September 26, 2023

Greg Moll, Hydrogeologist
Wisconsin Department of Natural Resources
2300 N. Dr. Martin Luther King Jr. Drive
Milwaukee, WI 53212

Re: PFAS Sampling Update
Former One Hour Martinizing
13405 Watertown Plank Road, Elm Grove, Wisconsin
BRRTS# 02-68-552102

Dear Mr. Moll:

EnviroForensics, LLC (EnviroForensics) is providing the results of recent groundwater sampling for PFAS compounds. Samples of groundwater were collected from monitoring wells MW-4, MW-7, and MW-9 on July 31, 2023. MW-4 is a down-gradient well; MW-7 is a source area well that has historically contained the highest concentrations of drycleaning-related chlorinated volatile organic compounds (CVOCs); and MW-9 is an up-gradient well. The locations of these wells are shown on attached **Figure 2**. This figure is taken from a previously submitted remedial status update report dated February 16, 2021, and shows the consistent direction of groundwater flow and iso-concentrations of 1,2-DCE (the highest concentration of any CVOC at that time. All samples were collected using disposable bailers.

As can be seen in the attached laboratory results report, a few PFAS compounds were detected in all of the wells sampled with the greatest number of detections and the highest concentrations of detected compounds occurring in off-site and up-gradient well MW-9. However, all of the compounds detected were at concentrations below their respective proposed groundwater standards. DUP-1 is a duplicate sample of MW-7. There were no detections of PFAS compounds in the field blank collected as part of our QA/QC procedure. A copy of our standard operating procedures for collection of PFAS samples is attached.

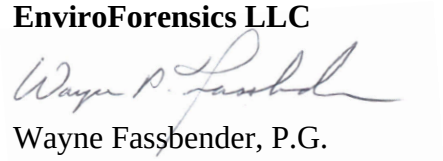
Due to the very low concentrations of PFAS compounds detected, we conclude that investigations regarding the release of PFAS compounds at this property are complete and further investigations are not necessary.

We believe that all site investigations at this property are complete and that past groundwater remedial efforts have been largely successful in reducing concentrations of CVOC impacts. The Village of Elm Grove has acquired the property and has demolished the existing building which eliminates the need for further vapor intrusion sampling. The concrete slab remains, as well as the asphalt paving. This provides a barrier to further downward migration to the water table of

contaminants in the shallow unsaturated soil. As such, we are prepared to submit case closure request documentation in the near future.

If you have questions regarding the content of this report, please feel free to contact me at 262-490-6472 or wfassbender@enviroforensics.com.

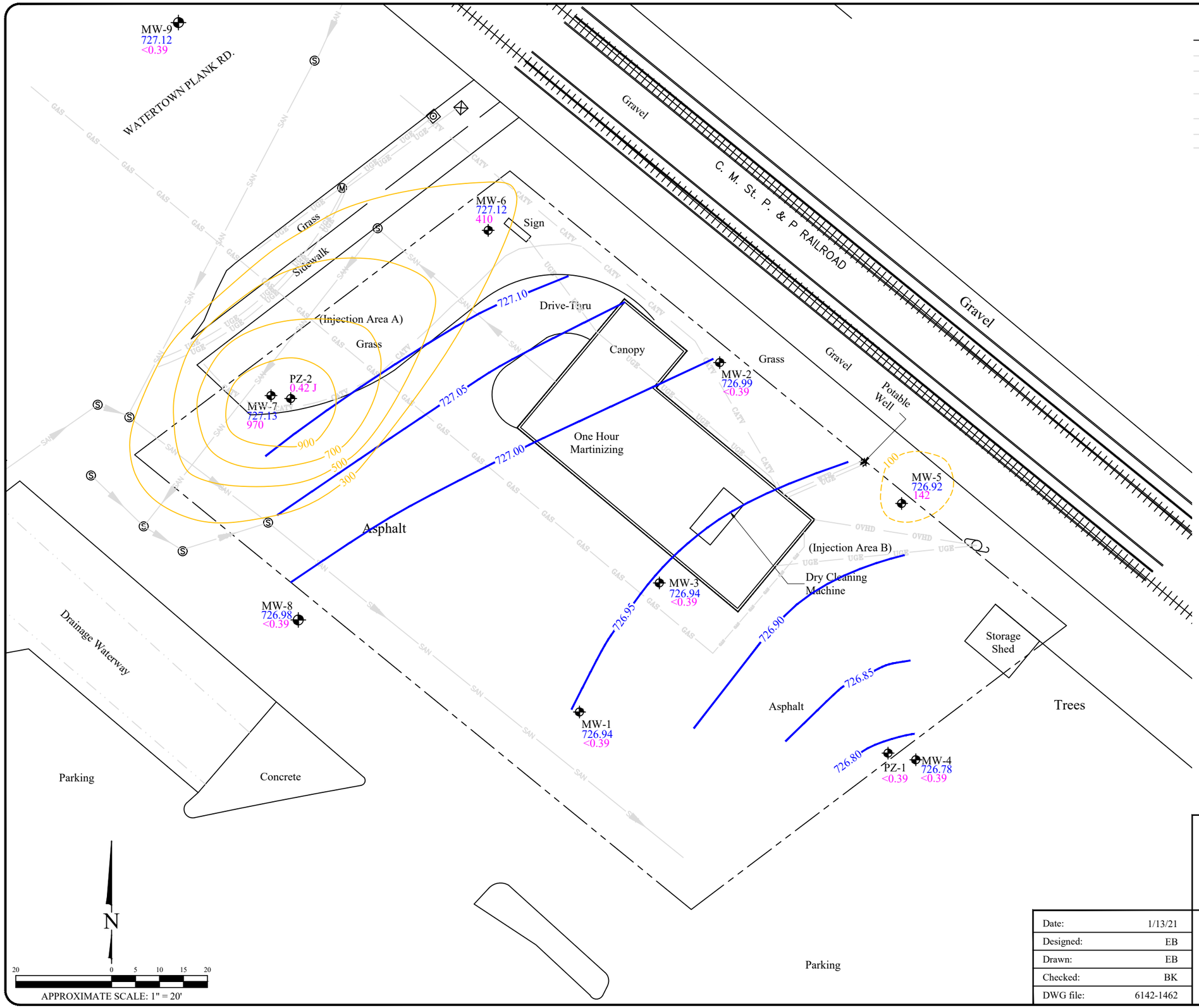
Sincerely,
EnviroForensics LLC



Wayne Fassbender, P.G.
Senior Project Manager

Enclosure: Figure: cis-1,2-DCE Groundwater Results and Potentiometric Surface Contour Map, December 10, 2020
Pace Analytical Laboratory Results Report
EnviroForensics PFAS Sampling Standard Operating Procedures (SOP)

Copy: Collin Martin, Ash Union, LLC
Dave DeAngeles, Village of Elm Grove Administrator



Legend

- Property boundary
- Underground gas utility line
- Underground water utility line
- Underground sanitary utility line (Arrow shows direction of flow)
- Underground cable television utility line
- Over head electrical utility line
- Underground electrical utility line
- MW-1 — Monitoring well location
- Sanitary Sewer Manhole
- Manhole
- 726.95 — Groundwater elevation contour
- 726.94 — Groundwater elevation (feet above mean sea level)
- 0.53 J — cis-1,2-DCE concentration in ug/L
  ug/L = Micrograms per Liter
- 500 — cis-1,2-DCE contour interval in ug/L
  Dashed boundaries are inferred

cis-1,2-DCE GROUNDWATER RESULTS AND POTENTIOMETRIC SURFACE CONTOUR MAP
DECEMBER 10, 2020

One Hour Martinizing
13405 Watertown Plank Road
Elm Grove, WI

Date:	1/13/21
Designed:	EB
Drawn:	EB
Checked:	BK
DWG file:	6142-1462

ENVIRO forensics
825 North Capitol Avenue • Indianapolis, IN 46204
EnviroForensics.com

Figure
2
Project
6142

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

August 22, 2023

Wayne Fassbender
Enviroforensics
N16 W23390 Stone Ridge Drive
Suite G
Waukesha, WI 53188

RE: Project: 6142 OHM ELM GROVE
Pace Project No.: 40265982

Dear Wayne Fassbender:

Enclosed are the analytical results for sample(s) received by the laboratory on August 01, 2023. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Baton Rouge
- Pace Analytical Services - Green Bay

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Dan Milewsky
dan.milewsky@pacelabs.com
(920)469-2436
Project Manager

Enclosures

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

CERTIFICATIONS

Project: 6142 OHM ELM GROVE
Pace Project No.: 40265982

Pace Analytical Services Green Bay
1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168
Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150
South Carolina Certification #: 83006001
Texas Certification #: T104704529-21-8
Virginia VELAP Certification ID: 11873
Wisconsin Certification #: 405132750
Wisconsin DATCP Certification #: 105-444
USDA Soil Permit #: P330-21-00008
Federal Fish & Wildlife Permit #: 51774A

Pace Analytical Services Baton Rouge
7979 Innovation Park Drive Ste A, Baton Rouge, LA 70820-7402
Louisiana Dept of Enviromental Quality (NELAC/LELAP): 01979
Florida Dept of Health (NELAC/FELAP): E87854
DoD ELAP (A2LA) #: 6429.01
Alabama DEM #: 41900
Alaska DEC-DW #: LA00024
Alaska DEC CS-LAP #: 21-001
Arkansas DEQ #: 88-0655
California ELAP #: 3063
Georgia DPD #: C050
Hawaii DOH State Laboratories Division
Illinois EPA #: 200048
Kansas DoHE #: E-10354
Kentucky DEP UST Branch #: 123054
Louisiana DOH #: LA036
Minnesota DOH #: 2233799
Mississippi State Dept of Health
Montana Department of Environmental Quality
Nebraska DHHS #: NE-OS-35.21
Nevada DCNR DEP #: LA00024
New York DOH #: 12149
North Carolina DEQ - WW & GW #: 618
North Dakota DEQ #: R195
Ohio EPA #: 87782
Oklahoma Dept of Environmental Quality #: 9403
Oregon ELAP #: 4168
Pennsylvania Dept of Environmental Protection #: 68-05973
South Carolina DHEC #: 73006001
Texas CEQ #: T104704178-23-15
Utah DOH #: LA00024
Virginia DCLS #: 6460215
Washington Dept of Ecology #: C929
Wisconsin DNR #: 399139510

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SAMPLE SUMMARY

Project: 6142 OHM ELM GROVE
Pace Project No.: 40265982

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40265982001	**6142-MW9**	Water	07/31/23 14:00	08/01/23 09:00
40265982002	**6142-FB**	Water	07/31/23 14:10	08/01/23 09:00
40265982003	**6142-MW4**	Water	07/31/23 15:15	08/01/23 09:00
40265982004	**6142-MW7**	Water	07/31/23 15:35	08/01/23 09:00
40265982005	**6142-DUP**	Water	07/31/23 00:00	08/01/23 09:00
40265982006	**6142-IDM-1**	Water	07/31/23 15:45	08/01/23 09:00

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SAMPLE ANALYTE COUNT

Project: 6142 OHM ELM GROVE
Pace Project No.: 40265982

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
40265982001	**6142-MW9**	EPA 537 Mod	AG	33	PASI-BR
40265982002	**6142-FB**	EPA 537 Mod	AG	33	PASI-BR
40265982003	**6142-MW4**	EPA 537 Mod	AG	33	PASI-BR
40265982004	**6142-MW7**	EPA 537 Mod	AG	33	PASI-BR
40265982005	**6142-DUP**	EPA 537 Mod	AG	33	PASI-BR
40265982006	**6142-IDM-1**	EPA 8260	SMT	64	PASI-G

PASI-BR = Pace Analytical Services - Baton Rouge
PASI-G = Pace Analytical Services - Green Bay

