62
CN	TEXTILE_FINISHING	PRODUCT_AQ	nonAFFF	COATINGS	http://doi.org/10.1007/s11783-019-1145-0	12	0	3.635E+09	2928849.6	1.37E+09
CN	TEXTILE_MANUFACTURING	SW	nonAFFF	UNK	http://doi.org/10.1021/acs.est.6b03213	3	0	289.52	78.93	109.76
CN	TIANJIN_LANDFILLS	LEACHATE	nonAFFF	UNK	http://doi.org/10.1016/j.scitotenv.2019.135832	7	0	84324.85	3004.02	28080.14

CN	URBAN_RIVER	SW	UNK	UNK	http://doi.org/10.1007/s00244-021-00855-x	16	0	25424.75	506.63	3157.54
CN	VARIOUS_LANDFILL	LEACHATE	nonAFFF	UNK	http://doi.org/10.1016/j.scitotenv.2015.03.111	5	0	381094.63	6636.73	282149.51
CN	XIAOQING_RIVER	SW	nonAFFF	UNK	http://doi.org/10.1016/j.jhazmat.2015.12.059	30	0	1203580.7	32.12	1060295
CN	YANGTZE-DW	SW	nonAFFF	UNK	http://doi.org/10.1016/j.scitotenv.2019.133949	12	0	328.38	20.46	36.97
CN	TOP-CHINA_TEXTILE_FINISHING_AGENTS	PRODUCT_AQ	nonAFFF_TOP	COATINGS	http://doi.org/10.1007/s11783-019-1145-0	12	0	1.747E+10	58823404	3.362E+09
CN	TOP_TEXTILE_FINISHING	PRODUCT_AQ	nonAFFF_TOP	COATINGS	http://doi.org/10.1007/s11783-019-1145-0	12	12	0	0	0
CZ	CZECH-BUILDING-MATERIALS-AND-WASTES	PRODUCT_MASS	nonAFFF	TEXTILES,CONSTRUCTION,ELECTRONICS,UNK	http://doi.org/10.1016/j.chemosphere.2016.08.112	126	0	858.16	0.64	157.15
CZ	MICROWAVE-POPCORN-BAGS	PRODUCT_MASS	nonAFFF	PACKAGING	http://doi.org/10.1016/j.foodchem.2017.03.074	1	0	7.63	7.63	7.63
DE	COLOGNE_FIREFIGHTING_SITE	GW	AFFF	3M	http://doi.org/10.1016/j.ijheh.2011.08.016	14	0	34434.92	36.95	11340
DE	HOUSEHOLD	PRODUCT_AQ	AFFF	UNK	http://doi.org/10.1080/02772248.2010.491482	1	0	7333674.6	7333674.6	7333674.6
DE	AQUEOUSENVIRONMENT	SW	UNK	UNK	http://doi.org/10.1007/s11356-016-7076-4	6	0	435.3	24.24	246.96
DE	CONTINENTAL_RIVERS	SW	UNK	UNK	http://doi.org/10.1021/es071471p	6	0	149.92	19.33	32.93
DE	GERMANY_HASSE	SW	UNK	UNK	http://doi.org/10.1016/j.scitotenv.2012.05.011	24	0	404.57	2.4	87.87
DE	MOEHNE_RIVER	SW	UNK	UNK	http://doi.org/10.1065/espr2006.07.326	12	0	108733.52	4.81	43348
DE	NORTH_BALTIC_COASTAL_WATER	SW	UNK	UNK	http://doi.org/10.1016/j.scitotenv.2019.05.363	92	0	467.75	1.3	13.19
DE	NORTH_SEA_2010	SW	UNK	UNK	http://doi.org/10.1016/j.envpol.2010.07.019	7	0	36.2	1.23	11.51
DE	RHINE_RIVER	SW	UNK	UNK	http://doi.org/10.1021/acs.est.8b00829	1	0	47.16	47.16	47.16
DE	RHINE_RIVER_2010	SW	UNK	UNK	http://doi.org/10.1016/j.envpol.2010.07.019	68	0	6975.55	3.52	614.56
DE	RHINE_RIVER	SW	UNK	UNK	http://doi.org/10.1065/espr2006.07.326	37	0	1394.03	7.04	178

DE	RUHR	SW	UNK	UNK	http://doi.org/10.1065/espr2006.07.326	22	0	12034.57	6.19	4386
DE	ELBE_RIVER	SW	nonAFFF	UNK	http://doi.org/10.1016/j.marpolbul.2009.04.028	15	0	294.24	9.62	26.49
DE	GERMANY_22_LANDFILLS	LEACHATE	nonAFFF	UNK	http://doi.org/10.1016/j.envpol.2009.12.031	20	0	26864.56	12.62	8028.27
DE	GERMAN-CONSUMER-PRODUCT	PRODUCT_AREA	nonAFFF	UNK	http://doi.org/10.1007/s11356-015-4202-7	3	0	170.83	23.83	104.21
DE	GERMAN-CONSUMER-PRODUCT	PRODUCT_MASS	nonAFFF	UNK	http://doi.org/10.1007/s11356-015-4202-7	5	0	359692.91	55.7	235747.48
DE	GREENPEACE	PRODUCT_AREA	nonAFFF	TEXTILES	http://www.greenpeace.de/sites/www.greenpeace.de/files/publications/20120315-outdoor-report-engl.pdf	14	0	4560.61	173.98	716
DE	HOUSEHOLD	PRODUCT_AQ	nonAFFF	COATINGS,LUBRICANT,INSECTICIDE,CLEANING	http://doi.org/10.1080/02772248.2010.491482	24	0	982977102	128182.53	396101662
DE	OUTDOOR_JACKETS	PRODUCT_AREA	nonAFFF	TEXTILES	http://doi.org/10.1016/j.chemosphere.2016.06.043	20	0	1907.52	5.96	723.77
DE	MICROWAVE-POPCORN-BAGS	PRODUCT_MASS	nonAFFF	PACKAGING	http://doi.org/10.1016/j.foodchem.2017.03.074	1	0	14.64	14.64	14.64
DE	RIVER_ESTUARY_SYSTEMS	SW	nonAFFF	UNK	http://doi.org/10.1021/acs.est.5b01648	65	0	1264.23	4.24	111.71
DK	DANISH_WWTPS	INFLUENT	nonAFFF	UNK	http://doi.org/10.1016/j.envint.2007.10.002	6	0	161.57	18.3	49.27
EG	FOOD_PACKAGING	PRODUCT_MASS	nonAFFF	PACKAGING	http://doi.org/10.1016/j.chemosphere.2015.08.066	24	0	5994.71	1.19	774.22
ES	ALBUFERA-NP	INFLUENT	UNK	UNK	http://doi.org/10.1016/j.scitotenv.2018.07.304	1	0	262	262	262
ES	ALBUFERA-NP	SW	UNK	UNK	http://doi.org/10.1016/j.scitotenv.2018.07.304	1	0	6.6	6.6	6.6
ES	CANTABRIAN_SEA	SW	UNK	UNK	http://doi.org/10.1016/j.marpolbul.2011.02.049	28	0	15.43	0.07	8
ES	CONTINENTAL_RIVERS	SW	UNK	UNK	http://doi.org/10.1021/es071471p	2	0	26.7	12.56	14.14
ES	EBRO-GUADALQUIVIR	SW	UNK	UNK	http://doi.org/10.1016/j.scitotenv.2015.07.045	2	0	317.01	51.92	265.09
ES	L'ALBUFERA_NATURAL_PARK	SW	UNK	UNK	http://doi.org/10.1007/s11356-011-0560-y	12	0	931.32	3.83	216.42

