



# REVISED SITE INVESTIGATION REPORT Waukau Lot 359 West Waukau Avenue Oshkosh, Wisconsin BRRTS No. 02-71-587405

February 21, 2023 File No. 20.0157080.00

### **PREPARED FOR:**

Oshkosh Defense, LLC c/o Godfrey & Kahn, S.C.

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February 21, 2023 File No. 20.0157080.00

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

Subject: Revised Site Investigation Report

Waukau Lot

359 West Waukau Avenue Oshkosh, Wisconsin BRRTS No. 02-71-587405

Dear Mr. McKnight:

GZA GeoEnvironmental, Inc. (GZA), on behalf of Oshkosh Defense, LLC (Oshkosh/"Client") and its outside legal counsel, Godfrey & Kahn, S.C., has prepared this Revised Site Investigation Report to document a subsurface evaluation for possible per- and poly-fluoroalkyl substances (PFAS) at 359 West Waukau Avenue in Oshkosh, Wisconsin, referred to as the Waukau Lot ("Site").

The investigation focused on evaluating soil and groundwater for the presence of PFAS in the testing area within the Waukau Lot and in the drainage south of the testing area and also upgradient of the testing area. The information contained within this revised report is consistent with the previous Site Investigation Report submitted in March 2021,<sup>1</sup> and the Supplemental Site Investigation Work Plan submitted in June 2022.<sup>2</sup> This revised report includes results of the additional investigation activities performed to evaluate groundwater conditions in the testing area and upgradient of the testing area. At this time, Oshkosh is requesting the Wisconsin Department of Natural Resources' (WDNR) review of the documentation and findings provided in this report and provide its concurrence on our conclusions and path forward.

Should you have any questions or comments, please feel free to contact the undersigned at (262) 754-2578.

Very truly yours,

GZA GeoEnvironmental, Inc.

Kevin M. Hedinger Senior Hydrogeologist John C. Osborne, P.G. Principal Hydrogeologist

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Attachments

cc: Mr. Edward B. Witte, Godfrey & Kahn, S.C. Mr. Kevin Tubbs, Oshkosh Defense, LLC

<sup>&</sup>lt;sup>1</sup> Site Investigation Report, Waukau Lot Site, 359 West Waukau Avenue, Oshkosh, Wisconsin, dated March 29, 2021, GZA File No. 20.0157080.00.

<sup>&</sup>lt;sup>2</sup> Supplemental Site Investigation Work Plan, Oshkosh Defense Waukau Lot, 359 West Waukau Avenue, Oshkosh, Wisconsin, BRRTS No. 02-71-587405, dated June 7, 2022, GZA File No. 20.0157080.00.





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#### 1.0 GENERAL INFORMATION

GZA GeoEnvironmental, Inc. (GZA), on behalf of Godfrey & Kahn, S.C., outside legal counsel for Oshkosh Defense, LLC (Oshkosh/"Client"), has prepared this Revised Site Investigation Report for the property located at 359 West Waukau Avenue in Oshkosh, Wisconsin, referred to as the Waukau Lot ("Site"). This report presents the results of a subsurface investigation designed to evaluate the presence of per- and polyfluoroalkyl substances (PFAS) from testing firefighting vehicles at the Site. On March 29,2021, a Site Investigation Report, along with a Release Notification Form 4400-225, were submitted to the Wisconsin Department of Natural Resources (WDNR). The WDNR subsequently assigned Bureau of Remediation and Redevelopment Tracking System (BRRTS) No. 02-71-587405 to the Site.

In a letter dated October 6, 2021, groundwater sample results from a sample collected from one monitoring well at the Site on September 13, 2021, were submitted to the WDNR. Based on the results, it was determined that one additional groundwater sample would be collected from the monitoring well. The results of the additional sample collected on October 16, 2021, were submitted to the WDNR on November 30, 2021.

The WDNR PFAS Review Committee provided comments to the soil and groundwater data collected at the Site on February 14, 2022, and requested additional monitoring wells be installed to delineate the results identified at the Site. On June 7, 2022, a Supplemental Site Investigation Work Plan was submitted to the WDNR that included installation of three additional monitoring wells and collecting a total of two soil samples, one along the creek east of the Site and one in the drainage ditch from the paved area at the Site.

The Responsible Party for the Site is as follows:

Oshkosh Defense, LLC Mr. Kevin Tubbs 1917 Four Wheel Drive Oshkosh, Wisconsin 54902 ktubbs@oshkoshcorp.com 920-502-3043

The environmental consultant for this project is:

GZA GeoEnvironmental, Inc. Mr. Kevin Hedinger 17975 West Sarah Lane, Suite 100 Brookfield, Wisconsin 53045 kevin.hedinger@gza.com 262-754-2578

The Site name and address is:

Oshkosh Defense, LLC Waukau Lot 359 West Waukau Avenue Oshkosh, Wisconsin 54902

The Site is part of an L-shaped, approximately 32-acre parcel (Parcel ID No. 1413610000) with the investigation area located on the west side of an intermittent creek, referred to as Gallups/Merritts Creek, that crosses through the parcel. The Site includes the far southern portion of the paved area, drainage ditch, and storm water retention ponds. The Site





is located in a mixed commercial and industrial use area within the northeast ¼ of the northeast ¼ of Section 2, Township 17 North, Range 16 East, Winnebago County, Wisconsin, as shown on Figure 1. The WTM91 coordinates for the approximate center of the Site are as follows X: 636656.52473, Y: 390517.95297.

The Site parcel is currently an asphalt-covered lot that is divided by a fence between an area of 5.4 acres for employee parking along the northern portion of the lot and a lot that is approximately 13.6 acres for the storage of decommissioned military vehicles returned to Oshkosh for refurbishing. The northern employee parking lot is accessible by driveways on the north side of the Site along West Waukau Avenue. The southern portion of this lot is accessible through a guarded gate in the center of the northern fence. Currently, the Site is not developed with buildings, except for the small guard building located adjacent to the gate. The far southern portion of the lot area is considered the "Site" for this report and is relatively flat with only slight topographic relief from the north/northwest toward the south/southeast.

Surface water from the Site flows to the southeast corner of the lot and discharges through a drainage ditch. Two ponds are located to the south, which treat and discharge storm water. The runoff in the drainage ditch flows into a natural pond that is further connected to an engineered pond used to contain spills or discharges that emanate from the Site. The engineered pond is constructed to retain light non-aqueous phase liquid (LNAPL) and allow discharge of the water to Gallups/Merritts Creek, located east of the Site. An approximately 4- to 6-foot-high berm separates the drainage ditch from the creek. Gallups/Merritts Creek begins approximately 1 mile southwest of the Site and drains surface water from Wittman Regional Airport, commercial and industrial properties, and agricultural fields before reaching the Site. Downstream of the Site, the creek, when flowing, drains surface water from industrial, commercial, and residential properties before discharging into Lake Winnebago, located approximately 0.8-mile northeast of the Site.

Based on previous use of the Site for testing firefighting vehicles, on behalf of Oshkosh, GZA conducted an investigation to determine if a release to the environment occurred, as summarized in this report. The report is being submitted in consideration of relevant sections of Wisconsin Administrative Code (Wis. Adm. Code) NR 716 to satisfy general site investigation requirements. This report is also subject to the Limitations provided in Appendix A.

#### 1.1 POTENTIAL RECEPTORS

There are no known receptors that are impacted by the testing of firefighting equipment activities at this Site. The testing area is situated in the southwest corner of the approximate 32-acre Oshkosh property. The land use surrounding the Site includes industrial properties to the west, north, and southwest and residential properties to the southeast and east. The closest residential properties are located approximately 600 to 800 feet east-southeast of the Site. The Site is part of a large area that is zoned as heavy industrial that has two smaller areas zoned as single-family residential. The zoning map for the City of Oshkosh is shown below and can be viewed online at <a href="https://www.ci.oshkosh.wi.us/GISOnlineMaps/">https://www.ci.oshkosh.wi.us/GISOnlineMaps/</a>.

The WDNR Water Well database was reviewed for the areas closest to the Site zoned as single-family residential. This review identified well records to the east of the Site along Oregon Street. The well records indicate that the wells were installed from 1942 through 1986 and range in depth from 150 feet to 375 feet.





City of Oshkosh Zoning Map

The Site and area east of the Site is within the City of Oshkosh which supplies municipal drinking water to these properties. City of Oshkosh water is obtained from Lake Winnebago, located east of the Site, which is part of a 5,700 square-mile watershed. A surface water feature crosses the Oshkosh property east of the testing area; however, it is an intermittent stream indicating that it does not receive groundwater discharge continuously throughout the year.

Based on this review there are no receptors affected by the testing activities previously performed at the Site.

#### 1.2 APPLICABLE STANDARDS

As of the date of this report, there are no Wisconsin regulatory standards promulgated for PFAS in soil or groundwater other than an interim drinking water standard of 70 parts per trillion for the sum of perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA). In consideration of adopting groundwater standards for several PFAS within Chapter NR 140 (Wis. Adm. Code), the Wisconsin Department of Health Services (DHS) provided recommended groundwater standards to the WDNR in November 2020. However, the recommended standards have not received the legislative support required for the standards to be adopted by the WDNR. For the purposes of providing guidance and perspective on our Site investigation results, GZA used the DHS-recommended groundwater standards for the 11 PFAS awaiting approval.

There are no recommended or proposed standards for soil other than direction from the WDNR to calculate residual contaminant levels (RCLs) in soils using the United States Environmental Protection Agency (USEPA) Regional Screening Level (RSL) Calculator. Based on a discussion with the WDNR and on several factors, including: 1) the lack of certain PFAS physical/chemical parameters being available; 2) the toxicology data for individual and cumulative effects are frequently being revised; and 3) the lack of groundwater standards, the WDNR has not published calculated RCLs for the soil-to-groundwater pathway. In GZA's review of the RSLs on January 9, 2023, there are only five PFAS in the USEPA calculator database, perfluorobutanesulfonic acid (PFBS), perfluorohexanesulfonic acid (PFHxS), perfluorononanoic acid (PFNA),





PFOS, and PFOA. The resulting soil-to-groundwater RCLs calculated from the information on January 9, 2023, are different than the RCLs calculated by the WDNR in April 2021, during its review of soil-to-groundwater RCLs for the Site. Due to the lack of consistent physical and toxicological information to calculate soil-to-groundwater RCLs, these standards were not calculated for this report.

#### 2.0 BACKGROUND AND SITE HISTORY

At the Waukau Lot, mobile aircraft rescue and firefighting (ARFF) vehicles, manufactured by Oshkosh and equipped with aqueous film forming foam (AFFF) and other fire suppressants, were periodically tested under a controlled testing procedure, overseen by Oshkosh personnel, on the southeastern portion of the Site from October 2013 through October 2019. During this time period, the testing was performed seven times, generally once per year. The AFFF and fire suppressants used during the testing at times contained PFAS. The primary documented AFFF products utilized during this period included:

- ANSULITE LOW VISCOSITY 3x3 (Ansulite 3%) from 2013 through at least 2016;
- SOLBERG® RE-HEALING™ RF3 (Fluorine-Free), 3% Foam Concentrate in 2017 and 2019;
- Buckeye Platinum 3% and Buckeye 3% Mil Spec in 2018; and
- Buckeye 3% Mil Spec in 2019.

The Safety Data Sheets (SDSs) for each of these products are provided in Appendix B.

The testing was performed on, and contained within, the asphalt lot in an area that sloped to a central point that facilitated containment and collection of the AFFF and fire suppressant materials following discharge. An approximately 10- to 15-foot-long dam of absorbent materials was constructed across the lowest discharge point from the asphalt lot to prevent direct drainage into the downgradient ditch and to allow for efficient collection of liquids. The collected materials were removed using a vacuum truck that stored and subsequently transported the liquids off-Site for disposal. Figure 2 shows the general location of the testing within the Waukau Lot, the surface slope of the asphalt lot, and the location of the absorbent dam that was constructed for collection of the discharged material.

Between 2000 and 2006, manufacturing companies committed to reducing the manufacturing of long-chain PFAS, those having a carbon chain length of eight fluorinated carbons, such as PFOS and PFOA. The USEPA indicates that by 2010, 95% of long-chain PFAS was eliminated and by 2015, the elimination of long-chain PFAS manufacturing was reportedly complete.<sup>3</sup>

The testing that was performed at the Waukau Lot is documented and began in October 2013, during this transition period in which long-chain PFAS compounds were replaced with shorter chain PFAS compounds. Therefore, Oshkosh believes that the AFFF used during the testing activities at this Site likely did not contain the long-chain PFAS because by that time, the manufacturers had already converted the AFFF products to next-generation short-chain PFAS.

Interstate Technology & Regulatory Council, History and Use of Per-and Polyfluoroalkyl Substances (PFAS), April 2020.



#### 3.0 GEOLOGIC AND HYDROGEOLOGIC SETTING

The Site is located within a region of Winnebago County characterized by glacially derived, unconsolidated deposits of the Kewaunee Formation ranging from lake sediments associated with glacial Lake Oshkosh to various glacial till units primarily associated with the Kirby Lake Member of the Kewaunee Formation.<sup>4</sup> The till deposits are described as red, clayey silt that contains some coarser-grained deposits and is generally at least 3 meters thick and tend to have low relief, flay-lying topography. In the area of the Site, the Kirby Lake member is reported to include thin (less than 6 feet) patches of lake sediment. Other characteristics of these units include:

- A higher percentage of fine-grained sediment with sand, silt, and clay grain-size distributions averaging 24%, 42%, and 34%, respectively; and
- Measured hydraulic conductivity values in field tests averaging 7.19 x 10<sup>-5</sup> centimeters per second (cm/sec) while laboratory testing indicated averages of 9.46 x 10<sup>-8</sup> cm/sec.

The upper bedrock unit in eastern Winnebago County underlying the Site is dolomite of the Ordivician Sinnipee Group. The bedrock is generally encountered less than 40 feet below ground surface (bgs) in this portion of the County.<sup>5</sup>

While groundwater occurs in both the unconsolidated glacial units and bedrock formations, the glacial deposits are generally not considered part of the regional aquifer system. These fine-grained glacial deposits that cover most of the broad lowlands in the eastern portion of the County are believed to hydraulically confine the underlying bedrock aquifers and tend to restrict groundwater recharge and discharge to shallow and deeper regional groundwater systems. Based on general topography and the location of recharge areas and shallow groundwater discharge zones, the groundwater flow direction in the area of the Site is expected to be predominantly eastward toward Lake Winnebago.

Surface water at the Site is controlled by the slope of the asphalt lot and a drainage ditch that collects water from the asphalt area. The drainage ditch is hydraulically connected to a naturalized pond within the berm area. The pond discharges surface water into and through an engineered, lined pond that is designed to remove LNAPL that may be in the surface water. The water from the lined pond discharges into Gallups/Merritts Creek once the water level reaches the elevation of the discharge pipe.

#### 4.0 INVESTIGATION ACTIVITIES AND METHODS

The investigation activities at the Site consisted of advancing 15 soil borings and installing four monitoring wells for sample collection and analytical testing to determine the presence and potential distribution of PFAS in unsaturated soils and shallow groundwater in the area most likely to be affected. The soil borings and monitoring wells advanced and installed at the Site are shown on Figure 2. The Site area was considered to be south end of the paved area and the drainage ditch extending from this area.

<sup>&</sup>lt;sup>4</sup> Hooyer, T.S., Mode, W.N., 2008, Quaternary Geology of Winnebago County, Wisconsin, Wisconsin Geological and Natural History Survey, Bulletin 105, James M. Robertson, Director, 33 pp.

<sup>&</sup>lt;sup>5</sup> Olcott, P.G., 1966, Geology and Water Resources of Winnebago County, Wisconsin, Geological Water Supply Paper 1814, prepared in cooperation with the University of Wisconsin Geological and Natural History Survey, 61 pp.





#### 4.1 SOIL BORINGS AND SOIL SAMPLING

On November 6, 2020, GZA provided oversight of its subcontractor, On-Site Environmental, Inc. (OSE), during the advancement of eight Geoprobe® borings (WL-B1 through WL-B6, WL-B8, and WL-B10) and two hand auger borings (WL-B7 and WL-B9) on the Site at the locations identified on Figure 2. Prior to initiating field sampling activities, GZA requested confirmation that OSE's Geoprobe® sampling systems, tooling, and ancillary equipment were fully evaluated for the presence of PFAS that could result in inducing impacts to the samples collected. OSE provided GZA with quality assurance/quality control (QA/QC) protocols for deployment of its sampling equipment to ensure that the equipment was PFAS-free and sample integrity was retained.

Borings WL-B1 through WL-B4 and WL-B8, were advanced to a depth of 10 feet bgs, WL-B6 and WL-B10 were advanced to depths of 15 and 14 feet bgs, respectively, and WL-B5 was advanced to 5 feet bgs using the Geoprobe®. Hand auger borings (WL-B7 and WL-B9) were completed to depths of 3 feet bgs in areas where armored vehicles were parked and there was no access for the Geoprobe® rig. Geoprobe® soil samples were collected continuously from the ground surface to the terminus of the borings using 2-inch diameter by 5-foot long, stainless-steel sampling tubes lined with disposable acetate liners. The soil samples were visually observed and classified in accordance with the Unified Soil Classification System (USCS) and then divided into 1-foot intervals for placement into sealable plastic bags. During soil classification and soil handling, activities were completed by personnel wearing disposable latex gloves. Based on the soil classification and observations, discrete intervals were selected, and the samples were placed into laboratory-supplied containers for submittal of laboratory analysis for the Wisconsin list of the PFAS. The physical observations and classification of soils are presented on the soil boring logs, which are provided in Appendix C.

The rationale for each boring was as follows:

- Borings WL-B1, WL-B2, and WL-B3 were located south and immediately downgradient of the edge of the asphalt pavement where the collection dam had been established during testing. The collection dam was established immediately upgradient of the asphalt edge to allow for foam and liquid collection using a vacuum truck on the asphalt. These borings were downslope of the collection dam in an area that would likely receive surface runoff that may have migrated beyond the collection dam during testing or from residual PFAS migrating as surface runoff from the asphalt lot area.
- Borings WL-B4, WL-B6, WL-B8, and WL-B10 were located within the asphalt area where the AFFF was discharged and collected. WL-B-6 was north of the collection dam where AFFF could have accumulated and seeped through cracks in the asphalt pavement. WL-B8 and WL-B10 were located along the centerline of the shallow paved drainageway, which receives runoff from the Waukau lot immediately upgradient from WL-B6. WL-B4 flanked the drainageway to the west and was in an area that appeared to have contained ponded water based on the presence of fine-grained sediment on the asphalt.
- Borings WL-B5, WL-B7, and WL-B9 were located along the east edge of the asphalt. This area is upslope from the drainageway that flows from north to south. It is unlikely that surface flow would have drained into this area and was anticipated to be an unaffected area.

Because of the nature of the AFFF discharges being applied to the surface, the focus of analytical testing for evidence of PFAS impacts was the upper portion of the soil column. Soil samples for laboratory analysis were collected in the upper 3 feet above the water table and from a second sample interval that was above the observed water table at the time of drilling. Therefore, two soil samples from each boring were selected for laboratory analysis, except for borings WL-B1, WL-B2, WL-B5, WL-B7, and WL-B9, in which one soil sample was selected for laboratory analysis and the deeper sample was held by the laboratory pending the results of the shallower interval.





On August 14, 2021, GZA advanced one Geoprobe® boring (WL-B11) to a depth of 15 feet bgs near WL-B1 to collect a soil sample at or near the groundwater interface, and advanced three shallow borings to 0.5 feet bgs using hand tools (WL-SED1, WL-SED2, and WL-SED3) to evaluate soils in the drainage ditch. The drainage ditch did not contain flowing water at the time of sampling. The borings were advanced within the drainage ditch in a depositional area to quantify the potential PFAS in the soils at this location. The locations of WL-B11, WL-SED1, WL-SED2, and WL-SED3 are shown on Figure 2.

On June 17, 2022, GZA advanced one shallow borings to 0.5 feet bgs using hand tools to evaluate the soils conditions along Gallups/Merritts Creek (WL-B12) and in the drainage ditch near the natural pond and (WL-B13). Boring WL-B12 was advanced adjacent to Gallups/Merritts Creek in a depositional area to quantify the potential PFAS in the soil that is being transported by or influenced by the water flow through the creek from off-Site. Boring WL-B13 was advanced in the drainage ditch prior to the pond. The locations of WL-B12 and WL-B13 are shown on Figure 2.

#### 4.2 MONITORING WELL INSTALLATION AND SAMPLING

On August 14, 2021, GZA provided oversight of its subcontractor, OSE, during the installation of one monitoring well (WL-MW-1) in accordance with Wis. Adm. Code NR 141. The monitoring well was installed near soil boring WL-B3 because this is the location at which the AFFF was recovered during testing and the soil samples indicated the presence of PFAS in soil. The soil boring was advanced to a depth of approximately 18.5 feet bgs where auger refusal was encountered. Based on the materials recovered during drilling, this is likely bedrock, as dolomite gravel was recovered. Soil samples were continuously recovered throughout the boring and observations were recorded on a boring log. Soil samples were not collected from this boring for laboratory analysis. Following soil boring activities, the monitoring well was installed in the boring to a depth of approximately 16 feet bgs. The well was constructed with 2-inch-diameter, Schedule 40 polyvinyl chloride (PVC) riser and a 10-foot-long, 0.010-inch, factory slotted well screen. The annular space around the well screen was filled with a sand filter pack to approximately 2 feet above the top of the well screen and the annular space above the sand filter pack was filled with bentonite chips to approximately the surface. The surface of the well was completed with a flush-mount, 8-inch steel manway. The location of the monitoring well is shown on Figure 2.

On June 17, 2022, GZA provided oversight of its subcontractor, OSE, during the installation of two monitoring wells (WL-MW-2 and WL-MW-4) in accordance with Wis. Adm. Code NR 141. The monitoring wells were installed near the northwest and southwest corner of the retention ponds to evaluate PFAS detected in groundwater and to determine the groundwater flow direction at the Site. Monitoring well WL-MW-2 and WL-MW-4 were advanced to a depth of 15 feet bgs.

Monitoring well WL-MW-3 required additional vegetation clearing so it was not installed on June 17, 2022. On July 22, 2022, GZA provided oversight of its subcontractor, OSE, during the installation of one monitoring well (WL-MW-3) in accordance with Wis. Admin. Code NR 141. Monitoring well WL-MW-3 was advanced to a depth of 15 feet bgs. At the base of WL-MW-1 gravel was encountered, which is likely near or at the top of the bedrock surface. Each well was constructed using 2-inch-diameter, Schedule 40 PVC riser and a 10-foot-long, 0.010-inch, factory slotted well screen. The annular space around the well screen was filled with a sand filter pack to approximately 2 feet above the top of the well screen and the annular space above the sand filter pack was filled with bentonite chips to approximately the surface. The surface for WL-MW-1 was completed with a flush-mount, 8-inch steel manway and the surface for WL-MW-2, WL-MW-3, and WL-MW-4 were completed with a 4-inch steel above-grade protective cover. The monitoring well locations are shown on Figure 2.

On July 27, 2022, the monitoring wells were developed by surging the wells and removing a volume of water using a disposable polyethylene bailer. The purpose of the well development is to remove sediment from the sand filter pack and well casing so that a representative sample can be collected. Approximately 20 gallons of groundwater were removed





from each well, or the well was purged dry, during the development process and containerized on-Site until proper disposal is arranged.

On August 3, 2022, GZA performed groundwater sampling activities on the four monitoring wells on-Site using low-flow groundwater sampling techniques. The wells were purged with a peristaltic pump at a rate of 250 to 300 milliliter per minute (ml/min) and the groundwater elevation was monitored to limit the drawdown in the well due to pumping. During purging, a flow-through cell was used to measure the field parameters for temperature, dissolved oxygen (DO), specific conductivity, pH, oxidation-reduction potential (ORP), and turbidity. Purging continued until the field parameters stabilized with acceptable ranges. The flow-through cell was disconnected from the peristaltic pump and the groundwater sample was collected directly from the sample tube into laboratory-supplied sample containers.

The physical observations and classification of soils are presented on the soil boring logs, the monitoring well completion details are presented on the well completion records, and the well development information for each well is included on the well development forms included in Appendix C. If a boring was abandoned following advancement, the abandonment was documented on the boring abandonment forms included in Appendix C.

To conduct the analyses, GZA selected Pace Analytical Services, Inc. (Pace) of West Columbia, South Carolina (formerly Shealy Environmental Services, Inc.), a WDNR-certified laboratory, to provide these laboratory services in Wisconsin. Following collection and recording, the soil samples were placed into laboratory-supplied containers, on ice within an insulated cooler, and submitted to Pace under chain-of-custody protocol. Soil samples were submitted for the analysis of 36 PFAS, which are presently recommended for quantification by the WDNR, by Method 537.1 using the liquid chromatography-tandem mass spectrometry (LC-MS/MS) procedure. The laboratory analytical reports for the soil samples submitted from the Site are provided in Appendix D.

#### 5.0 PRESENTATION AND DISCUSSION OF RESULTS

#### 5.1 SUBSURFACE CONDITIONS

The surface conditions and underlying soil lithology encountered at the Site during the soil boring activities within the asphalt lot consisted of approximately 3 to 4 inches of asphalt underlain by up to 6 inches of base course gravel. The soils beneath the asphalt and base course generally consisted of red/brown clay to a depth of 7 to 10 feet bgs; brown, fine to medium sand and brown silt to a depth of 9 to 13 feet bgs; clay to the maximum depth of 20 feet bgs.

Groundwater was visually observed to be present in the sand and silt layers; however, the clay layers, while appearing moist, did not show evidence of complete saturation. Based on field observations, the groundwater in the sand was noted to be under a slight pressure head, causing the groundwater to rise 2 to 3 feet above the clay/sand interface, depending on the boring, once the boring encountered the sand layer. Therefore, the lower portion of the upper clay unit is also likely saturated. The estimated water table depth, 4 to 8 feet bgs (~766 feet), is approximately 2 to 3 feet below the approximate elevation of the base of the intermittent creek east of the Site. The water levels were measured in August 2022 which is expected to be a seasonal low period for groundwater elevation therefore, discharge of groundwater to the creek is likely seasonal depending on groundwater elevations. The sand layer appeared to be laterally continuous across the area in which borings were advanced. Bedrock was encountered in WL-MW-1 as indicated by the presence of weathered bedrock. Based on the clayey soils encountered at the Site, the hydraulic connection of groundwater to the adjacent creek may be impeded by the low hydraulic conductivity of the clay. Figure 3 shows a cross-section showing the Site geology and topography relative to the adjacent creek.





Groundwater was visually observed to be present in the silt and sand layers encountered. The overlying clay deposit appeared to be moist, but groundwater was not readily apparent. The depths to groundwater in the monitoring wells were measured during groundwater sampling activities at depths of approximately 4 to 10 feet bgs. Based on the groundwater elevations, the groundwater flow is east-northeast at a hydraulic gradient of 0.010 feet per foot (ft/ft). Figure 4 presents the potentiometric surface map showing the resulting groundwater flow direction.

Using assumptions for aquifer properties of hydraulic conductivity and porosity, and the hydraulic gradient measured on August 3, 2022, the average linear velocity of the groundwater is calculated using the following equation:

$$v = \frac{k * i}{n}$$

Where,

v = average linear velocity, ft

 $k = hydraulic conductivity, ft/day = 1.417 ft/day or 5 x <math>10^{-4}$  cm/sec

i = hydraulic gradient, ft/ft = 0.010 ft/ft

n = effective porosity, unitless = 0.30

The hydraulic conductivity indicated above is likely a conservatively high value based on the range presented in Freeze and Cherry<sup>6</sup> and may best represent the most permeable deposits encountered during the investigation. Therefore, this hydraulic conductivity will provide a proportionately conservative average linear velocity. The effective porosity used is considered to be an average porosity for the different geologic materials encountered at the Site. Based on these parameters, the calculated groundwater average linear velocity is 0.047 feet per day (ft/day) or 17.24 feet per year (ft/yr).

#### 5.2 SOIL ANALYTICAL RESULTS

A total of 21 soil samples (WL-B1 through WL-B13) were analyzed for the Wisconsin list of PFAS compounds and four samples (WL-SED1 through WL-SED3 and WL-B11) were analyzed for the list of PFAS detected in the soil in the testing area.

Samples WL-B1 through WL-B13 detected 6 PFAS above the method detection limit (MDL), including 1H,1H,2H,2H-perfluorooctane sulfonic acid (6:2 FTS), PFHxS, perfluorohexanoic acid (PFHxA), PFOA, PFOS, and perfluoropentanoic acid (PFPeA).

The PFAS detected in soil samples from borings in the paved area (WL-B1 through WL-B11) were primarily 6:2 FTS and PFPeA. PFHxA was detected in two of these borings, WL-B5 and WL-B11, which are near the southern edge of the paved area. The reported concentrations of these PFAS are near the respective MDLs indicating there are limited soil impacts in this area.

Soil samples collected from the drainage ditch, WL-SED1 through WL-SED3 and WL-B13, had detections of 6:2 FTS, PFHxS, PFHxA, PFOS, and PFPeA. Of these, PFHxS was only detected in soil samples from WL-B13, and the concentrations was reported as estimated values because the concentration is between the MDL and the limit of quantitation. 6:2 FTS, PFHxA, PFOS, and PFPeA were detected at low-level concentrations in the samples collected from within the drainage ditch.

Soil sample WL-B12 was collected from along Gallups/Merritts Creek and had detections of PFOA and PFOS. The concentration of PFOA is an estimated value because it is between the MDL and the limit of quantitation and the concentration of PFOS is at the MDL.

<sup>&</sup>lt;sup>6</sup> Freeze, R.A. and Cherry, J.A., Groundwater, p. 29, Prentice-Hall, Inc., Englewood Cliffs. 1979.



The analytical results indicate limited PFAS detection in soil samples collected near and downgradient of the testing area. The drainage ditch is a conduit to transmit storm water runoff from the paved area to the natural retention pond to the south. This drainage ditch contains vegetation that slows storm water runoff causing particulates to be deposited in the drainage ditch, which is at an elevation that is above the groundwater interface. It is important to note that Oshkosh, during its testing procedure, installed a collection dam on the paved areas that allowed containment and collection of discharged AFFF. The low-level concentrations detected in the soils are an indication that there was not a significant release of PFAS associated with the testing that was performed on the paved area from 2013 to 2019. In addition, the PFAS detected in the samples are short-chain PFAS as expected based on the timing of the testing. The paved area and the drainage ditch are separated from the area to the east by a berm that contains and controls surface water therefore, we believe the area of potential soil impact is limited to the area investigated.

The highest PFAS concentration detected at the Site was of 6:2 FTS, a short chain fluorotelomer with eight carbon atoms, which, unlike PFOS and PFOA, contains only six completely fluorinated carbon atoms. The structure of this fluorotelomer allows for it to be partially degraded under aerobic groundwater conditions. The biodegradation of 6:2 FTS results in the generation of PFHxA and PFPeA due to the loss of carbon from the chemical structure during the degradation process. 6:2 FTS and its breakdown products are generally believed to be of lower toxicity than PFOS and PFOA due to the shorter carbon chain length, lack of bioaccumulation, and shorter half-lives.<sup>7</sup>

A summary of the soil analytical results is presented on Table 1 and the laboratory analytical report is provided in Appendix D. Figure 5 shows the distribution of PFAS compounds detected above the laboratory MDL in soil samples.

#### 5.3 GROUNDWATER ANALYTICAL RESULTS

Groundwater samples were collected from monitoring well WP-MW-1 during three sampling events and from WP-MW-2 through WP-MW-4 during one sampling event. Monitoring well WL-MW-1 is located near the edge of pavement in the area of testing, WL-MW-2 and WL-MW-4 are located on the western upgradient property boundary and WL-MW-3 is located near the creek at the upstream property boundary. The groundwater analytical sample results from samples collected on August 3, 2022, detected 12 PFAS above the MDLs, including 6:2 FTS, 1H, 1H, 2H, 2H,-perfluorhexane sulfonic acid (4:2 FTS), PFBS, perfluoropentanesulfonic acid (PFPeS), PFHxS, perfluorobutanoic acid (PFBA), perfluoroheptanoic acid (PFHpA), PFHxA, PFNA, PFOA, PFPeA, and PFOS. The laboratory analytical reports are provided in Appendix D and are summarized on Table 2.

A comparison of the groundwater results to the recommended standards indicates that the PFOA groundwater concentrations in monitoring well WL-MW-1 is the only PFAS that exceeds the recommended enforcement standard (ES), as shown in the table below.

Well	PFAS	Recommended ES (ng/L)*	Concentration (ng/L)
WL-MW-1	PFOA	20	38

<sup>\*</sup>ng/L = nanograms per liter.

The other PFAS concentrations in the samples from this monitoring well did not exceed the recommended ESs.

Based on regional groundwater flow conditions, monitoring wells WL-MW-2, WL-MW-3, and WL-MW-4 are located upgradient of the testing area. The results for the sample from monitoring well WL-MW-2 were reported as less than the

<sup>&</sup>lt;sup>7</sup> National Association for Surface Finishing, 6:2 Fluorotelomer Sulfonate (6:2 FTS), Toxicology at a Glance, March 2019.





MDL for the PFAS analyzed. The results for monitoring well WL-MW-3 had detections of six of the PFAS detected in groundwater and the results from WL-MW-4 had detections of two of the PFAS detected in groundwater.

The highest concentrations of PFAS detected in groundwater at the Site were detected in monitoring well WL-MW-1 which is near the testing area. The sample from this well detected seven PFAS that were not detected in the other monitoring wells, including 6:2 FTS, 4:2 FTS, PFPeS, PFHxS, PFHpA, PFNA, and PFOS.

A summary of the soil analytical results is presented on Table 1 and the laboratory analytical report is provided in Appendix D. Figure 6 shows the distribution of PFAS detected above the laboratory MDL in groundwater samples.

#### 6.0 SUMMARY AND CONCLUSIONS

The following summary and conclusions are based on the results of Site investigation activities, analytical results, and historical operations performed at the Site.

- The Waukau Lot was used for testing activities that involved the use of AFFF and fire suppressant substances from October 2013 through October 2019. The testing was performed approximately seven times during this period and was generally performed once per year.
- Best management practices employed by Oshkosh personnel included containing the AFFF to the asphalt lot, which
  was sloped such that it drained to a central point enabling foams and free liquid to be collected with a vacuum truck.
  A collection dam was established at the lowest point on the asphalt to allow for efficient collection of the AFFF and
  removal by the vacuum truck.
- Although the AFFF used during the earlier testing periods did contain PFAS (Ansulite 3%), the testing was performed
  near the end of the phase-out period for the manufacturing of long-chain PFAS. Therefore, the products used during
  the testing, especially most recently, are believed to contain the short-chain PFAS or be fluorine free.
- A total of 17 soil borings were advanced to depths up to 15 feet bgs within the immediate area where AFFF discharged
  and along the upgradient property boundary, from which 21 soil samples were submitted to Pace to identify the
  potential presence of the Wisconsin List of PFAS.
- Underlying a surficial layer of asphalt and base course gravel in the upper 1 foot, geologic conditions consist of low-permeability clay deposits (consistent with till of the regional Kewaunee Formation) extending to a depth of approximately 7 to 10 feet bgs. Sand and silt layers, approximately 3 to 5 feet thick, which may represent patchy lake sediment, were encountered beneath the clay. In the boring advanced to 15 feet bgs, the sand and silt layers are underlain by an additional clay deposit.
- Groundwater was observed in the sand layer and, based on estimated static water levels, is estimated to occur
  approximately 4 to 8 feet bgs. The underlying sand layer appears to be continuous throughout the borings advanced
  on the Site.
- The groundwater flow, as measured on August 3, 2022, is to the east at a hydraulic gradient of 0.01 ft/ft. The groundwater elevation appears to be below the base of Gallups/Merritts Creek. The presence of the low hydraulic conductivity clay soils and the groundwater elevations likely limit the hydraulic connection of the groundwater to the creek.



- Assuming conservatively high values for hydraulic conductivity, an average effective porosity for soil encountered on-Site, and the measured hydraulic gradient on August 3, 2022, the groundwater velocity is estimated at approximately 17 feet/year.
- There are no receptors that are known or expected to be affected by the PFAS-affected soil and groundwater in the testing area. The Site is expected to remain as an industrial property.
- The soil analytical results indicate that six PFAS were detected at concentrations exceeding the MDLs, including 6:2
  FTS, PFHxS, PFHxA, PFOA, PFOS, and PFPeA. The highest concentrations were detected in the samples at the edge of
  the pavement and in the drainage ditch.
- The soil sample collected from near the creek, WL-B12, had detections of PFOA and PFOS, but did not have detections of other PFAS.
- Site groundwater samples detected 12 PFAS above the MDLs, including 6:2 FTS, 4:2 FTS, PFBS, PFPeS, PFHxS, PFBA, PFHpA, PFHxA, PFNA, PFOA, PFPeA, and PFOS.
- The groundwater sample from WL-MW-2 did not have detections of PFAS above the MDLs. Monitoring wells WL-MW-3 and WL-MW-4 had detection of PFAS above the MDLs; however, WL-MW-1 contained the widest range of individual PFAS constituents and at the highest concentrations in the investigation area.
- The PFAS detected in groundwater tend to be predominantly short-chain PFAS, as expected based on the timing of the testing from 2013 through 2019.
- The current investigation results indicate limited magnitude and extent of PFAS in soil and groundwater related to the
  Site. These observed conditions are consistent with the best management practices employed by Oshkosh during
  testing and the limited duration of practices that resulted in the discharge of AFFF at the Site. Therefore, in GZA's
  opinion, these factors indicate there is low potential risk to human health and the environment resulting from the
  residual impacts detected.
- The relatively low-level concentrations of long-chain PFAS (PFOS and PFOA) and the limited presence of shorter chain PFAS (6:2 FTS) support the understanding that Oshkosh employed more recent short-chain AFFF, or PFAS-free formulations that eliminated long-chain PFAS in its mobile AFFF testing activities at the Site. Note that PFHxA and PFPeA, which were also detected, are potential degradation products of 6:2 FTS.

In consideration of these findings, also note that this Site is and will continue to be used for industrial manufacturing with restricted access only through secured gates with security personnel. Additionally, no water supply wells exist at the Site and groundwater in the area of and surrounding the Site is not used for potable drinking water supply, as the City of Oshkosh supplies municipal water to this area of Oshkosh.

#### 7.0 PROPOSED ADDITIONAL GROUNDWATER MONITORING

Based on the results of the previous groundwater monitoring, GZA proposes to perform up to two additional groundwater sampling events of the four monitoring wells on-Site to evaluate the groundwater conditions and to evaluate the seasonal variability, stability, and/or attenuation of PFAS detected in groundwater. The monitoring wells will be sampled using low-flow groundwater sampling techniques and the samples will be submitted for laboratory analysis of the Wisconsin list of PFAS. The groundwater sample results from the investigation will be evaluated to determine if additional investigation activities are necessary.



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Monitoring well MW-1 is the only well that detected PFAS concentrations that exceed the DHS-recommended ES for PFHxS and PFOA. The concentrations of PFHxS in monitoring well MW-1 only exceeded the ES during one of the three sampling events and the PFOA concentrations are indicative of low-level concentrations that slightly exceed the ES.

Equipment testing activities at the Waukau Lot have not been performed by Oshkosh for approximately four years and there are no activities currently being performed at the Site that could be potential source of PFAS. This proposed sampling will evaluate the potential for attenuation of PFAS and will be used to evaluate the appropriate subsequent activities.

#### 8.0 CERTIFICATION

"I, Kevin M. Hedinger, hereby certify that I am a hydrogeologist as that term is defined in s NR 712.03 (1), Wis. Adm. Code, and that, to the best of my knowledge, all of the information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code."

Kevin M. Hedinger

Senior Project Manager / Hydrogeologist

February 21, 2023

Date



# **TABLES**

# TABLE 1 SUMMARY OF SOIL ANALYTICAL RESULTS Waukau Lot Oshkosh, Wisconsin

	Sample ID	Wissonsin	Wisconsin	Soil-to-	WL B-1	WL-B-11	WL B-2	WL	B-3	WL	B-4	WL B-5	WL	B-6
	Wisconsin Non-Industrial	Industrial	,	WL B-1 (1-2')	WL-B11 (5-6')	WL B-2 (1-2')	WL B-3 (1-2')	WL B-3 (6-7')	WL B-4 (1-2')	WL B-4 (4-5')	WL B-5 (1-2')	WL B-6 (1-2')	WL B-6 (4-5)	
Lahr		Direct Contact		VK08048-016	WH17016-001	VK08048-014	VK08048-011	VK08048-012	VK08048-009	VK08048-010	VK08048-013	VK08048-007	VK08048-008	
Labo	oratory Sample ID Sample Date	RCL (μg/kg)	RCL (μg/kg)	RCL (µg/kg)	11/6/2020	8/14/2021	11/6/2020	11/6/2020	11/6/2020	11/6/2020	11/6/2020	11/6/2020	11/6/2020	11/6/2020
Parameter (µg/kg)	CAS Number		(167.167	(P6/ N6/	11/0/2020	0/14/2021	11/0/2020	11/0/2020	11/0/2020	11/0/2020	11/0/2020	11/0/2020	11/0/2020	11,0,2020
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	763051-92-9	NS	NS	NS	< 2.1	NT	< 2.4	< 2.1	< 2.4	< 2.0	< 2.2	< 2.2	< 2.0	< 2.0
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	NS	NS	NS	7.5	4.1	< 2.4	2.5	4.2	2.8	< 2.2	< 2.2	2.0	< 2.0
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	39108-34-4	NS	NS	NS	< 2.1	NT	< 2.4	< 2.1	< 2.4	< 2.0	< 2.2	< 2.2	< 2.0	< 2.0
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	757124-72-4	NS	NS	NS	< 2.1	NT	< 2.4	< 2.1	< 2.4	< 2.0	< 2.2	< 2.2	< 2.0	< 2.0
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-D	13252-13-6	NS	NS	NS	< 4.2	NT	< 4.7	< 4.2	< 4.8	< 4.0	< 4.4	< 4.5	< 4.0	< 4.0
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	919005-14-4	NS	NS	NS	< 2.1	NT	< 2.4	< 2.1	< 2.4	< 2.0	< 2.2	< 2.2	< 2.0	< 2.0
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	756426-58-1	NS	NS	NS	< 2.1	NT	< 2.4	< 2.1	< 2.4	< 2.0	< 2.2	< 2.2	< 2.0	< 2.0
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	NS	NS	NS	< 2.1	NT	< 2.4	< 2.1	< 2.4	< 2.0	< 2.2	< 2.2	< 2.0	< 2.0
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	NS	NS	NS	< 2.1	NT	< 2.4	< 2.1	< 2.4	< 2.0	< 2.2	< 2.2	< 2.0	< 2.0
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	NS	NS	NS	< 1.0	NT	< 1.2	< 1.0	< 1.2	< 1.0	< 1.1	< 1.1	< 0.99	< 1.0
Perfluorobutanoic Acid (PFBA)	375-22-4	NS	NS	NS	< 1.0	NT	< 1.2	< 1.0	< 1.2	< 1.0	< 1.1	< 1.1	< 0.99	< 1.0
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	NS	NS	NS	< 1.0	NT	< 1.2	< 1.0	< 1.2	< 1.0	< 1.1	< 1.1	< 0.99	< 1.0
Perfluorodecanoic Acid (PFDA)	335-76-2	NS	NS	NS	< 1.0	NT	< 1.2	< 1.0	< 1.2	< 1.0	< 1.1	< 1.1	< 0.99	< 1.0
Perfluorododecanoic Acid (PFDoA)	307-55-1	NS	NS	NS	< 1.0	NT	< 1.2	< 1.0	< 1.2	< 1.0	< 1.1	< 1.1	< 0.99	< 1.0
Perfluoroheptanesulfonic Acid (PFHPS)	375-92-8	NS	NS	NS	< 1.0	NT	< 1.2	< 1.0	< 1.2	< 1.0	< 1.1	< 1.1	< 0.99	< 1.0
Perfluoroheptanoic Acid (PFHpA)	375-85-9	NS	NS	NS	< 1.0	NT	< 1.2	< 1.0	< 1.2	< 1.0	< 1.1	< 1.1	< 0.99	< 1.0
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	NS	NS	NS	< 1.0	NT	< 1.2	< 1.0	< 1.2	< 1.0	< 1.1	< 1.1	< 0.99	< 1.0
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	NS	NS	NS	< 1.0	0.28 J	< 1.2	< 1.0	< 1.2	< 1.0	< 1.1	1.2	< 0.99	< 1.0
Perfluorononanesulfonic Acid (PFNS)	68259-12-1	NS	NS	NS	< 1.0	NT	< 1.2	< 1.0	< 1.2	< 1.0	< 1.1	< 1.1	< 0.99	< 1.0
Perfluorononanoic Acid (PFNA)	375-95-1	NS	NS	NS	< 1.0	NT	< 1.2	< 1.0	< 1.2	< 1.0	< 1.1	< 1.1	< 0.99	< 1.0
Perfluorooctanesulfonamide (FOSA)	754-91-6	NS	NS	NS	< 1.0	NT	< 1.2	< 1.0	< 1.2	< 1.0	< 1.1	< 1.1	< 0.99	< 1.0
Perfluoro-n-octanoic acid (PFOA)	335-67-1	1,260	16,400	NS	< 1.0	<1.1	< 1.2	< 1.0	< 1.2	< 1.0	< 1.1	< 1.1	< 0.99	< 1.0
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	1,260	16,400	NS	< 1.0	<1.1	< 1.2	< 1.0	< 1.2	< 1.0	< 1.1	< 1.1	< 0.99	< 1.0
PFOS + PFOA (Calculated)	PFOS+PFOA	1,260	16,400	NS	ND	ND	ND							
Perfluoropentanesulfonic Acid (PFPeS)	2706-91-4	NS	NS	NS	< 1.0	NT	< 1.2	< 1.0	< 1.2	< 1.0	< 1.1	< 1.1	< 0.99	< 1.0
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	NS	NS	NS	< 1.0	0.46 J	< 1.2	< 1.0	1.6	< 1.0	< 1.1	2.3	< 0.99	< 1.0
Perfluorotetradecanoic Acid (PFTA)	376-06-7	NS	NS	NS	< 1.0	NT	< 1.2	< 1.0	< 1.2	< 1.0	< 1.1	< 1.1	< 0.99	< 1.0
Perfluorotridecanoic Acid (PFTrDA)	72629-94-8	NS	NS	NS	< 1.0	NT	< 1.2	< 1.0	< 1.2	< 1.0	< 1.1	< 1.1	< 0.99	< 1.0
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	NS	NS	NS	< 1.0	NT	< 1.2	< 1.0	< 1.2	< 1.0	< 1.1	< 1.1	< 0.99	< 1.0

# TABLE 1 SUMMARY OF SOIL ANALYTICAL RESULTS Waukau Lot Oshkosh, Wisconsin

		1	140	Soil-to-		1					1	ī	
	Sample ID		consin		WL B-7	WL	. B-8	WL B-9	WL	B-10	WL-SED-1	WL-SED-2	WL-SED-3
	Non-Industrial	Direct Contact	Groundwate r Pathway	WL B-7 (1-2')	WL B-8 (1-2')	WL B-8 (4-5')	WL B-9 (1-2')	WL B-10 (1-2')	WL B-10 (4-5')	WL-SED 1 (0-0.5')	WL-SED 2 (0-0.5')	WL-SED 3 (0-0.5')	
Labo	oratory Sample ID	Direct Contact	RCL	RCL	VK08048-018	VK08048-005	VK08048-006	VK08048-019	VK08048-003	VK08048-004	WH17016-002	WH17016-003	WH17016-004
	Sample Date	RCL (μg/kg)	(μg/kg)	(µg/kg)	11/6/2020	11/6/2020	11/6/2020	11/6/2020	11/6/2020	11/6/2020	8/14/2021	8/14/2021	8/14/2021
Parameter (μg/kg)	CAS Number												
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	763051-92-9	NS	NS	NS	< 1.9	< 2.2	< 2.2	< 2.2	< 2.5	< 1.9	NT	NT	NT
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	NS	NS	NS	< 1.9	< 2.2	< 2.2	< 2.2	< 2.5	< 1.9	41	9.3	5.1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	39108-34-4	NS	NS	NS	< 1.9	< 2.2	< 2.2	< 2.2	< 2.5	< 1.9	NT	NT	NT
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	757124-72-4	NS	NS	NS	< 1.9	< 2.2	< 2.2	< 2.2	< 2.5	< 1.9	NT	NT	NT
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-D	13252-13-6	NS	NS	NS	< 3.9	< 4.4	< 4.5	< 4.4	< 5.1	< 3.8	NT	NT	NT
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	919005-14-4	NS	NS	NS	< 1.9	< 2.2	< 2.2	< 2.2	< 2.5	< 1.9	NT	NT	NT
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	756426-58-1	NS	NS	NS	< 1.9	< 2.2	< 2.2	< 2.2	< 2.5	< 1.9	NT	NT	NT
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	NS	NS	NS	< 1.9	< 2.2	< 2.2	< 2.2	< 2.5	< 1.9	NT	NT	NT
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	NS	NS	NS	< 1.9	< 2.2	< 2.2	< 2.2	< 2.5	< 1.9	NT	NT	NT
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	NS	NS	NS	< 0.97	< 1.1	< 1.1	< 1.1	< 1.3	< 0.94	NT	NT	NT
Perfluorobutanoic Acid (PFBA)	375-22-4	NS	NS	NS	< 0.97	< 1.1	< 1.1	< 1.1	< 1.3	< 0.94	NT	NT	NT
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	NS	NS	NS	< 0.97	< 1.1	< 1.1	< 1.1	< 1.3	< 0.94	NT	NT	NT
Perfluorodecanoic Acid (PFDA)	335-76-2	NS	NS	NS	< 0.97	< 1.1	< 1.1	< 1.1	< 1.3	< 0.94	NT	NT	NT
Perfluorododecanoic Acid (PFDoA)	307-55-1	NS	NS	NS	< 0.97	< 1.1	< 1.1	< 1.1	< 1.3	< 0.94	NT	NT	NT
Perfluoroheptanesulfonic Acid (PFHPS)	375-92-8	NS	NS	NS	< 0.97	< 1.1	< 1.1	< 1.1	< 1.3	< 0.94	NT	NT	NT
Perfluoroheptanoic Acid (PFHpA)	375-85-9	NS	NS	NS	< 0.97	< 1.1	< 1.1	< 1.1	< 1.3	< 0.94	NT	NT	NT
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	NS	NS	NS	< 0.97	< 1.1	< 1.1	< 1.1	< 1.3	< 0.94	NT	NT	NT
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	NS	NS	NS	< 0.97	< 1.1	< 1.1	< 1.1	< 1.3	< 0.94	2.7	4.6	4.3
Perfluorononanesulfonic Acid (PFNS)	68259-12-1	NS	NS	NS	< 0.97	< 1.1	< 1.1	< 1.1	< 1.3	< 0.94	NT	NT	NT
Perfluorononanoic Acid (PFNA)	375-95-1	NS	NS	NS	< 0.97	< 1.1	< 1.1	< 1.1	< 1.3	< 0.94	NT	NT	NT
Perfluorooctanesulfonamide (FOSA)	754-91-6	NS	NS	NS	< 0.97	< 1.1	< 1.1	< 1.1	< 1.3	< 0.94	NT	NT	NT
Perfluoro-n-octanoic acid (PFOA)	335-67-1	1,260	16,400	NS	< 0.97	< 1.1	< 1.1	< 1.1	< 1.3	< 0.94	<1.6	<1.4	<1.3
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	1,260	16,400	NS	< 0.97	< 1.1	< 1.1	< 1.1	< 1.3	< 0.94	<u>3.9</u>	<u>5.1</u>	<u>2.8</u>
PFOS + PFOA (Calculated)	PFOS+PFOA	1,260	16,400	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND
Perfluoropentanesulfonic Acid (PFPeS)	2706-91-4	NS	NS	NS	< 0.97	< 1.1	< 1.1	< 1.1	< 1.3	< 0.94	NT	NT	NT
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	NS	NS	NS	< 0.97	< 1.1	< 1.1	1.8	< 1.3	< 0.94	2.9	17	15
Perfluorotetradecanoic Acid (PFTA)	376-06-7	NS	NS	NS	< 0.97	< 1.1	< 1.1	< 1.1	< 1.3	< 0.94	NT	NT	NT
Perfluorotridecanoic Acid (PFTrDA)	72629-94-8	NS	NS	NS	< 0.97	< 1.1	< 1.1	< 1.1	< 1.3	< 0.94	NT	NT	NT
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	NS	NS	NS	< 0.97	< 1.1	< 1.1	< 1.1	< 1.3	< 0.94	NT	NT	NT

# TABLE 1 SUMMARY OF SOIL ANALYTICAL RESULTS Waukau Lot Oshkosh, Wisconsin

	Wisconsin Non-Industrial	Wisconsin Industrial Direct Contact	Soil-to- Groundwate r Pathway	WL-B12 WL-B12 (0-0.5')	WL-B-13 WL-B13 (0-0.5')	
Labo	Direct Contact RCL (µg/kg)	RCL	RCL	XF21008-001	XF21008-002	
	Sample Date					6/17/2022
Parameter (μg/kg)	CAS Number					
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	763051-92-9	NS	NS	NS	<2.5	<5.0
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	NS	NS	NS	<2.5	7.6
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	39108-34-4	NS	NS	NS	<2.5	<5.0
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	757124-72-4	NS	NS	NS	<2.5	<5.0
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-D	13252-13-6	NS	NS	NS	<5.0	<9.9
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	919005-14-4	NS	NS	NS	<2.5	<5.0
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	756426-58-1	NS	NS	NS	<2.5	<5.0
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	NS	NS	NS	<2.5	<5.0
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	NS	NS	NS	<2.5	<5.0
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	NS	NS	NS	<1.2	<2.5
Perfluorobutanoic Acid (PFBA)	375-22-4	NS	NS	NS	<1.2	<2.5
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	NS	NS	NS	<1.2	<2.5
Perfluorodecanoic Acid (PFDA)	335-76-2	NS	NS	NS	<1.2	<2.5
Perfluorododecanoic Acid (PFDoA)	307-55-1	NS	NS	NS	<1.2	<2.5
Perfluoroheptanesulfonic Acid (PFHPS)	375-92-8	NS	NS	NS	<1.2	<2.5
Perfluoroheptanoic Acid (PFHpA)	375-85-9	NS	NS	NS	<1.2	<2.5
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	NS	NS	NS	<1.2	0.86 J
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	NS	NS	NS	<1.2	1.2 J
Perfluorononanesulfonic Acid (PFNS)	68259-12-1	NS	NS	NS	<1.2	<2.5
Perfluorononanoic Acid (PFNA)	375-95-1	NS	NS	NS	<1.2	<2.5
Perfluorooctanesulfonamide (FOSA)	754-91-6	NS	NS	NS	<1.2	<2.5
Perfluoro-n-octanoic acid (PFOA)	335-67-1	1,260	16,400	NS	0.46J	<2.5
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	1,260	16,400	NS	<u>1.2</u>	<u>4.7</u>
PFOS + PFOA (Calculated)	PFOS+PFOA	1,260	16,400	NS	1.2	4.7
Perfluoropentanesulfonic Acid (PFPeS)	2706-91-4	NS	NS	NS	<1.2	<2.5
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	NS	NS	NS	<1.2	2.0 J
Perfluorotetradecanoic Acid (PFTA)	376-06-7	NS	NS	NS	<1.2	<2.5
Perfluorotridecanoic Acid (PFTrDA)	72629-94-8	NS	NS	NS	<1.2	<2.5
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	NS	NS	NS	<1.2	<2.5

#### Notes:

- 1. Results are presented in micrograms per kilogram ( $\mu g/kg$ ).
- 2. "ND" indicates the parameters used in the calculation were not detected; and "NT" indicates the sample was not tested for that parameter.
- 3. "J"-flagged concentrations indicate that the estimated result is less than the Limit of Quantitation (LOQ) and

# TABLE 2 SUMMARY OF GROUNDWATER ANALYTICAL RESULTS Waukau Lot Oshkosh, Wisconsin

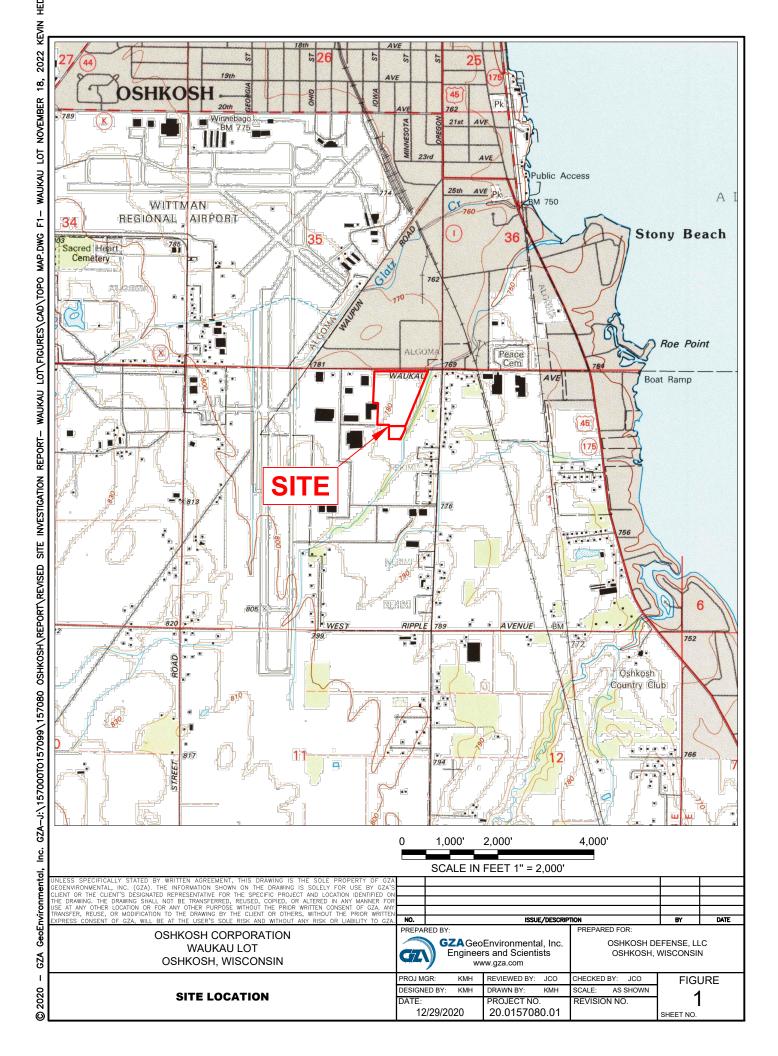
	DHS- Recommende	DHS- Recommende		WL-MW-1		WL-MW-2	WL-MW-3	WL-MW-4	
Labor	Laboratory Sample ID		d	WH24025-001	WJ23010-001	XH08006-001	XH08006-002	XH08006-003	XH08006-004
	Sample Date	ES	PAL	8/19/2021	10/16/2021	8/3/2022	8/3/2022	8/3/2022	8/3/2022
Parameter (ng/L)	CAS Number								
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	NS	NS	<9.2	<22	<7.0	<7.0	<7.7	<7.3
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	763051-92-9	NS	NS	<13	<30	<7.0	<7.0	<7.7	<7.3
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	NS	NS	<30	<73	<7.0	<7.0	<7.7	<7.3
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	NS	NS	10,000	14,000	7,600 B	<7.0	<7.7	<7.3
1H, 1H, 2H, 2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	NS	NS	<17	<40	2.5 JQ	<7.0	<7.7	<7.3
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	300	30	<39	<95	<7.0	<7.0	<7.7	<7.3
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	3,000	600	<9.2	<22	<7.0	<7.0	<7.7	<7.3
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	20	2	<26	<62	<7.0	<7.0	<7.7	<7.3
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	20	2	<14	<34	<7.0	<7.0	<7.7	<7.3
2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)	1691-99-2	20	2	<18	<44	<7.0	<7.0	<7.7	<7.3
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	NS	NS	<24	<58	<14	<14	<15	<15
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	NS	NS	<18	<43	<7.0	<7.0	<7.7	<7.3
2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)	24448-09-7	NS	NS	<24	<59	<7.0	<7.0	<7.7	<7.3
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	450,000	90,000	<7.9	44 J	<3.5 S	<3.5	0.73 J	0.95 J
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	NS	NS	<15	<36	<3.5	<3.5	<3.9	<3.6
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	NS	NS	<9.5	<23	<3.5	<3.5	<3.9	<3.6
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	NS	NS	<14	<33	<3.5	<3.5	<3.9	<3.6
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	20	2	<12	<28	<3.5	<3.5	<3.9	<3.6
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	NS	NS	<11	<27	4.6	<3.5	<3.9	<3.6
Perfluorododecanesulfonic acid (PFDOS)	79780-39-5	NS	NS	<20	<48	<7.0	<7.0	<7.7	<7.3
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	40	4	34 J	45 J	34	<3.5	<3.9	<3.6
Perfluoro-n-butanoic acid (PFBA)	375-22-4	10,000	2,000	460	880	850	<3.5	5.4	3.7
Perfluoro-n-decanoic acid (PFDA)	335-76-2	300	60	<10	<24	<3.5	<3.5	<3.9	<3.6
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	500	100	<9.0	<22	<3.5	<3.5	<3.9	<3.6
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	NS	NS	320	590	590	<3.5	<3.9	<3.6
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	150,000	30,000	1,600	2,200	2,100	<3.5	1.1 J	<3.6
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	30	3	<8.8	<21	5.6	<3.5	<3.9	<3.6
Perfluoro-n-octanoic acid (PFOA)	335-67-1	20	2	<u>41 J</u>	<u>56 J</u>	38	<3.5	1.1 J	<3.6
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	NS	NS	3,200	5,400	6,100	<3.5	2.9 J	<3.6
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	10,000	2,000	<11	<27	<3.5	<3.5	<3.9	<3.6
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	NS	NS	<10	<27	<3.5	<3.5	<3.9	<3.6
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	3,000	600	<12	<27	<3.5	<3.5	<3.9	<3.6
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	20	2	<38	<27		<3.5	<3.9	<3.6
PFOS + PFOA (Calculated)	PFOS+PFOA	20	2	<u>41 J</u>	<u>56 J</u>	<u>47.9</u>	<3.5	1.1 J	<3.6