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SUMMARY OF DETECTION

Project: 6142 OHM ELM GROVE
Pace Project No.: 40265982

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
40265982001	**6142-MW9**					
EPA 537 Mod	NMeFOSAA	1.7J	ng/L	8.7	08/15/23 13:13	2q
EPA 537 Mod	Perfluorobutanesulfonic acid	7.2	ng/L	4.3	08/15/23 13:13	
EPA 537 Mod	Perfluorohexanoic acid	18.8	ng/L	4.3	08/15/23 13:13	
EPA 537 Mod	PFBA	27.1	ng/L	4.3	08/15/23 13:13	
EPA 537 Mod	PFPeA	29.4	ng/L	4.3	08/15/23 13:13	
EPA 537 Mod	Perfluoroheptanoic acid	5.2	ng/L	4.3	08/15/23 13:13	
EPA 537 Mod	Perfluorooctanesulfonic acid	2.6J	ng/L	4.3	08/15/23 13:13	
EPA 537 Mod	Perfluorooctanoic acid	2.4J	ng/L	4.3	08/15/23 13:13	
40265982003	**6142-MW4**					
EPA 537 Mod	Perfluorobutanesulfonic acid	2.5	ng/L	2.0	08/15/23 13:44	
EPA 537 Mod	Perfluorohexanoic acid	5.2	ng/L	2.0	08/15/23 13:44	
EPA 537 Mod	PFBA	7.7	ng/L	2.0	08/15/23 13:44	
EPA 537 Mod	PFPeA	9.9	ng/L	2.0	08/15/23 13:44	
EPA 537 Mod	Perfluoroheptanoic acid	1.7J	ng/L	2.0	08/15/23 13:44	
EPA 537 Mod	Perfluorohexanesulfonic acid	0.66J	ng/L	2.0	08/15/23 13:44	
EPA 537 Mod	Perfluorooctanesulfonic acid	0.73J	ng/L	2.0	08/15/23 13:44	B
EPA 537 Mod	Perfluorooctanoic acid	1.1J	ng/L	2.0	08/15/23 13:44	
40265982004	**6142-MW7**					
EPA 537 Mod	Perfluorobutanesulfonic acid	2.2	ng/L	1.9	08/15/23 13:59	
EPA 537 Mod	Perfluorohexanoic acid	2.1	ng/L	1.9	08/15/23 13:59	
EPA 537 Mod	PFBA	4.3	ng/L	1.9	08/15/23 13:59	
EPA 537 Mod	PFOSA	0.58J	ng/L	1.9	08/15/23 13:59	2q
EPA 537 Mod	PFPeA	4.2	ng/L	1.9	08/15/23 13:59	
EPA 537 Mod	Perfluoroheptanoic acid	1.0J	ng/L	1.9	08/15/23 13:59	
EPA 537 Mod	Perfluorooctanesulfonic acid	0.92J	ng/L	1.9	08/15/23 13:59	B
EPA 537 Mod	Perfluorooctanoic acid	0.63J	ng/L	1.9	08/15/23 13:59	
40265982005	**6142-DUP**					
EPA 537 Mod	Perfluorobutanesulfonic acid	2.5	ng/L	2.0	08/15/23 14:15	
EPA 537 Mod	Perfluorohexanoic acid	2.0	ng/L	2.0	08/15/23 14:15	
EPA 537 Mod	PFBA	4.3	ng/L	2.0	08/15/23 14:15	
EPA 537 Mod	PFPeA	4.2	ng/L	2.0	08/15/23 14:15	
EPA 537 Mod	Perfluoroheptanoic acid	1.0J	ng/L	2.0	08/15/23 14:15	
EPA 537 Mod	Perfluorooctanesulfonic acid	0.65J	ng/L	2.0	08/15/23 14:15	B
EPA 537 Mod	Perfluorooctanoic acid	0.54J	ng/L	2.0	08/15/23 14:15	
40265982006	**6142-IDM-1**					
EPA 8260	cis-1,2-Dichloroethene	74.9	ug/L	1.0	08/02/23 20:26	
EPA 8260	trans-1,2-Dichloroethene	2.2	ug/L	1.0	08/02/23 20:26	
EPA 8260	Tetrachloroethene	0.98J	ug/L	1.0	08/02/23 20:26	
EPA 8260	Trichloroethene	1.2	ug/L	1.0	08/02/23 20:26	
EPA 8260	Vinyl chloride	18.0	ug/L	1.0	08/02/23 20:26	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 6142 OHM ELM GROVE
Pace Project No.: 40265982

Sample: 6142-MW9 **Lab ID: 40265982001** Collected: 07/31/23 14:00 Received: 08/01/23 09:00 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
PFAS in Water-EPA 537 Mod	Analytical Method: EPA 537 Mod Preparation Method: EPA 537 Mod Pace Analytical Services - Baton Rouge								
11Cl-PF3OUdS	**<0.97**	ng/L	4.3	0.97	1	08/11/23 09:11	08/15/23 13:13	763051-92-9	
4:2 FTS	**<1.3**	ng/L	4.3	1.3	1	08/11/23 09:11	08/15/23 13:13	757124-72-4	
6:2 FTS	**<1.6**	ng/L	4.3	1.6	1	08/11/23 09:11	08/15/23 13:13	27619-97-2	
8:2 FTS	**<1.1**	ng/L	4.3	1.1	1	08/11/23 09:11	08/15/23 13:13	39108-34-4	2q
9Cl-PF3ONS	**<0.97**	ng/L	4.3	0.97	1	08/11/23 09:11	08/15/23 13:13	756426-58-1	
ADONA	**<0.93**	ng/L	4.3	0.93	1	08/11/23 09:11	08/15/23 13:13	919005-14-4	
HFPO-DA	**<7.2**	ng/L	21.7	7.2	1	08/11/23 09:11	08/15/23 13:13	13252-13-6	
NEtFOSAA	**<1.7**	ng/L	8.7	1.7	1	08/11/23 09:11	08/15/23 13:13	2991-50-6	2q
NEtFOSA	**<1.5**	ng/L	8.7	1.5	1	08/11/23 09:11	08/15/23 13:13	4151-50-2	2q,L1
NEtFOSE	**<1.1**	ng/L	8.7	1.1	1	08/11/23 09:11	08/15/23 13:13	1691-99-2	2q,N2
NMeFOSAA	**1.7J**	ng/L	8.7	0.97	1	08/11/23 09:11	08/15/23 13:13	2355-31-9	2q
NMeFOSA	**<1.8**	ng/L	8.7	1.8	1	08/11/23 09:11	08/15/23 13:13	31506-32-8	2q,L1
NMeFOSE	**<1.4**	ng/L	8.7	1.4	1	08/11/23 09:11	08/15/23 13:13	24448-09-7	2q,L1, N2
Perfluorobutanesulfonic acid	**7.2**	ng/L	4.3	0.67	1	08/11/23 09:11	08/15/23 13:13	375-73-5	
Perfluorodecanoic acid	**<1.6**	ng/L	4.3	1.6	1	08/11/23 09:11	08/15/23 13:13	335-76-2	
Perfluorohexanoic acid	**18.8**	ng/L	4.3	1.0	1	08/11/23 09:11	08/15/23 13:13	307-24-4	
PFBA	**27.1**	ng/L	4.3	1.6	1	08/11/23 09:11	08/15/23 13:13	375-22-4	
PFDS	**<1.3**	ng/L	4.3	1.3	1	08/11/23 09:11	08/15/23 13:13	335-77-3	
PFDoS	**<1.4**	ng/L	4.3	1.4	1	08/11/23 09:11	08/15/23 13:13	79780-39-5	
PFHpS	**<1.3**	ng/L	4.3	1.3	1	08/11/23 09:11	08/15/23 13:13	375-92-8	
PFNS	**<1.9**	ng/L	4.3	1.9	1	08/11/23 09:11	08/15/23 13:13	68259-12-1	
PFOSA	**<0.80**	ng/L	4.3	0.80	1	08/11/23 09:11	08/15/23 13:13	754-91-6	
PFPeA	**29.4**	ng/L	4.3	0.95	1	08/11/23 09:11	08/15/23 13:13	2706-90-3	
PFPeS	**<1.1**	ng/L	4.3	1.1	1	08/11/23 09:11	08/15/23 13:13	2706-91-4	
Perfluorododecanoic acid	**<1.4**	ng/L	4.3	1.4	1	08/11/23 09:11	08/15/23 13:13	307-55-1	2q
Perfluoroheptanoic acid	**5.2**	ng/L	4.3	1.3	1	08/11/23 09:11	08/15/23 13:13	375-85-9	
Perfluorohexanesulfonic acid	**<1.3**	ng/L	4.3	1.3	1	08/11/23 09:11	08/15/23 13:13	355-46-4	
Perfluorononanoic acid	**<1.1**	ng/L	4.3	1.1	1	08/11/23 09:11	08/15/23 13:13	375-95-1	
Perfluorooctanesulfonic acid	**2.6J**	ng/L	4.3	0.82	1	08/11/23 09:11	08/15/23 13:13	1763-23-1	
Perfluorooctanoic acid	**2.4J**	ng/L	4.3	0.91	1	08/11/23 09:11	08/15/23 13:13	335-67-1	
Perfluorotetradecanoic acid	**<1.2**	ng/L	4.3	1.2	1	08/11/23 09:11	08/15/23 13:13	376-06-7	2q
Perfluorotridecanoic acid	**<1.3**	ng/L	4.3	1.3	1	08/11/23 09:11	08/15/23 13:13	72629-94-8	2q
Perfluoroundecanoic acid	**<1.3**	ng/L	4.3	1.3	1	08/11/23 09:11	08/15/23 13:13	2058-94-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 6142 OHM ELM GROVE
Pace Project No.: 40265982

Sample: 6142-FB **Lab ID: 40265982002** Collected: 07/31/23 14:10 Received: 08/01/23 09:00 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
PFAS in Water-EPA 537 Mod	Analytical Method: EPA 537 Mod Preparation Method: EPA 537 Mod Pace Analytical Services - Baton Rouge								
11Cl-PF3OUdS	**<0.42**	ng/L	1.9	0.42	1	08/11/23 09:11	08/15/23 13:29	763051-92-9	
4:2 FTS	**<0.58**	ng/L	1.9	0.58	1	08/11/23 09:11	08/15/23 13:29	757124-72-4	
6:2 FTS	**<0.70**	ng/L	1.9	0.70	1	08/11/23 09:11	08/15/23 13:29	27619-97-2	
8:2 FTS	**<0.50**	ng/L	1.9	0.50	1	08/11/23 09:11	08/15/23 13:29	39108-34-4	
9Cl-PF3ONS	**<0.42**	ng/L	1.9	0.42	1	08/11/23 09:11	08/15/23 13:29	756426-58-1	
ADONA	**<0.40**	ng/L	1.9	0.40	1	08/11/23 09:11	08/15/23 13:29	919005-14-4	
HFPO-DA	**<3.1**	ng/L	9.3	3.1	1	08/11/23 09:11	08/15/23 13:29	13252-13-6	
NEtFOSAA	**<0.74**	ng/L	3.7	0.74	1	08/11/23 09:11	08/15/23 13:29	2991-50-6	
NEtFOSA	**<0.65**	ng/L	3.7	0.65	1	08/11/23 09:11	08/15/23 13:29	4151-50-2	L1
NEtFOSE	**<0.47**	ng/L	3.7	0.47	1	08/11/23 09:11	08/15/23 13:29	1691-99-2	N2
NMeFOSAA	**<0.42**	ng/L	3.7	0.42	1	08/11/23 09:11	08/15/23 13:29	2355-31-9	
NMeFOSA	**<0.78**	ng/L	3.7	0.78	1	08/11/23 09:11	08/15/23 13:29	31506-32-8	L1
NMeFOSE	**<0.61**	ng/L	3.7	0.61	1	08/11/23 09:11	08/15/23 13:29	24448-09-7	L1,N2
Perfluorobutanesulfonic acid	**<0.29**	ng/L	1.9	0.29	1	08/11/23 09:11	08/15/23 13:29	375-73-5	
Perfluorodecanoic acid	**<0.67**	ng/L	1.9	0.67	1	08/11/23 09:11	08/15/23 13:29	335-76-2	
Perfluorohexanoic acid	**<0.44**	ng/L	1.9	0.44	1	08/11/23 09:11	08/15/23 13:29	307-24-4	
PFBA	**<0.71**	ng/L	1.9	0.71	1	08/11/23 09:11	08/15/23 13:29	375-22-4	
PFDS	**<0.57**	ng/L	1.9	0.57	1	08/11/23 09:11	08/15/23 13:29	335-77-3	
PFDoS	**<0.61**	ng/L	1.9	0.61	1	08/11/23 09:11	08/15/23 13:29	79780-39-5	
PFHpS	**<0.57**	ng/L	1.9	0.57	1	08/11/23 09:11	08/15/23 13:29	375-92-8	
PFNS	**<0.81**	ng/L	1.9	0.81	1	08/11/23 09:11	08/15/23 13:29	68259-12-1	
PFOSA	**<0.35**	ng/L	1.9	0.35	1	08/11/23 09:11	08/15/23 13:29	754-91-6	
PFPeA	**<0.41**	ng/L	1.9	0.41	1	08/11/23 09:11	08/15/23 13:29	2706-90-3	
PFPeS	**<0.48**	ng/L	1.9	0.48	1	08/11/23 09:11	08/15/23 13:29	2706-91-4	
Perfluorododecanoic acid	**<0.61**	ng/L	1.9	0.61	1	08/11/23 09:11	08/15/23 13:29	307-55-1	
Perfluoroheptanoic acid	**<0.54**	ng/L	1.9	0.54	1	08/11/23 09:11	08/15/23 13:29	375-85-9	
Perfluorohexanesulfonic acid	**<0.58**	ng/L	1.9	0.58	1	08/11/23 09:11	08/15/23 13:29	355-46-4	
Perfluorononanoic acid	**<0.46**	ng/L	1.9	0.46	1	08/11/23 09:11	08/15/23 13:29	375-95-1	
Perfluorooctanesulfonic acid	**<0.36**	ng/L	1.9	0.36	1	08/11/23 09:11	08/15/23 13:29	1763-23-1	
Perfluorooctanoic acid	**<0.39**	ng/L	1.9	0.39	1	08/11/23 09:11	08/15/23 13:29	335-67-1	
Perfluorotetradecanoic acid	**<0.53**	ng/L	1.9	0.53	1	08/11/23 09:11	08/15/23 13:29	376-06-7	
Perfluorotridecanoic acid	**<0.57**	ng/L	1.9	0.57	1	08/11/23 09:11	08/15/23 13:29	72629-94-8	
Perfluoroundecanoic acid	**<0.58**	ng/L	1.9	0.58	1	08/11/23 09:11	08/15/23 13:29	2058-94-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 6142 OHM ELM GROVE
Pace Project No.: 40265982