ES	LLOBREGAT-RIVER	SW	UNK	UNK	http://doi.org/10.1016/j.scitotenv.2014.05.094	1	0	271423.64	271423.64	271423.64
ES	LLOBREGAT	SW	UNK	UNK	http://doi.org/10.1016/j.scitotenv.2013.05.026	1	0	11250	11250	11250
ES	SPAIN	SW	UNK	UNK	http://doi.org/10.1016/j.scitotenv.2012.05.011	79	0	3591.72	1.53	357.61
ES	MICROWAVE-POPCORN-BAGS	PRODUCT_MASS	nonAFFF	PACKAGING	http://doi.org/10.1016/j.foodchem.2017.03.074	7	0	4882	4.88	2674.88
ES	PAPERBAG	PRODUCT_MASS	nonAFFF	PACKAGING	http://doi.org/10.1080/03067319.2018.1562062	1	0	1618.96	1618.96	1618.96
ES	SPAIN_NORTH_LANDFILL	LEACHATE	nonAFFF	UNK	http://doi.org/10.1016/j.chemosphere.2016.10.072	6	0	7934.4	787.42	2734.42
ES	SPAIN	PRODUCT_MASS	nonAFFF	PACKAGING	http://doi.org/10.1016/j.talanta.2012.09.007	3	0	1071.86	168.16	548.7
ET	TANA_LAKE	SW	UNK	UNK	http://doi.org/10.1016/j.chemosphere.2016.09.007	5	0	14.93	0.23	5.63
EU	BALTIC_SEA	SW	UNK	UNK	http://doi.org/10.1071/EN10039	74	0	163.11	0.71	5.25
EU	NORTH_AND_BALTIC_SEAS	SW	UNK	UNK	http://doi.org/10.1007/s11356-011-0451-2	55	0	198.84	0.23	24.37
FI	ATM-DEPOSITION	SW	UNK	UNK	http://doi.org/10.3390/w11040870	1	0	86.55	86.55	86.55
FR	FIREFIGHTER_TRAINING_CENTRE	SW	AFFF	UNK	http://doi.org/10.1007/s00244-018-0585-z	36	0	17451054	6553.45	7803400.8
FR	FIREFIGHTING_SITES	PRODUCT_AQ	AFFF	UNK	http://doi.org/10.1016/j.chemosphere.2017.05.055	9	0	4278890.8	10688.78	3196322.7
FR	FIREFIGHTING_SITES_TOP	PRODUCT_AQ_TOP	AFFF	UNK	http://doi.org/10.1016/j.chemosphere.2017.05.056	3	0	4092749	102549	2021360
FR	FIREFIGHTNG_SITES	GW	AFFF	UNK	http://doi.org/10.1016/j.chemosphere.2017.05.056	8	0	2675.24	22.18	1095
FR	FIREFIGHTNG_SITES	SW	AFFF	UNK	http://doi.org/10.1016/j.chemosphere.2017.05.056	16	0	1798.04	19.19	1030.6
FR	TRAINING_SITE	GW	AFFF	UNK	http://doi.org/10.1080/03067319.2016.1196683	6	0	828.68	54.5	430.24
FR	TRAINING_SITE	SW	AFFF	UNK	http://doi.org/10.1080/03067319.2016.1196683	2	0	19938.12	235.11	19703.01
FR	CONTINENTAL_RIVERS	SW	UNK	UNK	http://doi.org/10.1021/es071471p	7	0	113.4	5.8	35.12
FR	GIRONDE	SW	UNK	UNK	http://doi.org/10.1021/acs.est.7b03626	1	0	8.17	8.17	8.17
FR	MARSEILLE_BAY	SW	UNK	UNK	http://doi.org/10.1016/j.marpolbul.2019.110491	31	0	1235.12	0.69	200.13

FR	OVERSEAS-TERRITORIES	GW	UNK	UNK	http://doi.org/10.1016/j.scitotenv.2017.06.146	1	0	1.01	1.01	1.01
FR	OVERSEAS-TERRITORIES	SW	UNK	UNK	http://doi.org/10.1016/j.scitotenv.2017.06.146	1	0	1.62	1.62	1.62
FR	SCREENING	GW	UNK	UNK	http://doi.org/10.1007/s00244-012-9754-7	31	0	1259.36	17.76	125.57
FR	SCREENING	SW	UNK	UNK	http://doi.org/10.1007/s00244-012-9754-7	35	0	989.75	17.12	84.74
FR	UNKNATIONWIDE-FRESHWATER-ECOSYSTEMS	SW	UNK	UNK	http://doi.org/10.1016/j.scitotenv.2015.02.043	1	0	784.03	784.03	784.03
FR	NORTH_FRANCE_RIVER-DW	SW	nonAFFF	UNK	http://doi.org/10.1016/j.scitotenv.2017.01.079	28	2	5021.43	0	1217
FR	PACKAGING	PRODUCT_MASS	nonAFFF	PACKAGING	http://doi.org/10.1016/j.foodchem.2017.03.074	6	0	70.03	6.82	15.08
GB	CONTINENTAL_RIVERS	SW	UNK	UNK	http://doi.org/10.1021/es071471p	2	0	118.77	56.78	61.99
GB	PACKAGING	PRODUCT_MASS	nonAFFF	PACKAGING	http://doi.org/10.1016/j.foodchem.2017.03.074	2	0	22.58	8.58	14
GB	YORKSHIRE_STP_RIVERS	SW	UNK	UNK	http://doi.org/10.1016/j.envint.2014.05.004	47	0	650.6	0.18	33.85
GH	PRA_KAKUM	SW	UNK	UNK	http://doi.org/10.1016/j.scitotenv.2016.11.035	9	0	2960.99	104.07	574.74
GR	FOODSTUFF	PRODUCT_MASS	nonAFFF	PACKAGING	http://doi.org/10.1016/j.chemosphere.2013.09.092	2	0	1543.98	628.53	915.44
CN	HONG_KONG_MARINE_ENVIRONMENT	SW	UNK	UNK	http://doi.org/10.1021/es303805k	16	0	178.42	0.92	37.93
CN	HONG_KONG_SEAWATER	SW	UNK	UNK	http://doi.org/10.1016/j.jhazmat.2014.10.065	9	0	44.62	2.3	14.58
HU	PACKAGING	PRODUCT_MASS	nonAFFF	PACKAGING	http://doi.org/10.1016/j.foodchem.2017.03.074	2	0	16.3	8.11	8.19
IE	IRELAND_10_LANDFILLS	GW	nonAFFF	UNK	http://doi.org/10.1016/j.scitotenv.2019.135834	10	0	309.08	2.06	141.33
IE	IRELAND	LEACHATE	nonAFFF	UNK	http://doi.org/10.1016/j.scitotenv.2019.133810	48	0	114112.94	14.16	17524.53
IE	PACKAGING	PRODUCT_MASS	nonAFFF	PACKAGING	http://doi.org/10.1016/j.foodchem.2017.03.074	1	0	2.46	2.46	2.46
IN	GANGES_RIVER	GW	UNK	UNK	http://doi.org/10.1016/j.envpol.2015.10.050	14	0	142.66	7.49	13.24
IN	GANGES_RIVER	SW	UNK	UNK	http://doi.org/10.1016/j.envpol.2015.10.050	14	0	125.4	1.84	18.65

IN	PACKAGING	PRODUCT_MASS	nonAFFF	PACKAGING	http://doi.org/10.1016/j.foodchem.2017.03.074	1	0	19.15	19.15	19.15
IT	MIXED_CNR	GW	UNK	UNK	http://ipchem.jrc.ec.europa.eu/#showmetadata/CNRPFAS	68	0	6530.23	30.3	1702.5
IT	MIXED_CNR	SW	UNK	UNK	http://ipchem.jrc.ec.europa.eu/#showmetadata/CNRPFAS	260	0	43256.92	17.3	5471.5
IT	MIXED_CNR_WW	WW	UNK	UNK	http://ipchem.jrc.ec.europa.eu/#showmetadata/CNRPFAS	20	0	5881532.9	34.9	5836543.3
IT	CONTINENTAL_RIVERS	SW	UNK	UNK	http://doi.org/10.1021/es071471p	2	0	454.11	222.9	231.21
IT	LAMBRO_RIVER	SW	UNK	UNK	http://doi.org/10.1016/j.jhazmat.2014.06.007	31	0	3787.54	17	893.48
IT	RIVER_PO	SW	UNK	UNK	http://doi.org/10.1016/j.chemosphere.2007.09.022	23	0	2636.38	1.07	1298
IT	PACKAGING	PRODUCT_MASS	nonAFFF	PACKAGING	http://doi.org/10.1016/j.foodchem.2017.03.074	1	0	12.58	12.58	12.58
JO	ZARQA_RIVER	INFLUENT	UNK	UNK	http://doi.org/10.1016/j.scitotenv.2020.137057	2	0	26.49	11.24	15.25
JO	ZARQA_RIVER	SW	UNK	UNK	http://doi.org/10.1016/j.scitotenv.2020.137057	8	0	100.01	0.79	27.53
JP	CONSUMER	PRODUCT_MASS	AFFF	UNK	http://doi.org/10.1016/j.chemosphere.2015.02.026	1	0	101126.95	101126.95	101126.95
JP	FIRSTGRADE-RIVERS	SW	UNK	UNK	http://doi.org/10.1021/es800353f	20	0	1782.62	2.87	315.72
JP	MIXED-HYOGO_PREFECTURE	SW	UNK	UNK	http://doi.org/10.1016/j.envpol.2013.09.016	41	14	16221.96	0	16003.91
JP	8_WWTPS	INFLUENT	UNK	UNK	http://doi.org/10.1039/B927287A	8	0	664.36	9.71	432.15
JP	JAPAN	INFLUENT	UNK	UNK	http://doi.org/10.1016/j.chemosphere.2008.10.018	6	0	860.73	56.72	446.43
JP	JAPAN_RIVERS	SW	UNK	UNK	http://doi.org/10.1007/s00128-007-9243-2	5	0	354.08	16.1	126.65
JP	JAPAN_SEA_2005	SW	UNK	UNK	http://doi.org/10.1016/j.chemosphere.2019.05.132	25	0	1.5	0.02	0.14
JP	JAPAN_SEA_2010	SW	UNK	UNK	http://doi.org/10.1016/j.chemosphere.2019.05.132	40	0	11.19	0.04	1.05
JP	KYOTO_OSAKA	SW	UNK	UNK	http://doi.org/10.1016/j.chemosphere.2008.08.029	15	0	16.66	0.26	4.08
JP	OSAKA_BAY	SW	UNK	UNK	http://doi.org/10.1016/j.chemosphere.2016.12.028	15	0	129.31	0.81	53.86
JP	OSAKA	SW	UNK	UNK	http://doi.org/10.1016/j.chemosphere.2008.05.034	25	0	885.1	5.57	96.5
JP	OSAKA_DW_TREATED	SW	UNK	UNK	http://doi.org/10.1016/j.chemosphere.2008.05.034	26	0	653.65	2.59	86.4

