ATTACHMENT 11

Merrimack River Sampling Memorandum

Memorandum

Date: October 23, 2025

To: Conservation Law Foundation

From: Eastern Research Group, Inc. (ERG)

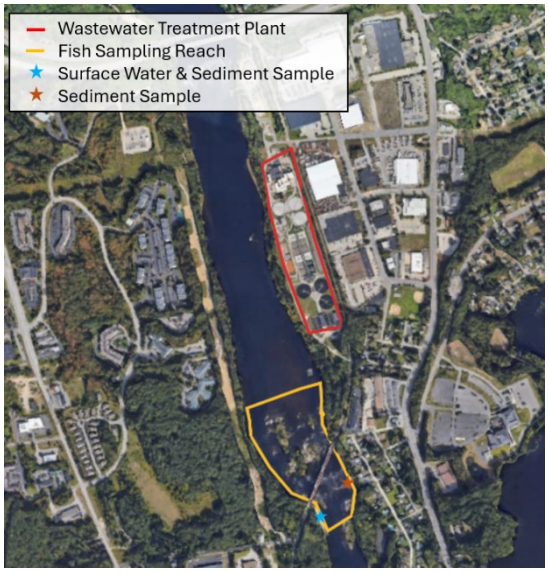
Subject: Results from Merrimack River Sampling

The Conservation Law Foundation (CLF) conducted a study to determine if per- and polyfluoroalkyl substances (PFAS) are present in the Merrimack River, specifically in the area downstream of the wastewater treatment facility (WWTF) located in Manchester, New Hampshire. This facility discharges treated effluent into the river, raising concerns about the presence of PFAS in the surrounding environment. To complete the study, CLF contracted with Eastern Research Group, Inc. (ERG) to determine whether PFAS are present in surface water, sediment, and fish immediately downstream of the WWTF. ERG subcontracted with Gomez and Sullivan (Henniker, New Hampshire) to collect the samples and Pace Analytical (Mansfield, Massachusetts) to conduct the laboratory analyses. The study aims to assess the presence of PFAS and determine whether further investigation is needed. This memo provides a brief overview of the sampling and analysis methods, along with key findings.

Methods

On July 30, 2025, Gomez and Sullivan collected environmental samples immediately downstream of the WWTF in Manchester, New Hampshire under contract with ERG. Field staff collected two surface water samples, two sediment samples, and 16 fish following the procedures described in the project Sampling and Analysis Plan (SAP). These samples were collected downstream from the WWTF in the area defined as the "fish sampling reach" (Figure 1). Field staff packaged and shipped samples to Pace Analytical, where analysts measured 40 PFAS analytes using EPA Method 1633A (EPA, 2024). Ten fish were processed as boneless, skinless filets prior to analysis and six were analyzed as whole fish for comparison. Appendix Table 1 lists the 40 PFAS analytes and the minimum concentrations at which the analytical laboratory can detect (method detection limits or MDLs) and reliably quantify (method reporting limits or MRLs) these analytes. Additional details on sampling procedures are provided in the project SAP.

Figure 1: Sampling Locations



Upon receipt of the analytical results, ERG reviewed the data to ensure consistency with the quality control parameters outlined in the SAP. We then compared results to various human health benchmarks

from state agencies and the peer-reviewed literature. Specifically, we evaluated surface water, sediment, and fish results against available screening values published by the New Hampshire Department of Environmental Services (NHDES), the Massachusetts Department of Public Health (MADPH), and a New-Hampshire specific study that calculated fish consumption advisory levels for PFAS (Pickard et al., 2022).

NHDES (2019) has published screening levels for PFBS, PFHxS, PFNA, PFOA, and PFOS in surface water, sediment, and fish filets. Those levels provide conservative estimates to guide site-specific investigations and protect human health during recreational fish consumption, swimming, and wading (NHDES, 2019). MADPH has published action levels for surface water contact at public beaches and for fish consumption for HFPO-DA (or GenX), PFBA, PFBS, PFHxA, PFHxS, PFNA, PFOA, and PFOS (MADPH, 2023; MADPH, 2024). Pickard et al. (2022) developed daily, weekly, monthly, and yearly fish consumption advisory thresholds for PFHxS, PFNA, PFOA, and PFOS. We compared surface water, sediment, and fish filet concentrations to these screening values. These entities have not published screening values for whole fish consumption. For additional context, we compared PFAS results from fish filets to those reported in whole fish, as well as to screening values developed for fish filets.

Results

Surface Water Results

Field staff collected two surface water samples from the Merrimack River. These two samples were collected from the same location, one immediately after the other, to serve as duplicates for quality assurance. Table 1 presents results for the seven PFAS detected in these samples, along with the relative percent difference (RPD) between reported values. PFOA was detected at the highest concentration. RPDs ranged from 0.8% to 26.0%, and all RPDs were within the criteria outlined in the SAP (i.e., for reported concentrations at least five times the MDL, the RPD should be 40% or less; for concentrations less than five times the MDL, the RPD should be 100% or less).

