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AREA 19 (R-1)
RESPONSE ACTIVITY PLAN
North Kent Study Area

June 18, 2020, Revised December 18, 2020
File No. 16.0062961.10

PREPARED FOR:
Wolverine World Wide, Inc.
Rockford, Michigan

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TABLE OF CONTENTS

TABLES

APPENDED FIGURES

APPENDIX

ACRONYMS

AMSL	Above Mean Sea Level
CD	Consent Decree
CFS	Cubic Feet per Second
COVID-19	Coronavirus Disease 2019
CSM	Conceptual Site Model
DoD	United States Department of Defense
DWC	Part 201 Generic Groundwater Cleanup Criteria Protective of Drinking Water for Residential Land Uses
EGLE	Michigan Department of Environmental, Great Lakes and Energy
GIS	Geographic Information Systems
GSI	Groundwater-Surface Water Interface
HSDS	House Street Disposal Site
HUC	Hydrologic Unit Code
ID	Identification
MDEQ	Michigan Department of Environmental Quality
MGDL	Michigan GIS Data Library
MS/MSD	Matrix Spike/Matrix Spike Duplicate
ng/L	Nanogram per Liter
NKLF	North Kent Landfill Area
NKSA	North Kent Study Area
PDF	Portable Document Format
PFAS	Per- and Polyfluoroalkyl Substances
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctane Sulfonate
QAPP	Quality Assurance Project Plan [*Former Wolverine Tannery, House Street Disposal Area, and Wolven/Jewell Area, Per- and Polyfluoroalkyl Substances Investigation Program]*
QA/QC	Quality Assurance/Quality Control
QSM	Quality Systems Manual
R&W/GZA	Rose & Westra, a Division of GZA GeoEnvironmental, Inc.
RAP	Response Activity Plan
SAP	Sampling and Analysis Plan
SOP	Standard Operating Procedures
USGS	United States Geological Survey
VAP	Vertical Aquifer Profiling
Wolverine	Wolverine World Wide, Inc,

1.0 INTRODUCTION

On behalf of Wolverine, R&W/GZA, prepared this RAP for the Area 19 (Area R-1) investigation in the NKSA. The objective of this RAP is to define the vertical and horizontal extent of PFAS at Area 19 in compliance with Section 7.9(b)(ii) of the CD.

Area 19 is located northeast of the Wellington Ridge neighborhood, generally north of 11 Mile Road and south of 12 Mile Road. Area 19 includes a small detached area immediately east of US-131 (see **Figure 1**). Elevated PFOA+PFOS concentrations were measured in the Wellington Ridge neighborhood, located between 10 Mile and 11 Mile Roads, west of Wolven Avenue. The groundwater elevation and PFAS monitoring data (from both monitoring wells and residential wells) indicated flow paths from Wellington Ridge northwesterly toward the Rogue River and northeasterly toward Area 19.

Most of the Area 19 residential water wells either had no measurable PFOA+PFOS, or the PFOA+PFOS concentrations were less than 10 ng/L. Six residential wells had PFOA or PFOS concentrations over 8 ng/L or 16 ng/L for PFOA and PFOS respectively.

This RAP is prepared pursuant to CD No. 1:18-cv-00039-JTN-SJB, effective February 19, 2020. Specifically, this scope of work is established in Sections 7.4, 7.9(b) and Appendix R of the CD. This RAP is organized into the following sections:

- Introduction
- CSM
- Proposed Statement of Work
- Investigation Methodologies
- Sampling and Analysis Methods and Procedures
- Data Quality Objectives
- Data Quality Control and Assurance
- Project Schedule for Field Sampling and Analysis
- Project Schedule for Data Evaluation and Report Submittals

2.0 CONCEPTUAL SITE MODEL

The CSM (as defined in Section 4.4 of the CD) was based on interpretation of regional geology and hydrogeology, residential water well sampling data in the NKSA, and groundwater investigations performed associated with the Wolven and Jewell area. The CSM is focused on the groundwater flow from the presumed source area in the vicinity of the Wellington Ridge neighborhood to Area 19, PFAS distribution in groundwater, and the fate and transport of PFAS in groundwater. For the purpose of this RAP, the current understanding of the CSM as related to the human receptors in Area 19 was evaluated and potential data gaps were identified. Two sets of permanent groundwater monitoring wells are located within Area 19: MW-WV-12 cluster (3 wells) and MW-WV-14 cluster (2 wells). There are also two well clusters within Area 19 along Summit that were installed by EGLE. See **Tables 1** and **2** for a list of residential water wells and addresses in Area 19 and their associated PFAS analytical results. **Figure 1** provides an outlined boundary for Area 19 which is a portion of the Wolven Northeast Study Area and

12 Mile Road and Summit Avenue portions of the Wolven/Jewell Study Area, which are part of the overall NKSA. The Wolven/Jewell Study Area is characterized by topographic highs and lowland areas, generally trending between ridges and hilly rolling topography.

For the purpose of this RAP, the CSM is focused on PFAS distribution in groundwater, and the fate and transport of PFAS in groundwater likely to migrate toward and within Area 19. The following sections provide discussions of source areas, hydrology, geology and hydrogeology, PFAS distribution in groundwater, groundwater flow, and PFAS transport.

2.01 WOLVEN AND JEWELL STUDY AREA AND OTHER POTENTIAL SOURCE AREAS

Figure 1 provides an outlined boundary for Area 19, which is a portion of the Wolven/Jewell Study Area. The Wolven/Jewell Study Area is characterized by topographic highs and lowland areas, generally trending between ridges and hilly rolling topography. In general, the Rogue River forms the western most, northwesterly and northeasterly boundaries of the Wolven/Jewell Study Area. The southern boundary is generally defined from west to east by 10 Mile Road and then trends to the north, east of Wolven Avenue, then trending eastward along 11 Mile Road to the Rogue River and northward to 12 Mile Road.

EGLE has alleged that there is a potential source area in the Wellington Ridge neighborhood where historic disposal of PFAS took place. GZA's investigations and review of available information have not revealed evidence of waste material. Historical aerial photographs suggest a portion of a former gravel pit was previously located in the area of the Lady Lauren cul-de-sac of the Wellington Ridge Development. The Wellington Ridge neighborhood is a high point within the Wolven/Jewell Study Area (approximately 860 feet AMSL) resulting in groundwater flow in multiple directions. In addition, certain PFAS have also historically been detected in the groundwater monitoring wells installed within, and adjacent to the NKLF.

Multiple PFAS compounds have been detected in Area 19, however, PFOS and PFOA are the only PFAS compounds present with existing Part 201 cleanup criteria. The PFOA+PFOS in residential wells located northeast or east of the intersection of 11 Mile Road and Wolven Avenue likely results from PFOA+PFOS migrating from the southwest corner of Area 19, from the Wellington Ridge area to those hydraulically downgradient residences within Area 19.

Although the presence of other sources does not impact the obligations of the parties under the CD, there are other possible sources of PFAS at residential properties such as those in Area 19, including septic systems, rain deposition, and the use of domestic products that contain PFAS (Schaider et al, 2016; EGLE, 2019a; ITRC, 2020).

2.02 TOPOGRAPHY

As shown in **Figure 1**, the Wolven/Jewell Study Area has moderately undulating terrain characteristic of glacial end-moraine and pitted outwash topography. The ground surface elevations in the central portion where the Wellington Ridge neighborhood development is located range from approximately 780 feet AMSL to greater than 930 feet AMSL. Most of the neighborhoods in the eastern portion of the Wolven/Jewell Study Area are situated on topographically elevated areas sloping along surface water drainageways toward lowland areas. The terrain is sloped in various directions, to the west and northwest toward the Rogue River, and northeast toward the Rogue River. The portion of the Wolven/Jewell Study Area located west of US-131 has ground surface elevations ranging from approximately 724 to 850 feet AMSL. The lowest elevations within the Wolven/Jewell Study Area occur along the Rogue River ranging from approximately 723 feet AMSL on the western boundary to 700 feet AMSL on the eastern boundary. Area 19 has ground surface elevations ranging from approximately 700 to 910 feet AMSL.

2.03 HYDROLOGY

Based on the *Michigan's Major Watersheds – Sub-basins GIS data* (EGLE, 2019b) downloaded from MGDL, NKSA is situated within the Rogue River Basin (Basin No. 14F), which is part of the Lower Grand River watershed (HUC 0405006). The Rogue River Basin consists of 12 sub-basins, and Area 19 falls within sub-basin HUC 04050006040110. This sub-basin drains to the Rogue River, which discharges at the confluence with the Grand River to the south.

The 2016 National Oceanic and Atmospheric Administration climate data report[1] for Grand Rapids, Michigan, indicates that the mean annual precipitation for the 80-year record period is approximately 36 inches. Based on the state-wide GIS data for the estimated annual groundwater recharge from precipitation (Michigan State University, 2005), at the NKSA it ranged from 9 to 15 inches.

From 1989 to 2016, the average annual streamflow rate at USGS Gaging Station No. 04118500 in Rockford, Michigan, is approximately 260 cfs, and the average baseflow rate approximately 210 cfs. The gaging station measures the flow for the sub-basin, HUC 04050006040110, and all the upstream sub-basins, representing a drainage area of approximately 234 square miles, according to the USGS record.

2.04 GEOLOGY

Overburden in Kent County is a thick sequence of Pleistocene glacial deposits. The thickness of glacial deposits ranges from 11 to 800 feet in Kent County; however, the majority of glacial deposits range from 200 to 400 feet in thickness (Western Michigan University, 1981; Farrand, 1982). The glacial deposits in the County include till, outwash, and lacustrine deposits. Till occurs in end moraines and ground moraines (till plains), interspersed on the surface throughout the County (Stramel, Wisler, & Laird, 1954). For the area near the City of Rockford and Plainfield Township, the Michigan Glacial Land systems (Michigan State University, 2015) indicates that proglacial outwash plain is present along the Rogue River, and end moraines are present either side of the Rogue River extending to the "wide" near the Grand River. End moraines of medium-textured till are present at the NKSA and its vicinity. The ground moraine (till plain) and end moraine belong to the unstratified group of deposits, composed of fine- to coarse-grained material, including silt, sand, gravel, and boulders.

Based upon bedrock maps for the area (MDEQ, 1987), the bedrock beneath the NKSA includes the Michigan basin series. Based on GIS data from EGLE (MDEQ, 1987), Jurassic "red beds" are present in most of the site area and its vicinity, with small areas of Saginaw formation outcrops. The Jurassic "red beds" are often poorly consolidated or unconsolidated and consist primarily of clay, mudstone, siltstone, sandstone, shale, and gypsum. The "red beds" are of low permeability and are considered a confining unit. However, locally in the county, the "red beds" have been documented to supply small quantities of water (Apple & Reeves, 2007). Beneath the "red beds," bedrock in the region consists of the Mississippian-aged sandstone (Marshall formation), shale (Michigan formation), and the Bayport limestone as well as the Pennsylvanian-aged Saginaw formation. The regional dip is northeasterly toward the center of the Michigan basin.

Based on the *Hydrogeologic Atlas of Michigan* (Western Michigan University, 1981), the top of bedrock elevation ranges from 500 to 550 feet near the City of Rockford and within the Study Area.

Wolven/Jewell Study Area Geology

This summary of the geology in the Wolven/Jewell Study Area is based on borehole data collected during the subsurface exploration, groundwater monitoring well installation described in **Appendix A,** and the residential

[1] https://www.ncdc.noaa.gov/cdo-web/search

water well construction information and lithology data downloaded from the online Wellogic System[2]. The Wellogic System made available individual well logs in PDF, GIS shapefiles of county-wide well locations and construction information, and database files of lithology data for some of the wells. Geologic cross-sections A-A' and B-B' (see **Figure 5** for transect locations) were created to show the general spatial variability of the depositional environment beneath the Wolven/Jewell Study Area. See **Figures 6** and **7** for geological cross-sections A-A' and B-B' respectively.

Cross-section A-A' was constructed from the northwest quadrant of the Wolven/Jewell Study Area west of US-131, trending eastward to Area 19. In general, east of US-131, finer-grained deposits comprised of clay and silt till with interbedded and discontinuous sand lenses is more predominant. West of US-131, coarser-grained deposits comprised of sand, or sand with gravel trend westward toward the Rogue River where glacial outwash sand and gravel and post-glacial alluvial deposition predominates. The thickness of clay and silt till soil varies from less than 10 feet to more than 80 feet and is sometimes interbedded above or below the coarser-grained sand, or sand with gravel in the Study Area. Clay and silt till were not observed above the sand encountered in residential wells along 11 Mile Road, where more than 100 feet of sand is present above the top of the lower clay and silt till stratum. In general, water-bearing sand and sand with gravel units were encountered below the fine-grained clay and silt till stratum or between clay/silt strata, but this varies topographically.

Cross Section B-B' is constructed from the Wellington Ridge neighborhood through the Wolven Northeast area. Fine-grained soil is predominant in the boreholes on cross-section B-B'. Water-bearing units were encountered below the clay till stratum or between clay till strata. The thickness of fine-grained soil varies from approximately 20 feet to more than 100 feet. In most of the boreholes on cross-section B-B', the top of the clay stratum was shallow, except the well at 3616 11 Mile Road, where more than 100 feet of sand were present above the top of the clay stratum, presenting a potential pathway for surface/shallow contamination to migrate to the deeper zones.

The moraine and ablation till deposits are characterized by sandy till that includes varying amounts of silt and clay and can vary from loose to medium density. Note that specific locations underlying the Wellington Ridge area, dominated by clay and silt, become very dense based on standard penetration N-values exceeding 30 blows/foot (see MW-9D), and may represent limited areas of lodgment till underlying this area. West of US-131 closer to the Rogue River, coarse-grained sand and sand with some gravel are present in stratigraphically greater thickness and are dominant in some locations. Individual borings containing only coarse-grained sand exist even in the areas where fine-grained soils are predominant. Where continuous, these more permeable strata may provide preferential migration pathways to the deeper water-bearing zone. The presence and thickness of clay and silt till deposits varies horizontally and vertically and are unstratified and appear discontinuous in the Study Area. The lithologies shown on the cross-sections are characteristic of end moraines and complex depositional mechanisms vertically and horizontally in the hillier portions of the Study Area and are characteristic of glacial outwash sand and gravel and post glacial alluvium deposition in low lying areas approaching the Rogue River. The complex depositional environment and variability horizontally and vertically affects the transmissivity of the water-bearing deposits, and therefore influences groundwater flow and contaminant transport.

2.05 HYDROGEOLOGY

NKSA Groundwater Flow

The direction of regional groundwater flow is influenced by the primary surface water features of the Rogue River and the Grand River. Streamflow data from the USGS Gaging Station indicates that the Rogue River is a gaining

[2] https://secure1.state.mi.us/wellogic/Login.aspx?ReturnUrl= percent2fwellogic percent2fdefault.aspx

stream, acting as a groundwater discharge zone. R&W/GZA interpolated regional groundwater flows based on the static groundwater level in the Wellogic - Statewide Wells GIS Data for Kent County (Michigan State University, 2005a through 2005d). The regional groundwater contours also indicate regional groundwater flow pattern generally follows the topography, discharging to the Rogue River and the Grand River.

Based on the static water level data and the ground surface elevation data from USGS Digital Elevation Model GIS data downloaded from MGDL, the regional groundwater elevations were estimated, and groundwater contours interpolated for Area 19 and the larger Wolven/Jewell Study Area. The groundwater flow pattern generally follows the topography in the region. Overall groundwater flows from elevated areas where the highest amounts of recharge occur, discharging to the Rogue River as the dominant receiving surface water body which flows southward to the Grand River. The combination of the Rogue River, which borders Area 19 to the east, as the controlling discharge feature and the topographical high in the Wellington Ridge neighborhood southwest of Area 19, groundwater flow from the Wellington Ridge area tends to occur in a radial pattern. The predominant groundwater directions within the Wolven/Jewell Study Area are expected to be west-northwest, north-northeast, and east-southeast toward the Rogue River.

Static water levels were collected from the monitoring wells and the staff gages. Groundwater and surface water elevations were calculated from the surveyed elevations of the top of casing for the monitoring wells or reference points for the staff gages. In addition, surface water elevations recorded at USGS Gaging Station No. 04118500 were also downloaded and converted to the same datum as the monitoring well survey. See **Table 3** for the well installation information in the NKSA and **Table 4** for a summary of the static groundwater water level measurements. Note these tables include information for NKSA as a whole, while only a portion of the data is relevant to Area 19.

In addition to the R&W/GZA-installed groundwater monitoring wells, EGLE also collected static water level data from the monitoring wells installed by EGLE during the November 2019 monitoring event and requested that NKLF collect and provide static water level data in November 2019. In combination, the November 2019 static water level data provided the most complete set of static water levels and elevations for the NKSA.

For the locations where multiple wells were installed at different intervals, R&W/GZA grouped the wells into the shallow zone and deep zone by borehole lithologies, screen intervals, and static water elevations. See **Table 3** for the well grouping designations.

Based on the November 2019 data set, groundwater elevation contours were interpolated from the static water level data. See **Figure 2** for the groundwater elevation contours in the shallow zone and **Figure 3** for the deep zone.

As shown on **Figures 2** and **3**, groundwater in both the deep and shallow zones of the NKSA flows to the Rogue River. The Wellington Ridge neighborhood is situated at or near a groundwater divide. Groundwater predominantly flows from this area in three directions: northwest, northeast, and southeast. The hydraulic gradient to the northeast appears to be slightly higher than the gradient to the northwest.

Wolven/Jewell Study Area Groundwater Flow

As shown on **Figure 2**, the shallow groundwater flow regime in the Wolven/Jewell Study Area is characterized by a general radial pattern from topographic highs toward the Rogue River as it surrounds much of the Wolven/Jewell Study Area and represents the primary groundwater discharge feature for the region. There appears to be a groundwater divide that corresponds to a topographically elevated moraine in the Wellington Ridge neighborhood. The divide is likely a primary recharge zone and appears oriented northeast to southwest. The divide appears to extend across 10 Mile Road to the south and includes the NKLF. Groundwater flow is predominantly to the northwest from the Wellington Ridge area across the Wolven/Jewell Study Area. However, components of flow toward the northeast and east are evident in the Wolven Northeast area, and generally eastward toward Area 19. Deep zone groundwater contours are similar to the shallow zone although the groundwater divide appears within the approximate north central portion of the Wolven/Jewell Study Area (WV-MW-5S/5D) west of the shallow groundwater flow divide by approximately 2,000 to 3,000 feet (**Figure 3**). The deeper divide is based on a limited number of data points; however, the available head data indicates that the vertical component of flow could partially account for the wider distribution of PFAS impacts throughout the Study area.

Area 19 Groundwater Flow

In Area 19, the shallow groundwater flows to the east-northeast toward the Rogue River. The deeper groundwater contours show an overall east-northeast flow toward the Rogue River, with a small southeast component in the southeast corner of Area 19. However, these contours are limited as there are minimal investigative monitoring wells within Area 19. The contours are based on well information both inside and outside of Area 19. As such, this is one of the data gaps identified in this CSM. Site-specific hydraulic conductivity values for Area 19 and the larger Wolven/Jewell Study Area are not available; as such, Area 19-specific groundwater seepage velocity is not estimated.

2.06 PFAS DISTRIBUTION IN GROUNDWATER

Distribution of PFAS in the Wolven/Jewell Study Area

It is GZA's opinion that groundwater and residential well sampling completed since 2017 has identified two primary PFAS plumes within the Wolven/Jewell Study Area. Groundwater samples collected from the monitoring wells across the Study Area in 2019 identified PFOA and PFOS as the primary PFAS compounds (approximately 26 percent and 57 percent of the total PFAS in monitoring well samples, respectively). Note total PFAS analyte lists have varied between 14 and 23 (i.e., the EPA Method 537.1 14-analyte list and the 23 analytes included in the isotope dilution methodology under the most recent DoD QSM revision in effect at the time of sampling). However, given that the percent of the total PFAS mass that is comprised of PFOA+PFOS is relatively high, the slight variations in the total PFAS due to the varied number of analytes is negligible. Specifically, the analytes included on the 23 list that are not on the 14 list (i.e., 9 different compounds) comprise approximately 8 percent of the total PFAS in the monitoring well samples. For consistency in the mapping, the total PFAS presented on **Figure 8** are calculated from the sum of the 12 PFAS compounds that are common between EPA Method 537.1 and the isotope dilution, DoD QSM methodology. However, the total PFAS values used throughout the remainder of this RAP and associated documents are reported as full totals of either the 14 or 23 analytes.

PFAS analytical data from the groundwater monitoring wells, and residential water well samples collected until December 2019 were combined and used for the interpolation of isoconcentration maps for total PFAS (**Figure 8**), and PFOA+PFOS (**Figure 9**). Where data from multiple sampling depths or sampling events are available at one location, the maximum concentrations were used during interpolation. It is important to note that the isoconcentration maps were geostatistically interpolated from spatially distributed point data, therefore they may overestimate the concentrations or extents in areas where data points were relatively sparse. As implied by the method, the isoconcentration maps are estimations only and are not intended to represent measured or true conditions.

Given the mobility of PFAS in groundwater, the migration and distribution in the Study Area is expected to correlate strongly to the groundwater flow pattern. Based on available data, it appears that there are two potential PFAS source areas in the primary Study Area:

1. The Wellington Ridge neighborhood. Note that GZA's investigation of this area and review of available data did not yield evidence of waste material.
2. The NKLF, where PFAS impacts do exist and a reported landfill underdrain system previously discharged to the northwest trending drainage feature that discharges under 10 Mile Road then northwest toward US-131. Both the underdrain discharge and groundwater underlying the NKLF could migrate into the Study Area and contribute to PFAS in residential wells.

The PFOA+PFOS isoconcentration map (**Figure 9**) suggests radial migration from the groundwater divide, east-northeast toward Wolven Northeast, 12 Mile Road and Summit Avenue areas, northwest across US-131 toward the Rogue River, and to the south-southeast into the North Childsdale area. Based on the groundwater flow evaluation; the PFOA+PFOS-impacted groundwater is expected to continue migrating along preferential flow paths primarily controlled by a complex depositional environment, established surface drainage and surface water features as well as topography toward the Rogue River.

Distribution of PFAS in Area 19

Within Area 19, PFOS+PFOA concentrations above 10 ng/L have been identified in approximately 20 percent of the drinking water wells sampled (see **Table 2**), but the PFOA+PFOS concentrations were less than both 8 ng/L (PFOA) and 16 ng/L (PFOS) except in six locations. The majority of the residential wells (63 percent) in Area 19 did not contain detectable PFOA+PFOS.

Table 5, below, summarizes the detections, maximum concentration, and frequency of detection in groundwater samples collected in Area 19 for PFOA and PFOS analytes. Analytical data for the residential wells in Area 19 are provided in **Table 2**, and PFAS analytical results for the samples collected from the Study Area in 2019 are provided in **Table 6. Figures 8** and **9** depict total PFAS (12 compounds as previously discussed) and PFOA+PFOS in the Wolven/Jewell Study Area near Area 19, respectively.

Table 5: Summary of PFOA, PFOS and Combined PFOA+PFOS Data in Groundwater
2019 Area 19 Quarterly Monitoring Well Sampling

Compound	Total Samples	Number of Detections	Number of Exceedances	Maximum Conc. (µg/L)	Threshold Value (µg/L)	Basis for Value[1]
PFOA	30	11	6	0.54	0.008	DWC
PFOS	30	6	3	1.0	0.016	DWC
Combined PFOA+PFOS	30	11	6	1.11	0.010	CD Value[2]

1. Discussion of criterion applicability is included in Section 2.07.
2. The listed CD value is not a state-wide criterion, but rather a negotiated value from the CD. There are currently no applicable criteria or regulations establishing 10 ng/L PFOA+PFOS

Vertically, the residential water wells in Area 19 appear to be screened at a deeper elevation than monitoring well WV-MW-14D where PFOA+PFOS was detected at concentrations greater than the Part 201 Drinking Water Criteria of 8 ng/L and 16 ng/L (PFOA and PFOS, respectively) but shallower than WV-MW-12D which has not had detected concentrations of PFOA or PFOS, as shown in both cross-sections A-A' and B-B'. The migration of PFAS and PFOA+PFOS within Area 19 remains to be further evaluated.

Data gaps are described in **Section 2.08**, and data collection to resolve the gaps is discussed in **Section 3.0**.

3-Dimensional Representation of PFAS in Area 19

Because only four monitoring well clusters (two installed by R&W/GZA and two installed by EGLE) are in Area 19, a 3-dimensional representation of PFAS is not practicable at this time. The possibility of 3-dimensional representation will be evaluated once the data proposed in **Section 3.0** are collected.

2.07 EXPOSURE PATHWAYS – APPLICABLE PART 201 CLEANUP CRITERIA AND CD ACTION LEVELS

The residents in Area 19 who use groundwater for drinking water are potential receptors of PFOA+PFOS exposure via groundwater ingestion. Therefore, based on EGLE's Part 201 administrative rules, the applicable Part 201 groundwater cleanup criterion for Area 19 is the Part 201 Generic Groundwater Cleanup Criteria Protective of Drinking Water for Residential Land Uses (DWC), which is protective of human health from being exposed to groundwater via ingestion.

For PFAS compounds, Michigan only has Part 201 cleanup criteria for PFOS and PFOA. In addition, Section 7.1 of the CD requires preventing exposure to PFOA+PFOS concentration in excess of 10 ng/L as one of the performance objectives. These are summarized in the following table. Note that the listed CD value is not a state-wide criterion, but rather a negotiated value in the CD. There are currently no applicable federal or State regulations establishing 10 ng/L as the groundwater cleanup criterion for PFOA+PFOS.

Compound	Threshold Value (µg/L)	Basis for Value
PFOA	12	GSI
PFOS	0.012	GSI
PFOA	0.008	DWC
PFOS	0.016	DWC
Combined PFOA+PFOS	0.010	CD Value

The GSI pathway for PFAS and PFOA+PFOS is addressed in a separate RAP submitted to EGLE in September2020 (R&W/GZA, 2020).

Based on the Part 201 cleanup criteria and the CD requirements, the project action levels for PFOA + PFOS concentrations are set to be 10 ng/L combined, 8 ppt for PFOA, and 16 ppt for PFOS. The project objectives are to monitor possible migration of PFAS/PFOA+PFOS to Area 19 and evaluate if Area 19 receptors are potentially exposed to PFOA+PFOS above 10 ng/L via groundwater ingestion, and to define the horizontal and vertical extent of PFAS in Area 19.

2.08 DATA GAPS

Based on the current understanding of the CSM and the above discussions, the following data gaps are identified:

- Groundwater elevation and groundwater flow patterns within Area 19;
- Potential for PFOA+PFOS-, PFAS-impacted groundwater in the shallow and deep zones migrating to Area 19; and,
- Depth to bedrock within Area 19.

R&W/GZA has identified the following areas within Area 19 where additional data is needed to further characterize the plume, meet the project objectives, and address the data gaps:

- North of 12 Mile Road and west of the Rogue River;
- In the central and eastern portions of Area 19 (near the WV-MW-12 well cluster);
- In the southern and south-central portion of Area 19 (near the WV-MW-14 well cluster); and
- In the western portion of Area 19 (east of US-131).

3.0 PROPOSED STATEMENT OF WORK

The following provides a summary of the proposed investigation, based on the identified data gaps. The proposed sampling locations are shown on **Figure 10**. Actual monitoring well locations may vary slightly from the proposed locations during installation. While the target locations for the well clusters are shown, limitations for access on private properties, site conditions, and utilities may require moving monitoring well locations.

- To monitor for migration from the Wellington Ridge area (Area 7) toward Area R-1 (19), four monitoring well locations, Area19-MW-13, Area19-MW-14, Area19-MW-15, and Area19-MW-16, are proposed. Existing monitoring well clusters WV-MW-14 and WV-MW-12 will be included as part of the monitoring network for Area R-1 (19).
- Three remedial investigation well cluster locations (Area19-MW-1, Area19-MW-2, and Area19-MW-10) are proposed immediately downgradient of the potential groundwater mound near the southwestern corner of Area R-1 (19). The purpose is to further evaluate the PFOA+PFOS extent and groundwater elevations in this area and the PFAS distribution east of the potential groundwater mound. Currently, one nested well set (MW-WV-14S/14D) has been installed east of this area. Area19-MW-10, Area19-MW-1 and Area19-MW-2 are proposed north, northeast and south of MW-WV-14S/14D (northeast and southeast of the potential mound) to assess downgradient PFAS concentrations and groundwater elevations.
- Two additional monitoring well clusters (Area19-MW-8 and Area19-MW-9) are proposed west-northwest, and north of the intersection of 11 Mile Road and Wolven to provide detection monitoring for the downgradient area, north and northwest of that area. Groundwater contours indicate potential migration from the groundwater mound area to the north. These monitoring well clusters will also provide better understanding of groundwater elevations and groundwater flow north and northwest of the apparent groundwater mound.
- Two remedial investigation well cluster locations (Area19-MW-3 and Area19-MW-4) are proposed near Whirlwind Road to further evaluate the PFOA+PFOS extent (PFOA+PFOS plume width).
- Three additional remedial investigation well cluster locations (Area19-MW-6 and Area19-MW-7) are proposed northwest and north of the estimated 10 ppt PFOA+PFOS contour in the east side of Area R-1 (19). The purpose is to further delineate the extent of PFOA+PFOS in the area. Based on current information, Area19-MW-6 and Area19-MW-7 are also perimeter monitoring wells for the north and west edges of the PFOA+PFOS plume.
- Three additional remedial investigation well cluster locations (Area19-MW-5, Area19-MW-11 and Area19-MW-12) are proposed near Summit Avenue. The purpose of these wells is to further characterize the PFOA+PFOS plume in the area.

The combination of groundwater monitoring, institutional controls (groundwater use ordinance), and filters (as required) are designed to protect Area 19 residents from unacceptable exposure to PFOA + PFOS in drinking water.

In addition to groundwater monitoring proposed in this RAP, additional residential well resampling is proposed (see separate residential well sampling RAP submitted September 2020). If a residential well exceeds 10 ng/L PFOA + PFOS, or applicable criteria, the CD requires that Wolverine provide a drinking water filter, and further requires that Plainfield and Algoma Townships adopt groundwater use ordinances that mandate use and maintenance of these filters.

4.0 INVESTIGATION METHODOLOGY

Relevant tasks performed under this RAP will be completed in accordance with the most recent revision of the QAPP prepared for Wolverine by R&W/GZA.

The proposed well cluster locations will be drilled using either hollow-stem auger or rotosonic methods in accordance with SOPs A03 through A06 of the QAPP. When possible, the initial boring at each location will be drilled to the top of bedrock or upon refusal. The borehole terminal depth will also be evaluated based on the depths of adjacent water wells and the presence of confining strata.

As the initial borings are drilled at each location, vertical aquifer profiling samples will be collected for PFAS analysis from water-bearing and permeable formation(s) at an interval of 10 feet. Vertical Aquifer Profiling will be completed in accordance with *SOP A25, Vertical Aquifer Profiling* included in the QAPP. The turn-around time for laboratory samples will be approximately three weeks.

Well installation depths are not predetermined. Based on the profiling data, encountered geology, and nearby drinking water well elevations, R&W/GZA will determine the depth(s) of wells installed at each nest location. The monitoring wells will be developed in accordance with *SOP A13, Well Development* in the QAPP. Upon completion, the wells will also be surveyed by a licensed surveyor.

5.0 SAMPLING AND ANALYTICAL PROCEDURES

This section provides a generalized SAP for the Area 19 monitoring well sampling. Specific information regarding sampling procedures and analytical methods is provided in the site-specific QAPP.

Wells will be sampled as follows:

Well Type	**Initial Sampling Post Installation/ Development (at least 2 weeks post development)**	**Annual Sampling Until Substantial Completion of Perimeter Well Network***	**Quarterly sampling For One Year Once Perimeter Well Network is Substantially Complete***
Perimeter Wells**	X	X	X
RI Wells	X		

* Substantial Completion will be agreed upon by R&W/GZA and EGLE.

**Perimeter wells are defined as the wells installed at the perimeter of areas where municipal water will be installed. For perimeter wells only, after four quarters of sampling, the wells will be tied into the Perimeter Well SOW and the long-term monitoring plan will be included with those wells.

The sampling will be conducted using methods established in SOPs A14, A15, A16, and B01 of the QAPP. The samples will be analyzed using DoD QSM 5.3 guidelines for PFAS by isotope dilution methodology.

5.01 SAMPLING LOCATIONS

As discussed in **Section 3.0**, the following monitoring well locations are proposed:

Grouping/Area	Well Nomenclature
Existing	MW-WV-14S/14D, WV-MW-12S/12M/12D
Evaluate groundwater flow direction further in Area 19	Area19-MW-1, Area19-MW-2, Area19-MW-10,
Evaluate groundwater flow and monitor potential migration into Area 19	Area19-MW-13, Area19-MW-14, Area19-MW-15 and Area19-MW-16
Delineation of extent of Wolven/Jewell Plume in the east and southeast portions of Area 19	Area19-MW-8, Area19-MW-9, Area19-MW-5, Area19-MW-11 and Area19-MW-12
Delineation of extent of Wolven/Jewell Plume in the central portion of Area 19	Area19-MW-3 and Area19-MW-4
Delineation of extent of Wolven/Jewell Plume in the northern portion of Area 19	Area19-MW-6 and Area19-MW-7

5.02 SAMPLE COLLECTION AND LABELING

Samples will be collected for PFAS analysis following the methods summarized in **Section 4.0** and detailed in the sampling SOPs for Groundwater Monitoring Wells (SOP A16; Low Flow Sampling). Detailed field and laboratory requirements are provided in the site-specific QAPP.

Sample identification will consist of nomenclature that includes the unique location identification (see reference table above). If applicable, sample identification for each sample will be repeated for each sampling event, with consistent spelling.

To prevent misidentification of samples, legible labels will be affixed to each sample container. The labels will be sufficiently durable to remain legible even when wet. At a minimum, the labels will contain the following information:

- Location ID;
- Name or initials of collector; and
- Date and time of collection.

5.03 SAMPLE SHIPPING

Sample bottles will be placed into the cooler and packed with double-bagged wet ice immediately following collection. Packing material will be used as necessary. A temperature blank will be placed in the cooler prior to shipment. The cooler shall be addressed to the appropriate laboratory and dispatched as soon as practical to ensure timely arrival.

5.04 ANALYTICAL METHOD AND PARAMETERS

PFAS will be analyzed using DoD QSM 5.3 guidelines for PFAS by isotope dilution methodology. The analyte list will include the 28 PFAS compounds specified by EGLE, and reporting limits are provided in Table A.7.7 of the project specific QAPP.

6.0 DATA QUALITY ASSURANCE AND CONTROL

The following field quality control samples will be collected at a rate of one per 20 samples in accordance with the project specific QAPP: Field blanks, field duplicates, and MS/MSDs.

- Field blanks will be collected by pouring laboratory-supplied, certified PFAS-free water into a sample container at the point of sample collection. The purpose of field blanks is to assess potential contamination at the sample point.
- Field duplicates will be collected by filling one additional sample container with water from the sample point. The purpose of field duplicates is to assess variability in sample composition. Field duplicates are not intended to be blind duplicates.
- MS/MSD will be collected by filling two additional sets of sample bottles with water from the sample point. MS/MSD analyses are conducted by the analytical laboratory after samples have been collected and submitted. Analysis of known concentrations of analytes spiked in the MS/MSD samples indicate if matrix interference effects are occurring.
- QA/QC samples will be collected using the methods described in **Section 5.0** and the SOPs in the site-specific QAPP. Samples will be labeled described in **Section 5.0.** The location of QA/QC samples will be entered into the Monitoring Checklist. QA/QC samples will be analyzed using the same analytical methods used for the primary sample.

7.0 INVESTIGATION DERIVED WASTE

Soil cuttings will be containerized and transported to the HSDS property for staging/storage until off-site treatment/disposal or other approved handling can be arranged. The monitoring well development and purge water will be managed as follows:

- For locations where PFAS concentrations are below Part 201 GRCC, the water can be discharged to the ground surface in accordance with EGLE interoffice communication regarding purge-water disposal from well sampling and development (EGLE, 1999).

- For locations where PFAS concentrations are unknown or known to exceed Part 201 GRCC, the water will be disposed of appropriately in accordance with the EGLE interoffice communication regarding purge water disposal from well sampling and development (EGLE, 1999), and not discharged to the ground surface.

8.0 ANTICIPATED SCHEDULE

The schedule for monitoring well installation will depend greatly on R&W/GZA's ability to procure access to the desired locations and the potential impact of coronavirus disease 2019 (COVID-19). The schedule for installation of the well cluster locations will depend on R&W/GZA's ability to obtain access to the desired locations or proximate alternate locations. The following table outlines R&W/GZA's current estimates of the steps and approximate timeframes for the tasks in this RAP (upon EGLE approval).

Task	Estimated Timeframe per Location
Access	1 to 3 months
Initial Drilling	2 to 3 weeks
VAP analysis	3 weeks
Monitoring Wells Installation	1 to 2 weeks
Development Wait Time	2 weeks
First Groundwater Sampling	1 week
First Laboratory Analysis	3 weeks

Assuming one month per location, R&W/GZA estimates this RAP will require 16 months to complete drilling, vertical aquifer profiling, and monitoring well installation. This will be completed in conjunction with the other RAPs submitted under the CD. R&W/GZA will coordinate with EGLE to prioritize drilling locations if access is obtained for multiple locations throughout the RAPs simultaneously. Because access will likely be obtained piecemeal, the actual well installation schedule will likely exceed six months.

Following the full year of quarterly sampling of the well network, R&W/GZA will evaluate the data in consultation with EGLE and determine appropriate next steps.

9.0 REFERENCES

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TABLES

See Page 4 for Notes

TABLE 1
PARCEL LIST AND WELL SCREEN INFORMATION
Area R-1 (19)
Wolven/Jewell Area, Kent County, MI

Area	PPN	Address	Note	Well Screen Elevation (feet)
Area R-1 (19)	410626300011	3409 11 MILE RD NE	VACANT	NA
Area R-1 (19)	410635100023	3500 11 MILE RD NE	SAMPLED BY R&W/GZA	706-695
Area R-1 (19)	410635100005	3530 11 MILE RD NE	SAMPLED BY R&W/GZA	NA
Area R-1 (19)	410626300021	3535 11 MILE RD NE	SAMPLED BY R&W/GZA	806-802
Area R-1 (19)	410626300022	3599 11 MILE RD NE	SAMPLED BY R&W/GZA	694-682
Area R-1 (19)	410635201012	3616 11 MILE RD NE	SAMPLED BY R&W/GZA	686-682
Area R-1 (19)	410626400005	3617 11 MILE RD NE	SAMPLED BY R&W/GZA	NA
Area R-1 (19)	410626400004	3651 11 MILE RD NE	SAMPLED BY R&W/GZA	NA
Area R-1 (19)	410626400009	3749 11 MILE RD NE	SAMPLED BY R&W/GZA	618-608
Area R-1 (19)	410635226001	3820 11 MILE RD NE	SAMPLED BY R&W/GZA	718-713
Area R-1 (19)	410626400010	3883 11 MILE RD NE	VACANT	NA
Area R-1 (19)	410635227001	3900 11 MILE RD NE	SAMPLED BY R&W/GZA	587-552
Area R-1 (19)	410635227003	3990 11 MILE RD NE	SAMPLED BY R&W/GZA	716-706
Area R-1 (19)	410636101008	3994 11 MILE RD NE	VACANT	NA
Area R-1 (19)	410636101010	4010 11 MILE RD NE	SAMPLED BY R&W/GZA	693-688
Area R-1 (19)	410636101011	4080 11 MILE RD NE	SAMPLED BY R&W/GZA	742-737
Area R-1 (19)	410625351002	4099 11 MILE RD NE	SAMPLED BY R&W/GZA	719-714
Area R-1 (19)	410625351003	4145 11 MILE RD NE	SAMPLED BY R&W/GZA	NA
Area R-1 (19)	410636101007	4170 11 MILE RD NE	SAMPLED BY R&W/GZA	701-696
Area R-1 (19)	410625100038	4020 12 MILE RD NE	SAMPLED BY R&W/GZA	NA
Area R-1 (19)	410625100061	4050 12 MILE RD NE	SAMPLED BY R&W/GZA	NA
Area R-1 (19)	410625100060	4100 12 MILE RD NE	SAMPLED BY R&W/GZA	NA
Area R-1 (19)	410625100022	4150 12 MILE RD NE	SAMPLED BY R&W/GZA	691-687
Area R-1 (19)	410626400011	9351 ALSHIRE FARMS DR NE	SAMPLED BY R&W/GZA	NA
Area R-1 (19)	410625100042	9915 BRADLEY DR NE	SAMPLED BY R&W/GZA	NA
Area R-1 (19)	410625100043	9920 BRADLEY DR NE	SAMPLED BY R&W/GZA	NA
Area R-1 (19)	410626200037	9787 DEER TRL NE	SAMPLED BY R&W/GZA	NA
Area R-1 (19)	410626200026	9790 DEER TRL NE	SAMPLED BY R&W/GZA	NA
Area R-1 (19)	410626200024	9798 DEER TRL NE	SAMPLED BY R&W/GZA	690-685
Area R-1 (19)	410626200030	9799 DEER TRL NE	SAMPLED BY R&W/GZA	719-709
Area R-1 (19)	410626200035	9820 DEER TRL NE	SAMPLED BY R&W/GZA	693-683
Area R-1 (19)	410626200034	9831 DEER TRL NE	SAMPLED BY R&W/GZA	711-706
Area R-1 (19)	410626200036	9859 DEER TRL NE	SAMPLED BY R&W/GZA	693-681
Area R-1 (19)	410626300001	9410 ELSTNER AVE NE	VACANT	NA
Area R-1 (19)	410625100029	4350 RIVERWATCH RD NE	SAMPLED BY OTHERS	NA
Area R-1 (19)	410625100028	4320 RIVERWATCH RD NE	SAMPLED BY OTHERS	NA
Area R-1 (19)	410625100026	4325 RIVERWATCH RD NE	VACANT	NA
Area R-1 (19)	410625100027	4355 RIVERWATCH RD NE	NA	NA
Area R-1 (19)	410625451001	9220 SUMMIT AVE NE	SAMPLED BY OTHERS	NA
Area R-1 (19)	410625376003	9300 SUMMIT AVE NE	SAMPLED BY OTHERS	695-685
Area R-1 (19)	410625376002	9320 SUMMIT AVE NE	SAMPLED BY OTHERS	593-583
Area R-1 (19)	410625376001	9350 SUMMIT AVE NE	SAMPLED BY OTHERS	NA
Area R-1 (19)	410625326008	9380 SUMMIT AVE NE	SAMPLED BY OTHERS	676-671
Area R-1 (19)	410625326006	9450 SUMMIT AVE NE	SAMPLED BY OTHERS	NA
Area R-1 (19)	410625326005	9490 SUMMIT AVE NE	SAMPLED BY OTHERS	661-651
Area R-1 (19)	410625326004	9530 SUMMIT AVE NE	SAMPLED BY OTHERS	668-658
Area R-1 (19)	410625326003	9552 SUMMIT AVE NE	SAMPLED BY OTHERS	NA
Area R-1 (19)	410625326002	9558 SUMMIT AVE NE	SAMPLED BY OTHERS	NA

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PARCEL LIST AND WELL SCREEN INFORMATION
Area R-1 (19)
Wolven/Jewell Area, Kent County, MI

Area	PPN	Address	Note	Well Screen Elevation (feet)
Area R-1 (19)	410625326001	9564 SUMMIT AVE NE	SAMPLED BY OTHERS	637-633
Area R-1 (19)	410625100044	9610 SUMMIT AVE NE	SAMPLED BY OTHERS	NA
Area R-1 (19)	410625100045	9620 SUMMIT AVE NE	SAMPLED BY OTHERS	NA
Area R-1 (19)	410625100048	9630 SUMMIT AVE NE	SAMPLED BY OTHERS	690-683
Area R-1 (19)	410625100025	9740 SUMMIT AVE NE	SAMPLED BY OTHERS	687-683
Area R-1 (19)	410625100036	9796 SUMMIT AVE NE	SAMPLED BY OTHERS	NA
Area R-1 (19)	410625100072	9800 SUMMIT AVE NE	SAMPLED BY OTHERS	674-669
Area R-1 (19)	410625100071	9908 SUMMIT AVE NE	SAMPLED BY OTHERS	641-636
Area R-1 (19)	410625100065	9924 SUMMIT AVE NE	SAMPLED BY OTHERS	676-670
Area R-1 (19)	410625100062	9958 SUMMIT AVE NE	SAMPLED BY OTHERS	691-686
Area R-1 (19)	410636101013	9105 SUMMIT AVE NE	SAMPLED BY R&W/GZA	742-738
Area R-1 (19)	410636101014	9111 SUMMIT AVE NE	SAMPLED BY R&W/GZA	NA
Area R-1 (19)	410636101012	9115 SUMMIT AVE NE	VACANT	NA
Area R-1 (19)	410636101003	9145 SUMMIT AVE NE	SAMPLED BY R&W/GZA	594-589
Area R-1 (19)	410636101002	9185 SUMMIT AVE NE	SAMPLED BY R&W/GZA	NA
Area R-1 (19)	410625376004	9200 SUMMIT AVE NE	SAMPLED BY OTHERS	NA
Area R-1 (19)	410625351001	9391 SUMMIT AVE NE	SAMPLED BY R&W/GZA	675-670
Area R-1 (19)	410625401001	9400 SUMMIT AVE NE	SAMPLED BY OTHERS	NA
Area R-1 (19)	410625326007	9410 SUMMIT AVE NE	NA	NA
Area R-1 (19)	410625315003	9489 SUMMIT AVE NE	SAMPLED BY R&W/GZA	658-654
Area R-1 (19)	410625315002	9545 SUMMIT AVE NE	SAMPLED BY R&W/GZA	NA
Area R-1 (19)	410625315001	9555 SUMMIT AVE NE	SAMPLED BY R&W/GZA	705-700
Area R-1 (19)	410625100074	9605 SUMMIT AVE NE	SAMPLED BY R&W/GZA	NA
Area R-1 (19)	410625100073	9617 SUMMIT AVE NE	VACANT	NA
Area R-1 (19)	410625100032	9737 SUMMIT AVE NE	SAMPLED BY R&W/GZA	NA
Area R-1 (19)	410625100031	9881 SUMMIT AVE NE	SAMPLED BY R&W/GZA	NA
Area R-1 (19)	410625100057	9887 SUMMIT AVE NE	SAMPLED BY R&W/GZA	677-672
Area R-1 (19)	410625100068	9900 SUMMIT AVE NE	SAMPLED BY OTHERS	NA
Area R-1 (19)	410625100056	9905 SUMMIT AVE NE	SAMPLED BY R&W/GZA	651-641
Area R-1 (19)	410625100058	9907 SUMMIT AVE NE	SAMPLED BY R&W/GZA	NA
Area R-1 (19)	410625100067	9910 SUMMIT AVE NE	SAMPLED BY OTHERS	NA
Area R-1 (19)	410625100020	9911 SUMMIT AVE NE	SAMPLED BY R&W/GZA	687-683
Area R-1 (19)	410625100069	9916 SUMMIT AVE NE	VACANT	NA
Area R-1 (19)	410625100064	9920 SUMMIT AVE NE	SAMPLED BY OTHERS	NA
Area R-1 (19)	410625100023	9933 SUMMIT AVE NE	SAMPLED BY R&W/GZA	684-679
Area R-1 (19)	410625100063	9940 SUMMIT AVE NE	SAMPLED BY OTHERS	NA
Area R-1 (19)	410625301007	4090 TRADEWIND DR NE	SAMPLED BY R&W/GZA	NA
Area R-1 (19)	410625301008	4144 TRADEWIND DR NE	SAMPLED BY R&W/GZA	710-690
Area R-1 (19)	410625301006	4155 TRADEWIND DR NE	SAMPLED BY R&W/GZA	693-683
Area R-1 (19)	410625301009	4158 TRADEWIND DR NE	SAMPLED BY R&W/GZA	NA
Area R-1 (19)	410625301010	4164 TRADEWIND DR NE	SAMPLED BY R&W/GZA	640-630
Area R-1 (19)	410625301005	4167 TRADEWIND DR NE	SAMPLED BY R&W/GZA	688-678
Area R-1 (19)	410625301011	4168 TRADEWIND DR NE	SAMPLED BY R&W/GZA	579-568
Area R-1 (19)	410625301012	4172 TRADEWIND DR NE	SAMPLED BY R&W/GZA	685-675
Area R-1 (19)	410625301004	4175 TRADEWIND DR NE	SAMPLED BY R&W/GZA	706-696
Area R-1 (19)	410625301013	4176 TRADEWIND DR NE	SAMPLED BY R&W/GZA	689-679
Area R-1 (19)	410625301003	4183 TRADEWIND DR NE	SAMPLED BY R&W/GZA	702-692
Area R-1 (19)	410625301014	4184 TRADEWIND DR NE	SAMPLED BY R&W/GZA	700-690
Area R-1 (19)	410625301002	4189 TRADEWIND DR NE	SAMPLED BY R&W/GZA	697-687

TABLE 1
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Area R-1 (19)
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Area	PPN	Address	Note	Well Screen Elevation (feet)
Area R-1 (19)	410625301001	4195 TRADEWIND DR NE	SAMPLED BY R&W/GZA	NA
Area R-1 (19)	410626200009	3640 VERSCHEL DR NE	SAMPLED BY R&W/GZA	635-622
Area R-1 (19)	410626200011	3725 VERSCHEL DR NE	SAMPLED BY R&W/GZA	NA
Area R-1 (19)	410626200012	3800 VERSCHEL DR NE	SAMPLED BY R&W/GZA	703-698
Area R-1 (19)	410625301040	3823 WHIRLWIND DR NE	SAMPLED BY R&W/GZA	700-690
Area R-1 (19)	410625301039	3826 WHIRLWIND DR NE	SAMPLED BY R&W/GZA	701-691
Area R-1 (19)	410625301038	3830 WHIRLWIND DR NE	SAMPLED BY R&W/GZA	719-709
Area R-1 (19)	410625301037	3848 WHIRLWIND DR NE	SAMPLED BY R&W/GZA	718-708
Area R-1 (19)	410625301041	3855 WHIRLWIND DR NE	SAMPLED BY R&W/GZA	704-694
Area R-1 (19)	410625301036	3862 WHIRLWIND DR NE	SAMPLED BY R&W/GZA	715-705
Area R-1 (19)	410625301042	3869 WHIRLWIND DR NE	SAMPLED BY R&W/GZA	NA
Area R-1 (19)	410625301035	3870 WHIRLWIND DR NE	SAMPLED BY R&W/GZA	709-699
Area R-1 (19)	410625301034	3882 WHIRLWIND DR NE	SAMPLED BY R&W/GZA	712-702
Area R-1 (19)	410625301043	3885 WHIRLWIND DR NE	SAMPLED BY R&W/GZA	698-688
Area R-1 (19)	410625301033	3900 WHIRLWIND DR NE	SAMPLED BY R&W/GZA	701-691
Area R-1 (19)	410625301044	3909 WHIRLWIND DR NE	SAMPLED BY R&W/GZA	697-687
Area R-1 (19)	410625301045	3913 WHIRLWIND DR NE	SAMPLED BY R&W/GZA	699-689
Area R-1 (19)	410625301032	3914 WHIRLWIND DR NE	SAMPLED BY R&W/GZA	NA
Area R-1 (19)	410625301046	3921 WHIRLWIND DR NE	SAMPLED BY R&W/GZA	702-692
Area R-1 (19)	410625301031	3926 WHIRLWIND DR NE	SAMPLED BY R&W/GZA	705-695
Area R-1 (19)	410625301030	3938 WHIRLWIND DR NE	SAMPLED BY R&W/GZA	696-686
Area R-1 (19)	410625301047	3945 WHIRLWIND DR NE	SAMPLED BY R&W/GZA	691-681
Area R-1 (19)	410625301029	3950 WHIRLWIND DR NE	SAMPLED BY R&W/GZA	692-682
Area R-1 (19)	410625301048	3963 WHIRLWIND DR NE	SAMPLED BY OTHERS	707-697
Area R-1 (19)	410625301028	3966 WHIRLWIND DR NE	SAMPLED BY R&W/GZA	693-683
Area R-1 (19)	410625301049	3975 WHIRLWIND DR NE	SAMPLED BY R&W/GZA	693-688
Area R-1 (19)	410625301027	3980 WHIRLWIND DR NE	SAMPLED BY R&W/GZA	701-691
Area R-1 (19)	410625301050	3983 WHIRLWIND DR NE	SAMPLED BY R&W/GZA	694-684
Area R-1 (19)	410625301051	3989 WHIRLWIND DR NE	SAMPLED BY R&W/GZA	693-683
Area R-1 (19)	410625301052	3991 WHIRLWIND DR NE	SAMPLED BY R&W/GZA	691-681
Area R-1 (19)	410625301026	3998 WHIRLWIND DR NE	SAMPLED BY R&W/GZA	702-692
Area R-1 (19)	410625301053	4011 WHIRLWIND DR NE	SAMPLED BY R&W/GZA	689-679
Area R-1 (19)	410625301025	4020 WHIRLWIND DR NE	SAMPLED BY R&W/GZA	718-708
Area R-1 (19)	410625301054	4029 WHIRLWIND DR NE	SAMPLED BY R&W/GZA	678-668
Area R-1 (19)	410625301024	4036 WHIRLWIND DR NE	SAMPLED BY R&W/GZA	697-687
Area R-1 (19)	410625301023	4050 WHIRLWIND DR NE	SAMPLED BY R&W/GZA	712-702
Area R-1 (19)	410625301022	4064 WHIRLWIND DR NE	SAMPLED BY R&W/GZA	708-698
Area R-1 (19)	410625301055	4065 WHIRLWIND DR NE	SAMPLED BY R&W/GZA	702-692
Area R-1 (19)	410625301021	4078 WHIRLWIND DR NE	SAMPLED BY R&W/GZA	702-692
Area R-1 (19)	410625301056	4079 WHIRLWIND DR NE	SAMPLED BY R&W/GZA	720-710
Area R-1 (19)	410625301057	4095 WHIRLWIND DR NE	SAMPLED BY R&W/GZA	699-689
Area R-1 (19)	410625301020	4096 WHIRLWIND DR NE	SAMPLED BY R&W/GZA	702-692
Area R-1 (19)	410625301019	4112 WHIRLWIND DR NE	SAMPLED BY R&W/GZA	NA
Area R-1 (19)	410625301058	4117 WHIRLWIND DR NE	SAMPLED BY R&W/GZA	714-704
Area R-1 (19)	410625301018	4124 WHIRLWIND DR NE	NO RESPONSE TO SAMPLING REQUEST	673-663
Area R-1 (19)	410625301059	4125 WHIRLWIND DR NE	SAMPLED BY R&W/GZA	696-686
Area R-1 (19)	410625301060	4139 WHIRLWIND DR NE	SAMPLED BY R&W/GZA	711-701
Area R-1 (19)	410625301017	4140 WHIRLWIND DR NE	SAMPLED BY R&W/GZA	665-655
Area R-1 (19)	410625301016	4154 WHIRLWIND DR NE	SAMPLED BY R&W/GZA	704-694

TABLE 1
PARCEL LIST AND WELL SCREEN INFORMATION
Area R-1 (19)
Wolven/Jewell Area, Kent County, MI

Area	PPN	Address	Note	Well Screen Elevation (feet)
Area R-1 (19)	410625301061	4155 WHIRLWIND DR NE	SAMPLED BY R&W/GZA	722-712
Area R-1 (19)	410625301015	4168 WHIRLWIND DR NE	SAMPLED BY R&W/GZA	694-684
Area R-1 (19)	410626300019	9300 WINZER CT NE	SAMPLED BY R&W/GZA	NA
Area R-1 (19)	410626300020	9269 WINZER CT NE	SAMPLED BY R&W/GZA	NA
Area R-1 (19)	410626300025	9313 WINZER CT NE	VACANT	NA
Area R-1 (19)	410626300026	9322 WINZER CT NE	VACANT	NA
Area R-1 (19)	410626300023	9345 WINZER CT NE	SAMPLED BY R&W/GZA	NA
Area R-1 (19)	410626300024	9350 WINZER CT NE	VACANT	NA
Area R-1 (19)	410626300031	9244 WOLVEN AVE NE	SAMPLED BY R&W/GZA	703-696
Area R-1 (19)	410626300016	9280 WOLVEN AVE NE	SAMPLED BY R&W/GZA	NA
Area R-1 (19)	410626300009	9300 WOLVEN AVE NE	SAMPLED BY R&W/GZA	788-784
Area R-1 (19)	410626300008	9350 WOLVEN AVE NE	SAMPLED BY R&W/GZA	565-558
Area R-1 (19)	410626300028	9400 WOLVEN AVE NE	SAMPLED BY R&W/GZA	549-526
Area R-1 (19)	410626300014	9524 WOLVEN AVE NE	SAMPLED BY R&W/GZA	708-703
Area R-1 (19)	410626300015	9550 WOLVEN AVE NE	SAMPLED BY R&W/GZA	705-700
Area R-1 (19)	410626300003	9590 WOLVEN AVE NE	SAMPLED BY R&W/GZA	NA
Area R-1 (19)	410626100014	9612 WOLVEN AVE NE	SAMPLED BY R&W/GZA	776-772
Area R-1 (19)	410626100016	9620 WOLVEN AVE NE	SAMPLED BY R&W/GZA	NA
Area R-1 (19)	410626100043	9680 WOLVEN AVE NE	SAMPLED BY R&W/GZA	778-773
Area R-1 (19)	410626100033	9684 WOLVEN AVE NE	VACANT	NA
Area R-1 (19)	410626200010	9688 WOLVEN AVE NE	VACANT	NA
Area R-1 (19)	410626100058	9691 WOLVEN AVE NE	SAMPLED BY R&W/GZA	795-785
Area R-1 (19)	410626100059	9693 WOLVEN AVE NE	SAMPLED BY R&W/GZA	694-686
Area R-1 (19)	410626100048	9715 WOLVEN AVE NE	SAMPLED BY R&W/GZA	702-697
Area R-1 (19)	410626100051	9740 WOLVEN AVE NE	SAMPLED BY R&W/GZA	791-786
Area R-1 (19)	410626100049	9754 WOLVEN AVE NE	SAMPLED BY R&W/GZA	775-765
Area R-1 (19)	410626100034	9766 WOLVEN AVE NE	SAMPLED BY R&W/GZA	713-708
Area R-1 (19)	410626100032	9776 WOLVEN AVE NE	VACANT	NA
Area R-1 (19)	410626100029	9789 WOLVEN AVE NE	SAMPLED BY R&W/GZA	690-686
Area R-1 (19)	410625100053	4100 WRENS WAY CT NE	SAMPLED BY R&W/GZA	623-613
Area R-1 (19)	410625100049	4101 WRENS WAY CT NE	SAMPLED BY R&W/GZA	NA
Area R-1 (19)	410625100050	4117 WRENS WAY CT NE	SAMPLED BY R&W/GZA	NA
Area R-1 (19)	410625100051	4133 WRENS WAY CT NE	SAMPLED BY R&W/GZA	NA
Area R-1 (19)	410625100052	4159 WRENS WAY CT NE	SAMPLED BY R&W/GZA	NA

Notes:

1. Well screen elevations provided in feet above mean sea level, North American Vertical Datum of 1988 (NAVD 88). Well screen elevations were calculated using well information provided by the State of Michigan's Wellogic database and ground surface elevations of the center of the PPN generated from LiDAR data provided by Kent County. Elevations are rounded to the nearest foot.
2. "NA" indicates not available.

TABLE 2
SUMMARY OF DRINKING WATER SAMPLE ANALYSIS - PFAS
Area R-1 (19)
Wolven/Jewell Area, Kent County, MI

Area	**Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2]**	**MCL[3]**	**CD Value[4]**	**Area R-1 (19)**	**Area R-1 (19)**	**Area R-1 (19)**	**Area R-1 (19)**	**Area R-1 (19)**	**Area R-1 (19)**	**Area R-1 (19)**	**Area R-1 (19)**	**Area R-1 (19)**	**Area R-1 (19)**	**Area R-1 (19)**	**Area R-1 (19)**	**Area R-1 (19)**	**Area R-1 (19)**	**Area R-1 (19)**	**Area R-1 (19)**
PPN				**410635100023**	**410626300022**	**410626300031**	**410626300031**	**410626300016**	**410626300009**	**410626300008**	**410635100005**	**410626300021**	**410626300020**	**410626300023**	**410626300019**	**410625100062**	**410625326005**	**410625100045**	**410625326002**
Address				**3500 11 MILE RD NE**	**3599 11 MILE RD NE**	**9244 WOLVEN AVE NE**	**9244 WOLVEN AVE NE**	**9280 WOLVEN AVE NE**	**9300 WOLVEN AVE NE**	**9350 WOLVEN AVE NE**	**3530 11 MILE RD NE**	**3535 11 MILE RD NE**	**9269 WINZER CT NE**	**9345 WINZER CT NE**	**9300 WINZER CT NE**	**9958 SUMMIT AVE NE**	**9490 SUMMIT AVE NE**	**9620 SUMMIT AVE NE**	**9558 SUMMIT AVE NE**
Sample Name				**3500 11 Mile Rd NE**	**3599 11 Mile Rd NE**	**9260 Wolven Ave**	**9270 Wolven Ave**	**9280 Wolven Ave**	**9300 Wolven Ave**	**9350 Wolven Ave**	**3530 11 Mile NE**	**3535 11 Mile NE**	**9269 11 Mile NE**	**3541 Winzer Ct**	**3593 11 Mile Rd NE**	**WR1712040920 MK**	**WR1712040940 MK**	**WR1712041005 MK**	**WR1712041035 MK**
Matrix				**Drinking Water**	**Drinking Water**	**Drinking Water**	**Drinking Water**	**Drinking Water**	**Drinking Water**	**Drinking Water**	**Drinking Water**	**Drinking Water**	**Drinking Water**	**Drinking Water**	**Drinking Water**	**Drinking Water**	**Drinking Water**	**Drinking Water**	**Drinking Water**
Laboratory ID				**K1712649-012**	**K1712649-013**	**K1712649-006**	**K1712649-007**	**K1712649-008**	**K1712649-009**	**K1712649-010**	**K1712639-009**	**K1712639-011**	**K1712639-008**	**K1712651-001**	**K1712947-008**	**1701862-01**	**1701862-02**	**1701862-03**	**1701862-05**
Sample Date				**11/17/2017**	**11/17/2017**	**11/17/2017**	**11/17/2017**	**11/17/2017**	**11/17/2017**	**11/17/2017**	**11/20/2017**	**11/20/2017**	**11/20/2017**	**11/20/2017**	**11/30/2017**	**12/04/2017**	**12/04/2017**	**12/04/2017**	**12/04/2017**
Parameter (µg/L)																			
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	NCL	NA	NA	<0.0044	<0.0044	<0.0045	<0.0043	<0.0044	<0.0044	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0077	<0.00242	<0.00254	<0.00247	<0.00254
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	NCL	NA	NA	<0.0044	<0.0044	<0.0045	<0.0043	<0.0044	<0.0044	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.034	<0.00242	<0.00254	<0.00247	<0.00254
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	NCL	NA	NA	<0.0044	<0.0044	<0.0045	<0.0043	<0.0044	<0.0044	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0041	-	-	-	-
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE)	NCL	NA	NA	<0.0044	<0.0044	<0.0045	<0.0043	<0.0044	<0.0044	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0041	-	-	-	-
N-Methyl perfluorooctane sulfonamide (MeFOSA)	NCL	NA	NA	<0.0044	<0.0044	<0.0045	<0.0043	<0.0044	<0.0044	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0041	-	-	-	-
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE)	NCL	NA	NA	<0.0044	<0.0044	<0.0045	<0.0043	<0.0044	<0.0044	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0041	-	-	-	-
Perfluorobutane sulfonic acid (PFBS)	NCL	0.42	NA	<0.0044	<0.0044	<0.0045	<0.0043	<0.0044	<0.0044	<0.0043	<0.0043	0.011	<0.0043	<0.0043	<0.0041	0.012	0.0147	0.0247	0.00655
Perfluorodecane sulfonic acid (PFDS)	NCL	NA	NA	<0.0044	<0.0044	<0.0045	<0.0043	<0.0044	<0.0044	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0041	<0.00242	<0.00254	<0.00247	<0.00254
Perfluorooctadecanoic acid (PFODA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	<0.00727	<0.00762	<0.00741	<0.00762
Perfluoroheptane sulfonic acid (PFHpS)	NCL	NA	NA	<0.0044	<0.0044	<0.0045	<0.0043	<0.0044	<0.0044	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0041	0.00254	<0.00254	0.00261	<0.00254
Perfluorooctane sulfonamide (FOSA)	NCL	NA	NA	<0.0044	<0.0044	<0.0045	<0.0043	<0.0044	<0.0044	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0041	<0.00242	<0.00254	<0.00247	<0.00254
Perfluorohexane sulfonic acid (PFHxS)	NCL	0.051	NA	<0.0044	<0.0044	<0.0045	<0.0043	<0.0044	<0.0044	<0.0043	<0.0043	0.006	<0.0043	<0.0043	<0.0041	0.00752	0.00418	0.021	0.00206
Perfluorobutanoic acid (PFBA)	NCL	NA	NA	<0.0088	<0.0088	<0.009	<0.0086	<0.0088	<0.0088	<0.0086	<0.0087	<0.0087	<0.0086	<0.0087	<0.0081	0.00153	0.00142	0.00235	<0.00254
Perfluorodecanoic acid (PFDA)	NCL	NA	NA	<0.0044	<0.0044	<0.0045	<0.0043	<0.0044	<0.0044	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0041	<0.00242	<0.00254	<0.00247	<0.00254
Perfluorododecanoic acid (PFDoDA)	NCL	NA	NA	<0.0044	<0.0044	<0.0045	<0.0043	<0.0044	<0.0044	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0041	<0.00242	<0.00254	<0.00247	<0.00254
Perfluoroheptanoic acid (PFHpA)	NCL	NA	NA	<0.0044	<0.0044	<0.0045	<0.0043	<0.0044	<0.0044	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0041	0.00204	0.00062	0.00421	<0.00254
Perfluorohexanoic acid (PFHxA)	NCL	400	NA	<0.0044	<0.0044	<0.0045	<0.0043	<0.0044	<0.0044	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0041	<0.00242	<0.00254	0.003	<0.00254
Perfluorononanoic acid (PFNA)	NCL	0.006	NA	<0.0044	<0.0044	<0.0045	<0.0043	<0.0044	<0.0044	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0041	<0.00242	<0.00254	<0.00247	<0.00254
Perfluorooctanoic acid (PFOA)	0.008	0.008	NA	<0.0018	<0.0018	<0.0018	<0.0017	<0.0018	<0.0018	<0.0017	<0.0017	***0.011***	<0.0017	<0.0017	<0.0016	***0.0148***	0.00263	***0.0259***	<0.00254
Perfluorooctane sulfonic acid (PFOS)	0.016	0.016	NA	<0.0044	<0.0044	<0.0045	<0.0043	<0.0044	<0.0044	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0041	0.0124	<0.00254	0.00525	<0.00254
PFOA + PFOS (Calculated)	NCL	NA	0.01	ND	ND	ND	ND	ND	ND	ND	ND	***0.011***	ND	ND	ND	***0.027***	0.0026	***0.031***	ND
Perfluoropentanoic acid (PFPeA)	NCL	NA	NA	<0.0044	<0.0044	<0.0045	<0.0043	<0.0044	<0.0044	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0041	0.00102	<0.00254	0.00202	<0.00254
Perfluorotetradecanoic acid (PFTeDA)	NCL	NA	NA	<0.0044	<0.0044	<0.0045	<0.0043	<0.0044	<0.0044	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0041	<0.00242	<0.00254	<0.00247	<0.00254
Perfluorotridecanoic acid (PFTrDA)	NCL	NA	NA	<0.0044	<0.0044	<0.0045	<0.0043	<0.0044	<0.0044	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0041	<0.00242	<0.00254	<0.00247	<0.00254
Perfluoroundecanoic acid (PFUnDA)	NCL	NA	NA	<0.0044	<0.0044	<0.0045	<0.0043	<0.0044	<0.0044	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0041	<0.00242	<0.00254	<0.00247	<0.00254
Perfluorohexadecanoic acid (PFHxDA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	<0.00242	<0.00254	<0.00247	<0.00254
Total PFAS (Calculated)	NCL	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	0.028	ND	ND	ND	0.054	0.024	0.091	0.0086

TABLE 2
SUMMARY OF DRINKING WATER SAMPLE ANALYSIS - PFAS
Area R-1 (19)
Wolven/Jewell Area, Kent County, MI

Area	Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2]	MCL[3]	CD Value[4]	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)
PPN				410625376002	410625376003	410625100048	410625100071	410625326003	410625100044	410625326008	410625100065	410625100036	410625376001	410625100072	410625100029	410625326004	410625451001	410625100025	410625326006
Address				9320 SUMMIT AVE NE	9300 SUMMIT AVE NE	9630 SUMMIT AVE NE	9908 SUMMIT AVE NE	9552 SUMMIT AVE NE	9610 SUMMIT AVE NE	9380 SUMMIT AVE NE	9924 SUMMIT AVE NE	9796 SUMMIT AVE NE	9350 SUMMIT AVE NE	9800 SUMMIT AVE NE	4550 RIVERWATCH RD NE	9530 SUMMIT AVE NE	9220 SUMMIT AVE NE	9740 SUMMIT AVE NE	9450 SUMMIT AVE NE
Sample Name				WR1712041115MK	WR1712041130MK	WR1712041315MK	WR1712041340MK	WT1712041405MK	WT1712041545MK	WR1712051610JNR	WR1712041750MK	WR1712041810MK	WR1712051625JNR	WR1712070930JLB	WR1712081510JLB	WR1712081525JLB	WR1712121305MK	WT1712121330MK	WT1712201705MK
Matrix				Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water
Laboratory ID				1701862-06	1701862-11	1701862-07	1701862-08	1701862-09	1701862-10	1701862-16	1701862-12	1701862-13	1701862-14	1701905-04	1701930-01	1701930-02	1701971-13	1701971-14	1702001-17
Sample Date				12/04/2017	12/04/2017	12/04/2017	12/04/2017	12/04/2017	12/04/2017	12/04/2017	12/04/2017	12/04/2017	12/05/2017	12/07/2017	12/08/2017	12/08/2017	12/12/2017	12/12/2017	12/20/2017
Parameter (µg/L)																			
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	NCL	NA	NA	<0.00267	<0.0024	<0.00241	<0.00251	<0.00251	<0.00247	<0.00239	<0.00254	<0.00248	<0.0024	<0.0023	<0.00245	<0.00239	<0.0024	<0.00243	<0.00231
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	NCL	NA	NA	0.00117	<0.0024	<0.00241	0.00101	<0.00251	<0.00247	<0.00239	<0.00254	<0.00248	0.00118	<0.0023	<0.00245	<0.00239	<0.0024	<0.00243	<0.00231
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Methyl perfluorooctane sulfonamide (MeFOSA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorobutane sulfonic acid (PFBS)	NCL	0.42	NA	0.00314	0.0145	0.0123	0.00138	0.0119	0.00912	0.0154	0.00363	0.00349	0.0158	0.00726	<0.00245	0.0199	<0.0024	0.016	0.0155
Perfluorodecane sulfonic acid (PFDS)	NCL	NA	NA	<0.00267	<0.0024	<0.00241	<0.00251	<0.00251	<0.00247	<0.00239	<0.00254	<0.00248	<0.0024	<0.0023	<0.00245	<0.00239	<0.0024	<0.00243	<0.00231
Perfluorooctadecanoic acid (PFODA)	NCL	NA	NA	<0.00801	<0.00721	<0.00724	<0.00753	<0.00753	<0.00741	<0.00716	<0.00762	<0.00744	<0.00721	<0.00689	<0.00735	<0.00718	<0.00721	<0.0073	<0.00692
Perfluoroheptane sulfonic acid (PFHpS)	NCL	NA	NA	<0.00267	<0.0024	<0.00241	<0.00251	0.00182	0.00327	0.00141	<0.00254	<0.00248	0.00152	<0.0023	0.00126	<0.00239	0.00113	0.00303	<0.00231
Perfluorooctane sulfonamide (FOSA)	NCL	NA	NA	<0.00267	<0.0024	<0.00241	<0.00251	<0.00251	<0.00247	<0.00239	<0.00254	<0.00248	<0.0024	<0.0023	<0.00245	<0.00239	<0.0024	<0.00243	<0.00231
Perfluorohexane sulfonic acid (PFHxS)	NCL	0.051	NA	<0.00267	0.00771	0.0119	0.00059	0.00891	0.00525	0.00844	0.00108	0.0014	0.00921	0.00487	<0.00245	0.00489	<0.0024	0.0118	0.00711
Perfluorobutanoic acid (PFBA)	NCL	NA	NA	<0.00267	0.00343	0.00185	<0.00251	0.00132	0.003	0.00254	<0.00254	<0.00248	0.0023	0.00074	<0.00245	0.00283	<0.0024	0.00159	0.00119
Perfluorodecanoic acid (PFDA)	NCL	NA	NA	<0.00267	<0.0024	<0.00241	<0.00251	<0.00251	<0.00247	<0.00239	<0.00254	<0.00248	<0.0024	<0.0023	<0.00245	<0.00239	<0.0024	<0.00243	<0.00231
Perfluorododecanoic acid (PFDoDA)	NCL	NA	NA	<0.00267	<0.0024	<0.00241	<0.00251	<0.00251	<0.00247	<0.00239	<0.00254	<0.00248	<0.0024	<0.0023	<0.00245	<0.00239	<0.0024	<0.00243	<0.00231
Perfluoroheptanoic acid (PFHpA)	NCL	NA	NA	<0.00267	0.00378	0.00434	<0.00251	0.00122	0.00238	0.00253	<0.00254	<0.00248	0.00255	0.0003	<0.00245	0.00242	<0.0024	0.00128	<0.00231
Perfluorohexanoic acid (PFHxA)	NCL	400	NA	<0.00267	0.00561	0.00356	<0.00251	<0.00251	0.00305	0.00302	<0.00254	<0.00248	0.00225	<0.0023	<0.00245	0.00593	<0.0024	<0.00243	0.00156
Perfluorononanoic acid (PFNA)	NCL	0.006	NA	<0.00267	<0.0024	<0.00241	<0.00251	<0.00251	<0.00247	<0.00239	<0.00254	<0.00248	<0.0024	<0.0023	<0.00245	<0.00239	<0.0024	<0.00243	<0.00231
Perfluorooctanoic acid (PFOA)	0.008	0.008	NA	0.00037	***0.0173***	***0.0399***	0.00034	***0.0141***	***0.0167***	***0.0101***	0.00244	0.00091	***0.0163***	0.00408	<0.00245	0.00696	<0.0024	***0.0232***	0.00628
Perfluorooctane sulfonic acid (PFOS)	0.016	0.016	NA	<0.00267	<0.0024	0.00934	<0.00251	0.00126	***0.0198***	0.00205	<0.00254	<0.00248	0.00344	0.00913	<0.00245	<0.00239	<0.0024	***0.022***	0.00114
PFOA + PFOS (Calculated)	NCL	NA	0.01	0.00037	***0.017***	***0.049***	0.00034	***0.015***	***0.037***	***0.012***	0.0024	0.00091	***0.02***	***0.013***	ND	0.007	ND	***0.045***	0.0074
Perfluoropentanoic acid (PFPeA)	NCL	NA	NA	<0.00267	0.0033	0.002	<0.00251	<0.00251	0.00139	<0.00239	<0.00254	<0.00248	<0.0024	<0.0023	<0.00245	0.0044	<0.0024	<0.00243	<0.00231
Perfluorotetradecanoic acid (PFTeDA)	NCL	NA	NA	<0.00267	<0.0024	<0.00241	<0.00251	<0.00251	<0.00247	<0.00239	<0.00254	<0.00248	<0.0024	<0.0023	<0.00245	<0.00239	<0.0024	<0.00243	<0.00231
Perfluorotridecanoic acid (PFTrDA)	NCL	NA	NA	<0.00267	<0.0024	<0.00241	<0.00251	<0.00251	<0.00247	<0.00239	<0.00254	<0.00248	<0.0024	<0.0023	<0.00245	<0.00239	<0.0024	<0.00243	<0.00231
Perfluoroundecanoic acid (PFUnDA)	NCL	NA	NA	<0.00267	<0.0024	<0.00241	<0.00251	<0.00251	<0.00247	<0.00239	<0.00254	<0.00248	<0.0024	<0.0023	<0.00245	<0.00239	<0.0024	<0.00243	<0.00231
Perfluorohexadecanoic acid (PFHxDA)	NCL	NA	NA	<0.00267	<0.0024	<0.00241	<0.00251	<0.00251	<0.00247	<0.00239	<0.00254	<0.00248	<0.0024	<0.0023	<0.00245	<0.00239	<0.0024	<0.00243	<0.00231
Total PFAS (Calculated)	NCL	NA	NA	0.0047	0.056	0.085	0.0033	0.041	0.064	0.045	0.0072	0.0058	0.055	0.026	0.0013	0.047	0.0011	0.079	0.033

TABLE 2
SUMMARY OF DRINKING WATER SAMPLE ANALYSIS - PFAS
Area R-1 (19)
Wolven/Jewell Area, Kent County, MI

Area	Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2]	MCL[3]	CD Value[4]	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)
PPN				410625326001	410626300021	410625301039	410625301038	410625301037	410625301041	410625301042	410625301043	410625301033	410625301032	410625301046	410625301031	410625301030	410625301047	410625301027	410625301050
Address				9564 SUMMIT AVE NE	3535 11 MILE RD NE	3826 WHIRLWIND DR NE	3830 WHIRLWIND DR NE	3848 WHIRLWIND DR NE	3855 WHIRLWIND DR NE	3869 WHIRLWIND DR NE	3885 WHIRLWIND DR NE	3900 WHIRLWIND DR NE	3914 WHIRLWIND DR NE	3921 WHIRLWIND DR NE	3926 WHIRLWIND DR NE	3938 WHIRLWIND DR NE	3945 WHIRLWIND DR NE	3980 WHIRLWIND DR NE	3983 WHIRLWIND DR NE
Sample Name				WR1801160935CKA	3535 11 Mile-IN-1/23 Grab Potable Water	3826 Whirlwinn Dr. NE	3830 Whirlwinn Dr. NE	3848 Whirlwinn Dr. NE	3855 Whirlwinn Dr. NE	3869 Whirlwind Dr NE	3885 Whirlwind Dr NE	3900 Whirlwinn Dr. NE	3914 Whirlwinn Dr. NE	3921 Whirlwind Dr NE	3926 Whirlwinn Dr. NE	3938 Whirlwinn Dr. NE	3945 Whirlwind Dr NE	3980 Whirlwind Dr NE	3983 Whirlwind Dr NE
Matrix				Drinking Water	POET Influent	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water
Laboratory ID				1800135-01	9423879	K1801248-008	K1801248-007	K1801248-006	K1801248-009	K1801252-013	K1801252-011	K1801248-005	K1801248-003	K1801252-010	K1801248-002	K1801248-001	K1801252-009	K1801252-012	K1801252-008
Sample Date				01/16/2018	01/23/2018	02/07/2018	02/07/2018	02/07/2018	02/07/2018	02/07/2018	02/07/2018	02/07/2018	02/07/2018	02/07/2018	02/07/2018	02/07/2018	02/07/2018	02/07/2018	02/07/2018
Parameter (µg/L)																			
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	NCL	NA	NA	<0.00243	<0.005	<0.0044	<0.0044	<0.0046	<0.0045	<0.0047	<0.0047	<0.0044	<0.0046	<0.0047	<0.0044	<0.0044	<0.0045	<0.0046	<0.0044
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	NCL	NA	NA	<0.00243	<0.008	<0.0044	<0.0044	<0.0046	<0.0045	<0.0047	<0.0047	<0.0044	<0.0046	<0.0047	<0.0044	<0.0044	<0.0045	<0.0046	<0.0044
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	NCL	NA	NA	-	<0.008	<0.0044	<0.0044	<0.0046	<0.0045	<0.0047	<0.0047	<0.0044	<0.0046	<0.0047	<0.0044	<0.0044	<0.0045	<0.0046	<0.0044
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE)	NCL	NA	NA	-	<0.003	<0.0044	<0.0044	<0.0046	<0.0045	<0.0047	<0.0047	<0.0044	<0.0046	<0.0047	<0.0044	<0.0044	<0.0045	<0.0046	<0.0044
N-Methyl perfluorooctane sulfonamide (MeFOSA)	NCL	NA	NA	-	<0.008	<0.0044	<0.0044	<0.0046	<0.0045	<0.0047	<0.0047	<0.0044	<0.0046	<0.0047	<0.0044	<0.0044	<0.0045	<0.0046	<0.0044
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE)	NCL	NA	NA	-	<0.003	<0.0044	<0.0044	<0.0046	<0.0045	<0.0047	<0.0047	<0.0044	<0.0046	<0.0047	<0.0044	<0.0044	<0.0045	<0.0046	<0.0044
Perfluorobutane sulfonic acid (PFBS)	NCL	0.42	NA	0.00894	0.014	0.026	0.0092	0.0054	0.0063	0.0051	<0.0047	0.0061	<0.0046	<0.0047	<0.0044	<0.0044	<0.0045	<0.0046	<0.0044
Perfluorodecane sulfonic acid (PFDS)	NCL	NA	NA	<0.00243	<0.002	<0.0044	<0.0044	<0.0046	<0.0045	<0.0047	<0.0047	<0.0044	<0.0046	<0.0047	<0.0044	<0.0044	<0.0045	<0.0046	<0.0044
Perfluorooctadecanoic acid (PFODA)	NCL	NA	NA	<0.0073	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluoroheptane sulfonic acid (PFHpS)	NCL	NA	NA	0.00048	0.0006 J	<0.0044	<0.0044	<0.0046	<0.0045	<0.0047	<0.0047	<0.0044	<0.0046	<0.0047	<0.0044	<0.0044	<0.0045	<0.0046	<0.0044
Perfluorooctane sulfonamide (FOSA)	NCL	NA	NA	<0.00243	<0.003	<0.0044	<0.0044	<0.0046	<0.0045	<0.0047	<0.0047	<0.0044	<0.0046	<0.0047	<0.0044	<0.0044	<0.0045	<0.0046	<0.0044
Perfluorohexane sulfonic acid (PFHxS)	NCL	0.051	NA	0.00474	0.007	0.021	<0.0044	<0.0046	<0.0045	<0.0047	<0.0047	<0.0044	<0.0046	<0.0047	<0.0044	<0.0044	<0.0045	<0.0046	<0.0044
Perfluorobutanoic acid (PFBA)	NCL	NA	NA	<0.00243	0.002 J	<0.0089	<0.0089	<0.0092	<0.0091	<0.0094	<0.0094	<0.0089	<0.0092	<0.0094	<0.0089	<0.0089	<0.0091	<0.0092	<0.0089
Perfluorodecanoic acid (PFDA)	NCL	NA	NA	<0.00243	<0.002	<0.0044	<0.0044	<0.0046	<0.0045	<0.0047	<0.0047	<0.0044	<0.0046	<0.0047	<0.0044	<0.0044	<0.0045	<0.0046	<0.0044
Perfluorododecanoic acid (PFDoDA)	NCL	NA	NA	<0.00243	<0.0009	<0.0044	<0.0044	<0.0046	<0.0045	<0.0047	<0.0047	<0.0044	<0.0046	<0.0047	<0.0044	<0.0044	<0.0045	<0.0046	<0.0044
Perfluoroheptanoic acid (PFHpA)	NCL	NA	NA	<0.00243	0.002	0.041	0.0057	<0.0046	<0.0045	<0.0047	<0.0047	<0.0044	<0.0046	<0.0047	<0.0044	<0.0044	<0.0045	<0.0046	<0.0044
Perfluorohexanoic acid (PFHxA)	NCL	400	NA	<0.00243	0.002	0.025	0.0056	<0.0046	0.0048	<0.0047	<0.0047	0.0091	<0.0046	<0.0047	<0.0044	<0.0044	<0.0045	<0.0046	<0.0044
Perfluorononanoic acid (PFNA)	NCL	0.006	NA	<0.00243	<0.002	<0.0044	<0.0044	<0.0046	<0.0045	<0.0047	<0.0047	<0.0044	<0.0046	<0.0047	<0.0044	<0.0044	<0.0045	<0.0046	<0.0044
Perfluorooctanoic acid (PFOA)	0.008	0.008	NA	0.00337	***0.011***	***0.079***	***0.013***	0.0028	<0.0018	<0.0019	<0.0019	***0.012***	<0.0018	<0.0019	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018
Perfluorooctane sulfonic acid (PFOS)	0.016	0.016	NA	<0.00243	0.006	<0.0044	<0.0044	<0.0046	<0.0045	<0.0047	<0.0047	0.013	<0.0046	<0.0047	<0.0044	<0.0044	<0.0045	<0.0046	<0.0044
PFOA + PFOS (Calculated)	NCL	NA	0.01	0.0034	***0.017***	***0.079***	***0.013***	0.0028	ND	ND	ND	***0.025***	ND	ND	ND	ND	ND	ND	ND
Perfluoropentanoic acid (PFPeA)	NCL	NA	NA	<0.00243	<0.005	0.01	<0.0044	<0.0046	<0.0045	<0.0047	<0.0047	0.011	<0.0046	<0.0047	<0.0044	<0.0044	<0.0045	<0.0046	<0.0044
Perfluorotetradecanoic acid (PFTeDA)	NCL	NA	NA	<0.00243	<0.0009	<0.0044	<0.0044	<0.0046	<0.0045	<0.0047	<0.0047	<0.0044	<0.0046	<0.0047	<0.0044	<0.0044	<0.0045	<0.0046	<0.0044
Perfluorotridecanoic acid (PFTrDA)	NCL	NA	NA	<0.00243	<0.0009	<0.0044	<0.0044	<0.0046	<0.0045	<0.0047	<0.0047	<0.0044	<0.0046	<0.0047	<0.0044	<0.0044	<0.0045	<0.0046	<0.0044
Perfluoroundecanoic acid (PFUnDA)	NCL	NA	NA	<0.00243	<0.002	<0.0044	<0.0044	<0.0046	<0.0045	<0.0047	<0.0047	<0.0044	<0.0046	<0.0047	<0.0044	<0.0044	<0.0045	<0.0046	<0.0044
Perfluorohexadecanoic acid (PFHxDA)	NCL	NA	NA	<0.00243	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total PFAS (Calculated)	NCL	NA	NA	0.018	0.042	0.2	0.034	0.0082	0.011	0.0051	ND	0.051	ND	ND	ND	ND	ND	ND	ND

TABLE 2
SUMMARY OF DRINKING WATER SAMPLE ANALYSIS - PFAS
Area R-1 (19)
Wolven/Jewell Area, Kent County, MI

Area	Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2]	MCL[3]	CD Value[4]	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)
PPN				410625301051	410625301025	410625301054	410625301024	410625301021	410625301056	410625301020	410625301019	410625301058	410625301061	410625301015	410626100059	410626400004	410626400009	410626400011	410626200026
Address				3989 WHIRLWIND DR NE	4020 WHIRLWIND DR NE	4029 WHIRLWIND DR NE	4036 WHIRLWIND DR NE	4078 WHIRLWIND DR NE	4079 WHIRLWIND DR NE	4096 WHIRLWIND DR NE	4112 WHIRLWIND DR NE	4117 WHIRLWIND DR NE	4155 WHIRLWIND DR NE	4168 WHIRLWIND DR NE	9693 WOLVEN AVE NE	3651 11 MILE RD NE	3749 11 MILE RD NE	9351 ALSHIRE FARMS DR NE	9790 DEER TRL NE
Sample Name				3989 Whirlwind Dr NE	4020 Whirlwind Dr NE	4029 Whirlwind Dr NE	4036 Whirlwind Dr NE	4078 Whirlwinn Dr. NE	4079 Whirlwind Dr NE	4096 Whirlwinn Dr. NE	4112 Whirlwinn Dr. NE	4117 Whirlwind Dr NE	4155 Whirlwind Dr NE	4168 Whirlwinn Dr. NE	9695 Woven Ave NE	3651 11 Mile Rd NE	3749 11 Mile Rd NE	9351 Alshire Farms Dr NE	9790 Deer Trl NE
Matrix				Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water
Laboratory ID				K1801252-007	K1801252-015	K1801252-006	K1801252-014	K1801248-013	K1801252-004	K1801248-012	K1801248-011	K1801252-003	K1801252-002	K1801248-010	K1801252-001	K1801319-014	K1801319-016	K1801319-015	K1801319-011
Sample Date				02/07/2018	02/07/2018	02/07/2018	02/07/2018	02/07/2018	02/07/2018	02/07/2018	02/07/2018	02/07/2018	02/07/2018	02/07/2018	02/07/2018	02/08/2018	02/08/2018	02/08/2018	02/08/2018
Parameter (µg/L)																			
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	NCL	NA	NA	<0.0046	<0.0046	<0.0045	<0.0045	<0.0044	<0.0045	<0.0044	<0.0046	<0.0045	<0.0046	<0.0044	<0.0045	<0.0048	<0.0048	<0.0049	<0.0046
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	NCL	NA	NA	<0.0046	<0.0046	<0.0045	<0.0045	<0.0044	<0.0045	<0.0044	<0.0046	<0.0045	<0.0046	<0.0044	<0.0045	<0.0048	<0.0048	<0.0049	<0.0046
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	NCL	NA	NA	<0.0046	<0.0046	<0.0045	<0.0045	<0.0044	<0.0045	<0.0044	<0.0046	<0.0045	<0.0046	<0.0044	<0.0045	<0.0048	<0.0048	<0.0049	<0.0046
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE)	NCL	NA	NA	<0.0046	<0.0046	<0.0045	<0.0045	<0.0044	<0.0045	<0.0044	<0.0046	<0.0045	<0.0046	<0.0044	<0.0045	<0.0048	<0.0048	<0.0049	<0.0046
N-Methyl perfluorooctane sulfonamide (MeFOSA)	NCL	NA	NA	<0.0046	<0.0046	<0.0045	<0.0045	<0.0044	<0.0045	<0.0044	<0.0046	<0.0045	<0.0046	<0.0044	<0.0045	<0.0048	<0.0048	<0.0049	<0.0046
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE)	NCL	NA	NA	<0.0046	<0.0046	<0.0045	<0.0045	<0.0044	<0.0045	<0.0044	<0.0046	<0.0045	<0.0046	<0.0044	<0.0045	<0.0048	<0.0048	<0.0049	<0.0046
Perfluorobutane sulfonic acid (PFBS)	NCL	0.42	NA	<0.0046	<0.0046	<0.0045	<0.0045	0.0081	<0.0045	0.018	0.021	0.015	0.014	0.026	<0.0045	<0.0048	<0.0048	<0.0049	<0.0046
Perfluorodecane sulfonic acid (PFDS)	NCL	NA	NA	<0.0046	<0.0046	<0.0045	<0.0045	<0.0044	<0.0045	<0.0044	<0.0046	<0.0045	<0.0046	<0.0044	<0.0045	<0.0048	<0.0048	<0.0049	<0.0046
Perfluorooctadecanoic acid (PFODA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluoroheptane sulfonic acid (PFHpS)	NCL	NA	NA	<0.0046	<0.0046	<0.0045	<0.0045	<0.0044	<0.0045	<0.0044	<0.0046	<0.0045	<0.0046	<0.0044	<0.0045	<0.0048	<0.0048	<0.0049	<0.0046
Perfluorooctane sulfonamide (FOSA)	NCL	NA	NA	<0.0046	<0.0046	<0.0045	<0.0045	<0.0044	<0.0045	<0.0044	<0.0046	<0.0045	<0.0046	<0.0044	<0.0045	<0.0048	<0.0048	<0.0049	<0.0046
Perfluorohexane sulfonic acid (PFHxS)	NCL	0.051	NA	<0.0046	<0.0046	<0.0045	<0.0045	0.0049	<0.0045	0.01	0.013	0.0048	0.0082	0.011	<0.0045	<0.0048	<0.0048	<0.0049	<0.0046
Perfluorobutanoic acid (PFBA)	NCL	NA	NA	<0.0092	<0.0092	<0.0091	<0.0091	<0.0089	<0.0091	<0.0089	<0.0092	<0.0091	<0.0092	<0.0089	<0.0091	<0.0096	<0.0096	<0.0098	<0.0093
Perfluorodecanoic acid (PFDA)	NCL	NA	NA	<0.0046	<0.0046	<0.0045	<0.0045	<0.0044	<0.0045	<0.0044	<0.0046	<0.0045	<0.0046	<0.0044	<0.0045	<0.0048	<0.0048	<0.0049	<0.0046
Perfluorododecanoic acid (PFDoDA)	NCL	NA	NA	<0.0046	<0.0046	<0.0045	<0.0045	<0.0044	<0.0045	<0.0044	<0.0046	<0.0045	<0.0046	<0.0044	<0.0045	<0.0048	<0.0048	<0.0049	<0.0046
Perfluoroheptanoic acid (PFHpA)	NCL	NA	NA	<0.0046	<0.0046	<0.0045	<0.0045	<0.0044	<0.0045	<0.0044	<0.0046	<0.0045	<0.0046	<0.0044	<0.0045	<0.0048	<0.0048	<0.0049	<0.0046
Perfluorohexanoic acid (PFHxA)	NCL	400	NA	<0.0046	<0.0046	<0.0045	<0.0045	<0.0044	<0.0045	<0.0044	<0.0046	<0.0045	<0.0046	<0.0044	<0.0045	<0.0048	<0.0048	<0.0049	<0.0046
Perfluorononanoic acid (PFNA)	NCL	0.006	NA	<0.0046	<0.0046	<0.0045	<0.0045	<0.0044	<0.0045	<0.0044	<0.0046	<0.0045	<0.0046	<0.0044	<0.0045	<0.0048	<0.0048	<0.0049	<0.0046
Perfluorooctanoic acid (PFOA)	0.008	0.008	NA	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018	0.005	0.0047	0.005	<0.0018	<0.0019	0.0035	<0.002	<0.0019
Perfluorooctane sulfonic acid (PFOS)	0.016	0.016	NA	<0.0046	<0.0046	<0.0045	<0.0045	<0.0044	<0.0045	<0.0044	<0.0046	<0.0045	<0.0046	<0.0044	<0.0045	<0.0048	<0.0048	<0.0049	<0.0046
PFOA + PFOS (Calculated)	NCL	NA	0.01	ND	ND	ND	ND	ND	ND	ND	ND	0.005	0.0047	0.005	ND	ND	0.0035	ND	ND
Perfluoropentanoic acid (PFPeA)	NCL	NA	NA	<0.0046	<0.0046	<0.0045	<0.0045	<0.0044	<0.0045	<0.0044	<0.0046	<0.0045	<0.0046	<0.0044	<0.0045	<0.0048	<0.0048	<0.0049	<0.0046
Perfluorotetradecanoic acid (PFTeDA)	NCL	NA	NA	<0.0046	<0.0046	<0.0045	<0.0045	<0.0044	<0.0045	<0.0044	<0.0046	<0.0045	<0.0046	<0.0044	<0.0045	<0.0048	<0.0048	<0.0049	<0.0046
Perfluorotridecanoic acid (PFTrDA)	NCL	NA	NA	<0.0046	<0.0046	<0.0045	<0.0045	<0.0044	<0.0045	<0.0044	<0.0046	<0.0045	<0.0046	<0.0044	<0.0045	<0.0048	<0.0048	<0.0049	<0.0046
Perfluoroundecanoic acid (PFUnDA)	NCL	NA	NA	<0.0046	<0.0046	<0.0045	<0.0045	<0.0044	<0.0045	<0.0044	<0.0046	<0.0045	<0.0046	<0.0044	<0.0045	<0.0048	<0.0048	<0.0049	<0.0046
Perfluorohexadecanoic acid (PFHxDA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total PFAS (Calculated)	NCL	NA	NA	ND	ND	ND	ND	0.013	ND	0.028	0.034	0.025	0.027	0.042	ND	ND	0.0035	ND	ND

TABLE 2
SUMMARY OF DRINKING WATER SAMPLE ANALYSIS - PFAS
Area R-1 (19)
Wolven/Jewell Area, Kent County, MI

