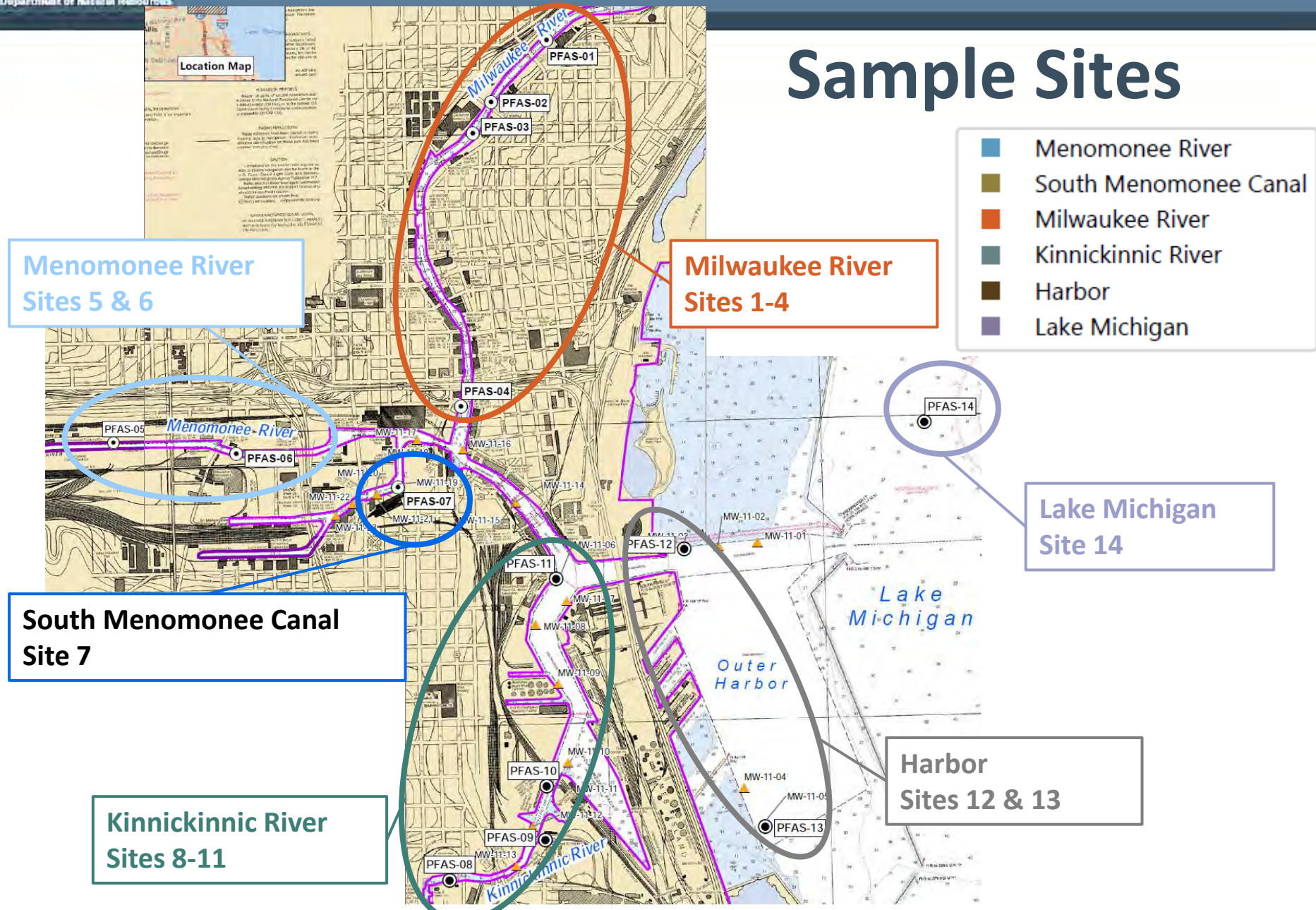
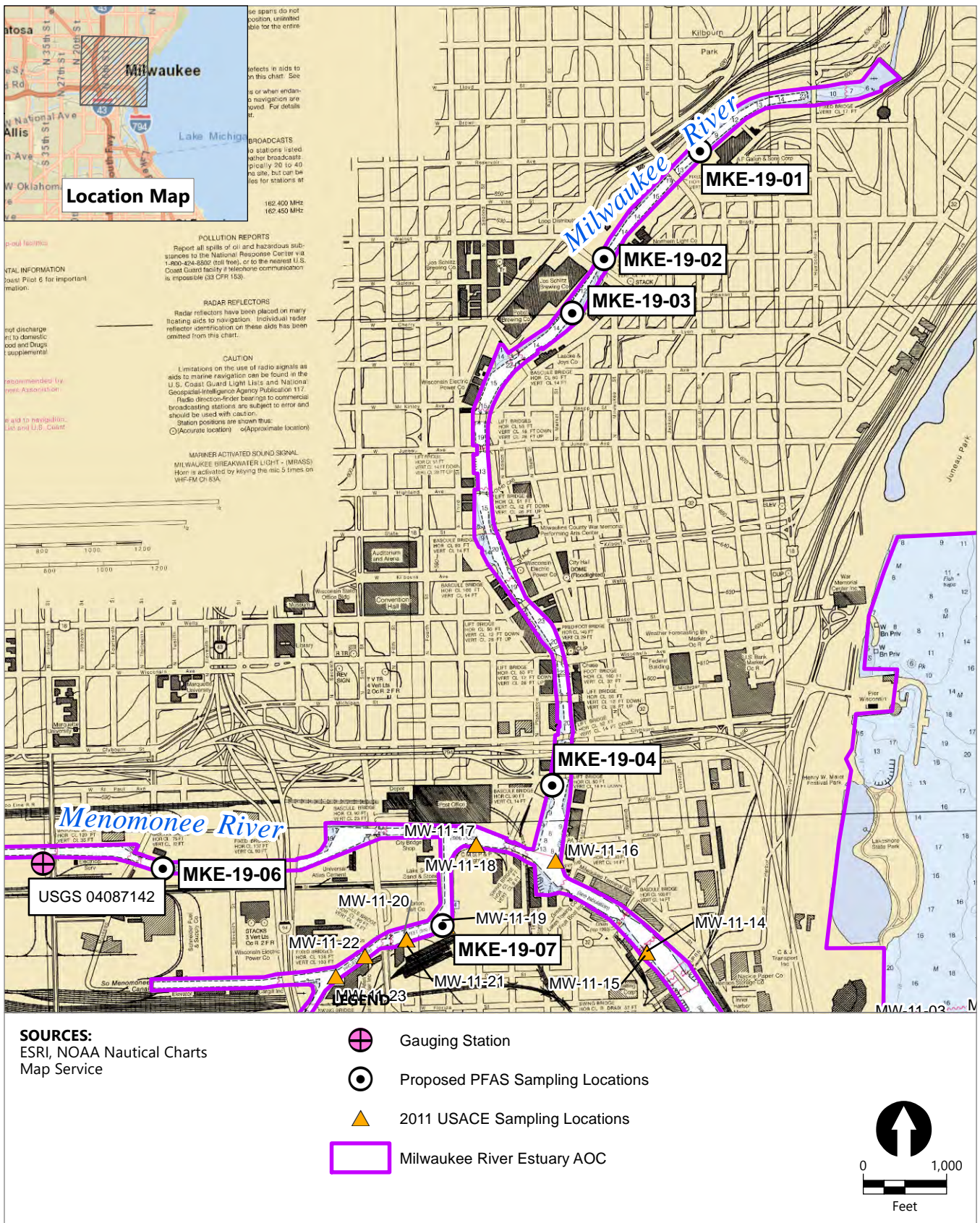


Sample Sites

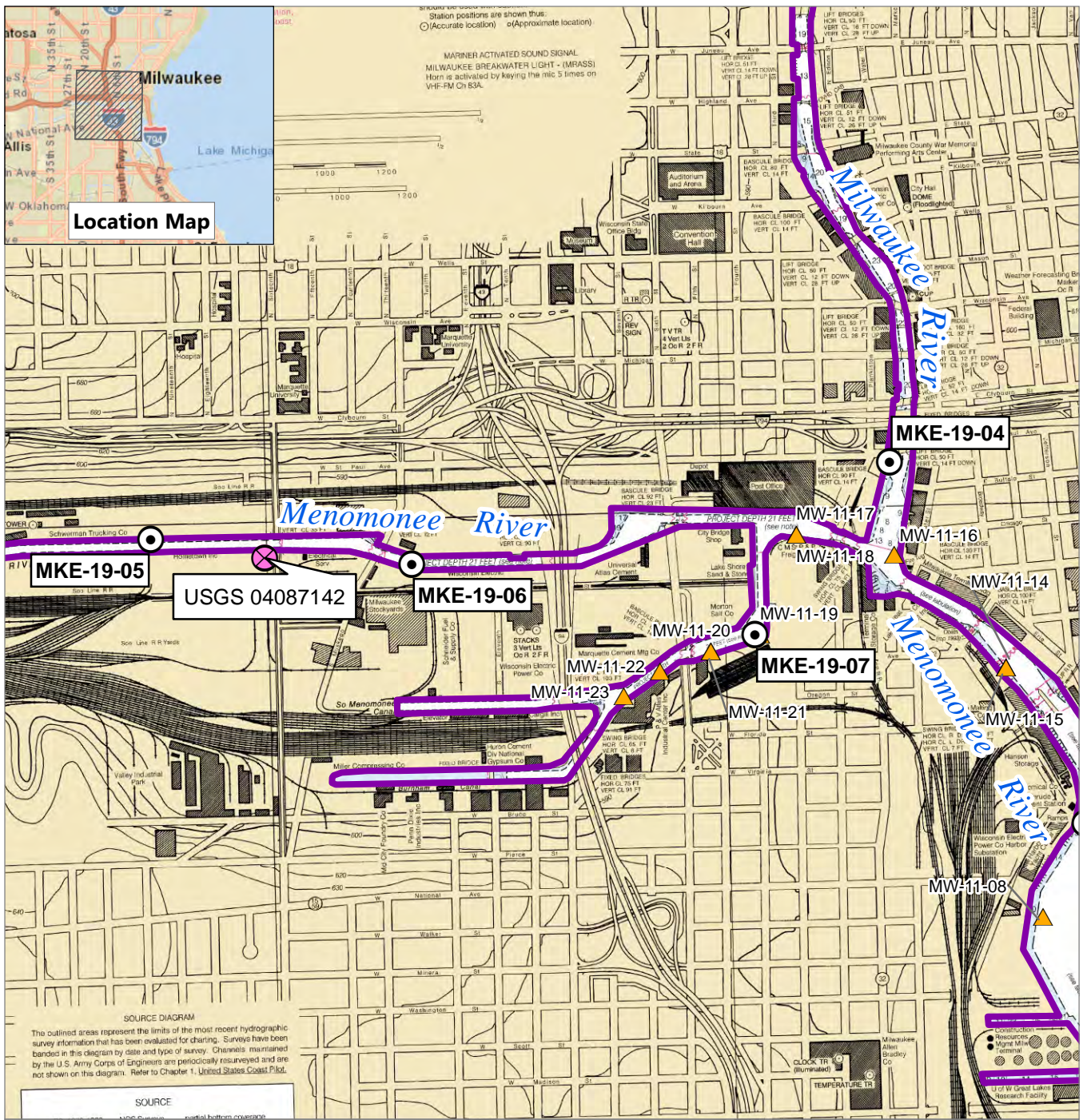




Publish Date: 2019/10/31, 10:10 AM | User: bhurry
 Filepath: K:\Projects\0000-Milwaukee\Milwaukee\GIS\Milwaukee_Estuary - Figure 3 Milwaukee River.mxd



Figure 3
PFAS Sampling - Milwaukee River
 Milwaukee River Estuary Area of Concern
 Milwaukee, Wisconsin

