Known for excellence.
Built on trust.

GEOTECHNICAL
ENVIRONMENTAL
ECOLOGICAL
WATER
CONSTRUCTION MANAGEMENT

17975 West Sarah Lane
Suite 100
Brookfield, WI 53045
T: 262.754.2560
F: 262.923.7758
www.gza.com

November 28, 2023
File No. 20.0157080.00

Mr. Kevin McKnight, Advanced Hydrogeologist
Wisconsin Department of Natural Resources
625 East County Road Y, Suite 700
Oshkosh, Wisconsin 54901-9731

Re: Additional Groundwater Monitoring Results
Oshkosh Defense Waukau Lot
359 Waukau Avenue
Oshkosh, Wisconsin
WDNR BRRTS No. 02-71-587405

Dear Mr. McKnight:

GZA GeoEnvironmental, Inc. (GZA), on behalf of Oshkosh Defense LLC (Oshkosh), is submitting additional groundwater monitoring results that were collected from the monitoring well network installed at the Waukau Lot at 359 West Waukau Avenue in Oshkosh, Wisconsin ("Site"). In the Revised Site Investigation Report (SIR), dated February 21, 2023,[1] two additional groundwater sampling events were proposed to evaluate seasonal variability, stability, and/or attenuation of per- and polyfluoroalkyl substances (PFAS) detected in groundwater.

On March 23 and July 10, 2023, groundwater samples were collected from Site monitoring wells MW-1 through MW-4 using low-flow sampling techniques. The wells were purged with a peristaltic pump equipped with a flow-through cell and multimeter to measure field parameters for temperature, pH, conductivity, dissolved oxygen, oxidation-reduction potential, and turbidity. The wells were purged in accordance with the Wisconsin Department of Natural Resources' (WDNR) Groundwater Sampling Field Manual (RR-037) until the field parameters stabilized. Following stabilization, the tubing was disconnected from the flow-through cell and the samples were collected in laboratory-supplied sample containers. The samples were placed on ice in an insulated cooler and shipped to Pace Analytical® in West Columbia, South Carolina for analysis of the Wisconsin List of 33 PFAS by isotope dilution.

The results of the groundwater samples collected at the Site during these two events and the previous events are summarized in **Table 1** and the laboratory analytical reports are provided in **Attachment 1**. A depth to water measurements and resulting groundwater elevations are provided in **Table 2**. **Figure 1** is a Site Plan that shows the location of the monitoring wells for the Waukau Lot.

The groundwater sampling results show a general consistency in detected PFAS and respective concentrations with previous sampling events. However, fluctuating concentrations can be observed between the March and July 2023 sampling events with groundwater levels fluctuating over the same interval. The groundwater elevations were elevated approximately 3.5 to 6.5 feet in the March 2023 sampling event during which PFAS concentrations were higher than in the July sampling event where groundwater levels lowered similar to levels measured during the August 2022 sampling event. As with previous sampling rounds, groundwater flow direction appears to

[1] *Revised Site Investigation Report, Waukau Lot, 359 West Waukau Avenue, Oshkosh, Wisconsin, BRRTS No. 02-71-587405*, dated February 21, 2023, GZA File No. 20.0157080.00.

consistently be to the east-northeast. Ongoing monitoring events will aid in establishing the validity of the seasonal variation observed.

Based on the result of the two additional groundwater sampling events, Oshkosh proposes to continue with the groundwater monitoring to establish trends to demonstrate long-term stability of PFAS concentrations within the shallow groundwater flow system. As of this letter, a minimum of three monitoring events were performed at each well, with monitoring well MW-1 having been sampled for five sampling events. Oshkosh proposes to perform additional groundwater sampling events for laboratory analysis of the Wisconsin List of 33 PFAS and submit sample results to the WDNR. The next sampling event will be in November 2023.

The results of these sampling events will be provided to the WDNR by letter as the results are received and evaluated. If you have questions about the results or proposed groundwater sampling plan, please feel free to contact Kevin Hedinger at (262) 754-2578 or by email at kevin.hedinger@gza.com.

Sincerely,

GZA GeoEnvironmental, Inc.

Kevin M. Hedinger
Senior Hydrogeologist

John C. Osborne, P.G.
Principal Hydrogeologist

J:\157000to157099\157080 Oshkosh\Report\Transmittal Letter - Waukau Lot\FINAL 20.0157080.00 Addl GW Monitoring Results_Waukau Lot 11-28-23.docx

Attachments: Tables 1 and 2
Figure 1
Laboratory Analytical Reports

TABLES

TABLE 1
GROUNDWATER ANALYTICAL RESULTS - PFAS
Waukau Lot
Oshkosh, Wisconsin

Location		NR 140 Proposed ES	NR 140 Proposed PAL	WL-MW-1					WL-MW-2 "Upgradient"			WL-MW-3			WL-MW-4		
Sample Name																	
Laboratory Sample ID				WH24025-001	WJ23010-001	XH08006-001	YC25010-003	YG11007-004	XH08006-002	YC25010-004	YG11007-003	XH08006-003	YC25010-002	YG11007-002	XH08006-004	YC25010-001	YG11007-001
Sample Date				8/19/2021	10/16/2021	8/3/2022	3/22/2023	7/10/2023	8/3/2022	3/22/2023	7/10/2023	8/3/2022	3/22/2023	7/10/2023	8/3/2022	3/22/2023	7/10/2023
Parameter (ng/L)	CAS Number																
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	NS	NS	<9.2	<22	<7.0	<360	<6.8	<7.0	<7.3	<6.9	<7.7	<7.1	<7.2	<7.3	<6.9	<6.9
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	763051-92-9	NS	NS	<13	<30	<7.0	<360	<6.8	<7.0	<7.3	<6.9	<7.7	<7.1	<7.2	<7.3	<6.9	<6.9
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	NS	NS	<30	<73	<7.0	<360	<6.8	<7.0	<7.3	<6.9	<7.7	<7.1	<7.2	<7.3	<6.9	<6.9
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	NS	NS	10,000	14,000	7,600 B	220 BJ	7,900	<7.0	<7.3	<6.9	<7.7	<7.1	<7.2	<7.3	<6.9	<6.9
1H, 1H, 2H, 2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	NS	NS	<17	<40	2.5 JQ	<360	2.4 QJ	<7.0	<7.3	<6.9	<7.7	<7.1	<7.2	<7.3	<6.9	<6.9
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	300	30	<39	<95	<7.0	<360	<6.8	<7.0	<7.3	<6.9	<7.7	<7.1	<7.2	<7.3	<6.9	<6.9
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	3,000	600	<9.2	<22	<7.0	<360	<6.8	<7.0	<7.3	<6.9	<7.7	<7.1	<7.2	<7.3	<6.9	<6.9
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	20	2	<26	<62	<7.0	<360	<6.8	<7.0	<7.3	<6.9	<7.7	<7.1	<7.2	<7.3	<6.9	<6.9
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	20	2	<14	<34	<7.0	<360	<6.8	<7.0	<7.3	<6.9	<7.7	<7.1	<7.2	<7.3	<6.9	<6.9
2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)	1691-99-2	20	2	<18	<44	<7.0	<360	<6.8	<7.0	<7.3	<6.9	<7.7	<7.1	<7.2	<7.3	<6.9	<6.9
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	NS	NS	<24	<58	<14	<720	<14	<14	<15	<14	<15	<7.1	<14	<15	<14	<14
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	NS	NS	<18	<43	<7.0	<360	<6.8	<7.0	<7.3	<6.9	<7.7	<7.1	<7.2	<7.3	<6.9	<6.9
2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)	24448-09-7	NS	NS	<24	<59	<7.0	<360	<6.8	<7.0	<7.3	<6.9	<7.7	<7.1	<7.2	<7.3	<6.9	<6.9
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	450,000	90,000	<7.9	44 J	<3.5 S	<180	5.7	<3.5	19	<3.5	0.73 J	9.1	0.72 J	0.95 J	8.3	0.41 J
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	NS	NS	<15	<36	<3.5	<180	<3.4	<3.5	<3.6	<3.5	<3.9	<3.6	<3.6	<3.6	<3.5	<3.4
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	NS	NS	<9.5	<23	<3.5	<180	<3.4	<3.5	0.49 J	<3.5	<3.9	0.56 J	<3.6	<3.6	<3.5	<3.4
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	NS	NS	<14	<33	<3.5	<180	<3.4	<3.5	<3.6	<3.5	<3.9	<3.6	<3.6	<3.6	<3.5	<3.4
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	20	2	<12	<28	<3.5	<180	<3.4	<3.5	<3.6	<3.5	<3.9	<3.6	<3.6	<3.6	<3.5	<3.4
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	NS	NS	<11	<27	4.6	<180	4.6	<3.5	16	<3.5	<3.9	3.6	<3.6	<3.6	2.7 J	<3.4
Perfluorododecanesulfonic acid (PFDOS)	79780-39-5	NS	NS	<20	<48	<7.0	<360	<6.8	<7.0	<7.3	<6.9	<7.7	<7.1	<7.2	<7.3	<6.9	<6.9
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	40	4	**34 J**	**45 J**	**34**	<180	30	<3.5	**100**	<3.5	<3.9	**19**	<3.6	<3.6	**17**	<3.4
Perfluoro-n-butanoic acid (PFBA)	375-22-4	10,000	2,000	460	880	850	**2,200**	890	<3.5	6.4	<3.5	5.4	0.85 J	4.8	3.7	12	1.1 J
Perfluoro-n-decanoic acid (PFDA)	335-76-2	300	60	<10	<24	<3.5	<180	<3.4	<3.5	<3.6	<3.5	<3.9	<3.6	<3.6	<3.6	<3.5	<3.4
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	500	100	<9.0	<22	<3.5	<180	<3.4	<3.5	<3.6	<3.5	<3.9	<3.6	<3.6	<3.6	<3.5	<3.4
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	NS	NS	320	590	590	910	680	<3.5	3.6	<3.5	<3.9	0.52 J	<3.6	<3.6	2.0 J	<3.4
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	150,000	30,000	1,600	2,200	2,100	5,700	2,100	<3.5	11	<3.5	1.1 J	0.79 J	<3.6	<3.6	5.7	<3.4
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	30	3	<8.8	<21	**5.6**	<180	**4.8**	<3.5	**6.3**	<3.5	<3.9	2.0 J	<3.6	<3.6	0.48 J	<3.4
Perfluoro-n-octanoic acid (PFOA)	335-67-1	20	2	**41 J**	**56 J**	**38**	**120 J**	**30**	<3.5	**2.8 J**	<3.5	1.1 J	1.2 J	<3.6	<3.6	**2.6 J**	<3.4
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	NS	NS	3,200	5,400	6,100	12,000	5,900	<3.5	11	<3.5	2.9 J	0.69 J	1.1 J	<3.6	7.4	<3.4
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	10,000	2,000	<11	<27	<3.5	<180	<3.4	<3.5	<3.6	<3.5	<3.9	<3.6	<3.6	<3.6	<3.5	<3.4
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	NS	NS	<10	<27	<3.5	<180	<3.4	<3.5	<3.6	<3.5	<3.9	<3.6	<3.6	<3.6	<3.5	<3.4
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	3,000	600	<12	<27	<3.5	<180	<3.4	<3.5	<3.6	<3.5	<3.9	<3.6	<3.6	<3.6	<3.5	<3.4
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	20	2	<38	<27	**9.9**	<180	**8.7**	<3.5	**21**	<3.5	<3.9	**26**	<3.6	<3.6	1.7 J	<3.4
PFOS + PFOA (Calculated)	PFOS+PFOA	20	2	**41 J**	**56 J**	**47.9**	**120**	**38.7**	<3.5	**23.9**	<3.5	1.1 J	**27.2**	<3.6	<3.6	4.3	<3.4

