

GROUNDWATER ANALYTICAL RESULTS - PFAS

Waukau Lot
Oshkosh, Wisconsin

Location		NR 140 Proposed ES	NR 140 Proposed PAL	WL MW-1	
Sample Name				WH24025-001	WJ23010-001
Laboratory Sample ID				8/19/2021	10/16/2021
Sample Date					
Parameter (ng/L)	CAS Number				
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	NS	NS	<9.2	<22
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	763051-92-9	NS	NS	<13	<30
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	NS	NS	<30	<73
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	NS	NS	10,000	14,000
1H, 1H, 2H, 2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	NS	NS	<17	<40
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	300	30	<39	<95
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	3,000	600	<9.2	<22
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	20	2	<26	<62
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	20	2	<14	<34
2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)	1691-99-2	20	2	<18	<44
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	NS	NS	<24	<58
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	NS	NS	<18	<43
2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)	24448-09-7	NS	NS	<24	<59
Perfluoro-1-butanefluoronic acid (PFBS)	375-73-5	450,000	90,000	<7.9	44 J
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	NS	NS	<15	<36
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	NS	NS	<9.5	<23
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	NS	NS	<14	<33
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	20	2	<12	<28
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	NS	NS	<11	<27
Perfluorododecanesulfonic acid (PFDOS)	79780-39-5	NS	NS	<20	<48
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	40	4	34 J	45 J
Perfluoro-n-butanoic acid (PFBA)	375-22-4	10,000	2,000	460	880
Perfluoro-n-decanoic acid (PFDA)	335-76-2	300	60	<10	<24
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	500	100	<9.0	<22
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	NS	NS	320	590
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	150,000	30,000	1,600	2,200
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	30	3	<8.8	<21
Perfluoro-n-octanoic acid (PFOA)	335-67-1	20	2	41 J	56 J
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	NS	NS	3,200	5,400
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	10,000	2,000	<11	<27
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	NS	NS	<10	<27
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	3,000	600	<12	<27
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	20	2	<38	<27
PFOS + PFOA (Calculated)	PFOS+PFOA	20	2	41 J	56 J

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).



Report of Analysis

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

Project Name: OshKosh Corporation

Project Number: 20.0157080.00

Lot Number: **WJ23010**

Date Completed: 11/12/2021

Kathy Smith

11/12/2021 9:48 AM

Approved and released by:
Project Manager II: **Kathy E. Smith**



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Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
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PACE ANALYTICAL SERVICES, LLC

SC DHEC No: 32010001

NELAC No: E87653

NC DENR No: 329

NC Field Parameters No: 5639

Case Narrative GZA GeoEnvironmental, Inc. Lot Number: WJ23010

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 was in compliance 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). For undiluted analysis. For undiluted analysis, the extract is prepared for injection by adding 182 uL of sample extract + 8 uL of reagent water + 10 uL of internal standard solution to a polypropylene autosampler vial. An extra correction factor of 0.91 (182 uL / 200 uL = 0.91) applies. 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 = 1/0.91.

Sample concentration for aqueous samples:

Concentration (ng/L) = Cs*CF,

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

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 ANALYTICAL SERVICES, LLC

SC DHEC No: 32010001

NELAC No: E87653

NC DENR No: 329

NC Field Parameters No: 5639

Pace is a TNI accredited laboratory; however, the following analyses are currently not listed on our TNI scope of accreditation:

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, Fecal Coliform SM 9221 C E-2006 & SM 9222D-2006, Strontium SW-846 6010D, VOC SM 6200 B-2011, Drinking Water: VOC (excluding BTEX, MTBE, Naphthalene, & 1,2-dichloroethane) EPA 524.2, Solid Chemical Material: TOC Walkley-Black.