JP	TAMA_RIVER_BASIN	SW	UNK	UNK	http://doi.org/10.1016/j.watres.2014.09.014	12	0	277.26	4.18	38.14
JP	TOKYOBAY	GW	UNK	UNK	http://doi.org/10.1021/es901213s	41	0	907.77	4.02	52
JP	TOKYOBAY	GW	UNK	UNK	http://doi.org/10.1021/es901213s	41	0	1961.04	8.15	134.08
JP	TOKYO_BAY_BASIN	SW	UNK	UNK	http://doi.org/10.1021/es103917r	76	0	11004.46	1.43	5896.47
JP	TOKYO_BAY_DISTRIBUTION	SW	UNK	UNK	http://doi.org/10.1021/es1007609	20	0	430.8	14.3	30.5
JP	TOMAKOMAI	SW	UNK	UNK	http://doi.org/10.1016/j.chroma.2006.12.071	4	0	405.36	0.82	356.26
JP	YODO_RIVER	SW	UNK	UNK	http://doi.org/10.1016/j.chemosphere.2015.05.060	45	0	700.62	0.89	89.12
JP	UNK_TOP-TAMA_RIVER	SW	UNK_TOP	UNK	http://doi.org/10.1016/j.watres.2014.09.014	12	0	346.73	5.49	43.03
JP	CONSUMER	PRODUCT_MASS	nonAFFF	COATINGS,PAINT,INSECTICIDE	http://doi.org/10.1016/j.chemosphere.2015.02.026	25	0	44052.79	194.36	25608.4
JP	PERSONAL	PRODUCT_MASS	nonAFFF	COSMETIC	http://doi.org/10.1016/j.chemosphere.2013.06.049	26	0	112157.46	83.17	35500
JP	TOKYO_2009	GW	nonAFFF	UNK	http://doi.org/10.1021/es803556w	16	0	832.37	2.74	269.65
JP	TOKYO_2014	GW	nonAFFF	UNK	http:// doi.org/10.1016/j.scitotenv.2014.04.066	53	0	7286.84	1.14	1954.75
KE	AQUEOUSENVIRONMENT	SW	UNK	UNK	http://doi.org/10.1007/s11356-016-7076-4	3	0	278.38	59.19	120.15
KE	LAKE_VICTORIA_GULF	SW	nonAFFF	UNK	http://doi.org/10.1007/s00128-008-9543-1	13	0	117.54	0.43	74.58
KR	15_WWTP	INFLUENT	UNK	UNK	http://doi.org/10.1016/j.jhazmat.2011.11.036	3	0	1767.76	108.74	1065.44
KR	BROWN_RICE	GW	UNK	UNK	http://doi.org/10.1016/j.scitotenv.2019.03.240	27	0	2210.05	0.87	1777.5
KR	COASTAL_WATER	SW	UNK	UNK	http://doi.org/10.1021/es049441z	11	0	1173.59	0.29	1120.33
KR	DWTP	DW_RAW	UNK	UNK	http://doi.org/10.3390/ijerph18052645	2	0	190.43	39.23	151.2
KR	HAN_ RIVER	SW	UNK	UNK	http://doi.org/10.1021/acs.est.8b00829	1	0	24.04	24.04	24.04
KR	KOREAN_COAST	SW	UNK	UNK	http://doi.org/10.1016/j.chemosphere.2020.126633	1	0	4.46	4.46	4.46
KR	KOREA_RIVERS_LAKES	SW	UNK	UNK	http://doi.org/10.1016/j.scitotenv.2014.01.045	6	0	71.81	1.59	24.39
KR	WEST_COAST	SW	UNK	UNK	http://doi.org/10.1016/j.envpol.2010.01.023	15	0	1793.63	13.74	694.96
KR	WWTPS_2010	INFLUENT	UNK	UNK	http://doi.org/10.1016/j.watres.2010.03.028	19	0	1275.17	3.12	629.24
KR	YOUNGSANG-NAKDONG	SW	UNK	UNK	http://doi.org/10.1016/j.scitotenv.2012.12.040	6	0	753.62	43.57	202.6

KR	ASAN_LAKE	SW	nonAFFF	UNK	http://doi.org/10.1016/j.jhazmat.2019.120909	2	1	171.7	0	171.7
KR	HYUNG_SAN_RIVER	SW	nonAFFF	UNK	http://doi.org/10.1016/j.jhazmat.2018.10.012	11	0	223.42	7.46	36.64
KR	SHIHWA_LAKE	SW	UNK	nonAFFF	http://doi.org/10.1897/05-627R.1	25	0	2390.42	5.52	867.09
KR	WWTPS	INFLUENT	nonAFFF	UNK	http://doi.org/10.1016/j.scitotenv.2016.04.077	25	0	12647.92	0.67	4356
LK	SRI_LANKA_SURFACE_WATER	SW	UNK	UNK	http://doi.org/10.1016/j.marpolbul.2007.05.021	12	0	191.91	5.01	76.79
LV	CONTINENTAL_RIVERS	SW	UNK	UNK	http://doi.org/10.1021/es071471p	1	0	1.76	1.76	1.76
MS	SEA	SW	UNK	UNK	http://doi.org/10.1016/j.chemosphere.2019.05.132	36	0	11.52	0.11	1.49
MT	MALTA	GW	UNK	UNK	http://doi.org/10.1016/j.scitotenv.2019.04.403	10	0	22.87	0.13	11.26
MT	MALTA	SW	UNK	UNK	http://doi.org/10.1016/j.scitotenv.2017.02.128	41	0	413.58	0.96	35.03
MX	PACKAGING	PRODUCT_MASS	nonAFFF	PACKAGING	http://doi.org/10.1016/j.foodchem.2017.03.074	5	0	34.6	3.3	9.56
MY	LANGAT_RIVER	SW	nonAFFF	UNK	http://doi.org/10.1080/15275922.2011.643335	105	0	843.96	0.71	88.35
NG	SELECTED_RIVERS	SW	UNK	UNK	http://doi.org/10.1016/j.jece.2018.06.020	9	0	76.47	4.77	11.55
NL	AMSTERDAM_AIRPORT	SW	AFFF	3M	http://doi.org/10.1002/etc.2602	4	0	3403.43	42.95	2380
NL	WSNP_BONAIRE	SW	AFFF	UNK	http://doi.org/10.1016/j.marpolbul.2017.07.017	16	0	6608.35	5.37	993.38
NL	CATCHMENT	GW	UNK	UNK	http://doi.org/10.1016/j.scitotenv.2013.04.066	15	0	5197.58	2.86	4400.01
NL	FLUOROCHEMICAL_PRODUCTION_PLANT	SW	nonAFFF,UNK	UNK	http://doi.org/10.1021/acs.est.7b02488	18	0	3264.91	40.71	879.95
NL	PACKAGING	PRODUCT_MASS	nonAFFF	PACKAGING	http://doi.org/10.1016/j.foodchem.2017.03.074	2	0	22.1	9.34	12.77
NL	RIVER_ESTUARY_SYSTEMS	SW	nonAFFF	UNK	http://doi.org/10.1021/acs.est.5b01648	17	0	538.4	5.52	104.9
NO	CONSUMER	PRODUCT_AQ	AFFF	UNK	http://doi.org/10.1016/j.chemosphere.2012.03.035	3	0	3.255E+09	82515154	2.384E+09
NO	FLESLAND_AIRPORT	GW	AFFF	3M	http://doi.org/10.1071/EN10145	3	0	27845.08	8230.23	10951.91
NO	REPORT_GARDERMOEN	GW	AFFF	na	http://evalueringsportalen.no/evaluering/screening-of-polyfluorinated-organic-compounds-at-four-fire-training-facilities-in-norway/ta2444.pdf/@@inline	3	0	76133.98	4161.15	58657.82