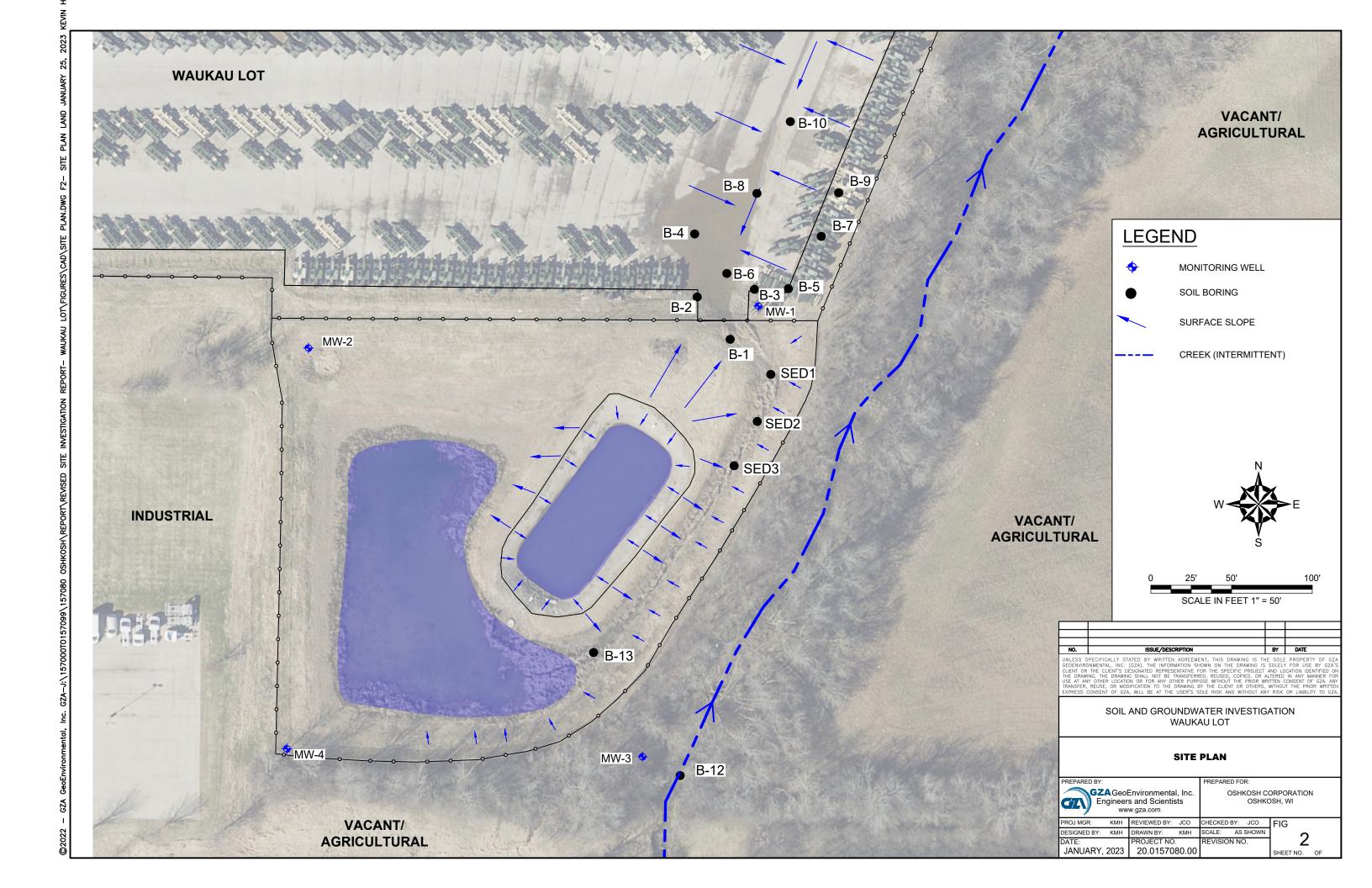
#### Notes

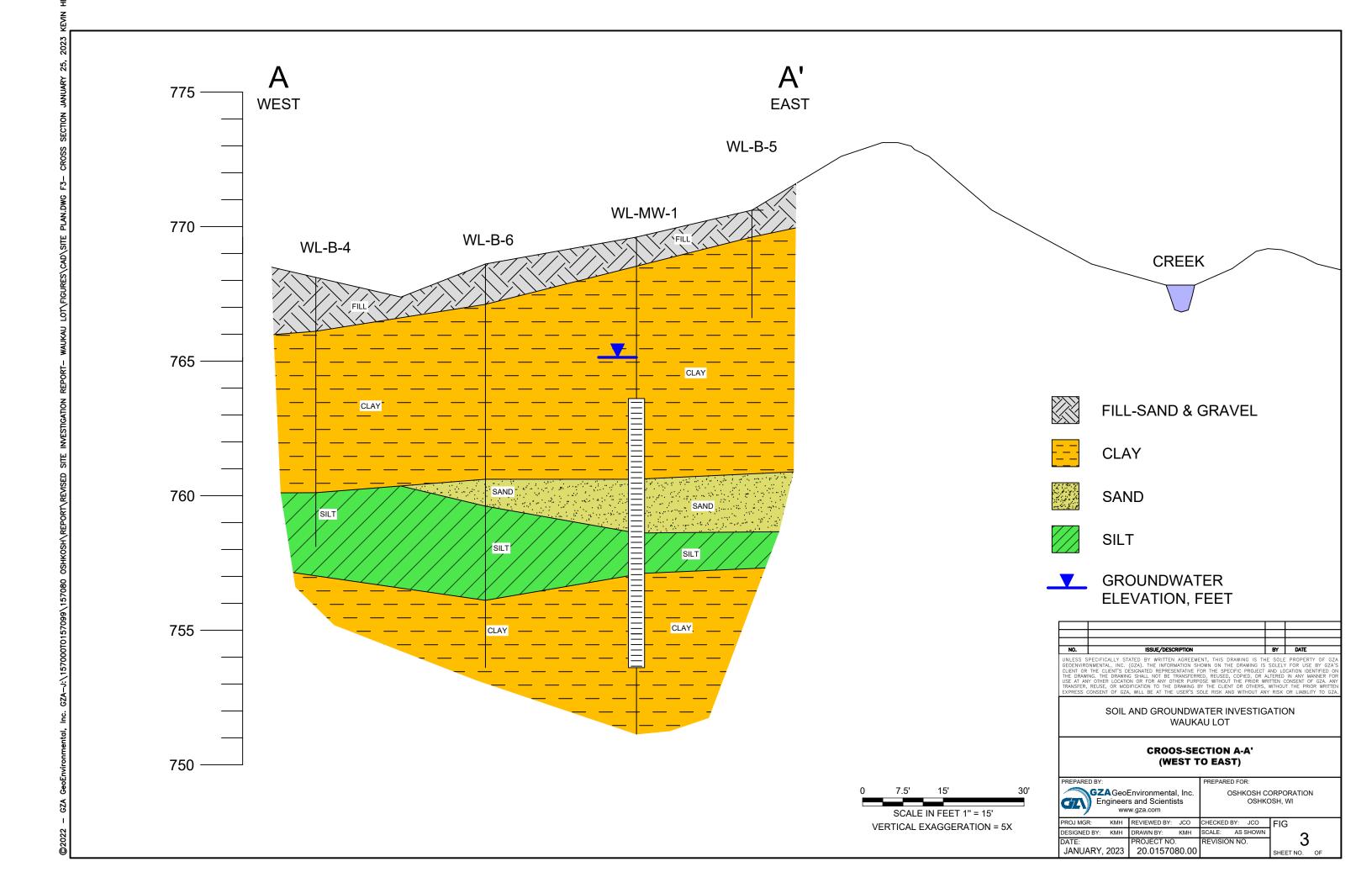
- 1. Samples were collected by GZA GeoEnvironmental, Inc. on the date indicated.
- 2. Results are presented in nanograms per liter (ng/L).
- 3. "J"-flagged concentrations indicate that the estimated result is less than the Limit of Quantitation (LOQ) and greater than or equal to the Method Detection Limit (DL).
- 4. "B"- detected in the method blank
- 5. "Q"-Surrogate failure
- 6. MS/MSD failure

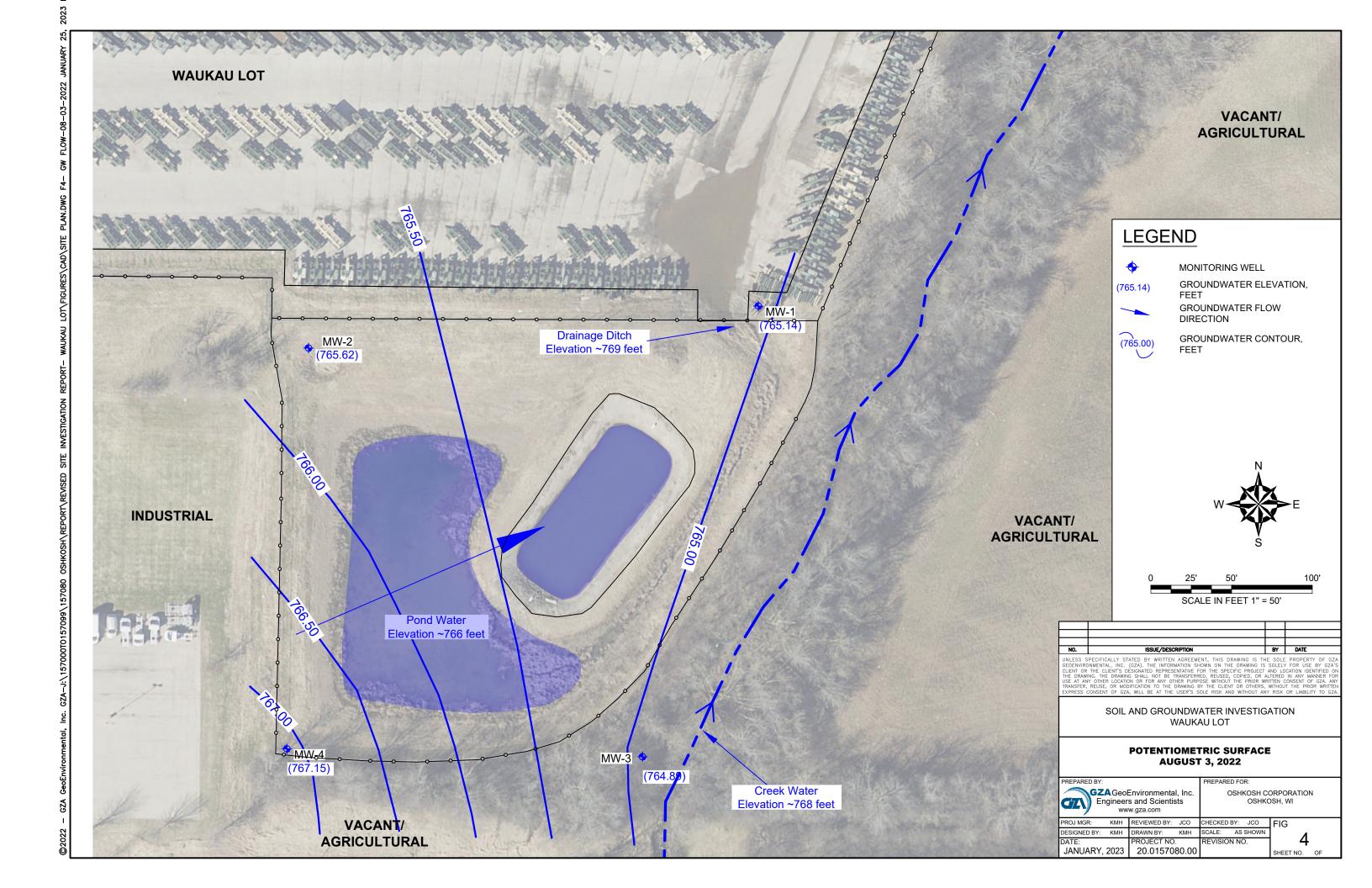


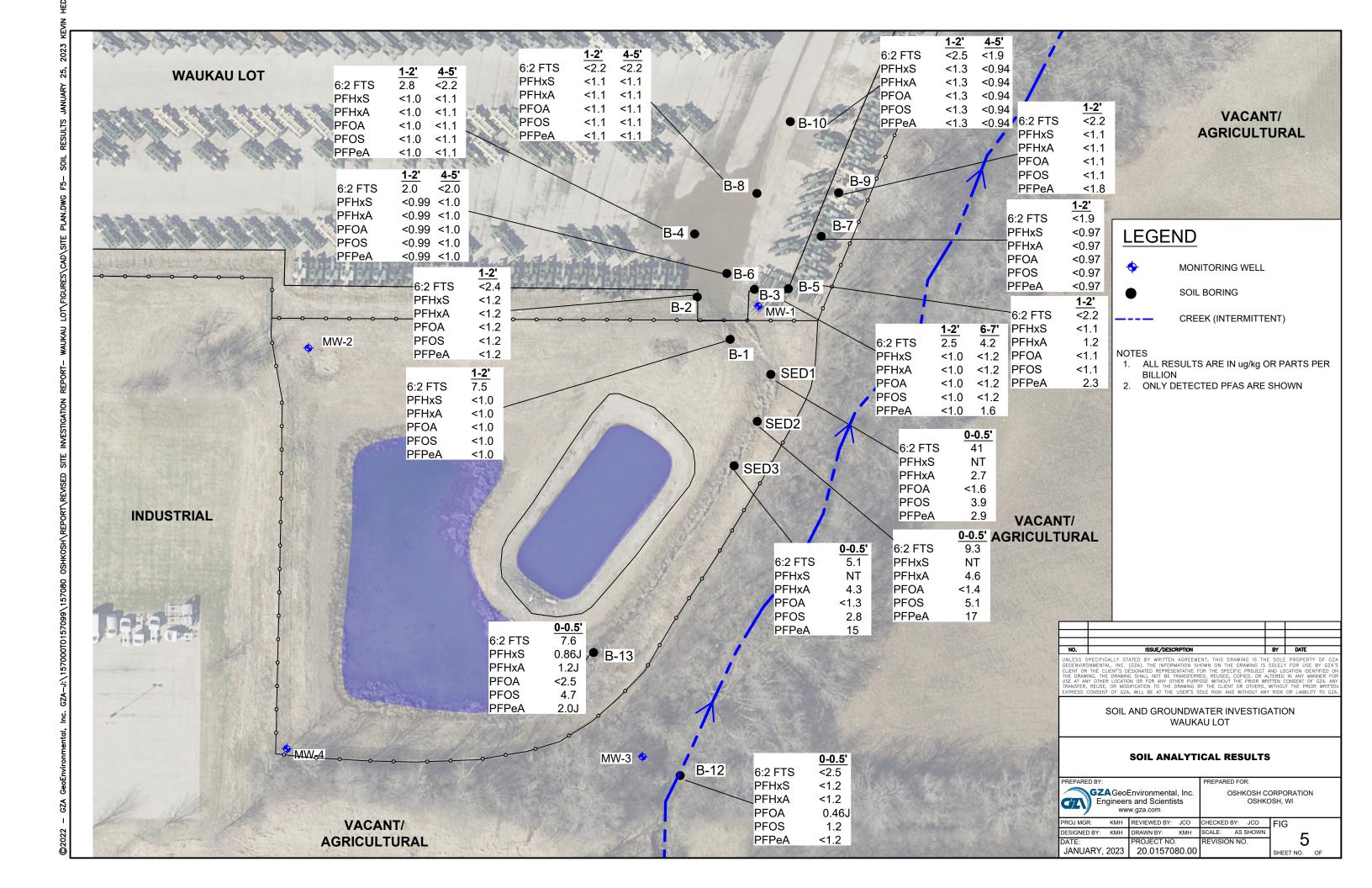
# **FIGURES**

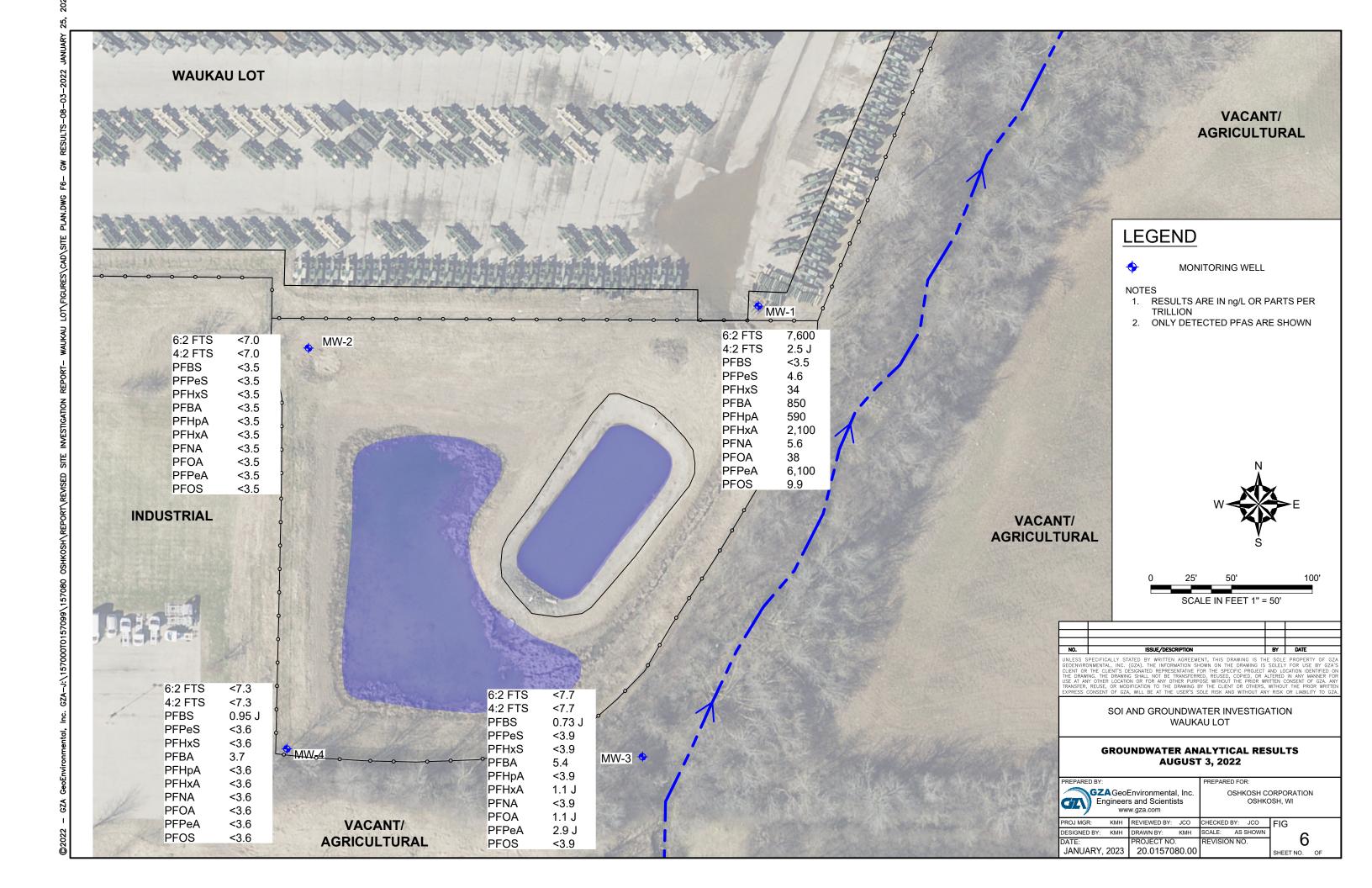














# **APPENDIX A**

**LIMITATIONS** 



#### **LIMITATIONS**

#### Standard of Care

- 1. GZA's findings and conclusions are based on the work conducted as part of the Scope of Services set forth in the proposal and/or report and reflect our professional judgment. These findings and conclusions must be considered not as scientific or engineering certainties, but rather as our professional opinions concerning the limited data gathered during the course of our work. Conditions other than described in this report may be found at the subject location(s).
- 2. GZA's services were performed using the degree of skill and care ordinarily exercised by qualified professionals performing the same type of services, at the same time, under similar conditions, at the same or a similar property. No warranty, expressed or implied, is made. Specifically, GZA does not and cannot represent that the site contains no hazardous material, oil, or other latent condition beyond that observed by GZA during its study. Additionally, GZA makes no warranty that any response action or recommended action will achieve all of its objectives or that the findings of this study will be upheld by a local, state, or federal agency.
- 3. In conducting our work, GZA relied upon certain information made available by public agencies, Client and/or others. GZA did not attempt to independently verify the accuracy or completeness of that information. Inconsistencies in this information which we have noted, if any, are discussed in the report.

#### **Subsurface Conditions**

- 4. The generalized soil profile(s) provided in our report are based on widely spaced subsurface explorations and are intended only to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized and were based on our assessment of subsurface conditions. The composition of strata and the transitions between strata may be more variable and more complex than indicated. For more specific information on soil conditions at a specific location, refer to the exploration logs.
- 5. Water level readings have been made in test holes (as described in the report) and monitoring wells at the specified times and under the stated conditions. These data have been reviewed and interpretations have been made in this report. Fluctuations in the level of the groundwater, however, occur due to temporal or spatial variations in areal recharge rates, soil heterogeneities, the presence of subsurface utilities and/or natural or artificially induced perturbations. The observed water table may be other than indicated in the report.

#### Compliance with Codes and Regulations

6. GZA used reasonable care in identifying and interpreting applicable codes and regulations necessary to execute our scope of work. These codes and regulations are subject to various and possibly contradictory interpretations. Interpretations and compliance with codes and regulations by other parties are beyond our control.

#### Screening and Analytical Testing

- 7. GZA collected environmental samples at the locations identified in the report. These samples were analyzed for the specific parameters identified in the report. Additional constituents, for which analyses were not conducted, may be present in soil, groundwater, surface water, sediment and/or air. Future site activities and uses may result in a requirement for additional testing.
- 8. Our interpretation of field screening and laboratory data is presented in the report. Unless otherwise noted, GZA relied on the laboratory's quality assurance (QA)/quality control (QC) program to validate these data.
- 9. Variations in the types and concentrations of contaminants observed at a given location or time may occur due to release mechanisms, disposal practices, changes in flow paths, and/or the influence of various physical, chemical, biological or radiological processes. Subsequently observed concentrations may be other than indicated in the report.

#### **Interpretation of Data**

10. Our opinions are based on available information, as described in the report, and on our professional judgment. Additional observations made over time and/or space may not support the opinions provided in the report.



#### **Additional Information**

11. In the event that Client or others authorized to use this report obtain information on environmental or hazardous waste issues at the site not contained in this report, such information shall be brought to GZA's attention forthwith. GZA will evaluate such information and, on the basis of this evaluation, may modify the conclusions stated in this report.

#### **Additional Services**

12. GZA recommends that we be retained to provide services during any future investigations, design, implementation activities, construction and/or property development/ redevelopment at the site. This will allow us the opportunity to: i) observe conditions and compliance with our design concepts and opinions; ii) allow for changes in the event that conditions are other than anticipated; iii) provide modifications to our design; and iv) assess the consequences of changes in technologies and/or regulations.



# **APPENDIX B**

AFFF PRODUCT SAFETY DATA SHEETS



# **Safety Data Sheet**

This safety data sheet complies with the requirements of: 2012 OSHA Hazard Communication Standard (29CFR 1910.1200)

Product name ANSULITE LOW VISCOSITY 3X3 AR-AFFF Foam Concentrate

#### 1. Identification

1.1. Product Identifier

Product name ANSULITE LOW VISCOSITY 3X3 AR-AFFF Foam Concentrate

1.2. Other means of identification

Product code 416493 Synonyms None

Chemical Family No information available

1.3. Recommended use of the chemical and restrictions on use

**Recommended use** Fire extinguishing agent.

Uses advised against Consumer use.

1.4. Details of the Supplier of the Safety Data Sheet

Company Name Tyco Fire Protection Products

One Stanton Street Marinette, WI 54143-2542 Telephone: 715-735-7411

Contact point Product Stewardship at 1-715-735-7411

E-mail address psra@tycofp.com

1.5. Emergency Telephone Number

Emergency telephone CHEMTREC 001-800-424-9300 or 001-703-527-3887

#### 2. Hazards Identification

#### Classification

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Serious eye damage/eye irritation - Category 1

#### 2.2. Label Elements

## Signal Word

DANGER

#### **Hazard Statements**

Causes serious eye damage



#### **Precautionary Statements**



/ Product name ANSULITE LOW / VISCOSITY 3X3 AR-AFFF Foam Concentrate **PAGE** 2/9

\_\_\_\_\_\_

#### Prevention

Wear protective gloves/protective clothing/eye protection/face protection.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/physician.

#### 2.3. Hazards Not Otherwise Classified (HNOC)

Not Applicable.

#### 2.4. Other Information

Causes mild skin irritation.

#### 3. Composition/information on Ingredients

#### 3.1. Mixture

The following component(s) in this product are considered hazardous under applicable OSHA(USA)

Chemical name	CAS No.	weight-%
2-(2-Butoxyethoxy)ethanol	112-34-5	7 - 13
Caprylcaprilyl glucoside	68515-73-1	1 - 5
Sodium Decyl Sulfate	142-87-0	1 - 5

#### 4. First aid measures

#### 4.1. Description of first aid measures

**Eye Contact**Rinse thoroughly with plenty of water for at least 15 minutes, lifting lower and upper eyelids.

Consult a physician.

**Skin contact** Wash skin with soap and water. Get medical attention if irritation develops and persists.

Inhalation Remove to fresh air. If breathing is difficult, give oxygen. (Get medical attention immediately

if symptoms occur.).

**Ingestion** Rinse mouth. Do not induce vomiting without medical advice. If swallowed, call a poison

control center or physician immediately.

#### 4.2. Most Important Symptoms and Effects, Both Acute and Delayed

**Symptoms** No information available.

#### 4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed

#### 5. Fire-fighting measures

#### 5.1. Suitable Extinguishing Media

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

#### 5.2. Unsuitable Extinguishing Media

None.



/ Product name ANSULITE LOW / VISCOSITY 3X3 AR-AFFF Foam Concentrate

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#### 5.3. Specific Hazards Arising from the Chemical

None known.

**Hazardous Combustion** 

**Products** 

Carbon oxides, Fluorinated oxides, Nitrogen oxides (NOx), Oxides of sulfur

#### 5.4. Explosion Data

Sensitivity to Mechanical Impact None. Sensitivity to Static Discharge None.

#### 5.5. Protective Equipment and Precautions for Firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

#### 6. Accidental release measures

#### 6.1. Personal precautions, protective equipment and emergency procedures

Personal Precautions Ensure adequate ventilation, especially in confined areas.

6.2. Environmental Precautions

**Environmental Precautions** Prevent further leakage or spillage if safe to do so. Prevent entry into waterways, sewers,

basements or confined areas. See Section 12 for additional Ecological Information.

#### 6.3. Methods and material for containment and cleaning up

**Methods for Containment** Prevent further leakage or spillage if safe to do so.

**Methods for Cleaning Up** Pick up and transfer to properly labeled containers.

#### 7. Handling and Storage

#### 7.1. Precautions for Safe Handling

Advice on safe handling Avoid contact with skin and eyes. Handle in accordance with good industrial hygiene and

safety practice.

#### 7.2. Conditions for safe storage, including any incompatibilities

**Storage Conditions** Keep containers tightly closed in a dry, cool and well-ventilated place.

**Incompatible Materials** Strong oxidizing agents. Strong acids. Strong bases.

#### 8. Exposure Controls/Personal Protection

#### 8.1. Control Parameters

**Exposure guidelines** 



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Chemical name ACGIH TLV OSHA PEL NIOSH IDLH Mexico OEL

2-(2-Butoxyethoxy)ethanol TWA: 10 ppm inhalable ration and vapor 112-34-5 fraction and vapor ACGIH (American Conference of Governmental Industrial Hygienists) OSHA (Occupational Safety and Health Administration of the

8.2. Appropriate Engineering Controls

**Engineering controls** Ensure adequate ventilation, especially in confined areas.

8.3. Individual protection measures, such as personal protective equipment

US Department of Labor) NIOSH IDLH Immediately Dangerous to Life or Health

**Eye/Face Protection** Avoid contact with eyes. Tight sealing safety goggles.

**Skin and Body Protection** Wear protective gloves and protective clothing.

Respiratory Protection If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved

respiratory protection should be worn. Positive-pressure supplied air respirators may be required for high airborne contaminant concentrations. Respiratory protection must be

provided in accordance with current local regulations.

Ventilation Use local exhaust or general dilution ventilation to control exposure with applicable limits

8.4. General hygiene considerations

Do not eat, drink or smoke when using this product. Handle in accordance with good industrial hygiene and safety practice.

#### 9. Physical and Chemical Properties

#### 9.1. Information on basic physical and chemical properties

Physical State Liquid

Odor Characteristic Color Light yellow

Odor Threshold No data available

Property Values Remarks • Method

pH

Melting point/freezing point

Boiling point / boiling range
Flash Point

Evaporation Rate
Flammability (solid, gas)

No data available

No data available

No data available

No data available

Flammability limit in air

Upper flammability limit:
Lower flammability limit:
Vapor Pressure
Vapor Density
No data available

Solubility in Other Solvents
Partition coefficient
Autoignition Temperature
Decomposition Temperature
Kinematic viscosity
No data available
No data available
No data available
No data available



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Density 1.05

# 10. Stability and Reactivity

#### 10.1. Chemical Stability

Stable under recommended storage conditions.

#### 10.2. Reactivity

No data available

#### 10.3. Possibility of hazardous reactions

None under normal processing.

**Hazardous Polymerization** Hazardous polymerization does not occur.

#### 10.4. Conditions to Avoid

Extremes of temperature and direct sunlight.

#### 10.5. Incompatible Materials

Strong oxidizing agents. Strong acids. Strong bases.

#### 10.6. Hazardous decomposition products

Carbon oxides. Nitrogen oxides (NOx). Oxides of sulfur. Fluorinated oxides.

# 11. Toxicological Information

#### 11.1. Information on Likely Routes of Exposure

Product information No data available

**Inhalation** No data available.

**Eye Contact** Severely irritating to eyes.

**Skin contact** May cause irritation.

**Ingestion** No data available.

#### **Component Information**

**Acute Toxicity** 

Chemical name	Oral LD50	Dermal LD50	Inhalation LC50
2-(2-Butoxyethoxy)ethanol	= 5660 mg/kg (Rat)	= 2700 mg/kg ( Rabbit )	-
112-34-5			
Sodium Decyl Sulfate	= 1950 mg/kg (Rat)	=	-
142-87-0			

#### 11.2. Information on Toxicological Effects



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**Symptoms** No information available.

11.3. Delayed and immediate effects as well as chronic effects from short and long-term exposure

Skin Corrosion/Irritation Irritating to skin.

Serious eye damage/eye irritation
Carcinogenicity
Reproductive Toxicity
STOT - Single Exposure
STOT - Repeated Exposure
Aspiration Hazard
Severely irritating to eyes.
No information available.
No information available.
No information available.

#### 11.4. Numerical Measures of Toxicity - Product information

The following values are calculated based on chapter 3.1 of the GHS document

 ATEmix (oral)
 18148 mg/kg

 ATEmix (dermal)
 23945 mg/kg

# 12. Ecological Information

#### 12.1. Ecotoxicity

Not classified.

ı	Chemical name	Algae/aquatic plants	Fish	Crustacea					
Ī	2-(2-Butoxyethoxy)ethanol	EC50 (96h) > 100 mg/L	LC50 (96h) static = 1300 mg/L	EC50 (48h) > 100 mg/L Daphnia					
	112-34-5	Desmodesmus subspicatus	Lepomis macrochirus	magna EC50 (24h) = 2850 mg/L					
ļ				Daphnia magna					
	n-Butanol	EC50 (96h) > 500 mg/L	LC50 (96h) static = 1910000 μg/L	EC50 (48h) Static 1897 - 2072					
	71-36-3	Desmodesmus subspicatus EC50		mg/L Daphnia magna EC50 (48h) =					
		(72h) > 500 mg/L Desmodesmus	static 1730 - 1910 mg/L	1983 mg/L Daphnia magna					
		subspicatus	Pimephales promelas LC50 (96h)						
			static 100000 - 500000 µg/L						
			Lepomis macrochirus LC50 (96h)						
			flow-through = 1740 mg/L						
ŀ			Pimephales promelas						
	Sodium Hydrogen Carbonate	, , ,	LC50 (96h) static 8250 - 9000 mg/L	EC50 (48h) = 2350 mg/L Daphnia					
ŀ	144-55-8	linearis	Lepomis macrochirus	magna					
	Hexamethylenetetramine	-	LC50 (96h) flow-through 44600 -	EC50 (48h) 29868 - 43390 mg/L					
ŀ	100-97-0	5050 (501) 500 (6	55600 mg/L Pimephales promelas	Daphnia magna					
	Methylene chloride	EC50 (72h) > 500 mg/L	LC50 (96h) static = 193 mg/L	EC50 (48h) Static 1532 - 1847					
	75-09-2	Pseudokirchneriella subcapitata		mg/L Daphnia magna EC50 (48h) =					
		EC50 (96h) > 500 mg/L	flow-through = 193 mg/L Lepomis	190 mg/L Daphnia magna					
		Pseudokirchneriella subcapitata	macrochirus LC50 (96h) static 262						
			- 855 mg/L Pimephales promelas LC50 (96h) flow-through 140.8 -						
			277.8 mg/L Pimephales promelas						
ł	1.2 Diableronrones	EC50 (96h) 2.45 - 6.45 mg/L	LC50 (96h) semi-static = 4.5 mg/L	EC50 (48h) Static 0.063 - 0.129					
	1,3-Dichloropropene 542-75-6	Pseudokirchneriella subcapitata	, ,	mg/L Daphnia magna EC50 (48h) =					
	342-73-0	EC50 (72h) 3.12 - 10.5 mg/L	= 2 mg/L Oncorhynchus mykiss	0.09 mg/L Daphnia magna					
		Pseudokirchneriella subcapitata	LC50 (96h) static 3.1 - 4.9 mg/L	0.05 mg/L Dapinna magna					
		1 Seddekii erineriena subsapitata	Oncorhynchus mykiss LC50 (96h)						
			flow-through 0.211 - 0.271 mg/L						
			Pimephales promelas LC50 (96h)						
			static 1.52 - 2.68 mg/L Pimephales						
			promelas LC50 (96h) static 5.1 -						
			6.8 mg/L Lepomis macrochirus						



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#### 12.2. Persistence and Degradability

No information available.

# 12.3. Bioaccumulation

No information available.

#### 12.4. Other Adverse Effects

No information available

# 13. Disposal Considerations

#### 13.1. Waste Treatment Methods

Disposal of wastes

Disposal should be in accordance with applicable regional, national and local laws and

regulations.

Contaminated Packaging Do not reuse container.

# 14. Transport Information

**DOT** NOT REGULATED

TDG NOT REGULATED

MEX NOT REGULATED

ICAO (air) NOT REGULATED

IATA NOT REGULATED

IMDG NOT REGULATED

# 15. Regulatory Information

#### 15.1. International Inventories

TSCA Complies

DSL/NDSL Complies

ENCS Does not comply

IECSC Does not comply

KECL Does not comply

PICCS Does not comply

AICS Complies

#### <u>Legend:</u>

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

ENCS - Japan Existing and New Chemical Substances

IECSC - China Inventory of Existing Chemical Substances

**KECL** - Korean Existing and Evaluated Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

AICS - Australian Inventory of Chemical Substances



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#### 15.2. US Federal Regulations

#### **SARA 313**

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

Chemical name	SARA 313 - Threshold Values %
2-(2-Butoxyethoxy)ethanol - 112-34-5	1.0
SARA 311/312 Hazard Categories	
Acute Health Hazard	Yes
Chronic health hazard	No
Fire Hazard	No
Sudden Release of Pressure Hazard	No
Reactive Hazard	No

#### **CWA (Clean Water Act)**

This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

#### **CERCLA**

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

#### 15.3. US State Regulations

#### **California Proposition 65**

This product contains the following Proposition 65 chemicals

Chemical name	California Proposition 65
Methylene chloride - 75-09-2	Carcinogen
1.3-Dichloropropene - 542-75-6	Carcinogen

#### **U.S. State Right-to-Know Regulations**

Chemical name	New Jersey	Massachusetts	Pennsylvania
2-(2-Butoxyethoxy)ethanol	X	-	X
112-34-5			
n-Butanol	X	X	X
71-36-3			
1-(3-Chloroallyl)-3,5,7-triaza-1-azoni a Adamantane chloride 4080-31-3	X	-	-
Hexamethylenetetramine 100-97-0	X	-	-
Methylene chloride 75-09-2	Х	Х	Х
1,3-Dichloropropene 542-75-6	Х	X	Х

# 16. Other information, including date of preparation of the last revision



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NFPA Health Hazards 3 Flammability 1 Instability 0 Physical and chemical

properties -

HMIS Health Hazards 3 Flammability 1 Physical Hazards 0 Personal Protection X

Revision date 20-Mar-2018

Revision note No information available.

#### **Disclaimer**

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

**End of Safety Data Sheet** 



# RE-HEALING™ RF3, 3% FOAM CONCENTRATE

#### **MATERIAL SAFETY DATA SHEET**

# Section 1: Chemical product and company identification

**Product Name**: RE-HEALING™ RF3, 3% Foam Concentrate

Synonym: RE-HEALING RF3 or RF3
Chemical Name: N/A This product is a mixture
C.A.S No.: N/A This product is a mixture
Chemical Formula: N/A This product is a mixture
EINECS Number: N/A This product is a mixture

Use of this product: The intended use of this product is as a fire extinguishing agent.

# Company / Undertaking Identification:

Americas	Europe/Middle East/Africa	Asia-Pacific
The Solberg Company 1520 Brookfield Avenue Green Bay, WI 54313 United States	Solberg Scandinavian AS Radøyvegen 721 - Olsvollstranda N-5938 Sæbøvågen Norway	Solberg Asia Pacific Pty Ltd 3 Charles Street St. Marys NSW 2760 Australia
Tel: +1 920 593 9445	Tel: +47 56 34 97 00	Tel: +61 2 9673 5300
Telephone: Emergency Contacts: Revised:	(920) 593-9445 Chemtrec: (800) 42 December, 2014	4-9300 or (703) 527-3887

# Section 2: Hazard identification and emergency overview

HMIS: Health 1, Flammability 0, Reactivity 0, PPE B

NFPA: Health 1, Flammability 0, Reactivity 0

WHMIS: D2B - may irritate eyes, skin, mucous membranes

**Human Exposure**:

Product:

EU Classification: Xi Irritant

R Phrases: 36 Irritating to eyes

S Phrases: 2 Keep out of reach of children

24 Avoid contact with skin

In case of contact with eyes, rinse immediately with

copious amounts of water and seek medical advice.



#### Components:

**Diethylene Glycol Monobutyl Ether:** 

EU Classification Xi Irritant

R Phrases 36 Irritating to eyes

S Phrases 2 Keep out of reach of children

24 Avoid skin contact

In case of contact with eyes, rinse immediately with

copious amounts of water and seek medical advice

Limit Values for Exposure:

**Diethylene Glycol Monobutyl Ether:** 

OSHA PEL (General Industry) 8 hour TWA: None established

MAK (DE) Limit Value: 100 mg/m<sup>3</sup>

Short term exposure limit value

(8 times, 5 minutes): 200mg/m<sup>3</sup>

Neither this product nor any of the ingredients contained in it have been listed as carcinogenic by the National Toxicology Program IARC, or OSHA. As part of good industrial and personal hygiene and safety procedure, avoid all unnecessary exposure to chemical substances and ensure prompt removal from skin, eyes, and clothing

#### Signs and Symptoms:

Acute Exposure:

Eye Contact: May cause mild to moderate transient irritation
Skin Contact: May cause mild transient irritation and/or dermatitis

Inhalation: Not a normal route of entry
Ingestion: Irritating to mucous membranes

Chronic Overexposure: Possible systemic and motor disorders, diethethylene glycol

monobutyl ether did not interfere with reproduction; however,

body weights of newborn animals were decreased.

Medical conditions generally aggravated by exposure: Diseases of the kidney and liver.

For Environment: As much as possible, keep from being washed into surface water.

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# Section 3. Composition/information on ingredients

**Ingredient Name:** Proprietary mixture consisting of hydrocarbon surfactants,

complex carbohydrates, inorganic salts, solvent and water

Chemical Formula: N/A - This is a mixture C.A.S. No.: N/A - This is a mixture N/A - This is a mixture N/A - This is a mixture

Concentration, Wt. %: >85%

Hazard Classification: See section 2

Ingredient Name: Diethylene Glycol Monobutyl Ether (a)

Chemical Formula:  $C_4H_9O(CH_2CH_2O)_2H$ 

**C.A.S. No.:** 112-35-5 **EINECS Number:** 230-961-6



Concentration, Wt.%: 12%

Hazard Classification: See section 2

(a) This chemical is subject to reporting requirements of SARA Title III Section 313 and 40CFR Section 372

#### Section 4. First aid measures

Eye Exposure: Irrigate eyes at eye wash station and repeat until pain free. Seek medical

attention immediately.

**Skin Exposure:** In case of contact, wash with plenty of soap and water. If irritation

persists seek medical attention.

**Inhalation:** If respiratory irritation or distress occurs remove victim to fresh air.

Provide oxygen if breathing is difficult. Seek medical attention if irritation

develops or persists.

**Ingestion:** Do not induce vomiting. If victim is alert, give liquids such as milk or

water. Seek immediate medical attention. Do not leave victim

unattended. To prevent aspiration of swallowed product, lay victim on

side with head lower than waist.

Medical conditions possibly aggravated by exposure: Inhalation of product may aggravate existing chronic respiratory conditions.

# Section 5. Firefighting measures

This product is an extinguishing media. No special protective equipment is required for fire fighters. Insensitive to mechanical impact or static discharge.

HMIS (hazardous materials identification system) rankings (as liquid): health = 1, flammability = 0, reactivity = 0, personal protective equipment: eye and skin protection (see Section 8).

#### Section 6: Accidental release measures

For personal protection: Prevent skin and eye contact, see Heading 8 Clean up: Use an absorbent material, to include but not be limited to, diatomaceous earth, kitty litter, or saw dust, and sweep up. See Heading 12

# Section 7: Handling and storage

Avoid eye, respiratory, and skin exposure. Use appropriate PPE (personal protective equipment) when handling, and wash thoroughly after handling (Section 8). Keep product in original container until packaging for use as extinguisher. Clean used equipment before storage. Use this product only in well



ventilated areas. Do not mix with other extinguishing agents.

# Section 8: Exposure controls/ personal protection

Respiratory protection: None expected to be needed, mechanical ventilation is recommended

Hand Protection: Use chemical resistant gloves when handling the product

Eye protection: Chemical goggles are recommended

Skin protection: Standard fire-fighting equipment should provide all necessary protection

### Section 9: Physical and chemical properties

Appearance: Brown colored gelled liquid; mild sweet odor

Solubility: Completely soluble in water

Flammability: Non -flammable Flash point: Does not flash

Vapor density (Air = 1): Not determined, but <1

**Explosive properties**: Not explosive **Oxidizing properties**: Not an oxidizer **Relative density**: 1.06 (Water = 1)

**pH**: 7.0 to 8.5

Boiling point: ~ 220° F

# Section 10: Stability and reactivity

Stability: stable

Incompatibles: Reactive metals, electrically energized equipment, any material reactive with water and

strong oxidizers.

Conditions to avoid: There are no known conditions which may cause a dangerous reaction.

# **Section 11: Toxicological Information**

**Product:** The toxicity of the product mixture has not been determined

Components:

**Diethylene Glycol Monobutyl Ether** 

**Toxicity Data:** Oral (rat)  $LD_{50}$  5,660 mg/kg

Oral (rat) LD<sub>50</sub> 9,626 mg/kg (EINECS ESIS)

Dermal (rabbit) LD<sub>50</sub> 4,000 mg/kg



Dermal (rabbit) LD<sub>50</sub> 2,764 mg/kg (EINECS ESIS)

Irritation Data: Eye (rabbit) 20 mg/day Moderate (EINECS ESIS)

Eye (rabbit) Highly-irritating (EINECS ESIS)

Skin (rabbit) 1000 mg/kg/day Moderate with edema,

fissuring, leathery appearance (EINECS ESIS)

Target organs: Kidney, blood, liver, lungs, gastrointestinal, spleen

# **Section 12: Ecological information**

#### Components:

# **Ecotoxicity:**

#### **Diethylene Glycol Monobutyl Ether**

Fish Lepomis marcrochinus: LC<sub>50</sub> (96 hrs.) 1,300 mg/L

Carassius auratus:  $LC_{50}$  (24 hrs.) 2,700 mg/L Daphnids, Daphnia magna:  $EC_{50}$  24 hrs.) 3,184 mg/L Algae, Scenedesmus subspicatus:  $EC_{50}$  (96 hrs.) >100 mg/L

#### **Mobility:**

#### **Diethylene Glycol Monobutyl Ether**

Should not partition from a water column to organic matter contained in sediments and suspended solids.

#### Persistence/ Degradability:

# **Diethylene Glycol Monobutyl Ether:**

Indirect photodegradation is about 50% in 3.5 hours Aerobic degradation with adapted activated sludge is 60% after 28 days COD = 2080 mg/g of substance  $BOD_5 = 250 \text{ mg } O_2/g \text{ substance}$ Theoretical oxygen demand = 2.17 mg/mg

#### **Bioaccumulation:**

#### **Diethylene Glycol Monobutyl Ether**

Should not bioaccumulate

# **Section 13: Disposal considerations**

As much as possible, keep from being washed into surface water, see Heading 12. Dispose of in compliance with national, regional, and local provisions that may be in force.

# **Section 14: Transportation information**

This product is not a hazardous material under U.S. Department of Transportation (DOT) 49 CFR 172, and is not regulated by the DOT, IMO, IATA, RID/ADR, or Canada's TDG.



# Section 15: Regulatory information Product:

EU Classification: Xi Irritant

R Phrases: 36 Irritating to eyes

S Phrases: 2 Keep out of reach of children

24 Avoid contact with skin

In case of contact with eyes, rinse immediately with copious amounts of water and seek medical advice.

Limit Values for Exposure:

**Diethylene Glycol Monobutyl Ether:** 

OSHA PEL (General Industry) 8 hour TWA: None established

MAK (DE) Limit Value: 100 mg/m<sup>3</sup>

Short term exposure limit value

(8 times, 5 minutes): 200mg/m<sup>3</sup>

State regulatory information:

Chemicals in this product under specific State regulations, as denoted below:

California - Permissible Exposure Limits for Chemical Contaminants: None

Florida - Substance List: None

Massachusetts - Substance List: None

Minnesota - List of Hazardous Substances: None

New Jersey - Right to Know Hazardous Substance List: None

Pennsylvania: Hazardous Substance List: None

California Proposition 65: No component is listed on the California Proposition 65 list or the No Significant Risk Level List.

# Section 16. Other information

This MSDS conforms to requirements under U.S., U.K., Canadian, Australian, and EU regulations or standards, and conforms to the 2003 ANSI Z400.1 format.

The information herein is given in good faith to be correct but does not claim to be all inclusive and shall be used only as a guide. Solberg or Amerex Corporation shall not be held liable for any damage resulting from handling or from contact with the above product

Date Prepared: 04 December, 2014

Supersedes: Feb, 2012

#### **SECTION I. Chemical Product and Company Identification**

Product Name: Buckeye Platinum 3% AFFF (BFC-3.1)

Synonym: AFFF Concentrate, Aqueous Film Forming Foam

Manufacturer: Buckeye Fire Equipment Company

110 Kings Road

Kings Mountain, NC 28086

Telephone: 704.739.7415

Web Address: <a href="https://www.buckeyefire.com">www.buckeyefire.com</a>
Email Address: <a href="https://bread.org/bfc.com">bfec@buckeyef.com</a>

Recommended Use: Fire suppression, not for human or animal drug use.

Emergency: CHEMTREC 1.800.424.9300

Revision Date: 05/2015

#### **SECTION II. Hazard Identification**

GHS - Classification

GHS Label Elements:

Hazard Symbols: NONE Signal Word: WARNING

Hazard Statements:

H320 Causes eve irritation

Precautionary Statements:

P101 If medical advice is needed, have product container or label at hand.

P102 Keep out of reach of children. P234 Keep in original container.

P264 Wash hands and face thoroughly after handling P301+322 If swallowed, drink 2-3 glasses of water. P302+352 If on skin, wash with soap and water

P305+351+338 If in eyes, rinse cautiously with water for several minutes. Remove contact lenses if

present and easy to do, and continue to rinse.

P337+313 If eye irritation persists, get medical advice/attention. P401+402+403 Store in original container in a dry, well ventilated place.

#### **SECTION III. Composition/Information on Ingredients**

Chemical Name	Weight %*	CAS#
Water	> 80	7732-18-5
Hexylene Glycol	10	107-41-5
Proprietary mixture of fluorosurfactants and	< 10	N/A
hydrocarbon surfactants		

<sup>\* %</sup> is rounded to the nearest appropriate number. Values are not to be considered product specifications

Note: Buckeye Platinum 3% AFFF does not degrade into nor does it contain PFOS.

#### **SECTION IV. First Aid Measures**

*Eye Exposure*- Flush eyes at eye wash station for 15 minutes and repeat until pain-free. If irritation develops or persists or vision changes occur, seek medical attention.

Skin Exposure- Wash with plenty of soap and water. If irritation develops or persists, seek medical attention.

Inhalation- Not anticipated to be a route of exposure. If irritation develops move victim to fresh air and if it persists, seek medical attention.

*Ingestion*- If victim is conscious and alert, give 2-3 glasses of water to drink. Do not leave victim unattended. Seek immediate medical attention. On the advice of medical personnel, induce vomiting.

If vomiting occurs and the victim is conscious, give additional water to further dilute the chemical. Prevent aspiration of swallowed product by laying victim on side with head lower than their waist.

Medical Conditions Possibly Aggravated by Exposure-Skin contact may aggravate existing chronic skin conditions.

#### **SECTION V. Firefighting Measures**

Extinguishing Media: N/A. This product is an extinguishing agent. It is nonflammable and noncombustible.

Special Firefighting Procedures: N/A

Unusual Fire and Explosion Hazards: This product may decompose in fire and release oxides of sulfur and nitrogen (Refer

to Section X).

Sensitivity to Mechanical Impact or Static Discharge: None

#### **SECTION VI. Accidental Release Measures**

Large spills (1 drum or more) should be addressed by hazardous materials technicians following a site-specific emergency response plan and trained in the appropriate use of personal protection equipment. Clean up released product using absorbent socks for containment followed by absorbent material within the containment. If deemed necessary, wear appropriate APR for amines/glycol ethers (See Section VIII). Bag and drum for disposal. If product is used on a fire and/or contaminated, use personal protection equipment and containment appropriate to the nature of the mixture. Prevent material from entering waterways. Handle and dispose of as a hazardous waste unless testing indicates otherwise. Decontaminate with detergent and water.

#### **SECTION VII. Handling and Storage**

Avoid eye, respiratory, and skin exposure. Use the appropriate personal protective equipment when handling. Wash thoroughly after handling (Refer to Section VIII). Product should be stored in its original container or extinguisher. Use in well-ventilated areas. Do not mix with other extinguishing agents.

#### **SECTION VIII. Exposure Controls and Personal Protection**

Respiratory Protection: During the use of this product on fires, exhaust gases and products of incomplete combustion are the main respiratory hazards. In the manufacture of this product, employers and employees must use their collective judgment in determining the on-the-job settings where the use of a respirator is prudent. The need for respiratory protection is not likely for short-term use in well-ventilated areas. Use air-purifying respirators or powered air-purifying respirators with organic vapor and amine cartridges for acute short-term exposures. Long term exposures may require the use of positive pressure supplied air respirators or self-contained breathing apparatus.

Eye Protection: Wear chemical goggles.

*Skin Protection:* Use nitrile, latex, or similar gloves and coveralls. Good personal hygiene practices are essential. After handling the product, avoid food, tobacco products, or other means of transferring the product from hand to mouth until after thoroughly washing.

#### **SECTION IX. Physical and Chemical Properties**

Appearance and Odor: Pale yellow liquid solution with a mild, sweet odor.

Specific Gravity: 1.01 Boiling Point: 97° C Flash Point: N/A Flammability: N/A Solubility: 100%

#### **SECTION X. Stability and Reactivity**

Stability: Stable

Incompatibles: Strong acids, bases, and oxidizers. Reactive metals. Any material reactive with water

Decomposition Products: Not known, but oxides of sulfur and nitrogen may be formed.

Hazardous Reactions: None

#### **SECTION XI. Toxicological Information**

Routes of Entry:

Eye Contact: May cause mild transient irritation

Skin Contact: May cause mild transient irritation and/or dermatitis

Inhalation: Inhalation is not anticipated to be a problem

Ingestion: Irritating to mucous membranes. Large oral doses could produce narcosis

Chronic Toxicity: This product's ingredients are not considered as probable or suspected carcinogens by OSHA, IARC, or

ACGIH.

Reproductive Toxicity: This product is not known to have any reproductive effects.

# **SECTION XII. Ecological Information**

Ecotoxicity: May cause harm to aquatic life, due to oxygen depletion from the dilution of product after use.

Degradibility: Biodegradable in water.

#### **SECTION XIII. Disposal Considerations**

This product is not a RCRA characteristically hazardous or listed hazardous waste. Dispose of according to state or local laws, which may be more restrictive than federal regulations. Be aware that product used on a fire may be altered or contaminated and thereby require different disposal considerations.

# **SECTION XIV. Transportation Information**

This product is not defined as a hazardous material under U.S. Department of Transportation 49 CFR 172, or by Transport Canada "Transportation of Dangerous Goods" regulations.

### **SECTION XV. Regulatory Information**

International Inventory Status: Some ingredients are on the following inventories

<u>Country</u>	<u>Agency</u>
U.S.A.	TSCA
Canada	DSL
Europe	EINECS/ELINCS
Australia	AICS
Japan	MITI
South Korea	KECL

European Risk and Safety Phrases:

EU Classification- Xi Irritant

R Phrases- 36 Irritating to eyes, respiratory system, and skin.

S Phrases- 26 In case of contact with eyes, rinse immediately with plenty of water and seek

medical advice

Wear suitable protective clothing

#### U.S. Federal Regulatory Information:

None of the chemicals in this product are under SARA reporting requirements or have SARA Threshold Planning Quantities or CERCLA Reportable Quantities.

#### State Regulatory Information:

Chemicals in this product are covered under the specific State regulations noted:

Alaska Designated Toxic and Hazardous Substances- None

California Permissible Exposure Limits for Chemical Contaminants- None

Florida Substance list- None
Illinois Toxic Substance List- None
Kansas Section 302/303 List- None
Massachusetts Substance list- None

Minnesota List of Hazardous Substances- None

Missouri Employer Information/Toxic Substance List- None New Jersey Right to Know Hazardous Substance List- None

North Dakota List of Hazardous Chemicals, Reportable Quantities- None

Pennsylvania Hazardous Substance List- None
Rhode Island Hazardous Substance List- None
Texas Hazardous Substance List- No
West Virginia Hazardous Substance List- None
Wisconsin Toxic and Hazardous Substances- None

California Proposition 65- No component is listed on the California Proposition 65 List

# **SECTION XVI. Other Information**

This Safety Data Sheet prepared in accordance with OSHA's Hazard Communication Standard (29 CFR 1910.1200) and the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

# **HMIS RATINGS:**

Health 1 Flammability 0 Reactivity 0

Personal Protective Equipment: use eye protection, gloves, and appropriate skin protection (See Section 8)

WHMIS (Canadian Workplace Hazardous Materials Identification)

D2B- May irritate eyes, mucous membranes, or skin

The information contained herein is given in good faith as typical values and not as product specifications. No warranty, either expressed or implied, is hereby made.

#### **SECTION I. Chemical Product and Company Identification**

Product Name: Buckeye 3% Mil Spec AFFF (BFC-3MS)

Synonym: 3% Mil Spec Concentrate, Mil Spec Aqueous Film Forming Foam

Manufacturer: Buckeye Fire Equipment Company

110 Kings Road

Kings Mountain, NC 28086

Telephone: 704.739.7415

Web Address: <a href="www.buckeyefire.com">www.buckeyefire.com</a>
Email Address: <a href="block">bfec@buckeyef.com</a>

Recommended Use: Fire suppression, not for human or animal drug use.

Emergency: CHEMTREC 1.800.424.9300

Revision Date: 05/2015

#### **SECTION II. Hazard Identification**

GHS - Classification

GHS Label Elements:

Hazard Symbols: NONE Signal Word: WARNING

Hazard Statements:

H320 Causes eye irritation

Precautionary Statements:

P101 If medical advice is needed, have product container or label at hand.

P102 Keep out of reach of children. P234 Keep in original container.

P264 Wash hands and face thoroughly after handling P301+322 If swallowed, drink 2-3 glasses of water. P302+352 If on skin, wash with soap and water

P305+351+338 If in eyes, rinse cautiously with water for several minutes. Remove contact lenses if

present and easy to do, and continue to rinse.

P337+313 If eye irritation persists, get medical advice/attention. P401+402+403 Store in original container in a dry, well ventilated place.

#### **SECTION III. Composition/Information on Ingredients**

<u>Chemical Name</u>	Weight %*	<u>CAS #</u>
Water	> 56	7732-18-5
Hexylene Glycol	< 19	107-41-5
Proprietary mixture of fluorosurfactants and	< 25	N/A
hydrocarbon surfactants		

<sup>\* %</sup> is rounded to the nearest appropriate number. Values are not to be considered product specifications

Note: Buckeye 3% Mil Spec AFFF does not degrade into nor does it contain PFOS.

#### **SECTION IV. First Aid Measures**

*Eye Exposure*- Flush eyes at eye wash station for 15 minutes and repeat until pain-free. If irritation develops or persists or vision changes occur, seek medical attention.

Skin Exposure- Wash with plenty of soap and water. If irritation develops or persists, seek medical attention.

Inhalation- Not anticipated to be a route of exposure. If irritation develops move victim to fresh air and if it persists, seek medical attention.

*Ingestion*- If victim is conscious and alert, give 2-3 glasses of water to drink. Do not leave victim unattended. Seek immediate medical attention. On the advice of medical personnel, induce vomiting.

If vomiting occurs and the victim is conscious, give additional water to further dilute the chemical. Prevent aspiration of swallowed product by laying victim on side with head lower than their waist.

Medical Conditions Possibly Aggravated by Exposure- Skin contact may aggravate existing chronic skin conditions.

#### **SECTION V. Firefighting Measures**

Extinguishing Media: N/A. This product is an extinguishing agent. It is nonflammable and noncombustible.

Special Firefighting Procedures: N/A

Unusual Fire and Explosion Hazards: This product may decompose in fire and release oxides of sulfur and nitrogen (Refer

to Section X).

Sensitivity to Mechanical Impact or Static Discharge: None

#### **SECTION VI. Accidental Release Measures**

Large spills (1 drum or more) should be addressed by hazardous materials technicians following a site-specific emergency response plan and trained in the appropriate use of personal protection equipment. Clean up released product using absorbent socks for containment followed by absorbent material within the containment. If deemed necessary, wear appropriate APR for amines/glycol ethers (See Section VIII). Bag and drum for disposal. If product is used on a fire and/or contaminated, use personal protection equipment and containment appropriate to the nature of the mixture. Prevent material from entering waterways. Handle and dispose of as a hazardous waste unless testing indicates otherwise. Decontaminate with detergent and water.

#### **SECTION VII. Handling and Storage**

Avoid eye, respiratory, and skin exposure. Use the appropriate personal protective equipment when handling. Wash thoroughly after handling (Refer to Section VIII). Product should be stored in its original container or extinguisher. Use in well-ventilated areas. Do not mix with other extinguishing agents.

#### SECTION VIII. Exposure Controls and Personal Protection

Respiratory Protection: During the use of this product on fires, exhaust gases and products of incomplete combustion are the main respiratory hazards. In the manufacture of this product, employers and employees must use their collective judgment in determining the on-the-job settings where the use of a respirator is prudent. The need for respiratory protection is not likely for short-term use in well-ventilated areas. Use air-purifying respirators or powered air-purifying respirators with organic vapor and amine cartridges for acute short-term exposures. Long term exposures may require the use of positive pressure supplied air respirators or self-contained breathing apparatus.

Eye Protection: Wear chemical goggles.

*Skin Protection:* Use nitrile, latex, or similar gloves and coveralls. Good personal hygiene practices are essential. After handling the product, avoid food, tobacco products, or other means of transferring the product from hand to mouth until after thoroughly washing.

#### **SECTION IX. Physical and Chemical Properties**

Appearance and Odor: Pale yellow liquid solution with a mild, sweet odor.

Specific Gravity: 1.02 Boiling Point: 97° C Flash Point: N/A Flammability: N/A Solubility: 100%

#### SECTION X. Stability and Reactivity

Stability: Stable

Incompatibles: Strong acids, bases, and oxidizers. Reactive metals. Any material reactive with water

Decomposition Products: Not known, but oxides of sulfur and nitrogen may be formed.

Hazardous Reactions: None

# **SECTION XI. Toxicological Information**

Routes of Entry:

Eye Contact: May cause mild transient irritation

Skin Contact: May cause mild transient irritation and/or dermatitis

Inhalation: Inhalation is not anticipated to be a problem

Ingestion: Irritating to mucous membranes. Large oral doses could produce narcosis

Chronic Toxicity: This product's ingredients are not considered as probable or suspected carcinogens by OSHA, IARC, or

ACGIH.

Reproductive Toxicity: This product is not known to have any reproductive effects.

#### **SECTION XII. Ecological Information**

Ecotoxicity: May cause harm to aquatic life, due to oxygen depletion from the dilution of product after use.

Degradibility: Biodegradable in water.

#### **SECTION XIII. Disposal Considerations**

This product is not a RCRA characteristically hazardous or listed hazardous waste. Dispose of according to state or local laws, which may be more restrictive than federal regulations. Be aware that product used on a fire may be altered or contaminated and thereby require different disposal considerations.

# **SECTION XIV. Transportation Information**

This product is not defined as a hazardous material under U.S. Department of Transportation 49 CFR 172, or by Transport Canada "Transportation of Dangerous Goods" regulations.

#### **SECTION XV. Regulatory Information**

International Inventory Status: Some ingredients are on the following inventories

<u>Country</u>	<u>Agency</u>
U.S.A.	TSCA
Canada	DSL
Europe	EINECS/ELINCS
Australia	AICS
Japan	MITI
South Korea	KECL

European Risk and Safety Phrases:

EU Classification- Xi Irritant

R Phrases- 36 Irritating to eyes, respiratory system, and skin.