Area	Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2]	MCL[3]	CD Value[4]	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)
PPN				410626200024	410626200030	410625100074	410625100032	410625100031	410625301007	410625301010	410625301004	410625301002	410625301001	410626200009	410626200012	410625301040	410625301028	410625301023	410625301022
Address				9798 DEER TRL NE	9799 DEER TRL NE	9605 SUMMIT AVE NE	9737 SUMMIT AVE NE	9881 SUMMIT AVE NE	4090 TRADEWIND DR NE	4164 TRADEWIND DR NE	4175 TRADEWIND DR NE	4189 TRADEWIND DR NE	4195 TRADEWIND DR NE	3640 VERSCHEL DR NE	3800 VERSCHEL DR NE	3823 WHIRLWIND DR NE	3966 WHIRLWIND DR NE	4050 WHIRLWIND DR NE	4064 WHIRLWIND DR NE
Sample Name				9798 Deer Trl NE	9799 Deer Trl NE	9605 Summit Ave NE	9737 Summit Ave NE	9881 Summit Ave NE	4090 Tradewind Dr NE	4164 Tradewind Dr NE	4175 Tradewind Dr NE	4189 Tradewind Dr NE	4195 Tradewind Dr NE	3640 Verschel Dr NE	3800 Verschel Dr NE	3823 Whirlwind Dr NE	3966 Whirlwind Dr NE	4050 Whirlwind Dr NE	4064 Whirlwind Dr NE
Matrix				Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water
Laboratory ID				K1801319-013	K1801319-012	K1801319-008	K1801319-009	K1801319-010	K1801319-006	K1801319-007	K1801319-004	K1801317-003	K1801319-003	K1801317-006	K1801317-004	K1801319-001	K1801319-002	K1801317-001	K1801317-002
Sample Date				02/08/2018	02/08/2018	02/08/2018	02/08/2018	02/08/2018	02/08/2018	02/08/2018	02/08/2018	02/08/2018	02/08/2018	02/08/2018	02/08/2018	02/08/2018	02/08/2018	02/08/2018	02/08/2018
Parameter (µg/L)																			
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	NCL	NA	NA	<0.0048	<0.0046	<0.0047	<0.0047	<0.0046	<0.0047	<0.0048	<0.0049	<0.0048	<0.005	<0.0049	<0.005	<0.0047	<0.0048	<0.0048	<0.0049
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	NCL	NA	NA	<0.0048	<0.0046	<0.0047	<0.0047	<0.0046	<0.0047	<0.0048	<0.0049	<0.0048	<0.005	<0.0049	<0.005	<0.0047	<0.0048	<0.0048	<0.0049
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	NCL	NA	NA	<0.0048	<0.0046	<0.0047	<0.0047	<0.0046	<0.0047	<0.0048	<0.0049	<0.0048	<0.005	<0.0049	<0.005	<0.0047	<0.0048	<0.0048	<0.0049
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE)	NCL	NA	NA	<0.0048	<0.0046	<0.0047	<0.0047	<0.0046	<0.0047	<0.0048	<0.0049	<0.0048	<0.005	<0.0049	<0.005	<0.0047	<0.0048	<0.0048	<0.0049
N-Methyl perfluorooctane sulfonamide (MeFOSA)	NCL	NA	NA	<0.0048	<0.0046	<0.0047	<0.0047	<0.0046	<0.0047	<0.0048	<0.0049	<0.0048	<0.005	<0.0049	<0.005	<0.0047	<0.0048	<0.0048	<0.0049
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE)	NCL	NA	NA	<0.0048	<0.0046	<0.0047	<0.0047	<0.0046	<0.0047	<0.0048	<0.0049	<0.0048	<0.005	<0.0049	<0.005	<0.0047	<0.0048	<0.0048	<0.0049
Perfluorobutane sulfonic acid (PFBS)	NCL	0.42	NA	0.025	<0.0046	0.042	0.025	0.019	<0.0047	<0.0048	<0.0049	0.014	0.015	0.0081	<0.005	0.029	<0.0048	0.007	0.01
Perfluorodecane sulfonic acid (PFDS)	NCL	NA	NA	<0.0048	<0.0046	<0.0047	<0.0047	<0.0046	<0.0047	<0.0048	<0.0049	<0.0048	<0.005	<0.0049	<0.005	<0.0047	<0.0048	<0.0048	<0.0049
Perfluorooctadecanoic acid (PFODA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluoroheptane sulfonic acid (PFHpS)	NCL	NA	NA	<0.0048	<0.0046	<0.0047	<0.0047	<0.0046	<0.0047	<0.0048	<0.0049	<0.0048	0.0097	<0.0049	<0.005	<0.0047	<0.0048	<0.0048	<0.0049
Perfluorooctane sulfonamide (FOSA)	NCL	NA	NA	<0.0048	<0.0046	<0.0047	<0.0047	<0.0046	<0.0047	<0.0048	<0.0049	<0.0048	<0.005	<0.0049	<0.005	<0.0047	<0.0048	<0.0048	<0.0049
Perfluorohexane sulfonic acid (PFHxS)	NCL	0.051	NA	0.028	<0.0046	0.0093	0.019	0.0068	<0.0047	<0.0048	<0.0049	0.0088	0.0098	0.0054	<0.005	0.041	<0.0048	<0.0048	<0.0049
Perfluorobutanoic acid (PFBA)	NCL	NA	NA	<0.0096	<0.0093	<0.0094	<0.0094	<0.0093	<0.0094	<0.0096	<0.0098	<0.0096	<0.01	<0.0098	<0.01	0.0097	<0.0096	<0.0096	<0.0098
Perfluorodecanoic acid (PFDA)	NCL	NA	NA	<0.0048	<0.0046	<0.0047	<0.0047	<0.0046	<0.0047	<0.0048	<0.0049	<0.0048	<0.005	<0.0049	<0.005	<0.0047	<0.0048	<0.0048	<0.0049
Perfluorododecanoic acid (PFDoDA)	NCL	NA	NA	<0.0048	<0.0046	<0.0047	<0.0047	<0.0046	<0.0047	<0.0048	<0.0049	<0.0048	<0.005	<0.0049	<0.005	<0.0047	<0.0048	<0.0048	<0.0049
Perfluoroheptanoic acid (PFHpA)	NCL	NA	NA	0.044	<0.0046	<0.0047	<0.0047	<0.0046	<0.0047	<0.0048	<0.0049	<0.0048	0.0059	<0.0049	<0.005	0.056	<0.0048	<0.0048	<0.0049
Perfluorohexanoic acid (PFHxA)	NCL	400	NA	0.023	<0.0046	0.0049	<0.0047	<0.0046	<0.0047	<0.0048	<0.0049	<0.0048	<0.005	<0.0049	<0.005	0.024	<0.0048	<0.0048	<0.0049
Perfluorononanoic acid (PFNA)	NCL	0.006	NA	<0.0048	<0.0046	<0.0047	<0.0047	<0.0046	<0.0047	<0.0048	<0.0049	<0.0048	<0.005	<0.0049	<0.005	<0.0047	<0.0048	<0.0048	<0.0049
Perfluorooctanoic acid (PFOA)	0.008	0.008	NA	***0.059***	<0.0019	***0.021***	***0.015***	<0.0019	<0.0019	<0.0019	<0.002	***0.022***	***0.033***	0.0038	<0.002	***0.083***	<0.0019	<0.0019	<0.002
Perfluorooctane sulfonic acid (PFOS)	0.016	0.016	NA	<0.0048	<0.0046	***0.027***	0.0064	<0.0046	<0.0047	<0.0048	<0.0049	***0.024***	***0.018***	<0.0049	<0.005	<0.0047	<0.0048	<0.0048	<0.0049
PFOA + PFOS (Calculated)	NCL	NA	0.01	***0.059***	ND	***0.048***	***0.021***	ND	ND	ND	ND	***0.046***	***0.051***	0.0038	ND	***0.083***	ND	ND	ND
Perfluoropentanoic acid (PFPeA)	NCL	NA	NA	0.012	<0.0046	<0.0047	<0.0047	<0.0046	<0.0047	<0.0048	<0.0049	<0.0048	<0.005	<0.0049	<0.005	0.013	<0.0048	<0.0048	<0.0049
Perfluorotetradecanoic acid (PFTeDA)	NCL	NA	NA	<0.0048	<0.0046	<0.0047	<0.0047	<0.0046	<0.0047	<0.0048	<0.0049	<0.0048	<0.005	<0.0049	<0.005	<0.0047	<0.0048	<0.0048	<0.0049
Perfluorotridecanoic acid (PFTrDA)	NCL	NA	NA	<0.0048	<0.0046	<0.0047	<0.0047	<0.0046	<0.0047	<0.0048	<0.0049	<0.0048	<0.005	<0.0049	<0.005	<0.0047	<0.0048	<0.0048	<0.0049
Perfluoroundecanoic acid (PFUnDA)	NCL	NA	NA	<0.0048	<0.0046	<0.0047	<0.0047	<0.0046	<0.0047	<0.0048	<0.0049	<0.0048	<0.005	<0.0049	<0.005	<0.0047	<0.0048	<0.0048	<0.0049
Perfluorohexadecanoic acid (PFHxDA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total PFAS (Calculated)	NCL	NA	NA	0.19	ND	0.1	0.065	0.026	ND	ND	ND	0.069	0.091	0.017	ND	0.26	ND	0.007	0.01

TABLE 2
SUMMARY OF DRINKING WATER SAMPLE ANALYSIS - PFAS
Area R-1 (19)
Wolven/Jewell Area, Kent County, MI

Area	Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2]	MCL[3]	CD Value[4]	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)
PPN				410625301017	410626100043	410626100048	410626100034	410625100053	410625100049	410625100050	410625351001	410625315001	410625301008	410625301006	410625301009	410625301014	410626200011	410625301036	410625301045
Address				4140 WHIRLWIND DR NE	9680 WOLVEN AVE NE	9715 WOLVEN AVE NE	9766 WOLVEN AVE NE	4100 WRENS WAY CT NE	4101 WRENS WAY CT NE	4117 WRENS WAY CT NE	9391 SUMMIT AVE NE	9555 SUMMIT AVE NE	4144 TRADEWIND DR NE	4155 TRADEWIND DR NE	4158 TRADEWIND DR NE	4184 TRADEWIND DR NE	3725 VERSCHEL DR NE	3862 WHIRLWIND DR NE	3913 WHIRLWIND DR NE
Sample Name				4140 Whirlwind Dr NE	9680 Wolven Ave NE	9715 Wolven Ave NE	9766 Wolven Ave NE	4100 Wrens Way Ct NE	4101 Wrens Way Ct NE	4117 Wrens Way Ct NE	9391 Summit Ave NE	9555 Summit Ave NE	4144 Tradewind Dr NE	4155 Tradewind Dr NE	4158 Tradewind Dr NE	4184 Tradewind	3725 Verschel Dr NE	3862 Whirlwinn Dr NE	3913 Whirlwinn Dr NE
Matrix				Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water
Laboratory ID				K1801317-013	K1801317-009	K1801317-008	K1801317-007	K1801317-012	K1801317-010	K1801317-011	K1801316-003	K1801316-004	K1801316-008	K1801316-009	K1801316-007	K1801316-006	K1801316-010	K1801316-001	K1801316-002
Sample Date				02/08/2018	02/08/2018	02/08/2018	02/08/2018	02/08/2018	02/08/2018	02/08/2018	02/09/2018	02/09/2018	02/09/2018	02/09/2018	02/09/2018	02/09/2018	02/09/2018	02/09/2018	02/09/2018
Parameter (µg/L)																			
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	NCL	NA	NA	<0.005	<0.0048	<0.0047	<0.005	<0.0049	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.005	<0.0048	<0.0048	<0.0046	<0.0049	<0.0048
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	NCL	NA	NA	<0.005	<0.0048	<0.0047	<0.005	<0.0049	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.005	<0.0048	<0.0048	<0.0046	<0.0049	<0.0048
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	NCL	NA	NA	<0.005	<0.0048	<0.0047	<0.005	<0.0049	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.005	<0.0048	<0.0048	<0.0046	<0.0049	<0.0048
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE)	NCL	NA	NA	<0.005	<0.0048	<0.0047	<0.005	<0.0049	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.005	<0.0048	<0.0048	<0.0046	<0.0049	<0.0048
N-Methyl perfluorooctane sulfonamide (MeFOSA)	NCL	NA	NA	<0.005	<0.0048	<0.0047	<0.005	<0.0049	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.005	<0.0048	<0.0048	<0.0046	<0.0049	<0.0048
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE)	NCL	NA	NA	<0.005	<0.0048	<0.0047	<0.005	<0.0049	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.005	<0.0048	<0.0048	<0.0046	<0.0049	<0.0048
Perfluorobutane sulfonic acid (PFBS)	NCL	0.42	NA	0.02	0.0059	<0.0047	0.0077	<0.0049	<0.0048	<0.0048	0.029	0.013	<0.0048	<0.005	<0.0048	0.01	<0.0046	<0.0049	<0.0048
Perfluorodecane sulfonic acid (PFDS)	NCL	NA	NA	<0.005	<0.0048	<0.0047	<0.005	<0.0049	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.005	<0.0048	<0.0048	<0.0046	<0.0049	<0.0048
Perfluorooctadecanoic acid (PFODA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluoroheptane sulfonic acid (PFHpS)	NCL	NA	NA	<0.005	<0.0048	<0.0047	<0.005	<0.0049	<0.0048	<0.0048	0.0054	<0.0048	<0.0048	<0.005	<0.0048	<0.0048	<0.0046	<0.0049	<0.0048
Perfluorooctane sulfonamide (FOSA)	NCL	NA	NA	<0.005	<0.0048	<0.0047	<0.005	<0.0049	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.005	<0.0048	<0.0048	<0.0046	<0.0049	<0.0048
Perfluorohexane sulfonic acid (PFHxS)	NCL	0.051	NA	0.0084	<0.0048	<0.0047	<0.005	<0.0049	<0.0048	<0.0048	0.02	0.0054	<0.0048	<0.005	<0.0048	0.0082	<0.0046	<0.0049	<0.0048
Perfluorobutanoic acid (PFBA)	NCL	NA	NA	<0.01	<0.0096	<0.0094	<0.01	<0.0098	<0.0096	<0.0096	<0.0096	<0.0096	<0.0096	<0.01	<0.0096	<0.0096	<0.0093	<0.0098	<0.0096
Perfluorodecanoic acid (PFDA)	NCL	NA	NA	<0.005	<0.0048	<0.0047	<0.005	<0.0049	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.005	<0.0048	<0.0048	<0.0046	<0.0049	<0.0048
Perfluorododecanoic acid (PFDoDA)	NCL	NA	NA	<0.005	<0.0048	<0.0047	<0.005	<0.0049	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.005	<0.0048	<0.0048	<0.0046	<0.0049	<0.0048
Perfluoroheptanoic acid (PFHpA)	NCL	NA	NA	<0.005	<0.0048	<0.0047	<0.005	<0.0049	0.0052	<0.0048	0.0074	<0.0048	<0.0048	<0.005	<0.0048	<0.0048	<0.0046	<0.0049	<0.0048
Perfluorohexanoic acid (PFHxA)	NCL	400	NA	<0.005	<0.0048	<0.0047	<0.005	<0.0049	0.0053	<0.0048	0.0074	<0.0048	<0.0048	<0.005	<0.0048	<0.0048	<0.0046	<0.0049	<0.0048
Perfluorononanoic acid (PFNA)	NCL	0.006	NA	<0.005	<0.0048	<0.0047	<0.005	<0.0049	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.005	<0.0048	<0.0048	<0.0046	<0.0049	<0.0048
Perfluorooctanoic acid (PFOA)	0.008	0.008	NA	<0.002	<0.0019	<0.0019	<0.002	<0.002	<0.0019	<0.0019	***0.035***	0.0056	<0.0019	<0.002	<0.0019	0.0042	<0.0019	<0.002	<0.0019
Perfluorooctane sulfonic acid (PFOS)	0.016	0.016	NA	<0.005	<0.0048	<0.0047	<0.005	<0.0049	<0.0048	<0.0048	***0.021***	<0.0048	<0.0048	<0.005	<0.0048	<0.0048	<0.0046	<0.0049	<0.0048
PFOA + PFOS (Calculated)	NCL	NA	0.01	ND	ND	ND	ND	ND	ND	ND	***0.056***	0.0056	ND	ND	ND	0.0042	ND	ND	ND
Perfluoropentanoic acid (PFPeA)	NCL	NA	NA	<0.005	<0.0048	<0.0047	<0.005	<0.0049	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.005	<0.0048	<0.0048	<0.0046	<0.0049	<0.0048
Perfluorotetradecanoic acid (PFTeDA)	NCL	NA	NA	<0.005	<0.0048	<0.0047	<0.005	<0.0049	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.005	<0.0048	<0.0048	<0.0046	<0.0049	<0.0048
Perfluorotridecanoic acid (PFTrDA)	NCL	NA	NA	<0.005	<0.0048	<0.0047	<0.005	<0.0049	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.005	<0.0048	<0.0048	<0.0046	<0.0049	<0.0048
Perfluoroundecanoic acid (PFUnDA)	NCL	NA	NA	<0.005	<0.0048	<0.0047	<0.005	<0.0049	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.005	<0.0048	<0.0048	<0.0046	<0.0049	<0.0048
Perfluorohexadecanoic acid (PFHxDA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total PFAS (Calculated)	NCL	NA	NA	0.028	0.0059	ND	0.0077	ND	0.011	ND	0.13	0.024	ND	ND	ND	0.022	ND	ND	ND

Area	Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2]	MCL[3]	CD Value[4]	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)
PPN				410626300014	410626100058	410625100051	410625100052	410626100049	410626400005	410625351003	410625315002	410625100031	410625301012	410625301013	410625301035	410625301029	410625301026	410625301053	410625301055
Address				9524 WOLVEN AVE NE	9691 WOLVEN AVE NE	4133 WRENS WAY CT NE	4159 WRENS WAY CT NE	9754 WOLVEN AVE NE	3617 11 MILE RD NE	4145 11 MILE RD NE	9545 SUMMIT AVE NE	9881 SUMMIT AVE NE	4172 TRADEWIND DR NE	4176 TRADEWIND DR NE	3870 WHIRLWIND DR NE	3950 WHIRLWIND DR NE	3998 WHIRLWIND DR NE	4011 WHIRLWIND DR NE	4065 WHIRLWIND DR NE
Sample Name				9524 Wolven Ave NE	9691 Wolven Ave NE	4133 Wrens Way Ct NE	4159 Wrens Way Ct NE	9754 Wolven Ave NE	3617 11 Mile Rd NE	4145 11 Mile Rd NE	9545 Summit Dr Ne	9881 Summit Ave PB	4172 Tradewind Dr NE	4176 Tradewind Dr NE	3870 Whirlwind Dr NE	3950 Whirlwind Dr NE	3998 Whirlwind Dr NE	4011 Whirlwind Dr NE	4065 Whirlwind Dr NE
Matrix				Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water
Laboratory ID				K1801316-011	K1801316-014	K1801316-013	K1801316-012	K1801510-001	K1801596-012	K1801596-010	K1801596-009	K1801594-002	K1801596-011	K1801596-008	K1801596-003	K1801596-007	K1801596-001	K1801596-004	K1801596-005
Sample Date				02/09/2018	02/09/2018	02/09/2018	02/09/2018	02/12/2018	02/15/2018	02/15/2018	02/15/2018	02/15/2018	02/15/2018	02/15/2018	02/15/2018	02/15/2018	02/15/2018	02/15/2018	02/15/2018
Parameter (µg/L)																			
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	NCL	NA	NA	0.04	<0.0049	<0.0049	<0.0049	<0.0045	<0.0048	<0.0048	<0.0047	<0.0047	<0.0051	<0.0046	<0.0046	<0.0046	<0.0046	<0.0047	<0.0046
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	NCL	NA	NA	0.048	<0.0049	<0.0049	<0.0049	<0.0045	<0.0048	<0.0048	<0.0047	<0.0047	<0.0051	<0.0046	<0.0046	<0.0046	<0.0046	<0.0047	<0.0046
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	NCL	NA	NA	<0.0048	<0.0049	<0.0049	<0.0049	<0.0045	<0.0048	<0.0048	<0.0047	<0.0047	<0.0051	<0.0046	<0.0046	<0.0046	<0.0046	<0.0047	<0.0046
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE)	NCL	NA	NA	<0.0048	<0.0049	<0.0049	<0.0049	<0.0045	<0.0048	<0.0048	<0.0047	<0.0047	<0.0051	<0.0046	<0.0046	<0.0046	<0.0046	<0.0047	<0.0046
N-Methyl perfluorooctane sulfonamide (MeFOSA)	NCL	NA	NA	<0.0048	<0.0049	<0.0049	<0.0049	<0.0045	<0.0048	<0.0048	<0.0047	<0.0047	<0.0051	<0.0046	<0.0046	<0.0046	<0.0046	<0.0047	<0.0046
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE)	NCL	NA	NA	<0.0048	<0.0049	<0.0049	<0.0049	<0.0045	<0.0048	<0.0048	<0.0047	<0.0047	<0.0051	<0.0046	<0.0046	<0.0046	<0.0046	<0.0047	<0.0046
Perfluorobutane sulfonic acid (PFBS)	NCL	0.42	NA	<0.0048	<0.0049	0.021	0.011	<0.0045	<0.0048	0.026	0.012	0.026	0.0052	<0.0046	<0.0046	<0.0046	<0.0046	<0.0047	<0.0046
Perfluorodecane sulfonic acid (PFDS)	NCL	NA	NA	<0.0048	<0.0049	<0.0049	<0.0049	<0.0045	<0.0048	<0.0048	<0.0047	<0.0047	<0.0051	<0.0046	<0.0046	<0.0046	<0.0046	<0.0047	<0.0046
Perfluorooctadecanoic acid (PFODA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluoroheptane sulfonic acid (PFHpS)	NCL	NA	NA	<0.0048	<0.0049	<0.0049	<0.0049	<0.0045	<0.0048	<0.0048	<0.0047	<0.0047	<0.0051	<0.0046	<0.0046	<0.0046	<0.0046	<0.0047	<0.0046
Perfluorooctane sulfonamide (FOSA)	NCL	NA	NA	<0.0048	<0.0049	<0.0049	<0.0049	<0.0045	<0.0048	<0.0048	<0.0047	<0.0047	<0.0051	<0.0046	<0.0046	<0.0046	<0.0046	<0.0047	<0.0046
Perfluorohexane sulfonic acid (PFHxS)	NCL	0.051	NA	<0.0048	<0.0049	0.01	0.0067	<0.0045	<0.0048	0.013	0.0085	0.019	<0.0051	<0.0046	<0.0046	<0.0046	<0.0046	<0.0047	<0.0046
Perfluorobutanoic acid (PFBA)	NCL	NA	NA	<0.0096	<0.0098	<0.0098	<0.0098	<0.0091	<0.0096	<0.0096	<0.0094	<0.0094	<0.01	<0.0093	<0.0093	<0.0093	<0.0093	<0.0094	<0.0093
Perfluorodecanoic acid (PFDA)	NCL	NA	NA	<0.0048	<0.0049	<0.0049	<0.0049	<0.0045	<0.0048	<0.0048	<0.0047	<0.0047	<0.0051	<0.0046	<0.0046	<0.0046	<0.0046	<0.0047	<0.0046
Perfluorododecanoic acid (PFDoDA)	NCL	NA	NA	<0.0048	<0.0049	<0.0049	<0.0049	<0.0045	<0.0048	<0.0048	<0.0047	<0.0047	<0.0051	<0.0046	<0.0046	<0.0046	<0.0046	<0.0047	<0.0046
Perfluoroheptanoic acid (PFHpA)	NCL	NA	NA	<0.0048	<0.0049	<0.0049	<0.0049	<0.0045	<0.0048	0.0063	<0.0047	<0.0047	<0.0051	<0.0046	<0.0046	<0.0046	<0.0046	<0.0047	<0.0046
Perfluorohexanoic acid (PFHxA)	NCL	400	NA	<0.0048	<0.0049	0.0082	<0.0049	<0.0045	<0.0048	0.0067	<0.0047	<0.0047	<0.0051	<0.0046	<0.0046	<0.0046	<0.0046	<0.0047	<0.0046
Perfluorononanoic acid (PFNA)	NCL	0.006	NA	<0.0048	<0.0049	<0.0049	<0.0049	<0.0045	<0.0048	<0.0048	<0.0047	<0.0047	<0.0051	<0.0046	<0.0046	<0.0046	<0.0046	<0.0047	<0.0046
Perfluorooctanoic acid (PFOA)	0.008	0.008	NA	0.0029	<0.002	***0.021***	0.0026	0.004	<0.0019	***0.022***	***0.024***	***0.0082***	0.0025	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019
Perfluorooctane sulfonic acid (PFOS)	0.016	0.016	NA	<0.0048	<0.0049	0.011	<0.0049	<0.0045	<0.0048	0.012	***0.026***	0.0058	<0.0051	<0.0046	<0.0046	<0.0046	<0.0046	<0.0047	<0.0046
PFOA + PFOS (Calculated)	NCL	NA	0.01	0.0029	ND	***0.032***	0.0026	0.004	ND	***0.034***	***0.05***	***0.014***	0.0025	ND	ND	ND	ND	ND	ND
Perfluoropentanoic acid (PFPeA)	NCL	NA	NA	<0.0048	<0.0049	0.0063	<0.0049	<0.0045	<0.0048	<0.0048	<0.0047	<0.0047	<0.0051	<0.0046	<0.0046	<0.0046	<0.0046	<0.0047	<0.0046
Perfluorotetradecanoic acid (PFTeDA)	NCL	NA	NA	0.0049	<0.0049	<0.0049	<0.0049	<0.0045	<0.0048	<0.0048	<0.0047	<0.0047	<0.0051	<0.0046	<0.0046	<0.0046	<0.0046	<0.0047	<0.0046
Perfluorotridecanoic acid (PFTrDA)	NCL	NA	NA	<0.0048	<0.0049	<0.0049	<0.0049	<0.0045	<0.0048	<0.0048	<0.0047	<0.0047	<0.0051	<0.0046	<0.0046	<0.0046	<0.0046	<0.0047	<0.0046
Perfluoroundecanoic acid (PFUnDA)	NCL	NA	NA	<0.0048	<0.0049	<0.0049	<0.0049	<0.0045	<0.0048	<0.0048	<0.0047	<0.0047	<0.0051	<0.0046	<0.0046	<0.0046	<0.0046	<0.0047	<0.0046
Perfluorohexadecanoic acid (PFHxDA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total PFAS (Calculated)	NCL	NA	NA	0.096	ND	0.078	0.02	0.004	ND	0.086	0.071	0.059	0.0077	ND	ND	ND	ND	ND	ND

TABLE 2
SUMMARY OF DRINKING WATER SAMPLE ANALYSIS - PFAS
Area R-1 (19)
Wolven/Jewell Area, Kent County, MI

Area	Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2]	MCL[3]	CD Value[4]	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)
PPN				410625301060	410626100029	410626300028	410626300015	410626300003	410626100016	410626100051	410625301049	410625301059	410626200036	410625301052	410626100014	410626200034	410625301011	410625301003	410625301034
Address				4139 WHIRLWIND DR NE	9789 WOLVEN AVE NE	9400 WOLVEN AVE NE	9550 WOLVEN AVE NE	9590 WOLVEN AVE NE	9620 WOLVEN AVE NE	9740 WOLVEN AVE NE	3975 WHIRLWIND DR NE	4125 WHIRLWIND DR NE	9859 DEER TRL NE	3991 WHIRLWIND DR NE	9612 WOLVEN AVE NE	9831 DEER TRL NE	4168 TRADEWIND DR NE	4183 TRADEWIND DR NE	3882 WHIRLWIND DR NE
Sample Name				4139 Whirlwind Dr NE	9789 Wolven Ave	9400 Wolven Ave	9550 Wolven Ave	9590 Wolven Ave	9620 Wolven Ave	9740 Wolven Ave	3975 Whirlwind Dr NE	4125 Whirlwind Dr NE	9859 Deer TRL NE	3991 Whirlwind Dr NE	9612 Wolven	9831 Deer TRL	4168 Tradewind	4183 Tradewind	3882 Whirlwind Dr
Matrix				Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water
Laboratory ID				K1801596-006	K1801594-003	K1801595-004	K1801595-002	K1801595-006	K1801595-001	K1801595-005	K1801675-003	K1801675-001	K1801708-003	K1801708-004	K1801708-001	K1801777-004	K1801777-003	K1801777-001	K1801777-006
Sample Date				02/15/2018	02/15/2018	02/16/2018	02/16/2018	02/16/2018	02/16/2018	02/16/2018	02/19/2018	02/19/2018	02/21/2018	02/21/2018	02/21/2018	02/22/2018	02/22/2018	02/22/2018	02/22/2018
Parameter (µg/L)																			
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	NCL	NA	NA	<0.0048	<0.0047	<0.0049	<0.0051	<0.0046	<0.0049	<0.0046	<0.0046	<0.0046	<0.0045	<0.0046	<0.0045	<0.0051	<0.0045	<0.0045	<0.0046
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	NCL	NA	NA	<0.0048	<0.0047	<0.0049	<0.0051	<0.0046	<0.0049	<0.0046	<0.0046	<0.0046	<0.0045	<0.0046	<0.0045	<0.0051	<0.0045	<0.0045	<0.0046
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	NCL	NA	NA	<0.0048	<0.0047	<0.0049	<0.0051	<0.0046	<0.0049	<0.0046	<0.0046	<0.0046	<0.0045	<0.0046	<0.0045	<0.0051	<0.0045	<0.0045	<0.0046
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE)	NCL	NA	NA	<0.0048	<0.0047	<0.0049	<0.0051	<0.0046	<0.0049	<0.0046	<0.0046	<0.0046	<0.0045	<0.0046	<0.0045	<0.0051	<0.0045	<0.0045	<0.0046
N-Methyl perfluorooctane sulfonamide (MeFOSA)	NCL	NA	NA	<0.0048	<0.0047	<0.0049	<0.0051	<0.0046	<0.0049	<0.0046	<0.0046	<0.0046	<0.0045	<0.0046	<0.0045	<0.0051	<0.0045	<0.0045	<0.0046
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE)	NCL	NA	NA	<0.0048	<0.0047	<0.0049	<0.0051	<0.0046	<0.0049	<0.0046	<0.0046	<0.0046	<0.0045	<0.0046	<0.0045	<0.0051	<0.0045	<0.0045	<0.0046
Perfluorobutane sulfonic acid (PFBS)	NCL	0.42	NA	0.018	<0.0047	<0.0049	<0.0051	<0.0046	<0.0049	<0.0046	<0.0046	0.0085	<0.0045	<0.0046	0.0059	<0.0051	0.02	0.0067	<0.0046
Perfluorodecane sulfonic acid (PFDS)	NCL	NA	NA	<0.0048	<0.0047	<0.0049	<0.0051	<0.0046	<0.0049	<0.0046	<0.0046	<0.0046	<0.0045	<0.0046	<0.0045	<0.0051	<0.0045	<0.0045	<0.0046
Perfluorooctadecanoic acid (PFODA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluoroheptane sulfonic acid (PFHpS)	NCL	NA	NA	<0.0048	<0.0047	<0.0049	<0.0051	<0.0046	<0.0049	<0.0046	<0.0046	<0.0046	<0.0045	<0.0046	<0.0045	<0.0051	<0.0045	<0.0045	<0.0046
Perfluorooctane sulfonamide (FOSA)	NCL	NA	NA	<0.0048	<0.0047	<0.0049	<0.0051	<0.0046	<0.0049	<0.0046	<0.0046	<0.0046	<0.0045	<0.0046	<0.0045	<0.0051	<0.0045	<0.0045	<0.0046
Perfluorohexane sulfonic acid (PFHxS)	NCL	0.051	NA	0.0067	<0.0047	<0.0049	<0.0051	<0.0046	<0.0049	<0.0046	<0.0046	0.0051	<0.0045	<0.0046	<0.0045	<0.0051	0.012	<0.0045	<0.0046
Perfluorobutanoic acid (PFBA)	NCL	NA	NA	<0.0096	<0.0094	<0.0098	<0.01	<0.0093	<0.0098	<0.0093	<0.0093	<0.0093	<0.0091	<0.0093	<0.0091	<0.01	<0.0091	<0.0091	<0.0093
Perfluorodecanoic acid (PFDA)	NCL	NA	NA	<0.0048	<0.0047	<0.0049	<0.0051	<0.0046	<0.0049	<0.0046	<0.0046	<0.0046	<0.0045	<0.0046	<0.0045	<0.0051	<0.0045	<0.0045	<0.0046
Perfluorododecanoic acid (PFDoDA)	NCL	NA	NA	<0.0048	<0.0047	<0.0049	<0.0051	<0.0046	<0.0049	<0.0046	<0.0046	<0.0046	<0.0045	<0.0046	<0.0045	<0.0051	<0.0045	<0.0045	<0.0046
Perfluoroheptanoic acid (PFHpA)	NCL	NA	NA	<0.0048	<0.0047	<0.0049	<0.0051	<0.0046	<0.0049	<0.0046	<0.0046	<0.0046	<0.0045	<0.0046	<0.0045	<0.0051	<0.0045	<0.0045	<0.0046
Perfluorohexanoic acid (PFHxA)	NCL	400	NA	<0.0048	<0.0047	<0.0049	<0.0051	<0.0046	<0.0049	<0.0046	<0.0046	<0.0046	<0.0045	<0.0046	<0.0045	<0.0051	0.005	<0.0045	<0.0046
Perfluorononanoic acid (PFNA)	NCL	0.006	NA	<0.0048	<0.0047	<0.0049	<0.0051	<0.0046	<0.0049	<0.0046	<0.0046	<0.0046	<0.0045	<0.0046	<0.0045	<0.0051	<0.0045	<0.0045	<0.0046
Perfluorooctanoic acid (PFOA)	0.008	0.008	NA	0.0036	<0.0019	<0.002	<0.002	<0.0019	<0.002	<0.0019	<0.0019	<0.0019	<0.0018	<0.0019	<0.0018	<0.002	***0.012***	<0.0018	<0.0019
Perfluorooctane sulfonic acid (PFOS)	0.016	0.016	NA	<0.0048	<0.0047	<0.0049	<0.0051	<0.0046	<0.0049	<0.0046	<0.0046	<0.0046	<0.0045	<0.0046	<0.0045	<0.0051	<0.0045	<0.0045	<0.0046
PFOA + PFOS (Calculated)	NCL	NA	0.01	0.0036	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	***0.012***	ND	ND
Perfluoropentanoic acid (PFPeA)	NCL	NA	NA	<0.0048	<0.0047	<0.0049	<0.0051	<0.0046	<0.0049	<0.0046	<0.0046	<0.0046	<0.0045	<0.0046	<0.0045	<0.0051	<0.0045	<0.0045	<0.0046
Perfluorotetradecanoic acid (PFTeDA)	NCL	NA	NA	<0.0048	<0.0047	<0.0049	<0.0051	<0.0046	<0.0049	<0.0046	<0.0046	<0.0046	<0.0045	<0.0046	<0.0045	<0.0051	<0.0045	<0.0045	<0.0046
Perfluorotridecanoic acid (PFTrDA)	NCL	NA	NA	<0.0048	<0.0047	<0.0049	<0.0051	<0.0046	<0.0049	<0.0046	<0.0046	<0.0046	<0.0045	<0.0046	<0.0045	<0.0051	<0.0045	<0.0045	<0.0046
Perfluoroundecanoic acid (PFUnDA)	NCL	NA	NA	<0.0048	<0.0047	<0.0049	<0.0051	<0.0046	<0.0049	<0.0046	<0.0046	<0.0046	<0.0045	<0.0046	<0.0045	<0.0051	<0.0045	<0.0045	<0.0046
Perfluorohexadecanoic acid (PFHxDA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total PFAS (Calculated)	NCL	NA	NA	0.028	ND	ND	ND	ND	ND	ND	ND	0.014	ND	ND	0.0059	ND	0.049	0.0067	ND

TABLE 2
SUMMARY OF DRINKING WATER SAMPLE ANALYSIS - PFAS
Area R-1 (19)
Wolven/Jewell Area, Kent County, MI

Area	Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2]	MCL[3]	CD Value[4]	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)
PPN				410625301016	410625351002	410626200035	410625301057	410625301005	410636101011	410636101013	410635226001	410636101007	410636101014	410636101002	410625301039	410635227001	410625301044	410636101010	410635227003
Address				4154 WHIRLWIND DR NE	4099 11 MILE RD NE	9820 DEER TRL NE	4095 WHIRLWIND DR NE	4167 TRADEWIND DR NE	4080 11 MILE RD NE	9105 SUMMIT AVE NE	3820 11 MILE RD NE	4170 11 MILE RD NE	9111 SUMMIT AVE NE	9185 SUMMIT AVE NE	3826 WHIRLWIND DR NE	3900 11 MILE RD NE	3909 WHIRLWIND DR NE	4010 11 MILE RD NE	3990 11 MILE RD NE
Sample Name				4154 Whirlwind Dr	4099 11 Mile Rd	9820 Deer Trail-3/6	4095 Whirlwind Dr-3/6	4167 Tradewind	4080 11 Mile	9105 Summit	3820 11 Mile	4170 11 Mile	9111 Summit	9185 Summit	3826 Whirlwind-IN-3/30 Grab Potable Water	3900 11 Mile	3909 Whirlwind Dr	4010 11 Mile Rd	3990 11 Mile
Matrix				Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	POET Influent	Drinking Water	Drinking Water	Drinking Water	Drinking Water
Laboratory ID				K1801777-007	K1801906-001	K1802092-003	K1802092-001	K1802386-001	K1802892-001	K1802892-003	K1802959-005	K1802959-002	K1802959-004	K1802959-003	9536044	K1803217-002	K1803377-001	K1803487-002	K1803486-001
Sample Date				02/22/2018	02/27/2018	03/06/2018	03/06/2018	03/12/2018	03/28/2018	03/28/2018	03/29/2018	03/29/2018	03/29/2018	03/29/2018	03/30/2018	04/02/2018	04/09/2018	04/12/2018	04/13/2018
Parameter (µg/L)																			
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	NCL	NA	NA	<0.0045	<0.0045	<0.0048	<0.0048	<0.0047	<0.0047	<0.0051	<0.0051	<0.0047	<0.0047	<0.005	<0.0055	<0.0047	<0.0047	<0.0046	<0.0049
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	NCL	NA	NA	<0.0045	<0.0045	<0.0048	<0.0048	<0.0047	<0.0047	<0.0051	<0.0051	<0.0047	<0.0047	<0.005	<0.0083	<0.0047	<0.0047	<0.0046	<0.0049
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	NCL	NA	NA	<0.0045	<0.0045	<0.0048	<0.0048	<0.0047	<0.0047	<0.0051	<0.0051	<0.0047	<0.0047	<0.005	<0.0083	<0.0047	<0.0047	<0.0046	<0.0049
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE)	NCL	NA	NA	<0.0045	<0.0045	<0.0048	<0.0048	<0.0047	<0.0047	<0.0051	<0.0051	<0.0047	<0.0047	<0.005	<0.0028	<0.0047	<0.0047	<0.0046	<0.0049
N-Methyl perfluorooctane sulfonamide (MeFOSA)	NCL	NA	NA	<0.0045	<0.0045	<0.0048	<0.0048	<0.0047	<0.0047	<0.0051	<0.0051	<0.0047	<0.0047	<0.005	<0.0083	<0.0047	<0.0047	<0.0046	<0.0049
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE)	NCL	NA	NA	<0.0045	<0.0045	<0.0048	<0.0048	<0.0047	<0.0047	<0.0051	<0.0051	<0.0047	<0.0047	<0.005	<0.0028	<0.0047	<0.0047	<0.0046	<0.0049
Perfluorobutane sulfonic acid (PFBS)	NCL	0.42	NA	0.033	0.028	<0.0048	<0.0048	<0.0047	0.021	0.012	<0.0051	0.021	<0.0047	<0.005	0.023	<0.0047	<0.0047	0.04	0.022
Perfluorodecane sulfonic acid (PFDS)	NCL	NA	NA	<0.0045	<0.0045	<0.0048	<0.0048	<0.0047	<0.0047	<0.0051	<0.0051	<0.0047	<0.0047	<0.005	<0.0018	<0.0047	<0.0047	<0.0046	<0.0049
Perfluorooctadecanoic acid (PFODA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluoroheptane sulfonic acid (PFHpS)	NCL	NA	NA	<0.0045	<0.0045	<0.0048	<0.0048	<0.0047	<0.0047	<0.0051	<0.0051	<0.0047	<0.0047	<0.005	<0.0018	<0.0047	<0.0047	<0.0046	<0.0049
Perfluorooctane sulfonamide (FOSA)	NCL	NA	NA	<0.0045	<0.0045	<0.0048	<0.0048	<0.0047	<0.0047	<0.0051	<0.0051	<0.0047	<0.0047	<0.005	<0.0028	<0.0047	<0.0047	<0.0046	<0.0049
Perfluorohexane sulfonic acid (PFHxS)	NCL	0.051	NA	0.011	0.024	<0.0048	<0.0048	<0.0047	0.016	0.015	<0.0051	0.017	<0.0047	<0.005	0.022	<0.0047	<0.0047	0.011	<0.0049
Perfluorobutanoic acid (PFBA)	NCL	NA	NA	<0.0091	<0.0091	<0.0096	<0.0096	<0.0094	<0.0094	<0.01	<0.01	<0.0094	<0.0094	<0.01	0.0077	<0.0094	<0.0094	<0.0093	<0.0098
Perfluorodecanoic acid (PFDA)	NCL	NA	NA	<0.0045	<0.0045	<0.0048	<0.0048	<0.0047	<0.0047	<0.0051	<0.0051	<0.0047	<0.0047	<0.005	<0.0018	<0.0047	<0.0047	<0.0046	<0.0049
Perfluorododecanoic acid (PFDoDA)	NCL	NA	NA	<0.0045	<0.0045	<0.0048	<0.0048	<0.0047	<0.0047	<0.0051	<0.0051	<0.0047	<0.0047	<0.005	<0.00092	<0.0047	<0.0047	<0.0046	<0.0049
Perfluoroheptanoic acid (PFHpA)	NCL	NA	NA	<0.0045	<0.0045	<0.0048	<0.0048	<0.0047	0.0097	0.0084	<0.0051	0.0062	<0.0047	<0.005	0.03	<0.0047	<0.0047	<0.0046	<0.0049
Perfluorohexanoic acid (PFHxA)	NCL	400	NA	<0.0045	<0.0045	<0.0048	<0.0048	<0.0047	0.014	0.0084	<0.0051	0.0054	<0.0047	<0.005	0.019	<0.0047	<0.0047	0.0055	<0.0049
Perfluorononanoic acid (PFNA)	NCL	0.006	NA	<0.0045	<0.0045	<0.0048	<0.0048	<0.0047	<0.0047	<0.0051	<0.0051	<0.0047	<0.0047	<0.005	<0.0018	<0.0047	<0.0047	<0.0046	<0.0049
Perfluorooctanoic acid (PFOA)	0.008	0.008	NA	0.004	0.0055	<0.0019	<0.0019	<0.0019	***0.045***	***0.037***	<0.002	***0.034***	<0.0019	<0.002	***0.065***	<0.0019	<0.0019	0.0069	<0.002
Perfluorooctane sulfonic acid (PFOS)	0.016	0.016	NA	<0.0045	<0.0045	<0.0048	<0.0048	<0.0047	0.015	***0.018***	<0.0051	***0.019***	<0.0047	<0.005	0.0022	<0.0047	<0.0047	<0.0046	<0.0049
PFOA + PFOS (Calculated)	NCL	NA	0.01	0.004	0.0055	ND	ND	ND	***0.06***	***0.055***	ND	***0.053***	ND	ND	***0.067***	ND	ND	0.0069	ND
Perfluoropentanoic acid (PFPeA)	NCL	NA	NA	<0.0045	<0.0045	<0.0048	<0.0048	<0.0047	0.0087	<0.0051	<0.0051	<0.0047	<0.0047	<0.005	0.0083	<0.0047	<0.0047	<0.0046	<0.0049
Perfluorotetradecanoic acid (PFTeDA)	NCL	NA	NA	<0.0045	<0.0045	<0.0048	<0.0048	<0.0047	<0.0047	<0.0051	<0.0051	<0.0047	<0.0047	<0.005	<0.00092	<0.0047	<0.0047	<0.0046	<0.0049
Perfluorotridecanoic acid (PFTrDA)	NCL	NA	NA	<0.0045	<0.0045	<0.0048	<0.0048	<0.0047	<0.0047	<0.0051	<0.0051	<0.0047	<0.0047	<0.005	<0.00092	<0.0047	<0.0047	<0.0046	<0.0049
Perfluoroundecanoic acid (PFUnDA)	NCL	NA	NA	<0.0045	<0.0045	<0.0048	<0.0048	<0.0047	<0.0047	<0.0051	<0.0051	<0.0047	<0.0047	<0.005	<0.0018	<0.0047	<0.0047	<0.0046	<0.0049
Perfluorohexadecanoic acid (PFHxDA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total PFAS (Calculated)	NCL	NA	NA	0.048	0.058	ND	ND	ND	0.13	0.099	ND	0.1	ND	ND	0.18	ND	ND	0.063	0.022

TABLE 2
SUMMARY OF DRINKING WATER SAMPLE ANALYSIS - PFAS
Area R-1 (19)
Wolven/Jewell Area, Kent County, MI

Area	Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2]	MCL[3]	CD Value[4]	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)
PPN				410626200009	410635201012	410625315003	410626200037	410625301040	410625100060	410625100058	410625100020	410636101003	410625100022	410625100042	410625100043	410625100038	410625100061	410625100057	410625100023
Address				3640 VERSCHEL DR NE	3616 11 MILE RD NE	9489 SUMMIT AVE NE	9787 DEER TRL NE	3823 WHIRLWIND DR NE	4100 12 MILE RD NE	9907 SUMMIT AVE NE	9911 SUMMIT AVE NE	9145 SUMMIT AVE NE	4150 12 MILE RD NE	9915 BRADLEY DR NE	9920 BRADLEY DR NE	4020 12 MILE RD NE	4050 12 MILE RD NE	9887 SUMMIT AVE NE	9933 SUMMIT AVE NE
Sample Name				3640 Verschel	3616 11 Mile Rd	9489 Summit Ave NE-4/24	9787 Deer Trl NE-5/3	3823 Whirlwind DR NE-IN-5/14	4100 12 Mile-5/30	9907 Summit-5/30	9911 Summit-5/30	9145 Summit Ave-6/1	4150 12 Mile-6/6	9915 Bradley-6/6	9920 Bradley-6/6	4020 12 Mile-6/14	4050 12 Mile-6/14	9887 Summit-6/14	9933 Summit-6/14
Matrix				Drinking Water	Drinking Water	Drinking Water	Drinking Water	POET Influent	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water
Laboratory ID				K1803645-001	K1803741-002	K1803877-001	TE05011-001	TE17027-004	TE31013-003	TE31013-002	TE31013-001	TF02016-001	TF07018-001	TF07027-002	TF07027-001	TF15025-001	TF15025-002	TF15025-004	TF15025-003
Sample Date				04/16/2018	04/19/2018	04/24/2018	05/03/2018	05/14/2018	05/30/2018	05/30/2018	05/30/2018	06/01/2018	06/06/2018	06/06/2018	06/06/2018	06/14/2018	06/14/2018	06/14/2018	06/14/2018
Parameter (µg/L)																			
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	NCL	NA	NA	<0.0046	<0.0045	<0.0047	-	-	-	-	-	-	-	-	-	-	-	-	-
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	NCL	NA	NA	<0.0046	<0.0045	<0.0047	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	NCL	NA	NA	<0.0046	<0.0045	<0.0047	-	-	-	-	-	-	-	-	-	-	-	-	-
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	NCL	NA	NA	-	-	-	<0.0034	<0.0037	<0.0035	<0.0033	<0.0034	<0.0035	<0.0034	<0.0036	<0.0035	<0.0036	<0.0034	<0.0036	<0.0035
N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE)	NCL	NA	NA	<0.0046	<0.0045	<0.0047	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Methyl perfluorooctane sulfonamide (MeFOSA)	NCL	NA	NA	<0.0046	<0.0045	<0.0047	-	-	-	-	-	-	-	-	-	-	-	-	-
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	NCL	NA	NA	-	-	-	<0.0034	<0.0037	<0.0035	<0.0033	<0.0034	<0.0035	<0.0034	<0.0036	<0.0035	<0.0036	<0.0034	<0.0036	<0.0035
N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE)	NCL	NA	NA	<0.0046	<0.0045	<0.0047	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorobutane sulfonic acid (PFBS)	NCL	0.42	NA	0.0098	0.069	0.012	<0.0034	0.024	<0.0035	<0.0033	0.0055	<0.0035	0.0062	<0.0036	<0.0035	<0.0036	<0.0034	0.012	<0.0035
Perfluorodecane sulfonic acid (PFDS)	NCL	NA	NA	<0.0046	<0.0045	<0.0047	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorooctadecanoic acid (PFODA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluoroheptane sulfonic acid (PFHpS)	NCL	NA	NA	<0.0046	<0.0045	<0.0047	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorooctane sulfonamide (FOSA)	NCL	NA	NA	<0.0046	<0.0045	<0.0047	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorohexane sulfonic acid (PFHxS)	NCL	0.051	NA	0.0073	***0.095***	0.01	<0.0034	0.028	<0.0035	<0.0033	<0.0034	<0.0035	0.0055	<0.0036	<0.0035	<0.0036	<0.0034	<0.0036	<0.0035
Perfluorobutanoic acid (PFBA)	NCL	NA	NA	<0.0093	0.025	<0.0094	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorodecanoic acid (PFDA)	NCL	NA	NA	<0.0046	<0.0045	<0.0047	<0.0034	<0.0037	<0.0035	<0.0033	<0.0034	<0.0035	<0.0034	<0.0036	<0.0035	<0.0036	<0.0034	<0.0036	<0.0035
Perfluorododecanoic acid (PFDoDA)	NCL	NA	NA	<0.0046	<0.0045	<0.0047	<0.0034	<0.0037	<0.0035	<0.0033	<0.0034	<0.0035	<0.0034	<0.0036	<0.0035	<0.0036	<0.0034	<0.0036	<0.0035
Perfluoroheptanoic acid (PFHpA)	NCL	NA	NA	<0.0046	0.17	<0.0047	<0.0034	0.045	<0.0035	<0.0033	<0.0034	<0.0035	<0.0034	<0.0036	<0.0035	<0.0036	<0.0034	<0.0036	<0.0035
Perfluorohexanoic acid (PFHxA)	NCL	400	NA	<0.0046	0.088	<0.0047	<0.0034	0.022	<0.0035	<0.0033	<0.0034	<0.0035	0.0074	<0.0036	<0.0035	<0.0036	<0.0034	<0.0036	<0.0035
Perfluorononanoic acid (PFNA)	NCL	0.006	NA	<0.0046	<0.0045	<0.0047	<0.0034	<0.0037	<0.0035	<0.0033	<0.0034	<0.0035	<0.0034	<0.0036	<0.0035	<0.0036	<0.0034	<0.0036	<0.0035
Perfluorooctanoic acid (PFOA)	0.008	0.008	NA	0.0031	***0.31***	***0.028***	<0.0034	***0.1***	<0.0035	<0.0033	<0.0034	<0.0035	***0.014***	<0.0036	<0.0035	<0.0036	<0.0034	<0.0036	<0.0035
Perfluorooctane sulfonic acid (PFOS)	0.016	0.016	NA	<0.0046	<0.0045	0.015	<0.0034	<0.0037	<0.0035	<0.0033	<0.0034	<0.0035	0.0097	<0.0036	<0.0035	<0.0036	<0.0034	<0.0036	<0.0035
PFOA + PFOS (Calculated)	NCL	NA	0.01	0.0031	***0.31***	***0.043***	ND	***0.1***	ND	ND	ND	ND	***0.024***	ND	ND	ND	ND	ND	ND
Perfluoropentanoic acid (PFPeA)	NCL	NA	NA	<0.0046	0.029	<0.0047	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorotetradecanoic acid (PFTeDA)	NCL	NA	NA	<0.0046	<0.0045	<0.0047	<0.0034	<0.0037	<0.0035	<0.0033	<0.0034	<0.0035	<0.0034	<0.0036	<0.0035	<0.0036	<0.0034	<0.0036	<0.0035
Perfluorotridecanoic acid (PFTrDA)	NCL	NA	NA	<0.0046	<0.0045	<0.0047	<0.0034	<0.0037	<0.0035	<0.0033	<0.0034	<0.0035	<0.0034	<0.0036	<0.0035	<0.0036	<0.0034	<0.0036	<0.0035
Perfluoroundecanoic acid (PFUnDA)	NCL	NA	NA	<0.0046	<0.0045	<0.0047	<0.0034	<0.0037	<0.0035	<0.0033	<0.0034	<0.0035	<0.0034	<0.0036	<0.0035	<0.0036	<0.0034	<0.0036	<0.0035
Perfluorohexadecanoic acid (PFHxDA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total PFAS (Calculated)	NCL	NA	NA	0.02	0.79	0.065	ND	0.22	ND	ND	0.0055	ND	0.043	ND	ND	ND	ND	0.012	ND

TABLE 2
SUMMARY OF DRINKING WATER SAMPLE ANALYSIS - PFAS
Area R-1 (19)
Wolven/Jewell Area, Kent County, MI

Area	Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2]	MCL[3]	CD Value[4]	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)
PPN				410625301039	410626300021	410635201012	410625301039	410635201012	410625301039	410626300021	410625301056	410625301058	410625301016	410626200026	410625100057	410635227001	410625315002	410625315001	410625301012
Address				3826 WHIRLWIND DR NE	3535 11 MILE RD NE	3616 11 MILE RD NE	3826 WHIRLWIND DR NE	3616 11 MILE RD NE	3826 WHIRLWIND DR NE	3535 11 MILE RD NE	4079 WHIRLWIND DR NE	4117 WHIRLWIND DR NE	4154 WHIRLWIND DR NE	9790 DEER TRL NE	9887 SUMMIT AVE NE	3900 11 MILE RD NE	9545 SUMMIT AVE NE	9555 SUMMIT AVE NE	4172 TRADEWIND DR NE
Sample Name				3826 Whirlwind-IN-6/29	3535 11 Mile-IN-7/24	3616 11 MILE RD NE-IN-9/21	3826 WHIRLWIND DR NE-IN-9/28	3616 11 Mile Rd NE-IN-12/17	3826 Whirlwind Dr-IN-12/19	3535 11 Mile-IN-1/22	4079 Whirlwind 21119	4117 Whirlwind 21119	4154 Whirlwind 21119	9790 Deertrail 21319	9887 Summit 21319	3900 11 Mile 21419	9545 Summit 21419	9555 Summit 21419	4172 Tradewind 21419
Matrix				POET Influent	POET Influent	POET Influent	POET Influent	POET Influent	POET Influent	POET Influent	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water
Laboratory ID				TF30011-003	TG25024-002	L1837878-02	L1839193-05	TL21034-001	TL21036-002	UA24005-005	UB14077-012	UB14077-011	UB14077-010	UB16024-006	UB16024-009	UB16024-013	UB16024-016	UB16024-011	UB16024-014
Sample Date				06/29/2018	07/24/2018	09/21/2018	09/28/2018	12/17/2018	12/19/2018	01/22/2019	02/11/2019	02/11/2019	02/11/2019	02/13/2019	02/13/2019	02/14/2019	02/14/2019	02/14/2019	02/14/2019
Parameter (µg/L)																			
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	NCL	NA	NA	<0.0036	<0.0036	<0.0037	<0.00402	<0.0037	<0.004	<0.004	<0.0035	<0.0034	<0.0035	<0.0035	<0.0034	<0.0035	<0.0035	<0.0035	<0.0034
N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Methyl perfluorooctane sulfonamide (MeFOSA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	NCL	NA	NA	<0.0036	<0.0036	<0.0037	<0.00402	<0.0037	<0.004	<0.004	<0.0035	<0.0034	<0.0035	<0.0035	<0.0034	<0.0035	<0.0035	<0.0035	<0.0034
N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorobutane sulfonic acid (PFBS)	NCL	0.42	NA	0.019	0.0083	0.0881	0.0204	0.076	0.02	0.01	<0.0035	0.0092	0.019	<0.0035	0.0097	<0.0035	0.0096	0.0091	0.0048
Perfluorodecane sulfonic acid (PFDS)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorooctadecanoic acid (PFODA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluoroheptane sulfonic acid (PFHpS)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorooctane sulfonamide (FOSA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorohexane sulfonic acid (PFHxS)	NCL	0.051	NA	0.018	0.006	***0.105***	0.0194	***0.093***	0.017	0.006	<0.0035	0.0053	0.0078	<0.0035	<0.0034	<0.0035	0.0071	0.0048	<0.0034
Perfluorobutanoic acid (PFBA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorodecanoic acid (PFDA)	NCL	NA	NA	<0.0036	<0.0036	<0.0037	<0.00402	<0.0037	<0.004	<0.004	<0.0035	<0.0034	<0.0035	<0.0035	<0.0034	<0.0035	<0.0035	<0.0035	<0.0034
Perfluorododecanoic acid (PFDoDA)	NCL	NA	NA	<0.0036	<0.0036	<0.0037	<0.00402	<0.0037	<0.004	<0.004	<0.0035	<0.0034	<0.0035	<0.0035	<0.0034	<0.0035	<0.0035	<0.0035	<0.0034
Perfluoroheptanoic acid (PFHpA)	NCL	NA	NA	0.026	<0.0036	0.153	0.028	0.13	0.025	<0.004	<0.0035	<0.0034	<0.0035	<0.0035	<0.0034	<0.0035	<0.0035	<0.0035	<0.0034
Perfluorohexanoic acid (PFHxA)	NCL	400	NA	0.016	<0.0036	0.0899	0.0182	0.077	0.013	<0.004	<0.0035	<0.0034	<0.0035	<0.0035	<0.0034	<0.0035	<0.0035	<0.0035	<0.0034
Perfluorononanoic acid (PFNA)	NCL	0.006	NA	<0.0036	<0.0036	<0.0037	<0.00402	<0.0037	<0.004	<0.004	<0.0035	<0.0034	<0.0035	<0.0035	<0.0034	<0.0035	<0.0035	<0.0035	<0.0034
Perfluorooctanoic acid (PFOA)	0.008	0.008	NA	***0.065***	***0.014***	***0.288***	***0.0586***	***0.3***	***0.057***	***0.017***	<0.0035	0.0034	0.0043	<0.0035	<0.0034	<0.0035	***0.023***	0.0046	<0.0034
Perfluorooctane sulfonic acid (PFOS)	0.016	0.016	NA	<0.0036	<0.0036	<0.0037	<0.00402	<0.0037	<0.004	<0.004	<0.0035	0.0034	<0.0035	<0.0035	<0.0034	<0.0035	***0.023***	0.0043	<0.0034
PFOA + PFOS (Calculated)	NCL	NA	0.01	***0.065***	***0.014***	***0.29***	***0.059***	***0.3***	***0.057***	***0.017***	ND	0.0068	0.0043	ND	ND	ND	***0.046***	0.0089	ND
Perfluoropentanoic acid (PFPeA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorotetradecanoic acid (PFTeDA)	NCL	NA	NA	<0.0036	<0.0036	<0.0037	<0.00402	<0.0037	<0.004	<0.004	<0.0035	<0.0034	<0.0035	<0.0035	<0.0034	<0.0035	<0.0035	<0.0035	<0.0034
Perfluorotridecanoic acid (PFTrDA)	NCL	NA	NA	<0.0036	<0.0036	<0.0037	<0.00402	<0.0037	<0.004	<0.004	<0.0035	<0.0034	<0.0035	<0.0035	<0.0034	<0.0035	<0.0035	<0.0035	<0.0034
Perfluoroundecanoic acid (PFUnDA)	NCL	NA	NA	<0.0036	<0.0036	<0.0037	<0.00402	<0.0037	<0.004	<0.004	<0.0035	<0.0034	<0.0035	<0.0035	<0.0034	<0.0035	<0.0035	<0.0035	<0.0034
Perfluorohexadecanoic acid (PFHxDA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total PFAS (Calculated)	NCL	NA	NA	0.14	0.028	0.72	0.14	0.68	0.13	0.033	ND	0.021	0.031	ND	0.0097	ND	0.063	0.023	0.0048

TABLE 2
SUMMARY OF DRINKING WATER SAMPLE ANALYSIS - PFAS
Area R-1 (19)
Wolven/Jewell Area, Kent County, MI

Area	Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2]	MCL[3]	CD Value[4]	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)
PPN				410625301001	410626100034	410625100032	410625301014	410625301002	410625301017	410625100050	410636101010	410625301004	410625301038	410625301023	410625100052	410626200024	410636101002	410625315003	410625100058
Address				4195 TRADEWIND DR NE	9766 WOLVEN AVE NE	9737 SUMMIT AVE NE	4184 TRADEWIND DR NE	4189 TRADEWIND DR NE	4140 WHIRLWIND DR NE	4117 WRENS WAY CT NE	4010 11 MILE RD NE	4175 TRADEWIND DR NE	3830 WHIRLWIND DR NE	4050 WHIRLWIND DR NE	4159 WRENS WAY CT NE	9798 DEER TRL NE	9185 SUMMIT AVE NE	9489 SUMMIT AVE NE	9907 SUMMIT AVE NE
Sample Name				4195 Tradewind 21419	9766 Wolven 21419	9737 Summitt Ave NE	4184 Tradewind DR NE	4189 Tradewind DR NE	4140 Whirlwind DR NE	4117 Wrens Way CT NE	4010 11 Mile Rd NE	4175 Tradewind Dr NE	3830 Whirlwind Dr NE	4050 Whirlwind Dr NE	4159 Wrens Way CT NE	9798 Deer Trl NE	9185 Summit Ave NE	9489 Summit Ave NE	9907 Summit Ave
Matrix				Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water
Laboratory ID				UB16024-015	UB16024-017	UB21031-003	UB21031-005	UB21031-001	UB21031-004	UB21031-007	UB21032-006	UB21032-004	UB21032-005	UB21032-001	UB21032-007	UB21033-003	UB21033-008	UB21033-009	UB21033-007
Sample Date				02/14/2019	02/14/2019	02/18/2019	02/18/2019	02/18/2019	02/18/2019	02/18/2019	02/19/2019	02/19/2019	02/19/2019	02/19/2019	02/19/2019	02/20/2019	02/20/2019	02/20/2019	02/20/2019
Parameter (µg/L)																			
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	NCL	NA	NA	<0.0035	<0.0034	<0.0035	<0.0041	<0.0035	<0.0036	<0.0035	<0.0037	<0.0034	<0.0036	<0.0037	<0.0036	<0.0036	<0.0036	<0.0035	<0.0034
N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Methyl perfluorooctane sulfonamide (MeFOSA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	NCL	NA	NA	<0.0035	<0.0034	<0.0035	<0.0041	<0.0035	<0.0036	<0.0035	<0.0037	<0.0034	<0.0036	<0.0037	<0.0036	<0.0036	<0.0036	<0.0035	<0.0034
N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorobutane sulfonic acid (PFBS)	NCL	0.42	NA	0.016	0.006	0.022	0.012	0.011	0.02	<0.0035	0.029	<0.0034	0.0078	0.0082	0.011	0.018	<0.0036	0.0097	<0.0034
Perfluorodecane sulfonic acid (PFDS)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorooctadecanoic acid (PFODA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluoroheptane sulfonic acid (PFHpS)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorooctane sulfonamide (FOSA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorohexane sulfonic acid (PFHxS)	NCL	0.051	NA	0.0086	<0.0034	0.015	0.0078	0.0073	0.0098	<0.0035	0.0081	<0.0034	<0.0036	0.0042	0.0054	0.014	<0.0036	0.0085	<0.0034
Perfluorobutanoic acid (PFBA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorodecanoic acid (PFDA)	NCL	NA	NA	<0.0035	<0.0034	<0.0035	<0.0041	<0.0035	<0.0036	<0.0035	<0.0037	<0.0034	<0.0036	<0.0037	<0.0036	<0.0036	<0.0036	<0.0035	<0.0034
Perfluorododecanoic acid (PFDoDA)	NCL	NA	NA	<0.0035	<0.0034	<0.0035	<0.0041	<0.0035	<0.0036	<0.0035	<0.0037	<0.0034	<0.0036	<0.0037	<0.0036	<0.0036	<0.0036	<0.0035	<0.0034
Perfluoroheptanoic acid (PFHpA)	NCL	NA	NA	<0.0035	<0.0034	<0.0035	<0.0041	<0.0035	<0.0036	<0.0035	<0.0037	<0.0034	0.0047	<0.0037	<0.0036	0.024	<0.0036	<0.0035	<0.0034
Perfluorohexanoic acid (PFHxA)	NCL	400	NA	0.0038	<0.0034	<0.0035	<0.0041	<0.0035	<0.0036	<0.0035	0.0038	<0.0034	0.004	<0.0037	<0.0036	0.014	<0.0036	<0.0035	<0.0034
Perfluorononanoic acid (PFNA)	NCL	0.006	NA	<0.0035	<0.0034	<0.0035	<0.0041	<0.0035	<0.0036	<0.0035	<0.0037	<0.0034	<0.0036	<0.0037	<0.0036	<0.0036	<0.0036	<0.0035	<0.0034
Perfluorooctanoic acid (PFOA)	0.008	0.008	NA	***0.036***	<0.0034	***0.015***	<0.0041	***0.022***	<0.0036	<0.0035	0.0053	<0.0034	0.0049	<0.0037	<0.0036	***0.044***	<0.0036	***0.021***	<0.0034
Perfluorooctane sulfonic acid (PFOS)	0.016	0.016	NA	0.012	<0.0034	0.006	0.005	***0.019***	<0.0036	<0.0035	<0.0037	<0.0034	<0.0036	<0.0037	0.0052	<0.0036	<0.0036	0.011	<0.0034
PFOA + PFOS (Calculated)	NCL	NA	0.01	***0.048***	ND	***0.021***	0.005	***0.041***	ND	ND	0.0053	ND	0.0049	ND	0.0052	***0.044***	ND	***0.032***	ND
Perfluoropentanoic acid (PFPeA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorotetradecanoic acid (PFTeDA)	NCL	NA	NA	<0.0035	<0.0034	<0.0035	<0.0041	<0.0035	<0.0036	<0.0035	<0.0037	<0.0034	<0.0036	<0.0037	<0.0036	<0.0036	<0.0036	<0.0035	<0.0034
Perfluorotridecanoic acid (PFTrDA)	NCL	NA	NA	<0.0035	<0.0034	<0.0035	<0.0041	<0.0035	<0.0036	<0.0035	<0.0037	<0.0034	<0.0036	<0.0037	<0.0036	<0.0036	<0.0036	<0.0035	<0.0034
Perfluoroundecanoic acid (PFUnDA)	NCL	NA	NA	<0.0035	<0.0034	<0.0035	<0.0041	<0.0035	<0.0036	<0.0035	<0.0037	<0.0034	<0.0036	<0.0037	<0.0036	<0.0036	<0.0036	<0.0035	<0.0034
Perfluorohexadecanoic acid (PFHxDA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total PFAS (Calculated)	NCL	NA	NA	0.076	0.006	0.058	0.025	0.059	0.03	ND	0.046	ND	0.021	0.012	0.022	0.11	ND	0.05	ND

TABLE 2
SUMMARY OF DRINKING WATER SAMPLE ANALYSIS - PFAS
Area R-1 (19)
Wolven/Jewell Area, Kent County, MI

Area	Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2]	MCL[3]	CD Value[4]	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)
PPN				410626200009	410626200009	410625301015	410636101011	410625100043	410636101003	410625301003	410626200011	410625301037	410625301042	410625301022	410625301055	410625301021	410625100053	410625100051	410635227003
Address				3640 VERSCHEL DR NE	3640 VERSCHEL DR NE	4168 WHIRLWIND DR NE	4080 11 MILE RD NE	9920 BRADLEY DR NE	9145 SUMMIT AVE NE	4183 TRADEWIND DR NE	3725 VERSCHEL DR NE	3848 WHIRLWIND DR NE	3869 WHIRLWIND DR NE	4064 WHIRLWIND DR NE	4065 WHIRLWIND DR NE	4078 WHIRLWIND DR NE	4100 WRENS WAY CT NE	4133 WRENS WAY CT NE	3990 11 MILE RD NE
Sample Name				3640 Verschel Dr NE	3640 Verschel-Deep	4168 Whirlwind Dr NE	4080 11 Mile Rd NE	9920 Bradley Dr NE	9145 Summit Ave NE	4183 Tradewind Dr NE	3725 Verschel Dr NE	3848 Whirlwind Dr NE	3869 Whirlwind Dr NE	4064 WHirlwind Dr NE	4065 WHirlwind Dr NE	4078 Whirlwind Dr NE	4100 Wrens Way CT NE	4133 Wrens Way CT NE	3990 11 Mile
Matrix				Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water	Drinking Water
Laboratory ID				UB21033-011	UB21033-001	UB21033-005	UB23018-009	UB23018-007	UB23018-015	UB23018-008	UB23018-013	UB23018-002	UB23018-003	UB23018-005	UB23018-004	UB23018-014	UB23018-001	UB23018-012	UB27002-004
Sample Date				02/20/2019	02/20/2019	02/20/2019	02/21/2019	02/21/2019	02/21/2019	02/21/2019	02/21/2019	02/21/2019	02/21/2019	02/21/2019	02/21/2019	02/21/2019	02/21/2019	02/21/2019	02/25/2019
Parameter (µg/L)																			
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	NCL	NA	NA	<0.0035	<0.0034	<0.0038	<0.0034	<0.0034	<0.0037	<0.0035	<0.0039	<0.0035	<0.0034	<0.0035	<0.0035	<0.0035	<0.0034	<0.0038	<0.0035
N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Methyl perfluorooctane sulfonamide (MeFOSA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	NCL	NA	NA	<0.0035	<0.0034	<0.0038	<0.0034	<0.0034	<0.0037	<0.0035	<0.0039	<0.0035	<0.0034	<0.0035	<0.0035	<0.0035	<0.0034	<0.0038	<0.0035
N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorobutane sulfonic acid (PFBS)	NCL	0.42	NA	0.0069	0.0067	0.02	0.019	<0.0034	<0.0037	0.0067	<0.0039	0.0052	0.0055	0.0097	0.0055	0.01	<0.0034	0.017	0.019
Perfluorodecane sulfonic acid (PFDS)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorooctadecanoic acid (PFODA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluoroheptane sulfonic acid (PFHpS)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorooctane sulfonamide (FOSA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorohexane sulfonic acid (PFHxS)	NCL	0.051	NA	0.0037	<0.0034	0.0093	0.016	<0.0034	<0.0037	<0.0035	<0.0039	<0.0035	<0.0034	0.0045	<0.0035	0.0053	<0.0034	0.0094	0.004
Perfluorobutanoic acid (PFBA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorodecanoic acid (PFDA)	NCL	NA	NA	<0.0035	<0.0034	<0.0038	<0.0034	<0.0034	<0.0037	<0.0035	<0.0039	<0.0035	<0.0034	<0.0035	<0.0035	<0.0035	<0.0034	<0.0038	<0.0035
Perfluorododecanoic acid (PFDoDA)	NCL	NA	NA	<0.0035	<0.0034	<0.0038	<0.0034	<0.0034	<0.0037	<0.0035	<0.0039	<0.0035	<0.0034	<0.0035	<0.0035	<0.0035	<0.0034	<0.0038	<0.0035
Perfluoroheptanoic acid (PFHpA)	NCL	NA	NA	<0.0035	<0.0034	<0.0038	0.0083	<0.0034	<0.0037	<0.0035	<0.0039	<0.0035	<0.0034	<0.0035	<0.0035	<0.0035	<0.0034	0.0055	<0.0035
Perfluorohexanoic acid (PFHxA)	NCL	400	NA	<0.0035	<0.0034	<0.0038	0.012	<0.0034	<0.0037	<0.0035	<0.0039	<0.0035	<0.0034	<0.0035	<0.0035	<0.0035	<0.0034	0.013	<0.0035
Perfluorononanoic acid (PFNA)	NCL	0.006	NA	<0.0035	<0.0034	<0.0038	<0.0034	<0.0034	<0.0037	<0.0035	<0.0039	<0.0035	<0.0034	<0.0035	<0.0035	<0.0035	<0.0034	<0.0038	<0.0035
Perfluorooctanoic acid (PFOA)	0.008	0.008	NA	<0.0035	<0.0034	0.0059	***0.037***	<0.0034	<0.0037	<0.0035	<0.0039	0.0035	<0.0034	<0.0035	0.0043	<0.0035	<0.0034	***0.027***	<0.0035
Perfluorooctane sulfonic acid (PFOS)	0.016	0.016	NA	<0.0035	<0.0034	<0.0038	***0.017***	<0.0034	<0.0037	<0.0035	<0.0039	<0.0035	<0.0034	<0.0035	<0.0035	<0.0035	<0.0034	0.0097	<0.0035
PFOA + PFOS (Calculated)	NCL	NA	0.01	ND	ND	0.0059	***0.054***	ND	ND	ND	ND	0.0035	ND	ND	0.0043	ND	ND	***0.037***	ND
Perfluoropentanoic acid (PFPeA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorotetradecanoic acid (PFTeDA)	NCL	NA	NA	<0.0035	<0.0034	<0.0038	<0.0034	<0.0034	<0.0037	<0.0035	<0.0039	<0.0035	<0.0034	<0.0035	<0.0035	<0.0035	<0.0034	<0.0038	<0.0035
Perfluorotridecanoic acid (PFTrDA)	NCL	NA	NA	<0.0035	<0.0034	<0.0038	<0.0034	<0.0034	<0.0037	<0.0035	<0.0039	<0.0035	<0.0034	<0.0035	<0.0035	<0.0035	<0.0034	<0.0038	<0.0035
Perfluoroundecanoic acid (PFUnDA)	NCL	NA	NA	<0.0035	<0.0034	<0.0038	<0.0034	<0.0034	<0.0037	<0.0035	<0.0039	<0.0035	<0.0034	<0.0035	<0.0035	<0.0035	<0.0034	<0.0038	<0.0035
Perfluorohexadecanoic acid (PFHxDA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total PFAS (Calculated)	NCL	NA	NA	0.011	0.0067	0.035	0.11	ND	ND	0.0067	ND	0.0087	0.0055	0.014	0.0098	0.015	ND	0.082	0.023

TABLE 2
SUMMARY OF DRINKING WATER SAMPLE ANALYSIS - PFAS
Area R-1 (19)
Wolven/Jewell Area, Kent County, MI

Area	**Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2]**	**MCL[3]**	**CD Value[4]**	**Area R-1 (19)**	**Area R-1 (19)**	**Area R-1 (19)**	**Area R-1 (19)**	**Area R-1 (19)**	**Area R-1 (19)**	**Area R-1 (19)**	**Area R-1 (19)**	**Area R-1 (19)**	**Area R-1 (19)**	**Area R-1 (19)**	**Area R-1 (19)**	**Area R-1 (19)**	**Area R-1 (19)**	**Area R-1 (19)**	**Area R-1 (19)**
PPN				410626200030	410625100023	410625301007	410625301006	410625301020	410625301019	410626200036	410625100020	410625100056	410635100005	410635201012	410626400009	410625301036	410625301040	410626100043	410625301039
Address				**9799 DEER TRL NE**	**9933 SUMMIT AVE NE**	**4090 TRADEWIND DR NE**	**4155 TRADEWIND DR NE**	**4096 WHIRLWIND DR NE**	**4112 WHIRLWIND DR NE**	**9859 DEER TRL NE**	**9911 SUMMIT AVE NE**	**9905 SUMMIT AVE NE**	**3530 11 MILE RD NE**	**3616 11 MILE RD NE**	**3749 11 MILE RD NE**	**3862 WHIRLWIND DR NE**	**3823 WHIRLWIND DR NE**	**9680 WOLVEN AVE NE**	**3826 WHIRLWIND DR NE**
Sample Name				**9799 Deer Trl**	**9933 Summit**	**4090 Tradewind**	**4155 Tradewind**	**4096 Whirlwind**	**4112 Whirlwind**	**9859 Deer Trl**	**9911 Summit**	**9905 Summit Ave**	**3530 11 Mile**	**3616 11 Mile-IN-3/19**	**3749 11 Mile Rd**	**3862 Whirlwind**	**3823 Whirlwind-IN-3/21**	**9680 Wolven**	**3826 Whirlwind-IN-3/29**
Matrix				**Drinking Water**	**Drinking Water**	**Drinking Water**	**Drinking Water**	**Drinking Water**	**Drinking Water**	**Drinking Water**	**Drinking Water**	**Drinking Water**	**Drinking Water**	**POET Influent**	**Drinking Water**	**Drinking Water**	**POET Influent**	**Drinking Water**	**POET Influent**
Laboratory ID				**UB27002-002**	**UB27002-003**	**UB27002-007**	**UB27002-009**	**UB27002-006**	**UB27002-001**	**UB27002-011**	**UC07049-005**	**UC14023-001**	**UC21018-003**	**UC21025-001**	**UC21018-001**	**UC21018-002**	**UC23025-003**	**UC23034-001**	**UC30010-002**
Sample Date				**02/25/2019**	**02/25/2019**	**02/25/2019**	**02/25/2019**	**02/25/2019**	**02/25/2019**	**02/26/2019**	**03/06/2019**	**03/11/2019**	**03/19/2019**	**03/19/2019**	**03/19/2019**	**03/19/2019**	**03/21/2019**	**03/21/2019**	**03/29/2019**
Parameter (µg/L)																			
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	NCL	NA	NA	<0.0035	<0.0035	<0.0034	<0.0034	<0.0035	<0.0034	<0.0035	<0.0035	<0.0035	<0.0034	<0.0036	<0.0034	<0.0035	<0.0038	<0.0035	<0.0036
N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Methyl perfluorooctane sulfonamide (MeFOSA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	NCL	NA	NA	<0.0035	<0.0035	<0.0034	<0.0034	<0.0035	<0.0034	<0.0035	<0.0035	<0.0035	<0.0034	<0.0036	<0.0034	<0.0035	<0.0038	<0.0035	<0.0036
N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorobutane sulfonic acid (PFBS)	NCL	0.42	NA	<0.0035	0.014	<0.0034	0.0069	0.013	0.017	<0.0035	<0.0035	<0.0035	<0.0034	0.078	0.0054	<0.0035	0.024	0.0051	0.022
Perfluorodecane sulfonic acid (PFDS)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorooctadecanoic acid (PFODA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluoroheptane sulfonic acid (PFHpS)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorooctane sulfonamide (FOSA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorohexane sulfonic acid (PFHxS)	NCL	0.051	NA	<0.0035	0.006	<0.0034	0.0043	0.0079	0.0092	<0.0035	<0.0035	<0.0035	<0.0034	***0.1***	<0.0034	<0.0035	0.031	0.0036	0.021
Perfluorobutanoic acid (PFBA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorodecanoic acid (PFDA)	NCL	NA	NA	<0.0035	<0.0035	<0.0034	<0.0034	<0.0035	<0.0034	<0.0035	<0.0035	<0.0035	<0.0034	<0.0036	<0.0034	<0.0035	<0.0038	<0.0035	<0.0036
Perfluorododecanoic acid (PFDoDA)	NCL	NA	NA	<0.0035	<0.0035	<0.0034	<0.0034	<0.0035	<0.0034	<0.0035	<0.0035	<0.0035	<0.0034	<0.0036	<0.0034	<0.0035	<0.0038	<0.0035	<0.0036
Perfluoroheptanoic acid (PFHpA)	NCL	NA	NA	<0.0035	0.0091	<0.0034	<0.0034	<0.0035	<0.0034	<0.0035	<0.0035	<0.0035	<0.0034	0.12	0.0038	<0.0035	0.038	<0.0035	0.03
Perfluorohexanoic acid (PFHxA)	NCL	400	NA	<0.0035	0.0062	<0.0034	<0.0034	<0.0035	<0.0034	<0.0035	<0.0035	<0.0035	<0.0034	0.066	<0.0034	<0.0035	0.022	<0.0035	0.019
Perfluorononanoic acid (PFNA)	NCL	0.006	NA	<0.0035	<0.0035	<0.0034	<0.0034	<0.0035	<0.0034	<0.0035	<0.0035	<0.0035	<0.0034	<0.0036	<0.0034	<0.0035	<0.0038	<0.0035	<0.0036
Perfluorooctanoic acid (PFOA)	0.008	0.008	NA	<0.0035	***0.014***	<0.0034	<0.0034	<0.0035	<0.0034	<0.0035	<0.0035	<0.0035	<0.0034	***0.28***	0.0074	<0.0035	***0.099***	<0.0035	***0.061***
Perfluorooctane sulfonic acid (PFOS)	0.016	0.016	NA	<0.0035	0.0041	<0.0034	<0.0034	<0.0035	<0.0034	<0.0035	<0.0035	<0.0035	<0.0034	<0.0036	<0.0034	<0.0035	<0.0038	<0.0035	<0.0036
PFOA + PFOS (Calculated)	NCL	NA	0.01	ND	***0.018***	ND	ND	ND	ND	ND	ND	ND	ND	***0.28***	0.0074	ND	***0.099***	ND	***0.061***
Perfluoropentanoic acid (PFPeA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorotetradecanoic acid (PFTeDA)	NCL	NA	NA	<0.0035	<0.0035	<0.0034	<0.0034	<0.0035	<0.0034	<0.0035	<0.0035	<0.0035	<0.0034	<0.0036	<0.0034	<0.0035	<0.0038	<0.0035	<0.0036
Perfluorotridecanoic acid (PFTrDA)	NCL	NA	NA	<0.0035	<0.0035	<0.0034	<0.0034	<0.0035	<0.0034	<0.0035	<0.0035	<0.0035	<0.0034	<0.0036	<0.0034	<0.0035	<0.0038	<0.0035	<0.0036
Perfluoroundecanoic acid (PFUnDA)	NCL	NA	NA	<0.0035	<0.0035	<0.0034	<0.0034	<0.0035	<0.0034	<0.0035	<0.0035	<0.0035	<0.0034	<0.0036	<0.0034	<0.0035	<0.0038	<0.0035	<0.0036
Perfluorohexadecanoic acid (PFHxDA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total PFAS (Calculated)	NCL	NA	NA	ND	0.053	ND	0.011	0.021	0.026	ND	ND	ND	ND	0.64	0.017	ND	0.21	0.0087	0.15

TABLE 2
SUMMARY OF DRINKING WATER SAMPLE ANALYSIS - PFAS
Area R-1 (19)
Wolven/Jewell Area, Kent County, MI

Area	Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2]	MCL[3]	CD Value[4]	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)	Area R-1 (19)
PPN				410625301057	410625301060	410635201012	410625301040	410625301039	410626300021	410625301040	410625301039	410625301039	410635201012	410625301040	410626300021
Address				4095 WHIRLWIND DR NE	4139 WHIRLWIND DR NE	3616 11 MILE RD NE	3823 WHIRLWIND DR NE	3826 WHIRLWIND DR NE	3535 11 MILE RD NE	3823 WHIRLWIND DR NE	3826 WHIRLWIND DR NE	3826 WHIRLWIND DR NE	3616 11 MILE RD NE	3823 WHIRLWIND DR NE	3535 11 MILE RD NE
Sample Name				4095 Whirlwind	4139 Whirlwind Dr NE	3616 11 Mile-IN-6/18	3823 Whirlwind-IN-6/18	3826 Whirlwind-IN-6/21	3535 11 Mile-IN-7/30	3823 Whirlwind-IN-9/24	3826 Whirlwind-IN-9/24	3826 Whirlwind-IN-12/10	3616 11 Mile-IN-12/17	3823 Whirlwind-IN-12/19	3535 11 Mile-IN-1/28
Matrix				Drinking Water	Drinking Water	POET Influent	POET Influent	POET Influent	POET Influent	POET Influent	POET Influent	POET Influent	POET Influent	POET Influent	POET Influent
Laboratory ID				UC30006-001	UE25006-001	UF20010-001	UF20010-002	UF22006-001	UH01060-002	UI26022-004	UI26022-002	UL12030-002	UL19092-004	UL21013-002	VA30036-003
Sample Date				03/29/2019	05/24/2019	06/18/2019	06/18/2019	06/20/2019	07/30/2019	09/24/2019	09/24/2019	12/10/2019	12/17/2019	12/19/2019	01/28/2020
Parameter (µg/L)															
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	NCL	NA	NA	<0.0035	<0.0035	<0.0038	<0.004	<0.0037	<0.0038	<0.0043	<0.0038	<0.0036	<0.0037	<0.0039	<0.0038
N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
N-Methyl perfluorooctane sulfonamide (MeFOSA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	NCL	NA	NA	<0.0035	<0.0035	<0.0038	<0.004	<0.0037	<0.0038	<0.0043	<0.0038	<0.0036	<0.0037	<0.0039	<0.0038
N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorobutane sulfonic acid (PFBS)	NCL	0.42	NA	<0.0035	0.013	0.093	0.03	0.024	0.017	0.022	0.02	0.021	0.065	0.025	0.017
Perfluorodecane sulfonic acid (PFDS)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorooctadecanoic acid (PFODA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
Perfluoroheptane sulfonic acid (PFHpS)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorooctane sulfonamide (FOSA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorohexane sulfonic acid (PFHxS)	NCL	0.051	NA	<0.0035	0.0071	***0.12***	0.036	0.022	0.0096	0.028	0.023	0.021	***0.091***	0.029	0.0099
Perfluorobutanoic acid (PFBA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorodecanoic acid (PFDA)	NCL	NA	NA	<0.0035	<0.0035	<0.0038	<0.004	<0.0037	<0.0038	<0.0043	<0.0038	<0.0036	<0.0037	<0.0039	<0.0038
Perfluorododecanoic acid (PFDoDA)	NCL	NA	NA	<0.0035	<0.0035	<0.0038	<0.004	<0.0037	<0.0038	<0.0043	<0.0038	<0.0036	<0.0037	<0.0039	<0.0038
Perfluoroheptanoic acid (PFHpA)	NCL	NA	NA	<0.0035	<0.0035	0.14	0.04	0.033	<0.0038	0.034	0.026	0.028	0.11	0.036	<0.0038
Perfluorohexanoic acid (PFHxA)	NCL	400	NA	<0.0035	<0.0035	0.079	0.026	0.02	<0.0038	0.02	0.016	0.014	0.063	0.022	<0.0038
Perfluorononanoic acid (PFNA)	NCL	0.006	NA	<0.0035	<0.0035	<0.0038	<0.004	<0.0037	<0.0038	<0.0043	<0.0038	<0.0036	<0.0037	<0.0039	<0.0038
Perfluorooctanoic acid (PFOA)	0.008	0.008	NA	<0.0035	0.0035	***0.35***	***0.11***	***0.093***	***0.02***	***0.093 E***	***0.074***	***0.066***	***0.26***	***0.1***	***0.015***
Perfluorooctane sulfonic acid (PFOS)	0.016	0.016	NA	<0.0035	<0.0035	<0.0038	<0.004	<0.0037	0.0041	<0.0043	<0.0038	<0.0036	<0.0037	<0.0039	<0.0038
PFOA + PFOS (Calculated)	NCL	NA	0.01	ND	0.0035	***0.35***	***0.11***	***0.093***	***0.024***	***0.093***	***0.074***	***0.066***	***0.26***	***0.1***	***0.015***
Perfluoropentanoic acid (PFPeA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorotetradecanoic acid (PFTeDA)	NCL	NA	NA	<0.0035	<0.0035	<0.0038	<0.004	<0.0037	<0.0038	<0.0043	<0.0038	<0.0036	<0.0037	<0.0039	<0.0038
Perfluorotridecanoic acid (PFTrDA)	NCL	NA	NA	<0.0035	<0.0035	<0.0038	<0.004	<0.0037	<0.0038	<0.0043	<0.0038	<0.0036	<0.0037	<0.0039	<0.0038
Perfluoroundecanoic acid (PFUnDA)	NCL	NA	NA	<0.0035	<0.0035	<0.0038	<0.004	<0.0037	<0.0038	<0.0043	<0.0038	<0.0036	<0.0037	<0.0039	<0.0038
Perfluorohexadecanoic acid (PFHxDA)	NCL	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
Total PFAS (Calculated)	NCL	NA	NA	ND	0.024	0.78	0.24	0.19	0.051	0.2	0.16	0.15	0.59	0.21	0.042

TABLE 2 NOTES
Area R-1 (19)
Wolven/Jewell Area, Kent County, MI

NOTES:

1. Concentration and criteria units are micrograms per Liter (µg/L) or parts per billion (ppb). Calculated criteria and concentrations are rounded to two significant digits. "ND" indicates the parameters used in the calculation were not detected.
2. Michigan Part 201 Groundwater Cleanup Criteria are based on "Table 1, Groundwater: Residential and Nonresidential Part 201 Generic Cleanup Criteria and Screening Levels/Part 213 Tier I Risk Based Screening Levels," Michigan Administrative Code, Cleanup Criteria Requirements for Response Activity, Rules 299.44 and 299.49, effective December 30, 2013; last updated August 3, 2020.
   Abbreviations Include:
   "NCL" indicates no criterion listed in EGLE Table 1.
3. Maxium Contaminant Levels (MCLs) were published by EGLE, effective August 3, 2020.
   Abbreviations Include:
   "NA" indicates no Proposed MCL listed.
4. "CD Value" refers to the PFOA+PFOS value of 0.01 µg/L in the Consent Decree.
5. Bold, italic number with thick line border or italic parameter name indicates that parameter was detected above the Michigan Part 201 Groundwater Cleanup Criteria, MCLs, or CD Value listed.
6. Abbreviations include:
   "< RL" indicates the parameter was analyzed for but not detected above the method detection limit; RL = Reporting Limit.
   "DUP" indicates a duplicate sample.
   "-" indicates the paramater was not analyzed.
   "E" indicates the quantitation of the compound exceeded the calibration range.
   "J" indicates the parameter was detected at a concentration greater than the limit of quantitation (LOQ) but less than the detection limit (DL) and the result is estimated.