Table 1: Summary Statistics for Surface Water Samples

PFAS	Sample SW_01		Sample SW_01_DUP		Relative Percent Difference (RPD) Between Results
	Reported Result (ng/L)	MDL (ng/L)	SW_01_DUP (ng/L)	SW_01_DUP MDL (ng/L)	
PFBS	1.56	0.514	1.65	0.520	5.6%
PFHpA	1.20 J	0.514	0.924 J	0.520	26.0%
PFHxS	1.07 J	0.514	0.994 J	0.520	7.4%
PFHxA	1.89	0.514	1.80	0.520	4.9%
PFOS	1.90	0.514	1.71	0.520	10.5%
PFOA	2.38	0.514	2.40	0.520	0.8%
PFPeA	1.64 J	1.02	1.84 J	1.03	11.5%

Notes:
This table presents results for the seven PFAS detected in at least one of the two samples.
ng/L: nanograms per liter; J: PFAS was detected between the MDL and MRL, reported result is an estimated value.

ERG also compared surface water results to applicable screening values for recreational water use published by NHDES and to surface water action levels for swimming beaches published by MADPH. Reported PFAS concentrations for these samples were below comparison values for all PFAS (Table 2).

Table 2: Surface Water Comparison to Applicable Screening Levels

PFAS	NHDES Recreational Surface Water Screening Levels [a] (ng/L)	MADPH Recreational Surface Water Action Levels [b] (ng/L)	Maximum Detected Concentration from Merrimack River Sampling (ng/L)	Maximum Exceeds Either NHDES or MADPH Comparison Values?
HFPO-DA	NA	20	ND (<2.07)	No
PFBA	NA	20	ND (<2.07)	No
PFBS	1,014,000	20	1.65	No
PFHxA	NA	20	1.89	No
PFHxS	406	20	1.07	No
PFNA	436	20	ND (<0.520)	No
PFOA	618	20	2.40	No
PFOS	304	20	1.90	No

Notes:
ng/L: nanograms per liter; NA: not applicable.
ND: not detected; values shown in parentheses represent the highest MDL across the two samples.
[a] For this comparison, the values shown represent the most conservative (lowest) screening values from the NHDES 2019 memo, based on NHDES' reference doses and for children (NHDES, 2019)
[b] For this comparison, the values shown represent the initial screening value for no restrictions on swimming from MADPH's "Operational Guidance for Bathing Beaches at PFAS Impacted Waterbodies" (MADPH, 2024).

Sediment Results

Field staff collected two sediment samples from the Merrimack River, each at depth of 0-0.1 feet. These samples were collected on opposite banks of the river to evaluate environmental conditions in two areas. Both samples were described in the field as "sandy." One sample was reported by the lab as 73.6% solids and the other was 58.2% solids. Note that PFAS adsorption is typically lower in sandy soils than in clay or mixed soil types (Moavenzadeh Ghaznavi et al., 2025).

Of the 40 PFAS analyzed using EPA Method 1633A, only PFOS was detected, and it appeared in just one of the two sediment samples at a concentration of 0.079 nanogram per gram (ng/g). The laboratory flagged this concentration as an estimated value because it was above the MDL but below the MRL. This concentration is below NHDES' most conservative recreational sediment screening value (based on NHDES reference dose and for children) of 91.41 ng/g (NHDES, 2019). Detection limits for the other PFAS ranged from 0.066 ng/g in [PFAS] to 1.66 ng/g.

Fish Results

As described in the methods, field teams collected a total of 16 fish. The laboratory processed and analyzed ten of these as boneless, skinless filets and six as whole fish. Results for each group are presented separately below.

Fish Filets

Ten fish were collected and processed into filets for analysis, including five redbreast sunfish and five smallmouth bass. The redbreast sunfish ranged from 105-154 millimeters (mm) in length and 23-91 grams (g) in weight, and the smallmouth bass ranged from 145–275 mm in length and 46–296 g in weight.

A total of nine PFAS were detected in at least one of the filet samples, with PFOS and PFUnA detected in all samples. PFOS was detected at the highest concentrations, with a mean of 2.45 ng/g and a maximum of 3.36 ng/g. Table 3 displays descriptive statistics for all PFAS detected in at least one filet. Appendix Table 2 presents sample-specific results for all PFAS detected in at least one filet.

Table 3: Summary Statistics for Fish Filet Samples (n=10)

PFAS	Frequency of Detection (Count [%])	Minimum (ng/g)	Maximum (ng/g)	Mean (standard deviation) (ng/g)	Median (ng/g)
NEtFOSAA	1 (10%)	<MDL	0.221 J	--	--
NMeFOSAA	4 (40%)	<MDL	0.541	--	--
PFDA	8 (80%)	<MDL	0.250 J	0.175 (0.056)	0.182
PFDoA	9 (90%)	<MDL	0.339 J	0.224 (0.079)	0.232
PFOSA	1 (10%)	<MDL	0.170 J	--	--
PFOS	10 (100%)	1.52	3.36	2.45 (0.540)	2.47
PFTeDA	6 (60%)	<MDL	0.279 J	0.163 (0.075)	0.176
PFTrDA	8 (80%)	<MDL	0.422 J	0.247 (0.117)	0.264
PFUnA	10 (100%)	<MDL	0.404 J	0.288 (0.065)	0.269

Notes:
This table includes all PFAS that were detected in at least one fish filet sample.
Means and standard deviations are presented only for PFAS detected in more than 50% of samples. In these calculations, non-detect observations were substituted with a value equal to one half of the MDL.
ng/g: nanograms per gram; J: PFAS was detected between the MDL and MRL, reported result is an estimated value.