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

PACE ANALYTICAL SERVICES, LLC

Sample Summary
GZA GeoEnvironmental, Inc.
Lot Number: WJ23010
Project Name: OshKosh Corporation
Project Number: 20.0157080.00

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	WL-MW-1	Aqueous	10/16/2021 1014	10/20/2021
002	Field Blank	Aqueous	10/16/2021 1024	10/20/2021

(2 samples)

PACE ANALYTICAL SERVICES, LLC

Detection Summary
GZA GeoEnvironmental, Inc.
Lot Number: WJ23010
Project Name: OshKosh Corporation
Project Number: 20.0157080.00

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	WL-MW-1	Aqueous	6:2 FTS	PFAS by ID	14000		ng/L	5
001	WL-MW-1	Aqueous	PFBS	PFAS by ID	44	J	ng/L	5
001	WL-MW-1	Aqueous	PFHxS	PFAS by ID	45	J	ng/L	5
001	WL-MW-1	Aqueous	PFBA	PFAS by ID	880		ng/L	5
001	WL-MW-1	Aqueous	PFHpA	PFAS by ID	590		ng/L	5
001	WL-MW-1	Aqueous	PFHxA	PFAS by ID	2200		ng/L	5
001	WL-MW-1	Aqueous	PFOA	PFAS by ID	56	J	ng/L	5
001	WL-MW-1	Aqueous	PFPeA	PFAS by ID	5400		ng/L	5
002	Field Blank	Aqueous	6:2 FTS	PFAS by ID	24		ng/L	7
002	Field Blank	Aqueous	PFBA	PFAS by ID	1.6	J	ng/L	7
002	Field Blank	Aqueous	PFHpA	PFAS by ID	1.2	J	ng/L	7
002	Field Blank	Aqueous	PFHxA	PFAS by ID	4.6		ng/L	7
002	Field Blank	Aqueous	PFPeA	PFAS by ID	11		ng/L	7

(13 detections)

PFAS by LC/MS/MS

Client: **GZA GeoEnvironmental, Inc.**

Laboratory ID: **WJ23010-001**

Description: **WL-MW-1**

Matrix: **Aqueous**

Date Sampled: **10/16/2021 1014**

Project Name: **OshKosh Corporation**

Date Received: **10/20/2021**

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	11/11/2021 1851	MMM	11/09/2021 1201	21762

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		370	22	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		370	30	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		370	73	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	14000		370	92	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		370	40	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		370	95	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		370	22	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	ND		370	62	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		370	34	ng/L	1
2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)	1691-99-2	PFAS by ID SOP	ND		370	44	ng/L	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	PFAS by ID SOP	ND		730	58	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		370	43	ng/L	1
2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)	24448-09-7	PFAS by ID SOP	ND		370	59	ng/L	1
Perfluoro-1-butanefluoronic acid (PFBS)	375-73-5	PFAS by ID SOP	44	J	180	19	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		180	36	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		180	23	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		180	33	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		180	28	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		370	48	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	45	J	180	25	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	880		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	22	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	590		180	20	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2200		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	56	J	180	38	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	5400		180	25	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	29	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		180	92	ng/L	1

Surrogate	Run 1 Q	Acceptance % Recovery	Limits
13C2_4:2FTS		112	25-150
13C2_6:2FTS		113	25-150
13C2_8:2FTS		94	25-150
13C2_PFDa		90	25-150
13C2_PFTeDA		96	25-150
13C3_PFBS		105	25-150
13C3_PFHxS		106	25-150
13C3-HFPO-DA		112	25-150
13C4_PFBA		105	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

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PFAS by LC/MS/MS

Client: GZA GeoEnvironmental, Inc.	Laboratory ID: WJ23010-001
Description: WL-MW-1	Matrix: Aqueous
Date Sampled: 10/16/2021 1014	Project Name: OshKosh Corporation
Date Received: 10/20/2021	Project Number: 20.0157080.00

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C4_PFHpA		99	25-150
13C5_PFHxA		102	25-150
13C5_PFPeA		98	25-150
13C6_PFDA		116	25-150
13C7_PFUdA		101	25-150
13C8_PFOA		103	25-150
13C8_PFOS		94	25-150
13C8_PFOSA		94	10-150
13C9_PFNA		97	25-150
d-EtFOSA		107	10-150
d5-EtFOSAA		120	25-150
d9-EtFOSE		93	10-150
d-MeFOSA		107	10-150
d3-MeFOSAA		130	25-150
d7-MeFOSE		107	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