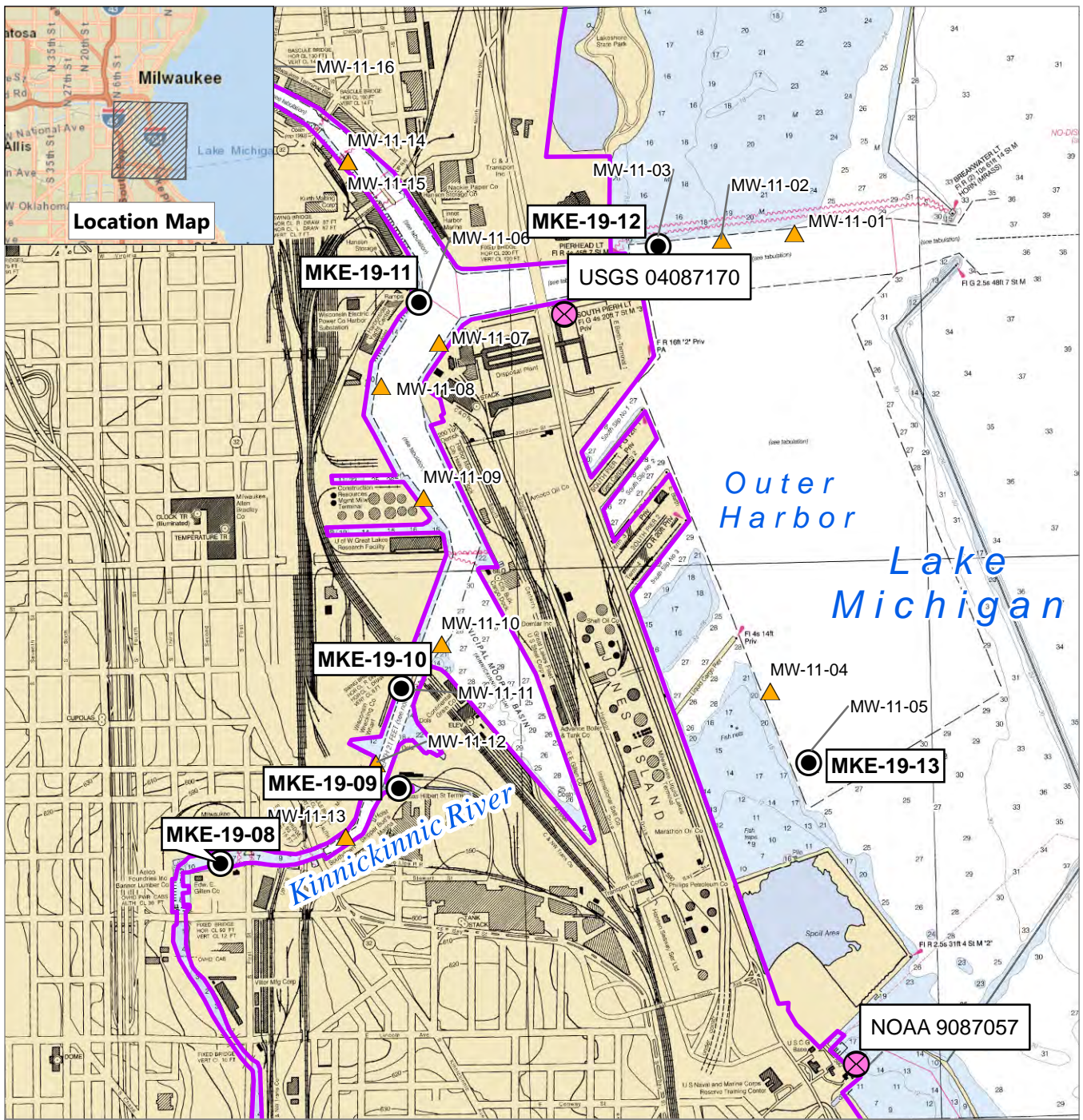


SOURCES:
 ESRI, NOAA Nautical Charts
 Map Service

Publish Date: 2019/10/31, 10:11 AM | User: bhurry
 Filepath: K:\Projects\0000-Milwaukee\Milwaukee\GIS\Milwaukee_Estuary - Figure 4 Menomonee River.mxd







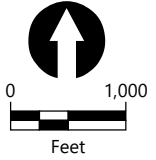
Figure 4
PFAS Sampling - Menomonee River
 Milwaukee River Estuary Area of Concern
 Milwaukee, Wisconsin



Location Map

SOURCES:
 ESRI, NOAA Nautical Charts
 Map Service

- LEGEND**
-  Gaging Station
 -  Proposed PFAS Sampling Locations
 -  2011 USACE Sampling Locations
 -  Milwaukee River Estuary AOC



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 Filepath: K:\Projects\0000-Milwaukee\Milwaukee\GIS\Milwaukee_Estuary - Figure 5 KK River and Outer Harbor.mxd



Figure 5
PFAS Sampling - Kinnickinnic River and Outer Harbor
 Milwaukee River Estuary Area of Concern
 Milwaukee, Wisconsin

Table 1
Surface Water PFAS Concentrations in the Milwaukee River Estuary Area of Concern

Task	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19
Location ID	MKE-19-01-SW	MKE-19-02-SW	MKE-19-03-SW	MKE-19-04-SW	MKE-19-04-SW	MKE-19-05-SW	MKE-19-05-SW	MKE-19-06-SW	MKE-19-06-SW
Sample ID	MKE-19-01-SW-201911201434	MKE-19-02-SW-201911201522	MKE-19-03-SW-201911210945	MKE-19-04-SW-FD-SW-201911211048	MKE-19-04-SW-MKE-19-04-SW-201911211048	MKE-19-05-SW-FD-SW-201911191238	MKE-19-05-SW-MKE-19-05-SW-201911191238	MKE-19-06-SW-MKE-19-06-SW-201911191351	MKE-19-06-SW-MKE-19-06-SW-201911191351
Sample Date	11/20/2019	11/20/2019	11/21/2019	11/21/2019	11/21/2019	11/19/2019	11/19/2019	11/19/2019	11/19/2019
Depth	7.2 - 7.2 ft	16.3 - 16.3 ft	7.7 - 7.7 ft	7.9 - 7.9 ft	7.9 - 7.9 ft	8 - 8 ft	8 - 8 ft	16.6 - 16.6 ft	16.6 - 16.6 ft
Sample Type	N	N	N	FD	N	FD	N	N	N
Matrix	WS	WS	WS	WS	WS	WS	WS	WS	WS
X	2528868.228	2527717.743	2527344.405	2527095.413	2527095.413	2519879.165	2519879.165	2522430.527	2522430.527
Y	391662.618	390394.871	389704.763	384025.516	384025.516	383285.824	383285.824	383043.559	383043.559
Method									
Conventional Parameters (mg/L)									
Total suspended solids	SM2540D	1.80 J	1.90 J	10.4	0.800 J	5.00 U	3.2	2.30 J	6
Perfluorochemicals (ng/L)									
10:2-fluorotelomer sulfonate	E537M	1.19 U	-- R	1.14 U	1.15 U	1.12 U	1.20 U	1.19 U	1.19 U
11-chloroeicosafluoro-3-oxaundecane-1-sulfonate (PF3OUdS)	E537M	1.19 U	-- R	1.14 U	1.15 U	1.12 U	1.20 U	1.19 U	1.19 U
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	E537M	0.594 U	-- R	0.572 U	0.573 U	0.560 U	0.598 U	0.596 U	0.593 U
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	E537M	0.594 U	-- R	0.572 U	0.573 U	0.560 U	0.598 U	0.596 U	0.593 U
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid	E537M	0.594 U	-- R	0.572 U	0.573 U	0.560 U	0.598 U	0.596 U	0.593 U
4:2 fluorotelomer sulfonate	E537M	5.94 U	-- R	5.72 U	5.73 U	5.60 U	5.98 U	5.96 U	5.93 U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonate	E537M	0.594 U	-- R	0.572 U	0.573 U	0.560 U	0.598 U	0.596 U	0.593 U
N-ethyl perfluoro-1-octanesulfonamide	E537M	0.594 U	-- R	0.572 U	0.573 U	0.560 U	0.598 U	0.596 U	0.593 U
N-ethyl perfluorooctanesulfonamidoacetic acid	E537M	1.19 U	-- R	1.14 U	1.15 U	1.12 U	1.20 U	1.19 U	1.19 U
N-methyl perfluoro-1-octanesulfonamide	E537M	1.19 U	-- R	1.14 U	1.15 U	1.12 U	1.20 U	1.19 U	1.19 U
N-methyl perfluorooctanesulfonamidoacetic acid	E537M	1.19 U	-- R	1.14 U	1.15 U	1.12 U	1.20 U	1.19 U	1.19 U
Perfluorodecane sulfonate (PFDS)	E537M	0.594 U	-- R	0.572 U	0.573 U	0.560 U	0.598 U	0.596 U	0.593 U
Perfluorohexadecanoic acid	E537M	1.19 U	-- R	5.72 U	1.15 U	5.60 U	1.20 U	5.96 U	1.34 J
Perfluorononane sulfonate	E537M	0.630 U	-- R	0.607 U	0.608 U	0.594 U	0.634 U	0.632 U	0.629 U
Perfluorooctadecanoic acid	E537M	0.594 UJ	-- R	1.14 UJ	1.15 UJ	1.12 UJ	0.598 U	0.596 U	0.593 U
Perfluoropentane sulfonate	E537M	0.594 U	-- R	0.572 U	0.573 U	0.560 U	0.616 J	0.825 J	0.673 J
Sodium dodecafluoro-3H-4,8-dioxanonanoate (ADONA)	E537M	0.594 U	-- R	0.572 U	0.573 U	0.560 U	0.598 U	0.596 U	0.593 U
1H,1H,2H,2H-Perfluorodecane-sulphonic acid	E537M	1.19 U	-- R	1.14 U	1.15 U	1.12 U	1.20 U	1.19 U	1.19 U
1h,1h,2h,2h-perfluorooctanesulfonic acid (THPFOS)	E537M	1.19 U	-- R	1.14 U	1.15 U	5.60 U	5.98 U	2.09 J	2.41 J
Perfluorobutanesulfonate (PFBS)	E537M	1.68	-- R	1.89	2.11	1.96	3.08	3.25	3.08
Perfluorobutanoate (PFBA)	E537M	5.64	-- R	5.93	6.24	5.98	7.99	8.96	6.86 J
Perfluorodecanoate (PFDA)	E537M	0.703 U	-- R	0.676 U	0.677 U	0.662 U	0.706 U	0.705 U	0.701 U
Perfluorododecanoate (PFDoA)	E537M	0.594 U	-- R	0.572 U	0.573 U	0.560 U	0.598 U	0.596 U	0.593 U
Perfluoroheptanesulfonic acid	E537M	0.594 U	-- R	0.572 U	0.573 U	0.560 U	0.598 U	0.596 U	0.593 U
Perfluoroheptanoate (PFHpA)	E537M	1.28 J	-- R	1.21 J	1.29 J	1.26 J	2	2.18	2.1
Perfluorohexanesulfonate (PFHxS)	E537M	2.84	-- R	3.09	3.14	2.81	4.21	4.83	4.79
Perfluorohexanoate (PFHxA)	E537M	3.96	-- R	3.08	3.01	2.82	5.37	5.32	5.53
Perfluorononanoate (PFNA)	E537M	0.594 U	-- R	0.572 U	0.573 U	0.560 U	0.737 J	1.01 J	0.883 J
Perfluorooctane sulfonamide (PFOSA)	E537M	0.594 U	-- R	0.572 U	0.573 U	0.560 U	0.598 U	0.596 U	0.593 U
Perfluorooctanesulfonate (PFOS)	E537M	2.38	-- R	3.48	3.53	3.05	5.91	8.04	7.56
Perfluorooctanoate (PFOA)	E537M	3.27	-- R	2.32	2.41	2.42	2.78	3.52	3.71
Perfluoropentanoate (PFPeA)	E537M	3.72	-- R	2.83	3.48	3.32	6.69	7.29	7.49
Perfluorotetradecanoic acid (PFTeDA)	E537M	0.742 J	-- R	0.694 U	0.695 U	0.810 J	0.831 J	1.02 J	0.852 J

Table 1
Surface Water PFAS Concentrations in the Milwaukee River Estuary Area of Concern

Task	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19
Location ID	MKE-19-01-SW	MKE-19-02-SW	MKE-19-03-SW	MKE-19-04-SW	MKE-19-04-SW	MKE-19-05-SW	MKE-19-05-SW	MKE-19-06-SW	MKE-19-06-SW
Sample ID	MKE-19-01-SW-201911201434	MKE-19-02-SW-201911201522	MKE-19-03-SW-201911210945	MKE-19-04-SW-FD-SW-201911211048	MKE-19-04-SW-MKE-19-04-SW-201911211048	MKE-19-05-SW-FD-SW-201911191238	MKE-19-05-SW-MKE-19-05-SW-201911191238	MKE-19-06-SW-MKE-19-06-SW-201911191351	MKE-19-06-SW-MKE-19-06-SW-201911191351
Sample Date	11/20/2019	11/20/2019	11/21/2019	11/21/2019	11/21/2019	11/19/2019	11/19/2019	11/19/2019	11/19/2019
Depth	7.2 - 7.2 ft	16.3 - 16.3 ft	7.7 - 7.7 ft	7.9 - 7.9 ft	7.9 - 7.9 ft	8 - 8 ft	8 - 8 ft	16.6 - 16.6 ft	16.6 - 16.6 ft
Sample Type	N	N	N	FD	N	FD	N	N	N
Matrix	WS	WS	WS	WS	WS	WS	WS	WS	WS
X	2528868.228	2527717.743	2527344.405	2527095.413	2527095.413	2519879.165	2519879.165	2522430.527	2522430.527
Y	391662.618	390394.871	389704.763	384025.516	384025.516	383285.824	383285.824	383043.559	383043.559
Method	E537M	E537M	E537M	E537M	E537M	E537M	E537M	E537M	E537M
Perfluorotridecanoic acid (PFTrDA)	0.594 U	-- R	0.572 U	0.573 U	0.560 U	0.598 U	0.596 U	0.593 U	0.593 U
Perfluoroundecanoate (PFUnA)	0.594 U	-- R	0.572 U	0.573 U	0.560 U	0.598 U	0.596 U	0.593 U	0.593 U

Notes:

Bold: Detected result

J: Estimated value

R: Rejected

U: Compound analyzed for, but not detected above detection limit

UJ: Compound analyzed for, but not detected above estimated detection limit

FD: field duplicate sample

Horizontal Datum: Wisconsin State Plane, South Zone, North American Datum of 1983 (NAD83), U.S. feet

mg/kg: milligrams per kilogram

mg/L: milligrams per liter

N: normal environmental sample

ng/g: nanograms per gram

ng/kg: nanograms per kilogram

ng/L: nanograms per liter

pct : percent

SE: sediment matrix

WS: surface water

USEPA Stage 2A/ 4 data validation was completed by Laboratory Data Consultants (LDC).