Table 4 presents a comparison of fish filet sample results to PFAS screening levels for human consumption, as published by NHDES, MADPH, and Pickhard et al. (2022). Among the nine PFAS detected in filets, only one (i.e., PFOS) has fish consumption screening levels from these sources. The other eight PFAS do not have published comparison values.

PFOS concentrations in all filets exceeded the most conservative NHDES fish tissue screening level (for children), the MADPH candidate fish action level, and the Pickard et al. (2022) advisory trigger level for daily consumption for children. One filet was above the Pickard et al. (2022) advisory trigger level for weekly consumption for children. Figure 2 illustrates PFOS concentrations in fish filets relative to these screening levels. Note that some fish collected for this project were smaller than that which would likely be kept for consumption (Appendix Table 2).

Table 4: Comparison of Fish Filet PFAS Concentrations to Screening Levels for Fish Tissue Consumption

PFAS	Maximum Detected Concentration from Merrimack River (ng/g)	NHDES [a]		MADPH [b]		Pickard et al. (2022)– Daily [c]		Pickard et al. (2022) – Weekly [c]	
		Screening Level (ng/g)	Number (%) of filets above	Fish Action Level (ng/g)	Number (%) of filets above	Advisory Trigger (ng/g)	Number (%) of filets above	Advisory Trigger (ng/g)	Number (%) of filets above
HFPO-DA	ND (<0.663)	NA	0	0.22	0	NA	0	NA	0
PFBA	ND (<1.29)[d]	NA	0	0.22	0	NA	0	NA	0
PFBS	ND (<0.166)	2,610	0	0.22	0	NA	0	NA	0
PFHxS	ND (<0.166)	1.04	0	0.22	0	0.60	0	4.17	0
PFNA	ND (<0.166)	1.12	0	0.22	0	0.64	0	4.49	0
PFOA	ND (<0.166)	1.59	0	0.22	0	0.91	0	6.36	0
PFOS	3.36	0.78	10 (100%)	0.22	10	0.45	10	3.13	1 (10%)

Notes

ng/L: nanograms per liter; NA: not applicable.

ND: not detected; values shown in parentheses represent the highest MDL across the two samples.

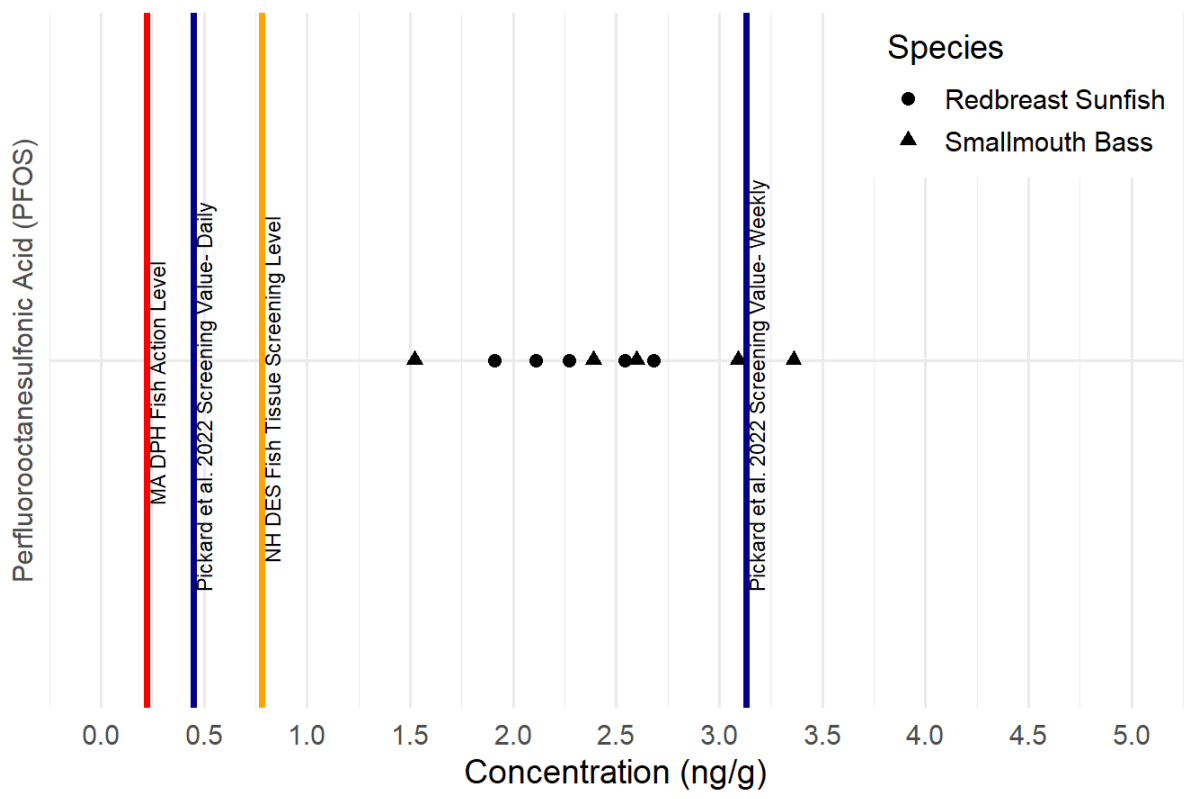
[a] *The values shown represent the most conservative (lowest) screening values from the NHDES 2019 memo, derived using NHDES' reference doses and for children (NHDES, 2019).*