S Phrases- 26 In case of contact with eyes, rinse immediately with plenty of water and seek

medical advice

36 Wear suitable protective clothing

#### U.S. Federal Regulatory Information:

None of the chemicals in this product are under SARA reporting requirements or have SARA Threshold Planning Quantities or CERCLA Reportable Quantities.

#### State Regulatory Information:

Chemicals in this product are covered under the specific State regulations noted:

Alaska Designated Toxic and Hazardous Substances- None

California Permissible Exposure Limits for Chemical Contaminants- None

Florida Substance list- None
Illinois Toxic Substance List- None
Kansas Section 302/303 List- None
Massachusetts Substance list- None

Minnesota List of Hazardous Substances- None

Missouri Employer Information/Toxic Substance List-None New Jersey Right to Know Hazardous Substance List-None

North Dakota List of Hazardous Chemicals, Reportable Quantities- None

Pennsylvania Hazardous Substance List- None
Rhode Island Hazardous Substance List- None
Texas Hazardous Substance List- No
West Virginia Hazardous Substance List- None
Wisconsin Toxic and Hazardous Substances- None

California Proposition 65- No component is listed on the California Proposition 65 List

# **SECTION XVI. Other Information**

This Safety Data Sheet prepared in accordance with OSHA's Hazard Communication Standard (29 CFR 1910.1200) and the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

# **HMIS RATINGS:**

Health 1 Flammability 0 Reactivity 0

Personal Protective Equipment: use eye protection, gloves, and appropriate skin protection (See Section 8)

WHMIS (Canadian Workplace Hazardous Materials Identification)

D2B- May irritate eyes, mucous membranes, or skin

The information contained herein is given in good faith as typical values and not as product specifications. No warranty, either expressed or implied, is hereby made.



# **APPENDIX C**

WDNR SOIL BORING LOGS, WELL DEVELOPMENT FORMS,
AND ABANDONMENT FORMS

				Route to:		Wastewater L		Waste Managme	nt						Pag	je _	1	of	1
Facility/P	-		2000000	nti ou					License/	Peri	mit/Moi	nitoring	Numb	er	E	Soring	Numb		/L-B1
Boring D		h <b>Kosh (</b> 7: Name		chief (firs	st, last) an	d Firm			Date Dri	illin	g Starte	ed	Date 1	Drilling	Compl	eted	Drill	ing M	
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Local Gr State Pla	_	n□ (es		(1.11) or	Boring Lo	ocation [		/C	Lat 72	2428	Fe	et		<b>70.0'</b> Grid Lo	ocation	MSL	_	NA	_ inches
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Facility			Cou					County Coo		$\neg$	Civil Tov	wn/City		lage osh, W					
Sam	nlo			<i>r</i> 1									USIIK			Proper	tion		
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2	60/60	NA	5— — — — — — — — — — — — — — — — — — —	(5'-8') C fine; bro (8'-10') trace-lit	ÉLAY (CL); wn/red; ha ELAY (CL); wn/red; ha Poorly-gradle Silt; bro	little Sand ard; dry. ded SANI wn; wet.	d, F-C	; trace Gravel, ; trace Gravel, SM), F-M;	Sp.										Silt conteincreases towards bottom 2' 5-10' run
Signatur								Firm											
	S.	Stepl	nens	on						ЭZ	A Ge	eoEn	viror	men	tal, l	nc.			

State of Wisconsin Department of Natural Resources									il Bo1 n 4400-12		og It	nformation
	Route to: Watershed/Wastewater  Remediation/Redevelopment	Waste Managmen Other	_					Pag	je _	1	of	f <u>1</u>
Facility/Project Name OshKosh Co	rnoration		License/P	ermit/Mo	nitoring	Numb	er	В	Soring	Numb		VL-B10
			Date Drill	ing Starte	ed	Date I	Orilling	Comple	eted	Drill		lethod
	crew chief (first, last) and Firm Last Name			1-6-20			11-6-	-			opro	
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racinty iD	71	71		CIVII 10	wii/City		osh, W	iscons	in			
Sample								Soil	Proper	ties		
Number and Type Length All. & Recovered (in) Blow Counts	Soil/Rock Descript And Geologic Origin Each Major Uni	n For	USCS	Graphic Log	Well Diagram	PID/FID	Compressive Strength	Moisture Content	Liquid Limit	Plastic Limit	P 200	RQD/ Comments
1 60/60 NA 2 60/56 NA	(0-1'2") FILL; Well-graded SAND Silt; little frag rocks; black; dry. (1'2"-1'11") Base Coarse Gravel (i F-M; White; dry. (1'11"-5') CLAY (CL); trace Sand, brown/red.  (5'-7.5') CLAY (CL); trace Sand, fbrown/red. (7.5'-8.5') Poorly-graded SAND (Slittle-Some SIlt; brown; wet. (8.5'-9'8") SILT (MH); with Clay/Cl orange mottling; barves visible; br	GW); ittle Sand fine; hard; fine; hard; SP-SM), F-M; layey SILT; sligl	e SW d, GW CL			NA NA						Change in color from black to gray and increase in Silt content at 8"

Signature

S. Stephenson

GZA GeoEnvironmental, Inc.

State of Wis	sconsin t of Natural R	esources												il Boı 14400-12		og Ir	nformation
				Route to: Watershed/Waste Remediation/Red	ewater  levelopment  X	Waste Managmer	_						Pag	je _	1	of	1
Facility/P	-		nse -	West Plant			Lice	nse/Per	mit/Mo	nitoring	Numb	er	В	oring	Numb		VL-B11
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Sam	1												Soil	Proper	ties		
Number and Type	Length All. & Recovered (in)	Blow Counts	Depth in Feet	And Geo	ock Descript ologic Origir n Major Uni	1 For		USCS	Graphic Log	Well Diagram	PID/FID	Compressive Strength	Moisture Content	Liquid Limit	Plastic Limit	P 200	RQD/ Comments
2	60/60	NA NA	10	(10'-10'4") Same as Above (9'2"-10') Poorly grade brown, wet  (10'-10'4") Same as Above (10'4"-12'9") Silt (ML), and loose, gray/brown, (12'9"-15') Very stiff let sand fine, brown, mois	, coarse, tan lay (CL), son sh brown, mo ay (CL), some moist  /e d Sand (SP)	ne sand F-C, pist e sand fine, tra F-M, little Silt,	soft	SP ML CL									Clay more wet around 7'
I hereby	certify the	at the inf	Ormat	ion on this form is true and	correct to the	he best of my	knowl	edge					<u> </u>				
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State of Wi	isconsin nt of Natural R	esources												So	il Boı	ring L	og Iı	nformation 7-98
				Route to:	Watershed/Waste	_	Waste Managme	nt						Pag				1
T 11: //					Remediation/Red	levelopment X	Other	I	70									
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GZA WI DNR FORMAT - GZADEPTH, GDT - 11/9/22 19:58 - J.\GEOTECH PROJECTS\GINT PROJECT DATABASES\20.0157080.00 OSHKOSH CORP - WEST PLANT.GPJ

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Firm G	que Well	No.		DNR Well II	D No.	Well Nan	ne	Final	Statio	Water l	Level	Surfa	ce Eleva	ation		Bore	ehole	Diameter
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Number and Type	Length All. & Recovered (in)	Blow Counts	Depth in Feet		And Geo	ock Descript ologic Origir h Major Uni	n For		USCS	Graphic Log	Well Diagram	PID/FID	Compressive Strength	Moisture Content	Liquid Limit	Plastic Limit	P 200	RQD/ Comments
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				organics; dark brown/ (0.5'-5') CLAY (CL); lit	ttle Sand, F-		I, C										
				fine; red/brown; hard;	dry.												
			_														
2	60/60	NA	5-	(5'-9') CLAY (CL); little	Sand F-C	· trace Gravel					NA						Hit rock
2	00/00	INA		fine; red/brown; hard; (9'-10') Poorly-graded	dry.	,					IVA						between 2.5-3' whi
				trace-little Silt; brown;	moist.	,											caused ribboning
			_														clay. Softe
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Firm <b>O</b> WI Uniq				Services NR Well ID No.	Well Nar	ne	Final Stat		Level	Surfa	ce Eleva					Diameter
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Sam	ple											Soil	Proper	ties		
Number and Type	Length All. & Recovered (in)	Blow Counts	Depth in Feet	And Geo	ock Descript ologic Origin h Major Uni	n For	USCS	Graphic Log	Well Diagram	PID/FID	Compressive Strength	Moisture Content	Liquid Limit	Plastic Limit	P 200	RQD/ Comments
1	60/60	NA	- -	(0-2") TOP SEDIMEN brown; wet. (2"-5') CLAY (CL); tra red/brown; dry.		, ,	MLCL		N I	NA NA		20	I	I	<u> </u>	White rood fragments (~1" in diameter) 2", 8", and 17".
2	60/60	NA	5	(5'-9') CLAY (CL); trac red/brown; dry. (9'-10') Poorly-graded trace-little Silt; brown;	SAND (SP-		SP-S	M William		NA						Softer consistence and black oxidation specs note in clay froi 8.5'-9'.
			10													
I hereby	certify the	at the info	ormation	n on this form is true and	correct to th	ne best of my k	nowledge									
Signatur						Firm	_		_							
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State of Wis	sconsin of Natural Re	sources											So	il Boı	ing L	og Ir	nformation
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	-	hKosh	Corpo	ration										6			NL-B4
Boring D First Nan	rilled By ne <b>Tony</b>	r: Name <b>Kapug</b> i	of cre	w chief (first, last) and F Last Name	ïrm		Date D		ng Starte	ed	Date I	Orilling (	_	eted		_	lethod
				l Services					-6-20			11-6-			Ge	opro	be
WI Uniq	ue Well	No.		DNR Well ID No.	Well Nan	ne	Final St	tatio	Water I			ce Eleva <b>72.0'</b>		MSL	Bore	ehole <b>NA</b>	Diameter inches
				ed 🗓 ) or Boring Locat N,E		/C	Lat _	7243	340		Local	Grid Lo		Ν			<b>X</b> E
	1/4 of <b>N</b>			ection <b>2</b> , T <b>17</b>	, R 16	,	Long 2	2351	376				Feet				Feet W
Facility 1	ID		Co	ounty <b>71</b>		County Cod	le		Civil Tov	wn/City	or Vill Oshk	age osh, Wi	iscons	in			
Sam													Soil	Proper	ties		
Number and Type	Length All. & Recovered (in)	Blow Counts	Depth in Feet	And Geo	ock Descript ologic Origir n Major Uni	n For	7	USCS	Graphic Log	Well Diagram	PID/FID	Compressive Strength	Moisture Content	Liquid Limit	Plastic Limit	P 200	RQD/ Comments
1	60/60	NA	-	(0'-1') FILL; Well-grae trace Gravel, F-M; bla (1'-1'7') Base Coarse little Sand, F; wet (per (1'7"-5') CLAY (CL); tr F; brown/red; hard; dr	ck; moist. Gravel (GM) ched water) ace Sand, F	) F-M; with Silt	; ;	GM CL			NA						From 8" to 12" increase in Silt content and change in color to gray.
2	60/51	NA	5	(5'-7') CLAY (CL); trac brown/red; hard; dry. (7'-7'8") Poorly-graded brown; wet. (7'8"-9'3") SILT (MH) orange mottling; barve (9'3"-10") No recovery.	SAND (SM with Clay/Cla	), F-M; with Si	ne	SM МН			NA						Color change to gray at 8'9".

Signature S. Stephenson

Firn

GZA GeoEnvironmental, Inc.

				Route to: Watershed/Waster Remediation/Red		Waste Managmen							n 4400-12 <b>je</b> _			: 7-98 : <u>1</u>
Facility/P	-	ame hKosh (	Corpor	ation			License/P	ermit/Mo	onitoring	Numb	er	Е	Boring	Numb		WL-B5
Boring D First Nan	rilled By ne <b>Tony</b>	r: Name <b>Kapugi</b>	of crev	v chief (first, last) and F Last Name	ïrm		Date Dril	_	ed	Date l	Drilling	_	eted		_	lethod
Firm <b>O</b> WI Uniq				Services  ONR Well ID No.	Well Nan	ne	Final Stat	1-6-20	I evel	Surfa	.ce Eleva				oprole	Diameter
				d(X) or Boring Locat				F	eet	7	<b>72.0'</b> Grid Lo	Feet	MSL		NA	inches
State Pla			1	N,E	S [	_/C/N	Lat			Locui	GHG L		<b>₹</b> N			XI Feet \( \square\)
Facility I		<u> </u>	Cou	inty	, R_ 10	County Cod		Civil To	wn/City	or Vill	age	Feet [				_ Feet L
Samı	ole			71		71				OSNK	osh, W		In Proper	ties		
Number and Type	Length All. & Recovered (in)	Blow Counts	Depth in Feet	And Geo	ock Descript blogic Origir n Major Unit	n For	USCS	Graphic Log	Well Diagram	PID/FID	Compressive Strength	Moisture Content	Liquid Limit	Plastic Limit	P 200	RQD/ Comments
1	60/48	NA	5	(0-3") TOPSOIL; brow (3"-8") CLAY (CL); tra F; red/brown; hard; dr (8"-11") Base Coarse (11"-4') CLAY (CL); tr F; brown/red; hard; dr (4'-5') No recovery.	ce Sand, F-0 y. Gravel (GW ace Sand, F	); dry.	GW			NA						White roo fragment (~1" diameter from 1'3"-1'10'
Signature	e			n on this form is true and	correct to the	Firm		74.0		visa:	. m. c :-	tal '	n.c			
	S.	Step	nens	son			G	ZA G	eo⊵n	viror	ımen	taı, I	nc.			

				Route to: Watershed/Wast Remediation/Red		Waste Managmen							Pa	ge _	11	o	f1
Facility/I	Project N						License	e/Per	mit/Mo	nitoring	Numb	er	I	Boring	Numb		
Boring [		hKosh ( 7: Name			Firm		Date D	rillin	g Starte	ed	Date	Drilling	Comp	leted	Drill		WL-B6 Iethod
				v chief (first, last) and F Last Name <b>Services</b>					·6-20			11-6-	•			opro	
	que Well			NR Well ID No.	Well Naı	me	Final S	tatic	Water I			ce Eleva 71.0'		t MSL	Bore	ehole <b>NA</b>	Diameter inches
				or Boring Loca		/C/N	Lat _	7243				Grid Lo	ocation	1			<del></del>
	1/4 of			ction 2 , T 17			Long 2	2351	394				Feet [	XN S			XE _Feet □ W
Facility	ID		Cou	nty <b>71</b>		County Cod 71	le	(	Civil To	wn/City	or Vil	lage osh, W	iscon	sin			
Sam	1					·							Soil	Proper	ties		
Number and Type	Length All. & Recovered (in)	Blow Counts	Depth in Feet	And Geo	ock Descrip ologic Origi h Major Un	n For	5	OSCS	Graphic Log	Well Diagram	PID/FID	Compressive Strength	Moisture Content	Liquid Limit	Plastic Limit	P 200	RQD/ Comments
1	60/52	NA	- - - 5-	(0'-1') FILL; Well-grac Silt; trace Gravel, F-M (1'-1' 5") Base Coarse Sand, F; moist (perch (1'5"-4'4") CLAY (CL) Gravel, F-M; red/brow (4'4"-5') No recovery.	l; black; dry. e Gravel (GN eed water). ; trace Sand n/dry.	M); with Silt; littl	e (	GM CL			NA						Increase in Sandand Si content an change in color to graffrom 6"-1". Softer consistency in clay from 1'5"-1'7" du to perched water above
2	60/60	NA	- - -	(5'-8') CLAY (CL); trac F-M; red/brown/dry. (8-8'10") Poorly-grade brown; wet. (8'10"-10') SILT (MH); barves visible; brown;	ed SAND (Si	M), F-M; with S	ilt;	эм мн			NA						Softer consistency noted in cla at 7.5' Color chang to gray at 9'4".
3	60/48	NA	10-	(10-12.5') SILT (MH); barves visible; gray; w (12.5'-14') CLAY (CL) brown and gray; dry. (14'-15') No recovery.	vet.			CL			NA						Increase in clay content and less water note from 11.5'-12.5'
[]. · · ·	4.6 4	-441		4Li- f	4 . 4		1										
I hereby Signatur		at the inf	ormatio	n on this form is true and	correct to th	Firm	nowledge	:									
		Steph	ensc	on			C	SZA	A Ge	oEnv	ironi	menta	al, Ir	IC.			

State of Wi Departmen	isconsin t of Natural Re	esources											So	il Bo1 n 4400-12	ring L	og It	nformation
				Route to: Watershed/Wast  Remediation/Rec	_	Waste Managme Other	ent						Pag	ge _	1	o	f <u>1</u>
Facility/I	Project N	ame					Licens	e/Pe	rmit/Mo	nitoring	Numb	er	E	Boring	Numb	er	
Boring F		hKosh	•		Girm.		Date F	rillir	ng Starte	ed	Date 1	Drilling	Compl	eted	Drill		WL-B7 Iethod
				w chief (first, last) and I Last Name	IIII		Date L		-6-20	ou	Date	11-6-	•	cica		ıd Au	
	que Well			Services ONR Well ID No.	Well Na	me	Final S	Static	Water			ce Eleva			Bore		Diameter
Local Gr	rid Origi	n 🗌 (es	stimated	d:☑) or Boring Loca	tion 🗌			70.46	Fe	eet		<b>72.0'</b> Grid Lo	_	MSL	_	NA	inches
State Pl	ane	NE 1	N /4 of Se	N, E	S , R 16	_/C/N	Lat _ Long						Feet [	N De			XE Feet □ V
Facility		1		unty	, K	County Coo		$\overline{}$	Civil To	wn/City	or Vil	lage					reetv
Sam	mle		<u> </u>	71		71					Osnk	osh, W		Proper	tios		<u> </u>
Number and Type	Length All. & Recovered (in)	Blow Counts	Depth in Feet	And Geo	ock Descrip ologic Origi h Major Un	in For		USCS	Graphic Log	Well Diagram	PID/FID	Compressive Strength	Moisture Content	Liquid Limit		P 200	RQD/ Comments
1	12/12	NA		(0'-1') Well-graded SA Some Gravel, F-C; tra				SM			NA						At 1' depth Tony pulle
2	12/12	NA	_	brown; dry. (1'-2') CLAY (CL); littl F-M; red/brown; dry.	e Sand, F-C	; trace Gravel,		CL			NA						out 6 large rocks (~4" diameter
3	12/12	NA	_	(2'-3') CLAY (CL); littl F-M; red/brown; dry.	e Sand, F-C	; trace Gravel,					NA						each) fron the hole.
			_														
			-														
			5-														
			_														
			_														
			_														
			_														
			10-														
			-														
			-														
			-														
			_														
I hereby Signatur		at the inf	ormatio	n on this form is true and	correct to the	ne best of my k	nowledg	e									
	S.	Step	hens	son				GΖ	'A Ge	eoEn	viror	men	tal, l	nc.			
this form Personal	n may resi Ily identif	ult in for iable info	feiture o ormation	rs 281, 283, 289, 291, 29 of between \$10 and \$25,0 on on this form is not inden or should be sent	00, or impri	isonment for up	to one y	ear,	dependir	ng on the	progra	m anď co	onduct i	nvolve	d.		

State of Wi Departmen	sconsin t of Natural Re	sources		Route to: Watershed/Waste	water	Waste Managmer	nt 🔲						Forn	n 4400-12	2	Rev.	formation 7-98
				Remediation/Rede	evelopment X	Other							Pag	je _	1	_ of	1
Facility/I		ame h <b>Kosh</b> (	Corpo	ration			Licen	ise/Pe	rmit/Moi	nitoring	Numb	er	В	oring	Numb		VL-B8
Boring I	Drilled By	: Name	of cre	w chief (first, last) and Fi	irm		Date	Drilli	ng Starte	ed	Date I	Orilling (	Comple	eted	Drilli	ng M	ethod
First Na				Last Name Services				11	-6-20			11-6-	20		Ge	oprob	е
	ue Well			DNR Well ID No.	Well Nan	ne	Final	Statio	Water I			ce Eleva <b>72.0'</b>		MSL	Bore	hole l	Diameter inches
Local Gr State Pl	_	ı (es		ed: X ) or Boring Locati		/C /N		724			Local	Grid Lo	ocation	(N			<b>X</b> E
	1/4 of N	IE 1	/4 of S		, R 16	1		g <b>2351</b>		/61			Feet				Feet W
Facility	ID		Co	unty <b>71</b>		County Cod	le		Civil Tov	wn/City		age <mark>osh, W</mark> i	iscons	in			
Sam													Soil l	Propert	ties		
Number and Type	Length All. & Recovered (in)	Blow Counts	Depth in Feet	And Geo	ck Descript logic Origin Major Uni	n For		USCS	Graphic Log	Well Diagram	PID/FID	Compressive Strength	Moisture Content	Liquid Limit	Plastic Limit	P 200	RQD/ Comments
2	60/60	NA NA		(0'-1') FILL; Well-grade Silt; trace Gravel, F-M; (1'-13") Base Coarse (1'3"-5') CLAY (CL); trace of the second se	black; moi Gravel; wet ace Sand, F race Sand, d SAND (SI wet. th Clay/ Clay s visible; br	ist. (perched wate ; trace Gravel;  F; trace Grave  M), F-M; yey Silt; slight	Ė;	SM CL			NA NA						

Signature

S. Stephenson

GZA GeoEnvironmental, Inc.

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis Stats. Completeion of this form is manatory. Failure to file this form may result in forfeiture of between \$10 and \$25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not indended to be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent

Firm

State of Wi Department	sconsin t of Natural Re	esources											So	il Bor	ing L	og In	formation
				Route to: Watershed/Waste Remediation/Red	_	Waste Managmen	nt						Pag	e _			. 7-98
Facility/I		ame	Corpo	ration			Licen	ise/Per	rmit/Mo	nitoring	Numb	er	В	oring	Numb		VL-B9
Boring D First Nar			_ •	w chief (first, last) and F Last Name	irm		Date		ng Starte	ed	Date I	Orilling (	-	eted		_	ethod
Firm O	n-Site E	nvironr	nental	Services				11	-6-20			11-6-	20		Han	d Au	ger
WI Unic	jue Well	No.	I	ONR Well ID No.	Well Nam	ne	Final	Static	Water I		ı	ce Eleva <b>72.0'</b>		MSL	Bore	hole <b>NA</b>	Diameter _ inches
				d(X) or Boring Locat N,E		]/C	Lat	7243	867		Local	Grid Lo		ΙN			XE
NE	1/4 of <b>N</b>	<b>IE</b> _1	/4 of S	ection <b>2</b> , T <b>17</b>	, R 16		Long	g <b>2351</b>	462				Feet				Feet W
Facility	ID		Co	unty <b>71</b>		County Cod	le	_	Civil To	wn/City	or Vill Oshk	age osh, Wi	scons	in			
Sam													Soil l	Propert	ies		
Number and Type	Length All. & Recovered (in)	Blow Counts	Depth in Feet	And Geo	ock Descript ologic Origin n Major Unit	n For		USCS	Graphic Log	Well Diagram	PID/FID	Compressive Strength	Moisture Content	Liquid Limit	Plastic Limit	P 200	RQD/ Comments
1	12/12	NA		(0-8") CLAY (CL); little				CL			NA	0 01					
2	12/12	NA	_	F-M; trace-little root do (8"-1') Base Coarse G Sand, F-M; brown; dry (1'-1.5') Base Coarse Sand, F-M; brown; dry (1.5'-2') CLAY (CL); Li	ravel (GM); : Gravel (GM)	Some Šilt; Litt ); Some Silt; Li		GM CL	O Y O		NA						
3	12/12	NA	_	Gravel, F-M; red/brow (2'-3') CLAY (CL); Littl Gravel, F-M; red/brow	n; dry. e Sand, F-C						NA						
			-	-													
			5-														
			_	-													
			10-	-													
			_	-													
			_	-													
			_	-													
			_	-													

Signature

S. Stephenson

GZA GeoEnvironmental, Inc.

State of Wiscon Department of	onsin of Natural Re	esources												So	ring il Bon 14400-12	ing L	og Inf	WL-SED1 formation
				Route to:	Watershed/Was	tewater Z	Waste Managme	nt 🗌						Pag			_ of .	1
Facility/Pr	-		ıse - W	/aukau Lot				Licens	e/Per	mit/Mo	nitoring	Numb	er	В	oring	Numbe		-SED1
Boring Dr First Nam	illed By	: Name	of crev	v chief (first		Firm		Date D		ng Starte	ed	Date I	Orilling 8-14-	_	eted		ng Me	thod
Firm <b>GZ</b> WI Uniqu		No.	Γ	ONR Well II	O No.	Well Nar	me SED1	Final S		Water I Fee		Surfa	ce Eleva		ACI.	Bore		Diameter inches
Local Gri		(es		d:X) or B	Boring Loca	tion 🗌	□/C□ /N□	Lat _				Local	Grid Lo	cation	] N			
	/4 of <b>N</b>	IE 1/	4 of Se			, R 16		Long						Feet				Feet □ W
Facility I	)		Cou	unty <b>71</b>			County Coo		(	Civil To	wn/City	or Vil	lage osh, W	iscons	in			
Samp							1							Soil P	ropert	ies		
Number and Type	Dength All. & Recovered (in)	ZBlow Counts	Depth in Feet	1: Organic	And Geo Each	ock Descrip blogic Origi n Major Un	in For		H USCS	Graphic Log	Well Diagram	PID/FID	Compressive Strength	Moisture Content	Liquid Limit	Plastic Limit	P200	RQD/ Comments
I hereby c																		
I hereby c	ertify tha	at the inf	ormatio	on on this for	rm is true an	d correct to	the best of my	knowled	lge									
Signature This form							Firm											
Personally	may resu identifi	ılt in for able info	feiture ormatio	of between \$	\$10 and \$25, m is not inde	,000, or imp	5, and 299, Wi orisonment for used for any of	up to one	e year	, depend	ling on t	he prog	ram and	conduc	t invol	e lved.		

State of Wisconsin	
Department of Natural Resources	2

Facility/Project Name

Route to:

OshKosh Defense - Waukau Lot

Boring Number: WL-SED2 Soil Boring Log Information Form 4400-122 Rev. 7-98

WL-SED2

Boring Number

Waste Managment Watershed/Wastewater Page of \_\_\_1\_ Remediation/Redevelopment X Other

License/Permit/Monitoring Number

Boring Drilled By: Name of crew chief (first, last) and Firm First Name E. Stapleton Firm GZA				Date Drilli	Date Drilling Completed 8-14-21				Drilling Method  Hand Auger				
				8-									
WI Unique Well No.  DNR Well ID No.  Well Name WL-SED2				Final Statio	Surface Elevation Feet MSL				Borehole Diameter NA inches				
Local Grid Origin (estimated:X) or Boring Location State Plane N, E S /C /N					Feet Feet MSL Local Grid Location N								
NE 1/4 of NE 1/4 of Section 2 , T 17N , R 16			Long							Feet V			
Facility ID	County Cod 71	le	Civil To	wn/City	y/or Village Oshkosh, Wisconsin								
Sample							Soil Propert				ies		
Number and Type and Type Secovered (in)  VA Blow Counts	Depth in F	oil/Rock Descripti d Geologic Origin Each Major Unit nt, silt, some clay, li , moist to wet	For	HO USCS	Graphic Log	Well Diagram	PID/FID	Compressive Strength	Moisture Content	Liquid Limit	Plastic Limit	P200	RQD/ Comments
hereby certify that the infe	ormation on this form is to	rue and correct to the	he best of my	knowledge									
ignature			Firm										
his form may result in fort	Chapters 281, 283, 289, 2 feiture of between \$10 and ormation on this form is no eted form should be sent	1 \$25,000, or impri	sonment for u	ip to one yea	ar, depend	ling on t	he progi	ram and	conduc	t invol	e ved.		

State of Wisconsin Department of Natural Resources	N. 1 10V		W	. 🗖						So	oring il Bon 11 4400-12	ring L	ber: .og Ii .Rev.	WL-SED3 nformation 7-98
	Route to: Watershed/Waster Remediation/Rede		Waste Managmer	nt [_]						Pag	ge _	11	of	
Facility/Project Name OshKosh Defense	- Waukau Lot			License	/Per	rmit/Mo	nitoring	Numb	er	E	Boring	Numb		L-SED3
Boring Drilled By: Name of		irm		Date Dr	illir	ng Starte	d	Date I	Orilling	Compl	eted	Drill	ing N	lethod
First Name E. Stapleton Firm GZA	Last Name				8-1	14-21			8-14-	21		Han	d Au	ger
WI Unique Well No.	DNR Well ID No.	Well Nam WL-	ne -SED3	Final Sta	atic	Water I Fee		Surfa	ce Eleva	tion Feet N	ИSL	Bore	ehole <b>NA</b>	Diameterinches
Local Grid Origin (estim			/C /N	Lat				Local	Grid Lo		N			□ E
NE 1/4 of NE 1/4 o	of Section 2 , T 17N			Long _	_					Feet	-			_Feet W
Facility ID	County <b>71</b>		County Cod	le	(	Civil To	wn/City		lage osh, W	iscons	sin			
Sample			I				Soil Properties							
Number and Type Length All. & Recovered (in) Blow Counts	And Geol	ck Descript ogic Origir Major Uni	n For	3031	202	Graphic Log	Well Diagram	PID/FID	Compressive Strength	Moisture Content	Liquid Limit	Plastic Limit	P200	RQD/ Comments
	1: Organic sediment, silt, brown to reddish brown,	some clay, I	ittle sand fine,	1 - 1 -	o H	ČŽ	ĕÖ		<u>22</u>	Σŭ	22	Z Z	P2	_ ಷರ_
I hereby certify that the inform														
I hereby certify that the inforn	nation on this form is true and	correct to t	the best of my	knowledg	ge									
-			Firm											
This form is authorized by Chethis form may result in forfeit Personally identifiable inform including where the complete	ture of between \$10 and \$25,0 nation on this form is not inder	00, or impr	risonment for u	up to one	yeai	r, depend	ling on t	he prog	ram and	condu	et invo	lved.		

State of Wisconsin Department of Natur	al Resources			Route to: Watershed/Wastev	vater	Waste Managmer	nt 🗍							m 4400-12	.2	Rev.		
				Remediation/Rede		Other	_						Pa	ge _	1_	of	1	
Facility/Project			- \A/	est Plant			Licens	se/Pe	ermit/Mo	nitoring	Numb	er	F	Boring	Numb		L-MW-1	
				chief (first, last) and Fi			Data I	:11	ng Starte	.d	Doto I	Orilling	Compi	latad	D.::11		L-IVIVV-1 [ethod	-
First Name <b>Ga</b>	ge Kapu	gi	ciew	Last Name	1111		Date		ng Starte 14-21	м	Date 1	8-14-		icica		oprol		
Firm On-Site		me																-
WI Unique W	ell No.		Dì	NR Well ID No.	Well Nan	ne	Final	Stati	c Water I Fee		l	ce Eleva <b>71.0'</b>		MSL	Bore	hole <b>NA</b>	Diameter inches	
Local Grid Ori State Plane	gin 🗌 (	estin		) or Boring Locati		/C /N	Lat _				Local	Grid Lo		ı XN			<b>X</b> E	
NE 1/4 of	NE	1/4 (	of Sect				Long						Feet [				Feet W	
Facility ID			Cour	nty <b>71</b>		County Cod	le		Civil To	wn/City	or Vil	lage <b>osh, W</b> i	iscon	sin				
Sample								·					Soil	Proper	ties			
Number and Type Length All. &	Blow Counts		Depth in Feet	And Geo	ck Descript logic Origir Major Uni	ı For		USCS	Graphic Log	Well Diagram	PID/FID	Compressive Strength	Moisture Content	Liquid Limit	Plastic Limit	P 200	RQD/ Comments	
1 60/6 2 60/6 3 60/6	) NA			(0-4") FILL; Well-graded little Gravel; brown; moi (4"-2") Very stiff lean Clasilt; trace Gravel, reddis (2"-5") Same as Above.  (5'-8.5") Same as Above.  (5'-8.5") Same as Above mottling. (8.5"-9"3") Stiff lean Clasilt, reddish brown, wet (9"3"-10") Poorly graded brown, wet.  (10'-10'10") Same As A (10'10"-12.5") Silt (ML), wet.  (12.5"-13"5") Silt (ML), strace Gravel, brown/gra (13.5"-15") Very stiff lear (13.5"-15") Very stiff lear Sand, reddish gray, with 14" transitions to tan/gripieces.	st ay (CL), son sh brown, m e, reddish br (CL), little some Sand (SP)  bove, wet. some clay, lity, wet. n Clay (CL), with gray m	rown with gray Sand fine, little F-M, little Silt, fine Sand, some Silt, little tottling, wet. little Silt, little fng, wet. Bottor	vn,	SP ML CL									Refusal at 18.5' - likel bedrock	,

Firm

Signature

State of Wi Departmen	sconsin t of Natural R	esources												il Bor 14400-12		og In	nformation
				Route to: Watershed/Waste Remediation/Red		Waste Managmer Other	_						Pag	je _	1	_ of	1
Facility/I	-		nse -	West Plant			Licens	se/Pei	mit/Moi	nitoring	Numb	er	В	oring	Numb		L-MW-2
Boring D First Nar	Drilled By	r: Name <b>Kapug</b> i	of cr	ew chief (first, last) and F Last Name	irm		Date I	Drillir	ng Starte	d	Date I	Orilling	Comple	eted	Drilli	ng M	ethod
				al Services				6-1	17-22			6-17-	22		Geo	oProk	)e
WI Unic	lue Well	No.		DNR Well ID No.	Well Nan	ne	Final S	Static	Water I Fee		1	ce Eleva <b>73.4'</b>	ation Feet	MSL	Bore	hole l	Diameterinches
State Pla	_			ed: (X) or Boring Locat N, E Section 2 , T 17N	S [	/C /N	Lat _				Local	Grid Lo		(N			<b>X</b> E Feet □ W
Facility		1/		ounty 71	, K	County Coc		-	Civil To	wn/City	or Vil Oshk	lage osh, Wi	_				_reet 🔲 w
Sam	ple												Soil	Proper	ties		
Number and Type	Length All. & Recovered (in)	Blow Counts	Depth in Feet	And Geo	ock Descript ologic Origin Major Uni	n For		USCS	Graphic Log	Well Diagram	PID/FID	Compressive Strength	Moisture Content	Liquid Limit	Plastic Limit	P 200	RQD/ Comments
3	60/60	NA NA	10 15 20	(10-13') Same as Abov (13-13.5') Well graded red, loose, wet (13.5-14') Lean Clay (C soft, wet (14-15') Well Graded S with gravel fine to med saturated  (15-17') Same as Abov (17-20') Lean clay (CL) moist, firm	red, mosit, see SAND Fine to SAND fine to ium, some le	soft  to Medium (SW gray mottling, coarse (SW), ean clay, soft, ark gray/red,	v),	SW CL SWG									End of Boring
		at the inf	orma	tion on this form is true and	l correct to t	the best of my	knowle	dge									
Signatur	e					Firm											

GZA WI DNR FORMAT - GZADEPTH, GDT - 11/9/22 19:57 - J.\GEOTECH PROJECTS\GINT PROJECT DATABASES\20.0157080.00 OSHKOSH CORP - WEST PLANT.GPJ

State of Wi	sconsin t of Natural R	esources													il Bor		og In	formation
				Route to:	Watershed/Waste	_	Waste Managmen							Pag				1
					Remediation/Rede	evelopment X	Other											
Facility/I	-		nse - V	Vest Plant				Licens	se/Pe	rmit/Mor	nitoring	Numbe	er	В	oring l	Numb		L-MW-3
Boring D	orilled By	r: Name <b>Kapugi</b>	of crev	v chief (first	t, last) and Fi ast Name	rm		Date I	Drilli	ng Starte	d	Date I	Orilling	Comple	eted	Drilli	ng M	ethod
				Services	ast Ivallic				7-	22-22			7-22-	22		Geo	Prol	oe
	ue Well			ONR Well I	D No.	Well Nam	ie	Final	Statio	Water I Fee		1	ce Eleva <b>71.4'</b>	tion Feet	MSL	Bore	hole <b>NA</b>	Diameter inches
State Pl	ane		N	I,	Boring LocatE	S	]/C □/N □				_	Local	Grid Lo	Σ	(N			X E
Facility	1/4 of ID	1/		ction 2 unty	, T <b>17N</b> _,	R 16	County Cod	Long le		Civil To	wn/City	or Vill		Feet	_IS			Feet W
1 acmity	ID.			71			71		_	CIVII 10	WID City	Oshk	osh, Wi	scons	in			
Sam	1													Soil l	Propert	ies		
Number and Type	Length All. & Recovered (in)	Blow Counts	Depth in Feet		And Geo	ock Descripti ologic Origin o Major Unit	For		USCS	Graphic Log	Well Diagram	PID/FID	Compressive Strength	Moisture Content	Liquid Limit	Plastic Limit	P 200	RQD/ Comments
2	60/60	NA NA	5— 5— — — — — — — — — — — — — — — — — —	(0.5-2.5') (2.5-2'10' (2'10"-5') medium, (5-7') Sa (7-7.5') F (7.5-10') hard, rec (10.33-1 brown/re (11.33-1: (13-15')	Sandy loam, br.) Sandy Clay L.  ") Clayey Sand, Clay L.  ") Lean Clay (Cl., hard, red/brown, red/brown, clay (CL.), trace d/brown, moist  ") Silty Sand (1.33') Clay (CL., trace), wet Clay (CL.), trace d/brown, moist  ") Silty Sand (S.) Si	oam, dark brod (SC) fine, b L), trace grave vn, moist  white, dry the gravel fine SM) fine, bro the gravel fine, wet the gravel fine,	to medium,  wn, wet erbeds, , brown brown, wet	knowlec	SC CL SM CL SM CL									End of Boring
I hereby	certify the	at the inf	ormatio	on on this for	rm is true and	correct to th		knowled	dge									
Signatur	е						Firm											

GZA WI DNR FORMAT - GZADEPTH, GDT - 1/19/22 19:57 - J/GEOTECH PROJECTS/GINT PROJECT DATABASES/20.0157080.00 OSHKOSH CORP - WEST PLANT.GPJ

State of Wi Departmen	sconsin t of Natural R	esources											Sc	il Bor n 4400-12	ring L	og In	nformation
				Route to: Watershed/Waster  Remediation/Rede		Waste Managmer Other	_						Pag	ge _	1	_ of	1
Facility/I	-		nse - \	West Plant			Licen	se/Pe	rmit/Moi	nitoring	Numbe	er	F	Boring 1	Numb		MW-4
				w chief (first, last) and Fi Last Name	irm		Date l		ng Starte	d	Date D	7-22-	_	eted		ing Mo	
	n-Site E jue Well			DNR Well ID No.	Well Nam	ie	Final		c Water I		1	ce Eleva				hole I	Diameter
				ed: X ) or Boring Locat N,E			Lat		Fee			<b>75.0'</b> Grid Lo	cation	MSL N		NA	_ inches
	1/4 of			ection <b>2</b> , T <b>17N</b>			Long						Feet [				Feet W
Facility	ID		Co	ounty <b>71</b>		County Cod	le	_	Civil To	wn/City	or Vill Oshko	age osh, Wi	iscons	in			
Sam	1												Soil	Proper	ties		
Number and Type	Length All. & Recovered (in)	Blow Counts	Depth in Feet	And Geo	ck Descripti logic Origin Major Unit	For		USCS	Graphic Log	Well Diagram	PID/FID	Compressive Strength	Moisture Content	Liquid Limit	Plastic Limit	P 200	RQD/ Comments
3	60/60 60/60 60/60	NA NA		(0-5') Lean Clay (CL), v some silt, moist, red/bridge (6-8') Lean Clay (CL), s loose, red with gray mo (8-10') Lean Clay (CL), with gray mottling  (10-15') Lean Clay (CL) hard, dry  (16-17') Lean Clay (CL) mottling, loose, wet (17-18') Poorly graded with gray mottling, loose (18-20') Lean Clay (CL) gray mottling, soft, moistling, soft, s	some silt, trace stilling some silt, so high some silt, trace sand (See, wet high trace sand high some silt.	ce fine sand, d oft, moist, red el fine to mediu GP), trace clay, ine, red with g	ım,	SP CL SC CL									End of
				-													Boring
I hereby	certify the	at the inf	formati	on on this form is true and	correct to the	he best of my	knowle	edge									

Firm

Signature

	Vatershed/Wastewater  Remediation/Redevelopment	Waste Management  Other	MONITORING WELL CONSTRUCTION Form 4400-113A Rev. 7-98
Facility/Project Name	Local Grid Location of Well		Well Name
Oshkosh Defense- Waukau Lot	ft. 🔲	NftftW.	WL-MW-1
Facility License, Permit or Monitoring No. MW-1	Local Grid Origin (estimate	ed: 🗌 ) or Well Location 🔲	Wis. Unique Well No. DNR Well ID No.
Facility ID	St. Planeft. N,	-	Date Well Installed 8 / 1 4 /2 0 2 1
	Section Location of Waste/Source		$\frac{1}{m}\frac{m}{m}\frac{d}{d}\frac{d}{d}\frac{v}{v}\frac{v}{v}\frac{v}{v}$
Type of Well	NE 1/4 of NE 1/4 of Sec. 2		Well Installed By: Name (first, last) and Firm Gage Kapugi
Well Code/	Location of Well Relative to Wa		
Source ft. Apply	~ -	Sidegradient Not Known ————	On-Site Environmental
A. Protective pipe, top elevation		1. Cap and lock?	ĭ Yes □ No
	ft. MSL /	2. Protective cover	
2, want casting, top the value		a. Inside diamete	or: <u>8</u> in. 1 ft.
C. Land surface elevation	ft. MSL	b. Length:	<u>-                                 </u>
D. Surface seal, bottom ft. MS	SLor ft.	C. Material:	Other □
12. USCS classification of soil near screen	n:	d. Additional pro	
	SW 🗆 SP 🖾 📗	19.	e:
SM SC ML MH C	CL CH CH C	3, Surface scal:	Bentonite □ 30
Bedrock		3. Bullace scal.	Concrete 🖾 01
	Yes ⊠ No	×	Other 🗆
1	tary 🗆 5 0	4. Material between	n well casing and protective pipe:  Bentonite □ 30
Hollow Stem A	iger ⊠ 41   1000 ther □ □ □		Other 🗆
		5. Annular space se	
15. Drilling fluid used: Water □ 0 2	Air □ 01		mud weight Bentonite-sand slurry □ 35
Drilling Mud □ 0 3	None 🛛 99 💮		mud weight Bentonite slurry   31
16. Drilling additives used?	Vas M Na	d % Benton	nite Bentonite-cement grout 5 0
16. Dining additives used?	Yes ⊠ No	e5Ft	<sup>3</sup> volume added for any of the above
Describe		f. How installed	
17. Source of water (attach analysis, if requ	ired):		Tremie pumped □ 02 Gravity □ 08
		6. Bentonite seal:	Gravity ⊠ 08 a. Bentonite granules □ 33
	<del></del>	KOC4	33/8 in. □1/2 in. Bentonite chips ☑ 3.2
E. Bentonite seal, top ft. MS	Lor0ft.	/ c	Other 🗆 🧱
		7 Fine sand materi	al: Manufacturer, product name & mesh size
F. Fine sand, top ft. MS	L or 4 ft.	RW Sidley	, 1
G Filter mock ton fr MS	L or 5 ft.	* · · · · · · · · · · · · · · · · · · ·	O.F. 3
G. Filter pack, top ft. MS	201	b. Volume adde	rial: Manufacturer, product name & mesh size
H. Screen joint, top ft. MS	L or 6 ft.	Red Flint	Tail Wandington, product havie & most one
· · ·		b. Volume adde	d = 3.0 ft <sup>3</sup>
I. Well bottomft. MS	Lor 16 ft.	9. Well casing:	Flush threaded PVC schedule 40 \( \text{\tinit}}\\ \text{\ti}\text{\texi{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\tiliex{\tint{\text{\text{\text{\text{\text{\text{\text{\text{\tex{\tex
A MC	, <sub></sub> 16 a.		Flush threaded PVC schedule 80  24
J. Filter pack, bottom ft. MS	L or i.	10. Screen material:	2" Schedule 40 PVC
K. Borehole, bottom ft. MS	Lor 18.5 ft.	a. Screen type:	2" Schedule 40 PVC Factory cut ☑ 11
II. Dordino, obtoin		a. corocartype.	Continuous slot  01
L. Borehole, diameter8.25 in.		<b>~</b> \	Other 🗆 🧼
0.07		b. Manufacturer	Monoflex
M. O.D. well casing $\frac{2.37}{10.00}$ in.		c. Slot size:	0. <u>010</u> in. 10 ft
N. I.D. well casing		d. Slotted length	
N. I.D. well casing $-\frac{2.05}{}$ in.		11. Backtill matcha Soil	l (below filter pack): None ☐ 14 Other ☐
I hereby certify that the information on this	form is true and correct to the be	est of my knowledge.	
Signature Mandalon W	Firm		
(1. A.M. /An. Into. 1 A	L GZA (	GeoEnvironmental, Inc.	

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a forfeiture of between \$10 and \$25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent

<u> </u>	Vatershed/Wastewater [ Remediation/Redevelops			MONITORING WELL Form 4400-113A	CONSTR Rev. 7-98	UC:	ΓΙΟΝ
Facility/Project Name Oshkosh Defense- Waukau Lot	Remediation/Redevelops Local Grid Location of	Well N.		Well Name WL-MW-2	<u> </u>		
Facility License, Permit or Monitoring No. MW-2	Local Grid Origin   Lat	(estimated: 🗆 ) or	Well Location	Wis. Unique Well No.	DNR Well	ID ì	Vo.
Facility ID	St. Plane			Date Well Installed 6	1 7 /2 0	2	
Type of Well	Section Location of Wa	•		Well Installed By: Nam	d d v	y y	y
Well Code /	NE 1/4 of NE 1/4		_N, R. <u>16</u> ₩	Gage Kapugi	ie (msi, iasi,	) alic	тип
Distance from Waste/ Enf. Stds. Sourceft. Apply	Location of Well Relat u Upgradient d Downgradient	s 🗌 Sidegradient	Gov. Lot Number	On-Site Environ	mental		
A. Protective pipe, top elevation			I. Cap and lock?		⊠ Yes	П	No
			2. Protective cover p	oipe:		_	
B. Well casing, top elevation	ft. MSL		a. Inside diameter	-	_	_ 4	<u>1</u> in.
C. Land surface elevation	ft. MSL _	<u>ا ا ا ا</u>	b. Length:		_	_ 4	<u>4</u> ft.
D. Surface seal, bottom ft. M			c. Material:		Steel	_	
					Other		
12. USCS classification of soil near scree GP □ GM □ GC □ GW □ S	\	"	d. Additional pro		☐ Yes	ш	No
	SW   SP   '	/訂 [[] / /	ir yes, describe	3:	Bentonite	<b>5</b> 71	3 0
Bedrock 🗆			3. Surface scal:		Concrete		01
13. Sieve analysis performed?	Yes ⊠ No				Other		***
14. Drilling method used: Ro	tary □ 50		4. Material between	well casing and protective		_	3000000
Hollow Stem A	· _				Bentonite	X	3 0
	ther 🗆 🚐				Other		
			5. Annular space sea	al: a. Granular/Chippe	d Bentonite	K	33
15. Drilling fluid used: Water □ 0 2	Air □ 01		ь Lbs/gal n	and weight Bentonite	-sand slurry	, 🗆	35
Drilling Mud □ 0 3	None 2 99	923 DAN		nud weight Bento			3 1
1.6. D. 2010 on and 425 on a second 2	Vac MAINT		d % Benton	ite Bentonite-co	ement grout		50
16. Drilling additives used?	Yes ⊠ No		e1.2Ft ·	<sup>3</sup> volume added for any o	f the above		
Describe			f. How installed:		Tremie	_	<b>0</b> 1
17. Source of water (attach analysis, if req	uired):			Trem	iie pumped		02
17. Source of water (attack analysis, if fed	unca).			<b>.</b>	Gravity		0.8
			6. Bentonite seal:		ite granules	_	33
E.D. 1. 1. 6-346	ot O 64		b. □1/4 m. ⊠	3/8 in. □ 1/2 in. Ben	-		32
E. Bentonite seal, top ft. MS	or or or		c		Other	ш	***
F. Fine sand, top ft. MS	SL or3.5 ft.		7. Fine sand materia	l: Manufacturer, produc	et name & n	nesh	size
			a. RW Sidley	30 x 100			
G. Filter pack, top ft. MS	L or 4 ft.\		b. Volume added	0.5 ft	3		
				ial: Manufacturer, produ	ct name & 1	mesl	h size
H. Screen joint, top ft. MS	SL or <u>5</u> ft.		a. RW Sidley				
			b. Volume added	1 3.6 ft	3		
I. Well bottom ft. MS	SL or <u>15</u> ft.		9. Well casing:	Flush threaded PVC sc	hedule 40	X	23
	45 -			Flush threaded PVC sc			24
J. Filter pack, bottom ft. MS	SL or 15 ft.			Oll Cabadula 40 DV	Other		******
	ν 15 O α	10	0. Screen material:	2" Schedule 40 PV			
K. Borehole, bottom ft. MS	SL or 19.9 m.		a. Screen type:		Factory cut	_	1 1
8.00	`			Cont	inuous slot	_	01
L. Borehole, diameter $-\frac{8.00}{100}$ in.		\	1 77 2	Monofley	Other	Ц	
M. O.D. well casing2.37 in.		\	<ul><li>b. Manufacturer</li><li>c. Slot size:</li></ul>	IVIOLIONEX		010	0_ in.
M. O.D. well casing $-\frac{2.37}{}$ in.		\	<ul><li>c. Slot size:</li><li>d. Slotted length</li></ul>	<b>!</b>			<u>0</u> ft.
N. I.D. well casing2.05 in.		1		· (below filter pack):	None		14
m. I.D. well casing m.		1	1. Dackini matchai	toolow lines back).	Other		200
I hereby certify that the information on this	form is true and correct	t to the best of my kno	wledge.			_	20,000
Signature M.	Diama						
- // /// /// /// ///		GZA GeoEnvironi	mental inc				

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a forfeiture of between \$10 and \$25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent

<u> </u>	Vatershed/Wastewater  Remediation/Redevelopment	Waste Mana; X Other □ -	gement[]		CONSTRU Rev. 7-98	JCTION
Facility/Project Name Oshkosh Defense- Waukau Lot	Remediation/Redevelopment Local Grid Location of Wellft.	□ Ñ. = = -	ft. □ E.	Well Name WL-MW-4		
Facility License, Permit or Monitoring No. MW-4	Local Grid Origin   (estin	nated: 🔲 ) or 🗎	Well Location □	Wis. Unique Well No.	ONR Well I	D No.
Facility ID	St. Plane ft.	"Long	or ft. E. S/C/N	Date Well Installed <sub>6</sub> / 1	   7	2 2
	Section Location of Waste/So			$\frac{m}{m}\frac{m'}{d}$	ld v v	v v
Type of Well	NE 1/4 of NE 1/4 of Sec	e. <sup>2</sup> .T. <sup>17</sup>	N, R. <u>16</u> □ W	Well Installed By: Name	(first, last)	and Firm
Well Code/	Location of Well Relative to		Gov. Lot Number	. Gage Kapugi		_
	d □ Downgradient n			On-Site Environn	nental	
A. Protective pipe, top elevation	ft. MSL		Cap and lock?	•	⊠ Yes [	] No
B. Well casing, top elevation	ft. MSL		Protective cover p a. Inside diameter	=		_ <u>4</u> in.
	ft. MSL	[	b. Length:	•		4 ft.
D. Surface seal, bottom ft. MS			c. Material:		Steel [	
12. USCS classification of soil near screen	#25000 AS I		d. Additional pro	to ation?	Other [	57555555
GP GM GC GW S	1 1 1	}\ \		ecuon <i>:</i>	□ res [	_ 140
SM □ SC □ ML□ MH□ (		\ \ \ .	·		 Bentonite <b>E</b>	₫ 30
Bedrock □		<b>₩</b> \ ' '	. Surface scal:		Concrete [	01
	Yes ⊠ No	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		77 1 1 1	Other [	
_	tary □ 50	4.	. Material between	well casing and protective	e pipe: Bentonite [	⊠ 30
Hollow Stem At	iger ⊠ 411   % % % % % % % % % % % % % % % % % %				Other I	10000000
		5.	. Annular space sea	al: a. Granular/Chipped		33
15. Drilling fluid used: Water   0 2	Air 01	1 🖓 — h	Lbs/gal n	and weight Bentonite-s	sand slurry[	□ 35
Drilling Mud □ 0 3	None 🛛 99	<b>2</b> c		nud weight Bentor		
16. Drilling additives used?	Yes ⊠ No		1.2 Ft	ite Bentonite-cer  volume added for any of	ment grout l	□ 50
					Tremie [	<b>0</b> 1
Describe		f	, now instance:		e pumped [	
17. Source of water (attach analysis, if requ	iired):				Gravity [	
		6	. Bentonite seal:	a. Bentonite	-	_
E. Bentonite seal, top ft. MS	Lor Off		b. □1/4 in. ⊠	3/8 in. □ 1/2 in. Bento	-	
E. Bentomie seal, top It. M.3	201		С		Other [	·er.es
F. Fine sand, top ft. MS	L or <u>3.5</u> ft.			d: Manufacturer, product	name & m	esh size
G. Filter pack, top ft. MS	Lor 4 ft.		a. RW Sidley	0 = 0		202
G. Filter pack, top ft. MS	Lot 11.		b. Volume added	ial: Manufacturer, product	t name & m	esh size
H. Screen joint, top ft. MS	L or 5 ft.	_	a. RW Sidley	#5		
0.150	15.0		b. Volume added			
I. Well bottom ft. MS	L or 12 II.	9	. Well casing:	Flush threaded PVC sche Flush threaded PVC sche		
J. Filter pack, bottomft. MS	Lor 15_ft.				Other [	□ 🚛
Z D I I I & MS	τ <sub>σπ</sub> 15.0 <del>β</del> .	`10	Screen material:	2" Schedule 40 PV0		
K. Borehole, bottom ft. MS	L or 15.5 II.		a. Screen type:		actory cut [ uous slot ]	_
L. Borehole, diameter8.00_ in.			b. Manufacturer		Other	
M. O.D. well casing $2.37$ in.			c. Slot size: d. Slotted length		-	010_in. _10_ft.
N. I.D. well casing $2.05$ in.		11		(below filter pack):	None   Other	<b>X</b> 14
I hereby certify that the information on this	form is true and correct to the	e best of my know	vledge.		Oulei I	
Signature		A GeoEnvironm	<del>-</del>			

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a forfeiture of between \$10 and \$25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

<u> </u>	Vatershed/Wastewater Remediation/Redevelopme	Waste Mana nt⊠ Other □ _	igement	MONITORING WELL Form 4400-113A	CONSTRU Rev. 7-98	UCI	ΓΙΟΝ
Facility/Project Name Oshkosh Defense- Waukau Lot	Remediation/Redevelopme Local Grid Location of W	ell N.		Well Name WL-MW-3	}		
Facility License, Permit or Monitoring No. MW-3	Local Grid Origin  (e	stimated: 🔲 ) or	Well Location	Wis. Unique Well No.	DNR Well	ID N	Vo.
Facility ID	St. Plane	ft. N,		Date Well Installed 7	22120	2	<u>-</u>
Type of Well	Section Location of Waste	•	N, R. 16 □ W	Well Installed By: Nan	d d v ne (first, last)	v <u>v</u> ) and	<u>y</u> I Firm
Well Code/	NE 1/4 of NE 1/4 of Location of Well Relative		N, R. 16 W	Tony Kapugi			
Distance from Waste/ Enf. Stds. Sourceft. Apply _		s 🗌 Sidegradient		On-Site Environ	mental		
A. Protective pipe, top elevation	ft. MSL ———		. Cap and lock?		▼ Yes		No
B. Well casing, top elevation = - = -	ft. MSL	╫┌╜╠ <mark>╱</mark> ╱	<ol> <li>Protective cover p a. Inside diameter</li> </ol>	=		4	l in.
2, 1	ft. MSL		b. Length:	•	_		4 ft.
	-		c. Material:		Steel		_
D. Surface seal, bottom ft. MS					Other		
12. USCS classification of soil near screen	\	M   K	d. Additional pro		☐ Yes		No
GP GM GC GW S SM SC ML MH G	SW D SP D		If yes, describe	s:		<b>.</b>	2.0
Bedrock □		<b>₩ ₩</b> \ 3	3. Surface seal:		Bentonite Concrete		30
13. Sieve analysis performed?	Yes ⊠ No				Other		
14. Drilling method used: Ro	tary □ 50	₩ ₩ 4	I. Material between	well casing and protective			<del>340.440</del>
Hollow Stem At				•	Bentonite	X	3 0
	ther 🗆 🏬				Other		
45 D W. Cuid and Water C 0.2	A:- [] 0.1	5	5. Annular space sea	al: a. Granular/Chippe	d Bentonite	KI	33
15. Drilling fluid used: Water □ 0 2  Drilling Mud □ 0 3	Air □ 01 None 図 99			and weight Bentonite			35
	tone is a			nud weight Bento			31
16. Drilling additives used?	Yes ⊠ No	<b>***</b> *********************************	d	ite Bentonite-co  volume added for any c	of the above	. Ц	5 0
			e. ————————————————————————————————————		Tremie		0 1
Describe	<del></del>		I. HOW Instances.		ie pumped		02
17. Source of water (attach analysis, if requ	ifred):				Gravity		0.8
			5. Bentonite seal:		ite granules	_	33
	, O.G		b. □1/4 in. ☒:	3/8 in. □ 1/2 in. Ben	-		3 2
E. Bentonite seal, top ft. MS	r or ir.		с	_	Other	Ц	\$\$ \$\frac{1}{2}\$
F. Fine sand, top ft. MS	L or3.5 ft.			d: Manufacturer, produc	et name & n	nesh	size
0.100			a. RW Sidley	0.5			200
G. Filter pack, top ft. MS	L or 4 ft.		b. Volume added	·			
H. Screen joint, top ft. MS	Lor 5ft.	黒闇 ノ゛	RW Sidley	ial: Manufacturer, produ #5	ct name & r	nesn	2000000000
Ti. Sereen Joint, top	201		a. Volume added		3		
I. Well bottom ft. MS	L or <u>_ 15</u> ft.		9. Well casing:	Flush threaded PVC sc		X	23
			-	Flush threaded PVC sc	hedule 80		24
J. Filter pack, bottomft. MS	L or 15_ft.			011 O 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Other		
	- 15 O o	`10	0. Screen material:	2" Schedule 40 P\			
K. Borehole, bottom ft. MS	L or 15.0 II.		a. Screen type:		Factory cut	_	1 1
L. Borehole, diameter8.00 in.				Cont	inuous slot Other		01
,		\	b. Manufacturer	Monoflex		_	aasaast
M. O.D. well casing $-2.35$ in.		\	c. Slot size:				<u>)</u> in.
2.05		\	d. Slotted length				<u>0</u> ft.
N. I.D. well casing $-\frac{2.05}{}$ in.		11	l. Backfill material	(below filter pack):	None Other		14
I hereby certify that the information on this	form is true and correct to	the best of my know	wledge.				200
Signature M. A. A. A.	Ti						
- // /// /// /// ///		GZA GeoEnvironr	mental inc				

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a forfeiture of between \$10 and \$25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent

State of Wis., Dept. of Natural Resources

Well / Drillhole / Borehole Filling & Sealing Report dnr.wi.gov Form 3300-005 (R 4/2015) Notice: Completion of this report is required by chs. 160, 281, 283, 289, 291-293, 295, and 299, Wis. Stats., and chs. NR 141 and 812, Wis. Adm. Code. In accordance with chs. 281, 289, 291-293, 295, and 299, Wis. Stats., failure to file this form may result in a forfeiture of between \$10-25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be used for any other purpose. Return form to the appropriate DNR office and bureau. See instructions on reverse for more information. Route to DNR Bureau: Watershed/Wastewater X Remediation/Redevelopment **Drinking Water** Verification Only of Fill and Seal Waste Management Other: 1. Well Location Information 2. Facility / Owner Information County WI Unique Well # of Hicap # Facility Name Removed Well Waukau Lot Winnebago Facility ID (FID or PWS) Latitude / Longitude (see instructions) Format Code Method Code GPS008 DD Ν License/Permit/Monitoring # SCR002 DDM WL-B1 W OTH001 Range Original Well Owner 1/4 / 1/4 NE Section Township NE XE or Gov't Lot # 16 2 17 Present Well Owner Well Street Address Oshkosh Corporation 3231 Oregon Street Mailing Address of Present Owner Well ZIP Code Well City, Village or Town 54902 Oshkosh City of Present Owner State ZIP Code Subdivision Name Lot # WI 54209 Oshkosh 4. Pump, Liner, Screen, Casing & Sealing Material Reason for Removal from Service WI Unique Well # of Replacement Well Pump and piping removed? X N/A No Soil Boring Liner(s) removed? No Yes X N/A 3. Filled & Sealed Well / Drillhole / Borehole Information Liner(s) perforated? Yes Nο X N/A Original Construction Date (mm/dd/yyyy) Monitoring Well Screen removed? Yes Νο X N/A 11/6/2020 Water Well Casing left in place? Yes No X N/A If a Well Construction Report is available, X Borehole / Drillhole Was casing cut off below surface? Yes Nο X N/A please attach. Construction Type: Did sealing material rise to surface? Yes No X N/A Did material settle after 24 hours? Yes No X N/A X Drilled Driven (Sandpoint) Dug If yes, was hole retopped? X N/A Yes Other (specify): If bentonite chips were used, were they hydrated X N/A Formation Type: Yes No with water from a known safe source? X Unconsolidated Formation Bedrock Required Method of Placing Sealing Material Conductor Pipe-Gravity Conductor Pipe-Pumped Total Well Depth From Ground Surface (ft.) Casing Diameter (in.) Screened & Poured Other (Explain): (Bentonite Chips) Lower Drillhole Diameter (in.) Casing Depth (ft.) Sealing Materials Neat Cement Grout Concrete NA Sand-Cement (Concrete) Grout Bentonite Chips Was well annular space grouted? X No Unknown For Monitoring Wells and Monitoring Well Boreholes Only: If yes, to what depth (feet)? Depth to Water (feet) X Bentonite Chips Bentonite - Cement Grout Bentonite - Sand Slurry Granular Bentonite No. Yards, Sacks Sealant or Mix Ratio or 5. Material Used to Fill Well / Drillhole From (ft.) To (ft.) /olume (circle one) 1 bag Bentonite Chips Surface 10'