Table 1
Surface Water PFAS Concentrations in the Milwaukee River Estuary Area of Concern

Task	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19
Location ID	MKE-19-07-SW	MKE-19-08-SW	MKE-19-09-SW	MKE-19-10-SW	MKE-19-11-SW	MKE-19-12-SW	MKE-19-13-SW	MKE-19-14-SW	MKE-19-14-SW
Sample ID	MKE-19-07-SW-201911191502	MKE-19-08-SW-201911181336	MKE-19-09-SW-201911181336	MKE-19-10-SW-201911190901	MKE-19-11-SW-201911180939	MKE-19-12-SW-201911201024	MKE-19-13-SW-201911200935	MKE-19-14-SW-201911200844	MKE-19-14-SW-201911200844
Sample Date	11/19/2019	11/18/2019	11/18/2019	11/19/2019	11/18/2019	11/20/2019	11/20/2019	11/20/2019	11/20/2019
Depth	16.3 - 16.3 ft	6.3 - 6.3 ft	6.3 - 6.3 ft	17 - 17 ft	23 - 23 ft	11.7 - 11.7 ft	18.5 - 18.5 ft	25.3 - 25.3 ft	25.3 - 25.3 ft
Sample Type	N	N	N	N	N	N	N	N	N
Matrix	WS	WS	WS	WS	WS	WS	WS	WS	WS
X	2525835.789	2526854.03	2528711.244	2528824.825	2528997.193	2531877.485	2533171.123	2536368.934	2536368.934
Y	382362.709	374417.948	375263.834	376311.553	380520.806	381470.361	375452.918	383481.366	383481.366
Method									
Conventional Parameters (mg/L)									
Total suspended solids	SM2540D	2.8	4.8	1.60 J	2.30 J	1.30 J	0.900 J	2.50 U	2.50 U
Perfluorochemicals (ng/L)									
10:2-fluorotelomer sulfonate	E537M	1.17 U	1.22 U	1.19 U	1.13 U	1.21 U	1.20 U	1.16 U	1.16 U
11-chloroeicosafluoro-3-oxaundecane-1-sulfonate (PF3OUdS)	E537M	1.17 U	1.22 U	1.19 U	1.13 U	1.21 U	1.20 U	1.16 U	1.16 U
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	E537M	0.584 U	0.609 U	0.594 U	0.566 U	0.604 U	0.599 U	0.581 U	0.579 U
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	E537M	0.584 U	0.609 U	0.594 U	0.566 U	0.604 U	0.599 U	0.581 U	0.579 U
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid	E537M	0.584 U	0.609 U	0.594 U	0.566 U	0.604 U	0.599 U	0.581 U	0.579 U
4:2 fluorotelomer sulfonate	E537M	5.84 U	6.09 U	5.94 U	5.66 U	6.04 U	1.20 U	5.81 U	1.16 U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonate	E537M	0.584 U	0.609 U	0.594 U	0.566 U	0.604 U	0.599 U	0.581 U	0.579 U
N-ethyl perfluoro-1-octanesulfonamide	E537M	0.584 U	0.609 U	0.594 U	0.566 U	0.604 U	0.599 U	0.581 U	0.579 U
N-ethyl perfluorooctanesulfonamidoacetic acid	E537M	1.17 U	1.22 U	1.19 U	1.13 U	1.21 U	1.20 U	5.81 U	1.16 U
N-methyl perfluoro-1-octanesulfonamide	E537M	1.17 U	1.22 U	1.19 U	1.13 U	1.21 U	1.20 U	1.16 U	1.16 U
N-methyl perfluorooctanesulfonamidoacetic acid	E537M	1.17 U	1.22 U	1.19 U	1.13 U	1.21 U	1.20 U	1.16 U	1.16 U
Perfluorodecane sulfonate (PFDS)	E537M	0.584 U	0.609 U	0.594 U	0.566 U	0.604 U	0.599 U	0.581 U	0.579 U
Perfluorohexadecanoic acid	E537M	1.20 J	1.27 J	1.19 U	1.13 U	1.21 U	1.20 U	1.16 U	1.16 U
Perfluorononane sulfonate	E537M	0.619 U	0.646 U	0.630 U	0.600 U	0.641 U	0.635 U	0.616 U	0.614 U
Perfluorooctadecanoic acid	E537M	0.584 U	0.609 U	0.594 U	0.566 U	0.604 U	0.599 U	0.581 U	0.605 J
Perfluoropentane sulfonate	E537M	0.621 J	7.7	2.14	3.04	1.18 J	0.599 U	0.581 U	0.579 U
Sodium dodecafluoro-3H-4,8-dioxanonanoate (ADONA)	E537M	0.584 U	0.609 U	0.594 U	0.566 U	0.604 U	0.599 U	0.581 U	0.579 U
1H,1H,2H,2H-Perfluorodecanesulphonic acid	E537M	1.17 U	1.22 U	1.19 U	1.13 U	1.21 U	1.20 U	1.16 U	1.16 U
1h,1h,2h,2h-perfluorooctanesulfonic acid (THPFOS)	E537M	1.65 J	19.8	5.94 U	9.5	2.92 J	1.20 U	17.5	1.16 U
Perfluorobutanesulfonate (PFBS)	E537M	2.75	8.91	3.4	4.43	2.52	0.599 U	1.02 J	0.579 U
Perfluorobutanoate (PFBA)	E537M	6.49 J	12	7.29	7.84	6.84	0.940 J	2.38	1.68 J
Perfluorodecanoate (PFDA)	E537M	0.690 U	0.720 U	0.702 U	0.669 U	0.714 U	0.708 U	0.686 U	0.685 U
Perfluorododecanoate (PFDoA)	E537M	0.584 U	0.609 U	0.594 U	0.566 U	0.604 U	0.599 U	0.581 U	0.579 U
Perfluoroheptanesulfonic acid	E537M	0.584 U	1.74 J	0.594 U	0.605 J	0.604 U	0.599 U	0.581 U	0.579 U
Perfluoroheptanoate (PFHpA)	E537M	1.91	4.42	2.55	3.02	1.66 J	0.599 U	1.78	0.579 U
Perfluorohexanesulfonate (PFHxS)	E537M	4.04	44.4	14.2	16.9	7.47	0.599 U	0.581 U	0.579 U
Perfluorohexanoate (PFHxA)	E537M	5.07	24.9	8.56	11.9	5.29	0.726 U	4.87	0.738 J
Perfluorononanoate (PFNA)	E537M	0.706 J	0.917 J	0.594 U	0.566 U	0.604 U	0.599 U	0.581 U	0.579 U
Perfluorooctane sulfonamide (PFOSA)	E537M	0.584 U	0.609 U	0.594 U	0.566 U	0.604 U	0.599 U	0.581 U	0.579 U
Perfluorooctanesulfonate (PFOS)	E537M	6.08	32.7	11.1	14.2	6.76	0.726 U	2.14	0.702 U
Perfluorooctanoate (PFOA)	E537M	3.07	7.14	3.58	4.15	3.43	0.726 U	1.51 J	0.702 U
Perfluoropentanoate (PFPeA)	E537M	6.22	17.9	7.07	9.21	4.94	0.599 U	4.49	0.579 U
Perfluorotetradecanoic acid (PFTeDA)	E537M	0.743 J	0.794 J	0.720 U	0.686 U	0.733 U	0.726 U	0.704 U	0.705 J

Table 1
Surface Water PFAS Concentrations in the Milwaukee River Estuary Area of Concern

Task	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19
Location ID	MKE-19-07-SW	MKE-19-08-SW	MKE-19-09-SW	MKE-19-10-SW	MKE-19-11-SW	MKE-19-12-SW	MKE-19-13-SW	MKE-19-14-SW	MKE-19-14-SW
Sample ID	MKE-19-07-SW-201911191502	MKE-19-08-SW-201911181336	MKE-19-09-SW-201911181336	MKE-19-10-SW-201911190901	MKE-19-11-SW-201911180939	MKE-19-12-SW-201911201024	MKE-19-13-SW-201911200935	MKE-19-14-SW-201911200844	MKE-19-14-SW-201911200844
Sample Date	11/19/2019	11/18/2019	11/18/2019	11/19/2019	11/18/2019	11/20/2019	11/20/2019	11/20/2019	11/20/2019
Depth	16.3 - 16.3 ft	6.3 - 6.3 ft	6.3 - 6.3 ft	17 - 17 ft	23 - 23 ft	11.7 - 11.7 ft	18.5 - 18.5 ft	25.3 - 25.3 ft	25.3 - 25.3 ft
Sample Type	N	N	N	N	N	N	N	N	N
Matrix	WS	WS	WS	WS	WS	WS	WS	WS	WS
X	2525835.789	2526854.03	2528711.244	2528824.825	2528997.193	2531877.485	2533171.123	2536368.934	2536368.934
Y	382362.709	374417.948	375263.834	376311.553	380520.806	381470.361	375452.918	383481.366	383481.366
Method	E537M	E537M	E537M	E537M	E537M	E537M	E537M	E537M	E537M
Perfluorotridecanoic acid (PFTrDA)	0.584 U	0.609 U	0.594 U	0.566 U	0.604 U	0.599 U	0.581 U	0.579 U	0.579 U
Perfluoroundecanoate (PFUnA)	0.584 U	0.609 U	0.594 U	0.566 U	0.604 U	0.599 U	0.581 U	0.579 U	0.579 U

Notes:

Bold: Detected result

J: Estimated value

R: Rejected

U: Compound analyzed for, but not detected above detection limit

UJ: Compound analyzed for, but not detected above estimated detection limit

FD: field duplicate sample

Horizontal Datum: Wisconsin State Plane, South Zone, North American Datum of 1983 (NAD83), U

mg/kg: milligrams per kilogram

mg/L: milligrams per liter

N: normal environmental sample

ng/g: nanograms per gram

ng/kg: nanograms per kilogram

ng/L: nanograms per liter

pct : percent

SE: sediment matrix

WS: surface water

USEPA Stage 2A/ 4 data validation was completed by Laboratory Data Consultants (LDC).