Sample: 6142-MW4 **Lab ID: 40265982003** Collected: 07/31/23 15:15 Received: 08/01/23 09:00 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
PFAS in Water-EPA 537 Mod	Analytical Method: EPA 537 Mod Preparation Method: EPA 537 Mod Pace Analytical Services - Baton Rouge								
11Cl-PF3OUdS	**<0.44**	ng/L	2.0	0.44	1	08/11/23 09:11	08/15/23 13:44	763051-92-9	
4:2 FTS	**<0.61**	ng/L	2.0	0.61	1	08/11/23 09:11	08/15/23 13:44	757124-72-4	
6:2 FTS	**<0.74**	ng/L	2.0	0.74	1	08/11/23 09:11	08/15/23 13:44	27619-97-2	
8:2 FTS	**<0.52**	ng/L	2.0	0.52	1	08/11/23 09:11	08/15/23 13:44	39108-34-4	
9Cl-PF3ONS	**<0.44**	ng/L	2.0	0.44	1	08/11/23 09:11	08/15/23 13:44	756426-58-1	
ADONA	**<0.42**	ng/L	2.0	0.42	1	08/11/23 09:11	08/15/23 13:44	919005-14-4	
HFPO-DA	**<3.3**	ng/L	9.8	3.3	1	08/11/23 09:11	08/15/23 13:44	13252-13-6	
NEtFOSAA	**<0.77**	ng/L	3.9	0.77	1	08/11/23 09:11	08/15/23 13:44	2991-50-6	
NEtFOSA	**<0.69**	ng/L	3.9	0.69	1	08/11/23 09:11	08/15/23 13:44	4151-50-2	2q,L1
NEtFOSE	**<0.50**	ng/L	3.9	0.50	1	08/11/23 09:11	08/15/23 13:44	1691-99-2	2q,N2
NMeFOSAA	**<0.44**	ng/L	3.9	0.44	1	08/11/23 09:11	08/15/23 13:44	2355-31-9	
NMeFOSA	**<0.81**	ng/L	3.9	0.81	1	08/11/23 09:11	08/15/23 13:44	31506-32-8	2q,L1
NMeFOSE	**<0.64**	ng/L	3.9	0.64	1	08/11/23 09:11	08/15/23 13:44	24448-09-7	L1,N2
Perfluorobutanesulfonic acid	**2.5**	ng/L	2.0	0.30	1	08/11/23 09:11	08/15/23 13:44	375-73-5	
Perfluorodecanoic acid	**<0.71**	ng/L	2.0	0.71	1	08/11/23 09:11	08/15/23 13:44	335-76-2	
Perfluorohexanoic acid	**5.2**	ng/L	2.0	0.46	1	08/11/23 09:11	08/15/23 13:44	307-24-4	
PFBA	**7.7**	ng/L	2.0	0.75	1	08/11/23 09:11	08/15/23 13:44	375-22-4	
PFDS	**<0.60**	ng/L	2.0	0.60	1	08/11/23 09:11	08/15/23 13:44	335-77-3	
PFDoS	**<0.64**	ng/L	2.0	0.64	1	08/11/23 09:11	08/15/23 13:44	79780-39-5	
PFHpS	**<0.60**	ng/L	2.0	0.60	1	08/11/23 09:11	08/15/23 13:44	375-92-8	
PFNS	**<0.85**	ng/L	2.0	0.85	1	08/11/23 09:11	08/15/23 13:44	68259-12-1	
PFOSA	**<0.36**	ng/L	2.0	0.36	1	08/11/23 09:11	08/15/23 13:44	754-91-6	
PFPeA	**9.9**	ng/L	2.0	0.43	1	08/11/23 09:11	08/15/23 13:44	2706-90-3	
PFPeS	**<0.50**	ng/L	2.0	0.50	1	08/11/23 09:11	08/15/23 13:44	2706-91-4	
Perfluorododecanoic acid	**<0.64**	ng/L	2.0	0.64	1	08/11/23 09:11	08/15/23 13:44	307-55-1	
Perfluoroheptanoic acid	**1.7J**	ng/L	2.0	0.57	1	08/11/23 09:11	08/15/23 13:44	375-85-9	
Perfluorohexanesulfonic acid	**0.66J**	ng/L	2.0	0.61	1	08/11/23 09:11	08/15/23 13:44	355-46-4	
Perfluorononanoic acid	**<0.48**	ng/L	2.0	0.48	1	08/11/23 09:11	08/15/23 13:44	375-95-1	
Perfluorooctanesulfonic acid	**0.73J**	ng/L	2.0	0.37	1	08/11/23 09:11	08/15/23 13:44	1763-23-1	B
Perfluorooctanoic acid	**1.1J**	ng/L	2.0	0.41	1	08/11/23 09:11	08/15/23 13:44	335-67-1	
Perfluorotetradecanoic acid	**<0.56**	ng/L	2.0	0.56	1	08/11/23 09:11	08/15/23 13:44	376-06-7	2q
Perfluorotridecanoic acid	**<0.60**	ng/L	2.0	0.60	1	08/11/23 09:11	08/15/23 13:44	72629-94-8	
Perfluoroundecanoic acid	**<0.61**	ng/L	2.0	0.61	1	08/11/23 09:11	08/15/23 13:44	2058-94-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 6142 OHM ELM GROVE
Pace Project No.: 40265982

Sample: 6142-MW7 **Lab ID: 40265982004** Collected: 07/31/23 15:35 Received: 08/01/23 09:00 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
PFAS in Water-EPA 537 Mod	Analytical Method: EPA 537 Mod Preparation Method: EPA 537 Mod Pace Analytical Services - Baton Rouge								
11Cl-PF3OUdS	**<0.43**	ng/L	1.9	0.43	1	08/11/23 09:11	08/15/23 13:59	763051-92-9	
4:2 FTS	**<0.60**	ng/L	1.9	0.60	1	08/11/23 09:11	08/15/23 13:59	757124-72-4	1q
6:2 FTS	**<0.72**	ng/L	1.9	0.72	1	08/11/23 09:11	08/15/23 13:59	27619-97-2	
8:2 FTS	**<0.51**	ng/L	1.9	0.51	1	08/11/23 09:11	08/15/23 13:59	39108-34-4	
9Cl-PF3ONS	**<0.43**	ng/L	1.9	0.43	1	08/11/23 09:11	08/15/23 13:59	756426-58-1	
ADONA	**<0.41**	ng/L	1.9	0.41	1	08/11/23 09:11	08/15/23 13:59	919005-14-4	
HFPO-DA	**<3.2**	ng/L	9.6	3.2	1	08/11/23 09:11	08/15/23 13:59	13252-13-6	
NEtFOSAA	**<0.76**	ng/L	3.8	0.76	1	08/11/23 09:11	08/15/23 13:59	2991-50-6	
NEtFOSA	**<0.67**	ng/L	3.8	0.67	1	08/11/23 09:11	08/15/23 13:59	4151-50-2	2q,L1
NEtFOSE	**<0.49**	ng/L	3.8	0.49	1	08/11/23 09:11	08/15/23 13:59	1691-99-2	2q,N2
NMeFOSAA	**<0.43**	ng/L	3.8	0.43	1	08/11/23 09:11	08/15/23 13:59	2355-31-9	
NMeFOSA	**<0.80**	ng/L	3.8	0.80	1	08/11/23 09:11	08/15/23 13:59	31506-32-8	2q,L1
NMeFOSE	**<0.63**	ng/L	3.8	0.63	1	08/11/23 09:11	08/15/23 13:59	24448-09-7	2q,L1, N2
Perfluorobutanesulfonic acid	**2.2**	ng/L	1.9	0.30	1	08/11/23 09:11	08/15/23 13:59	375-73-5	
Perfluorodecanoic acid	**<0.69**	ng/L	1.9	0.69	1	08/11/23 09:11	08/15/23 13:59	335-76-2	
Perfluorohexanoic acid	**2.1**	ng/L	1.9	0.45	1	08/11/23 09:11	08/15/23 13:59	307-24-4	
PFBA	**4.3**	ng/L	1.9	0.73	1	08/11/23 09:11	08/15/23 13:59	375-22-4	
PFDS	**<0.59**	ng/L	1.9	0.59	1	08/11/23 09:11	08/15/23 13:59	335-77-3	
PFDoS	**<0.63**	ng/L	1.9	0.63	1	08/11/23 09:11	08/15/23 13:59	79780-39-5	
PFHpS	**<0.59**	ng/L	1.9	0.59	1	08/11/23 09:11	08/15/23 13:59	375-92-8	
PFNS	**<0.84**	ng/L	1.9	0.84	1	08/11/23 09:11	08/15/23 13:59	68259-12-1	
PFOSA	**0.58J**	ng/L	1.9	0.36	1	08/11/23 09:11	08/15/23 13:59	754-91-6	2q
PFPeA	**4.2**	ng/L	1.9	0.42	1	08/11/23 09:11	08/15/23 13:59	2706-90-3	
PFPeS	**<0.49**	ng/L	1.9	0.49	1	08/11/23 09:11	08/15/23 13:59	2706-91-4	
Perfluorododecanoic acid	**<0.63**	ng/L	1.9	0.63	1	08/11/23 09:11	08/15/23 13:59	307-55-1	2q
Perfluoroheptanoic acid	**1.0J**	ng/L	1.9	0.56	1	08/11/23 09:11	08/15/23 13:59	375-85-9	
Perfluorohexanesulfonic acid	**<0.60**	ng/L	1.9	0.60	1	08/11/23 09:11	08/15/23 13:59	355-46-4	
Perfluorononanoic acid	**<0.47**	ng/L	1.9	0.47	1	08/11/23 09:11	08/15/23 13:59	375-95-1	
Perfluorooctanesulfonic acid	**0.92J**	ng/L	1.9	0.37	1	08/11/23 09:11	08/15/23 13:59	1763-23-1	B
Perfluorooctanoic acid	**0.63J**	ng/L	1.9	0.40	1	08/11/23 09:11	08/15/23 13:59	335-67-1	
Perfluorotetradecanoic acid	**<0.55**	ng/L	1.9	0.55	1	08/11/23 09:11	08/15/23 13:59	376-06-7	2q
Perfluorotridecanoic acid	**<0.59**	ng/L	1.9	0.59	1	08/11/23 09:11	08/15/23 13:59	72629-94-8	2q
Perfluoroundecanoic acid	**<0.60**	ng/L	1.9	0.60	1	08/11/23 09:11	08/15/23 13:59	2058-94-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 6142 OHM ELM GROVE
Pace Project No.: 40265982