[b] *Values shown represent candidate fish action levels derived by MADPH (MADPH, 2023).*

[c] *The advisory triggers shown represent the most conservative triggers for these timeframes in Pickard et al. (2022).*

[d] *This is the highest MRL for PFBA, applicable to one sample. All other MRLs for PFBA in filets were ≤0.663 ng/g.*

Figure 2: PFOS Concentrations in Fish Filets



Whole Fish

Field staff collected and processed six whole fish samples for PFAS analysis, including two common carp, two largemouth bass, and two white suckers. The common carp were the largest, ranging from 609–688 mm in length and 4,697–6,800 g in weight, followed by white suckers (390–460 mm, 1,002–1,130 g) and largemouth bass (261–383 mm, 208–624 g). Thirteen PFAS were detected in at least one whole fish sample, with PFDA, PFDoA, PFOS, PFTeDA, PFTrDA, and PFUnA present in all whole fish samples. PFOS was detected at the highest concentrations, with a mean of 9.26 ng/g and a maximum of 17.4 ng/g. Table 5 presents descriptive statistics for all PFAS detected in at least one whole fish. Appendix Table 3 presents sample-specific results for all PFAS detected in at least one whole fish.

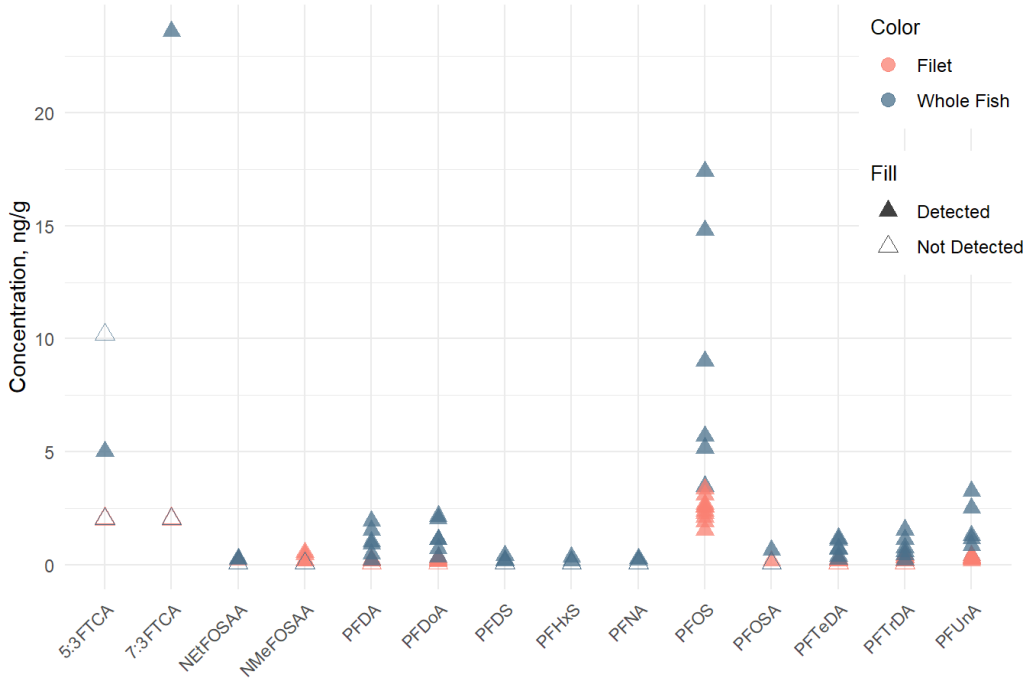
Table 5: Summary Statistics for Whole Fish Samples (n=6)

PFAS	Frequency of Detection (Count [%])	Minimum (ng/g)	Maximum (ng/g)	Mean (Standard Deviation) (ng/g)	Median (ng/g)
5:3FTCA	1 (16.7%)	<MDL	5.01 J	--	--
7:3FTCA	1 (16.7%)	<MDL	23.6	--	--
NEtFOSAA	2 (33.3%)	<MDL	0.292 J	--	--
PFDA	6 (100%)	0.211J	1.94	1.02 (0.639)	0.983
PFDS	3 (50%)	<MDL	0.414	0.176 (0.130)	0.134
PFDoA	6 (100%)	0.340J	2.16	1.25 (0.721)	1.13
PFHxS	2 (33.3%)	<MDL	0.341 J	--	--
PFNA	2 (33.3%)	<MDL	0.294 J	--	--
PFOSA	1 (16.7%)	<MDL	0.663	--	--
PFOS	6 (100%)	3.48	17.4	9.26 (5.66)	7.35
PFTeDA	6 (100%)	0.257 J	1.18	0.721 (0.364)	0.706
PFTrDA	6 (100%)	0.201 J	1.55	0.786 (0.488)	0.682
PFUnA	6 (100%)	0.426 J	3.27	1.59 (1.08)	1.24

Notes:
This table includes all PFAS that were detected in at least one whole fish sample.
Means and standard deviations are presented only for PFAS detected in more than 50% of samples. In these calculations, non-detect observations were substituted with a value equal to one half of the MDL.
ng/g: nanograms per gram; J: PFAS was detected between the MDL and MRL, reported result is an estimated value.
<MDL: minimum value was a non-detect observation (below the MDL).