Table 2

Sediment PFAS Concentrations in the Milwaukee River Estuary Area of Concern

Task	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19
Location ID	MKE-19-01-SC	MKE-19-01-SC	MKE-19-01-SC	MKE-19-01-SC	MKE-19-02-SC	MKE-19-02-SC	MKE-19-02-SC	MKE-19-02-SC
Sample ID	MKE-19-01-SC-0.5-	MKE-19-01-SC-00-	MKE-19-01-SC-01-	MKE-19-01-SC-02-	MKE-19-02-SC-0.5-	MKE-19-02-SC-00-	MKE-19-02-SC-01-	MKE-19-02-SC-01-
Sample Date	01-191121	0.5-191121	02-191121	3.4-191121	01-191121	0.5-191121	02-191121	02-191121
Sample Date	11/21/2019	11/21/2019	11/21/2019	11/21/2019	11/21/2019	11/21/2019	11/21/2019	11/21/2019
Depth	0.5 - 1 ft	0 - 0.5 ft	1 - 2 ft	2 - 3.4 ft	0.5 - 1 ft	0 - 0.5 ft	1 - 2 ft	1 - 2 ft
Sample Type	N	N	N	N	N	N	N	N
Matrix	SE	SE	SE	SE	SE	SE	SE	SE
X	2528868.228	2528868.228	2528868.228	2528868.228	2527717.743	2527717.743	2527717.743	2527717.743
Y	391662.618	391662.618	391662.618	391662.618	390394.871	390394.871	390394.871	390394.871
Method								
Conventional Parameters (pct)								
Total organic carbon	SW9060M	6.74	6.44	6.46	3.54	4.25	5.16	7.44
Total Solids	SM2540G	64.3	61.6	66.7	77.5	77.7	80.8	62.2
Perfluorochemicals (ng/g)								
10:2-fluorotelomer sulfonate	E537M	0.363 U	0.462 U	0.408 U	0.417 U	0.369 U	0.386 U	0.404 U
11-chloroicosafafluoro-3-oxaundecane-1-sulfonate (PF3OUdS)	E537M	0.363 U	0.462 U	0.408 U	0.417 U	0.369 U	0.386 U	0.404 U
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	E537M	0.434 U	0.553 U	0.489 U	0.499 U	0.442 U	0.462 U	0.484 U
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	E537M	0.429 U	0.546 U	0.483 U	0.493 U	0.436 U	0.456 U	0.477 U
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid	E537M	0.181 U	0.231 U	0.204 U	0.208 U	0.184 U	0.193 U	0.202 U
4:2 fluorotelomer sulfonate	E537M	0.440 U	0.560 U	0.495 U	0.505 U	0.447 U	0.468 U	0.490 U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonate	E537M	0.363 U	0.462 U	0.408 U	0.417 U	0.369 U	0.386 U	0.404 U
N-ethyl perfluoro-1-octanesulfonamide	E537M	0.451 U	0.574 U	0.507 U	0.518 U	0.458 U	0.479 U	0.502 U
N-ethyl perfluorooctanesulfonamidoacetic acid	E537M	0.920 J	0.385 U	1.65	0.347 U	0.307 U	0.321 U	0.663 J
N-methyl perfluoro-1-octanesulfonamide	E537M	0.478 U	0.609 U	0.538 U	0.550 U	0.486 U	0.508 U	0.532 U
N-methyl perfluorooctanesulfonamidoacetic acid	E537M	0.748 J	0.462 U	1.27	0.417 U	0.369 U	0.386 U	0.713 J
Perfluorodecane sulfonate (PFDS)	E537M	0.371 J	0.231 U	0.822	0.208 U	0.184 U	0.193 U	0.362 J
Perfluorohexadecanoic acid	E537M	0.363 U	0.462 U	0.408 U	0.417 U	0.369 U	0.386 U	0.404 U
Perfluorononane sulfonate	E537M	0.181 U	0.231 U	0.204 U	0.208 U	0.184 U	0.193 U	0.202 U
Perfluorooctadecanoic acid	E537M	0.429 UJ	0.546 UJ	0.483 UJ	0.493 UJ	0.436 UJ	0.456 UJ	0.477 UJ
Perfluoropentane sulfonate	E537M	0.181 U	0.231 U	0.204 U	0.208 U	0.184 U	0.193 U	0.202 U
Sodium dodecafluoro-3H-4,8-dioxanonanoate (ADONA)	E537M	0.363 U	0.462 U	0.408 U	0.417 U	0.369 U	0.386 U	0.404 U
Perfluorochemicals (ng/kg)								
1H,1H,2H,2H-Perfluorodecanesulphonic acid	E537M	423 U	539 U	476 U	486 U	430 U	450 U	471 U
1h,1h,2h,2h-perfluorooctanesulfonic acid (THPFOS)	E537M	429 U	546 U	483 U	493 U	436 U	456 U	477 U
Perfluorobutanesulfonate (PFBS)	E537M	181 U	231 U	204 U	208 U	184 U	193 U	202 U
Perfluorobutanoate (PFBA)	E537M	220 U	280 U	247 U	253 U	224 U	234 U	245 U
Perfluorodecanoate (PFDA)	E537M	407 U	518 U	458 U	467 U	414 U	432 U	453 U
Perfluorododecanoate (PFDoA)	E537M	181 U	231 U	204 U	208 U	184 U	193 U	202 U
Perfluoroheptanesulfonic acid	E537M	203 U	259 U	229 U	234 U	207 U	216 U	226 U
Perfluoroheptanoate (PFHpA)	E537M	181 U	231 U	204 U	208 U	184 U	193 U	202 U
Perfluorohexanesulfonate (PFHxS)	E537M	181 U	231 U	204 U	208 U	184 U	193 U	202 U
Perfluorohexanoate (PFHxA)	E537M	220 U	280 U	247 U	253 U	224 U	234 U	245 U
Perfluorononanoate (PFNA)	E537M	181 U	231 U	204 U	208 U	184 U	193 U	202 U
Perfluorooctane sulfonamide (PFOSA)	E537M	181 U	231 U	204 U	208 U	184 U	193 U	202 U
Perfluorooctanesulfonate (PFOS)	E537M	821	338 J	1690	253 U	224 U	234 U	539 J

Table 2
Sediment PFAS Concentrations in the Milwaukee River Estuary Area of Concern

Task	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19
Location ID	MKE-19-01-SC	MKE-19-01-SC	MKE-19-01-SC	MKE-19-01-SC	MKE-19-01-SC	MKE-19-02-SC	MKE-19-02-SC
Sample ID	MKE-19-01-SC-0.5	MKE-19-01-SC-00	MKE-19-01-SC-01	MKE-19-01-SC-02	MKE-19-02-SC-0.5	MKE-19-02-SC-00	MKE-19-02-SC-01
Sample Date	01-191121	0.5-191121	02-191121	3.4-191121	01-191121	0.5-191121	02-191121
Sample Date	11/21/2019	11/21/2019	11/21/2019	11/21/2019	11/21/2019	11/21/2019	11/21/2019
Depth	0.5 - 1 ft	0 - 0.5 ft	1 - 2 ft	2 - 3.4 ft	0.5 - 1 ft	0 - 0.5 ft	1 - 2 ft
Sample Type	N	N	N	N	N	N	N
Matrix	SE	SE	SE	SE	SE	SE	SE
X	2528868.228	2528868.228	2528868.228	2528868.228	2527717.743	2527717.743	2527717.743
Y	391662.618	391662.618	391662.618	391662.618	390394.871	390394.871	390394.871
Method	E537M	E537M	E537M	E537M	E537M	E537M	E537M
Perfluorooctanoate (PFOA)	220 U	280 U	247 U	253 U	224 U	234 U	245 U
Perfluoropentanoate (PFPeA)	181 U	231 U	204 U	208 U	184 U	193 U	202 U
Perfluorotetradecanoic acid (PFTeDA)	220 U	280 U	247 U	253 U	224 U	234 U	245 U
Perfluorotridecanoic acid (PFTrDA)	181 U	231 U	204 U	208 U	184 U	193 U	202 U
Perfluoroundecanoate (PFUnA)	181 U	231 U	204 U	208 U	184 U	193 U	202 U

Notes:

Bold: Detected result

J: Estimated value

R: Rejected

U: Compound analyzed for, but not detected above detection limit

UJ: Compound analyzed for, but not detected above estimated detection limit

FD: field duplicate sample

Horizontal Datum: Wisconsin State Plane, South Zone, North American Datum of 1983 (NAD83), U.S. feet

mg/kg: milligrams per kilogram

mg/L: milligrams per liter

N: normal environmental sample

ng/g: nanograms per gram

ng/kg: nanograms per kilogram

ng/L: nanograms per liter

pct : percent

SE: sediment matrix

WS: surface water

USEPA Stage 2A/ 4 data validation was completed by Laboratory Data Consultants (LDC).

Table 2

Sediment PFAS Concentrations in the Milwaukee River Estuary Area of Concern

Task	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19
Location ID	MKE-19-02-SC	MKE-19-03-SC	MKE-19-03-SC	MKE-19-03-SC	MKE-19-03-SC	MKE-19-03-SC	MKE-19-03-SC	MKE-19-04-SC
Sample ID	MKE-19-02-SC-02-	FD-SC-	MKE-19-03-SC-0.5-	MKE-19-03-SC-00-	MKE-19-03-SC-01-	MKE-19-03-SC-02-	MKE-19-03-SC-02-	MKE-19-04-SC-0.5-
Sample Date	3.7-191121	201911211445	01-191121	0.5-191121	02-191121	04-191121	04-191121	01-191121
Sample Date	11/21/2019	11/21/2019	11/21/2019	11/21/2019	11/21/2019	11/21/2019	11/21/2019	11/21/2019
Depth	2 - 3.7 ft	0 - 0.5 ft	0.5 - 1 ft	0 - 0.5 ft	1 - 2 ft	2 - 4 ft	2 - 4 ft	0.5 - 1 ft
Sample Type	N	FD	N	N	N	N	N	N
Matrix	SE	SE	SE	SE	SE	SE	SE	SE
X	2527717.743	2527344.405	2527344.405	2527344.405	2527344.405	2527344.405	2527344.405	2527095.413
Y	390394.871	389704.763	389704.763	389704.763	389704.763	389704.763	389704.763	384025.516
Method								
Conventional Parameters (pct)								
Total organic carbon	SW9060M	13.4	6.73	6.93	7.62	6.43	12.9	13.6
Total Solids	SM2540G	56.8	73.4	70.8	65	80.2	47.9	48.7
Perfluorochemicals (ng/g)								
10:2-fluorotelomer sulfonate	E537M	0.514 U	0.410 U	0.438 U	0.381 U	0.382 U	0.565 U	0.537 U
11-chloroicosafafluoro-3-oxaundecane-1-sulfonate (PF3OUdS)	E537M	0.514 U	0.410 U	0.438 U	0.381 U	0.382 U	0.565 U	0.537 U
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	E537M	0.615 U	0.491 U	0.524 U	0.456 U	0.457 U	0.676 U	0.643 U
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	E537M	0.608 U	0.485 U	0.518 U	0.450 U	0.451 U	0.667 U	0.685 J
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid	E537M	0.257 U	0.205 U	0.219 U	0.190 U	0.191 U	0.282 U	0.269 U
4:2 fluorotelomer sulfonate	E537M	0.623 U	0.497 U	0.531 U	0.462 U	0.463 U	0.684 U	0.651 U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonate	E537M	0.514 U	0.410 U	0.438 U	0.381 U	0.382 U	0.565 U	0.537 U
N-ethyl perfluoro-1-octanesulfonamide	E537M	0.639 U	0.510 U	0.544 U	0.473 U	0.474 U	0.701 U	0.667 U
N-ethyl perfluorooctanesulfonamidoacetic acid	E537M	5.05	0.342 U	0.365 U	0.317 U	0.318 U	10.3	5.86
N-methyl perfluoro-1-octanesulfonamide	E537M	0.678 U	0.541 U	0.578 U	0.502 U	0.503 U	0.744 U	0.708 U
N-methyl perfluorooctanesulfonamidoacetic acid	E537M	1.43 J	0.410 U	0.438 U	0.381 U	0.382 U	2.49	2.49
Perfluorodecane sulfonate (PFDS)	E537M	1.98	0.205 U	0.219 U	0.190 U	0.191 U	1.08	2.04
Perfluorohexadecanoic acid	E537M	0.514 U	0.410 U	0.438 U	0.381 U	0.382 U	0.565 U	0.537 U
Perfluorononane sulfonate	E537M	0.257 U	0.205 U	0.219 U	0.190 U	0.191 U	0.282 U	0.269 U
Perfluorooctadecanoic acid	E537M	0.608 UJ	0.485 UJ	0.518 UJ	0.450 UJ	0.451 UJ	0.667 UJ	0.635 UJ
Perfluoropentane sulfonate	E537M	0.257 U	0.205 U	0.219 U	0.190 U	0.191 U	0.282 U	0.269 U
Sodium dodecafluoro-3H-4,8-dioxanonanoate (ADONA)	E537M	0.514 U	0.410 U	0.438 U	0.381 U	0.382 U	0.565 U	0.537 U
Perfluorochemicals (ng/kg)								
1H,1H,2H,2H-Perfluorodecanesulphonic acid	E537M	600 U	479 U	511 U	444 U	445 U	659 U	627 U
1h,1h,2h,2h-perfluorooctanesulfonic acid (THPFOS)	E537M	692 J	485 U	518 U	450 U	451 U	667 U	635 U
Perfluorobutanesulfonate (PFBS)	E537M	257 U	205 U	219 U	190 U	191 U	282 U	269 U
Perfluorobutanoate (PFBA)	E537M	312 U	249 U	266 U	231 U	231 U	342 U	326 U
Perfluorodecanoate (PFDA)	E537M	576 U	460 U	491 U	427 U	428 U	633 U	602 U
Perfluorododecanoate (PFDoA)	E537M	257 U	205 U	219 U	190 U	191 U	282 U	269 U
Perfluoroheptanesulfonic acid	E537M	288 U	230 U	246 U	214 U	214 U	316 U	301 U
Perfluoroheptanoate (PFHpA)	E537M	257 U	205 U	219 U	190 U	191 U	282 U	269 U
Perfluorohexanesulfonate (PFHxS)	E537M	257 U	205 U	219 U	190 U	191 U	282 U	269 U
Perfluorohexanoate (PFHxA)	E537M	312 U	249 U	266 U	231 U	231 U	342 U	326 U
Perfluorononanoate (PFNA)	E537M	257 U	205 U	219 U	190 U	191 U	282 U	269 U
Perfluorooctane sulfonamide (PFOSA)	E537M	257 U	205 U	219 U	190 U	191 U	282 U	347 J
Perfluorooctanesulfonate (PFOS)	E537M	1080	249 U	266 U	231 U	231 U	530 J	1670