Sample: 6142-DUP **Lab ID: 40265982005** Collected: 07/31/23 00:00 Received: 08/01/23 09:00 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
PFAS in Water-EPA 537 Mod	Analytical Method: EPA 537 Mod Preparation Method: EPA 537 Mod Pace Analytical Services - Baton Rouge								
11Cl-PF3OUdS	**<0.44**	ng/L	2.0	0.44	1	08/11/23 09:11	08/15/23 14:15	763051-92-9	
4:2 FTS	**<0.61**	ng/L	2.0	0.61	1	08/11/23 09:11	08/15/23 14:15	757124-72-4	1q
6:2 FTS	**<0.74**	ng/L	2.0	0.74	1	08/11/23 09:11	08/15/23 14:15	27619-97-2	
8:2 FTS	**<0.52**	ng/L	2.0	0.52	1	08/11/23 09:11	08/15/23 14:15	39108-34-4	
9Cl-PF3ONS	**<0.44**	ng/L	2.0	0.44	1	08/11/23 09:11	08/15/23 14:15	756426-58-1	
ADONA	**<0.42**	ng/L	2.0	0.42	1	08/11/23 09:11	08/15/23 14:15	919005-14-4	
HFPO-DA	**<3.3**	ng/L	9.8	3.3	1	08/11/23 09:11	08/15/23 14:15	13252-13-6	
NEtFOSAA	**<0.78**	ng/L	3.9	0.78	1	08/11/23 09:11	08/15/23 14:15	2991-50-6	
NEtFOSA	**<0.69**	ng/L	3.9	0.69	1	08/11/23 09:11	08/15/23 14:15	4151-50-2	2q,L1
NEtFOSE	**<0.50**	ng/L	3.9	0.50	1	08/11/23 09:11	08/15/23 14:15	1691-99-2	2q,N2
NMeFOSAA	**<0.44**	ng/L	3.9	0.44	1	08/11/23 09:11	08/15/23 14:15	2355-31-9	
NMeFOSA	**<0.82**	ng/L	3.9	0.82	1	08/11/23 09:11	08/15/23 14:15	31506-32-8	2q,L1
NMeFOSE	**<0.64**	ng/L	3.9	0.64	1	08/11/23 09:11	08/15/23 14:15	24448-09-7	2q,L1, N2
Perfluorobutanesulfonic acid	**2.5**	ng/L	2.0	0.30	1	08/11/23 09:11	08/15/23 14:15	375-73-5	
Perfluorodecanoic acid	**<0.71**	ng/L	2.0	0.71	1	08/11/23 09:11	08/15/23 14:15	335-76-2	
Perfluorohexanoic acid	**2.0**	ng/L	2.0	0.46	1	08/11/23 09:11	08/15/23 14:15	307-24-4	
PFBA	**4.3**	ng/L	2.0	0.75	1	08/11/23 09:11	08/15/23 14:15	375-22-4	
PFDS	**<0.60**	ng/L	2.0	0.60	1	08/11/23 09:11	08/15/23 14:15	335-77-3	
PFDoS	**<0.64**	ng/L	2.0	0.64	1	08/11/23 09:11	08/15/23 14:15	79780-39-5	
PFHpS	**<0.60**	ng/L	2.0	0.60	1	08/11/23 09:11	08/15/23 14:15	375-92-8	
PFNS	**<0.86**	ng/L	2.0	0.86	1	08/11/23 09:11	08/15/23 14:15	68259-12-1	
PFOSA	**<0.36**	ng/L	2.0	0.36	1	08/11/23 09:11	08/15/23 14:15	754-91-6	2q
PFPeA	**4.2**	ng/L	2.0	0.43	1	08/11/23 09:11	08/15/23 14:15	2706-90-3	
PFPeS	**<0.50**	ng/L	2.0	0.50	1	08/11/23 09:11	08/15/23 14:15	2706-91-4	
Perfluorododecanoic acid	**<0.64**	ng/L	2.0	0.64	1	08/11/23 09:11	08/15/23 14:15	307-55-1	2q
Perfluoroheptanoic acid	**1.0J**	ng/L	2.0	0.57	1	08/11/23 09:11	08/15/23 14:15	375-85-9	
Perfluorohexanesulfonic acid	**<0.61**	ng/L	2.0	0.61	1	08/11/23 09:11	08/15/23 14:15	355-46-4	
Perfluorononanoic acid	**<0.48**	ng/L	2.0	0.48	1	08/11/23 09:11	08/15/23 14:15	375-95-1	
Perfluorooctanesulfonic acid	**0.65J**	ng/L	2.0	0.37	1	08/11/23 09:11	08/15/23 14:15	1763-23-1	B
Perfluorooctanoic acid	**0.54J**	ng/L	2.0	0.41	1	08/11/23 09:11	08/15/23 14:15	335-67-1	
Perfluorotetradecanoic acid	**<0.56**	ng/L	2.0	0.56	1	08/11/23 09:11	08/15/23 14:15	376-06-7	2q
Perfluorotridecanoic acid	**<0.60**	ng/L	2.0	0.60	1	08/11/23 09:11	08/15/23 14:15	72629-94-8	2q
Perfluoroundecanoic acid	**<0.61**	ng/L	2.0	0.61	1	08/11/23 09:11	08/15/23 14:15	2058-94-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: 6142 OHM ELM GROVE
Pace Project No.: 40265982

Sample: 6142-IDM-1 **Lab ID: 40265982006** Collected: 07/31/23 15:45 Received: 08/01/23 09:00 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260 Pace Analytical Services - Green Bay								
Benzene	**<0.30**	ug/L	1.0	0.30	1		08/02/23 20:26	71-43-2	
Bromobenzene	**<0.36**	ug/L	1.0	0.36	1		08/02/23 20:26	108-86-1	
Bromochloromethane	**<0.36**	ug/L	1.0	0.36	1		08/02/23 20:26	74-97-5	
Bromodichloromethane	**<0.42**	ug/L	1.0	0.42	1		08/02/23 20:26	75-27-4	
Bromoform	**<0.43**	ug/L	1.0	0.43	1		08/02/23 20:26	75-25-2	
Bromomethane	**<1.2**	ug/L	5.0	1.2	1		08/02/23 20:26	74-83-9	
n-Butylbenzene	**<0.86**	ug/L	1.0	0.86	1		08/02/23 20:26	104-51-8	
sec-Butylbenzene	**<0.42**	ug/L	1.0	0.42	1		08/02/23 20:26	135-98-8	
tert-Butylbenzene	**<0.59**	ug/L	1.0	0.59	1		08/02/23 20:26	98-06-6	
Carbon tetrachloride	**<0.37**	ug/L	1.0	0.37	1		08/02/23 20:26	56-23-5	
Chlorobenzene	**<0.86**	ug/L	1.0	0.86	1		08/02/23 20:26	108-90-7	
Chloroethane	**<1.4**	ug/L	5.0	1.4	1		08/02/23 20:26	75-00-3	
Chloroform	**<0.50**	ug/L	5.0	0.50	1		08/02/23 20:26	67-66-3	
Chloromethane	**<1.6**	ug/L	5.0	1.6	1		08/02/23 20:26	74-87-3	
2-Chlorotoluene	**<0.89**	ug/L	5.0	0.89	1		08/02/23 20:26	95-49-8	
4-Chlorotoluene	**<0.89**	ug/L	5.0	0.89	1		08/02/23 20:26	106-43-4	
1,2-Dibromo-3-chloropropane	**<2.4**	ug/L	5.0	2.4	1		08/02/23 20:26	96-12-8	
Dibromochloromethane	**<2.6**	ug/L	5.0	2.6	1		08/02/23 20:26	124-48-1	
1,2-Dibromoethane (EDB)	**<0.31**	ug/L	1.0	0.31	1		08/02/23 20:26	106-93-4	
Dibromomethane	**<0.99**	ug/L	5.0	0.99	1		08/02/23 20:26	74-95-3	
1,2-Dichlorobenzene	**<0.33**	ug/L	1.0	0.33	1		08/02/23 20:26	95-50-1	
1,3-Dichlorobenzene	**<0.35**	ug/L	1.0	0.35	1		08/02/23 20:26	541-73-1	
1,4-Dichlorobenzene	**<0.89**	ug/L	1.0	0.89	1		08/02/23 20:26	106-46-7	
Dichlorodifluoromethane	**<0.46**	ug/L	5.0	0.46	1		08/02/23 20:26	75-71-8	
1,1-Dichloroethane	**<0.30**	ug/L	1.0	0.30	1		08/02/23 20:26	75-34-3	
1,2-Dichloroethane	**<0.29**	ug/L	1.0	0.29	1		08/02/23 20:26	107-06-2	
1,1-Dichloroethene	**<0.58**	ug/L	1.0	0.58	1		08/02/23 20:26	75-35-4	
cis-1,2-Dichloroethene	**74.9**	ug/L	1.0	0.47	1		08/02/23 20:26	156-59-2	
trans-1,2-Dichloroethene	**2.2**	ug/L	1.0	0.53	1		08/02/23 20:26	156-60-5	
1,2-Dichloropropane	**<0.45**	ug/L	1.0	0.45	1		08/02/23 20:26	78-87-5	
1,3-Dichloropropane	**<0.30**	ug/L	1.0	0.30	1		08/02/23 20:26	142-28-9	
2,2-Dichloropropane	**<0.42**	ug/L	1.0	0.42	1		08/02/23 20:26	594-20-7	
1,1-Dichloropropene	**<0.41**	ug/L	1.0	0.41	1		08/02/23 20:26	563-58-6	
cis-1,3-Dichloropropene	**<0.24**	ug/L	1.0	0.24	1		08/02/23 20:26	10061-01-5	
trans-1,3-Dichloropropene	**<0.27**	ug/L	1.0	0.27	1		08/02/23 20:26	10061-02-6	
Diisopropyl ether	**<1.1**	ug/L	5.0	1.1	1		08/02/23 20:26	108-20-3	
Ethylbenzene	**<0.33**	ug/L	1.0	0.33	1		08/02/23 20:26	100-41-4	
Hexachloro-1,3-butadiene	**<2.7**	ug/L	5.0	2.7	1		08/02/23 20:26	87-68-3	
Isopropylbenzene (Cumene)	**<1.0**	ug/L	5.0	1.0	1		08/02/23 20:26	98-82-8	
p-Isopropyltoluene	**<1.0**	ug/L	5.0	1.0	1		08/02/23 20:26	99-87-6	
Methylene Chloride	**<0.32**	ug/L	5.0	0.32	1		08/02/23 20:26	75-09-2	
Methyl-tert-butyl ether	**<1.1**	ug/L	5.0	1.1	1		08/02/23 20:26	1634-04-4	
Naphthalene	**<1.9**	ug/L	5.0	1.9	1		08/02/23 20:26	91-20-3	
n-Propylbenzene	**<0.35**	ug/L	1.0	0.35	1		08/02/23 20:26	103-65-1	
Styrene	**<0.36**	ug/L	1.0	0.36	1		08/02/23 20:26	100-42-5	L1

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 6142 OHM ELM GROVE
Pace Project No.: 40265982

Sample: 6142-IDM-1 **Lab ID: 40265982006** Collected: 07/31/23 15:45 Received: 08/01/23 09:00 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
	Pace Analytical Services - Green Bay								
1,1,1,2-Tetrachloroethane	**<0.36**	ug/L	1.0	0.36	1		08/02/23 20:26	630-20-6	
1,1,2,2-Tetrachloroethane	**<0.38**	ug/L	1.0	0.38	1		08/02/23 20:26	79-34-5	
Tetrachloroethene	**0.98J**	ug/L	1.0	0.41	1		08/02/23 20:26	127-18-4	
Toluene	**<0.29**	ug/L	1.0	0.29	1		08/02/23 20:26	108-88-3	
1,2,3-Trichlorobenzene	**<1.0**	ug/L	5.0	1.0	1		08/02/23 20:26	87-61-6	
1,2,4-Trichlorobenzene	**<0.95**	ug/L	5.0	0.95	1		08/02/23 20:26	120-82-1	
1,1,1-Trichloroethane	**<0.30**	ug/L	1.0	0.30	1		08/02/23 20:26	71-55-6	
1,1,2-Trichloroethane	**<0.34**	ug/L	1.0	0.34	1		08/02/23 20:26	79-00-5	
Trichloroethene	**1.2**	ug/L	1.0	0.32	1		08/02/23 20:26	79-01-6	
Trichlorofluoromethane	**<0.42**	ug/L	1.0	0.42	1		08/02/23 20:26	75-69-4	
1,2,3-Trichloropropane	**<0.56**	ug/L	1.0	0.56	1		08/02/23 20:26	96-18-4	
1,2,4-Trimethylbenzene	**<0.45**	ug/L	1.0	0.45	1		08/02/23 20:26	95-63-6	
1,3,5-Trimethylbenzene	**<0.36**	ug/L	1.0	0.36	1		08/02/23 20:26	108-67-8	
Vinyl chloride	**18.0**	ug/L	1.0	0.17	1		08/02/23 20:26	75-01-4	
m&p-Xylene	**<0.70**	ug/L	2.0	0.70	1		08/02/23 20:26	179601-23-1	
o-Xylene	**<0.35**	ug/L	1.0	0.35	1		08/02/23 20:26	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	101	%	70-130		1		08/02/23 20:26	460-00-4	
1,2-Dichlorobenzene-d4 (S)	100	%	70-130		1		08/02/23 20:26	2199-69-1	
Toluene-d8 (S)	103	%	70-130		1		08/02/23 20:26	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 6142 OHM ELM GROVE
Pace Project No.: 40265982

QC Batch: 451259
QC Batch Method: EPA 8260
Analysis Method: EPA 8260
Analysis Description: 8260 MSV
Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40265982006