NO	MIXED-TYRIFIJORDEN	PRODUCT_MASS	nonAFFF	PAPER	http://doi.org/10.1016/j.envpol.2020.116259	1	0	20448.31	20448.31	20448.31
NO	MIXED-TYRIFIJORDEN	SW	nonAFFF,AFFF	MIXED	http://doi.org/10.1016/j.envpol.2020.116259	2	0	34420.21	1610.61	32809.6
NO	NORWEGIAN_SEAS	SW	UNK	UNK	http://doi.org/10.1016/j.marpolbul.2009.09.013	19	0	79.31	0.16	16.79
NO	SVALBARD	SW	UNK	UNK	http://doi.org/10.1016/j.scitotenv.2012.10.091	3	0	6.36	0.68	3.26
NO	CONSUMER	PRODUCT_MASS	nonAFFF	PAINT,ELECTRONICS,NON-STICK	http://doi.org/10.1016/j.chemosphere.2012.03.035	12	0	4570.24	10.78	2618.89
NO	CONSUMER	PRODUCT_AQ	nonAFFF	COATINGS	http://doi.org/10.1016/j.chemosphere.2012.03.035	5	0	676188142	10851879	468880281
NO	CONSUMER	PRODUCT_AREA	nonAFFF	TEXTILES	http://doi.org/10.1016/j.chemosphere.2012.03.035	8	0	1880.32	9.36	766.93
NO	EXPORTED_TO_NORWAY	PRODUCT_AREA	nonAFFF	TEXTILES,PACKAGING	http://doi.org/10.1016/j.envpol.2014.12.034	45	0	1921.05	0.44	374.08
NO	SKI_WAX	PRODUCT_MASS	nonAFFF	UNK	http://doi.org/10.1039/D0EM00357C	11	0	582600.27	266	217557.5
NP	EVEREST	SW	UNK	UNK	http://doi.org/10.1016/j.scitotenv.2020.144421	7	0	26.54	2.62	6.7
PH	DRINKING_WATER	SW	UNK	UNK	http://doi.org/10.1016/j.chemosphere.2020.127115	15	0	219.39	5.51	29.93
PL	CONTINENTAL_RIVERS	SW	UNK	UNK	http://doi.org/10.1021/es071471p	2	0	13.6	6.14	7.46
PL	POLAND_SURVEY	SW	UNK	UNK	http://doi.org/10.1080/10934520903263330	34	0	890.95	1.27	329.97
PL	FOOD_CONTACT_MATERIALS	PRODUCT_AREA	nonAFFF	PACKAGING	http://doi.org/10.1002/pts.2140	12	0	367374.78	11263.24	68237.72
PT	PACKAGING	PRODUCT_MASS	nonAFFF	PACKAGING	http://doi.org/10.1016/j.foodchem.2017.03.074	1	0	10.22	10.22	10.22
RO	CONTINENTAL_RIVERS	SW	UNK	UNK	http://doi.org/10.1021/es071471p	6	0	102.16	12.38	22.27
RO	DANUBE-RIVER	SW	UNK	UNK	http://doi.org/10.1016/j.scitotenv.2017.07.039	1	0	25.5	25.5	25.5
SA	RED_SEA	SW	AFFF	UNK	http://doi.org/10.1007/s11356-020-09897-5	28	0	2644.85	1.15	848.32
SE	AIRFORCE_BASE	GW	AFFF	UNK	http://doi.org/10.1016/j.chemosphere.2014.09.005	16	0	18381.24	1.79	8840
SE	AIRFORCE_BASE	SW	AFFF	UNK	http://doi.org/10.1016/j.chemosphere.2014.09.005	14	0	361.98	1.15	79

SE	ARLANDA_AIRPORT	GW	AFFF	3M	http://doi.org/10.1021/acs.est.7b02926	5	0	37620.92	486.4	18341.57
SE	ARLANDA_AIRPORT	SW	AFFF	UNK	http://doi.org/10.1039/c9em00281b	7	0	5913.55	30.56	2786.78
SE	FFTS	SW	AFFF	UNK	http://doi.org/10.1021/acs.est.9b02211	23	0	382760.89	6.91	209120.3
SE	GOBELIUS_FIRETRAINING	GW	AFFF	UNK	http://doi.org/10.1021/acs.est.7b05718	41	0	7669.97	2.39	6424.72
SE	GOBELIUS_FIRETRAINING	SW	AFFF	UNK	http://doi.org/10.1021/acs.est.7b05718	142	0	28888.42	2.36	12906.24
SE	STOCKHOLM_ARLANDA	GW	AFFF	3M	http://www.ivl.se/download/18.1369484715f59ce4babf2/1509550871689/B2289.pdf	26	0	2214159.7	184.3	797517.27
SE	3WWTPS	SW	UNK	UNK	http://doi.org/10.1016/j.jes.2017.05.004	3	0	165.78	30.59	83.3
SE	3WWTPS	SW	UNK	UNK	http://doi.org/10.1016/j.jes.2017.05.004	3	0	173.87	40.06	86.81
SE	ANN-STORLIEN	GW	UNK	UNK	http://doi.org/10.1016/j.scitotenv.2018.10.016	2	0	32.42	10.3	22.13
SE	ANN-STORLIEN	SW	UNK	UNK	http://doi.org/10.1016/j.scitotenv.2018.10.016	8	0	12.65	0.95	3.49
SE	BALTIC-SEA	SW	UNK	UNK	http://doi.org/10.1021/acs.est.6b01197	1	0	2.2	2.2	2.2
SE	CONTINENTAL_RIVERS	SW	UNK	UNK	http://doi.org/10.1021/es071471p	3	0	6.01	1.77	2.23
SE	GOBELIUS_ENVIRO	GW	UNK	UNK	http://doi.org/10.1021/acs.est.7b05718	39	0	171.61	2.46	13.21
SE	GOBELIUS_ENVIRO	SW	UNK	UNK	http://doi.org/10.1021/acs.est.7b05718	60	0	1576.69	2.58	347.42
SE	GOBELIUS_INDUSTRY	GW	UNK	UNK	http://doi.org/10.1021/acs.est.7b05718	61	0	536.14	2.28	214.8
SE	GOBELIUS_INDUSTRY	SW	UNK	UNK	http://doi.org/10.1021/acs.est.7b05718	45	0	703.44	2.16	174.11
SE	GOBELIUS_URBAN	GW	UNK	UNK	http://doi.org/10.1021/acs.est.7b05718	16	0	93.28	2.44	23.55
SE	GOBELIUS_URBAN	SW	UNK	UNK	http://doi.org/10.1021/acs.est.7b05718	8	0	35.57	3.48	5.33
SE	MALAREN_LAKE	SW	UNK	UNK	http://doi.org/10.1021/acs.est.8b00829	1	0	18.72	18.72	18.72
SE	SWEDEN_COASTAL	SW	UNK	UNK	http://doi.org/10.1016/j.envpol.2016.10.089	62	0	532.2	1.28	60.13
SE	SWEDISH	GW	UNK	UNK	http://doi.org/10.1021/acs.est.7b05718	170	0	8840.5	2.02	6424.66
SE	SWEDISH	SW	UNK	UNK	http://doi.org/10.1021/acs.est.7b05718	311	0	33008.4	1.75	12906.2
SE	WWTP	INFLUENT	UNK	UNK	http://doi.org/10.1016/j.chemosphere.2014.07.082	12	0	259.75	11.81	34.19
SE	COSMETIC	PRODUCT_MASS	nonAFFF	COSMETIC	http://doi.org/10.1039/C8EM00368H	31	0	282386.94	366.71	128322.2