## 6. Comments

7. Supervision of Work					DNR U	se Only
Name of Person or Firm Doing Filling & Sealing	Licens	e #	Date of	Filling & Sealing or Verification	Date Received	Noted By
Tony Kapugi- On-Site Environmental			(mm/dd/	/yyyy) 11/6/2020		
Street or Route	•			Telephone Number	Comments	
P.O. Box 280				(608) 837-8992		
City	State	ZIP Code		Signature of Person Doing W	/ork	Date Signed
Sun Prairie	WI	53290				

State of Wis., Dept. of Natural Resources

## Well / Drillhole / Borehole Filling & Sealing Report

dnr.wi.gov Form 3300-005 (R 4/2015) Notice: Completion of this report is required by chs. 160, 281, 283, 289, 291-293, 295, and 299, Wis. Stats., and chs. NR 141 and 812, Wis. Adm. Code. In accordance with chs. 281, 289, 291-293, 295, and 299, Wis. Stats., failure to file this form may result in a forfeiture of between \$10-25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be used for any other purpose. Return form to the appropriate DNR office and bureau. See instructions on reverse for more information. Route to DNR Bureau:

□ Verification Only of Fill and Seal     □ Drinking V						Vater		\	Watershed/W	astewater/	>	Remed	iation/l	Redeve	lopment		
	•					_ W	aste Ma	nagemer	nt		Other:						
1. Well Location	on Infor	mation							2. Facilit	y /	Owner Inf	ormatior	1				
County			ue Well #	of	Hica	ар #			Facility Na	me	)						
Winnebago		Remove	d Well						Wauka	au	Lot						
	1 (	l						0 1	Facility ID	(FI	D or PWS)					,	
Latitude / Longitue	de (see ir	struction	,	Forma		ie	Method GF	Code PS008									
			N		DD			CR002	License/Pe	erm	nit/Monitoring	#					
			W		DDM		_ ⊟от	ΓH001		١	WL-B2						
1/4 / 1/4 NE	¼ NE		Section	To	wnsh	ip	Range	ΧE	Original W	'ell	Owner						
or Gov't Lot #	112		2		17	N	16	⊠ w									
Well Street Addre	255					14			Present W	'ell	Owner						
3231 Oregon									Oshko	osł	n Corporation	n					
Well City, Village					Ιν	Vell 7	ZIP Code	2	Mailing Ad	ldre	ess of Presen	t Owner					
Oshkosh	OI TOWN				ľ		1902	•									
Subdivision Name					-	ot #			City of Pre	sei	nt Owner			State	ZIP (	Code	
Cabalviolori (ame	•				-	-Ot 11			Oshko	osł	h			WI	54	4209	
Reason for Remo	val from	Service	WI I In	iaue We	# II	f Ren	olaceme	nt Well	4. Pump	, L	iner, Scree	n, Casin	g & Seal	ing Mate	erial		
Soil Boring	vai iioiii v	oci vicc	IVVI OIII	ique vve	<i>π</i> 0	ПССР	лассттс	iii vvoii			piping remov				Yes	No	X N/A
3. Filled & Sea	lad Wal	L / Drille	oolo / Ro	robol	- Inf	orm	ation		Liner(s)	rei	moved?				Yes	No	X N/A
			Original Co					/vvv)	Liner(s)	ре	erforated?				Yes	No	X N/A
Monitoring V	Well		11/6/20			(.	,	777/	Screen	rer	moved?				Yes	No	X N/A
Water Well									Casing	left	in place?				Yes	No	X N/A
X Borehole / D	Orillhole		f a Well Colease att		ction F	Repo	rt is avai	ilable,	Was cas	sin	g cut off belo	w surface?	)		Yes	No	X N/A
Construction Type			Jiease all	aui.							g material rise				Yes	No	X N/A
						_					al settle after			H	Yes	No	X N/A
X Drilled	ш	Jriven (Sa	andpoint)			Dug					was hole reto			H	Yes	No	X N/A
Other (spec	:ify):								1		e chips were	• •	they hydr	ated —	100		
Formation Type:											from a know				Yes	No	X N/A
X Unconsolida	ted Form	ation		Bed	rock				Required N	Vlet	thod of Placir	ng Sealing	Material				
Total Well Depth	From Gro	und Surf	ace (ft.)	Casing	Dian	neter	(in.)		Cond	duc	tor Pipe-Gra	vity C	onductor F	Pipe-Pump	oed		
10'				NA							ed & Poured	Пс	ther (Expla	ain):			
Lower Drillhole Di	iameter (i	n )		Casing	Dent	th (ft '	`		Sealing Ma		nite Chips)						
Lower Dillinoic Di	iameter (i	11.,				ui (it.,	,		l — *		ement Grout			Concrete			
				NA									. H		Ola :		
Was well annular	space gro	uted?		Yes	X	No	Ur	nknown			ement (Cond	,		Bentonite			
									1 —		ng Wells and	Monitoring		•			
If yes, to what dep	pin (leet)	?	рери	h to Wa	tei (ie	eet)			X Bent	oni	ite Chips	Į	Bentor	nite - Cem	ent Gr	out	
									Gran	ıula	ar Bentonite			nite - Sand			
5. Material Use	ed to Fil	l Well /	Drillhol	е					From (ft.)	)	To (ft.)	No. Yard	s, Sacks S me (circle	ealant or		Mix Rat Mud We	io or
Bentonite C	hins								Surface		10'		bag	one)	'	viuu vve	signi
Bornorino O	ПРО								Bullace		10						
										+							
6. Comments																	
7. Supervision				1.							.,			NR Use			
Name of Person of		-	-	ng  Li	cense	e #				_	or Verificatio	n Date R	eceived		Noted	Ву	
Tony Kapugi- C	Jn-Site E	rivironn	nental				(n	nm/dd/yy									
Street or Route								T∈	lephone Nu	uml	ber	Commo	ents				

P.O. Box 280 (608) 837-8992

City ZIP Code Signature of Person Doing Work State Date Signed Sun Prairie WI 53290

State of Wis., Dept. of Natural Resources dnr.wi.gov

City

Sun Prairie

State

WI

ZIP Code

53290

Signature of Person Doing Work

Date Signed

## Well / Drillhole / Borehole Filling & Sealing Report

Form 3300-005 (R 4/2015)

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State of Wis., Dept. of Natural Resources dnr.wi.gov

## Well / Drillhole / Borehole Filling & Sealing Report

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7. Supervision of Work					DNR Us	e Only
Name of Person or Firm Doing Filling & Sealing	Licens	e #	Date of	Filling & Sealing or Verification	Date Received	Noted By
Tony Kapugi- On-Site Environmental			(mm/dd	/yyyy) 11/6/2020		
Street or Route	•			Telephone Number	Comments	
P.O. Box 280				(608) 837-8992		
City	State	ZIP Code		Signature of Person Doing V	Vork D	ate Signed
Sun Prairie	WI	53290				

State of Wis., Dept. of Natural Resources dnr.wi.gov

## Well / Drillhole / Borehole Filling & Sealing Report

			Koui	ie io div	in buiea	u	_				
Verification Only	of Fill and	l Seal		Drinkin	g Water		Watershed/V	Vastewater	X Reme	diation/Redev	elopment
_				Waste	Manager	nent	Other:				
1. Well Location Infor							/ Owner In	formation			
County Winnebago	WI Unique V Removed W		Hicap	) #		Facility Nar Wauka					
Latitude / Longitude (see i	nstructions)	Form	_   nat Code	Meth	nod Code	Facility ID (	FID or PWS)				
Latitude / Longitude (See 1	noti dotiono)	_			GPS008						
		_ w   _	DDM		SCR002 OTH001		rmit/Monitorinç WL-B5	g #			
1/4 / 1/4 NE 1/4 NE	Se	ction T	ownship	Ranç	ge X E	Original We	ell Owner				
or Gov't Lot #		2	17	N 16	$\overline{}$	V					
Well Street Address 3231 Oregon Street				I		Present We Oshko	ell Owner sh Corporati	on			
Well City, Village or Town			We	ell ZIP C	ode	Mailing Add	lress of Prese	nt Owner			
Oshkosh				54902							
Subdivision Name			Lo	t #		City of Pres Oshko			State WI	ZIP Code 54209	
Reason for Removal from	Service V	VI Unique W	Vell # of I	Replace	ment We			en, Casing &	Sealing Ma	terial	
Soil Boring							d piping remo	ved?		Yes No	
3. Filled & Sealed We						` ′	removed?		L	Yes No	
Monitoring Well		nal Constru	ction Dat	te (mm/c	dd/yyyy)		perforated?			JYes ∐No	=
Water Well	11,	/6/2020					emoved? eft in place?			」Yes	
X Borehole / Drillhole		Well Constru	uction Re	eport is a	available,	<del></del>	ing cut off belo	ow surface?			
Construction Type:	plea	se attach.					ng cut on beit			」Yes	=
	Drivon (Cond	naint\		)a			rial settle afte			]Yes ∏No	=
	Driven (Sand	,		Dug			s, was hole ret			Yes No	
Other (specify): Formation Type:								used, were they	hydrated	 ]Yes ∏ No	
		□ <b>p</b> a	ماسم مال					vn safe source?	riol		
X Unconsolidated Form			drock	.t (! )		1 —	uctor Pipe-Gra	ing Sealing Mate	riai ctor Pipe-Pun	nned	
Total Well Depth From Gro	ound Surface	(π.) Casin	ng Diame A	eter (in.)		Scree	ned & Poured onite Chips)	,	(Explain):	iped .	
Lower Drillhole Diameter (	in.)	Casin	ng Depth	(ft.)		Sealing Ma	terials				
		N/	A			Neat	Cement Grout		Concret	е	
Was well annular space gro	outod2	Yes	χN	Jo [	Unknow	Sand-	Cement (Con	crete) Grout	Bentonit	te Chips	
		. —			Olikilow	For Monitor	•	Monitoring Well	Boreholes Or	nly:	
If yes, to what depth (feet)	?	Depth to W	ater (fee	et)			nite Chips		entonite - Cer		
						Granu	ılar Bentonite		entonite - Sar		
5. Material Used to Fi	II Well / Dri	llhole				From (ft.)	To (ft.)	No. Yards, Sa Volume (d		r   Mix Ra Mud W	
Bentonite Chips						Surface	4'	1 bag	·		
0.0											
6. Comments											
7. Supervision of Wo							) / If		DNR Us		
Name of Person or Firm D Tony Kapugi- On-Site		_	License #	#	Date of (mm/dd	Filling & Sealin /yyyy) 11/6/	-	on Date Receiv	ed	Noted By	
Street or Route					1,, 00	Telephone Nu		Comments			
P.O. Box 280						(608 ) 837					
City		Sta	te Z	IP Code		Signature o	f Person Doin	g Work	D	ate Signed	
Sun Prairie		l v	VI	53290							

State of Wis., Dept. of Natural Resources

## Well / Drillhole / Borehole Filling & Sealing Report

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7. Supervision of Work					DNR U	se Only
Name of Person or Firm Doing Filling & Sealing Tony Kapugi- On-Site Environmental	Licens		Date of (mm/dd/	3	Date Received	Noted By
Street or Route P.O. Box 280				Telephone Number (608) 837-8992	Comments	
City Sun Prairie	State WI	ZIP Code 53290		Signature of Person Doing W	Vork	Date Signed

State of Wis., Dept. of Natural Resources dnr.wi.gov

City

Sun Prairie

State

WI

ZIP Code

53290

Signature of Person Doing Work

Date Signed

## Well / Drillhole / Borehole Filling & Sealing Report

Form 3300-005 (R 4/2015)

Notice: Completion of this report is required by chs. 160, 281, 283, 289, 291-293, 295, and 299, Wis. Stats., and chs. NR 141 and 812, Wis. Adm. Code. In accordance with chs. 281, 289, 291-293, 295, and 299, Wis. Stats., failure to file this form may result in a forfeiture of between \$10-25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be used for any other purpose. Return form to the appropriate DNR office and bureau. See instructions on reverse for more information. Route to DNR Bureau: X Remediation/Redevelopment **Drinking Water** Watershed/Wastewater Verification Only of Fill and Seal Waste Management Other: 2. Facility / Owner Information 1. Well Location Information County WI Unique Well # of Hicap # Facility Name Removed Well Waukau Lot Winnebago Facility ID (FID or PWS) Latitude / Longitude (see instructions) Format Code Method Code GPS008 DD Ν License/Permit/Monitoring # SCR002 DDM WL-B7 W OTH001 Range Original Well Owner 1/4 / 1/4 NE Section Township NE ΧE or Gov't Lot # 16 2 17 Present Well Owner Well Street Address Oshkosh Corporation 3231 Oregon Street Mailing Address of Present Owner Well ZIP Code Well City, Village or Town 54902 Oshkosh City of Present Owner State ZIP Code Subdivision Name Lot # W/I 54209 Oshkosh 4. Pump, Liner, Screen, Casing & Sealing Material Reason for Removal from Service WI Unique Well # of Replacement Well Pump and piping removed? X N/A No Soil Boring Liner(s) removed? X N/A Yes No 3. Filled & Sealed Well / Drillhole / Borehole Information X N/A Liner(s) perforated? Yes Nο Original Construction Date (mm/dd/yyyy) Monitoring Well Screen removed? Yes Νο X N/A 11/6/2020 Water Well Casing left in place? Yes No X N/A If a Well Construction Report is available, X Borehole / Drillhole Was casing cut off below surface? Yes Nο X N/A please attach. Construction Type: Did sealing material rise to surface? Yes No X N/A Did material settle after 24 hours? Yes No X N/A Drilled Driven (Sandpoint) Dug If yes, was hole retopped? X N/A Yes X Other (specify): Hand Auger If bentonite chips were used, were they hydrated X N/A Formation Type: Yes No with water from a known safe source? X Unconsolidated Formation Bedrock Required Method of Placing Sealing Material Conductor Pipe-Gravity Conductor Pipe-Pumped Total Well Depth From Ground Surface (ft.) Casing Diameter (in.) Screened & Poured Other (Explain): (Bentonite Chips) Lower Drillhole Diameter (in.) Casing Depth (ft.) Sealing Materials Neat Cement Grout Concrete NA Sand-Cement (Concrete) Grout Bentonite Chips Was well annular space grouted? X No Unknown For Monitoring Wells and Monitoring Well Boreholes Only: If yes, to what depth (feet)? Depth to Water (feet) X Bentonite Chips Bentonite - Cement Grout Bentonite - Sand Slurry Granular Bentonite No. Yards, Sacks Sealant or Mix Ratio or 5. Material Used to Fill Well / Drillhole From (ft.) To (ft.) /olume (circle one) 1 bag Bentonite Chips Surface 3' 6. Comments 7. Supervision of Work DNR Use Only Name of Person or Firm Doing Filling & Sealing Date of Filling & Sealing or Verification Date Received License # Noted By 11/6/2020 Tony Kapugi- On-Site Environmental (mm/dd/yyyy) Street or Route Telephone Number Comments P.O. Box 280 (608) 837-8992

State of Wis., Dept. of Natural Resources dnr.wi.gov

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Route to DNR Bureau:

Verification Only	of Fill ar	nd Seal	I		rinking Wate	er		Watershed/W	/astewater	K Remedia	ation/Redeve	elopment
				W	/aste Manag	gemei		Other:				
1. Well Location Inform							2. Facility		ormation			
	WI Unique Removed		of	Hicap #			Facility Name Waukau					
Latituda / Lagaituda /aaa ia		<del></del>		0-1-	Mathad Ca		Facility ID (F	ID or PWS)				
Latitude / Longitude (see in	istructions)		Format	DD	Method Co							
		N			SCRO			nit/Monitoring	#			
1//1/ NE 1/	lo	W		DDM	ОТНО			WL-B8				
½ / ½ NE         ½ NE           or Gov't Lot #	S	Section 2		vnship 17 N	Range X	E W	Original Well	Owner				
Well Street Address							Present Well Oshkos	Owner h Corporatio	on			
3231 Oregon Street				l				ess of Presen				
Well City, Village or Town Oshkosh					ZIP Code 4902		ivialining / taar	000 01 1 10001	it Owner			
Subdivision Name				Lot #			City of Prese	nt Owner		State	ZIP Code	
							Oshkos			WI	54209	
Reason for Removal from S	Service	WI Unic	que We	II # of Re	placement V	Vell			en, Casing & Sea			N/ N//A
Soil Boring							Liner(s) re	piping remov	/ea?		Yes No	X N/A
3. Filled & Sealed Well							Liner(s) re				Yes No	X N/A
Monitoring Well		-		on Date (	(mm/dd/yyyy	y)	Screen rei			=	Yes No	X N/A
Water Well	'	1/6/202	<u>2</u> 0				Casing lef			=	Yes No	X N/A
X Borehole / Drillhole		a Well Co ease atta		tion Repo	ort is availab	ole,		g cut off belo	w surface?		Yes No	X N/A
Construction Type:	!'						Did sealing	g material rise	e to surface?		Yes No	X N/A
X Drilled	Driven (San	dpoint)		Dug	q		Did materi	al settle after	24 hours?		Yes No	X N/A
Other (specify):	•	. ,					1	was hole reto	• •		Yes No	X N/A
Formation Type:									used, were they hyd n safe source?	ated \	Yes No	X N/A
X Unconsolidated Forma	ation	Г	Bedr	ock					ng Sealing Material			
Total Well Depth From Gro		e (ft.)		Diameter	r (in.)			ctor Pipe-Gra	<u> </u>	Pipe-Pump	ed	
10'			NA		( )			ed & Poured nite Chips)	Other (Expl	ain):		
Lower Drillhole Diameter (in	n.)	(	Casing	Depth (ft	·.)		Sealing Mate	erials				
			NA				Neat C	ement Grout		Concrete		
\\\\\\\\\\\\\\\\\\\\\\\\				√ N-			Sand-C	Cement (Cond	rete) Grout	Bentonite	Chips	
Was well annular space gro			Yes	X No	Unkn	iown	-1	•	Monitoring Well Bore	holes Only	:	
If yes, to what depth (feet)?	?	Depth	to Wat	er (feet)			X Benton	ite Chips	Bento	nite - Ceme	ent Grout	
							Granula	ar Bentonite		nite - Sand	Slurry	
5. Material Used to Fill	l Well / D	rillhole					From (ft.)	To (ft.)	No. Yards, Sacks S Volume (circle		Mix Rat Mud We	
Bentonite Chips							Surface	10'	1 bag	3.137	11100 111	J.g. 11
6. Comments												
7. Supervision of Wor										ONR Use		
Name of Person or Firm Do Tony Kapugi- On-Site E			g  Lic	ense #			lling & Sealing /yy) 11/6/2		n Date Received	١	Noted By	
Street or Route		iildi			(mm/	/dd/yy	elephone Num		Comments			
P.O. Box 280						- 1	608 ) 837-		Comments			
City			State		Code		Signature of	Person Doing	ı Work	Date	e Signed	
Sun Prairie			WI	50	3290		1					

State of Wis., Dept. of Natural Resources dnr.wi.gov

## Well / Drillhole / Borehole Filling & Sealing Report

Form 3300-005 (R 4/2015)

Page 1 of 2

					KC	oute t	O DNK	Bureau:									
Verificatio	n Only	of Fill a	nd Sea	al		Dı	rinking V	Vater		٧	Vatershed/V	Vastewate	r [	X Remed	diation/	Redeve	elopment
	•					W	aste Ma	anageme	nt	] c	Other:						
1. Well Location	on Infor	mation							2. Facilit	y /	Owner Inf	formatio	n				
County		WI Uniqu		of	Hic	ap#			Facility Na								
Winnebago		Removed	ı vveii						Wauka								
Latitude / Longitu	de (see ir	l estructions	 s)	Form	at Co	de	Method	I Code	Facility ID	(FII	O or PWS)						
_ag.ta	(555		N				□GI	PS008									
					_ ]ddv	4		CR002	License/Pe		it/Monitoring VL-B9	<b>j</b> #					
½ / ¼ NE	11/	-	W	<u> </u>				TH001	Original W								
	<sup>1</sup> / <sub>4</sub> NE		Section	'	ownsh		Range 16	XE	Original W	en	JWHEI						
or Gov't Lot #			2		17	N	10	W	Present W	ell (	Owner						
Well Street Address 3231 Oregon									Oshko	osh	Corporation						
Well City, Village	or Town				- 1		ZIP Cod	е	Mailing Ad	are	ss of Preser	nt Owner					
Oshkosh							1902		City of Pre	000	t Owner			State	ZID	Code	
Subdivision Name	е					Lot #			Oshko					WI		4209	
Reason for Remo	oval from	Service	WI Uni	ique W	ell # d	of Rep	olaceme	ent Well	4. Pump	, Li	ner, Scree	en, Casi	ng & Sea	aling Mat	erial		
Soil Boring				·				_	'		piping remov	ved?			Yes	No	X N/A
3. Filled & Sea	aled Wel	I / Drillh	ole / Bo	reho	le Inf	form	ation		Liner(s)						Yes	No	X N/A
Monitoring \	Well		riginal Co		tion [	Date (	mm/dd/y	уууу)	, ,	•	forated?				Yes	∐ No	X N/A
Water Well			11/6/20	20					Screen						Yes	No No	X N/A
		If	a Well C	onstru	ction	Repo	rt is ava	ilable,	I —		in place?				Yes	No	X N/A
X Borehole / [		р	lease att	ach.						_	cut off belo				Yes	∐ No	X N/A
Construction Type						1_				_	material rise Il settle after				Yes Yes	∐ No □ No	X N/A
Drilled		Oriven (Sa	. ,			Dug					was hole ret				Yes	No	X N/A
X Other (spec	cify): <u>Ha</u>	na Auge	r						-		chips were		re they hyd	drated	1		_
Formation Type:			_	_							rom a know				Yes	No	X N/A
X Unconsolida					drock				1 —		hod of Placii			D: D			
Total Well Depth	From Gro	ound Surfa	ice (ft.)	Casin N	-	meter	(in.)				or Pipe-Gra			Pipe-Pum	pea		
3'									└─ (Ben	toni	te Chips)		Other (Exp	olain):			
Lower Drillhole D	iameter (i	n.)		Casin		oth (ft.	)		Sealing Ma					7 -			
				N/	4						ment Grout			Concrete			
Was well annular	space gro	outed?		Yes	X	No	Пυ	nknown	1 —		ement (Cond			Bentonite		3	
If yes, to what de			Dont	h to W						_	g Wells and	Monitorin	-		-		
ii yes, to what de	ptii (icct)	•	Вори	11 10 11	ator (i	ccij			X Bent					onite - Cem			
											r Bentonite	No Var		onite - Sand Sealant or	_	y Mix Rat	tio or
5. Material Use		l Well / I	Drillhol	е					From (ft.)		To (ft.)	Vol	ume (circle			Mud W	
Bentonite C	hips								Surface	:	3'	1	bag				
										+							
6. Comments																	
o. comments																	
7.0																	
7. Supervision Name of Person			n & Seali	na li	icens	e #	l n	ate of F	illing & Seali	na a	or Verification	n Date I	Received	DNR Use	Noted		
Tony Kapugi- (			_	ا ق		- "		mm/dd/y	_	_					0.00	_,	
Street or Route									elephone Nu			Comn	nents				
P.O. Box 280								(	608 ) 83	87-8	3992						
City				Stat		ZIP (			Signature	of P	erson Doing	g Work		Da	ate Sig	ned	
Sun Prairie				l W	1	53	290		1					1			

State of Wis., Dept. of Natural Resources dnr.wi.gov

City

Sun Prairie

State

WI

ZIP Code

53290

Signature of Person Doing Work

Date Signed

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## **APPENDIX D**

SOIL AND GROUNDWATER LABORATORY ANALYTICAL REPORTS
AND CHAIN-OF-CUSTODY DOCUMENTATION



## **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

Lot Number: VK08048

Date Completed:11/25/2020

Project Manager: Nisreen Saikaly

Kary Coman

11/25/2020 5:00 PM
Approved and released by:
Project Manager II: **Karen L. Coonan** 





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

This report shall not be reproduced, except in its entirety, without the written approval of Pace Analytical Services, LLC.

## 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: VK08048

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 most current approved The NELAC Institute (TNI) standards, the Pace Analytical Services, LLC ("Pace") Laboratory Quality Manual, standard operating procedures (SOPs), and Pace policies. Any exceptions to the TNI standards, the Laboratory Quality Manual, SOPs or policies are qualified on the results page or discussed below.

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W" qualifier

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: VK08048

Project Name: Oshkosh Corporation Project Number: 20.0157080

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	WL Equipment Blank DS 1	Aqueous	11/06/2020 0810	11/07/2020
002	WL Equipment Blank HA 2	Aqueous	11/06/2020 0815	11/07/2020
003	WL B-10 (1-2')	Solid	11/06/2020 0830	11/07/2020
004	WL B-10 (4-5')	Solid	11/06/2020 0840	11/07/2020
005	WL B-8 (1-2')	Solid	11/06/2020 0910	11/07/2020
006	WL B-8 (4-5')	Solid	11/06/2020 0920	11/07/2020
007	WL B-6 (1-2')	Solid	11/06/2020 0930	11/07/2020
800	WL B-6 (4-5)	Solid	11/06/2020 0935	11/07/2020
009	WL B-4 (1-2')	Solid	11/06/2020 0955	11/07/2020
010	WL B-4 (4-5')	Solid	11/06/2020 1000	11/07/2020
011	WL B-3 (1-2')	Solid	11/06/2020 1025	11/07/2020
012	WL B-3 (6-7')	Solid	11/06/2020 1030	11/07/2020
013	WL B-5 (1-2')	Solid	11/06/2020 1040	11/07/2020
014	WL B-2 (1-2')	Solid	11/06/2020 1050	11/07/2020
015	WL B-2 (6-7')	Solid	11/06/2020 1055	11/07/2020
016	WL B-1 (1-2')	Solid	11/06/2020 1110	11/07/2020
017	WL B-1 (5-6')	Solid	11/06/2020 1115	11/07/2020
018	WL B-7 (1-2')	Solid	11/06/2020 1135	11/07/2020
019	WL B-9 (1-2')	Solid	11/06/2020 1150	11/07/2020

(19 samples)

## PACE ANALYTICAL SERVICES, LLC

## **Detection Summary**

## **GZA** GeoEnvironmental, Inc.

Lot Number: VK08048

Project Name: Oshkosh Corporation Project Number: 20.0157080

Sample	e Sample ID	Matrix	Parameter	Method	Result	Q Units	Page
007	WL B-6 (1-2')	Solid	6:2 FTS	PFAS by ID	2.0	ug/kg	17
009	WL B-4 (1-2')	Solid	6:2 FTS	PFAS by ID	2.8	ug/kg	21
011	WL B-3 (1-2')	Solid	6:2 FTS	PFAS by ID	2.5	ug/kg	25
012	WL B-3 (6-7')	Solid	6:2 FTS	PFAS by ID	4.2	ug/kg	27
012	WL B-3 (6-7')	Solid	PFPeA	PFAS by ID	1.6	ug/kg	27
013	WL B-5 (1-2')	Solid	PFHxA	PFAS by ID	1.2	ug/kg	29
013	WL B-5 (1-2')	Solid	PFPeA	PFAS by ID	2.3	ug/kg	29
016	WL B-1 (1-2')	Solid	6:2 FTS	PFAS by ID	7.5	ug/kg	33
019	WL B-9 (1-2')	Solid	PFPeA	PFAS by ID	1.8	ug/kg	37

(9 detections)

Client: GZA GeoEnvironmental, Inc.

Laboratory ID: VK08048-001

Matrix: Aqueous

Description: WL Equipment Blank DS 1

Date Received: 11/07/2020

Date Sampled:11/06/2020 0810

Project Name: Oshkosh Corporation

**Analytical** 

Project Number: 20.0157080

CAS

Run Prep Method **Analytical Method Dilution Analysis Date Analyst Prep Date Batch** 1 SOP SPE PFAS by ID SOP 11/18/2020 1728 MMM 11/17/2020 1034 73728

Parameter	Number	Method	Result Q	LOQ	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	ND	9.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3)	763051-92-9	PFAS by ID SOP	ND	9.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	9.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	9.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	9.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND	9.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND	9.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND	9.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND	9.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND	4.9	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND	4.9	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND	4.9	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND	4.9	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND	4.9	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND	4.9	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND	4.9	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND	4.9	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND	4.9	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND	4.9	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND	4.9	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND	4.9	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND	4.9	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND	4.9	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND	4.9	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND	4.9	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND	4.9	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND	4.9	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND	4.9	ng/L	1
		otance nits				
_		-150				
<del>-</del>		i-150				
13C2_8:2FTS	96 25	-150				
13C2_PFDoA	92 25	-150				
13C2_PFTeDA	86 25	-150				
13C3_PFBS	88 25	-150				
13C3_PFHxS	98 25	-150				
13C3-HFPO-DA	96 25	-150				
13C4_PFBA	101 25	-150				
13C4_PFHpA	96 25	-150				
13C5_PFHxA	97 25	-150				

LOQ = Limit of Quantitation

13C5\_PFPeA

13C6\_PFDA

13C7\_PFUdA

B = Detected in the method blank

N = Recovery is out of criteria W = Reported on wet weight basis P = The RPD between two GC columns exceeds 40%

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100

97

93

25-150

25-150

25-150

E = Quantitation of compound exceeded the calibration range

ND = Not detected at or above the LOQ H = Out of holding time

Client: GZA GeoEnvironmental, Inc.

Description: WL Equipment Blank DS 1

Date Sampled: 11/06/2020 0810

Date Received: 11/07/2020

Project Name: Oshkosh Corporation

Project Number: 20.0157080

Laboratory ID: VK08048-001

Matrix: Aqueous

Surrogate	Run 1 A Q % Recovery	cceptance Limits
13C8_PFOA	99	25-150
13C8_PFOS	84	25-150
13C8_PFOSA	99	10-150
13C9_PFNA	98	25-150
d5-EtFOSAA	97	25-150
d3-MeFOSAA	97	25-150

LOQ = Limit of Quantitation ND = Not detected at or above the LOQ N = Recovery is out of criteria

B = Detected in the method blank

E = Quantitation of compound exceeded the calibration range

H = Out of holding time

W = Reported on wet weight basis

P = The RPD between two GC columns exceeds 40%

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

Client: GZA GeoEnvironmental, Inc.

Laboratory ID: VK08048-002

Matrix: Aqueous

Description: WL Equipment Blank HA 2

Date Received: 11/07/2020

Date Sampled: 11/06/2020 0815

Project Name: Oshkosh Corporation

Project Number: 20.0157080

Run Prep Method SOP SPE 1

Analytical Method Dilution PFAS by ID SOP

**Analysis Date Analyst** 11/18/2020 1811 MMM

**Prep Date** 11/17/2020 1704 73795

Batch

CAS **Analytical** Result Q LOQ Number Method Units Run **Parameter** 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) PFAS by ID SOP 756426-58-1 ND 8.9 ng/L 1 PFAS by ID SOP 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...) 763051-92-9 ND 8.9 ng/L 1 PFAS by ID SOP ND 1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS) 39108-34-4 8.9 ng/L 1 1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS) 27619-97-2 PFAS by ID SOP ND 8.9 ng/L 1 1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS) 757124-72-4 PFAS by ID SOP ND 8.9 ng/L 1 Hexafluoropropylene oxide dimer acid (GenX) 13252-13-6 PFAS by ID SOP ND 8.9 ng/L 1 4,8-dioxa-3H-perfluorononanoic acid (ADONA) 919005-14-4 PFAS by ID SOP ND 8.9 ng/L N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA) 2991-50-6 PFAS by ID SOP ND ng/L 8.9 1 N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA) 2355-31-9 PFAS by ID SOP ND 8.9 ng/L Perfluoro-1-butanesulfonic acid (PFBS) 375-73-5 PFAS by ID SOP ND ng/L 44 Perfluoro-1-decanesulfonic acid (PFDS) 335-77-3 PFAS by ID SOP ND 4.4 ng/L Perfluoro-1-heptanesulfonic acid (PFHpS) 375-92-8 PFAS by ID SOP ND 44 ng/L 1 Perfluoro-1-nonanesulfonic acid (PFNS) 68259-12-1 PFAS by ID SOP ND 4.4 ng/L 1 Perfluoro-1-octanesulfonamide (PFOSA) PFAS by ID SOP 754-91-6 ND 4.4 ng/L Perfluoro-1-pentanesulfonic acid (PFPeS) 2706-91-4 PFAS by ID SOP ND ng/L Perfluorohexanesulfonic acid (PFHxS) 355-46-4 PFAS by ID SOP ND ng/L 44 Perfluoro-n-butanoic acid (PFBA) PFAS by ID SOP 375-22-4 ND 4.4 ng/L 1 Perfluoro-n-decanoic acid (PFDA) 335-76-2 PFAS by ID SOP ND 44 ng/L Perfluoro-n-dodecanoic acid (PFDoA) 307-55-1 PFAS by ID SOP ND ng/L 4.4 1 Perfluoro-n-heptanoic acid (PFHpA) 375-85-9 PFAS by ID SOP ND 4.4 ng/L Perfluoro-n-hexanoic acid (PFHxA) 307-24-4 PFAS by ID SOP ND 4.4 ng/L 1 4.4 Perfluoro-n-nonanoic acid (PFNA) 375-95-1 PFAS by ID SOP ND ng/L Perfluoro-n-octanoic acid (PFOA) PFAS by ID SOP 335-67-1 ND 4.4 ng/L Perfluoro-n-pentanoic acid (PFPeA) 2706-90-3 PFAS by ID SOP ND 44 ng/L Perfluoro-n-tetradecanoic acid (PFTeDA) 376-06-7 PFAS by ID SOP ND 4.4 ng/L Perfluoro-n-tridecanoic acid (PFTrDA) PFAS by ID SOP ND 72629-94-8 44 ng/L Perfluoro-n-undecanoic acid (PFUdA) 2058-94-8 PFAS by ID SOP ND 4.4 ng/L 1 Perfluorooctanesulfonic acid (PFOS) 1763-23-1 PFAS by ID SOP ND 4.4 ng/L 1 Run 1 **Acceptance** 

Surrogate	Q	% Recovery	Limits
13C2_4:2FTS		100	25-150
13C2_6:2FTS		97	25-150
13C2_8:2FTS		89	25-150
13C2_PFDoA		87	25-150
13C2_PFTeDA		75	25-150
13C3_PFBS		76	25-150
13C3_PFHxS		80	25-150
13C3-HFPO-DA		97	25-150
13C4_PFBA		86	25-150
13C4_PFHpA		77	25-150
13C5_PFHxA		84	25-150
13C5_PFPeA		90	25-150
13C6_PFDA		79	25-150
13C7_PFUdA		80	25-150

LOQ = Limit of Quantitation ND = Not detected at or above the LOQ

B = Detected in the method blank N = Recovery is out of criteria

W = Reported on wet weight basis

P = The RPD between two GC columns exceeds 40%

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

E = Quantitation of compound exceeded the calibration range

H = Out of holding time

Client: GZA GeoEnvironmental, Inc.

Description: WL Equipment Blank HA 2

Date Sampled:11/06/2020 0815

Date Received: 11/07/2020

Project Number: 20.0157080

Project Name: Oshkosh Corporation

Laboratory ID: VK08048-002 Matrix: Aqueous

Surrogate	Run 1 A Q % Recovery	Acceptance Limits	
13C8_PFOA	88	25-150	
13C8_PFOS	76	25-150	
13C8_PFOSA	93	10-150	
13C9_PFNA	83	25-150	
d5-EtFOSAA	93	25-150	
d3-MeFOSAA	90	25-150	

LOQ = Limit of Quantitation

B = Detected in the method blank

E = Quantitation of compound exceeded the calibration range

H = Out of holding time

ND = Not detected at or above the LOQ N = Recovery is out of criteria W = Reported on wet weight basis P = The RPD between two GC columns exceeds 40%

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

Client: GZA GeoEnvironmental, Inc.

Laboratory ID: VK08048-003

Description: WL B-10 (1-2')

Matrix: Solid

Date Sampled:11/06/2020 0830

Project Name: Oshkosh Corporation

CAS

% Solids: 82.8 11/10/2020 0016

Date Received: 11/07/2020 Project Number: 20.0157080

Run Prep Method 1 SOP SPE Analytical Method Dilution Analysis Date Analyst PFAS by ID SOP

11/12/2020 1920 MMM

Analytical

**Prep Date** 11/11/2020 0952 72992

**Batch** 

Parameter	CAS Number	Analytical Method	Result	Q LOQ	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	ND	2.5	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3)	763051-92-9	PFAS by ID SOP	ND	2.5	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	2.5	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	2.5	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	2.5	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND	5.1	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND	2.5	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND	2.5	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND	2.5	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND	1.3	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND	1.3	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND	1.3	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND	1.3	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND	1.3	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND	1.3	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND	1.3	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND	1.3	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND	1.3	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND	1.3	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND	1.3	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND	1.3	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND	1.3	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND	1.3	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND	1.3	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND	1.3	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND	1.3	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND	1.3	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND	1.3	ug/kg	1
D	un 1 Acce	otance				
		nits				
13C2_4:2FTS	76 25	-150				
13C2_6:2FTS	76 25	-150				
13C2_8:2FTS	69 25	-150				
13C2_PFDoA	74 25	-150				
13C2_PFTeDA	78 25	-150				
13C3_PFBS	77 25	-150				
13C3_PFHxS	73 25	-150				
13C3-HFPO-DA	75 25	-150				
13C4_PFBA	74 25	-150				
13C4_PFHpA	80 25	-150				

LOQ = Limit of Quantitation

13C5\_PFHxA

13C5\_PFPeA

13C6\_PFDA

13C7\_PFUdA

B = Detected in the method blank N = Recovery is out of criteria

W = Reported on wet weight basis

P = The RPD between two GC columns exceeds 40%

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79

75

76

76

25-150

25-150

25-150

25-150

E = Quantitation of compound exceeded the calibration range

ND = Not detected at or above the LOQ H = Out of holding time

Client: GZA GeoEnvironmental, Inc.

Description: WL B-10 (1-2')

Date Sampled:11/06/2020 0830 Project Name: Oshkosh Corporation

Matrix: Solid

Laboratory ID: VK08048-003

Date Received: 11/07/2020 Project Number: 20.0157080 % Solids: 82.8 11/10/2020 0016

Surrogate	Q	Run 1 % Recovery	Acceptance Limits		
13C8_PFOA		77	25-150		
13C8_PFOS		72	25-150		
13C8_PFOSA		81	10-150		
13C9_PFNA		75	25-150		
d5-EtFOSAA		72	25-150		
d3-MeFOSAA		62	25-150		

LOQ = Limit of Quantitation ND = Not detected at or above the LOQ N = Recovery is out of criteria

B = Detected in the method blank

E = Quantitation of compound exceeded the calibration range

H = Out of holding time

W = Reported on wet weight basis

P = The RPD between two GC columns exceeds 40%

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

Client: GZA GeoEnvironmental, Inc.

Laboratory ID: VK08048-004

Description: WL B-10 (4-5') Date Sampled: 11/06/2020 0840

Matrix: Solid

Project Name: Oshkosh Corporation

% Solids: 81.4 11/10/2020 0016

Date Received: 11/07/2020 Project Number: 20.0157080

Run Prep Method SOP SPE 1

Analytical Method Dilution PFAS by ID SOP

**Analysis Date Analyst** 11/12/2020 1930 MMM

**Prep Date** 11/11/2020 0952 72992

Batch

CAS **Analytical** LOQ Number Method Result Q Units Run **Parameter** 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) PFAS by ID SOP 756426-58-1 ND 1.9 ug/kg 1 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...) 763051-92-9 PFAS by ID SOP ND 1.9 ug/kg 1 PFAS by ID SOP ND 1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS) 39108-34-4 1.9 ug/kg 1 1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS) 27619-97-2 PFAS by ID SOP ND 1.9 ug/kg 1 1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS) 757124-72-4 PFAS by ID SOP ND 1.9 ug/kg 1 Hexafluoropropylene oxide dimer acid (GenX) 13252-13-6 PFAS by ID SOP ND 3.8 ua/ka 1 4,8-dioxa-3H-perfluorononanoic acid (ADONA) 919005-14-4 PFAS by ID SOP ND 1.9 ug/kg N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA) 2991-50-6 PFAS by ID SOP ND 1.9 ug/kg N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA) 2355-31-9 PFAS by ID SOP ND 1.9 ug/kg Perfluoro-1-butanesulfonic acid (PFBS) 375-73-5 PFAS by ID SOP ND 0.94 ug/kg Perfluoro-1-decanesulfonic acid (PFDS) PFAS by ID SOP 335-77-3 ND 0.94 ug/kg Perfluoro-1-heptanesulfonic acid (PFHpS) 375-92-8 PFAS by ID SOP ND 0.94 ug/kg 1 Perfluoro-1-nonanesulfonic acid (PFNS) 68259-12-1 PFAS by ID SOP ND 0.94 1 ua/ka PFAS by ID SOP Perfluoro-1-octanesulfonamide (PFOSA) 754-91-6 ND 0.94 ug/kg Perfluoro-1-pentanesulfonic acid (PFPeS) 2706-91-4 PFAS by ID SOP ND 0.94 ug/kg Perfluorohexanesulfonic acid (PFHxS) 355-46-4 PFAS by ID SOP ND 0.94 ug/kg PFAS by ID SOP Perfluoro-n-butanoic acid (PFBA) 375-22-4 ND 0.94 ug/kg Perfluoro-n-decanoic acid (PFDA) 335-76-2 PFAS by ID SOP ND 0.94 ug/kg Perfluoro-n-dodecanoic acid (PFDoA) 307-55-1 PFAS by ID SOP ND 0.94 ua/ka 1 Perfluoro-n-heptanoic acid (PFHpA) 375-85-9 PFAS by ID SOP ND 0.94 ug/kg Perfluoro-n-hexanoic acid (PFHxA) 307-24-4 PFAS by ID SOP ND 0.94 ua/ka 1 Perfluoro-n-nonanoic acid (PFNA) 375-95-1 PFAS by ID SOP ND 0.94 ua/ka PFAS by ID SOP Perfluoro-n-octanoic acid (PFOA) 335-67-1 ND 0.94 ug/kg Perfluoro-n-pentanoic acid (PFPeA) 2706-90-3 PFAS by ID SOP NΠ 0.94 ug/kg Perfluoro-n-tetradecanoic acid (PFTeDA) 376-06-7 PFAS by ID SOP ND 0.94 ug/kg Perfluoro-n-tridecanoic acid (PFTrDA) ND 72629-94-8 PFAS by ID SOP 0.94 ug/kg 1 Perfluoro-n-undecanoic acid (PFUdA) 2058-94-8 PFAS by ID SOP ND 0.94 ug/kg 1 Perfluorooctanesulfonic acid (PFOS) 1763-23-1 PFAS by ID SOP ND 0.94 ug/kg 1 Run 1 Acceptance Surrogate % Recovery Q Limits 13C2\_4:2FTS 80 25-150 13C2\_6:2FTS 76 25-150 75 13C2\_8:2FTS 25-150 13C2\_PFDoA 76 25-150 79 13C2\_PFTeDA 25-150

LOQ = Limit of Quantitation ND = Not detected at or above the LOQ

13C3\_PFBS

13C3 PFHxS

13C4\_PFBA

13C4\_PFHpA

13C5 PFHxA

13C5\_PFPeA

13C6\_PFDA

13C7 PFUdA

13C3-HFPO-DA

B = Detected in the method blank N = Recovery is out of criteria

W = Reported on wet weight basis

P = The RPD between two GC columns exceeds 40%

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84

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25-150

25-150

25-150

25-150

25-150

25-150

25-150

25-150

25-150

E = Quantitation of compound exceeded the calibration range

H = Out of holding time

Project Name: Oshkosh Corporation

Client: GZA GeoEnvironmental, Inc.

Description: WL B-10 (4-5')

Date Sampled:11/06/2020 0840

Date Received: 11/07/2020

Laboratory ID: VK08048-004

Matrix: Solid

% Solids: 81.4 11/10/2020 0016

Project Number: 20.0157080

Surrogate		eptance Limits		
13C8_PFOA	77	25-150		
13C8_PFOS	77	25-150		
13C8_PFOSA	81	10-150		
13C9_PFNA	72	25-150		
d5-EtFOSAA	69	25-150		
d3-MeFOSAA	63	25-150		

LOQ = Limit of Quantitation ND = Not detected at or above the LOQ N = Recovery is out of criteria

B = Detected in the method blank

E = Quantitation of compound exceeded the calibration range

H = Out of holding time

W = Reported on wet weight basis

P = The RPD between two GC columns exceeds 40%

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

Client: GZA GeoEnvironmental, Inc.

Laboratory ID: VK08048-005

Description: WL B-8 (1-2') Date Sampled: 11/06/2020 0910

Matrix: Solid

Project Name: Oshkosh Corporation

% Solids: 81.0 11/10/2020 0016

Date Received: 11/07/2020

Project Number: 20.0157080

CAS

Run Prep Method SOP SPE 1

Analytical Method Dilution PFAS by ID SOP

**Analysis Date Analyst** 11/13/2020 1719 MMM

**Analytical** 

**Prep Date** 11/11/2020 0952 72992

Batch

LOQ Number Method Result Q Units Run **Parameter** 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) PFAS by ID SOP 22 756426-58-1 ND ug/kg 1 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...) 763051-92-9 PFAS by ID SOP ND 22 ug/kg 1 PFAS by ID SOP ND 1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS) 39108-34-4 22 ug/kg 1 1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS) 27619-97-2 PFAS by ID SOP ND 22 ug/kg 1 1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS) 757124-72-4 PFAS by ID SOP ND 22 ug/kg 1 Hexafluoropropylene oxide dimer acid (GenX) 13252-13-6 PFAS by ID SOP ND 4.4 ua/ka 1 4,8-dioxa-3H-perfluorononanoic acid (ADONA) 919005-14-4 PFAS by ID SOP ND 22 ug/kg N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA) 2991-50-6 PFAS by ID SOP ND 22 ug/kg N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA) 2355-31-9 PFAS by ID SOP ND 2.2 ug/kg Perfluoro-1-butanesulfonic acid (PFBS) 375-73-5 PFAS by ID SOP ND 1 1 ug/kg Perfluoro-1-decanesulfonic acid (PFDS) PFAS by ID SOP 335-77-3 ND 1.1 ug/kg Perfluoro-1-heptanesulfonic acid (PFHpS) 375-92-8 PFAS by ID SOP ND 1 1 ug/kg 1 Perfluoro-1-nonanesulfonic acid (PFNS) 68259-12-1 PFAS by ID SOP ND 1.1 ug/kg 1 PFAS by ID SOP Perfluoro-1-octanesulfonamide (PFOSA) 754-91-6 ND 1.1 ug/kg Perfluoro-1-pentanesulfonic acid (PFPeS) 2706-91-4 PFAS by ID SOP ND 1.1 ug/kg PFAS by ID SOP Perfluorohexanesulfonic acid (PFHxS) 355-46-4 ND 1 1 ug/kg PFAS by ID SOP Perfluoro-n-butanoic acid (PFBA) 375-22-4 ND 1.1 ug/kg Perfluoro-n-decanoic acid (PFDA) 335-76-2 PFAS by ID SOP ND 1 1 ug/kg Perfluoro-n-dodecanoic acid (PFDoA) 307-55-1 PFAS by ID SOP ND 1.1 ua/ka 1 Perfluoro-n-heptanoic acid (PFHpA) 375-85-9 PFAS by ID SOP ND 1.1 ug/kg Perfluoro-n-hexanoic acid (PFHxA) 307-24-4 PFAS by ID SOP ND 1.1 ua/ka 1 Perfluoro-n-nonanoic acid (PFNA) 375-95-1 PFAS by ID SOP ND 1.1 ua/ka PFAS by ID SOP Perfluoro-n-octanoic acid (PFOA) 335-67-1 ND 1.1 ug/kg Perfluoro-n-pentanoic acid (PFPeA) 2706-90-3 PFAS by ID SOP NΠ 1.1 ug/kg Perfluoro-n-tetradecanoic acid (PFTeDA) 376-06-7 PFAS by ID SOP ND 1.1 ug/kg Perfluoro-n-tridecanoic acid (PFTrDA) ND 72629-94-8 PFAS by ID SOP 1.1 ug/kg 1 Perfluoro-n-undecanoic acid (PFUdA) 2058-94-8 PFAS by ID SOP ND 1.1 ug/kg 1 Perfluorooctanesulfonic acid (PFOS) 1763-23-1 PFAS by ID SOP ND 1.1 ug/kg 1 Run 1 Acceptance Surrogate % Recovery Q Limits 13C2\_4:2FTS 74 25-150 13C2\_6:2FTS 78 25-150 81 13C2\_8:2FTS 25-150 13C2\_PFDoA 83 25-150 86 13C2\_PFTeDA 25-150 13C3\_PFBS 83 25-150 13C3 PFHxS 82 25-150 13C3-HFPO-DA 87 25-150

LOQ = Limit of Quantitation

13C4\_PFBA

13C4\_PFHpA

13C5 PFHxA

13C5\_PFPeA

13C6\_PFDA

13C7 PFUdA

B = Detected in the method blank N = Recovery is out of criteria

E = Quantitation of compound exceeded the calibration range

ND = Not detected at or above the LOQ H = Out of holding time

W = Reported on wet weight basis

P = The RPD between two GC columns exceeds 40%

25-150

25-150

25-150

25-150

25-150

25-150

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80

83

80

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Client: GZA GeoEnvironmental, Inc.

Description: WL B-8 (1-2')

Date Sampled:11/06/2020 0910 Project Name: Oshkosh Corporation Laboratory ID: VK08048-005

Matrix: Solid

% Solids: 81.0 11/10/2020 0016

Date Received: 11/07/2020 Project Number: 20.0157080

Surrogate Q	Run 1 % Recovery	Acceptance Limits		
13C8_PFOA	83	25-150		
13C8_PFOS	76	25-150		
13C8_PFOSA	87	10-150		
13C9_PFNA	79	25-150		
d5-EtFOSAA	80	25-150		
d3-MeFOSAA	82	25-150		

LOQ = Limit of Quantitation ND = Not detected at or above the LOQ N = Recovery is out of criteria

B = Detected in the method blank

E = Quantitation of compound exceeded the calibration range

H = Out of holding time

W = Reported on wet weight basis

P = The RPD between two GC columns exceeds 40%

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

Client: GZA GeoEnvironmental, Inc.

Laboratory ID: VK08048-006

Description: WL B-8 (4-5')

Project Name: Oshkosh Corporation

Matrix: Solid

Date Sampled:11/06/2020 0920

Analytical

% Solids: 81.6 11/10/2020 0016

Date Received: 11/07/2020

Project Number: 20.0157080

CAS

Run	Prep Method
1	SOP SPE

**Analytical Method Dilution** Analysis Date Analyst PFAS by ID SOP 11/13/2020 1730 MMM

**Prep Date** 

**Batch** 11/11/2020 0952 72992

Parameter	Number	Analytical Method	Result Q	LOQ	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	ND	2.2	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3)	763051-92-9	PFAS by ID SOP	ND	2.2	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	2.2	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	2.2	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	2.2	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND	4.5	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND	2.2	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND	2.2	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND	2.2	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND	1.1	ug/kg	1
		otance nits				
13C2 4:2FTS		i-150				
13C2_6:2FTS		i-150				
13C2_8:2FTS	82 25	i-150				
13C2_PFDoA	81 25	i-150				
- 13C2_PFTeDA	81 25	i-150				
13C3_PFBS		i-150				
13C3_PFHxS		i-150				
13C3-HFPO-DA		i-150				
13C4_PFBA		i-150				
13C4_PFHpA		i-150				

H = Out of holding time W = Reported on wet weight basis

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83

80

74

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LOQ = Limit of Quantitation

13C5\_PFHxA

13C5\_PFPeA

13C6\_PFDA

13C7\_PFUdA

ND = Not detected at or above the LOQ

B = Detected in the method blank N = Recovery is out of criteria

E = Quantitation of compound exceeded the calibration range P = The RPD between two GC columns exceeds 40%

25-150

25-150

25-150

25-150

Client: GZA GeoEnvironmental, Inc.

Description: WL B-8 (4-5')

Date Sampled:11/06/2020 0920 Project Name: Oshkosh Corporation Laboratory ID: VK08048-006

Matrix: Solid

% Solids: 81.6 11/10/2020 0016

Date Received: 11/07/2020 Project Number: 20.0157080

Surrogate	Run 1 Q % Recovery	Acceptance Limits		
13C8_PFOA	80	25-150		
13C8_PFOS	74	25-150		
13C8_PFOSA	87	10-150		
13C9_PFNA	79	25-150		
d5-EtFOSAA	74	25-150		
d3-MeFOSAA	74	25-150		

LOQ = Limit of Quantitation ND = Not detected at or above the LOQ N = Recovery is out of criteria

B = Detected in the method blank

E = Quantitation of compound exceeded the calibration range

H = Out of holding time

W = Reported on wet weight basis

P = The RPD between two GC columns exceeds 40%

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

Client: GZA GeoEnvironmental, Inc.

Laboratory ID: VK08048-007

Description: WL B-6 (1-2') Date Sampled:11/06/2020 0930

Matrix: Solid

Project Name: Oshkosh Corporation

CAS

% Solids: 82.3 11/10/2020 0016

Date Received: 11/07/2020 Project Number: 20.0157080

Run Prep Method 1 SOP SPE Analytical Method Dilution Analysis Date Analyst PFAS by ID SOP

11/13/2020 1741 MMM

Analytical

**Prep Date** 11/11/2020 0952 72992

**Batch** 

Parameter	CAS Number	Analytical Method	Result C	Q LOQ	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	ND	2.0	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3)	763051-92-9	PFAS by ID SOP	ND	2.0	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	2.0	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	2.0	2.0	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	2.0	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND	4.0	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND	2.0	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND	2.0	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND	2.0	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND	0.99	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND	0.99	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND	0.99	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND	0.99	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND	0.99	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND	0.99	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND	0.99	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND	0.99	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND	0.99	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND	0.99	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND	0.99	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND	0.99	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND	0.99	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND	0.99	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND	0.99	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND	0.99	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND	0.99	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND	0.99	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND	0.99	ug/kg	1
D	un 1 Accei	-tamaa				
		otance nits				
13C2_4:2FTS	77 25	-150				
13C2_6:2FTS	76 25	-150				
13C2_8:2FTS	76 25	-150				
13C2_PFDoA	77 25	-150				
13C2_PFTeDA	79 25	-150				
13C3_PFBS	73 25	-150				
13C3_PFHxS	77 25	-150				
13C3-HFPO-DA	80 25	-150				

H = Out of holding time W = Reported on wet weight basis

13C4\_PFBA

13C4\_PFHpA

13C5\_PFHxA

13C5\_PFPeA

13C6\_PFDA

13C7\_PFUdA

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range ND = Not detected at or above the LOQ N = Recovery is out of criteria P = The RPD between two GC columns exceeds 40%

25-150

25-150

25-150

25-150

25-150

25-150

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77

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Client: GZA GeoEnvironmental, Inc.

Description: WL B-6 (1-2')

Matrix: Solid

Laboratory ID: VK08048-007

Date Sampled:11/06/2020 0930 Project Name: Oshkosh Corporation

% Solids: 82.3 11/10/2020 0016

Date Received: 11/07/2020 Project Number: 20.0157080

Surrogate		Acceptance Limits		
13C8_PFOA	77	25-150		
13C8_PFOS	72	25-150		
13C8_PFOSA	84	10-150		
13C9_PFNA	76	25-150		
d5-EtFOSAA	69	25-150		
d3-MeFOSAA	69	25-150		

LOQ = Limit of Quantitation

B = Detected in the method blank

E = Quantitation of compound exceeded the calibration range

H = Out of holding time

ND = Not detected at or above the LOQ N = Recovery is out of criteria W = Reported on wet weight basis P = The RPD between two GC columns exceeds 40%

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

Client: GZA GeoEnvironmental, Inc.

Laboratory ID: VK08048-008

Description: WL B-6 (4-5)

Date Sampled:11/06/2020 0935 Project Name: Oshkosh Corporation

Matrix: Solid

% Solids: 80.3 11/10/2020 0016

Date Received: 11/07/2020 Project Number: 20.0157080

**Run Prep Method**1 SOP SPE

Analytical Method Dilution
PFAS by ID SOP 1

Analysis Date Analyst 11/13/2020 1752 MMM **Prep Date Batch** 11/11/2020 0952 72992

CAS **Analytical** LOQ Number Method Result Q Units Run **Parameter** 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) PFAS by ID SOP 2.0 756426-58-1 ND ug/kg 1 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...) 763051-92-9 PFAS by ID SOP ND 20 ug/kg 1 PFAS by ID SOP ND 1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS) 39108-34-4 20 ug/kg 1 1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS) 27619-97-2 PFAS by ID SOP ND 20 ug/kg 1 1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS) 757124-72-4 PFAS by ID SOP ND 2.0 ug/kg 1 Hexafluoropropylene oxide dimer acid (GenX) 13252-13-6 PFAS by ID SOP ND 4.0 ua/ka 1 4,8-dioxa-3H-perfluorononanoic acid (ADONA) 919005-14-4 PFAS by ID SOP ND 20 ug/kg N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA) 2991-50-6 PFAS by ID SOP ND 20 ug/kg N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA) 2355-31-9 PFAS by ID SOP ND 2.0 ug/kg Perfluoro-1-butanesulfonic acid (PFBS) 375-73-5 PFAS by ID SOP ND 1.0 ug/kg Perfluoro-1-decanesulfonic acid (PFDS) PFAS by ID SOP 335-77-3 ND 1.0 ug/kg Perfluoro-1-heptanesulfonic acid (PFHpS) 375-92-8 PFAS by ID SOP ND 1.0 ug/kg 1 Perfluoro-1-nonanesulfonic acid (PFNS) 68259-12-1 PFAS by ID SOP ND 1.0 ug/kg 1 PFAS by ID SOP Perfluoro-1-octanesulfonamide (PFOSA) 754-91-6 ND 1.0 ug/kg Perfluoro-1-pentanesulfonic acid (PFPeS) 2706-91-4 PFAS by ID SOP ND 1.0 ug/kg Perfluorohexanesulfonic acid (PFHxS) 355-46-4 PFAS by ID SOP ND 1.0 ug/kg PFAS by ID SOP Perfluoro-n-butanoic acid (PFBA) 375-22-4 ND 1.0 ug/kg Perfluoro-n-decanoic acid (PFDA) 335-76-2 PFAS by ID SOP ND 1.0 ug/kg Perfluoro-n-dodecanoic acid (PFDoA) 307-55-1 PFAS by ID SOP ND 1.0 ua/ka 1 Perfluoro-n-heptanoic acid (PFHpA) 375-85-9 PFAS by ID SOP ND 1.0 ug/kg Perfluoro-n-hexanoic acid (PFHxA) 307-24-4 PFAS by ID SOP ND 1.0 ua/ka 1 Perfluoro-n-nonanoic acid (PFNA) 375-95-1 PFAS by ID SOP ND 1.0 ua/ka PFAS by ID SOP Perfluoro-n-octanoic acid (PFOA) 335-67-1 ND 1.0 ug/kg Perfluoro-n-pentanoic acid (PFPeA) 2706-90-3 PFAS by ID SOP NΠ 1.0 ug/kg Perfluoro-n-tetradecanoic acid (PFTeDA) 376-06-7 PFAS by ID SOP ND 1.0 ug/kg Perfluoro-n-tridecanoic acid (PFTrDA) ND 72629-94-8 PFAS by ID SOP 1.0 ug/kg 1 Perfluoro-n-undecanoic acid (PFUdA) 2058-94-8 PFAS by ID SOP ND 1.0 ug/kg 1 Perfluorooctanesulfonic acid (PFOS) 1763-23-1 PFAS by ID SOP ND 1.0 ug/kg 1 Run 1 Acceptance Surrogate % Recovery O Limits 13C2\_4:2FTS 78 25-150 13C2\_6:2FTS 78 25-150 80 13C2\_8:2FTS 25-150 13C2\_PFDoA 79 25-150 81 13C2\_PFTeDA 25-150 13C3\_PFBS 78 25-150 13C3 PFHxS 79 25-150 13C3-HFPO-DA 80 25-150

LOQ = Limit of Quantitation

ND = Not detected at or above the LOQ

H = Out of holding time

13C4\_PFBA

13C4\_PFHpA

13C5 PFHxA

13C5\_PFPeA

13C6\_PFDA

13C7 PFUdA

B = Detected in the method blank N = Recovery is out of criteria

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25-150

25-150

25-150

25-150

25-150

25-150

E = Quantitation of compound exceeded the calibration range

W = Reported on wet weight basis

 $<sup>\</sup>mathsf{P} = \mathsf{The}\;\mathsf{RPD}$  between two GC columns exceeds 40%

Client: GZA GeoEnvironmental, Inc.

Description: WL B-6 (4-5)

Date Sampled:11/06/2020 0935 Project Name: Oshkosh Corporation Laboratory ID: VK08048-008

Matrix: Solid

% Solids: 80.3 11/10/2020 0016

Date Received: 11/07/2020 Project Number: 20.0157080

Surrogate	Run 1 Q % Recovery	Acceptance Limits		
13C8_PFOA	77	25-150		
13C8_PFOS	71	25-150		
13C8_PFOSA	83	10-150		
13C9_PFNA	77	25-150		
d5-EtFOSAA	70	25-150		
d3-MeFOSAA	70	25-150		

LOQ = Limit of Quantitation ND = Not detected at or above the LOQ N = Recovery is out of criteria

B = Detected in the method blank

E = Quantitation of compound exceeded the calibration range

H = Out of holding time W = Reported on wet weight basis P = The RPD between two GC columns exceeds 40%

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

Client: GZA GeoEnvironmental, Inc.