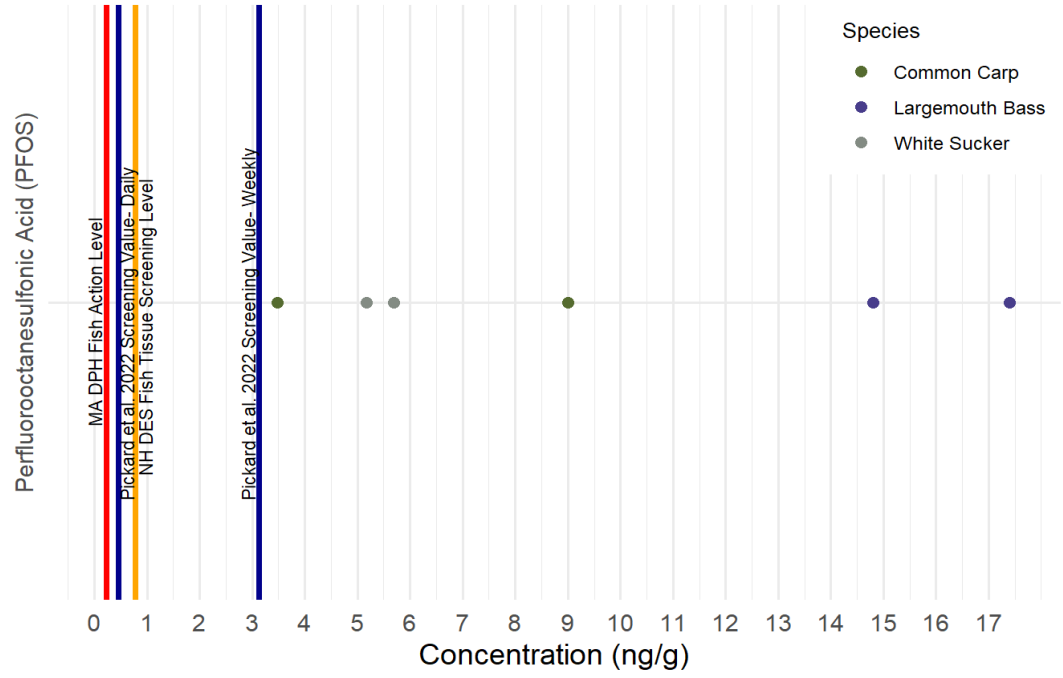
Thirteen PFAS were detected in whole fish, compared to nine PFAS in filets. In general, PFAS concentrations were higher in whole fish than in filets (Figure 3). The fish consumption screening levels described above were developed specifically for fish muscle (filets), not whole fish. However, whole fish and fish parts, including skin and other organs, may be eaten in addition to filets. While not directly comparable to the filet screening values, PFOS concentrations in all whole fish samples exceeded the NHDES screening level for children, the MADPH candidate fish action level, and Pickard et al. (2022) daily and weekly advisory trigger values (Figure 4). PFHxS and PFNA also exceeded the MADPH candidate fish action level in one whole fish sample (Figure 5, Figure 6).

Figure 3: Concentrations of PFAS in Filets and Whole Fish



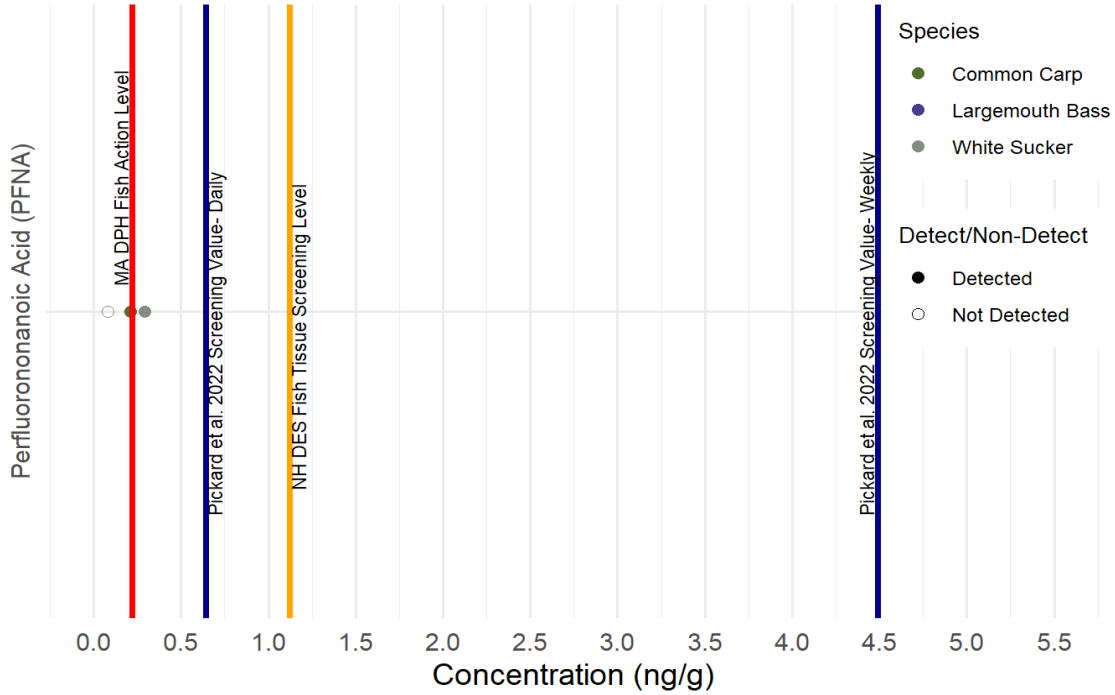
Notes:
This chart presents all PFAS detected in at least one fish filet or whole fish sample. Non-detected results are included at a value equal to one half of the MDL and are indicated by an empty icon.