Table 2
Sediment PFAS Concentrations in the Milwaukee River Estuary Area of Concern

Task	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19
Location ID	MKE-19-02-SC	MKE-19-03-SC	MKE-19-03-SC	MKE-19-03-SC	MKE-19-03-SC	MKE-19-03-SC	MKE-19-03-SC
Sample ID	MKE-19-02-SC-02-	FD-SC-	MKE-19-03-SC-0.5-	MKE-19-03-SC-00-	MKE-19-03-SC-01-	MKE-19-03-SC-02-	MKE-19-04-SC-0.5-
Sample Date	3.7-191121	201911211445	01-191121	0.5-191121	02-191121	04-191121	01-191121
Sample Date	11/21/2019	11/21/2019	11/21/2019	11/21/2019	11/21/2019	11/21/2019	11/21/2019
Depth	2 - 3.7 ft	0 - 0.5 ft	0.5 - 1 ft	0 - 0.5 ft	1 - 2 ft	2 - 4 ft	0.5 - 1 ft
Sample Type	N	FD	N	N	N	N	N
Matrix	SE	SE	SE	SE	SE	SE	SE
X	2527717.743	2527344.405	2527344.405	2527344.405	2527344.405	2527344.405	2527095.413
Y	390394.871	389704.763	389704.763	389704.763	389704.763	389704.763	384025.516
Method	E537M	E537M	E537M	E537M	E537M	E537M	E537M
Perfluorooctanoate (PFOA)	312 U	249 U	266 U	231 U	231 U	342 U	326 U
Perfluoropentanoate (PFPeA)	257 U	205 U	219 U	190 U	191 U	282 U	269 U
Perfluorotetradecanoic acid (PFTeDA)	312 U	249 U	266 U	231 U	231 U	342 U	326 U
Perfluorotridecanoic acid (PFTrDA)	257 U	205 U	219 U	190 U	191 U	282 U	269 U
Perfluoroundecanoate (PFUnA)	257 U	205 U	219 U	190 U	191 U	282 U	269 U

Notes:

Bold: Detected result

J: Estimated value

R: Rejected

U: Compound analyzed for, but not detected above detection limit

UJ: Compound analyzed for, but not detected above estimated detection limit

FD: field duplicate sample

Horizontal Datum: Wisconsin State Plane, South Zone, North American Datum of 1983 (NAD83), U.S.

mg/kg: milligrams per kilogram

mg/L: milligrams per liter

N: normal environmental sample

ng/g: nanograms per gram

ng/kg: nanograms per kilogram

ng/L: nanograms per liter

pct : percent

SE: sediment matrix

WS: surface water

USEPA Stage 2A/ 4 data validation was completed by Laboratory Data Consultants (LDC).

Table 2

Sediment PFAS Concentrations in the Milwaukee River Estuary Area of Concern

Task	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	
Location ID	MKE-19-04-SC	MKE-19-04-SC	MKE-19-04-SC	MKE-19-05-SC	MKE-19-05-SC	MKE-19-05-SC	MKE-19-05-SC	
Sample ID	MKE-19-04-SC-00-	MKE-19-04-SC-01-	MKE-19-04-SC-02-	FD-SC-	MKE-19-05-SC-0.5-	MKE-19-05-SC-00-	MKE-19-05-SC-01-	
Sample Date	0.5-191121	02-191121	3.8-191121	201911200830	01-191120	0.5-191120	02-191120	
Sample Date	11/21/2019	11/21/2019	11/21/2019	11/20/2019	11/20/2019	11/20/2019	11/20/2019	
Depth	0 - 0.5 ft	1 - 2 ft	2 - 3.8 ft	1 - 2 ft	0.5 - 1 ft	0 - 0.5 ft	1 - 2 ft	
Sample Type	N	N	N	FD	N	N	N	
Matrix	SE	SE	SE	SE	SE	SE	SE	
X	2527095.413	2527095.413	2527095.413	2519879.165	2519879.165	2519879.165	2519879.165	
Y	384025.516	384025.516	384025.516	383285.824	383285.824	383285.824	383285.824	
Method								
Conventional Parameters (pct)								
Total organic carbon	SW9060M	13	14.2	15.4	11.4	7.44	8.62	9.04
Total Solids	SM2540G	63.9	50.4	42.7	37.1	36.3	32.9	36.2
Perfluorochemicals (ng/g)								
10:2-fluorotelomer sulfonate	E537M	0.415 U	0.524 U	0.601 U	0.772 U	0.776 U	0.760 U	0.735 U
11-chloroicosafafluoro-3-oxaundecane-1-sulfonate (PF3OUdS)	E537M	0.415 U	0.524 U	0.601 U	0.772 U	0.776 U	0.760 U	0.735 U
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	E537M	0.497 U	0.627 U	0.720 U	0.924 U	0.929 U	0.909 U	0.880 U
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	E537M	0.490 U	0.620 U	0.939 J	0.912 U	0.917 U	0.898 U	0.869 U
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid	E537M	0.207 U	0.262 U	0.301 U	0.386 U	0.388 U	0.380 U	0.367 U
4:2 fluorotelomer sulfonate	E537M	0.503 U	0.635 U	0.729 U	4.68 U	4.70 U	0.921 U	4.45 U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonate	E537M	0.415 U	0.524 U	0.601 U	0.772 U	0.776 U	0.760 U	0.735 U
N-ethyl perfluoro-1-octanesulfonamide	E537M	0.515 U	0.651 U	0.747 U	0.959 U	0.965 U	0.944 U	0.913 U
N-ethyl perfluorooctanesulfonamidoacetic acid	E537M	1.34	6.26	8.39	0.643 U	0.647 U	0.633 U	0.612 U
N-methyl perfluoro-1-octanesulfonamide	E537M	0.547 U	0.691 U	0.793 U	1.02 U	1.02 U	1.00 U	0.969 U
N-methyl perfluorooctanesulfonamidoacetic acid	E537M	0.840 J	1.79	4.98	0.772 U	0.776 U	0.760 U	0.735 U
Perfluorodecane sulfonate (PFDS)	E537M	0.755	1.53	0.301 U	0.451 J	0.448 J	0.380 U	0.666 J
Perfluorohexadecanoic acid	E537M	0.415 U	0.524 U	0.601 U	0.772 U	3.88 U	3.80 U	3.67 U
Perfluorononane sulfonate	E537M	0.207 U	0.262 U	0.301 U	0.386 U	0.388 U	0.380 U	0.367 U
Perfluorooctadecanoic acid	E537M	0.490 UJ	0.620 UJ	0.711 UJ	0.912 U	0.917 U	0.898 U	0.869 U
Perfluoropentane sulfonate	E537M	0.207 U	0.262 U	0.301 U	0.386 U	0.388 U	0.380 U	0.367 U
Sodium dodecafluoro-3H-4,8-dioxanonanoate (ADONA)	E537M	0.415 U	0.524 U	0.601 U	0.772 U	0.776 U	0.760 U	0.735 U
Perfluorochemicals (ng/kg)								
1H,1H,2H,2H-Perfluorodecanesulphonic acid	E537M	484 U	612 U	702 U	900 U	906 U	886 U	857 U
1h,1h,2h,2h-perfluorooctanesulfonic acid (THPFOS)	E537M	490 U	620 U	711 U	1310 J	917 U	898 U	1830 J
Perfluorobutanesulfonate (PFBS)	E537M	207 U	262 U	301 U	386 U	388 U	380 U	367 U
Perfluorobutanoate (PFBA)	E537M	251 U	318 U	365 U	468 U	543 J	488 J	492 J
Perfluorodecanoate (PFDA)	E537M	465 U	588 U	674 U	865 U	870 U	852 U	824 U
Perfluorododecanoate (PFDoA)	E537M	207 U	262 U	301 U	545 J	545 J	503 J	552 J
Perfluoroheptanesulfonic acid	E537M	233 U	294 U	337 U	433 U	435 U	426 U	412 U
Perfluoroheptanoate (PFHpA)	E537M	207 U	262 U	301 U	386 U	388 U	380 U	367 U
Perfluorohexanesulfonate (PFHxS)	E537M	207 U	262 U	301 U	386 U	388 U	380 U	367 U
Perfluorohexanoate (PFHxA)	E537M	251 U	318 U	365 U	468 U	470 U	460 U	445 U
Perfluorononanoate (PFNA)	E537M	207 U	262 U	301 U	386 U	388 U	380 U	367 U
Perfluorooctane sulfonamide (PFOSA)	E537M	207 U	262 U	301 U	386 U	388 U	380 U	367 U
Perfluorooctanesulfonate (PFOS)	E537M	608 J	678 J	365 U	969 J	991 J	769 J	1280

Table 2
Sediment PFAS Concentrations in the Milwaukee River Estuary Area of Concern

Task	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	
Location ID	MKE-19-04-SC	MKE-19-04-SC	MKE-19-04-SC	MKE-19-05-SC	MKE-19-05-SC	MKE-19-05-SC	MKE-19-05-SC	
Sample ID	MKE-19-04-SC-00-	MKE-19-04-SC-01-	MKE-19-04-SC-02-	FD-SC-	MKE-19-05-SC-0.5-	MKE-19-05-SC-00-	MKE-19-05-SC-01-	
Sample Date	0.5-191121	02-191121	3.8-191121	201911200830	01-191120	0.5-191120	02-191120	
Sample Date	11/21/2019	11/21/2019	11/21/2019	11/20/2019	11/20/2019	11/20/2019	11/20/2019	
Depth	0 - 0.5 ft	1 - 2 ft	2 - 3.8 ft	1 - 2 ft	0.5 - 1 ft	0 - 0.5 ft	1 - 2 ft	
Sample Type	N	N	N	FD	N	N	N	
Matrix	SE	SE	SE	SE	SE	SE	SE	
X	2527095.413	2527095.413	2527095.413	2519879.165	2519879.165	2519879.165	2519879.165	
Y	384025.516	384025.516	384025.516	383285.824	383285.824	383285.824	383285.824	
Method								
Perfluorooctanoate (PFOA)	E537M	251 U	318 U	365 U	468 U	470 U	460 U	445 U
Perfluoropentanoate (PFPeA)	E537M	207 U	262 U	301 U	386 U	388 U	380 U	367 U
Perfluorotetradecanoic acid (PFTeDA)	E537M	251 U	318 U	365 U	700 J	636 J	593 J	815 J
Perfluorotridecanoic acid (PFTrDA)	E537M	207 U	262 U	301 U	386 U	388 U	380 U	367 U
Perfluoroundecanoate (PFUnA)	E537M	207 U	262 U	301 U	386 U	388 U	380 U	367 U

Notes:

Bold: Detected result

J: Estimated value

R: Rejected

U: Compound analyzed for, but not detected above detection limit

UJ: Compound analyzed for, but not detected above estimated detection limit

FD: field duplicate sample

Horizontal Datum: Wisconsin State Plane, South Zone, North American Datum of 1983 (NAD83), U.S.

mg/kg: milligrams per kilogram

mg/L: milligrams per liter

N: normal environmental sample

ng/g: nanograms per gram

ng/kg: nanograms per kilogram

ng/L: nanograms per liter

pct : percent

SE: sediment matrix

WS: surface water

USEPA Stage 2A/ 4 data validation was completed by Laboratory Data Consultants (LDC).