METHOD BLANK: 2592677 Matrix: Water
Associated Lab Samples: 40265982006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.36	1.0	08/02/23 14:13	
1,1,1-Trichloroethane	ug/L	<0.30	1.0	08/02/23 14:13	
1,1,2,2-Tetrachloroethane	ug/L	<0.38	1.0	08/02/23 14:13	
1,1,2-Trichloroethane	ug/L	<0.34	1.0	08/02/23 14:13	
1,1-Dichloroethane	ug/L	<0.30	1.0	08/02/23 14:13	
1,1-Dichloroethene	ug/L	<0.58	1.0	08/02/23 14:13	
1,1-Dichloropropene	ug/L	<0.41	1.0	08/02/23 14:13	
1,2,3-Trichlorobenzene	ug/L	<1.0	5.0	08/02/23 14:13	
1,2,3-Trichloropropane	ug/L	<0.56	1.0	08/02/23 14:13	
1,2,4-Trichlorobenzene	ug/L	<0.95	5.0	08/02/23 14:13	
1,2,4-Trimethylbenzene	ug/L	<0.45	1.0	08/02/23 14:13	
1,2-Dibromo-3-chloropropane	ug/L	<2.4	5.0	08/02/23 14:13	
1,2-Dibromoethane (EDB)	ug/L	<0.31	1.0	08/02/23 14:13	
1,2-Dichlorobenzene	ug/L	<0.33	1.0	08/02/23 14:13	
1,2-Dichloroethane	ug/L	<0.29	1.0	08/02/23 14:13	
1,2-Dichloropropane	ug/L	<0.45	1.0	08/02/23 14:13	
1,3,5-Trimethylbenzene	ug/L	<0.36	1.0	08/02/23 14:13	
1,3-Dichlorobenzene	ug/L	<0.35	1.0	08/02/23 14:13	
1,3-Dichloropropane	ug/L	<0.30	1.0	08/02/23 14:13	
1,4-Dichlorobenzene	ug/L	<0.89	1.0	08/02/23 14:13	
2,2-Dichloropropane	ug/L	<0.42	1.0	08/02/23 14:13	
2-Chlorotoluene	ug/L	<0.89	5.0	08/02/23 14:13	
4-Chlorotoluene	ug/L	<0.89	5.0	08/02/23 14:13	
Benzene	ug/L	<0.30	1.0	08/02/23 14:13	
Bromobenzene	ug/L	<0.36	1.0	08/02/23 14:13	
Bromochloromethane	ug/L	<0.36	1.0	08/02/23 14:13	
Bromodichloromethane	ug/L	<0.42	1.0	08/02/23 14:13	
Bromoform	ug/L	<0.43	1.0	08/02/23 14:13	
Bromomethane	ug/L	<1.2	5.0	08/02/23 14:13	
Carbon tetrachloride	ug/L	<0.37	1.0	08/02/23 14:13	
Chlorobenzene	ug/L	<0.86	1.0	08/02/23 14:13	
Chloroethane	ug/L	<1.4	5.0	08/02/23 14:13	
Chloroform	ug/L	<0.50	5.0	08/02/23 14:13	
Chloromethane	ug/L	<1.6	5.0	08/02/23 14:13	
cis-1,2-Dichloroethene	ug/L	<0.47	1.0	08/02/23 14:13	
cis-1,3-Dichloropropene	ug/L	<0.24	1.0	08/02/23 14:13	
Dibromochloromethane	ug/L	<2.6	5.0	08/02/23 14:13	
Dibromomethane	ug/L	<0.99	5.0	08/02/23 14:13	
Dichlorodifluoromethane	ug/L	<0.46	5.0	08/02/23 14:13	
Diisopropyl ether	ug/L	<1.1	5.0	08/02/23 14:13	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 6142 OHM ELM GROVE
Pace Project No.: 40265982

METHOD BLANK: 2592677 Matrix: Water
Associated Lab Samples: 40265982006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Ethylbenzene	ug/L	<0.33	1.0	08/02/23 14:13	
Hexachloro-1,3-butadiene	ug/L	<2.7	5.0	08/02/23 14:13	
Isopropylbenzene (Cumene)	ug/L	<1.0	5.0	08/02/23 14:13	
m&p-Xylene	ug/L	<0.70	2.0	08/02/23 14:13	
Methyl-tert-butyl ether	ug/L	<1.1	5.0	08/02/23 14:13	
Methylene Chloride	ug/L	<0.32	5.0	08/02/23 14:13	
n-Butylbenzene	ug/L	<0.86	1.0	08/02/23 14:13	
n-Propylbenzene	ug/L	<0.35	1.0	08/02/23 14:13	
Naphthalene	ug/L	<1.9	5.0	08/02/23 14:13	
o-Xylene	ug/L	<0.35	1.0	08/02/23 14:13	
p-Isopropyltoluene	ug/L	<1.0	5.0	08/02/23 14:13	
sec-Butylbenzene	ug/L	<0.42	1.0	08/02/23 14:13	
Styrene	ug/L	<0.36	1.0	08/02/23 14:13	
tert-Butylbenzene	ug/L	<0.59	1.0	08/02/23 14:13	
Tetrachloroethene	ug/L	<0.41	1.0	08/02/23 14:13	
Toluene	ug/L	<0.29	1.0	08/02/23 14:13	
trans-1,2-Dichloroethene	ug/L	<0.53	1.0	08/02/23 14:13	
trans-1,3-Dichloropropene	ug/L	<0.27	1.0	08/02/23 14:13	
Trichloroethene	ug/L	<0.32	1.0	08/02/23 14:13	
Trichlorofluoromethane	ug/L	<0.42	1.0	08/02/23 14:13	
Vinyl chloride	ug/L	<0.17	1.0	08/02/23 14:13	
1,2-Dichlorobenzene-d4 (S)	%	99	70-130	08/02/23 14:13	
4-Bromofluorobenzene (S)	%	103	70-130	08/02/23 14:13	
Toluene-d8 (S)	%	105	70-130	08/02/23 14:13	

LABORATORY CONTROL SAMPLE: 2592678

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/L	50	50.6	101	70-134	
1,1,2,2-Tetrachloroethane	ug/L	50	54.1	108	69-130	
1,1,2-Trichloroethane	ug/L	50	53.4	107	70-130	
1,1-Dichloroethane	ug/L	50	53.2	106	70-130	
1,1-Dichloroethene	ug/L	50	52.6	105	74-131	
1,2,4-Trichlorobenzene	ug/L	50	46.9	94	68-130	
1,2-Dibromo-3-chloropropane	ug/L	50	44.9	90	64-137	
1,2-Dibromoethane (EDB)	ug/L	50	50.2	100	70-130	
1,2-Dichlorobenzene	ug/L	50	51.0	102	70-130	
1,2-Dichloroethane	ug/L	50	50.0	100	70-137	
1,2-Dichloropropane	ug/L	50	51.7	103	80-121	
1,3-Dichlorobenzene	ug/L	50	52.4	105	70-130	
1,4-Dichlorobenzene	ug/L	50	50.3	101	70-130	
Benzene	ug/L	50	52.2	104	70-130	
Bromodichloromethane	ug/L	50	52.2	104	70-130	
Bromoform	ug/L	50	43.8	88	70-130	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 6142 OHM ELM GROVE
Pace Project No.: 40265982

LABORATORY CONTROL SAMPLE: 2592678

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Bromomethane	ug/L	50	44.4	89	21-147	
Carbon tetrachloride	ug/L	50	44.0	88	80-146	
Chlorobenzene	ug/L	50	52.9	106	70-130	
Chloroethane	ug/L	50	45.6	91	52-165	
Chloroform	ug/L	50	51.7	103	80-123	
Chloromethane	ug/L	50	41.7	83	51-122	
cis-1,2-Dichloroethene	ug/L	50	51.4	103	70-130	
cis-1,3-Dichloropropene	ug/L	50	53.0	106	70-130	
Dibromochloromethane	ug/L	50	44.5	89	70-130	
Dichlorodifluoromethane	ug/L	50	26.8	54	25-121	
Ethylbenzene	ug/L	50	56.1	112	80-120	
Isopropylbenzene (Cumene)	ug/L	50	54.5	109	70-130	
m&p-Xylene	ug/L	100	111	111	70-130	
Methyl-tert-butyl ether	ug/L	50	49.6	99	70-130	
Methylene Chloride	ug/L	50	39.0	78	70-130	
o-Xylene	ug/L	50	55.2	110	70-130	
Styrene	ug/L	50	65.7	131	70-130	L1
Tetrachloroethene	ug/L	50	48.5	97	70-130	
Toluene	ug/L	50	53.8	108	80-120	
trans-1,2-Dichloroethene	ug/L	50	52.8	106	70-130	
trans-1,3-Dichloropropene	ug/L	50	55.6	111	70-130	
Trichloroethene	ug/L	50	51.5	103	70-130	
Trichlorofluoromethane	ug/L	50	50.0	100	65-160	
Vinyl chloride	ug/L	50	42.9	86	63-134	
1,2-Dichlorobenzene-d4 (S)	%			98	70-130	
4-Bromofluorobenzene (S)	%			101	70-130	
Toluene-d8 (S)	%			104	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2592999 2593000

Parameter	Units	40265817012 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,1,1-Trichloroethane	ug/L	<0.30	50	50	52.7	52.2	105	104	70-134	1	20	
1,1,2,2-Tetrachloroethane	ug/L	<0.38	50	50	56.2	57.6	112	115	61-135	2	20	
1,1,2-Trichloroethane	ug/L	<0.34	50	50	56.4	53.2	113	106	70-130	6	20	
1,1-Dichloroethane	ug/L	<0.30	50	50	54.5	51.7	109	103	70-130	5	20	
1,1-Dichloroethene	ug/L	<0.58	50	50	55.4	53.8	111	108	71-130	3	20	
1,2,4-Trichlorobenzene	ug/L	<0.95	50	50	46.9	47.9	94	96	68-131	2	20	
1,2-Dibromo-3-chloropropane	ug/L	<2.4	50	50	47.1	48.7	94	97	51-141	3	20	
1,2-Dibromoethane (EDB)	ug/L	<0.31	50	50	51.6	51.6	103	103	70-130	0	20	
1,2-Dichlorobenzene	ug/L	<0.33	50	50	52.0	52.7	104	105	70-130	1	20	
1,2-Dichloroethane	ug/L	<0.29	50	50	51.8	51.4	104	103	70-137	1	20	
1,2-Dichloropropane	ug/L	<0.45	50	50	50.9	51.3	102	103	80-121	1	20	
1,3-Dichlorobenzene	ug/L	<0.35	50	50	52.6	52.9	105	106	70-130	0	20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 6142 OHM ELM GROVE
Pace Project No.: 40265982

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2592999 2593000

Parameter	Units	40265817012 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,4-Dichlorobenzene	ug/L	<0.89	50	50	51.2	51.8	102	104	70-130	1	20	
Benzene	ug/L	<0.30	50	50	53.9	51.9	108	104	70-130	4	20	
Bromodichloromethane	ug/L	<0.42	50	50	54.0	53.5	108	107	70-130	1	20	
Bromoform	ug/L	<0.43	50	50	44.7	45.7	89	91	70-133	2	20	
Bromomethane	ug/L	<1.2	50	50	49.8	49.5	100	99	21-149	1	22	
Carbon tetrachloride	ug/L	<0.37	50	50	47.1	49.3	94	99	80-146	5	20	
Chlorobenzene	ug/L	<0.86	50	50	55.0	54.8	110	110	70-130	0	20	
Chloroethane	ug/L	<1.4	50	50	49.3	46.2	99	92	52-165	6	20	
Chloroform	ug/L	<0.50	50	50	52.7	51.1	105	102	80-123	3	20	
Chloromethane	ug/L	<1.6	50	50	42.4	43.0	85	86	42-125	1	20	
cis-1,2-Dichloroethene	ug/L	<0.47	50	50	52.9	52.5	105	104	70-130	1	20	
cis-1,3-Dichloropropene	ug/L	<0.24	50	50	55.0	53.7	110	107	70-130	2	20	
Dibromochloromethane	ug/L	<2.6	50	50	46.6	48.6	93	97	70-130	4	20	
Dichlorodifluoromethane	ug/L	<0.46	50	50	28.7	26.8	57	54	25-121	7	20	
Ethylbenzene	ug/L	<0.33	50	50	58.5	56.3	117	113	80-121	4	20	
Isopropylbenzene (Cumene)	ug/L	<1.0	50	50	57.2	53.9	114	108	70-130	6	20	
m&p-Xylene	ug/L	<0.70	100	100	116	112	116	112	70-130	4	20	
Methyl-tert-butyl ether	ug/L	<1.1	50	50	51.9	51.3	104	103	70-130	1	20	
Methylene Chloride	ug/L	<0.32	50	50	41.0	38.5	82	77	70-130	6	20	
o-Xylene	ug/L	<0.35	50	50	56.8	54.4	114	109	70-130	4	20	
Styrene	ug/L	<0.36	50	50	68.5	65.5	137	131	70-132	4	20	M0
Tetrachloroethene	ug/L	<0.41	50	50	51.1	51.9	102	104	70-130	2	20	
Toluene	ug/L	<0.29	50	50	55.5	53.1	111	106	80-120	4	20	
trans-1,2-Dichloroethene	ug/L	<0.53	50	50	54.0	53.1	108	106	70-130	2	20	
trans-1,3-Dichloropropene	ug/L	<0.27	50	50	56.9	55.2	114	110	70-130	3	20	
Trichloroethene	ug/L	<0.32	50	50	52.5	51.4	105	103	70-130	2	20	
Trichlorofluoromethane	ug/L	<0.42	50	50	51.2	49.5	102	99	65-160	3	20	
Vinyl chloride	ug/L	<0.17	50	50	44.8	44.4	90	89	60-137	1	20	
1,2-Dichlorobenzene-d4 (S)	%						98	98	70-130			
4-Bromofluorobenzene (S)	%						100	102	70-130			
Toluene-d8 (S)	%						104	103	70-130			