TABLE 3
MONITORING WELL INSTALLATION INFORMATION
Area R-1 (19)
Wolven/Jewell Area, Kent County, MI

Site Location	Well Ownership/ Data Provider	Well Field ID	Top of Casing Elevation (ft)	Ground Surface Elevation (ft)	Top of Screen Depth (ft bgs)	Bottom of Screen Depth (ft bgs)	Casing Diameter (in)	Casing Type	Aquifer Zone	Protective Casing Type
House Street	EGLE	HS-DEQ-MW1D	799.43	799.7	ND	123.82	ND	ND	D	ND
House Street	EGLE	HS-DEQ-MW1I	799.83	800.2	ND	77.58	ND	ND	S	ND
House Street	EGLE	HS-DEQ-MW1S	799.42	799.7	ND	56.56	ND	ND	S	ND
House Street	EGLE	HS-DEQ-MW3D	857.29	857.9	ND	177.41	ND	ND	D	ND
House Street	EGLE	HS-DEQ-MW3S	857.40	857.9	ND	106.45	ND	ND	S	ND
House Street	EGLE	HS-DEQ-MW4-102	733.80	734.4	ND	102.8	ND	ND	D	ND
House Street	EGLE	HS-DEQ-MW4-16	734.23	734.7	ND	16.04	ND	ND	S	ND
House Street	EGLE	HS-DEQ-MW4-53	734.33	734.7	ND	53.85	ND	ND	D	ND
House Street	EGLE	HS-DEQ-MW4-80	734.33	734.7	ND	80.09	ND	ND	D	ND
House Street	EGLE	HS-DEQ-MW4-85	733.61	734.4	ND	85.79	ND	ND	D	ND
House Street	EGLE	HS-DEQ-MW4-90	733.99	734.4	ND	89.68	ND	ND	D	ND
House Street	EGLE	HS-DEQ-MW4-97	733.71	734.4	ND	98.81	ND	ND	D	ND
House Street	EGLE	HS-DEQ-MW5D	812.95	813.5	ND	130.16	ND	ND	S	ND
House Street	EGLE	HS-DEQ-MW5S	813.12	813.5	ND	47.28	ND	ND	S	ND
House Street	EGLE	HS-DEQ-MW6D	795.59	796.4	ND	176.36	ND	ND	D	ND
House Street	EGLE	HS-DEQ-MW6S	796.09	796.4	ND	45.71	ND	ND	S	ND
House Street	EGLE	HS-DEQ-MW7-102	775.04	775.4	ND	102.11	ND	ND	S	ND
House Street	EGLE	HS-DEQ-MW7-33	775.15	775.4	ND	33.33	ND	ND	S	ND
House Street	EGLE	HS-DEQ-MW7-87	775.02	775.4	ND	87.71	ND	ND	S	ND
House Street	EGLE	HS-DEQ-MW7-94	775.16	775.4	ND	94.32	ND	ND	S	ND
House Street	EGLE	HS-DEQ-MW8D	677.86	678.2	ND	33.37	ND	ND	S	ND
House Street	EGLE	HS-DEQ-MW8S	677.87	678.2	ND	28.28	ND	ND	S	ND
House Street	R&W/GZA	HS-MW-10D	780.94	778.1	188.2	193.2	2	PVC	D	Stickup
House Street	R&W/GZA	HS-MW-10M	780.64	777.7	126.4	131.4	2	PVC	S	Stickup
House Street	R&W/GZA	HS-MW-10S	780.06	777.2	48.3	58.3	2	PVC	S	Stickup
House Street	R&W/GZA	HS-MW-11D	744.75	742.1	153.6	158.6	2	PVC	D	Stickup
House Street	R&W/GZA	HS-MW-11M	744.96	742.3	96.4	101.4	2	PVC	D	Stickup
House Street	R&W/GZA	HS-MW-11S	744.78	742.1	21.2	31.2	2	PVC	S	Stickup
House Street	R&W/GZA	HS-MW-12A	716.50	716.8	15.4	20.4	2	PVC	S	Flush
House Street	R&W/GZA	HS-MW-12B	716.36	716.8	51.5	56.5	2	PVC	S	Flush
House Street	R&W/GZA	HS-MW-12C	716.17	716.9	127.7	132.7	2	PVC	D	Flush
House Street	R&W/GZA	HS-MW-12D	716.48	717.0	158.7	163.7	2	PVC	D	Flush
House Street	R&W/GZA	HS-MW-12E	716.29	716.8	187.5	192.5	2	PVC	D	Flush
House Street	R&W/GZA	HS-MW-13A	ND	ND	79.0	84.0	2	PVC	ND	ND
House Street	R&W/GZA	HS-MW-13B	ND	ND	149.0	154.0	2	PVC	ND	ND
House Street	R&W/GZA	HS-MW-13C	ND	ND	199.5	114.5	2	PVC	ND	ND
House Street	R&W/GZA	HS-MW-14D	673.20	670.7	109.0	114.0	2	PVC	D	Stickup
House Street	R&W/GZA	HS-MW-14M	673.53	671.0	68.1	73.1	2	PVC	D	Stickup
House Street	R&W/GZA	HS-MW-14S	673.64	671.2	13.0	23.0	2	PVC	S	Stickup
House Street	R&W/GZA	HS-MW-15D	642.86	639.7	108.6	118.6	2	PVC	D	Stickup
House Street	R&W/GZA	HS-MW-15M	640.98	638.0	44.8	49.8	2	PVC	D	Stickup
House Street	R&W/GZA	HS-MW-15S	640.71	637.5	6.9	16.9	2	PVC	S	Stickup
House Street	R&W/GZA	HS-MW-17D	784.64	782.3	222.1	227.1	2	PVC	D	Stickup
House Street	R&W/GZA	HS-MW-17M	784.17	781.9	167.3	172.3	2	PVC	D	Stickup
House Street	R&W/GZA	HS-MW-17S	784.77	782.0	105.8	110.8	2	PVC	S	Stickup
House Street	R&W/GZA	HS-MW-18D	684.73	682.0	140.6	145.6	2	PVC	D	Stickup
House Street	R&W/GZA	HS-MW-18S	683.93	682.0	12.8	22.8	2	PVC	S	Stickup
House Street	R&W/GZA	HS-MW-19D	680.79	677.7	85.9	95.9	2	PVC	D	Stickup
House Street	R&W/GZA	HS-MW-19S	680.83	677.8	58.4	61.4	2	PVC	S	Stickup
House Street	R&W/GZA	HS-MW-1D	790.73	788.7	172.3	176.9	2	PVC	D	Stickup
House Street	R&W/GZA	HS-MW-1S	791.01	788.8	67.4	72.1	2	PVC	S	Stickup
House Street	R&W/GZA	HS-MW-20D	706.64	703.9	126.1	131.1	2	PVC	D	Stickup
House Street	R&W/GZA	HS-MW-20M	706.90	704.2	101.5	106.5	2	PVC	S	Stickup
House Street	R&W/GZA	HS-MW-20S	706.72	703.9	61.1	66.1	2	PVC	S	Stickup
House Street	R&W/GZA	HS-MW-21D	648.38	645.7	76.2	86.2	2	PVC	D	Stickup
House Street	R&W/GZA	HS-MW-21M	648.85	645.9	59.0	64.0	2	PVC	D	Stickup
House Street	R&W/GZA	HS-MW-21S	648.67	645.8	9.8	19.8	2	PVC	S	Stickup
House Street	R&W/GZA	HS-MW-23A	791.23	791.7	72.1	77.1	2	PVC	S	Flush
House Street	R&W/GZA	HS-MW-23B	791.21	791.5	137.9	142.8	2	PVC	D	Flush
House Street	R&W/GZA	HS-MW-23C	791.09	791.4	210.2	215.0	2	PVC	D	Flush
House Street	R&W/GZA	HS-MW-23D	791.47	792.0	238.9	243.9	2	PVC	D	Flush
House Street	R&W/GZA	HS-MW-24A	776.01	776.3	55.6	60.4	2	PVC	S	Flush
House Street	R&W/GZA	HS-MW-24B	775.72	776.2	225.2	230.0	2	PVC	D	Flush
House Street	R&W/GZA	HS-MW-25D	650.61	651.1	65.7	70.7	2	PVC	D	Flush
House Street	R&W/GZA	HS-MW-25S	650.83	651.2	51.1	56.1	2	PVC	S	Flush
House Street	R&W/GZA	HS-MW-26D	651.75	652.1	79.6	84.6	2	PVC	D	Flush
House Street	R&W/GZA	HS-MW-26M	651.31	651.7	61.7	66.7	2	PVC	D	Flush
House Street	R&W/GZA	HS-MW-26S	651.88	652.0	25.8	30.8	2	PVC	S	Flush
House Street	R&W/GZA	HS-MW-27A	668.44	668.7	21.6	26.2	2	PVC	S	Flush
House Street	R&W/GZA	HS-MW-27B	668.49	668.9	35.4	38.0	2	PVC	S	Flush
House Street	R&W/GZA	HS-MW-27C	668.64	669.0	41.3	45.9	2	PVC	S	Flush

TABLE 3
MONITORING WELL INSTALLATION INFORMATION
Area R-1 (19)
Wolven/Jewell Area, Kent County, MI

Site Location	Well Ownership/ Data Provider	Well Field ID	Top of Casing Elevation (ft)	Ground Surface Elevation (ft)	Top of Screen Depth (ft bgs)	Bottom of Screen Depth (ft bgs)	Casing Diameter (in)	Casing Type	Aquifer Zone	Protective Casing Type
House Street	R&W/GZA	HS-MW-27D	668.54	668.9	52.4	56.4	2	PVC	D	Flush
House Street	R&W/GZA	HS-MW-27E	668.56	668.9	58.5	62.5	2	PVC	D	Flush
House Street	R&W/GZA	HS-MW-28A	665.88	666.2	39.1	43.7	2	PVC	S	Flush
House Street	R&W/GZA	HS-MW-28B	666.14	666.4	43.3	47.9	2	PVC	S	Flush
House Street	R&W/GZA	HS-MW-28C	666.16	666.5	49.2	53.8	2	PVC	S	Flush
House Street	R&W/GZA	HS-MW-28D	665.89	666.3	62.2	66.8	2	PVC	D	Flush
House Street	R&W/GZA	HS-MW-28E	665.61	666.0	82.7	87.3	2	PVC	D	Flush
House Street	R&W/GZA	HS-MW-29A	633.13	630.3	3.5	13.5	2	PVC	S	Stickup
House Street	R&W/GZA	HS-MW-29B	633.89	630.5	16.8	21.8	2	PVC	S	Stickup
House Street	R&W/GZA	HS-MW-29C	633.60	630.4	27.2	32.2	2	PVC	D	Stickup
House Street	R&W/GZA	HS-MW-29D	633.19	630.7	37.1	42.1	2	PVC	D	Stickup
House Street	R&W/GZA	HS-MW-2S	799.66	797.6	77.9	82.5	2	PVC	S	Stickup
House Street	R&W/GZA	HS-MW-30A	672.78	673.0	46.9	51.5	2	PVC	S	Flush
House Street	R&W/GZA	HS-MW-30B	673.09	673.4	51.5	56.1	2	PVC	S	Flush
House Street	R&W/GZA	HS-MW-30C	672.90	673.1	77.4	82.0	2	PVC	D	Flush
House Street	R&W/GZA	HS-MW-30D	673.37	673.6	112.7	117.3	2	PVC	D	Flush
House Street	R&W/GZA	HS-MW-30E	672.32	672.9	123.2	127.7	2	PVC	D	Flush
House Street	R&W/GZA	HS-MW-31A	639.30	639.5	17.1	21.6	2	PVC	S	Flush
House Street	R&W/GZA	HS-MW-31B	639.27	639.3	26.0	30.5	2	PVC	S	Flush
House Street	R&W/GZA	HS-MW-31C	639.27	639.4	41.3	45.8	2	PVC	S	Flush
House Street	R&W/GZA	HS-MW-31D	638.96	639.1	48.8	53.4	2	PVC	D	Flush
House Street	R&W/GZA	HS-MW-31E	638.95	639.2	64.1	68.7	2	PVC	D	Flush
House Street	R&W/GZA	HS-MW-32A	727.36	724.8	60.9	65.5	2	PVC	S	Stickup
House Street	R&W/GZA	HS-MW-32B	727.85	725.1	79.1	83.7	2	PVC	D	Stickup
House Street	R&W/GZA	HS-MW-32C	727.72	725.1	108.8	113.4	2	PVC	D	Stickup
House Street	R&W/GZA	HS-MW-32D	727.55	725.0	142.3	146.9	2	PVC	D	Stickup
House Street	R&W/GZA	HS-MW-3P	790.15	787.7	19.3	24.3	2	PVC	P	Stickup
House Street	R&W/GZA	HS-MW-3S	790.69	788.1	70.1	75.0	2	PVC	S	Stickup
House Street	R&W/GZA	HS-MW-4S	784.88	782.3	70.2	74.8	2	PVC	S	Stickup
House Street	R&W/GZA	HS-MW-5D	781.99	779.3	190.5	200.5	2	PVC	D	Stickup
House Street	R&W/GZA	HS-MW-5P	781.55	779.1	17.7	22.4	2	PVC	P	Stickup
House Street	R&W/GZA	HS-MW-5S	781.79	779.2	60.3	65.0	2	PVC	S	Stickup
House Street	R&W/GZA	HS-MW-6D	773.44	771.0	157.5	162.5	2	PVC	D	Stickup
House Street	R&W/GZA	HS-MW-6S	773.34	770.7	58.2	62.9	2	PVC	S	Stickup
House Street	R&W/GZA	HS-MW-7S	791.09	788.9	69.9	74.5	2	PVC	S	Stickup
House Street	R&W/GZA	HS-MW-8	745.09	742.2	30.0	35.0	2	PVC	S	Stickup
House Street	R&W/GZA	HS-MW-9D	820.88	818.2	204.3	209.3	2	PVC	D	Stickup
House Street	R&W/GZA	HS-MW-9M	820.66	817.9	126.8	131.8	2	PVC	S	Stickup
House Street	R&W/GZA	HS-MW-9S	820.20	817.8	26.2	31.2	2	PVC	P	Stickup
North Kent Landfill	NKL	NKLF-MW-35	900.23	ND	ND	ND	ND	ND	ND	ND
North Kent Landfill	NKL	NKLF-MW-48	901.64	ND	ND	ND	ND	ND	ND	ND
North Kent Landfill	NKL	NKLF-MW-53	893.99	ND	ND	ND	ND	ND	ND	ND
North Kent Landfill	NKL	NKLF-MW-54	912.79	ND	ND	ND	ND	ND	ND	ND
North Kent Landfill	NKL	NKLF-MW-55	893.11	ND	ND	ND	ND	ND	ND	ND
North Kent Landfill	NKL	NKLF-MW-56	867.88	866.4	ND	43.97	ND	ND	S	ND
North Kent Landfill	NKL	NKLF-MW-57	894.35	ND	ND	ND	ND	ND	ND	ND
North Kent Landfill	NKL	NKLF-MW-60	844.35	ND	ND	ND	ND	ND	ND	ND
North Kent Landfill	NKL	NKLF-MW-61	841.14	839.8	ND	28.47	ND	ND	S	ND
North Kent Landfill	NKL	NKLF-MW-63	840.81	839.1	ND	102.41	ND	ND	D	ND
North Kent Landfill	NKL	NKLF-MW-65	835.27	834.2	ND	21.87	ND	ND	S	ND
North Kent Landfill	NKL	NKLF-MW-66	874.57	ND	ND	ND	ND	ND	ND	ND
North Kent Landfill	NKL	NKLF-MW-67	902.72	ND	ND	ND	ND	ND	ND	ND
North Kent Landfill	NKL	NKLF-MW-68	900.98	899.2	ND	92.79	ND	ND	S	ND
North Kent Landfill	NKL	NKLF-MW-69	893.04	ND	ND	ND	ND	ND	ND	ND
North Kent Landfill	NKL	NKLF-MW-70	897.8	895.6	ND	63.33	ND	ND	S	ND
North Kent Landfill	NKL	NKLF-MW-71	894.71	ND	ND	ND	ND	ND	ND	ND
North Kent Landfill	NKL	NKLF-MW-72	882.18	879.5	ND	26.98	ND	ND	S	ND
North Kent Landfill	NKL	NKLF-MW-73	900.19	ND	ND	ND	ND	ND	ND	ND
North Kent Landfill	NKL	NKLF-MW-74	880.34	ND	ND	ND	ND	ND	ND	ND
North Kent Landfill	NKL	NKLF-MW-75	881.23	ND	ND	ND	ND	ND	ND	ND
North Kent Landfill	NKL	NKLF-MW-76	849.47	ND	ND	ND	ND	ND	ND	ND
North Kent Landfill	NKL	NKLF-MW-77	837.14	834.2	ND	22.8	ND	ND	S	ND
North Kent Landfill	NKL	NKLF-MW-78	883.89	ND	ND	ND	ND	ND	ND	ND
North Kent Landfill	NKL	NKLF-MW-80	888.05	887.4	ND	42.44	ND	ND	S	ND
North Kent Landfill	NKL	NKLF-MW-81	834.71	ND	ND	ND	ND	ND	ND	ND
North Kent Landfill	NKL	NKLF-MW-82	896.26	ND	ND	ND	ND	ND	ND	ND
North Kent Landfill	NKL	NKLF-TW-02	900.95	ND	ND	ND	ND	ND	ND	ND
North Kent Landfill	NKL	NKLF-TW-04	858.20	ND	ND	ND	ND	ND	ND	ND
North Kent Landfill	NKL	NKLF-TW-05	838.64	ND	ND	ND	ND	ND	ND	ND
North Kent Landfill	NKL	NKLF-TW-06	883.99	ND	ND	ND	ND	ND	ND	ND
Wolven	EGLE	WV-DEQ-MW10-121	764.74	763.865	ND	120.72	ND	ND	D	ND

TABLE 3
MONITORING WELL INSTALLATION INFORMATION
Area R-1 (19)
Wolven/Jewell Area, Kent County, MI

Site Location	Well Ownership/ Data Provider	Well Field ID	Top of Casing Elevation (ft)	Ground Surface Elevation (ft)	Top of Screen Depth (ft bgs)	Bottom of Screen Depth (ft bgs)	Casing Diameter (in)	Casing Type	Aquifer Zone	Protective Casing Type
Wolven	EGLE	WV-DEQ-MW10-177	764.934	763.865	*ND*	177.63	*ND*	*ND*	*D*	*ND*
Wolven	EGLE	WV-DEQ-MW10-55	764.909	763.376	*ND*	55.21	*ND*	*ND*	*S*	*ND*
Wolven	EGLE	WV-DEQ-MW10-84	764.442	763.376	*ND*	84.14	*ND*	*ND*	*D*	*ND*
Wolven	EGLE	WV-DEQ-MW10-95	764.931	763.376	*ND*	95.25	*ND*	*ND*	*D*	*ND*
Wolven	EGLE	WV-DEQ-MW11-130	859.121	855.95	*ND*	130.22	*ND*	*ND*	*D*	*ND*
Wolven	EGLE	WV-DEQ-MW11-137	859.212	855.763	*ND*	136.65	*ND*	*ND*	*D*	*ND*
Wolven	EGLE	WV-DEQ-MW11-145	859.14	855.95	*ND*	145.71	*ND*	*ND*	*D*	*ND*
Wolven	EGLE	WV-DEQ-MW11-57	858.794	855.95	*ND*	56.99	*ND*	*ND*	*S*	*ND*
Wolven	EGLE	WV-DEQ-MW11-95	859.129	855.763	*ND*	95.47	*ND*	*ND*	*S*	*ND*
Wolven	EGLE	WV-DEQ-MW2D	877.53	877.80	*ND*	168.72	*ND*	*ND*	*D*	*ND*
Wolven	EGLE	WV-DEQ-MW2S	877.57	877.80	*ND*	58.04	*ND*	*ND*	*S*	*ND*
Wolven	EGLE	WV-DEQ-MW9-114	712.079	712.402	*ND*	114.07	*ND*	*ND*	*D*	*ND*
Wolven	EGLE	WV-DEQ-MW9-131	712.031	712.402	*ND*	130.97	*ND*	*ND*	*D*	*ND*
Wolven	EGLE	WV-DEQ-MW9-57	712.128	712.562	*ND*	56.85	*ND*	*ND*	*ND*	*ND*
Wolven	EGLE	WV-DEQ-MW9-73	712.096	712.562	*ND*	73.34	*ND*	*ND*	*D*	*ND*
Wolven	EGLE	WV-DEQ-MW9-94	711.979	712.562	*ND*	94.09	*ND*	*ND*	*D*	*ND*
Wolven	R&W/GZA	WV-MW-1	859.24	859.2	137.8	142.8	2	PVC	D	Stickup
Wolven	R&W/GZA	WV-MW-10D	751.00	748.6	165	170	2	PVC	D	Stickup
Wolven	R&W/GZA	WV-MW-10M	751.19	748.7	69.9	74.9	2	PVC	S	Stickup
Wolven	R&W/GZA	WV-MW-10S	751.26	748.4	7.0	12.0	2	PVC	S	Stickup
Wolven	R&W/GZA	WV-MW-11D	735.96	733.0	158.9	163.9	2	PVC	D	Stickup
Wolven	R&W/GZA	WV-MW-11S	735.89	732.8	29.4	34.4	2	PVC	S	Stickup
Wolven	R&W/GZA	WV-MW-12D	771.12	771.4	179.2	184.2	2	PVC	D	Flush
Wolven	R&W/GZA	WV-MW-12M	770.75	771.3	146.6	151.6	2	PVC	D	Flush
Wolven	R&W/GZA	WV-MW-12S	771.06	771.3	75.8	80.8	2	PVC	S	Flush
Wolven	R&W/GZA	WV-MW-13D	823.91	821.3	58.8	63.8	2	PVC	D	Stickup
Wolven	R&W/GZA	WV-MW-13M	823.75	821.6	18.1	23.1	2	PVC	S	Stickup
Wolven	R&W/GZA	WV-MW-13S	823.68	821.3	1.7	6.7	2	PVC	S	Stickup
Wolven	R&W/GZA	WV-MW-14D	872.05	872.3	142.3	147.3	2	PVC	D	Flush
Wolven	R&W/GZA	WV-MW-14S	872.18	872.5	8.9	13.9	2	PVC	S	Flush
Wolven	R&W/GZA	WV-MW-15A	721.25	721.5	9.0	14	2	PVC	P	Flush
Wolven	R&W/GZA	WV-MW-15B	721.07	721.4	33.1	38.1	2	PVC	S	Flush
Wolven	R&W/GZA	WV-MW-15C	720.84	721.3	43.7	48.5	2	PVC	S	Flush
Wolven	R&W/GZA	WV-MW-15D	721.09	721.3	135.1	137.8	2	PVC	D	Flush
Wolven	R&W/GZA	WV-MW-16D	823.45	820.9	91.7	96.7	2	PVC	D	Stickup
Wolven	R&W/GZA	WV-MW-16S	823.42	820.9	17.5	22.5	2	PVC	S	Stickup
Wolven	R&W/GZA	WV-MW-2D	791.36	790.5	30.2	35.2	2	PVC	D	Stickup
Wolven	R&W/GZA	WV-MW-2S	793.39	790.6	20.2	25.2	2	PVC	S	Stickup
Wolven	R&W/GZA	WV-MW-3D	823.28	820.7	57.5	62.5	2	PVC	D	Stickup
Wolven	R&W/GZA	WV-MW-3S	823.31	820.6	5.1	10.1	2	PVC	S	Stickup
Wolven	R&W/GZA	WV-MW-4	854.99	852.5	130.2	135.2	2	PVC	D	Stickup
Wolven	R&W/GZA	WV-MW-5D	865.07	862.0	68.7	73.7	2	PVC	D	Stickup
Wolven	R&W/GZA	WV-MW-5S	865.01	862.1	61.5	66.5	2	PVC	S	Stickup
Wolven	R&W/GZA	WV-MW-6D	786.51	784.1	99.1	104.1	2	PVC	D	Stickup
Wolven	R&W/GZA	WV-MW-6S	786.62	784.6	13.3	18.3	2	PVC	S	Stickup
Wolven	R&W/GZA	WV-MW-7D	727.36	727.8	89.5	94.5	2	PVC	S	Flush
Wolven	R&W/GZA	WV-MW-7M	728.19	728.5	49.9	54.9	2	PVC	S	Flush
Wolven	R&W/GZA	WV-MW-7S	727.61	728.0	16.1	21.1	2	PVC	S	Flush
Wolven	R&W/GZA	WV-MW-8D	845.81	846.0	117.2	122.2	2	PVC	D	Flush
Wolven	R&W/GZA	WV-MW-8M	845.74	845.9	60.0	65.0	2	PVC	S	Flush
Wolven	R&W/GZA	WV-MW-8S	845.55	846.0	30.0	35.0	2	PVC	S	Flush
Wolven	R&W/GZA	WV-MW-9	859.86	857.4	92.3	97.3	2	PVC	S	Stickup

Abbreviations
ND = No data provided/ available
ft = feet
bgs = below ground surface
in = inches
NKL = Kent County North Kent Landfill
EGLE = Michigan Department of Environment, Great Lakes, and Energy
R&W/GZA = Rose & Westra, a Division of GZA
P = perched zone
S = shallow zone
D = deep zone

Notes
1) Elevations are provided in North American Vertical Datum of 1988 (NAVD 88).
2) North Kent Landfill elevations converted from NGVD29 to NAVD88 by R&W/GZA by subtracting 0.43 feet from provided elevation.

TABLE 4
MONITORING WELL STATIC WATER LEVELS
Area R-1 (19)
Wolven/Jewell Area, Kent County, MI

Site Location	Well Field ID	November 4, 2019 Static Water Level Elevation (ft)
House Street	HS-DEQ-MW1D	739.09
House Street	HS-DEQ-MW1I	748.63
House Street	HS-DEQ-MW1S	749.96
House Street	HS-DEQ-MW3D	748.76
House Street	HS-DEQ-MW3S	839.76
House Street	HS-DEQ-MW4-102	687.91
House Street	HS-DEQ-MW4-16	729.17
House Street	HS-DEQ-MW4-53	688.26
House Street	HS-DEQ-MW4-80	688.11
House Street	HS-DEQ-MW4-85	688.07
House Street	HS-DEQ-MW4-90	688.00
House Street	HS-DEQ-MW4-97	687.77
House Street	HS-DEQ-MW5D	740.83
House Street	HS-DEQ-MW5S	*Dry*
House Street	HS-DEQ-MW6D	650.30
House Street	HS-DEQ-MW6S	*Dry*
House Street	HS-DEQ-MW7-102	751.35
House Street	HS-DEQ-MW7-33	751.20
House Street	HS-DEQ-MW7-87	751.33
House Street	HS-DEQ-MW7-94	751.36
House Street	HS-DEQ-MW8D	652.76
House Street	HS-DEQ-MW8S	653.68
House Street	HS-MW-10D	734.19
House Street	HS-MW-10M	726.19
House Street	HS-MW-10S	726.18
House Street	HS-MW-11D	719.37
House Street	HS-MW-11M	719.35
House Street	HS-MW-11S	720.13
House Street	HS-MW-12A	*ND*
House Street	HS-MW-12B	*ND*
House Street	HS-MW-12C	*ND*
House Street	HS-MW-12D	*ND*
House Street	HS-MW-12E	*ND*
House Street	HS-MW-13A	*ND*
House Street	HS-MW-13B	*ND*
House Street	HS-MW-13C	*ND*
House Street	HS-MW-14D	660.09
House Street	HS-MW-14M	661.24
House Street	HS-MW-14S	656.70
House Street	HS-MW-15D	635.56
House Street	HS-MW-15M	634.13
House Street	HS-MW-15S	630.84
House Street	HS-MW-17D	689.38
House Street	HS-MW-17M	689.45
House Street	HS-MW-17S	703.64
House Street	HS-MW-18D	663.55
House Street	HS-MW-18S	670.37
House Street	HS-MW-19D	649.16
House Street	HS-MW-19S	651.59
House Street	HS-MW-1D	727.41
House Street	HS-MW-1S	728.00
House Street	HS-MW-20D	648.97
House Street	HS-MW-20M	649.07
House Street	HS-MW-20S	649.12
House Street	HS-MW-21D	638.75
House Street	HS-MW-21M	637.58
House Street	HS-MW-21S	637.79
House Street	HS-MW-23A	723.53
House Street	HS-MW-23B	723.47
House Street	HS-MW-23C	723.48
House Street	HS-MW-23D	723.45
House Street	HS-MW-24A	723.25
House Street	HS-MW-24B	723.21
House Street	HS-MW-25D	627.83
House Street	HS-MW-25S	627.93
House Street	HS-MW-26D	640.12
House Street	HS-MW-26M	639.96
House Street	HS-MW-26S	636.05
House Street	HS-MW-27A	644.51
House Street	HS-MW-27B	644.58
House Street	HS-MW-27C	645.51

TABLE 4
MONITORING WELL STATIC WATER LEVELS
Area R-1 (19)
Wolven/Jewell Area, Kent County, MI

Site Location	Well Field ID	November 4, 2019 Static Water Level Elevation (ft)
House Street	HS-MW-27D	645.74
House Street	HS-MW-27E	645.61
House Street	HS-MW-28A	629.35
House Street	HS-MW-28B	629.37
House Street	HS-MW-28C	629.30
House Street	HS-MW-28D	630.25
House Street	HS-MW-28E	630.35
House Street	HS-MW-29A	*ND*
House Street	HS-MW-29B	*ND*
House Street	HS-MW-29C	*ND*
House Street	HS-MW-29D	*ND*
House Street	HS-MW-2S	725.55
House Street	HS-MW-30A	631.99
House Street	HS-MW-30B	632.00
House Street	HS-MW-30C	632.35
House Street	HS-MW-30D	632.53
House Street	HS-MW-30E	632.54
House Street	HS-MW-31A	624.83
House Street	HS-MW-31B	625.05
House Street	HS-MW-31C	624.83
House Street	HS-MW-31D	624.69
House Street	HS-MW-31E	624.77
House Street	HS-MW-32A	720.65
House Street	HS-MW-32B	720.67
House Street	HS-MW-32C	720.90
House Street	HS-MW-32D	720.75
House Street	HS-MW-3P	763.67
House Street	HS-MW-3S	724.86
House Street	HS-MW-4S	724.49
House Street	HS-MW-5D	724.82
House Street	HS-MW-5P	758.61
House Street	HS-MW-5S	724.82
House Street	HS-MW-6D	725.47
House Street	HS-MW-6S	725.44
House Street	HS-MW-7S	726.43
House Street	HS-MW-8	724.19
House Street	HS-MW-9D	744.72
House Street	HS-MW-9M	744.56
House Street	HS-MW-9S	793.72
North Kent Landfill	NKLF-MW-35	867.33
North Kent Landfill	NKLF-MW-48	870.29
North Kent Landfill	NKLF-MW-53	872.08
North Kent Landfill	NKLF-MW-54	877.50
North Kent Landfill	NKLF-MW-55	867.98
North Kent Landfill	NKLF-MW-56	845.56
North Kent Landfill	NKLF-MW-57	862.99
North Kent Landfill	NKLF-MW-60	834.09
North Kent Landfill	NKLF-MW-61	834.67
North Kent Landfill	NKLF-MW-63	752.97
North Kent Landfill	NKLF-MW-65	834.86
North Kent Landfill	NKLF-MW-66	871.83
North Kent Landfill	NKLF-MW-67	863.70
North Kent Landfill	NKLF-MW-68	867.15
North Kent Landfill	NKLF-MW-69	855.72
North Kent Landfill	NKLF-MW-70	848.12
North Kent Landfill	NKLF-MW-71	862.76
North Kent Landfill	NKLF-MW-72	856.81
North Kent Landfill	NKLF-MW-73	895.07
North Kent Landfill	NKLF-MW-74	871.50
North Kent Landfill	NKLF-MW-75	870.84
North Kent Landfill	NKLF-MW-76	848.24
North Kent Landfill	NKLF-MW-77	832.26
North Kent Landfill	NKLF-MW-78	836.08
North Kent Landfill	NKLF-MW-80	867.52
North Kent Landfill	NKLF-MW-81	831.74
North Kent Landfill	NKLF-MW-82	863.27
North Kent Landfill	NKLF-TW-02	863.72
North Kent Landfill	NKLF-TW-04	846.15
North Kent Landfill	NKLF-TW-05	835.50

TABLE 4
MONITORING WELL STATIC WATER LEVELS
Area R-1 (19)
Wolven/Jewell Area, Kent County, MI

Site Location	Well Field ID	November 4, 2019 Static Water Level Elevation (ft)
North Kent Landfill	NKLF-TW-06	854.24
Wolven	WV-DEQ-MW10-121	719.14
Wolven	WV-DEQ-MW10-177	721.88
Wolven	WV-DEQ-MW10-55	723.29
Wolven	WV-DEQ-MW10-84	720.09
Wolven	WV-DEQ-MW10-95	715.81
Wolven	WV-DEQ-MW11-130	757.03
Wolven	WV-DEQ-MW11-137	757.20
Wolven	WV-DEQ-MW11-145	756.95
Wolven	WV-DEQ-MW11-57	815.57
Wolven	WV-DEQ-MW11-95	810.62
Wolven	WV-DEQ-MW2D	753.80
Wolven	WV-DEQ-MW2S	826.21
Wolven	WV-DEQ-MW9-114	711.27
Wolven	WV-DEQ-MW9-131	711.27
Wolven	WV-DEQ-MW9-57	703.29
Wolven	WV-DEQ-MW9-73	711.32
Wolven	WV-DEQ-MW9-94	711.39
Wolven	WV-MW-1	751.30
Wolven	WV-MW-10D	749.49
Wolven	WV-MW-10M	747.82
Wolven	WV-MW-10S	742.24
Wolven	WV-MW-11D	*Artesian Conditions*
Wolven	WV-MW-11S	726.20
Wolven	WV-MW-12D	716.97
Wolven	WV-MW-12M	716.94
Wolven	WV-MW-12S	721.81
Wolven	WV-MW-13D	803.32
Wolven	WV-MW-13M	820.92
Wolven	WV-MW-13S	820.91
Wolven	WV-MW-14D	731.14
Wolven	WV-MW-14S	861.25
Wolven	WV-MW-15A	*ND*
Wolven	WV-MW-15B	*ND*
Wolven	WV-MW-15C	*ND*
Wolven	WV-MW-15D	*ND*
Wolven	WV-MW-16D	761.52
Wolven	WV-MW-16S	815.71
Wolven	WV-MW-2D	785.38
Wolven	WV-MW-2S	790.29
Wolven	WV-MW-3D	802.01
Wolven	WV-MW-3S	819.14
Wolven	WV-MW-4	753.96
Wolven	WV-MW-5D	802.39
Wolven	WV-MW-5S	802.11
Wolven	WV-MW-6D	765.11
Wolven	WV-MW-6S	781.51
Wolven	WV-MW-7D	715.73
Wolven	WV-MW-7M	715.73
Wolven	WV-MW-7S	715.71
Wolven	WV-MW-8D	754.38
Wolven	WV-MW-8M	823.77
Wolven	WV-MW-8S	823.75
Wolven	WV-MW-9	824.90
Rogue River	Dam Seawall	680.71
Rogue River	E Bridge Street Bridge	680.34
Rogue River	Rogue River Road Bridge	618.90
Rogue River	Jericho Ave Bridge	672.24
Rogue River	USGS04118500	630.419
Rogue River	Rogue River at Rum Creek	692.84

Abbreviations
ND = No data provided/available
ft = feet

Notes
1) Elevations are provided in North American Vertical Datum of 1988 (NAVD 88).
2) Water level static measurements were completed on November 4, 2019 by R&W/GZA, AECOM (for EGLE), and North Kent Landfill.
3) North Kent Landfill elevations converted from NGVD29 to NAVD88 by R&W/GZA by subtracting 0.43 feet from provided elevation.

TABLE 6
SUMMARY OF GROUNDWATER SAMPLE ANALYSIS - PFAS
Area R-1 (19)
Wolven/Jewell Area, Kent County, MI

Sample Location	Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2]	Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2]	Part 201 Generic Residential Groundwater Cleanup Criteria – Groundwater Volatilization to Indoor Air Inhalation[2]	CD Value[3]	EGLE Residential Recommended Volatilization to Indoor Air Interim Action Screening Level - Groundwater[4]	U.S. EPA Residential Tap Water Regional Removal Management Levels[5]	WV-MW-1	WV-MW-1	WV-MW-1	WV-MW-1	WV-MW-2D	WV-MW-2D	WV-MW-2D	WV-MW-2D	WV-MW-2S	WV-MW-2S	WV-MW-2S	WV-MW-2S
Sample Name							MW-WV-1	WV-GW-MW1	WV-GW-MW1	WV-GW-MW-1	MW-WV-2D	WV-GW-MW2D	WV-GW-MW2D	WV-GW-MW-2D	MW-WV-2S	WV-GW-MW2S	WV-GW-MW2S	WV-GW-MW-2S
Well Screen Interval (Feet below ground surface)							137.8-142.8	137.8-142.8	137.8-142.8	137.8-142.8	30.2-35.2	30.2-35.2	30.2-35.2	30.2-35.2	20.2-25.2	20.2-25.2	20.2-25.2	20.2-25.2
Laboratory Sample ID(s)							UB20051-010	UE09028-012	UI05007-008	UK13023-002	UB20051-002	UE09028-013	UI05007-005	UK07051-005	UB20051-001	UE09028-014	UI05007-004	UK07051-004
Sample Date							02/20/2019	05/10/2019	09/04/2019	11/12/2019	02/18/2019	05/10/2019	09/03/2019	11/05/2019	02/18/2019	05/10/2019	09/03/2019	11/05/2019
Parameter (µg/L)																		
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0035	<0.0036	<0.0034	<0.0035	<0.0036	<0.0036	<0.0036	<0.0038	<0.0036	<0.0037	<0.0036	<0.0036
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0035	<0.0036	<0.0034	<0.0035	<0.0036	<0.0036	<0.0036	<0.0038	<0.0036	<0.0037	<0.0036	<0.0036
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0035	<0.0036	<0.0034	<0.0035	<0.0036	<0.0036	<0.0036	<0.0038	<0.0036	<0.0037	<0.0036	<0.0036
N-Methyl perfluorooctane sulfonamide (MeFOSA)	NCL	NCL	NCL	NA	NCL	NCL	<0.007	<0.0071	<0.0067	<0.007	<0.0071	<0.0072	<0.0072	<0.0077	<0.0071	<0.0073	<0.0071	<0.0073
Perfluorobutane sulfonic acid (PFBS)	NCL	NCL	NCL	NA	NCL	1,200	0.032	0.0072	0.048	0.041	0.051	0.046	0.045	0.042	0.014	0.013	0.016	0.013
Perfluorodecane sulfonic acid (PFDS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0035	<0.0036	<0.0034	<0.0035	<0.0036	<0.0036	<0.0036	<0.0038	<0.0036	<0.0037	<0.0036	<0.0036
Perfluoroheptane sulfonic acid (PFHpS)	NCL	NCL	NCL	NA	NCL	NCL	0.17	0.071	0.25	0.22	0.016	0.016	0.022	0.016	0.062	0.047	0.054	0.049
Perfluorononane sulfonic acid (PFNS)	NCL	NCL	NCL	NA	NCL	NCL	<0.007	<0.0071	<0.0067	<0.007	<0.0071	<0.0072	<0.0072	<0.0077	<0.0071	<0.0073	<0.0071	<0.0073
Perfluorooctane sulfonamide (FOSA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0035	0.0099	<0.0034	<0.0035	<0.0036	<0.0036	<0.0036	<0.0038	<0.0036	<0.0037	<0.0036	<0.0036
Perfluoropentane sulfonic acid (PFPeS)	NCL	NCL	NCL	NA	NCL	NCL	0.1	0.022	0.14	0.12	0.14	0.12	0.13	0.13	0.015	0.016	0.02	0.017
Perfluorohexane sulfonic acid (PFHxS)	NCL	NCL	NCL	NA	NCL	NCL	0.81	0.18	1.1	0.77	0.32	0.28	0.26	0.28	0.065	0.052	0.065	0.061
Perfluorobutanoic acid (PFBA)	NCL	NCL	NCL	NA	NCL	NCL	0.022	0.0059	0.037	0.029	0.022	0.02	0.017	0.019	0.0081	0.0074	0.0096	0.0081
Perfluorodecanoic acid (PFDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0035	<0.0036	<0.0034	<0.0035	<0.0036	<0.0036	<0.0036	<0.0038	<0.0036	<0.0037	<0.0036	<0.0036
Perfluorododecanoic acid (PFDoDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0035	<0.0036	<0.0034	<0.0035	<0.0036	<0.0036	<0.0036	<0.0038	<0.0036	<0.0037	<0.0036	<0.0036
Perfluoroheptanoic acid (PFHpA)	NCL	NCL	NCL	NA	NCL	NCL	0.17	0.035	0.26	0.22	0.14	0.13	0.12	0.12	0.024	0.022	0.032	0.023
Perfluorohexanoic acid (PFHxA)	NCL	NCL	NCL	NA	NCL	NCL	0.065	0.014	0.11	0.095	0.068	0.061	0.055	0.057	0.016	0.015	0.017	0.013
Perfluorononanoic acid (PFNA)	NCL	NCL	NCL	NA	NCL	NCL	0.01	0.0049	0.017	0.013	<0.0036	<0.0036	<0.0036	<0.0038	0.0059	0.006	0.0071	0.0059
Perfluorooctanoic acid (PFOA)	0.008	12	ID	NA	NCL	NCL	***2.8***	***0.57***	***4.3***	***2.9***	***1.1***	***1***	***0.89***	***0.92***	***0.29***	***0.27***	***0.32***	***0.27***
Perfluorooctane sulfonic acid (PFOS)	0.016	0.012	NLV	NA	NCL	NCL	***6.1***	***3.7***	***10***	***6.7***	***0.064***	***0.077***	***0.15***	***0.11***	***3.8***	***3.4***	***3.8***	***3.1***
PFOA + PFOS (Calculated)	NCL	NCL	NCL	0.01	NCL	NCL	***8.9***	***4.3***	***14***	***9.6***	***1.2***	***1.1***	***1***	***1***	***4.1***	***3.7***	***4.1***	***3.4***
Perfluoropentanoic acid (PFPeA)	NCL	NCL	NCL	NA	NCL	NCL	0.025	0.0057	0.037	0.036	0.027	0.026	0.025	0.026	0.0093	0.0083	0.0089	0.0079
Perfluorotetradecanoic acid (PFTeDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0035	<0.0036	<0.0034	<0.0035	<0.0036	<0.0036	<0.0036	<0.0038	<0.0036	<0.0037	<0.0036	<0.0036
Perfluorotridecanoic acid (PFTrDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0035	<0.0036	<0.0034	<0.0035	<0.0036	<0.0036	<0.0036	<0.0038	<0.0036	<0.0037	<0.0036	<0.0036
Perfluoroundecanoic acid (PFUnDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0035	<0.0036	<0.0034	<0.0035	<0.0036	<0.0036	<0.0036	<0.0038	<0.0036	<0.0037	<0.0036	<0.0036
Total PFAS (Calculated)	NCL	NCL	NCL	NA	NCL	NCL	10	4.6	16	11	1.9	1.8	1.7	1.7	4.3	3.9	4.3	3.6

TABLE 6
SUMMARY OF GROUNDWATER SAMPLE ANALYSIS - PFAS
Area R-1 (19)
Wolven/Jewell Area, Kent County, MI

Sample Location	Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2]	Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2]	Part 201 Generic Residential Groundwater Cleanup Criteria – Groundwater Volatilization to Indoor Air Inhalation[2]	CD Value[3]	EGLE Residential Recommended Volatilization to Indoor Air Interim Action Screening Level - Groundwater[4]	U.S. EPA Residential Tap Water Regional Removal Management Levels[5]	WV-MW-3D	WV-MW-3D	WV-MW-3D	WV-MW-3D	WV-MW-3S	WV-MW-3S	WV-MW-3S	WV-MW-3S	WV-MW-4	WV-MW-4	WV-MW-4	WV-MW-4
Sample Name							MW-WV-3D	WV-GW-MW3D	WV-GW-MW3D	WV-GW-MW-3D	MW-WV-3S	WV-GW-MW3S	WV-GW-MW3S	WV-GW-MW-3S	MW-WV-4	WV-GW-MW4	WV-GW-MW4	WV-GW-MW-4
Well Screen Interval (Feet below ground surface)							57.5-62.5	57.5-62.5	57.5-62.5	57.5-62.5	5.1-10.1	5.1-10.1	5.1-10.1	5.1-10.1	130.2-135.2	130.2-135.2	130.2-135.2	130.2-135.2
Laboratory Sample ID(s)							UB16022-008	UE09028-018	UI05007-010	UK07025-005	UB16022-007	UE09028-022	UI05007-011	UK07025-004	UB20051-013	UE16022-001	UI05007-002	UK19013-002
Sample Date							02/15/2019	05/09/2019	09/04/2019	11/06/2019	02/15/2019	05/09/2019	09/04/2019	11/06/2019	02/21/2019	05/13/2019	09/03/2019	11/13/2019
Parameter (µg/L)																		
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0038	<0.0037	<0.0037	<0.0039	<0.0037	<0.0037	<0.0035	<0.0037	<0.0035	<0.0036	<0.0035	<0.0037
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0038	<0.0037	<0.0037	0.0049	<0.0037	<0.0037	<0.0035	<0.0037	<0.0035	<0.0036	<0.0035	<0.0037
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0038	<0.0037	<0.0037	<0.0039	<0.0037	<0.0037	<0.0035	<0.0037	<0.0035	<0.0036	<0.0035	<0.0037
N-Methyl perfluorooctane sulfonamide (MeFOSA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0076	<0.0074	<0.0073	<0.0078	<0.0075	<0.0074	<0.0071	<0.0075	<0.007	<0.0071	<0.0069	<0.0074
Perfluorobutane sulfonic acid (PFBS)	NCL	NCL	NCL	NA	NCL	1,200	0.006	0.0051	0.006	0.0054	0.006	0.0068	0.0082	0.0074	<0.0035	<0.0036	<0.0035	<0.0037
Perfluorodecane sulfonic acid (PFDS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0038	<0.0037	<0.0037	<0.0039	<0.0037	<0.0037	<0.0035	<0.0037	<0.0035	<0.0036	<0.0035	<0.0037
Perfluoroheptane sulfonic acid (PFHpS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0038	<0.0037	<0.0037	<0.0039	0.0044	<0.0037	0.0041	<0.0037	<0.0035	<0.0036	<0.0035	<0.0037
Perfluorononane sulfonic acid (PFNS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0076	<0.0074	<0.0073	<0.0078	<0.0075	<0.0074	<0.0071	<0.0075	<0.007	<0.0071	<0.0069	<0.0074
Perfluorooctane sulfonamide (FOSA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0038	<0.0037	<0.0037	<0.0039	<0.0037	<0.0037	<0.0035	<0.0037	<0.0035	<0.0036	<0.0035	<0.0037
Perfluoropentane sulfonic acid (PFPeS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0038	<0.0037	<0.0037	<0.0039	0.0052	0.0053	0.0074	0.0054	<0.0035	<0.0036	<0.0035	<0.0037
Perfluorohexane sulfonic acid (PFHxS)	NCL	NCL	NCL	NA	NCL	NCL	0.004	<0.0037	0.004	0.0039	0.018	0.014	0.024	0.015	<0.0035	<0.0036	<0.0035	<0.0037
Perfluorobutanoic acid (PFBA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0038	<0.0037	<0.0037	<0.0039	0.008	0.0081	0.0097	0.0085	<0.0035	<0.0036	<0.0035	<0.0037
Perfluorodecanoic acid (PFDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0038	<0.0037	<0.0037	<0.0039	<0.0037	<0.0037	<0.0035	<0.0037	<0.0035	<0.0036	<0.0035	<0.0037
Perfluorododecanoic acid (PFDoDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0038	<0.0037	<0.0037	<0.0039	<0.0037	<0.0037	<0.0035	<0.0037	<0.0035	<0.0036	<0.0035	<0.0037
Perfluoroheptanoic acid (PFHpA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0038	<0.0037	<0.0037	<0.0039	0.0097	0.009	0.014	0.0089	<0.0035	<0.0036	<0.0035	<0.0037
Perfluorohexanoic acid (PFHxA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0038	<0.0037	<0.0037	<0.0039	0.007	0.008	0.0083	0.0063	<0.0035	<0.0036	<0.0035	<0.0037
Perfluorononanoic acid (PFNA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0038	<0.0037	<0.0037	<0.0039	<0.0037	<0.0037	<0.0035	<0.0037	<0.0035	<0.0036	<0.0035	<0.0037
Perfluorooctanoic acid (PFOA)	0.008	12	ID	NA	NCL	NCL	<0.0019	<0.0018	0.0019	<0.0019	***0.082***	***0.063***	***0.099***	***0.06***	<0.0017	<0.0018	<0.0017	<0.0019
Perfluorooctane sulfonic acid (PFOS)	0.016	0.012	NLV	NA	NCL	NCL	<0.0038	<0.0037	<0.0037	<0.0039	***0.15***	***0.11***	***0.15***	***0.095***	<0.0035	<0.0036	<0.0035	<0.0037
PFOA + PFOS (Calculated)	NCL	NCL	NCL	0.01	NCL	NCL	ND	ND	0.0019	ND	***0.23***	***0.17***	***0.25***	***0.16***	ND	ND	ND	ND
Perfluoropentanoic acid (PFPeA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0038	<0.0037	<0.0037	<0.0039	<0.0037	<0.0037	0.0049	<0.0037	<0.0035	<0.0036	<0.0035	<0.0037
Perfluorotetradecanoic acid (PFTeDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0038	<0.0037	<0.0037	<0.0039	<0.0037	<0.0037	<0.0035	<0.0037	<0.0035	<0.0036	<0.0035	<0.0037
Perfluorotridecanoic acid (PFTrDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0038	<0.0037	<0.0037	<0.0039	<0.0037	<0.0037	<0.0035	<0.0037	<0.0035	<0.0036	<0.0035	<0.0037
Perfluoroundecanoic acid (PFUnDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0038	<0.0037	<0.0037	<0.0039	<0.0037	<0.0037	<0.0035	<0.0037	<0.0035	<0.0036	<0.0035	<0.0037
Total PFAS (Calculated)	NCL	NCL	NCL	NA	NCL	NCL	0.01	0.0051	0.012	0.014	0.29	0.22	0.33	0.21	ND	ND	ND	ND

TABLE 6
SUMMARY OF GROUNDWATER SAMPLE ANALYSIS - PFAS
Area R-1 (19)
Wolven/Jewell Area, Kent County, MI

Sample Location	Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2]	Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2]	Part 201 Generic Residential Groundwater Cleanup Criteria – Groundwater Volatilization to Indoor Air Inhalation[2]	CD Value[3]	EGLE Residential Recommended Volatilization to Indoor Air Interim Action Screening Level - Groundwater[4]	U.S. EPA Residential Tap Water Regional Removal Management Levels[5]	WV-MW-5D	WV-MW-5D	WV-MW-5D	WV-MW-5D	WV-MW-5D	WV-MW-5S	WV-MW-5S	WV-MW-5S	WV-MW-5S	WV-MW-6D	WV-MW-6D	WV-MW-6D
Sample Name							MW-WV-5D	MW-WV-5D DUP	WV-GW-MW5D	WV-GW-MW5D	WV-GW-MW-5D	MW-WV-5S	WV-GW-MW5S	WV-GW-MW5S	WV-GW-MW-5S	MW-WV-6D	VW-GW-MW-6D	WV-GW-MW6D
Well Screen Interval (Feet below ground surface)							68.7-73.7	68.7-73.7	68.7-73.7	68.7-73.7	68.7-73.7	61.5-66.5	61.5-66.5	61.5-66.5	61.5-66.5	99.1-104.1	99.1-104.1	99.1-104.1
Laboratory Sample ID(s)							UB16022-003	UB16022-005	UE09028-017	UI05007-001	UK19013-003	UB16022-004	UE09028-016	UI05007-003	UK19013-004	UB20051-005	UK09009-004	UE02030-010
Sample Date							02/14/2019	02/14/2019	05/09/2019	09/03/2019	11/13/2019	02/14/2019	05/09/2019	09/03/2019	11/13/2019	02/19/2019	11/08/2019	05/02/2019
Parameter (µg/L)																		
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0037	<0.0038	<0.0035	<0.0034	<0.0036	<0.0037	<0.0036	<0.0035	<0.0038	<0.0036	<0.0036	<0.0036
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0037	<0.0038	<0.0035	<0.0034	<0.0036	<0.0037	<0.0036	<0.0035	<0.0038	<0.0036	<0.0036	<0.0036
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0037	<0.0038	<0.0035	<0.0034	<0.0036	<0.0037	<0.0036	<0.0035	<0.0038	<0.0036	<0.0036	<0.0036
N-Methyl perfluorooctane sulfonamide (MeFOSA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0073	<0.0076	<0.007	<0.0069	<0.0072	<0.0073	<0.0072	<0.007	<0.0077	<0.0072	<0.0072	<0.0072
Perfluorobutane sulfonic acid (PFBS)	NCL	NCL	NCL	NA	NCL	1,200	0.0077	0.0074	0.0074	0.0086	0.009	0.0088	0.0075	0.0087	0.0074	0.016	0.017	0.016
Perfluorodecane sulfonic acid (PFDS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0037	<0.0038	<0.0035	<0.0034	<0.0036	<0.0037	<0.0036	<0.0035	<0.0038	<0.0036	<0.0036	<0.0036
Perfluoroheptane sulfonic acid (PFHpS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0037	<0.0038	<0.0035	<0.0034	<0.0036	<0.0037	<0.0036	<0.0035	<0.0038	<0.0036	<0.0036	<0.0036
Perfluorononane sulfonic acid (PFNS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0073	<0.0076	<0.007	<0.0069	<0.0072	<0.0073	<0.0072	<0.007	<0.0077	<0.0072	<0.0072	<0.0072
Perfluorooctane sulfonamide (FOSA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0037	<0.0038	<0.0035	<0.0034	<0.0036	<0.0037	<0.0036	<0.0035	<0.0038	<0.0036	<0.0036	<0.0036
Perfluoropentane sulfonic acid (PFPeS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0037	<0.0038	<0.0035	<0.0034	<0.0036	<0.0037	<0.0036	<0.0035	<0.0038	<0.0036	<0.0036	<0.0036
Perfluorohexane sulfonic acid (PFHxS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0037	0.0038	0.0039	0.0037	0.0036	<0.0037	<0.0036	0.004	<0.0038	<0.0036	<0.0036	<0.0036
Perfluorobutanoic acid (PFBA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0037	<0.0038	0.005	0.0041	<0.0036	<0.0037	<0.0036	<0.0035	<0.0038	0.0047	0.0053	0.0049
Perfluorodecanoic acid (PFDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0037	<0.0038	<0.0035	<0.0034	<0.0036	<0.0037	<0.0036	<0.0035	<0.0038	<0.0036	<0.0036	<0.0036
Perfluorododecanoic acid (PFDoDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0037	<0.0038	<0.0035	<0.0034	<0.0036	<0.0037	<0.0036	<0.0035	<0.0038	<0.0036	<0.0036	<0.0036
Perfluoroheptanoic acid (PFHpA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0037	<0.0038	<0.0035	<0.0034	<0.0036	<0.0037	<0.0036	<0.0035	<0.0038	<0.0036	<0.0036	<0.0036
Perfluorohexanoic acid (PFHxA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0037	<0.0038	<0.0035	0.0051	0.0046	0.004	<0.0036	<0.0035	<0.0038	<0.0036	<0.0036	<0.0036
Perfluorononanoic acid (PFNA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0037	<0.0038	<0.0035	<0.0034	<0.0036	<0.0037	<0.0036	<0.0035	<0.0038	<0.0036	<0.0036	<0.0036
Perfluorooctanoic acid (PFOA)	0.008	12	ID	NA	NCL	NCL	0.0027	0.0027	0.0055	***0.0082***	0.0061	0.005	0.0047	0.0061	0.0026	0.0027	0.0035	0.0027
Perfluorooctane sulfonic acid (PFOS)	0.016	0.012	NLV	NA	NCL	NCL	<0.0037	<0.0038	<0.0035	<0.0034	<0.0036	<0.0037	<0.0036	<0.0035	<0.0038	<0.0036	<0.0036	<0.0036
PFOA + PFOS (Calculated)	NCL	NCL	NCL	0.01	NCL	NCL	0.0027	0.0027	0.0055	0.0082	0.0061	0.005	0.0047	0.0061	0.0026	0.0027	0.0035	0.0027
Perfluoropentanoic acid (PFPeA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0037	<0.0038	<0.0035	<0.0034	<0.0036	<0.0037	<0.0036	<0.0035	<0.0038	<0.0036	<0.0036	<0.0036
Perfluorotetradecanoic acid (PFTeDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0037	<0.0038	<0.0035	<0.0034	<0.0036	<0.0037	<0.0036	<0.0035	<0.0038	<0.0036	<0.0036	<0.0036
Perfluorotridecanoic acid (PFTrDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0037	<0.0038	<0.0035	<0.0034	<0.0036	<0.0037	<0.0036	<0.0035	<0.0038	<0.0036	<0.0036	<0.0036
Perfluoroundecanoic acid (PFUnDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0037	<0.0038	<0.0035	<0.0034	<0.0036	<0.0037	<0.0036	<0.0035	<0.0038	<0.0036	<0.0036	<0.0036
Total PFAS (Calculated)	NCL	NCL	NCL	NA	NCL	NCL	0.01	0.014	0.022	0.03	0.023	0.018	0.012	0.019	0.01	0.023	0.026	0.024

TABLE 6
SUMMARY OF GROUNDWATER SAMPLE ANALYSIS - PFAS
Area R-1 (19)
Wolven/Jewell Area, Kent County, MI

Sample Location	Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2]	Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2]	Part 201 Generic Residential Groundwater Cleanup Criteria – Groundwater Volatilization to Indoor Air Inhalation[2]	CD Value[3]	EGLE Residential Recommended Volatilization to Indoor Air Interim Action Screening Level - Groundwater[4]	U.S. EPA Residential Tap Water Regional Removal Management Levels[5]	WV-MW-6D	WV-MW-6S	WV-MW-6S	WV-MW-6S	WV-MW-6S	WV-MW-7D	WV-MW-7D	WV-MW-7D	WV-MW-7D	WV-MW-7M	WV-MW-7M	WV-MW-7M
Sample Name							WV-GW-MW6D	MW-WV-6S	VW-GW-MW-6S	WV-GW-MW6S	WV-GW-MW6S	MW-WV-7D	WV-GW-MW 7D	WV-GW-MW7D	WV-GW-MW-7D	WV-GW-MW 7M	WV-GW-MW7M	WV-GW-MW-7M
Well Screen Interval (Feet below ground surface)							99.1-104.1	13.3-18.3	13.3-18.3	13.3-18.3	13.3-18.3	89.5-94.5	89.5-94.5	89.5-94.5	89.5-94.5	49.9-54.9	49.9-54.9	49.9-54.9
Laboratory Sample ID(s)							UH29005-021	UB20051-004	UK09009-003	UE02030-011	UH29005-020	UB14084-007	UH29005-001	UE02030-009	UK07051-003	UH29005-003	UE02030-008	UK07051-002
Sample Date							08/28/2019	02/19/2019	11/08/2019	05/02/2019	08/28/2019	02/13/2019	08/26/2019	05/03/2019	11/05/2019	08/26/2019	05/03/2019	11/05/2019
Parameter (µg/L)																		
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0033	<0.0036	<0.0036	<0.0036	<0.0034	<0.0038	<0.0036	<0.0036	<0.0039	<0.0035	<0.0036	<0.0038
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0033	<0.0036	<0.0036	<0.0036	<0.0034	<0.0038	<0.0036	<0.0036	<0.0039	<0.0035	<0.0036	<0.0038
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0033	<0.0036	<0.0036	<0.0036	<0.0034	<0.0038	<0.0036	<0.0036	<0.0039	<0.0035	<0.0036	<0.0038
N-Methyl perfluorooctane sulfonamide (MeFOSA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0067	<0.0071	<0.0072	<0.0071	<0.0069	<0.0077	<0.0071	<0.0072	<0.0078	<0.007	<0.0072	<0.0076
Perfluorobutane sulfonic acid (PFBS)	NCL	NCL	NCL	NA	NCL	1,200	0.017	0.0076	0.0093	0.0082	0.0086	0.012	0.011	0.01	0.0097	0.01	0.0083	0.0091
Perfluorodecane sulfonic acid (PFDS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0033	<0.0036	<0.0036	<0.0036	<0.0034	<0.0038	<0.0036	<0.0036	<0.0039	<0.0035	<0.0036	<0.0038
Perfluoroheptane sulfonic acid (PFHpS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0033	<0.0036	<0.0036	<0.0036	<0.0034	0.013	0.013	0.013	0.012	0.011	0.01	0.0097
Perfluorononane sulfonic acid (PFNS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0067	<0.0071	<0.0072	<0.0071	<0.0069	<0.0077	<0.0071	<0.0072	<0.0078	<0.007	<0.0072	<0.0076
Perfluorooctane sulfonamide (FOSA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0033	<0.0036	<0.0036	<0.0036	<0.0034	<0.0038	<0.0036	<0.0036	<0.0039	<0.0035	<0.0036	<0.0038
Perfluoropentane sulfonic acid (PFPeS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0033	<0.0036	<0.0036	<0.0036	<0.0034	0.0092	0.0069	0.0078	0.0077	0.0053	0.0046	0.0053
Perfluorohexane sulfonic acid (PFHxS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0033	<0.0036	0.0039	<0.0036	<0.0034	0.041	0.034	0.035	0.033	0.022	0.024	0.024
Perfluorobutanoic acid (PFBA)	NCL	NCL	NCL	NA	NCL	NCL	0.0055	0.0072	0.0098	0.0056	0.0036	0.0056	0.0055	0.0054	0.0052	0.0043	0.004	0.0042
Perfluorodecanoic acid (PFDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0033	<0.0036	<0.0036	<0.0036	<0.0034	<0.0038	<0.0036	<0.0036	<0.0039	<0.0035	<0.0036	<0.0038
Perfluorododecanoic acid (PFDoDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0033	<0.0036	<0.0036	<0.0036	<0.0034	<0.0038	<0.0036	<0.0036	<0.0039	<0.0035	<0.0036	<0.0038
Perfluoroheptanoic acid (PFHpA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0033	0.0039	0.0036	<0.0036	<0.0034	0.012	0.011	0.012	0.01	0.0078	0.0073	0.0074
Perfluorohexanoic acid (PFHxA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0033	0.0063	0.0066	<0.0036	<0.0034	0.011	0.0095	0.0097	0.0081	0.0061	0.0066	0.0059
Perfluorononanoic acid (PFNA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0033	<0.0036	<0.0036	<0.0036	<0.0034	<0.0038	<0.0036	<0.0036	<0.0039	<0.0035	<0.0036	<0.0038
Perfluorooctanoic acid (PFOA)	0.008	12	ID	NA	NCL	NCL	0.0034	***0.019***	***0.024***	***0.013***	0.0066	***0.11***	***0.12***	***0.1***	***0.095***	***0.077***	***0.067***	***0.076***
Perfluorooctane sulfonic acid (PFOS)	0.016	0.012	NLV	NA	NCL	NCL	<0.0033	0.0044	0.0089	0.0046	0.0066	***0.14***	***0.2***	***0.16***	***0.17***	***0.28***	***0.27***	***0.3***
PFOA + PFOS (Calculated)	NCL	NCL	NCL	0.01	NCL	NCL	0.0034	***0.023***	***0.033***	***0.018***	***0.013***	***0.25***	***0.32***	***0.26***	***0.27***	***0.36***	***0.34***	***0.38***
Perfluoropentanoic acid (PFPeA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0033	<0.0036	<0.0036	<0.0036	<0.0034	0.0049	0.005	0.0052	0.0046	0.0039	0.0038	<0.0038
Perfluorotetradecanoic acid (PFTeDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0033	<0.0036	<0.0036	<0.0036	<0.0034	<0.0038	<0.0036	<0.0036	<0.0039	<0.0035	<0.0036	<0.0038
Perfluorotridecanoic acid (PFTrDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0033	<0.0036	<0.0036	<0.0036	<0.0034	<0.0038	<0.0036	<0.0036	<0.0039	<0.0035	<0.0036	<0.0038
Perfluoroundecanoic acid (PFUnDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0033	<0.0036	<0.0036	<0.0036	<0.0034	<0.0038	<0.0036	<0.0036	<0.0039	<0.0035	<0.0036	<0.0038
Total PFAS (Calculated)	NCL	NCL	NCL	NA	NCL	NCL	0.026	0.048	0.066	0.031	0.025	0.36	0.42	0.36	0.36	0.43	0.41	0.44

TABLE 6
SUMMARY OF GROUNDWATER SAMPLE ANALYSIS - PFAS
Area R-1 (19)
Wolven/Jewell Area, Kent County, MI

Sample Location	Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2]	Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2]	Part 201 Generic Residential Groundwater Cleanup Criteria – Groundwater Volatilization to Indoor Air Inhalation[2]	CD Value[3]	EGLE Residential Recommended Volatilization to Indoor Air Interim Action Screening Level - Groundwater[4]	U.S. EPA Residential Tap Water Regional Removal Management Levels[5]	WV-MW-7S	WV-MW-7S	WV-MW-7S	WV-MW-7S	WV-MW-8D	WV-MW-8D	WV-MW-8D	WV-MW-8M	WV-MW-8M	WV-MW-8M	WV-MW-8M	WV-MW-8S
Sample Name							MW-WV-7S	WV-GW-MW 7S	WV-GW-MW7S	WV-GW-MW-7S	MW-WV-8D	VW-GW-MW-8D	WV-GW-MW 8D	MW-WV-8M	WV-GW-MW 8M	WV-GW-MW8M	WV-GW-MW-8M	MW-WV-8S
Well Screen Interval (Feet below ground surface)							16.1-21.1	16.1-21.1	16.1-21.1	16.1-21.1	117.2-122.2	117.2-122.2	117.2-122.2	60-65	60-65	60-65	60-65	30-35
Laboratory Sample ID(s)							UB14084-005	UH29005-002	UE02030-007	UK07051-001	UB16022-009	UK09009-001	UH29005-004	UB14084-002	UH29005-005	UE02030-003	UK07025-007	UB14084-001
Sample Date							02/13/2019	08/26/2019	05/03/2019	11/05/2019	02/15/2019	11/08/2019	08/26/2019	02/12/2019	08/26/2019	05/01/2019	11/06/2019	02/12/2019
Parameter (µg/L)																		
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0039	<0.0034	<0.0035	<0.0039	<0.0035	<0.0037	<0.0034	<0.0038	<0.0036	<0.0036	<0.0039	<0.0037
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0039	<0.0034	<0.0035	<0.0039	<0.0035	<0.0037	<0.0034	<0.0038	<0.0036	<0.0036	<0.0039	<0.0037
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0039	<0.0034	<0.0035	<0.0039	<0.0035	<0.0037	<0.0034	<0.0038	<0.0036	<0.0036	<0.0039	<0.0037
N-Methyl perfluorooctane sulfonamide (MeFOSA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0078	<0.0068	<0.0071	<0.0078	<0.007	<0.0075	<0.0069	<0.0075	<0.0071	<0.0072	<0.0078	<0.0074
Perfluorobutane sulfonic acid (PFBS)	NCL	NCL	NCL	NA	NCL	1,200	0.0039	<0.0034	<0.0035	<0.0039	<0.0035	<0.0037	0.0034	0.083	0.092	0.081	0.08	0.021
Perfluorodecane sulfonic acid (PFDS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0039	<0.0034	<0.0035	<0.0039	<0.0035	<0.0037	<0.0034	<0.0038	<0.0036	<0.0036	<0.0039	<0.0037
Perfluoroheptane sulfonic acid (PFHpS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0039	<0.0034	<0.0035	<0.0039	<0.0035	<0.0037	<0.0034	<0.0038	<0.0036	<0.0036	<0.0039	<0.0037
Perfluorononane sulfonic acid (PFNS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0078	<0.0068	<0.0071	<0.0078	<0.007	<0.0075	<0.0069	<0.0075	<0.0071	<0.0072	<0.0078	<0.0074
Perfluorooctane sulfonamide (FOSA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0039	<0.0034	<0.0035	<0.0039	<0.0035	<0.0037	<0.0034	<0.0038	<0.0036	<0.0036	<0.0039	<0.0037
Perfluoropentane sulfonic acid (PFPeS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0039	<0.0034	<0.0035	<0.0039	<0.0035	<0.0037	<0.0034	<0.0038	<0.0036	<0.0036	<0.0039	0.0042
Perfluorohexane sulfonic acid (PFHxS)	NCL	NCL	NCL	NA	NCL	NCL	0.0044	0.0065	<0.0035	<0.0039	<0.0035	<0.0037	<0.0034	0.012	0.011	0.01	0.01	0.019
Perfluorobutanoic acid (PFBA)	NCL	NCL	NCL	NA	NCL	NCL	0.0047	0.028	<0.0035	0.0053	<0.0035	<0.0037	<0.0034	0.0097	0.011	0.01	0.0099	0.0069
Perfluorodecanoic acid (PFDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0039	<0.0034	<0.0035	<0.0039	<0.0035	<0.0037	<0.0034	<0.0038	<0.0036	<0.0036	<0.0039	<0.0037
Perfluorododecanoic acid (PFDoDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0039	<0.0034	<0.0035	<0.0039	<0.0035	<0.0037	<0.0034	<0.0038	<0.0036	<0.0036	<0.0039	<0.0037
Perfluoroheptanoic acid (PFHpA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0039	0.016	<0.0035	0.0054	<0.0035	<0.0037	<0.0034	0.0052	0.0055	0.0046	0.0049	0.0048
Perfluorohexanoic acid (PFHxA)	NCL	NCL	NCL	NA	NCL	NCL	0.011	0.028	<0.0035	0.0079	<0.0035	<0.0037	<0.0034	0.011	0.012	0.011	0.011	0.0038
Perfluorononanoic acid (PFNA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0039	<0.0034	<0.0035	<0.0039	<0.0035	<0.0037	<0.0034	<0.0038	<0.0036	<0.0036	<0.0039	<0.0037
Perfluorooctanoic acid (PFOA)	0.008	12	ID	NA	NCL	NCL	***0.011***	***0.026***	***0.011***	***0.011***	0.0048	0.0057	0.0052	***0.03***	***0.033***	***0.03***	***0.031***	***0.055***
Perfluorooctane sulfonic acid (PFOS)	0.016	0.012	NLV	NA	NCL	NCL	<0.0039	<0.0034	0.0036	<0.0039	<0.0035	<0.0037	<0.0034	0.0065	0.0052	0.005	0.0055	***0.058***
PFOA + PFOS (Calculated)	NCL	NCL	NCL	0.01	NCL	NCL	***0.011***	***0.026***	***0.015***	***0.011***	0.0048	0.0057	0.0052	***0.037***	***0.038***	***0.035***	***0.037***	***0.11***
Perfluoropentanoic acid (PFPeA)	NCL	NCL	NCL	NA	NCL	NCL	0.0091	0.031	<0.0035	0.0069	<0.0035	<0.0037	<0.0034	0.0093	0.0096	0.0086	0.009	<0.0037
Perfluorotetradecanoic acid (PFTeDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0039	<0.0034	<0.0035	<0.0039	<0.0035	<0.0037	<0.0034	<0.0038	<0.0036	<0.0036	<0.0039	<0.0037
Perfluorotridecanoic acid (PFTrDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0039	<0.0034	<0.0035	<0.0039	<0.0035	<0.0037	<0.0034	<0.0038	<0.0036	<0.0036	<0.0039	<0.0037
Perfluoroundecanoic acid (PFUnDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0039	<0.0034	<0.0035	<0.0039	<0.0035	<0.0037	<0.0034	<0.0038	<0.0036	<0.0036	<0.0039	<0.0037
Total PFAS (Calculated)	NCL	NCL	NCL	NA	NCL	NCL	0.044	0.14	0.015	0.037	0.0048	0.0057	0.0086	0.17	0.18	0.16	0.16	0.17

TABLE 6
SUMMARY OF GROUNDWATER SAMPLE ANALYSIS - PFAS
Area R-1 (19)
Wolven/Jewell Area, Kent County, MI

Sample Location	Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2]	Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2]	Part 201 Generic Residential Groundwater Cleanup Criteria – Groundwater Volatilization to Indoor Air Inhalation[2]	CD Value[3]	EGLE Residential Recommended Volatilization to Indoor Air Interim Action Screening Level - Groundwater[4]	U.S. EPA Residential Tap Water Regional Removal Management Levels[5]	WV-MW-8S	WV-MW-8S	WV-MW-8S	WV-MW-8S	WV-MW-9	WV-MW-9	WV-MW-9	WV-MW-9	WV-MW-10D	WV-MW-10D	WV-MW-10D	WV-MW-10M
Sample Name							WV-GW-MW 8S	WV-GW-MW8S	WV-GW-MW8SDUP	WV-GW-MW-8S	MW-WV-9	WV-GW-MW9	WV-GW-MW9	WV-GW-MW9	WV-GW-MW10D	WV-GW-MW10D	WV-GW-MW-10D	WV-GW-MW10M
Well Screen Interval (Feet below ground surface)							30-35	30-35	30-35	30-35	92.3-97.3	92.3-97.3	92.3-97.3	92.3-97.3	165-170	165-170	165-170	69.9-74.9
Laboratory Sample ID(s)							UH29005-006	UE02030-004	UE02030-005	UK07025-006	UB20051-012	UE09028-015	UI05007-009	UK13023-011	UE09028-004	UH29005-011	UK07025-003	UE02030-002
Sample Date							08/26/2019	05/01/2019	05/01/2019	11/06/2019	02/21/2019	05/10/2019	09/04/2019	11/11/2019	05/08/2019	08/27/2019	11/06/2019	04/30/2019
Parameter (µg/L)																		
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0034	<0.0036	<0.0036	<0.0037	<0.0034	<0.0035	<0.0037	<0.0038	<0.0036	<0.0036	<0.0039	<0.0036
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0034	<0.0036	<0.0036	<0.0037	<0.0034	<0.0035	<0.0037	<0.0038	<0.0036	<0.0036	<0.0039	<0.0036
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0034	<0.0036	<0.0036	<0.0037	<0.0034	<0.0035	<0.0037	<0.0038	<0.0036	<0.0036	<0.0039	<0.0036
N-Methyl perfluorooctane sulfonamide (MeFOSA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0068	<0.0073	<0.0072	<0.0074	<0.0069	<0.0071	<0.0075	<0.0077	<0.0072	<0.0071	<0.0078	<0.0071
Perfluorobutane sulfonic acid (PFBS)	NCL	NCL	NCL	NA	NCL	1,200	0.015	0.012	0.014	0.013	0.014	0.012	0.014	0.015	0.0039	0.0042	0.0039	<0.0036
Perfluorodecane sulfonic acid (PFDS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0034	<0.0036	<0.0036	<0.0037	<0.0034	<0.0035	<0.0037	<0.0038	<0.0036	<0.0036	<0.0039	<0.0036
Perfluoroheptane sulfonic acid (PFHpS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0034	<0.0036	<0.0036	<0.0037	0.023	0.026	0.047	0.038	<0.0036	<0.0036	<0.0039	<0.0036
Perfluorononane sulfonic acid (PFNS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0068	<0.0073	<0.0072	<0.0074	<0.0069	<0.0071	<0.0075	<0.0077	<0.0072	<0.0071	<0.0078	<0.0071
Perfluorooctane sulfonamide (FOSA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0034	<0.0036	<0.0036	<0.0037	0.032	0.027	0.025	0.021	<0.0036	<0.0036	<0.0039	<0.0036
Perfluoropentane sulfonic acid (PFPeS)	NCL	NCL	NCL	NA	NCL	NCL	0.0037	0.0042	0.0043	0.0037	0.036	0.035	0.039	0.043	<0.0036	<0.0036	<0.0039	<0.0036
Perfluorohexane sulfonic acid (PFHxS)	NCL	NCL	NCL	NA	NCL	NCL	0.017	0.016	0.016	0.02	0.13	0.13	0.18	0.21	<0.0036	<0.0036	<0.0039	<0.0036
Perfluorobutanoic acid (PFBA)	NCL	NCL	NCL	NA	NCL	NCL	0.0061	0.0062	0.0063	0.0056	0.0075	0.0081	0.0099	0.011	<0.0036	<0.0036	<0.0039	<0.0036
Perfluorodecanoic acid (PFDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0034	<0.0036	<0.0036	<0.0037	<0.0034	<0.0035	<0.0037	<0.0038	<0.0036	<0.0036	<0.0039	<0.0036
Perfluorododecanoic acid (PFDoDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0034	<0.0036	<0.0036	<0.0037	<0.0034	<0.0035	<0.0037	<0.0038	<0.0036	<0.0036	<0.0039	<0.0036
Perfluoroheptanoic acid (PFHpA)	NCL	NCL	NCL	NA	NCL	NCL	0.0054	0.0047	0.005	0.007	0.047	0.049	0.062	0.067	<0.0036	<0.0036	<0.0039	<0.0036
Perfluorohexanoic acid (PFHxA)	NCL	NCL	NCL	NA	NCL	NCL	0.004	0.0042	<0.0036	0.0057	0.022	0.025	0.03	0.029	<0.0036	<0.0036	<0.0039	<0.0036
Perfluorononanoic acid (PFNA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0034	<0.0036	<0.0036	<0.0037	<0.0034	<0.0035	<0.0037	<0.0038	<0.0036	<0.0036	<0.0039	<0.0036
Perfluorooctanoic acid (PFOA)	0.008	12	ID	NA	NCL	NCL	***0.066***	***0.052***	***0.051***	***0.092***	***0.53***	***0.54***	***0.73***	***0.77***	0.0027	0.0029	0.0026	<0.0018
Perfluorooctane sulfonic acid (PFOS)	0.016	0.012	NLV	NA	NCL	NCL	***0.042***	***0.046***	***0.048***	***0.034***	***0.54***	***0.47***	***0.47***	***0.48***	<0.0036	<0.0036	<0.0039	<0.0036
PFOA + PFOS (Calculated)	NCL	NCL	NCL	0.01	NCL	NCL	***0.11***	***0.098***	***0.099***	***0.13***	***1.1***	***1***	***1.2***	***1.3***	0.0027	0.0029	0.0026	ND
Perfluoropentanoic acid (PFPeA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0034	<0.0036	<0.0036	<0.0037	0.0083	0.0086	0.01	0.011	<0.0036	<0.0036	<0.0039	<0.0036
Perfluorotetradecanoic acid (PFTeDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0034	<0.0036	<0.0036	<0.0037	<0.0034	<0.0035	<0.0037	<0.0038	<0.0036	<0.0036	<0.0039	<0.0036
Perfluorotridecanoic acid (PFTrDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0034	<0.0036	<0.0036	<0.0037	<0.0034	<0.0035	<0.0037	<0.0038	<0.0036	<0.0036	<0.0039	<0.0036
Perfluoroundecanoic acid (PFUnDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0034	<0.0036	<0.0036	<0.0037	<0.0034	<0.0035	<0.0037	<0.0038	<0.0036	<0.0036	<0.0039	<0.0036
Total PFAS (Calculated)	NCL	NCL	NCL	NA	NCL	NCL	0.16	0.15	0.14	0.18	1.4	1.3	1.6	1.7	0.0066	0.0071	0.0065	ND

TABLE 6
SUMMARY OF GROUNDWATER SAMPLE ANALYSIS - PFAS
Area R-1 (19)
Wolven/Jewell Area, Kent County, MI

Sample Location	Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2]	Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2]	Part 201 Generic Residential Groundwater Cleanup Criteria – Groundwater Volatilization to Indoor Air Inhalation[2]	CD Value[3]	EGLE Residential Recommended Volatilization to Indoor Air Interim Action Screening Level - Groundwater[4]	U.S. EPA Residential Tap Water Regional Removal Management Levels[5]	WV-MW-10M	WV-MW-10M	WV-MW-10S	WV-MW-10S	WV-MW-10S	WV-MW-11D	WV-MW-11D	WV-MW-11D	WV-MW-11D	WV-MW-11D	WV-MW-11S	WV-MW-11S
Sample Name							WV-GW-MW10M	WV-GW-MW-10M	WV-GW-MW10S	WV-GW-MW10S	WV-GW-MW-10S	MW-WV-11D	WV-GW-MW11D	WV-GW-MW11D	WV-GW-MW-11D	WV-GW-MW-11D DUP	MW-WV-11S	WV-GW-MW11S
Well Screen Interval (Feet below ground surface)							69.9-74.9	69.9-74.9	7-12	7-12	7-12	158.9-163.9	158.9-163.9	158.9-163.9	158.9-163.9	158.9-163.9	29.4-34.4	29.4-34.4
Laboratory Sample ID(s)							UH29005-009	UK07025-002	UE02030-001	UH29005-010	UK07025-001	UB16022-001	UE02030-012	UH29005-012	UK07051-006	UK07051-007	UB16022-002	UE02030-013
Sample Date							08/27/2019	11/06/2019	04/30/2019	08/27/2019	11/06/2019	02/14/2019	05/02/2019	08/27/2019	11/05/2019	11/05/2019	02/14/2019	05/02/2019
Parameter (µg/L)																		
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.0037	<0.0037	<0.0035	<0.0035	<0.0037	<0.0036	<0.004	<0.0037	<0.0037	<0.0036	<0.0036
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.0037	<0.0037	<0.0035	<0.0035	<0.0037	<0.0036	<0.004	<0.0037	<0.0037	<0.0036	<0.0036
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.0037	<0.0037	<0.0035	<0.0035	<0.0037	<0.0036	<0.004	<0.0037	<0.0037	<0.0036	<0.0036
N-Methyl perfluorooctane sulfonamide (MeFOSA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0072	<0.0074	<0.0073	<0.0071	<0.007	<0.0073	<0.0072	<0.0081	<0.0074	<0.0074	<0.0072	<0.0072
Perfluorobutane sulfonic acid (PFBS)	NCL	NCL	NCL	NA	NCL	1,200	<0.0036	<0.0037	0.011	0.013	0.009	<0.0037	<0.0036	<0.004	<0.0037	<0.0037	<0.0036	<0.0036
Perfluorodecane sulfonic acid (PFDS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.0037	<0.0037	<0.0035	<0.0035	<0.0037	<0.0036	<0.004	<0.0037	<0.0037	<0.0036	<0.0036
Perfluoroheptane sulfonic acid (PFHpS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.0037	0.014	0.014	0.016	<0.0037	<0.0036	<0.004	<0.0037	<0.0037	<0.0036	<0.0036
Perfluorononane sulfonic acid (PFNS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0072	<0.0074	<0.0073	<0.0071	<0.007	<0.0073	<0.0072	<0.0081	<0.0074	<0.0074	<0.0072	<0.0072
Perfluorooctane sulfonamide (FOSA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.0037	<0.0037	<0.0035	<0.0035	<0.0037	<0.0036	<0.004	<0.0037	<0.0037	<0.0036	<0.0036
Perfluoropentane sulfonic acid (PFPeS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.0037	0.0057	0.006	0.0044	<0.0037	<0.0036	<0.004	<0.0037	<0.0037	<0.0036	<0.0036
Perfluorohexane sulfonic acid (PFHxS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.0037	0.023	0.029	0.021	<0.0037	<0.0036	<0.004	<0.0037	<0.0037	<0.0036	<0.0036
Perfluorobutanoic acid (PFBA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.0037	0.0037	0.01	0.0051	<0.0037	<0.0036	<0.004	<0.0037	<0.0037	<0.0036	<0.0036
Perfluorodecanoic acid (PFDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.0037	<0.0037	<0.0035	<0.0035	<0.0037	<0.0036	<0.004	<0.0037	<0.0037	<0.0036	<0.0036
Perfluorododecanoic acid (PFDoDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.0037	<0.0037	<0.0035	<0.0035	<0.0037	<0.0036	<0.004	<0.0037	<0.0037	<0.0036	<0.0036
Perfluoroheptanoic acid (PFHpA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.0037	0.0053	0.012	0.0081	<0.0037	<0.0036	<0.004	<0.0037	<0.0037	<0.0036	<0.0036
Perfluorohexanoic acid (PFHxA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.0037	<0.0037	0.013	0.0048	<0.0037	<0.0036	<0.004	<0.0037	<0.0037	<0.0036	<0.0036
Perfluorononanoic acid (PFNA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.0037	<0.0037	<0.0035	<0.0035	<0.0037	<0.0036	<0.004	<0.0037	<0.0037	<0.0036	<0.0036
Perfluorooctanoic acid (PFOA)	0.008	12	ID	NA	NCL	NCL	<0.0018	<0.0018	***0.061***	***0.11***	***0.092***	<0.0018	<0.0018	<0.002	<0.0019	<0.0018	<0.0018	<0.0018
Perfluorooctane sulfonic acid (PFOS)	0.016	0.012	NLV	NA	NCL	NCL	<0.0036	<0.0037	***0.49***	***1***	***0.69***	<0.0037	<0.0036	<0.004	<0.0037	<0.0037	<0.0036	<0.0036
PFOA + PFOS (Calculated)	NCL	NCL	NCL	0.01	NCL	NCL	ND	ND	***0.55***	***1.1***	***0.78***	ND	ND	ND	ND	ND	ND	ND
Perfluoropentanoic acid (PFPeA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.0037	<0.0037	0.0092	<0.0035	<0.0037	<0.0036	<0.004	<0.0037	<0.0037	<0.0036	<0.0036
Perfluorotetradecanoic acid (PFTeDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.0037	<0.0037	<0.0035	<0.0035	<0.0037	<0.0036	<0.004	<0.0037	<0.0037	<0.0036	<0.0036
Perfluorotridecanoic acid (PFTrDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.0037	<0.0037	<0.0035	<0.0035	<0.0037	<0.0036	<0.004	<0.0037	<0.0037	<0.0036	<0.0036
Perfluoroundecanoic acid (PFUnDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.0037	<0.0037	<0.0035	<0.0035	<0.0037	<0.0036	<0.004	<0.0037	<0.0037	<0.0036	<0.0036
Total PFAS (Calculated)	NCL	NCL	NCL	NA	NCL	NCL	ND	ND	0.61	1.2	0.85	ND	ND	ND	ND	ND	ND	ND

TABLE 6
SUMMARY OF GROUNDWATER SAMPLE ANALYSIS - PFAS
Area R-1 (19)
Wolven/Jewell Area, Kent County, MI

Sample Location	Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2]	Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2]	Part 201 Generic Residential Groundwater Cleanup Criteria – Groundwater Volatilization to Indoor Air Inhalation[2]	CD Value[3]	EGLE Residential Recommended Volatilization to Indoor Air Interim Action Screening Level - Groundwater[4]	U.S. EPA Residential Tap Water Regional Removal Management Levels[5]	WV-MW-11S	WV-MW-11S	WV-MW-12D	WV-MW-12D	WV-MW-12D	WV-MW-12D	WV-MW-12M	WV-MW-12M	WV-MW-12M	WV-MW-12M	WV-MW-12S	WV-MW-12S
Sample Name							WV-GW-MW11S	WV-GW-MW-11S	MW-WV-12D	WV-GW-MW12D	WV-GW-MW12D	WV-GW-MW-12D	MW-WV-12M	WV-GW-MW12M	WV-GW-MW12M	WV-GW-MW-12M	MW-WV-12S	WV-GW-MW12S
Well Screen Interval (Feet below ground surface)							29.4-34.4	29.4-34.4	179.2-184.2	179.2-184.2	179.2-184.2	179.2-184.2	146.6-151.6	146.6-151.6	146.6-151.6	146.6-151.6	75.8-80.8	75.8-80.8
Laboratory Sample ID(s)							UH29005-013	UK07051-008	UB14084-006	UE09028-006	UH31001-004	UK09008-003	UB14084-004	UE09028-007	UH31001-007	UK09008-002	UB14084-003	UE09028-008
Sample Date							08/27/2019	11/05/2019	02/13/2019	05/07/2019	08/29/2019	11/07/2019	02/13/2019	05/07/2019	08/30/2019	11/07/2019	02/12/2019	05/07/2019
Parameter (µg/L)																		
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.0036	<0.0037	<0.0035	<0.0035	<0.0035	<0.0037	<0.0037	<0.0034	<0.0034	<0.0036	<0.0035
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.0036	<0.0037	<0.0035	<0.0035	<0.0035	<0.0037	<0.0037	<0.0034	<0.0034	<0.0036	<0.0035
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.0036	<0.0037	<0.0035	<0.0035	<0.0035	<0.0037	<0.0037	<0.0034	<0.0034	<0.0036	<0.0035
N-Methyl perfluorooctane sulfonamide (MeFOSA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0071	<0.0072	<0.0074	<0.0071	<0.007	<0.0071	<0.0074	<0.0074	<0.0068	<0.0068	<0.0072	<0.0071
Perfluorobutane sulfonic acid (PFBS)	NCL	NCL	NCL	NA	NCL	1,200	<0.0036	<0.0036	<0.0037	<0.0035	<0.0035	<0.0035	<0.0037	<0.0037	<0.0034	<0.0034	<0.0036	<0.0035
Perfluorodecane sulfonic acid (PFDS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.0036	<0.0037	<0.0035	<0.0035	<0.0035	<0.0037	<0.0037	<0.0034	<0.0034	<0.0036	<0.0035
Perfluoroheptane sulfonic acid (PFHpS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.0036	<0.0037	<0.0035	<0.0035	<0.0035	<0.0037	<0.0037	<0.0034	<0.0034	<0.0036	<0.0035
Perfluorononane sulfonic acid (PFNS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0071	<0.0072	<0.0074	<0.0071	<0.007	<0.0071	<0.0074	<0.0074	<0.0068	<0.0068	<0.0072	<0.0071
Perfluorooctane sulfonamide (FOSA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.0036	<0.0037	<0.0035	<0.0035	<0.0035	<0.0037	<0.0037	<0.0034	<0.0034	<0.0036	<0.0035
Perfluoropentane sulfonic acid (PFPeS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.0036	<0.0037	<0.0035	<0.0035	<0.0035	<0.0037	<0.0037	<0.0034	<0.0034	<0.0036	<0.0035
Perfluorohexane sulfonic acid (PFHxS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.0036	<0.0037	<0.0035	<0.0035	<0.0035	<0.0037	<0.0037	<0.0034	<0.0034	<0.0036	<0.0035
Perfluorobutanoic acid (PFBA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.0036	<0.0037	<0.0035	<0.0035	<0.0035	<0.0037	<0.0037	<0.0034	<0.0034	<0.0036	<0.0035
Perfluorodecanoic acid (PFDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.0036	<0.0037	<0.0035	<0.0035	<0.0035	<0.0037	<0.0037	<0.0034	<0.0034	<0.0036	<0.0035
Perfluorododecanoic acid (PFDoDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.0036	<0.0037	<0.0035	<0.0035	<0.0035	<0.0037	<0.0037	<0.0034	<0.0034	<0.0036	<0.0035
Perfluoroheptanoic acid (PFHpA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.0036	<0.0037	<0.0035	<0.0035	<0.0035	<0.0037	<0.0037	<0.0034	<0.0034	<0.0036	<0.0035
Perfluorohexanoic acid (PFHxA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.0036	<0.0037	<0.0035	<0.0035	<0.0035	<0.0037	<0.0037	<0.0034	<0.0034	<0.0036	<0.0035
Perfluorononanoic acid (PFNA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.0036	<0.0037	<0.0035	<0.0035	<0.0035	<0.0037	<0.0037	<0.0034	<0.0034	<0.0036	<0.0035
Perfluorooctanoic acid (PFOA)	0.008	12	ID	NA	NCL	NCL	<0.0018	<0.0018	<0.0018	<0.0018	<0.0017	<0.0018	<0.0018	<0.0018	<0.0017	<0.0017	<0.0018	<0.0018
Perfluorooctane sulfonic acid (PFOS)	0.016	0.012	NLV	NA	NCL	NCL	<0.0036	<0.0036	<0.0037	<0.0035	<0.0035	<0.0035	<0.0037	<0.0037	<0.0034	<0.0034	<0.0036	<0.0035
PFOA + PFOS (Calculated)	NCL	NCL	NCL	0.01	NCL	NCL	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Perfluoropentanoic acid (PFPeA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.0036	<0.0037	<0.0035	<0.0035	<0.0035	<0.0037	<0.0037	<0.0034	<0.0034	<0.0036	<0.0035
Perfluorotetradecanoic acid (PFTeDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.0036	<0.0037	<0.0035	<0.0035	<0.0035	<0.0037	<0.0037	<0.0034	<0.0034	<0.0036	<0.0035
Perfluorotridecanoic acid (PFTrDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.0036	<0.0037	<0.0035	<0.0035	<0.0035	<0.0037	<0.0037	<0.0034	<0.0034	<0.0036	<0.0035
Perfluoroundecanoic acid (PFUnDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.0036	<0.0037	<0.0035	<0.0035	<0.0035	<0.0037	<0.0037	<0.0034	<0.0034	<0.0036	<0.0035
Total PFAS (Calculated)	NCL	NCL	NCL	NA	NCL	NCL	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

TABLE 6
SUMMARY OF GROUNDWATER SAMPLE ANALYSIS - PFAS
Area R-1 (19)
Wolven/Jewell Area, Kent County, MI

Sample Location	Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2]	Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2]	Part 201 Generic Residential Groundwater Cleanup Criteria – Groundwater Volatilization to Indoor Air Inhalation[2]	CD Value[3]	EGLE Residential Recommended Volatilization to Indoor Air Interim Action Screening Level - Groundwater[4]	U.S. EPA Residential Tap Water Regional Removal Management Levels[5]	WV-MW-12S	WV-MW-12S	WV-MW-13D	WV-MW-13D	WV-MW-13D	WV-MW-13M	WV-MW-13M	WV-MW-13M	WV-MW-13S	WV-MW-13S	WV-MW-13S	WV-MW-14D
Sample Name							WV-GW-MW12S	WV-GW-MW-12S	WV-GW-MW13D	WV-GW-MW13D	WV-GW-MW-13D	WV-GW-MW13M	WV-GW-MW13M	WV-GW-MW-13M	WV-GW-MW13S	WV-GW-MW13S	WV-GW-MW-13S	VW-GW-MW-14D
Well Screen Interval (Feet below ground surface)							75.8-80.8	75.8-80.8	58.8-63.8	58.8-63.8	58.8-63.8	18.1-23.1	18.1-23.1	18.1-23.1	1.7-6.7	1.7-6.7	1.7-6.7	142.3-147.3
Laboratory Sample ID(s)							UH31001-003	UK09008-001	UE09028-002	UH29005-017	UK09008-006	UE09028-001	UH29005-019	UK09008-005	UE09028-003	UH29005-016	UK09008-004	UK09009-002
Sample Date							08/29/2019	11/07/2019	05/08/2019	08/28/2019	11/07/2019	05/08/2019	08/28/2019	11/07/2019	05/08/2019	08/28/2019	11/07/2019	11/08/2019
Parameter (µg/L)																		
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.004	<0.0036	<0.0036	<0.0038	<0.0035	<0.0036	<0.0036	<0.0036	<0.0036	<0.0038	<0.0035
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.004	<0.0036	<0.0036	<0.0038	<0.0035	<0.0036	<0.0036	<0.0036	<0.0036	<0.0038	<0.0035
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.004	<0.0036	<0.0036	<0.0038	<0.0035	<0.0036	<0.0036	<0.0036	<0.0036	<0.0038	<0.0035
N-Methyl perfluorooctane sulfonamide (MeFOSA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0072	<0.0079	<0.0072	<0.0073	<0.0076	<0.007	<0.0072	<0.0072	<0.0072	<0.0072	<0.0076	<0.007
Perfluorobutane sulfonic acid (PFBS)	NCL	NCL	NCL	NA	NCL	1,200	<0.0036	<0.004	0.01	0.01	0.0098	0.0052	0.0047	0.005	<0.0036	<0.0036	<0.0038	0.03
Perfluorodecane sulfonic acid (PFDS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.004	<0.0036	<0.0036	<0.0038	<0.0035	<0.0036	<0.0036	<0.0036	<0.0036	<0.0038	<0.0035
Perfluoroheptane sulfonic acid (PFHpS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.004	<0.0036	<0.0036	<0.0038	<0.0035	<0.0036	<0.0036	<0.0036	<0.0036	<0.0038	0.0036
Perfluorononane sulfonic acid (PFNS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0072	<0.0079	<0.0072	<0.0073	<0.0076	<0.007	<0.0072	<0.0072	<0.0072	<0.0072	<0.0076	<0.007
Perfluorooctane sulfonamide (FOSA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.004	<0.0036	<0.0036	<0.0038	<0.0035	<0.0036	<0.0036	<0.0036	<0.0036	<0.0038	<0.0035
Perfluoropentane sulfonic acid (PFPeS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.004	<0.0036	<0.0036	<0.0038	<0.0035	<0.0036	<0.0036	<0.0036	<0.0036	<0.0038	0.07
Perfluorohexane sulfonic acid (PFHxS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.004	<0.0036	<0.0036	0.0038	0.005	0.0048	0.0056	<0.0036	<0.0036	0.004	0.16
Perfluorobutanoic acid (PFBA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.004	<0.0036	<0.0036	<0.0038	0.0052	0.0066	0.0062	0.0045	0.0076	0.0078	0.0099
Perfluorodecanoic acid (PFDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.004	<0.0036	<0.0036	<0.0038	<0.0035	<0.0036	<0.0036	<0.0036	<0.0036	<0.0038	<0.0035
Perfluorododecanoic acid (PFDoDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.004	<0.0036	<0.0036	<0.0038	<0.0035	<0.0036	<0.0036	<0.0036	<0.0036	<0.0038	<0.0035
Perfluoroheptanoic acid (PFHpA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.004	<0.0036	<0.0036	<0.0038	<0.0035	<0.0036	<0.0036	<0.0036	<0.0036	<0.0038	0.076
Perfluorohexanoic acid (PFHxA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.004	<0.0036	<0.0036	<0.0038	<0.0035	<0.0036	<0.0036	<0.0036	<0.0036	<0.0038	0.033
Perfluorononanoic acid (PFNA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.004	<0.0036	<0.0036	<0.0038	<0.0035	<0.0036	<0.0036	<0.0036	<0.0036	<0.0038	<0.0035
Perfluorooctanoic acid (PFOA)	0.008	12	ID	NA	NCL	NCL	<0.0018	<0.002	0.0027	0.0031	0.003	***0.012***	***0.016***	***0.015***	***0.011***	***0.014***	***0.018***	***0.52***
Perfluorooctane sulfonic acid (PFOS)	0.016	0.012	NLV	NA	NCL	NCL	<0.0036	<0.004	<0.0036	<0.0036	<0.0038	***0.016***	***0.017***	***0.017***	***0.022***	***0.041***	***0.085***	0.0074
PFOA + PFOS (Calculated)	NCL	NCL	NCL	0.01	NCL	NCL	ND	ND	0.0027	0.0031	0.003	***0.028***	***0.033***	***0.032***	***0.033***	***0.055***	***0.1***	***0.53***
Perfluoropentanoic acid (PFPeA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.004	<0.0036	<0.0036	<0.0038	<0.0035	<0.0036	<0.0036	<0.0036	<0.0036	<0.0038	0.012
Perfluorotetradecanoic acid (PFTeDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.004	<0.0036	<0.0036	<0.0038	<0.0035	<0.0036	<0.0036	<0.0036	<0.0036	<0.0038	<0.0035
Perfluorotridecanoic acid (PFTrDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.004	<0.0036	<0.0036	<0.0038	<0.0035	<0.0036	<0.0036	<0.0036	<0.0036	<0.0038	<0.0035
Perfluoroundecanoic acid (PFUnDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0036	<0.004	<0.0036	<0.0036	<0.0038	<0.0035	<0.0036	<0.0036	<0.0036	<0.0036	<0.0038	<0.0035
Total PFAS (Calculated)	NCL	NCL	NCL	NA	NCL	NCL	ND	ND	0.013	0.013	0.017	0.043	0.049	0.049	0.038	0.063	0.11	0.92

TABLE 6
SUMMARY OF GROUNDWATER SAMPLE ANALYSIS - PFAS
Area R-1 (19)
Wolven/Jewell Area, Kent County, MI

Sample Location	Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2]	Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2]	Part 201 Generic Residential Groundwater Cleanup Criteria – Groundwater Volatilization to Indoor Air Inhalation[2]	CD Value[3]	EGLE Residential Recommended Volatilization to Indoor Air Interim Action Screening Level - Groundwater[4]	U.S. EPA Residential Tap Water Regional Removal Management Levels[5]	WV-MW-14D	WV-MW-14S	WV-MW-14S	WV-MW-15A	WV-MW-15B	WV-MW-15C	WV-MW-15D	WV-MW-15D	WV-MW-16D	WV-MW-16D	WV-MW-16D	WV-MW-16S
Sample Name							WV-GW-MW14D	WV-GW-MW14S	WV-GW-MW-14S	WV-GW-MW-15A	WV-GW-MW-15B	WV-GW-MW-15C	WV-GW-MW-15D	WV-GW-MW-15D DUP	WV-GW-MW16D	WV-GW-MW16D	WV-GW-MW-16D	WV-GW-MW16S
Well Screen Interval (Feet below ground surface)							142.3-147.3	8.9-13.9	8.9-13.9	9-14	33.1-38.1	43.7-48.5	135.1-137.8	135.1-137.8	91.7-96.7	91.7-96.7	91.7-96.7	17.5-22.5
Laboratory Sample ID(s)							UH29005-018	UH29005-015	UK09008-007	UK13023-008	UK13023-009	UK13023-010	UK13023-013	UK13023-014	UE09028-005	UH31001-005	UK13023-001	UE02030-006
Sample Date							08/28/2019	08/28/2019	11/07/2019	11/11/2019	11/11/2019	11/11/2019	11/11/2019	11/11/2019	05/08/2019	08/29/2019	11/12/2019	05/03/2019
Parameter (µg/L)																		
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0034	<0.0034	<0.0038	<0.0038	<0.0038	<0.0037	<0.0037	<0.0038	<0.0037	<0.0036	<0.0035	<0.0036
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0034	<0.0034	<0.0038	<0.0038	<0.0038	<0.0037	<0.0037	<0.0038	<0.0037	<0.0036	<0.0035	<0.0036
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0034	<0.0034	<0.0038	<0.0038	<0.0038	<0.0037	<0.0037	<0.0038	<0.0037	<0.0036	<0.0035	<0.0036
N-Methyl perfluorooctane sulfonamide (MeFOSA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0068	<0.0068	<0.0076	<0.0077	<0.0076	<0.0074	<0.0074	<0.0075	<0.0074	<0.0072	<0.007	<0.0071
Perfluorobutane sulfonic acid (PFBS)	NCL	NCL	NCL	NA	NCL	1,200	0.029	0.015	0.008	<0.0038	<0.0038	<0.0037	<0.0037	<0.0038	<0.0037	<0.0036	<0.0035	0.0073
Perfluorodecane sulfonic acid (PFDS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0034	<0.0034	<0.0038	<0.0038	<0.0038	<0.0037	<0.0037	<0.0038	<0.0037	<0.0036	<0.0035	<0.0036
Perfluoroheptane sulfonic acid (PFHpS)	NCL	NCL	NCL	NA	NCL	NCL	0.0035	<0.0034	<0.0038	<0.0038	<0.0038	<0.0037	<0.0037	<0.0038	<0.0037	<0.0036	<0.0035	<0.0036
Perfluorononane sulfonic acid (PFNS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0068	<0.0068	<0.0076	<0.0077	<0.0076	<0.0074	<0.0074	<0.0075	<0.0074	<0.0072	<0.007	<0.0071
Perfluorooctane sulfonamide (FOSA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0034	<0.0034	<0.0038	<0.0038	<0.0038	<0.0037	<0.0037	<0.0038	<0.0037	<0.0036	<0.0035	<0.0036
Perfluoropentane sulfonic acid (PFPeS)	NCL	NCL	NCL	NA	NCL	NCL	0.064	<0.0034	<0.0038	<0.0038	<0.0038	<0.0037	<0.0037	<0.0038	<0.0037	<0.0036	<0.0035	<0.0036
Perfluorohexane sulfonic acid (PFHxS)	NCL	NCL	NCL	NA	NCL	NCL	0.17	0.0085	0.01	<0.0038	<0.0038	<0.0037	<0.0037	<0.0038	<0.0037	<0.0036	<0.0035	<0.0036
Perfluorobutanoic acid (PFBA)	NCL	NCL	NCL	NA	NCL	NCL	0.011	<0.0034	<0.0038	<0.0038	<0.0038	<0.0037	<0.0037	<0.0038	<0.0037	<0.0036	<0.0035	0.0074
Perfluorodecanoic acid (PFDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0034	<0.0034	<0.0038	<0.0038	<0.0038	<0.0037	<0.0037	<0.0038	<0.0037	<0.0036	<0.0035	<0.0036
Perfluorododecanoic acid (PFDoDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0034	<0.0034	<0.0038	<0.0038	<0.0038	<0.0037	<0.0037	<0.0038	<0.0037	<0.0036	<0.0035	<0.0036
Perfluoroheptanoic acid (PFHpA)	NCL	NCL	NCL	NA	NCL	NCL	0.083	<0.0034	<0.0038	<0.0038	<0.0038	<0.0037	<0.0037	<0.0038	<0.0037	<0.0036	<0.0035	<0.0036
Perfluorohexanoic acid (PFHxA)	NCL	NCL	NCL	NA	NCL	NCL	0.033	<0.0034	<0.0038	<0.0038	<0.0038	<0.0037	<0.0037	<0.0038	<0.0037	<0.0036	<0.0035	0.0061
Perfluorononanoic acid (PFNA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0034	<0.0034	<0.0038	<0.0038	<0.0038	<0.0037	<0.0037	<0.0038	<0.0037	<0.0036	<0.0035	<0.0036
Perfluorooctanoic acid (PFOA)	0.008	12	ID	NA	NCL	NCL	***0.54***	0.0065	***0.013***	<0.0019	<0.0019	<0.0019	<0.0018	<0.0019	<0.0019	<0.0018	<0.0018	***0.0094***
Perfluorooctane sulfonic acid (PFOS)	0.016	0.012	NLV	NA	NCL	NCL	0.007	<0.0034	0.009	<0.0038	<0.0038	<0.0037	<0.0037	<0.0038	<0.0037	<0.0036	<0.0035	***0.026***
PFOA + PFOS (Calculated)	NCL	NCL	NCL	0.01	NCL	NCL	***0.55***	0.0065	***0.022***	ND	ND	ND	ND	ND	ND	ND	ND	***0.035***
Perfluoropentanoic acid (PFPeA)	NCL	NCL	NCL	NA	NCL	NCL	0.012	<0.0034	<0.0038	<0.0038	<0.0038	<0.0037	<0.0037	<0.0038	<0.0037	<0.0036	<0.0035	<0.0036
Perfluorotetradecanoic acid (PFTeDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0034	<0.0034	<0.0038	<0.0038	<0.0038	<0.0037	<0.0037	<0.0038	<0.0037	<0.0036	<0.0035	<0.0036
Perfluorotridecanoic acid (PFTrDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0034	<0.0034	<0.0038	<0.0038	<0.0038	<0.0037	<0.0037	<0.0038	<0.0037	<0.0036	<0.0035	<0.0036
Perfluoroundecanoic acid (PFUnDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0034	<0.0034	<0.0038	<0.0038	<0.0038	<0.0037	<0.0037	<0.0038	<0.0037	<0.0036	<0.0035	<0.0036
Total PFAS (Calculated)	NCL	NCL	NCL	NA	NCL	NCL	0.95	0.03	0.04	ND	ND	ND	ND	ND	ND	ND	ND	0.056

TABLE 6
SUMMARY OF GROUNDWATER SAMPLE ANALYSIS - PFAS
Area R-1 (19)
Wolven/Jewell Area, Kent County, MI

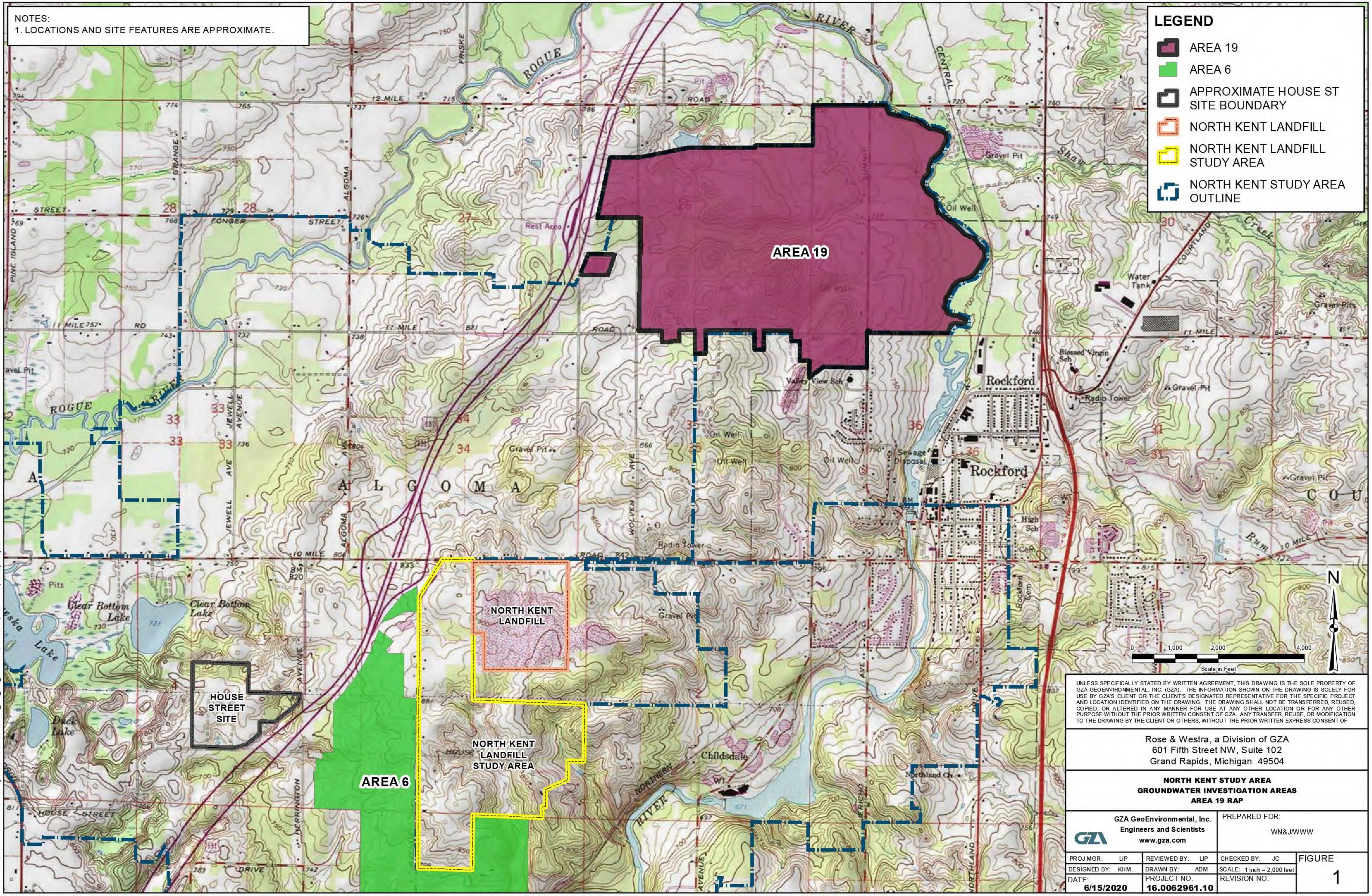
Sample Location	**Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2]**	**Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2]**	**Part 201 Generic Residential Groundwater Cleanup Criteria – Groundwater Volatilization to Indoor Air Inhalation[2]**	**CD Value[3]**	**EGLE Residential Recommended Volatilization to Indoor Air Interim Action Screening Level - Groundwater[4]**	**U.S. EPA Residential Tap Water Regional Removal Management Levels[5]**	**WV-MW-16S**	**WV-MW-16S**	**WV-MW-16S**
Sample Name							**WV-GW-MW16S**	**WV-GW-MW16S DUP**	**WV-GW-MW-16S**
Well Screen Interval (Feet below ground surface)							**17.5-22.5**	**17.5-22.5**	**17.5-22.5**
Laboratory Sample ID(s)							**UH31001-001**	**UH31001-002**	**UK19013-001**
Sample Date							**08/29/2019**	**08/29/2019**	**11/13/2019**
Parameter (µg/L)									
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0035	<0.0037	<0.0037
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0035	<0.0037	<0.0037
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0035	<0.0037	<0.0037
N-Methyl perfluorooctane sulfonamide (MeFOSA)	NCL	NCL	NCL	NA	NCL	NCL	<0.007	<0.0074	<0.0074
Perfluorobutane sulfonic acid (PFBS)	NCL	NCL	NCL	NA	NCL	1,200	0.016	0.018	0.016
Perfluorodecane sulfonic acid (PFDS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0035	<0.0037	<0.0037
Perfluoroheptane sulfonic acid (PFHpS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0035	<0.0037	<0.0037
Perfluorononane sulfonic acid (PFNS)	NCL	NCL	NCL	NA	NCL	NCL	<0.007	<0.0074	<0.0074
Perfluorooctane sulfonamide (FOSA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0035	<0.0037	<0.0037
Perfluoropentane sulfonic acid (PFPeS)	NCL	NCL	NCL	NA	NCL	NCL	<0.0035	0.004	<0.0037
Perfluorohexane sulfonic acid (PFHxS)	NCL	NCL	NCL	NA	NCL	NCL	0.0068	0.007	0.0072
Perfluorobutanoic acid (PFBA)	NCL	NCL	NCL	NA	NCL	NCL	0.028	0.029	0.02
Perfluorodecanoic acid (PFDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0035	<0.0037	<0.0037
Perfluorododecanoic acid (PFDoDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0035	<0.0037	<0.0037
Perfluoroheptanoic acid (PFHpA)	NCL	NCL	NCL	NA	NCL	NCL	0.0076	0.0085	0.0054
Perfluorohexanoic acid (PFHxA)	NCL	NCL	NCL	NA	NCL	NCL	0.023	0.023	0.013
Perfluorononanoic acid (PFNA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0035	<0.0037	<0.0037
Perfluorooctanoic acid (PFOA)	0.008	12	ID	NA	NCL	NCL	***0.026***	***0.029***	***0.021***
Perfluorooctane sulfonic acid (PFOS)	0.016	0.012	NLV	NA	NCL	NCL	***0.023***	***0.025***	***0.027***
PFOA + PFOS (Calculated)	NCL	NCL	NCL	0.01	NCL	NCL	***0.049***	***0.054***	***0.048***
Perfluoropentanoic acid (PFPeA)	NCL	NCL	NCL	NA	NCL	NCL	0.0097	0.011	0.007
Perfluorotetradecanoic acid (PFTeDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0035	<0.0037	<0.0037
Perfluorotridecanoic acid (PFTrDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0035	<0.0037	<0.0037
Perfluoroundecanoic acid (PFUnDA)	NCL	NCL	NCL	NA	NCL	NCL	<0.0035	<0.0037	<0.0037
Total PFAS (Calculated)	NCL	NCL	NCL	NA	NCL	NCL	0.14	0.15	0.12

TABLE 6 NOTES
Area R-1 (19)
Wolven/Jewell Area, Kent County, MI

NOTES:

1. Concentration and criteria units are micrograms per Liter (µg/L) or parts per billion (ppb). Calculated criteria and concentrations are rounded to two significant digits. "ND" indicates the parameters used in the calculation were not detected. "NC" indicates not calculated.
2. Michigan Part 201 Groundwater Cleanup Criteria are based on "Table 1, Groundwater: Residential and Nonresidential Part 201 Generic Cleanup Criteria and Screening Levels/Part 213 Tier I Risk Based Screening Levels," Michigan Administrative Code, Cleanup Criteria Requirements for Response Activity, Rules 299.44 and 299.49, effective December 30, 2013; last revised August 3, 2020.
   Abbreviations Include:
   "ID" indicates insufficient data to develop criterion.
   "NCL" indicates no criterion listed in EGLE Table 1.
3. "CD Value" refers to the PFOA+PFOS value of 0.01 µg/L in the Consent Decree.
4. EGLE Residential Groundwater Recommended Volatilization to Indoor Air Interim Action Screening Levels (RIASLs) for were based on EGLE's Toxics Steering Group's "Media-Specific Interim Action Screening Levels," published in August 2017. The EGLE published the RIASLs in August 2017, and recently removed the RIASLs from the EGLE website. The EGLE is reportedly evaluating the RIASLs for appropriate use and applicability. These are included for reference.
   Abbreviations Include:
   "NCL" indicates no value listed in the Media-Specific Interim Action Screening Levels table.
5. U.S. EPA Residential Tap Water Regional Removal Management Levels (RMLs) were based on "Generic RML Tables," updated November 2018.
6. Bold, italic number with thick line border or italic parameter name indicates that parameter was detected above the Michigan Part 201 Groundwater Cleanup Criteria, Media-Specific Interim Action Screening Levels, MCL, or CD Value. U.S. EPA RMLs are provided for reference only and results detected above the EPA RMLs are not bolded or italicized.
7. Abbreviations include:
   "< RL" indicates the parameter was analyzed for but not detected above the method detection limit; RL = Reporting Limit.
   "DUP" indicates a duplicate sample.
8. Sample names presented are from Shealy Environmental Services, Inc. laboratory reports. Sample names presented in ALS Environmental lab reports may have minor differences based on laboratory interpretation of the chains of custody.
9. Well screen interval presented is the top of the well screen to the bottom of the well screen in feet below ground surface.