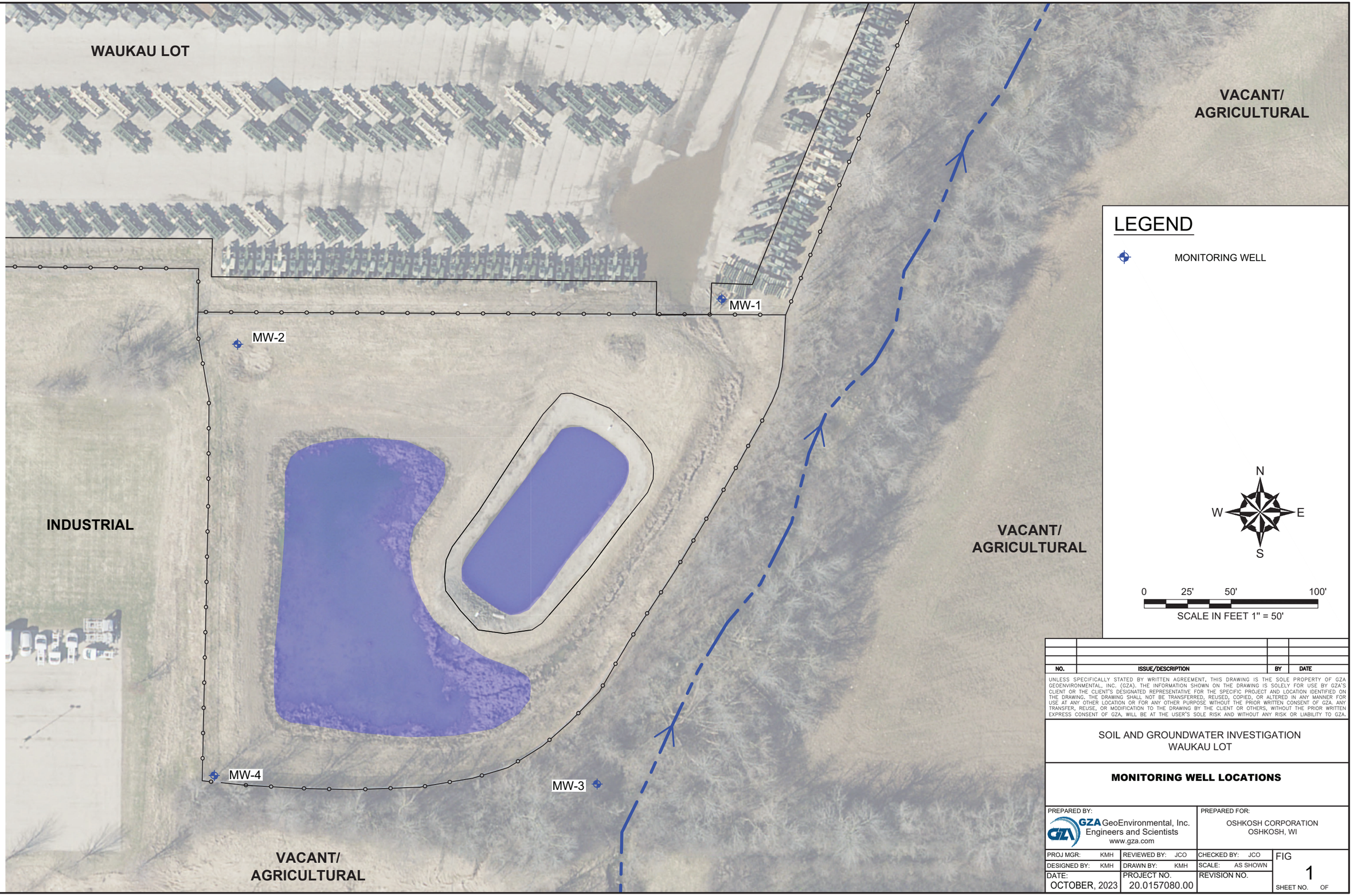
Notes:
1. Samples were collected by GZA GeoEnvironmental, Inc. on the date indicated.
2. **Bold** concentrations indicate an exceedance of the Wisconsin Administrative Code (Wis. Adm. Code) proposed Preventive Action Limit (PAL) and **bold/underlined** concentrations indicate an exceedance of the Wis. Adm. Code proposed Enforcement Standard (ES).
3. Results are presented in nanograms per liter (ng/L).
4. "NS" indicates there is no standard for that parameter.
5. "J"-flagged concentrations indicate that the estimated result is less than the Limit of Quantitation (LOQ) and greater than or equal to the Method Detection Limit (DL).

TABLE 2
SUMMARY OF GROUNDWATER ELEVATIONS
Waukau Lot
Oshkosh, Wisconsin

Well	Date	TOC Elevation (feet)	GS Elevation (feet)	Depth to Water (feet)	Groundwater Elevation (feet)
MW-1	8/19/2021	769.15	769.61	3.02	766.13
	10/16/2021			3.78	765.37
	8/3/2022			4.01	765.14
	3/22/2023			0.98	768.17
	7/10/2023			4.84	764.31
MW-2	8/3/2022	775.62	773.44	10.00	765.62
	3/22/2023			5.74	769.88
	7/10/2023			10.89	764.73
MW-3	8/3/2022	773.48	771.40	8.59	764.89
	3/22/2023			NA	NA
	7/10/2023			9.43	764.05
MW-4	8/3/2022	777.35	775.04	10.20	767.15
	3/22/2023			4.64	772.71
	7/10/2023			10.96	766.39

Notes:
1. TOC = top of casing.
2. GS = ground surface or rim elevation.
3. NA = not available.

FIGURES



LEGEND

MONITORING WELL

N
W E
S

0 25' 50' 100'

SCALE IN FEET 1" = 50'

NO.	ISSUE/DESCRIPTION	BY	DATE

SOIL AND GROUNDWATER INVESTIGATION
WAUKAU LOT

MONITORING WELL LOCATIONS

PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: OSHKOSH CORPORATION OSHKOSH, WI	
PROJ MGR: KMH	REVIEWED BY: JCO	CHECKED BY: JCO	FIG 1
DESIGNED BY: KMH	DRAWN BY: KMH	SCALE: AS SHOWN	
DATE: OCTOBER, 2023	PROJECT NO. 20.0157080.00	REVISION NO.	SHEET NO. OF

ATTACHMENT 1

Laboratory Analytical Reports

Report of Analysis

GZA GeoEnvironmental, Inc.
17975 West Sarah Lane, Suite 100
Brookfield, WI 53045
Attention: Kevin Hedinger

Project Name: Oshkosh GW PFAS Sampling

Project Number: 20.0157080.00

Lot Number:**YC25010**

Date Completed:04/12/2023

Kathy Smith

04/12/2023 1:59 PM
Approved and released by:
Project Manager II: **Kathy E. Smith**

Case Narrative
GZA GeoEnvironmental, Inc.
Lot Number: YC25010

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the Pace Quality Assurance Management Plan (QAMP), applicable Shealy standard operating procedures (SOPs), the 2003 NELAC standard, and Shealy policies. Additionally, the DoD QSM version 5.3 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the QAMP, SOPs, NELAC standards, the DoD QSM, or policies are qualified on the results page or discussed below.

All QC associated with these samples were compliant with DOD QSM 5.3 table B-15 and our PFAS SOP.

Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). The CF is calculated as follows:

CF = DF * FV / Vo

FV is volume of extract (mL)
Vo is initial sample volume (mL)
DF is dilution factor. For undiluted analysis, DF = 1.

Sample concentration for aqueous samples:
Concentration (ng/L) = Cs*CF,

$$C_s = \frac{\left(\frac{(A_s x C_{is})}{A_{is}}\right) - B}{M1}$$

Where

C_s is on column concentration of target analyte in the sample (ng/L)
C_{is} is concentration of internal standard in the sample (ng/L)
A_s is peak response of target analyte in the sample
A_{is} is peak response of internal standard in the sample
M1 is the average RF from ICAL or the slope from linear regression ICAL
B is the y-intercept from the ICAL

Pace is a TNI accredited laboratory; however, the following analyses are currently not listed on our TNI scope of accreditation: Drinking Water: VOC (excluding BTEX, MTBE, Naphthalene, & 1,2-dichloroethane) EPA 524.2, E. coli and Total coliforms SM 9223 B-2004, Solid Chemical Material: TOC Walkley-Black, Biological Tissue: All, Non-Potable Water: SGT-HEM EPA 1664B, Silica EPA 200.7, Boron, Calcium, Silicon, Strontium EPA 200.8, Bicarbonate, Carbonate, and Hydroxide Alkalinity SM 2320 B-2011, SM 9221 C E-2006 & SM 9222D-2006, Strontium SW-846 6010D, VOC SM 6200 B-2011, Fecal Coliform Colilert-18.

If you have any questions regarding this report, please contact the Pace Project Manager listed on the cover page.

PFAS
The method blank associated with batch 71668 had 6:2 FTS detected at a concentration that was above the MDL but below the PQL. All samples associated with this method blank that have detections for 6:2 FTS have been flagged with a "B”.

Surrogate recovery for the following sample was outside the upper control limit: YC25010-001. This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Sample Summary

GZA GeoEnvironmental, Inc.

Lot Number: YC25010

Project Name: Oshkosh GW PFAS Sampling

Project Number: 20.0157080.00

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	WP-MW-4	Aqueous	03/22/2023 1331	03/25/2023
002	WP-MW-3	Aqueous	03/22/2023 1500	03/25/2023
003	WP-MW-1	Aqueous	03/22/2023 1504	03/25/2023
004	WP-MW-2	Aqueous	03/22/2023 1605	03/25/2023
005	EQ-BLANK	Aqueous	03/22/2023 1605	03/25/2023
006	FIELD BLANK	Aqueous	03/22/2023 1600	03/25/2023

(6 samples)

Detection Summary

GZA GeoEnvironmental, Inc.