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 6142 OHM ELM GROVE
Pace Project No.: 40265982

QC Batch: 294104
QC Batch Method: EPA 537 Mod
Analysis Method: EPA 537 Mod
Analysis Description: PFAS in Water-EPA 537 Mod
Laboratory: Pace Analytical Services - Baton Rouge
Associated Lab Samples: 40265982001, 40265982002, 40265982003, 40265982004, 40265982005

METHOD BLANK: 1410141 Matrix: Water
Associated Lab Samples: 40265982001, 40265982002, 40265982003, 40265982004, 40265982005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
11Cl-PF3OUdS	ng/L	<0.90	4.0	08/15/23 11:57	
4:2 FTS	ng/L	<1.2	4.0	08/15/23 11:57	
6:2 FTS	ng/L	<1.5	4.0	08/15/23 11:57	
8:2 FTS	ng/L	<1.1	4.0	08/15/23 11:57	
9Cl-PF3ONS	ng/L	<0.90	4.0	08/15/23 11:57	
ADONA	ng/L	<0.86	4.0	08/15/23 11:57	
HFPO-DA	ng/L	<6.7	20.0	08/15/23 11:57	
NEtFOSA	ng/L	<1.4	8.0	08/15/23 11:57	2q
NEtFOSAA	ng/L	<1.6	8.0	08/15/23 11:57	
NEtFOSE	ng/L	<1.0	8.0	08/15/23 11:57	2q,N2
NMeFOSA	ng/L	2.2J	8.0	08/15/23 11:57	2q
NMeFOSAA	ng/L	<0.90	8.0	08/15/23 11:57	
NMeFOSE	ng/L	<1.3	8.0	08/15/23 11:57	2q,N2
Perfluorobutanesulfonic acid	ng/L	<0.62	4.0	08/15/23 11:57	
Perfluorodecanoic acid	ng/L	<1.4	4.0	08/15/23 11:57	
Perfluorododecanoic acid	ng/L	<1.3	4.0	08/15/23 11:57	
Perfluoroheptanoic acid	ng/L	<1.2	4.0	08/15/23 11:57	
Perfluorohexanesulfonic acid	ng/L	<1.2	4.0	08/15/23 11:57	
Perfluorohexanoic acid	ng/L	<0.94	4.0	08/15/23 11:57	
Perfluorononanoic acid	ng/L	<0.98	4.0	08/15/23 11:57	
Perfluorooctanesulfonic acid	ng/L	<0.76	4.0	08/15/23 11:57	
Perfluorooctanoic acid	ng/L	<0.84	4.0	08/15/23 11:57	
Perfluorotetradecanoic acid	ng/L	<1.1	4.0	08/15/23 11:57	
Perfluorotridecanoic acid	ng/L	<1.2	4.0	08/15/23 11:57	
Perfluoroundecanoic acid	ng/L	<1.2	4.0	08/15/23 11:57	
PFBA	ng/L	<1.5	4.0	08/15/23 11:57	
PFDoS	ng/L	<1.3	4.0	08/15/23 11:57	
PFDS	ng/L	<1.2	4.0	08/15/23 11:57	
PFHpS	ng/L	<1.2	4.0	08/15/23 11:57	
PFNS	ng/L	<1.7	4.0	08/15/23 11:57	
PFOSA	ng/L	<0.74	4.0	08/15/23 11:57	
PFPeA	ng/L	<0.88	4.0	08/15/23 11:57	
PFPeS	ng/L	<1.0	4.0	08/15/23 11:57	

LABORATORY CONTROL SAMPLE & LCSD: 1410142 1410143

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
11Cl-PF3OUdS	ng/L	75.6	66.3	75.8	88	100	70-130	13	30	
4:2 FTS	ng/L	74.8	68.3	80.7	91	108	70-130	17	30	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 6142 OHM ELM GROVE
Pace Project No.: 40265982

LABORATORY CONTROL SAMPLE & LCSD: 1410142 1410143

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
6:2 FTS	ng/L	76	72.8	82.7	96	109	70-130	13	30	
8:2 FTS	ng/L	76.8	77.9	86.6	101	113	70-130	11	30	
9Cl-PF3ONS	ng/L	74.8	67.2	78.0	90	104	70-130	15	30	
ADONA	ng/L	75.6	68.2	75.7	90	100	70-130	10	30	
HFPO-DA	ng/L	160	150	172	94	108	70-130	14	30	
NEtFOSA	ng/L	80	77.0	81.3	96	102	70-130	5	30	2q
NEtFOSAA	ng/L	80	73.8	82.6	92	103	70-130	11	30	
NEtFOSE	ng/L	80	74.5	83.1	93	104	70-130	11	30	N2
NMeFOSA	ng/L	80	79.7	86.8	100	108	70-130	9	30	2q
NMeFOSAA	ng/L	80	73.4	88.0	92	110	70-130	18	30	
NMeFOSE	ng/L	80	80.0	83.6	100	104	70-130	4	30	2q,N2
Perfluorobutanesulfonic acid	ng/L	70.8	65.9	75.3	93	106	70-130	13	30	
Perfluorodecanoic acid	ng/L	80	73.7	83.0	92	104	70-130	12	30	
Perfluorododecanoic acid	ng/L	80	76.7	84.0	96	105	70-130	9	30	
Perfluoroheptanoic acid	ng/L	80	73.5	84.0	92	105	70-130	13	30	
Perfluorohexanesulfonic acid	ng/L	73.2	68.3	77.0	93	105	70-130	12	30	
Perfluorohexanoic acid	ng/L	80	73.4	83.8	92	105	70-130	13	30	
Perfluorononanoic acid	ng/L	80	74.8	84.5	93	106	70-130	12	30	
Perfluorooctanesulfonic acid	ng/L	74.4	69.4	77.9	93	105	70-130	12	30	
Perfluorooctanoic acid	ng/L	80	75.0	82.0	94	103	70-130	9	30	
Perfluorotetradecanoic acid	ng/L	80	73.0	82.5	91	103	70-130	12	30	
Perfluorotridecanoic acid	ng/L	80	75.3	80.5	94	101	70-130	7	30	
Perfluoroundecanoic acid	ng/L	80	75.8	84.9	95	106	70-130	11	30	
PFBA	ng/L	80	76.0	84.6	95	106	70-130	11	30	
PFDoS	ng/L	77.6	68.4	72.1	88	93	70-130	5	30	
PFDS	ng/L	77.2	68.9	78.5	89	102	70-130	13	30	
PFHpS	ng/L	76.4	72.5	80.7	95	106	70-130	11	30	
PFNS	ng/L	76.8	70.8	80.4	92	105	70-130	13	30	
PFOSA	ng/L	80	77.0	87.2	96	109	70-130	12	30	
PFPeA	ng/L	80	75.0	84.8	94	106	70-130	12	30	
PFPeS	ng/L	75.2	71.3	81.7	95	109	70-130	14	30	

LABORATORY CONTROL SAMPLE: 1410391

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
11Cl-PF3OUdS	ng/L	7.5	7.8	104	70-130	
4:2 FTS	ng/L	7.5	9.0	120	70-130	
6:2 FTS	ng/L	7.6	9.1	119	70-130	
8:2 FTS	ng/L	7.7	9.2	120	70-130	
9Cl-PF3ONS	ng/L	7.5	8.2	109	70-130	
ADONA	ng/L	7.5	8.4	112	70-130	
HFPO-DA	ng/L	16	18.8J	117	70-130	
NEtFOSA	ng/L	8	11.8	147	70-130	2q,L1
NEtFOSAA	ng/L	8	9.3	117	70-130	
NEtFOSE	ng/L	8	9.2	115	70-130	2q,N2

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 6142 OHM ELM GROVE
Pace Project No.: 40265982

LABORATORY CONTROL SAMPLE: 1410391

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
NMeFOSA	ng/L	8	12.4	155	70-130	2q,L1
NMeFOSAA	ng/L	8	9.6	121	70-130	
NMeFOSE	ng/L	8	11.1	139	70-130	L1,N2
Perfluorobutanesulfonic acid	ng/L	7	8.4	120	70-130	
Perfluorodecanoic acid	ng/L	8	9.0	113	70-130	
Perfluorododecanoic acid	ng/L	8	9.4	117	70-130	
Perfluoroheptanoic acid	ng/L	8	9.2	115	70-130	
Perfluorohexanesulfonic acid	ng/L	7.4	8.6	117	70-130	
Perfluorohexanoic acid	ng/L	8	9.3	116	70-130	
Perfluorononanoic acid	ng/L	8	9.5	119	70-130	
Perfluorooctanesulfonic acid	ng/L	7.4	9.0	121	70-130	
Perfluorooctanoic acid	ng/L	8	9.1	114	70-130	
Perfluorotetradecanoic acid	ng/L	8	9.3	116	70-130	2q
Perfluorotridecanoic acid	ng/L	8	8.4	104	70-130	
Perfluoroundecanoic acid	ng/L	8	9.4	118	70-130	
PFBA	ng/L	8	9.5	119	70-130	
PFDoS	ng/L	7.8	6.0	77	70-130	
PFDS	ng/L	7.7	8.2	107	70-130	
PFHpS	ng/L	7.7	9.2	120	70-130	
PFNS	ng/L	7.7	8.6	112	70-130	
PFOSA	ng/L	8	9.5	119	70-130	
PFPeA	ng/L	8	9.5	119	70-130	
PFPeS	ng/L	7.5	8.8	117	70-130	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALIFIERS

Project: 6142 OHM ELM GROVE
Pace Project No.: 40265982

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above LOD.

J - Estimated concentration at or above the LOD and below the LOQ.

LOD - Limit of Detection adjusted for dilution factor, percent moisture, initial weight and final volume.

LOQ - Limit of Quantitation adjusted for dilution factor, percent moisture, initial weight and final volume.

DL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected at or above the adjusted LOD.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

1q	The extracted internal standard is above criteria.
2q	The extracted internal standard is below criteria.
B	Analyte was detected in the associated method blank.
L1	Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.
L1	Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results may be biased high.
M0	Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
N2	The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply. A complete list of accreditations/certifications is available upon request.

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 6142 OHM ELM GROVE
Pace Project No.: 40265982

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40265982006	**6142-IDM-1**	EPA 8260	451259		
40265982001	**6142-MW9**	EPA 537 Mod	294104	EPA 537 Mod	294522
40265982002	**6142-FB**	EPA 537 Mod	294104	EPA 537 Mod	294522
40265982003	**6142-MW4**	EPA 537 Mod	294104	EPA 537 Mod	294522
40265982004	**6142-MW7**	EPA 537 Mod	294104	EPA 537 Mod	294522
40265982005	**6142-DUP**	EPA 537 Mod	294104	EPA 537 Mod	294522

CHAIN-OF-CUSTODY Analytical Request Document

Pace Analytical®

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevent fields

LAB USE ONLY- Affix Workorder/Login Label Here or List Pace Workorder Number or MTJL Log-in Number Here: 402165982

ALL SHADED AREAS are for LAB USE ONLY

Company: Enviro Forensics, LLC	Billing Information:
Address:	
Report To: W. Fassbender	Email To: WFassbender@enviroforensics.com
Copy To:	Site Collection Info/Address:
Customer Project Name/Number: 6142 Elm Grove, 6142	State: WI County/City: Time Zone Collected: [ ] PT [ ] MT [X] CT [ ] ET
Phone: Email: 262-490-6472	Site/Facility ID #: Compliance Monitoring? [X] Yes [ ] No
Collected By (print): W. Fassbender	Purchase Order #: Quote #: DW PWS ID #: DW Location Code:
Collected By (signature):	Turnaround Date Required: Immediately Packed on Ice: [ ] Yes [ ] No
Sample Disposal: [ ] Dispose as appropriate [ ] Return [ ] Archive: [ ] Hold:	Rush: [ ] Same Day [ ] Next Day [ ] 2 Day [ ] 3 Day [ ] 4 Day [ ] 5 Day (Expedite Charges Apply)
	Field Filtered (if applicable): [ ] Yes [ ] No Analysis:

Container Preservative Type **: 3

Lab Project Manager:

** Preservative Types: (1) nitric acid, (2) sulfuric acid, (3) hydrochloric acid, (4) sodium hydroxide, (5) zinc acetate, (6) methanol, (7) sodium bisulfate, (8) sodium thiosulfate, (9) hexane, (A) ascorbic acid, (B) ammonium sulfate, (C) ammonium hydroxide, (D) TSP, (U) Unpreserved, (O) Other _____

* Matrix Codes (Insert in Matrix box below): Drinking Water (DW), Ground Water (GW), Wastewater (WW), Product (P), Soil/Solid (SL), Oil (OL), Wipe (WP), Air (AR), Tissue (TS), Bioassay (B), Vapor (V), Other (OT)

Customer Sample ID	Matrix *	Comp / Grab	Collected (or Composite Start) Date	Collected (or Composite Start) Time	Composite End Date	Composite End Time	Res Cl	# of Ctns	Analyses: PFAS 33 compounds	Analyses: Total VOC 8260	Lab Sample #
6142-MW9	Water	Grab	7/30/23	2:00				2	X		001
6142-FB	"		"	2:10				2	X		002
6142-MW4	"	Grab	"	3:15				2	X		003
6142-MW-7	"	"	"	3:35				2	X		004
6142-Dup	"	"	"					2	X		005
6142-EQM-C	"	"	"	3:45				3		X	006

Lab Profile/Line:

Lab Sample Receipt Checklist:

Custody Seals Present/Intact	Y N NA
Custody Signatures Present	Y N NA
Collector Signature Present	Y N NA
Bottles Intact	Y N NA
Correct Bottles	Y N NA
Sufficient Volume	Y N NA
Samples Received on Ice	Y N NA
VOA - Headspace Acceptable	Y N NA
USDA Regulated Soils	Y N NA
Samples in Holding Time	Y N NA
Residual Chlorine Present	Y N NA
Cl Strips:	
Sample pH Acceptable	Y N NA
pH Strips:	
Sulfide Present	Y N NA
Lead Acetate Strips:	

LAB USE ONLY:
Lab Sample # / Comments:

8/1/23

Customer Remarks / Special Conditions / Possible Hazards:

Type of Ice Used: Wet Blue Dry None

Packing Material Used:

Radchem sample(s) screened (<500 cpm): Y N NA

SHORT HOLDS PRESENT (<72 hours): Y N N/A

Lab Tracking #: 2908502

Samples received via: FEDEX UPS Client Courier Pace Courier

Lab Sample Temperature Info:

Temp Blank Received: Y N NA

Therm ID#: 10

Cooler 1 Temp Upon Receipt: 0.3 °C

Cooler 1 Therm Corr. Factor: 0.0

Cooler 1 Corrected Temp: 0.3 °C

Comments:

Trip Blank Received: Y N NA

HCL MeOH TSP Other

Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time: 7/31/23
Relinquished by/Company: (Signature) CS Logistic	Date/Time: 8/1/23 0900	Received by/Company: (Signature) Pace	Date/Time: 8/1/23 0900
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:

MTJL LAB USE ONLY

Table #:

Acctnum:

Template:

Prelogin:

PM:

PB:

Non Conformance(s): YES / NO

Client Name: Enviro Forensics

Sample Preservation Receipt Form

Project # 402605982

All containers needing preservation have been checked and noted below ☐Yes ☐No ☒N/A

Lab Lot# of pH paper.

Lab Std #ID of preservation (if pH adjusted)

Initial when completed

Date/ Time.

Pace Lab #	Glass							Plastic						Vials						Jars				General				VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)
	AG1U	BG1U	AG1H	AG4S	AG5U	AG2S	BG3U	BP1U	BP3U	BP3B	BP3N	BP3S	BP2Z	VG9C	DG9T	VG9U	VG9H	VG9M	VG9D	JGFU	JG9U	WGFU	WPFU	SP5T	ZPLC	GN 1	GN 2							
001									2																								2.5 / 5
002									2																								2.5 / 5
003									2																								2.5 / 5
004									2																								2.5 / 5
005									2																								2.5 / 5
006									~~2~~ yn 8/1/23								3																2.5 / 5
007																																	2.5 / 5
008																																	2.5 / 5
009																																	2.5 / 5
010																																	2.5 / 5
011																																	2.5 / 5
012																																	2.5 / 5
013																																	2.5 / 5
014																																	2.5 / 5
015								yn 8/1/23																									2.5 / 5
016																																	2.5 / 5
017																																	2.5 / 5
018																																	2.5 / 5
019																																	2.5 / 5
020																																	2.5 / 5

Exceptions to preservation check VOA, Coliform, TOC, TOX, TOH, O&G, WI DRO, Phenolics, Other_____ Headspace in VOA Vials (>6mm) · ☐Yes ☒No ☐N/A ***If yes look in headspace column**

AG1U	1 liter amber glass	BP1U	1 liter plastic unpres	VG9C	40 mL clear ascorbic w/ HCl	JGFU	4 oz amber jar unpres
BG1U	1 liter clear glass	BP3U	250 mL plastic unpres	DG9T	40 mL amber Na Thio	JG9U	9 oz amber jar unpres
AG1H	1 liter amber glass HCL	BP3B	250 mL plastic NaOH	VG9U	40 mL clear vial unpres	WGFU	4 oz clear jar unpres
AG4S	125 mL amber glass H2SO4	BP3N	250 mL plastic HNO3	VG9H	40 mL clear vial HCL	WPFU	4 oz plastic jar unpres
AG5U	100 mL amber glass unpres	BP3S	250 mL plastic H2SO4	VG9M	40 mL clear vial MeOH	SP5T	120 mL plastic Na Thiosulfate
AG2S	500 mL amber glass H2SO4	BP2Z	500 mL plastic NaOH + Zn	VG9D	40 mL clear vial DI	ZPLC	ziploc bag
BG3U	250 mL clear glass unpres					GN 1	
						GN 2	

Page 1 of 2

Sample Condition Upon Receipt Form (SCUR)

Project #:

WO# : 40265982

40265982

Client Name: Enviro Forensics

Courier: ☑ CS Logistics ☐ Fed Ex ☐ Speedee ☐ UPS ☐ Waltco
☐ Client ☐ Pace Other: _____

Tracking #: _____

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☐ yes ☑ no

Custody Seal on Samples Present: ☐ yes ☑ no Seals intact: ☐ yes ☑ no

Packing Material: ☑ Bubble Wrap ☐ Bubble Bags ☐ None ☐ Other _____

Thermometer Used SR - 127 **Type of Ice:** (Wet) Blue Dry None ☐ Meltwater Only

Cooler Temperature Uncorr: 3.0 /Corr: 3.0

Temp Blank Present: ☑ yes ☐ no **Biological Tissue is Frozen:** ☐ yes ☐ no

Temp should be above freezing to 6°C.
Biota Samples may be received at ≤ 0°C if shipped on Dry Ice.

Person examining contents:
Date: 8/1/23 /Initials: _____

Labeled By Initials: EZ

Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☐Yes ☐No ☐N/A	2. PJ # / Billing info YH 8/1/23
Chain of Custody Relinquished:	☐Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☐Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No	5.
- DI VOA Samples frozen upon receipt	☐Yes ☐No	Date/Time:
Short Hold Time Analysis (<72hr):	☐Yes ☑No	6.
Rush Turn Around Time Requested:	☐Yes ☑No	7.
Sufficient Volume:		8.
For Analysis: ☑Yes ☐No MS/MSD:	☐Yes ☑No ☐N/A	
Correct Containers Used:	☑Yes ☐No	9.
Correct Type: Pace Green Bay, Pace IR, Non-Pace		
Containers Intact:	☑Yes ☐No	10.
Filtered volume received for Dissolved tests	☐Yes ☑No ☐N/A	11.
Sample Labels match COC:	☐Yes ☐No ☐N/A	12. "002" Label FB-1 + no time "003-005" No time "006" no time YH 8/1/23
-Includes date/time/ID/Analysis Matrix: W		
Trip Blank Present:	☐Yes ☑No ☐N/A	13.
Trip Blank Custody Seals Present	☐Yes ☑No ☐N/A	
Pace Trip Blank Lot # (if purchased): _____		

Client Notification/ Resolution: If checked, see attached form for additional comments ☐

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

PM Review is documented electronically in LIMs. By releasing the project, the PM acknowledges they have reviewed the sample logi

Dan Milewsky

From: Wayne Fassbender <wfassbender@enviroforensics.com>
Sent: Tuesday, August 1, 2023 3:02 PM
To: Dan Milewsky
Subject: RE: Bottle order - EnviroForensics project #6142

I apologize Dan. I mislabeled the date. They were collected on Monday, July 31st.

Wayne Fassbender, Senior Project Manager
EnviroForensics®
Wisconsin Office/P.O. Box 128/Oconomowoc, WI/53066
262-490-6472 | wfassbender@enviroforensics.com

From: Dan Milewsky <Dan.Milewsky@pacelabs.com>
Sent: Tuesday, August 1, 2023 11:55 AM
To: Wayne Fassbender <wfassbender@enviroforensics.com>
Subject: RE: Bottle order - EnviroForensics project #6142

Wayne,

We received these today in good order. Can you confirm they were collected on Sunday?

Dan Milewsky
Project Manager | Pace Environmental Sciences
1241 Bellevue St, STE 9
Green Bay, WI 54302
Direct/Cell-920-412-8566 | Lab-920.469.2436 |
pacelabs.com

From: Dan Milewsky
Sent: Thursday, July 27, 2023 10:57 AM
To: Wayne Fassbender <wfassbender@enviroforensics.com>; Nicolette Morris <nmorris@enviroforensics.com>
Subject: RE: Bottle order - EnviroForensics project #6142

Nicolette,

STANDARD OPERATING PROCEDURE

Sampling Protocol for Per-and Polyfluoroalkyl Substances (PFAS)

INTRODUCTION

State regulatory agencies are currently developing sampling guidance, soil and groundwater standards, and other procedures aimed at the regulation of per- and polyfluoroalkyl substances (PFAS). Along with the developing regulatory procedures, there exist several sampling guidance resources from various agencies such as the State of Michigan, the U.S. Department of Defense, the U.S. Environmental Protection Agency, the Interstate Technology & Regulatory Council, and a few analytical laboratories such as Pace Analytical and Test America. This Standard Operating Procedure (SOP) was based on the procedures and guidance developed to date by these agencies. Since regulations and standards regarding PFAS are evolving, it is anticipated that this SOP will require periodic modifications.

When sampling for PFAS, this SOP should be used as a supplement to modify existing EnviroForensics SOP's related to standard groundwater and soil sampling procedures.

Although similar to standard sampling methods for other chemical compounds, special precautions are necessary when sampling for PFAS due to the laboratory detection limits that are in the parts per trillion range, and the proliferation of PFAS in common consumer products. This greatly raises the potential for these compounds to be inadvertently introduced to the samples, resulting in false-positive detections.

The sampling precautions and protocol for PFAS are rigorous and there are many potential opportunities for mistakes in the field that can result in cross-contamination, or the inadvertent introduction of PFAS into the sample media. **It is required that any field investigations for PFAS be conducted by a two (2) person team**. One (1) person is assigned the actual sample collection protocol and the other person is assigned to maintaining the integrity of the sample throughout the sampling process.

PRE-SAMPLING CONSIDERATIONS

As mentioned, PFAS have been detected in many everyday products including cosmetics, soaps, sun-screen, insect repellent, and many products having water repellents and/or stain-resistant coatings to include carpeting, car upholstery, some Tyvek suits, water proof leather boots, garments, and rain-wear. Several agencies have prepared a list of acceptable materials that have

been tested free of PFAS; however, there is a long list of items that have not been tested. This SOP provides some acceptable materials that can be safely used before and during sampling for PFAS, along with comments regarding materials that should not be used and various recommendations to improve sample integrity.

A limited number of readily available and recognizable products are presented below instead of listing all options. For example, there are numerous sun-screen and insect repellent products that have been determined to be PFAS-free (and the list will likely grow over time); however, only a few readily available and recognizable products are listed or recommended here to reduce the number of product decisions that project staff may need to make. If any other product is proposed for use, but is not identified in this SOP as PFAS-free, then that product or substance will need to be analyzed or otherwise determined to be PFAS-free before it can be used.

Personal Hygiene and Care Products

Many personal care products may contain PFAS. These products include soaps, shampoos, cosmetics, deodorants, and dental products including floss. By following this SOP it is not likely that these types of products will come into direct contact with a sample. However, it is **highly recommended that the use of personal care products be curtailed the day of sampling** until more information is available for personal care products that do not contain PFAS.