FIGURES


NOTES:
1. LOCATIONS AND SITE FEATURES ARE APPROXIMATE.
LEGEND
AREA 19
AREA 6
APPROXIMATE HOUSE ST SITE BOUNDARY
NORTH KENT LANDFILL
NORTH KENT LANDFILL STUDY AREA
NORTH KENT STUDY AREA OUTLINE
AREA 19
AREA 6
NORTH KENT LANDFILL
NORTH KENT LANDFILL STUDY AREA
HOUSE STREET SITE
Rockford
ALGOMA
ROGUE RIVER
N
0 1,000 2,000 4,000
Scale in Feet
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NORTH KENT STUDY AREA
GROUNDWATER INVESTIGATION AREAS
AREA 19 RAP
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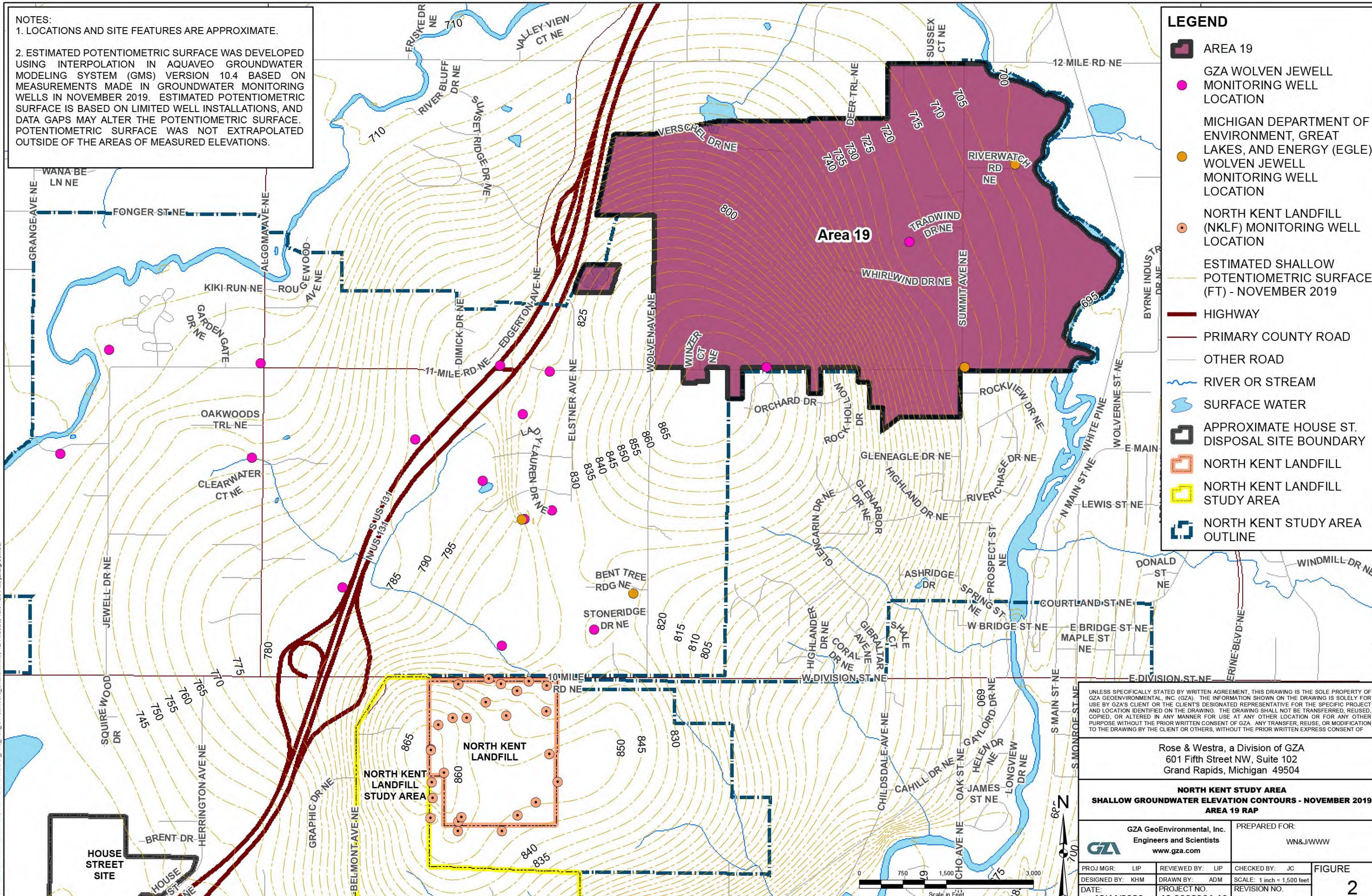
WN&J/WWW
PROJ MGR: LJP
REVIEWED BY: LJP
CHECKED BY: JC
FIGURE
DESIGNED BY: KHM
DRAWN BY: ADM
SCALE: 1 inch = 2,000 feet
DATE: 6/15/2020
PROJECT NO. 16.0062961.10
REVISION NO.
1

NOTES:
1. LOCATIONS AND SITE FEATURES ARE APPROXIMATE.

2. ESTIMATED POTENTIOMETRIC SURFACE WAS DEVELOPED USING INTERPOLATION IN AQUAVEO GROUNDWATER MODELING SYSTEM (GMS) VERSION 10.4 BASED ON MEASUREMENTS MADE IN GROUNDWATER MONITORING WELLS IN NOVEMBER 2019. ESTIMATED POTENTIOMETRIC SURFACE IS BASED ON LIMITED WELL INSTALLATIONS, AND DATA GAPS MAY ALTER THE POTENTIOMETRIC SURFACE. POTENTIOMETRIC SURFACE WAS NOT EXTRAPOLATED OUTSIDE OF THE AREAS OF MEASURED ELEVATIONS.



LEGEND

- AREA 19
- GZA WOLVEN JEWELL MONITORING WELL LOCATION
- MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY (EGLE) WOLVEN JEWELL MONITORING WELL LOCATION
- NORTH KENT LANDFILL (NKLF) MONITORING WELL LOCATION
- ESTIMATED SHALLOW POTENTIOMETRIC SURFACE (FT) - NOVEMBER 2019
- HIGHWAY
- PRIMARY COUNTY ROAD
- OTHER ROAD
- RIVER OR STREAM
- SURFACE WATER
- APPROXIMATE HOUSE ST. DISPOSAL SITE BOUNDARY
- NORTH KENT LANDFILL
- NORTH KENT LANDFILL STUDY AREA
- NORTH KENT STUDY AREA OUTLINE

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NORTH KENT STUDY AREA
SHALLOW GROUNDWATER ELEVATION CONTOURS - NOVEMBER 2019
AREA 19 RAP

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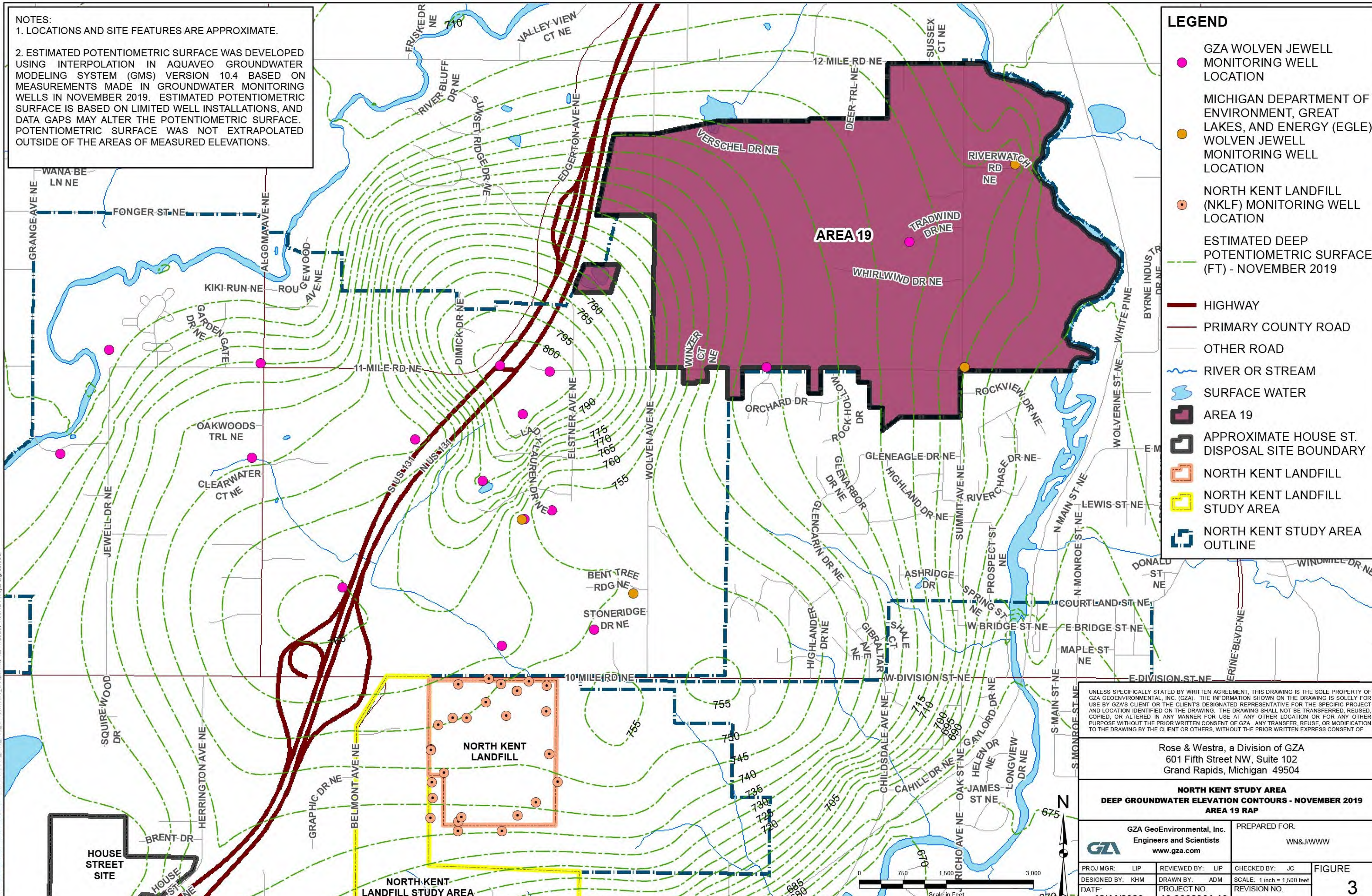
PREPARED FOR: WN&J/WWW

PROJ MGR: LIP	REVIEWED BY: LIP	CHECKED BY: JC	FIGURE
DESIGNED BY: KHM	DRAWN BY: ADM	SCALE: 1 inch = 1,500 feet	2
DATE: 12/11/2020	PROJECT NO. 16.0062961.10	REVISION NO.	

0 750 1,500 3,000
Scale in Feet



NOTES:
1. LOCATIONS AND SITE FEATURES ARE APPROXIMATE.

2. ESTIMATED POTENTIOMETRIC SURFACE WAS DEVELOPED USING INTERPOLATION IN AQUAVEO GROUNDWATER MODELING SYSTEM (GMS) VERSION 10.4 BASED ON MEASUREMENTS MADE IN GROUNDWATER MONITORING WELLS IN NOVEMBER 2019. ESTIMATED POTENTIOMETRIC SURFACE IS BASED ON LIMITED WELL INSTALLATIONS, AND DATA GAPS MAY ALTER THE POTENTIOMETRIC SURFACE. POTENTIOMETRIC SURFACE WAS NOT EXTRAPOLATED OUTSIDE OF THE AREAS OF MEASURED ELEVATIONS.

LEGEND

- GZA WOLVEN JEWELL MONITORING WELL LOCATION
- MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY (EGLE) WOLVEN JEWELL MONITORING WELL LOCATION
- NORTH KENT LANDFILL (NKLF) MONITORING WELL LOCATION
- ESTIMATED DEEP POTENTIOMETRIC SURFACE (FT) - NOVEMBER 2019
- HIGHWAY
- PRIMARY COUNTY ROAD
- OTHER ROAD
- RIVER OR STREAM
- SURFACE WATER
- AREA 19
- APPROXIMATE HOUSE ST. DISPOSAL SITE BOUNDARY
- NORTH KENT LANDFILL
- NORTH KENT LANDFILL STUDY AREA
- NORTH KENT STUDY AREA OUTLINE

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NORTH KENT STUDY AREA
DEEP GROUNDWATER ELEVATION CONTOURS - NOVEMBER 2019
AREA 19 RAP

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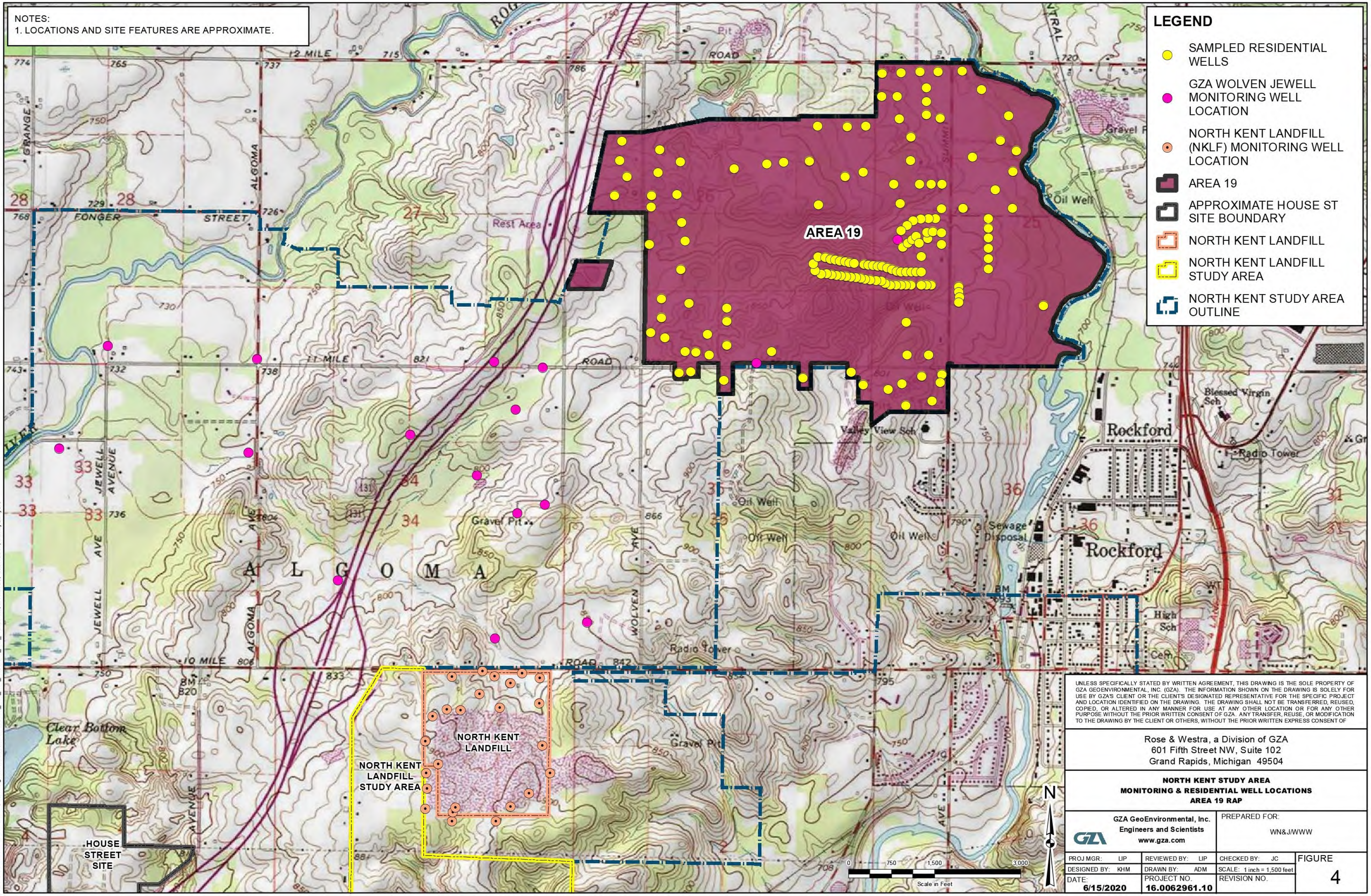
PROJ MGR: LIP	REVIEWED BY: LIP	CHECKED BY: JC	FIGURE
DESIGNED BY: KHM	DRAWN BY: ADM	SCALE: 1 inch = 1,500 feet	3
DATE: 12/11/2020	PROJECT NO. 16.0062961.10	REVISION NO.	


NOTES:
1. LOCATIONS AND SITE FEATURES ARE APPROXIMATE.
LEGEND
SAMPLED RESIDENTIAL WELLS
GZA WOLVEN JEWELL MONITORING WELL LOCATION
NORTH KENT LANDFILL (NKLF) MONITORING WELL LOCATION
AREA 19
APPROXIMATE HOUSE ST SITE BOUNDARY
NORTH KENT LANDFILL
NORTH KENT LANDFILL STUDY AREA
NORTH KENT STUDY AREA OUTLINE
AREA 19
NORTH KENT LANDFILL
NORTH KENT LANDFILL STUDY AREA
HOUSE STREET SITE
Rockford
FONGER STREET
11 MILE ROAD
10 MILE ROAD
12 MILE ROAD
ALGOMA
JEWELL AVENUE
WOLVEN AVE
Rest Area
Gravel Pit
Oil Well
Valley View Sch
Sewage Disposal
Radio Tower
Clear Bottom Lake
Blessed Virgin Sch
High Sch
Cem
N
0 750 1,500 3,000
Scale in Feet
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NORTH KENT STUDY AREA
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AREA 19 RAP
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PROJ MGR: LIP
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FIGURE 4
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SCALE: 1 inch = 1,500 feet
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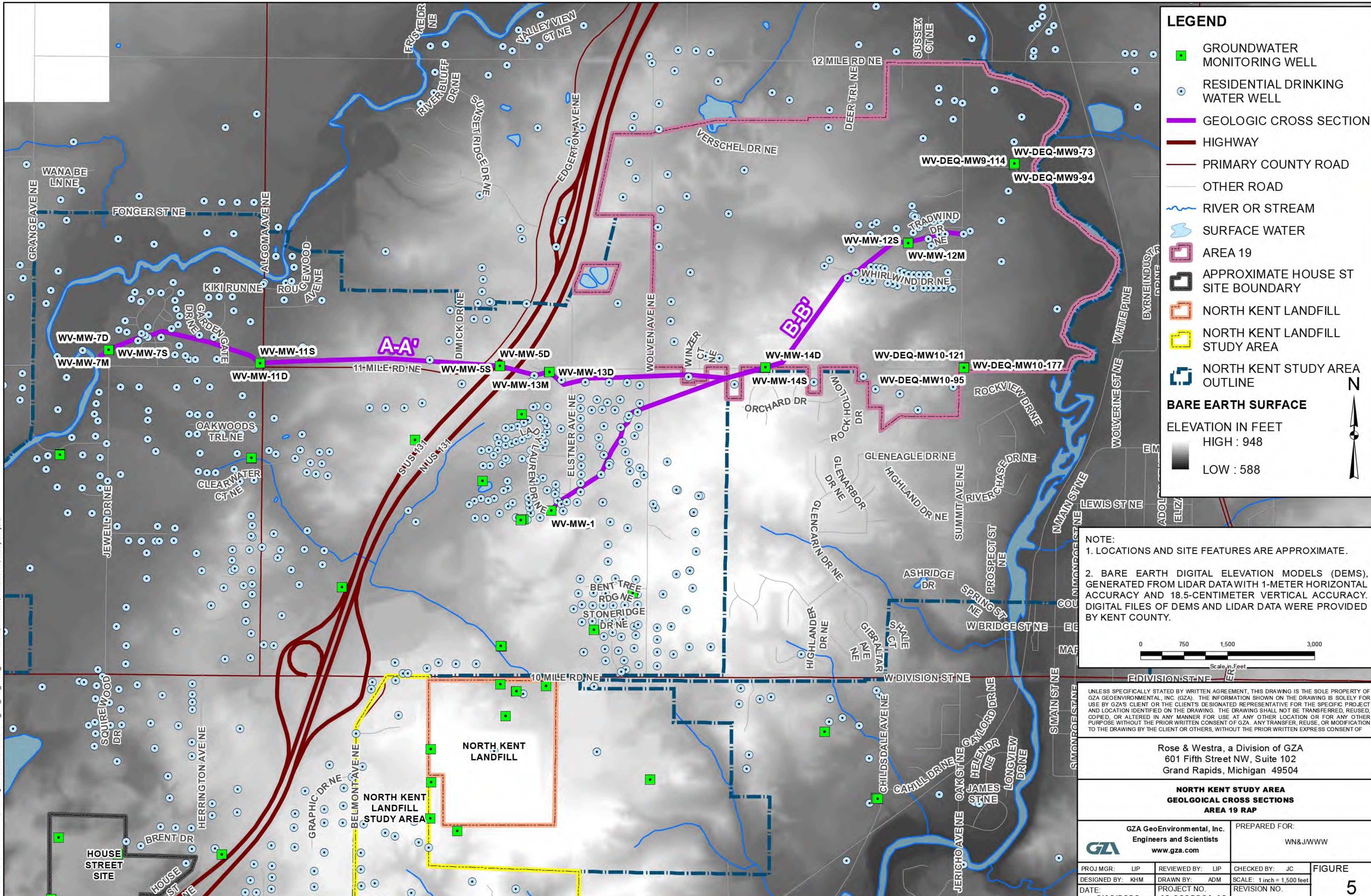

LEGEND

- GROUNDWATER MONITORING WELL
- RESIDENTIAL DRINKING WATER WELL
- GEOLOGIC CROSS SECTION
- HIGHWAY
- PRIMARY COUNTY ROAD
- OTHER ROAD
- RIVER OR STREAM
- SURFACE WATER
- AREA 19
- APPROXIMATE HOUSE ST SITE BOUNDARY
- NORTH KENT LANDFILL
- NORTH KENT LANDFILL STUDY AREA
- NORTH KENT STUDY AREA OUTLINE

BARE EARTH SURFACE

ELEVATION IN FEET

HIGH : 948

LOW : 588

N

NOTE:
1. LOCATIONS AND SITE FEATURES ARE APPROXIMATE.

2. BARE EARTH DIGITAL ELEVATION MODELS (DEMS), GENERATED FROM LIDAR DATA WITH 1-METER HORIZONTAL ACCURACY AND 18.5-CENTIMETER VERTICAL ACCURACY. DIGITAL FILES OF DEMS AND LIDAR DATA WERE PROVIDED BY KENT COUNTY.

0 750 1,500 3,000
Scale in Feet

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NORTH KENT STUDY AREA
GEOLGOICAL CROSS SECTIONS
AREA 19 RAP

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PROJ MGR: LIP	REVIEWED BY: LIP	CHECKED BY: JC	FIGURE
DESIGNED BY: KHM	DRAWN BY: ADM	SCALE: 1 inch = 1,500 feet	5
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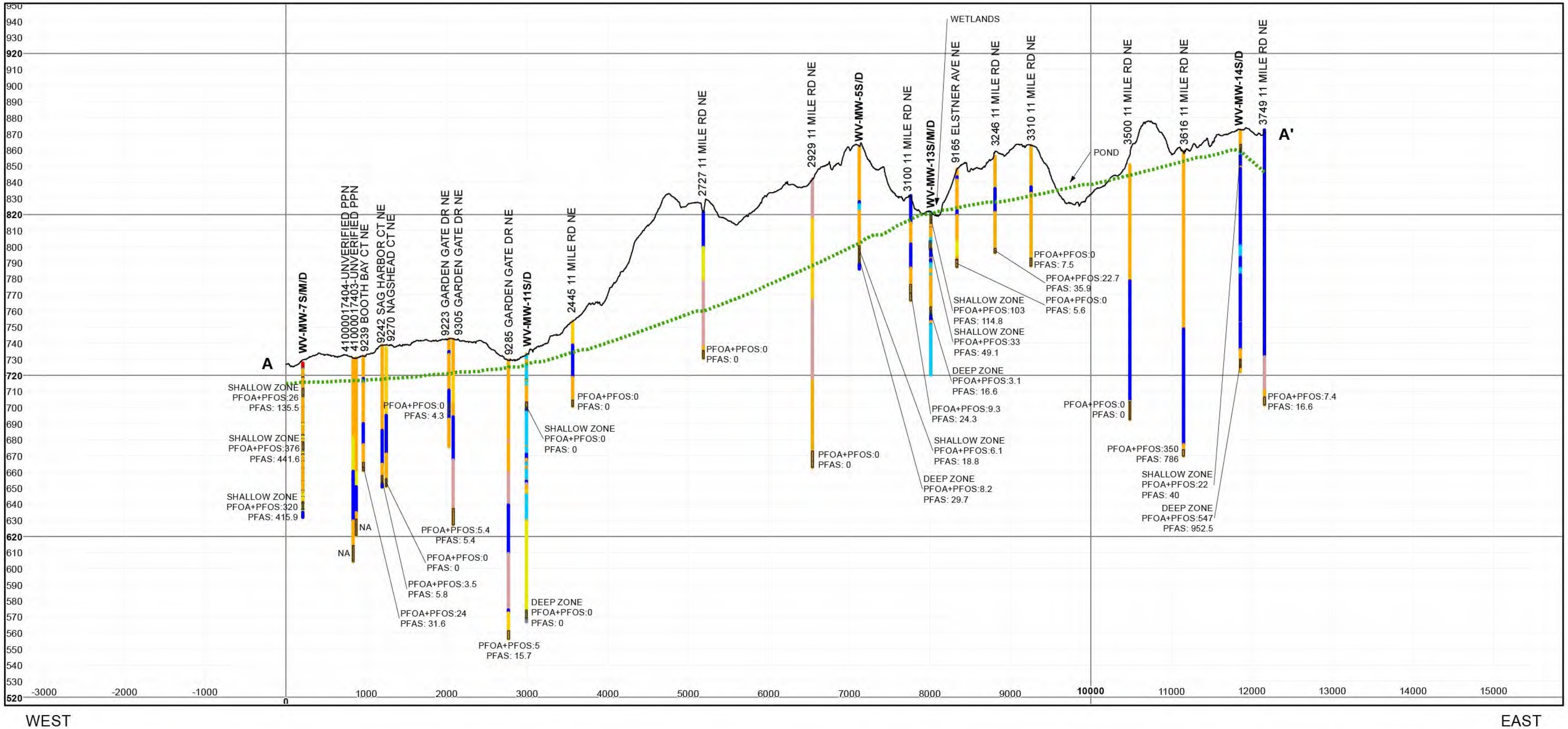


CROSS SECTION LEGEND

WELL SCREEN

- PFOA+PFOS (ng/L) PFAS (ng/L) 0 = NOT DETECTED NA = NOT AVAILABLE
- ESTIMATED POTENTIOMETRIC SURFACE (11/2019)
- GROUND SURFACE

BOREHOLE LITHOLOGY

- GRAVEL
- SAND AND GRAVEL
- SAND
- SAND/GRAVEL WITH CLAY/SILT
- CLAY/SILT WITH SAND/GRAVEL
- SILT
- CLAY AND SILT
- CLAY
- ORGANIC SOIL
- NOT AVAILABLE

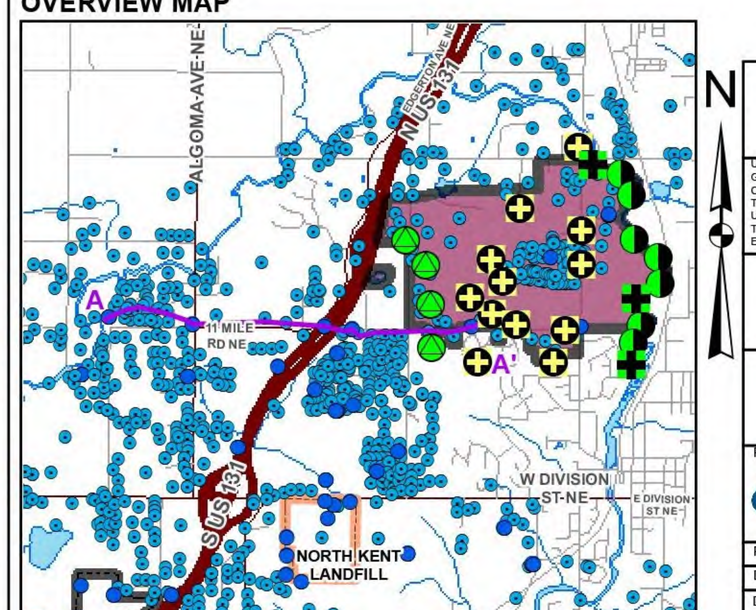
OVERVIEW MAP LEGEND

- PROPOSED INVESTIGATION MONITORING WELL
- PROPOSED INVESTIGATION / PERIMETER MONITORING WELL
- PROPOSED GSI PIEZOMETER
- PROPOSED PORE WATER SAMPLING LOCATION
- RESIDENTIAL WATER WELL
- MONITORING WELL
- CROSS SECTION LINE
- HIGHWAY
- PRIMARY COUNTY ROAD
- OTHER ROAD
- RIVER OR STREAM
- SURFACE WATER
- AREA 19
- APPROXIMATE HOUSE ST. DISPOSAL SITE BOUNDARY
- NORTH KENT LANDFILL

NOTES:

1. LOCATIONS AND SITE FEATURES ARE APPROXIMATE.
2. GROUND SURFACE ELEVATIONS ARE BASED ON DIGITAL RASTER FILES OF BARE EARTH DIGITAL ELEVATION MODELS (DEMS), GENERATED FROM LIDAR DATA WITH 1-METER HORIZONTAL ACCURACY AND 18.5-CENTIMETER VERTICAL ACCURACY. DIGITAL FILES OF DEMS AND LIDAR DATA WERE PROVIDED BY KENT COUNTY.
3. ESTIMATED POTENTIOMETRIC SURFACE WAS DEVELOPED BASED ON MEASUREMENTS MADE IN GROUNDWATER MONITORING WELLS IN NOVEMBER 2019. GROUNDWATER ELEVATIONS WERE NOT MEASURED FROM RESIDENTIAL WATER SUPPLY WELLS.
4. WELL SCREEN ELEVATIONS PROVIDED IN FEET ABOVE MEAN SEA LEVEL, NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88). RESIDENTIAL WELL SCREEN ELEVATIONS AND BOREHOLE LITHOLOGY ELEVATIONS WERE CALCULATED USING WELL INFORMATION PROVIDED BY THE STATE OF MICHIGAN'S WELLOGIC DATABASE AND GROUND SURFACE ELEVATIONS OF THE CENTER OF THE PPN GENERATED FROM LIDAR DATA PROVIDED BY KENT COUNTY. ELEVATIONS ARE ROUNDED TO THE NEAREST FOOT.
5. MONITORING WELL SCREEN AQUIFER ZONES ARE DESIGNATED AS PERCHED, SHALLOW, OR DEEP. CONCENTRATIONS OF TOTAL PFAS AND PFOA+PFOS DEPICTED ARE MAXIMUM CONCENTRATIONS DETECTED AT THE SPECIFIED LOCATION.

OVERVIEW MAP



0 3,000 6,000 12,000
SCALE IN FEET

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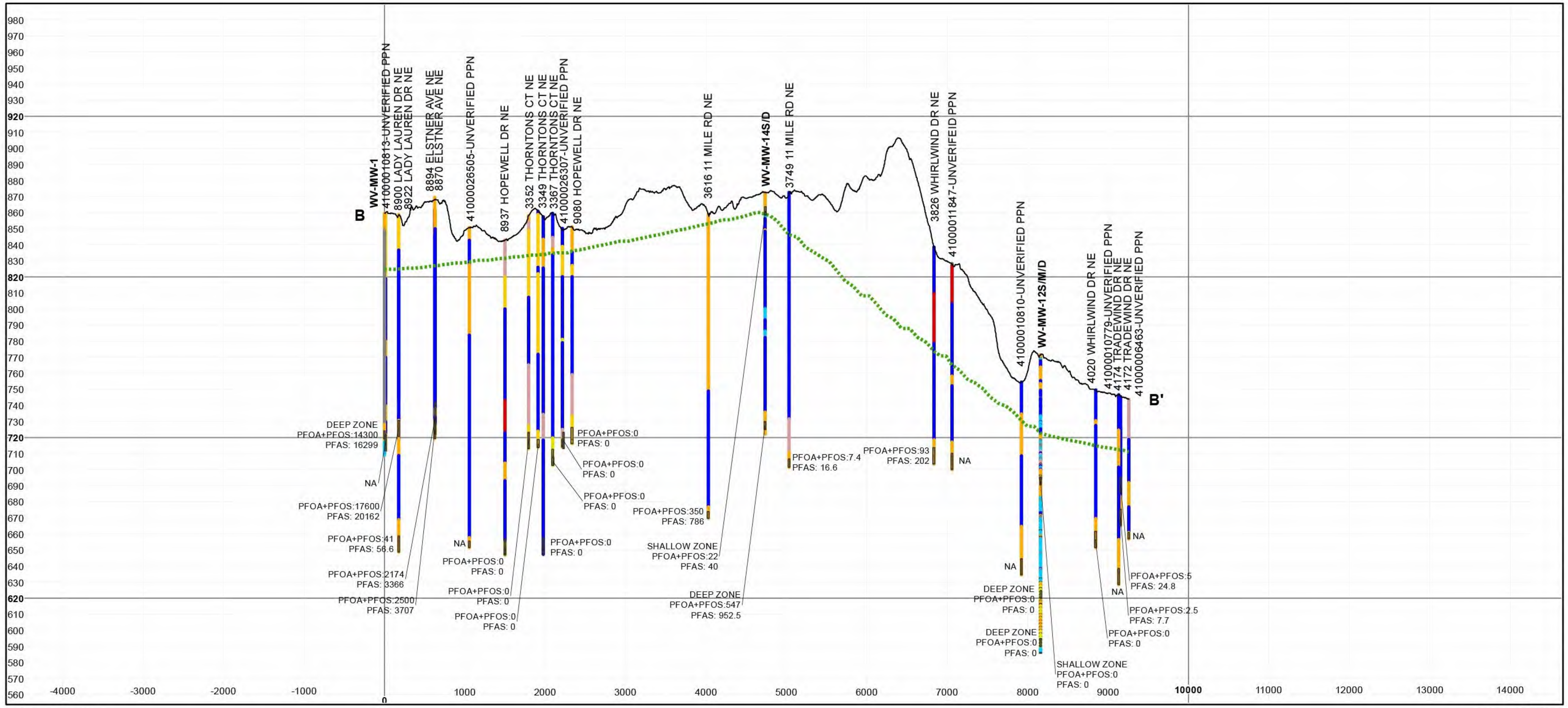
GRAND RAPIDS, MICHIGAN 49504

NORTH KENT STUDY AREA
GEOLOGICAL CROSS SECTION A-A'
AREA R-1 (19) RAP

PREPARED BY:		PREPARED FOR:	
GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		WN&J/WWW	
PROJ MGR: LMN	REVIEWED BY: MW	CHECKED BY: LMN	FIGURE
DESIGNED BY: JC	DRAWN BY: JC	SCALE: 1 in = 6,000 ft	6
DATE: 12/11/2020	PROJECT NO: 16.0062961.10	REVISION NO:	



CROSS SECTION LEGEND

WELL SCREEN

- PFOA+PFOS (ng/L)
  PFAS (ng/L)
  0 = NOT DETECTED
  NA = NOT AVAILABLE
- ESTIMATED POTENTIOMETRIC SURFACE (11/2019)
- GROUND SURFACE

BOREHOLE LITHOLOGY

- GRAVEL
- SAND AND GRAVEL
- SAND
- SAND/GRAVEL WITH CLAY/SILT
- CLAY/SILT WITH SAND/GRAVEL
- SILT
- CLAY AND SILT
- CLAY
- TOP SOIL
- NOT AVAILABLE

OVERVIEW MAP LEGEND

- PROPOSED INVESTIGATION MONITORING WELL
- PROPOSED INVESTIGATION / PERIMETER MONITORING WELL
- PROPOSED GSI PIEZOMETER
- PROPOSED PORE WATER SAMPLING LOCATION
- RESIDENTIAL WATER WELL
- MONITORING WELL
- CROSS SECTION LINE
- HIGHWAY
- PRIMARY COUNTY ROAD
- OTHER ROAD
- RIVER OR STREAM
- SURFACE WATER
- AREA 19
- APPROXIMATE HOUSE ST. DISPOSAL SITE BOUNDARY
- NORTH KENT LANDFILL

NOTES:

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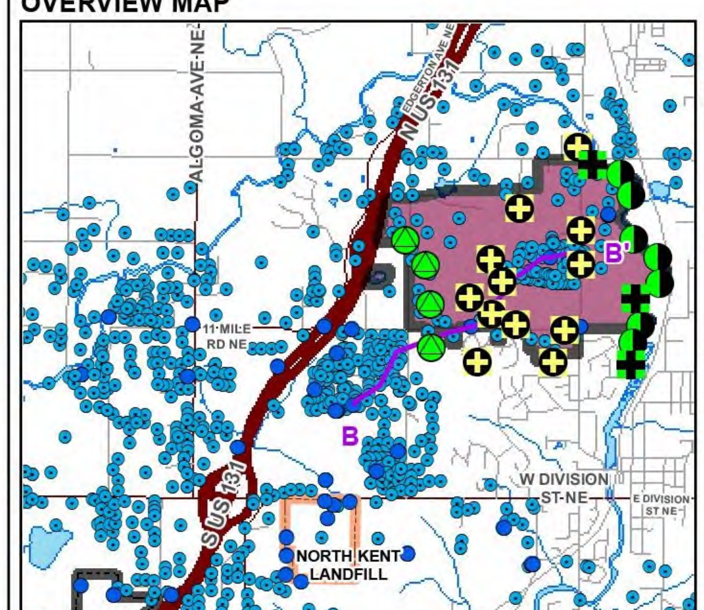
2. GROUND SURFACE ELEVATIONS ARE BASED ON DIGITAL RASTER FILES OF BARE EARTH DIGITAL ELEVATION MODELS (DEMS), GENERATED FROM LIDAR DATA WITH 1-METER HORIZONTAL ACCURACY AND 18.5-CENTIMETER VERTICAL ACCURACY. DIGITAL FILES OF DEMS AND LIDAR DATA WERE PROVIDED BY KENT COUNTY.
3. ESTIMATED POTENTIOMETRIC SURFACE WAS DEVELOPED BASED ON MEASUREMENTS MADE IN GROUNDWATER MONITORING WELLS IN NOVEMBER 2019. GROUNDWATER ELEVATIONS WERE NOT MEASURED FROM RESIDENTIAL WATER SUPPLY WELLS.
4. WELL SCREEN ELEVATIONS PROVIDED IN FEET ABOVE MEAN SEA LEVEL, NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88). RESIDENTIAL WELL SCREEN ELEVATIONS AND BOREHOLE LITHOLOGY ELEVATIONS WERE CALCULATED USING WELL INFORMATION PROVIDED BY THE STATE OF MICHIGAN'S WELLOGIC DATABASE AND GROUND SURFACE ELEVATIONS OF THE CENTER OF THE PPN GENERATED FROM LIDAR DATA PROVIDED BY KENT COUNTY. ELEVATIONS ARE ROUNDED TO THE NEAREST FOOT.
5. MONITORING WELL SCREEN AQUIFER ZONES ARE DESIGNATED AS PERCHED, SHALLOW, OR DEEP. CONCENTRATIONS OF TOTAL PFAS AND PFOA+PFOS DEPICTED ARE MAXIMUM CONCENTRATIONS DETECTED AT THE SPECIFIED LOCATION.

OVERVIEW MAP



N

0 3,000 6,000 12,000
SCALE IN FEET

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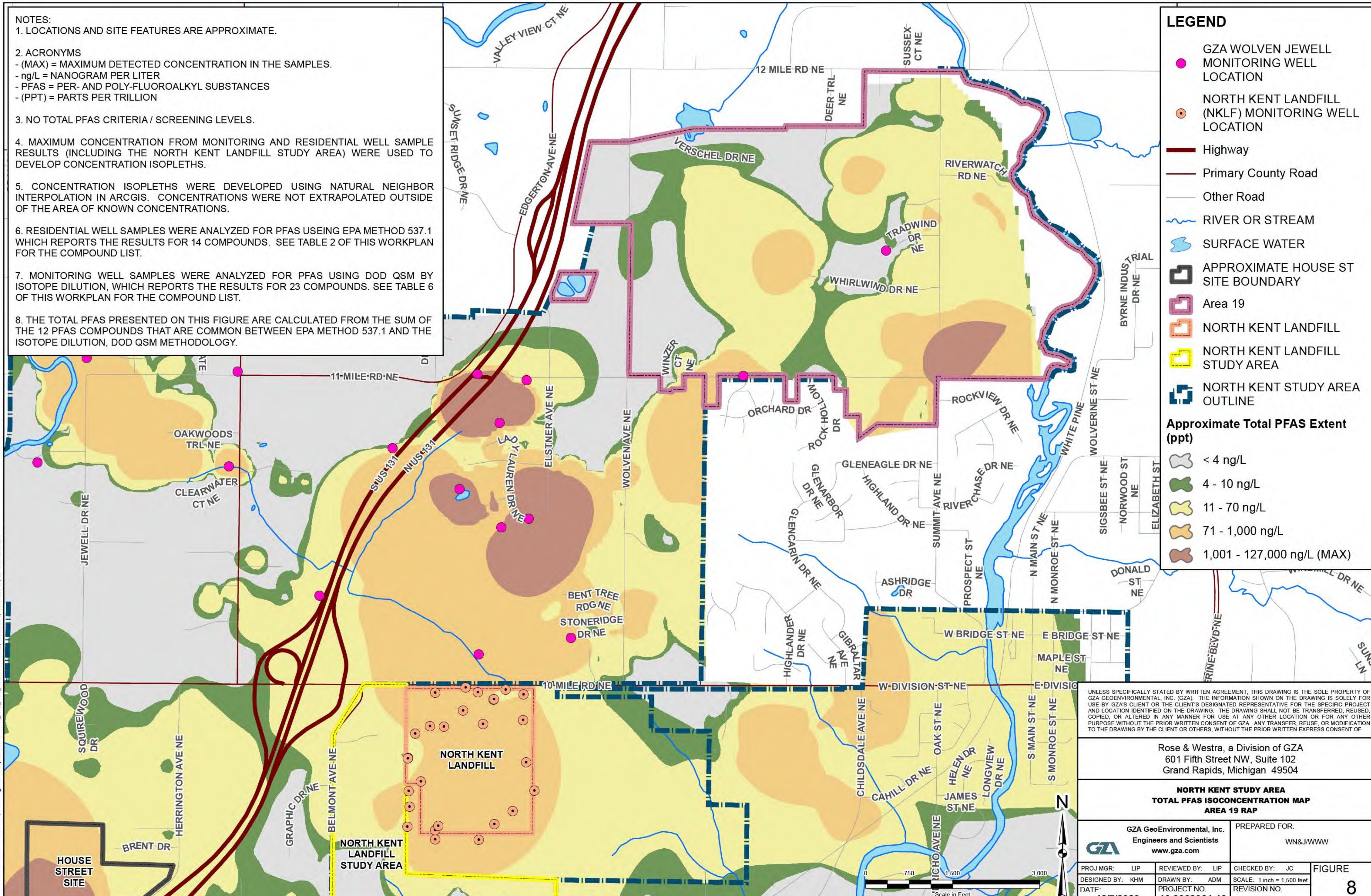
601 FIFTH STREET NW, SUITE 102
GRAND RAPIDS, MICHIGAN 49504

NORTH KENT STUDY AREA
GEOLOGICAL CROSS SECTION B-B'
AREA R-1 (19) RAP

PREPARED BY:		PREPARED FOR:	
GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		WN&J/WWW	
PROJ MGR: LMN	REVIEWED BY: MW	CHECKED BY: LMN	FIGURE
DESIGNED BY: JC	DRAWN BY: JC	SCALE: 1:72,000	7
DATE: 12/11/2020	PROJECT NO: 16.0062961.10	REVISION NO:	



NOTES:
1. LOCATIONS AND SITE FEATURES ARE APPROXIMATE.

2. ACRONYMS
- (MAX) = MAXIMUM DETECTED CONCENTRATION IN THE SAMPLES.
- ng/L = NANOGRAM PER LITER
- PFAS = PER- AND POLY-FLUOROALKYL SUBSTANCES
- (PPT) = PARTS PER TRILLION

3. NO TOTAL PFAS CRITERIA / SCREENING LEVELS.

4. MAXIMUM CONCENTRATION FROM MONITORING AND RESIDENTIAL WELL SAMPLE RESULTS (INCLUDING THE NORTH KENT LANDFILL STUDY AREA) WERE USED TO DEVELOP CONCENTRATION ISOPLETHS.

5. CONCENTRATION ISOPLETHS WERE DEVELOPED USING NATURAL NEIGHBOR INTERPOLATION IN ARCGIS. CONCENTRATIONS WERE NOT EXTRAPOLATED OUTSIDE OF THE AREA OF KNOWN CONCENTRATIONS.

6. RESIDENTIAL WELL SAMPLES WERE ANALYZED FOR PFAS USEING EPA METHOD 537.1 WHICH REPORTS THE RESULTS FOR 14 COMPOUNDS. SEE TABLE 2 OF THIS WORKPLAN FOR THE COMPOUND LIST.

7. MONITORING WELL SAMPLES WERE ANALYZED FOR PFAS USING DOD QSM BY ISOTOPE DILUTION, WHICH REPORTS THE RESULTS FOR 23 COMPOUNDS. SEE TABLE 6 OF THIS WORKPLAN FOR THE COMPOUND LIST.

8. THE TOTAL PFAS PRESENTED ON THIS FIGURE ARE CALCULATED FROM THE SUM OF THE 12 PFAS COMPOUNDS THAT ARE COMMON BETWEEN EPA METHOD 537.1 AND THE ISOTOPE DILUTION, DOD QSM METHODOLOGY.

LEGEND

- GZA WOLVEN JEWELL MONITORING WELL LOCATION
- NORTH KENT LANDFILL (NKLF) MONITORING WELL LOCATION
- Highway
- Primary County Road
- Other Road
- RIVER OR STREAM
- SURFACE WATER
- APPROXIMATE HOUSE ST SITE BOUNDARY
- Area 19
- NORTH KENT LANDFILL
- NORTH KENT LANDFILL STUDY AREA
- NORTH KENT STUDY AREA OUTLINE

Approximate Total PFAS Extent (ppt)

- < 4 ng/L
- 4 - 10 ng/L
- 11 - 70 ng/L
- 71 - 1,000 ng/L
- 1,001 - 127,000 ng/L (MAX)

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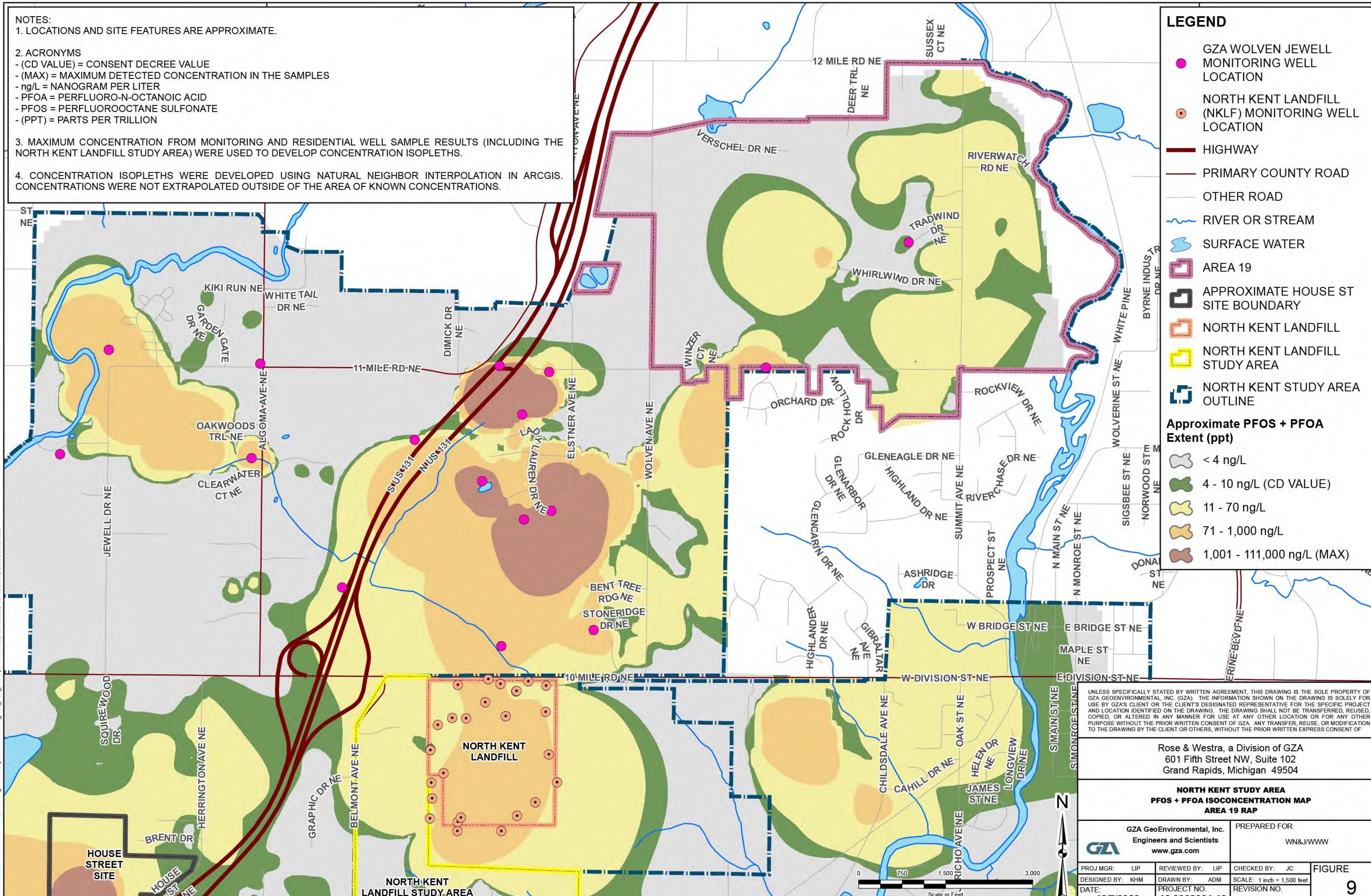
Grand Rapids, Michigan 49504

NORTH KENT STUDY AREA
TOTAL PFAS ISOCONCENTRATION MAP
AREA 19 RAP

GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR: WN&J/WWW

PROJ MGR: LIP	REVIEWED BY: LIP	CHECKED BY: JC	FIGURE
DESIGNED BY: KHM	DRAWN BY: ADM	SCALE: 1 inch = 1,500 feet	8
DATE: 12/7/2020	PROJECT NO. 16.0062961.10	REVISION NO.	


NOTES:
1. LOCATIONS AND SITE FEATURES ARE APPROXIMATE.
2. ACRONYMS
- (CD VALUE) = CONSENT DECREE VALUE
- (MAX) = MAXIMUM DETECTED CONCENTRATION IN THE SAMPLES
- ng/L = NANOGRAM PER LITER
- PFOA = PERFLUORO-N-OCTANOIC ACID
- PFOS = PERFLUOROOCTANE SULFONATE
- (PPT) = PARTS PER TRILLION
3. MAXIMUM CONCENTRATION FROM MONITORING AND RESIDENTIAL WELL SAMPLE RESULTS (INCLUDING THE NORTH KENT LANDFILL STUDY AREA) WERE USED TO DEVELOP CONCENTRATION ISOPLETHS.
4. CONCENTRATION ISOPLETHS WERE DEVELOPED USING NATURAL NEIGHBOR INTERPOLATION IN ARCGIS. CONCENTRATIONS WERE NOT EXTRAPOLATED OUTSIDE OF THE AREA OF KNOWN CONCENTRATIONS.
LEGEND
GZA WOLVEN JEWELL MONITORING WELL LOCATION
NORTH KENT LANDFILL (NKLF) MONITORING WELL LOCATION
HIGHWAY
PRIMARY COUNTY ROAD
OTHER ROAD
RIVER OR STREAM
SURFACE WATER
AREA 19
APPROXIMATE HOUSE ST SITE BOUNDARY
NORTH KENT LANDFILL
NORTH KENT LANDFILL STUDY AREA
NORTH KENT STUDY AREA OUTLINE
Approximate PFOS + PFOA Extent (ppt)
< 4 ng/L
4 - 10 ng/L (CD VALUE)
11 - 70 ng/L
71 - 1,000 ng/L
1,001 - 111,000 ng/L (MAX)
12 MILE RD NE
11 MILE RD NE
10 MILE RD NE
W DIVISION ST NE
E DIVISION ST NE
W BRIDGE ST NE
E BRIDGE ST NE
S US 131
N US 131
NORTH KENT LANDFILL
NORTH KENT LANDFILL STUDY AREA
HOUSE STREET SITE
UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF
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Grand Rapids, Michigan 49504
NORTH KENT STUDY AREA
PFOS + PFOA ISOCONCENTRATION MAP
AREA 19 RAP
GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com
PREPARED FOR:
WN&J/WWW
PROJ MGR: LIP
REVIEWED BY: LIP
CHECKED BY: JC
DESIGNED BY: KHM
DRAWN BY: ADM
SCALE: 1 inch = 1,500 feet
DATE: 12/7/2020
PROJECT NO. 16.0062961.10
REVISION NO.
FIGURE 9
0 750 1,500 3,000
Scale in Feet
© 2020 - GZA GeoEnvironmental, Inc.

NOTES:
1. LOCATIONS AND SITE FEATURES ARE APPROXIMATE.

2. ACRONYMS
- (CD VALUE) = CONSENT DECREE VALUE
- (MAX) = MAXIMUM DETECTED CONCENTRATION IN THE SAMPLES.
- ng/L = NANOGRAM PER LITER
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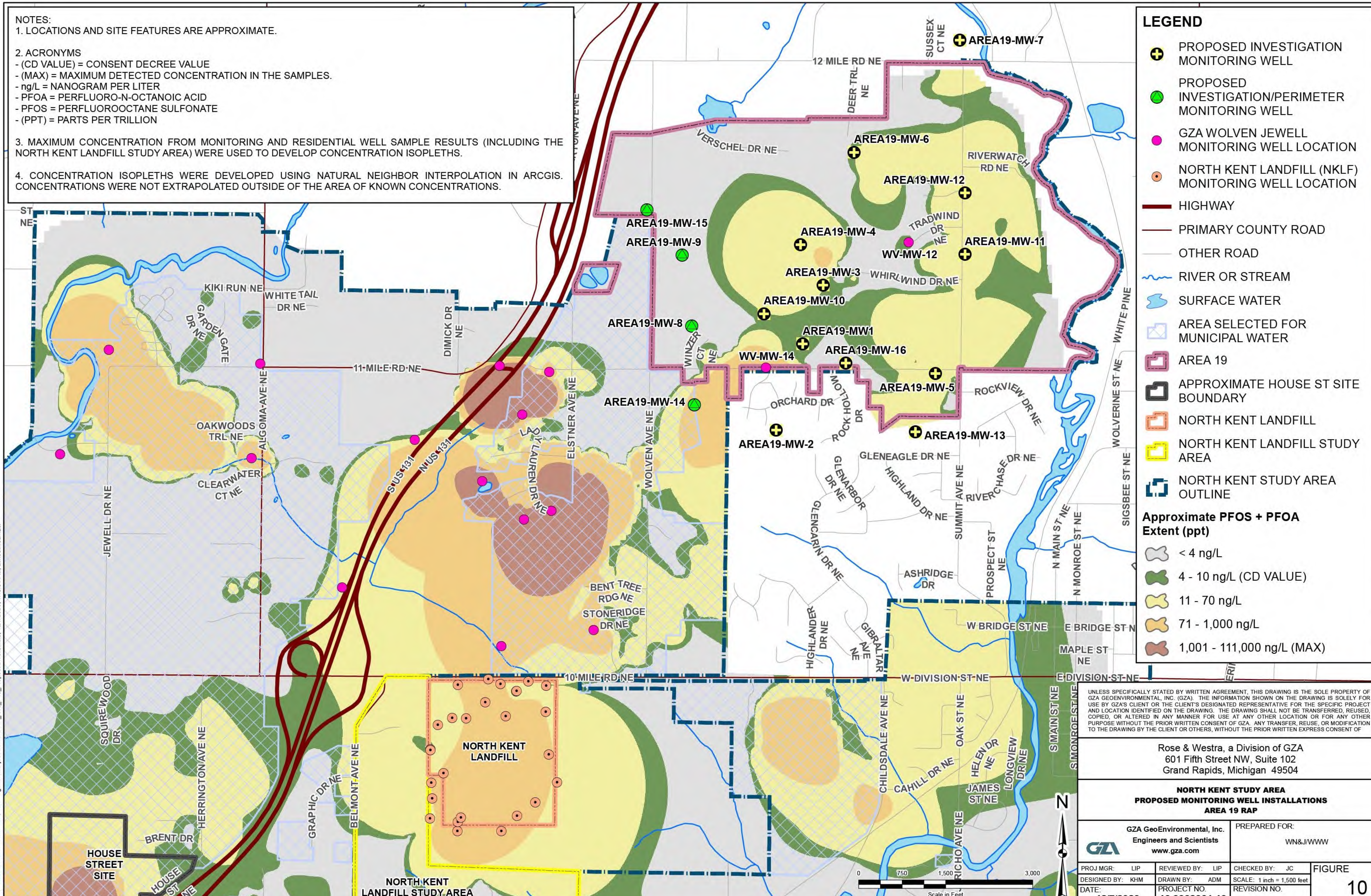
3. MAXIMUM CONCENTRATION FROM MONITORING AND RESIDENTIAL WELL SAMPLE RESULTS (INCLUDING THE NORTH KENT LANDFILL STUDY AREA) WERE USED TO DEVELOP CONCENTRATION ISOPLETHS.

4. CONCENTRATION ISOPLETHS WERE DEVELOPED USING NATURAL NEIGHBOR INTERPOLATION IN ARCGIS. CONCENTRATIONS WERE NOT EXTRAPOLATED OUTSIDE OF THE AREA OF KNOWN CONCENTRATIONS.



LEGEND

- PROPOSED INVESTIGATION MONITORING WELL
- PROPOSED INVESTIGATION/PERIMETER MONITORING WELL
- GZA WOLVEN JEWELL MONITORING WELL LOCATION
- NORTH KENT LANDFILL (NKLF) MONITORING WELL LOCATION
- HIGHWAY
- PRIMARY COUNTY ROAD
- OTHER ROAD
- RIVER OR STREAM
- SURFACE WATER
- AREA SELECTED FOR MUNICIPAL WATER
- AREA 19
- APPROXIMATE HOUSE ST SITE BOUNDARY
- NORTH KENT LANDFILL
- NORTH KENT LANDFILL STUDY AREA
- NORTH KENT STUDY AREA OUTLINE

Approximate PFOS + PFOA Extent (ppt)

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- 11 - 70 ng/L
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- 1,001 - 111,000 ng/L (MAX)

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NORTH KENT STUDY AREA
PROPOSED MONITORING WELL INSTALLATIONS
AREA 19 RAP

GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR: WN&J/WWW

PROJ MGR: LIP	REVIEWED BY: LIP	CHECKED BY: JC	FIGURE
DESIGNED BY: KHM	DRAWN BY: ADM	SCALE: 1 inch = 1,500 feet	10
DATE: 12/7/2020	PROJECT NO. 16.0062961.10	REVISION NO.	

APPENDIX A – 2019 GROUNDWATER SAMPLING SUPPLEMENTAL MEMORANDUM

1.0 INTRODUCTION

Since April 2017, Wolverine has voluntarily and proactively worked with EGLE, the Kent County Health Department (KCHD), and Michigan Department of Health and Human Services (MDHHS) to establish zones for drinking water well testing, provided alternate (bottled) water service, point of use (faucet) water filters, and point of entry (whole house) filter systems. As of December 2019, R&W/GZA has installed thirty-six (36) groundwater monitoring wells within the Wolven/Jewell Study Area as shown on **Figure 4** of the Draft Area 19 Response Activity Plan, North Kent Study Area, submitted to EGLE on June 18, 2020 (Draft Area 19 RAP [R&W/GZA, 2020]).

2.0 INVESTIGATION METHODOLOGY

The following sections summarize the groundwater monitoring activities conducted in 2019.

2.1 MONITORING WELL INSTALLATION

R&W/GZA retained drilling contractors to perform subsurface exploration and monitoring well installation to continue delineation of the extent of PFOA and PFOS both vertically and laterally in the NKSA. Thirty-six (36) groundwater monitoring wells have been installed in the Wolven/Jewell Area since 2017. Fifteen (15) of the groundwater monitoring wells have been installed since February 2019. At most of the locations, multi-depth cluster wells were installed. The borings were drilled using hollow stem auguring techniques. Soil samples were collected and logged every 5 feet. At certain locations VAP groundwater samples were collected every 10 feet in the saturated zone and submitted to an independent laboratory for the PFAS analysis using isotope dilution methodology in accordance with the most recent version of the DoD QSM procedures.

Monitoring well screen intervals were selected based on PFAS VAP sampling results and geological conditions. Each monitoring well was constructed of factory-slotted, 0.010-inch, 5-foot-long PVC screen (in a few cases, 10-foot), and flush-threaded well casing. The annular space surrounding the well screen was filled with sand filter pack to approximately 3 feet above the top of the well screen, followed by a one- to one-and-one-half-foot-thick hydrated bentonite seal. The remaining annulus was filled with cement and bentonite grout to approximately 1 foot below ground surface. The wells were finished with a steel protective casing set in a concrete pad. A locking expansion cap was placed in the top of the PVC casing. The NKSA-wide soil boring logs and well installation logs were included in the GSI RAP (R&W/GZA 2020). Static water level measurements are provided on **Table 4** of the Draft Area 19 RAP. See **Figure 4** of the Draft Area 19 RAP for the groundwater monitoring well and residential groundwater sampling locations.

Following installation, the newly installed wells were developed to remove sediment from the sand filter pack and well casing. The wells were developed using a 12-volt Mini-Typhoon® submersible pump equipped with dedicated tubing for each well. The pump was decontaminated between wells using a water and Alconox® wash with a water rinse. The wells were developed until the water ran clear. The development water was containerized and staged prior to proper disposal. The tubing and other disposable materials used during the well development were placed in a separate drum and stored for proper disposal.

2.2 GROUNDWATER SAMPLING

Groundwater sampling followed the low-flow purging and sampling procedures identified in the project QAPP approved by EGLE in December 2018 (R&W/GZA, 2018). The wells were purged using either a GeoTech Peristaltic Pump or a GeoTech Bladder Pump and control box. Static water levels in the monitoring wells were measured to maintain stabilized drawdowns during purging. Field indicator parameters, temperature, pH, dissolved oxygen, specific conductance, oxidation reduction potential, and turbidity were monitored using a YSI PRO and field turbidity meters in accordance with the low-flow sampling SOP in the project QAPP. Once the field parameters stabilized, a groundwater sample was collected by disconnecting the tubing from the flow-through cell and collecting the sample directly from the tubing.

Groundwater samples were collected in laboratory-supplied sample containers labeled with the well ID, sample time and date, and analytes. The samples were packed in coolers with ice and shipped to the laboratory under chain-of-custody control via overnight express shipping.

As the subsurface exploration and monitoring well installation progressed, the newly installed wells were added to the sampling list in the quarter following their installation and development.

Groundwater sampling was conducted quarterly throughout 2019. See **Table 1** below for sampling dates. The objective of the groundwater sampling was to provide data to evaluate water quality in the newly installed wells relative to historic, spatial, and temporal concentration trends.

Table 1. Quarterly Groundwater Sampling Dates, 2019

Sampling Round	Start Date	End Date	Number of Wells	Number of New Wells
Quarter 1	2/11/2019	2/21/2019	21	--
Quarter 2	4/30/2019	5/19/2019	29	8
Quarter 3	8/26/2019	9/4/2019	32	3
Quarter 4	11/5/2019	11/13/2019	36	4

Due to the well installation schedule all 36 wells were not sampled in all four quarters. **Table 2**, below, lists the wells that were sampled during Quarter 1 and those that were added during subsequent sampling rounds. Well construction information is provided in **Table 3** of the Area 19 RAP.

Table 2: Wolven/Jewell Study Area Well Additions

Quarter	Wells Sampled
Quarter 1	WV-MW-1 , WV-MW-2S , WV-MW-2D , WV-MW-3S , WV-MW-3D , WV-MW-4 , WV-MW-5S , WV-MW-5D , WV-MW-6S , WV-MW-6D , WV-MW-7S , WV-MW-7D , WV-MW-8S , WV-MW-8M , WV-MW-8D , WV-MW-9 , WV-MW-11S , WV-MW-11D , WV-MW-12S , WV-MW-12M , and WV-MW-12D
Quarter 2	Quarter 1 wells except MW-8D plus: WV-MW-7M , WV-MW-10S , WV-MW-10M , WV-MW-10D , WV-MW-13S , WV-MW-13M , WV-MW-13D , WV-MW-16S , and WV-MW-16D
Quarter 3	Quarter 2 wells plus: WV-MW-8D, WV-MW-14S, and WV-MW-14D
Quarter 4	Quarter 3 wells plus: WV-MW-15A, WV-MW-15B, WV-MW-15C, and WV-MW-15D

3.0 SITE SAMPLING RESULTS

Groundwater analytical results for PFAS are provided on **Table 6** of the Draft Area 19 RAP. The analytical reports and associated electronic data deliverables were previously provided to EGLE.

4.0 QA/QC

Investigative QA/QC procedures are outlined in the project QAPP approved by EGLE in December 2018 and subsequently revised. Selected data have or will be validated according to performance requirements and the QA/QC limits in Table D.1.1 of the project QAPP. In addition, R&W/GZA consulted the general guidance in the EPA Contract Laboratory Program National Functional Guidance for Organic and Inorganic Superfund Data Review and relevant analytical methods to assess data usability.

In R&W/GZA's opinion, the field and laboratory quality control results indicate that the sampling and analyses performed in generating the data described in this Report were generally consistent with the analytical methods and the project QAPP requirements. The project data are acceptable and suitable for site characterization purposes and consequently can be used for decision-making purposes. The limitations identified by the applied qualifiers should be considered when using the data.

5.0 REFERENCES

R&W/GZA. (2018). Quality Assurance Project Plan, Former Wolverine Tannery, House Street Disposal Area, and Wolven/Jewell Area, Per- and Polyfluoroalkyl Substances Investigation Program. Grand Rapids, MI: R&W/GZA.

R&W/GZA. (2020). Area 19 Response Activity Plan, North Kent Study Area. Submitted to EGLE June 18, 2020.

Attachment 1 – Laboratory Analytical Data

Report of Analysis

GZA GeoEnvironmental, Inc.
601 Fifth Street N.W., Suite 102
Grand Rapids, MI 49504
Attention: Loretta J. Powers

Project Name: 16.0062677.81

Project Number: 16.0062677.81

Lot Number:**UB16022**

Date Completed:03/05/2019

N. Saikaly

03/06/2019 3:01 PM
Approved and released by:
Project Manager: Nisreen Saikaly

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com

Case Narrative
GZA GeoEnvironmental, Inc.
Lot Number: UB16022

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 Shealy Environmental Services, Inc. ("Shealy") Quality Assurance Management Plan (QAMP), applicable Shealy standard operating procedures (SOPs), the 2003 NELAC standard, and Shealy policies. Additionally, the DoD QSM version 5.1 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 5.1 table B-15 and our PFAS SOP. DoD reporting conventions and qualifiers are not utilized in this data package.

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:

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,

$$Cs = \left(\frac{A_s}{A_{is}} - b\right) * \left(\frac{C_{is}}{a}\right)$$

Where:

A_s is peak response of target analyte in the sample
A_{is} is peak response of internal standard in the sample
C_s is concentration of target analyte in the sample
C_{is} is concentration of internal standard in the sample (1ng/mL)
a is the slope from the ICAL linear regression
b is the y-intercept from the ICAL linear regression

Internal standard response for 13C3-PFBA in the following sample exceeded the lower control limit: UB16022-007. The sample was re-analyzed with concurring results. Evidence of matrix interference is present; therefore, re-extraction was not performed. The original set of data has been reported.

Volatile Organic Compounds

Surrogate recovery for the following sample was outside the upper control limit: UB16022-002. This sample did not contain any target analytes; therefore, re-analysis was not performed.

The following sample submitted for volatiles analysis was received with insufficient preservation (pH 2): UB16022-009. The pH value of the sample were 4.

Nitrate-Nitrite

The matrix spike and matrix spike duplicate (MS/MSD) recoveries in batch 97767 were outside acceptance criteria. All other QC criteria for the batch was within acceptance criteria and method control limits. The MS/MSD recovery results are attributed to matrix interference. The associated sample results were reported and no corrective action was required.

Phosphorus

The MS/MSD recoveries in batch 98578 were outside acceptance criteria. All other QC criteria for the batch was within acceptance criteria and method control limits. The MS/MSD recovery results are attributed to matrix interference. The associated sample results were reported and no corrective action was required.

Sample Summary
GZA GeoEnvironmental, Inc.
Lot Number: UB16022

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	MW-WV-11D	Aqueous	02/14/2019 1045	02/16/2019
002	MW-WV-11S	Aqueous	02/14/2019 1055	02/16/2019
003	MW-WV-5D	Aqueous	02/14/2019 1445	02/16/2019
004	MW-WV-5S	Aqueous	02/14/2019 1610	02/16/2019
005	MW-WV-5D DUP	Aqueous	02/14/2019 1445	02/16/2019
006	FB-2/14	Aqueous	02/14/2019 1435	02/16/2019
007	MW-WV-3S	Aqueous	02/15/2019 1017	02/16/2019
008	MW-WV-3D	Aqueous	02/15/2019 1120	02/16/2019
009	MW-WV-8D	Aqueous	02/15/2019 1200	02/16/2019

(9 samples)

Detection Summary

GZA GeoEnvironmental, Inc.