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PFAS by LC/MS/MS

Client: **GZA GeoEnvironmental, Inc.**

Laboratory ID: **WJ23010-002**

Description: **Field Blank**

Matrix: **Aqueous**

Date Sampled: **10/16/2021 1024**

Project Name: **OshKosh Corporation**

Date Received: **10/20/2021**

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	11/10/2021 1910	MMM	11/09/2021 1201	21762

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		8.2	0.49	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		8.2	0.68	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		8.2	1.6	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	24		8.2	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		8.2	0.90	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		8.2	2.1	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		8.2	0.50	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	ND		8.2	1.4	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		8.2	0.77	ng/L	1
2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)	1691-99-2	PFAS by ID SOP	ND		8.2	0.98	ng/L	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	PFAS by ID SOP	ND		16	1.3	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		8.2	0.96	ng/L	1
2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)	24448-09-7	PFAS by ID SOP	ND		8.2	1.3	ng/L	1
Perfluoro-1-butanefluoronic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		4.1	0.42	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		4.1	0.80	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		4.1	0.51	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		4.1	0.73	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		4.1	0.63	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		4.1	0.61	ng/L	1
Perfluorododecanesulfonic acid (PFDOS)	79780-39-5	PFAS by ID SOP	ND		8.2	1.1	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		4.1	0.57	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.6	J	4.1	0.61	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		4.1	0.54	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		4.1	0.48	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.2	J	4.1	0.46	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	4.6		4.1	0.70	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		4.1	0.47	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		4.1	0.85	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	11		4.1	0.56	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		4.1	0.61	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		4.1	0.54	ng/L	1
Perfluoro-n-undecanoic acid (PFUDA)	2058-94-8	PFAS by ID SOP	ND		4.1	0.64	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		4.1	2.1	ng/L	1

Surrogate	Run 1 Q	Acceptance % Recovery	Limits
13C2_4:2FTS		121	25-150
13C2_6:2FTS		140	25-150
13C2_8:2FTS		119	25-150
13C2_PFDa		106	25-150
13C2_PFTeDA		105	25-150
13C3_PFBS		115	25-150
13C3_PFHxS		114	25-150
13C3-HFPO-DA		147	25-150
13C4_PFBA		114	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

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PFAS by LC/MS/MS

Client: GZA GeoEnvironmental, Inc.	Laboratory ID: WJ23010-002
Description: Field Blank	Matrix: Aqueous
Date Sampled: 10/16/2021 1024	Project Name: OshKosh Corporation
Date Received: 10/20/2021	Project Number: 20.0157080.00

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C4_PFHpA		118	25-150
13C5_PFHxA		111	25-150
13C5_PFPeA		112	25-150
13C6_PFDA		117	25-150
13C7_PFUdA		105	25-150
13C8_PFOA		123	25-150
13C8_PFOS		112	25-150
13C8_PFOSA		121	10-150
13C9_PFNA		120	25-150
d-EtFOSA		84	10-150
d5-EtFOSAA		126	25-150
d9-EtFOSE		109	10-150
d-MeFOSA		57	10-150
d3-MeFOSAA		122	25-150
d7-MeFOSE		122	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: WQ21762-001