Table 2

Sediment PFAS Concentrations in the Milwaukee River Estuary Area of Concern

Task	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19
Location ID	MKE-19-05-SC	MKE-19-06-SC	MKE-19-06-SC	MKE-19-06-SC	MKE-19-06-SC	MKE-19-06-SC	MKE-19-07-SC	MKE-19-07-SC
Sample ID	MKE-19-05-SC-02-	MKE-19-06-SC-05-	MKE-19-06-SC-00-	MKE-19-06-SC-01-	MKE-19-06-SC-02-	MKE-19-06-SC-02-	MKE-19-07-SC-05-	MKE-19-07-SC-00-
Sample Date	04-191120	01-191119	05-191119	02-191119	3.9-191119	01-191120	05-191120	
Sample Date	11/20/2019	11/19/2019	11/19/2019	11/19/2019	11/19/2019	11/20/2019	11/20/2019	
Depth	2 - 4 ft	0.5 - 1 ft	0 - 0.5 ft	1 - 2 ft	2 - 3.9 ft	0.5 - 1 ft	0 - 0.5 ft	
Sample Type	N	N	N	N	N	N	N	N
Matrix	SE	SE	SE	SE	SE	SE	SE	SE
X	2519879.165	2522430.527	2522430.527	2522430.527	2522430.527	2525835.789	2525835.789	
Y	383285.824	383043.559	383043.559	383043.559	383043.559	382362.709	382362.709	
Method								
Conventional Parameters (pct)								
Total organic carbon	SW9060M	8.68	9.21	9.66	8.28	8.06	9.24	8.88
Total Solids	SM2540G	44.1	42.8	40.2	50.4	48.4	34.1	29
Perfluorochemicals (ng/g)								
10:2-fluorotelomer sulfonate	E537M	0.658 U	0.681 U	0.839 U	0.621 U	0.563 U	0.711 U	0.859 U
11-chloroicosafuoro-3-oxaundecane-1-sulfonate (PF3OUdS)	E537M	0.658 U	0.681 U	0.839 U	0.621 U	0.563 U	0.711 U	0.859 U
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	E537M	0.787 U	0.815 U	1.00 U	0.744 U	0.673 U	0.851 U	1.03 U
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	E537M	0.777 U	0.804 U	0.991 U	0.734 U	0.665 U	0.840 U	1.02 U
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid	E537M	0.329 U	0.340 U	0.419 U	0.311 U	0.281 U	0.355 U	0.430 U
4:2 fluorotelomer sulfonate	E537M	3.99 U	0.825 U	5.08 U	0.753 U	0.682 U	0.861 U	1.04 U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonate	E537M	0.658 U	0.681 U	0.839 U	0.621 U	0.563 U	0.711 U	0.859 U
N-ethyl perfluoro-1-octanesulfonamide	E537M	0.817 U	0.845 U	1.04 U	0.772 U	0.699 U	0.883 U	1.07 U
N-ethyl perfluorooctanesulfonamidoacetic acid	E537M	0.548 U	0.648 J	0.699 U	2.75	11.5	0.592 U	0.716 U
N-methyl perfluoro-1-octanesulfonamide	E537M	0.867 U	0.897 U	1.11 U	0.819 U	0.742 U	0.937 U	1.13 U
N-methyl perfluorooctanesulfonamidoacetic acid	E537M	0.806 J	0.724 J	0.839 U	4.39	8.67	0.711 U	0.859 U
Perfluorodecane sulfonate (PFDS)	E537M	0.551 J	0.570 J	0.547 J	1.55	5.93	0.468 J	0.557 J
Perfluorohexadecanoic acid	E537M	0.658 U	0.681 U	0.839 U	0.621 U	0.563 U	3.55 U	4.30 U
Perfluorononane sulfonate	E537M	0.329 U	0.340 U	0.419 U	0.311 U	0.281 U	0.355 U	0.430 U
Perfluorooctadecanoic acid	E537M	0.777 U	0.804 U	0.991 U	0.734 U	0.665 U	0.840 U	1.02 U
Perfluoropentane sulfonate	E537M	0.329 U	0.340 U	0.419 U	0.311 U	0.281 U	0.355 U	0.430 U
Sodium dodecafluoro-3H-4,8-dioxanonanoate (ADONA)	E537M	0.658 U	0.681 U	0.839 U	0.621 U	0.563 U	0.711 U	0.859 U
Perfluorochemicals (ng/kg)								
1H,1H,2H,2H-Perfluorodecanesulphonic acid	E537M	767 U	794 U	979 U	725 U	3280 U	829 U	1000 U
1h,1h,2h,2h-perfluorooctanesulfonic acid (THPFOS)	E537M	777 U	804 U	5450	4680	1750	840 U	1020 U
Perfluorobutanesulfonate (PFBS)	E537M	329 U	340 U	419 U	311 U	281 U	355 U	430 U
Perfluorobutanoate (PFBA)	E537M	466 J	412 U	792 J	376 U	537 J	431 U	547 J
Perfluorodecanoate (PFDA)	E537M	738 U	763 U	941 U	696 U	631 U	797 U	964 U
Perfluorododecanoate (PFDoA)	E537M	631 J	628 J	627 J	391 J	368 J	656 J	706 J
Perfluoroheptanesulfonic acid	E537M	369 U	382 U	470 U	348 U	315 U	398 U	482 U
Perfluoroheptanoate (PFHpA)	E537M	329 U	340 U	419 U	311 U	281 U	355 U	430 U
Perfluorohexanesulfonate (PFHxS)	E537M	329 U	340 U	419 U	311 U	281 U	355 U	430 U
Perfluorohexanoate (PFHxA)	E537M	399 U	412 U	508 U	376 U	341 U	431 U	521 U
Perfluorononanoate (PFNA)	E537M	329 U	340 U	419 U	311 U	281 U	355 U	430 U
Perfluorooctane sulfonamide (PFOSA)	E537M	329 U	340 U	419 U	311 U	424 J	355 U	430 U
Perfluorooctanesulfonate (PFOS)	E537M	1220	1000 J	1200 J	1110	1530	906 J	1480

Table 2
Sediment PFAS Concentrations in the Milwaukee River Estuary Area of Concern

Task	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19
Location ID	MKE-19-05-SC	MKE-19-06-SC	MKE-19-06-SC	MKE-19-06-SC	MKE-19-06-SC	MKE-19-06-SC	MKE-19-07-SC
Sample ID	MKE-19-05-SC-02-	MKE-19-06-SC-0.5-	MKE-19-06-SC-00-	MKE-19-06-SC-01-	MKE-19-06-SC-02-	MKE-19-07-SC-0.5-	MKE-19-07-SC-00-
Sample Date	04-191120	01-191119	0.5-191119	02-191119	3.9-191119	01-191120	0.5-191120
Sample Date	11/20/2019	11/19/2019	11/19/2019	11/19/2019	11/19/2019	11/20/2019	11/20/2019
Depth	2 - 4 ft	0.5 - 1 ft	0 - 0.5 ft	1 - 2 ft	2 - 3.9 ft	0.5 - 1 ft	0 - 0.5 ft
Sample Type	N	N	N	N	N	N	N
Matrix	SE	SE	SE	SE	SE	SE	SE
X	2519879.165	2522430.527	2522430.527	2522430.527	2522430.527	2525835.789	2525835.789
Y	383285.824	383043.559	383043.559	383043.559	383043.559	382362.709	382362.709
Method	E537M	E537M	E537M	E537M	E537M	E537M	E537M
Perfluorooctanoate (PFOA)	399 U	412 U	508 U	376 U	341 U	431 U	521 U
Perfluoropentanoate (PFPeA)	329 U	340 U	419 U	311 U	281 U	355 U	430 U
Perfluorotetradecanoic acid (PFTeDA)	794 J	784 J	791 J	550 J	480 J	537 J	874 J
Perfluorotridecanoic acid (PFTrDA)	359 J	387 J	431 J	313 J	300 J	355 U	430 U
Perfluoroundecanoate (PFUnA)	329 U	340 U	419 U	311 U	281 U	355 U	430 U

Notes:

Bold: Detected result

J: Estimated value

R: Rejected

U: Compound analyzed for, but not detected above detection limit

UJ: Compound analyzed for, but not detected above estimated detection limit

FD: field duplicate sample

Horizontal Datum: Wisconsin State Plane, □South Zone, North American Datum of 1983 (NAD83), U.S.

mg/kg: milligrams per kilogram

mg/L: milligrams per liter

N: normal environmental sample

ng/g: nanograms per gram

ng/kg: nanograms per kilogram

ng/L: nanograms per liter

pct : percent

SE: sediment matrix

WS: surface water

USEPA Stage 2A/ 4 data validation was completed by Laboratory Data Consultants (LDC).

Table 2

Sediment PFAS Concentrations in the Milwaukee River Estuary Area of Concern

Task	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19
Location ID	MKE-19-07-SC	MKE-19-07-SC	MKE-19-08-SC	MKE-19-08-SC	MKE-19-08-SC	MKE-19-08-SC	MKE-19-08-SC	MKE-19-08-SC
Sample ID	MKE-19-07-SC-01-	MKE-19-07-SC-02-	FD-SC-	MKE-19-08-SC-0.5-	MKE-19-08-SC-00-	MKE-19-08-SC-01-	MKE-19-08-SC-02-	MKE-19-08-SC-02-
Sample Date	02-191120	3.8-191120	201911190830	01-191119	0.5-191119	02-191119	04-191119	
Sample Date	11/20/2019	11/20/2019	11/19/2019	11/19/2019	11/19/2019	11/19/2019	11/19/2019	11/19/2019
Depth	1 - 2 ft	2 - 3.8 ft	2 - 4 ft	0.5 - 1 ft	0 - 0.5 ft	1 - 2 ft	2 - 4 ft	
Sample Type	N	N	FD	N	N	N	N	N
Matrix	SE	SE	SE	SE	SE	SE	SE	SE
X	2525835.789	2525835.789	2526854.03	2526854.03	2526854.03	2526854.03	2526854.03	2526854.03
Y	382362.709	382362.709	374417.948	374417.948	374417.948	374417.948	374417.948	374417.948
Method								
Conventional Parameters (pct)								
Total organic carbon	SW9060M	12.4	5.53	1.84 J	11.3	18.1	12.2	11 J
Total Solids	SM2540G	42.5	46.9	46.3	44.9	37.1	38.7	49.8
Perfluorochemicals (ng/g)								
10:2-fluorotelomer sulfonate	E537M	0.713 U	0.612 U	0.742 J	1.41 J	4.99 U	1.02 J	3.22 U
11-chloroicosafuoro-3-oxaundecane-1-sulfonate (PF3OUdS)	E537M	0.713 U	0.612 U	0.562 U	0.665 U	0.997 U	0.767 U	0.644 U
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	E537M	0.854 U	0.732 U	0.672 U	0.796 U	1.19 U	0.918 U	0.771 U
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	E537M	0.843 U	0.723 U	0.664 U	0.786 U	1.18 U	0.906 U	0.761 U
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid	E537M	0.357 U	0.306 U	0.281 U	0.333 U	0.499 U	0.383 U	0.322 U
4:2 fluorotelomer sulfonate	E537M	0.865 U	0.741 U	3.40 U	4.03 U	6.04 U	4.65 U	3.90 U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonate	E537M	0.713 U	0.612 U	0.562 U	0.665 U	0.997 U	0.767 U	0.644 U
N-ethyl perfluoro-1-octanesulfonamide	E537M	0.886 U	0.760 U	0.698 U	0.826 U	1.24 U	0.952 U	4.00 U
N-ethyl perfluorooctanesulfonamidoacetic acid	E537M	1.60 J	5.94	0.898 J	0.720 J	0.831 U	0.639 U	0.958 J
N-methyl perfluoro-1-octanesulfonamide	E537M	0.940 U	0.806 U	0.740 U	0.877 U	1.31 U	1.01 U	0.849 U
N-methyl perfluorooctanesulfonamidoacetic acid	E537M	1.51 J	5.21	1.11 J	0.840 J	0.997 U	0.767 U	1.03 J
Perfluorodecane sulfonate (PFDS)	E537M	0.986 J	3.09	0.586 J	0.692 J	0.626 J	0.597 J	0.657 J
Perfluorohexadecanoic acid	E537M	3.57 U	3.06 U	0.586 J	0.665 U	0.997 U	0.767 U	0.644 U
Perfluorononane sulfonate	E537M	0.357 U	0.306 U	0.281 U	0.333 U	0.499 U	0.383 U	0.322 U
Perfluorooctadecanoic acid	E537M	0.843 U	-- R	0.664 U	0.786 U	1.18 U	0.906 U	0.761 U
Perfluoropentane sulfonate	E537M	0.357 U	0.306 U	0.281 U	0.333 U	0.499 U	0.383 U	0.322 U
Sodium dodecafluoro-3H-4,8-dioxanonanoate (ADONA)	E537M	0.713 U	0.612 U	0.562 U	0.665 U	0.997 U	0.767 U	0.644 U
Perfluorochemicals (ng/kg)								
1H,1H,2H,2H-Perfluorodecanesulphonic acid	E537M	832 U	714 U	655 U	3880 U	5820 U	894 U	3760 U
1h,1h,2h,2h-perfluorooctanesulfonic acid (THPFOS)	E537M	843 U	723 U	7650 J	14100 J	5890 U	8550	10100
Perfluorobutanesulfonate (PFBS)	E537M	357 U	306 U	281 U	333 U	499 U	383 U	322 U
Perfluorobutanoate (PFBA)	E537M	432 U	374 J	523 J	403 U	604 U	685 J	471 J
Perfluorodecanoate (PFDA)	E537M	800 U	686 U	630 U	746 U	1120 U	860 U	722 U
Perfluorododecanoate (PFDoA)	E537M	560 J	332 J	1450	1360	974 J	965 J	1550
Perfluoroheptanesulfonic acid	E537M	400 U	343 U	315 U	373 U	559 U	430 U	361 U
Perfluoroheptanoate (PFHpA)	E537M	357 U	306 U	281 U	333 U	499 U	383 U	322 U
Perfluorohexanesulfonate (PFHxS)	E537M	357 U	306 U	281 U	391 J	573 J	383 U	322 U
Perfluorohexanoate (PFHxA)	E537M	432 U	371 U	340 U	403 U	604 U	465 U	390 U
Perfluorononanoate (PFNA)	E537M	357 U	306 U	281 U	333 U	499 U	383 U	322 U
Perfluorooctane sulfonamide (PFOSA)	E537M	357 U	505 J	281 U	333 U	499 U	383 U	322 U
Perfluorooctanesulfonate (PFOS)	E537M	1090	1630	5030 J	9070	6680	6560	5780 J