Figure 4: PFOS Concentrations in Whole Fish



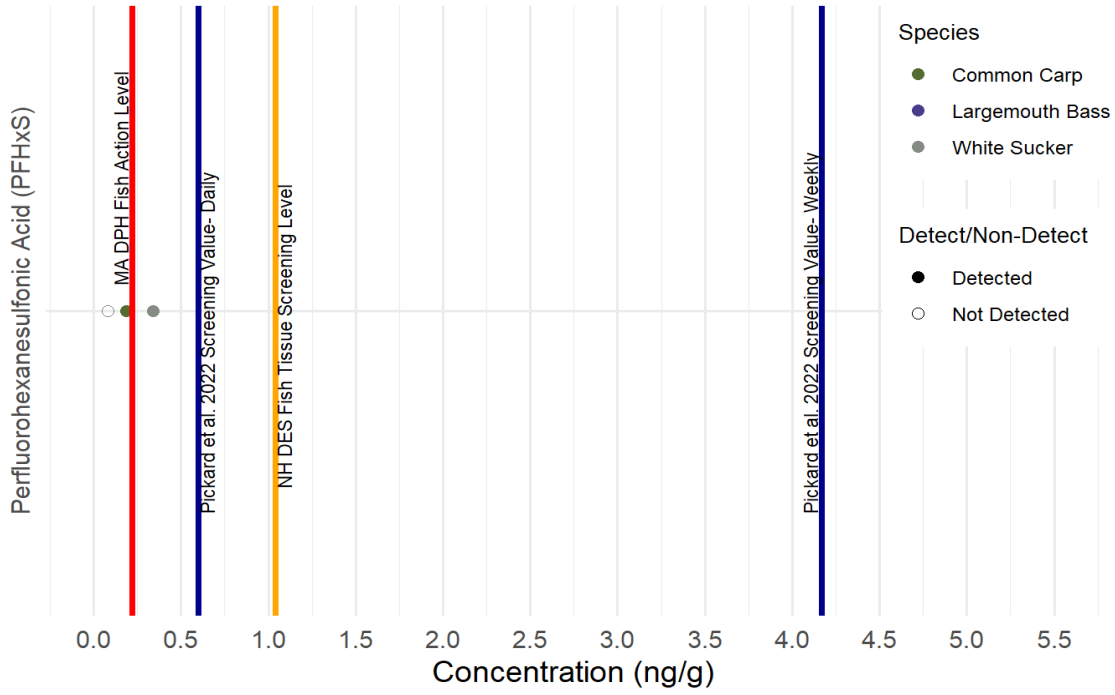
Notes: Screening values included on the plot are designed to be applied to fish filets rather than whole fish. Since screening values are not available for whole fish, filet screening values are included here as a reference point.

Figure 5: PFNA Concentrations in Whole Fish



Notes: Screening values included on the plot are designed to be applied to fish filets rather than whole fish. Since screening values are not available for whole fish, filet screening values are included here as a reference point.

Figure 6: PFHxS Concentrations in Whole Fish



Notes: Screening values included on the plot are designed to be applied to fish filets rather than whole fish. Since screening values are not available for whole fish, filet screening values are included here as a reference point.

Summary

Overall, this project confirmed the presence of PFAS immediately downstream of the Manchester WWTF. Samples were analyzed using EPA Method 1633A, which detects 40 of the thousands of PFAS compounds known to exist. PFOA was detected at the highest concentration in surface water samples, and none of the detected PFAS exceeded the NHDES screening levels or MADPH action level. In sediment, only PFOS was detected, and at a concentration below NHDES' sediment screening level. In all ten fish filet samples, PFOS concentrations exceeded the NHDES screening level for children, the MADPH candidate fish action level, and the Pickard et al. (2022) daily advisory trigger for children. PFOS in one fish tissue sample also exceeded the Pickard et al. (2022) weekly advisory trigger for children. Whole fish concentrations were generally higher than filet concentrations.

The screening levels used in this memo are designed either to prompt further investigation into human health implications or protect vulnerable populations, such as children. These data indicate that further investigation is warranted. Screening values are developed by agencies based on scientific evidence of the toxicity of the compounds and, as such, have only been developed for PFAS analytes with sufficient data. The absence of screening values for other PFAS reflects limited toxicological data rather than an absence of potential health risk. The screening values are also applicable to individual PFAS, and do not account for cumulative exposure to other PFAS.