Matrix: Aqueous

Batch: 21762

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP

Prep Date: 11/09/2021 1201

Parameter	Result	Q	Dil	LOQ	MDL	Units	Analysis Date
9CI-PF3ONS	ND		1	8.0	0.48	ng/L	11/10/2021 1806
11CI-PF3OUdS	ND		1	8.0	0.66	ng/L	11/10/2021 1806
8:2 FTS	ND		1	8.0	1.6	ng/L	11/10/2021 1806
6:2 FTS	ND		1	8.0	2.0	ng/L	11/10/2021 1806
4:2 FTS	ND		1	8.0	0.87	ng/L	11/10/2021 1806
GenX	ND		1	8.0	2.1	ng/L	11/10/2021 1806
ADONA	ND		1	8.0	0.48	ng/L	11/10/2021 1806
EtFOSA	ND		1	8.0	1.4	ng/L	11/10/2021 1806
EtFOSAA	ND		1	8.0	0.75	ng/L	11/10/2021 1806
EtFOSE	ND		1	8.0	0.95	ng/L	11/10/2021 1806
MeFOSA	ND		1	16	1.3	ng/L	11/10/2021 1806
MeFOSAA	ND		1	8.0	0.93	ng/L	11/10/2021 1806
MeFOSE	ND		1	8.0	1.3	ng/L	11/10/2021 1806
PFBS	ND		1	4.0	0.41	ng/L	11/10/2021 1806
PFDS	ND		1	4.0	0.78	ng/L	11/10/2021 1806
PFHpS	ND		1	4.0	0.50	ng/L	11/10/2021 1806
PFNS	ND		1	4.0	0.71	ng/L	11/10/2021 1806
PFOSA	ND		1	4.0	0.61	ng/L	11/10/2021 1806
PFPeS	ND		1	4.0	0.59	ng/L	11/10/2021 1806
PFDOS	ND		1	8.0	1.0	ng/L	11/10/2021 1806
PFHxS	ND		1	4.0	0.55	ng/L	11/10/2021 1806
PFBA	ND		1	4.0	0.60	ng/L	11/10/2021 1806
PFDA	ND		1	4.0	0.52	ng/L	11/10/2021 1806
PFDoA	ND		1	4.0	0.47	ng/L	11/10/2021 1806
PFHpA	ND		1	4.0	0.45	ng/L	11/10/2021 1806
PFHxA	ND		1	4.0	0.69	ng/L	11/10/2021 1806
PFNA	ND		1	4.0	0.46	ng/L	11/10/2021 1806
PFOA	ND		1	4.0	0.83	ng/L	11/10/2021 1806
PFPeA	ND		1	4.0	0.54	ng/L	11/10/2021 1806
PFTeDA	ND		1	4.0	0.60	ng/L	11/10/2021 1806
PFTTrDA	ND		1	4.0	0.53	ng/L	11/10/2021 1806
PFUdA	ND		1	4.0	0.63	ng/L	11/10/2021 1806
PFOS	ND		1	4.0	2.0	ng/L	11/10/2021 1806

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		95	25-150
13C2_6:2FTS		93	25-150
13C2_8:2FTS		95	25-150
13C2_PFDoA		87	25-150
13C2_PFTeDA		89	25-150
13C3_PFBs		102	25-150
13C3_PFHxS		93	25-150
13C3-HFPO-DA		115	25-150

LOQ = Limit of Quantitation

ND = Not detected at or above the DL

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and ≥ DL

P = The RPD between two GC columns exceeds 40%

* = RSD is out of criteria

+ = 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: WQ21762-001

Matrix: Aqueous

Batch: 21762

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP

Prep Date: 11/09/2021 1201

Surrogate	Q	% Rec	Acceptance Limit
13C4_PFBa		99	25-150
13C4_PFHpA		101	25-150
13C5_PFHxA		98	25-150
13C5_PFPeA		100	25-150
13C6_PFDA		93	25-150
13C7_PFUdA		88	25-150
13C8_PFOA		97	25-150
13C8_PFOS		94	25-150
13C8_PFOSA		96	10-150
13C9_PFNA		92	25-150
d-EtFOSA		75	10-150
d5-EtFOSAA		111	25-150
d9-EtFOSE		86	10-150
d-MeFOSA		67	10-150
d3-MeFOSAA		106	25-150
d7-MeFOSE		93	10-150