Laboratory ID: VK08048-009

Description: WL B-4 (1-2')

Date Sampled:11/06/2020 0955 Project Name: Oshkosh Corporation Matrix: Solid

% Solids: 84.1 11/10/2020 0016

Date Received: 11/07/2020 Project Number: 20.0157080

Run Prep Method SOP SPE Analytical Method Dilution Analysis Date Analyst PFAS by ID SOP

11/13/2020 1813 MMM

Analytical

CAS

**Prep Date** 11/11/2020 0952 72992

**Batch** 

Parameter	Number	Analytical Method	Result Q	LOQ	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	ND	2.0	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3)	763051-92-9	PFAS by ID SOP	ND	2.0	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	2.0	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	2.8	2.0	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	2.0	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND	4.0	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND	2.0	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND	2.0	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND	2.0	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND	1.0	ug/kg	1
		otance				
		mits				
13C2_4:2FTS		i-150				
13C2_6:2FTS		-150				
13C2_8:2FTS		-150				
13C2_PFDoA		i-150				
13C2_PFTeDA		i-150				
13C3_PFBS		i-150				
13C3_PFHxS		i-150				
13C3-HFPO-DA		i-150				
13C4_PFBA		i-150				
13C4_PFHpA	72 25	i-150				

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13C5\_PFHxA

13C5\_PFPeA

13C6\_PFDA

13C7\_PFUdA

LOQ = Limit of Quantitation

H = Out of holding time

ND = Not detected at or above the LOQ

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B = Detected in the method blank

W = Reported on wet weight basis

N = Recovery is out of criteria

67

72

71

73

25-150

25-150

25-150

25-150

E = Quantitation of compound exceeded the calibration range

P = The RPD between two GC columns exceeds 40%

Client: GZA GeoEnvironmental, Inc.

Description: WL B-4 (1-2')

Date Sampled:11/06/2020 0955 Project Name: Oshkosh Corporation Matrix: Solid

Laboratory ID: VK08048-009

% Solids: 84.1 11/10/2020 0016

Date Received: 11/07/2020 Project Number: 20.0157080

Surrogate	Run 1 Q % Recovery	Acceptance Limits
13C8_PFOA	73	25-150
13C8_PFOS	70	25-150
13C8_PFOSA	80	10-150
13C9_PFNA	69	25-150
d5-EtFOSAA	68	25-150
d3-MeFOSAA	69	25-150

LOQ = Limit of Quantitation ND = Not detected at or above the LOQ N = Recovery is out of criteria

B = Detected in the method blank

E = Quantitation of compound exceeded the calibration range

H = Out of holding time

W = Reported on wet weight basis

P = The RPD between two GC columns exceeds 40%

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

Client: GZA GeoEnvironmental, Inc.

Laboratory ID: VK08048-010

Description: WL B-4 (4-5') Date Sampled: 11/06/2020 1000

Matrix: Solid

Project Name: Oshkosh Corporation

CAS

% Solids: 79.3 11/10/2020 0016

Date Received: 11/07/2020 Project Number: 20.0157080

Run Prep Method 1 SOP SPE **Analytical Method Dilution** PFAS by ID SOP

**Analysis Date Analyst** 11/13/2020 1824 MMM

Analytical

**Prep Date** 11/11/2020 0952 72992

**Batch** 

Parameter	Number	Method	Result Q	LOQ	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	ND	2.2	ug/kg	1
${\it 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic\ acid\ (11Cl-PF3)}$	763051-92-9	PFAS by ID SOP	ND	2.2	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	2.2	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	2.2	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	2.2	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND	4.4	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND	2.2	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND	2.2	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND	2.2	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND	1.1	ug/kg	1
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	20					

LOQ = Limit of Quantitation ND = Not detected at or above the LOQ

13C3-HFPO-DA

13C4\_PFBA

13C4\_PFHpA

13C5\_PFHxA

13C5\_PFPeA

13C6\_PFDA

13C7\_PFUdA

B = Detected in the method blank N = Recovery is out of criteria

W = Reported on wet weight basis

P = The RPD between two GC columns exceeds 40%

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73

77

83

83

79

78

81

25-150

25-150

25-150

25-150

25-150

25-150

25-150

E = Quantitation of compound exceeded the calibration range

H = Out of holding time

Client: GZA GeoEnvironmental, Inc.

Description: WL B-4 (4-5') Date Sampled: 11/06/2020 1000

Project Name: Oshkosh Corporation

Laboratory ID: VK08048-010

Matrix: Solid

% Solids: 79.3 11/10/2020 0016

Date Received: 11/07/2020

Project Number: 20.0157080

Surrogate	Run 1 Q % Recovery	Acceptance Limits
13C8_PFOA	82	25-150
13C8_PFOS	72	25-150
13C8_PFOSA	87	10-150
13C9_PFNA	75	25-150
d5-EtFOSAA	71	25-150
d3-MeFOSAA	70	25-150

LOQ = Limit of Quantitation ND = Not detected at or above the LOQ N = Recovery is out of criteria

B = Detected in the method blank

E = Quantitation of compound exceeded the calibration range

H = Out of holding time

W = Reported on wet weight basis

P = The RPD between two GC columns exceeds 40%

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

Client: GZA GeoEnvironmental, Inc.

Laboratory ID: VK08048-011

Description: WL B-3 (1-2')

Project Name: Oshkosh Corporation

Matrix: Solid

Date Sampled: 11/06/2020 1025

% Solids: 79.6 11/10/2020 0016

Date Received: 11/07/2020

Project Number: 20.0157080

Run Prep Method 1 SOP SPE **Analytical Method Dilution** PFAS by ID SOP

Analysis Date Analyst 11/18/2020 0119 SES

**Prep Date** 

**Batch** 11/16/2020 1200 73594

Parameter	CAS Number	Analytical Method	Result Q	LOQ	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	ND	2.1	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3)	763051-92-9	PFAS by ID SOP	ND	2.1	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	2.1	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	2.5	2.1	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	2.1	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND	4.2	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND	2.1	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND	2.1	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND	2.1	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND	1.0	ug/kg	1
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_	72 25	-150				
13C3_PFHxS	82 25	-150				
13C3-HFPO-DA	79 25	-150				
13C4_PFBA	77 25	-150				
13C4_PFHpA	76 25	-150				
13C5_PFHxA	74 25	-150				
13C5_PFPeA	75 25	-150				
13C6_PFDA	80 25	-150				
13C7_PFUdA	79 25	-150				
LOQ = Limit of Quantitation B = Detected in the method blank	E = Quantitation	of compound exceeded th	e calibration range			
ND = Not detected at or above the LOQ N = Recovery is out of criteria H = Out of holding time W = Reported on wet weight basis	P = The RPD bet	ween two GC columns ex	ceeds 40%			

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

Client: GZA GeoEnvironmental, Inc.

Description: WL B-3 (1-2')

Date Sampled: 11/06/2020 1025 Project Name: Oshkosh Corporation Laboratory ID: VK08048-011

Matrix: Solid

% Solids: 79.6 11/10/2020 0016

Date Received: 11/07/2020 Project Number: 20.0157080

	Surrogate	Run 1 Q % Recovery	Acceptance Limits	
•	13C8_PFOA	80	25-150	
	13C8_PFOS	75	25-150	
	13C8_PFOSA	86	10-150	
	13C9_PFNA	75	25-150	
	d5-EtFOSAA	84	25-150	
	d3-MeFOSAA	80	25-150	

LOQ = Limit of Quantitation ND = Not detected at or above the LOQ N = Recovery is out of criteria

B = Detected in the method blank

E = Quantitation of compound exceeded the calibration range

H = Out of holding time

W = Reported on wet weight basis

P = The RPD between two GC columns exceeds 40%

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

Client: GZA GeoEnvironmental, Inc.

Laboratory ID: VK08048-012

Description: WL B-3 (6-7')

Date Sampled: 11/06/2020 1030 Project Name: Oshkosh Corporation Matrix: Solid

% Solids: 80.5 11/10/2020 0016

Date Received: 11/07/2020 Project Number: 20.0157080

Run Prep Method 1 SOP SPE **Analytical Method Dilution** PFAS by ID SOP

Analysis Date Analyst 11/18/2020 0130 SES

Analytical

CAS

**Prep Date** 

**Batch** 11/16/2020 1200 73594

Parameter	Number	Method	Result Q	LOQ	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	ND	2.4	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3)	763051-92-9	PFAS by ID SOP	ND	2.4	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	2.4	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	4.2	2.4	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	2.4	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND	4.8	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND	2.4	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND	2.4	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND	2.4	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND	1.2	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND	1.2	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND	1.2	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND	1.2	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND	1.2	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND	1.2	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND	1.2	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND	1.2	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND	1.2	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND	1.2	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND	1.2	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND	1.2	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND	1.2	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND	1.2	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.6	1.2	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND	1.2	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND	1.2	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND	1.2	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND	1.2	ug/kg	1
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13C2_PFTeDA	73 25	-150				
13C3_PFBS	69 25	-150				
13C3_PFHxS	73 25	-150				
13C3-HFPO-DA	74 25	-150				
13C4_PFBA	72 25	-150				
13C4_PFHpA	75 25	-150				
13C5_PFHxA	66 25	-150				

LOQ = Limit of Quantitation ND = Not detected at or above the LOQ

13C5\_PFPeA 13C6\_PFDA

13C7\_PFUdA

B = Detected in the method blank N = Recovery is out of criteria

W = Reported on wet weight basis

P = The RPD between two GC columns exceeds 40%

25-150

25-150

25-150

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70

74

75

E = Quantitation of compound exceeded the calibration range

H = Out of holding time

Project Number: 20.0157080

Client: GZA GeoEnvironmental, Inc.

Description: WL B-3 (6-7')

Date Received: 11/07/2020

Date Sampled: 11/06/2020 1030 Project Name: Oshkosh Corporation Matrix: Solid

Laboratory ID: VK08048-012

% Solids: 80.5 11/10/2020 0016

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		74	25-150
13C8_PFOS		73	25-150
13C8_PFOSA		82	10-150
13C9_PFNA		69	25-150
d5-EtFOSAA		73	25-150
d3-MeFOSAA		62	25-150

LOQ = Limit of Quantitation ND = Not detected at or above the LOQ N = Recovery is out of criteria

B = Detected in the method blank

E = Quantitation of compound exceeded the calibration range

H = Out of holding time

W = Reported on wet weight basis

P = The RPD between two GC columns exceeds 40%

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

Client: GZA GeoEnvironmental, Inc.

Laboratory ID: VK08048-013

Description: WL B-5 (1-2')

Matrix: Solid

Date Sampled: 11/06/2020 1040

Project Name: Oshkosh Corporation

% Solids: 81.4 11/10/2020 0016

Date Received: 11/07/2020 Project Number: 20.0157080

Run Prep Method 1 SOP SPE **Analytical Method Dilution** PFAS by ID SOP

Analysis Date Analyst 11/18/2020 0141 SES

**Prep Date Batch** 

11/16/2020 1200 73594

Parameter	CAS Number	Analytical Method	Result Q	LOQ	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	ND	2.2	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3)	763051-92-9	PFAS by ID SOP	ND	2.2	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	2.2	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	2.2	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	2.2	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND	4.5	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND	2.2	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND	2.2	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND	2.2	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.2	1.1	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	2.3	1.1	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND	1.1	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND	1.1	ug/kg	1
Surrogate Ri		otance nits				
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13C6\_PFDA

13C7\_PFUdA

LOQ = Limit of Quantitation

H = Out of holding time

ND = Not detected at or above the LOQ

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B = Detected in the method blank

W = Reported on wet weight basis

N = Recovery is out of criteria

85

81

25-150

25-150

E = Quantitation of compound exceeded the calibration range

P = The RPD between two GC columns exceeds 40%

Client: GZA GeoEnvironmental, Inc.

Description: WL B-5 (1-2')

Date Sampled: 11/06/2020 1040 Project Name: Oshkosh Corporation Laboratory ID: VK08048-013

Matrix: Solid

% Solids: 81.4 11/10/2020 0016

Date Received: 11/07/2020 Project Number: 20.0157080

Surrogate Q	Run 1 % Recovery	Acceptance Limits		
13C8_PFOA	83	25-150		
13C8_PFOS	78	25-150		
13C8_PFOSA	88	10-150		
13C9_PFNA	80	25-150		
d5-EtFOSAA	84	25-150		
d3-MeFOSAA	75	25-150		

LOQ = Limit of Quantitation ND = Not detected at or above the LOQ N = Recovery is out of criteria

B = Detected in the method blank

E = Quantitation of compound exceeded the calibration range

H = Out of holding time W = Reported on wet weight basis P = The RPD between two GC columns exceeds 40%

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Client: GZA GeoEnvironmental, Inc.

Laboratory ID: VK08048-014

Description: WL B-2 (1-2') Date Sampled: 11/06/2020 1050

Project Name: Oshkosh Corporation

Matrix: Solid

Date Received: 11/07/2020

% Solids: 81.3 11/10/2020 0016

Project Number: 20.0157080

Run Prep Method Analytical Method Dilution Analysis Date Analyst 1 SOP SPE PFAS by ID SOP

**Prep Date Batch** 11/18/2020 0151 SES 11/16/2020 1200 73594

Parameter	CAS Number	Analytical Method	Result	Q I	_OQ	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		2.4	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3)	763051-92-9	PFAS by ID SOP	ND		2.4	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		2.4	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		2.4	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		2.4	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		4.7	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		2.4	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		2.4	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		2.4	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		1.2	ug/kg	1

Surrogate	Q	% Recovery	Limits
13C2_4:2FTS		69	25-150
13C2_6:2FTS		74	25-150
13C2_8:2FTS		70	25-150
13C2_PFDoA		69	25-150
13C2_PFTeDA		66	25-150
13C3_PFBS		66	25-150
13C3_PFHxS		73	25-150
13C3-HFPO-DA		68	25-150
13C4_PFBA		66	25-150
13C4_PFHpA		67	25-150
13C5_PFHxA		66	25-150
13C5_PFPeA		64	25-150
13C6_PFDA		70	25-150
13C7_PFUdA		75	25-150

LOQ = Limit of Quantitation ND = Not detected at or above the LOQ

H = Out of holding time

B = Detected in the method blank N = Recovery is out of criteria W = Reported on wet weight basis

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

E = Quantitation of compound exceeded the calibration range

P = The RPD between two GC columns exceeds 40%

Client: GZA GeoEnvironmental, Inc.

Description: WL B-2 (1-2')

Date Received: 11/07/2020

Date Sampled: 11/06/2020 1050

Project Name: Oshkosh Corporation

Matrix: Solid

Laboratory ID: VK08048-014

% Solids: 81.3 11/10/2020 0016

Project Number: 20.0157080

Surrogate	Run 1 A Q % Recovery	cceptance Limits	
13C8_PFOA	68	25-150	
13C8_PFOS	64	25-150	
13C8_PFOSA	76	10-150	
13C9_PFNA	69	25-150	
d5-EtFOSAA	67	25-150	
d3-MeFOSAA	61	25-150	

LOQ = Limit of Quantitation ND = Not detected at or above the LOQ N = Recovery is out of criteria

B = Detected in the method blank

E = Quantitation of compound exceeded the calibration range

H = Out of holding time

W = Reported on wet weight basis

P = The RPD between two GC columns exceeds 40%

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

Client: GZA GeoEnvironmental, Inc.

Laboratory ID: VK08048-016

Description: WL B-1 (1-2')

Date Sampled:11/06/2020 1110 Project Name: Oshkosh Corporation Matrix: Solid

% Solids: 82.7 11/10/2020 0016

Date Received: 11/07/2020 Project Number: 20.0157080

Run Prep Method 1 SOP SPE **Analytical Method Dilution** PFAS by ID SOP

**Analysis Date Analyst** 11/18/2020 0202 SES

**Prep Date Batch** 11/16/2020 1200 73594

Parameter	CAS Number	Analytical Method	Result Q	LOQ	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	ND	2.1	ug/kg	1
$\hbox{11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11 CI-PF3)}\\$	763051-92-9	PFAS by ID SOP	ND	2.1	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	2.1	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	7.5	2.1	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	2.1	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND	4.2	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND	2.1	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND	2.1	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND	2.1	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND	1.0	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND	1.0	ug/kg	1
		otance nits				
•		-150				
		-150				
13C2_8:2FTS	72 25	-150				
13C2_PFDoA	75 25	-150				
_		-150				
_	74 25	-150				
_		-150				
_		-150				
4004 DEDA		450				

LOQ = Limit of Quantitation

13C4\_PFBA

13C4\_PFHpA

13C5\_PFHxA

13C5\_PFPeA

13C6\_PFDA

13C7\_PFUdA

B = Detected in the method blank N = Recovery is out of criteria

W = Reported on wet weight basis

25-150

25-150

25-150

25-150

25-150

25-150

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75

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74

77

E = Quantitation of compound exceeded the calibration range

ND = Not detected at or above the LOQ H = Out of holding time

P = The RPD between two GC columns exceeds 40%

Client: GZA GeoEnvironmental, Inc.

Description: WL B-1 (1-2')

Date Sampled:11/06/2020 1110

Date Received: 11/07/2020

Project Name: Oshkosh Corporation

Project Number: 20.0157080

Laboratory ID: VK08048-016

Matrix: Solid

% Solids: 82.7 11/10/2020 0016

Surrogate	Run 1 Q % Recovery	Acceptance Limits	
13C8_PFOA	75	25-150	
13C8_PFOS	77	25-150	
13C8_PFOSA	81	10-150	
13C9_PFNA	74	25-150	
d5-EtFOSAA	84	25-150	
d3-MeFOSAA	71	25-150	

LOQ = Limit of Quantitation ND = Not detected at or above the LOQ N = Recovery is out of criteria H = Out of holding time

B = Detected in the method blank

E = Quantitation of compound exceeded the calibration range

W = Reported on wet weight basis

P = The RPD between two GC columns exceeds 40%

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

Client: GZA GeoEnvironmental, Inc.

Laboratory ID: VK08048-018

Description: WL B-7 (1-2')

Date Sampled:11/06/2020 1135 Project Name: Oshkosh Corporation Matrix: Solid

% Solids: 81.1 11/10/2020 0016

Date Received: 11/07/2020 Project Number: 20.0157080

Run Prep Method 1 SOP SPE **Analytical Method Dilution** PFAS by ID SOP

**Analysis Date Analyst** 11/18/2020 0213 SES

**Prep Date Batch** 

11/16/2020 1200 73594

Parameter	CAS Number	Analytical Method	Result Q	LOQ	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	ND	1.9	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3)	763051-92-9	PFAS by ID SOP	ND	1.9	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	1.9	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	1.9	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	1.9	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND	3.9	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND	1.9	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND	1.9	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND	1.9	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND	0.97	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND	0.97	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND	0.97	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND	0.97	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND	0.97	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND	0.97	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND	0.97	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND	0.97	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND	0.97	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND	0.97	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND	0.97	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND	0.97	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND	0.97	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND	0.97	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND	0.97	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND	0.97	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND	0.97	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND	0.97	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND	0.97	ug/kg	1
		otance mits				
13C2_4:2FTS	77 25	-150				
13C2_6:2FTS	80 25	-150				
13C2_8:2FTS	76 25	-150				
13C2_PFDoA	80 25	-150				
13C2_PFTeDA	71 25	-150				
13C3_PFBS	73 25	-150				
13C3_PFHxS	79 25	-150				
13C3-HFPO-DA	79 25	i-150				
13C4_PFBA	75 25	i-150				
13C4_PFHpA	79 25	-150				

LOQ = Limit of Quantitation ND = Not detected at or above the LOQ

13C5\_PFHxA

13C5\_PFPeA

13C6\_PFDA

13C7\_PFUdA

B = Detected in the method blank N = Recovery is out of criteria

E = Quantitation of compound exceeded the calibration range

H = Out of holding time

W = Reported on wet weight basis

P = The RPD between two GC columns exceeds 40%

25-150

25-150

25-150

25-150

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Project Name: Oshkosh Corporation

Client: GZA GeoEnvironmental, Inc.

Description: WL B-7 (1-2')

Date Sampled:11/06/2020 1135

Date Received: 11/07/2020

Laboratory ID: VK08048-018

Matrix: Solid

% Solids: 81.1 11/10/2020 0016

Project Number: 20.0157080

Surrogate	Run 1 A Q % Recovery	cceptance Limits	
13C8_PFOA	77	25-150	
13C8_PFOS	79	25-150	
13C8_PFOSA	87	10-150	
13C9_PFNA	77	25-150	
d5-EtFOSAA	85	25-150	
d3-MeFOSAA	80	25-150	

LOQ = Limit of Quantitation ND = Not detected at or above the LOQ N = Recovery is out of criteria

B = Detected in the method blank

E = Quantitation of compound exceeded the calibration range

H = Out of holding time

W = Reported on wet weight basis

P = The RPD between two GC columns exceeds 40%

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

Client: GZA GeoEnvironmental, Inc.

Laboratory ID: VK08048-019

Description: WL B-9 (1-2')

Date Sampled:11/06/2020 1150 Project Name: Oshkosh Corporation

Matrix: Solid

% Solids: 84.8 11/10/2020 0016

Date Received: 11/07/2020 Project Number: 20.0157080

**Run Prep Method**1 SOP SPE

Analytical Method Dilution
PFAS by ID SOP 1

Analysis Date Analyst 11/18/2020 0223 SES **Prep Date Batch** 11/16/2020 1200 73594

CAS **Analytical** LOQ Number Method Result Q Units Run **Parameter** 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) PFAS by ID SOP 22 756426-58-1 ND ug/kg 1 PFAS by ID SOP 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...) 763051-92-9 ND 22 ug/kg 1 PFAS by ID SOP ND 1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS) 39108-34-4 22 ug/kg 1 1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS) 27619-97-2 PFAS by ID SOP ND 22 ug/kg 1 1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS) 757124-72-4 PFAS by ID SOP ND 22 ug/kg 1 Hexafluoropropylene oxide dimer acid (GenX) 13252-13-6 PFAS by ID SOP ND 4.4 ua/ka 1 4,8-dioxa-3H-perfluorononanoic acid (ADONA) 919005-14-4 PFAS by ID SOP ND 22 ug/kg N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA) 2991-50-6 PFAS by ID SOP ND 22 ug/kg N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA) 2355-31-9 PFAS by ID SOP ND 2.2 ug/kg Perfluoro-1-butanesulfonic acid (PFBS) 375-73-5 PFAS by ID SOP ND 1 1 ug/kg Perfluoro-1-decanesulfonic acid (PFDS) PFAS by ID SOP 335-77-3 ND 1.1 ug/kg Perfluoro-1-heptanesulfonic acid (PFHpS) 375-92-8 PFAS by ID SOP ND 1 1 ug/kg 1 Perfluoro-1-nonanesulfonic acid (PFNS) 68259-12-1 PFAS by ID SOP ND 1.1 ug/kg 1 Perfluoro-1-octanesulfonamide (PFOSA) PFAS by ID SOP 754-91-6 ND 1.1 ug/kg Perfluoro-1-pentanesulfonic acid (PFPeS) 2706-91-4 PFAS by ID SOP ND 1.1 ug/kg Perfluorohexanesulfonic acid (PFHxS) 355-46-4 PFAS by ID SOP ND 1 1 ug/kg Perfluoro-n-butanoic acid (PFBA) PFAS by ID SOP 375-22-4 ND 1.1 ug/kg 1 Perfluoro-n-decanoic acid (PFDA) 335-76-2 PFAS by ID SOP ND 1 1 ug/kg Perfluoro-n-dodecanoic acid (PFDoA) 307-55-1 PFAS by ID SOP ND 1.1 ua/ka 1 Perfluoro-n-heptanoic acid (PFHpA) 375-85-9 PFAS by ID SOP ND 1.1 ug/kg Perfluoro-n-hexanoic acid (PFHxA) 307-24-4 PFAS by ID SOP ND 1.1 ua/ka 1 Perfluoro-n-nonanoic acid (PFNA) 375-95-1 PFAS by ID SOP ND 1.1 ua/ka Perfluoro-n-octanoic acid (PFOA) PFAS by ID SOP 335-67-1 ND 1.1 ug/kg Perfluoro-n-pentanoic acid (PFPeA) 2706-90-3 PFAS by ID SOP 1.8 1 1 ug/kg 1 Perfluoro-n-tetradecanoic acid (PFTeDA) 376-06-7 PFAS by ID SOP ND 1.1 ug/kg Perfluoro-n-tridecanoic acid (PFTrDA) PFAS by ID SOP ND 72629-94-8 1.1 ug/kg 1 Perfluoro-n-undecanoic acid (PFUdA) 2058-94-8 PFAS by ID SOP ND 1.1 ug/kg 1 Perfluorooctanesulfonic acid (PFOS) 1763-23-1 PFAS by ID SOP ND 1.1 ug/kg 1 Run 1 **Acceptance** Surrogate % Recovery

Surrogate	Q	% Recovery	LIIIIII
13C2_4:2FTS		78	25-150
13C2_6:2FTS		79	25-150
13C2_8:2FTS		84	25-150
13C2_PFDoA		77	25-150
13C2_PFTeDA		72	25-150
13C3_PFBS		70	25-150
13C3_PFHxS		78	25-150
13C3-HFPO-DA		80	25-150
13C4_PFBA		75	25-150
13C4_PFHpA		79	25-150
13C5_PFHxA		76	25-150
13C5_PFPeA		77	25-150
13C6_PFDA		79	25-150
13C7_PFUdA		78	25-150

LOQ = Limit of Quantitation

ND = Not detected at or above the LOQ

H = Out of holding time

B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis

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

E = Quantitation of compound exceeded the calibration range

P = The RPD between two GC columns exceeds 40%

Project Name: Oshkosh Corporation

Client: GZA GeoEnvironmental, Inc.

Description: WL B-9 (1-2')

Date Sampled:11/06/2020 1150

Date Received: 11/07/2020

Laboratory ID: VK08048-019

Matrix: Solid

% Solids: 84.8 11/10/2020 0016

Project Number: 20.0157080

Surrogate	Run 1 A Q % Recovery	Acceptance Limits		
13C8_PFOA	79	25-150		
13C8_PFOS	77	25-150		
13C8_PFOSA	83	10-150		
13C9_PFNA	80	25-150		
d5-EtFOSAA	79	25-150		
d3-MeFOSAA	70	25-150		

LOQ = Limit of Quantitation

B = Detected in the method blank

E = Quantitation of compound exceeded the calibration range

H = Out of holding time

ND = Not detected at or above the LOQ N = Recovery is out of criteria W = Reported on wet weight basis P = The RPD between two GC columns exceeds 40%

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

QC Summary	

Sample ID: VQ72992-001

Batch: 72992

Analytical Method: PFAS by ID SOP

Matrix: Solid
Prep Method: SOP SPE

Prep Date: 11/11/2020 0952

Parameter	Result	Q Dil	LOQ	Units	Analysis Date
9CI-PF3ONS	ND	1	2.0	ug/kg	11/12/2020 1700
11CI-PF3OUdS	ND	1	2.0	ug/kg	11/12/2020 1700
8:2 FTS	ND	1	2.0	ug/kg	11/12/2020 1700
6:2 FTS	ND	1	2.0	ug/kg	11/12/2020 1700
4:2 FTS	ND	1	2.0	ug/kg	11/12/2020 1700
GenX	ND	1	4.0	ug/kg	11/12/2020 1700
ADONA	ND	1	2.0	ug/kg	11/12/2020 1700
EtFOSAA	ND	1	2.0	ug/kg	11/12/2020 1700
MeFOSAA	ND	1	2.0	ug/kg	11/12/2020 1700
PFBS	ND	1	1.0	ug/kg	11/12/2020 1700
PFDS	ND	1	1.0	ug/kg	11/12/2020 1700
PFHpS	ND	1	1.0	ug/kg	11/12/2020 1700
PFNS	ND	1	1.0	ug/kg	11/12/2020 1700
PFOSA	ND	1	1.0	ug/kg	11/12/2020 1700
PFPeS	ND	1	1.0	ug/kg	11/12/2020 1700
PFHxS	ND	1	1.0	ug/kg	11/12/2020 1700
PFBA	ND	1	1.0	ug/kg	11/12/2020 1700
PFDA	ND	1	1.0	ug/kg	11/12/2020 1700
PFDoA	ND	1	1.0	ug/kg	11/12/2020 1700
PFHpA	ND	1	1.0	ug/kg	11/12/2020 1700
PFHxA	ND	1	1.0	ug/kg	11/12/2020 1700
PFNA	ND	1	1.0	ug/kg	11/12/2020 1700
PFOA	ND	1	1.0	ug/kg	11/12/2020 1700
PFPeA	ND	1	1.0	ug/kg	11/12/2020 1700
PFTeDA	ND	1	1.0	ug/kg	11/12/2020 1700
PFTrDA	ND	1	1.0	ug/kg	11/12/2020 1700
PFUdA	ND	1	1.0	ug/kg	11/12/2020 1700
PFOS	ND	1	1.0	ug/kg	11/12/2020 1700
Surrogate	Q % Rec	Acceptance Limit			
13C2_4:2FTS	87	25-150			
13C2_6:2FTS	86	25-150			
13C2_8:2FTS	83	25-150			
13C2_PFDoA	86	25-150			
13C2_PFTeDA	86	25-150			
13C3_PFBS	76	25-150			
13C3_PFHxS	79	25-150			
13C3-HFPO-DA	83	25-150			
1004 DED4	81	25-150			
13C4_PFBA					
13C4_PFBA 13C4_PFHpA	84	25-150			
	84 83	25-150 25-150			

LOQ = Limit of Quantitation

ND = Not detected at or above the LOQ

N = Recovery is out of criteria

 $P = The \ RPD$  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

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

Sample ID: VQ72992-001 Batch: 72992

Batch: 72992 Analytical Method: PFAS by ID SOP Matrix: Solid Prep Method: SOP SPE

Prep Date: 11/11/2020 0952

Surrogate	Q % Rec	Acceptance Limit
13C6_PFDA	88	25-150
13C7_PFUdA	90	25-150
13C8_PFOA	87	25-150
13C8_PFOS	82	25-150
13C8_PFOSA	91	10-150
13C9_PFNA	78	25-150
d5-EtFOSAA	84	25-150
d3-MeFOSAA	85	25-150

LOQ = Limit of Quantitation

ND = Not detected at or above the LOQ

N = Recovery is out of criteria

P = The RPD between two GC columns exceeds 40%

\* = RSD is out of criteria

+ = RPD is out of criteria

# PFAS by LC/MS/MS - LCS

Sample ID: VQ72992-002

Batch: 72992

Analytical Method: PEAS by ID SO

Matrix: Solid Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP Prep Date: 11/11/2020 0952

	Spike					
Parameter	Amount (ug/kg)	Result (ug/kg) Q	Dil	% Rec	% Rec Limit	Analysis Data
9CI-PF3ONS			1	101		Analysis Date
11CI-PF3OUdS	1.9 1.9	1.9 1.9	1	99	50-150 50-150	11/12/2020 1711 11/12/2020 1711
8:2 FTS	1.9	1.8	1	93	50-150	11/12/2020 1711
6:2 FTS	1.9	1.8	1	93 98	50-150	11/12/2020 1711
4:2 FTS	1.9	2.0	1	105	50-150	11/12/2020 1711
GenX	4.0	3.6	1	90	50-150 50-150	11/12/2020 1711
ADONA	1.9	1.9	1	103	50-150	11/12/2020 1711
EtFOSAA	2.0	2.0	1	98	50-150	11/12/2020 1711
MeFOSAA	2.0	1.7	1	87	50-150	11/12/2020 1711
PFBS	1.8	1.7	1	98	50-150	11/12/2020 1711
PFDS	1.9	1.9	1	100	50-150	11/12/2020 1711
PFHpS	1.9	1.8	1	96	50-150	11/12/2020 1711
PFNS	1.9	1.9	1	97	50-150	11/12/2020 1711
PFOSA	2.0	1.9	1	96	50-150	11/12/2020 1711
PFPeS	1.9	2.0	1	108	50-150	11/12/2020 1711
PFHxS	1.8	1.6	1	86	50-150	11/12/2020 1711
PFBA	2.0	2.0	1	100	50-150	11/12/2020 1711
PFDA	2.0	2.0	1	98	50-150	11/12/2020 1711
PFDoA	2.0	2.0	1	98	50-150	11/12/2020 1711
PFHpA	2.0	2.1	1	106	50-150	11/12/2020 1711
PFHxA	2.0	2.1	1	103	50-150	11/12/2020 1711
PFNA	2.0	1.8	1	91	50-150	11/12/2020 1711
PFOA	2.0	2.0	1	102	50-150	11/12/2020 1711
PFPeA	2.0	2.0	1	100	50-150	11/12/2020 1711
PFTeDA	2.0	2.1	1	103	50-150	11/12/2020 1711
PFTrDA	2.0	1.9	1	96	50-150	11/12/2020 1711
PFUdA	2.0	1.9	1	93	50-150	11/12/2020 1711
PFOS	1.9	1.7	1	90	50-150	11/12/2020 1711
Surrogate	Q % Rec	Acceptance Limit				
13C2_4:2FTS	84	25-150				
13C2_6:2FTS	91	25-150				
13C2_8:2FTS	81	25-150				
13C2_PFDoA	84	25-150				
13C2_PFTeDA	84	25-150				
13C3_PFBS	77	25-150				
13C3_PFHxS	78	25-150				
13C3-HFPO-DA	83	25-150				
13C4_PFBA	86	25-150				
13C4_PFHpA	85	25-150				
13C5_PFHxA	86	25-150				
13C5_PFPeA	84	25-150				

LOQ = Limit of Quantitation

ND = Not detected at or above the LOQ

N = Recovery is out of criteria

 $P = The \ RPD$  between two GC columns exceeds 40%

\* = RSD is out of criteria

+ = RPD is out of criteria

# PFAS by LC/MS/MS - LCS

Sample ID: VQ72992-002 Batch: 72992

Analytical Method: PFAS by ID SOP

Matrix: Solid
Prep Method: SOP SPE

Prep Date: 11/11/2020 0952

Q % Rec	Acceptance Limit
90	25-150
95	25-150
83	25-150
82	25-150
88	10-150
84	25-150
89	25-150
90	25-150
•	90 95 83 82 88 84 89

LOQ = Limit of Quantitation

ND = Not detected at or above the LOQ

N = Recovery is out of criteria

P = The RPD between two GC columns exceeds 40%

\* = RSD is out of criteria

+ = RPD is out of criteria

Sample ID: VQ73594-001

Batch: 73594

Analytical Method: PFAS by ID SOP

Matrix: Solid
Prep Method: SOP SPE

Prep Date: 11/16/2020 1200

Parameter	Result	Q Dil	LOQ	Units	Analysis Date
9CI-PF3ONS	ND	1	2.0	ug/kg	11/17/2020 1546
11CI-PF3OUdS	ND	1	2.0	ug/kg	11/17/2020 1546
8:2 FTS	ND	1	2.0	ug/kg	11/17/2020 1546
6:2 FTS	ND	1	2.0	ug/kg	11/17/2020 1546
4:2 FTS	ND	1	2.0	ug/kg	11/17/2020 1546
GenX	ND	1	4.0	ug/kg	11/17/2020 1546
ADONA	ND	1	2.0	ug/kg	11/17/2020 1546
EtFOSAA	ND	1	2.0	ug/kg	11/17/2020 1546
MeFOSAA	ND	1	2.0	ug/kg	11/17/2020 1546
PFBS	ND	1	1.0	ug/kg	11/17/2020 1546
PFDS	ND	1	1.0	ug/kg	11/17/2020 1546
PFHpS	ND	1	1.0	ug/kg	11/17/2020 1546
PFNS	ND	1	1.0	ug/kg	11/17/2020 1546
PFOSA	ND	1	1.0	ug/kg	11/17/2020 1546
PFPeS	ND	1	1.0	ug/kg	11/17/2020 1546
PFHxS	ND	1	1.0	ug/kg	11/17/2020 1546
PFBA	ND	1	1.0	ug/kg	11/17/2020 1546
PFDA	ND	1	1.0	ug/kg	11/17/2020 1546
PFDoA	ND	1	1.0	ug/kg	11/17/2020 1546
PFHpA	ND	1	1.0	ug/kg	11/17/2020 1546
PFHxA	ND ND	1	1.0	ug/kg	11/17/2020 1546
PFNA PFOA	ND ND	1	1.0 1.0	ug/kg ug/kg	11/17/2020 1546 11/17/2020 1546
PFPeA	ND ND	1	1.0	ug/kg ug/kg	11/17/2020 1546
PFTeDA	ND	1	1.0	ug/kg	11/17/2020 1546
PFTrDA	ND	1	1.0	ug/kg	11/17/2020 1546
PFUdA	ND	1	1.0	ug/kg	11/17/2020 1546
PFOS	ND	1	1.0	ug/kg	11/17/2020 1546
Surrogate	Q % Rec	Acceptance Limit			
13C2_4:2FTS	76	25-150			
13C2_6:2FTS	85	25-150			
13C2_8:2FTS	91	25-150			
13C2_PFDoA	80	25-150			
13C2_PFTeDA	74	25-150			
13C3_PFBS	65	25-150			
13C3_PFHxS	71	25-150			
13C3-HFPO-DA	83	25-150			
100011110 271		25-150			
13C4_PFBA	80	20 100			
13C4_PFBA					
	80 85 77	25-150 25-150			

LOQ = Limit of Quantitation

ND = Not detected at or above the LOQ

N = Recovery is out of criteria

 $P = The \ RPD$  between two GC columns exceeds 40%

\* = RSD is out of criteria

+ = RPD is out of criteria

Sample ID: VQ73594-001 Batch: 73594

Analytical Method: PFAS by ID SOP

Matrix: Solid
Prep Method: SOP SPE

Prep Date: 11/16/2020 1200

Q % Rec	Acceptance Limit
83	25-150
80	25-150
82	25-150
78	25-150
87	10-150
81	25-150
86	25-150
85	25-150
-	83 80 82 78 87 81 86

LOQ = Limit of Quantitation

ND = Not detected at or above the LOQ

N = Recovery is out of criteria

P = The RPD between two GC columns exceeds 40%

\* = RSD is out of criteria

+ = RPD is out of criteria

# PFAS by LC/MS/MS - LCS

Sample ID: VQ73594-002

Batch: 73594

Analytical Method: PFAS by ID SOP

Matrix: Solid
Prep Method: SOP SPE

Prep Date: 11/16/2020 1200

	Spike Amount	Result			% Rec	
Parameter	(ug/kg)	(ug/kg) Q	Dil	% Rec	Limit	Analysis Date
9CI-PF3ONS	1.9	2.2	1	118	50-150	11/17/2020 1556
11CI-PF3OUdS	1.9	2.1	1	111	50-150	11/17/2020 1556
8:2 FTS	1.9	1.7	1	90	50-150	11/17/2020 1556
6:2 FTS	1.9	1.8	1	95	50-150	11/17/2020 1556
4:2 FTS	1.9	2.3	1	123	50-150	11/17/2020 1556
GenX	4.0	4.5	1	113	50-150	11/17/2020 1556
ADONA	1.9	2.1	1	112	50-150	11/17/2020 1556
EtFOSAA	2.0	1.8	1	92	50-150	11/17/2020 1556
MeFOSAA	2.0	2.7	1	134	50-150	11/17/2020 1556
PFBS	1.8	2.0	1	111	50-150	11/17/2020 1556
PFDS	1.9	2.3	1	118	50-150	11/17/2020 1556
PFHpS	1.9	2.1	1	108	50-150	11/17/2020 1556
PFNS	1.9	2.5	1	132	50-150	11/17/2020 1556
PFOSA	2.0	2.3	1	114	50-150	11/17/2020 1556
PFPeS	1.9	2.2	1	120	50-150	11/17/2020 1556
PFHxS	1.8	1.7	1	93	50-150	11/17/2020 1556
PFBA	2.0	2.2	1	111	50-150	11/17/2020 1556
PFDA	2.0	2.4	1	119	50-150	11/17/2020 1556
PFDoA	2.0	2.2	1	108	50-150	11/17/2020 1556
PFHpA	2.0	2.1	1	107	50-150	11/17/2020 1556
PFHxA	2.0	2.2	1	110	50-150	11/17/2020 1556
PFNA	2.0	2.1	1	106	50-150	11/17/2020 1556
PFOA	2.0	2.2	1	110	50-150	11/17/2020 1556
PFPeA	2.0	2.2	1	109	50-150	11/17/2020 1556
PFTeDA	2.0	2.3	1	117	50-150	11/17/2020 1556
PFTrDA	2.0	2.4	1	119	50-150	11/17/2020 1556
PFUdA	2.0	2.1	1	105	50-150	11/17/2020 1556
PFOS	1.9	2.2	1	119	50-150	11/17/2020 1556
Surrogate	Q % Rec	Acceptance Limit				
13C2_4:2FTS	78	25-150				
13C2_6:2FTS	90	25-150				
13C2_8:2FTS	95	25-150				
13C2_PFDoA	82	25-150				
13C2_PFTeDA	77	25-150				
13C3_PFBS	67	25-150				
13C3_PFHxS	80	25-150				
13C3-HFPO-DA	85	25-150				
	82	25-150				
		_0 .00				
13C4_PFBA		25-150				
	87 80	25-150 25-150				

LOQ = Limit of Quantitation

ND = Not detected at or above the LOQ

N = Recovery is out of criteria

 $P = The \ RPD$  between two GC columns exceeds 40%

\* = RSD is out of criteria

+ = RPD is out of criteria

# PFAS by LC/MS/MS - LCS

Sample ID: VQ73594-002 Batch: 73594

Analytical Method: PFAS by ID SOP

Matrix: Solid
Prep Method: SOP SPE

Prep Date: 11/16/2020 1200

Q % Rec	Acceptance Limit
85	25-150
85	25-150
82	25-150
77	25-150
88	10-150
83	25-150
88	25-150
83	25-150
	85 85 82 77 88 83 88

LOQ = Limit of Quantitation

ND = Not detected at or above the LOQ

N = Recovery is out of criteria

P = The RPD between two GC columns exceeds 40%

\* = RSD is out of criteria

+ = RPD is out of criteria

**Sample ID:** VQ73728-001 Batch: 73728

Analytical Method: PFAS by ID SOP

Matrix: Aqueous Prep Method: SOP SPE

Prep Date: 11/17/2020 1034

Result	Q Dil	LOQ	Units	Analysis Date
ND	1	8.0	ng/L	11/18/2020 1323
ND	1	8.0	ng/L	11/18/2020 1323
ND	1	8.0	ng/L	11/18/2020 1323
ND	1	8.0	ng/L	11/18/2020 1323
ND	1	8.0	ng/L	11/18/2020 1323
ND	1	8.0	ng/L	11/18/2020 1323
ND	1	8.0	ng/L	11/18/2020 1323
ND	1	8.0	ng/L	11/18/2020 1323
ND	1	8.0	ng/L	11/18/2020 1323
ND	1	4.0	ng/L	11/18/2020 1323
ND	1	4.0	ng/L	11/18/2020 1323
ND	1	4.0	ng/L	11/18/2020 1323
ND	1	4.0	ng/L	11/18/2020 1323
ND	1	4.0	ng/L	11/18/2020 1323
ND	1	4.0	ng/L	11/18/2020 1323
ND	1	4.0	ng/L	11/18/2020 1323
ND	1	4.0	ng/L	11/18/2020 1323
ND	1	4.0	ng/L	11/18/2020 1323
ND	1	4.0	ng/L	11/18/2020 1323
ND	1	4.0	ng/L	11/18/2020 1323
ND	1	4.0	ng/L	11/18/2020 1323
ND	1	4.0	ng/L	11/18/2020 1323
ND	1	4.0	ng/L	11/18/2020 1323
ND	1	4.0	ng/L	11/18/2020 1323
ND	1	4.0	ng/L	11/18/2020 1323
ND	1	4.0	ng/L	11/18/2020 1323
ND	1	4.0	ng/L	11/18/2020 1323
ND	1	4.0	ng/L	11/18/2020 1323
Q % Rec	Acceptance Limit			
109	25-150			
108	25-150			
95	25-150			
90	25-150			
88	25-150			
90	25-150			
92	25-150			
104	25-150			
98	25-150			
93	25-150			
99	25-150			
	ND N	ND 1	ND 1 8.0 ND 1 4.0 ND	ND

LOQ = Limit of Quantitation

ND = Not detected at or above the LOQ

N = Recovery is out of criteria

 $P = The \ RPD$  between two GC columns exceeds 40%

\* = RSD is out of criteria

+ = RPD is out of criteria

Sample ID: VQ73728-001 Batch: 73728

Analytical Method: PFAS by ID SOP

Matrix: Aqueous Prep Method: SOP SPE

Prep Date: 11/17/2020 1034

Q % Rec	Acceptance Limit
87	25-150
89	25-150
99	25-150
87	25-150
95	10-150
97	25-150
96	25-150
93	25-150
	87 89 99 87 95 97

LOQ = Limit of Quantitation

ND = Not detected at or above the LOQ

N = Recovery is out of criteria

P = The RPD between two GC columns exceeds 40%

\* = RSD is out of criteria

+ = RPD is out of criteria

# PFAS by LC/MS/MS - LCS

Sample ID: VQ73728-002

Batch: 73728

Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/17/2020 1034

Parameter	Spike Amount	Result	0 0:1	% Rec	% Rec Limit	Amelysis Deta
	(ng/L)	(ng/L)	Q Dil			Analysis Date
9CI-PF3ONS	15	14	1	91	50-150	11/18/2020 1334
11CI-PF3OUdS	15	13	1	87	50-150	11/18/2020 1334
8:2 FTS	15	13	1	84	50-150	11/18/2020 1334
6:2 FTS	15	12	1	81	50-150	11/18/2020 1334
4:2 FTS	15	14	1 1	91	50-150	11/18/2020 1334 11/18/2020 1334
GenX ADONA	32 15	29 15	1	89 101	50-150 50-150	11/18/2020 1334
EtFOSAA	16	14	1	86	50-150	11/18/2020 1334
MeFOSAA	16	15	1	93	50-150	11/18/2020 1334
PFBS	14	14	1	96	50-150	11/18/2020 1334
PFDS	15	14	1	90	50-150	11/18/2020 1334
PFHpS	15	15	1	97	50-150	11/18/2020 1334
PFNS	15	15	1	97	50-150	11/18/2020 1334
PFOSA	16	15	1	92	50-150	11/18/2020 1334
PFPeS	15	15	1	103	50-150	11/18/2020 1334
PFHxS	15	14	1	94	50-150	11/18/2020 1334
PFBA	16	15	1	96	50-150	11/18/2020 1334
PFDA	16	15	1	91	50-150	11/18/2020 1334
PFDoA	16	16	1	98	50-150	11/18/2020 1334
PFHpA	16	15	1	93	50-150	11/18/2020 1334
PFHxA	16	16	1	97	50-150	11/18/2020 1334
PFNA	16	15	1	94	50-150	11/18/2020 1334
PFOA	16	15	1	92	50-150	11/18/2020 1334
PFPeA	16	15	1	93	50-150	11/18/2020 1334
PFTeDA	16	16	1	99	50-150	11/18/2020 1334
PFTrDA	16	15	1	93	50-150	11/18/2020 1334
PFUdA	16	15	1	96	50-150	11/18/2020 1334
PFOS	15	13	1	90	50-150	11/18/2020 1334
Surrogate	Q % Rec	Acceptano Limit	e			
13C2_4:2FTS	96	25-150				
13C2_6:2FTS	106	25-150				
13C2_8:2FTS	91	25-150				
13C2_PFDoA	87	25-150				
13C2_PFTeDA	84	25-150				
13C3_PFBS	83	25-150				
13C3_PFHxS	83	25-150				
13C3-HFPO-DA	94	25-150				
13C4_PFBA	93	25-150				
13C4_PFHpA	94	25-150				
13C5_PFHxA	94	25-150				
1000_11111//1						

LOQ = Limit of Quantitation

ND = Not detected at or above the LOQ

N = Recovery is out of criteria

P = The RPD between two GC columns exceeds 40%

\* = RSD is out of criteria

+ = RPD is out of criteria

# PFAS by LC/MS/MS - LCS

Sample ID: ∨Q73728-002 Batch: 73728

Analytical Method: PFAS by ID SOP

Matrix: Aqueous Prep Method: SOP SPE

Prep Date: 11/17/2020 1034

Surrogate	Q % Rec	Acceptance Limit
13C6_PFDA	92	25-150
13C7_PFUdA	89	25-150
13C8_PFOA	98	25-150
13C8_PFOS	80	25-150
13C8_PFOSA	96	10-150
13C9_PFNA	91	25-150
d5-EtFOSAA	92	25-150
d3-MeFOSAA	86	25-150

LOQ = Limit of Quantitation

ND = Not detected at or above the LOQ

N = Recovery is out of criteria

P = The RPD between two GC columns exceeds 40%

\* = RSD is out of criteria

+ = RPD is out of criteria

Sample ID: VQ73795-001

Batch: 73795

Analytical Method: PFAS by ID SOP

Matrix: Aqueous Prep Method: SOP SPE

Prep Date: 11/17/2020 1704

1410LPF30US	Parameter	Result	Q Dil	LOQ	Units	Analysis Date
82 FTS	9CI-PF3ONS	ND	1	8.0	ng/L	11/18/2020 1750
82 FTS ND	11CI-PF3OUdS	ND	1	8.0	ng/L	11/18/2020 1750
42 FTS	8:2 FTS	ND	1	8.0	ng/L	11/18/2020 1750
42 FTS ND 1 1 8.0 ng/L 11/18/2020 17 ADONA ND 1 1 8.0 ng/L 11/18/2020 17 PTS ND 1 1 4.0 ng/L 11/18/2020 17 PTS ND ND 1 1 4.0 ng/L 11/18/2020 17 PTS ND ND 1 1 4.0 ng/L 11/18/2020 17 PTS ND ND 1 1 4.0 ng/L 11/18/2020 17 PTS ND ND 1 1 4.0 ng/L 11/18/2020 17 PTS ND ND 1 1 4.0 ng/L 11/18/2020 17 PTS ND ND 1 1 4.0 ng/L 11/18/2020 17 PTS ND ND 1 1 4.0 ng/L 11/18/2020 17 PTS ND ND 1 1 4.0 ng/L 11/18/2020 17 PTS ND ND 1 1 4.0 ng/L 11/18/2020 17 PTS ND ND 1 1 4.0 ng/L 11/18/2020 17 PTS ND ND ND 1 1 4.0 ng/L 11/18/2020 17 PTS ND ND ND 1 1 4.0 ng/L 11/18/2020 17 PTS ND ND ND ND 1 1 4.0 ng/L 11/18/2020 17 PTS ND	6:2 FTS	ND	1	8.0	ng/L	11/18/2020 1750
GenX         ND         1         8.0         ng/L         11/18/2020 17           ADONA         ND         1         8.0         ng/L         11/18/2020 17           EFOSAA         ND         1         8.0         ng/L         11/18/2020 17           MeFOSAA         ND         1         8.0         ng/L         11/18/2020 17           PFBS         ND         1         4.0         ng/L         11/18/2020 17           PFDS         ND         1         4.0         ng/L         11/18/2020 17           PFDS         ND         1         4.0         ng/L         11/18/2020 17           PFNS         ND         1         4.0         ng/L         11/18/2020 17           PFOSA         ND         1         4.0         ng/L         11/18/2020 17           PFOSA         ND         1         4.0         ng/L         11/18/2020 17           PFDSA         ND         1         4.0         ng/L         11/18/2020 17           PFNS         ND         1         4.0         ng/L         11/18/2020 17           PFDA         ND         1         4.0         ng/L         11/18/2020 17           PFNDA	4:2 FTS	ND	1	8.0		11/18/2020 1750
ADONA         ND         1         8.0         ng/L         11/18/2020 17           EIFOSAA         ND         1         8.0         ng/L         11/18/2020 17           MeFOSAA         ND         1         8.0         ng/L         11/18/2020 17           PFBS         ND         1         4.0         ng/L         11/18/2020 17           PFDS         ND         1         4.0         ng/L         11/18/2020 17           PFNS         ND         1         4.0         ng/L         11/18/2020 17           PFNS         ND         1         4.0         ng/L         11/18/2020 17           PFNS         ND         1         4.0         ng/L         11/18/2020 17           PFDSA         ND         1         4.0         ng/L         11/18/2020 17           PFDSA         ND         1         4.0         ng/L         11/18/2020 17           PFDA         ND         1         4.0         ng/L         11/18/2020 17           PFDA         ND         1         4.0         ng/L         11/18/2020 17           PFDA         ND         1         4.0         ng/L         11/18/2020 17           PFNA	GenX	ND	1	8.0		11/18/2020 1750
MeFOSAA         ND         1         8.0         ng/L         11/18/2020 17           PFBS         ND         1         4.0         ng/L         11/18/2020 17           PFBS         ND         1         4.0         ng/L         11/18/2020 17           PFHpS         ND         1         4.0         ng/L         11/18/2020 17           PFNS         ND         1         4.0         ng/L         11/18/2020 17           PFOSA         ND         1         4.0         ng/L         11/18/2020 17           PFPS         ND         1         4.0         ng/L         11/18/2020 17           PFPAS         ND         1         4.0         ng/L         11/18/2020 17           PFPAS         ND         1         4.0         ng/L         11/18/2020 17           PFBAS         ND         1         4.0         ng/L         11/18/2020 17           PFBAS         ND         1         4.0         ng/L         11/18/2020 17           PFBAS         ND         1         4.0         ng/L         11/18/2020 17           PFDA         ND         1         4.0         ng/L         11/18/2020 17           PFDA	ADONA	ND	1	8.0		11/18/2020 1750
PFBS         ND         1         4.0         ng/L         11/18/2020 17           PFDS         ND         1         4.0         ng/L         11/18/2020 17           PFNS         ND         1         4.0         ng/L         11/18/2020 17           PFNS         ND         1         4.0         ng/L         11/18/2020 17           PFNS         ND         1         4.0         ng/L         11/18/2020 17           PFDSA         ND         1         4.0         ng/L         11/18/2020 17           PFPSS         ND         1         4.0         ng/L         11/18/2020 17           PFNAS         ND         1         4.0         ng/L         11/18/2020 17           PFNAS         ND         1         4.0         ng/L         11/18/2020 17           PFNAS         ND         1         4.0         ng/L         11/18/2020 17           PFDA         ND         1         4.0         ng/L         11/18/2020 17           PFNA         ND         1         4.0         ng/L         11/18/2020 17           PFNA         ND         1         4.0         ng/L         11/18/2020 17           PFNA	EtFOSAA	ND	1	8.0	-	11/18/2020 1750
PFDS         ND         1         4.0         ng/L         11/18/2020 17           PFHpS         ND         1         4.0         ng/L         11/18/2020 17           PFNS         ND         1         4.0         ng/L         11/18/2020 17           PFOSA         ND         1         4.0         ng/L         11/18/2020 17           PFPS         ND         1         4.0         ng/L         11/18/2020 17           PFHS         ND         1         4.0         ng/L         11/18/2020 17           PFBA         ND         1         4.0         ng/L         11/18/2020 17           PFBA         ND         1         4.0         ng/L         11/18/2020 17           PFDA         ND         1         4.0         ng/L         11/18/2020 17           PFDA         ND         1         4.0         ng/L         11/18/2020 17           PFHAA         ND         1         4.0         ng/L         11/18/2020 17           PFHAA         ND         1         4.0         ng/L         11/18/2020 17           PFNA         ND         1         4.0         ng/L         11/18/2020 17           PFTBA	MeFOSAA	ND	1	8.0	ng/L	11/18/2020 1750
PFHpS         ND         1         4.0         ng/L         11/18/2020 17           PFNS         ND         1         4.0         ng/L         11/18/2020 17           PFOSA         ND         1         4.0         ng/L         11/18/2020 17           PFPS         ND         1         4.0         ng/L         11/18/2020 17           PFBA         ND         1         4.0         ng/L         11/18/2020 17           PFBA         ND         1         4.0         ng/L         11/18/2020 17           PFDA         ND         1         4.0         ng/L         11/18/2020 17           PFHAA         ND         1         4.0         ng/L         11/18/2020 17           PFNA         ND         1         4.0         ng/L         11/18/2020 17           PFPAA         ND         1         4.0         ng/L         11/18/2020 17           PFTEDA	PFBS	ND	1	4.0	ng/L	11/18/2020 1750
PFNS         ND         1         4.0         ng/L         11/18/2020 17           PFOSA         ND         1         4.0         ng/L         11/18/2020 17           PFPES         ND         1         4.0         ng/L         11/18/2020 17           PFHXS         ND         1         4.0         ng/L         11/18/2020 17           PFBA         ND         1         4.0         ng/L         11/18/2020 17           PFDA         ND         1         4.0         ng/L         11/18/2020 17           PFDA         ND         1         4.0         ng/L         11/18/2020 17           PFDA         ND         1         4.0         ng/L         11/18/2020 17           PFHAA         ND         1         4.0         ng/L         11/18/2020 17           PFNA         ND         1         4.0         ng/L         11/18/2020 17           PFNA         ND         1         4.0         ng/L         11/18/2020 17           PFDA         ND         1         4.0         ng/L         11/18/2020 17           PFTBA         ND         1         4.0         ng/L         11/18/2020 17           PFTDA	PFDS	ND	1	4.0	ng/L	11/18/2020 1750
PFNS         ND         1         4.0         ng/L         11/18/2020 17           PFOSA         ND         1         4.0         ng/L         11/18/2020 17           PFPES         ND         1         4.0         ng/L         11/18/2020 17           PFHXS         ND         1         4.0         ng/L         11/18/2020 17           PFBA         ND         1         4.0         ng/L         11/18/2020 17           PFDA         ND         1         4.0         ng/L         11/18/2020 17           PFDA         ND         1         4.0         ng/L         11/18/2020 17           PFDA         ND         1         4.0         ng/L         11/18/2020 17           PFHAA         ND         1         4.0         ng/L         11/18/2020 17           PFNA         ND         1         4.0         ng/L         11/18/2020 17           PFNA         ND         1         4.0         ng/L         11/18/2020 17           PFDA         ND         1         4.0         ng/L         11/18/2020 17           PFTBA         ND         1         4.0         ng/L         11/18/2020 17           PFTDA	PFHpS	ND	1	4.0	ng/L	11/18/2020 1750
PFOSA         ND         1         4.0         ng/L         11/18/2020 17           PFPeS         ND         1         4.0         ng/L         11/18/2020 17           PFBA         ND         1         4.0         ng/L         11/18/2020 17           PFBA         ND         1         4.0         ng/L         11/18/2020 17           PFDA         ND         1         4.0         ng/L         11/18/2020 17           PFDA         ND         1         4.0         ng/L         11/18/2020 17           PFDA         ND         1         4.0         ng/L         11/18/2020 17           PFHAA         ND         1         4.0         ng/L         11/18/2020 17           PFHAA         ND         1         4.0         ng/L         11/18/2020 17           PFNA         ND         1         4.0         ng/L         11/18/2020 17           PFNA         ND         1         4.0         ng/L         11/18/2020 17           PFNA         ND         1         4.0         ng/L         11/18/2020 17           PFDA         ND         1         4.0         ng/L         11/18/2020 17           PFTDA	PFNS	ND	1	4.0	ng/L	11/18/2020 1750
PFPeS         ND         1         4.0         ng/L         11/18/2020 17           PFHxS         ND         1         4.0         ng/L         11/18/2020 17           PFBA         ND         1         4.0         ng/L         11/18/2020 17           PFDA         ND         1         4.0         ng/L         11/18/2020 17           PFDA         ND         1         4.0         ng/L         11/18/2020 17           PFDA         ND         1         4.0         ng/L         11/18/2020 17           PFHAA         ND         1         4.0         ng/L         11/18/2020 17           PFHXA         ND         1         4.0         ng/L         11/18/2020 17           PFNA         ND         1         4.0         ng/L         11/18/2020 17           PFOA         ND         1         4.0         ng/L         11/18/2020 17           PFTEDA         ND         1         4.0         ng/L         11/18/2020 17           PFTEDA         ND         1         4.0         ng/L         11/18/2020 17           PFTEDA         ND         1         4.0         ng/L         11/18/2020 17           PFDGA			1			11/18/2020 1750
PFHXS         ND         1         4.0         ng/L         11/18/2020 17           PFBA         ND         1         4.0         ng/L         11/18/2020 17           PFDA         ND         1         4.0         ng/L         11/18/2020 17           PFDAA         ND         1         4.0         ng/L         11/18/2020 17           PFDAA         ND         1         4.0         ng/L         11/18/2020 17           PFHAA         ND         1         4.0         ng/L         11/18/2020 17           PFNA         ND         1         4.0         ng/L         11/18/2020 17           PFOA         ND         1         4.0         ng/L         11/18/2020 17           PFPAA         ND         1         4.0         ng/L         11/18/2020 17           PFTEDA         ND         1         4.0         ng/L         11/18/2020 17           PFTTDA         ND         1         4.0         ng/L         11/18/2020 17           PFTDA         ND         1         4.0         ng/L         11/18/2020 17           PFTDA         ND         1         4.0         ng/L         11/18/2020 17           PFTDA			1			11/18/2020 1750
PFDA         ND         1         4.0         ng/L         11/18/2020 17           PFDAA         ND         1         4.0         ng/L         11/18/2020 17           PFHAA         ND         1         4.0         ng/L         11/18/2020 17           PFHAA         ND         1         4.0         ng/L         11/18/2020 17           PFNA         ND         1         4.0         ng/L         11/18/2020 17           PFOA         ND         1         4.0         ng/L         11/18/2020 17           PFOA         ND         1         4.0         ng/L         11/18/2020 17           PFTeDA         ND         1         4.0         ng/L         11/18/2020 17           PFUGA         ND         1         4.0         ng/L         11/18/2020 17           PFTUGA         ND         1         4.0         ng/L         11/18/2020 17           PFUGA </td <td>PFHxS</td> <td>ND</td> <td>1</td> <td>4.0</td> <td></td> <td>11/18/2020 1750</td>	PFHxS	ND	1	4.0		11/18/2020 1750
PFDOA         ND         1         4.0         ng/L         11/18/2020 17           PFHPA         ND         1         4.0         ng/L         11/18/2020 17           PFHXA         ND         1         4.0         ng/L         11/18/2020 17           PFNA         ND         1         4.0         ng/L         11/18/2020 17           PFOA         ND         1         4.0         ng/L         11/18/2020 17           PFPEA         ND         1         4.0         ng/L         11/18/2020 17           PFTeDA         ND         1         4.0         ng/L         11/18/2020 17           PFTIDA         ND         1         4.0         ng/L         11/18/2020 17           PFTIDA         ND         1         4.0         ng/L         11/18/2020 17           PFUGA         ND         1         4.0         ng/L         11/18/2020 17           RETOS </td <td>PFBA</td> <td>ND</td> <td>1</td> <td>4.0</td> <td>ng/L</td> <td>11/18/2020 1750</td>	PFBA	ND	1	4.0	ng/L	11/18/2020 1750
PFDOA         ND         1         4.0         ng/L         11/18/2020 17           PFHDA         ND         1         4.0         ng/L         11/18/2020 17           PFHXA         ND         1         4.0         ng/L         11/18/2020 17           PFNA         ND         1         4.0         ng/L         11/18/2020 17           PFOA         ND         1         4.0         ng/L         11/18/2020 17           PFPA         ND         1         4.0         ng/L         11/18/2020 17           PFTeDA         ND         1         4.0         ng/L         11/18/2020 17           PFTIDA         ND         1         4.0         ng/L         11/18/2020 17           PFUGA         ND         1         4.0         ng/L         11/18/2020 17           PFTIDA         ND         1         4.0         ng/L         11/18/2020 17           PFUGA         ND         1         4.0         ng/L         11/18/2020 17           PFUGA         ND         1         4.0         ng/L         11/18/2020 17           PFOS         ND         1         4.0         ng/L         11/18/2020 17           3C2_e:2FT	PFDA	ND	1	4.0		11/18/2020 1750
PFHpA         ND         1         4.0         ng/L         11/18/2020 17           PFHxA         ND         1         4.0         ng/L         11/18/2020 17           PFNA         ND         1         4.0         ng/L         11/18/2020 17           PFOA         ND         1         4.0         ng/L         11/18/2020 17           PFPeA         ND         1         4.0         ng/L         11/18/2020 17           PFTeDA         ND         1         4.0         ng/L         11/18/2020 17           PFTDA         ND         1         4.0         ng/L         11/18/2020 17           PFTDA         ND         1         4.0         ng/L         11/18/2020 17           PFUDA         ND         2         8         25-150         25-150           13C2_PFDA	PFDoA	ND	1	4.0		11/18/2020 1750
PFHXA         ND         1         4.0         ng/L         11/18/2020 17           PFNA         ND         1         4.0         ng/L         11/18/2020 17           PFOA         ND         1         4.0         ng/L         11/18/2020 17           PFPAA         ND         1         4.0         ng/L         11/18/2020 17           PFTeDA         ND         1         4.0         ng/L         11/18/2020 17           PFTrDA         ND         1         4.0         ng/L         11/18/2020 17           PFUdA         ND         1         4.0         ng/L         11/18/2020 17           PFUGS         ND         1         4.0         ng/L         11/18/2020 17           PFUGA         ND         8         25-150         13/2         13/2         11/18/2020 17         13/2         13/2         13/2         13/2         13/2         13/2         13/2         13/	PFHpA	ND	1	4.0		11/18/2020 1750
PFNA         ND         1         4.0         ng/L         11/18/2020 17           PFOA         ND         1         4.0         ng/L         11/18/2020 17           PFPeA         ND         1         4.0         ng/L         11/18/2020 17           PFTeDA         ND         1         4.0         ng/L         11/18/2020 17           PFTrDA         ND         1         4.0         ng/L         11/18/2020 17           PFUdA         ND         1         4.0         ng/L         11/18/2020 17           PFUGA         9         88         25-150         13C2_PFDA         13C2_PFDA         13C2_PFDA	PFHxA	ND	1	4.0		11/18/2020 1750
PFOA         ND         1         4.0         ng/L         11/18/2020 17           PFPeA         ND         1         4.0         ng/L         11/18/2020 17           PFTeDA         ND         1         4.0         ng/L         11/18/2020 17           PFTrDA         ND         1         4.0         ng/L         11/18/2020 17           PFUdA         ND         1         4.0         ng/L         11/18/2020 17           PFOS         ND         1         4.0         ng/L         11/18/2020 17           Surrogate         Q         % Rec         Limit         4.0         ng/L         11/18/2020 17           13C2_4:2FTS         98         25-150         13C2_E:2FTS         13C2_E:2FTS         88         25-150           13C3_PFDA         77         25-150         13C3_PFBS         81         25-150           13C3_PFBA         93         25-150         13C4_PFBA	PFNA	ND	1	4.0		11/18/2020 1750
PFPEA         ND         1         4.0         ng/L         11/18/2020 17           PFTEDA         ND         1         4.0         ng/L         11/18/2020 17           PFTIDA         ND         1         4.0         ng/L         11/18/2020 17           PFUGA         ND         1         4.0         ng/L         11/18/2020 17           PFOS         ND         1         4.0         ng/L         11/18/2020 17           PFOS         ND         1         4.0         ng/L         11/18/2020 17           Surrogate         Q         NB         25-150         11/18/2020 17         11/18/2020 17           13C2_4:2FTS         98         25-150         25-150         13C2_8:2FTS         109         25-150           13C2_8:2FTS         88         25-150         13C2_PFDOA         79         25-150           13C3_PFBS         81         25-150         13C3_PFBS         84         25-150           13C3_PFBA         97         25-150         13C4_PFBA         93         25-150           13C4_PFBA         89         25-150         13C4_PFBA         13C4_PFBA         88         25-150           13C5_PFHxA         88         25-150 <td>PFOA</td> <td>ND</td> <td>1</td> <td>4.0</td> <td></td> <td>11/18/2020 1750</td>	PFOA	ND	1	4.0		11/18/2020 1750
PFTrDA         ND         1         4.0         ng/L         11/18/2020 17           PFUdA         ND         1         4.0         ng/L         11/18/2020 17           PFOS         ND         1         4.0         ng/L         11/18/2020 17           Surrogate         Q         Receptance Limit         1         4.0         ng/L         11/18/2020 17           3GC2_4:2FTS         98         25-150         25-150         25-150         25-150         25-150         25-150         25-150           13C2_PFDoA         79         25-150         25	PFPeA	ND	1	4.0		11/18/2020 1750
PFUdA PFOS         ND         1         4.0         ng/L         11/18/2020 17           Surrogate         Q         % Rec Limit         Acceptance Limit         Company (Company)         Acceptance (Company)         Company (Company)         C	PFTeDA	ND	1	4.0	ng/L	11/18/2020 1750
Surrogate         Q         % Rec Limit         4.0         ng/L         11/18/2020 17           13C2_4:2FTS         98         25-150           13C2_6:2FTS         109         25-150           13C2_8:2FTS         88         25-150           13C2_PFDoA         79         25-150           13C3_PFBS         81         25-150           13C3_PFBS         81         25-150           13C3_PFHxS         84         25-150           13C3-HFPO-DA         97         25-150           13C4_PFBA         93         25-150           13C4_PFHpA         89         25-150           13C5_PFHxA         88         25-150	PFTrDA	ND	1	4.0	ng/L	11/18/2020 1750
Surrogate         Q % Rec         Acceptance Limit           13C2_4:2FTS         98         25-150           13C2_6:2FTS         109         25-150           13C2_PFTDOA         79         25-150           13C2_PFTEDA         77         25-150           13C3_PFBS         81         25-150           13C3_PFHxS         84         25-150           13C3-HFPO-DA         97         25-150           13C4_PFBA         93         25-150           13C4_PFHpA         89         25-150           13C5_PFHxA         88         25-150	PFUdA	ND	1	4.0	ng/L	11/18/2020 1750
Surrogate       Q % Rec       Limit         13C2_4:2FTS       98       25-150         13C2_6:2FTS       109       25-150         13C2_8:2FTS       88       25-150         13C2_PFDoA       79       25-150         13C2_PFTeDA       77       25-150         13C3_PFBS       81       25-150         13C3_PFHxS       84       25-150         13C4_PFBA       97       25-150         13C4_PFBA       93       25-150         13C5_PFHxA       88       25-150	PFOS	ND	1	4.0	ng/L	11/18/2020 1750
13C2_6:2FTS       109       25-150         13C2_8:2FTS       88       25-150         13C2_PFDoA       79       25-150         13C2_PFTeDA       77       25-150         13C3_PFBS       81       25-150         13C3_PFHxS       84       25-150         13C3-HFPO-DA       97       25-150         13C4_PFBA       93       25-150         13C4_PFHpA       89       25-150         13C5_PFHxA       88       25-150	Surrogate	Q % Rec	Acceptance Limit			
13C2_6:2FTS       109       25-150         13C2_8:2FTS       88       25-150         13C2_PFDoA       79       25-150         13C2_PFTeDA       77       25-150         13C3_PFBS       81       25-150         13C3_PFHxS       84       25-150         13C3-HFPO-DA       97       25-150         13C4_PFBA       93       25-150         13C4_PFHpA       89       25-150         13C5_PFHxA       88       25-150	13C2_4:2FTS	98	25-150			
13C2_8:2FTS8825-15013C2_PFDoA7925-15013C2_PFTeDA7725-15013C3_PFBS8125-15013C3_PFHxS8425-15013C3-HFPO-DA9725-15013C4_PFBA9325-15013C4_PFHpA8925-15013C5_PFHxA8825-150		109	25-150			
13C2_PFDoA7925-15013C2_PFTeDA7725-15013C3_PFBS8125-15013C3_PFHxS8425-15013C3-HFPO-DA9725-15013C4_PFBA9325-15013C4_PFHpA8925-15013C5_PFHxA8825-150						
13C2_PFTeDA7725-15013C3_PFBS8125-15013C3_PFHxS8425-15013C3-HFPO-DA9725-15013C4_PFBA9325-15013C4_PFHpA8925-15013C5_PFHxA8825-150						
13C3_PFBS8125-15013C3_PFHxS8425-15013C3-HFPO-DA9725-15013C4_PFBA9325-15013C4_PFHpA8925-15013C5_PFHxA8825-150			25-150			
13C3-HFPO-DA       97       25-150         13C4_PFBA       93       25-150         13C4_PFHpA       89       25-150         13C5_PFHxA       88       25-150		81	25-150			
13C4_PFBA     93     25-150       13C4_PFHpA     89     25-150       13C5_PFHxA     88     25-150	13C3_PFHxS	84	25-150			
13C4_PFHpA     89     25-150       13C5_PFHxA     88     25-150	13C3-HFPO-DA	97	25-150			
13C5_PFHxA 88 25-150	13C4_PFBA	93	25-150			
13C5_PFHxA 88 25-150	13C4_PFHpA	89	25-150			
13C5 PFPeA 95 25-150	13C5_PFPeA	95	25-150			
	- <u>-</u>	30	2			