SE	GOBELIUS_LANDFILL	GW	nonAFFF	UNK	http://doi.org/10.1021/acs.est.7b05718	4	0	61.63	2.19	50.39
SE	GOBELIUS_LANDFILL	SW	nonAFFF	UNK	http://doi.org/10.1021/acs.est.7b05718	20	0	1328.63	2.54	759.57
SE	GOBELIUS_SKIING	GW	nonAFFF	UNK	http://doi.org/10.1021/acs.est.7b05718	3	0	9.67	2.54	3.89
SE	GOBELIUS_SKIING	SW	nonAFFF	UNK	http://doi.org/10.1021/acs.est.7b05718	6	0	93.17	3.39	59.27
SE	NORDIC	PRODUCT_AREA	nonAFFF	PACKAGING, DETERGENT, COATINGS	http://doi.org/10.6027/TN2017-543	17	0	177611.31	0.35	120303.31
SE	NORDIC	PRODUCT_MASS	nonAFFF	TEXTILES	http://doi.org/10.6027/TN2017-543	8	0	1447.09	1.06	1418.2
SE	PACKAGING	PRODUCT_MASS	nonAFFF	PACKAGING	http://doi.org/10.1016/j.foodchem.2017.03.074	3	0	27.04	6.85	10.52
SE	SWEDISH	SW	nonAFFF	UNK	http://doi.org/10.1021/acs.est.7b05718	3	0	588.61	3.47	443.28
SE	SWEDISH_WWTPS	INFLUENT	nonAFFF	UNK	http://doi.org/10.1016/j.jes.2017.05.004	3	0	198.93	49.56	88.18
SG	URBAN_CANAL	SW	UNK	UNK	http://doi.org/10.1016/j.chemosphere.2010.12.030	8	0	422.77	6.31	128.11
SG	2_WWTPS	INFLUENT	nonAFFF	UNK	http://doi.org/10.1016/j.watres.2009.03.009	10	0	2054.9	22	1012.7
TH	CHAOPRAYA 2	SW	UNK	UNK	http://doi.org/10.2166/wst.2011.686	4	0	54.28	4.54	23.6
TH	CHAOPRAYA	SW	UNK	UNK	http://doi.org/10.1061/(ASCE)EE.1943-7870.0000603	21	0	114.69	1.7	16.09
TH	DRINKING_WATER	SW	UNK	UNK	http://doi.org/10.1016/j.chemosphere.2020.127115	31	0	1074.82	7.38	65.83
TH	THAILAND_DW RAW	DW_RAW	UNK	UNK	http://doi.org/10.1016/j.chemosphere.2020.127115	31	0	1323.18	7.93	84.07
TH	AYUTTHAYA-CHONBURI	GW	nonAFFF	UNK	http://iwaponline.com/wst/article/2017/2/457/38772/Levels-of-perfluorinated-compounds-PFCs-in	2	0	100.84	11.15	89.69
JP	BANGKOK_WWTPS	INFLUENT	nonAFFF	UNK	http://doi.org/10.1039/B927287A	5	0	2537.96	31.43	1862.3
TH	PACKAGING	PRODUCT_AREA	nonAFFF	PACKAGING	http://doi.org/10.1016/j.jhazmat.2011.12.050	29	0	392.84	0.12	96.34
TW	TAIWANESE_RIVERS	INFLUENT	nonAFFF	UNK	http://doi.org/10.1016/j.envpol.2008.11.033	1	0	27650000	27650000	27650000
TW	TAIWANESE_RIVERS	SW	nonAFFF	UNK	http://doi.org/10.1016/j.envpol.2008.11.033	1	0	297.3	297.3	297.3
TZ	MOROGORO	SW	UNK	UNK	http://www.sciencedirect.com/science/article/pii/S0013935120311968	5	0	1.33	0.14	0.44

UG	KAMPALA_NAKIVUBO_WETLAND	SW	UNK	UNK	http://doi.org/10.1016/j.scitotenv.2018.03.024	6	0	26.83	1.13	7.57
UK	THAMES_RIVER	SW	UNK	UNK	http://doi.org/10.1021/acs.est.8b00829	1	0	83.84	83.84	83.84
UK	WIMS_DATABASE	EFFLUENT	UNK	UNK	http://environment.data.gov.uk/water-quality/view/landing	1	1	0	0	0
UK	WIMS_DATABASE	SW	UNK	UNK	http://environment.data.gov.uk/water-quality/view/landing	1	1	0	0	0
US	5_BASES	GW	AFFF	UNK	http://doi.org/10.1021/es3034999	19	0	3773405.7	12.68	1429863.9
US	5_BASES	PRODUCT_AQ	AFFF	ANSUL,CHEMGUARD,ANGUS,NATIONALFOAM,BUCKEYE,FSP,3M	http://doi.org/10.1021/es3034999	11	0	1.093E+11	2.611E+09	1.864E+10
US	AIRFORCE_BASE	PRODUCT_AQ	AFFF	3M,CHEMGUARD,ANSUL,BUCKEYE,NATIONALFOAM	http://doi.org/10.1021/es4018877	19	0	2.055E+11	900000000	2.1E+10
US	ALTUS	GW	AFFF	3M	http://ar.afcec-cloud.af.mil/	36	0	12290710	1249.18	2482457.7
US	ALTUS	SW	AFFF	3M	http://ar.afcec-cloud.af.mil/	3	0	53034.74	881.93	50838.47
US	CALI_STATE	GW	AFFF	UNK	http://geotracker.waterboards.ca.gov/map/pfas_map	222	0	12754719	13.11	8770877.6
US	CALI_STATE	SW	AFFF	UNK	http://geotracker.waterboards.ca.gov/map/pfas_map	30	0	286261.43	16.11	91095.53
US	CAPE_COD	SW	AFFF	UNK	http://doi.org/10.1021/acs.est.0c07296	41	0	9779.68	36.34	566.36
US	CLARENDON_OFF	GW	AFFF	MIX	http://anrweb.vt.gov/PubDocs/DEC/Hazsites/20184763.SVRA.2018.DW.SamplingSummary.rpt.pdf	39	0	2268.49	10.33	350.36
US	CLARENDON_ON	GW	AFFF	MIX	http://anrweb.vt.gov/PubDocs/DEC/Hazsites/20184763.RutlandSVRA.SI.2018.rpt.pdf	6	0	30033.99	117.41	10935.54
US	DAVIS-MONTHAN	GW	AFFF	3M	http://ar.afcec-cloud.af.mil/	8	0	40693.83	125.21	27123.66
US	ELLSWORTH-AFB	GW	AFFF	UNK	http://doi.org/10.1021/es5006187	36	0	9138.8	0.34	1405.94
US	FORENSICS	PRODUCT_AQ	AFFF	UNK	http://doi.org/10.1080/15275922.2020.1771631	4	0	641642708	43786972	444805582
US	ITC	SW	AFFF	ANSUL	http://doi.org/10.1016/j.envpol.2020.115009	52	0	36943	90.62	2071.01
US	MARINETTE	GW	AFFF	ANSUL	http://dnr.wi.gov/botw/GetActivityDetail.do;jsessionid=4JHfhvuzoRA2P36uArdpzcwujX6s-T_vIQPHFGU_xfZ9y-_CtUUX!1987276291?detailSeqNo=581955&siteId=643000&crumb=1&search=b	32	0	352029.8	7.21	60742.24