Lot Number: YC25010

Project Name: Oshkosh GW PFAS Sampling

Project Number: 20.0157080.00

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	WP-MW-4	Aqueous	PFBS	PFAS by ID	8.3		ng/L	6
001	WP-MW-4	Aqueous	PFPeS	PFAS by ID	2.7	J	ng/L	6
001	WP-MW-4	Aqueous	PFHxS	PFAS by ID	17		ng/L	6
001	WP-MW-4	Aqueous	PFBA	PFAS by ID	12		ng/L	6
001	WP-MW-4	Aqueous	PFHpA	PFAS by ID	2.0	J	ng/L	6
001	WP-MW-4	Aqueous	PFHxA	PFAS by ID	5.7		ng/L	6
001	WP-MW-4	Aqueous	PFNA	PFAS by ID	0.48	J	ng/L	6
001	WP-MW-4	Aqueous	PFOA	PFAS by ID	2.6	J	ng/L	6
001	WP-MW-4	Aqueous	PFPeA	PFAS by ID	7.4		ng/L	6
001	WP-MW-4	Aqueous	PFOS	PFAS by ID	1.7	J	ng/L	6
002	WP-MW-3	Aqueous	PFBS	PFAS by ID	9.1		ng/L	8
002	WP-MW-3	Aqueous	PFHpS	PFAS by ID	0.56	J	ng/L	8
002	WP-MW-3	Aqueous	PFPeS	PFAS by ID	3.6		ng/L	8
002	WP-MW-3	Aqueous	PFHxS	PFAS by ID	19		ng/L	8
002	WP-MW-3	Aqueous	PFBA	PFAS by ID	0.85	J	ng/L	8
002	WP-MW-3	Aqueous	PFHpA	PFAS by ID	0.52	J	ng/L	8
002	WP-MW-3	Aqueous	PFHxA	PFAS by ID	0.79	J	ng/L	8
002	WP-MW-3	Aqueous	PFNA	PFAS by ID	2.0	J	ng/L	8
002	WP-MW-3	Aqueous	PFOA	PFAS by ID	1.2	J	ng/L	8
002	WP-MW-3	Aqueous	PFPeA	PFAS by ID	0.69	J	ng/L	8
002	WP-MW-3	Aqueous	PFOS	PFAS by ID	26		ng/L	8
003	WP-MW-1	Aqueous	6:2 FTS	PFAS by ID	220	BJ	ng/L	10
003	WP-MW-1	Aqueous	PFBA	PFAS by ID	2200		ng/L	10
003	WP-MW-1	Aqueous	PFHpA	PFAS by ID	910		ng/L	10
003	WP-MW-1	Aqueous	PFHxA	PFAS by ID	5700		ng/L	10
003	WP-MW-1	Aqueous	PFOA	PFAS by ID	120	J	ng/L	10
003	WP-MW-1	Aqueous	PFPeA	PFAS by ID	12000		ng/L	10
004	WP-MW-2	Aqueous	PFBS	PFAS by ID	19		ng/L	12
004	WP-MW-2	Aqueous	PFHpS	PFAS by ID	0.49	J	ng/L	12
004	WP-MW-2	Aqueous	PFPeS	PFAS by ID	16		ng/L	12
004	WP-MW-2	Aqueous	PFHxS	PFAS by ID	100		ng/L	12
004	WP-MW-2	Aqueous	PFBA	PFAS by ID	6.4		ng/L	12
004	WP-MW-2	Aqueous	PFHpA	PFAS by ID	3.6		ng/L	12
004	WP-MW-2	Aqueous	PFHxA	PFAS by ID	11		ng/L	12
004	WP-MW-2	Aqueous	PFNA	PFAS by ID	6.3		ng/L	12
004	WP-MW-2	Aqueous	PFOA	PFAS by ID	2.8	J	ng/L	12
004	WP-MW-2	Aqueous	PFPeA	PFAS by ID	11		ng/L	12
004	WP-MW-2	Aqueous	PFOS	PFAS by ID	21		ng/L	12

(38 detections)

PFAS by LC/MS/MS

Client: **GZA GeoEnvironmental, Inc.** Laboratory ID: **YC25010-001**

Description: **WP-MW-4** Matrix: **Aqueous**

Date Sampled: **03/22/2023 1331** Project Name: **Oshkosh GW PFAS Sampling**

Date Received: **03/25/2023** Project Number: **20.0157080.00**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	04/07/2023 0245	OMNS	04/03/2023 1240	71668

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	MDL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.9	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	ND		6.9	1.2	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)	1691-99-2	PFAS by ID SOP	ND		6.9	0.83	ng/L	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	PFAS by ID SOP	ND		14	1.1	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.81	ng/L	1
2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)	24448-09-7	PFAS by ID SOP	ND		6.9	1.1	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**8.3**		**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**2.7**	**J**	**3.5**	**0.51**	**ng/L**	**1**
Perfluorododecanesulfonic acid (PFDOS)	79780-39-5	PFAS by ID SOP	ND		6.9	0.91	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**17**		**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**12**		**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**2.0**	**J**	**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**5.7**		**3.5**	**0.60**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**0.48**	**J**	**3.5**	**0.40**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**2.6**	**J**	**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**7.4**		**3.5**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**1.7**	**J**	**3.5**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	163	25-150
13C2_6:2FTS		105	25-150
13C2_8:2FTS		91	25-150
13C2_PFDoA		93	25-150
13C2_PFTeDA		98	25-150
13C3_PFBS		95	25-150
13C3_PFHxS		97	25-150
13C3-HFPO-DA		93	25-150
13C4_PFBA		70	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: **GZA GeoEnvironmental, Inc.** Laboratory ID: **YC25010-001**

Description: **WP-MW-4** Matrix: **Aqueous**

Date Sampled: **03/22/2023 1331** Project Name: **Oshkosh GW PFAS Sampling**

Date Received: **03/25/2023** Project Number: **20.0157080.00**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C4_PFHpA		95	25-150
13C5_PFHxA		101	25-150
13C5_PFPeA		94	25-150
13C6_PFDA		95	25-150
13C7_PFUdA		85	25-150
13C8_PFOA		98	25-150
13C8_PFOS		87	25-150
13C8_PFOSA		94	10-150
13C9_PFNA		88	25-150
d-EtFOSA		83	10-150
d5-EtFOSAA		93	25-150
d9-EtFOSE		92	10-150
d-MeFOSA		82	10-150
d3-MeFOSAA		97	25-150
d7-MeFOSE		87	10-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: **GZA GeoEnvironmental, Inc.** Laboratory ID: **YC25010-002**

Description: **WP-MW-3** Matrix: **Aqueous**

Date Sampled: **03/22/2023 1500** Project Name: **Oshkosh GW PFAS Sampling**

Date Received: **03/25/2023** Project Number: **20.0157080.00**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	04/07/2023 0256	OMNS	04/03/2023 1240	71668

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	MDL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.1	0.43	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.1	0.59	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.1	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.1	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.1	0.78	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.1	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.1	0.43	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	ND		7.1	1.2	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.1	0.67	ng/L	1
2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)	1691-99-2	PFAS by ID SOP	ND		7.1	0.85	ng/L	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	PFAS by ID SOP	ND		14	1.1	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.1	0.83	ng/L	1
2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)	24448-09-7	PFAS by ID SOP	ND		7.1	1.1	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**9.1**		**3.6**	**0.37**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.6	0.69	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**0.56**	**J**	**3.6**	**0.45**	**ng/L**	**1**
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.6	0.64	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.6	0.55	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**3.6**		**3.6**	**0.53**	**ng/L**	**1**
Perfluorododecanesulfonic acid (PFDOS)	79780-39-5	PFAS by ID SOP	ND		7.1	0.93	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**19**		**3.6**	**0.49**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**0.85**	**J**	**3.6**	**0.54**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.6	0.47	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.6	0.42	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**0.52**	**J**	**3.6**	**0.40**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**0.79**	**J**	**3.6**	**0.61**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**2.0**	**J**	**3.6**	**0.41**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**1.2**	**J**	**3.6**	**0.74**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**0.69**	**J**	**3.6**	**0.49**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.6	0.54	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.6	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.6	0.56	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**26**		**3.6**	**1.8**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		119	25-150
13C2_6:2FTS		103	25-150
13C2_8:2FTS		91	25-150
13C2_PFDoA		95	25-150
13C2_PFTeDA		96	25-150
13C3_PFBS		93	25-150
13C3_PFHxS		101	25-150
13C3-HFPO-DA		94	25-150
13C4_PFBA		85	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: **GZA GeoEnvironmental, Inc.** Laboratory ID: **YC25010-002**

Description: **WP-MW-3** Matrix: **Aqueous**

Date Sampled: **03/22/2023 1500** Project Name: **Oshkosh GW PFAS Sampling**

Date Received: **03/25/2023** Project Number: **20.0157080.00**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C4_PFHpA		91	25-150
13C5_PFHxA		98	25-150
13C5_PFPeA		102	25-150
13C6_PFDA		95	25-150
13C7_PFUdA		86	25-150
13C8_PFOA		91	25-150
13C8_PFOS		90	25-150
13C8_PFOSA		96	10-150
13C9_PFNA		89	25-150
d-EtFOSA		86	10-150
d5-EtFOSAA		96	25-150
d9-EtFOSE		95	10-150
d-MeFOSA		84	10-150
d3-MeFOSAA		98	25-150
d7-MeFOSE		92	10-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
ND = Not detected at or above the DL	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis			S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: **GZA GeoEnvironmental, Inc.** Laboratory ID: **YC25010-003**

Description: **WP-MW-1** Matrix: **Aqueous**

Date Sampled: **03/22/2023 1504** Project Name: **Oshkosh GW PFAS Sampling**

Date Received: **03/25/2023** Project Number: **20.0157080.00**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	50	04/07/2023 1439	OMNS	04/03/2023 1240	71668

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	MDL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		360	22	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		360	30	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		360	72	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	**27619-97-2**	**PFAS by ID SOP**	**220**	**BJ**	**360**	**90**	**ng/L**	**1**
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		360	39	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		360	93	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		360	22	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	ND		360	61	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		360	34	ng/L	1
2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)	1691-99-2	PFAS by ID SOP	ND		360	43	ng/L	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	PFAS by ID SOP	ND		720	57	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		360	42	ng/L	1
2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)	24448-09-7	PFAS by ID SOP	ND		360	58	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		180	19	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		180	35	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		180	22	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		180	32	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		180	27	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		180	27	ng/L	1
Perfluorododecanesulfonic acid (PFDOS)	79780-39-5	PFAS by ID SOP	ND		360	47	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		180	25	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**2200**		**180**	**27**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		180	24	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		180	21	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**910**		**180**	**20**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**5700**		**180**	**31**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		180	21	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**120**	**J**	**180**	**37**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**12000**		**180**	**24**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		180	27	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		180	24	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		180	28	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		180	90	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		97	25-150
13C2_6:2FTS		94	25-150
13C2_8:2FTS		95	25-150
13C2_PFDoA		98	25-150
13C2_PFTeDA		93	25-150
13C3_PFBS		95	25-150
13C3_PFHxS		95	25-150
13C3-HFPO-DA		103	25-150
13C4_PFBA		103	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: **GZA GeoEnvironmental, Inc.** Laboratory ID: **YC25010-003**

Description: **WP-MW-1** Matrix: **Aqueous**

Date Sampled: **03/22/2023 1504** Project Name: **Oshkosh GW PFAS Sampling**

Date Received: **03/25/2023** Project Number: **20.0157080.00**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C4_PFHpA		108	25-150
13C5_PFHxA		96	25-150
13C5_PFPeA		90	25-150
13C6_PFDA		98	25-150
13C7_PFUdA		96	25-150
13C8_PFOA		100	25-150
13C8_PFOS		92	25-150
13C8_PFOSA		101	10-150
13C9_PFNA		92	25-150
d-EtFOSA		98	10-150
d5-EtFOSAA		95	25-150
d9-EtFOSE		99	10-150
d-MeFOSA		106	10-150
d3-MeFOSAA		99	25-150
d7-MeFOSE		99	10-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: **GZA GeoEnvironmental, Inc.** Laboratory ID: **YC25010-004**

Description: **WP-MW-2** Matrix: **Aqueous**

Date Sampled: **03/22/2023 1605** Project Name: **Oshkosh GW PFAS Sampling**

Date Received: **03/25/2023** Project Number: **20.0157080.00**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	04/07/2023 0307	OMNS	04/03/2023 1240	71668

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	MDL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.3	0.44	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.3	0.60	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.3	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.3	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.3	0.79	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.3	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.3	0.44	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	ND		7.3	1.2	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.3	0.68	ng/L	1
2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)	1691-99-2	PFAS by ID SOP	ND		7.3	0.86	ng/L	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	PFAS by ID SOP	ND		15	1.1	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.3	0.84	ng/L	1
2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)	24448-09-7	PFAS by ID SOP	ND		7.3	1.2	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**19**		**3.6**	**0.38**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.6	0.71	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**0.49**	**J**	**3.6**	**0.45**	**ng/L**	**1**
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.6	0.65	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.6	0.56	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**16**		**3.6**	**0.54**	**ng/L**	**1**
Perfluorododecanesulfonic acid (PFDOS)	79780-39-5	PFAS by ID SOP	ND		7.3	0.95	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**100**		**3.6**	**0.50**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**6.4**		**3.6**	**0.54**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.6	0.48	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.6	0.43	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**3.6**		**3.6**	**0.41**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**11**		**3.6**	**0.62**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**6.3**		**3.6**	**0.42**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**2.8**	**J**	**3.6**	**0.75**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**11**		**3.6**	**0.49**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.6	0.54	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.6	0.48	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.6	0.57	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**21**		**3.6**	**1.8**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		117	25-150
13C2_6:2FTS		106	25-150
13C2_8:2FTS		97	25-150
13C2_PFDoA		90	25-150
13C2_PFTeDA		97	25-150
13C3_PFBS		95	25-150
13C3_PFHxS		96	25-150
13C3-HFPO-DA		93	25-150
13C4_PFBA		90	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: **GZA GeoEnvironmental, Inc.** Laboratory ID: **YC25010-004**