LOQ = Limit of Quantitation

ND = Not detected at or above the LOQ

N = Recovery is out of criteria

 $P = The \ RPD$  between two GC columns exceeds 40%

\* = RSD is out of criteria

+ = RPD is out of criteria

### PFAS by LC/MS/MS - MB

**Sample ID:** VQ73795-001 **Batch:** 73795

Analytical Method: PFAS by ID SOP

Matrix: Aqueous Prep Method: SOP SPE

Prep Date: 11/17/2020 1704

Surrogate	Q % Rec	Acceptance Limit	
13C6_PFDA	84	25-150	
13C7_PFUdA	86	25-150	
13C8_PFOA	87	25-150	
13C8_PFOS	76	25-150	
13C8_PFOSA	99	10-150	
13C9_PFNA	84	25-150	
d5-EtFOSAA	94	25-150	
d3-MeFOSAA	94	25-150	

LOQ = Limit of Quantitation

ND = Not detected at or above the LOQ

N = Recovery is out of criteria

P = The RPD between two GC columns exceeds 40%

\* = RSD is out of criteria

+ = RPD is out of criteria

### PFAS by LC/MS/MS - LCS

Sample ID: VQ73795-002

Batch: 73795

Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/17/2020 1704

**Spike** Amount Result % Rec Q Limit Parameter (ng/L) (ng/L) % Rec Dil **Analysis Date** 9CI-PF3ONS 15 16 1 109 50-150 11/18/2020 1800 11CI-PF3OUdS 15 15 1 103 50-150 11/18/2020 1800 8:2 FTS 15 15 1 100 50-150 11/18/2020 1800 6:2 FTS 15 17 1 109 50-150 11/18/2020 1800 4:2 FTS 15 16 1 104 50-150 11/18/2020 1800 GenX 32 35 1 108 50-150 11/18/2020 1800 **ADONA** 17 114 11/18/2020 1800 15 50-150 **EtFOSAA** 95 11/18/2020 1800 16 15 1 50-150 MeFOSAA 16 17 107 50-150 11/18/2020 1800 **PFBS** 14 17 118 50-150 11/18/2020 1800 **PFDS** 104 11/18/2020 1800 15 16 50-150 **PFHpS** 15 17 113 11/18/2020 1800 50-150 **PFNS** 15 17 108 50-150 11/18/2020 1800 **PFOSA** 16 16 102 50-150 11/18/2020 1800 **PFPeS** 15 17 115 50-150 11/18/2020 1800 **PFHxS** 15 112 50-150 11/18/2020 1800 16 **PFBA** 16 20 123 50-150 11/18/2020 1800 PFDA 11/18/2020 1800 16 18 113 50-150 PFDoA 16 19 121 50-150 11/18/2020 1800 **PFHpA** 16 18 113 50-150 11/18/2020 1800 PFHxA 16 19 1 118 50-150 11/18/2020 1800 PFNA 16 18 112 50-150 11/18/2020 1800 PFOA 16 18 114 50-150 11/18/2020 1800 **PFPeA** 16 18 113 50-150 11/18/2020 1800 **PFTeDA** 16 19 116 50-150 11/18/2020 1800 PFTrDA 16 18 1 112 50-150 11/18/2020 1800 **PFUdA** 16 20 1 126 50-150 11/18/2020 1800 **PFOS** 15 16 109 50-150 11/18/2020 1800 Acceptance

Surrogate Q % Rec Limit
13C2_4:2FTS 93 25-150
13C2_6:2FTS 106 25-150
13C2_8:2FTS 85 25-150
13C2_PFDoA 81 25-150
13C2_PFTeDA 78 25-150
13C3_PFBS 82 25-150
13C3_PFHxS 82 25-150
13C3-HFPO-DA 89 25-150
13C4_PFBA 90 25-150
13C4_PFHpA 82 25-150
13C5_PFHxA 89 25-150
13C5_PFPeA 95 25-150

LOQ = Limit of Quantitation

ND = Not detected at or above the LOQ

N = Recovery is out of criteria

P = The RPD between two GC columns exceeds 40%

\* = RSD is out of criteria

+ = RPD is out of criteria

### PFAS by LC/MS/MS - LCS

**Sample ID:** VQ73795-002 **Batch:** 73795

Analytical Method: PFAS by ID SOP

Matrix: Aqueous Prep Method: SOP SPE

Prep Date: 11/17/2020 1704

Surrogate	Q % Rec	Acceptance Limit
13C6_PFDA	80	25-150
13C7_PFUdA	76	25-150
13C8_PFOA	89	25-150
13C8_PFOS	79	25-150
13C8_PFOSA	94	10-150
13C9_PFNA	86	25-150
d5-EtFOSAA	92	25-150
d3-MeFOSAA	92	25-150

LOQ = Limit of Quantitation

ND = Not detected at or above the LOQ

N = Recovery is out of criteria

P = The RPD between two GC columns exceeds 40%

\* = RSD is out of criteria

+ = RPD is out of criteria

# Chain of Custody and Miscellaneous Documents

ce Analytical "

# PACE ANALYTICAL SERVICES, LLC

106 Vantage Point Drive • West Cotumbia, SC 29172 Telephone No. 803-791-9700 Fax No. 808-791-9111 www.pacelabs.com

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Note: All samples are retained for four weeks from receipt	ur weeks from receipt	$\Box$		Jano	OSSA Temperature MV D.M.
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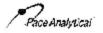
PACE ANALYTICAL SERVICES, LLC 106 Vantage Point Drive • West Columbia, SC 28172 Telephone No. 803-791-9700 Fax No. 803-791-9111 www.pacelabs.com

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Document Number: ME003N2-01



### 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/ 11/08/2020 Lot #: VK08048
Means of receipt: Pace	
	. Were custody seals present on the cooler?
Yes No VNA 2	. If custody scals were present, were they intact and unbroken?
pH Strip ID: NA	Chlorine Strip ID: NA Tested by: NA
3.3 /3.3 °C NA /NA	eceipt / Derived (Corrected) temperature upon receipt  %Solid Snap-Cup ID: 20-1438
Method:  Temperature Bl	ank Against Bottles TR Gun ID: 5 IR Gun Correction Factor: 0 °C
Method of coolant: W	et Ice Dice Packs Dry Ice None
☐Yes ☐No ☑NA 3	. If temperature of any cooler exceeded 6.0°C, was Project Manager Notified?  PM was Notified by: phone / cmail / face-to-face (circle one).
Yes No NA 4	Is the commercial courier's packing slip attached to this form?
	. Were proper custody procedures (relinquished/received) followed?
	. Were sample IDs listed on the COC?
	. Were sample IDs listed on all sample containers?
	. Was collection date & time listed on the COC?
	. Was collection date & time listed on all sample containers?
	Did all container label information (ID, date, time) agree with the COC?
	I. Were tests to be performed listed on the COC?
✓ yes □No	Did all samples arrive in the proper containers for each test and/or in good condition unbroken, lids on, etc.)?
Yes No	Was adequate sample volume available?
The second secon	4. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
Yes ✓ No 1:	5. Were any samples containers missing/excess (circle one) samples Not listed on COC?
	6. For VOA and RSK-175 samples, were bubbles present >"pea-size" (¼"or 6mm in diameter)
Lies Lie With in	any of the VOA vials?
	<ol> <li>Were all DRO/metals/nutrient samples received at a pH of &lt; 2?</li> </ol>
Yes No VNA I	<ol> <li>Were all cyanide samples received at a pH &gt; 12 and sulfide samples received at a pH &gt; 9?</li> </ol>
	9. Were all applicable NH <sub>3</sub> /TKN/cyanide/phonol/625.1/608.3 (< 0.5mg/L) samples free of sidual chlorine?
☐ Yes ☐ No ☑NA 20	Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc)
C. C.	prectly transcribed from the COC into the comment section in LIMS?
Yes V No 2	Was the quote number listed on the container label? If yes, Quote # 24122
	ist be completed for any sample(s) incorrectly preserved or with headspace.)
Sample(s) NA in sample receiving with NA	were received incorrectly preserved and were adjusted accordingly 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 me/L (If #10 is no.) and were
adjusted accordingly in samp	the receiving with sodium thiosulfate (Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> ) with Shealy ID: NA
SR barcode labels applied by	7: KBS Date: 11/08/2020
Comments:	



### **Report of Analysis**

**GZA GeoEnvironmental, Inc.** 

17975 West Sarah Lane, Suite 100 Brookfield, WI 53045 Attention: Kevin Hedinger

Project Name: 20.0157080 Oshkosh PFAS Sampling

Project Number: 20.0157080 Lot Number: WH17016 Date Completed: 09/16/2021

Kary Coman

09/16/2021 11:08 AM
Approved and released by:
Project Manager II: **Karen L. Coonan** 





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

This report shall not be reproduced, except in its entirety, without the written approval of 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: WH17016

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 most current approved The NELAC Institute (TNI) standards, the Pace Analytical Services, LLC ("Pace") Laboratory Quality Manual, standard operating procedures (SOPs), and Pace policies. Any exceptions to the TNI standards, the Laboratory Quality Manual, SOPs or policies are qualified on the results page or discussed below.

Where applicable, all soil sample results (including LOQ and DL if requested) are corrected for dry weight unless flagged with a "W" qualifier.

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

### Sample Summary

### GZA GeoEnvironmental, Inc.

Lot Number: WH17016

Project Name: 20.0157080 Oshkosh PFAS Sampling

Project Number: 20.0157080

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	WL-B11 (5-6')	Solid	08/14/2021 0910	08/17/2021
002	WL-SED 1 (0-0.5')	Solid	08/14/2021 1000	08/17/2021
003	WL-SED 2 (0-0.5')	Solid	08/14/2021 1010	08/17/2021
004	WL-SED 3 (0-0.5')	Solid	08/14/2021 1020	08/17/2021
005	WL-EQUIPMENT BLANK 1- TROWEL	Aqueous	08/14/2021 1030	08/17/2021
006	WL-EQUIPMENT BLANK 2- DRIVE SHOE	Aqueous	08/14/2021 1100	08/17/2021

(6 samples)

# Detection Summary GZA GeoEnvironmental, Inc.

Lot Number: WH17016

Project Name: 20.0157080 Oshkosh PFAS Sampling

Project Number: 20.0157080

Sampl	e Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	WL-B11 (5-6')	Solid	6:2 FTS	PFAS by ID	4.1		ug/kg	5
001	WL-B11 (5-6')	Solid	PFHxA	PFAS by ID	0.28	J	ug/kg	5
001	WL-B11 (5-6')	Solid	PFPeA	PFAS by ID	0.46	J	ug/kg	5
002	WL-SED 1 (0-0.5')	Solid	6:2 FTS	PFAS by ID	41		ug/kg	6
002	WL-SED 1 (0-0.5')	Solid	PFHxA	PFAS by ID	2.7		ug/kg	6
002	WL-SED 1 (0-0.5')	Solid	PFPeA	PFAS by ID	2.9		ug/kg	6
002	WL-SED 1 (0-0.5')	Solid	PFOS	PFAS by ID	3.9		ug/kg	6
003	WL-SED 2 (0-0.5')	Solid	6:2 FTS	PFAS by ID	9.3		ug/kg	7
003	WL-SED 2 (0-0.5')	Solid	PFHxA	PFAS by ID	4.6		ug/kg	7
003	WL-SED 2 (0-0.5')	Solid	PFPeA	PFAS by ID	17		ug/kg	7
003	WL-SED 2 (0-0.5')	Solid	PFOS	PFAS by ID	5.1		ug/kg	7
004	WL-SED 3 (0-0.5')	Solid	6:2 FTS	PFAS by ID	5.1		ug/kg	8
004	WL-SED 3 (0-0.5')	Solid	PFHxA	PFAS by ID	4.3		ug/kg	8
004	WL-SED 3 (0-0.5')	Solid	PFPeA	PFAS by ID	15		ug/kg	8
004	WL-SED 3 (0-0.5')	Solid	PFOS	PFAS by ID	2.8		ug/kg	8

(15 detections)

Client: GZA GeoEnvironmental, Inc.

Laboratory ID: WH17016-001

Description: WL-B11 (5-6')

Matrix: Solid

Date Sampled:08/14/2021 0910

Project Name: 20.0157080 Oshkosh PFAS

% Solids: 80.5 08/17/2021 2133

Date Received: 08/17/2021

Project Number: 20.0157080

Run Prep Method SOP SPE Analytical Method Dilution PFAS by ID SOP

Analysis Date Analyst 08/28/2021 0010 NK1

Prep Date 08/26/2021 1150 13393

Batch

Parameter	CAS Number	Analytical Method	Result	Q LO	DQ MI	DL Units	Run
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	4.1	:	2.3 0.	35 ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.28	J .	1.1 0.	21 ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		1.1 0.	24 ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.46	J .	1.1 0.	18 ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		1.1 0.	41 ug/kg	1

Surrogate	Run 1 A Q % Recovery	cceptance Limits		
13C2_6:2FTS	83	25-150		
13C5_PFHxA	86	25-150		
13C5_PFPeA	87	25-150		
13C8_PFOA	84	25-150		
13C8_PFOS	84	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 DL = Detection Limit  $J = Estimated \ result < LOQ \ and \ge DL$  Q = Surrogate failure L = LCS/LCSD failure S = MS/MSD failure

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E = Quantitation of compound exceeded the calibration range P = The RPD between two GC columns exceeds 40%

Client: GZA GeoEnvironmental, Inc.

Laboratory ID: WH17016-002

Description: WL-SED 1 (0-0.5')

Matrix: Solid

Date Sampled:08/14/2021 1000

Project Name: 20.0157080 Oshkosh PFAS

% Solids: 61.4 08/17/2021 2133

Date Received: 08/17/2021

Project Number: 20.0157080

Run	Prep Method	Analytical Method	Dilution	Analysis Date Analyst	Prep Date Batch
1	SOP SPE	PFAS by ID SOP	1	08/28/2021 0020 NK1	08/26/2021 1150 13393

Parameter	CAS Number	Analytical Method	Result Q	LOQ	MDL	Units	Run
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	41	3.2	0.48	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.7	1.6	0.29	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND	1.6	0.34	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	2.9	1.6	0.25	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	3.9	1.6	0.56	ug/kg	1

Surrogate	Run 1 Acceptance Q % Recovery Limits
13C2_6:2FTS	121 25-150
13C5_PFHxA	76 25-150
13C5_PFPeA	73 25-150
13C8_PFOA	75 25-150
13C8_PFOS	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  $J = Estimated \ result < LOQ \ and \ge DL$  Q = Surrogate failure L = LCS/LCSD failure S = MS/MSD failure

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

Client: GZA GeoEnvironmental, Inc.

Laboratory ID: WH17016-003

Description: WL-SED 2 (0-0.5')

Matrix: Solid

Date Sampled:08/14/2021 1010

Project Name: 20.0157080 Oshkosh PFAS

% Solids: 67.6 08/17/2021 2133

Date Received: 08/17/2021

Project Number: 20.0157080

Run Prep Method SOP SPE Analytical Method Dilution Analysis Date Analyst PFAS by ID SOP

08/28/2021 0031 NK1

Prep Date 08/26/2021 1150 13393

Batch

	CAS	Apolytical					
Parameter	Number	Analytical Method	Result Q	LOQ	MDL	Units	Run
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	9.3	2.8	0.42	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	4.6	1.4	0.26	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND	1.4	0.29	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	17	1.4	0.22	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	5.1	1.4	0.49	ug/kg	1

Surrogate	Run 1 Acceptance Q % Recovery Limits	
13C2_6:2FTS	99 25-150	
13C5_PFHxA	78 25-150	
13C5_PFPeA	74 25-150	
13C8_PFOA	82 25-150	
13C8_PFOS	71 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  $J = Estimated \ result < LOQ \ and \ge DL$  Q = Surrogate failure L = LCS/LCSD failure S = MS/MSD failure

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Client: GZA GeoEnvironmental, Inc.

Laboratory ID: WH17016-004

Description: WL-SED 3 (0-0.5')

Matrix: Solid

Date Sampled:08/14/2021 1020

Project Name: 20.0157080 Oshkosh PFAS

% Solids: 65.7 08/17/2021 2133

Date Received: 08/17/2021

Project Number: 20.0157080

Run	Prep Method
1	SOP SPE

Analytical Method Dilution PFAS by ID SOP

Analysis Date Analyst 08/28/2021 0041 NK1

Prep Date 08/26/2021 1150 13393

Batch

Parameter	CAS Number	Analytical Method	Result Q	LOQ	MDL	Units	Run
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	5.1	2.6	0.40	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	4.3	1.3	0.24	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND	1.3	0.28	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	15	1.3	0.21	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.8	1.3	0.47	ug/kg	1

Surrogate	Run 1 Acceptance Q % Recovery Limits	
13C2_6:2FTS	84 25-150	
13C5_PFHxA	73 25-150	
13C5_PFPeA	68 25-150	
13C8_PFOA	72 25-150	
13C8_PFOS	64 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  $J = Estimated \ result < LOQ \ and \ge DL$  Q = Surrogate failure L = LCS/LCSD failure S = MS/MSD failure

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Client: GZA GeoEnvironmental, Inc.

Laboratory ID: WH17016-005 Matrix: Aqueous

Description: WL-EQUIPMENT BLANK 1- TROWEL

Date Sampled:08/14/2021 1030

Project Name: 20.0157080 Oshkosh PFAS

Date Received: 08/17/2021

Project Number: 20.0157080

Run	Prep Method	Analytical Method	Dilution	Analysis Date Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	09/09/2021 1804 SES	09/08/2021 1730	14782

Parameter	CAS Number	Analytical Method	Result Q	LOQ	MDL	Units	Run
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	8.3	2.1	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND	4.2	0.72	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND	4.2	0.86	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND	4.2	0.57	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND	4.2	2.1	ng/L	1

Surrogate	Run 1 Acceptance Q % Recovery Limits	
13C2_6:2FTS	118 25-150	
13C5_PFHxA	92 25-150	
13C5_PFPeA	98 25-150	
13C8_PFOA	90 25-150	
13C8_PFOS	89 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  $J = Estimated \ result < LOQ \ and \ge DL$  Q = Surrogate failure L = LCS/LCSD failure S = MS/MSD failure

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

Client: GZA GeoEnvironmental, Inc.

Laboratory ID: WH17016-006

Description: WL-EQUIPMENT BLANK 2- DRIVE SHOE

Matrix: Aqueous

Date Sampled:08/14/2021 1100

Project Name: 20.0157080 Oshkosh PFAS

Date Received: 08/17/2021

Project Number: 20.0157080

Run Prep Method SOP SPE Analytical Method Dilution PFAS by ID SOP

Analysis Date Analyst 09/09/2021 1815 SES

Prep Date

Batch 09/08/2021 1730 14782

Parameter	CAS Number	Analytical Method	Result Q	LOQ	MDL	Units	Run
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	9.2	2.3	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND	4.6	0.79	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND	4.6	0.95	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND	4.6	0.62	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND	4.6	2.3	ng/L	1

Surrogate	Q	Run 1 A % Recovery	Acceptance Limits			
13C2_6:2FTS		142	25-150			
13C5_PFHxA		92	25-150			
13C5_PFPeA		96	25-150			
13C8_PFOA		87	25-150			
13C8_PFOS		93	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  $J = Estimated \ result < LOQ \ and \ge DL$  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

QC Summary

### PFAS by LC/MS/MS - MB

Sample ID: WQ13393-001 Batch: 13393 Analytical Method: PFAS by ID SOP Matrix: Solid Prep Method: SOP SPE

Prep Date: 08/26/2021 1150

Parameter	Result	Q	Dil	LOQ	MDL	Units	Analysis Date
6:2 FTS	ND		1	2.0	0.31	ug/kg	08/27/2021 1438
PFHxA	ND		1	1.0	0.18	ug/kg	08/27/2021 1438
PFOA	ND		1	1.0	0.21	ug/kg	08/27/2021 1438
PFPeA	ND		1	1.0	0.16	ug/kg	08/27/2021 1438
PFOS	ND		1	1.0	0.36	ug/kg	08/27/2021 1438
Surrogate	Q % Rec		eptance _imit				
13C2_6:2FTS	93	2	5-150				_
13C5_PFHxA	99	2	5-150				
13C5_PFPeA	92	2	5-150				
13C8_PFOA	102	2	5-150				
13C8_PFOS	91	2	5-150				

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

### PFAS by LC/MS/MS - LCS

Sample ID: WQ13393-002 Batch: 13393 Analytical Method: PFAS by ID SOP Matrix: Solid Prep Method: SOP SPE

Prep Date: 08/26/2021 1150

Parameter	Spike Amount (ug/kg)	Result (ug/kg)	Q Dil	% Rec	%Rec Limit	Analysis Date
6:2 FTS	1.9	2.0	1	105	50-150	08/27/2021 1448
PFHxA	2.0	1.9	1	93	50-150	08/27/2021 1448
PFOA	2.0	1.9	1	96	50-150	08/27/2021 1448
PFPeA	2.0	1.9	1	93	50-150	08/27/2021 1448
PFOS	1.9	1.7	1	91	50-150	08/27/2021 1448
Surrogate	Q % Rec	Acceptance Limit	•			
13C2_6:2FTS	95	25-150				
13C5_PFHxA	101	25-150				
13C5_PFPeA	95	25-150				
13C8_PFOA	98	25-150				
13C8_PFOS	92	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

### PFAS by LC/MS/MS - MB

Sample ID: WQ14782-001 Batch: 14782 Analytical Method: PFAS by ID SOP Matrix: Aqueous
Prep Method: SOP SPE

Prep Date: 09/08/2021 1730

Parameter	Result	Q	Dil	L	LOQ	MDL	Units	Analysis Date
6:2 FTS	ND		1	:	8.0	2.0	ng/L	09/09/2021 1411
PFHxA	ND		1		4.0	0.69	ng/L	09/09/2021 1411
PFOA	ND		1		4.0	0.83	ng/L	09/09/2021 1411
PFPeA	ND		1		4.0	0.54	ng/L	09/09/2021 1411
PFOS	ND		1		4.0	2.0	ng/L	09/09/2021 1411
Surrogate	Q % Rec	Α	cceptance Limit					
13C2_6:2FTS	90		25-150					
13C5_PFHxA	87		25-150					
13C5_PFPeA	95		25-150					
13C8_PFOA	79		25-150					
13C8_PFOS	95		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

### PFAS by LC/MS/MS - LCS

Sample ID: WQ14782-002 Batch: 14782 Analytical Method: PFAS by ID SOP Matrix: Aqueous
Prep Method: SOP SPE

Prep Date: 09/08/2021 1730

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
6:2 FTS	15	16		1	106	50-150	09/09/2021 1422
PFHxA	16	16		1	102	50-150	09/09/2021 1422
PFOA	16	18		1	110	50-150	09/09/2021 1422
PFPeA	16	18		1	111	50-150	09/09/2021 1422
PFOS	15	16		1	107	50-150	09/09/2021 1422
Surrogate	Q % Rec	Accepta Limit					
13C2_6:2FTS	89	25-15	50				
13C5_PFHxA	87	25-15	50				
13C5_PFPeA	87	25-15	60				
13C8_PFOA	80	25-15	60				
13C8_PFOS	78	25-15	60				

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

Chain of Custody and Miscellaneous Documents

Face Analytical "	<b>PA</b> 106 Va Telepho	CE ANALY ntage Point D one No. 809.7	PACE ANALYTICAL SERVICES, LLC 106 Vantage Point Drive - West Columbia, SC 29172 Telephone No. 808-791-9700 Fax No. 808-791-9111 www.pacelabs.com	29172 29172 1-9111	Number	124342
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ionn produke TMT). Samuel (Produke) is approved required for equalities TMT). Samuels Disposed IT Standard IT Rosh (Specify).	ad TAT.) Sample Disposed   Return to Cuent	impole Disposad Return to Cillent M. Disposal by Lab	Possible Mazard formillogiton XXvon-Hasard III Bommate	China Control Control	OC Regumenterits (Specify)	Specify)
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Note: All samples are retained for four weeks fro Unless other arrangements are made	ir weeks from receipt	7	LAB USE CANTY		-	4/3 Temp Blank DY ZN

Document Number: ME003N2-01

Pace Analytical

## 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: KDRW / 8/17/2021 Lot #- WIII7016
Means of receipt: Pace	Client UPS FedEx Other; Will7016
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: MA
Original temperature upon re 4.7 /4.7 °C NA /NA	cceipt / Derived (Corrected) temperature upon receipt
Method: Temperature Bla	t. EZIA de la marca della marca della marca della della marca della marca della marca della marca della marca d
Method of coolant: We	tilde Lilide Packs Dry Ide None
☐Yes ☐ No ☑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).
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?
17 res 1 No 5.	Were sample IDs listed on the COC?
✓ Yes No 7.	Were sample IDs listed on all sample containers?
Yes LIND 8.	Was collection date & time listed on the COC?
	Was collection date & time listed on all sample containers?
V Yes No 10	. Did all container label information (ID, date, time) agree with the COC2
✓ Yes No 11	. Were tests to be performed listed on the COC?
✓ Yes	Did all samples arrive in the proper containers for each test and/or in good condition abroken, lids on, etc.)?
	. Was adequate sample volume available?
Yes ✓ No 14.	Were all samples received within 16 the holding 16 the
The state of the s	Were all samples received within ½ the holding time or 48 hours, whichever comes first?
	Were any samples containers missing/excess (circle one) samples Not listed on COC?  For VOA and RSK-175 samples, were in the listed on COC?
	For VOA and RSK-175 samples, were bubbles present >"pca-size" (¼"or 6mm in diameter) any of the VOA vials?
	Were all DRO/metals/nutrient samples received at a pH of < 2?
103 LINO V NA 18.	were all cyanide samples received at a nH > 12 and sulfide samples appoint the samples are sized at a nH > 12 and sulfide samples are sized at a nH > 12 a
Ycs No VNA	idual chlorine?
☐ Yes ☐ No ☑NA 20.	Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc)
4011	total a ansertice from the COC into the comment section in 1 IMS?
V res L No 21.	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 in with neadspace.)
in sample receiving with NA Time of preservation NA	mL of circle one: H2SO4, HNO3, HCI, NaOH using SR # NA
Sample(s) NA	. If more than one preservative is needed, please note in the comments below.
Samples(s) NA	were received with bubbles >6 mm in diameter.
SP have de total and a sample	receiving with sodami unosutrate (Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> ) with Shealy (D: NA
SR barcode labels applied by:	Date: 8/17/2021
Comments:	



### **Report of Analysis**

**GZA GeoEnvironmental, Inc.** 

17975 West Sarah Lane, Suite 100 Brookfield, WI 53045 Attention: Kevin Hedinger

Project Name: Oshkosh

Lot Number: XF21008

Date Completed:07/15/2022

Kathy Smith

07/15/2022 11:20 AM
Approved and released by:
Project Manager II: **Kathy E. Smith** 





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

This report shall not be reproduced, except in its entirety, without the written approval of 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: XF21008

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.

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. 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:

### For solid samples:

CF = DF \* FV / Ws/S/1000

FV is volume of extract (mL)
Ws is initial sample weight (gram)
S is %Solids
DF is dilution factor. For undiluted analysis, DF = 1/0.91.

Concentration (ug/kg) = Cs\*CF,

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

Where

C<sub>s</sub> is on column concentration of target analyte in the sample (ng/L)
C<sub>is</sub> is concentration of internal standard in the sample (ng/L)
A<sub>s</sub> is peak response of target analyte in the sample
A<sub>is</sub> 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

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: 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.

Where applicable, all soil sample results (including LOQ and DL if requested) are corrected for dry weight unless flagged with a "W" qualifier.

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

Surrogate recovery for the following sample was outside the upper control limit: XF21008-002. 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: XF21008 Project Name: Oshkosh Project Number:

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	B-12	Solid	06/17/2022 1450	06/21/2022
002	B-13	Solid	06/17/2022 1250	06/21/2022

(2 samples)

# Detection Summary GZA GeoEnvironmental, Inc.

Lot Number: XF21008 Project Name: Oshkosh Project Number:

Sampl	e Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	B-12	Solid	PFOA	PFAS by ID	0.46	J	ug/kg	5
001	B-12	Solid	PFOS	PFAS by ID	1.2		ug/kg	5
002	B-13	Solid	6:2 FTS	PFAS by ID	7.6		ug/kg	7
002	B-13	Solid	PFHxS	PFAS by ID	0.86	J	ug/kg	7
002	B-13	Solid	PFHxA	PFAS by ID	1.2	J	ug/kg	7
002	B-13	Solid	PFPeA	PFAS by ID	2.0	J	ug/kg	7
002	B-13	Solid	PFOS	PFAS by ID	4.7		ug/kg	7

(7 detections)

Client: GZA GeoEnvironmental, Inc.

Laboratory ID: XF21008-001

Description: B-12

Matrix: Solid

Date Sampled:06/17/2022 1450

Project Name: Oshkosh

% Solids: 67.3 06/22/2022 2358

Date Received: 06/21/2022

Project Number:

Run Prep Method 1 SOP SPE Analytical Method Dilution PFAS by ID SOP

Analysis Date Analyst 07/05/2022 1159 MMM

Prep Date 06/30/2022 1207 46657

Batch

Parameter	CAS Number	Analytical Method	Result Q	LOQ	MDL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	ND	2.5	0.20	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3)	763051-92-9	PFAS by ID SOP	ND	2.5	0.21	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	2.5	0.34	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	2.5	0.38	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	2.5	0.27	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND	5.0	0.73	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND	2.5	0.19	ug/kg	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	ND	2.5	0.45	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND	2.5	0.36	ug/kg	1
2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)	1691-99-2	PFAS by ID SOP	ND	2.5	0.29	ug/kg	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	PFAS by ID SOP	ND	2.5	0.43	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND	2.5	0.49	ug/kg	1
2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)	24448-09-7	PFAS by ID SOP	ND	2.5	0.42	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND	1.2	0.16	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND	1.2	0.28	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND	1.2	0.22	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND	1.2	0.28	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND	1.2	0.22	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND	1.2	0.23	ug/kg	1
Perfluorododecanesulfonic acid (PFDOS)	79780-39-5	PFAS by ID SOP	ND	1.2	0.32	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND	1.2	0.22	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND	1.2	0.52	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND	1.2	0.20	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND	1.2	0.22	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND	1.2	0.18	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND	1.2	0.23	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND	1.2	0.19	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.46 J	1.2	0.27	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND	1.2	0.20	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND	1.2	0.24	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND	1.2	0.21	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND	1.2	0.23	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.2	1.2	0.45	ug/kg	1
		otance nits					
13C2_4:2FTS	115 25	-150					
13C2_6:2FTS	108 25	-150					
13C2_8:2FTS	109 25	-150					
13C2_PFDoA		-150					
13C2_PFTeDA	100 25	-150					
13C3_PFBS	103 25	-150					
13C3_PFHxS	102 25	-150					

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

13C3-HFPO-DA

LOQ = Limit of Quantitation

H = Out of holding time

ND = Not detected at or above the DL

13C4\_PFBA

106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

B = Detected in the method blank

W = Reported on wet weight basis

N = Recovery is out of criteria

97

98

25-150

25-150

E = Quantitation of compound exceeded the calibration range

P = The RPD between two GC columns exceeds 40%

DL = Detection Limit

 $J = Estimated \ result < LOQ \ and \ge DL$ 

Q = Surrogate failure

L = LCS/LCSD failure S = MS/MSD failure

Client: GZA GeoEnvironmental, Inc.

Laboratory ID: XF21008-001

Description: B-12

Date Sampled:06/17/2022 1450

Project Name: Oshkosh

Matrix: Solid

% Solids: 67.3 06/22/2022 2358

Date Received: 06/21/2022 Project Number:

Surrogate	Run 1 A Q % Recovery	cceptance Limits			
13C4_PFHpA	100	25-150			
13C5_PFHxA	100	25-150			
13C5_PFPeA	99	25-150			
13C6_PFDA	95	25-150			
13C7_PFUdA	109	25-150			
13C8_PFOA	98	25-150			
13C8_PFOS	103	25-150			
13C8_PFOSA	108	10-150			
13C9_PFNA	100	25-150			
d-EtFOSA	97	10-150			
d5-EtFOSAA	113	25-150			
d9-EtFOSE	99	10-150			
d-MeFOSA	107	10-150			
d3-MeFOSAA	103	25-150			
d7-MeFOSE	110	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  $J = Estimated \ result < LOQ \ and \ge DL$  Q = Surrogate failure L = LCS/LCSD failure S = MS/MSD failure

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

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Client: GZA GeoEnvironmental, Inc.

Laboratory ID: XF21008-002

Description: B-13

Date Sampled:06/17/2022 1250

Matrix: Solid

Date Received: 06/21/2022

Project Name: Oshkosh

Project Number:

% Solids: 38.0 07/13/2022 2345

Run Prep Method 1 SOP SPE Analytical Method Dilution PFAS by ID SOP

Analysis Date Analyst 07/05/2022 1210 MMM

Prep Date 06/30/2022 1207 46657

Batch

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	MDL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		5.0	0.39	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3)	763051-92-9	PFAS by ID SOP	ND		5.0	0.42	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	Q	5.0	0.68	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	7.6		5.0	0.76	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		5.0	0.54	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		9.9	1.4	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		5.0	0.37	ug/kg	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	ND		5.0	0.89	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		5.0	0.72	ug/kg	1
2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)	1691-99-2	PFAS by ID SOP	ND		5.0	0.57	ug/kg	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	PFAS by ID SOP	ND		5.0	0.87	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		5.0	0.98	ug/kg	1
2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)	24448-09-7	PFAS by ID SOP	ND		5.0	0.83	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		2.5	0.32	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		2.5	0.55	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		2.5	0.44	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		2.5	0.55	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		2.5	0.44	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		2.5	0.46	ug/kg	1
Perfluorododecanesulfonic acid (PFDOS)	79780-39-5	PFAS by ID SOP	ND		2.5	0.64	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.86	J	2.5	0.44	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		2.5	1.0	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		2.5	0.39	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		2.5	0.44	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		2.5	0.35	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.2	J	2.5	0.46	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		2.5	0.37	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		2.5	0.53	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	2.0	J	2.5	0.39	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		2.5	0.47	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		2.5	0.43	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		2.5	0.46	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	4.7		2.5	0.89	ug/kg	1
		otance mits						
13C2_4:2FTS	105 25	-150						
13C2_6:2FTS	105 25	-150						
13C2_8:2FTS N	151 25	-150						
13C2_PFDoA	97 25	-150						
13C2_PFTeDA	81 25	-150						
13C3_PFBS	86 25	-150						
13C3_PFHxS	80 25	-150						

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

13C3-HFPO-DA

LOQ = Limit of Quantitation

H = Out of holding time

ND = Not detected at or above the DL

13C4\_PFBA

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B = Detected in the method blank

W = Reported on wet weight basis

N = Recovery is out of criteria

78

81

25-150

25-150

E = Quantitation of compound exceeded the calibration range

P = The RPD between two GC columns exceeds 40%

DL = Detection Limit

 $J = Estimated \ result < LOQ \ and \ge DL$ 

Q = Surrogate failure

L = LCS/LCSD failure S = MS/MSD failure

Client: GZA GeoEnvironmental, Inc.

Description: B-13

Project Name: Oshkosh

Laboratory ID: XF21008-002

Matrix: Solid

Date Sampled:06/17/2022 1250 Projec

% Solids: 38.0 07/13/2022 2345

Date Received: 06/21/2022 Project Number:

Surrogate	Run 1 Ao Q % Recovery	cceptance Limits			
13C4_PFHpA	80	25-150			
13C5_PFHxA	80	25-150			
13C5_PFPeA	79	25-150			
13C6_PFDA	86	25-150			
13C7_PFUdA	95	25-150			
13C8_PFOA	77	25-150			
13C8_PFOS	84	25-150			
13C8_PFOSA	80	10-150			
13C9_PFNA	81	25-150			
d-EtFOSA	67	10-150			
d5-EtFOSAA	118	25-150			
d9-EtFOSE	67	10-150			
d-MeFOSA	71	10-150			
d3-MeFOSAA	108	25-150			
d7-MeFOSE	75	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  $\geq DL$ 

Q = Surrogate failure L = LCS/LCSD failure S = MS/MSD failure

 $\label{thm:pace-analytical-Services, LLC} \textbf{ (formerly Shealy Environmental Services, Inc.)}$ 

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QC Summary

### PFAS by LC/MS/MS - MB

Sample ID: XQ46657-001 Batch: 46657 Analytical Method: PFAS by ID SOP Matrix: Solid
Prep Method: SOP SPE

Prep Date: 06/30/2022 1207

Parameter	Result	Q Dil	LOQ	MDL	Units	Analysis Date
9CI-PF3ONS	ND	1	2.0	0.16	ug/kg	07/01/2022 1730
11CI-PF3OUdS	ND	1	2.0	0.17	ug/kg	07/01/2022 1730
8:2 FTS	ND	1	2.0	0.27	ug/kg	07/01/2022 1730
6:2 FTS	ND	1	2.0	0.31	ug/kg	07/01/2022 1730
4:2 FTS	ND	1	2.0	0.22	ug/kg	07/01/2022 1730
GenX	ND	1	4.0	0.58	ug/kg	07/01/2022 1730
ADONA	ND	1	2.0	0.15	ug/kg	07/01/2022 1730
EtFOSA	ND	1	2.0	0.36	ug/kg	07/01/2022 1730
EtFOSAA	ND	1	2.0	0.29	ug/kg	07/01/2022 1730
EtFOSE	ND	1	2.0	0.23	ug/kg	07/01/2022 1730
MeFOSA	ND	1	2.0	0.35	ug/kg	07/01/2022 1730
MeFOSAA	ND	1	2.0	0.40	ug/kg	07/01/2022 1730
MeFOSE	ND	1	2.0	0.33	ug/kg	07/01/2022 1730
PFBS	ND	1	1.0	0.13	ug/kg	07/01/2022 1730
PFDS	ND	1	1.0	0.22	ug/kg	07/01/2022 1730
PFHpS	ND	1	1.0	0.18	ug/kg	07/01/2022 1730
PFNS	ND	1	1.0	0.22	ug/kg	07/01/2022 1730
PFOSA	ND	1	1.0	0.18	ug/kg	07/01/2022 1730
PFPeS	ND	1	1.0	0.19	ug/kg	07/01/2022 1730
PFDOS	ND	1	1.0	0.26	ug/kg	07/01/2022 1730
PFHxS	ND	1	1.0	0.18	ug/kg	07/01/2022 1730
PFBA	ND	1	1.0	0.42	ug/kg	07/01/2022 1730
PFDA	ND	1	1.0	0.16	ug/kg	07/01/2022 1730
PFDoA	ND	1	1.0	0.18	ug/kg	07/01/2022 1730
PFHpA	ND	1	1.0	0.14	ug/kg	07/01/2022 1730
PFHxA	ND	1	1.0	0.18	ug/kg	07/01/2022 1730
PFNA	ND	1	1.0	0.15	ug/kg	07/01/2022 1730
PFOA	ND	1	1.0	0.21	ug/kg	07/01/2022 1730
PFPeA	ND	1	1.0	0.16	ug/kg	07/01/2022 1730
PFTeDA	ND	1	1.0	0.19	ug/kg	07/01/2022 1730
PFTrDA	ND	1	1.0	0.17	ug/kg	07/01/2022 1730
PFUdA	ND	1	1.0	0.18	ug/kg	07/01/2022 1730
PFOS	ND	1	1.0	0.36	ug/kg	07/01/2022 1730
	145	Acceptance	1.0	0.00	agritg	0770172022 1700
Surrogate	Q % Rec	Limit				
13C2_4:2FTS	98	25-150				
13C2_6:2FTS	103	25-150				
13C2_8:2FTS	102	25-150				
13C2_PFDoA	92	25-150				
13C2_PFTeDA	95	25-150				
13C3_PFBS	93	25-150				
13C3_PFHxS	97	25-150				
13C3-HFPO-DA	104	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  $\geq$  DL P = The RPD between two GC columns exceeds 40%

 $<sup>\</sup>star$  = RSD is out of criteria + = RPD is out of criteria

#### PFAS by LC/MS/MS - MB

Sample ID: XQ46657-001 Batch: 46657 Analytical Method: PFAS by ID SOP

Matrix: Solid Prep Method: SOP SPE

Prep Date: 06/30/2022 1207

Surrogate	Q % Rec	Acceptance Limit	 
13C4_PFBA	97	25-150	
13C4_PFHpA	96	25-150	
13C5_PFHxA	92	25-150	
13C5_PFPeA	94	25-150	
13C6_PFDA	96	25-150	
13C7_PFUdA	100	25-150	
13C8_PFOA	95	25-150	
13C8_PFOS	96	25-150	
13C8_PFOSA	103	10-150	
13C9_PFNA	95	25-150	
d-EtFOSA	107	10-150	
d5-EtFOSAA	104	25-150	
d9-EtFOSE	101	10-150	
d-MeFOSA	107	10-150	
d3-MeFOSAA	100	25-150	
d7-MeFOSE	102	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  $\geq$  DL

P = The RPD between two GC columns exceeds 40%

\* = RSD is out of criteria

+ = RPD is out of criteria

#### PFAS by LC/MS/MS - LCS

Sample ID: XQ46657-002 Batch: 46657 Analytical Method: PFAS by ID SOP Matrix: Solid
Prep Method: SOP SPE
Prep Date: 06/30/2022 1207

	Spike Amount	Daguilt			%Rec	
Parameter	(ug/kg)	Result (ug/kg) Q	Dil	% Rec	Limit	Analysis Date
9CI-PF3ONS	1.9	1.6	1	87	50-150	07/01/2022 1741
11CI-PF3OUdS	1.9	1.7	1	91	50-150	07/01/2022 1741
8:2 FTS	1.9	1.6	1	85	50-150	07/01/2022 1741
6:2 FTS	1.9	1.9	1	101	50-150	07/01/2022 1741
4:2 FTS	1.9	1.6	1	86	50-150	07/01/2022 1741
GenX	4.0	3.7	1	93	50-150	07/01/2022 1741
ADONA	1.9	1.7	1	88	50-150	07/01/2022 1741
EtFOSA	2.0	2.1	1	103	50-150	07/01/2022 1741
EtFOSAA	2.0	1.9	1	96	50-150	07/01/2022 1741
EtFOSE	2.0	1.9	1	94	50-150	07/01/2022 1741
MeFOSA	2.0	1.9	1	93	50-150	07/01/2022 1741
MeFOSAA	2.0	1.8	1	91	50-150	07/01/2022 1741
MeFOSE	2.0	2.4	1	121	50-150	07/01/2022 1741
PFBS	1.8	1.7	1	98	50-150	07/01/2022 1741
PFDS	1.9	1.8	1	92	50-150	07/01/2022 1741
PFHpS	1.9	1.9	1	98	50-150	07/01/2022 1741
PFNS	1.9	1.7	1	87	50-150	07/01/2022 1741
PFOSA	2.0	1.8	1	90	50-150	07/01/2022 1741
PFPeS	1.9	2.0	1	106	50-150	07/01/2022 1741
PFDOS	1.9	2.3	1	117	50-150	07/01/2022 1741
PFHxS	1.8	1.6	1	90	50-150	07/01/2022 1741
PFBA	2.0	1.9	1	94	50-150	07/01/2022 1741
PFDA	2.0	1.9	1	95	50-150	07/01/2022 1741
PFDoA	2.0	2.0	1	100	50-150	07/01/2022 1741
PFHpA	2.0	1.9	1	94	50-150	07/01/2022 1741
PFHxA	2.0	1.9	1	93	50-150	07/01/2022 1741
PFNA	2.0	1.9	1	94	50-150	07/01/2022 1741
PFOA	2.0	1.8	1	90	50-150	07/01/2022 1741
PFPeA	2.0	1.9	1	95	50-150	07/01/2022 1741
PFTeDA	2.0	1.9	1	96	50-150	07/01/2022 1741
PFTrDA	2.0	1.9	1	94	50-150	07/01/2022 1741
PFUdA	2.0	1.8	1	89	50-150	07/01/2022 1741
PFOS	1.9	1.7	1	91	50-150	07/01/2022 1741
Surrogate	Q % Rec	Acceptance Limit				
13C2_4:2FTS	114	25-150				
13C2_6:2FTS	109	25-150				
13C2_8:2FTS	114	25-150				
13C2_PFDoA	107	25-150				
13C2_PFTeDA	108	25-150				
13C3_PFBS	110	25-150				
13C3_PFHxS	110	25-150				
13C3-HFPO-DA	123	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%

<sup>\* =</sup> RSD is out of criteria

<sup>+ =</sup> RPD is out of criteria

#### PFAS by LC/MS/MS - LCS

Sample ID: XQ46657-002 Batch: 46657 Analytical Method: PFAS by ID SOP

Matrix: Solid Prep Method: SOP SPE

Prep Date: 06/30/2022 1207

Surrogate	Q	% Rec	Acceptance Limit	
13C4_PFBA		112	25-150	
13C4_PFHpA		109	25-150	
13C5_PFHxA		113	25-150	
13C5_PFPeA		108	25-150	
13C6_PFDA		110	25-150	
13C7_PFUdA		121	25-150	
13C8_PFOA		111	25-150	
13C8_PFOS		112	25-150	
13C8_PFOSA		123	10-150	
13C9_PFNA		110	25-150	
d-EtFOSA		121	10-150	
d5-EtFOSAA		119	25-150	
d9-EtFOSE		109	10-150	
d-MeFOSA		114	10-150	
d3-MeFOSAA		117	25-150	
d7-MeFOSE		117	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  $\geq$  DL

P = The RPD between two GC columns exceeds 40%

\* = RSD is out of criteria

+ = RPD is out of criteria

Chain of Custody and Miscellaneous Documents

LAB USE ONLY. A'IIX Workwider/Login Label Here or List Pace Workorder Number or MTE, Log-in Number Here	ALL SHADED AREAS are for LAB USE ONLY	Lab Project Managar.	Preservative types: (3) infaire adul, (3) suffair ands, (3) hydrochteric add, (4) sediom hydroxide, (5) sinc acetate, method (7) soften bivillatu (8) colline bloodings from houses. (1)	(G ammonlum hydroxida, jO) TSF, UJ Untreserved, jOj Other	ab Profile/Unie Lab Samele Receipt Checklist	nesant/Intact y N nos Present y N. Luip Present Y N	hi hi m	on ICe complable 7 118	me Y N	100	Soline figeen; Ind Anthre Strips: /	Semple # / Comments:											Post .	Temp Blank Received: Y N NA Them IDs: ————————————————————————————————————	Cooler 1 Therm Corr Factor of		Trip Blank Received: Y N NA HOL MeCH TSP Other	Non Conformance(s): Pege:
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GIAATINO 351	ALLSF	Container Preservative Type	is: (1) nitric acid, (	oxide, (0) TSP, (U)	Analyses	) <u>(</u>							ini Ni					1 × ×				W.	SHORT HOLDS PRESENT 4<72 hours!.		ived via: UPS Client	<u>ŭ</u>		22-1660
19		Const	Preservative Type	ammonium hydro	8.000 8.000 9.000 9.000		193	ઇ '	ES 4º	<b>+</b> 3	75	54.035	M	N/A									SHORTHOID	Lab Tracking #	Semples received via FEDEX UPS	Date/Time:	Date/Time:	(a 21/22
il Request Document Complete all relevent fields			9	3	Hime Zone Collectivity:	ompliance Monitoring? J. Yes. [X] No	0#:	Immediately Packed on Iba.	Field Filtered (if applicable): [ ] Yes [X] No		water (WW),	ite End Ress # of	Time								/		ua Dry Nore		30 opporate Y N NA	e/Terre: 15:30 Received by/Company: (Signature)	Received by/Company: (Signature)	glog by/Companya (Signe ture)
alytical Requi	All or a cone	6	Same	Size Collection Info/Address:	County/City: Film	Compliance [ ] Yes	DW PWS ID #: DW Location Code;	Immediate	Field Filters	Analysis:	Nater (GW), Waste say (B), Vapor (V), C	or cart) Composite End	Time Date	45/1	20		7000	100	/	/		_	ed: Wet Blue	al Osed:	Radchem samiple(s) screened (<500 cpm):	330 Received by/	Received by/	2
STODY An	Billing Information: $Ag_{\mathcal{O}}$	- 1	Email To:	Site Collection	State: Sx	i.		ed:	1 00	rges Apply)	(DW), Ground V ssue (TS), Blogs	Collected (or Composite Start)	-	11 28/6/10	C/1982 1750		-	ANN A	1				Type of ice Used:	Packing Marerial Osed:	Radchem samp	Date/Terre: 15	/Time:	Charles 1880
CHAIN-OF-CUSTODY Analytica Chain-of-Lustody is a LEGAL DOCUMENT		ito Besital but	40			Ste/Facility ID #:	Purchase Order 8: Quote 4:	Turnaround Date Regulated:	ush: [ ] Same Day [ ] Next D	(Expedite Charges Apply)	Orinking Water WP), Air (A3), Tb	ix* Greb	-	ه ا	3	-		1					sible Hazards:			Date	Date	9
Pace Analytical CH	Ges Environman	ACCRESS: 10. 540.1 Lar. 100 B.	Herry Hedwerle STO COM		Customer Project Name/Number: OshKosh - Whother Lot		Collected By point): 1 Purchase		Sample Disposal:   Ad Dispose as appropriate     Petum     1 200		<ul> <li>Marrix Codes (Insert in Matrix box below): Orinking Water (DW), Ground Water (GW), Wastewater (WW), Product (P), Soll/Solid (EL), Oil (OIL), Wipe (WP), Air (AR), Tissue (TS), Bioassay (B), Vapor (V), Other (OT)</li> </ul>	Customer Sample 15 Matrix *		2	2								Oustomor Remarks / Special Conditions / Possible Hazards:			elinquish ed by/Company: (Signature)	elinquished by/Company: (SpEnglurc)	A Company September A Comp

Pace Analytical

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

Revised:9/29/2020 Page 1 of 1

Sample Receipt Checki	ist (SRC)
The state of the s	/ 06/21/2022 Lot #: XF21008
Means of receipt: Pace Client UPS / FedEx Ot	per:
Yes No 1. Were custody scals present on the cooler?	
✓ Yes No NA 2. If custody seals were present, were they intach  NA 2. If custody seals were present, were they intach  NA 2. If custody seals were present, were they intach  NA 2. If custody seals were present, were they intach  NA 2. If custody seals were present, were they intach  NA 2. If custody seals were present, were they intach  NA 3. If custody seals were present, were they intach  NA 3. If custody seals were present, were they intach  NA 3. If custody seals were present, were they intach  NA 3. If custody seals were present, were they intach  NA 3. If custody seals were present, were they intach  NA 3. If custody seals were present, were they intach  NA 3. If custody seals were present, were they intach  NA 3. If custody seals were present, were they intach  NA 3. If custody seals were present, were they intach  NA 3. If custody seals were present were present with the custody seals were present with the custody with the custody seals were present with the custody seals we	t and unbroken?
pH Strip ID: NA Chlorine Strip ID: NA	Tested by: NA
Original temperature upon receipt / Derived (Corrected) temperature upon 4.9 /4.9 °C NA /NA °C NA /NA °C NA /NA °C	receipt %Solid Snap-Cup ID: 22-480
Method: Temperature Blank Against Bottles IR Gun ID: 6  Method of coolant: Wet Ice Lice Packs Dry Ice None	IR Gun Correction Factor: 0 °C
Yes No No NA 3. If temperature of any cooler exceeded 6.0°C	
PM was Notified by: phone / email / face-to-	face (circle one).
✓ Yes No NA 4. Is the commercial courier's packing slip atta	ched to this form?
✓ Yes No 5. Were proper custody procedures (relinquished)	d/received) followed?
Yes No 6. Were sample IDs listed on the COC?	
Yes No 7. Were sample 1Ds listed on all sample contain	
Yes No 8. Was collection date & time listed on the CO	
✓ Yes No 9. Was collection date & time listed on all sam	ple containers?
✓ Yes No 10. Did all container label information (ID, date	, time) agree with the COC?
Yes No 11. Were tests to be performed listed on the CO	C?
Yes No 12. Did all samples arrive in the proper contains (unbroken, lids on, etc.)?	rs for each test and/or in good condition
Yes No. 13. Was adequate sample volume available?	
Yes No 14. Were all samples received within ½ the hold	ing time or 48 hours, whichever comes first?
Yes V No 15. Were any samples containers missing/excess	(circle one) samples Not listed on COC?
Yes No No NA 16. For VOA and RSK-175 samples, were bubb in any of the VOA vials?	es present >"pea-size" ('//''or funt in diameter)
Yes No NA 17. Were all DRO/metals/nutrient samples recei	ved at a pH of < 2?
Ycs INo MA 18. Were all cyanide samples received at a pH >	12 and sulfide samples received at a nH > 92
Yes No No NA 19. Were all applicable NH <sub>3</sub> /TKN/cyanide/phenoresidual chlorine?	01/625.1/608.3 (< 0.5mg/L) samples free of
Yes No No NA 20. Were client remarks/requests (i.e. requested	dilutions, MS/MSD designations, etc)
correctly transcribed from the COC into the com	ment section in LIMS?
Yes No 21. Was the quote number listed on the container	label? If yes, Quote #
Sample Preservation (Must be completed for any sample(s) incorrectly p	
Sample(s) NA were received inco	rrectly preserved and were adjusted accordingly
mL of circle one: H2SO4, HNO3, HCl, Na	OH using SR # NA
Time of preservation MA	please note in the comments below.
	e received with bubbles >6 mm in diameter.
Samples(s) $\stackrel{NA}{=}$ were received wi adjusted accordingly in sample receiving with sodium thiosulfate (Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> )	th TRC > 0.5 mg/L (If #19 is no ) and were with Shealy ID: NA
SR barcode labels applied by: KNR Date: 06/21/202	
Comments:	



## **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 Lot Number: **WH24025** 

Date Completed:09/17/2021

Kary Coman

09/17/2021 3:06 PM
Approved and released by:
Project Manager II: **Karen L. Coonan** 





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This report shall not be reproduced, except in its entirety, without the written approval of 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: WH24025

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 most current approved The NELAC Institute (TNI) standards, the Pace Analytical Services, LLC ("Pace") Laboratory Quality Manual, standard operating procedures (SOPs), and Pace policies. Any exceptions to the TNI standards, the Laboratory Quality Manual, SOPs or policies are qualified on the results page or discussed below.