Table 2
Sediment PFAS Concentrations in the Milwaukee River Estuary Area of Concern

Task	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19
Location ID	MKE-19-07-SC	MKE-19-07-SC	MKE-19-08-SC	MKE-19-08-SC	MKE-19-08-SC	MKE-19-08-SC	MKE-19-08-SC
Sample ID	MKE-19-07-SC-01-	MKE-19-07-SC-02-	FD-SC-	MKE-19-08-SC-0.5-	MKE-19-08-SC-00-	MKE-19-08-SC-01-	MKE-19-08-SC-02-
Sample Date	02-191120	3.8-191120	201911190830	01-191119	0.5-191119	02-191119	04-191119
Sample Date	11/20/2019	11/20/2019	11/19/2019	11/19/2019	11/19/2019	11/19/2019	11/19/2019
Depth	1 - 2 ft	2 - 3.8 ft	2 - 4 ft	0.5 - 1 ft	0 - 0.5 ft	1 - 2 ft	2 - 4 ft
Sample Type	N	N	FD	N	N	N	N
Matrix	SE	SE	SE	SE	SE	SE	SE
X	2525835.789	2525835.789	2526854.03	2526854.03	2526854.03	2526854.03	2526854.03
Y	382362.709	382362.709	374417.948	374417.948	374417.948	374417.948	374417.948
Method	E537M	E537M	E537M	E537M	E537M	E537M	E537M
Perfluorooctanoate (PFOA)	432 U	371 U	340 U	403 U	604 U	465 U	390 U
Perfluoropentanoate (PFPeA)	357 U	306 U	281 U	333 U	499 U	383 U	322 U
Perfluorotetradecanoic acid (PFTeDA)	645 J	432 J	1500	1380	1240 J	1100 J	1500
Perfluorotridecanoic acid (PFTrDA)	374 J	306 U	607 J	634 J	547 J	486 J	637 J
Perfluoroundecanoate (PFUnA)	357 U	306 U	320 J	345 J	499 U	383 U	328 J

Notes:

Bold: Detected result

J: Estimated value

R: Rejected

U: Compound analyzed for, but not detected above detection limit

UJ: Compound analyzed for, but not detected above estimated detection limit

FD: field duplicate sample

Horizontal Datum: Wisconsin State Plane, South Zone, North American Datum of 1983 (NAD83), U.S.

mg/kg: milligrams per kilogram

mg/L: milligrams per liter

N: normal environmental sample

ng/g: nanograms per gram

ng/kg: nanograms per kilogram

ng/L: nanograms per liter

pct : percent

SE: sediment matrix

WS: surface water

USEPA Stage 2A/ 4 data validation was completed by Laboratory Data Consultants (LDC).

Table 2

Sediment PFAS Concentrations in the Milwaukee River Estuary Area of Concern

Task	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19
Location ID	MKE-19-09-SC	MKE-19-09-SC	MKE-19-09-SC	MKE-19-09-SC	MKE-19-10-SC	MKE-19-10-SC	MKE-19-10-SC	MKE-19-10-SC
Sample ID	MKE-19-09-SC-0.5	MKE-19-09-SC-00-	MKE-19-09-SC-01-	MKE-19-09-SC-02-	MKE-19-10-SC-0.5-	MKE-19-10-SC-00-	MKE-19-10-SC-01-	MKE-19-10-SC-01-
Sample Date	01-191119	0.5-191119	02-191119	04-191119	01-191119	0.5-191119	02-191119	02-191119
Sample Date	11/19/2019	11/19/2019	11/19/2019	11/19/2019	11/19/2019	11/19/2019	11/19/2019	11/19/2019
Depth	0.5 - 1 ft	0 - 0.5 ft	1 - 2 ft	2 - 4 ft	0.5 - 1 ft	0 - 0.5 ft	1 - 2 ft	1 - 2 ft
Sample Type	N	N	N	N	N	N	N	N
Matrix	SE	SE	SE	SE	SE	SE	SE	SE
X	2528711.244	2528711.244	2528711.244	2528711.244	2528824.825	2528824.825	2528824.825	2528824.825
Y	375263.834	375263.834	375263.834	375263.834	376311.553	376311.553	376311.553	376311.553
Method								
Conventional Parameters (pct)								
Total organic carbon	SW9060M	11.8	13.4	11.3	16.2	14.7	11	15.2
Total Solids	SM2540G	53.7	42.3	54.9	57.2	48.6	44	54.3
Perfluorochemicals (ng/g)								
10:2-fluorotelomer sulfonate	E537M	0.494 U	0.619 U	0.510 U	0.537 U	0.623 U	0.980 U	0.564 U
11-chloroicosafuoro-3-oxaundecane-1-sulfonate (PF3OUdS)	E537M	0.494 U	0.619 U	0.510 U	0.537 U	0.623 U	0.980 U	0.564 U
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	E537M	0.591 U	0.740 U	1.02 J	0.643 U	0.746 U	1.17 U	0.675 U
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	E537M	0.583 U	0.731 U	0.603 U	0.635 U	0.737 U	1.16 U	0.666 U
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid	E537M	0.247 U	0.309 U	0.255 U	0.269 U	0.312 U	0.490 U	0.282 U
4:2 fluorotelomer sulfonate	E537M	0.598 U	0.750 U	0.619 U	3.26 U	0.756 U	1.19 U	0.684 U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonate	E537M	0.494 U	0.619 U	0.510 U	0.537 U	0.623 U	0.980 U	0.564 U
N-ethyl perfluoro-1-octanesulfonamide	E537M	0.613 U	0.768 U	0.636 J	0.731 J	0.774 U	1.22 U	0.701 U
N-ethyl perfluorooctanesulfonamidoacetic acid	E537M	8.38	4.19	11.2	7.39 J	1.94	0.828 J	13.9
N-methyl perfluoro-1-octanesulfonamide	E537M	0.651 U	0.815 U	0.673 U	0.708 U	0.822 U	1.29 U	0.743 U
N-methyl perfluorooctanesulfonamidoacetic acid	E537M	3.22	1.49 J	1.93	0.946 J	1.56 J	0.980 U	7.88
Perfluorodecane sulfonate (PFDS)	E537M	6.32	5.42	2.05	0.269 U	1.24	0.724 J	7.57
Perfluorohexadecanoic acid	E537M	0.494 U	0.619 U	0.510 U	0.537 U	0.623 U	0.980 U	0.564 U
Perfluorononane sulfonate	E537M	0.247 U	0.309 U	0.255 U	0.269 U	0.312 U	0.490 U	0.282 U
Perfluorooctadecanoic acid	E537M	0.583 U	0.731 U	0.603 U	0.635 U	0.737 U	1.16 U	0.666 U
Perfluoropentane sulfonate	E537M	0.247 U	0.309 U	0.255 U	0.269 U	0.312 U	0.490 U	0.282 U
Sodium dodecafluoro-3H-4,8-dioxanonanoate (ADONA)	E537M	0.494 U	0.619 U	0.510 U	0.537 U	0.623 U	0.980 U	0.564 U
Perfluorochemicals (ng/kg)								
1H,1H,2H,2H-Perfluorodecanesulphonic acid	E537M	576 U	722 U	596 U	627 U	727 U	1140 U	658 U
1h,1h,2h,2h-perfluorooctanesulfonic acid (THPFOS)	E537M	2890	5790	4140	4030 J	11500	25200	12900
Perfluorobutanesulfonate (PFBS)	E537M	247 U	309 U	255 U	269 U	312 U	490 U	282 U
Perfluorobutanoate (PFBA)	E537M	299 U	375 U	310 J	385 J	378 U	594 U	406 J
Perfluorodecanoate (PFDA)	E537M	553 U	694 U	572 U	602 U	699 U	1100 U	632 U
Perfluorododecanoate (PFDoA)	E537M	247 U	480 J	255 U	269 U	1160	965 J	454 J
Perfluoroheptanesulfonic acid	E537M	277 U	347 U	286 U	301 U	349 U	549 U	316 U
Perfluoroheptanoate (PFHpA)	E537M	247 U	309 U	255 U	269 U	312 U	490 U	282 U
Perfluorohexanesulfonate (PFHxS)	E537M	247 U	309 U	255 U	269 U	312 U	490 U	282 U
Perfluorohexanoate (PFHxA)	E537M	299 U	375 U	309 U	326 U	378 U	594 U	342 U
Perfluorononanoate (PFNA)	E537M	247 U	309 U	255 U	269 U	312 U	490 U	282 U
Perfluorooctane sulfonamide (PFOSA)	E537M	432 J	309 U	958	3470	312 U	490 U	839 J
Perfluorooctanesulfonate (PFOS)	E537M	2030	3280	1770	1400	3760	3750	7520

Table 2
Sediment PFAS Concentrations in the Milwaukee River Estuary Area of Concern

Task	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19
Location ID	MKE-19-09-SC	MKE-19-09-SC	MKE-19-09-SC	MKE-19-09-SC	MKE-19-10-SC	MKE-19-10-SC	MKE-19-10-SC
Sample ID	MKE-19-09-SC-0.5	MKE-19-09-SC-00	MKE-19-09-SC-01	MKE-19-09-SC-02	MKE-19-10-SC-0.5	MKE-19-10-SC-00	MKE-19-10-SC-01
Sample Date	01-191119	0.5-191119	02-191119	04-191119	01-191119	0.5-191119	02-191119
Sample Date	11/19/2019	11/19/2019	11/19/2019	11/19/2019	11/19/2019	11/19/2019	11/19/2019
Depth	0.5 - 1 ft	0 - 0.5 ft	1 - 2 ft	2 - 4 ft	0.5 - 1 ft	0 - 0.5 ft	1 - 2 ft
Sample Type	N	N	N	N	N	N	N
Matrix	SE	SE	SE	SE	SE	SE	SE
X	2528711.244	2528711.244	2528711.244	2528711.244	2528824.825	2528824.825	2528824.825
Y	375263.834	375263.834	375263.834	375263.834	376311.553	376311.553	376311.553
Method	E537M	E537M	E537M	E537M	E537M	E537M	E537M
Perfluorooctanoate (PFOA)	299 U	375 U	309 U	326 U	378 U	594 U	342 U
Perfluoropentanoate (PFPeA)	247 U	309 U	255 U	269 U	312 U	490 U	282 U
Perfluorotetradecanoic acid (PFTeDA)	366 J	690 J	309 U	326 U	1070	1010 J	671 J
Perfluorotridecanoic acid (PFTrDA)	247 U	348 J	436 J	269 U	566 J	551 J	695 J
Perfluoroundecanoate (PFUnA)	247 U	309 U	255 U	269 U	312 U	490 U	317 J

Notes:

Bold: Detected result

J: Estimated value

R: Rejected

U: Compound analyzed for, but not detected above detection limit

UJ: Compound analyzed for, but not detected above estimated detection limit

FD: field duplicate sample

Horizontal Datum: Wisconsin State Plane, South Zone, North American Datum of 1983 (NAD83), U.S.

mg/kg: milligrams per kilogram

mg/L: milligrams per liter

N: normal environmental sample

ng/g: nanograms per gram

ng/kg: nanograms per kilogram

ng/L: nanograms per liter

pct : percent

SE: sediment matrix

WS: surface water

USEPA Stage 2A/ 4 data validation was completed by Laboratory Data Consultants (LDC).