US	MARINETTE_RES	GW	AFFF	ANSUL	http://dnr.wi.gov/botw/GetActivityDetail.do;jsessionid=4JHfhvuzoRA2P36uArdpzcwujX6s-T_vIQPHFGU_xfZ9y-_CtUUX!1987276291?detailSeqNo=581955&siteId=643000&crumb=1&search=b	1192	0	119553.06	6.28	2234.41
US	MARINETTE	SW	AFFF	ANSUL	http://dnr.wi.gov/botw/GetActivityDetail.do;jsessionid=4JHfhvuzoRA2P36uArdpzcwujX6s-T_vIQPHFGU_xfZ9y-_CtUUX!1987276291?detailSeqNo=581955&siteId=643000&crumb=1&search=b	40	0	34476.77	20.26	6672.1
US	PDX	GW	AFFF	MIX	http://www.deq.state.or.us/Webdocs/Forms/Output/FPController.ashx?SourceId=3324&SourceIdType=11	147	0	1437489.1	5.55	279955.11
US	PDX	SW	AFFF	MIX	http://www.deq.state.or.us/Webdocs/Forms/Output/FPController.ashx?SourceId=3324&SourceIdType=11	24	0	55553.68	9.94	19196.43
US	AFFF_TOP-AIRFORCE_BASE	GW	AFFF_TOP	3M	http://doi.org/10.1021/es4018877	26	0	9420900	200	1354900
US	MIXED-NEWSVT	PRODUCT_MASS	nonAFFF	TEXTILES,CONSTRUCTION,COATINGS,UNK	http://legislature.vermont.gov/Documents/2020/WorkGroups/House%20Natural/Contaminants/W~Matt%20Chapman~PFAS%20Waste%20Source%20Testing%20Report~1-16-2020.pdf	58	0	15531.29	1.34	6753.14
US	6_LANDFILL	LEACHATE	UNK	UNK	http://doi.org/10.1016/j.chroma.2014.07.056	7	0	278318.86	3249.34	160851.21
US	CALI_STATE	GW	UNK	UNK	http://geotracker.waterboards.ca.gov/map/pfas_map	2856	0	128840.68	12.36	3345.97
US	CALI_STATE_LANDFILL	LEACHATE	UNK	UNK	http://geotracker.waterboards.ca.gov/map/pfas_map	758	0	302538.89	13.97	54606.37
US	CAPE_COD	SW	UNK	UNK	http://doi.org/10.1021/acs.est.0c07296	13	0	115.82	6.5	12.23
US	CAPE_FEAR_RIVER	DW_RAW	UNK	UNK	http://doi.org/10.1021/acs.estlett.6b00398	3	0	539.88	86.26	362.24
US	DELAWARE_RIVER	SW	UNK	UNK	http://doi.org/10.1021/acs.est.8b00829	1	0	44.16	44.16	44.16
US	FLORIDA-LEACHATE	LEACHATE	UNK	UNK	http://doi.org/10.1021/acs.estlett.0c00819	3	0	16714.41	3382.61	9828.95
US	GALIFGAMA	GW	UNK	UNK	http://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/Default.asp#	10475	0	16311529	0.01	8212896.2
US	GREAT-LAKES-USA-CA	SW	UNK	UNK	http://doi.org/10.1021/acs.est.9b01337	92	0	924.68	2.22	89.46
US	LAKE_SUPERIOR	SW	UNK	UNK	http://doi.org/10.1016/j.jglr.2010.03.003	41	0	62.02	0.2	3.52
US	LANG_EST2017	LEACHATE	UNK	UNK	http://pubs.acs.org/doi/10.1021/acs.est.6b05005	87	0	1041427.4	411.32	65917.62

US	MEDEP_DATABASE	GW	UNK	UNK	http://www.maine.gov/dep/maps-data/egad/	2067	0	4087497.7	0	271060
US	MEDEP_DATABASE	LEACHATE	UNK	UNK	http://www.maine.gov/dep/maps-data/egad/	2	0	1923.18	106.98	1816.2
US	MEDEP_DATABASE	PRODUCT_AQ	UNK	UNK	http://www.maine.gov/dep/maps-data/egad/	3	0	580	0	580
US	MEDEP_DATABASE	PRODUCT_MASS	UNK	UNK	http://www.maine.gov/dep/maps-data/egad/	1	0	0	0	0
US	MEDEP_DATABASE	SW	UNK	UNK	http://www.maine.gov/dep/maps-data/egad/	154	0	126398.55	0	18082.42
US	NEVADA_2WATERSHEDS	SW	UNK	UNK	http://doi.org/10.1016/j.scitotenv.2020.141622	18	0	3527.58	54.3	625.39
US	NORTHWESTERN_ATLANTIC-SW	SW	UNK	UNK	http://doi.org/10.1021/acs.est.9b03230	54	0	75.94	0.34	4.07
USA	PERDIDO-BAY	SW	UNK	UNK	http://doi.org/10.1016/j.talanta.2018.07.053	32	0	409.79	4.48	25.08
USA	SOUTH-IOWA	SW	UNK	UNK	http://doi.org/10.1021/es050213u	1	0	33.82	33.82	33.82
US	VTWWTF	INFLUENT	UNK,AFFF	UNK	http://dec.vermont.gov/sites/dec/files/wmp/SolidWaste/Documents/02.03.20_PFAS%20in%20LF%20and%20WWTF%20Final%20Report.pdf	124	0	14542.22	17.81	1914.44
US	WQP_DATABASE	GW	UNK	UNK	http://www.waterqualitydata.us/	1246	957	9549.9	0	2029.62
US	WQP_DATABASE	SW	UNK	UNK	http://www.waterqualitydata.us/	3207	2651	32266.25	0	1952
US	BENNINGTON	GW	nonAFFF	UNK	http://dec.vermont.gov/pfas/pfoa/communities	1525	0	189642.3	6.61	4663.71
US	CALI_STATE_CHROME_PLATING	GW	nonAFFF	UNK	http://geotracker.waterboards.ca.gov/map/pfas_map	49	0	13426.31	14.44	2826.5
US	CALI_STATE_CHROME_PLATING	INFLUENT	nonAFFF	UNK	http://geotracker.waterboards.ca.gov/map/pfas_map	9	0	375447.11	21.33	373973.34
US	CALI_STATE_CHROME_PLATING	SW	nonAFFF	UNK	http://geotracker.waterboards.ca.gov/map/pfas_map	9	0	3689.16	22.58	1354.38
US	CAPEFEAR	SW	nonAFFF	CHEMOURS	http://deq.nc.gov/	456	0	206196.41	89.14	3208.9
US	CENTRE	SW	nonAFFF	MIX	http://www.adem.state.al.us/default.cnt	97	0	43685.48	243.56	926.98
US	CHILDCARE_CARPETS	PRODUCT_MASS	nonAFFF	TEXTILES	http://doi.org/10.1016/j.chemosphere.2020.126771	29	0	28607.09	43.34	8532.9
US	COSMETIC	PRODUCT_MASS	nonAFFF	COSMETIC	http://doi.org/10.1021/acs.estlett.1c00240	12	0	15282.17	147.95	10399.1

US	DECATUR_TENNESSEE_RIVER	SW	nonAFFF	3M	http://doi.org/10.1021/es010780r	40	0	10012.85	24.61	731
US	DRINKING_STRAWS	PRODUCT_MASS	nonAFFF	PACKAGING	http://doi.org/10.1016/j.chemosphere.2021.130238	59	0	433.23	2.51	40.23
US	DU-WEL_DBS_VAS	GW	nonAFFF	UNK	http://www.michigan.gov/pfasresponse/investigations/sites-aoi/van-buren-county/du-wel-metals	14	0	18157.8	18.67	14186.4
US	DU-WEL_MW	GW	nonAFFF	UNK	http://www.michigan.gov/pfasresponse/investigations/sites-aoi/van-buren-county/du-wel-metals	24	0	33221.27	14.88	8820.54
US	DU-WEL_RES_WELLS	GW	nonAFFF	UNK	http://www.michigan.gov/pfasresponse/investigations/sites-aoi/van-buren-county/du-wel-metals	82	0	6471.34	17.13	924.27
US	DU-WEL_VAS_OFF	GW	nonAFFF	UNK	http://www.michigan.gov/pfasresponse/investigations/sites-aoi/van-buren-county/du-wel-metals	48	0	19723.45	13.78	5259.16
US	DU-WEL_VAS_ON	GW	nonAFFF	UNK	http://www.michigan.gov/pfasresponse/investigations/sites-aoi/van-buren-county/du-wel-metals	102	0	991038.6	18.15	264811.35
US	EASTMETRO_A	GW	nonAFFF	UNK	http://webapp.pca.state.mn.us/cleanup/search	7852	0	757219126	0.48	108011810
US	FLORIDA_LANDFILLVEHICLES	LEACHATE	nonAFFF	UNK	http://doi.org/10.1021/acs.estlett.0c00819	3	0	16790.9	3411.9	9828.04
US	FLUOROPOLYMER_PRODUCTION	DW_RAW	nonAFFF	UNK	http://doi.org/10.1021/acs.est.9b07384	2	0	153.27	68.09	85.18
US	FLUOROPOLYMER_PRODUCTION	SW	nonAFFF	UNK	http://doi.org/10.1021/acs.est.9b07384	91	0	52725.38	29.61	3269.68
US	FORENSICS	PRODUCT_MASS	nonAFFF	PACKAGING	http://doi.org/10.1080/15275922.2020.1771631	5	0	134405402	8453676.8	93553153
US	GADSDEN	SW	nonAFFF	MIX	http://lf.adem.alabama.gov/WebLink/DocView.aspx?id=103684837&dbid=0&cr=1	175	0	61988.21	164.17	3059.89
US	HUSET2011_LANDFILL	LEACHATE	nonAFFF	UNK	http://doi.org/10.1016/j.chemosphere.2010.11.072	6	0	28052.2	2668.61	7415.36
US	INDOOR_ENVIRONMENT_CONSUMER	PRODUCT_MASS	nonAFFF	TEXTILES,COATINGS,PACKAGING,UNK	http://doi.org/10.1016/j.chemosphere.2014.06.012	54	0	762046.58	384.45	423857.89
US	MANUFACTURING-DECATUR	SW	UNK	UNK	http://doi.org/10.1021/acs.est.6b05330	9	0	1412.04	38.95	740.8