Lot Number: UB16022

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	MW-WV-11D	Aqueous	Ammonia - N (gas	350.1	0.097	BJ	mg/L	8
001	MW-WV-11D	Aqueous	Chloride	300.0	28	B	mg/L	8
001	MW-WV-11D	Aqueous	Hardness (total)	SM 2340C-	320		mg/L	8
001	MW-WV-11D	Aqueous	Nitrate-Nitrite - N	353.2	0.015	J	mg/L	8
001	MW-WV-11D	Aqueous	Phosphorus	365.1	0.016	J	mg/L	8
001	MW-WV-11D	Aqueous	Sulfate	300.0	89		mg/L	8
001	MW-WV-11D	Aqueous	Sulfide	SM 4500-S2 F-	1.2		mg/L	8
001	MW-WV-11D	Aqueous	Acetone	8260B	3.6	J	ug/L	9
001	MW-WV-11D	Aqueous	Barium	200.8	53		ug/L	14
001	MW-WV-11D	Aqueous	Boron	200.8	21	J	ug/L	14
001	MW-WV-11D	Aqueous	Copper	200.8	1.9	J	ug/L	14
001	MW-WV-11D	Aqueous	Iron	200.8	910		ug/L	14
001	MW-WV-11D	Aqueous	Magnesium	200.8	19000		ug/L	14
001	MW-WV-11D	Aqueous	Sodium	200.8	4500		ug/L	14
002	MW-WV-11S	Aqueous	Chloride	300.0	50	B	mg/L	16
002	MW-WV-11S	Aqueous	Hardness (total)	SM 2340C-	300		mg/L	16
002	MW-WV-11S	Aqueous	Nitrate-Nitrite - N	353.2	0.63		mg/L	16
002	MW-WV-11S	Aqueous	Phosphorus	365.1	0.010	J	mg/L	16
002	MW-WV-11S	Aqueous	Sulfate	300.0	14		mg/L	16
002	MW-WV-11S	Aqueous	Sulfide	SM 4500-S2 F-	1.0		mg/L	16
002	MW-WV-11S	Aqueous	Acetone	8260B	4.3	J	ug/L	17
002	MW-WV-11S	Aqueous	Aluminum	200.8	13	J	ug/L	22
002	MW-WV-11S	Aqueous	Barium	200.8	43		ug/L	22
002	MW-WV-11S	Aqueous	Boron	200.8	25	J	ug/L	22
002	MW-WV-11S	Aqueous	Iron	200.8	140		ug/L	22
002	MW-WV-11S	Aqueous	Magnesium	200.8	27000		ug/L	22
002	MW-WV-11S	Aqueous	Sodium	200.8	22000		ug/L	22
003	MW-WV-5D	Aqueous	Chloride	300.0	55	B	mg/L	24
003	MW-WV-5D	Aqueous	Hardness (total)	SM 2340C-	330		mg/L	24
003	MW-WV-5D	Aqueous	Nitrate-Nitrite - N	353.2	5.0		mg/L	24
003	MW-WV-5D	Aqueous	Phosphorus	365.1	0.013	J	mg/L	24
003	MW-WV-5D	Aqueous	Sulfate	300.0	13		mg/L	24
003	MW-WV-5D	Aqueous	Acetone	8260B	4.0	J	ug/L	25
003	MW-WV-5D	Aqueous	Barium	200.8	20		ug/L	30
003	MW-WV-5D	Aqueous	Boron	200.8	30	J	ug/L	30
003	MW-WV-5D	Aqueous	Iron	200.8	150		ug/L	30
003	MW-WV-5D	Aqueous	Magnesium	200.8	26000		ug/L	30
003	MW-WV-5D	Aqueous	Sodium	200.8	31000		ug/L	30
003	MW-WV-5D	Aqueous	PFBS	537 Modified-	7.7		ng/L	31
003	MW-WV-5D	Aqueous	PFOA	537 Modified-	2.7		ng/L	31
004	MW-WV-5S	Aqueous	Chloride	300.0	65	B	mg/L	32
004	MW-WV-5S	Aqueous	Hardness (total)	SM 2340C-	330		mg/L	32
004	MW-WV-5S	Aqueous	Nitrate-Nitrite - N	353.2	5.1		mg/L	32
004	MW-WV-5S	Aqueous	Phosphorus	365.1	0.0083	J	mg/L	32
004	MW-WV-5S	Aqueous	Sulfate	300.0	13		mg/L	32

Detection Summary (Continued)

Lot Number: UB16022

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
004	MW-WV-5S	Aqueous	Acetone	8260B	3.1	J	ug/L	33
004	MW-WV-5S	Aqueous	Aluminum	200.8	200		ug/L	38
004	MW-WV-5S	Aqueous	Barium	200.8	21		ug/L	38
004	MW-WV-5S	Aqueous	Boron	200.8	26	J	ug/L	38
004	MW-WV-5S	Aqueous	Iron	200.8	460		ug/L	38
004	MW-WV-5S	Aqueous	Lead	200.8	0.25	J	ug/L	38
004	MW-WV-5S	Aqueous	Magnesium	200.8	27000		ug/L	38
004	MW-WV-5S	Aqueous	Sodium	200.8	38000		ug/L	38
004	MW-WV-5S	Aqueous	Titanium	200.8	6.1		ug/L	38
004	MW-WV-5S	Aqueous	Zinc	200.8	3.2	J	ug/L	38
004	MW-WV-5S	Aqueous	PFBS	537 Modified-	8.8		ng/L	39
004	MW-WV-5S	Aqueous	PFHxA	537 Modified-	4.0		ng/L	39
004	MW-WV-5S	Aqueous	PFOA	537 Modified-	5.0		ng/L	39
005	MW-WV-5D DUP	Aqueous	Chloride	300.0	55	B	mg/L	40
005	MW-WV-5D DUP	Aqueous	Hardness (total)	SM 2340C-	330		mg/L	40
005	MW-WV-5D DUP	Aqueous	Nitrate-Nitrite - N	353.2	5.0		mg/L	40
005	MW-WV-5D DUP	Aqueous	Sulfate	300.0	13		mg/L	40
005	MW-WV-5D DUP	Aqueous	Acetone	8260B	2.3	J	ug/L	41
005	MW-WV-5D DUP	Aqueous	Barium	200.8	20		ug/L	46
005	MW-WV-5D DUP	Aqueous	Boron	200.8	30	J	ug/L	46
005	MW-WV-5D DUP	Aqueous	Iron	200.8	150		ug/L	46
005	MW-WV-5D DUP	Aqueous	Magnesium	200.8	26000		ug/L	46
005	MW-WV-5D DUP	Aqueous	Sodium	200.8	31000		ug/L	46
005	MW-WV-5D DUP	Aqueous	PFBS	537 Modified-	7.4		ng/L	47
005	MW-WV-5D DUP	Aqueous	PFHxS	537 Modified-	3.8		ng/L	47
005	MW-WV-5D DUP	Aqueous	PFOA	537 Modified-	2.7		ng/L	47
007	MW-WV-3S	Aqueous	Ammonia - N (gas	350.1	1.6	B	mg/L	49
007	MW-WV-3S	Aqueous	Chloride	300.0	24	B	mg/L	49
007	MW-WV-3S	Aqueous	Hardness (total)	SM 2340C-	68		mg/L	49
007	MW-WV-3S	Aqueous	Nitrate-Nitrite - N	353.2	0.058		mg/L	49
007	MW-WV-3S	Aqueous	Phosphorus	365.1	0.078		mg/L	49
007	MW-WV-3S	Aqueous	Sulfate	300.0	0.34	J	mg/L	49
007	MW-WV-3S	Aqueous	Sulfide	SM 4500-S2 F-	1.1		mg/L	49
007	MW-WV-3S	Aqueous	Acetone	8260B	4.6	J	ug/L	50
007	MW-WV-3S	Aqueous	Aluminum	200.8	670		ug/L	55
007	MW-WV-3S	Aqueous	Barium	200.8	59		ug/L	55
007	MW-WV-3S	Aqueous	Boron	200.8	20	J	ug/L	55
007	MW-WV-3S	Aqueous	Chromium	200.8	2.1	J	ug/L	55
007	MW-WV-3S	Aqueous	Iron	200.8	4000		ug/L	55
007	MW-WV-3S	Aqueous	Magnesium	200.8	5800		ug/L	55
007	MW-WV-3S	Aqueous	Nickel	200.8	1.7	J	ug/L	55
007	MW-WV-3S	Aqueous	Sodium	200.8	8900		ug/L	55
007	MW-WV-3S	Aqueous	Titanium	200.8	9.5		ug/L	55
007	MW-WV-3S	Aqueous	PFBS	537 Modified-	6.0		ng/L	56
007	MW-WV-3S	Aqueous	PFHpS	537 Modified-	4.4		ng/L	56
007	MW-WV-3S	Aqueous	PFPeS	537 Modified-	5.2		ng/L	56
007	MW-WV-3S	Aqueous	PFHxS	537 Modified-	18		ng/L	56
007	MW-WV-3S	Aqueous	PFBA	537 Modified-	8.0		ng/L	56

Detection Summary (Continued)

Lot Number: UB16022

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
007	MW-WV-3S	Aqueous	PFHpA	537 Modified-	9.7		ng/L	56
007	MW-WV-3S	Aqueous	PFHxA	537 Modified-	7.0		ng/L	56
007	MW-WV-3S	Aqueous	PFOA	537 Modified-	82		ng/L	56
007	MW-WV-3S	Aqueous	PFOS	537 Modified-	150		ng/L	56
008	MW-WV-3D	Aqueous	Ammonia - N (gas	350.1	0.041	BJ	mg/L	57
008	MW-WV-3D	Aqueous	Chloride	300.0	62	B	mg/L	57
008	MW-WV-3D	Aqueous	Hardness (total)	SM 2340C-	270		mg/L	57
008	MW-WV-3D	Aqueous	Nitrate-Nitrite - N	353.2	2.2		mg/L	57
008	MW-WV-3D	Aqueous	Phosphorus	365.1	0.0060	J	mg/L	57
008	MW-WV-3D	Aqueous	Sulfate	300.0	11		mg/L	57
008	MW-WV-3D	Aqueous	Acetone	8260B	3.5	J	ug/L	58
008	MW-WV-3D	Aqueous	Barium	200.8	25		ug/L	63
008	MW-WV-3D	Aqueous	Boron	200.8	16	J	ug/L	63
008	MW-WV-3D	Aqueous	Iron	200.8	140		ug/L	63
008	MW-WV-3D	Aqueous	Magnesium	200.8	23000		ug/L	63
008	MW-WV-3D	Aqueous	Nickel	200.8	1.3	J	ug/L	63
008	MW-WV-3D	Aqueous	Sodium	200.8	25000		ug/L	63
008	MW-WV-3D	Aqueous	PFBS	537 Modified-	6.0		ng/L	64
008	MW-WV-3D	Aqueous	PFHxS	537 Modified-	4.0		ng/L	64
009	MW-WV-8D	Aqueous	Ammonia - N (gas	350.1	0.31	B	mg/L	65
009	MW-WV-8D	Aqueous	Chloride	300.0	37	B	mg/L	65
009	MW-WV-8D	Aqueous	Hardness (total)	SM 2340C-	230		mg/L	65
009	MW-WV-8D	Aqueous	Nitrate-Nitrite - N	353.2	0.27		mg/L	65
009	MW-WV-8D	Aqueous	Phosphorus	365.1	0.023	J	mg/L	65
009	MW-WV-8D	Aqueous	Sulfate	300.0	29		mg/L	65
009	MW-WV-8D	Aqueous	bis(2-Ethylhexyl)phthalate	8270D	0.61	J	ug/L	68
009	MW-WV-8D	Aqueous	Aluminum	200.8	440		ug/L	71
009	MW-WV-8D	Aqueous	Arsenic	200.8	1.8	J	ug/L	71
009	MW-WV-8D	Aqueous	Barium	200.8	68		ug/L	71
009	MW-WV-8D	Aqueous	Boron	200.8	28	J	ug/L	71
009	MW-WV-8D	Aqueous	Iron	200.8	600		ug/L	71
009	MW-WV-8D	Aqueous	Magnesium	200.8	22000		ug/L	71
009	MW-WV-8D	Aqueous	Molybdenum	200.8	4.7	J	ug/L	71
009	MW-WV-8D	Aqueous	Sodium	200.8	11000		ug/L	71
009	MW-WV-8D	Aqueous	Titanium	200.8	16		ug/L	71
009	MW-WV-8D	Aqueous	Zinc	200.8	5.9	J	ug/L	71
009	MW-WV-8D	Aqueous	PFOA	537 Modified-	4.8		ng/L	72

(130 detections)

Inorganic non-metals

Client: **GZA GeoEnvironmental, Inc.**	Laboratory ID: **UB16022-001**
Description: **MW-WV-11D**	Matrix: **Aqueous**
Date Sampled: **02/14/2019 1045**	
Date Received: **02/16/2019**	

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	350.1	(Ammonia - N) 350.1	1	02/25/2019 1643	DMA		98613
1		(Chloride) 300.0	1	02/19/2019 2006	SLU		98109
1	10-204-00-1-X	(Cyanide - To) SM 4500-CN E-	1	02/26/2019 1517	MSG	02/26/2019 1135	98683
1		(Hardness (to) SM 2340C-2011	1	02/25/2019 1817	KFE		98653
1		(Nitrate-Nitr) 353.2	1	02/16/2019 1756	MDD		97767
1		(Phosphorus) 365.1	1	02/25/2019 1621	DMA	02/25/2019 1047	98578
1		(Sulfate) 300.0	1	02/19/2019 2006	SLU		98111
1		(Sulfide) SM 4500-S2 F-2011	1	02/18/2019 1716	HET		97966

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Ammonia - N (gas diffusion)		**350.1**	**0.097**	**BJ**	**0.10**	**0.020**	**mg/L**	**1**
Chloride		**300.0**	**28**	**B**	**1.0**	**0.20**	**mg/L**	**1**
Cyanide - Total	57-12-5	SM 4500-CN E-	ND		0.010	0.010	mg/L	1
Hardness (total)		**SM 2340C-**	**320**		**10**	**2.0**	**mg/L**	**1**
Nitrate-Nitrite - N		**353.2**	**0.015**	**J**	**0.020**	**0.0015**	**mg/L**	**1**
Phosphorus	**7723-14-0**	**365.1**	**0.016**	**J**	**0.050**	**0.0050**	**mg/L**	**1**
Sulfate		**300.0**	**89**		**1.0**	**0.20**	**mg/L**	**1**
Sulfide	**18496-25-8**	**SM 4500-S2 F-**	**1.2**		**1.0**	**1.0**	**mg/L**	**1**

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

Volatile Organic Compounds by GC/MS

Client: **GZA GeoEnvironmental, Inc.**	Laboratory ID: **UB16022-001**
Description: **MW-WV-11D**	Matrix: **Aqueous**
Date Sampled: **02/14/2019 1045**	
Date Received: **02/16/2019**	

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	02/21/2019 1746	BWS		98299

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Acetone	**67-64-1**	**8260B**	**3.6**	**J**	**20**	**2.0**	**ug/L**	**1**
Benzene	71-43-2	8260B	ND		1.0	0.40	ug/L	1
Bromodichloromethane	75-27-4	8260B	ND		1.0	0.40	ug/L	1
Bromoform	75-25-2	8260B	ND		1.0	0.40	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		2.0	0.40	ug/L	1
2-Butanone (MEK)	78-93-3	8260B	ND		10	2.0	ug/L	1
Carbon disulfide	75-15-0	8260B	ND		1.0	0.40	ug/L	1
Carbon tetrachloride	56-23-5	8260B	ND		1.0	0.40	ug/L	1
Chlorobenzene	108-90-7	8260B	ND		1.0	0.40	ug/L	1
Chloroethane	75-00-3	8260B	ND		2.0	0.40	ug/L	1
Chloroform	67-66-3	8260B	ND		1.0	0.40	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		1.0	0.50	ug/L	1
Cyclohexane	110-82-7	8260B	ND		1.0	0.40	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260B	ND		1.0	0.40	ug/L	1
Dibromochloromethane	124-48-1	8260B	ND		1.0	0.40	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260B	ND		1.0	0.40	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		1.0	0.40	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260B	ND		1.0	0.40	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260B	ND		1.0	0.40	ug/L	1
Dichlorodifluoromethane	75-71-8	8260B	ND		2.0	0.60	ug/L	1
1,1-Dichloroethane	75-34-3	8260B	ND		1.0	0.40	ug/L	1
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.40	ug/L	1
1,1-Dichloroethene	75-35-4	8260B	ND		1.0	0.40	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260B	ND		1.0	0.40	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260B	ND		1.0	0.40	ug/L	1
1,2-Dichloropropane	78-87-5	8260B	ND		1.0	0.40	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		1.0	0.40	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		1.0	0.40	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		1.0	0.40	ug/L	1
2-Hexanone	591-78-6	8260B	ND		10	2.0	ug/L	1
Isopropylbenzene	98-82-8	8260B	ND		1.0	0.40	ug/L	1
Methyl acetate	79-20-9	8260B	ND		1.0	0.40	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		1.0	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		10	2.0	ug/L	1
Methylcyclohexane	108-87-2	8260B	ND		5.0	0.40	ug/L	1
Methylene chloride	75-09-2	8260B	ND		1.0	0.40	ug/L	1
Styrene	100-42-5	8260B	ND		1.0	0.41	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		1.0	0.40	ug/L	1
Tetrachloroethene	127-18-4	8260B	ND		1.0	0.40	ug/L	1
Toluene	108-88-3	8260B	ND		1.0	0.40	ug/L	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	8260B	ND		1.0	0.42	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260B	ND		1.0	0.40	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		1.0	0.40	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		1.0	0.40	ug/L	1

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

Volatile Organic Compounds by GC/MS

Client: **GZA GeoEnvironmental, Inc.**	Laboratory ID: **UB16022-001**
Description: **MW-WV-11D**	Matrix: **Aqueous**
Date Sampled: **02/14/2019 1045**	
Date Received: **02/16/2019**	

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	02/21/2019 1746	BWS		98299

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Trichloroethene	79-01-6	8260B	ND		1.0	0.40	ug/L	1
Trichlorofluoromethane	75-69-4	8260B	ND		1.0	0.40	ug/L	1
Vinyl chloride	75-01-4	8260B	ND		1.0	0.40	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.40	ug/L	1
m+p - Xylenes	179601-23-1	8260B	ND		1.0	0.40	ug/L	1
o - Xylenes	95-47-6	8260B	ND		1.0	0.40	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		87	70-130
Bromofluorobenzene		99	70-130
Toluene-d8		99	70-130

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

Semivolatile Organic Compounds by GC/MS

Client: **GZA GeoEnvironmental, Inc.** Laboratory ID: **UB16022-001**
Description: **MW-WV-11D** Matrix: **Aqueous**
Date Sampled: **02/14/2019 1045**
Date Received: **02/16/2019**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3520C	8270D	1	02/21/2019 1542	CMP2	02/18/2019 1401	97888

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Acenaphthene	83-32-9	8270D	ND		0.20	0.20	ug/L	1
Acenaphthylene	208-96-8	8270D	ND		0.20	0.20	ug/L	1
Acetophenone	98-86-2	8270D	ND		0.80	0.50	ug/L	1
Anthracene	120-12-7	8270D	ND		0.20	0.20	ug/L	1
Atrazine	1912-24-9	8270D	ND		0.80	0.50	ug/L	1
Benzidine	92-87-5	8270D	ND		20	1.0	ug/L	1
Benzo(a)anthracene	56-55-3	8270D	ND		0.20	0.20	ug/L	1
Benzo(a)pyrene	50-32-8	8270D	ND		0.20	0.20	ug/L	1
Benzo(b)fluoranthene	205-99-2	8270D	ND		0.20	0.20	ug/L	1
Benzo(g,h,i)perylene	191-24-2	8270D	ND		0.20	0.20	ug/L	1
Benzo(k)fluoranthene	207-08-9	8270D	ND		0.20	0.20	ug/L	1
Butyl benzyl phthalate	85-68-7	8270D	ND		0.80	0.50	ug/L	1
Caprolactam	105-60-2	8270D	ND		1.6	1.0	ug/L	1
Carbazole	86-74-8	8270D	ND		0.80	0.50	ug/L	1
4-Chloro-3-methyl phenol	59-50-7	8270D	ND		0.80	0.50	ug/L	1
bis(2-Chloroethyl)ether	111-44-4	8270D	ND		0.80	0.50	ug/L	1
2-Chloronaphthalene	91-58-7	8270D	ND		0.80	0.50	ug/L	1
2-Chlorophenol	95-57-8	8270D	ND		0.80	0.50	ug/L	1
Chrysene	218-01-9	8270D	ND		0.20	0.20	ug/L	1
Dibenzo(a,h)anthracene	53-70-3	8270D	ND		0.20	0.20	ug/L	1
Dibenzofuran	132-64-9	8270D	ND		0.80	0.50	ug/L	1
3,3'-Dichlorobenzidine	91-94-1	8270D	ND		0.80	1.8	ug/L	1
2,4-Dichlorophenol	120-83-2	8270D	ND		1.6	1.0	ug/L	1
Diethylphthalate	84-66-2	8270D	ND		0.80	0.50	ug/L	1
Dimethyl phthalate	131-11-3	8270D	ND		0.80	0.50	ug/L	1
2,4-Dimethylphenol	105-67-9	8270D	ND		0.80	0.48	ug/L	1
Di-n-butyl phthalate	84-74-2	8270D	ND		0.80	0.50	ug/L	1
4,6-Dinitro-2-methylphenol	534-52-1	8270D	ND		4.0	1.0	ug/L	1
2,4-Dinitrotoluene	121-14-2	8270D	ND		1.6	0.50	ug/L	1
Di-n-octylphthalate	117-84-0	8270D	ND		0.80	0.50	ug/L	1
1,2-Diphenylhydrazine(as azobenzene)	103-33-3	8270D	ND		0.80	0.50	ug/L	1
bis(2-Ethylhexyl)phthalate	117-81-7	8270D	ND		4.0	0.50	ug/L	1
Fluoranthene	206-44-0	8270D	ND		0.20	0.20	ug/L	1
Fluorene	86-73-7	8270D	ND		0.20	0.20	ug/L	1
Hexachlorobenzene	118-74-1	8270D	ND		0.80	0.50	ug/L	1
Hexachlorobutadiene	87-68-3	8270D	ND		0.80	0.50	ug/L	1
Hexachlorocyclopentadiene	77-47-4	8270D	ND		4.0	2.0	ug/L	1
Hexachloroethane	67-72-1	8270D	ND		0.80	0.31	ug/L	1
Indeno(1,2,3-c,d)pyrene	193-39-5	8270D	ND		0.20	0.20	ug/L	1
Isophorone	78-59-1	8270D	ND		0.80	0.50	ug/L	1
2-Methylnaphthalene	91-57-6	8270D	ND		0.20	0.20	ug/L	1
2-Methylphenol	95-48-7	8270D	ND		0.80	0.21	ug/L	1
3+4-Methylphenol	106-44-5	8270D	ND		0.80	1.5	ug/L	1
Naphthalene	91-20-3	8270D	ND		0.20	0.20	ug/L	1

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

Semivolatile Organic Compounds by GC/MS

Client: **GZA GeoEnvironmental, Inc.**
Laboratory ID: **UB16022-001**
Description: **MW-WV-11D**
Matrix: **Aqueous**
Date Sampled: **02/14/2019 1045**
Date Received: **02/16/2019**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3520C	8270D	1	02/21/2019 1542	CMP2	02/18/2019 1401	97888

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Nitrobenzene	98-95-3	8270D	ND		0.80	0.55	ug/L	1
2-Nitrophenol	88-75-5	8270D	ND		0.80	1.0	ug/L	1
N-Nitrosodi-n-propylamine	621-64-7	8270D	ND		0.80	0.50	ug/L	1
N-Nitrosodiphenylamine (Diphenylamine)	86-30-6	8270D	ND		0.80	0.50	ug/L	1
Pentachlorophenol	87-86-5	8270D	ND		4.0	2.0	ug/L	1
Phenanthrene	85-01-8	8270D	ND		0.20	0.20	ug/L	1
Phenol	108-95-2	8270D	ND		0.80	0.50	ug/L	1
Pyrene	129-00-0	8270D	ND		0.20	0.20	ug/L	1
2,4,5-Trichlorophenol	95-95-4	8270D	ND		0.80	0.50	ug/L	1
2,4,6-Trichlorophenol	88-06-2	8270D	ND		0.80	0.50	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
2-Fluorobiphenyl		49	37-129
2-Fluorophenol		30	24-127
Nitrobenzene-d5		53	38-127
Phenol-d5		44	28-128
Terphenyl-d14		74	10-148
2,4,6-Tribromophenol		49	35-144

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

Client: **GZA GeoEnvironmental, Inc.**		Laboratory ID: **UB16022-001**	
Description: **MW-WV-11D**		Matrix: **Aqueous**	
Date Sampled: **02/14/2019 1045**			
Date Received: **02/16/2019**			

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		7470A	1	02/21/2019 1808	JMH	02/21/2019 1246	98268

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Mercury	7439-97-6	7470A	ND		0.00020	0.000091	mg/L	1

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ICP-MS

Client: **GZA GeoEnvironmental, Inc.**	Laboratory ID: **UB16022-001**
Description: **MW-WV-11D**	Matrix: **Aqueous**
Date Sampled: **02/14/2019 1045**	
Date Received: **02/16/2019**	

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.2	200.8	1	02/20/2019 0742	BNW	02/19/2019 1041	97985

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Aluminum	7429-90-5	200.8	ND		40	10	ug/L	1
Antimony	7440-36-0	200.8	ND		2.0	0.50	ug/L	1
Arsenic	7440-38-2	200.8	ND		2.0	1.3	ug/L	1
Barium	**7440-39-3**	**200.8**	**53**		**5.0**	**1.3**	**ug/L**	**1**
Beryllium	7440-41-7	200.8	ND		0.40	0.15	ug/L	1
Boron	**7440-42-8**	**200.8**	**21**	**J**	**50**	**6.3**	**ug/L**	**1**
Cadmium	7440-43-9	200.8	ND		0.50	0.13	ug/L	1
Chromium	7440-47-3	200.8	ND		5.0	1.3	ug/L	1
Cobalt	7440-48-4	200.8	ND		5.0	1.3	ug/L	1
Copper	**7440-50-8**	**200.8**	**1.9**	**J**	**5.0**	**1.3**	**ug/L**	**1**
Iron	**7439-89-6**	**200.8**	**910**		**50**	**13**	**ug/L**	**1**
Lead	7439-92-1	200.8	ND		1.0	0.25	ug/L	1
Magnesium	**7439-95-4**	**200.8**	**19000**		**400**	**50**	**ug/L**	**1**
Molybdenum	7439-98-7	200.8	ND		10	2.5	ug/L	1
Nickel	7440-02-0	200.8	ND		5.0	1.3	ug/L	1
Selenium	7782-49-2	200.8	ND		5.0	1.3	ug/L	1
Silver	7440-22-4	200.8	ND		1.0	0.25	ug/L	1
Sodium	**7440-23-5**	**200.8**	**4500**		**400**	**150**	**ug/L**	**1**
Thallium	7440-28-0	200.8	ND		0.50	0.15	ug/L	1
Titanium	7440-32-6	200.8	ND		5.0	1.3	ug/L	1
Vanadium	7440-62-2	200.8	ND		5.0	2.5	ug/L	1
Zinc	7440-66-6	200.8	ND		10	2.5	ug/L	1

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PFAS by LC/MS/MS

Client: **GZA GeoEnvironmental, Inc.**
Laboratory ID: **UB16022-001**
Description: **MW-WV-11D**
Matrix: **Aqueous**
Date Sampled: **02/14/2019 1045**
Date Received: **02/16/2019**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537 MOD	537 Modified-ID	1	02/28/2019 0014	SES	02/25/2019 1033	98558

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	537 Modified-	ND		3.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	537 Modified-	ND		3.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	537 Modified-	ND		3.7	ng/L	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	537 Modified-	ND		7.3	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	537 Modified-	ND		3.7	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	537 Modified-	ND		3.7	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	537 Modified-	ND		3.7	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	537 Modified-	ND		7.3	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	537 Modified-	ND		3.7	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	537 Modified-	ND		3.7	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	537 Modified-	ND		3.7	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	537 Modified-	ND		3.7	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537 Modified-	ND		3.7	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537 Modified-	ND		3.7	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537 Modified-	ND		3.7	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537 Modified-	ND		3.7	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537 Modified-	ND		3.7	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537 Modified-	ND		1.8	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	537 Modified-	ND		3.7	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537 Modified-	ND		3.7	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537 Modified-	ND		3.7	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537 Modified-	ND		3.7	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	537 Modified-	ND		3.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		117	50-150
13C2_8:2FTS		106	50-150
13C2_PFDoA		96	50-150
13C2_PFTeDA		109	50-150
13C3_PFBS		112	50-150
13C3_PFHxS		111	50-150
13C4_PFBA		119	50-150
13C4_PFHpA		114	50-150
13C5_PFHxA		114	50-150
13C5_PFPeA		121	50-150
13C6_PFDA		112	50-150
13C7_PFUdA		109	50-150
13C8_PFOA		120	50-150
13C8_PFOS		108	50-150
13C8_PFOSA		104	50-150
13C9_PFNA		118	50-150
d-EtFOSA		76	50-150
d-MeFOSA		91	50-150

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Inorganic non-metals

Client: **GZA GeoEnvironmental, Inc.**	Laboratory ID: **UB16022-002**
Description: **MW-WV-11S**	Matrix: **Aqueous**
Date Sampled: **02/14/2019 1055**	
Date Received: **02/16/2019**	

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	350.1	(Ammonia - N) 350.1	1	02/25/2019 1645	DMA		98613
1		(Chloride) 300.0	1	02/19/2019 2024	SLU		98109
1	10-204-00-1-X	(Cyanide - To) SM 4500-CN E-	1	02/26/2019 1519	MSG	02/26/2019 1135	98683
1		(Hardness (to) SM 2340C-2011	1	02/25/2019 1817	KFE		98653
1		(Nitrate-Nitr) 353.2	1	02/16/2019 1804	MDD		97767
1		(Phosphorus) 365.1	1	02/25/2019 1652	DMA	02/25/2019 1047	98578
1		(Sulfate) 300.0	1	02/19/2019 2024	SLU		98111
1		(Sulfide) SM 4500-S2 F-2011	1	02/18/2019 1716	HET		97966

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Ammonia - N (gas diffusion)		350.1	ND		0.10	0.020	mg/L	1
Chloride		**300.0**	**50**	**B**	**1.0**	**0.20**	**mg/L**	**1**
Cyanide - Total	57-12-5	SM 4500-CN E-	ND		0.010	0.010	mg/L	1
Hardness (total)		**SM 2340C-**	**300**		**10**	**2.0**	**mg/L**	**1**
Nitrate-Nitrite - N		**353.2**	**0.63**		**0.020**	**0.0015**	**mg/L**	**1**
Phosphorus	**7723-14-0**	**365.1**	**0.010**	**J**	**0.050**	**0.0050**	**mg/L**	**1**
Sulfate		**300.0**	**14**		**1.0**	**0.20**	**mg/L**	**1**
Sulfide	**18496-25-8**	**SM 4500-S2 F-**	**1.0**		**1.0**	**1.0**	**mg/L**	**1**

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Volatile Organic Compounds by GC/MS

Client: **GZA GeoEnvironmental, Inc.**		Laboratory ID: **UB16022-002**	
Description: **MW-WV-11S**		Matrix: **Aqueous**	
Date Sampled: **02/14/2019 1055**			
Date Received: **02/16/2019**			

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	02/21/2019 1809	BWS		98299

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Acetone	**67-64-1**	**8260B**	**4.3**	**J**	**20**	**2.0**	**ug/L**	**1**
Benzene	71-43-2	8260B	ND		1.0	0.40	ug/L	1
Bromodichloromethane	75-27-4	8260B	ND		1.0	0.40	ug/L	1
Bromoform	75-25-2	8260B	ND		1.0	0.40	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		2.0	0.40	ug/L	1
2-Butanone (MEK)	78-93-3	8260B	ND		10	2.0	ug/L	1
Carbon disulfide	75-15-0	8260B	ND		1.0	0.40	ug/L	1
Carbon tetrachloride	56-23-5	8260B	ND		1.0	0.40	ug/L	1
Chlorobenzene	108-90-7	8260B	ND		1.0	0.40	ug/L	1
Chloroethane	75-00-3	8260B	ND		2.0	0.40	ug/L	1
Chloroform	67-66-3	8260B	ND		1.0	0.40	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		1.0	0.50	ug/L	1
Cyclohexane	110-82-7	8260B	ND		1.0	0.40	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260B	ND		1.0	0.40	ug/L	1
Dibromochloromethane	124-48-1	8260B	ND		1.0	0.40	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260B	ND		1.0	0.40	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		1.0	0.40	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260B	ND		1.0	0.40	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260B	ND		1.0	0.40	ug/L	1
Dichlorodifluoromethane	75-71-8	8260B	ND		2.0	0.60	ug/L	1
1,1-Dichloroethane	75-34-3	8260B	ND		1.0	0.40	ug/L	1
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.40	ug/L	1
1,1-Dichloroethene	75-35-4	8260B	ND		1.0	0.40	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260B	ND		1.0	0.40	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260B	ND		1.0	0.40	ug/L	1
1,2-Dichloropropane	78-87-5	8260B	ND		1.0	0.40	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		1.0	0.40	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		1.0	0.40	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		1.0	0.40	ug/L	1
2-Hexanone	591-78-6	8260B	ND		10	2.0	ug/L	1
Isopropylbenzene	98-82-8	8260B	ND		1.0	0.40	ug/L	1
Methyl acetate	79-20-9	8260B	ND		1.0	0.40	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		1.0	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		10	2.0	ug/L	1
Methylcyclohexane	108-87-2	8260B	ND		5.0	0.40	ug/L	1
Methylene chloride	75-09-2	8260B	ND		1.0	0.40	ug/L	1
Styrene	100-42-5	8260B	ND		1.0	0.41	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		1.0	0.40	ug/L	1
Tetrachloroethene	127-18-4	8260B	ND		1.0	0.40	ug/L	1
Toluene	108-88-3	8260B	ND		1.0	0.40	ug/L	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	8260B	ND		1.0	0.42	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260B	ND		1.0	0.40	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		1.0	0.40	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		1.0	0.40	ug/L	1

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Volatile Organic Compounds by GC/MS

Client: **GZA GeoEnvironmental, Inc.** Laboratory ID: **UB16022-002**
Description: **MW-WV-11S** Matrix: **Aqueous**
Date Sampled: **02/14/2019 1055**
Date Received: **02/16/2019**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	02/21/2019 1809	BWS		98299

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Trichloroethene	79-01-6	8260B	ND		1.0	0.40	ug/L	1
Trichlorofluoromethane	75-69-4	8260B	ND		1.0	0.40	ug/L	1
Vinyl chloride	75-01-4	8260B	ND		1.0	0.40	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.40	ug/L	1
m+p - Xylenes	179601-23-1	8260B	ND		1.0	0.40	ug/L	1
o - Xylenes	95-47-6	8260B	ND		1.0	0.40	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		88	70-130
Bromofluorobenzene	N	131	70-130
Toluene-d8		125	70-130

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Semivolatile Organic Compounds by GC/MS

Client: **GZA GeoEnvironmental, Inc.**		Laboratory ID: **UB16022-002**	
Description: **MW-WV-11S**		Matrix: **Aqueous**	
Date Sampled: **02/14/2019 1055**			
Date Received: **02/16/2019**			

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3520C	8270D	1	02/21/2019 1606	CMP2	02/18/2019 1401	97888

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Acenaphthene	83-32-9	8270D	ND		0.20	0.20	ug/L	1
Acenaphthylene	208-96-8	8270D	ND		0.20	0.20	ug/L	1
Acetophenone	98-86-2	8270D	ND		0.80	0.50	ug/L	1
Anthracene	120-12-7	8270D	ND		0.20	0.20	ug/L	1
Atrazine	1912-24-9	8270D	ND		0.80	0.50	ug/L	1
Benzidine	92-87-5	8270D	ND		20	1.0	ug/L	1
Benzo(a)anthracene	56-55-3	8270D	ND		0.20	0.20	ug/L	1
Benzo(a)pyrene	50-32-8	8270D	ND		0.20	0.20	ug/L	1
Benzo(b)fluoranthene	205-99-2	8270D	ND		0.20	0.20	ug/L	1
Benzo(g,h,i)perylene	191-24-2	8270D	ND		0.20	0.20	ug/L	1
Benzo(k)fluoranthene	207-08-9	8270D	ND		0.20	0.20	ug/L	1
Butyl benzyl phthalate	85-68-7	8270D	ND		0.80	0.50	ug/L	1
Caprolactam	105-60-2	8270D	ND		1.6	1.0	ug/L	1
Carbazole	86-74-8	8270D	ND		0.80	0.50	ug/L	1
4-Chloro-3-methyl phenol	59-50-7	8270D	ND		0.80	0.50	ug/L	1
bis(2-Chloroethyl)ether	111-44-4	8270D	ND		0.80	0.50	ug/L	1
2-Chloronaphthalene	91-58-7	8270D	ND		0.80	0.50	ug/L	1
2-Chlorophenol	95-57-8	8270D	ND		0.80	0.50	ug/L	1
Chrysene	218-01-9	8270D	ND		0.20	0.20	ug/L	1
Dibenzo(a,h)anthracene	53-70-3	8270D	ND		0.20	0.20	ug/L	1
Dibenzofuran	132-64-9	8270D	ND		0.80	0.50	ug/L	1
3,3'-Dichlorobenzidine	91-94-1	8270D	ND		0.80	1.8	ug/L	1
2,4-Dichlorophenol	120-83-2	8270D	ND		1.6	1.0	ug/L	1
Diethylphthalate	84-66-2	8270D	ND		0.80	0.50	ug/L	1
Dimethyl phthalate	131-11-3	8270D	ND		0.80	0.50	ug/L	1
2,4-Dimethylphenol	105-67-9	8270D	ND		0.80	0.48	ug/L	1
Di-n-butyl phthalate	84-74-2	8270D	ND		0.80	0.50	ug/L	1
4,6-Dinitro-2-methylphenol	534-52-1	8270D	ND		4.0	1.0	ug/L	1
2,4-Dinitrotoluene	121-14-2	8270D	ND		1.6	0.50	ug/L	1
Di-n-octylphthalate	117-84-0	8270D	ND		0.80	0.50	ug/L	1
1,2-Diphenylhydrazine(as azobenzene)	103-33-3	8270D	ND		0.80	0.50	ug/L	1
bis(2-Ethylhexyl)phthalate	117-81-7	8270D	ND		4.0	0.50	ug/L	1
Fluoranthene	206-44-0	8270D	ND		0.20	0.20	ug/L	1
Fluorene	86-73-7	8270D	ND		0.20	0.20	ug/L	1
Hexachlorobenzene	118-74-1	8270D	ND		0.80	0.50	ug/L	1
Hexachlorobutadiene	87-68-3	8270D	ND		0.80	0.50	ug/L	1
Hexachlorocyclopentadiene	77-47-4	8270D	ND		4.0	2.0	ug/L	1
Hexachloroethane	67-72-1	8270D	ND		0.80	0.31	ug/L	1
Indeno(1,2,3-c,d)pyrene	193-39-5	8270D	ND		0.20	0.20	ug/L	1
Isophorone	78-59-1	8270D	ND		0.80	0.50	ug/L	1
2-Methylnaphthalene	91-57-6	8270D	ND		0.20	0.20	ug/L	1
2-Methylphenol	95-48-7	8270D	ND		0.80	0.21	ug/L	1
3+4-Methylphenol	106-44-5	8270D	ND		0.80	1.5	ug/L	1
Naphthalene	91-20-3	8270D	ND		0.20	0.20	ug/L	1

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

Semivolatile Organic Compounds by GC/MS

Client: **GZA GeoEnvironmental, Inc.**	Laboratory ID: **UB16022-002**
Description: **MW-WV-11S**	Matrix: **Aqueous**
Date Sampled: **02/14/2019 1055**	
Date Received: **02/16/2019**	

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3520C	8270D	1	02/21/2019 1606	CMP2	02/18/2019 1401	97888

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Nitrobenzene	98-95-3	8270D	ND		0.80	0.55	ug/L	1
2-Nitrophenol	88-75-5	8270D	ND		0.80	1.0	ug/L	1
N-Nitrosodi-n-propylamine	621-64-7	8270D	ND		0.80	0.50	ug/L	1
N-Nitrosodiphenylamine (Diphenylamine)	86-30-6	8270D	ND		0.80	0.50	ug/L	1
Pentachlorophenol	87-86-5	8270D	ND		4.0	2.0	ug/L	1
Phenanthrene	85-01-8	8270D	ND		0.20	0.20	ug/L	1
Phenol	108-95-2	8270D	ND		0.80	0.50	ug/L	1
Pyrene	129-00-0	8270D	ND		0.20	0.20	ug/L	1
2,4,5-Trichlorophenol	95-95-4	8270D	ND		0.80	0.50	ug/L	1
2,4,6-Trichlorophenol	88-06-2	8270D	ND		0.80	0.50	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
2-Fluorobiphenyl		61	37-129
2-Fluorophenol		37	24-127
Nitrobenzene-d5		69	38-127
Phenol-d5		53	28-128
Terphenyl-d14		89	10-148
2,4,6-Tribromophenol		66	35-144

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

CVAA

Client: **GZA GeoEnvironmental, Inc.**	Laboratory ID: **UB16022-002**
Description: **MW-WV-11S**	Matrix: **Aqueous**
Date Sampled: **02/14/2019 1055**	
Date Received: **02/16/2019**	

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		7470A	1	02/21/2019 1810	JMH	02/21/2019 1246	98268

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Mercury	7439-97-6	7470A	ND		0.00020	0.000091	mg/L	1

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

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com

ICP-MS

Client: **GZA GeoEnvironmental, Inc.**		Laboratory ID: **UB16022-002**	
Description: **MW-WV-11S**		Matrix: **Aqueous**	
Date Sampled: **02/14/2019 1055**			
Date Received: **02/16/2019**			

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.2	200.8	1	02/20/2019 0748	BNW	02/19/2019 1041	97985

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Aluminum	**7429-90-5**	**200.8**	**13**	**J**	**40**	**10**	**ug/L**	**1**
Antimony	7440-36-0	200.8	ND		2.0	0.50	ug/L	1
Arsenic	7440-38-2	200.8	ND		2.0	1.3	ug/L	1
Barium	**7440-39-3**	**200.8**	**43**		**5.0**	**1.3**	**ug/L**	**1**
Beryllium	7440-41-7	200.8	ND		0.40	0.15	ug/L	1
Boron	**7440-42-8**	**200.8**	**25**	**J**	**50**	**6.3**	**ug/L**	**1**
Cadmium	7440-43-9	200.8	ND		0.50	0.13	ug/L	1
Chromium	7440-47-3	200.8	ND		5.0	1.3	ug/L	1
Cobalt	7440-48-4	200.8	ND		5.0	1.3	ug/L	1
Copper	7440-50-8	200.8	ND		5.0	1.3	ug/L	1
Iron	**7439-89-6**	**200.8**	**140**		**50**	**13**	**ug/L**	**1**
Lead	7439-92-1	200.8	ND		1.0	0.25	ug/L	1
Magnesium	**7439-95-4**	**200.8**	**27000**		**400**	**50**	**ug/L**	**1**
Molybdenum	7439-98-7	200.8	ND		10	2.5	ug/L	1
Nickel	7440-02-0	200.8	ND		5.0	1.3	ug/L	1
Selenium	7782-49-2	200.8	ND		5.0	1.3	ug/L	1
Silver	7440-22-4	200.8	ND		1.0	0.25	ug/L	1
Sodium	**7440-23-5**	**200.8**	**22000**		**400**	**150**	**ug/L**	**1**
Thallium	7440-28-0	200.8	ND		0.50	0.15	ug/L	1
Titanium	7440-32-6	200.8	ND		5.0	1.3	ug/L	1
Vanadium	7440-62-2	200.8	ND		5.0	2.5	ug/L	1
Zinc	7440-66-6	200.8	ND		10	2.5	ug/L	1

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

PFAS by LC/MS/MS

Client: **GZA GeoEnvironmental, Inc.**
Laboratory ID: **UB16022-002**
Description: **MW-WV-11S**
Matrix: **Aqueous**
Date Sampled: **02/14/2019 1055**
Date Received: **02/16/2019**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537 MOD	537 Modified-ID	1	02/28/2019 0129	SES	02/25/2019 1033	98558

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	537 Modified-	ND		3.6	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	537 Modified-	ND		3.6	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	537 Modified-	ND		3.6	ng/L	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	537 Modified-	ND		7.2	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	537 Modified-	ND		3.6	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	537 Modified-	ND		3.6	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	537 Modified-	ND		3.6	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	537 Modified-	ND		7.2	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	537 Modified-	ND		3.6	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	537 Modified-	ND		3.6	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	537 Modified-	ND		3.6	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	537 Modified-	ND		3.6	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537 Modified-	ND		3.6	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537 Modified-	ND		3.6	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537 Modified-	ND		3.6	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537 Modified-	ND		3.6	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537 Modified-	ND		3.6	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537 Modified-	ND		1.8	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	537 Modified-	ND		3.6	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537 Modified-	ND		3.6	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537 Modified-	ND		3.6	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537 Modified-	ND		3.6	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	537 Modified-	ND		3.6	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		123	50-150
13C2_8:2FTS		108	50-150
13C2_PFDoA		93	50-150
13C2_PFTeDA		105	50-150
13C3_PFBS		106	50-150
13C3_PFHxS		106	50-150
13C4_PFBA		116	50-150
13C4_PFHpA		112	50-150
13C5_PFHxA		113	50-150
13C5_PFPeA		114	50-150
13C6_PFDA		105	50-150
13C7_PFUdA		102	50-150
13C8_PFOA		112	50-150
13C8_PFOS		106	50-150
13C8_PFOSA		101	50-150
13C9_PFNA		110	50-150
d-EtFOSA		65	50-150
d-MeFOSA		77	50-150

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

Client: **GZA GeoEnvironmental, Inc.** Laboratory ID: **UB16022-003**

Description: **MW-WV-5D** Matrix: **Aqueous**

Date Sampled: **02/14/2019 1445**

Date Received: **02/16/2019**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	350.1	(Ammonia - N) 350.1	1	02/25/2019 1657	DMA		98618
1		(Chloride) 300.0	1	02/19/2019 2042	SLU		98109
1	10-204-00-1-X	(Cyanide - To) SM 4500-CN E-	1	02/26/2019 1520	MSG	02/26/2019 1135	98683
1		(Hardness (to) SM 2340C-2011	1	02/25/2019 1817	KFE		98653
1		(Nitrate-Nitr) 353.2	5	02/16/2019 1805	MDD		97767
1		(Phosphorus) 365.1	1	02/25/2019 1652	DMA	02/25/2019 1047	98578
1		(Sulfate) 300.0	1	02/19/2019 2042	SLU		98111
1		(Sulfide) SM 4500-S2 F-2011	1	02/18/2019 1716	HET		97966

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Ammonia - N (gas diffusion)		350.1	ND		0.10	0.020	mg/L	1
Chloride		**300.0**	**55**	**B**	**1.0**	**0.20**	**mg/L**	**1**
Cyanide - Total	57-12-5	SM 4500-CN E-	ND		0.010	0.010	mg/L	1
Hardness (total)		**SM 2340C-**	**330**		**10**	**2.0**	**mg/L**	**1**
Nitrate-Nitrite - N		**353.2**	**5.0**		**0.10**	**0.0075**	**mg/L**	**1**
Phosphorus	**7723-14-0**	**365.1**	**0.013**	**J**	**0.050**	**0.0050**	**mg/L**	**1**
Sulfate		**300.0**	**13**		**1.0**	**0.20**	**mg/L**	**1**
Sulfide	18496-25-8	SM 4500-S2 F-	ND		1.0	1.0	mg/L	1

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

Volatile Organic Compounds by GC/MS

Client: **GZA GeoEnvironmental, Inc.**
Laboratory ID: **UB16022-003**
Description: **MW-WV-5D**
Matrix: **Aqueous**
Date Sampled: **02/14/2019 1445**
Date Received: **02/16/2019**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	02/21/2019 1831	BWS		98299

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Acetone	**67-64-1**	**8260B**	**4.0**	**J**	**20**	**2.0**	**ug/L**	**1**
Benzene	71-43-2	8260B	ND		1.0	0.40	ug/L	1
Bromodichloromethane	75-27-4	8260B	ND		1.0	0.40	ug/L	1
Bromoform	75-25-2	8260B	ND		1.0	0.40	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		2.0	0.40	ug/L	1
2-Butanone (MEK)	78-93-3	8260B	ND		10	2.0	ug/L	1
Carbon disulfide	75-15-0	8260B	ND		1.0	0.40	ug/L	1
Carbon tetrachloride	56-23-5	8260B	ND		1.0	0.40	ug/L	1
Chlorobenzene	108-90-7	8260B	ND		1.0	0.40	ug/L	1
Chloroethane	75-00-3	8260B	ND		2.0	0.40	ug/L	1
Chloroform	67-66-3	8260B	ND		1.0	0.40	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		1.0	0.50	ug/L	1
Cyclohexane	110-82-7	8260B	ND		1.0	0.40	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260B	ND		1.0	0.40	ug/L	1
Dibromochloromethane	124-48-1	8260B	ND		1.0	0.40	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260B	ND		1.0	0.40	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		1.0	0.40	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260B	ND		1.0	0.40	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260B	ND		1.0	0.40	ug/L	1
Dichlorodifluoromethane	75-71-8	8260B	ND		2.0	0.60	ug/L	1
1,1-Dichloroethane	75-34-3	8260B	ND		1.0	0.40	ug/L	1
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.40	ug/L	1
1,1-Dichloroethene	75-35-4	8260B	ND		1.0	0.40	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260B	ND		1.0	0.40	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260B	ND		1.0	0.40	ug/L	1
1,2-Dichloropropane	78-87-5	8260B	ND		1.0	0.40	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		1.0	0.40	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		1.0	0.40	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		1.0	0.40	ug/L	1
2-Hexanone	591-78-6	8260B	ND		10	2.0	ug/L	1
Isopropylbenzene	98-82-8	8260B	ND		1.0	0.40	ug/L	1
Methyl acetate	79-20-9	8260B	ND		1.0	0.40	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		1.0	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		10	2.0	ug/L	1
Methylcyclohexane	108-87-2	8260B	ND		5.0	0.40	ug/L	1
Methylene chloride	75-09-2	8260B	ND		1.0	0.40	ug/L	1
Styrene	100-42-5	8260B	ND		1.0	0.41	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		1.0	0.40	ug/L	1
Tetrachloroethene	127-18-4	8260B	ND		1.0	0.40	ug/L	1
Toluene	108-88-3	8260B	ND		1.0	0.40	ug/L	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	8260B	ND		1.0	0.42	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260B	ND		1.0	0.40	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		1.0	0.40	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		1.0	0.40	ug/L	1

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

Volatile Organic Compounds by GC/MS

Client: **GZA GeoEnvironmental, Inc.**	Laboratory ID: **UB16022-003**
Description: **MW-WV-5D**	Matrix: **Aqueous**
Date Sampled: **02/14/2019 1445**	
Date Received: **02/16/2019**	

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	02/21/2019 1831	BWS		98299

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Trichloroethene	79-01-6	8260B	ND		1.0	0.40	ug/L	1
Trichlorofluoromethane	75-69-4	8260B	ND		1.0	0.40	ug/L	1
Vinyl chloride	75-01-4	8260B	ND		1.0	0.40	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.40	ug/L	1
m+p - Xylenes	179601-23-1	8260B	ND		1.0	0.40	ug/L	1
o - Xylenes	95-47-6	8260B	ND		1.0	0.40	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		88	70-130
Bromofluorobenzene		104	70-130
Toluene-d8		98	70-130

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

Semivolatile Organic Compounds by GC/MS

Client: **GZA GeoEnvironmental, Inc.**		Laboratory ID: **UB16022-003**	
Description: **MW-WV-5D**		Matrix: **Aqueous**	
Date Sampled: **02/14/2019 1445**			
Date Received: **02/16/2019**			

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3520C	8270D	1	02/21/2019 1631	CMP2	02/18/2019 1401	97888

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Acenaphthene	83-32-9	8270D	ND		0.20	0.20	ug/L	1
Acenaphthylene	208-96-8	8270D	ND		0.20	0.20	ug/L	1
Acetophenone	98-86-2	8270D	ND		0.80	0.50	ug/L	1
Anthracene	120-12-7	8270D	ND		0.20	0.20	ug/L	1
Atrazine	1912-24-9	8270D	ND		0.80	0.50	ug/L	1
Benzidine	92-87-5	8270D	ND		20	1.0	ug/L	1
Benzo(a)anthracene	56-55-3	8270D	ND		0.20	0.20	ug/L	1
Benzo(a)pyrene	50-32-8	8270D	ND		0.20	0.20	ug/L	1
Benzo(b)fluoranthene	205-99-2	8270D	ND		0.20	0.20	ug/L	1
Benzo(g,h,i)perylene	191-24-2	8270D	ND		0.20	0.20	ug/L	1
Benzo(k)fluoranthene	207-08-9	8270D	ND		0.20	0.20	ug/L	1
Butyl benzyl phthalate	85-68-7	8270D	ND		0.80	0.50	ug/L	1
Caprolactam	105-60-2	8270D	ND		1.6	1.0	ug/L	1
Carbazole	86-74-8	8270D	ND		0.80	0.50	ug/L	1
4-Chloro-3-methyl phenol	59-50-7	8270D	ND		0.80	0.50	ug/L	1
bis(2-Chloroethyl)ether	111-44-4	8270D	ND		0.80	0.50	ug/L	1
2-Chloronaphthalene	91-58-7	8270D	ND		0.80	0.50	ug/L	1
2-Chlorophenol	95-57-8	8270D	ND		0.80	0.50	ug/L	1
Chrysene	218-01-9	8270D	ND		0.20	0.20	ug/L	1
Dibenzo(a,h)anthracene	53-70-3	8270D	ND		0.20	0.20	ug/L	1
Dibenzofuran	132-64-9	8270D	ND		0.80	0.50	ug/L	1
3,3'-Dichlorobenzidine	91-94-1	8270D	ND		0.80	1.8	ug/L	1
2,4-Dichlorophenol	120-83-2	8270D	ND		1.6	1.0	ug/L	1
Diethylphthalate	84-66-2	8270D	ND		0.80	0.50	ug/L	1
Dimethyl phthalate	131-11-3	8270D	ND		0.80	0.50	ug/L	1
2,4-Dimethylphenol	105-67-9	8270D	ND		0.80	0.48	ug/L	1
Di-n-butyl phthalate	84-74-2	8270D	ND		0.80	0.50	ug/L	1
4,6-Dinitro-2-methylphenol	534-52-1	8270D	ND		4.0	1.0	ug/L	1
2,4-Dinitrotoluene	121-14-2	8270D	ND		1.6	0.50	ug/L	1
Di-n-octylphthalate	117-84-0	8270D	ND		0.80	0.50	ug/L	1
1,2-Diphenylhydrazine(as azobenzene)	103-33-3	8270D	ND		0.80	0.50	ug/L	1
bis(2-Ethylhexyl)phthalate	117-81-7	8270D	ND		4.0	0.50	ug/L	1
Fluoranthene	206-44-0	8270D	ND		0.20	0.20	ug/L	1
Fluorene	86-73-7	8270D	ND		0.20	0.20	ug/L	1
Hexachlorobenzene	118-74-1	8270D	ND		0.80	0.50	ug/L	1
Hexachlorobutadiene	87-68-3	8270D	ND		0.80	0.50	ug/L	1
Hexachlorocyclopentadiene	77-47-4	8270D	ND		4.0	2.0	ug/L	1
Hexachloroethane	67-72-1	8270D	ND		0.80	0.31	ug/L	1
Indeno(1,2,3-c,d)pyrene	193-39-5	8270D	ND		0.20	0.20	ug/L	1
Isophorone	78-59-1	8270D	ND		0.80	0.50	ug/L	1
2-Methylnaphthalene	91-57-6	8270D	ND		0.20	0.20	ug/L	1
2-Methylphenol	95-48-7	8270D	ND		0.80	0.21	ug/L	1
3+4-Methylphenol	106-44-5	8270D	ND		0.80	1.5	ug/L	1
Naphthalene	91-20-3	8270D	ND		0.20	0.20	ug/L	1

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

Semivolatile Organic Compounds by GC/MS

Client: **GZA GeoEnvironmental, Inc.**	Laboratory ID: **UB16022-003**
Description: **MW-WV-5D**	Matrix: **Aqueous**
Date Sampled: **02/14/2019 1445**	
Date Received: **02/16/2019**	

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3520C	8270D	1	02/21/2019 1631	CMP2	02/18/2019 1401	97888

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Nitrobenzene	98-95-3	8270D	ND		0.80	0.55	ug/L	1
2-Nitrophenol	88-75-5	8270D	ND		0.80	1.0	ug/L	1
N-Nitrosodi-n-propylamine	621-64-7	8270D	ND		0.80	0.50	ug/L	1
N-Nitrosodiphenylamine (Diphenylamine)	86-30-6	8270D	ND		0.80	0.50	ug/L	1
Pentachlorophenol	87-86-5	8270D	ND		4.0	2.0	ug/L	1
Phenanthrene	85-01-8	8270D	ND		0.20	0.20	ug/L	1
Phenol	108-95-2	8270D	ND		0.80	0.50	ug/L	1
Pyrene	129-00-0	8270D	ND		0.20	0.20	ug/L	1
2,4,5-Trichlorophenol	95-95-4	8270D	ND		0.80	0.50	ug/L	1
2,4,6-Trichlorophenol	88-06-2	8270D	ND		0.80	0.50	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
2-Fluorobiphenyl		57	37-129
2-Fluorophenol		44	24-127
Nitrobenzene-d5		88	38-127
Phenol-d5		55	28-128
Terphenyl-d14		94	10-148
2,4,6-Tribromophenol		87	35-144

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

CVAA

Client: **GZA GeoEnvironmental, Inc.**	Laboratory ID: **UB16022-003**
Description: **MW-WV-5D**	Matrix: **Aqueous**
Date Sampled: **02/14/2019 1445**	
Date Received: **02/16/2019**	

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		7470A	1	02/21/2019 1813	JMH	02/21/2019 1246	98268

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Mercury	7439-97-6	7470A	ND		0.00020	0.000091	mg/L	1

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

ICP-MS

Client: **GZA GeoEnvironmental, Inc.**	Laboratory ID: **UB16022-003**
Description: **MW-WV-5D**	Matrix: **Aqueous**
Date Sampled: **02/14/2019 1445**	
Date Received: **02/16/2019**	

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.2	200.8	1	02/20/2019 0823	BNW	02/19/2019 1041	97985

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Aluminum	7429-90-5	200.8	ND		40	10	ug/L	1
Antimony	7440-36-0	200.8	ND		2.0	0.50	ug/L	1
Arsenic	7440-38-2	200.8	ND		2.0	1.3	ug/L	1
Barium	**7440-39-3**	**200.8**	**20**		**5.0**	**1.3**	**ug/L**	**1**
Beryllium	7440-41-7	200.8	ND		0.40	0.15	ug/L	1
Boron	**7440-42-8**	**200.8**	**30**	**J**	**50**	**6.3**	**ug/L**	**1**
Cadmium	7440-43-9	200.8	ND		0.50	0.13	ug/L	1
Chromium	7440-47-3	200.8	ND		5.0	1.3	ug/L	1
Cobalt	7440-48-4	200.8	ND		5.0	1.3	ug/L	1
Copper	7440-50-8	200.8	ND		5.0	1.3	ug/L	1
Iron	**7439-89-6**	**200.8**	**150**		**50**	**13**	**ug/L**	**1**
Lead	7439-92-1	200.8	ND		1.0	0.25	ug/L	1
Magnesium	**7439-95-4**	**200.8**	**26000**		**400**	**50**	**ug/L**	**1**
Molybdenum	7439-98-7	200.8	ND		10	2.5	ug/L	1
Nickel	7440-02-0	200.8	ND		5.0	1.3	ug/L	1
Selenium	7782-49-2	200.8	ND		5.0	1.3	ug/L	1
Silver	7440-22-4	200.8	ND		1.0	0.25	ug/L	1
Sodium	**7440-23-5**	**200.8**	**31000**		**400**	**150**	**ug/L**	**1**
Thallium	7440-28-0	200.8	ND		0.50	0.15	ug/L	1
Titanium	7440-32-6	200.8	ND		5.0	1.3	ug/L	1
Vanadium	7440-62-2	200.8	ND		5.0	2.5	ug/L	1
Zinc	7440-66-6	200.8	ND		10	2.5	ug/L	1

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

PFAS by LC/MS/MS

Client: **GZA GeoEnvironmental, Inc.**	Laboratory ID: **UB16022-003**
Description: **MW-WV-5D**	Matrix: **Aqueous**
Date Sampled: **02/14/2019 1445**	
Date Received: **02/16/2019**	

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537 MOD	537 Modified-ID	1	02/28/2019 0142	SES	02/25/2019 1033	98558

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	537 Modified-	ND		3.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	537 Modified-	ND		3.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	537 Modified-	ND		3.7	ng/L	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	537 Modified-	ND		7.3	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**537 Modified-**	**7.7**		**3.7**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	537 Modified-	ND		3.7	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	537 Modified-	ND		3.7	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	537 Modified-	ND		7.3	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	537 Modified-	ND		3.7	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	537 Modified-	ND		3.7	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	537 Modified-	ND		3.7	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	537 Modified-	ND		3.7	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537 Modified-	ND		3.7	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537 Modified-	ND		3.7	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537 Modified-	ND		3.7	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537 Modified-	ND		3.7	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537 Modified-	ND		3.7	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**537 Modified-**	**2.7**		**1.8**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	537 Modified-	ND		3.7	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537 Modified-	ND		3.7	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537 Modified-	ND		3.7	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537 Modified-	ND		3.7	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	537 Modified-	ND		3.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		107	50-150
13C2_8:2FTS		111	50-150
13C2_PFDoA		96	50-150
13C2_PFTeDA		104	50-150
13C3_PFBS		109	50-150
13C3_PFHxS		110	50-150
13C4_PFBA		119	50-150
13C4_PFHpA		117	50-150
13C5_PFHxA		113	50-150
13C5_PFPeA		115	50-150
13C6_PFDA		104	50-150
13C7_PFUdA		108	50-150
13C8_PFOA		112	50-150
13C8_PFOS		109	50-150
13C8_PFOSA		109	50-150
13C9_PFNA		112	50-150
d-EtFOSA		73	50-150
d-MeFOSA		79	50-150

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

Inorganic non-metals

Client: **GZA GeoEnvironmental, Inc.** Laboratory ID: **UB16022-004**
Description: **MW-WV-5S** Matrix: **Aqueous**
Date Sampled: **02/14/2019 1610**
Date Received: **02/16/2019**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	350.1	(Ammonia - N) 350.1	1	02/25/2019 1659	DMA		98618
1		(Chloride) 300.0	1	02/19/2019 2100	SLU		98109
1	10-204-00-1-X	(Cyanide - To) SM 4500-CN E-	1	02/26/2019 1521	MSG	02/26/2019 1135	98683
1		(Hardness (to) SM 2340C-2011	1	02/25/2019 1817	KFE		98653
1		(Nitrate-Nitr) 353.2	5	02/16/2019 1807	MDD		97767
1		(Phosphorus) 365.1	1	02/25/2019 1652	DMA	02/25/2019 1047	98578
1		(Sulfate) 300.0	1	02/19/2019 2100	SLU		98111
1		(Sulfide) SM 4500-S2 F-2011	1	02/18/2019 1716	HET		97966

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Ammonia - N (gas diffusion)		350.1	ND		0.10	0.020	mg/L	1
Chloride		**300.0**	**65**	**B**	**1.0**	**0.20**	**mg/L**	**1**
Cyanide - Total	57-12-5	SM 4500-CN E-	ND		0.010	0.010	mg/L	1
Hardness (total)		**SM 2340C-**	**330**		**10**	**2.0**	**mg/L**	**1**
Nitrate-Nitrite - N		**353.2**	**5.1**		**0.10**	**0.0075**	**mg/L**	**1**
Phosphorus	**7723-14-0**	**365.1**	**0.0083**	**J**	**0.050**	**0.0050**	**mg/L**	**1**
Sulfate		**300.0**	**13**		**1.0**	**0.20**	**mg/L**	**1**
Sulfide	18496-25-8	SM 4500-S2 F-	ND		1.0	1.0	mg/L	1

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

Volatile Organic Compounds by GC/MS

Client: **GZA GeoEnvironmental, Inc.**	Laboratory ID: **UB16022-004**
Description: **MW-WV-5S**	Matrix: **Aqueous**
Date Sampled: **02/14/2019 1610**	
Date Received: **02/16/2019**	

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	02/22/2019 1629	BWS		98458

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Acetone	**67-64-1**	**8260B**	**3.1**	**J**	**20**	**2.0**	**ug/L**	**1**
Benzene	71-43-2	8260B	ND		1.0	0.40	ug/L	1
Bromodichloromethane	75-27-4	8260B	ND		1.0	0.40	ug/L	1
Bromoform	75-25-2	8260B	ND		1.0	0.40	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		2.0	0.40	ug/L	1
2-Butanone (MEK)	78-93-3	8260B	ND		10	2.0	ug/L	1
Carbon disulfide	75-15-0	8260B	ND		1.0	0.40	ug/L	1
Carbon tetrachloride	56-23-5	8260B	ND		1.0	0.40	ug/L	1
Chlorobenzene	108-90-7	8260B	ND		1.0	0.40	ug/L	1
Chloroethane	75-00-3	8260B	ND		2.0	0.40	ug/L	1
Chloroform	67-66-3	8260B	ND		1.0	0.40	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		1.0	0.50	ug/L	1
Cyclohexane	110-82-7	8260B	ND		1.0	0.40	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260B	ND		1.0	0.40	ug/L	1
Dibromochloromethane	124-48-1	8260B	ND		1.0	0.40	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260B	ND		1.0	0.40	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		1.0	0.40	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260B	ND		1.0	0.40	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260B	ND		1.0	0.40	ug/L	1
Dichlorodifluoromethane	75-71-8	8260B	ND		2.0	0.60	ug/L	1
1,1-Dichloroethane	75-34-3	8260B	ND		1.0	0.40	ug/L	1
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.40	ug/L	1
1,1-Dichloroethene	75-35-4	8260B	ND		1.0	0.40	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260B	ND		1.0	0.40	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260B	ND		1.0	0.40	ug/L	1
1,2-Dichloropropane	78-87-5	8260B	ND		1.0	0.40	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		1.0	0.40	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		1.0	0.40	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		1.0	0.40	ug/L	1
2-Hexanone	591-78-6	8260B	ND		10	2.0	ug/L	1
Isopropylbenzene	98-82-8	8260B	ND		1.0	0.40	ug/L	1
Methyl acetate	79-20-9	8260B	ND		1.0	0.40	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		1.0	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		10	2.0	ug/L	1
Methylcyclohexane	108-87-2	8260B	ND		5.0	0.40	ug/L	1
Methylene chloride	75-09-2	8260B	ND		1.0	0.40	ug/L	1
Styrene	100-42-5	8260B	ND		1.0	0.41	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		1.0	0.40	ug/L	1
Tetrachloroethene	127-18-4	8260B	ND		1.0	0.40	ug/L	1
Toluene	108-88-3	8260B	ND		1.0	0.40	ug/L	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	8260B	ND		1.0	0.42	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260B	ND		1.0	0.40	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		1.0	0.40	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		1.0	0.40	ug/L	1

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%

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

Volatile Organic Compounds by GC/MS

Client: **GZA GeoEnvironmental, Inc.**
Laboratory ID: **UB16022-004**
Description: **MW-WV-5S**
Matrix: **Aqueous**
Date Sampled: **02/14/2019 1610**
Date Received: **02/16/2019**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	02/22/2019 1629	BWS		98458

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Trichloroethene	79-01-6	8260B	ND		1.0	0.40	ug/L	1
Trichlorofluoromethane	75-69-4	8260B	ND		1.0	0.40	ug/L	1
Vinyl chloride	75-01-4	8260B	ND		1.0	0.40	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.40	ug/L	1
m+p - Xylenes	179601-23-1	8260B	ND		1.0	0.40	ug/L	1
o - Xylenes	95-47-6	8260B	ND		1.0	0.40	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		103	70-130
Bromofluorobenzene		110	70-130
Toluene-d8		88	70-130

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

Semivolatile Organic Compounds by GC/MS

Client: **GZA GeoEnvironmental, Inc.** Laboratory ID: **UB16022-004**
Description: **MW-WV-5S** Matrix: **Aqueous**
Date Sampled: **02/14/2019 1610**
Date Received: **02/16/2019**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3520C	8270D	1	02/21/2019 1656	CMP2	02/18/2019 1401	97888

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Acenaphthene	83-32-9	8270D	ND		0.20	0.20	ug/L	1
Acenaphthylene	208-96-8	8270D	ND		0.20	0.20	ug/L	1
Acetophenone	98-86-2	8270D	ND		0.80	0.50	ug/L	1
Anthracene	120-12-7	8270D	ND		0.20	0.20	ug/L	1
Atrazine	1912-24-9	8270D	ND		0.80	0.50	ug/L	1
Benzidine	92-87-5	8270D	ND		20	1.0	ug/L	1
Benzo(a)anthracene	56-55-3	8270D	ND		0.20	0.20	ug/L	1
Benzo(a)pyrene	50-32-8	8270D	ND		0.20	0.20	ug/L	1
Benzo(b)fluoranthene	205-99-2	8270D	ND		0.20	0.20	ug/L	1
Benzo(g,h,i)perylene	191-24-2	8270D	ND		0.20	0.20	ug/L	1
Benzo(k)fluoranthene	207-08-9	8270D	ND		0.20	0.20	ug/L	1
Butyl benzyl phthalate	85-68-7	8270D	ND		0.80	0.50	ug/L	1
Caprolactam	105-60-2	8270D	ND		1.6	1.0	ug/L	1
Carbazole	86-74-8	8270D	ND		0.80	0.50	ug/L	1
4-Chloro-3-methyl phenol	59-50-7	8270D	ND		0.80	0.50	ug/L	1
bis(2-Chloroethyl)ether	111-44-4	8270D	ND		0.80	0.50	ug/L	1
2-Chloronaphthalene	91-58-7	8270D	ND		0.80	0.50	ug/L	1
2-Chlorophenol	95-57-8	8270D	ND		0.80	0.50	ug/L	1
Chrysene	218-01-9	8270D	ND		0.20	0.20	ug/L	1
Dibenzo(a,h)anthracene	53-70-3	8270D	ND		0.20	0.20	ug/L	1
Dibenzofuran	132-64-9	8270D	ND		0.80	0.50	ug/L	1
3,3'-Dichlorobenzidine	91-94-1	8270D	ND		0.80	1.8	ug/L	1
2,4-Dichlorophenol	120-83-2	8270D	ND		1.6	1.0	ug/L	1
Diethylphthalate	84-66-2	8270D	ND		0.80	0.50	ug/L	1
Dimethyl phthalate	131-11-3	8270D	ND		0.80	0.50	ug/L	1
2,4-Dimethylphenol	105-67-9	8270D	ND		0.80	0.48	ug/L	1
Di-n-butyl phthalate	84-74-2	8270D	ND		0.80	0.50	ug/L	1
4,6-Dinitro-2-methylphenol	534-52-1	8270D	ND		4.0	1.0	ug/L	1
2,4-Dinitrotoluene	121-14-2	8270D	ND		1.6	0.50	ug/L	1
Di-n-octylphthalate	117-84-0	8270D	ND		0.80	0.50	ug/L	1
1,2-Diphenylhydrazine(as azobenzene)	103-33-3	8270D	ND		0.80	0.50	ug/L	1
bis(2-Ethylhexyl)phthalate	117-81-7	8270D	ND		4.0	0.50	ug/L	1
Fluoranthene	206-44-0	8270D	ND		0.20	0.20	ug/L	1
Fluorene	86-73-7	8270D	ND		0.20	0.20	ug/L	1
Hexachlorobenzene	118-74-1	8270D	ND		0.80	0.50	ug/L	1
Hexachlorobutadiene	87-68-3	8270D	ND		0.80	0.50	ug/L	1
Hexachlorocyclopentadiene	77-47-4	8270D	ND		4.0	2.0	ug/L	1
Hexachloroethane	67-72-1	8270D	ND		0.80	0.31	ug/L	1
Indeno(1,2,3-c,d)pyrene	193-39-5	8270D	ND		0.20	0.20	ug/L	1
Isophorone	78-59-1	8270D	ND		0.80	0.50	ug/L	1
2-Methylnaphthalene	91-57-6	8270D	ND		0.20	0.20	ug/L	1
2-Methylphenol	95-48-7	8270D	ND		0.80	0.21	ug/L	1
3+4-Methylphenol	106-44-5	8270D	ND		0.80	1.5	ug/L	1
Naphthalene	91-20-3	8270D	ND		0.20	0.20	ug/L	1

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

Semivolatile Organic Compounds by GC/MS

Client: **GZA GeoEnvironmental, Inc.**	Laboratory ID: **UB16022-004**
Description: **MW-WV-5S**	Matrix: **Aqueous**
Date Sampled: **02/14/2019 1610**	
Date Received: **02/16/2019**	

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3520C	8270D	1	02/21/2019 1656	CMP2	02/18/2019 1401	97888

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Nitrobenzene	98-95-3	8270D	ND		0.80	0.55	ug/L	1
2-Nitrophenol	88-75-5	8270D	ND		0.80	1.0	ug/L	1
N-Nitrosodi-n-propylamine	621-64-7	8270D	ND		0.80	0.50	ug/L	1
N-Nitrosodiphenylamine (Diphenylamine)	86-30-6	8270D	ND		0.80	0.50	ug/L	1
Pentachlorophenol	87-86-5	8270D	ND		4.0	2.0	ug/L	1
Phenanthrene	85-01-8	8270D	ND		0.20	0.20	ug/L	1
Phenol	108-95-2	8270D	ND		0.80	0.50	ug/L	1
Pyrene	129-00-0	8270D	ND		0.20	0.20	ug/L	1
2,4,5-Trichlorophenol	95-95-4	8270D	ND		0.80	0.50	ug/L	1
2,4,6-Trichlorophenol	88-06-2	8270D	ND		0.80	0.50	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
2-Fluorobiphenyl		59	37-129
2-Fluorophenol		41	24-127
Nitrobenzene-d5		77	38-127
Phenol-d5		58	28-128
Terphenyl-d14		89	10-148
2,4,6-Tribromophenol		72	35-144

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

CVAA

Client: **GZA GeoEnvironmental, Inc.**
Laboratory ID: **UB16022-004**
Description: **MW-WV-5S**
Matrix: **Aqueous**
Date Sampled: **02/14/2019 1610**
Date Received: **02/16/2019**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		7470A	1	02/21/2019 1815	JMH	02/21/2019 1246	98268

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Mercury	7439-97-6	7470A	ND		0.00020	0.000091	mg/L	1

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

ICP-MS

Client: **GZA GeoEnvironmental, Inc.**	Laboratory ID: **UB16022-004**
Description: **MW-WV-5S**	Matrix: **Aqueous**
Date Sampled: **02/14/2019 1610**	
Date Received: **02/16/2019**	

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.2	200.8	1	02/20/2019 0835	BNW	02/19/2019 1041	97985

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Aluminum	**7429-90-5**	**200.8**	**200**		**40**	**10**	**ug/L**	**1**
Antimony	7440-36-0	200.8	ND		2.0	0.50	ug/L	1
Arsenic	7440-38-2	200.8	ND		2.0	1.3	ug/L	1
Barium	**7440-39-3**	**200.8**	**21**		**5.0**	**1.3**	**ug/L**	**1**
Beryllium	7440-41-7	200.8	ND		0.40	0.15	ug/L	1
Boron	**7440-42-8**	**200.8**	**26**	**J**	**50**	**6.3**	**ug/L**	**1**
Cadmium	7440-43-9	200.8	ND		0.50	0.13	ug/L	1
Chromium	7440-47-3	200.8	ND		5.0	1.3	ug/L	1
Cobalt	7440-48-4	200.8	ND		5.0	1.3	ug/L	1
Copper	7440-50-8	200.8	ND		5.0	1.3	ug/L	1
Iron	**7439-89-6**	**200.8**	**460**		**50**	**13**	**ug/L**	**1**
Lead	**7439-92-1**	**200.8**	**0.25**	**J**	**1.0**	**0.25**	**ug/L**	**1**
Magnesium	**7439-95-4**	**200.8**	**27000**		**400**	**50**	**ug/L**	**1**
Molybdenum	7439-98-7	200.8	ND		10	2.5	ug/L	1
Nickel	7440-02-0	200.8	ND		5.0	1.3	ug/L	1
Selenium	7782-49-2	200.8	ND		5.0	1.3	ug/L	1
Silver	7440-22-4	200.8	ND		1.0	0.25	ug/L	1
Sodium	**7440-23-5**	**200.8**	**38000**		**400**	**150**	**ug/L**	**1**
Thallium	7440-28-0	200.8	ND		0.50	0.15	ug/L	1
Titanium	**7440-32-6**	**200.8**	**6.1**		**5.0**	**1.3**	**ug/L**	**1**
Vanadium	7440-62-2	200.8	ND		5.0	2.5	ug/L	1
Zinc	**7440-66-6**	**200.8**	**3.2**	**J**	**10**	**2.5**	**ug/L**	**1**

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

PFAS by LC/MS/MS

Client: **GZA GeoEnvironmental, Inc.** Laboratory ID: **UB16022-004**
Description: **MW-WV-5S** Matrix: **Aqueous**
Date Sampled: **02/14/2019 1610**
Date Received: **02/16/2019**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537 MOD	537 Modified-ID	1	02/28/2019 0155	SES	02/25/2019 1033	98558

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	537 Modified-	ND		3.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	537 Modified-	ND		3.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	537 Modified-	ND		3.7	ng/L	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	537 Modified-	ND		7.3	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**537 Modified-**	**8.8**		**3.7**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	537 Modified-	ND		3.7	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	537 Modified-	ND		3.7	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	537 Modified-	ND		7.3	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	537 Modified-	ND		3.7	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	537 Modified-	ND		3.7	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	537 Modified-	ND		3.7	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	537 Modified-	ND		3.7	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537 Modified-	ND		3.7	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537 Modified-	ND		3.7	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537 Modified-	ND		3.7	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**537 Modified-**	**4.0**		**3.7**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537 Modified-	ND		3.7	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**537 Modified-**	**5.0**		**1.8**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	537 Modified-	ND		3.7	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537 Modified-	ND		3.7	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537 Modified-	ND		3.7	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537 Modified-	ND		3.7	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	537 Modified-	ND		3.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		101	50-150
13C2_8:2FTS		92	50-150
13C2_PFDoA		91	50-150
13C2_PFTeDA		99	50-150
13C3_PFBS		107	50-150
13C3_PFHxS		102	50-150
13C4_PFBA		115	50-150
13C4_PFHpA		106	50-150
13C5_PFHxA		105	50-150
13C5_PFPeA		114	50-150
13C6_PFDA		105	50-150
13C7_PFUdA		99	50-150
13C8_PFOA		112	50-150
13C8_PFOS		105	50-150
13C8_PFOSA		100	50-150
13C9_PFNA		109	50-150
d-EtFOSA		72	50-150
d-MeFOSA		76	50-150

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

Inorganic non-metals

Client: **GZA GeoEnvironmental, Inc.** Laboratory ID: **UB16022-005**
Description: **MW-WV-5D DUP** Matrix: **Aqueous**
Date Sampled: **02/14/2019 1445**
Date Received: **02/16/2019**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	350.1	(Ammonia - N) 350.1	1	02/25/2019 1701	DMA		98618
1		(Chloride) 300.0	1	02/19/2019 2118	SLU		98109
1	10-204-00-1-X	(Cyanide - To) SM 4500-CN E-	1	02/26/2019 1522	MSG	02/26/2019 1135	98683
1		(Hardness (to) SM 2340C-2011	1	02/25/2019 1817	KFE		98653
1		(Nitrate-Nitr) 353.2	5	02/16/2019 1808	MDD		97767
1		(Phosphorus) 365.1	1	02/25/2019 1653	DMA	02/25/2019 1047	98578
1		(Sulfate) 300.0	1	02/19/2019 2118	SLU		98111
1		(Sulfide) SM 4500-S2 F-2011	1	02/18/2019 1716	HET		97966

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Ammonia - N (gas diffusion)		350.1	ND		0.10	0.020	mg/L	1
Chloride		**300.0**	**55**	**B**	**1.0**	**0.20**	**mg/L**	**1**
Cyanide - Total	57-12-5	SM 4500-CN E-	ND		0.010	0.010	mg/L	1
Hardness (total)		**SM 2340C-**	**330**		**10**	**2.0**	**mg/L**	**1**
Nitrate-Nitrite - N		**353.2**	**5.0**		**0.10**	**0.0075**	**mg/L**	**1**
Phosphorus	7723-14-0	365.1	ND		0.050	0.0050	mg/L	1
Sulfate		**300.0**	**13**		**1.0**	**0.20**	**mg/L**	**1**
Sulfide	18496-25-8	SM 4500-S2 F-	ND		1.0	1.0	mg/L	1

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

Volatile Organic Compounds by GC/MS

Client: **GZA GeoEnvironmental, Inc.**
Laboratory ID: **UB16022-005**
Description: **MW-WV-5D DUP**
Matrix: **Aqueous**
Date Sampled: **02/14/2019 1445**
Date Received: **02/16/2019**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	02/22/2019 1652	BWS		98458

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Acetone	**67-64-1**	**8260B**	**2.3**	**J**	**20**	**2.0**	**ug/L**	**1**
Benzene	71-43-2	8260B	ND		1.0	0.40	ug/L	1
Bromodichloromethane	75-27-4	8260B	ND		1.0	0.40	ug/L	1
Bromoform	75-25-2	8260B	ND		1.0	0.40	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		2.0	0.40	ug/L	1
2-Butanone (MEK)	78-93-3	8260B	ND		10	2.0	ug/L	1
Carbon disulfide	75-15-0	8260B	ND		1.0	0.40	ug/L	1
Carbon tetrachloride	56-23-5	8260B	ND		1.0	0.40	ug/L	1
Chlorobenzene	108-90-7	8260B	ND		1.0	0.40	ug/L	1
Chloroethane	75-00-3	8260B	ND		2.0	0.40	ug/L	1
Chloroform	67-66-3	8260B	ND		1.0	0.40	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		1.0	0.50	ug/L	1
Cyclohexane	110-82-7	8260B	ND		1.0	0.40	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260B	ND		1.0	0.40	ug/L	1
Dibromochloromethane	124-48-1	8260B	ND		1.0	0.40	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260B	ND		1.0	0.40	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		1.0	0.40	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260B	ND		1.0	0.40	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260B	ND		1.0	0.40	ug/L	1
Dichlorodifluoromethane	75-71-8	8260B	ND		2.0	0.60	ug/L	1
1,1-Dichloroethane	75-34-3	8260B	ND		1.0	0.40	ug/L	1
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.40	ug/L	1
1,1-Dichloroethene	75-35-4	8260B	ND		1.0	0.40	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260B	ND		1.0	0.40	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260B	ND		1.0	0.40	ug/L	1
1,2-Dichloropropane	78-87-5	8260B	ND		1.0	0.40	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		1.0	0.40	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		1.0	0.40	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		1.0	0.40	ug/L	1
2-Hexanone	591-78-6	8260B	ND		10	2.0	ug/L	1
Isopropylbenzene	98-82-8	8260B	ND		1.0	0.40	ug/L	1
Methyl acetate	79-20-9	8260B	ND		1.0	0.40	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		1.0	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		10	2.0	ug/L	1
Methylcyclohexane	108-87-2	8260B	ND		5.0	0.40	ug/L	1
Methylene chloride	75-09-2	8260B	ND		1.0	0.40	ug/L	1
Styrene	100-42-5	8260B	ND		1.0	0.41	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		1.0	0.40	ug/L	1
Tetrachloroethene	127-18-4	8260B	ND		1.0	0.40	ug/L	1
Toluene	108-88-3	8260B	ND		1.0	0.40	ug/L	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	8260B	ND		1.0	0.42	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260B	ND		1.0	0.40	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		1.0	0.40	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		1.0	0.40	ug/L	1

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

Volatile Organic Compounds by GC/MS

Client: **GZA GeoEnvironmental, Inc.**	Laboratory ID: **UB16022-005**
Description: **MW-WV-5D DUP**	Matrix: **Aqueous**
Date Sampled: **02/14/2019 1445**	
Date Received: **02/16/2019**	

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	02/22/2019 1652	BWS		98458

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Trichloroethene	79-01-6	8260B	ND		1.0	0.40	ug/L	1
Trichlorofluoromethane	75-69-4	8260B	ND		1.0	0.40	ug/L	1
Vinyl chloride	75-01-4	8260B	ND		1.0	0.40	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.40	ug/L	1
m+p - Xylenes	179601-23-1	8260B	ND		1.0	0.40	ug/L	1
o - Xylenes	95-47-6	8260B	ND		1.0	0.40	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		86	70-130
Bromofluorobenzene		93	70-130
Toluene-d8		98	70-130

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

Semivolatile Organic Compounds by GC/MS

Client: **GZA GeoEnvironmental, Inc.** Laboratory ID: **UB16022-005**
Description: **MW-WV-5D DUP** Matrix: **Aqueous**
Date Sampled: **02/14/2019 1445**
Date Received: **02/16/2019**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3520C	8270D	1	02/21/2019 1720	CMP2	02/18/2019 1401	97888

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Acenaphthene	83-32-9	8270D	ND		0.20	0.20	ug/L	1
Acenaphthylene	208-96-8	8270D	ND		0.20	0.20	ug/L	1
Acetophenone	98-86-2	8270D	ND		0.80	0.50	ug/L	1
Anthracene	120-12-7	8270D	ND		0.20	0.20	ug/L	1
Atrazine	1912-24-9	8270D	ND		0.80	0.50	ug/L	1
Benzidine	92-87-5	8270D	ND		20	1.0	ug/L	1
Benzo(a)anthracene	56-55-3	8270D	ND		0.20	0.20	ug/L	1
Benzo(a)pyrene	50-32-8	8270D	ND		0.20	0.20	ug/L	1
Benzo(b)fluoranthene	205-99-2	8270D	ND		0.20	0.20	ug/L	1
Benzo(g,h,i)perylene	191-24-2	8270D	ND		0.20	0.20	ug/L	1
Benzo(k)fluoranthene	207-08-9	8270D	ND		0.20	0.20	ug/L	1
Butyl benzyl phthalate	85-68-7	8270D	ND		0.80	0.50	ug/L	1
Caprolactam	105-60-2	8270D	ND		1.6	1.0	ug/L	1
Carbazole	86-74-8	8270D	ND		0.80	0.50	ug/L	1
4-Chloro-3-methyl phenol	59-50-7	8270D	ND		0.80	0.50	ug/L	1
bis(2-Chloroethyl)ether	111-44-4	8270D	ND		0.80	0.50	ug/L	1
2-Chloronaphthalene	91-58-7	8270D	ND		0.80	0.50	ug/L	1
2-Chlorophenol	95-57-8	8270D	ND		0.80	0.50	ug/L	1
Chrysene	218-01-9	8270D	ND		0.20	0.20	ug/L	1
Dibenzo(a,h)anthracene	53-70-3	8270D	ND		0.20	0.20	ug/L	1
Dibenzofuran	132-64-9	8270D	ND		0.80	0.50	ug/L	1
3,3'-Dichlorobenzidine	91-94-1	8270D	ND		0.80	1.8	ug/L	1
2,4-Dichlorophenol	120-83-2	8270D	ND		1.6	1.0	ug/L	1
Diethylphthalate	84-66-2	8270D	ND		0.80	0.50	ug/L	1
Dimethyl phthalate	131-11-3	8270D	ND		0.80	0.50	ug/L	1
2,4-Dimethylphenol	105-67-9	8270D	ND		0.80	0.48	ug/L	1
Di-n-butyl phthalate	84-74-2	8270D	ND		0.80	0.50	ug/L	1
4,6-Dinitro-2-methylphenol	534-52-1	8270D	ND		4.0	1.0	ug/L	1
2,4-Dinitrotoluene	121-14-2	8270D	ND		1.6	0.50	ug/L	1
Di-n-octylphthalate	117-84-0	8270D	ND		0.80	0.50	ug/L	1
1,2-Diphenylhydrazine(as azobenzene)	103-33-3	8270D	ND		0.80	0.50	ug/L	1
bis(2-Ethylhexyl)phthalate	117-81-7	8270D	ND		4.0	0.50	ug/L	1
Fluoranthene	206-44-0	8270D	ND		0.20	0.20	ug/L	1
Fluorene	86-73-7	8270D	ND		0.20	0.20	ug/L	1
Hexachlorobenzene	118-74-1	8270D	ND		0.80	0.50	ug/L	1
Hexachlorobutadiene	87-68-3	8270D	ND		0.80	0.50	ug/L	1
Hexachlorocyclopentadiene	77-47-4	8270D	ND		4.0	2.0	ug/L	1
Hexachloroethane	67-72-1	8270D	ND		0.80	0.31	ug/L	1
Indeno(1,2,3-c,d)pyrene	193-39-5	8270D	ND		0.20	0.20	ug/L	1
Isophorone	78-59-1	8270D	ND		0.80	0.50	ug/L	1
2-Methylnaphthalene	91-57-6	8270D	ND		0.20	0.20	ug/L	1
2-Methylphenol	95-48-7	8270D	ND		0.80	0.21	ug/L	1
3+4-Methylphenol	106-44-5	8270D	ND		0.80	1.5	ug/L	1
Naphthalene	91-20-3	8270D	ND		0.20	0.20	ug/L	1

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

Semivolatile Organic Compounds by GC/MS

Client: **GZA GeoEnvironmental, Inc.**	Laboratory ID: **UB16022-005**
Description: **MW-WV-5D DUP**	Matrix: **Aqueous**
Date Sampled: **02/14/2019 1445**	
Date Received: **02/16/2019**	

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3520C	8270D	1	02/21/2019 1720	CMP2	02/18/2019 1401	97888

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Nitrobenzene	98-95-3	8270D	ND		0.80	0.55	ug/L	1
2-Nitrophenol	88-75-5	8270D	ND		0.80	1.0	ug/L	1
N-Nitrosodi-n-propylamine	621-64-7	8270D	ND		0.80	0.50	ug/L	1
N-Nitrosodiphenylamine (Diphenylamine)	86-30-6	8270D	ND		0.80	0.50	ug/L	1
Pentachlorophenol	87-86-5	8270D	ND		4.0	2.0	ug/L	1
Phenanthrene	85-01-8	8270D	ND		0.20	0.20	ug/L	1
Phenol	108-95-2	8270D	ND		0.80	0.50	ug/L	1
Pyrene	129-00-0	8270D	ND		0.20	0.20	ug/L	1
2,4,5-Trichlorophenol	95-95-4	8270D	ND		0.80	0.50	ug/L	1
2,4,6-Trichlorophenol	88-06-2	8270D	ND		0.80	0.50	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
2-Fluorobiphenyl		50	37-129
2-Fluorophenol		29	24-127
Nitrobenzene-d5		59	38-127
Phenol-d5		50	28-128
Terphenyl-d14		82	10-148
2,4,6-Tribromophenol		57	35-144

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

CVAA

Client: **GZA GeoEnvironmental, Inc.**	Laboratory ID: **UB16022-005**
Description: **MW-WV-5D DUP**	Matrix: **Aqueous**
Date Sampled: **02/14/2019 1445**	
Date Received: **02/16/2019**	

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		7470A	1	02/21/2019 1823	JMH	02/21/2019 1246	98268

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Mercury	7439-97-6	7470A	ND		0.00020	0.000091	mg/L	1

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

ICP-MS

Client: **GZA GeoEnvironmental, Inc.**	Laboratory ID: **UB16022-005**
Description: **MW-WV-5D DUP**	Matrix: **Aqueous**
Date Sampled: **02/14/2019 1445**	
Date Received: **02/16/2019**	

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.2	200.8	1	02/20/2019 0841	BNW	02/19/2019 1041	97985

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Aluminum	7429-90-5	200.8	ND		40	10	ug/L	1
Antimony	7440-36-0	200.8	ND		2.0	0.50	ug/L	1
Arsenic	7440-38-2	200.8	ND		2.0	1.3	ug/L	1
Barium	**7440-39-3**	**200.8**	**20**		**5.0**	**1.3**	**ug/L**	**1**
Beryllium	7440-41-7	200.8	ND		0.40	0.15	ug/L	1
Boron	**7440-42-8**	**200.8**	**30**	**J**	**50**	**6.3**	**ug/L**	**1**
Cadmium	7440-43-9	200.8	ND		0.50	0.13	ug/L	1
Chromium	7440-47-3	200.8	ND		5.0	1.3	ug/L	1
Cobalt	7440-48-4	200.8	ND		5.0	1.3	ug/L	1
Copper	7440-50-8	200.8	ND		5.0	1.3	ug/L	1
Iron	**7439-89-6**	**200.8**	**150**		**50**	**13**	**ug/L**	**1**
Lead	7439-92-1	200.8	ND		1.0	0.25	ug/L	1
Magnesium	**7439-95-4**	**200.8**	**26000**		**400**	**50**	**ug/L**	**1**
Molybdenum	7439-98-7	200.8	ND		10	2.5	ug/L	1
Nickel	7440-02-0	200.8	ND		5.0	1.3	ug/L	1
Selenium	7782-49-2	200.8	ND		5.0	1.3	ug/L	1
Silver	7440-22-4	200.8	ND		1.0	0.25	ug/L	1
Sodium	**7440-23-5**	**200.8**	**31000**		**400**	**150**	**ug/L**	**1**
Thallium	7440-28-0	200.8	ND		0.50	0.15	ug/L	1
Titanium	7440-32-6	200.8	ND		5.0	1.3	ug/L	1
Vanadium	7440-62-2	200.8	ND		5.0	2.5	ug/L	1
Zinc	7440-66-6	200.8	ND		10	2.5	ug/L	1

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range
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H = Out of holding time	W = Reported on wet weight basis	

PFAS by LC/MS/MS

Client: **GZA GeoEnvironmental, Inc.** Laboratory ID: **UB16022-005**
Description: **MW-WV-5D DUP** Matrix: **Aqueous**
Date Sampled: **02/14/2019 1445**
Date Received: **02/16/2019**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537 MOD	537 Modified-ID	1	02/28/2019 0208	SES	02/25/2019 1033	98558

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	537 Modified-	ND		3.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	537 Modified-	ND		3.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	537 Modified-	ND		3.8	ng/L	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	537 Modified-	ND		7.6	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**537 Modified-**	**7.4**		**3.8**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	537 Modified-	ND		3.8	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	537 Modified-	ND		3.8	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	537 Modified-	ND		7.6	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	537 Modified-	ND		3.8	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	537 Modified-	ND		3.8	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**537 Modified-**	**3.8**		**3.8**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	375-22-4	537 Modified-	ND		3.8	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537 Modified-	ND		3.8	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537 Modified-	ND		3.8	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537 Modified-	ND		3.8	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537 Modified-	ND		3.8	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537 Modified-	ND		3.8	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**537 Modified-**	**2.7**		**1.9**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	537 Modified-	ND		3.8	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537 Modified-	ND		3.8	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537 Modified-	ND		3.8	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537 Modified-	ND		3.8	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	537 Modified-	ND		3.8	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		91	50-150
13C2_8:2FTS		110	50-150
13C2_PFDoA		99	50-150
13C2_PFTeDA		110	50-150
13C3_PFBS		111	50-150
13C3_PFHxS		110	50-150
13C4_PFBA		120	50-150
13C4_PFHpA		117	50-150
13C5_PFHxA		117	50-150
13C5_PFPeA		121	50-150
13C6_PFDA		111	50-150
13C7_PFUdA		106	50-150
13C8_PFOA		123	50-150
13C8_PFOS		115	50-150
13C8_PFOSA		108	50-150
13C9_PFNA		121	50-150
d-EtFOSA		69	50-150
d-MeFOSA		79	50-150

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

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com

PFAS by LC/MS/MS

Client: **GZA GeoEnvironmental, Inc.**
Laboratory ID: **UB16022-006**
Description: **FB-2/14**
Matrix: **Aqueous**
Date Sampled: **02/14/2019 1435**
Date Received: **02/16/2019**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537 MOD	537 Modified-ID	1	02/28/2019 0220	SES	02/26/2019 1100	98665

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	537 Modified-	ND		4.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	537 Modified-	ND		4.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	537 Modified-	ND		4.0	ng/L	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	537 Modified-	ND		8.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	537 Modified-	ND		4.0	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	537 Modified-	ND		4.0	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	537 Modified-	ND		4.0	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	537 Modified-	ND		8.0	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	537 Modified-	ND		4.0	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	537 Modified-	ND		4.0	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	537 Modified-	ND		4.0	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	537 Modified-	ND		4.0	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537 Modified-	ND		4.0	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537 Modified-	ND		4.0	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537 Modified-	ND		4.0	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537 Modified-	ND		4.0	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537 Modified-	ND		4.0	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537 Modified-	ND		2.0	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	537 Modified-	ND		4.0	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537 Modified-	ND		4.0	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537 Modified-	ND		4.0	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537 Modified-	ND		4.0	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	537 Modified-	ND		4.0	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		118	50-150
13C2_8:2FTS		98	50-150
13C2_PFDoA		96	50-150
13C2_PFTeDA		107	50-150
13C3_PFBS		110	50-150
13C3_PFHxS		109	50-150
13C4_PFBA		126	50-150
13C4_PFHpA		118	50-150
13C5_PFHxA		118	50-150
13C5_PFPeA		117	50-150
13C6_PFDA		108	50-150
13C7_PFUdA		103	50-150
13C8_PFOA		118	50-150
13C8_PFOS		107	50-150
13C8_PFOSA		96	50-150
13C9_PFNA		112	50-150
d-EtFOSA		60	50-150
d-MeFOSA		65	50-150

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

Inorganic non-metals

Client: **GZA GeoEnvironmental, Inc.** Laboratory ID: **UB16022-007**

Description: **MW-WV-3S** Matrix: **Aqueous**

Date Sampled: **02/15/2019 1017**

Date Received: **02/16/2019**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	350.1	(Ammonia - N) 350.1	1	02/25/2019 1703	DMA		98618
1		(Chloride) 300.0	1	02/19/2019 2136	SLU		98109
1	10-204-00-1-X	(Cyanide - To) SM 4500-CN E-	1	02/26/2019 1523	MSG	02/26/2019 1135	98683
1		(Hardness (to) SM 2340C-2011	1	02/25/2019 1817	KFE		98653
1		(Nitrate-Nitr) 353.2	1	02/16/2019 1809	MDD		97767
1		(Phosphorus) 365.1	1	02/25/2019 1653	DMA	02/25/2019 1047	98578
1		(Sulfate) 300.0	1	02/19/2019 2136	SLU		98111
1		(Sulfide) SM 4500-S2 F-2011	1	02/18/2019 1716	HET		97966

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Ammonia - N (gas diffusion)		**350.1**	**1.6**	**B**	**0.10**	**0.020**	**mg/L**	**1**
Chloride		**300.0**	**24**	**B**	**1.0**	**0.20**	**mg/L**	**1**
Cyanide - Total	57-12-5	SM 4500-CN E-	ND		0.010	0.010	mg/L	1
Hardness (total)		**SM 2340C-**	**68**		**10**	**2.0**	**mg/L**	**1**
Nitrate-Nitrite - N		**353.2**	**0.058**		**0.020**	**0.0015**	**mg/L**	**1**
Phosphorus	**7723-14-0**	**365.1**	**0.078**		**0.050**	**0.0050**	**mg/L**	**1**
Sulfate		**300.0**	**0.34**	**J**	**1.0**	**0.20**	**mg/L**	**1**
Sulfide	**18496-25-8**	**SM 4500-S2 F-**	**1.1**		**1.0**	**1.0**	**mg/L**	**1**

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%

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

Volatile Organic Compounds by GC/MS

Client: **GZA GeoEnvironmental, Inc.**
Laboratory ID: **UB16022-007**
Description: **MW-WV-3S**
Matrix: **Aqueous**
Date Sampled: **02/15/2019 1017**
Date Received: **02/16/2019**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	02/22/2019 1714	BWS		98458

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Acetone	**67-64-1**	**8260B**	**4.6**	**J**	**20**	**2.0**	**ug/L**	**1**
Benzene	71-43-2	8260B	ND		1.0	0.40	ug/L	1
Bromodichloromethane	75-27-4	8260B	ND		1.0	0.40	ug/L	1
Bromoform	75-25-2	8260B	ND		1.0	0.40	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		2.0	0.40	ug/L	1
2-Butanone (MEK)	78-93-3	8260B	ND		10	2.0	ug/L	1
Carbon disulfide	75-15-0	8260B	ND		1.0	0.40	ug/L	1
Carbon tetrachloride	56-23-5	8260B	ND		1.0	0.40	ug/L	1
Chlorobenzene	108-90-7	8260B	ND		1.0	0.40	ug/L	1
Chloroethane	75-00-3	8260B	ND		2.0	0.40	ug/L	1
Chloroform	67-66-3	8260B	ND		1.0	0.40	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		1.0	0.50	ug/L	1
Cyclohexane	110-82-7	8260B	ND		1.0	0.40	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260B	ND		1.0	0.40	ug/L	1
Dibromochloromethane	124-48-1	8260B	ND		1.0	0.40	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260B	ND		1.0	0.40	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		1.0	0.40	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260B	ND		1.0	0.40	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260B	ND		1.0	0.40	ug/L	1
Dichlorodifluoromethane	75-71-8	8260B	ND		2.0	0.60	ug/L	1
1,1-Dichloroethane	75-34-3	8260B	ND		1.0	0.40	ug/L	1
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.40	ug/L	1
1,1-Dichloroethene	75-35-4	8260B	ND		1.0	0.40	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260B	ND		1.0	0.40	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260B	ND		1.0	0.40	ug/L	1
1,2-Dichloropropane	78-87-5	8260B	ND		1.0	0.40	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		1.0	0.40	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		1.0	0.40	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		1.0	0.40	ug/L	1
2-Hexanone	591-78-6	8260B	ND		10	2.0	ug/L	1
Isopropylbenzene	98-82-8	8260B	ND		1.0	0.40	ug/L	1
Methyl acetate	79-20-9	8260B	ND		1.0	0.40	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		1.0	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		10	2.0	ug/L	1
Methylcyclohexane	108-87-2	8260B	ND		5.0	0.40	ug/L	1
Methylene chloride	75-09-2	8260B	ND		1.0	0.40	ug/L	1
Styrene	100-42-5	8260B	ND		1.0	0.41	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		1.0	0.40	ug/L	1
Tetrachloroethene	127-18-4	8260B	ND		1.0	0.40	ug/L	1
Toluene	108-88-3	8260B	ND		1.0	0.40	ug/L	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	8260B	ND		1.0	0.42	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260B	ND		1.0	0.40	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		1.0	0.40	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		1.0	0.40	ug/L	1

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

Volatile Organic Compounds by GC/MS

Client: **GZA GeoEnvironmental, Inc.**	Laboratory ID: **UB16022-007**
Description: **MW-WV-3S**	Matrix: **Aqueous**
Date Sampled: **02/15/2019 1017**	
Date Received: **02/16/2019**	

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	02/22/2019 1714	BWS		98458

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Trichloroethene	79-01-6	8260B	ND		1.0	0.40	ug/L	1
Trichlorofluoromethane	75-69-4	8260B	ND		1.0	0.40	ug/L	1
Vinyl chloride	75-01-4	8260B	ND		1.0	0.40	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.40	ug/L	1
m+p - Xylenes	179601-23-1	8260B	ND		1.0	0.40	ug/L	1
o - Xylenes	95-47-6	8260B	ND		1.0	0.40	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		80	70-130
Bromofluorobenzene		117	70-130
Toluene-d8		90	70-130

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

Semivolatile Organic Compounds by GC/MS

Client: **GZA GeoEnvironmental, Inc.** Laboratory ID: **UB16022-007**
Description: **MW-WV-3S** Matrix: **Aqueous**
Date Sampled: **02/15/2019 1017**
Date Received: **02/16/2019**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3520C	8270D	1	02/21/2019 1745	CMP2	02/18/2019 1401	97888

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Acenaphthene	83-32-9	8270D	ND		0.20	0.20	ug/L	1
Acenaphthylene	208-96-8	8270D	ND		0.20	0.20	ug/L	1
Acetophenone	98-86-2	8270D	ND		0.80	0.50	ug/L	1
Anthracene	120-12-7	8270D	ND		0.20	0.20	ug/L	1
Atrazine	1912-24-9	8270D	ND		0.80	0.50	ug/L	1
Benzidine	92-87-5	8270D	ND		20	1.0	ug/L	1
Benzo(a)anthracene	56-55-3	8270D	ND		0.20	0.20	ug/L	1
Benzo(a)pyrene	50-32-8	8270D	ND		0.20	0.20	ug/L	1
Benzo(b)fluoranthene	205-99-2	8270D	ND		0.20	0.20	ug/L	1
Benzo(g,h,i)perylene	191-24-2	8270D	ND		0.20	0.20	ug/L	1
Benzo(k)fluoranthene	207-08-9	8270D	ND		0.20	0.20	ug/L	1
Butyl benzyl phthalate	85-68-7	8270D	ND		0.80	0.50	ug/L	1
Caprolactam	105-60-2	8270D	ND		1.6	1.0	ug/L	1
Carbazole	86-74-8	8270D	ND		0.80	0.50	ug/L	1
4-Chloro-3-methyl phenol	59-50-7	8270D	ND		0.80	0.50	ug/L	1
bis(2-Chloroethyl)ether	111-44-4	8270D	ND		0.80	0.50	ug/L	1
2-Chloronaphthalene	91-58-7	8270D	ND		0.80	0.50	ug/L	1
2-Chlorophenol	95-57-8	8270D	ND		0.80	0.50	ug/L	1
Chrysene	218-01-9	8270D	ND		0.20	0.20	ug/L	1
Dibenzo(a,h)anthracene	53-70-3	8270D	ND		0.20	0.20	ug/L	1
Dibenzofuran	132-64-9	8270D	ND		0.80	0.50	ug/L	1
3,3'-Dichlorobenzidine	91-94-1	8270D	ND		0.80	1.8	ug/L	1
2,4-Dichlorophenol	120-83-2	8270D	ND		1.6	1.0	ug/L	1
Diethylphthalate	84-66-2	8270D	ND		0.80	0.50	ug/L	1
Dimethyl phthalate	131-11-3	8270D	ND		0.80	0.50	ug/L	1
2,4-Dimethylphenol	105-67-9	8270D	ND		0.80	0.48	ug/L	1
Di-n-butyl phthalate	84-74-2	8270D	ND		0.80	0.50	ug/L	1
4,6-Dinitro-2-methylphenol	534-52-1	8270D	ND		4.0	1.0	ug/L	1
2,4-Dinitrotoluene	121-14-2	8270D	ND		1.6	0.50	ug/L	1
Di-n-octylphthalate	117-84-0	8270D	ND		0.80	0.50	ug/L	1
1,2-Diphenylhydrazine(as azobenzene)	103-33-3	8270D	ND		0.80	0.50	ug/L	1
bis(2-Ethylhexyl)phthalate	117-81-7	8270D	ND		4.0	0.50	ug/L	1
Fluoranthene	206-44-0	8270D	ND		0.20	0.20	ug/L	1
Fluorene	86-73-7	8270D	ND		0.20	0.20	ug/L	1
Hexachlorobenzene	118-74-1	8270D	ND		0.80	0.50	ug/L	1
Hexachlorobutadiene	87-68-3	8270D	ND		0.80	0.50	ug/L	1
Hexachlorocyclopentadiene	77-47-4	8270D	ND		4.0	2.0	ug/L	1
Hexachloroethane	67-72-1	8270D	ND		0.80	0.31	ug/L	1
Indeno(1,2,3-c,d)pyrene	193-39-5	8270D	ND		0.20	0.20	ug/L	1
Isophorone	78-59-1	8270D	ND		0.80	0.50	ug/L	1
2-Methylnaphthalene	91-57-6	8270D	ND		0.20	0.20	ug/L	1
2-Methylphenol	95-48-7	8270D	ND		0.80	0.21	ug/L	1
3+4-Methylphenol	106-44-5	8270D	ND		0.80	1.5	ug/L	1
Naphthalene	91-20-3	8270D	ND		0.20	0.20	ug/L	1

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

Semivolatile Organic Compounds by GC/MS

Client: **GZA GeoEnvironmental, Inc.**		Laboratory ID: **UB16022-007**	
Description: **MW-WV-3S**		Matrix: **Aqueous**	
Date Sampled: **02/15/2019 1017**			
Date Received: **02/16/2019**			

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3520C	8270D	1	02/21/2019 1745	CMP2	02/18/2019 1401	97888

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Nitrobenzene	98-95-3	8270D	ND		0.80	0.55	ug/L	1
2-Nitrophenol	88-75-5	8270D	ND		0.80	1.0	ug/L	1
N-Nitrosodi-n-propylamine	621-64-7	8270D	ND		0.80	0.50	ug/L	1
N-Nitrosodiphenylamine (Diphenylamine)	86-30-6	8270D	ND		0.80	0.50	ug/L	1
Pentachlorophenol	87-86-5	8270D	ND		4.0	2.0	ug/L	1
Phenanthrene	85-01-8	8270D	ND		0.20	0.20	ug/L	1
Phenol	108-95-2	8270D	ND		0.80	0.50	ug/L	1
Pyrene	129-00-0	8270D	ND		0.20	0.20	ug/L	1
2,4,5-Trichlorophenol	95-95-4	8270D	ND		0.80	0.50	ug/L	1
2,4,6-Trichlorophenol	88-06-2	8270D	ND		0.80	0.50	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
2-Fluorobiphenyl		60	37-129
2-Fluorophenol		38	24-127
Nitrobenzene-d5		81	38-127
Phenol-d5		56	28-128
Terphenyl-d14		90	10-148
2,4,6-Tribromophenol		94	35-144