LOQ = Limit of Quantitation

ND = Not detected at or above the DL

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and ≥ DL

P = The RPD between two GC columns exceeds 40%

* = RSD is out of criteria

+ = 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: WQ21762-002

Matrix: Aqueous

Batch: 21762

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP

Prep Date: 11/09/2021 1201

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9CI-PF3ONS	15	15		1	99	50-150	11/10/2021 1817
11CI-PF3OUdS	15	14		1	96	50-150	11/10/2021 1817
8:2 FTS	15	15		1	100	50-150	11/10/2021 1817
6:2 FTS	15	14		1	90	50-150	11/10/2021 1817
4:2 FTS	15	16		1	104	50-150	11/10/2021 1817
GenX	32	33		1	104	50-150	11/10/2021 1817
ADONA	15	15		1	100	50-150	11/10/2021 1817
EtFOSA	16	15		1	95	50-150	11/10/2021 1817
EtFOSAA	16	15		1	95	50-150	11/10/2021 1817
EtFOSE	16	16		1	99	50-150	11/10/2021 1817
MeFOSA	16	18		1	111	50-150	11/10/2021 1817
MeFOSAA	16	13		1	79	50-150	11/10/2021 1817
MeFOSE	16	13		1	83	50-150	11/10/2021 1817
PFBS	14	13		1	92	50-150	11/10/2021 1817
PFDS	15	14		1	93	50-150	11/10/2021 1817
PFHpS	15	15		1	97	50-150	11/10/2021 1817
PFNS	15	15		1	100	50-150	11/10/2021 1817
PFOSA	16	15		1	97	50-150	11/10/2021 1817
PFPeS	15	15		1	98	50-150	11/10/2021 1817
PFDOS	15	13		1	87	50-150	11/10/2021 1817
PFHxS	15	14		1	94	50-150	11/10/2021 1817
PFBA	16	15		1	96	50-150	11/10/2021 1817
PFDA	16	17		1	103	50-150	11/10/2021 1817
PFDoA	16	16		1	102	50-150	11/10/2021 1817
PFHpA	16	15		1	92	50-150	11/10/2021 1817
PFHxA	16	15		1	96	50-150	11/10/2021 1817
PFNA	16	16		1	100	50-150	11/10/2021 1817
PFOA	16	16		1	101	50-150	11/10/2021 1817
PFPeA	16	16		1	98	50-150	11/10/2021 1817
PFTeDA	16	17		1	107	50-150	11/10/2021 1817
PFTTrDA	16	14		1	90	50-150	11/10/2021 1817
PFUdA	16	16		1	98	50-150	11/10/2021 1817
PFOS	15	16		1	108	50-150	11/10/2021 1817

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		105	25-150
13C2_6:2FTS		99	25-150
13C2_8:2FTS		105	25-150
13C2_PFDoA		95	25-150
13C2_PFTeDA		98	25-150
13C3_PFBS		110	25-150
13C3_PFHxS		105	25-150
13C3-HFPO-DA		127	25-150

LOQ = Limit of Quantitation

ND = Not detected at or above the DL

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and ≥ DL

P = The RPD between two GC columns exceeds 40%

* = RSD is out of criteria

+ = 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: WQ21762-002

Matrix: Aqueous

Batch: 21762

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP

Prep Date: 11/09/2021 1201

Surrogate	Q	% Rec	Acceptance Limit
13C4_PFBFA		107	25-150
13C4_PFHpA		109	25-150
13C5_PFHxA		109	25-150
13C5_PFPeA		106	25-150
13C6_PFDA		103	25-150
13C7_PFUdA		99	25-150
13C8_PFOA		104	25-150
13C8_PFOS		101	25-150
13C8_PFOSA		104	10-150
13C9_PFNA		106	25-150
d-EtFOSA		75	10-150
d5-EtFOSAA		127	25-150
d9-EtFOSE		93	10-150
d-MeFOSA		51	10-150
d3-MeFOSAA		146	25-150
d7-MeFOSE		110	10-150