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

## Sample Summary GZA GeoEnvironmental, Inc.

Lot Number: WH24025

Project Name: Oshkosh GW PFAS Sampling

Project Number: 20.0157080

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	WL-MW-1	Aqueous	08/19/2021 1655	08/24/2021

(1 sample)

### **Detection Summary**

#### GZA GeoEnvironmental, Inc.

Lot Number: WH24025

Project Name: Oshkosh GW PFAS Sampling

Project Number: 20.0157080

Sample	e Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	WL-MW-1	Aqueous	6:2 FTS	PFAS by ID	10000		ng/L	5
001	WL-MW-1	Aqueous	PFHxS	PFAS by ID	34	J	ng/L	5
001	WL-MW-1	Aqueous	PFBA	PFAS by ID	460		ng/L	5
001	WL-MW-1	Aqueous	PFHpA	PFAS by ID	320		ng/L	5
001	WL-MW-1	Aqueous	PFHxA	PFAS by ID	1600		ng/L	5
001	WL-MW-1	Aqueous	PFOA	PFAS by ID	41	J	ng/L	6
001	WL-MW-1	Aqueous	PFPeA	PFAS by ID	3200		ng/L	6

(7 detections)

Client: GZA GeoEnvironmental, Inc.

Laboratory ID: WH24025-001

Description: WL-MW-1

Matrix: Aqueous

Date Sampled:08/19/2021 1655

Project Name: Oshkosh GW PFAS Sampling

Date Received: 08/24/2021

Project Number: 20.0157080

Run Prep Method Analytical Method Dilution Analysis Date Analyst Prep Date Batch SOP SPE PFAS by ID SOP 20 09/15/2021 1832 MMM 09/13/2021 1227 15147 CAS Analytical Parameter Number Result Q LOQ

	CAS	Anaiyucai					
Parameter	Number	Method	Result	Q LOQ	MDL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	ND	150	9.2	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3)	763051-92-9	PFAS by ID SOP	ND	150	13	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	150	30	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	10000	150	38	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	150	17	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND	150	39	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND	150	9.2	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	ND	150	26	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND	150	14	ng/L	1
2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)	1691-99-2	PFAS by ID SOP	ND	150	18	ng/L	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	PFAS by ID SOP	ND	300	24	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND	150	18	ng/L	1
2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)	24448-09-7	PFAS by ID SOP	ND	150	24	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND	76	7.9	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND	76	15	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND	76	9.5	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND	76	14	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND	76	12	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND	76	11	ng/L	1
Perfluorododecanesulfonic acid (PFDOS)	79780-39-5	PFAS by ID SOP	ND	150	20	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	34	J 76	10	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	460	76	11	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND	76	10	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND	76	9.0	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	320	76	8.5	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1600	76	13	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND	76	8.8	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	41	J 76	16	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	3200	76	10	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND	76	11	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND	76	10	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND	76	12	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND	76	38	ng/L	1

Surrogate	Run 1 Acceptance Q % Recovery Limits	
13C2_4:2FTS	132 25-150	
13C2_6:2FTS	130 25-150	
13C2_8:2FTS	120 25-150	
13C2_PFDoA	102 25-150	
13C2_PFTeDA	97 25-150	
13C3_PFBS	99 25-150	
13C3_PFHxS	87 25-150	
13C3-HFPO-DA	95 25-150	
13C4_PFBA	98 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%  $J = Estimated \ result < LOQ \ and \ge DL$ L = LCS/LCSD failure W = Reported on wet weight basis S = MS/MSD failure H = Out of holding time

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

Client: GZA GeoEnvironmental, Inc.

Description: WL-MW-1 Date Sampled:08/19/2021 1655

Laboratory ID: WH24025-001

Matrix: Aqueous

Date Received: 08/24/2021

Project Name: Oshkosh GW PFAS Sampling

Project Number: 20.0157080

Surrogate	Q % Recovery	Limits
13C4_PFHpA	110	25-150
13C5_PFHxA	94	25-150
13C5_PFPeA	99	25-150
13C6_PFDA	92	25-150
13C7_PFUdA	90	25-150
13C8_PFOA	97	25-150
13C8_PFOS	72	25-150
13C8_PFOSA	82	10-150
13C9_PFNA	95	25-150
d-EtFOSA	94	10-150
d5-EtFOSAA	106	25-150
d9-EtFOSE	90	10-150
d-MeFOSA	85	10-150
d3-MeFOSAA	104	25-150
d7-MeFOSE	90	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  $J = Estimated \ result < LOQ \ and \ge DL$  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

QC Summary

#### PFAS by LC/MS/MS - MB

Sample ID: WQ15147-001 Batch: 15147 Analytical Method: PFAS by ID SOP

Matrix: Aqueous Prep Method: SOP SPE

Prep Date: 09/13/2021 1227

Parameter	Result	Q Dil	LOQ	MDL	Units	Analysis Date
9CI-PF3ONS	ND	1	8.0	0.48	ng/L	09/14/2021 1800
11CI-PF3OUdS	ND	1	8.0	0.66	ng/L	09/14/2021 1800
8:2 FTS	ND	1	8.0	1.6	ng/L	09/14/2021 1800
6:2 FTS	ND	1	8.0	2.0	ng/L	09/14/2021 1800
4:2 FTS	ND	1	8.0	0.87	ng/L	09/14/2021 1800
GenX	ND	1	8.0	2.1	ng/L	09/14/2021 1800
ADONA	ND	1	8.0	0.48	ng/L	09/14/2021 1800
EtFOSA	ND	1	8.0	1.4	ng/L	09/14/2021 1800
EtFOSAA	ND	1	8.0	0.75	ng/L	09/14/2021 1800
EtFOSE	ND	1	8.0	0.95	ng/L	09/14/2021 1800
MeFOSA	ND	1	16	1.3	ng/L	09/14/2021 1800
MeFOSAA	ND	1	8.0	0.93	ng/L	09/14/2021 1800
MeFOSE	ND	1	8.0	1.3	ng/L	09/14/2021 1800
PFBS	ND	1	4.0	0.41	ng/L	09/14/2021 1800
PFDS	ND	1	4.0	0.78	ng/L	09/14/2021 1800
PFHpS	ND	1	4.0	0.50	ng/L	09/14/2021 1800
PFNS	ND	1	4.0	0.71	ng/L	09/14/2021 1800
PFOSA	ND	1	4.0	0.61	ng/L	09/14/2021 1800
PFPeS	ND	1	4.0	0.59	ng/L	09/14/2021 1800
PFDOS	ND	1	8.0	1.0	ng/L	09/14/2021 1800
PFHxS	ND	1	4.0	0.55	ng/L	09/14/2021 1800
PFBA	ND	1	4.0	0.60	ng/L	09/14/2021 1800
PFDA	ND	1	4.0	0.52	ng/L	09/14/2021 1800
PFDoA	ND	1	4.0	0.47	ng/L	09/14/2021 1800
PFHpA	ND	1	4.0	0.45	ng/L	09/14/2021 1800
PFHxA	ND	1	4.0	0.69	ng/L	09/14/2021 1800
PFNA	ND	1	4.0	0.46	ng/L	09/14/2021 1800
PFOA	ND	1	4.0	0.83	ng/L	09/14/2021 1800
PFPeA	ND	1	4.0	0.54	ng/L	09/14/2021 1800
PFTeDA	ND	1	4.0	0.60	ng/L	09/14/2021 1800
PFTrDA	ND	1	4.0	0.53	ng/L	09/14/2021 1800
PFUdA	ND	1	4.0	0.63	ng/L	09/14/2021 1800
PFOS	ND	1	4.0	2.0	ng/L	09/14/2021 1800
Surrogate	Q % Rec	Acceptance Limit			-	
13C2_4:2FTS	143	25-150				
13C2_6:2FTS	92	25-150				
13C2_8:2FTS	100	25-150				
13C2_PFDoA	115	25-150				
13C2_PFTeDA	126	25-150				
13C3_PFBS	114	25-150				
13C3_PFHxS	104	25-150				
13C3-HFPO-DA	125	25-150				
1000 111 1 0 0/4	123	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  $\geq$  DL

P = The RPD between two GC columns exceeds 40%

\* = RSD is out of criteria

+ = RPD is out of criteria

#### PFAS by LC/MS/MS - MB

Sample ID: WQ15147-001

Batch: 15147

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/13/2021 1227

Analytical Method: PFAS by ID SOP

Surrogate	Q % Rec	Acceptance Limit	
13C4_PFBA	111	25-150	
13C4_PFHpA	121	25-150	
13C5_PFHxA	123	25-150	
13C5_PFPeA	109	25-150	
13C6_PFDA	115	25-150	
13C7_PFUdA	118	25-150	
13C8_PFOA	119	25-150	
13C8_PFOS	128	25-150	
13C8_PFOSA	105	10-150	
13C9_PFNA	124	25-150	
d-EtFOSA	104	10-150	
d5-EtFOSAA	105	25-150	
d9-EtFOSE	108	10-150	
d-MeFOSA	107	10-150	
d3-MeFOSAA	110	25-150	
d7-MeFOSE	115	10-150	

LOQ = Limit of Quantitation

ND = Not detected at or above the DL

N = Recovery is out of criteria

DL = Detection Limit

 $J = Estimated result < LOQ and <math>\geq DL$ 

P = The RPD between two GC columns exceeds 40%

\* = RSD is out of criteria

+ = RPD is out of criteria

#### PFAS by LC/MS/MS - LCS

Sample ID: WQ15147-002 Batch: 15147 Analytical Method: PFAS by ID SOP Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/13/2021 1227

	Spike					
Parameter	Amount (ng/L)	Result (ng/L) Q	Dil	% Rec	%Rec Limit	Analysis Date
9CI-PF3ONS	_		 1	88	50-150	
11CI-PF3OUdS	15 15	13 13	1	88	50-150	09/14/2021 1810 09/14/2021 1810
8:2 FTS	15	13	1	83	50-150	09/14/2021 1810
6:2 FTS	15	15	1	os 102	50-150	09/14/2021 1810
	15	15				
4:2 FTS			1	100	50-150	09/14/2021 1810
GenX	32	25	1	79	50-150	09/14/2021 1810
ADONA	15 14	16	1 1	104	50-150	09/14/2021 1810 09/14/2021 1810
EtFOSA EtFOSAA	16	17		105	50-150	09/14/2021 1810
	16	16	1	103	50-150	
EtFOSE	16	16	1	102	50-150	09/14/2021 1810
MeFOSA	16	18	1	114	50-150	09/14/2021 1810
MeFOSAA	16	16	1	97	50-150	09/14/2021 1810
MeFOSE	16	14	1	89	50-150	09/14/2021 1810
PFBS	14	15	1	103	50-150	09/14/2021 1810
PFDS	15	13	1	87	50-150	09/14/2021 1810
PFHpS	15	16	1	104	50-150	09/14/2021 1810
PFNS	15	15	1	96	50-150	09/14/2021 1810
PFOSA	16	16	1	103	50-150	09/14/2021 1810
PFPeS	15	16	1	107	50-150	09/14/2021 1810
PFDOS	15	15	1	98	50-150	09/14/2021 1810
PFHxS	15	14	1	99	50-150	09/14/2021 1810
PFBA	16	17	1	107	50-150	09/14/2021 1810
PFDA	16	16	1	99	50-150	09/14/2021 1810
PFDoA	16	18	1	112	50-150	09/14/2021 1810
PFHpA	16	17	1	106	50-150	09/14/2021 1810
PFHxA	16	15	1	95	50-150	09/14/2021 1810
PFNA	16	16	1	97	50-150	09/14/2021 1810
PFOA	16	16	1	103	50-150	09/14/2021 1810
PFPeA	16	15	1	94	50-150	09/14/2021 1810
PFTeDA	16	18	1	112	50-150	09/14/2021 1810
PFTrDA	16	16	1	103	50-150	09/14/2021 1810
PFUdA	16	18	1	110	50-150	09/14/2021 1810
PFOS	15	15	1	101	50-150	09/14/2021 1810
Surrogate	Q % Rec	Acceptance Limit				
13C2_4:2FTS	141	25-150				
13C2_6:2FTS	91	25-150				
13C2_8:2FTS	104	25-150				
13C2_PFDoA	102	25-150				
13C2_PFTeDA	117	25-150				
13C3_PFBS	117	25-150				
13C3_PFHxS	108	25-150				
13C3-HFPO-DA	133	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

#### PFAS by LC/MS/MS - LCS

Sample ID: WQ15147-002 Batch: 15147 Analytical Method: PFAS by ID SOP Matrix: Aqueous
Prep Method: SOP SPE

Prep Date: 09/13/2021 1227

Surrogate	Q % Rec	Acceptance Limit
13C4_PFBA	112	25-150
13C4_PFHpA	107	25-150
13C5_PFHxA	117	25-150
13C5_PFPeA	125	25-150
13C6_PFDA	122	25-150
13C7_PFUdA	104	25-150
13C8_PFOA	119	25-150
13C8_PFOS	111	25-150
13C8_PFOSA	99	10-150
13C9_PFNA	128	25-150
d-EtFOSA	90	10-150
d5-EtFOSAA	112	25-150
d9-EtFOSE	108	10-150
d-MeFOSA	101	10-150
d3-MeFOSAA	107	25-150
d7-MeFOSE	113	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

Chain of Custody and Miscellaneous Documents

Document Number: ME003N2-01

DISTRIBUTION: WHITE & YELLOW-Rollinn to laboratory with Sample(s), Philic Field/Client Copy

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	Analytica	
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PACE ANALYTICAL SERVICES, LLC 106 Vantage Point Drivo · Wost Columbia, SC 29172 Telephone No. 803-791-9700 Fax No. 803-791-9111 www.pacelabs.com

Number 124339

Pace Analytical

#### 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: JSM / 08/24/2021 Lot #: WH24025
Means of receipt:	Pace Cicint UPS FedEx Other:
Yes V No	1. Were custody seals present on the cooler?
Yes No V	A 2. If custody seals were present, were they intact and unbroken?
pH Strip ID: NA	Chlorine Strip ID: NA Tested by: NA
Original temperature u	pon receipt / Derived (Corrected) temperature upon receipt
4.2 /4.2 °C NA	NA °C NA /NA °C NA /NA °C
Method: [ Temperatu	re Blank Against Bottles IR Gun ID: 5 IR Gun Correction Factor: 0 °C
Method of coolant:	Wet loc  ice Packs  Dry ice  None
Yes No V	A 3. If temperature of any cooler exceeded 6.0°C, was Project Manager Notified?
✓ Yes No No	PM was Notified by: phone / email / face-to-face (circle one).
✓ Yes No	A 4. Is the commercial courier's packing slip attached to this form?
✓ Yes No	Were proper custody procedures (refinquished/received) followed?      Were sample IDe listed on the COCC
✓ Yes No	6. Were sample IDs listed on the COC?
✓ Yes No	7. Were sample IDs listed on all sample containers?  8. Was collection date & time listed on the COC?
✓ Yes No	9. Was collection date & time listed on all sample containers?    9. Was collection date & time listed on all sample containers?
✓ Yes □ No	10. Did all container label information (ID, date, time) agree with the COC?
✓ Yes No	11. Were tests to be performed listed on the COC?
100	
Yes No	12. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
✓ Yes  No	13. Was adequate sample volume available?
Yes ✓ No	14. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
Yes V No	15. Were any samples containers missing/excess (circle one) samples Not listed on COC?
☐ Yes ☐ No ☑N	16. For VOA and RSK-175 samples, were bubbles present >"pea-size" (¼"or 6mm in diameter)
	In any of the VOA vials?
Yes No VN	[A 17. Were all DRO/metals/nutrient samples received at a pH of < 2?
L Yes L No ✓N	18. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
Yes No VN	residual chlorine?
☐ Yes ☐ No ☑N	20. Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc)
	correctly transcribed from the COC into the comment section in LIMS?
Yes ✓ No	21. 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	MAmL of circle one: H2SO4, HNO3, HCI, NaOH using SR # NA .
Time of preservation N.	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	wore received with TRC > 0.5 mg/L (If #19 is no ) and were
adjusted accordingly in	sample receiving with sodium thiosulfate (Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> ) with Shealy ID: NA
SR barcode labels applie	ed by: JSM Date: 08/24/2021
Comments:	
Constitution.	



## **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** 





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

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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<sub>s</sub> is on column concentration of target analyte in the sample (ng/L)
C<sub>is</sub> is concentration of internal standard in the sample (ng/L)
A<sub>s</sub> is peak response of target analyte in the sample
A<sub>is</sub> 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

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.

## 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)

## Detection Summary GZA GeoEnvironmental, Inc.

Lot Number: WJ23010 Project Name: OshKosh Corporation

Project Number: 20.0157080.00

Sample	e 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)

Client: GZA GeoEnvironmental, Inc.

Laboratory ID: WJ23010-001 Matrix: Aqueous

Description: WL-MW-1

Date Sampled:10/16/2021 1014

Project Name: OshKosh Corporation

Date Received: 10/20/2021

Project Number: 20.0157080.00

Run Prep Method 1 SOP SPE Analytical Method Dilution PFAS by ID SOP

Analysis Date Analyst 11/11/2021 1851 MMM

Prep Date

Batch 11/09/2021 1201 21762

9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3) 1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS) 1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS) 1H, 1H, 2H, 2H-perfluorohexane sulfonic acid (4:2 FTS) Hexafluoropropylene oxide dimer acid (GenX) 4,8-dioxa-3H-perfluorononanoic acid (ADONA) N-ethylperfluoro-1-octanesulfonamide (EtFOSA) N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSA) 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSA) 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) Perfluoro-1-butanesulfonic acid (PFBS) Perfluoro-1-decanesulfonic acid (PFDS) Perfluoro-1-heptanesulfonic acid (PFNS) Perfluoro-1-octanesulfonic acid (PFNS) Perfluoro-1-pentanesulfonic acid (PFPSS) Perfluoro-1-pentanesulfonic acid (PFPOS) Perfluoro-1-pentanesulfonic acid (PFPOS) Perfluoro-1-butanoic acid (PFDOS) Perfluorohexanesulfonic acid (PFDOS)	756426-58-1 763051-92-9 39108-34-4 27619-97-2	PFAS by ID SOP PFAS by ID SOP	ND ND		370 370	22	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS) 1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS) 1H, 1H, 2H, 2H-perfluorohexane sulfonic acid (4:2 FTS) Hexafluoropropylene oxide dimer acid (GenX) 4,8-dioxa-3H-perfluorononanoic acid (ADONA) N-ethylperfluoro-1-octanesulfonamide (EtFOSA) N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA) 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSA) N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA) 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) Perfluoro-1-butanesulfonic acid (PFBS) Perfluoro-1-decanesulfonic acid (PFDS) Perfluoro-1-nonanesulfonic acid (PFNS) Perfluoro-1-octanesulfonic acid (PFNS) Perfluoro-1-pentanesulfonic acid (PFPSS) Perfluoro-1-pentanesulfonic acid (PFDOS) Perfluorododecanesulfonic acid (PFDOS) Perfluorohexanesulfonic acid (PFHXS)	39108-34-4	•	ND		270			
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS) 1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS) Hexafluoropropylene oxide dimer acid (GenX) 4,8-dioxa-3H-perfluorononanoic acid (ADONA) N-ethylperfluoro-1-octanesulfonamide (EtFOSA) N-ethylperfluoro-1-octanesulfonamido-acetic acid (EtFOSAA) 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSA) N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA) 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) Perfluoro-1-butanesulfonic acid (PFBS) Perfluoro-1-decanesulfonic acid (PFDS) Perfluoro-1-heptanesulfonic acid (PFNS) Perfluoro-1-octanesulfonic acid (PFNS) Perfluoro-1-pentanesulfonic acid (PFPSS) Perfluoro-1-pentanesulfonic acid (PFDOS) Perfluorododecanesulfonic acid (PFDOS) Perfluorohexanesulfonic acid (PFHXS)		DEAS by ID SOD			3/0	30	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)  Hexafluoropropylene oxide dimer acid (GenX)  4,8-dioxa-3H-perfluorononanoic acid (ADONA)  N-ethylperfluoro-1-octanesulfonamide (EtFOSA)  N-ethylperfluoro-1-octanesulfonamido-etic acid (EtFOSAA)  2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)  N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSA)  N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSAA)  2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)  Perfluoro-1-butanesulfonic acid (PFBS)  Perfluoro-1-decanesulfonic acid (PFDS)  Perfluoro-1-heptanesulfonic acid (PFNS)  Perfluoro-1-octanesulfonic acid (PFNS)  Perfluoro-1-octanesulfonic acid (PFOSA)  Perfluoro-1-pentanesulfonic acid (PFDOS)  Perfluoro-1-pentanesulfonic acid (PFDOS)  Perfluoro-1-pentanesulfonic acid (PFDOS)  Perfluoro-1-pentanesulfonic acid (PFDOS)  Perfluoro-1-butanoic acid (PFDOS)	27619-97-2	PFAS by ID SOP	ND		370	73	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)  4,8-dioxa-3H-perfluorononanoic acid (ADONA)  N-ethylperfluoro-1-octanesulfonamide (EtFOSA)  N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)  2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)  N-methylperfluoro-1-octanesulfonamido (MeFOSA)  N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)  2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)  Perfluoro-1-butanesulfonic acid (PFBS)  Perfluoro-1-decanesulfonic acid (PFDS)  Perfluoro-1-heptanesulfonic acid (PFNS)  Perfluoro-1-octanesulfonic acid (PFNS)  Perfluoro-1-octanesulfonic acid (PFOSA)  Perfluoro-1-pentanesulfonic acid (PFPSS)  Perfluoro-1-pentanesulfonic acid (PFDOS)  Perfluoro-1-pentanesulfonic acid (PFDOS)  Perfluorohexanesulfonic acid (PFDOS)	2,0., ,, 2	PFAS by ID SOP	14000		370	92	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA) N-ethylperfluoro-1-octanesulfonamide (EtFOSA) N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA) 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) N-methylperfluoro-1-octanesulfonamido (MeFOSA) N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA) 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) Perfluoro-1-butanesulfonic acid (PFBS) Perfluoro-1-decanesulfonic acid (PFDS) Perfluoro-1-heptanesulfonic acid (PFHPS) Perfluoro-1-nonanesulfonic acid (PFNS) Perfluoro-1-pentanesulfonic acid (PFOSA) Perfluoro-1-pentanesulfonic acid (PFDOS) Perfluoro-1-pentanesulfonic acid (PFDOS) Perfluoro-n-butanoic acid (PFDOS)	757124-72-4	PFAS by ID SOP	ND		370	40	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA) N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA) 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) N-methylperfluoro-1-octanesulfonamido (MeFOSA) N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA) 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) Perfluoro-1-butanesulfonic acid (PFBS) Perfluoro-1-decanesulfonic acid (PFDS) Perfluoro-1-heptanesulfonic acid (PFHpS) Perfluoro-1-nonanesulfonic acid (PFNS) Perfluoro-1-octanesulfonic acid (PFOSA) Perfluoro-1-pentanesulfonic acid (PFPOS) Perfluoro-1-pentanesulfonic acid (PFPOS) Perfluoro-1-pentanesulfonic acid (PFDOS) Perfluoro-n-butanoic acid (PFBA)	13252-13-6	PFAS by ID SOP	ND		370	95	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA) 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) N-methylperfluoro-1-octanesulfonamide (MeFOSA) N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA) 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) Perfluoro-1-butanesulfonic acid (PFBS) Perfluoro-1-decanesulfonic acid (PFDS) Perfluoro-1-heptanesulfonic acid (PFHPS) Perfluoro-1-nonanesulfonic acid (PFNS) Perfluoro-1-octanesulfonic acid (PFOSA) Perfluoro-1-pentanesulfonic acid (PFPSS) Perfluoro-1-pentanesulfonic acid (PFPSS) Perfluoro-1-pentanesulfonic acid (PFDOSS) Perfluoro-1-pentanesulfonic acid (PFDOSS) Perfluoro-1-pentanesulfonic acid (PFDOSS)	919005-14-4	PFAS by ID SOP	ND		370	22	ng/L	1
2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) N-methylperfluoro-1-octanesulfonamide (MeFOSA) N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA) 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) Perfluoro-1-butanesulfonic acid (PFBS) Perfluoro-1-decanesulfonic acid (PFDS) Perfluoro-1-heptanesulfonic acid (PFHpS) Perfluoro-1-nonanesulfonic acid (PFNS) Perfluoro-1-octanesulfonamide (PFOSA) Perfluoro-1-pentanesulfonic acid (PFPSS) Perfluoro-1-pentanesulfonic acid (PFPSS) Perfluoro-1-pentanesulfonic acid (PFDOSS) Perfluoro-1-butanoic acid (PFDOSS)	4151-50-2	PFAS by ID SOP	ND		370	62	ng/L	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA) N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA) 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) Perfluoro-1-butanesulfonic acid (PFBS) Perfluoro-1-decanesulfonic acid (PFDS) Perfluoro-1-heptanesulfonic acid (PFHpS) Perfluoro-1-nonanesulfonic acid (PFNS) Perfluoro-1-octanesulfonamide (PFOSA) Perfluoro-1-pentanesulfonic acid (PFPeS) Perfluorododecanesulfonic acid (PFDOS) Perfluorohexanesulfonic acid (PFHxS) Perfluoro-n-butanoic acid (PFBA)	2991-50-6	PFAS by ID SOP	ND		370	34	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA) 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) Perfluoro-1-butanesulfonic acid (PFBS) Perfluoro-1-decanesulfonic acid (PFDS) Perfluoro-1-heptanesulfonic acid (PFHpS) Perfluoro-1-nonanesulfonic acid (PFNS) Perfluoro-1-octanesulfonic acid (PFOSA) Perfluoro-1-pentanesulfonic acid (PFPSS) Perfluoro-1-pentanesulfonic acid (PFDOS) Perfluoro-nodecanesulfonic acid (PFDOS) Perfluoro-nobutanoic acid (PFBA)	1691-99-2	PFAS by ID SOP	ND		370	44	ng/L	1
2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) Perfluoro-1-butanesulfonic acid (PFBS) Perfluoro-1-decanesulfonic acid (PFDS) Perfluoro-1-heptanesulfonic acid (PFHpS) Perfluoro-1-nonanesulfonic acid (PFNS) Perfluoro-1-octanesulfonamide (PFOSA) Perfluoro-1-pentanesulfonic acid (PFPeS) Perfluorododecanesulfonic acid (PFDOS) Perfluorohexanesulfonic acid (PFHXS) Perfluoron-butanoic acid (PFBA)	31506-32-8	PFAS by ID SOP	ND		730	58	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS) Perfluoro-1-decanesulfonic acid (PFDS) Perfluoro-1-heptanesulfonic acid (PFHpS) Perfluoro-1-nonanesulfonic acid (PFNS) Perfluoro-1-octanesulfonamide (PFOSA) Perfluoro-1-pentanesulfonic acid (PFPeS) Perfluorododecanesulfonic acid (PFDOS) Perfluorohexanesulfonic acid (PFHxS) Perfluoro-n-butanoic acid (PFBA)	2355-31-9	PFAS by ID SOP	ND		370	43	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS) Perfluoro-1-heptanesulfonic acid (PFHpS) Perfluoro-1-nonanesulfonic acid (PFNS) Perfluoro-1-octanesulfonamide (PFOSA) Perfluoro-1-pentanesulfonic acid (PFPeS) Perfluorododecanesulfonic acid (PFDOS) Perfluorohexanesulfonic acid (PFHxS) Perfluoro-n-butanoic acid (PFBA)	24448-09-7	PFAS by ID SOP	ND		370	59	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS) Perfluoro-1-nonanesulfonic acid (PFNS) Perfluoro-1-octanesulfonamide (PFOSA) Perfluoro-1-pentanesulfonic acid (PFPeS) Perfluorododecanesulfonic acid (PFDOS) Perfluorohexanesulfonic acid (PFHxS) Perfluoro-n-butanoic acid (PFBA)	375-73-5	PFAS by ID SOP	44	J	180	19	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS) Perfluoro-1-octanesulfonamide (PFOSA) Perfluoro-1-pentanesulfonic acid (PFPeS) Perfluorododecanesulfonic acid (PFDOS) Perfluorohexanesulfonic acid (PFHxS) Perfluoro-n-butanoic acid (PFBA)	335-77-3	PFAS by ID SOP	ND		180	36	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA) Perfluoro-1-pentanesulfonic acid (PFPeS) Perfluorododecanesulfonic acid (PFDOS) Perfluorohexanesulfonic acid (PFHxS) Perfluoro-n-butanoic acid (PFBA)	375-92-8	PFAS by ID SOP	ND		180	23	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS) Perfluorododecanesulfonic acid (PFDOS) Perfluorohexanesulfonic acid (PFHxS) Perfluoro-n-butanoic acid (PFBA)	68259-12-1	PFAS by ID SOP	ND		180	33	ng/L	1
Perfluorododecanesulfonic acid (PFDOS) Perfluorohexanesulfonic acid (PFHxS) Perfluoro-n-butanoic acid (PFBA)	754-91-6	PFAS by ID SOP	ND		180	28	ng/L	1
Perfluorohexanesulfonic acid (PFHxS) Perfluoro-n-butanoic acid (PFBA)	2706-91-4	PFAS by ID SOP	ND		180	27	ng/L	1
Perfluorohexanesulfonic acid (PFHxS) Perfluoro-n-butanoic acid (PFBA)	79780-39-5	PFAS by ID SOP	ND		370	48	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	355-46-4	PFAS by ID SOP	45	J	180	25	ng/L	1
	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
		otance mits						
		-150						_
		-150						
13C2_8:2FTS	94 25	-150						
13C2_PFDoA	90 25	-150						
13C2_PFTeDA	96 25	-150						
13C3_PFBS	105 25	-150						
13C3_PFHxS	105 25	100						
13C3-HFPO-DA		-150						

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

13C4\_PFBA

LOQ = Limit of Quantitation

H = Out of holding time

ND = Not detected at or above the DL

106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

B = Detected in the method blank

W = Reported on wet weight basis

N = Recovery is out of criteria

105

25-150

E = Quantitation of compound exceeded the calibration range

P = The RPD between two GC columns exceeds 40%

DL = Detection Limit

 $J = Estimated \ result < LOQ \ and \ge DL$ 

Q = Surrogate failure

L = LCS/LCSD failure

S = MS/MSD failure

Client: GZA GeoEnvironmental, Inc.

Description: WL-MW-1 Date Sampled:10/16/2021 1014 Laboratory ID: WJ23010-001

Matrix: Aqueous

Project Name: OshKosh Corporation

Date Received: 10/20/2021

d7-MeFOSE

Project Number: 20.0157080.00

107

Surrogate	Run 1 A Q % 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

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 DL = Detection Limit P = The RPD between two GC columns exceeds 40%

 $J = Estimated \ result < LOQ \ and \ge DL$ 

Q = Surrogate failure L = LCS/LCSD failure S = MS/MSD failure

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

Client: GZA GeoEnvironmental, Inc.

Laboratory ID: WJ23010-002 Matrix: Aqueous

Description: Field Blank Date Sampled:10/16/2021 1024

Project Name: OshKosh Corporation

Date Received: 10/20/2021 Project Number: 20.0157080.00

Run Prep Method 1 SOP SPE Analytical Method Dilution PFAS by ID SOP

Analysis Date Analyst 11/10/2021 1910 MMM

Prep Date

Batch

11/09/2021 1201 21762

Parameter	CAS Number	Analytical Method	Result Q	LOQ	MDL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-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-butanesulfonic 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
		ptance mits					
13C2_4:2FTS	121 25	-150					
13C2_6:2FTS	140 25	5-150					
13C2_8:2FTS	119 25	5-150					
13C2_PFDoA	106 25	5-150					
13C2_PFTeDA	105 25	5-150					
13C3_PFBS	115 25	5-150					
13C3_PFHxS	114 25	5-150					
13C3-HFPO-DA	147 25	5-150					
13C4_PFBA	114 25	5-150					

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

LOQ = Limit of Quantitation

H = Out of holding time

ND = Not detected at or above the DL

106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

B = Detected in the method blank

W = Reported on wet weight basis

N = Recovery is out of criteria

E = Quantitation of compound exceeded the calibration range

P = The RPD between two GC columns exceeds 40%

DL = Detection Limit

 $J = Estimated \ result < LOQ \ and \ge DL$ 

Q = Surrogate failure

L = LCS/LCSD failure

S = MS/MSD failure

Client: GZA GeoEnvironmental, Inc.

Laboratory ID: WJ23010-002

Matrix: Aqueous

Description: Field Blank Date Sampled:10/16/2021 1024

Project Name: OshKosh Corporation

Date Received: 10/20/2021

Project Number: 20.0157080.00

	Surrogate	Run 1 Ac Q % Recovery	cceptance 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 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  $J = Estimated \ result < LOQ \ and \ge DL$  Q = Surrogate failure L = LCS/LCSD failure S = MS/MSD failure

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

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QC Summary

#### PFAS by LC/MS/MS - MB

Sample ID: WQ21762-001 Batch: 21762 Analytical Method: PFAS by ID SOP Matrix: Aqueous Prep Method: SOP SPE

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
PFTrDA	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						
13C3-ULLO-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

 $J = Estimated result < LOQ and <math>\geq DL$ 

P = The RPD between two GC columns exceeds 40%

\* = RSD is out of criteria

+ = RPD is out of criteria

#### PFAS by LC/MS/MS - MB

Sample ID: WQ21762-001 Batch: 21762 Analytical Method: PFAS by ID SOP

Matrix: Aqueous Prep Method: SOP SPE

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  $\geq$  DL

P = The RPD between two GC columns exceeds 40%

\* = RSD is out of criteria

+ = RPD is out of criteria

#### PFAS by LC/MS/MS - LCS

Sample ID: WQ21762-002 Batch: 21762 Analytical Method: PFAS by ID SOP Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/09/2021 1201

	Spike Amount	Result			%Rec	
Parameter	(ng/L)	(ng/L) Q	Dil	% 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 PFDoA	16 16	17 16	1 1	103 102	50-150 50-150	11/10/2021 1817 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
PFTrDA	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 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%

<sup>\* =</sup> RSD is out of criteria

<sup>+ =</sup> RPD is out of criteria

#### PFAS by LC/MS/MS - LCS

Sample ID: WQ21762-002 Batch: 21762

Analytical Method: PFAS by ID SOP

Matrix: Aqueous Prep Method: SOP SPE

Prep Date: 11/09/2021 1201

Surrogate	Q % Rec	Acceptance Limit	
13C4_PFBA	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

Chain of Custody and Miscellaneous Documents

Document Number: ME003N2-01

The first fi	Pace Analytical"	PACE ANALYTICAL SERVICES, LLC 106 Variage Point Drive - West Columbia, SC 29172 Telephone No. 803-791-9700 Fax No. 803-791-9111 www.pacelebs.com	Number	. 127141
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#### 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 #: WJ23010	
Means of receipt: Pace Client UPS / FedEx Other:	_
Yes No Li Were custody seals present on the cooler?	-
Yes No VNA 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	
Marked Transfer of the second	
Method of coolant: ✓ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None	
Yes No 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?	
Yes No 7. Were sample IDs listed on all sample containers?	_
Yes No 8. Was collection date & time listed on the COC?	_
Yes No 9. Was collection date & time listed on all sample containers?	_
Yes No 10, Did all container label information (ID, date, time) agree with the COC?	_
✓ Yes No 11; Were tests to be performed listed on the COC?	_
Yes No 12. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?	
✓ Yes   No 13: Was adequate sample volume available?	-
Yes No 14. Were all samples received within ½ the holding time or 48 hours, whichever comes first?	_
Yes No 15: Were any samples containers missing/excess (circle one) samples Not listed on COC?	
16 For VOA and DCV 125 to 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	_
in any of the VOA viais?	
Yes No ✓ NA 17. Were all DRO/metals/nutrient samples received at a pH of < 2?  Yes No ✓ NA 18. Were all examples received at a pH > 12 and a 16 document of the samples received at a pH of < 2?	_
and symmetric are symmetric at a pri > 12 and suring samples received at a pri > 07	
Yes No No NA 19. Were all applicable NH <sub>2</sub> /TKN/cyanide/phenol/625,1/608.3 (< 0.5mg/L) samples free of residual chlorine?	
Yes No No 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?	٦
✓ Yes No 21. Was the quote number listed on the container label? If yes, Quote # 23431	_
and the data statement laber: If yes, Quite #	
preserved of with neglespace.)	-1
Sample(s) NA were received incorrectly preserved and were adjusted accordingly	
in sample receiving with NA mL of circle one: 1/2504, HNO3, HCl, NaOH using SR # NA  Time of preservation NA liftmore than one preservative is needed placed note in the company half.	- 1
Time of preservation NA . If more than one preservative is needed, please note in the comments below.	
Sample(s) NA were received with hubbles >6 mm in diameter.	٦
Samples(s) NA were received with TRC > 0.5 mg/L (if #19 is $n\sigma$ ) and were	ᅦ
adjusted accordingly in sample receiving with sodium thiosulfate (Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> ) with Shealy ID: NA	ı
SR barcode labels applied by: IRG2 Date: 10/22/2021	1
Comments:	
	_
	_
	-



#### **Report of Analysis**

**GZA GeoEnvironmental, Inc.** 

17975 West Sarah Lane, Suite 100 Brookfield, WI 53045 Attention: Kevin Hedinger

Project Name: Oshkosh Corp-West Plant

Project Number: 20.0157080.00

Lot Number: XH08006

Date Completed:09/08/2022

Kathy Smith

09/09/2022 12:19 PM Approved and released by: Project Manager II: **Kathy E. Smith** 





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

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SC DHEC No: 32010001

NELAC No: E87653

NC DENR No: 329

NC Field Parameters No: 5639

## Case Narrative GZA GeoEnvironmental, Inc. Lot Number: XH08006

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:

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,

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

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

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: 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.

The method blank associated with batch 52513 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: XH08006-001. This sample did not contain any target analytes over the LOQ; therefore, re-extraction and/or re-analysis was not performed.

Surrogate recovery for the following samples was outside the upper control limit: XH08006-003, XH08006-005, XH08006-006, XH08006-007. These samples did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

The MS/MSD associated with sample XH08006-001 had compounds recovered outside of the acceptance limits. The LCS was recovered within the required acceptance limits; therefore, this demonstrates a matrix effect and data quality is not impacted.

## Sample Summary GZA GeoEnvironmental, Inc.

Lot Number: XH08006

Project Name: Oshkosh Corp-West Plant Project Number: 20.0157080.00

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	WL-MW-1	Aqueous	08/03/2022 1218	08/05/2022
002	WL-MW-2	Aqueous	08/03/2022 1129	08/05/2022
003	WL-MW-3	Aqueous	08/03/2022 1043	08/05/2022
004	WL-MW-4	Aqueous	08/03/2022 1052	08/05/2022
005	WL-FB-1	Aqueous	08/03/2022 1200	08/05/2022
006	WL-EQ-1	Aqueous	08/03/2022 1211	08/05/2022
007	Trip	Aqueous	08/03/2022	08/05/2022

(7 samples)

### Detection Summary GZA GeoEnvironmental, Inc.

Lot Number: XH08006

Project Name: Oshkosh Corp-West Plant Project Number: 20.0157080.00

Sample	e Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	WL-MW-1	Aqueous	6:2 FTS	PFAS by ID	7600	В	ng/L	6
001	WL-MW-1	Aqueous	4:2 FTS	PFAS by ID	2.5	JQ	ng/L	6
001	WL-MW-1	Aqueous	PFPeS	PFAS by ID	4.6		ng/L	6
001	WL-MW-1	Aqueous	PFHxS	PFAS by ID	34		ng/L	6
001	WL-MW-1	Aqueous	PFBA	PFAS by ID	850		ng/L	6
001	WL-MW-1	Aqueous	PFHpA	PFAS by ID	590		ng/L	6
001	WL-MW-1	Aqueous	PFHxA	PFAS by ID	2100		ng/L	6
001	WL-MW-1	Aqueous	PFNA	PFAS by ID	5.6		ng/L	6
001	WL-MW-1	Aqueous	PFOA	PFAS by ID	38		ng/L	6
001	WL-MW-1	Aqueous	PFPeA	PFAS by ID	6100		ng/L	6
001	WL-MW-1	Aqueous	PFOS	PFAS by ID	9.9		ng/L	6
003	WL-MW-3	Aqueous	PFBS	PFAS by ID	0.73	J	ng/L	10
003	WL-MW-3	Aqueous	PFBA	PFAS by ID	5.4		ng/L	10
003	WL-MW-3	Aqueous	PFHxA	PFAS by ID	1.1	J	ng/L	10
003	WL-MW-3	Aqueous	PFOA	PFAS by ID	1.1	J	ng/L	10
003	WL-MW-3	Aqueous	PFPeA	PFAS by ID	2.9	J	ng/L	10
004	WL-MW-4	Aqueous	PFBS	PFAS by ID	0.95	J	ng/L	12
004	WL-MW-4	Aqueous	PFBA	PFAS by ID	3.7		ng/L	12

(18 detections)

Client: GZA GeoEnvironmental, Inc.

Laboratory ID: XH08006-001

Description: WL-MW-1

Date Received: 08/05/2022

Project Name: Oshkosh Corp-West Plant

SOP SPE

Matrix: Aqueous

Date Sampled:08/03/2022 1218

Project Number: 20.0157080.00

1

50

Run Prep Method 1 SOP SPE

2

13C3\_PFBS

13C3\_PFHxS

13C3-HFPO-DA

H = Out of holding time

LOQ = Limit of Quantitation

ND = Not detected at or above the DL

Analytical Method Dilution PFAS by ID SOP PFAS by ID SOP

Analysis Date Analyst 08/31/2022 1412 ALM 09/02/2022 1619 ALM

Prep Date Batch 08/29/2022 1015 52513 08/29/2022 1015 52513

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	MDL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	7600	В	350	88	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	2.5	JQ	7.0	0.77	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.43	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	ND		7.0	1.2	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.66	ng/L	1
2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)	1691-99-2	PFAS by ID SOP	ND		7.0	0.84	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		7.0	0.82	ng/L	1
2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)	24448-09-7	PFAS by ID SOP	ND		7.0	1.1	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND	S	3.5	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.63	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	4.6		3.5	0.52	ng/L	1
Perfluorododecanesulfonic acid (PFDOS)	79780-39-5	PFAS by ID SOP	ND		7.0	0.92	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	34		3.5	0.49	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	850		180	26	ng/L	2
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	0.42	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	590		180	20	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2100		180	30	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	5.6		3.5	0.41	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	38		3.5	0.73	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	6100		180	24	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	9.9		3.5	1.8	ng/L	1
			un 2 Ac ecovery	ceptance Limits	)			
13C2_4:2FTS N 2	226 25	-150	129	25-150				
13C2_6:2FTS	141 25	-150	123	25-150				
13C2_8:2FTS	106 25	-150	126	25-150				
13C2_PFDoA	96 25	-150	124	25-150				
13C2_PFTeDA	101 25	-150	118	25-150				

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

B = Detected in the method blank

W = Reported on wet weight basis

N = Recovery is out of criteria

88

96

82

25-150

25-150

25-150

E = Quantitation of compound exceeded the calibration range

P = The RPD between two GC columns exceeds 40%

121

111

118

25-150

25-150

25-150

DL = Detection Limit

J = Estimated result < LOQ and  $\geq$  DL

Q = Surrogate failure

L = LCS/LCSD failure

S = MS/MSD failure

Client: GZA GeoEnvironmental, Inc.

Date Sampled:08/03/2022 1218

Laboratory ID: XH08006-001

Matrix: Aqueous

Description: WL-MW-1

Project Name: Oshkosh Corp-West Plant

Date Received: 08/05/2022

Project Number: 20.0157080.00

Surrogate	Q %	Run 1 Recovery	Acceptance Limits	Q	Run 2 A % Recovery	cceptance Limits		
13C4_PFBA		41	25-150		125	25-150		
13C4_PFHpA		97	25-150		128	25-150		
13C5_PFHxA		73	25-150		120	25-150		
13C5_PFPeA		41	25-150		121	25-150		
13C6_PFDA		102	25-150		120	25-150		
13C7_PFUdA		98	25-150		124	25-150		
13C8_PFOA		103	25-150		122	25-150		
13C8_PFOS		97	25-150		121	25-150		
13C8_PFOSA		101	10-150		123	10-150		
13C9_PFNA		105	25-150		123	25-150		
d-EtFOSA		90	10-150		112	10-150		
d5-EtFOSAA		104	25-150		127	25-150		
d9-EtFOSE		93	10-150		129	10-150		
d-MeFOSA		73	10-150		114	10-150		
d3-MeFOSAA		100	25-150		126	25-150		
d7-MeFOSE		91	10-150		123	10-150		

LOQ = Limit of Quantitation ND = Not detected at or above the DL H = Out of holding time

N = Recovery is out of criteria W = Reported on wet weight basis

P = The RPD between two GC columns exceeds 40%

 $J = Estimated \ result < LOQ \ and \ge DL$ 

Q = Surrogate failure L = LCS/LCSD failure S = MS/MSD failure

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

Client: GZA GeoEnvironmental, Inc.

Laboratory ID: XH08006-002 Matrix: Aqueous

Description: WL-MW-2

Date Sampled:08/03/2022 1129

Project Name: Oshkosh Corp-West Plant

Date Received: 08/05/2022

Project Number: 20.0157080.00

CAS

Run Prep Method SOP SPE Analytical Method Dilution PFAS by ID SOP

Analysis Date Analyst 08/31/2022 1434 ALM

Analytical

Prep Date 08/29/2022 1015 52513

Batch

Publishmentandeanthurora 3 consonena i Sulfonia cadi (PCEPERONS)   7.646 28-81   PFAS by ID SOP   NO   7.0   0.58   ng/L   1   1   1   1   1   1   1   1   1	Parameter	Number	Method	Result Q	LOQ	MDL	Units	Run
H. H. H. 2H. 2H perfluorodecane sulfonic acid (62 PTS)   39108 34 4   PFAS by ID SOP   ND   7.0   1.4   ng/L   1   H. H. 2H 2H-perfluorodecane sulfonic acid (62 PTS)   77619-772   PFAS by ID SOP   ND   7.0   1.7   ng/L   1   H. H. 2H 2H-perfluorodecane sulfonic acid (62 PTS)   77612-742   PFAS by ID SOP   ND   7.0   0.76   ng/L   1   Hosditurogrophy enc oxide dimer acid (GenX)   13252-136   PFAS by ID SOP   ND   7.0   0.76   ng/L   1   Hosditurogrophy encoded dimer acid (GenX)   13252-136   PFAS by ID SOP   ND   7.0   0.42   ng/L   1   N-ethylperfluoro-1-outanesulfornamide (EIFOSA)   1451-502   PFAS by ID SOP   ND   7.0   0.42   ng/L   1   N-ethylperfluoro-1-outanesulfornamide encode acid (EIFOSA)   2991-30-6   PFAS by ID SOP   ND   7.0   0.66   ng/L   1   N-ethylperfluoro-1-outanesulfornamide encode acid (EIFOSA)   3150-328   PFAS by ID SOP   ND   7.0   0.66   ng/L   1   N-ethylperfluoro-1-outanesulfornamide encode acid (EIFOSA)   3150-328   PFAS by ID SOP   ND   7.0   0.83   ng/L   1   N-ethylperfluoro-1-outanesulfornamide encode acid (MEOSA)   3150-328   PFAS by ID SOP   ND   7.0   0.91   ng/L   1   N-ethylperfluoro-1-outanesulfornamide encode acid (MEOSA)   3150-328   PFAS by ID SOP   ND   7.0   0.91   ng/L   1   N-ethylperfluoro-1-outanesulfornamide encode (MEOSA)   3150-328   PFAS by ID SOP   ND   7.0   0.91   ng/L   1   N-ethylperfluoro-1-outanesulfornamide acid (MEOSA)   3757-35   PFAS by ID SOP   ND   3.5   0.36   ng/L   1   N-ethylperfluoro-1-outanesulfornamide acid (MEOSA)   7549-16   PFAS by ID SOP   ND   3.5   0.64   ng/L   1   N-ethylperfluoro-1-outanesulfornamide acid (MEOSA)   7549-16   PFAS by ID SOP   ND   3.5   0.64   ng/L   1   N-ethylperfluoro-1-outanesulfornamide acid (MEOSA)   7549-16   PFAS by ID SOP   ND   3.5   0.64   ng/L   1   N-ethylperfluoro-1-outanesulfornamide acid (MEOSA)   7549-16   PFAS by ID SOP   ND   3.5   0.64   ng/L   1   N-ethylperfluoro-1-outanesulfornamide acid (MEOSA)   7549-16   PFAS by ID SOP   ND   3.5   0.46   ng/L   1   N-ethylperfluoro-1-outanesulfonic acid (M	9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	ND	7.0	0.42	ng/L	1
H. H. 2H. 2H perfluoroctane sulfonic acid (42 FTS)   2761 9 972   PFAS by ID SOP   ND   7.0   0.76   ng/L   1   1H.1H.12H; perfluorocneane sulfonic acid (42 FTS)   75712H 724   PFAS by ID SOP   ND   7.0   0.76   ng/L   1   48 disox3 H perfluoronaneane sulfonic acid (42 FTS)   75712H 724   PFAS by ID SOP   ND   7.0   0.42   ng/L   1   48 disox3 H perfluoronaneanic acid (ADONA)   91905 144   PFAS by ID SOP   ND   7.0   0.42   ng/L   1   1   1   1   1   1   1   1   1	${\it 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic\ acid\ (11Cl-PF3)}$	763051-92-9	PFAS by ID SOP	ND	7.0	0.58	ng/L	1
H.H.2H.2H-berfluorohexane sulfonic acid (42 FTS)	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	7.0	1.4	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	7.0	1.7	ng/L	1
A,8 doxa 3H perfluorononanoic acid (ADONA)   1919005-14-4   PAS by ID SOP   ND   7.0   0.42   ng/L   1   Nethypierfluoro1-octanesulfonamide (EIFOSA)   4151-90-5   PAS by ID SOP   ND   7.0   0.66   ng/L   1   2 Nethypierfluoro1-octanesulfonamide (EIFOSA)   3150-63-28   PAS by ID SOP   ND   7.0   0.68   ng/L   1   2 Nethypierfluoro1-octanesulfonamide (MeFOSA)   3150-63-28   PAS by ID SOP   ND   14   1.1   ng/L   1   2 Nethypierfluoro1-octanesulfonamide (MeFOSA)   3150-63-28   PAS by ID SOP   ND   14   1.1   ng/L   1   2 Nethypierfluoro1-octanesulfonamide (MeFOSA)   3353-31-9   PAS by ID SOP   ND   7.0   0.81   ng/L   1   2 Nethypierfluoro1-octanesulfonamide (MeFOSA)   3353-31-9   PAS by ID SOP   ND   7.0   0.81   ng/L   1   2 Nethypierfluoro1-octanesulfonamide (MeFOSA)   3353-31-9   PAS by ID SOP   ND   3.5   0.36   ng/L   1   2 Nethypierfluoro1-octanesulfonamide (MeFOSA)   3353-31-9   PAS by ID SOP   ND   3.5   0.36   ng/L   1   2 Nethypierfluoro1-octanesulfonamide (MeFOSA)   3757-35   PAS by ID SOP   ND   3.5   0.36   ng/L   1   2 Nethypierfluoro1-octanesulfonamide (MeFOSA)   3757-35   PAS by ID SOP   ND   3.5   0.48   ng/L   1   2 Nethypierfluoro1-octanesulfonamide (MeFOSA)   3759-35   PAS by ID SOP   ND   3.5   0.48   ng/L   1   2 Nethypierfluoro1-octanesulfonamide (MeFOSA)   3759-35   PAS by ID SOP   ND   3.5   0.62   ng/L   1   2 Nethypierfluoro1-octanesulfonamide (MeFOSA)   3759-35   PAS by ID SOP   ND   3.5   0.62   ng/L   1   2 Nethypierfluoro1-octanesulfonamide (MeFOSA)   3759-35   PAS by ID SOP   ND   3.5   0.62   ng/L   1   2 Nethypierfluoro1-octanesulfonamide (MeFOSA)   3759-35   PAS by ID SOP   ND   3.5   0.62   ng/L   1   2 Nethypierfluoro1-octanesulfonamide (MeFOSA)   3759-35   PAS by ID SOP   ND   3.5   0.62   ng/L   1   2 Nethypierfluoro1-octanesulfonic acid (MeFOSA)   3759-35   PAS by ID SOP   ND   3.5   0.62   ng/L   1   2 Nethypierfluoro1-octanesulfonic acid (MeFOSA)   3759-35   PAS by ID SOP   ND   3.5   0.62   ng/L   1   2 Nethypierfluoro1-octanesulfonic acid (MeFOSA)   3759-35   PAS by	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	7.0	0.76	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EIFOSA)	Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND	7.0	1.8	ng/L	1
Nethylperfluoro-1-octanesulfonamidacetic acid (EFOSA)	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND	7.0	0.42	ng/L	1
2-Nethylperfluoro-1-octanesulfonamide (BFOSA) 3150-32-8 PFAS by ID SOP ND 14 1.1 ng/L 1 N-methylperfluoro-1-octanesulfonamide (MeFOSA) 3150-32-8 PFAS by ID SOP ND 14 1.1 ng/L 1 2-N-methylperfluoro-1-octanesulfonamide (MeFOSA) 2355-31-9 PFAS by ID SOP ND 7,0 0.81 ng/L 1 2-N-methylperfluoro-1-octanesulfonamide (MeFOSA) 2355-31-9 PFAS by ID SOP ND 7,0 0.81 ng/L 1 2-N-methylperfluoro-1-octanesulfonamide (MeFOSA) 375-73-5 PFAS by ID SOP ND 3.5 0.36 ng/L 1 2-N-methylperfluoro-1-octanesulfona acid (PFBS) 375-73-5 PFAS by ID SOP ND 3.5 0.68 ng/L 1 Perfluoro-1-hotanesulfonic acid (PFDS) 375-73-8 PFAS by ID SOP ND 3.5 0.68 ng/L 1 Perfluoro-1-nonanesulfonic acid (PFHS) 754-72-8 PFAS by ID SOP ND 3.5 0.68 ng/L 1 Perfluoro-1-nonanesulfonic acid (PFNS) 66259-12-1 PFAS by ID SOP ND 3.5 0.62 ng/L 1 Perfluoro-1-nonanesulfonic acid (PFNS) 754-91-6 PFAS by ID SOP ND 3.5 0.54 ng/L 1 Perfluoro-1-nonanesulfonic acid (PFNS) 7780-39-5 PFAS by ID SOP ND 3.5 0.52 ng/L 1 Perfluoro-1-nonanesulfonic acid (PFNS) 7780-39-5 PFAS by ID SOP ND 3.5 0.52 ng/L 1 Perfluoro-1-nonanesulfonic acid (PFNS) 7780-39-5 PFAS by ID SOP ND 3.5 0.52 ng/L 1 Perfluoro-1-nonanoic acid (PFNS) 7780-39-5 PFAS by ID SOP ND 3.5 0.52 ng/L 1 Perfluoro-1-nonanoic acid (PFNS) 7780-39-5 PFAS by ID SOP ND 3.5 0.52 ng/L 1 Perfluoro-n-bulanoic acid (PFNA) 758-24 PFAS by ID SOP ND 3.5 0.52 ng/L 1 Perfluoro-n-hetanoic acid (PFNA) 758-24 PFAS by ID SOP ND 3.5 0.62 ng/L 1 Perfluoro-n-hetanoic acid (PFNA) 758-24 PFAS by ID SOP ND 3.5 0.62 ng/L 1 Perfluoro-n-hetanoic acid (PFNA) 758-24 PFAS by ID SOP ND 3.5 0.64 ng/L 1 Perfluoro-n-hetanoic acid (PFNA) 758-24 PFAS by ID SOP ND 3.5 0.64 ng/L 1 Perfluoro-n-hetanoic acid (PFNA) 758-24 PFAS by ID SOP ND 3.5 0.64 ng/L 1 Perfluoro-n-hetanoic acid (PFNA) 758-24 PFAS by ID SOP ND 3.5 0.64 ng/L 1 Perfluoro-n-hetanoic acid (PFNA) 758-24 PFAS by ID SOP ND 3.5 0.64 ng/L 1 Perfluoro-n-hetanoic acid (PFNA) 758-24 PFAS by ID SOP ND 3.5 0.65 ng/L 1 Perfluoro-n-hetanoic acid (PFNA) 758-24 PFAS by ID SOP ND 3.5 0.65 ng/L 1 Perfluoro-n-hetanoic acid	N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	ND	7.0	1.2	ng/L	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND	7.0	0.66	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOS-A)	2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)	1691-99-2	PFAS by ID SOP	ND	7.0	0.83	ng/L	1
2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)	N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	PFAS by ID SOP	ND	14	1.1	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)   335-73-8   PFAS by ID SOP   ND   3.5   0.68   ng/L   1	N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND	7.0	0.81	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)   335-77-3   PFAS by ID SOP   ND   3.5   0.68   ng/L   1	2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)	24448-09-7	PFAS by ID SOP	ND	7.0	1.1	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)   375-92-8   PFAS by ID SOP   ND   3.5   0.64   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-nonanesulfonic acid (PFNS)	Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND	3.5	0.68	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)         754-91-6         PFAS by ID SOP         ND         3.5         0.54         ng/L         1           Perfluoro-1-pentanesulfonic acid (PFPOS)         2706-91-4         PFAS by ID SOP         ND         3.5         0.52         ng/L         1           Perfluoro-decanesulfonic acid (PFDOS)         779/80-39-5         PFAS by ID SOP         ND         7.0         0.91         ng/L         1           Perfluoro-hobidancia acid (PFBA)         375-22-4         PFAS by ID SOP         ND         3.5         0.48         ng/L         1           Perfluoro-n-butancia acid (PFDA)         375-22-4         PFAS by ID SOP         ND         3.5         0.46         ng/L         1           Perfluoro-n-decanoic acid (PFDA)         307-55-1         PFAS by ID SOP         ND         3.5         0.46         ng/L         1           Perfluoro-n-decanoic acid (PFDA)         307-58-9         PFAS by ID SOP         ND         3.5         0.40         ng/L         1           Perfluoro-n-bexanoic acid (PFIPA)         375-95-1         PFAS by ID SOP         ND         3.5         0.40         ng/L         1           Perfluoro-n-cheanoic acid (PFIDA)         335-62-7         PFAS by ID SOP         ND         3.5         0	Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND	3.5	0.44	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)   2706-91-4   PFAS by ID SOP   ND   3.5   0.52   ng/L   1     Perfluorododecanesulfonic acid (PFDOS)   79780-39-5   PFAS by ID SOP   ND   7.0   0.91   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 (PFHxS)   335-76-2   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   0.46   ng/L   1     Perfluoro-n-decanoic acid (PFDA)   335-76-2   PFAS by ID SOP   ND   3.5   0.41   ng/L   1     Perfluoro-n-heptanoic acid (PFDA)   375-85-9   PFAS by ID SOP   ND   3.5   0.40   ng/L   1     Perfluoro-n-heptanoic acid (PFHxA)   307-54-1   PFAS by ID SOP   ND   3.5   0.60   ng/L   1     Perfluoro-n-hexanoic acid (PFNA)   375-95-1   PFAS by ID SOP   ND   3.5   0.60   ng/L   1     Perfluoro-n-hexanoic acid (PFNA)   375-95-1   PFAS by ID SOP   ND   3.5   0.40   ng/L   1     Perfluoro-n-o-catanoic acid (PFNA)   375-95-1   PFAS by ID SOP   ND   3.5   0.40   ng/L   1     Perfluoro-n-o-catanoic acid (PFNA)   375-95-1   PFAS by ID SOP   ND   3.5   0.40   ng/L   1     Perfluoro-n-o-catanoic acid (PFDA)   376-95-1   PFAS by ID SOP   ND   3.5   0.52   ng/L   1     Perfluoro-n-pentanoic acid (PFDA)   376-95-1   PFAS by ID SOP   ND   3.5   0.52   ng/L   1     Perfluoro-n-tridecanoic acid (PFTeDA)   72629-948   PFAS by ID SOP   ND   3.5   0.52   ng/L   1     Perfluoro-n-tridecanoic acid (PFTDA)   72629-948   PFAS by ID SOP   ND   3.5   0.55   ng/L   1     Perfluoro-n-tridecanoic acid (PFDA)   72629-948   PFAS by ID SOP   ND   3.5   0.55   ng/L   1     Perfluoro-n-tridecanoic acid (PFDA)   72629-948   PFAS by ID SOP   ND   3.5   0.55   ng/L   1     Perfluoro-n-tridecanoic acid (PFDA)   72629-948   PFAS by ID SOP   ND   3.5   0.55   ng/L   1     Perfluoro-n-tridecanoic acid (PFDA)   72629-948   PFAS by ID SOP   ND   3.5   0.55   ng/L   1     Perfluoro-n-tridecanoic acid (PFDA)   72629-948   72629-948   PFAS by ID SOP   ND   3.5   0.55   ng/L   1	Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND	3.5	0.62	ng/L	1
Perfluorododecanesulfonic acid (PFDOS)   79780-39-5   PFAS by ID SOP   ND   7.0   0.91   ng/L   1	Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND	3.5	0.54	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)         355-4c-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         0.46         ng/L         1           Perfluoro-n-decanoic acid (PFDA)         307-52-1         PFAS by ID SOP         ND         3.5         0.41         ng/L         1           Perfluoro-n-deptanoic acid (PFHpA)         307-52-1         PFAS by ID SOP         ND         3.5         0.40         ng/L         1           Perfluoro-n-bexanoic acid (PFHxA)         307-24-4         PFAS by ID SOP         ND         3.5         0.60         ng/L         1           Perfluoro-n-bexanoic acid (PFHxA)         375-95-1         PFAS by ID SOP         ND         3.5         0.60         ng/L         1           Perfluoro-n-potanoic acid (PFDA)         335-67-1         PFAS by ID SOP         ND         3.5         0.48         ng/L         1           Perfluoro-n-bexanoic acid (PFDA)         376-69-94         PFAS by ID SOP         ND         3.5         0.5	Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND	3.5	0.52	ng/L	1
Perfluoro-n-butanoic acid (PFBA)   375-22-4   PFAS by ID SOP   ND   3.5   0.52   ng/L   1	Perfluorododecanesulfonic acid (PFDOS)	79780-39-5	PFAS by ID SOP	ND	7.0	0.91	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 (PFDA)         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-heptanoic acid (PFHAA)         307-24-4         PFAS by ID SOP         ND         3.5         0.60         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-onanoic acid (PFNA)         375-95-1         PFAS by ID SOP         ND         3.5         0.40         ng/L         1           Perfluoro-n-onancia acid (PFNA)         375-95-1         PFAS by ID SOP         ND         3.5         0.72         ng/L         1           Perfluoro-n-pentanoic acid (PFDA)         376-06-7         PFAS by ID SOP         ND         3.5         0.46         ng/L         1           Perfluoro-n-teltradecanoic acid (PFTeDA)         726-29-94-8         PFAS by ID SOP         ND         3.5         0.55	Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND	3.5	0.48	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         0.41         ng/L         1           Perfluoro-n-hexanoic acid (PFHAA)         307-24-4         PFAS by ID SOP         ND         3.5         0.60         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-nonanoic acid (PFNA)         335-67-1         PFAS by ID SOP         ND         3.5         0.40         ng/L         1           Perfluoro-n-pentanoic acid (PFOA)         335-67-1         PFAS by ID SOP         ND         3.5         0.48         ng/L         1           Perfluoro-n-tetradecanoic acid (PFPA)         376-06-7         PFAS by ID SOP         ND         3.5         0.46         ng/L         1           Perfluoro-n-tetradecanoic acid (PFTDA)         72629-94-8         PFAS by ID SOP         ND         3.5         0.52         ng/L         1           Perfluoro-n-tetradecanoic acid (PFUAA)         2058-94-8         PFAS by ID SOP         ND         3.5 <td< td=""><td>Perfluoro-n-butanoic acid (PFBA)</td><td>375-22-4</td><td>PFAS by ID SOP</td><td>ND</td><td>3.5</td><td>0.52</td><td>ng/L</td><td>1</td></td<>	Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND	3.5	0.52	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         0.60         ng/L         1           Perfluoro-n-hexanoic 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 (PFOA)         2706-90-3         PFAS by ID SOP         ND         3.5         0.48         ng/L         1           Perfluoro-n-terradecanoic acid (PFPAA)         376-06-7         PFAS by ID SOP         ND         3.5         0.48         ng/L         1           Perfluoro-n-terradecanoic acid (PFTEDA)         726-29-94-8         PFAS by ID SOP         ND         3.5         0.52         ng/L         1           Perfluoro-n-undecanoic acid (PFUdA)         1763-23-1         PFAS by ID SOP         ND         3.5         0.55         ng/L         1           Perfluoro-n-undecanoic acid (PFOS)         1763-23-1         PFAS by ID SOP         ND         3.5 <t< td=""><td>Perfluoro-n-decanoic acid (PFDA)</td><td>335-76-2</td><td>PFAS by ID SOP</td><td>ND</td><td>3.5</td><td>0.46</td><td>ng/L</td><td>1</td></t<>	Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND	3.5	0.46	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)         307-24-4         PFAS by ID SOP         ND         3.5         0.60         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-catonic acid (PFOA)         335-67-1         PFAS by ID SOP         ND         3.5         0.72         ng/L         1           Perfluoro-n-pentanoic acid (PFPAA)         2706-90-3         PFAS by ID SOP         ND         3.5         0.48         ng/L         1           Perfluoro-n-tetradecanoic acid (PFPAA)         376-06-7         PFAS by ID SOP         ND         3.5         0.48         ng/L         1           Perfluoro-n-tridecanoic acid (PFTDA)         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         0.55         ng/L         1           Perfluoro-n-undecanoic acid (PFOS)         1763-23-1         PFAS by ID SOP         ND         3.5         0.55         ng/L         1           Surrogate         Q         Recovery         Limits         25-150         1         1	Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND	3.5	0.41	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 (PFPOA)         2706-90-3         PFAS by ID SOP         ND         3.5         0.48         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 (PFTeDA)         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         0.55         ng/L         1           Perfluoro-n-undecanoic acid (PFUdA)         2058-94-8         PFAS by ID SOP         ND         3.5         0.55         ng/L         1           Perfluoro-n-undecanoic acid (PFUGA)         2058-94-8         PFAS by ID SOP         ND         3.5         0.55         ng/L         1           Perfluoro-n-undecanoic acid (PFUGA)         20         NB         20         NB         20	Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND	3.5	0.39	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         0.48         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-tridecanoic acid (PFUdA)         2058-94-8         PFAS by ID SOP         ND         3.5         0.55         ng/L         1           Perfluorocctanesulfonic acid (PFOS)         1763-23-1         PFAS by ID SOP         ND         3.5         0.55         ng/L         1           Surrogate         Q         Run 1 Acceptance         ND         3.5         1.7         ng/L         1           13C2_4:2FTS         108         25-150         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1	Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND	3.5	0.60	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)         2706-90-3         PFAS by ID SOP         ND         3.5         0.48         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         0.55         ng/L         1           Perfluoroctanesulfonic acid (PFOS)         1763-23-1         PFAS by ID SOP         ND         3.5         0.55         ng/L         1           Surrogate         Q         Run 1 / Acceptance         ND         3.5         1.7         ng/L         1           13C2_4:2FTS         108         25-150         25-150         1	Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND	3.5	0.40	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-tridecanoic acid (PFUdA)         2058-94-8         PFAS by ID SOP         ND         3.5         0.55         ng/L         1           Perfluorocotanesulfonic acid (PFOS)         1763-23-1         PFAS by ID SOP         ND         3.5         1.7         ng/L         1           Surrogate         Q         Recovery         Limits         Limits         1	Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND	3.5	0.72	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         0.55         ng/L         1           Perfluorooctanesulfonic acid (PFOS)         1763-23-1         PFAS by ID SOP         ND         3.5         0.55         ng/L         1           Surrogate         Q         Recovery         Limits         Limits         1 <t< td=""><td>Perfluoro-n-pentanoic acid (PFPeA)</td><td>2706-90-3</td><td>PFAS by ID SOP</td><td>ND</td><td>3.5</td><td>0.48</td><td>ng/L</td><td>1</td></t<>	Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND	3.5	0.48	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)         2058-94-8 PFAS by ID SOP         ND         3.5 0.55         ng/L         1           Perfluorooctanesulfonic acid (PFOS)         1763-23-1 PFAS by ID SOP         ND         3.5 0.55         ng/L         1           Surrogate         Q Recovery Limits         Limits         1	Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND	3.5	0.52	ng/L	1
Perfluorooctanesulfonic acid (PFOS)         1763-23-1         PFAS by ID SOP         ND         3.5         1.7         ng/L         1           Surrogate         Q         Recovery         Limits         Limits         1         25-150         1         1         1         1         1         25-150         1         1         1         1         1         25-150         1         1         1         25-150         1         1         1         25-150         1         1         1         25-150         1         1         1         25-150         1         1         25-150         1         1         25-150         1         1         25-150         1         1         25-150         1         1         25-150         1         1         25-150         1         25-150         1         25-150         1         25-150         1         25-150         1         25-150         1         25-150         1         25-150         1         25-150         1         25-150         1         25-150         1         25-150         2         25-150         2         2         2         2         2         2         2         2         2         2 <td>Perfluoro-n-tridecanoic acid (PFTrDA)</td> <td>72629-94-8</td> <td>PFAS by ID SOP</td> <td>ND</td> <td>3.5</td> <td>0.46</td> <td>ng/L</td> <td>1</td>	Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND	3.5	0.46	ng/L	1
Surrogate     Q     Run 1 Acceptance Limits       13C2_4:2FTS     108     25-150       13C2_6:2FTS     115     25-150       13C2_8:2FTS     101     25-150       13C2_PFDOA     103     25-150       13C2_PFTeDA     102     25-150       13C3_PFBS     104     25-150	Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND	3.5	0.55	ng/L	1
Surrogate         Q         % Recovery         Limits           13C2_4:2FTS         108         25-150           13C2_6:2FTS         115         25-150           13C2_8:2FTS         101         25-150           13C2_PFDOA         103         25-150           13C2_PFTeDA         102         25-150           13C3_PFBS         104         25-150	Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND	3.5	1.7	ng/L	1
13C2_4:2FTS       108       25-150         13C2_6:2FTS       115       25-150         13C2_8:2FTS       101       25-150         13C2_PFDOA       103       25-150         13C2_PFTeDA       102       25-150         13C3_PFBS       104       25-150								
13C2_6:2FTS       115       25-150         13C2_8:2FTS       101       25-150         13C2_PFDOA       103       25-150         13C2_PFTeDA       102       25-150         13C3_PFBS       104       25-150								
13C2_8:2FTS       101       25-150         13C2_PFDoA       103       25-150         13C2_PFTeDA       102       25-150         13C3_PFBS       104       25-150								
13C2_PFDoA     103     25-150       13C2_PFTeDA     102     25-150       13C3_PFBS     104     25-150								
13C2_PFTeDA     102     25-150       13C3_PFBS     104     25-150								
13C3_PFBS 104 25-150	_							
	_							