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

CVAA

Client: **GZA GeoEnvironmental, Inc.**
Laboratory ID: **UB16022-007**
Description: **MW-WV-3S**
Matrix: **Aqueous**
Date Sampled: **02/15/2019 1017**
Date Received: **02/16/2019**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		7470A	1	02/21/2019 1825	JMH	02/21/2019 1246	98268

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Mercury	7439-97-6	7470A	ND		0.00020	0.000091	mg/L	1

LOQ = Limit of Quantitation
B = Detected in the method blank
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N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
H = Out of holding time
W = Reported on wet weight basis

ICP-MS

Client: **GZA GeoEnvironmental, Inc.**	Laboratory ID: **UB16022-007**
Description: **MW-WV-3S**	Matrix: **Aqueous**
Date Sampled: **02/15/2019 1017**	
Date Received: **02/16/2019**	

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.2	200.8	1	02/20/2019 0847	BNW	02/19/2019 1041	97985

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Aluminum	**7429-90-5**	**200.8**	**670**		**40**	**10**	**ug/L**	**1**
Antimony	7440-36-0	200.8	ND		2.0	0.50	ug/L	1
Arsenic	7440-38-2	200.8	ND		2.0	1.3	ug/L	1
Barium	**7440-39-3**	**200.8**	**59**		**5.0**	**1.3**	**ug/L**	**1**
Beryllium	7440-41-7	200.8	ND		0.40	0.15	ug/L	1
Boron	**7440-42-8**	**200.8**	**20**	**J**	**50**	**6.3**	**ug/L**	**1**
Cadmium	7440-43-9	200.8	ND		0.50	0.13	ug/L	1
Chromium	**7440-47-3**	**200.8**	**2.1**	**J**	**5.0**	**1.3**	**ug/L**	**1**
Cobalt	7440-48-4	200.8	ND		5.0	1.3	ug/L	1
Copper	7440-50-8	200.8	ND		5.0	1.3	ug/L	1
Iron	**7439-89-6**	**200.8**	**4000**		**50**	**13**	**ug/L**	**1**
Lead	7439-92-1	200.8	ND		1.0	0.25	ug/L	1
Magnesium	**7439-95-4**	**200.8**	**5800**		**400**	**50**	**ug/L**	**1**
Molybdenum	7439-98-7	200.8	ND		10	2.5	ug/L	1
Nickel	**7440-02-0**	**200.8**	**1.7**	**J**	**5.0**	**1.3**	**ug/L**	**1**
Selenium	7782-49-2	200.8	ND		5.0	1.3	ug/L	1
Silver	7440-22-4	200.8	ND		1.0	0.25	ug/L	1
Sodium	**7440-23-5**	**200.8**	**8900**		**400**	**150**	**ug/L**	**1**
Thallium	7440-28-0	200.8	ND		0.50	0.15	ug/L	1
Titanium	**7440-32-6**	**200.8**	**9.5**		**5.0**	**1.3**	**ug/L**	**1**
Vanadium	7440-62-2	200.8	ND		5.0	2.5	ug/L	1
Zinc	7440-66-6	200.8	ND		10	2.5	ug/L	1

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range
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H = Out of holding time W = Reported on wet weight basis

PFAS by LC/MS/MS

Client: **GZA GeoEnvironmental, Inc.**
Laboratory ID: **UB16022-007**
Description: **MW-WV-3S**
Matrix: **Aqueous**
Date Sampled: **02/15/2019 1017**
Date Received: **02/16/2019**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537 MOD	537 Modified-ID	1	03/04/2019 1431	SES	02/26/2019 1100	98665

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	537 Modified-	ND		3.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	537 Modified-	ND		3.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	537 Modified-	ND		3.7	ng/L	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	537 Modified-	ND		7.5	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**537 Modified-**	**6.0**		**3.7**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	537 Modified-	ND		3.7	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**537 Modified-**	**4.4**		**3.7**	**ng/L**	**1**
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	537 Modified-	ND		7.5	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	537 Modified-	ND		3.7	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**537 Modified-**	**5.2**		**3.7**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**537 Modified-**	**18**		**3.7**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**537 Modified-**	**8.0**		**3.7**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537 Modified-	ND		3.7	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537 Modified-	ND		3.7	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**537 Modified-**	**9.7**		**3.7**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**537 Modified-**	**7.0**		**3.7**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537 Modified-	ND		3.7	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**537 Modified-**	**82**		**1.9**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	537 Modified-	ND		3.7	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537 Modified-	ND		3.7	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537 Modified-	ND		3.7	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537 Modified-	ND		3.7	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**537 Modified-**	**150**		**3.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		109	50-150
13C2_8:2FTS		103	50-150
13C2_PFDoA		93	50-150
13C2_PFTeDA		76	50-150
13C3_PFBS		101	50-150
13C3_PFHxS		102	50-150
13C4_PFBA		59	50-150
13C4_PFHpA		113	50-150
13C5_PFHxA		109	50-150
13C5_PFPeA		99	50-150
13C6_PFDA		103	50-150
13C7_PFUdA		100	50-150
13C8_PFOA		104	50-150
13C8_PFOS		104	50-150
13C8_PFOSA		86	50-150
13C9_PFNA		105	50-150
d-EtFOSA		75	50-150
d-MeFOSA		65	50-150

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

Inorganic non-metals

Client: **GZA GeoEnvironmental, Inc.**	Laboratory ID: **UB16022-008**
Description: **MW-WV-3D**	Matrix: **Aqueous**
Date Sampled: **02/15/2019 1120**	
Date Received: **02/16/2019**	

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	350.1	(Ammonia - N) 350.1	1	02/25/2019 1705	DMA		98618
1		(Chloride) 300.0	1	02/19/2019 2306	SLU		98109
1	10-204-00-1-X	(Cyanide - To) SM 4500-CN E-	1	02/26/2019 1524	MSG	02/26/2019 1135	98683
1		(Hardness (to) SM 2340C-2011	1	02/25/2019 1817	KFE		98653
1		(Nitrate-Nitr) 353.2	2	02/16/2019 1820	MDD		97767
1		(Phosphorus) 365.1	1	02/25/2019 1653	DMA	02/25/2019 1047	98578
1		(Sulfate) 300.0	1	02/19/2019 2306	SLU		98111
1		(Sulfide) SM 4500-S2 F-2011	1	02/18/2019 1716	HET		97966

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Ammonia - N (gas diffusion)		**350.1**	**0.041**	**BJ**	**0.10**	**0.020**	**mg/L**	**1**
Chloride		**300.0**	**62**	**B**	**1.0**	**0.20**	**mg/L**	**1**
Cyanide - Total	57-12-5	SM 4500-CN E-	ND		0.010	0.010	mg/L	1
Hardness (total)		**SM 2340C-**	**270**		**10**	**2.0**	**mg/L**	**1**
Nitrate-Nitrite - N		**353.2**	**2.2**		**0.040**	**0.0030**	**mg/L**	**1**
Phosphorus	**7723-14-0**	**365.1**	**0.0060**	**J**	**0.050**	**0.0050**	**mg/L**	**1**
Sulfate		**300.0**	**11**		**1.0**	**0.20**	**mg/L**	**1**
Sulfide	18496-25-8	SM 4500-S2 F-	ND		1.0	1.0	mg/L	1

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

Volatile Organic Compounds by GC/MS

Client: **GZA GeoEnvironmental, Inc.**
Laboratory ID: **UB16022-008**
Description: **MW-WV-3D**
Matrix: **Aqueous**
Date Sampled: **02/15/2019 1120**
Date Received: **02/16/2019**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	02/22/2019 1737	BWS		98458

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Acetone	**67-64-1**	**8260B**	**3.5**	**J**	**20**	**2.0**	**ug/L**	**1**
Benzene	71-43-2	8260B	ND		1.0	0.40	ug/L	1
Bromodichloromethane	75-27-4	8260B	ND		1.0	0.40	ug/L	1
Bromoform	75-25-2	8260B	ND		1.0	0.40	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		2.0	0.40	ug/L	1
2-Butanone (MEK)	78-93-3	8260B	ND		10	2.0	ug/L	1
Carbon disulfide	75-15-0	8260B	ND		1.0	0.40	ug/L	1
Carbon tetrachloride	56-23-5	8260B	ND		1.0	0.40	ug/L	1
Chlorobenzene	108-90-7	8260B	ND		1.0	0.40	ug/L	1
Chloroethane	75-00-3	8260B	ND		2.0	0.40	ug/L	1
Chloroform	67-66-3	8260B	ND		1.0	0.40	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		1.0	0.50	ug/L	1
Cyclohexane	110-82-7	8260B	ND		1.0	0.40	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260B	ND		1.0	0.40	ug/L	1
Dibromochloromethane	124-48-1	8260B	ND		1.0	0.40	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260B	ND		1.0	0.40	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		1.0	0.40	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260B	ND		1.0	0.40	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260B	ND		1.0	0.40	ug/L	1
Dichlorodifluoromethane	75-71-8	8260B	ND		2.0	0.60	ug/L	1
1,1-Dichloroethane	75-34-3	8260B	ND		1.0	0.40	ug/L	1
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.40	ug/L	1
1,1-Dichloroethene	75-35-4	8260B	ND		1.0	0.40	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260B	ND		1.0	0.40	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260B	ND		1.0	0.40	ug/L	1
1,2-Dichloropropane	78-87-5	8260B	ND		1.0	0.40	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		1.0	0.40	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		1.0	0.40	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		1.0	0.40	ug/L	1
2-Hexanone	591-78-6	8260B	ND		10	2.0	ug/L	1
Isopropylbenzene	98-82-8	8260B	ND		1.0	0.40	ug/L	1
Methyl acetate	79-20-9	8260B	ND		1.0	0.40	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		1.0	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		10	2.0	ug/L	1
Methylcyclohexane	108-87-2	8260B	ND		5.0	0.40	ug/L	1
Methylene chloride	75-09-2	8260B	ND		1.0	0.40	ug/L	1
Styrene	100-42-5	8260B	ND		1.0	0.41	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		1.0	0.40	ug/L	1
Tetrachloroethene	127-18-4	8260B	ND		1.0	0.40	ug/L	1
Toluene	108-88-3	8260B	ND		1.0	0.40	ug/L	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	8260B	ND		1.0	0.42	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260B	ND		1.0	0.40	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		1.0	0.40	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		1.0	0.40	ug/L	1

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

Volatile Organic Compounds by GC/MS

Client: **GZA GeoEnvironmental, Inc.**	Laboratory ID: **UB16022-008**
Description: **MW-WV-3D**	Matrix: **Aqueous**
Date Sampled: **02/15/2019 1120**	
Date Received: **02/16/2019**	

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	02/22/2019 1737	BWS		98458

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Trichloroethene	79-01-6	8260B	ND		1.0	0.40	ug/L	1
Trichlorofluoromethane	75-69-4	8260B	ND		1.0	0.40	ug/L	1
Vinyl chloride	75-01-4	8260B	ND		1.0	0.40	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.40	ug/L	1
m+p - Xylenes	179601-23-1	8260B	ND		1.0	0.40	ug/L	1
o - Xylenes	95-47-6	8260B	ND		1.0	0.40	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		97	70-130
Bromofluorobenzene		112	70-130
Toluene-d8		100	70-130

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

Semivolatile Organic Compounds by GC/MS

Client: **GZA GeoEnvironmental, Inc.**	Laboratory ID: **UB16022-008**
Description: **MW-WV-3D**	Matrix: **Aqueous**
Date Sampled: **02/15/2019 1120**	
Date Received: **02/16/2019**	

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3520C	8270D	1	02/21/2019 1809	CMP2	02/18/2019 1401	97888

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Acenaphthene	83-32-9	8270D	ND		0.20	0.20	ug/L	1
Acenaphthylene	208-96-8	8270D	ND		0.20	0.20	ug/L	1
Acetophenone	98-86-2	8270D	ND		0.80	0.50	ug/L	1
Anthracene	120-12-7	8270D	ND		0.20	0.20	ug/L	1
Atrazine	1912-24-9	8270D	ND		0.80	0.50	ug/L	1
Benzidine	92-87-5	8270D	ND		20	1.0	ug/L	1
Benzo(a)anthracene	56-55-3	8270D	ND		0.20	0.20	ug/L	1
Benzo(a)pyrene	50-32-8	8270D	ND		0.20	0.20	ug/L	1
Benzo(b)fluoranthene	205-99-2	8270D	ND		0.20	0.20	ug/L	1
Benzo(g,h,i)perylene	191-24-2	8270D	ND		0.20	0.20	ug/L	1
Benzo(k)fluoranthene	207-08-9	8270D	ND		0.20	0.20	ug/L	1
Butyl benzyl phthalate	85-68-7	8270D	ND		0.80	0.50	ug/L	1
Caprolactam	105-60-2	8270D	ND		1.6	1.0	ug/L	1
Carbazole	86-74-8	8270D	ND		0.80	0.50	ug/L	1
4-Chloro-3-methyl phenol	59-50-7	8270D	ND		0.80	0.50	ug/L	1
bis(2-Chloroethyl)ether	111-44-4	8270D	ND		0.80	0.50	ug/L	1
2-Chloronaphthalene	91-58-7	8270D	ND		0.80	0.50	ug/L	1
2-Chlorophenol	95-57-8	8270D	ND		0.80	0.50	ug/L	1
Chrysene	218-01-9	8270D	ND		0.20	0.20	ug/L	1
Dibenzo(a,h)anthracene	53-70-3	8270D	ND		0.20	0.20	ug/L	1
Dibenzofuran	132-64-9	8270D	ND		0.80	0.50	ug/L	1
3,3'-Dichlorobenzidine	91-94-1	8270D	ND		0.80	1.8	ug/L	1
2,4-Dichlorophenol	120-83-2	8270D	ND		1.6	1.0	ug/L	1
Diethylphthalate	84-66-2	8270D	ND		0.80	0.50	ug/L	1
Dimethyl phthalate	131-11-3	8270D	ND		0.80	0.50	ug/L	1
2,4-Dimethylphenol	105-67-9	8270D	ND		0.80	0.48	ug/L	1
Di-n-butyl phthalate	84-74-2	8270D	ND		0.80	0.50	ug/L	1
4,6-Dinitro-2-methylphenol	534-52-1	8270D	ND		4.0	1.0	ug/L	1
2,4-Dinitrotoluene	121-14-2	8270D	ND		1.6	0.50	ug/L	1
Di-n-octylphthalate	117-84-0	8270D	ND		0.80	0.50	ug/L	1
1,2-Diphenylhydrazine(as azobenzene)	103-33-3	8270D	ND		0.80	0.50	ug/L	1
bis(2-Ethylhexyl)phthalate	117-81-7	8270D	ND		4.0	0.50	ug/L	1
Fluoranthene	206-44-0	8270D	ND		0.20	0.20	ug/L	1
Fluorene	86-73-7	8270D	ND		0.20	0.20	ug/L	1
Hexachlorobenzene	118-74-1	8270D	ND		0.80	0.50	ug/L	1
Hexachlorobutadiene	87-68-3	8270D	ND		0.80	0.50	ug/L	1
Hexachlorocyclopentadiene	77-47-4	8270D	ND		4.0	2.0	ug/L	1
Hexachloroethane	67-72-1	8270D	ND		0.80	0.31	ug/L	1
Indeno(1,2,3-c,d)pyrene	193-39-5	8270D	ND		0.20	0.20	ug/L	1
Isophorone	78-59-1	8270D	ND		0.80	0.50	ug/L	1
2-Methylnaphthalene	91-57-6	8270D	ND		0.20	0.20	ug/L	1
2-Methylphenol	95-48-7	8270D	ND		0.80	0.21	ug/L	1
3+4-Methylphenol	106-44-5	8270D	ND		0.80	1.5	ug/L	1
Naphthalene	91-20-3	8270D	ND		0.20	0.20	ug/L	1

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

Semivolatile Organic Compounds by GC/MS

Client: **GZA GeoEnvironmental, Inc.**	Laboratory ID: **UB16022-008**
Description: **MW-WV-3D**	Matrix: **Aqueous**
Date Sampled: **02/15/2019 1120**	
Date Received: **02/16/2019**	

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3520C	8270D	1	02/21/2019 1809	CMP2	02/18/2019 1401	97888

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Nitrobenzene	98-95-3	8270D	ND		0.80	0.55	ug/L	1
2-Nitrophenol	88-75-5	8270D	ND		0.80	1.0	ug/L	1
N-Nitrosodi-n-propylamine	621-64-7	8270D	ND		0.80	0.50	ug/L	1
N-Nitrosodiphenylamine (Diphenylamine)	86-30-6	8270D	ND		0.80	0.50	ug/L	1
Pentachlorophenol	87-86-5	8270D	ND		4.0	2.0	ug/L	1
Phenanthrene	85-01-8	8270D	ND		0.20	0.20	ug/L	1
Phenol	108-95-2	8270D	ND		0.80	0.50	ug/L	1
Pyrene	129-00-0	8270D	ND		0.20	0.20	ug/L	1
2,4,5-Trichlorophenol	95-95-4	8270D	ND		0.80	0.50	ug/L	1
2,4,6-Trichlorophenol	88-06-2	8270D	ND		0.80	0.50	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
2-Fluorobiphenyl		47	37-129
2-Fluorophenol		33	24-127
Nitrobenzene-d5		62	38-127
Phenol-d5		47	28-128
Terphenyl-d14		89	10-148
2,4,6-Tribromophenol		62	35-144

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

Client: **GZA GeoEnvironmental, Inc.**	Laboratory ID: **UB16022-008**
Description: **MW-WV-3D**	Matrix: **Aqueous**
Date Sampled: **02/15/2019 1120**	
Date Received: **02/16/2019**	

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		7470A	1	02/21/2019 1833	JMH	02/21/2019 1246	98268

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Mercury	7439-97-6	7470A	ND		0.00020	0.000091	mg/L	1

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

ICP-MS

Client: **GZA GeoEnvironmental, Inc.**	Laboratory ID: **UB16022-008**
Description: **MW-WV-3D**	Matrix: **Aqueous**
Date Sampled: **02/15/2019 1120**	
Date Received: **02/16/2019**	

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.2	200.8	1	02/20/2019 0853	BNW	02/19/2019 1041	97985

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Aluminum	7429-90-5	200.8	ND		40	10	ug/L	1
Antimony	7440-36-0	200.8	ND		2.0	0.50	ug/L	1
Arsenic	7440-38-2	200.8	ND		2.0	1.3	ug/L	1
Barium	**7440-39-3**	**200.8**	**25**		**5.0**	**1.3**	**ug/L**	**1**
Beryllium	7440-41-7	200.8	ND		0.40	0.15	ug/L	1
Boron	**7440-42-8**	**200.8**	**16**	**J**	**50**	**6.3**	**ug/L**	**1**
Cadmium	7440-43-9	200.8	ND		0.50	0.13	ug/L	1
Chromium	7440-47-3	200.8	ND		5.0	1.3	ug/L	1
Cobalt	7440-48-4	200.8	ND		5.0	1.3	ug/L	1
Copper	7440-50-8	200.8	ND		5.0	1.3	ug/L	1
Iron	**7439-89-6**	**200.8**	**140**		**50**	**13**	**ug/L**	**1**
Lead	7439-92-1	200.8	ND		1.0	0.25	ug/L	1
Magnesium	**7439-95-4**	**200.8**	**23000**		**400**	**50**	**ug/L**	**1**
Molybdenum	7439-98-7	200.8	ND		10	2.5	ug/L	1
Nickel	**7440-02-0**	**200.8**	**1.3**	**J**	**5.0**	**1.3**	**ug/L**	**1**
Selenium	7782-49-2	200.8	ND		5.0	1.3	ug/L	1
Silver	7440-22-4	200.8	ND		1.0	0.25	ug/L	1
Sodium	**7440-23-5**	**200.8**	**25000**		**400**	**150**	**ug/L**	**1**
Thallium	7440-28-0	200.8	ND		0.50	0.15	ug/L	1
Titanium	7440-32-6	200.8	ND		5.0	1.3	ug/L	1
Vanadium	7440-62-2	200.8	ND		5.0	2.5	ug/L	1
Zinc	7440-66-6	200.8	ND		10	2.5	ug/L	1

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

PFAS by LC/MS/MS

Client: **GZA GeoEnvironmental, Inc.**
Laboratory ID: **UB16022-008**
Description: **MW-WV-3D**
Matrix: **Aqueous**
Date Sampled: **02/15/2019 1120**
Date Received: **02/16/2019**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537 MOD	537 Modified-ID	1	02/28/2019 0246	SES	02/26/2019 1100	98665

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	537 Modified-	ND		3.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	537 Modified-	ND		3.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	537 Modified-	ND		3.8	ng/L	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	537 Modified-	ND		7.6	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**537 Modified-**	**6.0**		**3.8**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	537 Modified-	ND		3.8	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	537 Modified-	ND		3.8	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	537 Modified-	ND		7.6	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	537 Modified-	ND		3.8	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	537 Modified-	ND		3.8	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**537 Modified-**	**4.0**		**3.8**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	375-22-4	537 Modified-	ND		3.8	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537 Modified-	ND		3.8	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537 Modified-	ND		3.8	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537 Modified-	ND		3.8	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537 Modified-	ND		3.8	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537 Modified-	ND		3.8	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	537 Modified-	ND		1.9	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	537 Modified-	ND		3.8	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537 Modified-	ND		3.8	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537 Modified-	ND		3.8	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537 Modified-	ND		3.8	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	537 Modified-	ND		3.8	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		111	50-150
13C2_8:2FTS		97	50-150
13C2_PFDoA		99	50-150
13C2_PFTeDA		112	50-150
13C3_PFBS		106	50-150
13C3_PFHxS		109	50-150
13C4_PFBA		119	50-150
13C4_PFHpA		113	50-150
13C5_PFHxA		117	50-150
13C5_PFPeA		117	50-150
13C6_PFDA		107	50-150
13C7_PFUdA		104	50-150
13C8_PFOA		115	50-150
13C8_PFOS		106	50-150
13C8_PFOSA		104	50-150
13C9_PFNA		116	50-150
d-EtFOSA		66	50-150
d-MeFOSA		81	50-150

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

Inorganic non-metals

Client: **GZA GeoEnvironmental, Inc.**	Laboratory ID: **UB16022-009**
Description: **MW-WV-8D**	Matrix: **Aqueous**
Date Sampled: **02/15/2019 1200**	
Date Received: **02/16/2019**	

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	350.1	(Ammonia - N) 350.1	1	02/25/2019 1707	DMA		98618
1		(Chloride) 300.0	1	02/19/2019 2325	SLU		98109
1	10-204-00-1-X	(Cyanide - To) SM 4500-CN E-	1	02/26/2019 1526	MSG	02/26/2019 1135	98683
1		(Hardness (to) SM 2340C-2011	1	02/25/2019 1817	KFE		98653
1		(Nitrate-Nitr) 353.2	1	02/16/2019 1821	MDD		97767
1		(Phosphorus) 365.1	1	02/25/2019 1653	DMA	02/25/2019 1047	98578
1		(Sulfate) 300.0	1	02/19/2019 2325	SLU		98111
1		(Sulfide) SM 4500-S2 F-2011	1	02/18/2019 1716	HET		97966

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Ammonia - N (gas diffusion)		**350.1**	**0.31**	**B**	**0.10**	**0.020**	**mg/L**	**1**
Chloride		**300.0**	**37**	**B**	**1.0**	**0.20**	**mg/L**	**1**
Cyanide - Total	57-12-5	SM 4500-CN E-	ND		0.010	0.010	mg/L	1
Hardness (total)		**SM 2340C-**	**230**		**10**	**2.0**	**mg/L**	**1**
Nitrate-Nitrite - N		**353.2**	**0.27**		**0.020**	**0.0015**	**mg/L**	**1**
Phosphorus	**7723-14-0**	**365.1**	**0.023**	**J**	**0.050**	**0.0050**	**mg/L**	**1**
Sulfate		**300.0**	**29**		**1.0**	**0.20**	**mg/L**	**1**
Sulfide	18496-25-8	SM 4500-S2 F-	ND		1.0	1.0	mg/L	1

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

Volatile Organic Compounds by GC/MS

Client: **GZA GeoEnvironmental, Inc.**
Laboratory ID: **UB16022-009**
Description: **MW-WV-8D**
Matrix: **Aqueous**
Date Sampled: **02/15/2019 1200**
Date Received: **02/16/2019**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	02/22/2019 1800	BWS		98458

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Acetone	67-64-1	8260B	ND		20	2.0	ug/L	1
Benzene	71-43-2	8260B	ND		1.0	0.40	ug/L	1
Bromodichloromethane	75-27-4	8260B	ND		1.0	0.40	ug/L	1
Bromoform	75-25-2	8260B	ND		1.0	0.40	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		2.0	0.40	ug/L	1
2-Butanone (MEK)	78-93-3	8260B	ND		10	2.0	ug/L	1
Carbon disulfide	75-15-0	8260B	ND		1.0	0.40	ug/L	1
Carbon tetrachloride	56-23-5	8260B	ND		1.0	0.40	ug/L	1
Chlorobenzene	108-90-7	8260B	ND		1.0	0.40	ug/L	1
Chloroethane	75-00-3	8260B	ND		2.0	0.40	ug/L	1
Chloroform	67-66-3	8260B	ND		1.0	0.40	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		1.0	0.50	ug/L	1
Cyclohexane	110-82-7	8260B	ND		1.0	0.40	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260B	ND		1.0	0.40	ug/L	1
Dibromochloromethane	124-48-1	8260B	ND		1.0	0.40	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260B	ND		1.0	0.40	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		1.0	0.40	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260B	ND		1.0	0.40	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260B	ND		1.0	0.40	ug/L	1
Dichlorodifluoromethane	75-71-8	8260B	ND		2.0	0.60	ug/L	1
1,1-Dichloroethane	75-34-3	8260B	ND		1.0	0.40	ug/L	1
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.40	ug/L	1
1,1-Dichloroethene	75-35-4	8260B	ND		1.0	0.40	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260B	ND		1.0	0.40	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260B	ND		1.0	0.40	ug/L	1
1,2-Dichloropropane	78-87-5	8260B	ND		1.0	0.40	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		1.0	0.40	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		1.0	0.40	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		1.0	0.40	ug/L	1
2-Hexanone	591-78-6	8260B	ND		10	2.0	ug/L	1
Isopropylbenzene	98-82-8	8260B	ND		1.0	0.40	ug/L	1
Methyl acetate	79-20-9	8260B	ND		1.0	0.40	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		1.0	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		10	2.0	ug/L	1
Methylcyclohexane	108-87-2	8260B	ND		5.0	0.40	ug/L	1
Methylene chloride	75-09-2	8260B	ND		1.0	0.40	ug/L	1
Styrene	100-42-5	8260B	ND		1.0	0.41	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		1.0	0.40	ug/L	1
Tetrachloroethene	127-18-4	8260B	ND		1.0	0.40	ug/L	1
Toluene	108-88-3	8260B	ND		1.0	0.40	ug/L	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	8260B	ND		1.0	0.42	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260B	ND		1.0	0.40	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		1.0	0.40	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		1.0	0.40	ug/L	1

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

Volatile Organic Compounds by GC/MS

Client: **GZA GeoEnvironmental, Inc.**	Laboratory ID: **UB16022-009**
Description: **MW-WV-8D**	Matrix: **Aqueous**
Date Sampled: **02/15/2019 1200**	
Date Received: **02/16/2019**	

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	02/22/2019 1800	BWS		98458

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Trichloroethene	79-01-6	8260B	ND		1.0	0.40	ug/L	1
Trichlorofluoromethane	75-69-4	8260B	ND		1.0	0.40	ug/L	1
Vinyl chloride	75-01-4	8260B	ND		1.0	0.40	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.40	ug/L	1
m+p - Xylenes	179601-23-1	8260B	ND		1.0	0.40	ug/L	1
o - Xylenes	95-47-6	8260B	ND		1.0	0.40	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		96	70-130
Bromofluorobenzene		108	70-130
Toluene-d8		97	70-130

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

Semivolatile Organic Compounds by GC/MS

Client: **GZA GeoEnvironmental, Inc.** Laboratory ID: **UB16022-009**
Description: **MW-WV-8D** Matrix: **Aqueous**
Date Sampled: **02/15/2019 1200**
Date Received: **02/16/2019**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3520C	8270D	1	02/21/2019 1834	CMP2	02/18/2019 1401	97888

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Acenaphthene	83-32-9	8270D	ND		0.20	0.20	ug/L	1
Acenaphthylene	208-96-8	8270D	ND		0.20	0.20	ug/L	1
Acetophenone	98-86-2	8270D	ND		0.80	0.50	ug/L	1
Anthracene	120-12-7	8270D	ND		0.20	0.20	ug/L	1
Atrazine	1912-24-9	8270D	ND		0.80	0.50	ug/L	1
Benzidine	92-87-5	8270D	ND		20	1.0	ug/L	1
Benzo(a)anthracene	56-55-3	8270D	ND		0.20	0.20	ug/L	1
Benzo(a)pyrene	50-32-8	8270D	ND		0.20	0.20	ug/L	1
Benzo(b)fluoranthene	205-99-2	8270D	ND		0.20	0.20	ug/L	1
Benzo(g,h,i)perylene	191-24-2	8270D	ND		0.20	0.20	ug/L	1
Benzo(k)fluoranthene	207-08-9	8270D	ND		0.20	0.20	ug/L	1
Butyl benzyl phthalate	85-68-7	8270D	ND		0.80	0.50	ug/L	1
Caprolactam	105-60-2	8270D	ND		1.6	1.0	ug/L	1
Carbazole	86-74-8	8270D	ND		0.80	0.50	ug/L	1
4-Chloro-3-methyl phenol	59-50-7	8270D	ND		0.80	0.50	ug/L	1
bis(2-Chloroethyl)ether	111-44-4	8270D	ND		0.80	0.50	ug/L	1
2-Chloronaphthalene	91-58-7	8270D	ND		0.80	0.50	ug/L	1
2-Chlorophenol	95-57-8	8270D	ND		0.80	0.50	ug/L	1
Chrysene	218-01-9	8270D	ND		0.20	0.20	ug/L	1
Dibenzo(a,h)anthracene	53-70-3	8270D	ND		0.20	0.20	ug/L	1
Dibenzofuran	132-64-9	8270D	ND		0.80	0.50	ug/L	1
3,3'-Dichlorobenzidine	91-94-1	8270D	ND		0.80	1.8	ug/L	1
2,4-Dichlorophenol	120-83-2	8270D	ND		1.6	1.0	ug/L	1
Diethylphthalate	84-66-2	8270D	ND		0.80	0.50	ug/L	1
Dimethyl phthalate	131-11-3	8270D	ND		0.80	0.50	ug/L	1
2,4-Dimethylphenol	105-67-9	8270D	ND		0.80	0.48	ug/L	1
Di-n-butyl phthalate	84-74-2	8270D	ND		0.80	0.50	ug/L	1
4,6-Dinitro-2-methylphenol	534-52-1	8270D	ND		4.0	1.0	ug/L	1
2,4-Dinitrotoluene	121-14-2	8270D	ND		1.6	0.50	ug/L	1
Di-n-octylphthalate	117-84-0	8270D	ND		0.80	0.50	ug/L	1
1,2-Diphenylhydrazine(as azobenzene)	103-33-3	8270D	ND		0.80	0.50	ug/L	1
bis(2-Ethylhexyl)phthalate	**117-81-7**	**8270D**	**0.61**	**J**	**4.0**	**0.50**	**ug/L**	**1**
Fluoranthene	206-44-0	8270D	ND		0.20	0.20	ug/L	1
Fluorene	86-73-7	8270D	ND		0.20	0.20	ug/L	1
Hexachlorobenzene	118-74-1	8270D	ND		0.80	0.50	ug/L	1
Hexachlorobutadiene	87-68-3	8270D	ND		0.80	0.50	ug/L	1
Hexachlorocyclopentadiene	77-47-4	8270D	ND		4.0	2.0	ug/L	1
Hexachloroethane	67-72-1	8270D	ND		0.80	0.31	ug/L	1
Indeno(1,2,3-c,d)pyrene	193-39-5	8270D	ND		0.20	0.20	ug/L	1
Isophorone	78-59-1	8270D	ND		0.80	0.50	ug/L	1
2-Methylnaphthalene	91-57-6	8270D	ND		0.20	0.20	ug/L	1
2-Methylphenol	95-48-7	8270D	ND		0.80	0.21	ug/L	1
3+4-Methylphenol	106-44-5	8270D	ND		0.80	1.5	ug/L	1
Naphthalene	91-20-3	8270D	ND		0.20	0.20	ug/L	1

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

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com

Semivolatile Organic Compounds by GC/MS

Client: **GZA GeoEnvironmental, Inc.**
Laboratory ID: **UB16022-009**
Description: **MW-WV-8D**
Matrix: **Aqueous**
Date Sampled: **02/15/2019 1200**
Date Received: **02/16/2019**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3520C	8270D	1	02/21/2019 1834	CMP2	02/18/2019 1401	97888

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Nitrobenzene	98-95-3	8270D	ND		0.80	0.55	ug/L	1
2-Nitrophenol	88-75-5	8270D	ND		0.80	1.0	ug/L	1
N-Nitrosodi-n-propylamine	621-64-7	8270D	ND		0.80	0.50	ug/L	1
N-Nitrosodiphenylamine (Diphenylamine)	86-30-6	8270D	ND		0.80	0.50	ug/L	1
Pentachlorophenol	87-86-5	8270D	ND		4.0	2.0	ug/L	1
Phenanthrene	85-01-8	8270D	ND		0.20	0.20	ug/L	1
Phenol	108-95-2	8270D	ND		0.80	0.50	ug/L	1
Pyrene	129-00-0	8270D	ND		0.20	0.20	ug/L	1
2,4,5-Trichlorophenol	95-95-4	8270D	ND		0.80	0.50	ug/L	1
2,4,6-Trichlorophenol	88-06-2	8270D	ND		0.80	0.50	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
2-Fluorobiphenyl		55	37-129
2-Fluorophenol		43	24-127
Nitrobenzene-d5		63	38-127
Phenol-d5		49	28-128
Terphenyl-d14		87	10-148
2,4,6-Tribromophenol		72	35-144

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

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com

Client: **GZA GeoEnvironmental, Inc.** Laboratory ID: **UB16022-009**

Description: **MW-WV-8D** Matrix: **Aqueous**

Date Sampled: **02/15/2019 1200**

Date Received: **02/16/2019**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		7470A	1	02/21/2019 1837	JMH	02/21/2019 1246	98268

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Mercury	7439-97-6	7470A	ND		0.00020	0.000091	mg/L	1

LOQ = Limit of Quantitation B = Detected in the method blank E = Quantitation of compound exceeded the calibration range
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ICP-MS

Client: **GZA GeoEnvironmental, Inc.** Laboratory ID: **UB16022-009**

Description: **MW-WV-8D** Matrix: **Aqueous**

Date Sampled: **02/15/2019 1200**

Date Received: **02/16/2019**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.2	200.8	1	02/20/2019 0859	BNW	02/19/2019 1041	97985
2	200.2	200.8	1	02/20/2019 1307	BNW	02/19/2019 1041	97985

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Aluminum	**7429-90-5**	**200.8**	**440**		**40**	**10**	**ug/L**	**1**
Antimony	7440-36-0	200.8	ND		2.0	0.50	ug/L	1
Arsenic	**7440-38-2**	**200.8**	**1.8**	**J**	**2.0**	**1.3**	**ug/L**	**1**
Barium	**7440-39-3**	**200.8**	**68**		**5.0**	**1.3**	**ug/L**	**1**
Beryllium	7440-41-7	200.8	ND		0.40	0.15	ug/L	1
Boron	**7440-42-8**	**200.8**	**28**	**J**	**50**	**6.3**	**ug/L**	**1**
Cadmium	7440-43-9	200.8	ND		0.50	0.13	ug/L	1
Chromium	7440-47-3	200.8	ND		5.0	1.3	ug/L	1
Cobalt	7440-48-4	200.8	ND		5.0	1.3	ug/L	1
Copper	7440-50-8	200.8	ND		5.0	1.3	ug/L	1
Iron	**7439-89-6**	**200.8**	**600**		**50**	**13**	**ug/L**	**1**
Lead	7439-92-1	200.8	ND		1.0	0.25	ug/L	1
Magnesium	**7439-95-4**	**200.8**	**22000**		**400**	**50**	**ug/L**	**1**
Molybdenum	**7439-98-7**	**200.8**	**4.7**	**J**	**10**	**2.5**	**ug/L**	**1**
Nickel	7440-02-0	200.8	ND		5.0	1.3	ug/L	1
Selenium	7782-49-2	200.8	ND		5.0	1.3	ug/L	1
Silver	7440-22-4	200.8	ND		1.0	0.25	ug/L	1
Sodium	**7440-23-5**	**200.8**	**11000**		**400**	**150**	**ug/L**	**1**
Thallium	7440-28-0	200.8	ND		0.50	0.15	ug/L	1
Titanium	**7440-32-6**	**200.8**	**16**		**5.0**	**1.3**	**ug/L**	**2**
Vanadium	7440-62-2	200.8	ND		5.0	2.5	ug/L	1
Zinc	**7440-66-6**	**200.8**	**5.9**	**J**	**10**	**2.5**	**ug/L**	**1**

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H = Out of holding time
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PFAS by LC/MS/MS

Client: **GZA GeoEnvironmental, Inc.**	Laboratory ID: **UB16022-009**
Description: **MW-WV-8D**	Matrix: **Aqueous**
Date Sampled: **02/15/2019 1200**	
Date Received: **02/16/2019**	

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	537 MOD	537 Modified-ID	1	02/28/2019 0258	SES	02/26/2019 1100	98665

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	537 Modified-	ND		3.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	537 Modified-	ND		3.5	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	537 Modified-	ND		3.5	ng/L	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	537 Modified-	ND		7.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	537 Modified-	ND		3.5	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	537 Modified-	ND		3.5	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	537 Modified-	ND		3.5	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	537 Modified-	ND		7.0	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	537 Modified-	ND		3.5	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	537 Modified-	ND		3.5	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	537 Modified-	ND		3.5	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	537 Modified-	ND		3.5	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	537 Modified-	ND		3.5	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	537 Modified-	ND		3.5	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	537 Modified-	ND		3.5	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	537 Modified-	ND		3.5	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	537 Modified-	ND		3.5	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**537 Modified-**	**4.8**		**1.8**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	537 Modified-	ND		3.5	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	537 Modified-	ND		3.5	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	537 Modified-	ND		3.5	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	537 Modified-	ND		3.5	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	537 Modified-	ND		3.5	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		99	50-150
13C2_8:2FTS		88	50-150
13C2_PFDoA		94	50-150
13C2_PFTeDA		106	50-150
13C3_PFBS		104	50-150
13C3_PFHxS		101	50-150
13C4_PFBA		116	50-150
13C4_PFHpA		107	50-150
13C5_PFHxA		107	50-150
13C5_PFPeA		111	50-150
13C6_PFDA		104	50-150
13C7_PFUdA		102	50-150
13C8_PFOA		109	50-150
13C8_PFOS		104	50-150
13C8_PFOSA		100	50-150
13C9_PFNA		105	50-150
d-EtFOSA		74	50-150
d-MeFOSA		80	50-150

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

QC Summary

Inorganic non-metals - MB

Sample ID: UQ97767-001 **Matrix:** Aqueous
Batch: 97767
Analytical Method: 353.2

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
Nitrate-Nitrite - N	ND		1	0.020	0.0015	mg/L	02/16/2019 1732

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

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

Inorganic non-metals - LCS

Sample ID: UQ97767-002
Batch: 97767
Analytical Method: 353.2

Matrix: Aqueous

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Nitrate-Nitrite - N	0.80	0.76		1	95	90-110	02/16/2019 1733

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

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

Inorganic non-metals - MS

Sample ID: UB16022-001MS | **Matrix:** Aqueous
Batch: 97767
Analytical Method: 353.2

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Nitrate-Nitrite - N	0.015	0.80	0.78		1	95	90-110	02/16/2019 1757

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

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

Inorganic non-metals - MSD

Sample ID: UB16022-001MD
Batch: 97767
Analytical Method: 353.2

Matrix: Aqueous

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Nitrate-Nitrite - N	0.015	0.80	0.80		1	98	3.0	90-110	20	02/16/2019 1759

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

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

Inorganic non-metals - MS

Sample ID: UB16022-007MS **Matrix:** Aqueous
Batch: 97767
Analytical Method: 353.2

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Nitrate-Nitrite - N	0.058	0.80	0.58	N	1	65	90-110	02/16/2019 1811

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

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

Inorganic non-metals - MSD

Sample ID: UB16022-007MD
Batch: 97767
Analytical Method: 353.2

Matrix: Aqueous

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Nitrate-Nitrite - N	0.058	0.80	0.59	N	1	67	1.7	90-110	20	02/16/2019 1812

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
ND = Not detected at or above the LOQ

N = Recovery is out of criteria
+ = RPD is out of criteria

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

Inorganic non-metals - MB

Sample ID: UQ97966-001
Batch: 97966
Analytical Method: SM 4500-S2 F-2011
Matrix: Aqueous

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
Sulfide	ND		1	1.0	1.0	mg/L	02/18/2019 1716

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

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

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Inorganic non-metals - LCS

Sample ID: UQ97966-002 **Matrix:** Aqueous
Batch: 97966
Analytical Method: SM 4500-S2 F-2011

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Sulfide	10	9.9		1	99	80-120	02/18/2019 1716

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and $\geq$ DL
ND = Not detected at or above the LOQ

N = Recovery is out of criteria
+ = RPD is out of criteria

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

Inorganic non-metals - LCSD

Sample ID: UQ97966-003 **Matrix:** Aqueous
Batch: 97966
Analytical Method: SM 4500-S2 F-2011

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Sulfide	10	10		1	100	1.0	80-120	20	02/18/2019 1716

LOQ = Limit of Quantitation P = The RPD between two GC columns exceeds 40% N = Recovery is out of criteria

DL = Detection Limit J = Estimated result < LOQ and ≥ DL + = RPD is out of criteria

LOD = Limit of Detection ND = Not detected at or above the LOQ

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

Inorganic non-metals - MB

Sample ID: UQ98109-001 **Matrix:** Aqueous
Batch: 98109
Analytical Method: 300.0

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
Chloride	0.20	J	1	1.0	0.20	mg/L	02/19/2019 1535

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

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

Inorganic non-metals - LCS

Sample ID: UQ98109-002

Batch: 98109

Analytical Method: 300.0

Matrix: Aqueous

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Chloride	20	20		1	100	90-110	02/19/2019 1611

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

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

Inorganic non-metals - MS

Sample ID: UB16022-007MS **Matrix:** Aqueous

Batch: 98109

Analytical Method: 300.0

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Chloride	24	20	44		1	98	90-110	02/19/2019 2154

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

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

Inorganic non-metals - MSD

Sample ID: UB16022-007MD
Batch: 98109
Analytical Method: 300.0

Matrix: Aqueous

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Chloride	24	20	44		1	98	0.23	90-110	20	02/19/2019 2212

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
ND = Not detected at or above the LOQ

N = Recovery is out of criteria
+ = RPD is out of criteria

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

Inorganic non-metals - MB

Sample ID: UQ98111-001 **Matrix:** Aqueous
Batch: 98111
Analytical Method: 300.0

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
Sulfate	ND		1	1.0	0.20	mg/L	02/19/2019 1535

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

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

Inorganic non-metals - LCS

Sample ID: UQ98111-002 **Matrix:** Aqueous
Batch: 98111
Analytical Method: 300.0

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Sulfate	20	20		1	100	90-110	02/19/2019 1611

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

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

Inorganic non-metals - MS

Sample ID: UB16022-007MS **Matrix:** Aqueous
Batch: 98111
Analytical Method: 300.0

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Sulfate	0.34	20	20		1	99	90-110	02/19/2019 2154

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

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

Inorganic non-metals - MSD

Sample ID: UB16022-007MD | **Matrix:** Aqueous
Batch: 98111
Analytical Method: 300.0

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Sulfate	0.34	20	20		1	99	0.00	90-110	20	02/19/2019 2212

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

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

Inorganic non-metals - MB

Sample ID: UQ98578-001
Batch: 98578
Analytical Method: 365.1

Matrix: Aqueous
Prep Method: 365.1
Prep Date: 02/25/2019 1047

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
Phosphorus	ND		1	0.050	0.0050	mg/L	02/25/2019 1621

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

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

Inorganic non-metals - LCS

Sample ID: UQ98578-002
Batch: 98578
Analytical Method: 365.1

Matrix: Aqueous
Prep Method: 365.1
Prep Date: 02/25/2019 1047

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Phosphorus	0.25	0.23		1	92	90-110	02/25/2019 1621

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and $\geq$ DL
ND = Not detected at or above the LOQ

N = Recovery is out of criteria
+ = RPD is out of criteria

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

Inorganic non-metals - MS

Sample ID: UB16022-003MS
Batch: 98578
Analytical Method: 365.1

Matrix: Aqueous
Prep Method: 365.1
Prep Date: 02/25/2019 1047

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Phosphorus	0.013	0.25	0.23	N	1	88	90-110	02/25/2019 1652

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

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

Inorganic non-metals - MSD

Sample ID: UB16022-003MD
Batch: 98578
Analytical Method: 365.1

Matrix: Aqueous
Prep Method: 365.1
Prep Date: 02/25/2019 1047

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Phosphorus	0.013	0.25	0.23	N	1	85	3.1	90-110	20	02/25/2019 1652

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
ND = Not detected at or above the LOQ

N = Recovery is out of criteria
+ = RPD is out of criteria

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

Inorganic non-metals - MS

Sample ID: UB16022-009MS
Batch: 98578
Analytical Method: 365.1

Matrix: Aqueous
Prep Method: 365.1
Prep Date: 02/25/2019 1047

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Phosphorus	0.023	0.25	0.25		1	91	90-110	02/25/2019 1653

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

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

Inorganic non-metals - MSD

Sample ID: UB16022-009MD
Batch: 98578
Analytical Method: 365.1

Matrix: Aqueous
Prep Method: 365.1
Prep Date: 02/25/2019 1047

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Phosphorus	0.023	0.25	0.25		1	90	0.64	90-110	20	02/25/2019 1656

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

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

Inorganic non-metals - MB

Sample ID: UQ98613-001
Batch: 98613
Analytical Method: 350.1
Matrix: Aqueous
Prep Method: 350.1

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
Ammonia - N (gas diffusion)	0.026	J	1	0.10	0.020	mg/L	02/25/2019 1543

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

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

Inorganic non-metals - LCS

Sample ID: UQ98613-002
Batch: 98613
Analytical Method: 350.1

Matrix: Aqueous
Prep Method: 350.1

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Ammonia - N (gas diffusion)	1.0	0.96		1	96	90-110	02/25/2019 1545

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

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

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Inorganic non-metals - MB

Sample ID: UQ98618-001 **Matrix:** Aqueous
Batch: 98618 **Prep Method:** 350.1
Analytical Method: 350.1

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
Ammonia - N (gas diffusion)	**0.031**	**J**	**1**	**0.10**	**0.020**	**mg/L**	**02/25/2019 1653**

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

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

Inorganic non-metals - LCS

Sample ID: UQ98618-002 **Matrix:** Aqueous
Batch: 98618 **Prep Method:** 350.1
Analytical Method: 350.1

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Ammonia - N (gas diffusion)	1.0	0.96		1	96	90-110	02/25/2019 1655

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

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

Inorganic non-metals - MB

Sample ID: UQ98653-001
Batch: 98653
Analytical Method: SM 2340C-2011

Matrix: Aqueous

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
Hardness (total)	ND		1	10	2.0	mg/L	02/25/2019 1817

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

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

Inorganic non-metals - LCS

Sample ID: UQ98653-002
Batch: 98653
Analytical Method: SM 2340C-2011

Matrix: Aqueous

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Hardness (total)	100	100		1	100	90-110	02/25/2019 1817

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

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

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Inorganic non-metals - MB

Sample ID:	UQ98683-001	**Matrix:**	Aqueous
Batch:	98683	**Prep Method:**	10-204-00-1-X
Analytical Method:	SM 4500-CN E-2011	**Prep Date:**	02/26/2019 1135

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
Cyanide - Total	ND		1	0.010	0.010	mg/L	02/26/2019 1449

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

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

Inorganic non-metals - LCS

Sample ID: UQ98683-002
Batch: 98683
Analytical Method: SM 4500-CN E-2011

Matrix: Aqueous
Prep Method: 10-204-00-1-X
Prep Date: 02/26/2019 1135

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Cyanide - Total	0.10	0.10		1	102	90-110	02/26/2019 1451

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

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

Volatile Organic Compounds by GC/MS - MB

Sample ID: UQ98299-001
Batch: 98299
Analytical Method: 8260B
Matrix: Aqueous
Prep Method: 5030B

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
Acetone	ND		1	20	2.0	ug/L	02/21/2019 1108
Benzene	ND		1	1.0	0.40	ug/L	02/21/2019 1108
Bromodichloromethane	ND		1	1.0	0.40	ug/L	02/21/2019 1108
Bromoform	ND		1	1.0	0.40	ug/L	02/21/2019 1108
Bromomethane (Methyl bromide)	ND		1	2.0	0.40	ug/L	02/21/2019 1108
2-Butanone (MEK)	ND		1	10	2.0	ug/L	02/21/2019 1108
Carbon disulfide	ND		1	1.0	0.40	ug/L	02/21/2019 1108
Carbon tetrachloride	ND		1	1.0	0.40	ug/L	02/21/2019 1108
Chlorobenzene	ND		1	1.0	0.40	ug/L	02/21/2019 1108
Chloroethane	ND		1	2.0	0.40	ug/L	02/21/2019 1108
Chloroform	ND		1	1.0	0.40	ug/L	02/21/2019 1108
Chloromethane (Methyl chloride)	ND		1	1.0	0.50	ug/L	02/21/2019 1108
Cyclohexane	ND		1	1.0	0.40	ug/L	02/21/2019 1108
1,2-Dibromo-3-chloropropane (DBCP)	ND		1	1.0	0.40	ug/L	02/21/2019 1108
Dibromochloromethane	ND		1	1.0	0.40	ug/L	02/21/2019 1108
1,2-Dibromoethane (EDB)	ND		1	1.0	0.40	ug/L	02/21/2019 1108
1,2-Dichlorobenzene	ND		1	1.0	0.40	ug/L	02/21/2019 1108
1,3-Dichlorobenzene	ND		1	1.0	0.40	ug/L	02/21/2019 1108
1,4-Dichlorobenzene	ND		1	1.0	0.40	ug/L	02/21/2019 1108
Dichlorodifluoromethane	ND		1	2.0	0.60	ug/L	02/21/2019 1108
1,1-Dichloroethane	ND		1	1.0	0.40	ug/L	02/21/2019 1108
1,2-Dichloroethane	ND		1	1.0	0.40	ug/L	02/21/2019 1108
1,1-Dichloroethene	ND		1	1.0	0.40	ug/L	02/21/2019 1108
cis-1,2-Dichloroethene	ND		1	1.0	0.40	ug/L	02/21/2019 1108
trans-1,2-Dichloroethene	ND		1	1.0	0.40	ug/L	02/21/2019 1108
1,2-Dichloropropane	ND		1	1.0	0.40	ug/L	02/21/2019 1108
cis-1,3-Dichloropropene	ND		1	1.0	0.40	ug/L	02/21/2019 1108
trans-1,3-Dichloropropene	ND		1	1.0	0.40	ug/L	02/21/2019 1108
Ethylbenzene	ND		1	1.0	0.40	ug/L	02/21/2019 1108
2-Hexanone	ND		1	10	2.0	ug/L	02/21/2019 1108
Isopropylbenzene	ND		1	1.0	0.40	ug/L	02/21/2019 1108
Methyl acetate	ND		1	1.0	0.40	ug/L	02/21/2019 1108
Methyl tertiary butyl ether (MTBE)	ND		1	1.0	0.40	ug/L	02/21/2019 1108
4-Methyl-2-pentanone	ND		1	10	2.0	ug/L	02/21/2019 1108
Methylcyclohexane	ND		1	5.0	0.40	ug/L	02/21/2019 1108
Methylene chloride	ND		1	1.0	0.40	ug/L	02/21/2019 1108
Styrene	ND		1	1.0	0.41	ug/L	02/21/2019 1108
1,1,2,2-Tetrachloroethane	ND		1	1.0	0.40	ug/L	02/21/2019 1108
Tetrachloroethene	ND		1	1.0	0.40	ug/L	02/21/2019 1108
Toluene	ND		1	1.0	0.40	ug/L	02/21/2019 1108
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		1	1.0	0.42	ug/L	02/21/2019 1108
1,2,4-Trichlorobenzene	ND		1	1.0	0.40	ug/L	02/21/2019 1108
1,1,1-Trichloroethane	ND		1	1.0	0.40	ug/L	02/21/2019 1108
1,1,2-Trichloroethane	ND		1	1.0	0.40	ug/L	02/21/2019 1108

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

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

Volatile Organic Compounds by GC/MS - MB

Sample ID: UQ98299-001
Batch: 98299
Analytical Method: 8260B
Matrix: Aqueous
Prep Method: 5030B

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
Trichloroethene	ND		1	1.0	0.40	ug/L	02/21/2019 1108
Trichlorofluoromethane	ND		1	1.0	0.40	ug/L	02/21/2019 1108
Vinyl chloride	ND		1	1.0	0.40	ug/L	02/21/2019 1108
Xylenes (total)	ND		1	1.0	0.40	ug/L	02/21/2019 1108
m+p - Xylenes	ND		1	1.0	0.40	ug/L	02/21/2019 1108
o - Xylenes	ND		1	1.0	0.40	ug/L	02/21/2019 1108

Surrogate	Q	% Rec	Acceptance Limit
1,2-Dichloroethane-d4		88	70-130
Bromofluorobenzene		95	70-130
Toluene-d8		93	70-130

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

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

Volatile Organic Compounds by GC/MS - LCS

Sample ID: UQ98299-002
Batch: 98299
Analytical Method: 8260B
Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Acetone	100	71		1	71	60-140	02/21/2019 1013
Benzene	50	42		1	85	70-130	02/21/2019 1013
Bromodichloromethane	50	44		1	88	70-130	02/21/2019 1013
Bromoform	50	50		1	101	70-130	02/21/2019 1013
Bromomethane (Methyl bromide)	50	46		1	92	70-130	02/21/2019 1013
2-Butanone (MEK)	100	76		1	76	70-130	02/21/2019 1013
Carbon disulfide	50	43		1	85	70-130	02/21/2019 1013
Carbon tetrachloride	50	44		1	88	70-130	02/21/2019 1013
Chlorobenzene	50	46		1	92	70-130	02/21/2019 1013
Chloroethane	50	45		1	90	70-130	02/21/2019 1013
Chloroform	50	42		1	85	70-130	02/21/2019 1013
Chloromethane (Methyl chloride)	50	43		1	86	60-140	02/21/2019 1013
Cyclohexane	50	40		1	81	70-130	02/21/2019 1013
1,2-Dibromo-3-chloropropane (DBCP)	50	53		1	106	70-130	02/21/2019 1013
Dibromochloromethane	50	49		1	99	70-130	02/21/2019 1013
1,2-Dibromoethane (EDB)	50	48		1	96	70-130	02/21/2019 1013
1,2-Dichlorobenzene	50	48		1	96	70-130	02/21/2019 1013
1,3-Dichlorobenzene	50	49		1	98	70-130	02/21/2019 1013
1,4-Dichlorobenzene	50	49		1	98	70-130	02/21/2019 1013
Dichlorodifluoromethane	50	53		1	106	60-140	02/21/2019 1013
1,1-Dichloroethane	50	40		1	80	70-130	02/21/2019 1013
1,2-Dichloroethane	50	46		1	92	70-130	02/21/2019 1013
1,1-Dichloroethene	50	41		1	82	70-130	02/21/2019 1013
cis-1,2-Dichloroethene	50	41		1	83	70-130	02/21/2019 1013
trans-1,2-Dichloroethene	50	42		1	83	70-130	02/21/2019 1013
1,2-Dichloropropane	50	36		1	73	70-130	02/21/2019 1013
cis-1,3-Dichloropropene	50	40		1	80	70-130	02/21/2019 1013
trans-1,3-Dichloropropene	50	44		1	89	70-130	02/21/2019 1013
Ethylbenzene	50	48		1	96	70-130	02/21/2019 1013
2-Hexanone	100	86		1	86	70-130	02/21/2019 1013
Isopropylbenzene	50	48		1	96	70-130	02/21/2019 1013
Methyl acetate	50	37		1	75	70-130	02/21/2019 1013
Methyl tertiary butyl ether (MTBE)	50	43		1	86	70-130	02/21/2019 1013
4-Methyl-2-pentanone	100	79		1	79	70-130	02/21/2019 1013
Methylcyclohexane	50	43		1	86	70-130	02/21/2019 1013
Methylene chloride	50	38		1	77	70-130	02/21/2019 1013
Styrene	50	49		1	98	70-130	02/21/2019 1013
1,1,2,2-Tetrachloroethane	50	47		1	95	70-130	02/21/2019 1013
Tetrachloroethene	50	47		1	94	70-130	02/21/2019 1013
Toluene	50	48		1	95	70-130	02/21/2019 1013
1,1,2-Trichloro-1,2,2-Trifluoroethane	50	41		1	81	70-130	02/21/2019 1013
1,2,4-Trichlorobenzene	50	50		1	99	70-130	02/21/2019 1013
1,1,1-Trichloroethane	50	44		1	87	70-130	02/21/2019 1013
1,1,2-Trichloroethane	50	48		1	96	70-130	02/21/2019 1013

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

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

Volatile Organic Compounds by GC/MS - LCS

Sample ID: UQ98299-002 **Matrix:** Aqueous
Batch: 98299 **Prep Method:** 5030B
Analytical Method: 8260B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Trichloroethene	50	44		1	88	70-130	02/21/2019 1013
Trichlorofluoromethane	50	48		1	96	70-130	02/21/2019 1013
Vinyl chloride	50	48		1	95	70-130	02/21/2019 1013
Xylenes (total)	100	96		1	96	70-130	02/21/2019 1013
m+p - Xylenes	50	48		1	96	70-130	02/21/2019 1013
o - Xylenes	50	47		1	95	70-130	02/21/2019 1013

Surrogate	Q	% Rec	Acceptance Limit
1,2-Dichloroethane-d4		90	70-130
Bromofluorobenzene		106	70-130
Toluene-d8		99	70-130

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

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

Volatile Organic Compounds by GC/MS - MB

Sample ID: UQ98458-001
Batch: 98458
Analytical Method: 8260B
Matrix: Aqueous
Prep Method: 5030B

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
Acetone	ND		1	20	2.0	ug/L	02/22/2019 1228
Benzene	ND		1	1.0	0.40	ug/L	02/22/2019 1228
Bromodichloromethane	ND		1	1.0	0.40	ug/L	02/22/2019 1228
Bromoform	ND		1	1.0	0.40	ug/L	02/22/2019 1228
Bromomethane (Methyl bromide)	ND		1	2.0	0.40	ug/L	02/22/2019 1228
2-Butanone (MEK)	ND		1	10	2.0	ug/L	02/22/2019 1228
Carbon disulfide	ND		1	1.0	0.40	ug/L	02/22/2019 1228
Carbon tetrachloride	ND		1	1.0	0.40	ug/L	02/22/2019 1228
Chlorobenzene	ND		1	1.0	0.40	ug/L	02/22/2019 1228
Chloroethane	ND		1	2.0	0.40	ug/L	02/22/2019 1228
Chloroform	ND		1	1.0	0.40	ug/L	02/22/2019 1228
Chloromethane (Methyl chloride)	ND		1	1.0	0.50	ug/L	02/22/2019 1228
Cyclohexane	ND		1	1.0	0.40	ug/L	02/22/2019 1228
1,2-Dibromo-3-chloropropane (DBCP)	ND		1	1.0	0.40	ug/L	02/22/2019 1228
Dibromochloromethane	ND		1	1.0	0.40	ug/L	02/22/2019 1228
1,2-Dibromoethane (EDB)	ND		1	1.0	0.40	ug/L	02/22/2019 1228
1,2-Dichlorobenzene	ND		1	1.0	0.40	ug/L	02/22/2019 1228
1,3-Dichlorobenzene	ND		1	1.0	0.40	ug/L	02/22/2019 1228
1,4-Dichlorobenzene	ND		1	1.0	0.40	ug/L	02/22/2019 1228
Dichlorodifluoromethane	ND		1	2.0	0.60	ug/L	02/22/2019 1228
1,1-Dichloroethane	ND		1	1.0	0.40	ug/L	02/22/2019 1228
1,2-Dichloroethane	ND		1	1.0	0.40	ug/L	02/22/2019 1228
1,1-Dichloroethene	ND		1	1.0	0.40	ug/L	02/22/2019 1228
cis-1,2-Dichloroethene	ND		1	1.0	0.40	ug/L	02/22/2019 1228
trans-1,2-Dichloroethene	ND		1	1.0	0.40	ug/L	02/22/2019 1228
1,2-Dichloropropane	ND		1	1.0	0.40	ug/L	02/22/2019 1228
cis-1,3-Dichloropropene	ND		1	1.0	0.40	ug/L	02/22/2019 1228
trans-1,3-Dichloropropene	ND		1	1.0	0.40	ug/L	02/22/2019 1228
Ethylbenzene	ND		1	1.0	0.40	ug/L	02/22/2019 1228
2-Hexanone	ND		1	10	2.0	ug/L	02/22/2019 1228
Isopropylbenzene	ND		1	1.0	0.40	ug/L	02/22/2019 1228
Methyl acetate	ND		1	1.0	0.40	ug/L	02/22/2019 1228
Methyl tertiary butyl ether (MTBE)	ND		1	1.0	0.40	ug/L	02/22/2019 1228
4-Methyl-2-pentanone	ND		1	10	2.0	ug/L	02/22/2019 1228
Methylcyclohexane	ND		1	5.0	0.40	ug/L	02/22/2019 1228
Methylene chloride	ND		1	1.0	0.40	ug/L	02/22/2019 1228
Styrene	ND		1	1.0	0.41	ug/L	02/22/2019 1228
1,1,2,2-Tetrachloroethane	ND		1	1.0	0.40	ug/L	02/22/2019 1228
Tetrachloroethene	ND		1	1.0	0.40	ug/L	02/22/2019 1228
Toluene	ND		1	1.0	0.40	ug/L	02/22/2019 1228
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		1	1.0	0.42	ug/L	02/22/2019 1228
1,2,4-Trichlorobenzene	ND		1	1.0	0.40	ug/L	02/22/2019 1228
1,1,1-Trichloroethane	ND		1	1.0	0.40	ug/L	02/22/2019 1228
1,1,2-Trichloroethane	ND		1	1.0	0.40	ug/L	02/22/2019 1228

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

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

Volatile Organic Compounds by GC/MS - MB

Sample ID: UQ98458-001 **Matrix:** Aqueous
Batch: 98458 **Prep Method:** 5030B
Analytical Method: 8260B

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
Trichloroethene	ND		1	1.0	0.40	ug/L	02/22/2019 1228
Trichlorofluoromethane	ND		1	1.0	0.40	ug/L	02/22/2019 1228
Vinyl chloride	ND		1	1.0	0.40	ug/L	02/22/2019 1228
Xylenes (total)	ND		1	1.0	0.40	ug/L	02/22/2019 1228
m+p - Xylenes	ND		1	1.0	0.40	ug/L	02/22/2019 1228
o - Xylenes	ND		1	1.0	0.40	ug/L	02/22/2019 1228

Surrogate	Q	% Rec	Acceptance Limit
1,2-Dichloroethane-d4		78	70-130
Bromofluorobenzene		119	70-130
Toluene-d8		127	70-130

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

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

Volatile Organic Compounds by GC/MS - LCS

Sample ID: UQ98458-002 **Matrix:** Aqueous
Batch: 98458 **Prep Method:** 5030B
Analytical Method: 8260B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Acetone	100	94		1	94	60-140	02/22/2019 1009
Benzene	50	46		1	93	70-130	02/22/2019 1009
Bromodichloromethane	50	42		1	84	70-130	02/22/2019 1009
Bromoform	50	51		1	103	70-130	02/22/2019 1009
Bromomethane (Methyl bromide)	50	45		1	89	70-130	02/22/2019 1009
2-Butanone (MEK)	100	91		1	91	70-130	02/22/2019 1009
Carbon disulfide	50	50		1	99	70-130	02/22/2019 1009
Carbon tetrachloride	50	44		1	88	70-130	02/22/2019 1009
Chlorobenzene	50	49		1	98	70-130	02/22/2019 1009
Chloroethane	50	44		1	87	70-130	02/22/2019 1009
Chloroform	50	42		1	85	70-130	02/22/2019 1009
Chloromethane (Methyl chloride)	50	45		1	90	60-140	02/22/2019 1009
Cyclohexane	50	46		1	92	70-130	02/22/2019 1009
1,2-Dibromo-3-chloropropane (DBCP)	50	57		1	114	70-130	02/22/2019 1009
Dibromochloromethane	50	50		1	101	70-130	02/22/2019 1009
1,2-Dibromoethane (EDB)	50	51		1	102	70-130	02/22/2019 1009
1,2-Dichlorobenzene	50	51		1	103	70-130	02/22/2019 1009
1,3-Dichlorobenzene	50	51		1	103	70-130	02/22/2019 1009
1,4-Dichlorobenzene	50	51		1	103	70-130	02/22/2019 1009
Dichlorodifluoromethane	50	53		1	107	60-140	02/22/2019 1009
1,1-Dichloroethane	50	43		1	87	70-130	02/22/2019 1009
1,2-Dichloroethane	50	45		1	89	70-130	02/22/2019 1009
1,1-Dichloroethene	50	45		1	90	70-130	02/22/2019 1009
cis-1,2-Dichloroethene	50	46		1	92	70-130	02/22/2019 1009
trans-1,2-Dichloroethene	50	46		1	92	70-130	02/22/2019 1009
1,2-Dichloropropane	50	40		1	81	70-130	02/22/2019 1009
cis-1,3-Dichloropropene	50	39		1	78	70-130	02/22/2019 1009
trans-1,3-Dichloropropene	50	46		1	91	70-130	02/22/2019 1009
Ethylbenzene	50	51		1	101	70-130	02/22/2019 1009
2-Hexanone	100	93		1	93	70-130	02/22/2019 1009
Isopropylbenzene	50	50		1	101	70-130	02/22/2019 1009
Methyl acetate	50	44		1	88	70-130	02/22/2019 1009
Methyl tertiary butyl ether (MTBE)	50	45		1	91	70-130	02/22/2019 1009
4-Methyl-2-pentanone	100	86		1	86	70-130	02/22/2019 1009
Methylcyclohexane	50	46		1	93	70-130	02/22/2019 1009
Methylene chloride	50	45		1	89	70-130	02/22/2019 1009
Styrene	50	52		1	104	70-130	02/22/2019 1009
1,1,2,2-Tetrachloroethane	50	57		1	114	70-130	02/22/2019 1009
Tetrachloroethene	50	49		1	98	70-130	02/22/2019 1009
Toluene	50	50		1	100	70-130	02/22/2019 1009
1,1,2-Trichloro-1,2,2-Trifluoroethane	50	44		1	88	70-130	02/22/2019 1009
1,2,4-Trichlorobenzene	50	56		1	113	70-130	02/22/2019 1009
1,1,1-Trichloroethane	50	44		1	87	70-130	02/22/2019 1009
1,1,2-Trichloroethane	50	51		1	101	70-130	02/22/2019 1009

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

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

Volatile Organic Compounds by GC/MS - LCS

Sample ID: UQ98458-002
Batch: 98458
Analytical Method: 8260B
Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Trichloroethene	50	46		1	92	70-130	02/22/2019 1009
Trichlorofluoromethane	50	45		1	90	70-130	02/22/2019 1009
Vinyl chloride	50	47		1	95	70-130	02/22/2019 1009
Xylenes (total)	100	100		1	101	70-130	02/22/2019 1009
m+p - Xylenes	50	50		1	101	70-130	02/22/2019 1009
o - Xylenes	50	51		1	102	70-130	02/22/2019 1009

Surrogate	Q	% Rec	Acceptance Limit
1,2-Dichloroethane-d4		81	70-130
Bromofluorobenzene		101	70-130
Toluene-d8		93	70-130

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

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

Semivolatile Organic Compounds by GC/MS - MB

Sample ID: UQ97888-001
Batch: 97888
Analytical Method: 8270D
Matrix: Aqueous
Prep Method: 3520C
Prep Date: 02/18/2019 1401

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
Acenaphthene	ND		1	0.20	0.20	ug/L	02/21/2019 1023
Acenaphthylene	ND		1	0.20	0.20	ug/L	02/21/2019 1023
Acetophenone	ND		1	0.80	0.50	ug/L	02/21/2019 1023
Anthracene	ND		1	0.20	0.20	ug/L	02/21/2019 1023
Atrazine	ND		1	0.80	0.50	ug/L	02/21/2019 1023
Benzidine	ND		1	20	1.0	ug/L	02/21/2019 1023
Benzo(a)anthracene	ND		1	0.20	0.20	ug/L	02/21/2019 1023
Benzo(a)pyrene	ND		1	0.20	0.20	ug/L	02/21/2019 1023
Benzo(b)fluoranthene	ND		1	0.20	0.20	ug/L	02/21/2019 1023
Benzo(g,h,i)perylene	ND		1	0.20	0.20	ug/L	02/21/2019 1023
Benzo(k)fluoranthene	ND		1	0.20	0.20	ug/L	02/21/2019 1023
Butyl benzyl phthalate	ND		1	0.80	0.50	ug/L	02/21/2019 1023
Caprolactam	ND		1	1.6	1.0	ug/L	02/21/2019 1023
Carbazole	ND		1	0.80	0.50	ug/L	02/21/2019 1023
4-Chloro-3-methyl phenol	ND		1	0.80	0.50	ug/L	02/21/2019 1023
bis(2-Chloroethyl)ether	ND		1	0.80	0.50	ug/L	02/21/2019 1023
2-Chloronaphthalene	ND		1	0.80	0.50	ug/L	02/21/2019 1023
2-Chlorophenol	ND		1	0.80	0.50	ug/L	02/21/2019 1023
Chrysene	ND		1	0.20	0.20	ug/L	02/21/2019 1023
Dibenzo(a,h)anthracene	ND		1	0.20	0.20	ug/L	02/21/2019 1023
Dibenzofuran	ND		1	0.80	0.50	ug/L	02/21/2019 1023
3,3'-Dichlorobenzidine	ND		1	0.80	1.8	ug/L	02/21/2019 1023
2,4-Dichlorophenol	ND		1	1.6	1.0	ug/L	02/21/2019 1023
Diethylphthalate	ND		1	0.80	0.50	ug/L	02/21/2019 1023
Dimethyl phthalate	ND		1	0.80	0.50	ug/L	02/21/2019 1023
2,4-Dimethylphenol	ND		1	0.80	0.48	ug/L	02/21/2019 1023
Di-n-butyl phthalate	ND		1	0.80	0.50	ug/L	02/21/2019 1023
4,6-Dinitro-2-methylphenol	ND		1	4.0	1.0	ug/L	02/21/2019 1023
2,4-Dinitrotoluene	ND		1	1.6	0.50	ug/L	02/21/2019 1023
Di-n-octylphthalate	ND		1	0.80	0.50	ug/L	02/21/2019 1023
1,2-Diphenylhydrazine(as azobenzene)	ND		1	0.80	0.50	ug/L	02/21/2019 1023
bis(2-Ethylhexyl)phthalate	ND		1	4.0	0.50	ug/L	02/21/2019 1023
Fluoranthene	ND		1	0.20	0.20	ug/L	02/21/2019 1023
Fluorene	ND		1	0.20	0.20	ug/L	02/21/2019 1023
Hexachlorobenzene	ND		1	0.80	0.50	ug/L	02/21/2019 1023
Hexachlorobutadiene	ND		1	0.80	0.50	ug/L	02/21/2019 1023
Hexachlorocyclopentadiene	ND		1	4.0	2.0	ug/L	02/21/2019 1023
Hexachloroethane	ND		1	0.80	0.31	ug/L	02/21/2019 1023
Indeno(1,2,3-c,d)pyrene	ND		1	0.20	0.20	ug/L	02/21/2019 1023
Isophorone	ND		1	0.80	0.50	ug/L	02/21/2019 1023
2-Methylnaphthalene	ND		1	0.20	0.20	ug/L	02/21/2019 1023
2-Methylphenol	ND		1	0.80	0.21	ug/L	02/21/2019 1023
3+4-Methylphenol	ND		1	0.80	1.5	ug/L	02/21/2019 1023
Naphthalene	ND		1	0.20	0.20	ug/L	02/21/2019 1023

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

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

Semivolatile Organic Compounds by GC/MS - MB

Sample ID:	UQ97888-001	**Matrix:**	Aqueous
Batch:	97888	**Prep Method:**	3520C
Analytical Method:	8270D	**Prep Date:**	02/18/2019 1401

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
Nitrobenzene	ND		1	0.80	0.55	ug/L	02/21/2019 1023
2-Nitrophenol	ND		1	0.80	1.0	ug/L	02/21/2019 1023
N-Nitrosodi-n-propylamine	ND		1	0.80	0.50	ug/L	02/21/2019 1023
N-Nitrosodiphenylamine (Diphenylamine)	ND		1	0.80	0.50	ug/L	02/21/2019 1023
Pentachlorophenol	ND		1	4.0	2.0	ug/L	02/21/2019 1023
Phenanthrene	ND		1	0.20	0.20	ug/L	02/21/2019 1023
Phenol	ND		1	0.80	0.50	ug/L	02/21/2019 1023
Pyrene	ND		1	0.20	0.20	ug/L	02/21/2019 1023
2,4,5-Trichlorophenol	ND		1	0.80	0.50	ug/L	02/21/2019 1023
2,4,6-Trichlorophenol	ND		1	0.80	0.50	ug/L	02/21/2019 1023

Surrogate	Q	% Rec	Acceptance Limit
2-Fluorobiphenyl		56	37-129
2-Fluorophenol		39	24-127
Nitrobenzene-d5		71	38-127
Phenol-d5		53	28-128
Terphenyl-d14		106	10-148
2,4,6-Tribromophenol		76	35-144

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

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

Semivolatile Organic Compounds by GC/MS - LCS

Sample ID: UQ97888-002
Batch: 97888
Analytical Method: 8270D
Matrix: Aqueous
Prep Method: 3520C
Prep Date: 02/18/2019 1401

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Acenaphthene	8.0	4.4		1	55	30-122	02/21/2019 1047
Acenaphthylene	8.0	4.7		1	59	30-130	02/21/2019 1047
Acetophenone	8.0	5.9		1	73	30-130	02/21/2019 1047
Anthracene	8.0	6.0		1	75	30-123	02/21/2019 1047
Atrazine	8.0	5.5		1	68	30-130	02/21/2019 1047
Benzidine	40	19		1	47	10-115	02/21/2019 1047
Benzo(a)anthracene	8.0	5.9		1	74	40-125	02/21/2019 1047
Benzo(a)pyrene	8.0	5.6		1	70	40-128	02/21/2019 1047
Benzo(b)fluoranthene	8.0	6.0		1	75	32-145	02/21/2019 1047
Benzo(g,h,i)perylene	8.0	6.8		1	85	42-128	02/21/2019 1047
Benzo(k)fluoranthene	8.0	5.9		1	73	50-135	02/21/2019 1047
Butyl benzyl phthalate	8.0	5.6		1	70	54-135	02/21/2019 1047
Caprolactam	8.0	7.0		1	88	30-130	02/21/2019 1047
Carbazole	8.0	6.4		1	79	30-130	02/21/2019 1047
4-Chloro-3-methyl phenol	8.0	5.8		1	73	30-123	02/21/2019 1047
bis(2-Chloroethyl)ether	8.0	6.1		1	77	35-114	02/21/2019 1047
2-Chloronaphthalene	8.0	4.2		1	53	39-128	02/21/2019 1047
2-Chlorophenol	8.0	4.6		1	57	39-115	02/21/2019 1047
Chrysene	8.0	6.0		1	75	50-130	02/21/2019 1047
Dibenzo(a,h)anthracene	8.0	6.7		1	84	30-130	02/21/2019 1047
Dibenzofuran	8.0	4.9		1	61	30-118	02/21/2019 1047
3,3'-Dichlorobenzidine	8.0	5.0		1	62	10-126	02/21/2019 1047
2,4-Dichlorophenol	8.0	5.0		1	62	30-121	02/21/2019 1047
Diethylphthalate	8.0	5.0		1	62	40-125	02/21/2019 1047
Dimethyl phthalate	8.0	4.6		1	57	40-127	02/21/2019 1047
2,4-Dimethylphenol	8.0	5.2		1	65	20-125	02/21/2019 1047
Di-n-butyl phthalate	8.0	6.3		1	79	40-127	02/21/2019 1047
4,6-Dinitro-2-methylphenol	8.0	8.2		1	102	46-134	02/21/2019 1047
2,4-Dinitrotoluene	8.0	5.2		1	65	51-128	02/21/2019 1047
Di-n-octylphthalate	8.0	5.4		1	68	55-143	02/21/2019 1047
1,2-Diphenylhydrazine(as azobenzene)	8.0	5.3		1	67	30-130	02/21/2019 1047
bis(2-Ethylhexyl)phthalate	8.0	5.3		1	66	50-133	02/21/2019 1047
Fluoranthene	8.0	6.2		1	78	40-128	02/21/2019 1047
Fluorene	8.0	4.7		1	59	30-124	02/21/2019 1047
Hexachlorobenzene	8.0	4.9		1	61	30-125	02/21/2019 1047
Hexachlorobutadiene	8.0	5.0		1	62	24-110	02/21/2019 1047
Hexachlorocyclopentadiene	40	14		1	35	22-122	02/21/2019 1047
Hexachloroethane	8.0	4.3		1	54	28-116	02/21/2019 1047
Indeno(1,2,3-c,d)pyrene	8.0	6.5		1	82	50-125	02/21/2019 1047
Isophorone	8.0	5.9		1	74	30-130	02/21/2019 1047
2-Methylnaphthalene	8.0	5.4		1	68	40-132	02/21/2019 1047
2-Methylphenol	8.0	5.7		1	71	37-115	02/21/2019 1047
3+4-Methylphenol	8.0	5.1		1	64	44-112	02/21/2019 1047
Naphthalene	8.0	5.2		1	65	40-122	02/21/2019 1047

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

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

Semivolatile Organic Compounds by GC/MS - LCS

Sample ID:	UQ97888-002	**Matrix:**	Aqueous
Batch:	97888	**Prep Method:**	3520C
Analytical Method:	8270D	**Prep Date:**	02/18/2019 1401

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Nitrobenzene	8.0	6.0		1	74	39-123	02/21/2019 1047
2-Nitrophenol	8.0	6.4		1	81	36-123	02/21/2019 1047
N-Nitrosodi-n-propylamine	8.0	5.6		1	70	39-119	02/21/2019 1047
N-Nitrosodiphenylamine (Diphenylamine)	8.0	5.7		1	72	30-123	02/21/2019 1047
Pentachlorophenol	16	14		1	90	34-137	02/21/2019 1047
Phenanthrene	8.0	5.7		1	72	40-123	02/21/2019 1047
Phenol	8.0	4.7		1	59	30-130	02/21/2019 1047
Pyrene	8.0	6.7		1	83	40-126	02/21/2019 1047
2,4,5-Trichlorophenol	8.0	4.5		1	56	30-123	02/21/2019 1047
2,4,6-Trichlorophenol	8.0	4.7		1	59	30-125	02/21/2019 1047

Surrogate	Q	% Rec	Acceptance Limit
2-Fluorobiphenyl		54	37-129
2-Fluorophenol		42	24-127
Nitrobenzene-d5		78	38-127
Phenol-d5		54	28-128
Terphenyl-d14		91	10-148
2,4,6-Tribromophenol		83	35-144

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

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

CVAA - MB

Sample ID: UQ98268-001
Batch: 98268
Analytical Method: 7470A

Matrix: Aqueous
Prep Method: 245.1
Prep Date: 02/21/2019 1246

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
Mercury	ND		1	0.00020	0.000091	mg/L	02/21/2019 1748

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
ND = Not detected at or above the LOQ

N = Recovery is out of criteria
+ = RPD is out of criteria

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

CVAA - LCS

Sample ID: UQ98268-002
Batch: 98268
Analytical Method: 7470A

Matrix: Aqueous
Prep Method: 245.1
Prep Date: 02/21/2019 1246

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Mercury	0.0020	0.0019		1	95	80-120	02/21/2019 1750

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

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

CVAA - MS

Sample ID: UB16022-004MS
Batch: 98268
Analytical Method: 7470A

Matrix: Aqueous
Prep Method: 245.1
Prep Date: 02/21/2019 1246

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Mercury	ND	0.0020	0.0020		1	98	85-115	02/21/2019 1818

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

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

CVAA - MSD

Sample ID:	UB16022-004MD	**Matrix:**	Aqueous
Batch:	98268	**Prep Method:**	245.1
Analytical Method:	7470A	**Prep Date:**	02/21/2019 1246

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Mercury	ND	0.0020	0.0020		1	98	0.28	85-115	20	02/21/2019 1820

LOQ = Limit of Quantitation | P = The RPD between two GC columns exceeds 40% | N = Recovery is out of criteria

DL = Detection Limit | J = Estimated result < LOQ and ≥ DL | + = RPD is out of criteria

LOD = Limit of Detection | ND = Not detected at or above the LOQ

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

ICP-MS - MB

Sample ID: UQ97985-001
Batch: 97985
Analytical Method: 200.8

Matrix: Aqueous
Prep Method: 200.2
Prep Date: 02/19/2019 1041

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
Aluminum	ND		1	40	10	ug/L	02/20/2019 0724
Antimony	ND		1	2.0	0.50	ug/L	02/20/2019 0724
Arsenic	ND		1	2.0	1.3	ug/L	02/20/2019 0724
Barium	ND		1	5.0	1.3	ug/L	02/20/2019 0724
Beryllium	ND		1	0.40	0.15	ug/L	02/20/2019 0724
Boron	ND		1	50	6.3	ug/L	02/20/2019 0724
Cadmium	ND		1	0.50	0.13	ug/L	02/20/2019 0724
Chromium	ND		1	5.0	1.3	ug/L	02/20/2019 0724
Cobalt	ND		1	5.0	1.3	ug/L	02/20/2019 0724
Copper	ND		1	5.0	1.3	ug/L	02/20/2019 0724
Iron	ND		1	50	13	ug/L	02/20/2019 0724
Lead	ND		1	1.0	0.25	ug/L	02/20/2019 0724
Magnesium	ND		1	400	50	ug/L	02/20/2019 0724
Molybdenum	ND		1	10	2.5	ug/L	02/20/2019 0724
Nickel	ND		1	5.0	1.3	ug/L	02/20/2019 0724
Selenium	ND		1	5.0	1.3	ug/L	02/20/2019 0724
Silver	ND		1	1.0	0.25	ug/L	02/20/2019 0724
Sodium	ND		1	400	150	ug/L	02/20/2019 0724
Thallium	ND		1	0.50	0.15	ug/L	02/20/2019 0724
Titanium	ND		1	5.0	1.3	ug/L	02/20/2019 0724
Vanadium	ND		1	5.0	2.5	ug/L	02/20/2019 0724
Zinc	ND		1	10	2.5	ug/L	02/20/2019 0724

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

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

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ICP-MS - LCS

Sample ID: UQ97985-002
Batch: 97985
Analytical Method: 200.8

Matrix: Aqueous
Prep Method: 200.2
Prep Date: 02/19/2019 1041

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Aluminum	100	100		1	100	85-115	02/20/2019 0730
Antimony	100	97		1	97	85-115	02/20/2019 0730
Arsenic	100	100		1	100	85-115	02/20/2019 0730
Barium	100	99		1	99	85-115	02/20/2019 0730
Beryllium	100	99		1	99	85-115	02/20/2019 0730
Boron	100	98		1	98	85-115	02/20/2019 0730
Cadmium	100	98		1	98	85-115	02/20/2019 0730
Chromium	100	98		1	98	85-115	02/20/2019 0730
Cobalt	100	98		1	98	85-115	02/20/2019 0730
Copper	100	100		1	102	85-115	02/20/2019 0730
Iron	1000	1000		1	105	85-115	02/20/2019 0730
Lead	100	99		1	99	85-115	02/20/2019 0730
Magnesium	1000	1100		1	106	85-115	02/20/2019 0730
Molybdenum	100	97		1	97	85-115	02/20/2019 0730
Nickel	100	100		1	101	85-115	02/20/2019 0730
Selenium	100	100		1	100	85-115	02/20/2019 0730
Silver	100	110		1	105	85-115	02/20/2019 0730
Sodium	1000	1000		1	103	85-115	02/20/2019 0730
Thallium	100	100		1	100	85-115	02/20/2019 0730
Titanium	100	100		1	101	85-115	02/20/2019 0730
Vanadium	100	97		1	97	85-115	02/20/2019 0730
Zinc	100	100		1	100	85-115	02/20/2019 0730

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

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

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ICP-MS - MS

Sample ID: UB16022-002MS
Batch: 97985
Analytical Method: 200.8
Matrix: Aqueous
Prep Method: 200.2
Prep Date: 02/19/2019 1041

Parameter	Sample Amount (ug/L)	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Aluminum	13	100	100		1	90	70-130	02/20/2019 0754
Antimony	ND	100	96		1	96	70-130	02/20/2019 0754
Arsenic	ND	100	99		1	99	70-130	02/20/2019 0754
Barium	43	100	140		1	97	70-130	02/20/2019 0754
Beryllium	ND	100	84		1	84	70-130	02/20/2019 0754
Boron	25	100	110		1	81	70-130	02/20/2019 0754
Cadmium	ND	100	95		1	95	70-130	02/20/2019 0754
Chromium	ND	100	95		1	95	70-130	02/20/2019 0754
Cobalt	ND	100	93		1	93	70-130	02/20/2019 0754
Copper	ND	100	96		1	96	70-130	02/20/2019 0754
Iron	140	1000	1100		1	100	70-130	02/20/2019 0754
Lead	ND	100	97		1	97	70-130	02/20/2019 0754
Magnesium	27000	1000	28000		1	100	70-130	02/20/2019 0754
Molybdenum	ND	100	98		1	98	70-130	02/20/2019 0754
Nickel	ND	100	95		1	95	70-130	02/20/2019 0754
Selenium	ND	100	98		1	98	70-130	02/20/2019 0754
Silver	ND	100	100		1	101	70-130	02/20/2019 0754
Sodium	22000	1000	22000		1	87	70-130	02/20/2019 0754
Thallium	ND	100	98		1	98	70-130	02/20/2019 0754
Titanium	ND	100	99		1	99	70-130	02/20/2019 0754
Vanadium	ND	100	97		1	97	70-130	02/20/2019 0754
Zinc	ND	100	96		1	96	70-130	02/20/2019 0754

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

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

ICP-MS - MSD

Sample ID: UB16022-002MD
Batch: 97985
Analytical Method: 200.8

Matrix: Aqueous
Prep Method: 200.2
Prep Date: 02/19/2019 1041

Parameter	Sample Amount (ug/L)	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Aluminum	13	100	100		1	89	0.29	70-130	20	02/20/2019 0800
Antimony	ND	100	94		1	94	1.6	70-130	20	02/20/2019 0800
Arsenic	ND	100	98		1	98	1.1	70-130	20	02/20/2019 0800
Barium	43	100	140		1	93	2.8	70-130	20	02/20/2019 0800
Beryllium	ND	100	83		1	83	1.8	70-130	20	02/20/2019 0800
Boron	25	100	110		1	81	0.095	70-130	20	02/20/2019 0800
Cadmium	ND	100	93		1	93	2.0	70-130	20	02/20/2019 0800
Chromium	ND	100	95		1	95	0.45	70-130	20	02/20/2019 0800
Cobalt	ND	100	92		1	92	0.81	70-130	20	02/20/2019 0800
Copper	ND	100	95		1	95	1.7	70-130	20	02/20/2019 0800
Iron	140	1000	1100		1	101	0.44	70-130	20	02/20/2019 0800
Lead	ND	100	96		1	96	1.0	70-130	20	02/20/2019 0800
Magnesium	27000	1000	28000		1	81	0.68	70-130	20	02/20/2019 0800
Molybdenum	ND	100	97		1	97	0.52	70-130	20	02/20/2019 0800
Nickel	ND	100	93		1	93	3.1	70-130	20	02/20/2019 0800
Selenium	ND	100	95		1	95	2.6	70-130	20	02/20/2019 0800
Silver	ND	100	99		1	99	1.9	70-130	20	02/20/2019 0800
Sodium	22000	1000	22000		1	74	0.58	70-130	20	02/20/2019 0800
Thallium	ND	100	97		1	97	1.2	70-130	20	02/20/2019 0800
Titanium	ND	100	98		1	98	0.86	70-130	20	02/20/2019 0800
Vanadium	ND	100	96		1	96	1.2	70-130	20	02/20/2019 0800
Zinc	ND	100	95		1	95	1.2	70-130	20	02/20/2019 0800

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

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

PFAS by LC/MS/MS - MB

Sample ID: UQ98558-001
Batch: 98558
Analytical Method: 537 Modified-ID

Matrix: Aqueous
Prep Method: 537 MOD
Prep Date: 02/25/2019 1033

Parameter	Result	Q	Dil	LOQ	Units	Analysis Date
8:2 FTS	ND		1	4.0	ng/L	02/27/2019 2001
6:2 FTS	ND		1	4.0	ng/L	02/27/2019 2001
EtFOSA	ND		1	4.0	ng/L	02/27/2019 2001
MeFOSA	ND		1	8.0	ng/L	02/27/2019 2001
PFBS	ND		1	4.0	ng/L	02/27/2019 2001
PFDS	ND		1	4.0	ng/L	02/27/2019 2001
PFHpS	ND		1	4.0	ng/L	02/27/2019 2001
PFNS	ND		1	8.0	ng/L	02/27/2019 2001
PFOSA	ND		1	4.0	ng/L	02/27/2019 2001
PFPeS	ND		1	4.0	ng/L	02/27/2019 2001
PFHxS	ND		1	4.0	ng/L	02/27/2019 2001
PFBA	ND		1	4.0	ng/L	02/27/2019 2001
PFDA	ND		1	4.0	ng/L	02/27/2019 2001
PFDoA	ND		1	4.0	ng/L	02/27/2019 2001
PFHpA	ND		1	4.0	ng/L	02/27/2019 2001
PFHxA	ND		1	4.0	ng/L	02/27/2019 2001
PFNA	ND		1	4.0	ng/L	02/27/2019 2001
PFOA	ND		1	2.0	ng/L	02/27/2019 2001
PFPeA	ND		1	4.0	ng/L	02/27/2019 2001
PFTeDA	ND		1	4.0	ng/L	02/27/2019 2001
PFTrDA	ND		1	4.0	ng/L	02/27/2019 2001
PFUdA	ND		1	4.0	ng/L	02/27/2019 2001
PFOS	ND		1	4.0	ng/L	02/27/2019 2001

Surrogate	Q	% Rec	Acceptance Limit
13C2_6:2FTS		101	50-150
13C2_8:2FTS		83	50-150
13C2_PFDoA		94	50-150
13C2_PFTeDA		95	50-150
13C3_PFBS		104	50-150
13C3_PFHxS		102	50-150
13C4_PFBA		111	50-150
13C4_PFHpA		107	50-150
13C5_PFHxA		109	50-150
13C5_PFPeA		109	50-150
13C6_PFDA		105	50-150
13C7_PFUdA		103	50-150
13C8_PFOA		108	50-150
13C8_PFOS		99	50-150
13C8_PFOSA		93	50-150
13C9_PFNA		111	50-150

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

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

PFAS by LC/MS/MS - MB

Sample ID: UQ98558-001
Batch: 98558
Analytical Method: 537 Modified-ID

Matrix: Aqueous
Prep Method: 537 MOD
Prep Date: 02/25/2019 1033

Surrogate	Q	% Rec	Acceptance Limit
d-EtFOSA		60	50-150
d-MeFOSA		71	50-150

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

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

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PFAS by LC/MS/MS - LCS

Sample ID: UQ98558-002
Batch: 98558
Analytical Method: 537 Modified-ID

Matrix: Aqueous
Prep Method: 537 MOD
Prep Date: 02/25/2019 1033

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
8:2 FTS	19	19		1	99	70-150	02/27/2019 2013
6:2 FTS	19	23		1	121	70-150	02/27/2019 2013
EtFOSA	20	23		1	113	70-150	02/27/2019 2013
MeFOSA	20	21		1	107	70-150	02/27/2019 2013
PFBS	18	18		1	100	70-150	02/27/2019 2013
PFDS	19	18		1	91	70-150	02/27/2019 2013
PFHpS	19	19		1	99	70-150	02/27/2019 2013
PFNS	19	18		1	95	70-150	02/27/2019 2013
PFOSA	20	20		1	98	70-150	02/27/2019 2013
PFPeS	19	17		1	93	70-150	02/27/2019 2013
PFHxS	18	19		1	103	70-150	02/27/2019 2013
PFBA	20	20		1	98	70-150	02/27/2019 2013
PFDA	20	20		1	99	70-150	02/27/2019 2013
PFDoA	20	20		1	98	70-150	02/27/2019 2013
PFHpA	20	20		1	98	70-150	02/27/2019 2013
PFHxA	20	20		1	99	70-150	02/27/2019 2013
PFNA	20	20		1	99	70-150	02/27/2019 2013
PFOA	20	19		1	97	70-150	02/27/2019 2013
PFPeA	20	20		1	98	70-150	02/27/2019 2013
PFTeDA	20	20		1	98	70-150	02/27/2019 2013
PFTrDA	20	17		1	86	70-150	02/27/2019 2013
PFUdA	20	19		1	94	70-150	02/27/2019 2013
PFOS	19	18		1	96	70-150	02/27/2019 2013

Surrogate	Q	% Rec	Acceptance Limit
13C2_6:2FTS		105	50-150
13C2_8:2FTS		116	50-150
13C2_PFDoA		106	50-150
13C2_PFTeDA		102	50-150
13C3_PFBS		116	50-150
13C3_PFHxS		117	50-150
13C4_PFBA		122	50-150
13C4_PFHpA		124	50-150
13C5_PFHxA		119	50-150
13C5_PFPeA		121	50-150
13C6_PFDA		117	50-150
13C7_PFUdA		115	50-150
13C8_PFOA		121	50-150
13C8_PFOS		114	50-150
13C8_PFOSA		108	50-150
13C9_PFNA		121	50-150

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

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

PFAS by LC/MS/MS - LCS

Sample ID:	UQ98558-002	**Matrix:**	Aqueous
Batch:	98558	**Prep Method:**	537 MOD
Analytical Method:	537 Modified-ID	**Prep Date:**	02/25/2019 1033

Surrogate	Q	% Rec	Acceptance Limit
d-EtFOSA		63	50-150
d-MeFOSA		68	50-150

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

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

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PFAS by LC/MS/MS - LCSD

Sample ID:	UQ98558-003	**Matrix:**	Aqueous
Batch:	98558	**Prep Method:**	537 MOD
Analytical Method:	537 Modified-ID	**Prep Date:**	02/25/2019 1033

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
8:2 FTS	19	23		1	122	21	70-150	30	02/27/2019 2026
6:2 FTS	19	21		1	110	9.7	70-150	30	02/27/2019 2026
EtFOSA	20	23		1	114	1.2	70-150	30	02/27/2019 2026
MeFOSA	20	20		1	98	9.4	70-150	30	02/27/2019 2026
PFBS	18	19		1	106	5.7	70-150	30	02/27/2019 2026
PFDS	19	18		1	93	2.1	70-150	30	02/27/2019 2026
PFHpS	19	19		1	100	0.47	70-150	30	02/27/2019 2026
PFNS	19	17		1	91	4.8	70-150	30	02/27/2019 2026
PFOSA	20	21		1	105	7.1	70-150	30	02/27/2019 2026
PFPeS	19	19		1	100	6.9	70-150	30	02/27/2019 2026
PFHxS	18	18		1	100	3.0	70-150	30	02/27/2019 2026
PFBA	20	19		1	97	1.0	70-150	30	02/27/2019 2026
PFDA	20	20		1	101	1.6	70-150	30	02/27/2019 2026
PFDoA	20	20		1	100	1.9	70-150	30	02/27/2019 2026
PFHpA	20	19		1	93	6.2	70-150	30	02/27/2019 2026
PFHxA	20	21		1	105	5.3	70-150	30	02/27/2019 2026
PFNA	20	20		1	98	0.20	70-150	30	02/27/2019 2026
PFOA	20	20		1	98	1.1	70-150	30	02/27/2019 2026
PFPeA	20	21		1	103	5.5	70-150	30	02/27/2019 2026
PFTeDA	20	21		1	104	6.8	70-150	30	02/27/2019 2026
PFTrDA	20	18		1	92	6.8	70-150	30	02/27/2019 2026
PFUdA	20	20		1	99	5.6	70-150	30	02/27/2019 2026
PFOS	19	18		1	98	2.3	70-150	30	02/27/2019 2026

Surrogate	Q	% Rec	Acceptance Limit
13C2_6:2FTS		122	50-150
13C2_8:2FTS		103	50-150
13C2_PFDoA		101	50-150
13C2_PFTeDA		100	50-150
13C3_PFBS		111	50-150
13C3_PFHxS		113	50-150
13C4_PFBA		119	50-150
13C4_PFHpA		119	50-150
13C5_PFHxA		115	50-150
13C5_PFPeA		117	50-150
13C6_PFDA		111	50-150
13C7_PFUdA		111	50-150
13C8_PFOA		120	50-150
13C8_PFOS		111	50-150
13C8_PFOSA		105	50-150
13C9_PFNA		117	50-150

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

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

PFAS by LC/MS/MS - LCSD

Sample ID:	UQ98558-003	**Matrix:**	Aqueous
Batch:	98558	**Prep Method:**	537 MOD
Analytical Method:	537 Modified-ID	**Prep Date:**	02/25/2019 1033

Surrogate	Q	% Rec	Acceptance Limit
d-EtFOSA		63	50-150
d-MeFOSA		69	50-150

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

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

PFAS by LC/MS/MS - MB

Sample ID: UQ98665-001
Batch: 98665
Analytical Method: 537 Modified-ID

Matrix: Aqueous
Prep Method: 537 MOD
Prep Date: 02/26/2019 1100

Parameter	Result	Q	Dil	LOQ	Units	Analysis Date
8:2 FTS	ND		1	4.0	ng/L	02/27/2019 1407
6:2 FTS	ND		1	4.0	ng/L	02/27/2019 1407
EtFOSA	ND		1	4.0	ng/L	02/27/2019 1407
MeFOSA	ND		1	8.0	ng/L	02/27/2019 1407
PFBS	ND		1	4.0	ng/L	02/27/2019 1407
PFDS	ND		1	4.0	ng/L	02/27/2019 1407
PFHpS	ND		1	4.0	ng/L	02/27/2019 1407
PFNS	ND		1	8.0	ng/L	02/27/2019 1407
PFOSA	ND		1	4.0	ng/L	02/27/2019 1407
PFPeS	ND		1	4.0	ng/L	02/27/2019 1407
PFHxS	ND		1	4.0	ng/L	02/27/2019 1407
PFBA	ND		1	4.0	ng/L	02/27/2019 1407
PFDA	ND		1	4.0	ng/L	02/27/2019 1407
PFDoA	ND		1	4.0	ng/L	02/27/2019 1407
PFHpA	ND		1	4.0	ng/L	02/27/2019 1407
PFHxA	ND		1	4.0	ng/L	02/27/2019 1407
PFNA	ND		1	4.0	ng/L	02/27/2019 1407
PFOA	ND		1	2.0	ng/L	02/27/2019 1407
PFPeA	ND		1	4.0	ng/L	02/27/2019 1407
PFTeDA	ND		1	4.0	ng/L	02/27/2019 1407
PFTrDA	ND		1	4.0	ng/L	02/27/2019 1407
PFUdA	ND		1	4.0	ng/L	02/27/2019 1407
PFOS	ND		1	4.0	ng/L	02/27/2019 1407

Surrogate	Q	% Rec	Acceptance Limit
13C2_6:2FTS		97	50-150
13C2_8:2FTS		113	50-150
13C2_PFDoA		98	50-150
13C2_PFTeDA		98	50-150
13C3_PFBS		108	50-150
13C3_PFHxS		109	50-150
13C4_PFBA		114	50-150
13C4_PFHpA		107	50-150
13C5_PFHxA		107	50-150
13C5_PFPeA		107	50-150
13C6_PFDA		103	50-150
13C7_PFUdA		106	50-150
13C8_PFOA		106	50-150
13C8_PFOS		105	50-150
13C8_PFOSA		92	50-150
13C9_PFNA		107	50-150

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

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

PFAS by LC/MS/MS - MB

Sample ID:	UQ98665-001	**Matrix:**	Aqueous
Batch:	98665	**Prep Method:**	537 MOD
Analytical Method:	537 Modified-ID	**Prep Date:**	02/26/2019 1100

Surrogate	Q	% Rec	Acceptance Limit
d-EtFOSA		51	50-150
d-MeFOSA		54	50-150

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

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

PFAS by LC/MS/MS - LCS

Sample ID: UQ98665-002
Batch: 98665
Analytical Method: 537 Modified-ID

Matrix: Aqueous
Prep Method: 537 MOD
Prep Date: 02/26/2019 1100

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
8:2 FTS	19	22		1	115	70-150	02/27/2019 1420
6:2 FTS	19	24		1	128	70-150	02/27/2019 1420
EtFOSA	20	22		1	109	70-150	02/27/2019 1420
MeFOSA	20	21		1	106	70-150	02/27/2019 1420
PFBS	18	18		1	99	70-150	02/27/2019 1420
PFDS	19	19		1	96	70-150	02/27/2019 1420
PFHpS	19	17		1	91	70-150	02/27/2019 1420
PFNS	19	18		1	93	70-150	02/27/2019 1420
PFOSA	20	21		1	106	70-150	02/27/2019 1420
PFPeS	19	19		1	103	70-150	02/27/2019 1420
PFHxS	18	18		1	98	70-150	02/27/2019 1420
PFBA	20	19		1	96	70-150	02/27/2019 1420
PFDA	20	18		1	92	70-150	02/27/2019 1420
PFDoA	20	21		1	107	70-150	02/27/2019 1420
PFHpA	20	18		1	92	70-150	02/27/2019 1420
PFHxA	20	20		1	99	70-150	02/27/2019 1420
PFNA	20	20		1	101	70-150	02/27/2019 1420
PFOA	20	20		1	99	70-150	02/27/2019 1420
PFPeA	20	19		1	96	70-150	02/27/2019 1420
PFTeDA	20	21		1	103	70-150	02/27/2019 1420
PFTrDA	20	19		1	97	70-150	02/27/2019 1420
PFUdA	20	19		1	97	70-150	02/27/2019 1420
PFOS	19	16		1	84	70-150	02/27/2019 1420

Surrogate	Q	% Rec	Acceptance Limit
13C2_6:2FTS		95	50-150
13C2_8:2FTS		112	50-150
13C2_PFDoA		101	50-150
13C2_PFTeDA		97	50-150
13C3_PFBS		113	50-150
13C3_PFHxS		118	50-150
13C4_PFBA		125	50-150
13C4_PFHpA		124	50-150
13C5_PFHxA		122	50-150
13C5_PFPeA		122	50-150
13C6_PFDA		116	50-150
13C7_PFUdA		114	50-150
13C8_PFOA		120	50-150
13C8_PFOS		118	50-150
13C8_PFOSA		100	50-150
13C9_PFNA		115	50-150

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

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

PFAS by LC/MS/MS - LCS

Sample ID:	UQ98665-002	**Matrix:**	Aqueous
Batch:	98665	**Prep Method:**	537 MOD
Analytical Method:	537 Modified-ID	**Prep Date:**	02/26/2019 1100

Surrogate	Q	% Rec	Acceptance Limit
d-EtFOSA		50	50-150
d-MeFOSA		58	50-150

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

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

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PFAS by LC/MS/MS - LCSD

Sample ID: UQ98665-003
Batch: 98665
Analytical Method: 537 Modified-ID
Matrix: Aqueous
Prep Method: 537 MOD
Prep Date: 02/26/2019 1100

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
8:2 FTS	19	18		1	96	18	70-150	30	02/27/2019 1433
6:2 FTS	19	23		1	122	5.0	70-150	30	02/27/2019 1433
EtFOSA	20	21		1	104	4.8	70-150	30	02/27/2019 1433
MeFOSA	20	18		1	92	14	70-150	30	02/27/2019 1433
PFBS	18	17		1	99	0.65	70-150	30	02/27/2019 1433
PFDS	19	17		1	90	6.8	70-150	30	02/27/2019 1433
PFHpS	19	18		1	94	3.4	70-150	30	02/27/2019 1433
PFNS	19	19		1	99	5.7	70-150	30	02/27/2019 1433
PFOSA	20	21		1	103	2.8	70-150	30	02/27/2019 1433
PFPeS	19	19		1	102	0.53	70-150	30	02/27/2019 1433
PFHxS	18	17		1	95	3.1	70-150	30	02/27/2019 1433
PFBA	20	19		1	94	1.7	70-150	30	02/27/2019 1433
PFDA	20	19		1	97	4.8	70-150	30	02/27/2019 1433
PFDoA	20	19		1	96	11	70-150	30	02/27/2019 1433
PFHpA	20	20		1	99	7.2	70-150	30	02/27/2019 1433
PFHxA	20	19		1	97	1.9	70-150	30	02/27/2019 1433
PFNA	20	18		1	91	9.6	70-150	30	02/27/2019 1433
PFOA	20	19		1	97	1.2	70-150	30	02/27/2019 1433
PFPeA	20	19		1	93	3.2	70-150	30	02/27/2019 1433
PFTeDA	20	20		1	99	3.7	70-150	30	02/27/2019 1433
PFTrDA	20	18		1	88	9.0	70-150	30	02/27/2019 1433
PFUdA	20	19		1	94	3.6	70-150	30	02/27/2019 1433
PFOS	19	17		1	92	8.2	70-150	30	02/27/2019 1433

Surrogate	Q	% Rec	Acceptance Limit
13C2_6:2FTS		110	50-150
13C2_8:2FTS		116	50-150
13C2_PFDoA		106	50-150
13C2_PFTeDA		96	50-150
13C3_PFBS		115	50-150
13C3_PFHxS		122	50-150
13C4_PFBA		124	50-150
13C4_PFHpA		121	50-150
13C5_PFHxA		119	50-150
13C5_PFPeA		127	50-150
13C6_PFDA		116	50-150
13C7_PFUdA		120	50-150
13C8_PFOA		120	50-150
13C8_PFOS		117	50-150
13C8_PFOSA		102	50-150
13C9_PFNA		121	50-150

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

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

PFAS by LC/MS/MS - LCSD

Sample ID: UQ98665-003
Batch: 98665
Analytical Method: 537 Modified-ID

Matrix: Aqueous
Prep Method: 537 MOD
Prep Date: 02/26/2019 1100

Surrogate	Q	% Rec	Acceptance Limit
d-EtFOSA		52	50-150
d-MeFOSA		60	50-150

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

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

Chain of Custody

and

Miscellaneous Documents

Chain of Custody Record

Shealy Environmental Services, Inc.
106 Vantage Point Drive
West Columbia, South Carolina 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111
www.shealylab.com

Number

Client	Rose and Westra / GZA
Address	601 Fifth Street NW, Suite 102
City / State / Zip Code	Grand Rapids / MI / 49504
Project Name	16.0062677.81
Project Number	16.0062677.81
P.O No.	
Report to Contact	Leslie Nelson
Sampler's Signature	x [signature]
Printed Name	Jen Martin
Telephone No. / E-mail	616-956-6123 leslie.nelson@gza.com
Quote No.	21129
Page	1 of 1
	UB16022

Analysis (Attach list if more space is needed)

Sample ID / Description (Containers for each sample may be combined on one line)	Date	Time	G=Grab C=Composite	Matrix: Aqueous	Solid	Non-Aqueous	Unpres	H2SO4	HNO3	HCl	NaOH	H2O	MeOH	PFAS	Remarks / Cooler I.D.
MW-WV-11D	2/14/19	1045	G	x			2							x	
MW-WV-11S		1055													
MW-WV-5D		1445													
MW-WV-5S		1610													
MW-WV-5D DUP		1445													
FB 2/14		1435													
MW-WV-3S	2/15/19	1017													
MW-WV-3D		1120													
MW-WV-8D		1200													

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

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

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

QC Requirements

Relinquished by	Date	Time	Received by	Date	Time
1. Jen Martin	2/15/19	1600	1.		
2.			2.		
3.			3.		
4. FedEx	2-16-19	0903	4. Laboratory Received by L Hite	2-16-19	0903

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

LAB USE ONLY
Received on Ice (Check) [X] Y [ ] N [ ] Ice Pack Receipt Temp. 3.0 °C

Document Number: ME002OW-01

SHEALY ENVIRONMENTAL SERVICES, INC.