LOQ = Limit of Quantitation

ND = Not detected at or above the DL

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and ≥ DL

P = The RPD between two GC columns exceeds 40%

* = RSD is out of criteria

+ = 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 SERVICES, LLC



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 127141

Client: GTA Construction, Inc Address: 1775 W. Sarah Lane STE 100 City: Brockfield State: WI Zip Code: 53045 Project Name: Oshkosh Corporation	Report to Contact: Mark Hedinger Sampler's Signature: <i>[Signature]</i> Printed Name: Alex Amundson	Telephone No. / E-Mail: 803-791-9700 / m.hedinger@pacelabs.com Analysis: (Attach list if more space is needed)	Quote No.: _____ Page: <u>1</u> of <u>1</u> Barcode: Kit # WJ23010 Kit #2: _____ Remnants / Container I.D.: _____
Project No.: 20-0157080-00 Sample ID / Description: _____ (Containers for each sample may be combined on one line)	P.O. No.: _____ Collection Date: _____ Evaluation Time (Mins): _____	Matrix: _____ No. of Containers by Preservative Type:	Possible Hazard Identification:
Turn Around Time Required (Prior lab approval required for expedited MT.) <input checked="" type="checkbox"/> Standard <input type="checkbox"/> Rush (Specify) _____	Sample Disposal: <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab	Possible Hazard Identification: <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Poison <input type="checkbox"/> Unknown	GC Requirements (Specify)
1. Requisitioned by: <i>[Signature]</i>	Date: 10-14-21 Time: 2000	1. Received by: Felix	Date: 10-19-21 Time: 2000
2. Requisitioned by: _____	Date: _____ Time: _____	2. Received by: _____	Date: _____ Time: _____
3. Requisitioned by: _____	Date: _____ Time: _____	3. Received by: _____	Date: _____ Time: _____
4. Requisitioned by: Felix	Date: 10/16/21 Time: 0915	4. Laboratory retained by: <i>[Signature]</i>	Date: 10/16/21 Time: 0915
Note: All samples are retained for four weeks from receipt unless other arrangements are made.			
LAG USE ONLY Received on ice (C/ice): <input checked="" type="checkbox"/> No <input type="checkbox"/> Ice Pack <input type="checkbox"/>		Receipt Temp: 5.4 °C	

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy
 Document Number: MFC00000-01

PACE ANALYTICAL SERVICES, LLC



Samples Receipt Checklist (SRC) (ME0018C-15)
Issuing Authority: Pace ENV - WCOL

Revised: 9/29/2020
Page 1 of 1

Sample Receipt Checklist (SRC)