References

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Appendix

Appendix Table 1: PFAS in EPA Method 1633A and associated detection limits and reporting limits from Pace

PFAS Analyte	Acronym	CASRN	Surface Water		Sediment		Tissue	
			MDL (ng/L)	MRL (ng/L)	MDL (ng/g)	MRL (ng/g)	MDL (ng/g)	MRL (ng/g)
Perfluoroalkyl carboxylic acids (PFCAs)								
Perfluorobutanoic acid	PFBA	375-22-4	0.527	6.4	0.028	0.8	0.215	2.0
Perfluoropentanoic acid	PFPeA	2706-90-3	0.359	3.2	0.038	0.4	0.088	1.0
Perfluorohexanoic acid	PFHxA	307-24-4	0.245	1.6	0.016	0.2	0.044	0.5
Perfluoroheptanoic acid	PFHpA	375-85-9	0.238	1.6	0.012	0.2	0.062	0.5
Perfluorooctanoic acid	PFOA	335-67-1	0.263	1.6	0.026	0.2	0.070	0.5
Perfluorononanoic acid	PFNA	375-95-1	0.266	1.6	0.012	0.2	0.099	0.5
Perfluorodecanoic acid	PFDA	335-76-2	0.210	1.6	0.035	0.2	0.102	0.5
Perfluoroundecanoic acid	PFUnA	2058-94-8	0.178	1.6	0.013	0.2	0.093	0.5
Perfluorododecanoic acid	PFDoA	307-55-1	0.214	1.6	0.021	0.2	0.052	0.5
Perfluorotridecanoic acid	PFTrDA	72629-94-8	0.187	1.6	0.016	0.2	0.067	0.5
Perfluorotetradecanoic acid	PFTeDA	376-06-7	0.160	1.6	0.024	0.2	0.039	0.5
Perfluoroalkane sulfonic acids (PFSAs)								
Perfluorobutanesulfonic acid	PFBS	375-73-5	0.402	1.6	0.020	0.2	0.044	0.5
Perfluoropentanesulfonic acid	PFPeS	2706-91-4	0.206	1.6	0.027	0.2	0.029	0.5
Perfluorohexanesulfonic acid	PFHxS	355-46-4	0.133	1.6	0.020	0.2	0.075	0.5
Perfluoroheptanesulfonic acid	PFHpS	375-92-8	0.201	1.6	0.020	0.2	0.093	0.5
Perfluorooctanesulfonic acid	PFOS	1763-23-1	0.264	1.6	0.031	0.2	0.084	0.5
Perfluorononanesulfonic acid	PFNS	68259-12-1	0.203	1.6	0.029	0.2	0.065	0.5
Perfluorodecanesulfonic acid	PFDS	335-77-3	0.140	1.6	0.015	0.2	0.056	0.5
Perfluorododecanesulfonic acid	PFDoS	79780-39-5	0.242	1.6	0.022	0.2	0.062	0.5
Perfluoroalkane sulfonamides (FASA) and derivatives								
Perfluorooctanesulfonamide	PFOSA	754-91-6	0.097	1.6	0.011	0.2	0.051	0.5

PFAS Analyte	Acronym	CASRN	Surface Water		Sediment		Tissue	
			MDL (ng/L)	MRL (ng/L)	MDL (ng/g)	MRL (ng/g)	MDL (ng/g)	MRL (ng/g)
N-ethyl perfluorooctane sulfonamidoethanol	NEtFOSE	1691-99-2	1.10	16	0.081	2	0.410	5.0
N-methyl perfluorooctane sulfonamidoethanol	NMeFOSE	24448-09-7	1.30	16	0.121	2	0.598	5.0
N-ethyl perfluorooctane sulfonamide	NEtFOSA	4151-50-2	0.351	1.6	0.022	0.2	0.115	0.5
N-methyl perfluorooctane sulfonamide	NMeFOSA	31506-32-8	0.226	1.6	0.026	0.2	0.139	0.5
N-ethyl perfluorooctanesulfonamidoacetic acid	NEtFOSAA	2991-50-6	0.478	1.6	0.044	0.2	0.106	0.5
N-methyl perfluorooctanesulfonamidoacetic acid	NMeFOSAA	2355-31-9	0.483	1.6	0.086	0.2	0.089	0.5
Fluorotelomer sulfonic acid (FTSA)								
4:2 Fluorotelomer sulfonic acid	4:2 FTS	757124-72-4	0.910	6.4	0.078	0.8	0.222	2.0
6:2 Fluorotelomer sulfonic acid	6:2 FTS	27619-97-2	4.82	6.4	0.148	0.8	0.934	2.0
8:2 Fluorotelomer sulfonic acid	8:2 FTS	39108-34-4	1.22	6.4	0.259	0.8	0.249	2.0
Perfluoroalkyl ether carboxylic acids (PFECAs)								
Perfluoro-3-methoxypropanoic acid	PFMPA	377-73-1	0.244	3.2	0.017	0.4	0.078	1.0
Perfluoro-4-methoxybutanoic acid	PFMBA	863090-89-5	0.360	3.2	0.024	0.4	0.086	1.0
Hexafluoropropylene oxide dimer acid	HFPO-DA	13252-13-6	1.60	6.4	0.039	0.8	0.072	2.0
Nonafluoro-3,6-dioxaheptanoic acid	NFDHA	151772-58-6	0.541	3.2	0.083	0.4	0.113	1.0
4,8-dioxa-3H-perfluorononanoic acid	ADONA	919005-14-4	0.376	6.4	0.030	0.8	0.139	2.0
Polyfluoroalkyl ether sulfonic acids (PFESAs)								
Perfluoro(2-ethoxyethane)sulfonic acid	PFEESA	113507-82-7	0.330	3.2	0.046	0.4	0.069	1.0
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	9Cl-PF3ONS	756426-58-1	0.442	6.4	0.029	0.8	0.179	2.0
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	11Cl-PF3OUdS	763051-92-9	0.447	6.4	0.040	0.8	0.228	2.0
Fluorotelomer carboxylic acids (FTCAs)								
3-Perfluoropropyl propanoic acid	3:3FTCA	356-02-5	0.535	8	0.092	1.0	0.145	2.5
2H,2H,3H,3H-Perfluorooctanoic acid	5:3FTCA	914637-49-3	4.26	40	0.236	5.0	1.54	12.5
3-Perfluoroheptyl propanoic acid	7:3FTCA	812-70-4	3.18	40	0.365	5.0	1.26	12.5