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13C3-HFPO-DA

LOQ = Limit of Quantitation

H = Out of holding time

ND = Not detected at or above the DL

13C4\_PFBA

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B = Detected in the method blank

W = Reported on wet weight basis

N = Recovery is out of criteria

103

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25-150

25-150

E = Quantitation of compound exceeded the calibration range

P = The RPD between two GC columns exceeds 40%

DL = Detection Limit

 $J = Estimated \ result < LOQ \ and \ge DL$ 

Q = Surrogate failure

L = LCS/LCSD failure S = MS/MSD failure

Client: GZA GeoEnvironmental, Inc.

Description: WL-MW-2 Date Sampled:08/03/2022 1129 Laboratory ID: XH08006-002

Matrix: Aqueous

Project Name: Oshkosh Corp-West Plant

Date Received: 08/05/2022 Project Number: 20.0157080.00

Surrogate	Run 1 Ao Q % Recovery	Acceptance Limits
13C4_PFHpA	108	25-150
13C5_PFHxA	99	25-150
13C5_PFPeA	108	25-150
13C6_PFDA	105	25-150
13C7_PFUdA	101	25-150
13C8_PFOA	108	25-150
13C8_PFOS	98	25-150
13C8_PFOSA	103	10-150
13C9_PFNA	102	25-150
d-EtFOSA	72	10-150
d5-EtFOSAA	105	25-150
d9-EtFOSE	92	10-150
d-MeFOSA	67	10-150
d3-MeFOSAA	104	25-150
d7-MeFOSE	93	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  $J = Estimated \ result < LOQ \ and \ge DL$  Q = Surrogate failure L = LCS/LCSD failure S = MS/MSD failure

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

Client: GZA GeoEnvironmental, Inc.

Laboratory ID: XH08006-003 Matrix: Aqueous

Q = Surrogate failure

L = LCS/LCSD failure S = MS/MSD failure

and  $\geq$  DL

Description: WL-MW-3 Date Sampled:08/03/2022 1043

Project Name: Oshkosh Corp-West Plant

Date Received: 08/05/2022

Project Number: 20.0157080.00

CAS

Run Prep Method SOP SPE

13C2\_PFTeDA

13C3 PFBS

13C3\_PFHxS

13C4 PFBA

13C3-HFPO-DA

Analytical Method Dilution PFAS by ID SOP

Analysis Date Analyst 08/31/2022 1517 ALM

Prep Date

Batch 08/29/2022 1015 52513

Analytical Number Result O LOO MDL Units Run Parameter Method 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS) PFAS by ID SOP ND 756426-58-1 7.7 0.47 ng/L 1 PFAS by ID SOP 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...) 763051-92-9 ND 7 7 0.64 ng/L 1 PFAS by ID SOP ND 77 1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS) 39108-34-4 ng/L 1 1.5 ng/L 1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS) 27619-97-2 PFAS by ID SOP ND 0 7.7 1 1.9 1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS) 757124-72-4 PFAS by ID SOP ND 7.7 ng/L 1 0.84 Hexafluoropropylene oxide dimer acid (GenX) 13252-13-6 PFAS by ID SOP ND 7.7 ng/L 1 2.0 4,8-dioxa-3H-perfluorononanoic acid (ADONA) 919005-14-4 PFAS by ID SOP ND 7.7 0.47 ng/L N-ethylperfluoro-1-octanesulfonamide (EtFOSA) 4151-50-2 PFAS by ID SOP ND 7.7 1.3 ng/L 1 N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA) 2991-50-6 PFAS by ID SOP ND 7.7 0.72 ng/L 1 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) 1691-99-2 PFAS by ID SOP ND 77 0.92 ng/L 1 31506-32-8 PFAS by ID SOP N-methylperfluoro-1-octanesulfonamide (MeFOSA) ND 15 1.2 ng/L N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA) 2355-31-9 PFAS by ID SOP ND 7 7 0.90 ng/L 1 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) 24448-09-7 PFAS by ID SOP ND 7.7 1.2 ng/L 1 PFAS by ID SOP 3.9 Perfluoro-1-butanesulfonic acid (PFBS) 375-73-5 0.73 0.40 ng/L Perfluoro-1-decanesulfonic acid (PFDS) 335-77-3 PFAS by ID SOP ND 3.9 0.75 ng/L Perfluoro-1-heptanesulfonic acid (PFHpS) 375-92-8 PFAS by ID SOP ND 3.9 ng/L 0.48 1 Perfluoro-1-nonanesulfonic acid (PFNS) 68259-12-1 PFAS by ID SOP ND 3.9 0.69 ng/L 1 Perfluoro-1-octanesulfonamide (PFOSA) 754-91-6 PFAS by ID SOP ND 39 0.59 ng/L Perfluoro-1-pentanesulfonic acid (PFPeS) 2706-91-4 PFAS by ID SOP ND 39 ng/L 0.57 1 79780-39-5 Perfluorododecanesulfonic acid (PFDOS) PFAS by ID SOP ND 7.7 1.0 ng/L 1 Perfluorohexanesulfonic acid (PFHxS) 355-46-4 PFAS by ID SOP ND 3.9 ng/L 1 0.53 Perfluoro-n-butanoic acid (PFBA) 375-22-4 PFAS by ID SOP 5.4 3.9 ng/L 0.58 Perfluoro-n-decanoic acid (PFDA) PFAS by ID SOP 335-76-2 ND 3.9 0.51 ng/L Perfluoro-n-dodecanoic acid (PFDoA) 307-55-1 PFAS by ID SOP ND 3.9 ng/L 0.46 1 Perfluoro-n-heptanoic acid (PFHpA) 375-85-9 PFAS by ID SOP ND 3.9 ng/L 0.43 3.9 Perfluoro-n-hexanoic acid (PFHxA) 307-24-4 PFAS by ID SOP 1.1 J 0.66 ng/L Perfluoro-n-nonanoic acid (PFNA) 375-95-1 PFAS by ID SOP ND 3.9 ng/L 1 0.45 Perfluoro-n-octanoic acid (PFOA) 335-67-1 PFAS by ID SOP 1.1 J 3.9 ng/L 0.80 1 Perfluoro-n-pentanoic acid (PFPeA) 2706-90-3 PFAS by ID SOP 2.9 3.9 ng/L 1 0.53 Perfluoro-n-tetradecanoic acid (PFTeDA) 376-06-7 PFAS by ID SOP ND 3.9 ng/L 0.58 Perfluoro-n-tridecanoic acid (PFTrDA) 72629-94-8 PFAS by ID SOP ND 3.9 ng/L 0.51 Perfluoro-n-undecanoic acid (PFUdA) 2058-94-8 PFAS by ID SOP ND 39 ng/L 1 0.60 Perfluorooctanesulfonic acid (PFOS) 1763-23-1 PFAS by ID SOP ND 3.9 1.9 ng/L 1 Run 1 Acceptance Surrogate Q % Recovery Limits 13C2\_4:2FTS 108 25-150 13C2\_6:2FTS Ν 163 25-150 13C2 8:2FTS 107 25-150 13C2\_PFDoA 110 25-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit
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 a
H = Out of holding time	W = Reported on wet weight basis		

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25-150

25-150

25-150

25-150

25-150

Client: GZA GeoEnvironmental, Inc.

Description: WL-MW-3 Date Sampled:08/03/2022 1043 Laboratory ID: XH08006-003 Matrix: Aqueous

Project Name: Oshkosh Corp-West Plant

Date Received: 08/05/2022

Project Number: 20.0157080.00

Surrogate	Run 1 Ao Q % Recovery	Acceptance Limits
13C4_PFHpA	115	25-150
13C5_PFHxA	110	25-150
13C5_PFPeA	117	25-150
13C6_PFDA	112	25-150
13C7_PFUdA	111	25-150
13C8_PFOA	114	25-150
13C8_PFOS	107	25-150
13C8_PFOSA	112	10-150
13C9_PFNA	112	25-150
d-EtFOSA	91	10-150
d5-EtFOSAA	117	25-150
d9-EtFOSE	102	10-150
d-MeFOSA	78	10-150
d3-MeFOSAA	114	25-150
d7-MeFOSE	111	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  $J = Estimated \ result < LOQ \ and \ge DL$  Q = Surrogate failure L = LCS/LCSD failure S = MS/MSD failure

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

Client: GZA GeoEnvironmental, Inc.

Laboratory ID: XH08006-004 Matrix: Aqueous

Description: WL-MW-4

Date Sampled:08/03/2022 1052

Project Name: Oshkosh Corp-West Plant

Date Received: 08/05/2022

Project Number: 20.0157080.00

Run Prep Method SOP SPE Analytical Method Dilution PFAS by ID SOP

Analysis Date Analyst 08/31/2022 1528 ALM

Prep Date

Batch

08/29/2022 1015 52513

Parameter	CAS Number	Analytical Method	Result Q	LOQ	MDL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	ND	7.3	0.44	ng/L	1
$\hbox{11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3)}\\$	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	0.87	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	0.85	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	0.95 J	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	ND	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	ND	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	ND	3.6	0.50	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	3.7	3.6	0.55	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	ND	3.6	0.41	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND	3.6	0.63	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	ND	3.6	0.49	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND	3.6	0.55	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
		otance mits					
		-150					
		-150					
13C2_8:2FTS	100 25	-150					
13C2_PFDoA		-150					
	105 25	-150					
13C3_PFBS	104 25	-150					
13C3_PFHxS	106 25	-150					
13C3-HFPO-DA	104 25	-150					

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13C4\_PFBA

LOQ = Limit of Quantitation

H = Out of holding time

ND = Not detected at or above the DL

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B = Detected in the method blank

W = Reported on wet weight basis

N = Recovery is out of criteria

105

25-150

E = Quantitation of compound exceeded the calibration range

P = The RPD between two GC columns exceeds 40%

DL = Detection Limit

 $J = Estimated \ result < LOQ \ and \ge DL$ 

Q = Surrogate failure

L = LCS/LCSD failure S = MS/MSD failure

Client: GZA GeoEnvironmental, Inc.

Date Sampled:08/03/2022 1052

Laboratory ID: XH08006-004

Matrix: Aqueous

Description: WL-MW-4

Project Name: Oshkosh Corp-West Plant

Date Received: 08/05/2022

Project Number: 20.0157080.00

Surrogate	Run 1 A Q % Recovery	cceptance Limits	
13C4_PFHpA	104	25-150	
13C5_PFHxA	102	25-150	
13C5_PFPeA	107	25-150	
13C6_PFDA	100	25-150	
13C7_PFUdA	101	25-150	
13C8_PFOA	107	25-150	
13C8_PFOS	97	25-150	
13C8_PFOSA	104	10-150	
13C9_PFNA	102	25-150	
d-EtFOSA	75	10-150	
d5-EtFOSAA	101	25-150	
d9-EtFOSE	85	10-150	
d-MeFOSA	64	10-150	
d3-MeFOSAA	104	25-150	
d7-MeFOSE	90	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  $J = Estimated \ result < LOQ \ and \ge DL$  Q = Surrogate failure L = LCS/LCSD failure S = MS/MSD failure

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

Client: GZA GeoEnvironmental, Inc.

Laboratory ID: XH08006-005

Matrix: Aqueous

Description: WL-FB-1

Project Name: Oshkosh Corp-West Plant

Date Sampled:08/03/2022 1200 Date Received: 08/05/2022

Project Number: 20.0157080.00

Run Prep Method SOP SPE Analytical Method Dilution PFAS by ID SOP

Analysis Date Analyst 08/31/2022 1539 ALM

Prep Date

Batch

08/29/2022 1015 52513

Parameter	CAS Number	Analytical Method	Result Q	LOQ	MDL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	ND	8.4	0.50	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3	) 763051-92-9	PFAS by ID SOP	ND	8.4	0.69	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	8.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND Q	8.4	2.1	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	8.4	0.91	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND	8.4	2.2	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND	8.4	0.51	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	ND	8.4	1.4	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND	8.4	0.78	ng/L	1
2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)	1691-99-2	PFAS by ID SOP	ND	8.4	1.0	ng/L	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	PFAS by ID SOP	ND	17	1.3	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND	8.4	0.98	ng/L	1
2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)	24448-09-7	PFAS by ID SOP	ND	8.4	1.3	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND	4.2	0.43	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND	4.2	0.81	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND	4.2	0.52	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND	4.2	0.74	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND	4.2	0.64	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND	4.2	0.62	ng/L	1
Perfluorododecanesulfonic acid (PFDOS)	79780-39-5	PFAS by ID SOP	ND	8.4	1.1	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND	4.2	0.58	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND	4.2	0.63	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND	4.2	0.55	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND	4.2	0.49	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND	4.2	0.47	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND	4.2	0.72	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND	4.2	0.48	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND	4.2	0.87	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND	4.2	0.57	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND	4.2	0.63	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND	4.2	0.55	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND	4.2	0.66	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND	4.2	2.1	ng/L	1
	!	otance					
13C2_4:2FTS		nits -150					
13C2_6:2FTS N		-150					
13C2_8:2FTS		-150					
13C2_PFDoA		-150					
13C2_PFTDDA 13C2_PFTeDA		-150 -150					
13C3_PFBS		-150					
13C3_PFHxS	106 25	-150					

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13C3-HFPO-DA

LOQ = Limit of Quantitation

H = Out of holding time

ND = Not detected at or above the DL

13C4\_PFBA

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B = Detected in the method blank

W = Reported on wet weight basis

N = Recovery is out of criteria

107

111

25-150

25-150

E = Quantitation of compound exceeded the calibration range

P = The RPD between two GC columns exceeds 40%

DL = Detection Limit

 $J = Estimated \ result < LOQ \ and \ge DL$ 

Q = Surrogate failure

L = LCS/LCSD failure S = MS/MSD failure

Client: GZA GeoEnvironmental, Inc.

Description: WL-FB-1

Date Sampled:08/03/2022 1200

Laboratory ID: XH08006-005 Matrix: Aqueous

Project Name: Oshkosh Corp-West Plant

Date Received: 08/05/2022

Project Number: 20.0157080.00

Surrogate	Run 1 A Q % Recovery	Acceptance Limits
13C4_PFHpA	112	25-150
13C5_PFHxA	104	25-150
13C5_PFPeA	109	25-150
13C6_PFDA	105	25-150
13C7_PFUdA	106	25-150
13C8_PFOA	107	25-150
13C8_PFOS	101	25-150
13C8_PFOSA	103	10-150
13C9_PFNA	109	25-150
d-EtFOSA	74	10-150
d5-EtFOSAA	117	25-150
d9-EtFOSE	90	10-150
d-MeFOSA	63	10-150
d3-MeFOSAA	104	25-150
d7-MeFOSE	96	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  $J = Estimated \ result < LOQ \ and \ge DL$  Q = Surrogate failure L = LCS/LCSD failure S = MS/MSD failure

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

Client: GZA GeoEnvironmental, Inc.

Laboratory ID: XH08006-006 Matrix: Aqueous

Description: WL-EQ-1

Date Sampled:08/03/2022 1211

Project Name: Oshkosh Corp-West Plant

Date Received: 08/05/2022

Project Number: 20.0157080.00

Run Prep Method 1 SOP SPE Analytical Method Dilution PFAS by ID SOP

Analysis Date Analyst 08/31/2022 1550 ALM

Prep Date

Batch 08/29/2022 1015 52513

Parameter	CAS Number	Analytical Method	Result Q	LOQ	MDL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	ND	8.7	0.53	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3	) 763051-92-9	PFAS by ID SOP	ND	8.7	0.72	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	8.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND Q	8.7	2.2	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	8.7	0.95	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND	8.7	2.3	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND	8.7	0.53	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	ND	8.7	1.5	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND	8.7	0.82	ng/L	1
2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)	1691-99-2	PFAS by ID SOP	ND	8.7	1.0	ng/L	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	PFAS by ID SOP	ND	17	1.4	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND	8.7	1.0	ng/L	1
2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)	24448-09-7	PFAS by ID SOP	ND	8.7	1.4	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND	4.4	0.45	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND	4.4	0.85	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND	4.4	0.54	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND	4.4	0.78	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND	4.4	0.67	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND	4.4	0.65	ng/L	1
Perfluorododecanesulfonic acid (PFDOS)	79780-39-5	PFAS by ID SOP	ND	8.7	1.1	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND	4.4	0.60	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND	4.4	0.66	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND	4.4	0.57	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND	4.4	0.52	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND	4.4	0.49	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND	4.4	0.75	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND	4.4	0.50	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND	4.4	0.91	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND	4.4	0.59	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND	4.4	0.65	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND	4.4	0.58	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND	4.4	0.68	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND	4.4	2.2	ng/L	1
Surrogate Q % Re	ecovery Lir	otance mits					
13C2_4:2FTS	99 25	-150					
13C2_6:2FTS N		-150					
13C2_8:2FTS	101 25	-150					
13C2_PFDoA	97 25	-150					
13C2_PFTeDA	102 25	-150					
13C3_PFBS	104 25	-150					
13C3_PFHxS	109 25	-150					
13C3-HFPO-DA	104 25	-150					

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13C4\_PFBA

LOQ = Limit of Quantitation

H = Out of holding time

ND = Not detected at or above the DL

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B = Detected in the method blank

W = Reported on wet weight basis

N = Recovery is out of criteria

107

25-150

E = Quantitation of compound exceeded the calibration range

P = The RPD between two GC columns exceeds 40%

DL = Detection Limit

 $J = Estimated \ result < LOQ \ and \ge DL$ 

Q = Surrogate failure

L = LCS/LCSD failure

S = MS/MSD failure

Client: GZA GeoEnvironmental, Inc.

Description: WL-EQ-1

Date Sampled:08/03/2022 1211

Laboratory ID: XH08006-006 Matrix: Aqueous

Project Name: Oshkosh Corp-West Plant

Date Received: 08/05/2022

Project Number: 20.0157080.00

Surrogate	Run 1 A Q % Recovery	Acceptance Limits
13C4_PFHpA	106	25-150
13C5_PFHxA	104	25-150
13C5_PFPeA	107	25-150
13C6_PFDA	103	25-150
13C7_PFUdA	100	25-150
13C8_PFOA	106	25-150
13C8_PFOS	96	25-150
13C8_PFOSA	100	10-150
13C9_PFNA	108	25-150
d-EtFOSA	65	10-150
d5-EtFOSAA	106	25-150
d9-EtFOSE	88	10-150
d-MeFOSA	54	10-150
d3-MeFOSAA	102	25-150
d7-MeFOSE	92	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  $J = Estimated \ result < LOQ \ and \ge DL$  Q = Surrogate failure L = LCS/LCSD failure S = MS/MSD failure

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Client: GZA GeoEnvironmental, Inc.

Laboratory ID: XH08006-007 Matrix: Aqueous

Description: Trip

Date Sampled:08/03/2022

Project Name: Oshkosh Corp-West Plant

Date Received: 08/05/2022

Project Number: 20.0157080.00

Run Prep Method SOP SPE Analytical Method Dilution PFAS by ID SOP

Analysis Date Analyst 08/31/2022 1601 ALM

Batch

Prep Date 08/29/2022 1015 52513

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	MDL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		8.2	0.49	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-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	ND	Q	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-butanesulfonic 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	ND		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	ND		4.1	0.46	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		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	ND		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
		otance mits						
13C2_4:2FTS		-150						
		-150						
13C2_8:2FTS		-150						
		-150						
	107 25	-150						
13C3_PFBS	103 25	-150						
13C3_PFHxS	106 25	-150						
13C3-HFPO-DA	104 25	-150						

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13C4\_PFBA

LOQ = Limit of Quantitation

H = Out of holding time

ND = Not detected at or above the DL

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B = Detected in the method blank

W = Reported on wet weight basis

N = Recovery is out of criteria

109

25-150

E = Quantitation of compound exceeded the calibration range

P = The RPD between two GC columns exceeds 40%

DL = Detection Limit

 $J = Estimated \ result < LOQ \ and \ge DL$ 

Q = Surrogate failure

L = LCS/LCSD failure S = MS/MSD failure

Client: GZA GeoEnvironmental, Inc.

Laboratory ID: XH08006-007

Description: Trip

Project Name: Oshkosh Corp-West Plant

Date Sampled:08/03/2022

Matrix: Aqueous

Date Received: 08/05/2022

Project Number: 20.0157080.00

	Surrogate	Run 1 Ao Q % Recovery	cceptance Limits	
•	13C4_PFHpA	109	25-150	
	13C5_PFHxA	104	25-150	
	13C5_PFPeA	106	25-150	
	13C6_PFDA	97	25-150	
	13C7_PFUdA	101	25-150	
	13C8_PFOA	106	25-150	
	13C8_PFOS	97	25-150	
	13C8_PFOSA	102	10-150	
	13C9_PFNA	105	25-150	
	d-EtFOSA	79	10-150	
	d5-EtFOSAA	106	25-150	
	d9-EtFOSE	93	10-150	
	d-MeFOSA	62	10-150	
	d3-MeFOSAA	102	25-150	
	d7-MeFOSE	96	10-150	

LOQ = Limit of Quantitation

ND = Not detected at or above the DL

H = Out of holding time

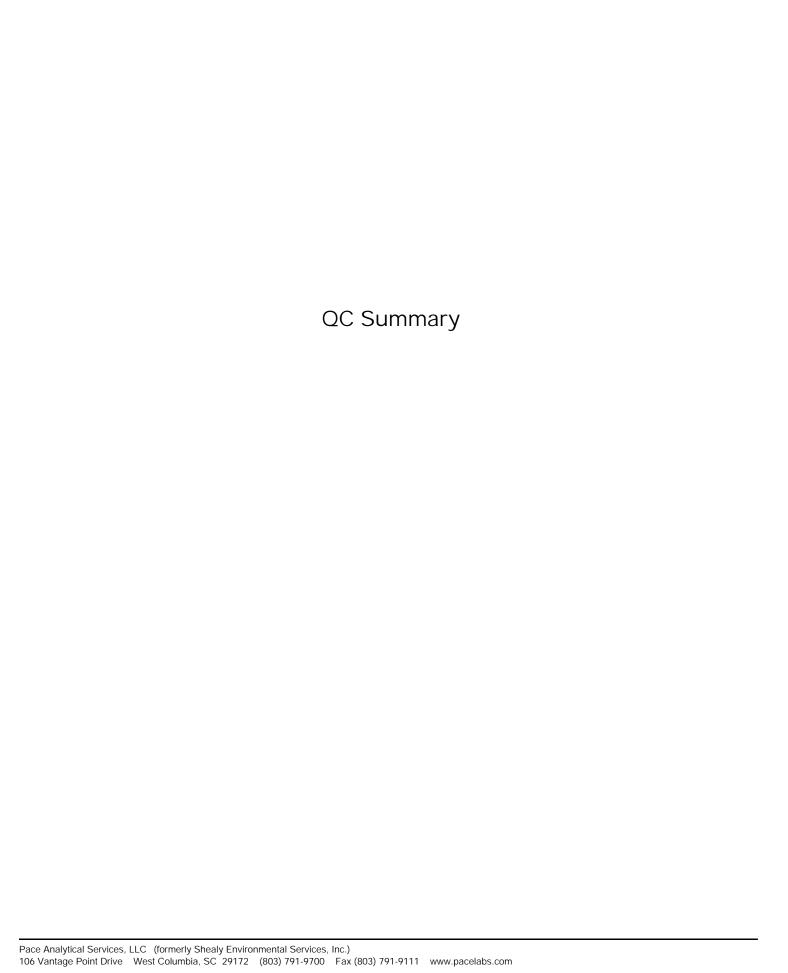
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis

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  $\geq DL$ 

Q = Surrogate failure L = LCS/LCSD failure S = MS/MSD failure

 $\label{thm:pace-analytical-Services, LLC} \textbf{ (formerly Shealy Environmental Services, Inc.)}$ 



#### PFAS by LC/MS/MS - MB

Sample ID: XQ52513-001 Batch: 52513

Analytical Method: PFAS by ID SOP

Matrix: Aqueous Prep Method: SOP SPE

Prep Date: 08/29/2022 1015

Parameter	Result	Q	Dil	LOQ	MDL	Units	Analysis Date
9CI-PF3ONS	ND		1	8.0	0.48	ng/L	08/31/2022 1222
11CI-PF3OUdS	ND		1	8.0	0.66	ng/L	08/31/2022 1222
8:2 FTS	ND		1	8.0	1.6	ng/L	08/31/2022 1222
6:2 FTS	5.1	J	1	8.0	2.0	ng/L	08/31/2022 1222
4:2 FTS	ND		1	8.0	0.87	ng/L	08/31/2022 1222
GenX	ND		1	8.0	2.1	ng/L	08/31/2022 1222
ADONA	ND		1	8.0	0.48	ng/L	08/31/2022 1222
EtFOSA	ND		1	8.0	1.4	ng/L	08/31/2022 1222
EtFOSAA	ND		1	8.0	0.75	ng/L	08/31/2022 1222
EtFOSE	ND		1	8.0	0.95	ng/L	08/31/2022 1222
MeFOSA	ND		1	16	1.3	ng/L	08/31/2022 1222
MeFOSAA	ND		1	8.0	0.93	ng/L	08/31/2022 1222
MeFOSE	ND		1	8.0	1.3	ng/L	08/31/2022 1222
PFBS	ND		1	4.0	0.41	ng/L	08/31/2022 1222
PFDS	ND		1	4.0	0.78	ng/L	08/31/2022 1222
PFHpS	ND		1	4.0	0.50	ng/L	08/31/2022 1222
PFNS	ND		1	4.0	0.71	ng/L	08/31/2022 1222
PFOSA	ND		1	4.0	0.61	ng/L	08/31/2022 1222
PFPeS	ND		1	4.0	0.59	ng/L	08/31/2022 1222
PFDOS	ND		1	8.0	1.0	ng/L	08/31/2022 1222
PFHxS	ND		1	4.0	0.55	ng/L	08/31/2022 1222
PFBA	ND		1	4.0	0.60	ng/L	08/31/2022 1222
PFDA	ND		1	4.0	0.52	ng/L	08/31/2022 1222
PFDoA	ND		1	4.0	0.47	ng/L	08/31/2022 1222
PFHpA	ND		1	4.0	0.45	ng/L	08/31/2022 1222
PFHxA	ND		1	4.0	0.69	ng/L	08/31/2022 1222
PFNA	ND		1	4.0	0.46	ng/L	08/31/2022 1222
PFOA	ND		1	4.0	0.83	ng/L	08/31/2022 1222
PFPeA	ND		1	4.0	0.54	ng/L	08/31/2022 1222
PFTeDA	ND		1	4.0	0.60	ng/L	08/31/2022 1222
PFTrDA	ND		1	4.0	0.53	ng/L	08/31/2022 1222
PFUdA	ND		1	4.0	0.63	ng/L	08/31/2022 1222
PFOS	ND		1	4.0	2.0	ng/L	08/31/2022 1222
Surrogate	Q % Re	Acce L	ptance imit				
13C2_4:2FTS	101	25	5-150				
13C2_6:2FTS	122	25	5-150				
13C2_8:2FTS	103	25	5-150				
13C2_PFDoA	103	25	5-150				
13C2_PFTeDA	104	25	5-150				
13C3_PFBS	101	25	5-150				
13C3_PFHxS	104	25	5-150				
13C3-HFPO-DA	105		5-150				
	100	2.					

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  $\geq$  DL

P = The RPD between two GC columns exceeds 40%

\* = RSD is out of criteria

+ = RPD is out of criteria

#### PFAS by LC/MS/MS - MB

Sample ID: XQ52513-001 Batch: 52513

Analytical Method: PFAS by ID SOP

Matrix: Aqueous Prep Method: SOP SPE

Prep Date: 08/29/2022 1015

Surrogate	Q % Rec	Acceptance Limit	
13C4_PFBA	109	25-150	
13C4_PFHpA	106	25-150	
13C5_PFHxA	104	25-150	
13C5_PFPeA	107	25-150	
13C6_PFDA	102	25-150	
13C7_PFUdA	104	25-150	
13C8_PFOA	109	25-150	
13C8_PFOS	100	25-150	
13C8_PFOSA	102	10-150	
13C9_PFNA	106	25-150	
d-EtFOSA	76	10-150	
d5-EtFOSAA	105	25-150	
d9-EtFOSE	93	10-150	
d-MeFOSA	67	10-150	
d3-MeFOSAA	104	25-150	
d7-MeFOSE	101	10-150	

LOQ = Limit of Quantitation

ND = Not detected at or above the DL

N = Recovery is out of criteria

DL = Detection Limit

 $J = Estimated \ result < LOQ \ and \ge DL$ 

P = The RPD between two GC columns exceeds 40%

\* = RSD is out of criteria

+ = RPD is out of criteria

#### PFAS by LC/MS/MS - LCS

Sample ID: XQ52513-002 Batch: 52513 Analytical Method: PFAS by ID SOP Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/29/2022 1015

Spike **Amount** Result %Rec % Rec Limit Analysis Date Parameter (ng/L) Q (ng/L) Dil 9CI-PF3ONS 15 15 1 98 50-150 08/31/2022 1233 11CI-PF3OUdS 15 13 1 88 50-150 08/31/2022 1233 8:2 FTS 15 16 1 107 50-150 08/31/2022 1233 15 1 6:2 FTS 15 100 50-150 08/31/2022 1233 4:2 FTS 15 17 1 111 50-150 08/31/2022 1233 GenX 32 34 1 107 50-150 08/31/2022 1233 **ADONA** 15 14 92 08/31/2022 1233 50-150 08/31/2022 1233 **EtFOSA** 110 16 18 1 50-150 **EtFOSAA** 16 16 98 50-150 08/31/2022 1233 **EtFOSE** 16 19 119 50-150 08/31/2022 1233 MeFOSA 08/31/2022 1233 16 18 115 50-150 97 MeFOSAA 50-150 08/31/2022 1233 16 15 MeFOSE 08/31/2022 1233 16 15 1 92 50-150 **PFBS** 14 14 1 98 50-150 08/31/2022 1233 **PFDS** 15 14 90 50-150 08/31/2022 1233 PFHpS 15 15 99 50-150 08/31/2022 1233 **PFNS** 93 08/31/2022 1233 15 14 50-150 99 **PFOSA** 50-150 08/31/2022 1233 16 16 1 **PFPeS** 15 15 1 98 50-150 08/31/2022 1233 **PFDOS** 15 15 94 50-150 08/31/2022 1233 **PFHxS** 15 14 98 50-150 08/31/2022 1233 PFBA 16 16 101 50-150 08/31/2022 1233 PFDA 96 08/31/2022 1233 16 15 50-150 **PFDoA** 101 08/31/2022 1233 16 16 50-150 **PFHpA** 16 15 96 50-150 08/31/2022 1233 **PFHxA** 16 16 100 50-150 08/31/2022 1233 **PFNA** 16 15 95 50-150 08/31/2022 1233 **PFOA** 16 16 102 50-150 08/31/2022 1233 **PFPeA** 16 15 96 50-150 08/31/2022 1233 **PFTeDA** 16 16 100 50-150 08/31/2022 1233 **PFTrDA** 17 108 16 1 50-150 08/31/2022 1233 **PFUdA** 16 16 98 50-150 08/31/2022 1233 **PFOS** 15 15 102 50-150 08/31/2022 1233 Acceptance Surrogate Q % Rec Limit 13C2 4:2FTS 92 25-150 13C2\_6:2FTS 111 25-150

LOQ =	Limit o	of Quantitation

13C2\_8:2FTS

13C2 PFDoA

13C2\_PFTeDA

13C3 PFBS

13C3\_PFHxS

13C3-HFPO-DA

ND = Not detected at or above the DL J = Estimated result < LOQ and  $\geq$  DL

N = Recovery is out of criteria

DL = Detection Limit

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

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25-150

25-150

25-150

25-150

25-150

25-150

<sup>\* =</sup> RSD is out of criteria

#### PFAS by LC/MS/MS - LCS

Sample ID: XQ52513-002 Batch: 52513

Analytical Method: PFAS by ID SOP

Matrix: Aqueous Prep Method: SOP SPE

Prep Date: 08/29/2022 1015

Surrogate	Q % Rec	Acceptance Limit	
13C4_PFBA	104	25-150	
13C4_PFHpA	109	25-150	
13C5_PFHxA	98	25-150	
13C5_PFPeA	105	25-150	
13C6_PFDA	108	25-150	
13C7_PFUdA	103	25-150	
13C8_PFOA	105	25-150	
13C8_PFOS	96	25-150	
13C8_PFOSA	97	10-150	
13C9_PFNA	103	25-150	
d-EtFOSA	63	10-150	
d5-EtFOSAA	103	25-150	
d9-EtFOSE	93	10-150	
d-MeFOSA	52	10-150	
d3-MeFOSAA	99	25-150	
d7-MeFOSE	96	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

#### PFAS by LC/MS/MS - LCSD

Sample ID: XQ52513-003 Batch: 52513 Analytical Method: PFAS by ID SOP Matrix: Aqueous Prep Method: SOP SPE

Prep Date: 08/29/2022 1015

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% RPD	%Rec Limit	% RPD Limit	Analysis Date
9CI-PF3ONS	15	14		1	95	2.7	50-150	30	08/31/2022 1244
11CI-PF3OUdS	15	13		1	84	4.1	50-150	30	08/31/2022 1244
8:2 FTS	15	17		1	108	1.3	50-150	30	08/31/2022 1244
6:2 FTS	15	15		1	96	4.5	50-150	30	08/31/2022 1244
4:2 FTS	15	15		1	99	12	50-150	30	08/31/2022 1244
GenX	32	34		1	106	0.83	50-150	30	08/31/2022 1244
ADONA	15	14		1	92	0.24	50-150	30	08/31/2022 1244
EtFOSA	16	18		1	115	3.8	50-150	30	08/31/2022 1244
EtFOSAA	16	15		1	97	1.6	50-150	30	08/31/2022 1244
EtFOSE	16	21		1	128	7.8	50-150	30	08/31/2022 1244
MeFOSA	16	19		1	121	5.3	50-150	30	08/31/2022 1244
MeFOSAA	16	16		1	98	0.86	50-150	30	08/31/2022 1244
MeFOSE	16	15		1	94	1.6	50-150	30	08/31/2022 1244
PFBS	14	14		1	99	1.5	50-150	30	08/31/2022 1244
PFDS	15	15		1	98	7.9	50-150	30	08/31/2022 1244
PFHpS	15	15		1	102	2.5	50-150	30	08/31/2022 1244
PFNS	15	14		1	94	0.88	50-150	30	08/31/2022 1244
PFOSA	16	16		1	101	2.0	50-150	30	08/31/2022 1244
PFPeS	15	15		1	98	0.65	50-150	30	08/31/2022 1244
PFDOS	15	14		1	92	2.6	50-150	30	08/31/2022 1244
PFHxS	15	14		1	99	0.84	50-150	30	08/31/2022 1244
PFBA	16	16		1	102	0.30	50-150	30	08/31/2022 1244
PFDA PFDoA	16 16	17 16		1 1	104 101	7.5 0.13	50-150 50-150	30 30	08/31/2022 1244 08/31/2022 1244
PFHpA	16	17		1	105	8.6	50-150	30	08/31/2022 1244
PFHxA	16	16		1	98	2.4	50-150	30	08/31/2022 1244
PFNA	16	16		1	97	2.2	50-150	30	08/31/2022 1244
PFOA	16	16		1	97	5.0	50-150	30	08/31/2022 1244
PFPeA	16	16		1	101	5.1	50-150	30	08/31/2022 1244
PFTeDA	16	16		1	101	1.3	50-150	30	08/31/2022 1244
PFTrDA	16	17		1	106	2.4	50-150	30	08/31/2022 1244
PFUdA	16	15		1	95	3.4	50-150	30	08/31/2022 1244
PFOS	15	15		1	100	2.3	50-150	30	08/31/2022 1244
Surrogate	Q % R	ec Acc	ceptance Limit						
13C2_4:2FTS	99		25-150						
13C2_6:2FTS	109	)	25-150						
13C2_8:2FTS	97		25-150						
13C2_PFDoA	97		25-150						
13C2_PFTeDA	100	)	25-150						
13C3_PFBS	99		25-150						
13C3_PFHxS	103	}	25-150						
13C3-HFPO-DA	99		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%

+ = RPD is out of criteria

<sup>\* =</sup> RSD is out of criteria

#### PFAS by LC/MS/MS - LCSD

Sample ID: XQ52513-003 Batch: 52513

Analytical Method: PFAS by ID SOP

Matrix: Aqueous Prep Method: SOP SPE

Prep Date: 08/29/2022 1015

Surrogate	Q % Rec	Acceptance Limit	
13C4_PFBA	102	25-150	
13C4_PFHpA	103	25-150	
13C5_PFHxA	100	25-150	
13C5_PFPeA	104	25-150	
13C6_PFDA	98	25-150	
13C7_PFUdA	99	25-150	
13C8_PFOA	104	25-150	
13C8_PFOS	97	25-150	
13C8_PFOSA	95	10-150	
13C9_PFNA	102	25-150	
d-EtFOSA	71	10-150	
d5-EtFOSAA	100	25-150	
d9-EtFOSE	88	10-150	
d-MeFOSA	63	10-150	
d3-MeFOSAA	99	25-150	
d7-MeFOSE	99	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

#### PFAS by LC/MS/MS - MS

Sample ID: XH08006-001MS Batch: 52513

Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE

Prep Date: 08/29/2022 1015

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9CI-PF3ONS	ND	13	12		 1	91	50-150	08/31/2022 1423
11CI-PF3OUdS	ND	13	11		1	84	50-150	08/31/2022 1423
8:2 FTS	ND	14	16		1	114	50-150	08/31/2022 1423
6:2 FTS	6400	13	6100	N	1	-2090	50-150	08/31/2022 1423
4:2 FTS	2.5	13	15		1	91	50-150	08/31/2022 1423
GenX	ND	28	31		1	109	50-150	08/31/2022 1423
ADONA	ND	13	13		1	94	50-150	08/31/2022 1423
EtFOSA	ND	14	17		1	119	50-150	08/31/2022 1423
EtFOSAA	ND	14	14		1	101	50-150	08/31/2022 1423
EtFOSE	ND	14	17		1	122	50-150	08/31/2022 1423
MeFOSA	ND	14	17		1	119	50-150	08/31/2022 1423
MeFOSAA	ND	14	13		1	93	50-150	08/31/2022 1423
MeFOSE	ND	14	14		1	96	50-150	08/31/2022 1423
PFBS	ND	13	20	N	1	158	50-150	08/31/2022 1423
PFDS	ND	14	12		1	89	50-150	08/31/2022 1423
PFHpS	ND	14	14		1	102	50-150	08/31/2022 1423
PFNS	ND	14	13		1	95	50-150	08/31/2022 1423
PFOSA	ND	14	14		1	96	50-150	08/31/2022 1423
PFPeS	4.6	13	19		1	109	50-150	08/31/2022 1423
PFDOS	ND	14	13		1	94	50-150	08/31/2022 1423
PFHxS	34	13	47		1	101	50-150	08/31/2022 1423
PFBA	850	14	860	N	1	38	50-150	08/31/2022 1423
PFDA	ND	14	14		1	101	50-150	08/31/2022 1423
PFDoA	ND	14	15		1	105	50-150	08/31/2022 1423
PFHpA	630	14	620	N	1	-35	50-150	08/31/2022 1423
PFHxA	1300	14	1400	N	1	222	50-150	08/31/2022 1423
PFNA	5.6	14	19		1	92	50-150	08/31/2022 1423
PFOA	38	14	51		1	90	50-150	08/31/2022 1423
PFPeA	2800	14	2800	N	1	165	50-150	08/31/2022 1423
PFTeDA	ND	14	14		1	101	50-150	08/31/2022 1423
PFTrDA	ND	14	15		1	108	50-150	08/31/2022 1423
PFUdA	ND	14	14		1	96	50-150	08/31/2022 1423
PFOS Surrogate	9.9 Q % Re	13 Acce ec L	23 eptance imit		1	99	50-150	08/31/2022 1423
13C2_4:2FTS	N 229	25	5-150					
13C2_6:2FTS	139		5-150					
13C2_8:2FTS	103	25	5-150					
13C2_PFDoA	93		5-150					
13C2_PFTeDA	99	25	5-150					
13C3_PFBS	88	25	5-150					
13C3_PFHxS	94	25	5-150					
13C3-HFPO-DA	79	25	5-150					

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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

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

#### PFAS by LC/MS/MS - MS

Sample ID: XH08006-001MS Batch: 52513

Analytical Method: PFAS by ID SOP

Matrix: Aqueous Prep Method: SOP SPE

Prep Date: 08/29/2022 1015

13C4_PFBA       40       25-150         13C4_PFHpA       96       25-150         13C5_PFHxA       70       25-150         13C5_PFPeA       41       25-150         13C6_PFDA       101       25-150         13C7_PFUdA       96       25-150         13C8_PFOA       103       25-150         13C8_PFOS       100       25-150         13C8_PFOSA       99       10-150         13C9_PFNA       105       25-150         d-EtFOSA       82       10-150         d5-EtFOSAA       97       25-150         d9-EtFOSE       89       10-150         d MoEOSA       73       10-150	Surrogate	Q % Rec	Acceptance Limit		
13C5_PFHxA       70       25-150         13C5_PFPeA       41       25-150         13C6_PFDA       101       25-150         13C7_PFUdA       96       25-150         13C8_PFOA       103       25-150         13C8_PFOS       100       25-150         13C8_PFOSA       99       10-150         13C9_PFNA       105       25-150         d-EtFOSA       82       10-150         d5-EtFOSAA       97       25-150         d9-EtFOSE       89       10-150	13C4_PFBA	40	25-150		
13C5_PFPeA       41       25-150         13C6_PFDA       101       25-150         13C7_PFUdA       96       25-150         13C8_PFOA       103       25-150         13C8_PFOS       100       25-150         13C8_PFOSA       99       10-150         13C9_PFNA       105       25-150         d-EtFOSA       82       10-150         d5-EtFOSAA       97       25-150         d9-EtFOSE       89       10-150	13C4_PFHpA	96	25-150		
13C6_PFDA 101 25-150 13C7_PFUdA 96 25-150 13C8_PFOA 103 25-150 13C8_PFOS 100 25-150 13C8_PFOSA 99 10-150 13C9_PFNA 105 25-150 d-EtFOSA 82 10-150 d5-EtFOSAA 97 25-150 d9-EtFOSE 89 10-150	13C5_PFHxA	70	25-150		
13C7_PFUdA       96       25-150         13C8_PFOA       103       25-150         13C8_PFOS       100       25-150         13C8_PFOSA       99       10-150         13C9_PFNA       105       25-150         d-EtFOSA       82       10-150         d5-EtFOSAA       97       25-150         d9-EtFOSE       89       10-150	13C5_PFPeA	41	25-150		
13C8_PFOA       103       25-150         13C8_PFOS       100       25-150         13C8_PFOSA       99       10-150         13C9_PFNA       105       25-150         d-EtFOSA       82       10-150         d5-EtFOSAA       97       25-150         d9-EtFOSE       89       10-150	13C6_PFDA	101	25-150		
13C8_PFOS       100       25-150         13C8_PFOSA       99       10-150         13C9_PFNA       105       25-150         d-EtFOSA       82       10-150         d5-EtFOSAA       97       25-150         d9-EtFOSE       89       10-150	13C7_PFUdA	96	25-150		
13C8_PFOSA       99       10-150         13C9_PFNA       105       25-150         d-EtFOSA       82       10-150         d5-EtFOSAA       97       25-150         d9-EtFOSE       89       10-150	13C8_PFOA	103	25-150		
13C9_PFNA       105       25-150         d-EtFOSA       82       10-150         d5-EtFOSAA       97       25-150         d9-EtFOSE       89       10-150	13C8_PFOS	100	25-150		
d-EtFOSA     82     10-150       d5-EtFOSAA     97     25-150       d9-EtFOSE     89     10-150	13C8_PFOSA	99	10-150		
d5-EtFOSAA     97     25-150       d9-EtFOSE     89     10-150	13C9_PFNA	105	25-150		
d9-EtFOSE 89 10-150	d-EtFOSA	82	10-150		
	d5-EtFOSAA	97	25-150		
d MoEOS A 72 10.150	d9-EtFOSE	89	10-150		
u-ivier OSA /2 10-130	d-MeFOSA	72	10-150		
d3-MeFOSAA 100 25-150	d3-MeFOSAA	100	25-150		
d7-MeFOSE 93 10-150	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

#### PFAS by LC/MS/MS - Duplicate

Sample ID: XH08006-002DU Batch: 52513

Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE

Prep Date: 08/29/2022 1015

	Sample Amount	Result			%RPD	
Parameter	(ng/L)	(ng/L)	Q Dil	% RPD	Limit	Analysis Date
9CI-PF3ONS	ND	ND	1	0.00	20	08/31/2022 1444
11CI-PF3OUdS	ND	ND	1	0.00	20	08/31/2022 1444
8:2 FTS	ND	ND	1	0.00	20	08/31/2022 1444
6:2 FTS	ND	ND	1	0.00	20	08/31/2022 1444
4:2 FTS	ND	ND	1	0.00	20	08/31/2022 1444
GenX	ND	ND	1	0.00	20	08/31/2022 1444
ADONA	ND	ND	1	0.00	20	08/31/2022 1444
EtFOSA	ND	ND	1	0.00	20	08/31/2022 1444
EtFOSAA	ND	ND	1	0.00	20	08/31/2022 1444
EtFOSE	ND	ND	1	0.00	20	08/31/2022 1444
MeFOSA	ND	ND	1	0.00	20	08/31/2022 1444
MeFOSAA	ND	ND	1	0.00	20	08/31/2022 1444
MeFOSE	ND	ND	1	0.00	20	08/31/2022 1444
PFBS	ND	ND	1	0.00	20	08/31/2022 1444
PFDS	ND	ND	1	0.00	20	08/31/2022 1444
PFHpS	ND	ND	1	0.00	20	08/31/2022 1444
PFNS	ND	ND	1	0.00	20	08/31/2022 1444
PFOSA	ND	ND	1	0.00	20	08/31/2022 1444
PFPeS	ND	ND	1	0.00	20	08/31/2022 1444
PFDOS	ND	ND	1	0.00	20	08/31/2022 1444
PFHxS	ND	ND	1	0.00	20	08/31/2022 1444
PFBA	ND	ND	1	0.00	20	08/31/2022 1444
PFDA	ND	ND	1	0.00	20	08/31/2022 1444
PFDoA	ND	ND	1	0.00	20	08/31/2022 1444
PFHpA	ND	ND	1	0.00	20	08/31/2022 1444
PFHxA	ND	ND	1	0.00	20	08/31/2022 1444
PFNA	ND	ND	1	0.00	20	08/31/2022 1444
PFOA	ND	ND	1	0.00	20	08/31/2022 1444
PFPeA	ND	ND	1	0.00	20	08/31/2022 1444
PFTeDA	ND	ND	1	0.00	20	08/31/2022 1444
PFTrDA	ND	ND	1	0.00	20	08/31/2022 1444
PFUdA	ND	ND	1	0.00	20	08/31/2022 1444
PFOS	ND	ND	1	0.00	20	08/31/2022 1444
Surrogate	Q % Rec	Acceptance Limit				
13C2_4:2FTS	110	25-150				
13C2_6:2FTS	121	25-150				
13C2_8:2FTS	108	25-150				
13C2_PFDoA	107	25-150				
13C2_PFTeDA	113	25-150				
13C3_PFBS	111	25-150				
13C3_PFHxS	113	25-150				
13C3-HFPO-DA	108	25-150				
<u>-</u>	. 30					

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

#### PFAS by LC/MS/MS - Duplicate

Sample ID: XH08006-002DU Batch: 52513

Analytical Method: PFAS by ID SOP

Matrix: Aqueous Prep Method: SOP SPE

Prep Date: 08/29/2022 1015

Surrogate	Q % Rec	Acceptance Limit	
13C4_PFBA	112	25-150	
13C4_PFHpA	110	25-150	
13C5_PFHxA	106	25-150	
13C5_PFPeA	113	25-150	
13C6_PFDA	111	25-150	
13C7_PFUdA	110	25-150	
13C8_PFOA	109	25-150	
13C8_PFOS	103	25-150	
13C8_PFOSA	109	10-150	
13C9_PFNA	110	25-150	
d-EtFOSA	84	10-150	
d5-EtFOSAA	107	25-150	
d9-EtFOSE	102	10-150	
d-MeFOSA	68	10-150	
d3-MeFOSAA	112	25-150	
d7-MeFOSE	107	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

Chain of Custody and Miscellaneous Documents

## Face Analytical "

# PACE ANALYTICAL SERVICES, LLC

108 Vantage Point Drive • Wast Columbia, SC 29172 Telephone No. 803-791-9700 Pax No. 803-791-9111 www.pacelabs.com

135644

Number

Remarks / Cooler (.D. XH08006 2 Page Lot Terrap Blaznk Z Y 1600 Ouole No. KESZ OC Requirements (Specify) Kevin . Healings Caza Com PLIE! Time Time いっている ç 84-77 Cete Cate Analysis (Allach Nat if more space is needed, Receipt Temp. □ Unknown ☐ Poison 767 - 424 - 1761 Ace Pack O Skin Irrifant ON (SO) SAFF 1. Laboratory received by  $\times$ × × × × X × 1. Received by E.J. Go Possible Hazard Identification ☐ Non-Hazard ☐ Plammable APPLY A Reserved on fac (Chola) LX SECS No of Containers by Preservative Type HOW 3. Received by 2. Received by MAN. FONH 10534 4 7 αυτίγη ~ 3 إدج Mondon □ Return to Catest □ Diaposen by Lab Hedinger 575 30 Mathk 900 These pyog Semplor's Signature ទាលទាស់ Ж × X, × Report to Contast 272 5 Note: All samples are retained for four weeks from receipt ٥ 6 ی S 9-4-22 Sample Dispose! 15.00 P \$ Colection Time (Miklay) Safe Safe 178 55 5 3 131 uniess other arrangements are made. Tum Around Time Required (Prior isb approval required for expedited LEL.) 8/3/32 21/2/8 26/4/8 21/2/8 8/3/12 8/3/32 Cofeetion Dane(s) P.O. No. 53045 7 Zip Cada COLF 17 Granimonent Inc. Project Name OSHKOSh (org - Markar State (Containers for each sample may be combined on one line.) F-03/74 Project No. 20. 015 7080. 00 W. EQ-1 7-FB-1 7975 W. Sach Standard | Rush (Specify) Trip WI-MM- H 1-1M1-1W 12-1412-2 WE-198-3 Stockfeld COMPAND OF 2 Painqualined by 4. Rothapuished by 3. Relinquistred by Relinquisheri by

Document Number: ME003N2-01

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: KSC / 08/08/2022 Lot #: XF08006
Means of receipt	
Yes No	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
2.81 1/28 MOC	ture upon receipt / Derived (Corrected) temperature upon receipt  %Solid Snap-Cup ID: NA NA NA C NA NA C NA NA C
<del></del>	perature Blank Against Bottles IR Gun ID: 8 IR Gun Correction Factor: 0 °C
	nt: Wet Ice   Ice Packs   Dry Ice   None
	Were all coolers received at or below 6.0902 If no, was through Manager notified?
✓ Yes No	PM was Notified by: phone / email / face-to-face (circle one).
✓ Yes No	
✓ Yes No	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	
✓ Yes No	
Yes No	NA 14. Were VOA, 8015C and RSK-175 samples free of bubbles > "pea-size" ('4" or 6mm in diameter) in any of the VOA vials?
Yes No	
Yes No	- mare
1165 1 100	17 Were all applicable NH (TVN/ampide/abana)/675 1/609 2 /c/ 0 Small V complex from of
Yes No	residual chlorine?
	18 Was the gusta number listed on the container label? If my Opera #
✓ Yes No	NA 25164
	tion (Must be completed for any sample(s) incorrectly preserved or with headspace.)
Sample(s) NA	were received incorrectly preserved and were adjusted according
in sample receiving	
Time of preservat	tion 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 $> 0.5 \text{ mg/L}$ (If #19 is $no$ ) and were
	gly in sample receiving with sodium thiosulfate (Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> ) with Unique ID: $\frac{NA}{C}$
Comments:	