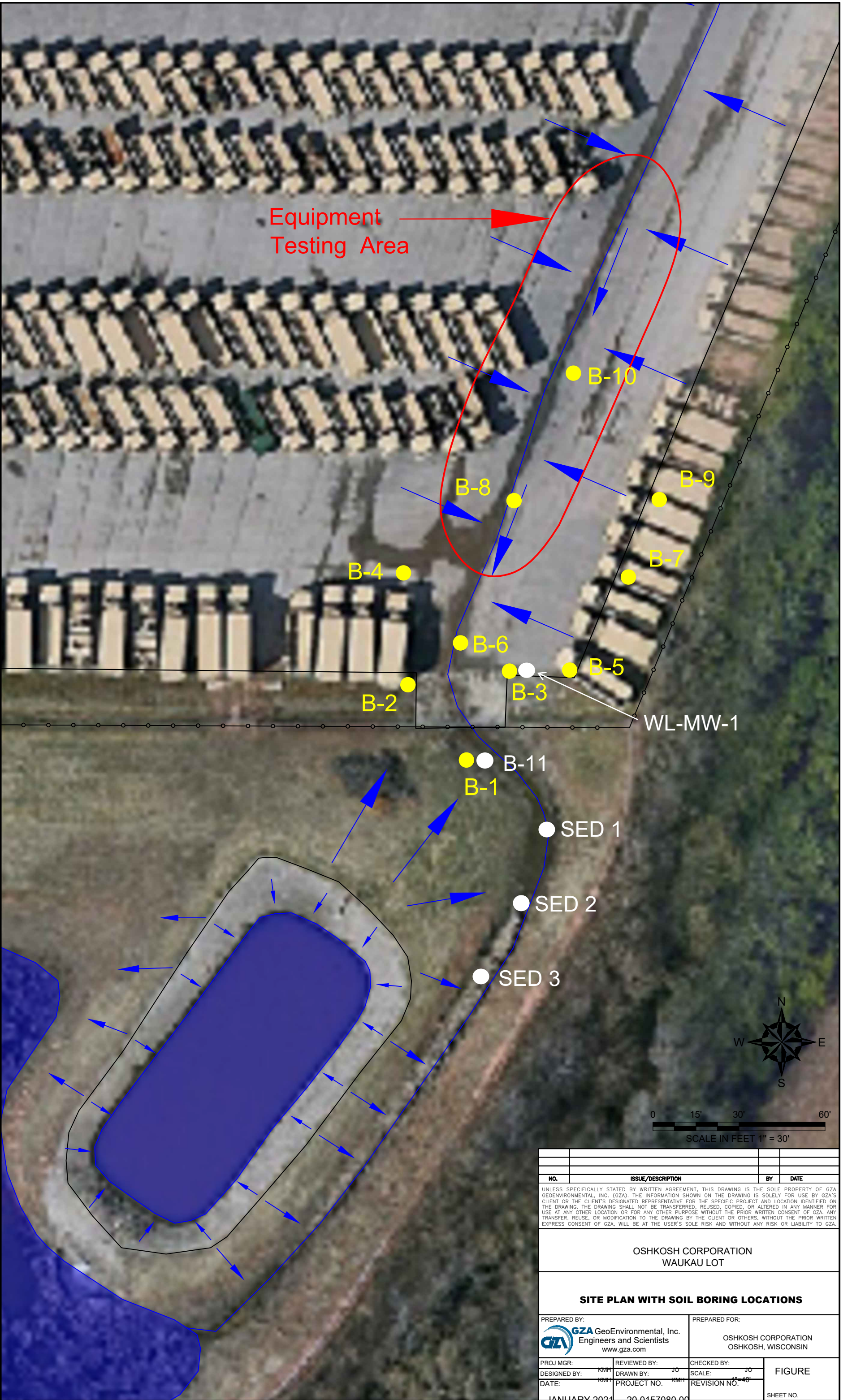
Client: GZA

Cooler Inspected by/date: KSC / 10/23/2021

Lot #: WJ25010

Means of receipt: <input type="checkbox"/> Pace <input type="checkbox"/> Client <input type="checkbox"/> UPS <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> Other:	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	1. Were custody seals present on the cooler?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> 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: <input checked="" type="checkbox"/> Temperature Blank <input type="checkbox"/> Against Bottles IR Gun ID: 5 IR Gun Correction Factor: 0 °C	
Method of coolant: <input checked="" type="checkbox"/> Wet Ice <input type="checkbox"/> Ice Packs <input type="checkbox"/> Dry Ice <input type="checkbox"/> None	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	3. If temperature of any cooler exceeded 6.0°C, was Project Manager Notified? PM was Notified by: phone / email / face-to-face (circle one).
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA	4. Is the commercial courier's packing slip attached to this form?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5. Were proper custody procedures (relinquished/received) followed?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6. Were sample IDs listed on the COC?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	7. Were sample IDs listed on all sample containers?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8. Was collection date & time listed on the COC?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9. Was collection date & time listed on all sample containers?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10. Did all container label information (ID, date, time) agree with the COC?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	11. Were tests to be performed listed on the COC?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	13. Was adequate sample volume available?
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	14. Were all samples received within 1/2 the holding time or 48 hours, whichever comes first?
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	15. Were any samples containers missing/excess (circle one) samples Not listed on COC?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	16. For VOA and RSK-175 samples, were bubbles present >"pea-size" (1/4" or 6mm in diameter) in any of the VOA vials?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	17. Were all DRO/metals/nutrient samples received at a pH of < 2?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	18. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	19. Were all applicable NH ₃ /TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	20. Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc...) correctly transcribed from the COC into the comment section in LIMS?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	21. Was the quote number listed on the container label? If yes, Quote # 25431
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.	
Sample(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 ₂ S ₂ O ₃) with Shealy ID: NA	
SR barcode labels applied by: JRG2 Date: 10/22/2021	
Comments:	

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NO.	ISSUE/DESCRIPTION	BY	DATE

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OSHKOSH CORPORATION
WAUKAU LOT

SITE PLAN WITH SOIL BORING LOCATIONS

PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: OSHKOSH CORPORATION OSHKOSH, WISCONSIN	
PROJ MGR: DESIGNED BY: DATE:	REVIEWED BY: DRAWN BY: PROJECT NO.:	CHECKED BY: SCALE: REVISION NO.:	FIGURE SHEET NO.
JANUARY 2021		20.0157080.00	