Appendix Table 2: Fish filet results for PFAS detected in at least one fish filet

Fish ID	Species	Length (mm)	Weight (g)	NEtFOSAA (ng/g)	NMeFOSAA (ng/g)	PFDA (ng/g)	PFDoA (ng/g)	PFOSA (ng/g)	PFOS (ng/g)	PFTeDA (ng/g)	PFTrDA (ng/g)	PFUnA (ng/g)
SB_FF_01	Smallmouth Bass	275	296	ND	0.196J	0.239J	0.325J	ND	2.6	0.186J	0.314J	0.404J
SB_FF_02	Smallmouth Bass	250	126	ND	0.447J	0.181J	0.162J	0.170J	3.09	ND	ND	0.238J
SB_FF_03	Smallmouth Bass	170	68	0.221J	0.541	0.187J	ND	ND	3.36	ND	ND	0.253J
SB_FF_04	Smallmouth Bass	145	46	ND	0.186J	0.200J	0.231J	ND	2.39	0.167J	0.220J	0.267J
SB_FF_05	Smallmouth Bass	146	43	ND	ND	ND	0.167J	ND	1.52	ND	0.187J	0.187J
RS_FF_01	Redbreast Sunfish	152	81	ND	ND	ND	0.233J	ND	1.91	0.208J	0.355J	0.241J
RS_FF_02	Redbreast Sunfish	141	67	ND	ND	0.250J	0.180J	ND	2.68	ND	0.168J	0.271J
RS_FF_03	Redbreast Sunfish	153	85	ND	ND	0.184J	0.33 9J	ND	2.27	0.279J	0.422J	0.346J
RS_FF_04	Redbreast Sunfish	154	91	ND	ND	0.167J	0.241 J	ND	2.11	0.229J	0.308J	0.346J
RS_FF_05	Redbreast Sunfish	105	23	ND	ND	0.178J	0.282 J	ND	2.54	0.229J	0.333J	0.322J

Notes:

ng/g: nanograms per gram; J: PFAS was detected between the MDL and MRL, reported result is an estimated value.

ND: PFAS was not detected above the MDL.

Appendix Table 3: Whole fish results for PFAS detected in at least one whole fish

Fish ID	Species	Length (mm)	Weight (g)	5:3FTCA (ng/g)	7:3FTCA (ng/g)	NEtFOSAA (ng/g)	PFDS (ng/g)	PFDA (ng/g)	PFDoA (ng/g)	PFHxS (ng/g)	PFNA (ng/g)	PFOSA (ng/g)	PFOS (ng/g)	PFTeDA (ng/g)	PFTrDA (ng/g)	PFUnA (ng/g)
CC_WF_02	Common Carp	609	4697	5.01J	ND	ND	0.210J	1.03	1.13	0.186J	0.208J	ND	9.01	0.703	0.598	1.31
CC_WF_01	Common Carp	688	6800	ND	23.6	0.292J	ND	0.211J	0.340J	ND	ND	ND	3.48	0.257J	0.201J	0.426J
LB_WF_01	Largemouth Bass	261	208	ND	ND	ND	ND	1.94	2.04	ND	ND	ND	17.4	1.18	1.55	3.27
LB_WF_02	Largemouth Bass	383	624	ND	ND	0.258J	0.414J	1.52	2.16	ND	ND	ND	14.8	1.08	1.14	2.5
WS_WF_01	White Sucker	460	1130	ND	ND	ND	0.185J	0.487J	0.713	ND	ND	ND	5.17	0.396J	0.461J	0.873
WS_WF_02	White Sucker	390	1002	ND	ND	ND	ND	0.935	1.12	0.341J	0.294J	0.663	5.69	0.708	0.767	1.16

Notes:

ng/g: nanograms per gram; J: PFAS was detected between the MDL and MRL, reported result is an estimated value.

ND: PFAS was not detected above the MDL.