Description: **WP-MW-2** Matrix: **Aqueous**

Date Sampled: **03/22/2023 1605** Project Name: **Oshkosh GW PFAS Sampling**

Date Received: **03/25/2023** Project Number: **20.0157080.00**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C4_PFHpA		89	25-150
13C5_PFHxA		97	25-150
13C5_PFPeA		101	25-150
13C6_PFDA		95	25-150
13C7_PFUdA		88	25-150
13C8_PFOA		93	25-150
13C8_PFOS		87	25-150
13C8_PFOSA		96	10-150
13C9_PFNA		88	25-150
d-EtFOSA		75	10-150
d5-EtFOSAA		95	25-150
d9-EtFOSE		89	10-150
d-MeFOSA		77	10-150
d3-MeFOSAA		94	25-150
d7-MeFOSE		88	10-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: **GZA GeoEnvironmental, Inc.** Laboratory ID: **YC25010-005**

Description: **EQ-BLANK** Matrix: **Aqueous**

Date Sampled: **03/22/2023 1605** Project Name: **Oshkosh GW PFAS Sampling**

Date Received: **03/25/2023** Project Number: **20.0157080.00**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	04/07/2023 1450	OMNS	04/03/2023 1240	71668

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	MDL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.5	0.45	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.5	0.62	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.5	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.5	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.5	0.82	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.5	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.5	0.45	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	ND		7.5	1.3	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.5	0.70	ng/L	1
2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)	1691-99-2	PFAS by ID SOP	ND		7.5	0.89	ng/L	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	PFAS by ID SOP	ND		15	1.2	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.5	0.87	ng/L	1
2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)	24448-09-7	PFAS by ID SOP	ND		7.5	1.2	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.7	0.39	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.7	0.73	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.7	0.47	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.7	0.66	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.7	0.57	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.7	0.55	ng/L	1
Perfluorododecanesulfonic acid (PFDOS)	79780-39-5	PFAS by ID SOP	ND		7.5	0.98	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.7	0.51	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		3.7	0.56	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.7	0.49	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.7	0.44	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.7	0.42	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.7	0.64	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.7	0.43	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.7	0.77	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.7	0.51	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.7	0.56	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.7	0.49	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.7	0.58	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.7	1.9	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		102	25-150
13C2_6:2FTS		95	25-150
13C2_8:2FTS		90	25-150
13C2_PFDoA		90	25-150
13C2_PFTeDA		91	25-150
13C3_PFBS		94	25-150
13C3_PFHxS		97	25-150
13C3-HFPO-DA		94	25-150
13C4_PFBA		101	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: **GZA GeoEnvironmental, Inc.** Laboratory ID: **YC25010-005**

Description: **EQ-BLANK** Matrix: **Aqueous**

Date Sampled: **03/22/2023 1605** Project Name: **Oshkosh GW PFAS Sampling**

Date Received: **03/25/2023** Project Number: **20.0157080.00**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C4_PFHpA		100	25-150
13C5_PFHxA		101	25-150
13C5_PFPeA		97	25-150
13C6_PFDA		96	25-150
13C7_PFUdA		95	25-150
13C8_PFOA		99	25-150
13C8_PFOS		95	25-150
13C8_PFOSA		90	10-150
13C9_PFNA		102	25-150
d-EtFOSA		71	10-150
d5-EtFOSAA		89	25-150
d9-EtFOSE		89	10-150
d-MeFOSA		81	10-150
d3-MeFOSAA		98	25-150
d7-MeFOSE		92	10-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: **GZA GeoEnvironmental, Inc.** Laboratory ID: **YC25010-006**

Description: **FIELD BLANK** Matrix: **Aqueous**

Date Sampled: **03/22/2023 1600** Project Name: **Oshkosh GW PFAS Sampling**

Date Received: **03/25/2023** Project Number: **20.0157080.00**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	04/05/2023 1542	ARC2	04/04/2023 1742	71805

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	MDL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.2	0.43	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.2	0.59	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.2	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.2	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.2	0.78	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.2	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.2	0.43	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	ND		7.2	1.2	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.2	0.67	ng/L	1
2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)	1691-99-2	PFAS by ID SOP	ND		7.2	0.85	ng/L	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	PFAS by ID SOP	ND		14	1.1	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.2	0.84	ng/L	1
2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)	24448-09-7	PFAS by ID SOP	ND		7.2	1.2	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.6	0.37	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.6	0.70	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.6	0.45	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.6	0.64	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.6	0.55	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.6	0.53	ng/L	1
Perfluorododecanesulfonic acid (PFDOS)	79780-39-5	PFAS by ID SOP	ND		7.2	0.94	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.6	0.49	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		3.6	0.54	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.6	0.47	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.6	0.42	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.6	0.40	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.6	0.62	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.6	0.41	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.6	0.74	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.6	0.49	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.6	0.54	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.6	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.6	0.56	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.6	1.8	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		91	25-150
13C2_6:2FTS		85	25-150
13C2_8:2FTS		83	25-150
13C2_PFDoA		83	25-150
13C2_PFTeDA		82	25-150
13C3_PFBS		91	25-150
13C3_PFHxS		90	25-150
13C3-HFPO-DA		91	25-150
13C4_PFBA		94	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: **GZA GeoEnvironmental, Inc.** Laboratory ID: **YC25010-006**

Description: **FIELD BLANK** Matrix: **Aqueous**

Date Sampled: **03/22/2023 1600** Project Name: **Oshkosh GW PFAS Sampling**

Date Received: **03/25/2023** Project Number: **20.0157080.00**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C4_PFHpA		88	25-150
13C5_PFHxA		90	25-150
13C5_PFPeA		91	25-150
13C6_PFDA		82	25-150
13C7_PFUdA		74	25-150
13C8_PFOA		90	25-150
13C8_PFOS		85	25-150
13C8_PFOSA		85	10-150
13C9_PFNA		87	25-150
d-EtFOSA		52	10-150
d5-EtFOSAA		78	25-150
d9-EtFOSE		82	10-150
d-MeFOSA		57	10-150
d3-MeFOSAA		86	25-150
d7-MeFOSE		78	10-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

QC Summary

PFAS by LC/MS/MS - MB

Sample ID: YQ71668-001
Batch: 71668
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 04/03/2023 1240

Parameter	Result	Q	Dil	LOQ	MDL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	04/10/2023 1646
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	04/10/2023 1646
8:2 FTS	ND		1	8.0	1.6	ng/L	04/10/2023 1646
6:2 FTS	**5.8**	**J**	**1**	**8.0**	**2.0**	**ng/L**	**04/10/2023 1646**
4:2 FTS	ND		1	8.0	0.87	ng/L	04/10/2023 1646
GenX	ND		1	8.0	2.1	ng/L	04/10/2023 1646
ADONA	ND		1	8.0	0.48	ng/L	04/10/2023 1646
EtFOSA	ND		1	8.0	1.4	ng/L	04/10/2023 1646
EtFOSAA	ND		1	8.0	0.75	ng/L	04/10/2023 1646
EtFOSE	ND		1	8.0	0.95	ng/L	04/10/2023 1646
MeFOSA	ND		1	16	1.3	ng/L	04/10/2023 1646
MeFOSAA	ND		1	8.0	0.93	ng/L	04/10/2023 1646
MeFOSE	ND		1	8.0	1.3	ng/L	04/10/2023 1646
PFBS	ND		1	4.0	0.41	ng/L	04/10/2023 1646
PFDS	ND		1	4.0	0.78	ng/L	04/10/2023 1646
PFHpS	ND		1	4.0	0.50	ng/L	04/10/2023 1646
PFNS	ND		1	4.0	0.71	ng/L	04/10/2023 1646
PFOSA	ND		1	4.0	0.61	ng/L	04/10/2023 1646
PFPeS	ND		1	4.0	0.59	ng/L	04/10/2023 1646
PFDOS	ND		1	8.0	1.0	ng/L	04/10/2023 1646
PFHxS	ND		1	4.0	0.55	ng/L	04/10/2023 1646
PFBA	ND		1	4.0	0.60	ng/L	04/10/2023 1646
PFDA	ND		1	4.0	0.52	ng/L	04/10/2023 1646
PFDoA	ND		1	4.0	0.47	ng/L	04/10/2023 1646
PFHpA	ND		1	4.0	0.45	ng/L	04/10/2023 1646
PFHxA	ND		1	4.0	0.69	ng/L	04/10/2023 1646
PFNA	ND		1	4.0	0.46	ng/L	04/10/2023 1646
PFOA	ND		1	4.0	0.83	ng/L	04/10/2023 1646
PFPeA	ND		1	4.0	0.54	ng/L	04/10/2023 1646
PFTeDA	ND		1	4.0	0.60	ng/L	04/10/2023 1646
PFTrDA	ND		1	4.0	0.53	ng/L	04/10/2023 1646
PFUdA	ND		1	4.0	0.63	ng/L	04/10/2023 1646
PFOS	ND		1	4.0	2.0	ng/L	04/10/2023 1646

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		102	25-150
13C2_6:2FTS		97	25-150
13C2_8:2FTS		97	25-150
13C2_PFDoA		100	25-150
13C2_PFTeDA		103	25-150
13C3_PFBS		102	25-150
13C3_PFHxS		105	25-150
13C3-HFPO-DA		97	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ71668-001
Batch: 71668
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 04/03/2023 1240

Surrogate	Q	% Rec	Acceptance Limit
13C4_PFBA		101	25-150
13C4_PFHpA		96	25-150
13C5_PFHxA		92	25-150
13C5_PFPeA		99	25-150
13C6_PFDA		96	25-150
13C7_PFUdA		91	25-150
13C8_PFOA		93	25-150
13C8_PFOS		97	25-150
13C8_PFOSA		91	10-150
13C9_PFNA		94	25-150
d-EtFOSA		71	10-150
d5-EtFOSAA		102	25-150
d9-EtFOSE		82	10-150
d-MeFOSA		74	10-150
d3-MeFOSAA		98	25-150
d7-MeFOSE		85	10-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ71668-002
Batch: 71668
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 04/03/2023 1240

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	15		1	100	50-150	04/10/2023 1657
11Cl-PF3OUdS	15	15		1	102	50-150	04/10/2023 1657
8:2 FTS	15	16		1	104	50-150	04/10/2023 1657
6:2 FTS	15	15		1	102	50-150	04/10/2023 1657
4:2 FTS	15	16		1	109	50-150	04/10/2023 1657
GenX	32	35		1	109	50-150	04/10/2023 1657
ADONA	15	14		1	95	50-150	04/10/2023 1657
EtFOSA	16	16		1	102	50-150	04/10/2023 1657
EtFOSAA	16	16		1	102	50-150	04/10/2023 1657
EtFOSE	16	16		1	98	50-150	04/10/2023 1657
MeFOSA	16	18		1	111	50-150	04/10/2023 1657
MeFOSAA	16	17		1	108	50-150	04/10/2023 1657
MeFOSE	16	17		1	103	50-150	04/10/2023 1657
PFBS	14	15		1	109	50-150	04/10/2023 1657
PFDS	15	16		1	106	50-150	04/10/2023 1657
PFHpS	15	15		1	96	50-150	04/10/2023 1657
PFNS	15	15		1	97	50-150	04/10/2023 1657
PFOSA	16	18		1	111	50-150	04/10/2023 1657
PFPeS	15	17		1	114	50-150	04/10/2023 1657
PFDOS	15	16		1	105	50-150	04/10/2023 1657
PFHxS	15	15		1	103	50-150	04/10/2023 1657
PFBA	16	17		1	108	50-150	04/10/2023 1657
PFDA	16	17		1	104	50-150	04/10/2023 1657
PFDoA	16	17		1	105	50-150	04/10/2023 1657
PFHpA	16	17		1	107	50-150	04/10/2023 1657
PFHxA	16	17		1	106	50-150	04/10/2023 1657
PFNA	16	17		1	104	50-150	04/10/2023 1657
PFOA	16	17		1	105	50-150	04/10/2023 1657
PFPeA	16	16		1	102	50-150	04/10/2023 1657
PFTeDA	16	17		1	104	50-150	04/10/2023 1657
PFTrDA	16	18		1	114	50-150	04/10/2023 1657
PFUdA	16	17		1	104	50-150	04/10/2023 1657
PFOS	15	15		1	101	50-150	04/10/2023 1657