Personal Protective Equipment

Many common types of protective equipment including clothes, jackets, boots, gloves, Tyvek products, sunscreen, and insect repellents contain PFAS. For common clothing, jackets, boots, and gloves, the PFAS occurs in water repellent and stain repellent treatments that have been applied to the clothing and outer wear. The use of fabric softeners during laundering may also impart PFAS to clothing. Rain suits made of breathable, yet water repellent, materials typically have PFAS in them. Items made of rubber or PVC do not contain PFAS.

Items that may be worn and are known to be free of PFAS include:

- Powderless nitrile gloves;
- Clothing made of natural and synthetic fibers (preferably cotton) and that have been **washed at least six (6) times and without using fabric softeners or dryer sheets**;
- Polyvinyl chloride (PVC) or wax-coated fabrics, including rain gear;
- Any boots or over-boots made of polyurethane or PVC;
- Neoprene;
- Un-coated Tyvek® coveralls;

- Sunscreen: Banana Boat Sport Performance Sunscreen Lotion Broad Spectrum SPF 30; or Coppertone Sunscreen Lotion Ultra Guard Broad Spectrum SPF 50; and
- Insect repellent: Off Deep Woods.

Items that **may not** be worn due to the potential for containing PFAS:

- Coated Tyvek® materials as they do contain PFAS;
- Leather or other steel-toed work boots unless polyurethane or PVC over-boots are used;
- Clothing treated with stain or water repellents;
- Clothing and outerwear that has been dry cleaned; and
- Any rain gear having Gore-Tex™ or other water-proof, or water-repellent fabrics or coatings.

Field Sampling Equipment

Carefully select sampling equipment that directly contacts the sample to ensure it is free from PFAS. Submersible pumps, down-hole instruments, and tubing used for groundwater sampling could have external or internal parts that are not PFAS-free. Check with the manufacturer to evaluate whether there are PFAS-containing components in the equipment. If unsure collect an equipment blank and have it analyzed for PFAS.

Some materials that are known to be PFAS-free include:

- Metals (metal components used for groundwater sampling are typically either stainless steel or brass);
- Nylon;
- PVC (bailers and pump parts);
- High-density polyethylene (HDPE);
- Polypropylene and polyurethane (bailer rope and tubing);
- Silicone (tubing); and
- Acetate (drill core sleeves).

Materials that may contain PFAS and **are not** to be used include:

- Low-density polyethylene (LDPE) tubing. LDPE does not inherently contain PFAS, but may have acquired it through materials used in the manufacturing process. LDPE Zip-loc® sample bags can be used if they do not contact the sample media directly;
- Aluminum foil;

- Teflon-lined tubing or equipment having Teflon components;
- Any product or equipment having any "fluoro" prefix;
- "Rite in the Rain" or other all-weather field books; and
- Sharpie markers, post-it notes, or other adhesive paper products.

In addition, **do not** transport field equipment in direct contact with vehicle carpet or seats. These materials typically contain PFAS in stain and water repellent applications. If equipment must be set on seats or carpet, then transport it in a closed container.

Sample Collection Recommendations:

1. If the depth to water is shallow, use disposable PVC bailers with polypropylene or polyurethane rope.
2. Collect an equipment blank from or through any sampling equipment before its use in the field, unless all equipment materials are inherently PFAS-free, or the manufacturer can guarantee that all components are PFAS-free.
3. Determine if the measuring tape on the water level meter contains PFAS, see #2 above.
4. If using a peristaltic pump to collect shallow water table samples, use only new, unused, tubing that is inherently PFAS-free at each sample location (HDPE, nylon, polyurethane, silicone).
5. If using any other submersible pump in deeper water table conditions, see #2 above.
6. If using any other down-hole data collection probe, see #2 above.
7. For longer-term monitoring of confirmed PFAS in groundwater, consider using dedicated and PFAS-free equipment such as dedicated pumps. Passive Diffusion Bags may be used if equipped with HDPE hydrasleeves and the de-ionized water is PFAS-free.
8. If setting temporary wells, collecting soil samples, or using any other drilling method, ensure that the core sleeves are either acetate, PVC, or HDPE (see #2 above).
9. Use only stainless steel tools or wooden disposable tongue depressors to collect soil sub-samples from drill cores.
10. Use only aluminum or Masonite clipboards with loose paper (non-water resistant) to record field notes.
11. Use only ball-point pens to record field data, prepare sample labels, etc.

Decontamination

It is extremely important that any **water** used for decontamination of equipment or hand washing before, between, and after sampling be free of PFAS. Commercially available distilled water sources should be analyzed for PFAS before its use in the field and should come in an HDPE container. If using municipal water, check with the municipality to determine if the source is

PFAS-free. If that cannot be readily determined, then sample the water for PFAS before its use.

All rental equipment and in-house equipment previously used at other sites needs to be decontaminated before its use. Use only Alconox®, Liquinox®, or Citranox® to decontaminate equipment or wash hands, and use only PVC or HDPE brushes for scrubbing equipment.

Decontaminate equipment before collecting samples, between samples, and at the end of the day. Triple-rinse equipment after cleaning, and change nitrile gloves after decontaminating equipment between sample locations.

FIELD SAMPLING PROCEDURES

Sample Handling

Sample handling procedures are implemented to ensure that sample integrity is maintained throughout the sample collection process. Therefore, the procedures for collecting PFAS samples are not unlike typical sample handling procedures already employed by EnviroForensics personnel. However, due to the pervasiveness of PFAS in the environment, low laboratory detection limits, and possibility of cross-sample contamination, the sample handling procedures for PFAS are more rigorous. EnviroForensics uses a clean hands/dirty hands approach during sample handling activities. One person handles all of the sampling equipment and the other person handles only the sample containers. Specific sample handling procedures with respect to PFAS include:

1. Label sample containers and zip-lock bags in the office before visiting the Site, or in a staging area, and keep the containers in a PFAS-free cooler for use on site. Wash hands and don new powderless nitrile gloves before sample collection.
2. The person designated "dirty hands" handles the sampling equipment only. The person designated "clean hands" holds the sample container and seals the container lid after collecting the sample.
3. **Do not** touch anything other than decontaminated field sampling equipment or sample containers after donning clean nitrile gloves. If you do by accident, change gloves before proceeding further.
4. **Do not** touch the sample or let the outside of the sampling equipment (tubing, bailer, etc.) touch the sample container during sample collection.
5. **Do not** set the sample container on the ground or other surfaces while collecting the sample. That is why there are two people involved.

6. Hands must be washed and new powderless nitrile gloves donned after any decontamination procedure, or (if using all disposable materials) before collecting another groundwater or soil sample;
7. Double bag individual soil or groundwater samples in zip-loc bags and immediately place samples on ice in the cooler.

Additional Considerations

1. Wash hands and change gloves frequently during a long decontamination procedure.
2. Set up a staging area away from the sample collection area for logging field notes, labeling samples containers before sampling, and for taking breaks.
3. **Do not bring any fast food to the site or go off site for lunch.** Fast food wrappers typically contain PFAS. Instead, prepare a lunch and bring it in a plain paper bag to consume in the staging area.
4. Wash hands thoroughly and don clean nitrile gloves following lunch and other breaks.

Laboratory

Many states are currently developing PFAS regulatory standards and laboratory certification programs. There are many compounds of concern contained in the overall PFAS family of chemicals. If State standards have not yet been developed, check with the State regulatory agency to determine the particular compounds to analyze for. Some analytical laboratories have been certified by various agencies such as: State regulatory agencies; Department of Defense; Department of Energy; National Environmental Laboratory Accreditation Program; and International Organization for Standardization. That does not mean that they are set up to analyze for all PFAS chemicals of concern to a particular State agency. Check with the laboratory after determining the State requirements.

Do not use glass sampling containers, as glass tends to adsorb PFAS. Instead, use HDPE or polypropylene containers. Container caps should be of the same material with no Teflon™ seal. Confirm that coolers used to store and ship laboratory samples are PFAS-free. A qualified laboratory will provide the appropriate media for these protocols.

For groundwater samples, do not filter or use a chemical preservative. For samples of municipal drinking water (also possibly used for equipment decontamination) the analytical methods call for preservation with Trizma® to buffer and remove chlorine. Check with the laboratory regarding how many sample containers are needed per sample and appropriate preservatives. Place samples separately in double zip-loc® bags and place immediately on ice. Maintain temperature of the samples below 50° F (10° C). Use regular ice. **Do not use "blue ice" or**

chemical ice packs.

Seal Chain-of-Custody forms and other forms in a zip-loc® bag and tape to the inside lid of the cooler. Tape the cooler closed with a custody seal and ship to the analytical laboratory. Hold time is 14 days to the laboratory with extraction within 28 days.

The current U.S. Environmental Protection Agency (USEPA) developed, and validated analytical methods for PFAS are USEPA Method 533, and USEPA Method 537.1. USEPA Method 533 is focused on the detection of short-chained PFAS (4-12 carbon chain lengths), while Method 537.1 is more focused on detecting longer chain PFAS. Using both methods, up to 29 PFAS chemicals can be detected. These methods were developed for drinking water, but would also apply to groundwater. Soil samples are currently being analyzed for PFAS using a modified Method 537M. New sampling methods are evolving, so these methods may change in the future. Check with State agencies and the analytical laboratories to determine if the above stated methods are still valid or if other methods have been developed and approved by the USEPA and State.

ADDITIONAL FIELD QUALITY CONTROL (BLANKS)

Several different blanks will need to be collected during and possibly before field sampling operations. As previously mentioned, equipment blanks should be collected and analyzed before site work if any materials to be used in field sampling cannot be determined to be PFAS-free. There are additional blanks that will need to be collected during the actual sample collection process to ensure that quality control has been maintained and samples have not been contaminated by outside sources.

Equipment Blanks

Equipment blanks are collected to determine the adequacy of the decontamination process. Equipment blanks are not needed if using dedicated or disposable sampling equipment that has been determined to be PFAS-free.

- Collect an equipment blank by passing PFAS-free water through/over field sampling equipment before use; and
- Collect an additional equipment blank for every five (5) samples collected.

Have the analytical laboratory hold the equipment blanks for possible analysis. Some of the equipment blanks may be analyzed if one or more samples contain PFAS detections.

Field Reagent Blanks

Field reagent blanks (FRBs) are collected to determine if PFAS have entered the samples through the ambient environment, the sampling process in general, and the analytical laboratory sample handling processes. The analytical laboratory will supply a vial of PFAS-free water and an empty sample container for collecting the FRB. The analytical laboratory should be consulted regarding the number of FRBs that should be collected per sampling event.

The FRB will be opened during the collection of one (1) site sample and handled in the same way as that of the site sample. The laboratory provided PFAS-free water will be poured into the provided clean sample vial to mimic field sample collection procedures. As with equipment blanks, reserve the FRBs for possible laboratory analysis if PFAS is detected in any given sample.

Field Duplicates

Collect duplicate samples to measure both field and laboratory precision. The State regulatory agency should be contacted to determine the number of duplicate samples to collect. The State may require more duplicate samples than would be typical for other types of contaminants. For example, the Wisconsin Department of Natural Resources typically requires that one (1) duplicate sample be collected for every 10 groundwater samples that are collected. However, this is guidance (refer to *Groundwater Sampling Desk Reference*, PUBL-DG-037, September 1996) and they may require more when sampling for PFAS.

Trip Blanks

Typically, trip blanks are utilized to determine cross-contamination during shipment of samples and the possible introduction of contaminants in the laboratory environment due to volatile organic compounds. However, the analytical laboratory should be consulted regarding the need for a trip blank during PFAS sampling.

If requested by the laboratory, the laboratory will prepare the trip blanks using PFAS-free water and will ship them with the cooler. If required, include one (1) trip blank in each sample cooler. Do not remove the trip blank from the cooler during sampling, or transport to and from the site. The laboratory will decide whether to run the trip blank if one (1) or more site samples contain PFAS.

REFERENCES

California State Water Quality Control Board, Division of Water Quality, 2019, *Per- and Polyfluoroalkyl Substances (PFAS) Sampling Guidelines*, 9 pp.

Interstate Technology Regulatory Council, 2018, *Site Characterization Considerations, Sampling Precautions, and Laboratory Analytical Methods for Per- and Polyfluoroalkyl Substances (PFAS)*, 9 pp.

Michigan Department of Environmental Quality, 2018, *General PFAS Sampling Guidance*, 24 pp.

Pace Analytical Webpage, *PFAS Field Sampling Guide*: https://www.pacelabs.com/assets/2020-01-14-pfas-field-sampling-guide.pdf.

United States Department of Defense Webpage, *Bottle Selection and Other Sampling Considerations When Sampling for Per- and Poly-Fluoroalkyl Substances (PFAS)*: https://www.denix.osd.mil/edqw/home/what-s-new/unassigned/edqw-pfas-sampling-factsheet-rev-1-2-july-2017/.

United States Environmental Protection Agency Webpage, *EPA Drinking Water Laboratory Method 537 Q&A*: https://www.epa.gov/pfas/epa-drinking-water-laboratory-method-537-qa.