US	PACKAGING	PRODUCT_MASS	nonAFFF	PACKAGING	http://doi.org/10.1016/j.foodchem.2017.03.074	3	1	11.01	0	7.08
US	PAPER_TEXTILES	PRODUCT_AREA	nonAFFF	PACKAGING, PAPER,TEXTILES	http://doi.org/10.1021/acs.est.7b02080	17	0	23034.27	4.16	14532.88
US	PET_FOOD_PACKAGING	PRODUCT_MASS	nonAFFF	PACKAGING	http://doi.org/10.1016/j.eti.2020.101247	1	0	2.97	2.97	2.97
US	RIVERS_NEAR_CARPET_CITY	SW	nonAFFF	UNK	http://doi.org/10.1897/07-659.1	11	0	5531.07	5.89	1776.3
US	TEXTILES	PRODUCT_AREA	nonAFFF	TEXTILES	http://doi.org/10.1016/j.envpol.2020.114940	3	0	16.86	0.61	13.32
US	WOLVERINE_HS	GW	nonAFFF	SCOTCHGARD	http://www.epa.gov/sites/production/files/2019-06/documents/wolverine-implementation-2018-workplan.pdf	111	0	9217735.8	3950.45	603529.29
US	WOLVERINE_TA	GW	nonAFFF	SCOTCHGARD	http://www.epa.gov/sites/production/files/2019-06/documents/wolverine-implementation-2018-workplan.pdf	112	0	6111959.1	4868.6	457829.37
US	WOLVERINE_TA	SW	nonAFFF	SCOTCHGARD	http://www.epa.gov/mi/wolverine-world-wide-tannery	14	0	3857.63	48.56	2043.49
US	TOP-PAPER_TEXTILES	PRODUCT_AREA	nonAFFF_TOP	PACKAGING, PAPER,TEXTILES	http://doi.org/10.1021/acs.est.7b02080	17	0	25369.52	0.33	21481.54
US	TOP-PET_FOOD_PACKAGING	PRODUCT_MASS	nonAFFF_TOP	PACKAGING	http://doi.org/10.1016/j.eti.2020.101247	1	0	12.42	12.42	12.42
US	TOP-TEXTILES	PRODUCT_AREA	nonAFFF_TOP	TEXTILES	http://doi.org/10.1016/j.envpol.2020.114940	3	0	157.47	2.7	96.91
VN	DAY_RIVER	SW	UNK	UNK	http://doi.org/10.1155/2021/5564994	10	0	43.3	3.34	6.86
VN	ENVIRONMENT_2014_1	SW	UNK	UNK	http://doi.org/10.1016/j.chemosphere.2014.11.023	28	0	81	0.51	16.92
VN	ENVIRONMENT_2014_2	SW	UNK	UNK	http://doi.org/10.1016/j.chemosphere.2014.11.023	14	0	7.76	0.25	1.24
VN	ENVIRONMENT_2014	GW	UNK	UNK	http://doi.org/10.1016/j.chemosphere.2014.11.023	22	0	35.89	0.16	21.07
VN	VIETNAM	SW	UNK	UNK	http://doi.org/10.1016/j.jhazmat.2016.04.010	11	0	55.4	0.77	36.25
VN	WASTE_DISPOSAL_CONTROL	SW	UNK	UNK	http://doi.org/10.1007/s10661-012-2759-x	1	0	14.16	14.16	14.16
VN	CRAFT_VILLAGES	SW	nonAFFF	UNK	http://doi.org/10.1155/2021/5564994	76	0	1018.36	0.96	60.34
VN	WASTE_DISPOSAL	LEACHATE	nonAFFF	UNK	http://doi.org/10.1007/s10661-012-2759-x	1	0	362.45	362.45	362.45

VN	WASTE_DISPOSAL	SW	nonAFFF	UNK	http://doi.org/10.1007/s10661-012-2759-x	4	0	111.11	15.75	57.99
ZA	RIVER_WATER	SW	UNK	UNK	http://doi.org/10.2166/wst.2013.566	56	0	3987.04	2	415.2
ZA	UMVOTI_MOUTH	SW	UNK	UNK	http://doi.org/10.1016/j.scitotenv.2019.135047	4	0	7331.53	1359.02	2673.26
ZA	VAAL_RIVER	SW	UNK	UNK	http://doi.org/10.1016/j.scitotenv.2018.02.023	3	0	220.59	11.69	122
ZA	PLANKENBURG_RIVER	SW	nonAFFF	UNK	http://doi.org/10.1007/s10661-018-6715-2	4	0	495.45	62.35	188.28

References

(1) Ellis, D. A.; Martin, J. W.; De Silva, A. O.; Mabury, S. A.; Hurley, M. D.; Sulbaek Andersen, M. P.; Wallington, T. J. Degradation of Fluorotelomer Alcohols: A Likely Atmospheric Source of Perfluorinated Carboxylic Acids. *Environmental science & technology* **2004**, *38* (12), 3316-3321. DOI: 10.1021/es049860w.

(2) Butt, C. M.; Muir, D. C. G.; Mabury, S. A. Biotransformation pathways of fluorotelomer-based polyfluoroalkyl substances: A review. *Environmental Toxicology and Chemistry* **2014**, *33* (2), 243-267, https://doi.org/10.1002/etc.2407. DOI: https://doi.org/10.1002/etc.2407 (acccessed 2021/09/23).

(3) Wang, N.; Szostek, B.; Buck, R. C.; Folsom, P. W.; Sulecki, L. M.; Gannon, J. T. 8-2 Fluorotelomer alcohol aerobic soil biodegradation: Pathways, metabolites, and metabolite yields. *Chemosphere* **2009**, *75* (8), 1089-1096. DOI: https://doi.org/10.1016/j.chemosphere.2009.01.033.

(4) Zhao, S.; Zhu, L. Uptake and metabolism of 10:2 fluorotelomer alcohol in soil-earthworm (Eisenia fetida) and soil-wheat (Triticum aestivum L.) systems. *Environmental Pollution* **2017**, *220*, 124-131. DOI: https://doi.org/10.1016/j.envpol.2016.09.030.

(5) Thackray, C. P.; Selin, N. E.; Young, C. J. A global atmospheric chemistry model for the fate and transport of PFCAs and their precursors. *Environmental Science: Processes & Impacts* **2020**, *22* (2), 285-293, 10.1039/C9EM00326F. DOI: 10.1039/C9EM00326F.

(6) Zhang, S.; Lu, X.; Wang, N.; Buck, R. C. Biotransformation potential of 6:2 fluorotelomer sulfonate (6:2 FTSA) in aerobic and anaerobic sediment. *Chemosphere* **2016**, *154*, 224-230. DOI: https://doi.org/10.1016/j.chemosphere.2016.03.062.

(7) Dasu, K.; Liu, J.; Lee, L. S. Aerobic Soil Biodegradation of 8:2 Fluorotelomer Stearate Monoester. *Environmental science & technology* **2012**, *46* (7), 3831-3836. DOI: 10.1021/es203978g.

(8) Butt, C. M.; Young, C. J.; Mabury, S. A.; Hurley, M. D.; Wallington, T. J. Atmospheric Chemistry of 4:2 Fluorotelomer Acrylate [C4F9CH2CH2OC(O)CH═CH2]: Kinetics, Mechanisms, and Products of Chlorine-Atom- and OH-Radical-Initiated Oxidation. *The Journal of Physical Chemistry A* **2009**, *113* (13), 3155-3161. DOI: 10.1021/jp810358k.

(9) Butt, C. M.; Muir, D. C. G.; Mabury, S. A. Biotransformation of the 8:2 fluorotelomer acrylate in rainbow trout. 1. In vivo dietary exposure. *Environmental Toxicology and Chemistry* **2010**, *29* (12), 2726-2735, https://doi.org/10.1002/etc.349. DOI: https://doi.org/10.1002/etc.349 (acccessed 2021/09/23).

(10) Royer, L. A.; Lee, L. S.; Russell, M. H.; Nies, L. F.; Turco, R. F. Microbial transformation of 8:2 fluorotelomer acrylate and methacrylate in aerobic soils. *Chemosphere* **2015**, *129*, 54-61. DOI: https://doi.org/10.1016/j.chemosphere.2014.09.077.

(11) Myers, A. L.; Mabury, S. A. Fate of fluorotelomer acids in a soil–water microcosm. *Environmental Toxicology and Chemistry* **2010**, *29* (8), 1689-1695, https://doi.org/10.1002/etc.211. DOI: https://doi.org/10.1002/etc.211 (acccessed 2021/09/23).