Table 2

Sediment PFAS Concentrations in the Milwaukee River Estuary Area of Concern

Task	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	
Location ID	MKE-19-10-SC	MKE-19-11-SC	MKE-19-11-SC	MKE-19-11-SC	MKE-19-12-SG	MKE-19-13-SG	MKE-19-14-SG	
Sample ID	MKE-19-10-SC-02-	MKE-19-11-SC-05-	MKE-19-11-SC-00-	MKE-19-11-SC-01-	MKE-19-12-SG-	MKE-19-13-SG-	MKE-19-14-SG-	
Sample Date	04-191119	01-191118	0.5-191118	1.8-191118	201911201024	201911200935	201911200844	
Sample Date	11/19/2019	11/18/2019	11/18/2019	11/18/2019	11/20/2019	11/20/2019	11/20/2019	
Depth	2 - 4 ft	0.5 - 1 ft	0 - 0.5 ft	1 - 1.8 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.33 ft	
Sample Type	N	N	N	N	N	N	N	
Matrix	SE	SE	SE	SE	SE	SE	SE	
X	2528824.825	2528997.193	2528997.193	2528997.193	2531877.485	2533171.123	2536368.934	
Y	376311.553	380520.806	380520.806	380520.806	381470.361	375452.918	383481.366	
Method								
Conventional Parameters (pct)								
Total organic carbon	SW9060M	16.2	13.6	11.7	8.38	3.36	4.83	6.22
Total Solids	SM2540G	54.3	47	28.2	49.9	74	54.1	67.9
Perfluorochemicals (ng/g)								
10:2-fluorotelomer sulfonate	E537M	2.37 U	0.686 U	0.920 U	0.615 U	0.353 U	0.500 U	0.366 U
11-chloroicosafuoro-3-oxaundecane-1-sulfonate (PF3OUdS)	E537M	0.474 U	0.686 U	0.920 U	0.615 U	0.353 U	0.500 U	0.366 U
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	E537M	0.567 U	0.822 U	1.10 U	0.736 U	0.423 U	0.599 U	0.439 U
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	E537M	0.560 U	0.811 U	1.09 U	0.727 U	0.418 U	0.591 U	0.433 U
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid	E537M	0.237 U	0.343 U	0.460 U	0.307 U	0.177 U	0.250 U	0.183 U
4:2 fluorotelomer sulfonate	E537M	0.574 U	0.832 U	1.12 U	0.745 U	0.428 U	0.606 U	0.444 U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonate	E537M	0.474 U	0.686 U	0.920 U	0.615 U	0.353 U	0.500 U	0.366 U
N-ethyl perfluoro-1-octanesulfonamide	E537M	0.588 U	0.853 U	1.14 U	0.764 U	0.439 U	0.621 U	0.455 U
N-ethyl perfluorooctanesulfonamidoacetic acid	E537M	7.61	2.06 J	0.767 U	7.99	0.294 U	0.658 J	0.305 U
N-methyl perfluoro-1-octanesulfonamide	E537M	0.624 U	0.905 U	1.21 U	0.811 U	0.466 U	0.659 U	0.483 U
N-methyl perfluorooctanesulfonamidoacetic acid	E537M	2.61	2.39	0.920 U	3.63	0.353 U	0.500 U	0.366 U
Perfluorodecane sulfonate (PFDS)	E537M	4.49	1.38	0.460 U	2.74	0.177 U	0.250 U	0.183 U
Perfluorohexadecanoic acid	E537M	0.474 U	0.686 U	0.920 U	0.615 U	1.77 U	2.50 U	1.83 U
Perfluorononane sulfonate	E537M	0.237 U	0.343 U	0.460 U	0.307 U	0.177 U	0.250 U	0.183 U
Perfluorooctadecanoic acid	E537M	0.560 U	0.811 U	1.09 U	0.727 U	-- R	0.591 U	0.433 U
Perfluoropentane sulfonate	E537M	0.237 U	0.343 U	0.460 U	0.307 U	0.177 U	0.250 U	0.183 U
Sodium dodecafluoro-3H-4,8-dioxanonanoate (ADONA)	E537M	0.474 U	0.686 U	0.920 U	0.615 U	0.353 U	0.500 U	0.366 U
Perfluorochemicals (ng/kg)								
1H,1H,2H,2H-Perfluorodecanesulphonic acid	E537M	2760 U	801 U	1070 U	717 U	412 U	584 U	427 U
1h,1h,2h,2h-perfluorooctanesulfonic acid (THPFOS)	E537M	2830	10000	20500	5640	418 U	591 U	433 U
Perfluorobutanesulfonate (PFBS)	E537M	237 U	343 U	460 U	307 U	177 U	250 U	183 U
Perfluorobutanoate (PFBA)	E537M	361 J	416 U	558 U	373 U	269 J	303 U	335 J
Perfluorodecanoate (PFDA)	E537M	531 U	770 U	1030 U	690 U	396 U	561 U	411 U
Perfluorododecanoate (PFDoA)	E537M	237 U	436 J	460 U	307 U	177 U	250 U	183 U
Perfluoroheptanesulfonic acid	E537M	265 U	385 U	516 U	345 U	198 U	280 U	205 U
Perfluoroheptanoate (PFHpA)	E537M	237 U	343 U	460 U	307 U	177 U	250 U	183 U
Perfluorohexanesulfonate (PFHxS)	E537M	237 U	343 U	460 U	307 U	177 U	250 U	183 U
Perfluorohexanoate (PFHxA)	E537M	287 U	416 U	558 U	373 U	214 U	303 U	222 U
Perfluorononanoate (PFNA)	E537M	237 U	343 U	460 U	307 U	177 U	250 U	183 U
Perfluorooctane sulfonamide (PFOSA)	E537M	768	343 U	460 U	420 J	177 U	250 U	183 U
Perfluorooctanesulfonate (PFOS)	E537M	2590	2350	2750	2150	214 U	303 U	246 J

Table 2
Sediment PFAS Concentrations in the Milwaukee River Estuary Area of Concern

Task	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19
Location ID	MKE-19-10-SC	MKE-19-11-SC	MKE-19-11-SC	MKE-19-11-SC	MKE-19-12-SG	MKE-19-13-SG	MKE-19-14-SG
Sample ID	MKE-19-10-SC-02-	MKE-19-11-SC-0.5-	MKE-19-11-SC-00-	MKE-19-11-SC-01-	MKE-19-12-SG-	MKE-19-13-SG-	MKE-19-14-SG-
Sample Date	04-191119	01-191118	0.5-191118	1.8-191118	201911201024	201911200935	201911200844
Sample Date	11/19/2019	11/18/2019	11/18/2019	11/18/2019	11/20/2019	11/20/2019	11/20/2019
Depth	2 - 4 ft	0.5 - 1 ft	0 - 0.5 ft	1 - 1.8 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.33 ft
Sample Type	N	N	N	N	N	N	N
Matrix	SE	SE	SE	SE	SE	SE	SE
X	2528824.825	2528997.193	2528997.193	2528997.193	2531877.485	2533171.123	2536368.934
Y	376311.553	380520.806	380520.806	380520.806	381470.361	375452.918	383481.366
Method	E537M	E537M	E537M	E537M	E537M	E537M	E537M
Perfluorooctanoate (PFOA)	287 U	416 U	558 U	373 U	214 U	303 U	222 U
Perfluoropentanoate (PFPeA)	237 U	343 U	460 U	307 U	177 U	250 U	183 U
Perfluorotetradecanoic acid (PFTeDA)	408 J	492 J	591 J	392 J	214 U	303 U	222 U
Perfluorotridecanoic acid (PFTrDA)	378 J	343 U	460 U	307 U	177 U	250 U	183 U
Perfluoroundecanoate (PFUnA)	237 U	343 U	460 U	307 U	177 U	250 U	183 U

Notes:

Bold: Detected result

J: Estimated value

R: Rejected

U: Compound analyzed for, but not detected above detection limit

UJ: Compound analyzed for, but not detected above estimated detection limit

FD: field duplicate sample

Horizontal Datum: Wisconsin State Plane, □South Zone, North American Datum of 1983 (NAD83), U.S.

mg/kg: milligrams per kilogram

mg/L: milligrams per liter

N: normal environmental sample

ng/g: nanograms per gram

ng/kg: nanograms per kilogram

ng/L: nanograms per liter

pct : percent

SE: sediment matrix

WS: surface water

USEPA Stage 2A/ 4 data validation was completed by Laboratory Data Consultants (LDC).

Table 3
Field and Rinse Blank PFAS Concentrations

Task	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19
Sample ID	BLANK-00-00-191121	RB-SC-191118-01	RB-SC-191121-01	RB-SG-191120-01	RB-SW-191119-01
Sample Date	11/21/2019	11/18/2019	11/21/2019	11/20/2019	11/19/2019
Sample Type	FB	RB	RB	RB	RB
Matrix	WQ	WQ	WQ	WQ	WQ
Method					
Perfluorochemicals (ng/L)					
10:2-fluorotelomer sulfonate	E537M	1.19 U	1.21 U	1.18 U	1.15 U
11-chloroeicosafluoro-3-oxaundecane-1-sulfonate (PF3OUdS)	E537M	1.19 U	1.21 U	1.18 U	1.15 U
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	E537M	0.594 U	0.605 U	0.588 U	0.575 U
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	E537M	0.594 U	0.605 U	0.588 U	0.575 U
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid	E537M	0.594 U	0.605 U	0.588 U	0.575 U
4:2 fluorotelomer sulfonate	E537M	1.19 U	1.21 U	1.18 U	1.15 U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonate	E537M	0.594 U	0.605 U	0.588 U	0.575 U
N-ethyl perfluoro-1-octanesulfonamide	E537M	0.594 U	0.605 U	0.588 U	2.90 U
N-ethyl perfluorooctanesulfonamidoacetic acid	E537M	1.19 U	1.21 U	1.18 U	1.15 U
N-methyl perfluoro-1-octanesulfonamide	E537M	1.19 U	1.21 U	1.18 U	1.15 U
N-methyl perfluorooctanesulfonamidoacetic acid	E537M	1.19 U	1.21 U	1.18 U	1.15 U
Perfluorodecane sulfonate (PFDS)	E537M	0.594 U	0.605 U	0.588 U	1.81
Perfluorohexadecanoic acid	E537M	1.19 U	1.21 U	1.18 U	1.15 U
Perfluorononane sulfonate	E537M	0.630 U	0.641 U	0.624 U	0.614 U
Perfluorooctadecanoic acid	E537M	1.19 UJ	0.605 U	1.18 UJ	0.579 UJ
Perfluoropentane sulfonate	E537M	0.594 U	0.605 U	0.588 U	0.579 U
Sodium dodecafluoro-3H-4,8-dioxanonanoate (ADONA)	E537M	0.594 U	0.605 U	0.588 U	0.579 U
1H,1H,2H,2H-Perfluorodecanesulphonic acid	E537M	1.19 U	1.21 U	1.18 U	1.16 U
1h,1h,2h,2h-perfluorooctanesulfonic acid (THPFOS)	E537M	1.19 U	1.21 U	1.18 U	1.16 U
Perfluorobutanesulfonate (PFBS)	E537M	0.594 U	0.605 U	0.588 U	0.579 U
Perfluorobutanoate (PFBA)	E537M	0.720 U	0.733 U	0.713 U	1.44 J
Perfluorodecanoate (PFDA)	E537M	0.702 U	0.715 U	0.695 U	0.750 J
Perfluorododecanoate (PFDoA)	E537M	0.594 U	0.605 U	0.588 U	0.666 J
Perfluoroheptanesulfonic acid	E537M	0.594 U	0.605 U	0.588 U	0.579 U
Perfluoroheptanoate (PFHpA)	E537M	0.594 U	0.605 U	0.588 U	0.579 U
Perfluorohexanesulfonate (PFHxS)	E537M	0.594 U	0.605 U	0.588 U	0.579 U
Perfluorohexanoate (PFHxA)	E537M	0.720 U	0.733 U	0.713 U	0.994 J
Perfluorononanoate (PFNA)	E537M	0.594 U	0.605 U	0.588 U	0.579 U
Perfluorooctane sulfonamide (PFOSA)	E537M	0.594 U	0.605 U	0.588 U	0.579 U
Perfluorooctanesulfonate (PFOS)	E537M	0.720 U	0.733 U	0.713 U	0.702 U
Perfluorooctanoate (PFOA)	E537M	0.720 U	0.733 U	0.713 U	0.860 J
Perfluoropentanoate (PFPeA)	E537M	0.594 U	0.605 U	0.588 U	0.579 U
Perfluorotetradecanoic acid (PFTeDA)	E537M	0.720 U	0.733 U	0.713 U	0.702 U
Perfluorotridecanoic acid (PFTrDA)	E537M	0.594 U	0.605 U	0.588 U	0.579 U

Table 3
Field and Rinse Blank PFAS Concentrations

	Task	MKE-19	MKE-19	MKE-19	MKE-19	MKE-19
	Sample ID	BLANK-00-00-191121	RB-SC-191118-01	RB-SC-191121-01	RB-SG-191120-01	RB-SW-191119-01
	Sample Date	11/21/2019	11/18/2019	11/21/2019	11/20/2019	11/19/2019
	Sample Type	FB	RB	RB	RB	RB
	Matrix	WQ	WQ	WQ	WQ	WQ
	Method	E537M				
Perfluoroundecanoate (PFUnA)		0.594 U	0.605 U	0.588 U	0.579 U	0.575 U

Notes:

Bold: Detected result

J: Estimated value

U: Compound analyzed for, but not detected above detection limit

UJ: Compound analyzed for, but not detected above estimated detection limit

FD: field duplicate sample

mg/kg: milligrams per kilogram

mg/L: milligrams per liter

N: normal environmental sample

ng/g: nanograms per gram

ng/kg: nanograms per kilogram

ng/L: nanograms per liter

pct : percent

SE: sediment matrix

WS: surface water