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com

SHEALY

Chain of Custody Record

Shealy Environmental Services, Inc.
106 Vantage Point Drive
West Columbia, South Carolina 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111
www.shealylab.com

Number

Client: **Rose and Westra / GZA**	Report to Contact: Leslie Nelson	Telephone No. / E-mail: 616-956-6123 leslie.nelson@gza.com	Quote No. 21120
Address: 601 Fifth Street NW, Suite 102	Sampler's Signature: x [signature]	Analysis (Attach list if more space is needed)	Page 1 of 1
City: Grand Rapids; State: MI; Zip Code: 49504	Printed Name: Jen Martin		
Project Name: 16.0062677.81			UB16022
Project Number: 16.0062677.81; P.O No.			

Sample ID / Description (Containers for each sample may be combined on one line)	Date	Time	G=Grab C=Composite	Matrix: Aqueous	Solid	Non-Aqueous		No of Containers by Preservative Type: Unpres	H2SO4	HNO3	HCl	NaOH	NaOH & Zn Acetate	MeOH	VOCs & SVOCs	Project List Metals, Hg, & Hardness	Chloride	Total phosphorus	Total ammonia, Nitrate/Nitrite	Sulfide	Sulfate	Total Cyanide		Remarks / Cooler I.D. Shealy Water
MW-WV-11D	2/14/19	1045	G	x				3	1	3	3	1	2		x	x	x	x	x	x	x	x		
MW-WV-11S		1055																						
MW-WV-5D		1445																						
~~MW-WV-5S~~		~~1610~~																						JM
MW-WV-5D DUP		1445																						

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

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

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

QC Requirements

Relinquished by	Date	Time	Received by	Date	Time
1. Relinquished by: Jen Martin	2/15/19	1600	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: Fed EX	2-16-19	0903	4. Laboratory Received by: L Hite	2-16-19	0903

Project Metals List: Al, Sb, As, Ba, Be, B, Cd, Cr, Co, Cu, Fe, Pb, Mg, Hg, Mo, Ni, Se, Ag, Na, Ti, Tl, V, Zn.
Samples are retained for 4 weeks unless other arrangements are made.

LAB USE ONLY
Received on Ice (Check) [X] Y [ ] N [ ] Ice Pack   Receipt Temp. 5.6 °C

Document Number: ME002OW-01

SHEALY ENVIRONMENTAL SERVICES, INC.

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Chain of Custody Record

Shealy Environmental Services, Inc.
106 Vantage Point Drive
West Columbia, South Carolina 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111
www.shealylab.com

Number

Client: Rose and Westra / GZA	Report to Contact: Leslie Nelson	Telephone No. / E-mail: 616-956-6123 leslie.nelson@gza.com	Quote No. 21129
Address: 601 Fifth Street NW, Suite 102	Sampler's Signature: x [signature]	Analysis (Attach list if more space is needed)	Page 1 of 1
City: Grand Rapids / State: MI / Zip Code: 49504	Printed Name: Jen Martin		
Project Name: 16.0062577.61			UB16022
Project Number: 16.0062577.61 / P.O No.			

Sample ID / Description (Containers for each sample may be combined on one line)	Date	Time	G=Grab C=Composite	Matrix: Aqueous	Solid	Non-Aqueous		No of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	NaOH & Zn Acetate	MeOH	VOCs & SVOCs	Project List Metals, Hg, & Hardness	Chloride	Total phosphorus	Total ammonia, Nitrate/Nitrite	Sulfide	Sulfate	Total Cyanide		Remarks / Cooler I.D. Shealy Water
MW-WV-5S	2/14/19	1610	G	x				3	1	3	3	1	2		x	x	x	x	x	x	x	x		
MW-WV-3S	2/15/19	1017	|	|				|	|	|	|	|	|		|	|	|	|	|	|	|	|		
MW-WV-3D	|	1120	|	|				|	|	|	|	|	|		|	|	|	|	|	|	|	|		
MW-WV-8D	|	1200	|	|				|	|	|	|	|	|		|	|	|	|	|	|	|	|		

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

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

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

QC Requirements

	Date	Time		Date	Time
1. Relinquished by: Jen Martin	2/15/19	1600	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: Fed Ex	2-16-19	0903	4. Laboratory Received by: L Hodi	2-16-19	0903

Project Metals List: Al, Sb, As, Ba, Be, B, Cd, Cr, Co, Cu, Fe, Pb, Mg, Hg, Mo, Ni, Se, Ag, Na, Ti, Tl, V, Zn.
Samples are retained for 4 weeks unless other arrangements are made.

LAB USE ONLY
Received on Ice (Check) [✓] Y [ ] N [ ] Ice Pack   Receipt Temp. 5.3 °C

Document Number: ME0020W-01

SHEALY ENVIRONMENTAL SERVICES, INC.

Shealy Environmental Services, Inc.
Document Number: ME0018C-14

Page 1 of 1
Effective Date: 8/2/2018

Sample Receipt Checklist (SRC)

Client: GZA Cooler Inspected by/date: LKH / 2-16-19 Lot #: UB16022

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

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

pH Strip ID: 18-2225 Chlorine Strip ID: 18-152 Tested by: LKH

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

5.6/5.6 °C 3.0/3.0 °C 5.3/5.3 °C ___/___ °C

Method: ☑ Temperature Blank ☐ Against Bottles IR Gun ID: 5 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice 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 / 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?
☐ Yes	☑ No	☐ NA	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	☐ NA	17. Were all DRO/metals/nutrient samples received at a pH of < 2?
☑ Yes	☐ No	☐ NA	18. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☑ Yes	☐ No	☐ NA	19. Were all applicable NH_3/TKN/cyanide/phenol/625 (< 0.5mg/L) samples free of residual chlorine?
☐ Yes	☐ 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?
☑ Yes	☐ No		21. Was the quote number listed on the container label? If yes, Quote # 21129

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

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

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

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

SR barcode labels applied by: LKH / MEC Date: 2-16-19

Comments:

ALS Environmental

Work Order: 1902602, 1902761, 1902809

Project Name:

16.0062677.81

Shealy Environmental Services, Inc.

Nisreen Saikaly
106 Vantage Point Dr.
West Columbia, SC 29169

25-Feb-2019

Certificate No: MN 026-999-449

Contents

ADDRESS 3352 128th Avenue, Holland Michigan 49424-9236 USA PHONE +1 616 399 6070 FAX +1 616 399 6185
ALS GROUP USA, CORP. Part of the ALS Group An ALS Limited Company

Section I

CASE NARRATIVE

ADDRESS 3352 128th Avenue, Holland Michigan 49424-9236 USA PHONE +1 616 399 6070 FAX +1 616 399 6185
ALS GROUP USA, CORP. Part of the ALS Group An ALS Limited Company

ALS Group, USA *Date: 25-Feb-19*

Client:	Shealy Environmental Services, Inc.	
Project:	16.0062677.81	**Case Narrative**
Work Order:	1902602	

Samples for the above noted Work Order were received on 02/13/2019. The attached "Sample Receipt Checklist" documents the status of custody seals, container integrity, preservation, and temperature compliance.

Samples were analyzed according to the analytical methodology previously transmitted in the "Work Order Acknowledgement". Methodologies are also documented in the "Analytical Result" section for each sample. Quality control results are listed in the "QC Report" section. Sample association for the reported quality control is located at the end of each batch summary. If applicable, results are appropriately qualified in the Analytical Result and QC Report sections. The "Qualifiers" section documents the various qualifiers, units, and acronyms utilized in reporting. A copy of the laboratory's scope of accreditation is available upon request.

With the following exceptions, all sample analyses achieved analytical criteria.

ALS Group, USA *Date: 25-Feb-19*

Client:	Shealy Environmental Services, Inc.
Project:	16.0062677.81
Work Order:	1902761

Case Narrative

Samples for the above noted Work Order were received on 02/15/2019. The attached "Sample Receipt Checklist" documents the status of custody seals, container integrity, preservation, and temperature compliance.

Samples were analyzed according to the analytical methodology previously transmitted in the "Work Order Acknowledgement". Methodologies are also documented in the "Analytical Result" section for each sample. Quality control results are listed in the "QC Report" section. Sample association for the reported quality control is located at the end of each batch summary. If applicable, results are appropriately qualified in the Analytical Result and QC Report sections. The "Qualifiers" section documents the various qualifiers, units, and acronyms utilized in reporting. A copy of the laboratory's scope of accreditation is available upon request.

With the following exceptions, all sample analyses achieved analytical criteria.

ALS Group, USA *Date: 25-Feb-19*

Client:	Shealy Environmental Services, Inc.
Project:	16.0062677.81
Work Order:	1902809

Case Narrative

Samples for the above noted Work Order were received on 02/15/2019. The attached "Sample Receipt Checklist" documents the status of custody seals, container integrity, preservation, and temperature compliance.

Samples were analyzed according to the analytical methodology previously transmitted in the "Work Order Acknowledgement". Methodologies are also documented in the "Analytical Result" section for each sample. Quality control results are listed in the "QC Report" section. Sample association for the reported quality control is located at the end of each batch summary. If applicable, results are appropriately qualified in the Analytical Result and QC Report sections. The "Qualifiers" section documents the various qualifiers, units, and acronyms utilized in reporting. A copy of the laboratory's scope of accreditation is available upon request.

With the following exceptions, all sample analyses achieved analytical criteria.

Section II

SAMPLE RECEIPT

-Sample Summary

-Shipping Documents*

-Chain of Custody

-Receipt Checklist

(* = As applicable)

ALS Group, USA

Date: 25-Feb-19

Client: Shealy Environmental Services, Inc.
Project: 16.0062677.81
Work Order: **1902602**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1902602-01	MW-WV-8S	Aqueous		2/12/2019 13:05	2/13/2019 11:20	☐
1902602-02	MW-WV-8M	Aqueous		2/12/2019 15:27	2/13/2019 11:20	☐
1902602-03	MW-WV-12S	Aqueous		2/12/2019 12:10	2/13/2019 11:20	☐
1902761-01	MW-WV-11D	Aqueous		2/14/2019 10:45	2/15/2019 10:30	☐
1902761-02	MW-WV-11S	Aqueous		2/14/2019 10:55	2/15/2019 10:30	☐
1902761-03	MW-WV-5D	Aqueous		2/14/2019 14:45	2/15/2019 10:30	☐
1902761-04	MW-WV-5S	Aqueous		2/14/2019 16:10	2/15/2019 10:30	☐
1902761-05	MW-WV-5D-Dup	Aqueous		2/14/2019 14:45	2/15/2019 10:30	☐
1902809-01	MW-WV-3S	Aqueous		2/15/2019 10:17	2/15/2019 14:32	☐
1902809-02	MW-WV-3D	Aqueous		2/15/2019 11:20	2/15/2019 14:32	☐
1902809-03	MW-WV-8D	Aqueous		2/15/2019 12:00	2/15/2019 14:32	☐

1902602

Sheally Environmental Services, Inc.
106 Vantage Point Drive
West Columbia, South Carolina 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111
www.shealylab.com

SHEALY

Chain of Custody Record

Number

Client	Rose and Westra / GZA
Address	601 Fifth Street NW, Suite 102
City / State / Zip Code	Grand Rapids / MI / 49504
Project Name	~~16.0062335.52 T-3~~ 16.0062677.81
Project Number	16.0062~~335.52 T-3~~ 677.81
P.O No.	
Report to Contact	Lori Powers
Sampler's Signature	X [signature]
Printed Name	Jen Martin
Telephone No. / E-mail	616-956-6123 loretta.powers@gza.com
Quote No.	20986
Page	1 of 1
Laboratory Lot Number	

Analysis (Attach list if more space is needed)

Sample ID / Description (Containers for each sample may be combined on one line)	Date	Time	G=Grab C=Composite	Aqueous	Solid	Non-Aqueous		Unpres.	H2SO4	HNO3	HCl	NaOH/Zn Acetate	NaOH	MeOH	Acetic Acid	Formic Acid	Available Cyanide	Hexavalent Chromium (7199)						Remarks / Cooler I.D. ALS Water
MW-WV ~~5~~ 8S	2/12/19	1305	G	x				4					1		x	x	x	x						
MW-WV - 8M	|	1527	|	|				|					|		|	|	|	|						
MW-WV - 12S	|	1210	|	|				|					|		|	|	|	|						

Matrix: Aqueous, Solid, Non-Aqueous. No of Containers by Preservative Type: Unpres., H2SO4, HNO3, HCl, NaOH/Zn Acetate, NaOH, MeOH.

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

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

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

QC Requirements

Relinquished by	Date	Time	Received by	Date	Time
1. Relinquished by Jen Martin	2/13/19	1000	1. Received by [signature]	2/13/19	1000
2. Relinquished by	Date	Time	2. Received by	Date	Time
3. Relinquished by	Date	Time	3. Received by	Date	Time
4. Relinquished by [signature]	2/13/19	1120	4. Laboratory Received by [signature]	Date	Time

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

LAB USE ONLY
Received on Ice (Check) [ ] Y [ ] N [ ] Ice Pack
Receipt Temp. 3.0 °C

52L
P415

Document Number: ME002OW-01

1902761

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Chain of Custody Record

Shealy Environmental Services, Inc.
106 Vantage Point Drive
West Columbia, South Carolina 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111
www.shealylab.com

Number

Client: **Rose and Westra / GZA**	Report to Contact: Leslie Nelson	Telephone No. / E-mail: 616-956-6123 leslie.nelson@gza.com	Quote No. 20986
Address: 601 Fifth Street NW, Suite 102	Sampler's Signature: x [signature]	Analysis (Attach list if more space is needed)	Page 1 of 1
City: Grand Rapids / State: MI / Zip Code: 49504	Printed Name: Jen Martin		
Project Name: 16.0062677.81			Laboratory Lot Number
Project Number: 16.0062677.81 / P.O No.			

Sample ID / Description (Containers for each sample may be combined on one line)	Date	Time	G=Grab C=Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	Unpres.	H2SO4	HNO3	HCl	NaOH/Zn Acetate	NaOH	MeOH	Acetic Acid	Formic Acid	Available Cyanide	Hexavalent Chromium (7199)	Remarks / Cooler I.D. ALS Water
MW-WV-11D	2/14/19	1045	G	x			5					1		x	x	x	x	
MW-WV-11S		1055																
MW-WV-5D		1445																
MW-WV-5S		1610																
MW-WV-5D-Dup		1445																

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

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

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

QC Requirements

Relinquished by	Date	Time	Received by	Date	Time
1. Jen Martin	2/15/19	0900	1. [signature]	2/15/19	[illegible]
2. [signature]	2/15/19	1020	2. [signature]		
3.			3.		
4.			4. Laboratory Received by		

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

LAB USE ONLY
Received on Ice (Check) [ ] Y [ ] N [ ] Ice Pack

Receipt Temp. 2.8 °C SRZ

2

Document Number: ME002OW-01

1902809

SHEALY

Chain of Custody Record

Shealy Environmental Services, Inc.
106 Vantage Point Drive
West Columbia, South Carolina 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111
www.shealylab.com

Number

Client: **Rose and Westra / GZA**	Report to Contact: Leslie Nelson	Telephone No. / E-mail: 616-956-6123 leslie.nelson@gza.com	Quote No. 20986
Address: 601 Fifth Street NW, Suite 102	Sampler's Signature: X [signature]	Analysis (Attach list if more space is needed)	Page 1 of 1
City: Grand Rapids / State: MI / Zip Code: 49504	Printed Name: Jen Martin		
Project Name: 16.0062677.81			Laboratory Lot Number
Project Number: 16.0062677.81 / P.O No.			

Sample ID / Description (Containers for each sample may be combined on one line)	Date	Time	G=Grab C=Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous		No of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH/Zn Acetate	NaOH	MeOH	Acetic Acid	Formic Acid	Available Cyanide	Hexavalent Chromium (7199)						Remarks / Cooler I.D. ALS Water
MW-WV-3S	2-15-19	1017	G	x				4					1		x	x	x	x						
MW-WV-3D	2-15-19	1120	G	X				4					1		X	X	X	X						
MW-WV-8D	2-15-19	1200	G	X				4					1		X	X	X	X						

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

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

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

QC Requirements

	Date	Time		Date	Time
1. Relinquished by: Jen Martin	2/15/19	1432	1. Received by: [signature]	2/15/19	1432
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by			4. Laboratory Received by		

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

LAB USE ONLY
Received on Ice (Check) [ ] Y [ ] N [ ] Ice Pack

Receipt Temp. 3.4 °C SR2 PU15

Document Number: ME002OW-01

ALS Group, USA

Sample Receipt Checklist

Client Name: **SHEALYENV** Date/Time Received: **13-Feb-19 11:20**

Work Order: **1902602** Received by: **DS**

Checklist completed by Diane Shaw (eSignature) 13-Feb-19 (Date) Reviewed by: Chad Whelton (eSignature) 13-Feb-19 (Date)

Matrices: Aqueous

Carrier name: ALSHN

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Sample(s) received on ice?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	3.0/3.0 c	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	2/13/2019 11:29:28 AM		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

ALS Group, USA

Sample Receipt Checklist

Client Name: **SHEALYENV** Date/Time Received: **15-Feb-19 10:30**

Work Order: **1902761** Received by: **DS**

Checklist completed by Diane Shaw (eSignature) 15-Feb-19 (Date) Reviewed by: Chad Whelton (eSignature) 15-Feb-19 (Date)

Matrices: Aqueous
Carrier name: ALSHN

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Sample(s) received on ice?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	2.8/2.8 c	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	2/15/2019 10:40:03 AM		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:	-		

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

ALS Group, USA

Sample Receipt Checklist

Client Name: **SHEALYENV** Date/Time Received: **15-Feb-19 14:32**

Work Order: **1902809** Received by: **KRW**

Checklist completed by: Keith Wierenga (eSignature) 15-Feb-19 (Date) Reviewed by: Chad Whelton (eSignature) 15-Feb-19 (Date)

Matrices: Water
Carrier name: Client

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Sample(s) received on ice?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	3.4/3.4 C	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	2/15/2019 2:57:19 PM		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:	-		

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

Section III

Analytical Data

-Analysis Data Sheet

-QC Summary

-QC Batch Report

-Summary Forms (if applicable)

-Raw Data

ADDRESS 3352 128th Avenue, Holland Michigan 49424-9236 USA PHONE +1 616 399 6070 FAX +1 616 399 6185
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Raw Data Format

Organic Ordering

-Field Sample Data

-Calibration Data

-Initial

-Continuing

-Instrument QC Data (BFB, DFTPP, etc. as applicable)

-QC Data

-Sequence Logs

-Extraction Logs

Inorganic Ordering

-Instrument Data

-Digestion/Preparation Data

-Calculation Data (if applicable)

Organic

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HPLC

1D
ACIDS BY HPLC ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW-WV-8S

Lab Name: ALS Group, USA

Lab Code: MI01262

SDG No. 1902602

Matrix: Water

Lab Sample ID: 1902602-01A

Sample wt/vol: 5.00 (g/mL) mL

Lab File ID:

% Moisture: not dec. 0

Date Received: 2/13/2019

Extraction Type:

Date Extracted 2/15/2019

Concentrated Extract Volume: (uL)

Date Analyzed: 2/16/2019

Injection Volume: 1 (uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: 0

CONCENTRATION UNITS: mg/L

CAS NO.	COMPOUND		Q
64-19-7	Acetic Acid	25	U
64-18-6	Formic Acid	25	U

1D
ACIDS BY HPLC ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW-WV-8M

Lab Name: ALS Group, USA

Lab Code: MI01262

SDG No. 1902602

Matrix: Water

Lab Sample ID: 1902602-02A

Sample wt/vol: 5.00 (g/mL) mL

Lab File ID:

% Moisture: not dec. 0

Date Received: 2/13/2019

Extraction Type:

Date Extracted 2/15/2019

Concentrated Extract Volume: (uL)

Date Analyzed: 2/16/2019

Injection Volume: 1 (uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N)_N_ pH: 0

CONCENTRATION UNITS: mg/L

CAS NO.	COMPOUND		Q
64-19-7	Acetic Acid	25	U
64-18-6	Formic Acid	25	U

FORM I-OTHER

1D

ACIDS BY HPLC ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW-WV-12S

Lab Name: ALS Group, USA

Lab Code: MI01262 SDG No. 1902602

Matrix: Water Lab Sample ID: 1902602-03A

Sample wt/vol: 5.00 (g/mL) mL Lab File ID:

% Moisture: not dec. 0 Date Received: 2/13/2019

Extraction Type: Date Extracted 2/15/2019

Concentrated Extract Volume: (uL) Date Analyzed: 2/16/2019

Injection Volume: 1 (uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N)_N_ pH: 0

CONCENTRATION UNITS: mg/L

CAS NO.	COMPOUND	mg/L	Q
64-19-7	Acetic Acid	25	U
64-18-6	Formic Acid	25	U

1D
ACIDS BY HPLC ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW-WV-11D

Lab Name: ALS Group, USA

Lab Code: MI01262

SDG No. 1902602

Matrix: Water

Lab Sample ID: 1902761-01A

Sample wt/vol: 5.00 (g/mL) mL

Lab File ID:

% Moisture: not dec. 0

Date Received: 2/15/2019

Extraction Type:

Date Extracted 2/15/2019

Concentrated Extract Volume: (uL)

Date Analyzed: 2/16/2019

Injection Volume: 1 (uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N)_N_ pH: 0

CONCENTRATION UNITS: mg/L

CAS NO.	COMPOUND		Q
64-19-7	Acetic Acid	25	U
64-18-6	Formic Acid	25	U

1D

ACIDS BY HPLC ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW-WV-11S

Lab Name: ALS Group, USA

Lab Code: MI01262

SDG No. 1902602

Matrix: Water

Lab Sample ID: 1902761-02A

Sample wt/vol: 5.00 (g/mL) mL

Lab File ID:

% Moisture: not dec. 0

Date Received: 2/15/2019

Extraction Type:

Date Extracted 2/15/2019

Concentrated Extract Volume: (uL)

Date Analyzed: 2/16/2019

Injection Volume: 1 (uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) _N_ pH: 0

CONCENTRATION UNITS: mg/L

CAS NO.	COMPOUND	mg/L	Q
64-19-7	Acetic Acid	25	U
64-18-6	Formic Acid	25	U

1D
ACIDS BY HPLC ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW-WV-5D

Lab Name: ALS Group, USA

Lab Code: MI01262

SDG No. 1902602

Matrix: Water

Lab Sample ID: 1902761-03A

Sample wt/vol: 5.00 (g/mL) mL

Lab File ID:

% Moisture: not dec. 0

Date Received: 2/15/2019

Extraction Type:

Date Extracted 2/15/2019

Concentrated Extract Volume: (uL)

Date Analyzed: 2/16/2019

Injection Volume: 1 (uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N)_N_ pH: 0

CONCENTRATION UNITS: mg/L

CAS NO.	COMPOUND		Q
64-19-7	Acetic Acid	25	U
64-18-6	Formic Acid	25	U

1D

ACIDS BY HPLC ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW-WV-5S

Lab Name: ALS Group, USA

Lab Code: MI01262

SDG No. 1902602

Matrix: Water

Lab Sample ID: 1902761-04A

Sample wt/vol: 5.00 (g/mL) mL

Lab File ID:

% Moisture: not dec. 0

Date Received: 2/15/2019

Extraction Type:

Date Extracted 2/15/2019

Concentrated Extract Volume: (uL)

Date Analyzed: 2/16/2019

Injection Volume: 1 (uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N)_N_ pH: 0

CONCENTRATION UNITS: mg/L

CAS NO.	COMPOUND	mg/L	Q
64-19-7	Acetic Acid	25	U
64-18-6	Formic Acid	25	U

1D

ACIDS BY HPLC ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW-WV-5D-Dup

Lab Name: ALS Group, USA

Lab Code: MI01262

SDG No. 1902602

Matrix: Water

Lab Sample ID: 1902761-05A

Sample wt/vol: 5.00 (g/mL) mL

Lab File ID:

% Moisture: not dec. 0

Date Received: 2/15/2019

Extraction Type:

Date Extracted 2/15/2019

Concentrated Extract Volume: (uL)

Date Analyzed: 2/16/2019

Injection Volume: 1 (uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N)_N_ pH: 0

CONCENTRATION UNITS: mg/L

CAS NO.	COMPOUND		Q
64-19-7	Acetic Acid	25	U
64-18-6	Formic Acid	25	U

1D

ACIDS BY HPLC ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW-WV-3S

Lab Name: ALS Group, USA

Lab Code: MI01262

SDG No. 1902602

Matrix: Water

Lab Sample ID: 1902809-01A

Sample wt/vol: 5.00 (g/mL) mL

Lab File ID:

% Moisture: not dec. 0

Date Received: 2/15/2019

Extraction Type:

Date Extracted 2/15/2019

Concentrated Extract Volume: (uL)

Date Analyzed: 2/16/2019

Injection Volume: 1 (uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) _N_ pH: 0

CONCENTRATION UNITS: mg/L

CAS NO.	COMPOUND	mg/L	Q
64-19-7	Acetic Acid	25	U
64-18-6	Formic Acid	25	U

1D
ACIDS BY HPLC ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW-WV-3D

Lab Name: ALS Group, USA

Lab Code: MI01262 SDG No. 1902602

Matrix: Water Lab Sample ID: 1902809-02A

Sample wt/vol: 5.00 (g/mL) mL Lab File ID:

% Moisture: not dec. 0 Date Received: 2/15/2019

Extraction Type: Date Extracted 2/15/2019

Concentrated Extract Volume: (uL) Date Analyzed: 2/16/2019

Injection Volume: 1 (uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N)_N_ pH: 0

CONCENTRATION UNITS: mg/L

CAS NO.	COMPOUND		Q
64-19-7	Acetic Acid	25	U
64-18-6	Formic Acid	25	U

1D

ACIDS BY HPLC ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW-WV-8D

Lab Name: ALS Group, USA

Lab Code: MI01262

SDG No. 1902602

Matrix: Water

Lab Sample ID: 1902809-03A

Sample wt/vol: 5.00 (g/mL) mL

Lab File ID:

% Moisture: not dec. 0

Date Received: 2/15/2019

Extraction Type:

Date Extracted 2/15/2019

Concentrated Extract Volume: (uL)

Date Analyzed: 2/16/2019

Injection Volume: 1 (uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N)_N_ pH: 0

CONCENTRATION UNITS: mg/L

CAS NO.	COMPOUND	mg/L	Q
64-19-7	Acetic Acid	25	U
64-18-6	Formic Acid	25	U

Date: 25-Feb-19

ALS Group, USA

QC BATCH REPORT

Client: Shealy Environmental Services, Inc.
Work Order: 1902602
Project: 16.0062677.81

Batch ID: **R255028** Instrument ID **HPLC2** Method: **SW8300M**

MBLK	Sample ID: **MBLKW1-R255028**			Units: **mg/L**			Analysis Date: **2/16/2019 01:18 AM**			
Client ID:		Run ID: **HPLC2_190215B**		SeqNo: **5525157**		Prep Date: **2/15/2019**		DF: **1**		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acetic Acid	ND	5.0								
Formic Acid	ND	5.0								

LCS	Sample ID: **LCSW1-R255028**			Units: **mg/L**			Analysis Date: **2/16/2019 01:31 AM**			
Client ID:		Run ID: **HPLC2_190215B**		SeqNo: **5525158**		Prep Date: **2/15/2019**		DF: **1**		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acetic Acid	521	5.0	500	0	104	80-120	0			
Formic Acid	520	5.0	500	0	104	80-120	0			

MS	Sample ID: **1902686-01A MS**			Units: **mg/L**			Analysis Date: **2/16/2019 01:44 AM**			
Client ID:		Run ID: **HPLC2_190215B**		SeqNo: **5525159**		Prep Date: **2/15/2019**		DF: **2**		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acetic Acid	1008	10	1000	0	101	75-125	0			
Formic Acid	999.2	10	1000	0	99.9	75-125	0			

MSD	Sample ID: **1902686-01A MSD**			Units: **mg/L**			Analysis Date: **2/16/2019 01:57 AM**			
Client ID:		Run ID: **HPLC2_190215B**		SeqNo: **5525160**		Prep Date: **2/15/2019**		DF: **2**		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acetic Acid	1026	10	1000	0	103	75-125	1008	1.77	20	
Formic Acid	997.5	10	1000	0	99.7	75-125	999.2	0.17	20	

The following samples were analyzed in this batch:

1902602-01A	1902602-02A	1902602-03A
1902761-01A	1902761-02A	1902761-03A
1902761-04A	1902761-05A	1902809-01A
1902809-02A	1902809-03A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151938.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 03:02
Operator : KM
Sample : 1902602-01A
Misc :
ALS Vial : 58 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:52:20 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Mon Feb 18 09:50:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

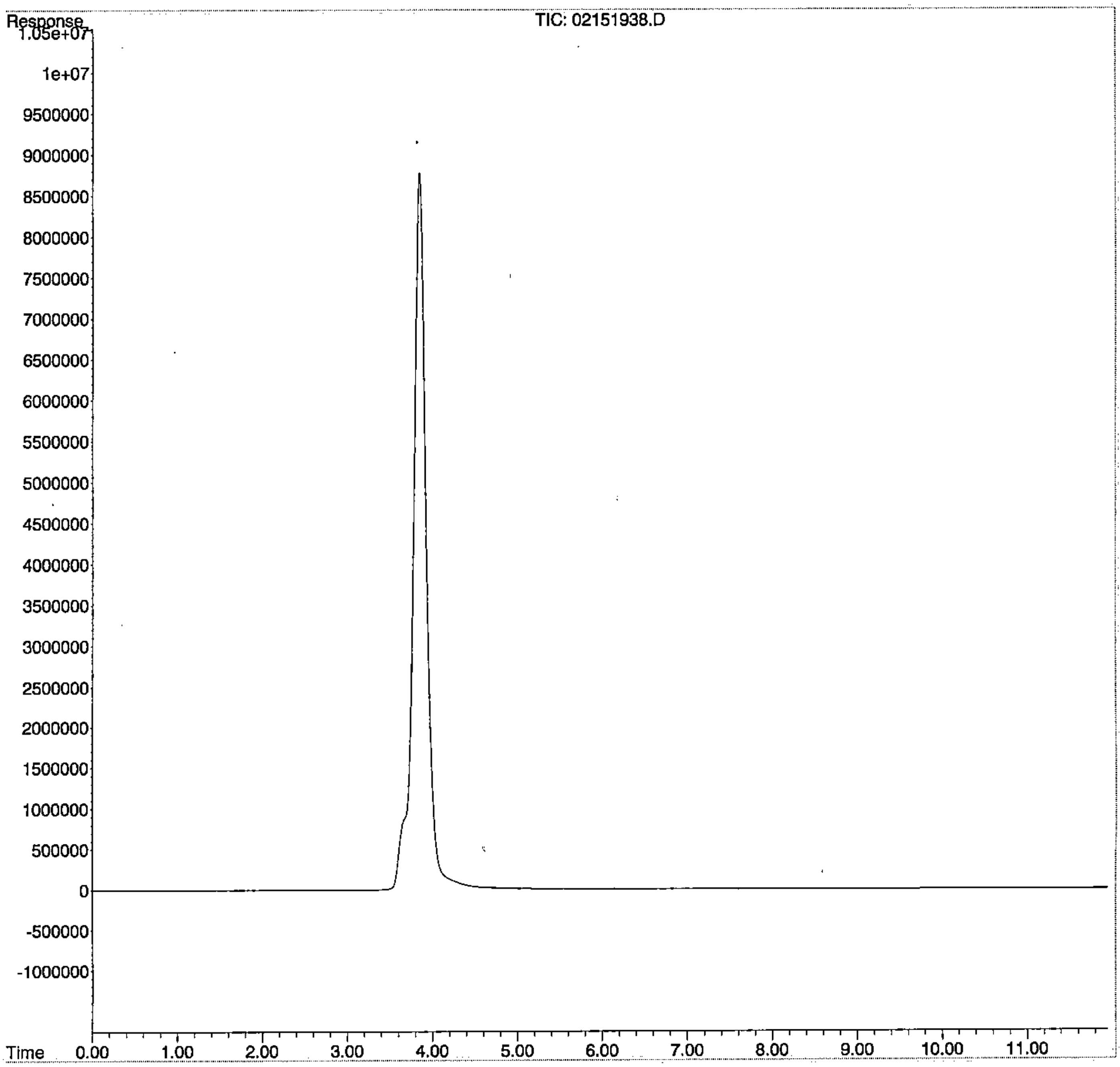
Compound	R.T.	Response	Conc	Units
Target Compounds				
1) t Formic Acid	0.000	0	N.D.	mg/L
2) t Acetic Acid	0.000	0	N.D.	mg/L

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151938.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 03:02
Operator : KM
Sample : 1902602-01A
Misc :
ALS Vial : 58 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:52:20 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Mon Feb 18 09:50:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151939.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 03:15
Operator : KM
Sample : 1902602-02A
Misc :
ALS Vial : 59 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:52:22 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Mon Feb 18 09:50:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

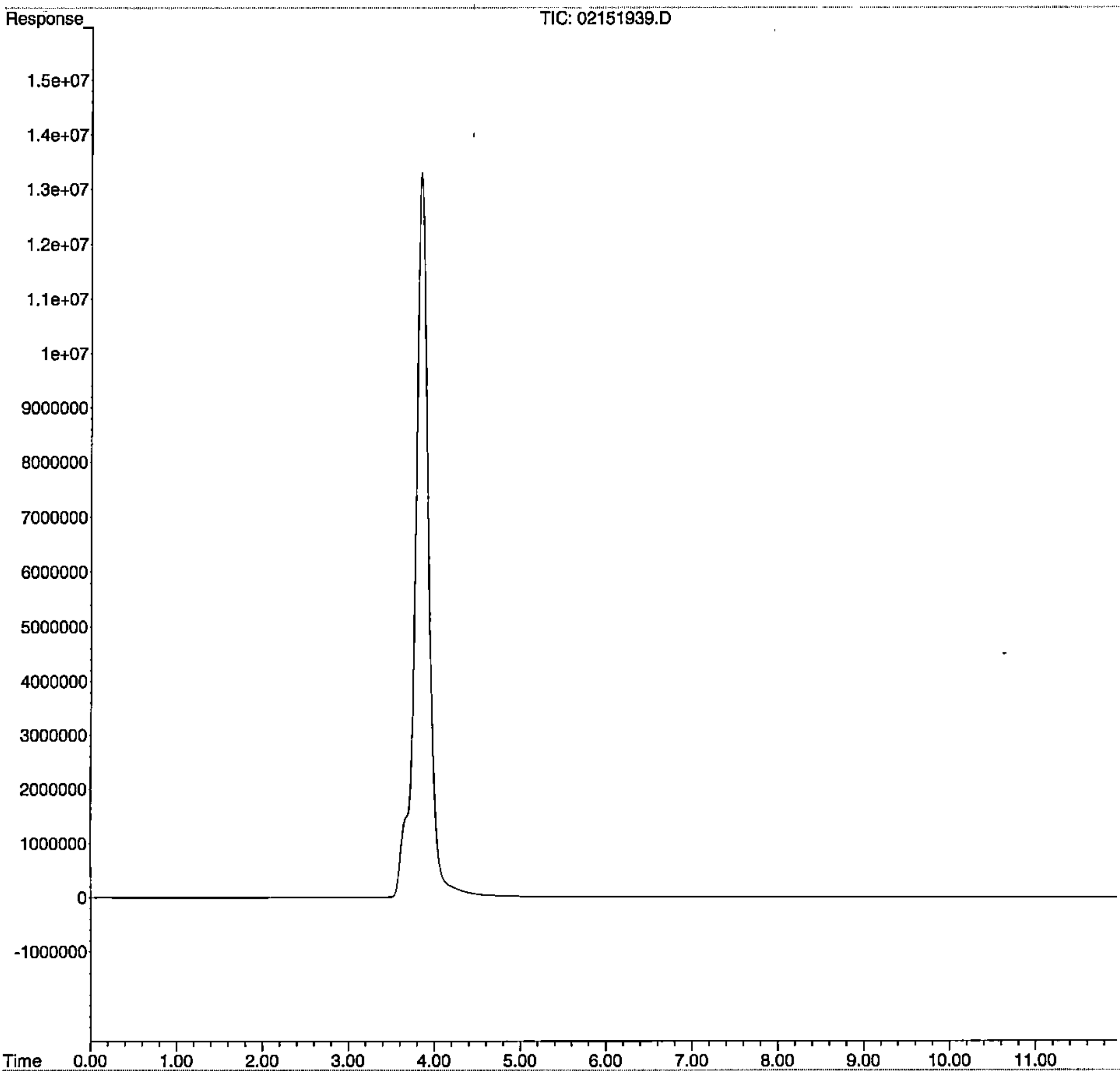
Compound	R.T.	Response	Conc	Units
Target Compounds				
1) t Formic Acid	0.000	0	N.D.	mg/L
2) t Acetic Acid	0.000	0	N.D.	mg/L

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151939.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 03:15
Operator : KM
Sample : 1902602-02A
Misc :
ALS Vial : 59 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:52:22 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Mon Feb 18 09:50:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :



Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151941.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 03:41
Operator : KM
Sample : 1902602-03A
Misc :
ALS Vial : 60 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:52:26 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Mon Feb 18 09:50:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

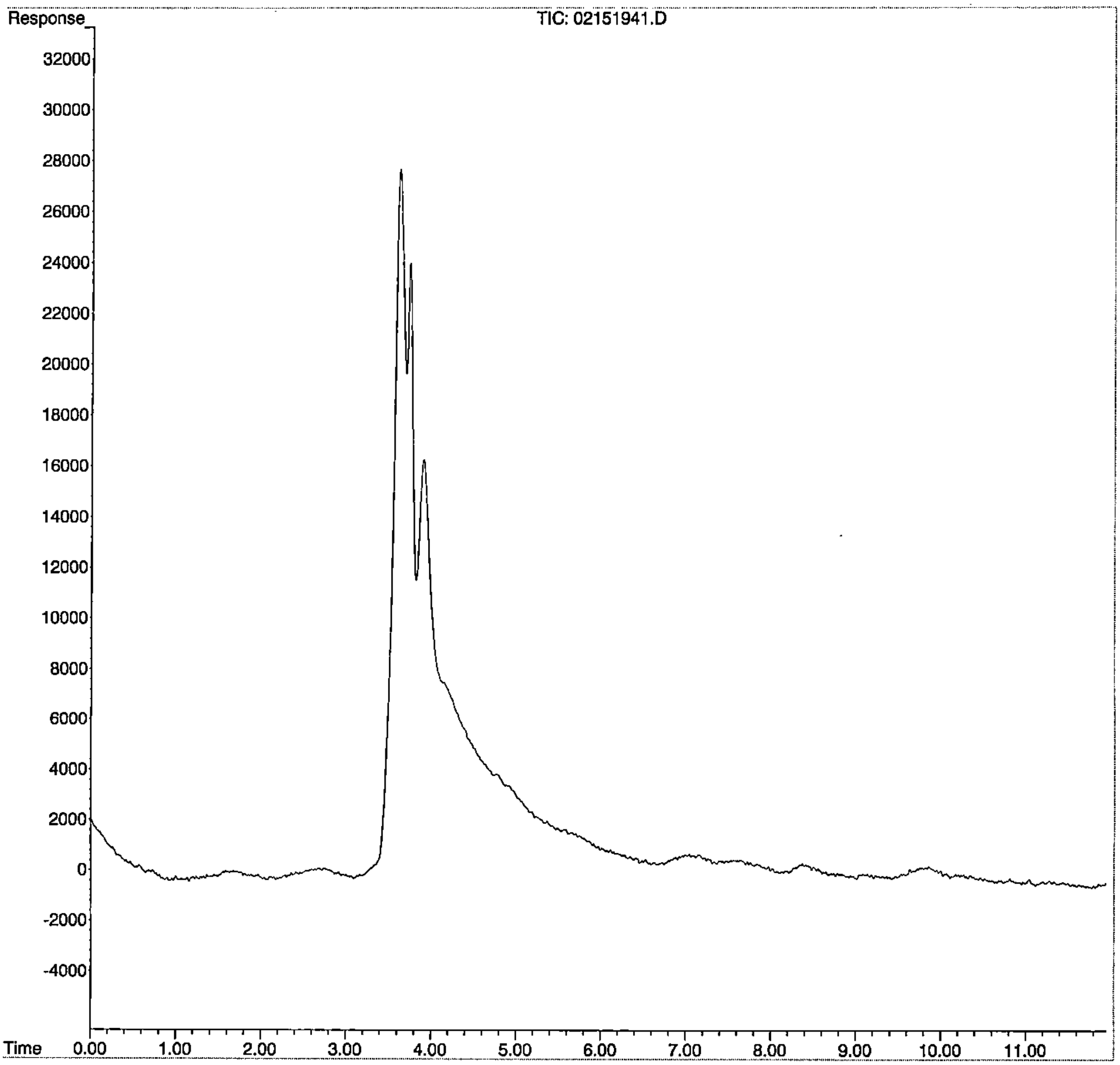
Compound	R.T.	Response	Conc	Units
Target Compounds				
1) t Formic Acid	0.000	0	N.D.	mg/L
2) t Acetic Acid	0.000	0	N.D.	mg/L

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151941.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 03:41
Operator : KM
Sample : 1902602-03A
Misc :
ALS Vial : 60 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:52:26 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Mon Feb 18 09:50:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :



Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151942.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 03:54
Operator : KM
Sample : 1902761-01A
Misc :
ALS Vial : 61 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:52:28 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Mon Feb 18 09:50:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

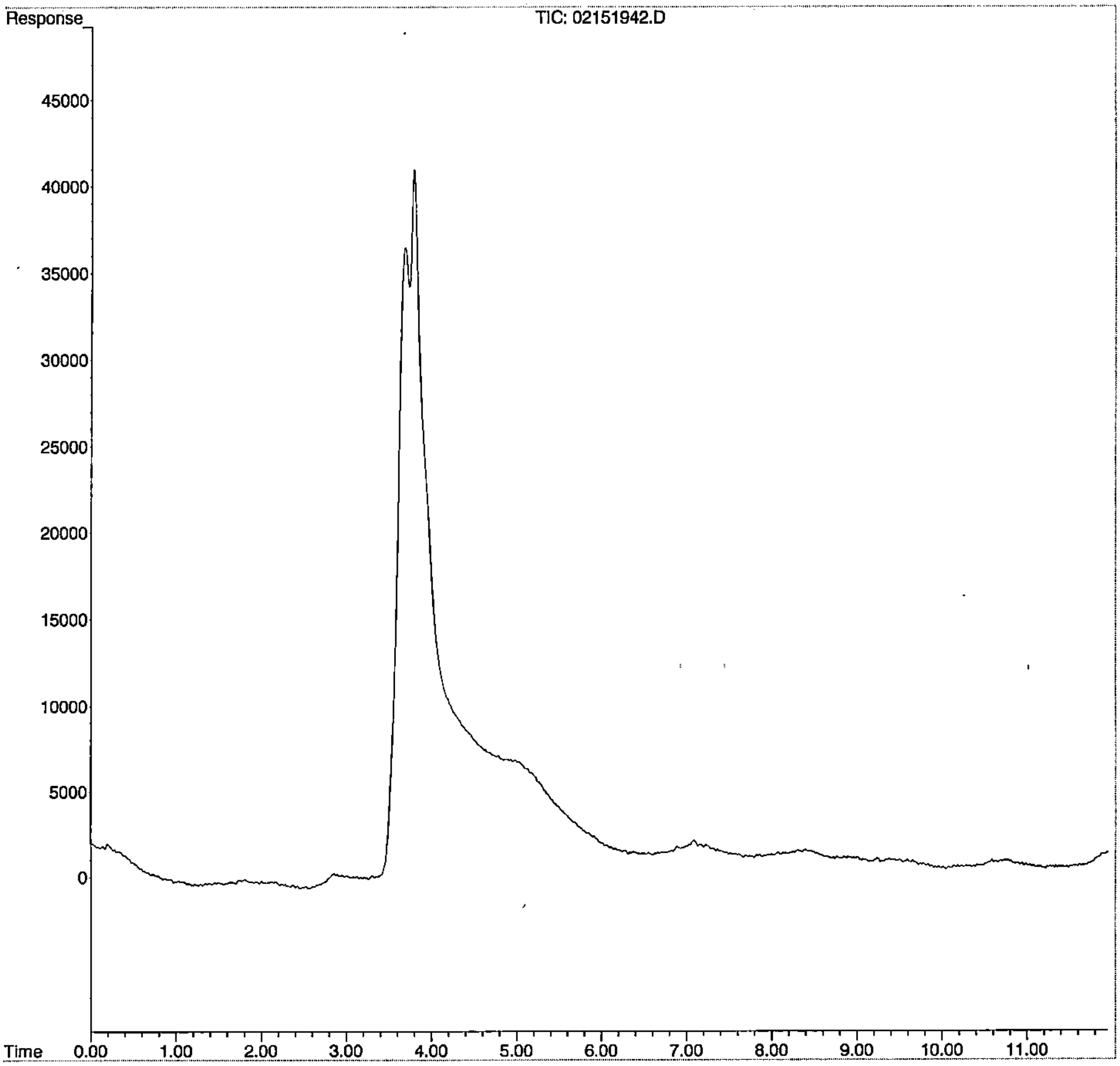
Compound	R.T.	Response	Conc Units
Target Compounds			
1) t Formic Acid	0.000	0	N.D. mg/L
2) t Acetic Acid	0.000	0	N.D. mg/L

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151942.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 03:54
Operator : KM
Sample : 1902761-01A
Misc :
ALS Vial : 61 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:52:28 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Mon Feb 18 09:50:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :



Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151943.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 04:07
Operator : KM
Sample : 1902761-02A
Misc :
ALS Vial : 62 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:52:30 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Mon Feb 18 09:50:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

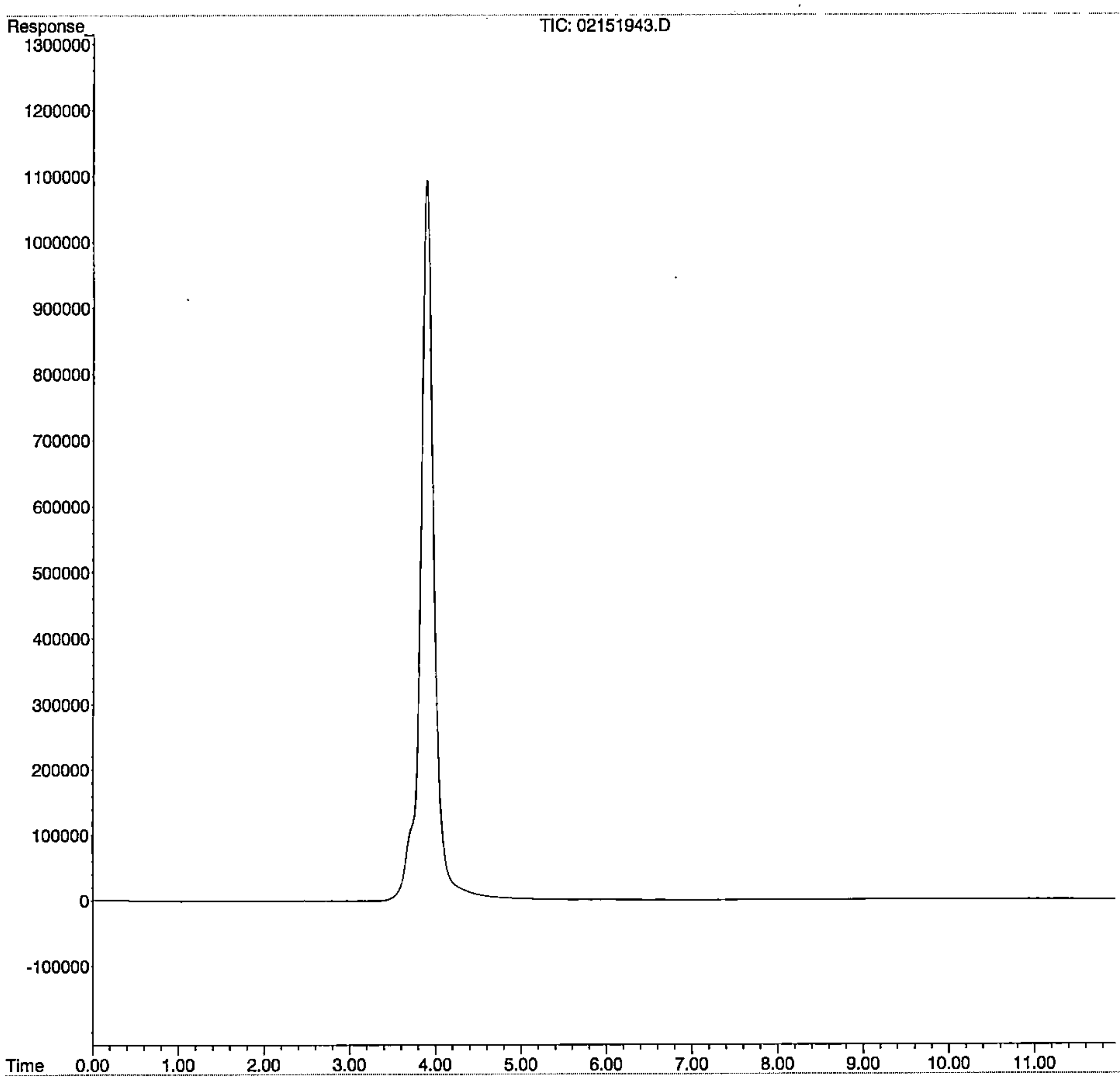
	Compound	R.T.	Response	Conc	Units
	Target Compounds				
1) t	Formic Acid	0.000	0	N.D.	mg/L
2) t	Acetic Acid	0.000	0	N.D.	mg/L

(f)=RT Delta > 1/2 Window (m)=manual int.

```
Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151943.D
Signal(s) : vwd1A.ch
Acq On    : 16-Feb-2019, 04:07
Operator  : KM
Sample    : 1902761-02A
Misc      :
ALS Vial  : 62   Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:52:30 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title  :
QLast Update : Mon Feb 18 09:50:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj.  :
Signal Phase :
Signal Info  :
```



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151944.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 04:20
Operator : KM
Sample : 1902761-03A
Misc :
ALS Vial : 63 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:52:32 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Mon Feb 18 09:50:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

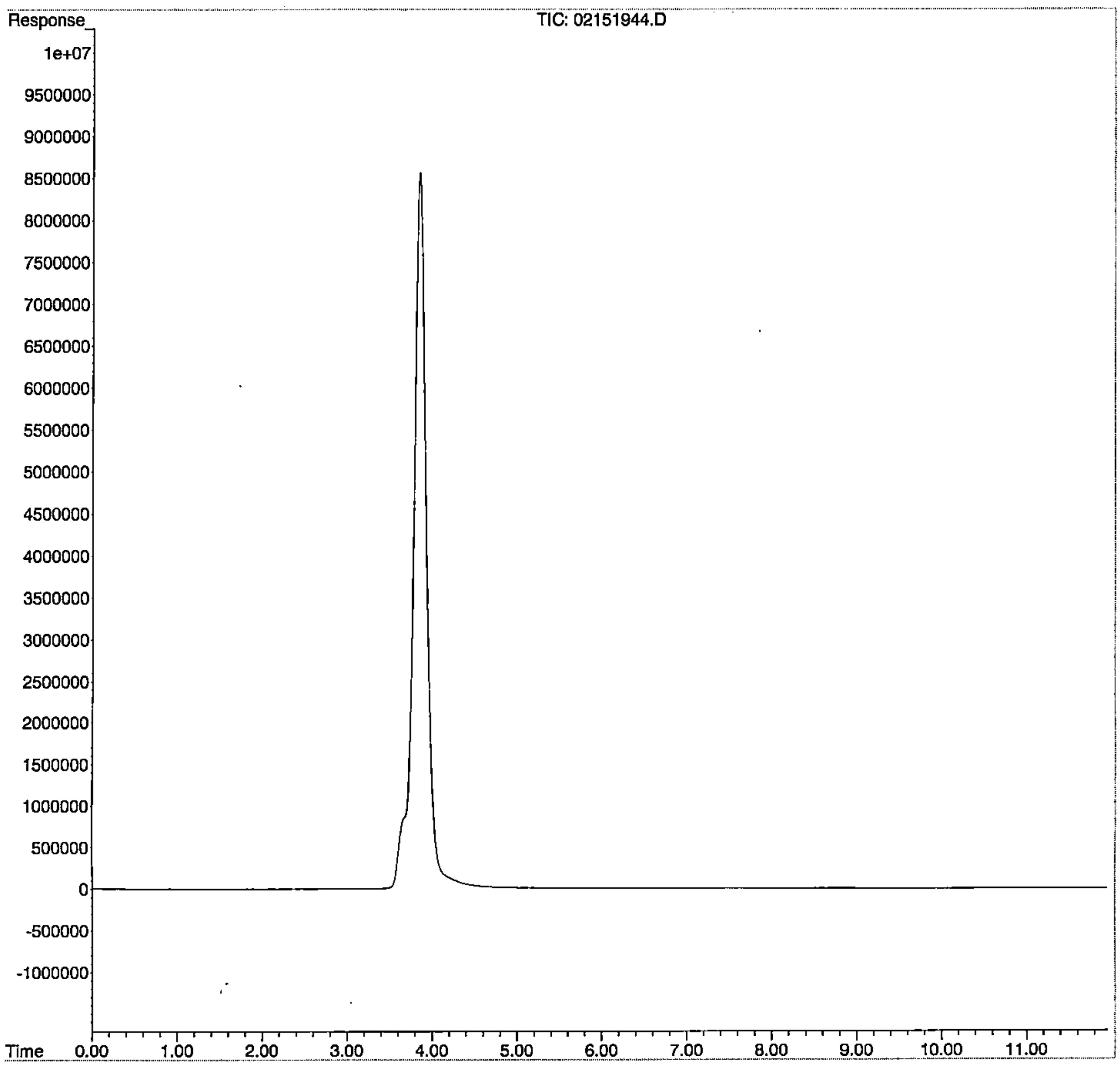
	Compound	R.T.	Response	Conc	Units
	Target Compounds				
1) t	Formic Acid	0.000	0	N.D.	mg/L
2) t	Acetic Acid	0.000	0	N.D.	mg/L

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151944.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 04:20
Operator : KM
Sample : 1902761-03A
Misc :
ALS Vial : 63 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:52:32 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Mon Feb 18 09:50:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151945.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 04:33
Operator : KM
Sample : 1902761-04A
Misc :
ALS Vial : 64 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:52:34 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Mon Feb 18 09:50:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

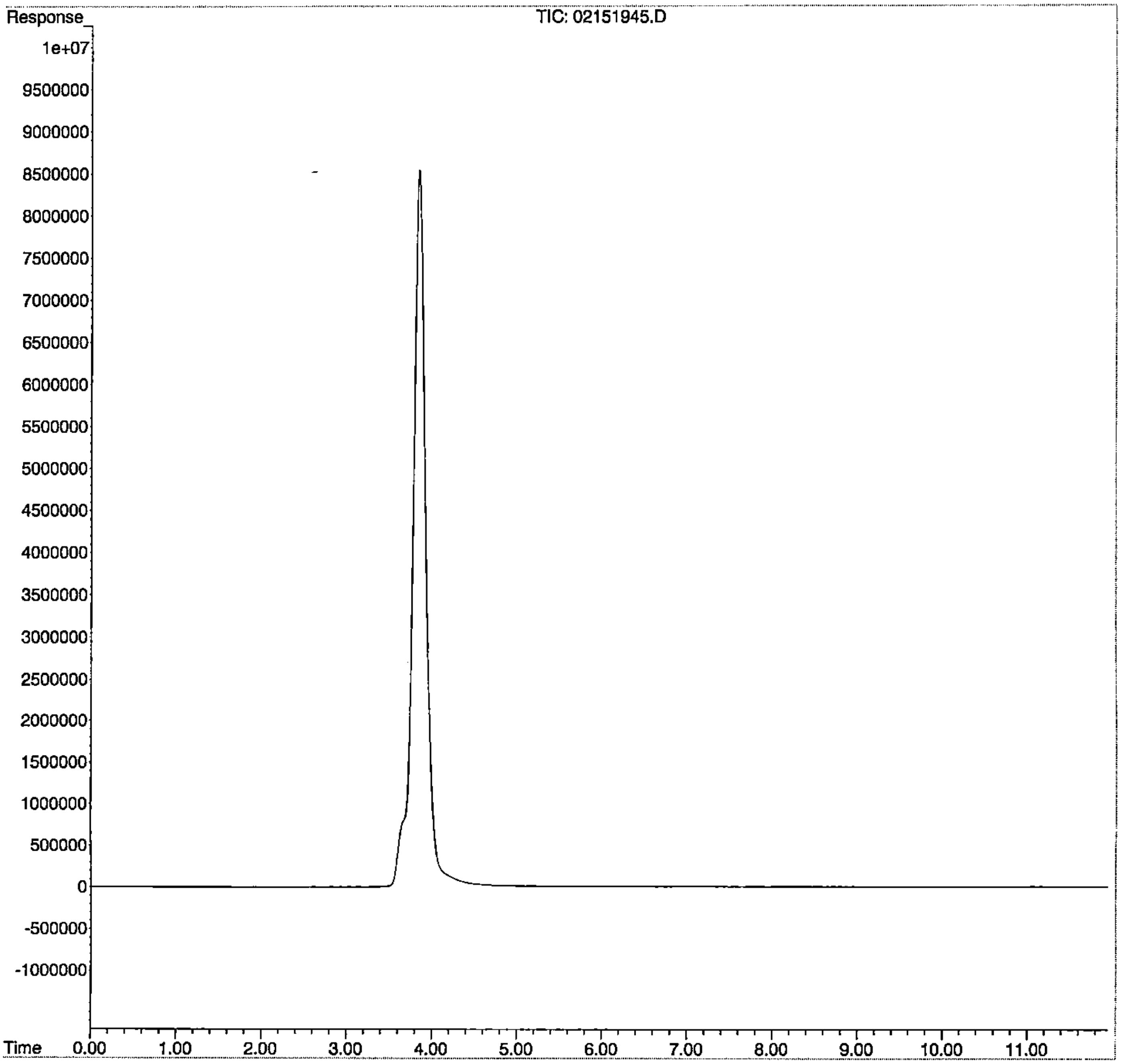
Compound	R.T.	Response	Conc	Units
Target Compounds				
1) t Formic Acid	0.000	0	N.D.	mg/L
2) t Acetic Acid	0.000	0	N.D.	mg/L

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151945.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 04:33
Operator : KM
Sample : 1902761-04A
Misc :
ALS Vial : 64 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:52:34 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Mon Feb 18 09:50:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :



Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151946.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 04:46
Operator : KM
Sample : 1902761-05A
Misc :
ALS Vial : 65 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:52:36 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Mon Feb 18 09:50:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

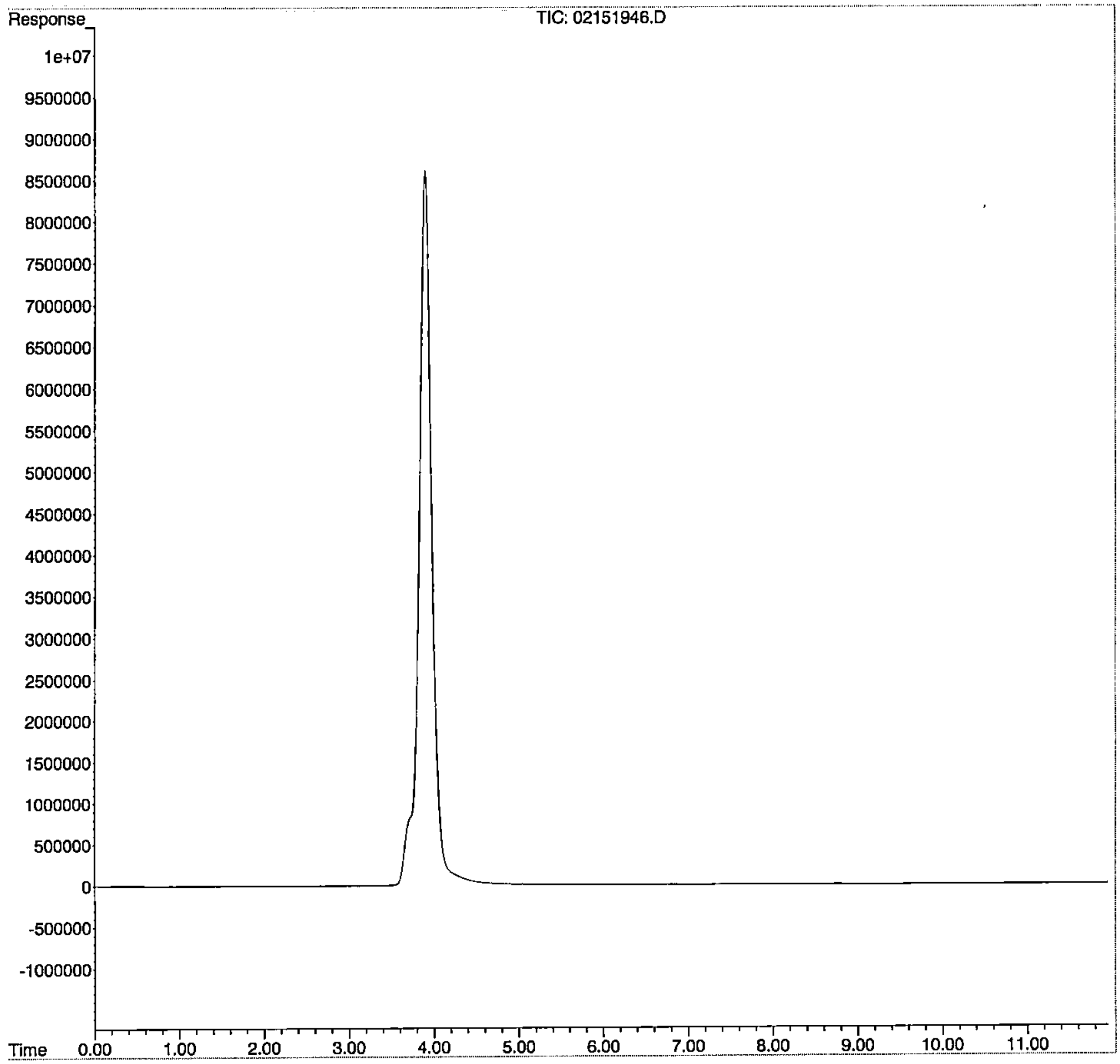
Compound	R.T.	Response	Conc	Units
Target Compounds				
1) t Formic Acid	0.000	0	N.D.	mg/L
2) t Acetic Acid	0.000	0	N.D.	mg/L

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151946.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 04:46
Operator : KM
Sample : 1902761-05A
Misc :
ALS Vial : 65 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:52:36 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Mon Feb 18 09:50:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151947.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 04:59
Operator : KM
Sample : 1902809-01A
Misc :
ALS Vial : 66 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:52:38 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Mon Feb 18 09:50:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

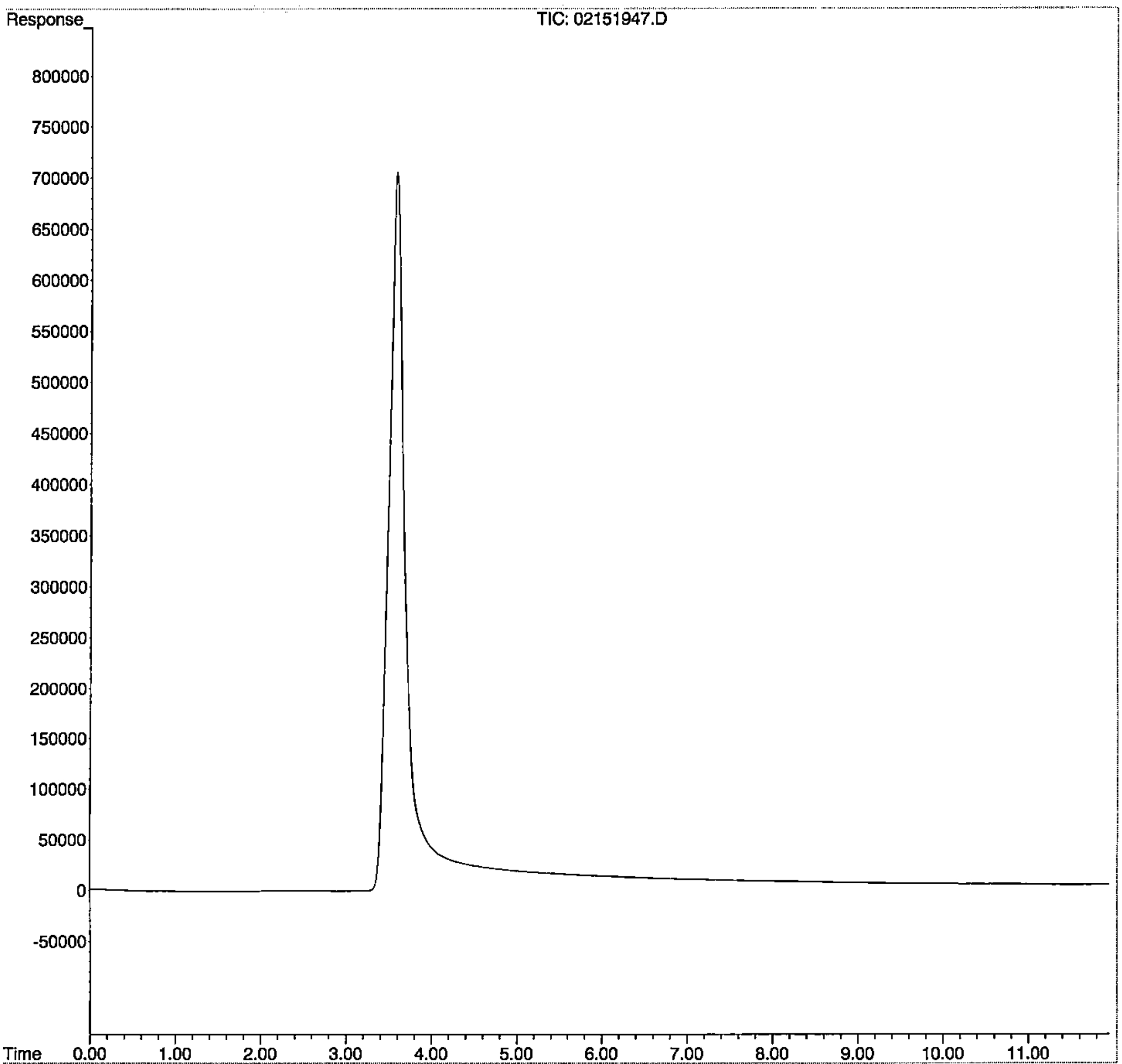
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1) t	Formic Acid	0.000	0	N.D.	mg/L
2) t	Acetic Acid	0.000	0	N.D.	mg/L

(f)=RT Delta > 1/2 Window (m)=manual int.

```
Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151947.D
Signal(s) : vwd1A.ch
Acq On    : 16-Feb-2019, 04:59
Operator  : KM
Sample    : 1902809-01A
Misc      :
ALS Vial  : 66   Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:52:38 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title  :
QLast Update : Mon Feb 18 09:50:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj.  :
Signal Phase :
Signal Info  :
```



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151948.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 05:12
Operator : KM
Sample : 1902809-02A
Misc :
ALS Vial : 67 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:52:40 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Mon Feb 18 09:50:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

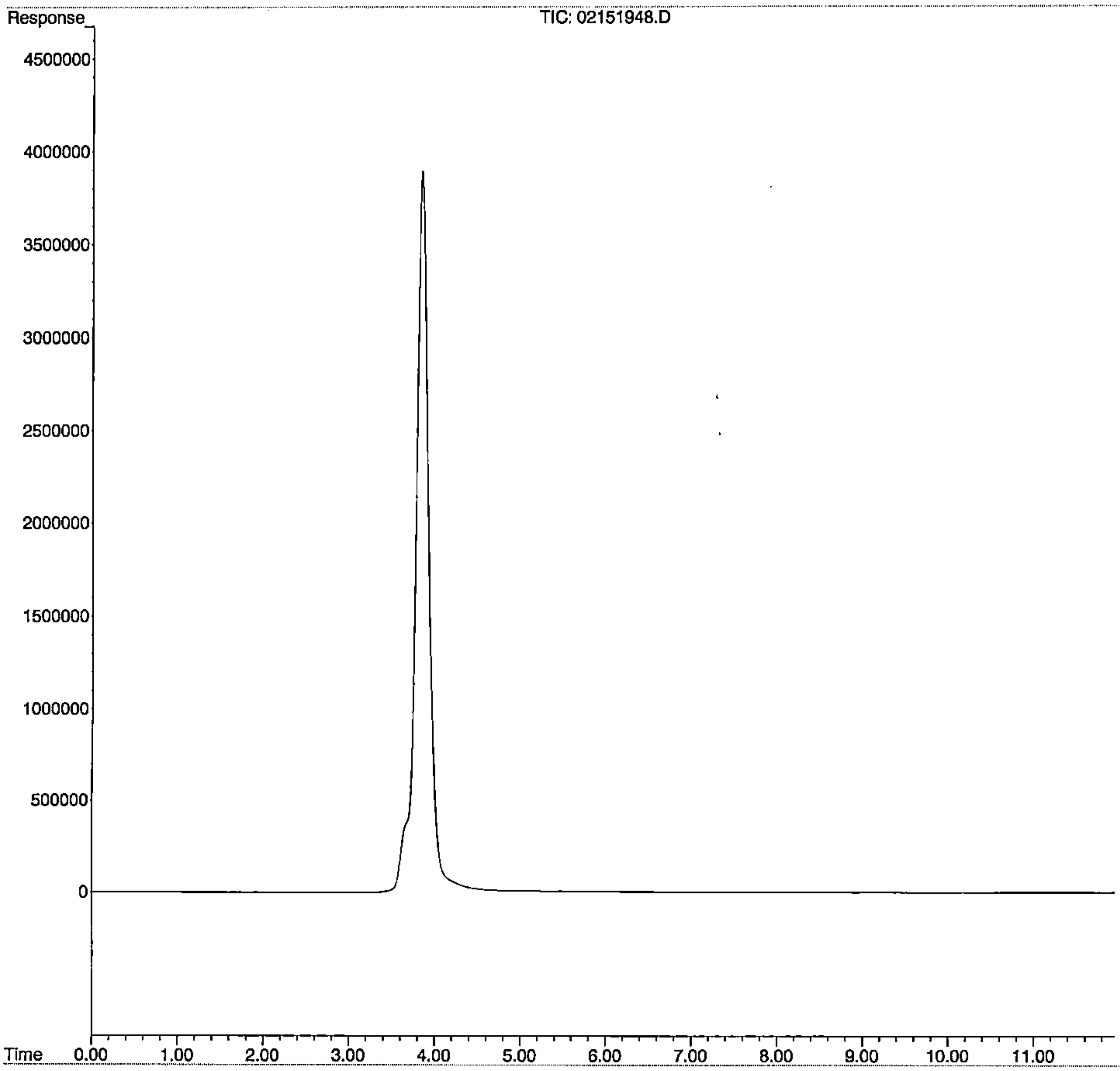
	Compound	R.T.	Response	Conc	Units
	Target Compounds				
1) t	Formic Acid	0.000	0	N.D.	mg/L
2) t	Acetic Acid	0.000	0	N.D.	mg/L

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151948.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 05:12
Operator : KM
Sample : 1902809-02A
Misc :
ALS Vial : 67 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:52:40 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Mon Feb 18 09:50:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151949.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 05:25
Operator : KM
Sample : 1902809-03A
Misc :
ALS Vial : 68 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:52:42 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Mon Feb 18 09:50:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

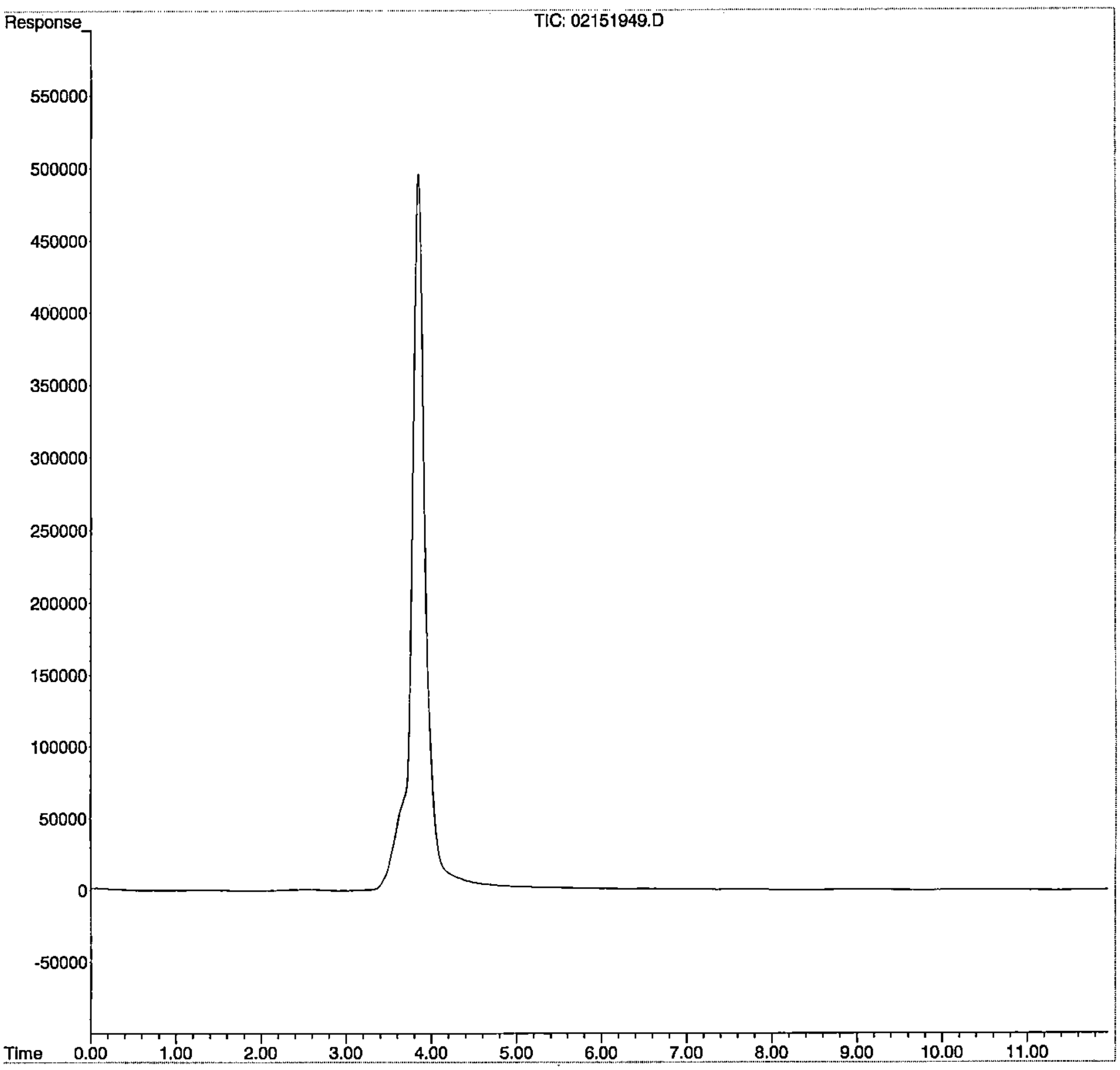
Compound	R.T.	Response	Conc Units
Target Compounds			
1) t Formic Acid	0.000	0	N.D. mg/L
2) t Acetic Acid	0.000	0	N.D. mg/L

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151949.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 05:25
Operator : KM
Sample : 1902809-03A
Misc :
ALS Vial : 68 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:52:42 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Mon Feb 18 09:50:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :



Response Factor Report G1314A

Method Path : C:\msdchem\1\HPLC\METHODS\Acids\
Method File : Ac021519.M
Title :
Last Update : Mon Feb 18 09:50:14 2019
Response Via : Initial Calibration

Calibration Files

1000	=02151928.D	500	=02151927.D	250	=02151926.D
100	=02151925.D	50	=02151924.D	25	=02151923.D

	Compound	1000	500	250	100	50	25	Avg	%RSD
1) t	Formic Acid	3.230	3.041	3.048	3.308	3.177	3.556	3.263 E5	5.94
2) t	Acetic Acid	1.654	1.630	1.594	1.717	1.613	1.791	1.663 E5	7.58

(#) = Out of Range ### Number of calibration levels exceeded format ###

Partial Calibration Report G1314A

Method Path : C:\msdchem\1\HPLC\METHODS\Acids\
Method File : Ac021519.M
Title :
Last Update : Mon Feb 18 09:50:14 2019
Response Via : Initial Calibration

Calibration Files
1000=02151928 500 =02151927 250 =02151926 100 =02151925 50 =02151924
25 =02151923 10 =02151922 5 =02151921

Compound	Fit	Constant	Linear	Quad	RSD/Cf

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151920.D
Signal(s) : vwd1A.ch
Acq On : 15-Feb-2019, 23:09
Operator : KM
Sample : Acids 5ug/ml
Misc :
ALS Vial : 41 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:43:56 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Tue Jan 29 09:25:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

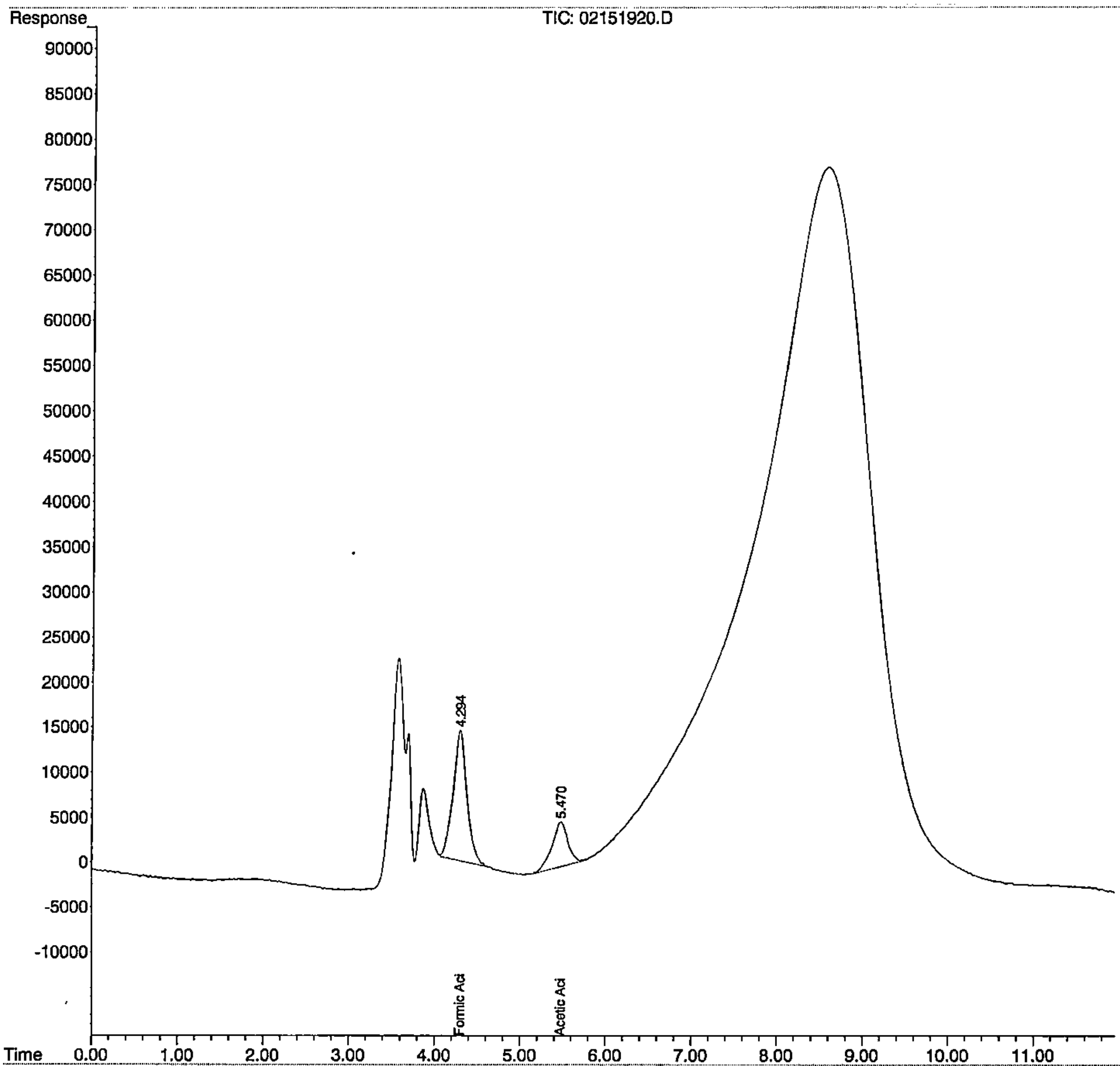
Compound	R.T.	Response	Conc Units
Target Compounds			
1) T Formic Acid	4.294	1621165	4.737 mg/L m
2) T Acetic Acid	5.470	657730	3.825 mg/L m

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151920.D
Signal(s) : vwd1A.ch
Acq On : 15-Feb-2019, 23:09
Operator : KM
Sample : Acids 5ug/ml
Misc :
ALS Vial : 41 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:43:56 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Tue Jan 29 09:25:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151921.D
Signal(s) : vwd1A.ch
Acq On : 15-Feb-2019, 23:22
Operator : KM
Sample : Acids 5ug/ml
Misc :
ALS Vial : 41 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:46:04 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Tue Jan 29 09:25:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

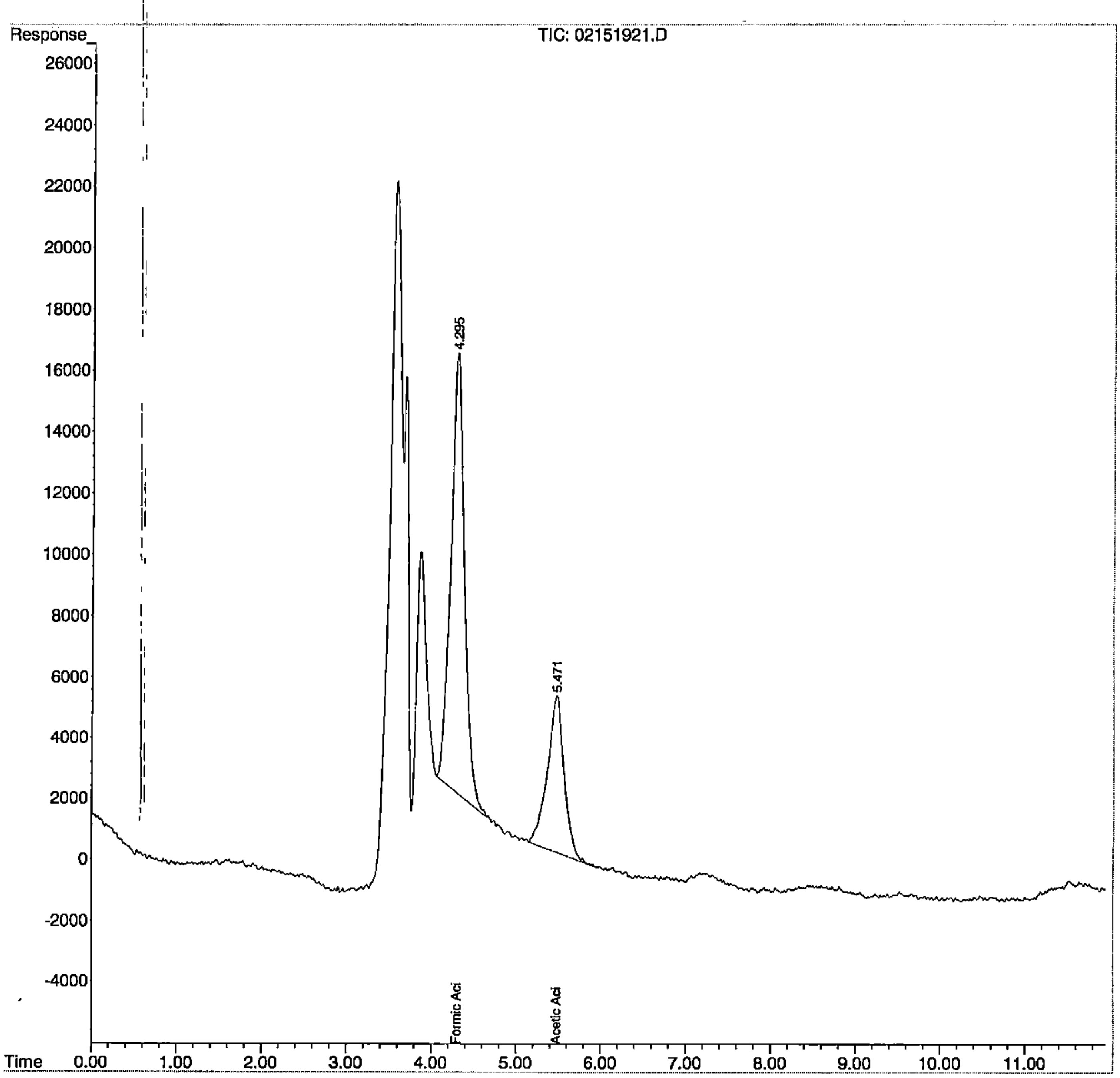
Compound	R.T.	Response	Conc Units
Target Compounds			
1) T Formic Acid	4.295	1609398	4.703 mg/L m
2) T Acetic Acid	5.470	724887	4.215 mg/L