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		109	25-150
13C2_6:2FTS		107	25-150
13C2_8:2FTS		102	25-150
13C2_PFDoA		98	25-150
13C2_PFTeDA		110	25-150
13C3_PFBS		100	25-150
13C3_PFHxS		114	25-150
13C3-HFPO-DA		106	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ71668-002
Batch: 71668
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 04/03/2023 1240

Surrogate	Q	% Rec	Acceptance Limit
13C4_PFBA		103	25-150
13C4_PFHpA		104	25-150
13C5_PFHxA		98	25-150
13C5_PFPeA		101	25-150
13C6_PFDA		100	25-150
13C7_PFUdA		98	25-150
13C8_PFOA		95	25-150
13C8_PFOS		105	25-150
13C8_PFOSA		94	10-150
13C9_PFNA		101	25-150
d-EtFOSA		78	10-150
d5-EtFOSAA		105	25-150
d9-EtFOSE		87	10-150
d-MeFOSA		87	10-150
d3-MeFOSAA		104	25-150
d7-MeFOSE		96	10-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ71805-001
Batch: 71805
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 04/04/2023 1742

Parameter	Result	Q	Dil	LOQ	MDL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	04/05/2023 1256
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	04/05/2023 1256
8:2 FTS	ND		1	8.0	1.6	ng/L	04/05/2023 1256
6:2 FTS	ND		1	8.0	2.0	ng/L	04/05/2023 1256
4:2 FTS	ND		1	8.0	0.87	ng/L	04/05/2023 1256
GenX	ND		1	8.0	2.1	ng/L	04/05/2023 1256
ADONA	ND		1	8.0	0.48	ng/L	04/05/2023 1256
EtFOSA	ND		1	8.0	1.4	ng/L	04/05/2023 1256
EtFOSAA	ND		1	8.0	0.75	ng/L	04/05/2023 1256
EtFOSE	ND		1	8.0	0.95	ng/L	04/05/2023 1256
MeFOSA	ND		1	16	1.3	ng/L	04/05/2023 1256
MeFOSAA	ND		1	8.0	0.93	ng/L	04/05/2023 1256
MeFOSE	ND		1	8.0	1.3	ng/L	04/05/2023 1256
PFBS	ND		1	4.0	0.41	ng/L	04/05/2023 1256
PFDS	ND		1	4.0	0.78	ng/L	04/05/2023 1256
PFHpS	ND		1	4.0	0.50	ng/L	04/05/2023 1256
PFNS	ND		1	4.0	0.71	ng/L	04/05/2023 1256
PFOSA	ND		1	4.0	0.61	ng/L	04/05/2023 1256
PFPeS	ND		1	4.0	0.59	ng/L	04/05/2023 1256
PFDOS	ND		1	8.0	1.0	ng/L	04/05/2023 1256
PFHxS	ND		1	4.0	0.55	ng/L	04/05/2023 1256
PFBA	ND		1	4.0	0.60	ng/L	04/05/2023 1256
PFDA	ND		1	4.0	0.52	ng/L	04/05/2023 1256
PFDoA	ND		1	4.0	0.47	ng/L	04/05/2023 1256
PFHpA	ND		1	4.0	0.45	ng/L	04/05/2023 1256
PFHxA	ND		1	4.0	0.69	ng/L	04/05/2023 1256
PFNA	ND		1	4.0	0.46	ng/L	04/05/2023 1256
PFOA	ND		1	4.0	0.83	ng/L	04/05/2023 1256
PFPeA	ND		1	4.0	0.54	ng/L	04/05/2023 1256
PFTeDA	ND		1	4.0	0.60	ng/L	04/05/2023 1256
PFTrDA	ND		1	4.0	0.53	ng/L	04/05/2023 1256
PFUdA	ND		1	4.0	0.63	ng/L	04/05/2023 1256
PFOS	ND		1	4.0	2.0	ng/L	04/05/2023 1256

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		92	25-150
13C2_6:2FTS		91	25-150
13C2_8:2FTS		87	25-150
13C2_PFDoA		86	25-150
13C2_PFTeDA		87	25-150
13C3_PFBS		92	25-150
13C3_PFHxS		91	25-150
13C3-HFPO-DA		92	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ71805-001
Batch: 71805
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 04/04/2023 1742

Surrogate	Q	% Rec	Acceptance Limit
13C4_PFBA		92	25-150
13C4_PFHpA		90	25-150
13C5_PFHxA		91	25-150
13C5_PFPeA		89	25-150
13C6_PFDA		86	25-150
13C7_PFUdA		82	25-150
13C8_PFOA		92	25-150
13C8_PFOS		90	25-150
13C8_PFOSA		86	10-150
13C9_PFNA		91	25-150
d-EtFOSA		47	10-150
d5-EtFOSAA		84	25-150
d9-EtFOSE		75	10-150
d-MeFOSA		53	10-150
d3-MeFOSAA		91	25-150
d7-MeFOSE		74	10-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ71805-002
Batch: 71805
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 04/04/2023 1742

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	18		1	117	50-150	04/05/2023 1308
11Cl-PF3OUdS	15	16		1	109	50-150	04/05/2023 1308
8:2 FTS	15	18		1	120	50-150	04/05/2023 1308
6:2 FTS	15	17		1	110	50-150	04/05/2023 1308
4:2 FTS	15	18		1	121	50-150	04/05/2023 1308
GenX	32	37		1	115	50-150	04/05/2023 1308
ADONA	15	17		1	111	50-150	04/05/2023 1308
EtFOSA	16	18		1	110	50-150	04/05/2023 1308
EtFOSAA	16	18		1	115	50-150	04/05/2023 1308
EtFOSE	16	18		1	116	50-150	04/05/2023 1308
MeFOSA	16	19		1	121	50-150	04/05/2023 1308
MeFOSAA	16	18		1	111	50-150	04/05/2023 1308
MeFOSE	16	17		1	106	50-150	04/05/2023 1308
PFBS	14	16		1	111	50-150	04/05/2023 1308
PFDS	15	17		1	109	50-150	04/05/2023 1308
PFHpS	15	16		1	103	50-150	04/05/2023 1308
PFNS	15	17		1	111	50-150	04/05/2023 1308
PFOSA	16	19		1	120	50-150	04/05/2023 1308
PFPeS	15	16		1	106	50-150	04/05/2023 1308
PFDOS	15	17		1	107	50-150	04/05/2023 1308
PFHxS	15	15		1	103	50-150	04/05/2023 1308
PFBA	16	18		1	114	50-150	04/05/2023 1308
PFDA	16	16		1	101	50-150	04/05/2023 1308
PFDoA	16	19		1	118	50-150	04/05/2023 1308
PFHpA	16	19		1	116	50-150	04/05/2023 1308
PFHxA	16	18		1	112	50-150	04/05/2023 1308
PFNA	16	19		1	116	50-150	04/05/2023 1308
PFOA	16	18		1	110	50-150	04/05/2023 1308
PFPeA	16	18		1	112	50-150	04/05/2023 1308
PFTeDA	16	19		1	119	50-150	04/05/2023 1308
PFTrDA	16	18		1	109	50-150	04/05/2023 1308
PFUdA	16	18		1	115	50-150	04/05/2023 1308
PFOS	15	17		1	113	50-150	04/05/2023 1308

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		88	25-150
13C2_6:2FTS		83	25-150
13C2_8:2FTS		85	25-150
13C2_PFDoA		86	25-150
13C2_PFTeDA		86	25-150
13C3_PFBS		91	25-150
13C3_PFHxS		89	25-150
13C3-HFPO-DA		90	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ71805-002
Batch: 71805
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 04/04/2023 1742

Surrogate	Q	% Rec	Acceptance Limit
13C4_PFBA		91	25-150
13C4_PFHpA		83	25-150
13C5_PFHxA		91	25-150
13C5_PFPeA		86	25-150
13C6_PFDA		84	25-150
13C7_PFUdA		83	25-150
13C8_PFOA		90	25-150
13C8_PFOS		87	25-150
13C8_PFOSA		84	10-150
13C9_PFNA		88	25-150
d-EtFOSA		47	10-150
d5-EtFOSAA		77	25-150
d9-EtFOSE		75	10-150
d-MeFOSA		50	10-150
d3-MeFOSAA		89	25-150
d7-MeFOSE		83	10-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Chain of Custody
and
Miscellaneous Documents

PaceAnalytical™ Chain of Custody Record

Pace Analytical Services, LLC.
106 Vantage Point Drive
West Columbia, South Carolina 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111
www.pacelabs.com

Number

Client: GZA GeoEnvironmental	Report to Contact: kevin.hedinger@gza.com	Telephone No. / E-mail: kevin.hedinger@gza.com	Quote No.
Address: 17975 W Sarah Lane	Sampler's Signature: X [signature]	Analysis (Attach list if more space is needed)	Page 1 of 1
City: Brookfield; State: WI; Zip Code: 53045	Printed Name: Sheryl Stephenson		Lot # Bar Code (lab use only): YC25010
Project Name: Oshkosh Corp GW			KE51
Project Number: 20.0157080.00	P.O. No.		

Sample ID / Description (Containers for each sample may be combined on one line)	Collection Date(s)	Collection Time (military)	G=Grab C=Composite	Aqueous	Solid	Non-Aqueous		Unpres.	H2SO4	HNO3	HCl	NaOH	5035 Kit	Field Filtered	PFAS
WP-MW-4	3/22/23	1331	G	X				2							X
WP-MW-3	3/22/23	1500	G	X				2							X
WP-MW-1	3/22/23	1504	G	X				2							X
WP-MW-2	3/22/23	1605	G	X				2							X
EQ-BLANK	3/22/23	1605	G	X				2							X
FIELD BLANK	3/22/23	1600	G	X				2							X
TEMP BLANK															

Matrix: Aqueous / Solid / Non-Aqueous. No of Containers by Preservative Type: Unpres. / H2SO4 / HNO3 / HCl / NaOH / 5035 Kit / Field Filtered.