(12) Liu, C.; Liu, J. Aerobic biotransformation of polyfluoroalkyl phosphate esters (PAPs) in soil. *Environmental Pollution* **2016**, *212*, 230-237. DOI: https://doi.org/10.1016/j.envpol.2016.01.069.

(13) Bizkarguenaga, E.; Zabaleta, I.; Prieto, A.; Fernández, L. A.; Zuloaga, O. Uptake of 8:2 perfluoroalkyl phosphate diester and its degradation products by carrot and lettuce from compost-amended soil. *Chemosphere* **2016**, *152*, 309-317. DOI: https://doi.org/10.1016/j.chemosphere.2016.02.130.

(14) Lee, H.; D'eon, J.; Mabury, S. A. Biodegradation of Polyfluoroalkyl Phosphates as a Source of Perfluorinated Acids to the Environment. *Environmental science & technology* **2010**, *44* (9), 3305-3310. DOI: 10.1021/es9028183.

(15) Harding-Marjanovic, K. C.; Houtz, E. F.; Yi, S.; Field, J. A.; Sedlak, D. L.; Alvarez-Cohen, L. Aerobic Biotransformation of Fluorotelomer Thioether Amido Sulfonate (Lodyne) in AFFF-Amended Microcosms. *Environmental science & technology* **2015**, *49* (13), 7666-7674. DOI: 10.1021/acs.est.5b01219.

(16) Rhoads, K. R.; Janssen, E. M. L.; Luthy, R. G.; Criddle, C. S. Aerobic Biotransformation and Fate of N-Ethyl Perfluorooctane Sulfonamidoethanol (N-EtFOSE) in Activated Sludge. *Environmental science & technology* **2008**, *42* (8), 2873-2878. DOI: 10.1021/es702866c.

(17) Motegi, M.; Nojiri, K.; Horii, Y. Biodegradation of Fluorinated Compounds in River Water/Sediment System by a Shake-Flask Batch Test. *Organohalogen Compound* **2013**, *75*, 301-304.

(18) D'Eon, J. C.; Hurley, M. D.; Wallington, T. J.; Mabury, S. A. Atmospheric Chemistry of N-methyl Perfluorobutane Sulfonamidoethanol, C4F9SO2N(CH3)CH2CH2OH: Kinetics and Mechanism of Reaction with OH. *Environmental science & technology* **2006**, *40* (6), 1862-1868. DOI: 10.1021/es0520767.

(19) Bao, Y.; Deng, S.; Jiang, X.; Qu, Y.; He, Y.; Liu, L.; Chai, Q.; Mumtaz, M.; Huang, J.; Cagnetta, G.; et al. Degradation of PFOA Substitute: GenX (HFPO–DA Ammonium Salt): Oxidation with UV/Persulfate or Reduction with UV/Sulfite? *Environmental science & technology* **2018**, *52* (20), 11728-11734. DOI: 10.1021/acs.est.8b02172.

(20) Zhang, C.; Hopkins, Z. R.; McCord, J.; Strynar, M. J.; Knappe, D. R. U. Fate of Per- and Polyfluoroalkyl Ether Acids in the Total Oxidizable Precursor Assay and Implications for the Analysis of Impacted Water. *Environmental Science & Technology Letters* **2019**, *6* (11), 662-668. DOI: 10.1021/acs.estlett.9b00525.

(21) Kaiser, A.-M.; Saracevic, E.; Schaar, H. P.; Weiss, S.; Hornek-Gausterer, R. Ozone as oxidizing agent for the total oxidizable precursor (TOP) assay and as a preceding step for activated carbon treatments concerning per- and polyfluoroalkyl substance removal. *Journal of Environmental Management* **2021**, *300*, 113692. DOI: https://doi.org/10.1016/j.jenvman.2021.113692.

(22) Yi, S.; Morson, N.; Edwards, E. A.; Yang, D.; Liu, R.; Zhu, L.; Mabury, S. A. Anaerobic Microbial Dechlorination of 6:2 Chlorinated Polyfluorooctane Ether Sulfonate and the

Underlying Mechanisms. *Environmental science & technology* **2022**, *56* (2), 907-916. DOI: 10.1021/acs.est.1c05475.

(23) Chen, H.; Choi, Y. J.; Lee, L. S. Sorption, Aerobic Biodegradation, and Oxidation Potential of PFOS Alternatives Chlorinated Polyfluoroalkyl Ether Sulfonic Acids. *Environmental science & technology* **2018**, *52* (17), 9827-9834. DOI: 10.1021/acs.est.8b02913.

(24) Venkatesan, A. K.; Halden, R. U. Loss and in situ production of perfluoroalkyl chemicals in outdoor biosolids–soil mesocosms. *Environmental Research* **2014**, *132*, 321-327. DOI: https://doi.org/10.1016/j.envres.2014.04.024.

(25) Huang, S.; Jaffé, P. R. Defluorination of Perfluorooctanoic Acid (PFOA) and Perfluorooctane Sulfonate (PFOS) by Acidimicrobium sp. Strain A6. *Environmental science & technology* **2019**, *53* (19), 11410-11419. DOI: 10.1021/acs.est.9b04047.

(26) Lyu, X.-J.; Li, W.-W.; Lam, P. K. S.; Yu, H.-Q. Insights into perfluorooctane sulfonate photodegradation in a catalyst-free aqueous solution. *Scientific Reports* **2015**, *5* (1), 9353. DOI: 10.1038/srep09353.

(27) Wang, S.; Yang, Q.; Chen, F.; Sun, J.; Luo, K.; Yao, F.; Wang, X.; Wang, D.; Li, X.; Zeng, G. Photocatalytic degradation of perfluorooctanoic acid and perfluorooctane sulfonate in water: A critical review. *Chemical Engineering Journal* **2017**, *328*, 927-942. DOI: https://doi.org/10.1016/j.cej.2017.07.076.

(28) Ochoa-Herrera, V.; Field, J. A.; Luna-Velasco, A.; Sierra-Alvarez, R. Microbial toxicity and biodegradability of perfluorooctane sulfonate (PFOS) and shorter chain perfluoroalkyl and polyfluoroalkyl substances (PFASs). *Environmental Science: Processes & Impacts* **2016**, *18* (9), 1236-1246, 10.1039/C6EM00366D. DOI: 10.1039/C6EM00366D.

(29) Presentato, A.; Lampis, S.; Vantini, A.; Manea, F.; Daprà, F.; Zuccoli, S.; Vallini, G. On the Ability of Perfluorohexane Sulfonate (PFHxS) Bioaccumulation by Two Pseudomonas sp. Strains Isolated from PFAS-Contaminated Environmental Matrices. *Microorganisms* **2020**, *8* (1). DOI: 10.3390/microorganisms8010092.

(30) Yi, L. B.; Chai, L. Y.; Xie, Y.; Peng, Q. J.; Peng, Q. Z. Isolation, identification, and degradation performance of a PFOA-degrading strain. *Genet Mol Res* **2016**, *15* (2). DOI: 10.4238/gmr.15028043 From NLM.

(31) Kwon, B. G.; Lim, H.-J.; Na, S.-H.; Choi, B.-I.; Shin, D.-S.; Chung, S.-Y. Biodegradation of perfluorooctanesulfonate (PFOS) as an emerging contaminant. *Chemosphere* **2014**, *109*, 221-225. DOI: https://doi.org/10.1016/j.chemosphere.2014.01.072.

(32) Chetverikov, S. P.; Sharipov, D. A.; Korshunova, T. Y.; Loginov, O. N. Degradation of perfluorooctanyl sulfonate by strain Pseudomonas plecoglossicida 2.4-D. *Applied Biochemistry and Microbiology* **2017**, *53* (5), 533-538. DOI: 10.1134/S0003683817050027.

(33) Shukla, A. K.; Upadhyay, S. N.; Dubey, S. K. Current trends in trichloroethylene biodegradation: a review. *Critical Reviews in Biotechnology* **2014**, *34* (2), 101-114. DOI: 10.3109/07388551.2012.727080.

(34) DTSC. Intermedia Transfer Factors for Contaminants Found at Hazardous Waste Sites 2,3,7,8 TETRACHLORODIBENZO-p-DIOXIN (TCDD). Toxicology, D. o. E., Ed.; DTSC: California, 1994.

(35) Qiu, L.; Zhang, W.; Gong, A.; Li, J. Isolation and identification of a 2,3,7,8-Tetrachlorodibenzo-P-dioxin degrading strain and its biochemical degradation pathway. *Journal of Environmental Health Science and Engineering* **2021**, *19* (1), 541-551. DOI: 10.1007/s40201-021-00626-9.