Turn Around Time Required (Prior lab approval required for expedited TAT): [X] Standard [ ] Rush (Please Specify)

Sample Disposal: [ ] Return to Client [X] Disposal by Lab

Possible Hazard Identification (List any known hazards in the remarks): [ ] Non-Hazardous [ ] Flammable [ ] Skin Irritant [ ] SDS provided [ ] Unknown

QC Requirements

Relinquished by	Date	Time	Received by	Date	Time
1. [signature]	3/23/23	1630	1. FEDEX 3/23/23	3/23/23	1630
2.			2.		
3.			3.		
4. FEDEX	3/25/23	0855	4. Laboratory Received by [signature]	3/25/23	0855

Note: All samples are retained for four weeks from receipt unless other arrangements are made

LAB USE ONLY — Received on Ice (Check) [✓] Y [ ] N [ ] Ice Pack — Receipt Temp. 0.6 °C — Temp. Blank [✓] Y / [ ] N

DC#_Title: ENV-FRM-WCOL-0286 v02_Samples Receipt Checklist (SRC)
Effective Date: 8/2/2022

Sample Receipt Checklist (SRC)

Client: GZA Cooler Inspected by/date: CDR / 3/25/23 Lot #: YC25010

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other: _____

☐ Yes	☑ No		1. Were custody seals present on the cooler?
☐ Yes	☐ No	☑ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA Chlorine Strip ID: NA Tested by: CDR

Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: NA

0.8 / 0.8 °C NA / NA °C NA / NA °C NA / NA °C

Method: ☑ Temperature Blank ☐ Against Bottles IR Gun ID: 8 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☑ Yes	☐ No	☐ NA	3. Were all coolers received at or below 6.0°C? If no, was Project Manager notified? PM was Notified by: phone / email / face-to-face (circle one).
☑ Yes	☐ No	☐ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC and all sample containers?
☑ Yes	☐ No		7. Was collection date & time listed on the COC and all sample containers?
☑ Yes	☐ No		8. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		9. Were tests to be performed listed on the COC?
☑ Yes	☐ No		10. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
☑ Yes	☐ No		11. Was adequate sample volume available?
☑ Yes	☐ No		12. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☑ Yes	☐ No		13. Were all samples containers accounted for? (No missing/excess)
☐ Yes	☐ No	☑ NA	14. Were VOA, 8015C and RSK-175 samples free of bubbles >"pea-size" (¼" or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	15. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	16. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	17. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☐ Yes	☑ No	☐ NA	18. Was the quote number listed on the container label? If yes, Quote #

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H_2SO_4, HNO_3, HCl, NaOH using SR # NA. ☐
Time of preservation NA. If more than one preservative is needed, please note in the comments below.

Sample(s) NA were received with bubbles >6 mm in diameter.

Samples(s) NA were received with TRC > 0.5 mg/L (If #19 is *no*) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Unique ID: NA.

Comments:

Qualtrax ID: 56360 Pace® Analytical Services, LLC Page 1 of 1

Report of Analysis

GZA GeoEnvironmental, Inc.
17975 West Sarah Lane, Suite 100
Brookfield, WI 53045
Attention: Sheryl Stephenson

Project Name: Oshkosh

Lot Number:**YG11007**

Date Completed:07/26/2023

07/27/2023 9:22 AM
Approved and released by:
Project Manager II: **Kathy E. Smith**

The electronic signature above is the equivalent of a handwritten signature.

Pace Analytical Services, LLC (*formerly Shealy Environmental Services, Inc.*)
106 Vantage Point Drive West Columbia, SC 29172
Tel: 803-791-9700 Fax: 803-791-9111 www.pacelabs.com

Case Narrative
GZA GeoEnvironmental, Inc.
Lot Number: YG11007

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the Pace Quality Assurance Management Plan (QAMP), applicable Shealy standard operating procedures (SOPs), the 2003 NELAC standard, and Shealy policies. Additionally, the DoD QSM version 5.4 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the QAMP, SOPs, NELAC standards, the DoD QSM, or policies are qualified on the results page or discussed below.

All QC associated with these samples were compliant with DOD QSM 5.4 table B-15 and our PFAS SOP.

Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). The CF is calculated as follows:

CF = DF * FV / Vo

FV is volume of extract (mL)
Vo is initial sample volume (mL)
DF is dilution factor. For undiluted analysis, DF = 1.

Sample concentration for aqueous samples:
Concentration (ng/L) = Cs*CF,

$$C_s = \frac{\left(\frac{(A_s x C_{is})}{A_{is}}\right) - B}{M1}$$

Where

C_s is on column concentration of target analyte in the sample (ng/L)
C_{is} is concentration of internal standard in the sample (ng/L)
A_s is peak response of target analyte in the sample
A_{is} is peak response of internal standard in the sample
M1 is the average RF from ICAL or the slope from linear regression ICAL
B is the y-intercept from the ICAL

Pace is a TNI accredited laboratory; however, the following analyses are currently not listed on our TNI scope of accreditation: Drinking Water: VOC (excluding BTEX, MTBE, Naphthalene, & 1,2-dichloroethane) EPA 524.2, E. coli and Total coliforms SM 9223 B-2004, Solid Chemical Material: TOC Walkley-Black, Biological Tissue: All, Non-Potable Water: SGT-HEM EPA 1664B, Silica EPA 200.7, Boron, Calcium, Silicon, Strontium EPA 200.8, Bicarbonate, Carbonate, and Hydroxide Alkalinity SM 2320 B-2011, SM 9221 C E-2006 & SM 9222D-2006, Strontium SW-846 6010D, VOC SM 6200 B-2011, Fecal Coliform Colilert-18, PFAS by Isotope Dilution SOP.

Pace is a DoD/DoE and TNI accredited laboratory; however, Pace is not accredited for PFAS Direct Aqueous Injection or Method D8421.

If you have any questions regarding this report, please contact the Pace Project Manager listed on the cover page.

PFAS
Sample YG11007-004 had surrogates recover high with a detection. YG11007-004 was analyzed in duplicate and the duplicate confirmed the high surrogate and detection. The data has been reported.

Sample Summary

GZA GeoEnvironmental, Inc.

Lot Number: YG11007

Project Name: Oshkosh

Project Number:

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	WL-MW-4	Aqueous	07/10/2023 1051	07/11/2023
002	WL-MW-3	Aqueous	07/10/2023 1100	07/11/2023
003	WL-MW-2	Aqueous	07/10/2023 1148	07/11/2023
004	WL-MW-1	Aqueous	07/10/2023 1237	07/11/2023
005	DUP-1	Aqueous	07/10/2023	07/11/2023

(5 samples)

Detection Summary

GZA GeoEnvironmental, Inc.

Lot Number: YG11007

Project Name: Oshkosh

Project Number:

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	WL-MW-4	Aqueous	PFBS	PFAS by ID	0.41	J	ng/L	5
001	WL-MW-4	Aqueous	PFBA	PFAS by ID	1.1	J	ng/L	5
002	WL-MW-3	Aqueous	PFBS	PFAS by ID	0.72	J	ng/L	7
002	WL-MW-3	Aqueous	PFBA	PFAS by ID	4.8		ng/L	7
002	WL-MW-3	Aqueous	PFPeA	PFAS by ID	1.1	J	ng/L	7
004	WL-MW-1	Aqueous	6:2 FTS	PFAS by ID	7900		ng/L	11
004	WL-MW-1	Aqueous	4:2 FTS	PFAS by ID	2.4	JQ	ng/L	11
004	WL-MW-1	Aqueous	PFBS	PFAS by ID	5.7		ng/L	11
004	WL-MW-1	Aqueous	PFPeS	PFAS by ID	4.6		ng/L	11
004	WL-MW-1	Aqueous	PFHxS	PFAS by ID	30		ng/L	11
004	WL-MW-1	Aqueous	PFBA	PFAS by ID	890		ng/L	11
004	WL-MW-1	Aqueous	PFHpA	PFAS by ID	680		ng/L	11
004	WL-MW-1	Aqueous	PFHxA	PFAS by ID	2100		ng/L	11
004	WL-MW-1	Aqueous	PFNA	PFAS by ID	4.8		ng/L	11
004	WL-MW-1	Aqueous	PFOA	PFAS by ID	30		ng/L	11
004	WL-MW-1	Aqueous	PFPeA	PFAS by ID	5900		ng/L	11
004	WL-MW-1	Aqueous	PFOS	PFAS by ID	8.7		ng/L	11
005	DUP-1	Aqueous	PFBS	PFAS by ID	8.1		ng/L	13
005	DUP-1	Aqueous	PFPeS	PFAS by ID	3.2	J	ng/L	13
005	DUP-1	Aqueous	PFHxS	PFAS by ID	21		ng/L	13
005	DUP-1	Aqueous	PFBA	PFAS by ID	12		ng/L	13
005	DUP-1	Aqueous	PFHpA	PFAS by ID	2.3	J	ng/L	13
005	DUP-1	Aqueous	PFHxA	PFAS by ID	8.4		ng/L	13
005	DUP-1	Aqueous	PFNA	PFAS by ID	3.8		ng/L	13
005	DUP-1	Aqueous	PFOA	PFAS by ID	3.6		ng/L	13
005	DUP-1	Aqueous	PFPeA	PFAS by ID	13		ng/L	13
005	DUP-1	Aqueous	PFOS	PFAS by ID	3.1	J	ng/L	13

(27 detections)

PFAS by LC/MS/MS

Client: GZA GeoEnvironmental, Inc. | Laboratory ID: YG11007-001
Description: WL-MW-4 | Matrix: Aqueous
Date Sampled: 07/10/2023 1051 | Project Name: Oshkosh
Date Received: 07/11/2023 | Project Number:

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	07/20/2023 1733	BWS	07/17/2023 1609	80134

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	MDL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.9	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	ND		6.9	1.2	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.64	ng/L	1
2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)	1691-99-2	PFAS by ID SOP	ND		6.9	0.82	ng/L	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	PFAS by ID SOP	ND		14	1.1	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.80	ng/L	1
2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)	24448-09-7	PFAS by ID SOP	ND		6.9	1.1	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.41	J	3.4	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorododecanesulfonic acid (PFDOS)	79780-39-5	PFAS by ID SOP	ND		6.9	0.90	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.4	0.47	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.1	J	3.4	0.52	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.4	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.4	0.59	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.4	0.71	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.4	0.47	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		87	25-150
13C2_6:2FTS		85	25-150
13C2_8:2FTS		74	25-150
13C2_PFDoA		75	25-150
13C2_PFTeDA		74	25-150
13C3_PFBS		80	25-150
13C3_PFHxS		81	25-150
13C3-HFPO-DA		79	25-150
13C4_PFBA		63	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: GZA GeoEnvironmental, Inc.
Laboratory ID: YG11007-001
Description: WL-MW-4
Matrix: Aqueous
Date Sampled: 07/10/2023 1051
Project Name: Oshkosh
Date Received: 07/11/2023
Project Number:

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C4_PFHpA		80	25-150
13C5_PFHxA		80	25-150
13C5_PFPeA		80	25-150
13C6_PFDA		78	25-150
13C7_PFUdA		75	25-150
13C8_PFOA		76	25-150
13C8_PFOS		76	25-150
13C8_PFOSA		75	10-150
13C9_PFNA		79	25-150
d-EtFOSA		62	10-150
d5-EtFOSAA		72	25-150
d9-EtFOSE		73	10-150
d-MeFOSA		62	10-150
d3-MeFOSAA		77	25-150
d7-MeFOSE		73	10-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

PFAS by LC/MS/MS

Client: GZA GeoEnvironmental, Inc. | Laboratory ID: YG11007-002
Description: WL-MW-3 | Matrix: Aqueous
Date Sampled: 07/10/2023 1100 | Project Name: Oshkosh
Date Received: 07/11/2023 | Project Number:

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	07/20/2023 1811	BWS	07/17/2023 1609	80134

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	MDL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.2	0.44	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.2	0.60	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.2	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.2	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.2	0.79	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.2	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.2	0.44	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	ND		7.2	1.2	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.2	0.68	ng/L	1
2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)	1691-99-2	PFAS by ID SOP	ND		7.2	0.86	ng/L	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	PFAS by ID SOP	ND		14	1.1	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.2	0.84	ng/L	1
2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)	24448-09-7	PFAS by ID SOP	ND		7.2	1.2	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.72	J	3.6	0.37	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.6	0.70	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.6	0.45	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.6	0.64	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.6	0.55	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.6	0.54	ng/L	1
Perfluorododecanesulfonic acid (PFDOS)	79780-39-5	PFAS by ID SOP	ND		7.2	0.95	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.6	0.50	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	4.8		3.6	0.54	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.6	0.47	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.6	0.43	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.6	0.40	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.6	0.62	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.6	0.42	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.6	0.75	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.1	J	3.6	0.49	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.6	0.54	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.6	0.48	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.6	0.57	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.6	1.8	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		104	25-150
13C2_6:2FTS		105	25-150
13C2_8:2FTS		93	25-150
13C2_PFDoA		94	25-150
13C2_PFTeDA		92	25-150
13C3_PFBS		98	25-150
13C3_PFHxS		93	25-150
13C3-HFPO-DA		91	25-150
13C4_PFBA		79	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: GZA GeoEnvironmental, Inc.
Laboratory ID: YG11007-002
Description: WL-MW-3
Matrix: Aqueous
Date Sampled: 07/10/2023 1100
Project Name: Oshkosh
Date Received: 07/11/2023
Project Number:

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C4_PFHpA		96	25-150
13C5_PFHxA		97	25-150
13C5_PFPeA		98	25-150
13C6_PFDA		89	25-150
13C7_PFUdA		95	25-150
13C8_PFOA		92	25-150
13C8_PFOS		90	25-150
13C8_PFOSA		93	10-150
13C9_PFNA		96	25-150
d-EtFOSA		80	10-150
d5-EtFOSAA		94	25-150
d9-EtFOSE		89	10-150
d-MeFOSA		76	10-150
d3-MeFOSAA		93	25-150
d7-MeFOSE		85	10-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: GZA GeoEnvironmental, Inc. | Laboratory ID: YG11007-003
Description: WL-MW-2 | Matrix: Aqueous
Date Sampled: 07/10/2023 1148 | Project Name: Oshkosh
Date Received: 07/11/2023 | Project Number:

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	07/20/2023 1824	BWS	07/17/2023 1609	80134

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	MDL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.9	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	ND		6.9	1.2	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)	1691-99-2	PFAS by ID SOP	ND		6.9	0.82	ng/L	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	PFAS by ID SOP	ND		14	1.1	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.80	ng/L	1
2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)	24448-09-7	PFAS by ID SOP	ND		6.9	1.1	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.5	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.51	ng/L	1
Perfluorododecanesulfonic acid (PFDOS)	79780-39-5	PFAS by ID SOP	ND		6.9	0.90	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.59	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.5	0.72	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		99	25-150
13C2_6:2FTS		109	25-150
13C2_8:2FTS		89	25-150
13C2_PFDoA		94	25-150
13C2_PFTeDA		95	25-150
13C3_PFBS		97	25-150
13C3_PFHxS		95	25-150
13C3-HFPO-DA		93	25-150
13C4_PFBA		80	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: GZA GeoEnvironmental, Inc.
Laboratory ID: YG11007-003
Description: WL-MW-2
Matrix: Aqueous
Date Sampled: 07/10/2023 1148
Project Name: Oshkosh
Date Received: 07/11/2023
Project Number:

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C4_PFHpA		95	25-150
13C5_PFHxA		97	25-150
13C5_PFPeA		96	25-150
13C6_PFDA		95	25-150
13C7_PFUdA		94	25-150
13C8_PFOA		96	25-150
13C8_PFOS		92	25-150
13C8_PFOSA		92	10-150
13C9_PFNA		97	25-150
d-EtFOSA		76	10-150
d5-EtFOSAA		89	25-150
d9-EtFOSE		92	10-150
d-MeFOSA		75	10-150
d3-MeFOSAA		95	25-150
d7-MeFOSE		86	10-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: GZA GeoEnvironmental, Inc. | Laboratory ID: YG11007-004
Description: WL-MW-1 | Matrix: Aqueous
Date Sampled: 07/10/2023 1237 | Project Name: Oshkosh
Date Received: 07/11/2023 | Project Number:

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	07/20/2023 1837	BWS	07/17/2023 1609	80134
2	SOP SPE	PFAS by ID SOP	50	07/24/2023 1351	BWS	07/17/2023 1609	80134

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	MDL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.56	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	7900		340	85	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	2.4	JQ	6.8	0.74	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	ND		6.8	1.2	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.64	ng/L	1
2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)	1691-99-2	PFAS by ID SOP	ND		6.8	0.81	ng/L	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	PFAS by ID SOP	ND		14	1.1	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.79	ng/L	1
2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)	24448-09-7	PFAS by ID SOP	ND		6.8	1.1	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	5.7		3.4	0.35	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.42	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.60	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	4.6		3.4	0.50	ng/L	1
Perfluorododecanesulfonic acid (PFDOS)	79780-39-5	PFAS by ID SOP	ND		6.8	0.89	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	30		3.4	0.47	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	890		170	25	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	680		170	19	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2100		170	29	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	4.8		3.4	0.39	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	30		3.4	0.70	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	5900		170	23	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	8.7		3.4	1.7	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	328	25-150		112	25-150
13C2_6:2FTS		117	25-150		109	25-150
13C2_8:2FTS		109	25-150		110	25-150
13C2_PFDoA		87	25-150		105	25-150
13C2_PFTeDA		99	25-150		106	25-150
13C3_PFBS		94	25-150		110	25-150
13C3_PFHxS		104	25-150		109	25-150
13C3-HFPO-DA		85	25-150		107	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: GZA GeoEnvironmental, Inc. | Laboratory ID: YG11007-004
Description: WL-MW-1 | Matrix: Aqueous
Date Sampled: 07/10/2023 1237 | Project Name: Oshkosh
Date Received: 07/11/2023 | Project Number:

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C4_PFBA		30	25-150		108	25-150
13C4_PFHpA		99	25-150		105	25-150
13C5_PFHxA		79	25-150		111	25-150
13C5_PFPeA		44	25-150		103	25-150
13C6_PFDA		95	25-150		103	25-150
13C7_PFUdA		92	25-150		104	25-150
13C8_PFOA		87	25-150		106	25-150
13C8_PFOS		93	25-150		108	25-150
13C8_PFOSA		95	10-150		112	10-150
13C9_PFNA		100	25-150		109	25-150
d-EtFOSA		82	10-150		105	10-150
d5-EtFOSAA		90	25-150		109	25-150
d9-EtFOSE		90	10-150		108	10-150
d-MeFOSA		76	10-150		112	10-150
d3-MeFOSAA		95	25-150		110	25-150
d7-MeFOSE		84	10-150		109	10-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: GZA GeoEnvironmental, Inc. | Laboratory ID: YG11007-005
Description: DUP-1 | Matrix: Aqueous
Date Sampled: 07/10/2023 | Project Name: Oshkosh
Date Received: 07/11/2023 | Project Number:

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	07/21/2023 1242	BWS	07/17/2023 1609	80134

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	MDL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.9	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	ND		6.9	1.2	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)	1691-99-2	PFAS by ID SOP	ND		6.9	0.83	ng/L	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	PFAS by ID SOP	ND		14	1.1	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.81	ng/L	1
2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)	24448-09-7	PFAS by ID SOP	ND		6.9	1.1	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	8.1		3.5	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	3.2	J	3.5	0.51	ng/L	1
Perfluorododecanesulfonic acid (PFDOS)	79780-39-5	PFAS by ID SOP	ND		6.9	0.91	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	21		3.5	0.48	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	12		3.5	0.52	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.3	J	3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	8.4		3.5	0.60	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	3.8		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	3.6		3.5	0.72	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	13		3.5	0.47	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	3.1	J	3.5	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		135	25-150
13C2_6:2FTS		106	25-150
13C2_8:2FTS		90	25-150
13C2_PFDoA		86	25-150
13C2_PFTeDA		87	25-150
13C3_PFBS		94	25-150
13C3_PFHxS		92	25-150
13C3-HFPO-DA		91	25-150
13C4_PFBA		57	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: GZA GeoEnvironmental, Inc.			Laboratory ID: YG11007-005
Description: DUP-1			Matrix: Aqueous
Date Sampled: 07/10/2023	Project Name: Oshkosh		
Date Received: 07/11/2023	Project Number:		

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C4_PFHpA		95	25-150
13C5_PFHxA		99	25-150
13C5_PFPeA		87	25-150
13C6_PFDA		91	25-150
13C7_PFUdA		85	25-150
13C8_PFOA		93	25-150
13C8_PFOS		90	25-150
13C8_PFOSA		90	10-150
13C9_PFNA		90	25-150
d-EtFOSA		70	10-150
d5-EtFOSAA		86	25-150
d9-EtFOSE		81	10-150
d-MeFOSA		73	10-150
d3-MeFOSAA		91	25-150
d7-MeFOSE		79	10-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
ND = Not detected at or above the DL	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis			S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

QC Summary

PFAS by LC/MS/MS - MB

Sample ID: YQ80134-001
Batch: 80134
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/17/2023 1609

Parameter	Result	Q	Dil	LOQ	MDL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	07/20/2023 1629
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	07/20/2023 1629
8:2 FTS	ND		1	8.0	1.6	ng/L	07/20/2023 1629
6:2 FTS	ND		1	8.0	2.0	ng/L	07/20/2023 1629
4:2 FTS	ND		1	8.0	0.87	ng/L	07/20/2023 1629
GenX	ND		1	8.0	2.1	ng/L	07/20/2023 1629
ADONA	ND		1	8.0	0.48	ng/L	07/20/2023 1629
EtFOSA	ND		1	8.0	1.4	ng/L	07/20/2023 1629
EtFOSAA	ND		1	8.0	0.75	ng/L	07/20/2023 1629
EtFOSE	ND		1	8.0	0.95	ng/L	07/20/2023 1629
MeFOSA	ND		1	16	1.3	ng/L	07/20/2023 1629
MeFOSAA	ND		1	8.0	0.93	ng/L	07/20/2023 1629
MeFOSE	ND		1	8.0	1.3	ng/L	07/20/2023 1629
PFBS	ND		1	4.0	0.41	ng/L	07/20/2023 1629
PFDS	ND		1	4.0	0.78	ng/L	07/20/2023 1629
PFHpS	ND		1	4.0	0.50	ng/L	07/20/2023 1629
PFNS	ND		1	4.0	0.71	ng/L	07/20/2023 1629
PFOSA	ND		1	4.0	0.61	ng/L	07/20/2023 1629
PFPeS	ND		1	4.0	0.59	ng/L	07/20/2023 1629
PFDOS	ND		1	8.0	1.0	ng/L	07/20/2023 1629
PFHxS	ND		1	4.0	0.55	ng/L	07/20/2023 1629
PFBA	ND		1	4.0	0.60	ng/L	07/20/2023 1629
PFDA	ND		1	4.0	0.52	ng/L	07/20/2023 1629
PFDoA	ND		1	4.0	0.47	ng/L	07/20/2023 1629
PFHpA	ND		1	4.0	0.45	ng/L	07/20/2023 1629
PFHxA	ND		1	4.0	0.69	ng/L	07/20/2023 1629
PFNA	ND		1	4.0	0.46	ng/L	07/20/2023 1629
PFOA	ND		1	4.0	0.83	ng/L	07/20/2023 1629
PFPeA	ND		1	4.0	0.54	ng/L	07/20/2023 1629
PFTeDA	ND		1	4.0	0.60	ng/L	07/20/2023 1629
PFTrDA	ND		1	4.0	0.53	ng/L	07/20/2023 1629
PFUdA	ND		1	4.0	0.63	ng/L	07/20/2023 1629
PFOS	ND		1	4.0	2.0	ng/L	07/20/2023 1629

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		91	25-150
13C2_6:2FTS		98	25-150
13C2_8:2FTS		90	25-150
13C2_PFDoA		89	25-150
13C2_PFTeDA		78	25-150
13C3_PFBS		95	25-150
13C3_PFHxS		91	25-150
13C3-HFPO-DA		91	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ80134-001
Batch: 80134
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/17/2023 1609

Surrogate	Q	% Rec	Acceptance Limit
13C4_PFBA		92	25-150
13C4_PFHpA		97	25-150
13C5_PFHxA		94	25-150
13C5_PFPeA		93	25-150
13C6_PFDA		91	25-150
13C7_PFUdA		96	25-150
13C8_PFOA		91	25-150
13C8_PFOS		94	25-150
13C8_PFOSA		91	10-150
13C9_PFNA		93	25-150
d-EtFOSA		72	10-150
d5-EtFOSAA		88	25-150
d9-EtFOSE		90	10-150
d-MeFOSA		71	10-150
d3-MeFOSAA		95	25-150
d7-MeFOSE		88	10-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ80134-002
Batch: 80134
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/17/2023 1609

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	17		1	117	50-150	07/20/2023 1641
11Cl-PF3OUdS	15	17		1	114	50-150	07/20/2023 1641
8:2 FTS	15	18		1	121	50-150	07/20/2023 1641
6:2 FTS	15	19		1	124	50-150	07/20/2023 1641
4:2 FTS	15	18		1	121	50-150	07/20/2023 1641
GenX	32	34		1	107	50-150	07/20/2023 1641
ADONA	15	18		1	120	50-150	07/20/2023 1641
EtFOSA	16	18		1	114	50-150	07/20/2023 1641
EtFOSAA	16	19		1	119	50-150	07/20/2023 1641
EtFOSE	16	20		1	124	50-150	07/20/2023 1641
MeFOSA	16	18		1	115	50-150	07/20/2023 1641
MeFOSAA	16	18		1	115	50-150	07/20/2023 1641
MeFOSE	16	19		1	121	50-150	07/20/2023 1641
PFBS	14	16		1	112	50-150	07/20/2023 1641
PFDS	15	17		1	107	50-150	07/20/2023 1641
PFHpS	15	18		1	115	50-150	07/20/2023 1641
PFNS	15	17		1	108	50-150	07/20/2023 1641
PFOSA	16	19		1	120	50-150	07/20/2023 1641
PFPeS	15	17		1	112	50-150	07/20/2023 1641
PFDOS	15	15		1	96	50-150	07/20/2023 1641
PFHxS	15	17		1	113	50-150	07/20/2023 1641
PFBA	16	18		1	111	50-150	07/20/2023 1641
PFDA	16	18		1	111	50-150	07/20/2023 1641
PFDoA	16	19		1	118	50-150	07/20/2023 1641
PFHpA	16	17		1	109	50-150	07/20/2023 1641
PFHxA	16	18		1	114	50-150	07/20/2023 1641
PFNA	16	19		1	116	50-150	07/20/2023 1641
PFOA	16	18		1	113	50-150	07/20/2023 1641
PFPeA	16	17		1	108	50-150	07/20/2023 1641
PFTeDA	16	18		1	112	50-150	07/20/2023 1641
PFTrDA	16	17		1	109	50-150	07/20/2023 1641
PFUdA	16	18		1	114	50-150	07/20/2023 1641
PFOS	15	16		1	109	50-150	07/20/2023 1641

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		96	25-150
13C2_6:2FTS		101	25-150
13C2_8:2FTS		94	25-150
13C2_PFDoA		91	25-150
13C2_PFTeDA		87	25-150
13C3_PFBS		92	25-150
13C3_PFHxS		93	25-150
13C3-HFPO-DA		95	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ80134-002
Batch: 80134
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/17/2023 1609

Surrogate	Q	% Rec	Acceptance Limit
13C4_PFBA		97	25-150
13C4_PFHpA		96	25-150
13C5_PFHxA		100	25-150
13C5_PFPeA		96	25-150
13C6_PFDA		93	25-150
13C7_PFUdA		94	25-150
13C8_PFOA		95	25-150
13C8_PFOS		93	25-150
13C8_PFOSA		89	10-150
13C9_PFNA		93	25-150
d-EtFOSA		80	10-150
d5-EtFOSAA		88	25-150
d9-EtFOSE		93	10-150
d-MeFOSA		76	10-150
d3-MeFOSAA		97	25-150
d7-MeFOSE		88	10-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - Duplicate

Sample ID: YG11007-004DU
Batch: 80134
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/17/2023 1609

Parameter	Sample Amount (ng/L)	Result (ng/L)	Q	Dil	% RPD	%RPD Limit	Analysis Date
9Cl-PF3ONS	ND	ND		1	0.00	20	07/20/2023 1849
11Cl-PF3OUdS	ND	ND		1	0.00	20	07/20/2023 1849
8:2 FTS	ND	ND		1	0.00	20	07/20/2023 1849
6:2 FTS	4700	4900	E	1	3.5	20	07/20/2023 1849
4:2 FTS	2.4	2.5	J	1	4.9	20	07/20/2023 1849
GenX	ND	ND		1	0.00	20	07/20/2023 1849
ADONA	ND	ND		1	0.00	20	07/20/2023 1849
EtFOSA	ND	ND		1	0.00	20	07/20/2023 1849
EtFOSAA	ND	ND		1	0.00	20	07/20/2023 1849
EtFOSE	ND	ND		1	0.00	20	07/20/2023 1849
MeFOSA	ND	ND		1	0.00	20	07/20/2023 1849
MeFOSAA	ND	ND		1	0.00	20	07/20/2023 1849
MeFOSE	ND	ND		1	0.00	20	07/20/2023 1849
PFBS	5.7	5.7		1	1.3	20	07/20/2023 1849
PFDS	ND	ND		1	0.00	20	07/20/2023 1849
PFHpS	ND	ND		1	0.00	20	07/20/2023 1849
PFNS	ND	ND		1	0.00	20	07/20/2023 1849
PFOSA	ND	ND		1	0.00	20	07/20/2023 1849
PFPeS	4.6	4.7		1	3.8	20	07/20/2023 1849
PFDOS	ND	ND		1	0.00	20	07/20/2023 1849
PFHxS	30	33		1	9.9	20	07/20/2023 1849
PFBA	870	900	E	1	3.4	20	07/20/2023 1849
PFDA	ND	ND		1	0.00	20	07/20/2023 1849
PFDoA	ND	ND		1	0.00	20	07/20/2023 1849
PFHpA	530	550	E	1	3.6	20	07/20/2023 1849
PFHxA	1600	1700	E	1	9.5	20	07/20/2023 1849
PFNA	4.8	5.0		1	5.1	20	07/20/2023 1849
PFOA	30	32		1	8.6	20	07/20/2023 1849
PFPeA	3600	3800	E	1	3.0	20	07/20/2023 1849
PFTeDA	ND	ND		1	0.00	20	07/20/2023 1849
PFTrDA	ND	ND		1	0.00	20	07/20/2023 1849
PFUdA	ND	ND		1	0.00	20	07/20/2023 1849
PFOS	8.7	9.7		1	10	20	07/20/2023 1849

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS	N	292	25-150
13C2_6:2FTS		109	25-150
13C2_8:2FTS		94	25-150
13C2_PFDoA		81	25-150
13C2_PFTeDA		83	25-150
13C3_PFBS		86	25-150
13C3_PFHxS		91	25-150
13C3-HFPO-DA		77	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - Duplicate

Sample ID: YG11007-004DU
Batch: 80134
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/17/2023 1609

Surrogate	Q	% Rec	Acceptance Limit
13C4_PFBA		27	25-150
13C4_PFHpA		89	25-150
13C5_PFHxA		71	25-150
13C5_PFPeA		42	25-150
13C6_PFDA		84	25-150
13C7_PFUdA		84	25-150
13C8_PFOA		77	25-150
13C8_PFOS		84	25-150
13C8_PFOSA		82	10-150
13C9_PFNA		88	25-150
d-EtFOSA		67	10-150
d5-EtFOSAA		77	25-150
d9-EtFOSE		78	10-150
d-MeFOSA		64	10-150
d3-MeFOSAA		85	25-150
d7-MeFOSE		75	10-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Chain of Custody

and

Miscellaneous Documents

Pace Analytical®

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 149727

Client: G2A GeoEnvironmental	Report to Contact: Sheryl.Stephenson@g2a.com	Telephone No. / E-mail: 262 202 1716	Quote No.
Address: 17975 W Sarah Lane	Sampler's Signature:	Analysis (Attach list if more space is needed)	Page 1 of 1
City: Brookfield	State: WI	Zip Code: 53210	Printed Name: Sheryl Stephenson
Project Name: Oshkosh Corp			YG11007
Project No.	P.O. No.		KE82

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Sample Type: Grab (G) / Composite (C)	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No. of Containers by Preservative Type: Unpres.	HCl	HNO3	H2SO4	NaOH	ASCR Kit	Field Filtered	PFAS	Remarks / Cooler I.D.
WL-MW-4	7/10/23	1051	G	X			2							X	
WL-MW-3	7/10/23	1100	G	X			2							X	
WL-MW-2	7/10/23	1148	G	X			2							X	
WL-MW-1	7/10/23	1237	G	X			2							X	
[illegible]	[illegible]	X													
[illegible]	[illegible]	X													
DUP-1	7/10/23	—	G	X			2							X	

Turn Around Time Requested (Prior lab approval required for expedited TAT)
☐ Standard ☐ Rush (Specify)

Sample Disposal
☐ Return to Client ☐ Disposal by Lab

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

	Date	Time
1. Relinquished by	7/10/23	1700
2. Relinquished by	Date	Time
[illegible]	Date	Time
fedex	7-11-23	1000

	Date	Time
1. Received by: FEDEX	7/10/23	1700
2. Received by	Date	Time
3. Received by	Date	Time
4. Laboratory received by	7/11/23	1000

LAB USE ONLY
Received on Ice (Circle) Yes No Ice Pack
Receipt Temp 3.6 °C
Temp Blank ☐ Y ☑ N

All samples are retained for four weeks from receipt unless other arrangements are made.

Document Number: ME903N2-01

WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

DC#_Title: ENV-FRM-WCOL-0286 v02_Samples Receipt Checklist (SRC)
Effective Date: 8/2/2022

Sample Receipt Checklist (SRC)

Client: GZA Cooler Inspected by/date: KDRW / 07/11/2023 Lot #: YG11007

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other:

☐ Yes	☑ No		1. Were custody seals present on the cooler?
☐ Yes	☐ No	☑ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA Chlorine Strip ID: NA Tested by: NA

Original temperature upon receipt / Derived (Corrected) temperature upon receipt: %Solid Snap-Cup ID: NA

3.6 / 3.6 °C NA / NA °C NA / NA °C NA / NA °C

Method: ☐ Temperature Blank ☑ Against Bottles IR Gun ID: 8 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☑ Yes	☐ No	☐ NA	3. Were all coolers received at or below 6.0°C? If no, was Project Manager notified? PM was Notified by: phone / email / face-to-face (circle one).
☑ Yes	☐ No	☐ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC and all sample containers?
☑ Yes	☐ No		7. Was collection date & time listed on the COC and all sample containers?
☑ Yes	☐ No		8. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		9. Were tests to be performed listed on the COC?
☑ Yes	☐ No		10. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
☑ Yes	☐ No		11. Was adequate sample volume available?
☑ Yes	☐ No		12. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☑ Yes	☐ No		13. Were all samples containers accounted for? (No missing/excess)
☐ Yes	☐ No	☑ NA	14. Were VOA, 8015C and RSK-175 samples free of bubbles >"pea-size" (¼" or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	15. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	16. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	17. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☑ Yes	☐ No	☐ NA	18. Was the quote number listed on the container label? If yes, Quote # 25164

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H2SO4, HNO3, HCl, NaOH using SR # NA. Time of preservation NA. If more than one preservative is needed, please note in the comments below.

Sample(s) NA were received with bubbles >6 mm in diameter.

Samples(s) NA were received with TRC > 0.5 mg/L. (If #19 is ***no***) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Unique ID: NA.

Comments:

Qualtrax ID: 56360 Pace® Analytical Services, LLC Page 1 of 1