(f)=RT Delta > 1/2 Window (m)=manual int.

```
Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151921.D
Signal(s) : vwd1A.ch
Acq On    : 15-Feb-2019, 23:22
Operator  : KM
Sample    : Acids 5ug/ml
Misc      :
ALS Vial  : 41   Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:46:04 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title  :
QLast Update : Tue Jan 29 09:25:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj.  :
Signal Phase :
Signal Info  :
```



Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151922.D
Signal(s) : vwd1A.ch
Acq On : 15-Feb-2019, 23:35
Operator : KM
Sample : Acids 10ug/ml
Misc :
ALS Vial : 42 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:46:12 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Tue Jan 29 09:25:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

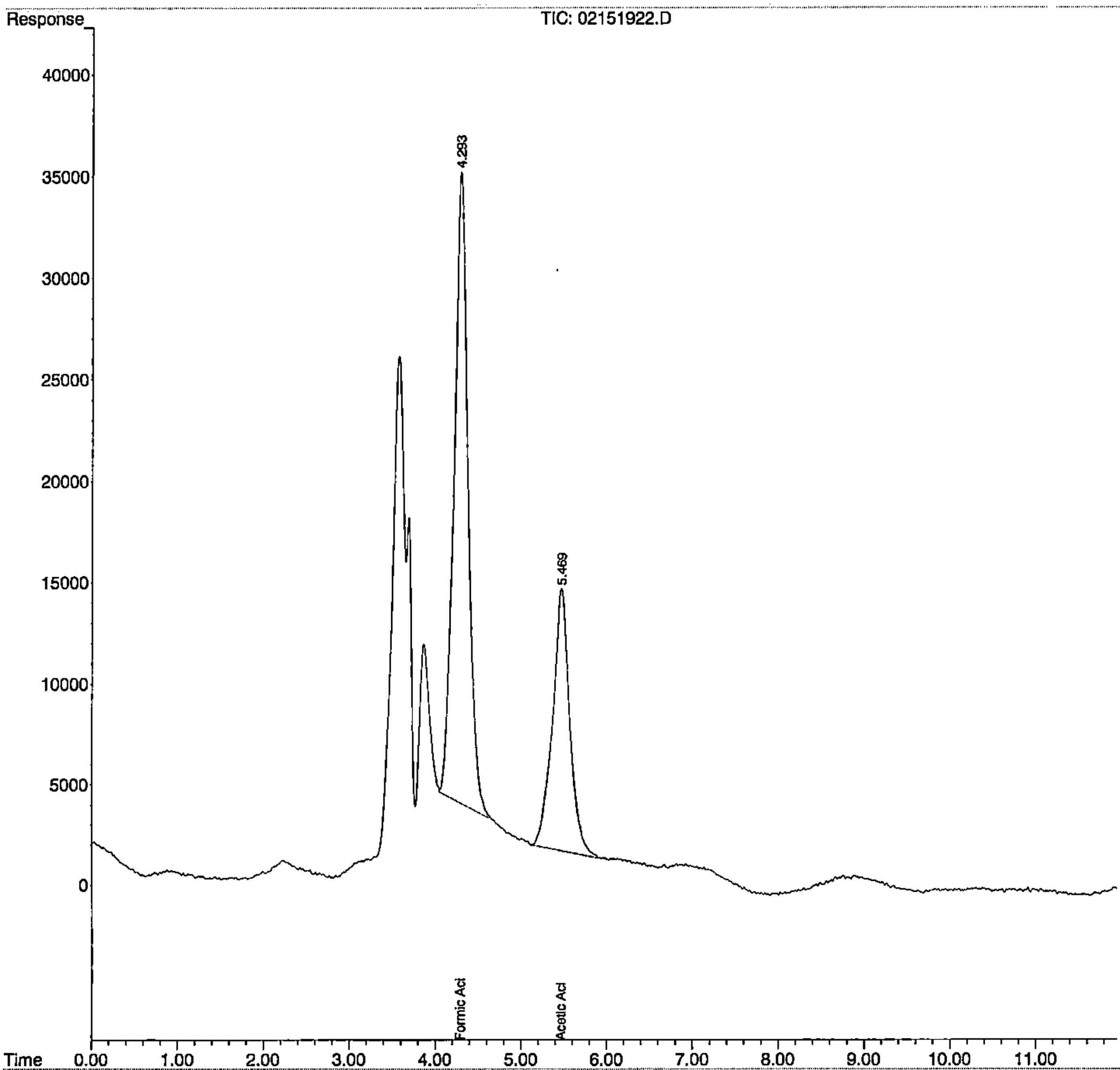
Compound	R.T.	Response	Conc Units
Target Compounds			
1) T Formic Acid	4.293	3524797	10.300 mg/L m
2) T Acetic Acid	5.470	1858175	10.805 mg/L

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151922.D
Signal(s) : vwd1A.ch
Acq On : 15-Feb-2019, 23:35
Operator : KM
Sample : Acids 10ug/ml
Misc :
ALS Vial : 42 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:46:12 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Tue Jan 29 09:25:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :



Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151923.D
Signal(s) : vwd1A.ch
Acq On : 15-Feb-2019, 23:48
Operator : KM
Sample : Acids 25ug/ml
Misc :
ALS Vial : 43 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:46:20 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Tue Jan 29 09:25:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

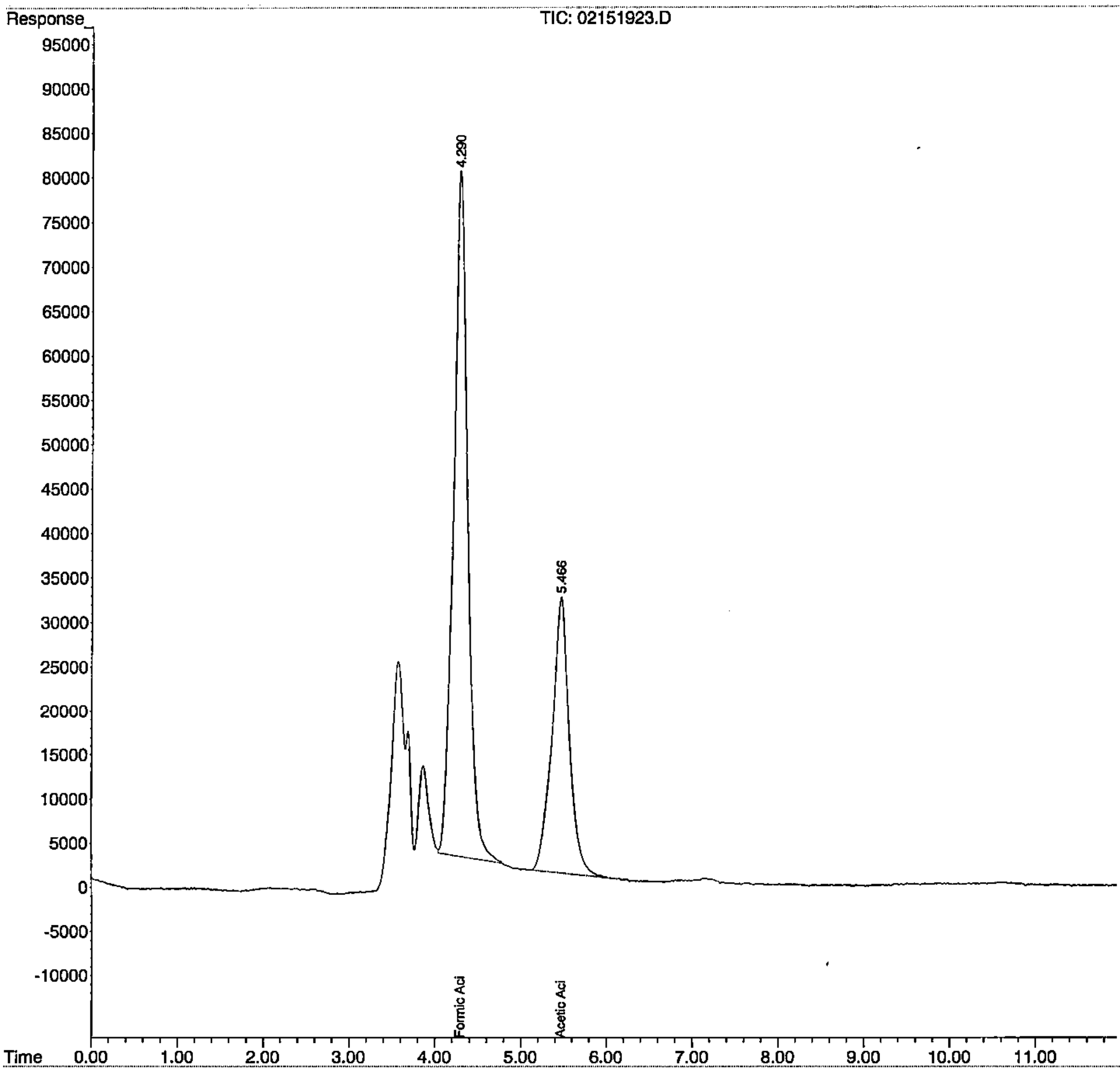
Compound	R.T.	Response	Conc Units
Target Compounds			
1) T Formic Acid	4.290	8890924	25.981 mg/L m
2) T Acetic Acid	5.468	4477523	26.036 mg/L

(f)=RT Delta > 1/2 Window (m)=manual int.

```
Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151923.D
Signal(s) : vwd1A.ch
Acq On    : 15-Feb-2019, 23:48
Operator  : KM
Sample    : Acids 25ug/ml
Misc      :
ALS Vial  : 43   Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:46:20 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title  :
QLast Update : Tue Jan 29 09:25:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj.  :
Signal Phase :
Signal Info  :
```



Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151924.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 00:01
Operator : KM
Sample : Acids 50ug/ml
Misc :
ALS Vial : 44 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:46:33 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Tue Jan 29 09:25:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

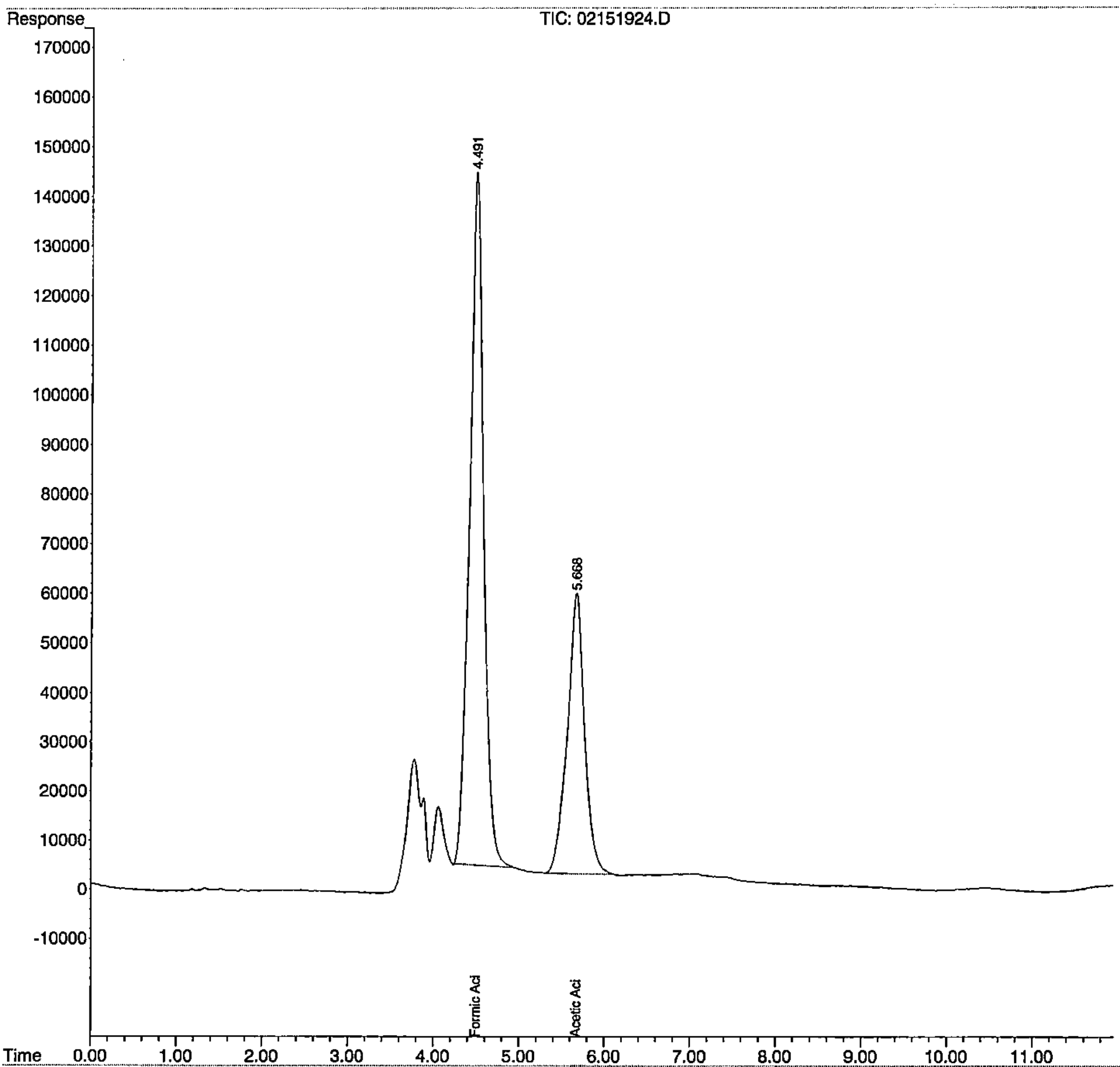
Compound	R.T.	Response	Conc Units
Target Compounds			
1) T Formic Acid	4.491	15887485	46.426 mg/L m
2) T Acetic Acid	5.668	8065980	46.902 mg/L m

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151924.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 00:01
Operator : KM
Sample : Acids 50ug/ml
Misc :
ALS Vial : 44 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:46:33 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Tue Jan 29 09:25:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :



Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151925.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 00:14
Operator : KM
Sample : Acids 100ug/ml
Misc :
ALS Vial : 45 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:46:50 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Tue Jan 29 09:25:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

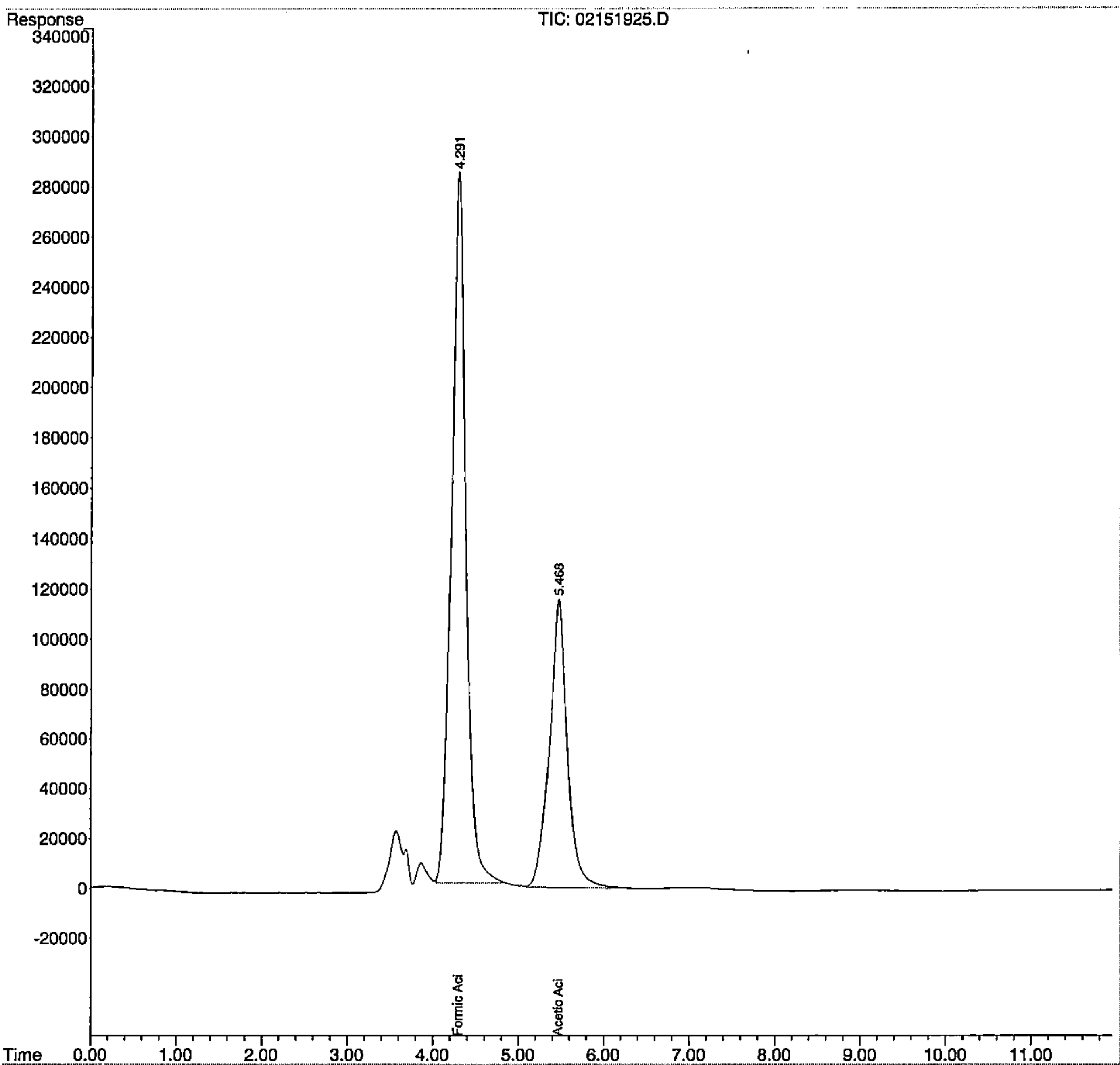
Compound	R.T.	Response	Conc Units
Target Compounds			
1) T Formic Acid	4.291	33077742	96.658 mg/L m
2) T Acetic Acid	5.468	17166968	99.823 mg/L m

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151925.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 00:14
Operator : KM
Sample : Acids 100ug/ml
Misc :
ALS Vial : 45 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:46:50 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Tue Jan 29 09:25:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151926.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 00:27
Operator : KM
Sample : Acids 250ug/ml
Misc :
ALS Vial : 46 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:47:01 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Tue Jan 29 09:25:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

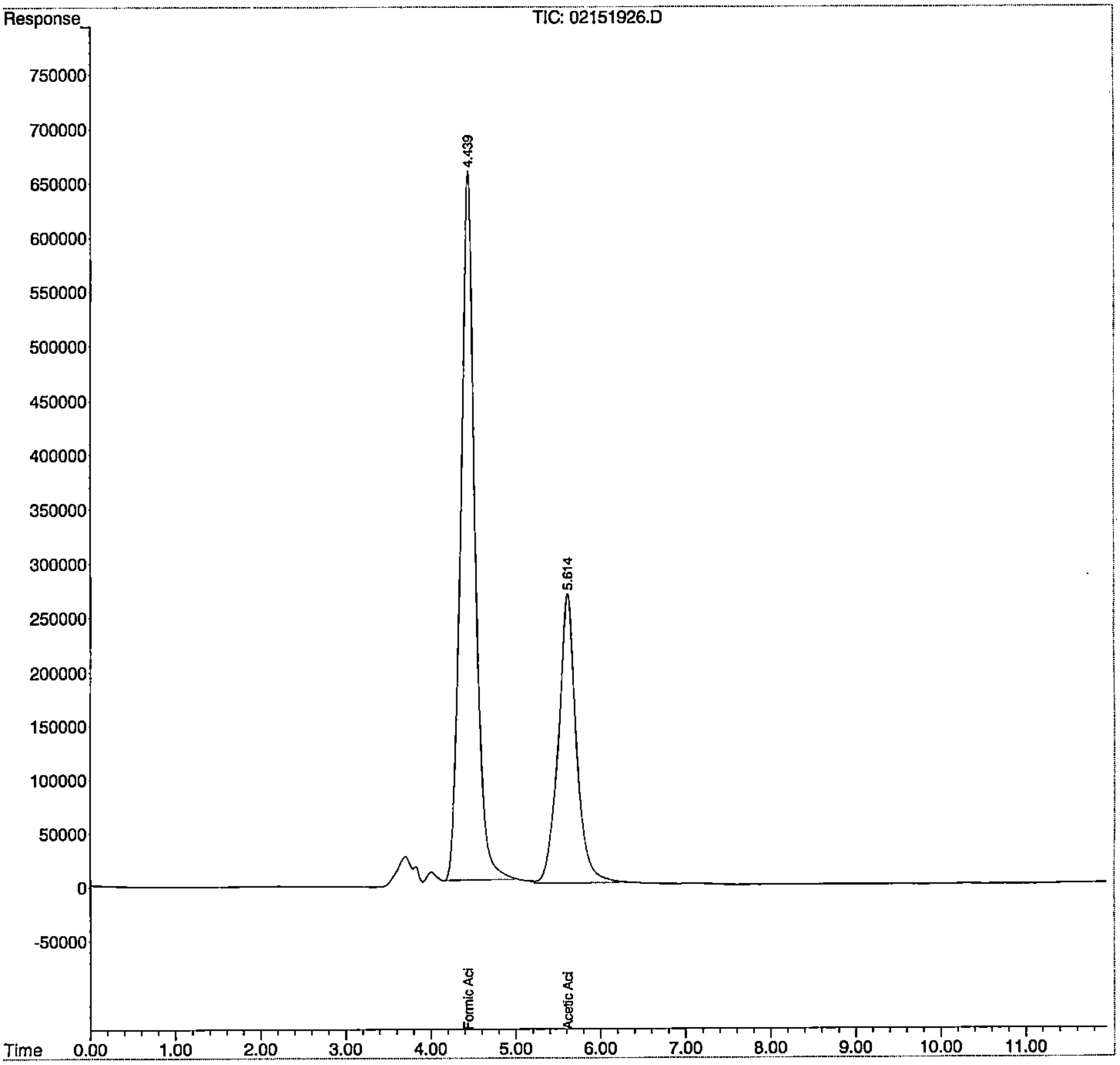
Compound	R.T.	Response	Conc Units
Target Compounds			
1) T Formic Acid	4.439	76187701	222.631 mg/L m
2) T Acetic Acid	5.614	39845106	231.693 mg/L m

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151926.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 00:27
Operator : KM
Sample : Acids 250ug/ml
Misc :
ALS Vial : 46 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:47:01 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Tue Jan 29 09:25:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151927.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 00:40
Operator : KM
Sample : Acids 500ug/ml
Misc :
ALS Vial : 47 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:47:10 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Tue Jan 29 09:25:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

Compound	R.T.	Response	Conc Units
Target Compounds			
1) T Formic Acid	4.340	152066988	444.362 mg/L m
2) T Acetic Acid	5.512	81503146	473.928 mg/L

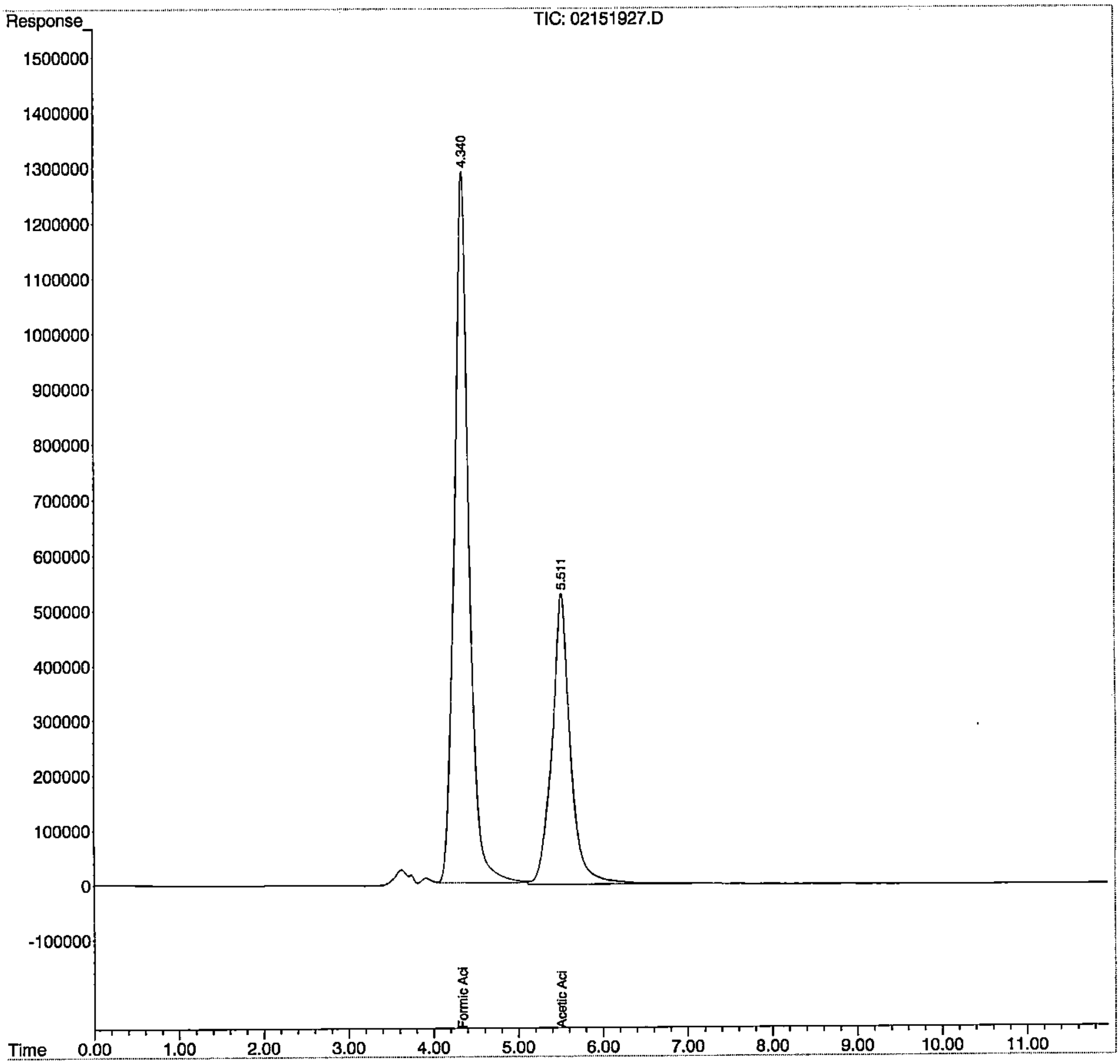
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151927.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 00:40
Operator : KM
Sample : Acids 500ug/ml
Misc :
ALS Vial : 47 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:47:10 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Tue Jan 29 09:25:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151928.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 00:52
Operator : KM
Sample : Acids 1000ug/ml
Misc :
ALS Vial : 48 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:47:25 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Tue Jan 29 09:25:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

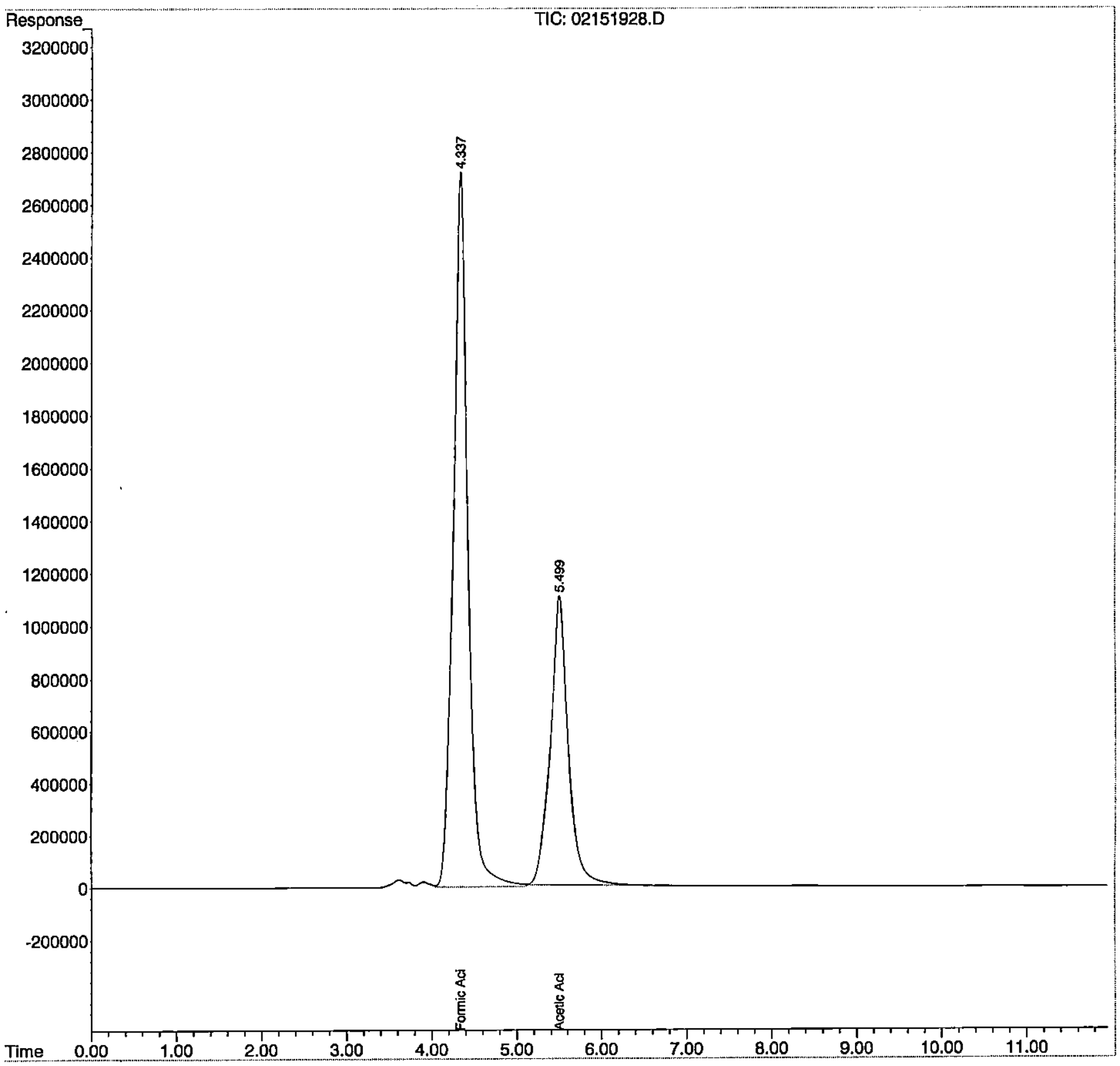
Compound	R.T.	Response	Conc Units
Target Compounds			
1) T Formic Acid	4.337	322999487	943.851 mg/L m
2) T Acetic Acid	5.499	165369398	961.596 mg/L m

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151928.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 00:52
Operator : KM
Sample : Acids 1000ug/ml
Misc :
ALS Vial : 48 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:47:25 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Tue Jan 29 09:25:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151929.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 01:05
Operator : KM
Sample : Acids 500ug/ml
Misc :
ALS Vial : 49 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 10:23:25 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Mon Feb 18 09:50:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

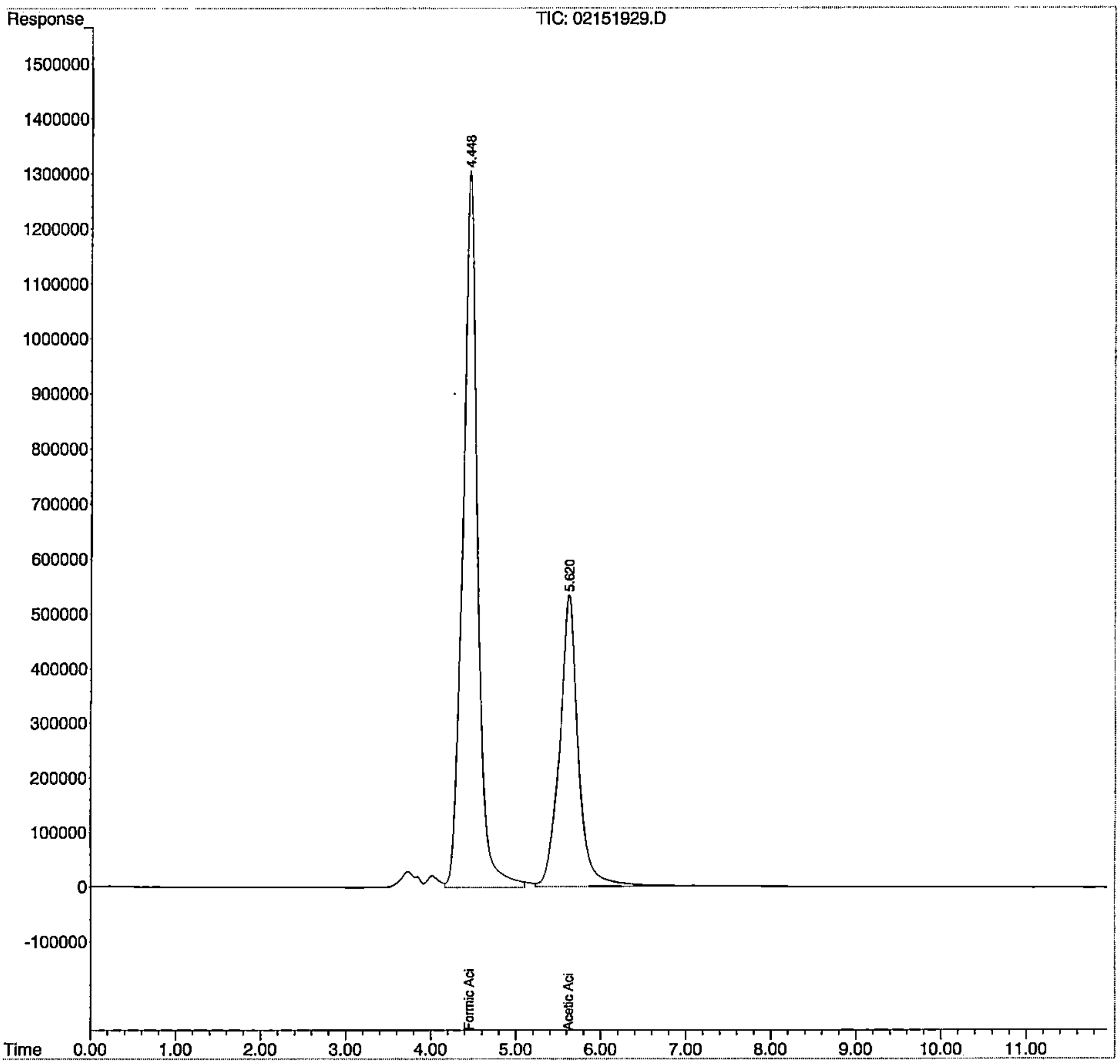
Compound	R.T.	Response	Conc Units
Target Compounds			
1) t Formic Acid	4.448	156920329	480.907 mg/L m
2) t Acetic Acid	5.621	82108721	493.649 mg/L

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151929.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 01:05
Operator : KM
Sample : Acids 500ug/ml
Misc :
ALS Vial : 49 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 10:23:25 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Mon Feb 18 09:50:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :



Evaluate Continuing Calibration Report

Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151929.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 01:05
Operator : KM
Sample : Acids 500ug/ml
Misc :
ALS Vial : 49 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 10:23:25 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Mon Feb 18 09:50:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 15% Max. Rel. Area : 150%

	Compound	Amount	Calc.	%Dev	Area%	Dev(Min)
1 t	Formic Acid	500.000	480.907	3.8	103	0.11
2 t	Acetic Acid	500.000	493.649	1.3	101	0.11

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Evaluate Continuing Calibration Report

Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151929.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 01:05
Operator : KM
Sample : Acids 500ug/ml
Misc :
ALS Vial : 49 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 10:23:25 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Mon Feb 18 09:50:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 15% Max. Rel. Area : 150%

		Compound	AvgRF	CCRF		%Dev	Area%	Dev(Min)
1	t	Formic Acid	326.301	313.841	E3	3.8	103	0.11
2	t	Acetic Acid	166.330	164.217	E3	1.3	101	0.11

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 7	Acids 500ug/ml	ACIDS	1	Sample		
2	Vial 10	MBLKS1	ACIDS	1	Sample		
3	Vial 11	LCSS1	ACIDS	1	Sample		
4	Vial 12	1902582-01A MS	ACIDS	1	Sample		
5	Vial 13	1902582-01A MSD	ACIDS	1	Sample		
6	Vial 14	1902582-01A	ACIDS	1	Sample		
7	Vial 15	1902582-02A	ACIDS	1	Sample		
8	Vial 16	1902582-03A	ACIDS	1	Sample		
9	Vial 17	1902582-04A	ACIDS	1	Sample		
10	Vial 7	Acids 500ug/ml	ACIDS	1	Sample		
11	Vial 21	MBLKW1	ACIDS	1	Sample		
12	Vial 22	LCSW1	ACIDS	1	Sample		
13	Vial 23	1902618-01A MS	ACIDS	1	Sample		
14	Vial 24	1902618-01A MS	ACIDS	1	Sample		
15	Vial 25	1902618-01A	ACIDS	1	Sample		
16	Vial 26	1902618-01A MS	ACIDS	1	Sample		
17	Vial 27	1902618-01A MSD	ACIDS	1	Sample		
18	Vial 28	1902618-01A	ACIDS	1	Sample		
19	Vial 7	Acids 500ug/ml	ACIDS	1	Sample		
20	Vial 41	Acids 5ug/ml	ACIDSSL	1	Sample		
21	Vial 41	Acids 5ug/ml	ACIDSSL	1	Sample		
22	Vial 42	Acids 10ug/ml	ACIDSSL	1	Sample		
23	Vial 43	Acids 25ug/ml	ACIDSSL	1	Sample		
24	Vial 44	Acids 50ug/ml	ACIDSSL	1	Sample		
25	Vial 45	Acids 100ug/ml	ACIDSSL	1	Sample		
26	Vial 46	Acids 250ug/ml	ACIDSSL	1	Sample		
27	Vial 47	Acids 500ug/ml	ACIDSSL	1	Sample		
28	Vial 48	Acids 1000ug/ml	ACIDSSL	1	Sample		
29	Vial 49	Acids 500ug/ml	ACIDSSL	1	Sample		
30	Vial 50	MBLKW1	ACIDSSL	1	Sample		
31	Vial 51	LCSW1	ACIDSSL	1	Sample		
32	Vial 52	1902686-01A MS	ACIDSSL	1	Sample		
33	Vial 53	1902686-01A MSD	ACIDSSL	1	Sample		
34	Vial 54	1902686-01A	ACIDSSL	1	Sample		
35	Vial 55	1902686-02A	ACIDSSL	1	Sample		
36	Vial 56	1902686-03A	ACIDSSL	1	Sample		
37	Vial 57	1902686-04A	ACIDSSL	1	Sample		
38	Vial 58	1902602-01A	ACIDSSL	1	Sample		
39	Vial 59	1902602-02A	ACIDSSL	1	Sample		
40	Vial 47	Acids 500ug/ml	ACIDSSL	1	Sample		
41	Vial 60	1902602-03A	ACIDSSL	1	Sample		
42	Vial 61	1902761-01A	ACIDSSL	1	Sample		
43	Vial 62	1902761-02A	ACIDSSL	1	Sample		
44	Vial 63	1902761-03A	ACIDSSL	1	Sample		
45	Vial 64	1902761-04A	ACIDSSL	1	Sample		
46	Vial 65	1902761-05A	ACIDSSL	1	Sample		
47	Vial 66	1902809-01A	ACIDSSL	1	Sample		
48	Vial 67	1902809-02A	ACIDSSL	1	Sample		
49	Vial 68	1902809-03A	ACIDSSL	1	Sample		
50	Vial 47	Acids 500ug/ml	ACIDSSL	1	Sample		

Evaluate Continuing Calibration Report

Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151940.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 03:28
Operator : KM
Sample : Acids 500ug/ml
Misc :
ALS Vial : 47 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:52:24 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Mon Feb 18 09:50:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 15% Max. Rel. Area : 150%

	Compound	Amount	Calc.	%Dev	Area%	Dev(Min)
1 t	Formic Acid	500.000	474.995	5.0	102	-0.05
2 t	Acetic Acid	500.000	490.421	1.9	100	-0.05

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151940.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 03:28
Operator : KM
Sample : Acids 500ug/ml
Misc :
ALS Vial : 47 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:52:24 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Mon Feb 18 09:50:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 15% Max. Rel. Area : 150%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(Min)
1 t	Formic Acid	326.301	309.983 E3	5.0	102	-0.05
2 t	Acetic Acid	166.330	163.144 E3	1.9	100	-0.05

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151940.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 03:28
Operator : KM
Sample : Acids 500ug/ml
Misc :
ALS Vial : 47 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:52:24 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Mon Feb 18 09:50:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

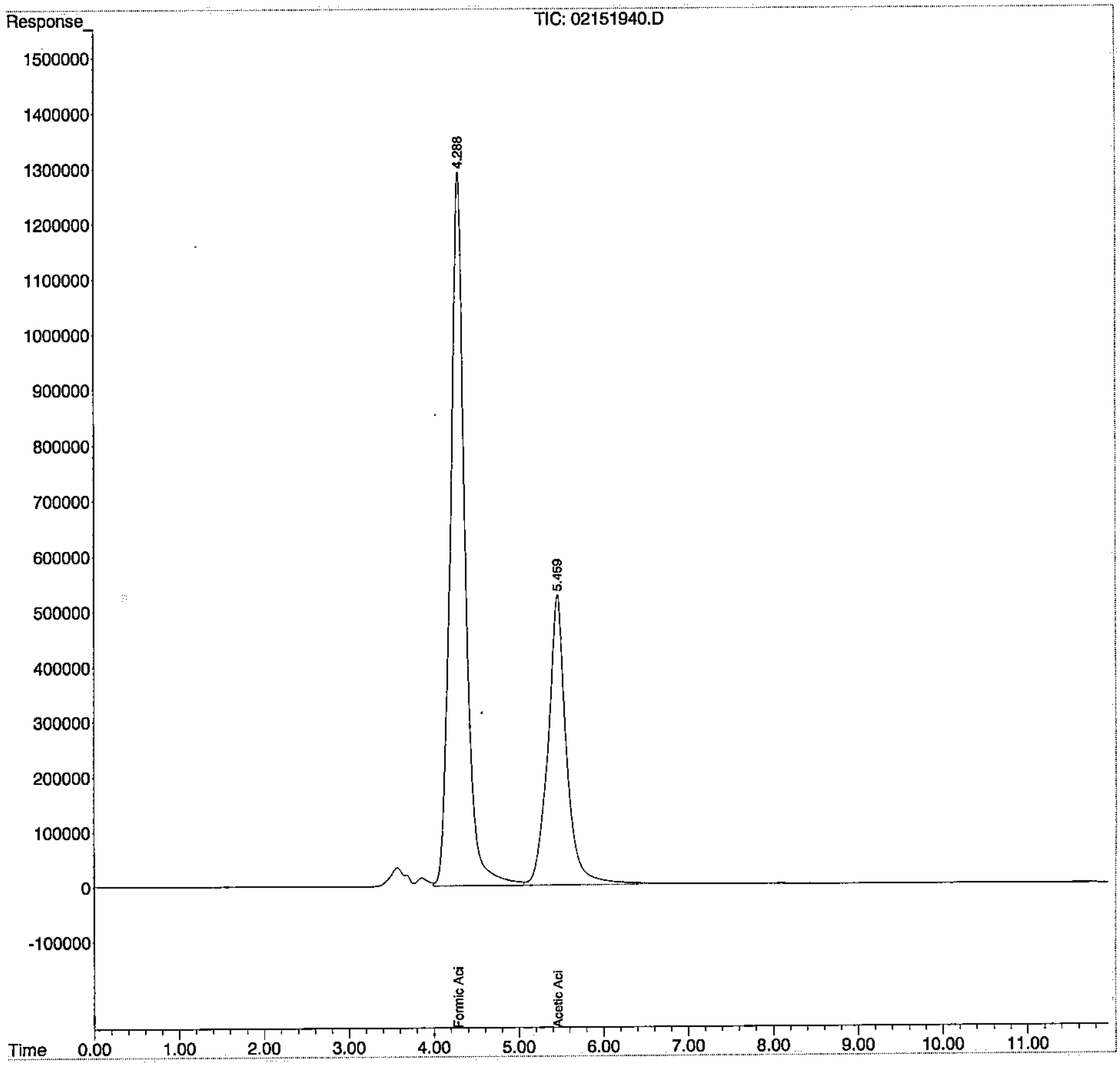
Compound	R.T.	Response	Conc Units
Target Compounds			
1) t Formic Acid	4.289	154991424	474.995 mg/L
2) t Acetic Acid	5.460	81571836	490.421 mg/L

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151940.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 03:28
Operator : KM
Sample : Acids 500ug/ml
Misc :
ALS Vial : 47 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:52:24 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Mon Feb 18 09:50:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :



Evaluate Continuing Calibration Report

Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151950.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 05:38
Operator : KM
Sample : Acids 500ug/ml
Misc :
ALS Vial : 47 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Feb 18 10:17:56 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Mon Feb 18 09:50:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 15% Max. Rel. Area : 150%

	Compound	Amount	Calc.	%Dev	Area%	Dev(Min)
1 t	Formic Acid	500.000	477.605	4.5	102	-0.05
2 t	Acetic Acid	500.000	488.871	2.2	100	-0.05

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Evaluate Continuing Calibration Report

Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151950.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 05:38
Operator : KM
Sample : Acids 500ug/ml
Misc :
ALS Vial : 47 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Feb 18 10:17:56 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Mon Feb 18 09:50:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 15% Max. Rel. Area : 150%

	Compound	AvgRF	CCRF		%Dev	Area%	Dev(Min)
1 t	Formic Acid	326.301	311.686	E3	4.5	102	-0.05
2 t	Acetic Acid	166.330	162.628	E3	2.2	100	-0.05

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151950.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 05:38
Operator : KM
Sample : Acids 500ug/ml
Misc :
ALS Vial : 47 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 10:17:56 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Mon Feb 18 09:50:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

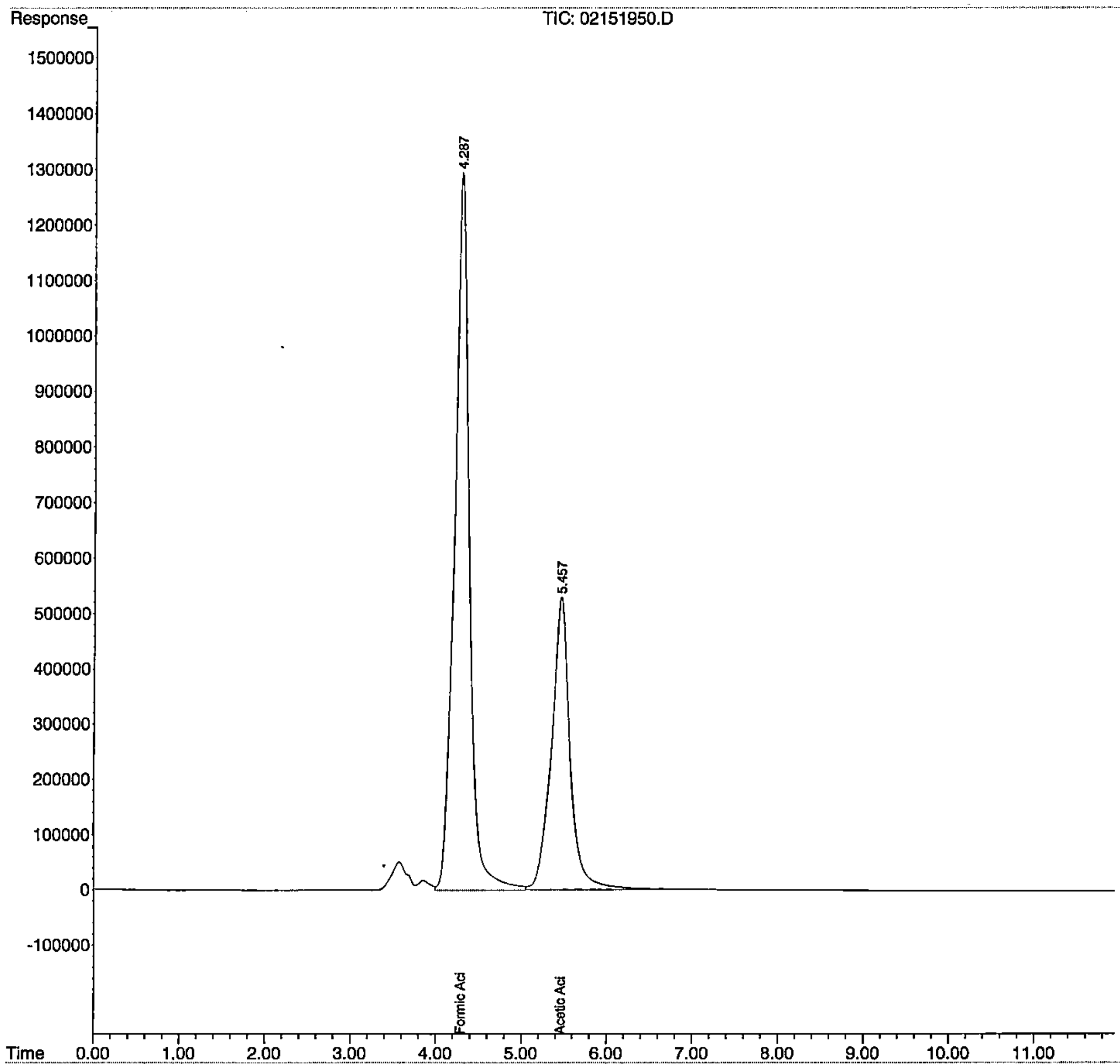
Compound	R.T.	Response	Conc Units
Target Compounds			
1) t Formic Acid	4.287	155842886	477.605 mg/L m
2) t Acetic Acid	5.458	81313976	488.871 mg/L

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151950.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 05:38
Operator : KM
Sample : Acids 500ug/ml
Misc :
ALS Vial : 47 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 10:17:56 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Mon Feb 18 09:50:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :



Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151930.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 01:18
Operator : KM
Sample : MBLKW1
Misc :
ALS Vial : 50 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:52:04 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Mon Feb 18 09:50:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

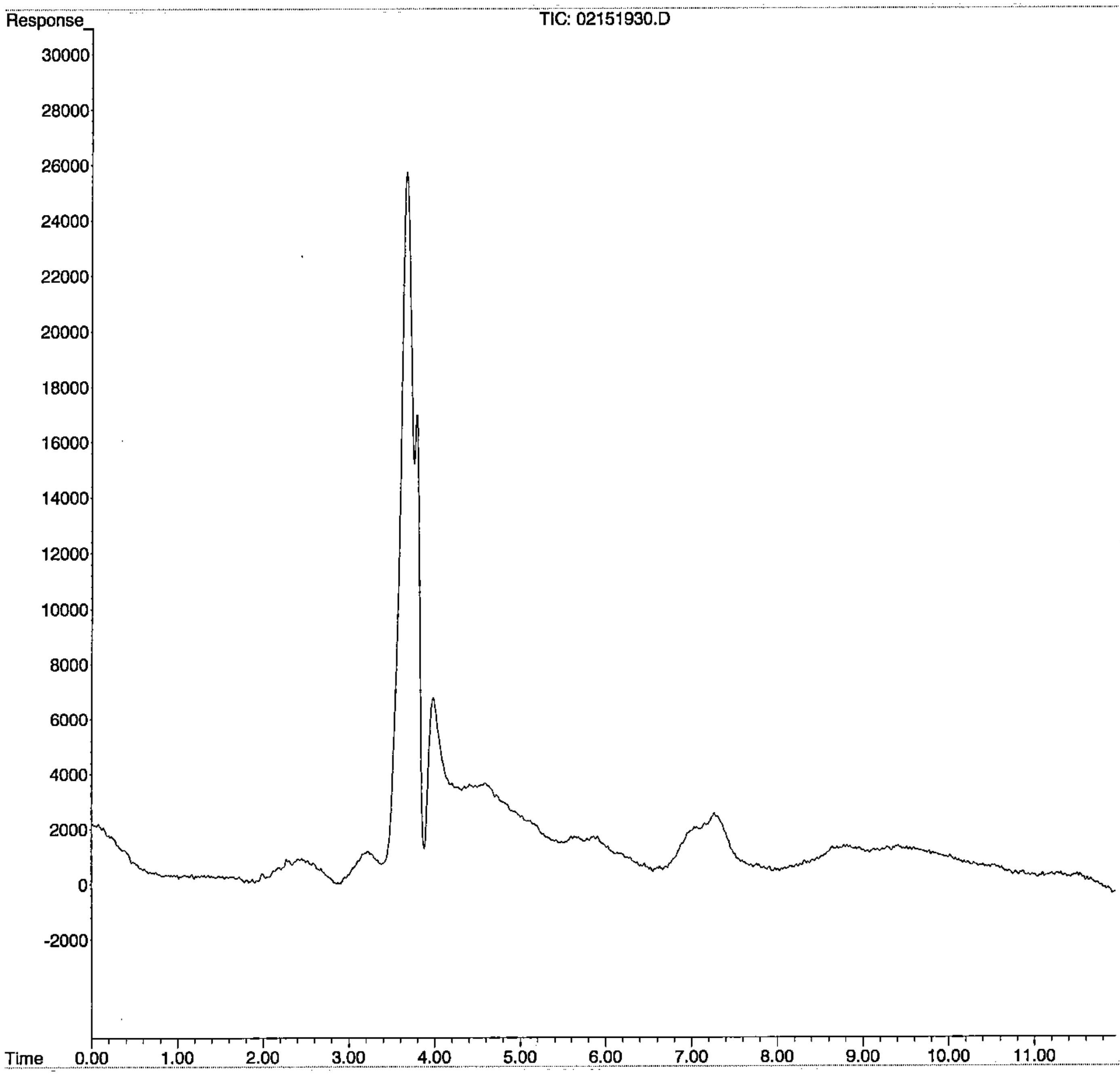
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1) t	Formic Acid	0.000	0	N.D.	mg/L
2) t	Acetic Acid	0.000	0	N.D.	mg/L

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151930.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 01:18
Operator : KM
Sample : MBLKW1
Misc :
ALS Vial : 50 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:52:04 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Mon Feb 18 09:50:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :



Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151931.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 01:31
Operator : KM
Sample : LCSW1
Misc :
ALS Vial : 51 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:58:35 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Mon Feb 18 09:50:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

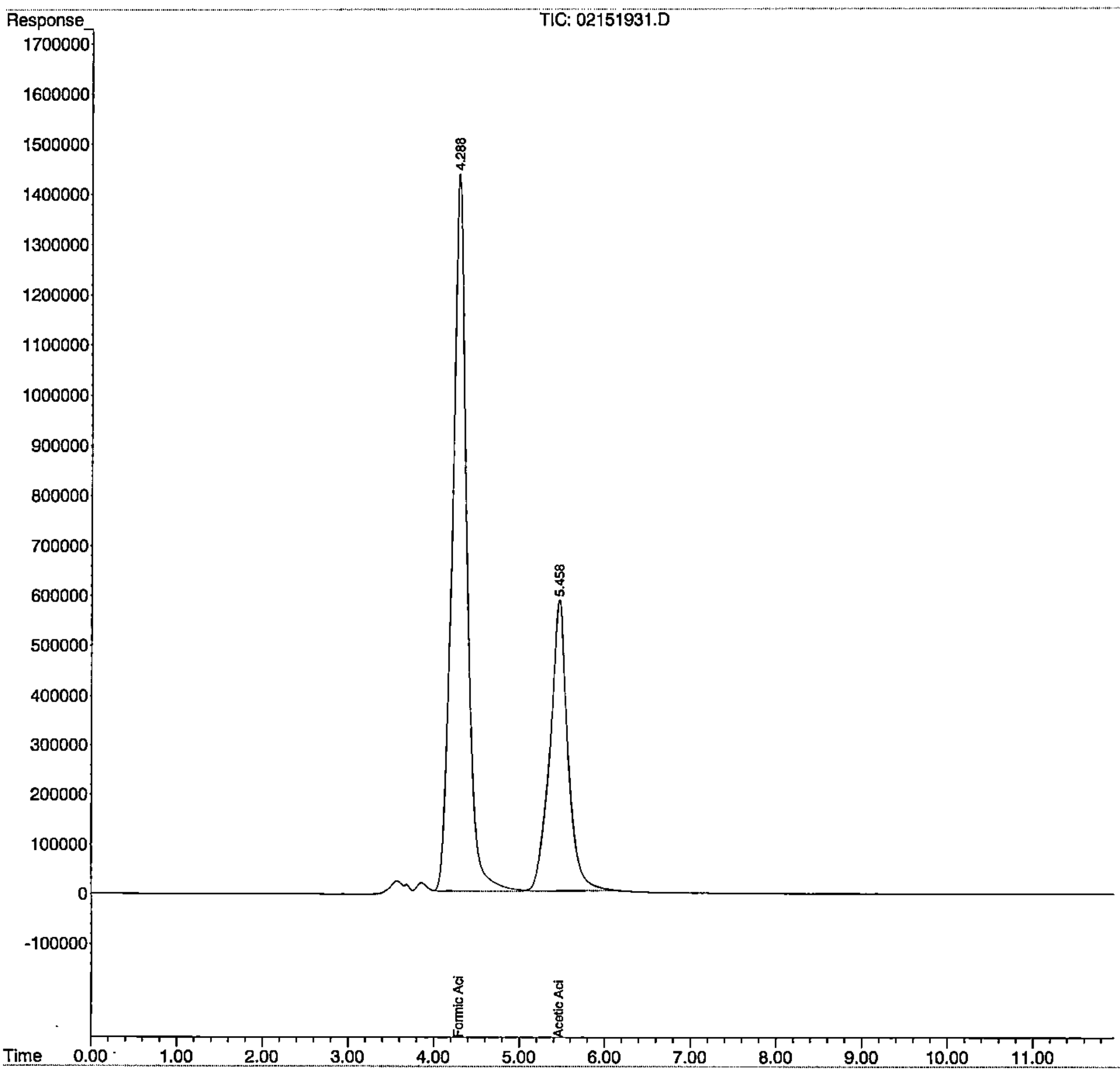
Compound	R.T.	Response	Conc Units
Target Compounds			
1) t Formic Acid	4.288	169677435	520.003 mg/L m
2) t Acetic Acid	5.458	86654363	520.978 mg/L m

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151931.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 01:31
Operator : KM
Sample : LCSW1
Misc :
ALS Vial : 51 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:58:35 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Mon Feb 18 09:50:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :



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Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151932.D
Signal(s) : vwd1A.ch
Acq On    : 16-Feb-2019, 01:44
Operator  : KM
Sample    : 1902686-01A MS
Misc      :
ALS Vial  : 52   Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:58:52 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title  :
QLast Update : Mon Feb 18 09:50:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj.  :
Signal Phase :
Signal Info  :
```

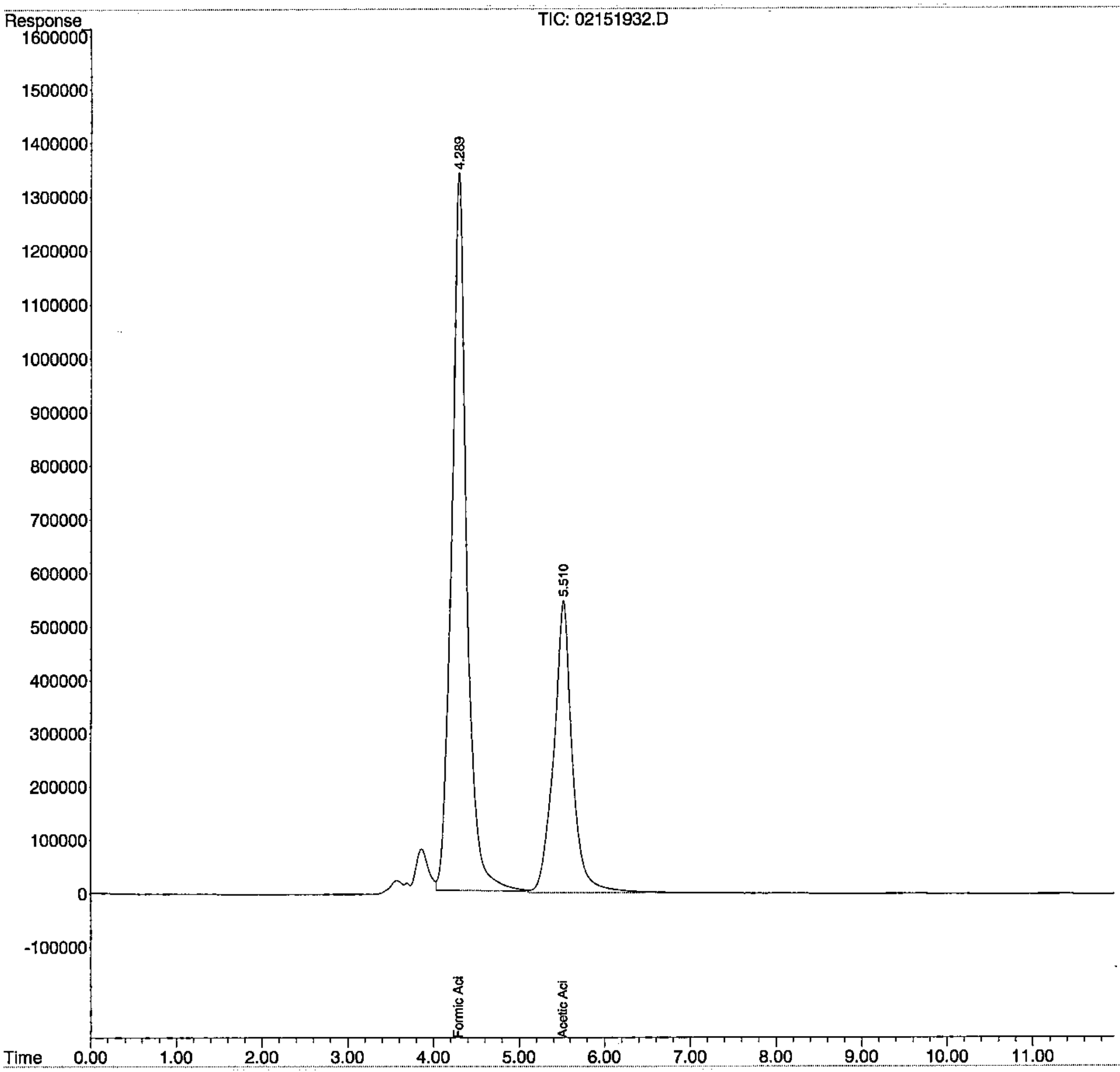
Compound	R.T.	Response	Conc Units
Target Compounds			
1) t Formic Acid	4.289	163016946	499.591 mg/L m
2) t Acetic Acid	5.510	83789130	503.752 mg/L m

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151932.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 01:44
Operator : KM
Sample : 1902686-01A MS
Misc :
ALS Vial : 52 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:58:52 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Mon Feb 18 09:50:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151933.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 01:57
Operator : KM
Sample : 1902686-01A MSD
Misc :
ALS Vial : 53 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:52:10 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Mon Feb 18 09:50:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

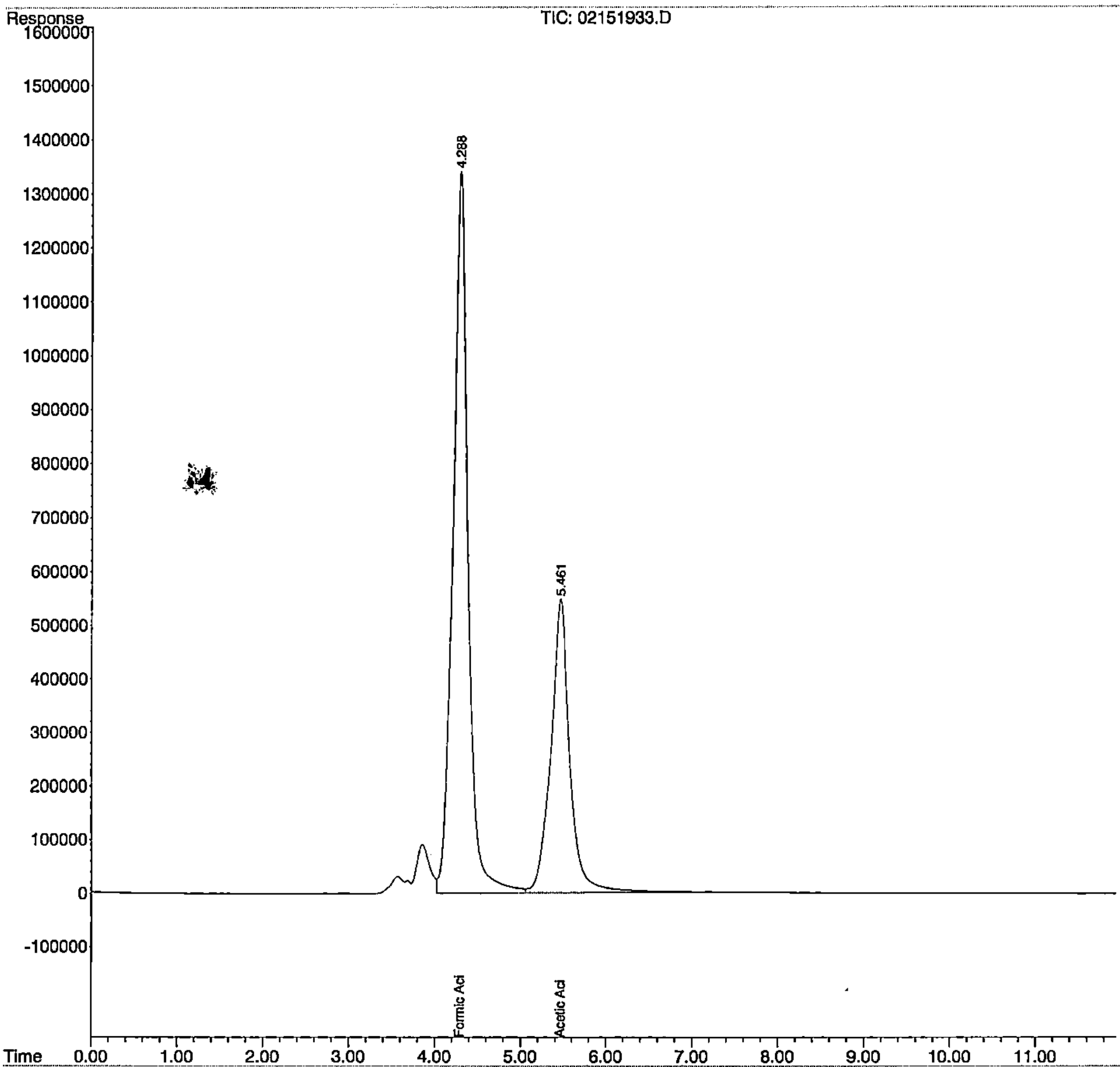
Compound	R.T.	Response	Conc Units
Target Compounds			
1) t Formic Acid	4.289	162740305	498.743 mg/L
2) t Acetic Acid	5.462	85287138	512.758 mg/L

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : C:\msdchem\HPLC2\DATA\021519A2\
Data File : 02151933.D
Signal(s) : vwd1A.ch
Acq On : 16-Feb-2019, 01:57
Operator : KM
Sample : 1902686-01A MSD
Misc :
ALS Vial : 53 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Feb 18 09:52:10 2019
Quant Method : C:\msdchem\1\HPLC\METHODS\Acids\Ac021519.M
Quant Title :
QLast Update : Mon Feb 18 09:50:14 2019
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :



Inorganic

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ALS GROUP USA, CORP. Part of the ALS Group An ALS Limited Company

Wet Chemistry

1

INORGANIC ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW-WV-8S

Lab Name: ALS Group, USA

Lab Code: MI01262 Case No. SAS No SDG No. 1902602

Matrix: Water Lab Sample ID: 1902602-01C

Level (low/med): LOW Date Received: 2/13/2019

% Moisture: not dec. 0 Date Prep:

CONCENTRATION UNITS: µg/L

CAS NO.	COMPOUND	CONCENTRATION	C	Q	M
CN AVAIL	Cyanide, Available	2.0	U		

1

INORGANIC ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW-WV-8M

Lab Name: ALS Group, USA

Lab Code: MI01262 Case No. SAS No SDG No. 1902602

Matrix: Water Lab Sample ID: 1902602-02C

Level (low/med): LOW Date Received: 2/13/2019

% Moisture: not dec. 0 Date Prep:

CONCENTRATION UNITS: µg/L

CAS NO.	COMPOUND	CONCENTRATION	C	Q	M
CN AVAIL	Cyanide, Available	2.0	U		

1

CLIENT SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MW-WV-12S

Lab Name: ALS Group, USA

Lab Code: MI01262 Case No. SAS No SDG No. 1902602

Matrix: Water Lab Sample ID: 1902602-03C

Level (low/med): LOW Date Received: 2/13/2019

% Moisture: not dec. 0 Date Prep:

CONCENTRATION UNITS: µg/L

CAS NO.	COMPOUND	CONCENTRATION	C	Q	M
CN AVAIL	Cyanide, Available	2.0	U		

1

CLIENT SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MW-WV-11D

Lab Name: ALS Group, USA

Lab Code: MI01262 Case No. SAS No SDG No. 1902602

Matrix: Water Lab Sample ID: 1902761-01C

Level (low/med): LOW Date Received: 2/15/2019

% Moisture: not dec. 0 Date Prep:

CONCENTRATION UNITS: µg/L

CAS NO.	COMPOUND	CONCENTRATION	C	Q	M
CN AVAIL	Cyanide, Available	2.0	U		

1

CLIENT SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MW-WV-11S

Lab Name: ALS Group, USA

Lab Code: MI01262 Case No. SAS No SDG No. 1902602

Matrix: Water

Lab Sample ID: 1902761-02C

Level (low/med): LOW

Date Received: 2/15/2019

% Moisture: not dec. 0

Date Prep:

CONCENTRATION UNITS: µg/L

CAS NO.	COMPOUND	CONCENTRATION	C	Q	M
CN AVAIL	Cyanide, Available	2.0	U		

1

INORGANIC ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW-WV-5D

Lab Name: ALS Group, USA

Lab Code: MI01262 Case No. SAS No SDG No. 1902602

Matrix: Water Lab Sample ID: 1902761-03C

Level (low/med): LOW Date Received: 2/15/2019

% Moisture: not dec. 0 Date Prep:

CONCENTRATION UNITS: µg/L

CAS NO.	COMPOUND	CONCENTRATION	C	Q	M
CN AVAIL	Cyanide, Available	2.0	U		

1

INORGANIC ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW-WV-5S

Lab Name: ALS Group, USA

Lab Code: MI01262 Case No. SAS No SDG No. 1902602

Matrix: Water Lab Sample ID: 1902761-04C

Level (low/med): LOW Date Received: 2/15/2019

% Moisture: not dec. 0 Date Prep:

CONCENTRATION UNITS: µg/L

CAS NO.	COMPOUND	CONCENTRATION	C	Q	M
CN AVAIL	Cyanide, Available	2.0	U		

1

INORGANIC ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW-WV-5D-Dup

Lab Name: ALS Group, USA

Lab Code: MI01262 Case No. SAS No SDG No. 1902602

Matrix: Water Lab Sample ID: 1902761-05C

Level (low/med): LOW Date Received: 2/15/2019

% Moisture: not dec. 0 Date Prep:

CONCENTRATION UNITS: µg/L

CAS NO.	COMPOUND	CONCENTRATION	C	Q	M
CN AVAIL	Cyanide, Available	2.0	U		

1

INORGANIC ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW-WV-3S

Lab Name: ALS Group, USA

Lab Code: MI01262 Case No. SAS No SDG No. 1902602

Matrix: Water Lab Sample ID: 1902809-01C

Level (low/med): LOW Date Received: 2/15/2019

% Moisture: not dec. 0 Date Prep:

CONCENTRATION UNITS: µg/L

CAS NO.	COMPOUND	CONCENTRATION	C	Q	M
CN AVAIL	Cyanide, Available	3.5			

1

INORGANIC ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW-WV-3D

Lab Name: ALS Group, USA

Lab Code: MI01262 Case No. SAS No SDG No. 1902602

Matrix: Water Lab Sample ID: 1902809-02C

Level (low/med): LOW Date Received: 2/15/2019

% Moisture: not dec. 0 Date Prep:

CONCENTRATION UNITS: µg/L

CAS NO.	COMPOUND	CONCENTRATION	C	Q	M
CN AVAIL	Cyanide, Available	2.0	U		

1

INORGANIC ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW-WV-8D

Lab Name: ALS Group, USA

Lab Code: MI01262 Case No. SAS No SDG No. 1902602

Matrix: Water Lab Sample ID: 1902809-03C

Level (low/med): LOW Date Received: 2/15/2019

% Moisture: not dec. 0 Date Prep:

CONCENTRATION UNITS: µg/L

CAS NO.	COMPOUND	CONCENTRATION	C	Q	M
CN AVAIL	Cyanide, Available	2.0	U		

CLIENT SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

MW-WV-8S

Lab Name: ALS Group, USA

Lab Code: MI01262 Case No. SAS No SDG No. 1902602

Matrix: Water Lab Sample ID: 1902602-01B

Level (low/med): LOW Date Received: 2/13/2019

% Moisture: not dec. 0 Date Prep:

CONCENTRATION UNITS: mg/L

CAS NO.	COMPOUND	CONCENTRATION	C	Q	M
18540-29-9	Chromium, Hexavalent	0.0050	U		C

1

INORGANIC ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW-WV-8M

Lab Name: ALS Group, USA

Lab Code: MI01262 Case No. SAS No SDG No. 1902602

Matrix: Water Lab Sample ID: 1902602-02B

Level (low/med): LOW Date Received: 2/13/2019

% Moisture: not dec. 0 Date Prep:

CONCENTRATION UNITS: mg/L

CAS NO.	COMPOUND	CONCENTRATION	C	Q	M
18540-29-9	Chromium, Hexavalent	0.0050	U		C

1

CLIENT SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MW-WV-12S

Lab Name: ALS Group, USA

Lab Code: MI01262 Case No. SAS No SDG No. 1902602

Matrix: Water Lab Sample ID: 1902602-03B

Level (low/med): LOW Date Received: 2/13/2019

% Moisture: not dec. 0 Date Prep:

CONCENTRATION UNITS: mg/L

CAS NO.	COMPOUND	CONCENTRATION	C	Q	M
18540-29-9	Chromium, Hexavalent	0.0050	U		C

1

INORGANIC ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW-WV-11D

Lab Name: ALS Group, USA

Lab Code: MI01262 Case No. SAS No SDG No. 1902602

Matrix: Water Lab Sample ID: 1902761-01B

Level (low/med): LOW Date Received: 2/15/2019

% Moisture: not dec. 0 Date Prep:

CONCENTRATION UNITS: mg/L

CAS NO.	COMPOUND	CONCENTRATION	C	Q	M
18540-29-9	Chromium, Hexavalent	0.0050	U		C

CLIENT SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

MW-WV-11S

Lab Name: ALS Group, USA

Lab Code: MI01262 Case No. SAS No SDG No. 1902602

Matrix: Water Lab Sample ID: 1902761-02B

Level (low/med): LOW Date Received: 2/15/2019

% Moisture: not dec. 0 Date Prep:

CONCENTRATION UNITS: mg/L

CAS NO.	COMPOUND	CONCENTRATION	C	Q	M
18540-29-9	Chromium, Hexavalent	0.0050	U		C

1

CLIENT SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MW-WV-5D

Lab Name: ALS Group, USA

Lab Code: MI01262 Case No. SAS No SDG No. 1902602

Matrix: Water Lab Sample ID: 1902761-03B

Level (low/med): LOW Date Received: 2/15/2019

% Moisture: not dec. 0 Date Prep:

CONCENTRATION UNITS: mg/L

CAS NO.	COMPOUND	CONCENTRATION	C	Q	M
18540-29-9	Chromium, Hexavalent	0.0050	U		C

1

INORGANIC ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW-WV-5S

Lab Name: ALS Group, USA

Lab Code: MI01262 Case No. SAS No SDG No. 1902602

Matrix: Water Lab Sample ID: 1902761-04B

Level (low/med): LOW Date Received: 2/15/2019

% Moisture: not dec. 0 Date Prep:

CONCENTRATION UNITS: mg/L

CAS NO.	COMPOUND	CONCENTRATION	C	Q	M
18540-29-9	Chromium, Hexavalent	0.0050	U		C

1

INORGANIC ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW-WV-5D-Dup

Lab Name: ALS Group, USA

Lab Code: MI01262 Case No. SAS No SDG No. 1902602

Matrix: Water Lab Sample ID: 1902761-05B

Level (low/med): LOW Date Received: 2/15/2019

% Moisture: not dec. 0 Date Prep:

CONCENTRATION UNITS: mg/L

CAS NO.	COMPOUND	CONCENTRATION	C	Q	M
18540-29-9	Chromium, Hexavalent	0.0050	U		C

1

INORGANIC ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW-WV-3S

Lab Name: ALS Group, USA

Lab Code: MI01262 Case No. SAS No SDG No. 1902602

Matrix: Water Lab Sample ID: 1902809-01B

Level (low/med): LOW Date Received: 2/15/2019

% Moisture: not dec. 0 Date Prep:

CONCENTRATION UNITS: mg/L

CAS NO.	COMPOUND	CONCENTRATION	C	Q	M
18540-29-9	Chromium, Hexavalent	0.0050	U		C

CLIENT SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

MW-WV-3D

Lab Name: ALS Group, USA

Lab Code: MI01262 Case No. SAS No SDG No. 1902602

Matrix: Water Lab Sample ID: 1902809-02B

Level (low/med): LOW Date Received: 2/15/2019

% Moisture: not dec. 0 Date Prep:

CONCENTRATION UNITS: mg/L

CAS NO.	COMPOUND	CONCENTRATION	C	Q	M
18540-29-9	Chromium, Hexavalent	0.0050	U		C

CLIENT SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

MW-WV-8D

Lab Name: ALS Group, USA

Lab Code: MI01262   Case No.   SAS No   SDG No. 1902602

Matrix: Water   Lab Sample ID: 1902809-03B

Level (low/med): LOW   Date Received: 2/15/2019

% Moisture: not dec. 0   Date Prep:

CONCENTRATION UNITS: mg/L

CAS NO.	COMPOUND	CONCENTRATION	C	Q	M
18540-29-9	Chromium, Hexavalent	0.0050	U		C

Date: 25-Feb-19

ALS Group, USA

QC BATCH REPORT

Client: Shealy Environmental Services, Inc.
Work Order: 1902602
Project: 16.0062677.81

Batch ID: **R254804** Instrument ID **WETCHEM** Method: **SW7196A**

MBLK Sample ID: **MB-R254804-R254804** Units: **mg/L** Analysis Date: **2/13/2019 11:55 AM**
Client ID: Run ID: **WETCHEM_190213I** SeqNo: **5519050** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	ND	0.0050								

LCS Sample ID: **LCS-R254804-R254804** Units: **mg/L** Analysis Date: **2/13/2019 11:55 AM**
Client ID: Run ID: **WETCHEM_190213I** SeqNo: **5519051** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.2006	0.0050	0.2	0	100	91-113	0			

MS Sample ID: **1902602-01B MS** Units: **mg/L** Analysis Date: **2/13/2019 11:55 AM**
Client ID: **MW-WV-8S** Run ID: **WETCHEM_190213I** SeqNo: **5519053** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.1956	0.0050	0.2	0.0015	97	91-113	0			

MSD Sample ID: **1902602-01B MSD** Units: **mg/L** Analysis Date: **2/13/2019 11:55 AM**
Client ID: **MW-WV-8S** Run ID: **WETCHEM_190213I** SeqNo: **5519054** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.1906	0.0050	0.2	0.0015	94.6	91-113	0.1956	2.59	10	

The following samples were analyzed in this batch: 1902602-01B 1902602-02B 1902602-03B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Client: Shealy Environmental Services, Inc.
Work Order: 1902602
Project: 16.0062677.81

Batch ID: **R254950** Instrument ID **WETCHEM** Method: **SW7196A**

MBLK Sample ID: **MB-R254950-R254950** Units: **mg/L** Analysis Date: **2/15/2019 10:40 AM**
Client ID: Run ID: **WETCHEM_190215H** SeqNo: **5523666** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	ND	0.0050								

LCS Sample ID: **LCS-R254950-R254950** Units: **mg/L** Analysis Date: **2/15/2019 10:40 AM**
Client ID: Run ID: **WETCHEM_190215H** SeqNo: **5523667** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.2019	0.0050	0.2	0	101	91-113	0			

MS Sample ID: **1902761-01B MS** Units: **mg/L** Analysis Date: **2/15/2019 10:40 AM**
Client ID: **MW-WV-11D** Run ID: **WETCHEM_190215H** SeqNo: **5523669** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.1969	0.0050	0.2	-0.001	99	91-113	0			

MSD Sample ID: **1902761-01B MSD** Units: **mg/L** Analysis Date: **2/15/2019 10:40 AM**
Client ID: **MW-WV-11D** Run ID: **WETCHEM_190215H** SeqNo: **5523670** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.1919	0.0050	0.2	-0.001	96.4	91-113	0.1969	2.57	10	

The following samples were analyzed in this batch:

1902761-01B	1902761-02B	1902761-03B
1902761-04B	1902761-05B	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Shealy Environmental Services, Inc.
Work Order: 1902602
Project: 16.0062677.81

QC BATCH REPORT

Batch ID: **R254983** Instrument ID **WETCHEM** Method: **SW7196A**

MBLK Sample ID: **MB-R254983-R254983** Units: **mg/L** Analysis Date: **2/15/2019 03:00 PM**
Client ID: Run ID: **WETCHEM_190215P** SeqNo: **5524277** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	ND	0.0050								

LCS Sample ID: **LCS-R254983-R254983** Units: **mg/L** Analysis Date: **2/15/2019 03:00 PM**
Client ID: Run ID: **WETCHEM_190215P** SeqNo: **5524278** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.2006	0.0050	0.2	0	100	91-113	0			

MS Sample ID: **1902809-02B MS** Units: **mg/L** Analysis Date: **2/15/2019 03:00 PM**
Client ID: **MW-WV-3D** Run ID: **WETCHEM_190215P** SeqNo: **5524281** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.1956	0.0050	0.2	0.0003	97.6	91-113	0			

MSD Sample ID: **1902809-02BMSD** Units: **mg/L** Analysis Date: **2/15/2019 03:00 PM**
Client ID: **MW-WV-3D** Run ID: **WETCHEM_190215P** SeqNo: **5524282** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.1856	0.0050	0.2	0.0003	92.6	91-113	0.1956	5.25	10	

The following samples were analyzed in this batch: 1902809-01B 1902809-02B 1902809-03B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Client: Shealy Environmental Services, Inc.
Work Order: 1902602
Project: 16.0062677.81

Batch ID: **R255121** Instrument ID **FS3100** Method: **OIA 1677**

MBLK Sample ID: **MB-R255121-R255121** Units: **µg/L** Analysis Date: **2/19/2019 11:00 AM**
Client ID: Run ID: **FS3100_190219A** SeqNo: **5527983** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Available	ND	2.0								

LCS Sample ID: **LCS-R255121-R255121** Units: **µg/L** Analysis Date: **2/19/2019 11:00 AM**
Client ID: Run ID: **FS3100_190219A** SeqNo: **5527984** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Available	44.63	2.0	50	0	89.3	82-132	0			

MS Sample ID: **1902783-02A MS** Units: **µg/L** Analysis Date: **2/19/2019 11:00 AM**
Client ID: Run ID: **FS3100_190219A** SeqNo: **5527990** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Available	46.72	2.0	50	0.41	92.6	82-130	0			

MSD Sample ID: **1902783-02A MSD** Units: **µg/L** Analysis Date: **2/19/2019 11:00 AM**
Client ID: Run ID: **FS3100_190219A** SeqNo: **5527991** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Available	50.63	2.0	50	0.41	100	82-130	46.72	8.03	11	

The following samples were analyzed in this batch: 1902602-01C 1902602-02C 1902602-03C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Shealy Environmental Services, Inc.
Work Order: 1902602
Project: 16.0062677.81

QC BATCH REPORT

Batch ID: **R255122** Instrument ID **FS3100** Method: **OIA 1677**

MBLK Sample ID: **MB-R255122-R255122** Units: **µg/L** Analysis Date: **2/19/2019 11:00 AM**
Client ID: Run ID: **FS3100_190219B** SeqNo: **5528000** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Available	ND	2.0								

LCS Sample ID: **LCS-R255122-R255122** Units: **µg/L** Analysis Date: **2/19/2019 11:00 AM**
Client ID: Run ID: **FS3100_190219B** SeqNo: **5528001** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Available	45.53	2.0	50	0	91.1	82-132	0			

MS Sample ID: **1902686-01C MS** Units: **µg/L** Analysis Date: **2/19/2019 11:00 AM**
Client ID: Run ID: **FS3100_190219B** SeqNo: **5528003** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Available	46.39	2.0	50	1.44	89.9	82-130	0			

MSD Sample ID: **1902686-01C MSD** Units: **µg/L** Analysis Date: **2/19/2019 11:00 AM**
Client ID: Run ID: **FS3100_190219B** SeqNo: **5528004** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Available	48.43	2.0	50	1.44	94	82-130	46.39	4.3	11	

The following samples were analyzed in this batch:

1902761-01C	1902761-02C	1902761-03C
1902761-04C	1902761-05C	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Shealy Environmental Services, Inc.
Work Order: 1902602
Project: 16.0062677.81

QC BATCH REPORT

Batch ID: **R255206** Instrument ID **FS3100** Method: **OIA 1677**

MBLK Sample ID: **MB-R255206-R255206** Units: **µg/L** Analysis Date: **2/20/2019 01:00 PM**
Client ID: Run ID: **FS3100_190220A** SeqNo: **5530132** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Available	ND	2.0								

LCS Sample ID: **LCS-R255206-R255206** Units: **µg/L** Analysis Date: **2/20/2019 01:00 PM**
Client ID: Run ID: **FS3100_190220A** SeqNo: **5530133** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Available	48.52	2.0	50	0	97	82-132	0			

MS Sample ID: **1902898-01A MS** Units: **µg/L** Analysis Date: **2/20/2019 01:00 PM**
Client ID: Run ID: **FS3100_190220A** SeqNo: **5530138** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Available	47.92	2.0	50	0.55	94.7	82-130	0			

MSD Sample ID: **1902898-01A MSD** Units: **µg/L** Analysis Date: **2/20/2019 01:00 PM**
Client ID: Run ID: **FS3100_190220A** SeqNo: **5530139** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Available	48.16	2.0	50	0.55	95.2	82-130	47.92	0.5	11	

The following samples were analyzed in this batch: 1902809-01C 1902809-02C 1902809-03C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Hexavalent Chromium By Colorimetry

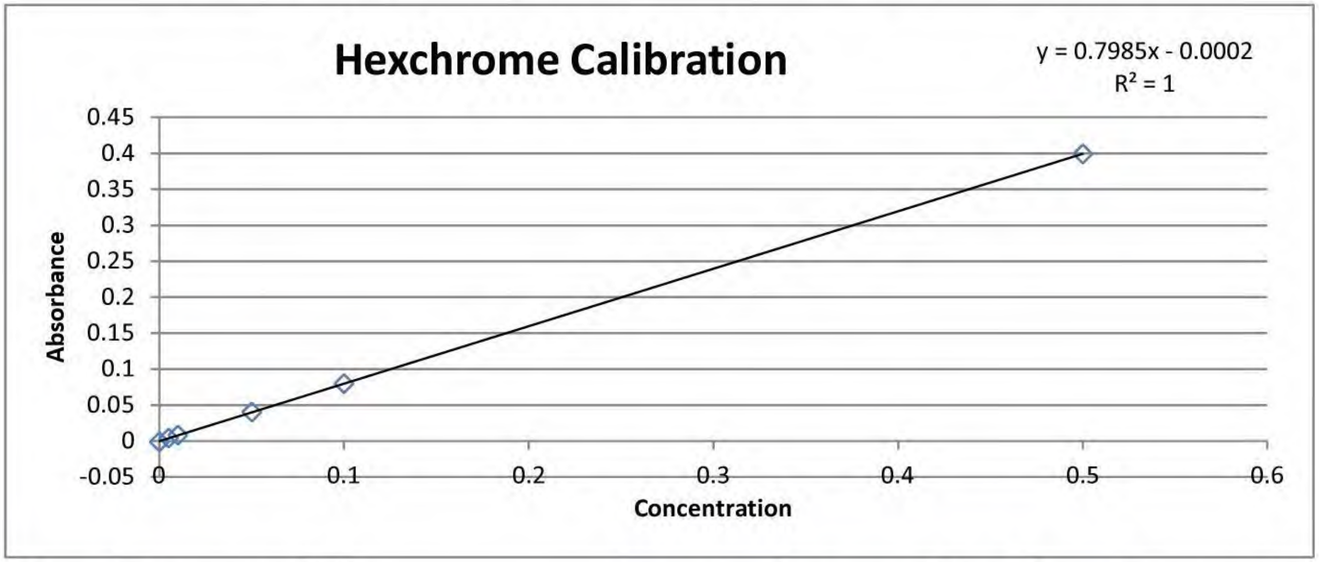
ALS Environmental

Spec ID:	SPEC03	Wavelength:	540 nm
Date/Time:	2/13/2019 11:55	Batch ID:	WETCHEM_190213

Analyst ID:	JEB
Method ID:	SW7196A/SM3500-Cr B
Matrix:	Water/Soil

Calibration Data Points		Cal. Date
Concentration	Absorbance	2/12/2019
0	-0.001	
0.005	0.004	
0.01	0.008	
0.05	0.04	
0.1	0.08	
0.5	0.399	

m =	0.7985
b =	-0.0002



Sample ID	Initial Absorbance	Background Abs	Blank Abs	pH 2 ± 0.5	Concentration (mg/L)
CCVH	0.309				0.3872
CCVL	0.041				0.0516
CCVLL	0.005				0.0065
CCB	0				0.0003
MBLK	0				0.0003
LCS	0.16				0.2006
1902602-01B	0.001				0.0015
1902602-01B MS	0.156				0.1956
1902602-01B MSD	0.152				0.1906
1902602-02B	0.009	0.02			-0.0135

Sample ID	Initial Absorbance	Background Abs	Blank Abs	pH 2 ± 0.5	Concentration (mg/L)
1902602-03B	0				0.0003
CCVH	0.308				0.3860
CCVL	0.04				0.0503
CCB	0				0.0003
MBLK	0.001				0.0015
LCS	0.034				0.0428
19011478-02A 5x	0.228				0.2858
1902396-01A	0.003				0.0040
1902396-01A MS	0.014				0.0178
1902396-01A MSD	0.016				0.0203

Calibration Standard BPL:	3072-239-13	Sulfuric Acid BPL:	2049-168-6
Check Standard BPL:	3072-214-3	Phosphoric Acid:	2049-28-7
LCS/MS/MSD Std. BPL:	3072-239-13	Color Time:	
Coloring Reagent BPL:	3072-245-1	pH lot#:	

*A CCVH & CCVL (±10%) and CCB (1/2 < PQL) are to be analyzed every 10 samples and at the end of the run. A CCVLL (±40%) is to be analyzed once per analytical batch of 20 samples.
***Theoretical Yeilds**: CCVH: 0.4, CCVL: 0.05, CCVLL: 0.005, LCS (Waters): 0.2, LCS (Soils): 0.05

***Minimum QC Frequency**: MB, LCS & Insoluble MS1/PDS1 every 20 samples. MS/MSD every 10 non-QC sample.
[1]Soil samples are prepared via SW-846 Method 3060A.

File Name: 190213A

Hexavalent Chromium By Colorimetry

ALS Environmental

Sample ID	Initial Absorbance	Background Abs	Blank Abs	pH 2 ± 0.5	Concentration (mg/L)
1902396-01A MSI 200X	0.138				0.1731
1902396-01A PDS	0.034				0.0428
1902396-02A	0.006	0.001			0.0065
1902396-03A	0.003	0.004			-0.0010
CCVH	0.309				0.3872
CCVL	0.04				0.0503
CCB	0				0.0003
1902492-01B	0.015	0.014			0.0015
CCVH	0.309				0.3872
CCVL	0.041				0.0516

Sample ID	Initial Absorbance	Background Abs	Blank Abs	pH 2 ± 0.5	Concentration (mg/L)
CCB	0				0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003

Sample ID	Initial Absorbance	Background Abs	Blank Abs	pH 2 ± 0.5	Concentration (mg/L)
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003

Sample ID	Initial Absorbance	Background Abs	Blank Abs	pH 2 ± 0.5	Concentration (mg/L)
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003

Digestion Vial: ____________________

Filter ID: ____________________

Reviewed By: ____________________

Reviewed Date: ____________________

*A CCVH & CCVL (±10%) and CCB (1/2 < PQL) are to be analyzed every 10 samples and at the end of the run. A CCVLL (±40%) is to be analyzed once per analytical batch of 20 samples.

***Theoretical Yeilds**: CCVH: 0.4, CCVL: 0.05, CCVLL: 0.005, LCS (Waters): 0.2, LCS (Soils): 0.05

***Minimum QC Frequency**: MB, LCS & Insoluble MS1/PDS1 every 20 samples. MS/MSD every 10 non-QC sample.

[1]Soil samples are prepared via SW-846 Method 3060A.

File Name: 190213A

Hexavalent Chromium By Colorimetry

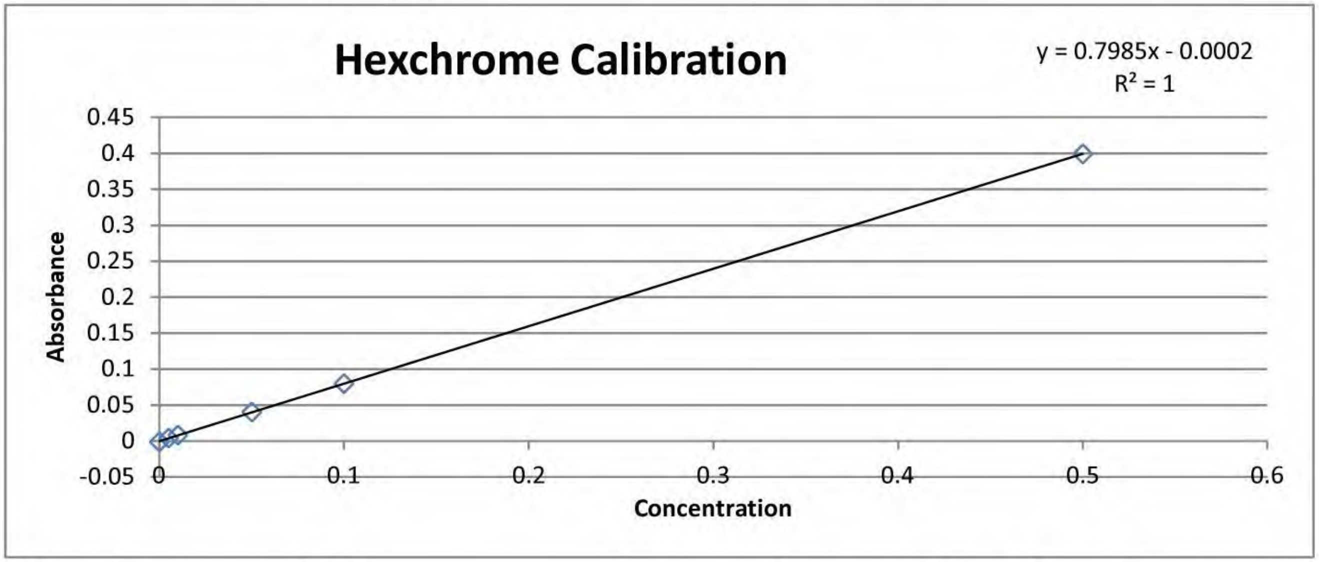
ALS Environmental

Spec ID:	SPEC03	Wavelength:	540 nm
Date/Time:	2/15/2019 10:40	Batch ID:	WETCHEM_190215

Analyst ID: JEB
Method ID: SW7196A/SM3500-Cr B
Matrix: Water/Soil

Calibration Data Points		Cal. Date
Concentration	Absorbance	2/12/2019
0	-0.001	
0.005	0.004	
0.01	0.008	
0.05	0.04	
0.1	0.08	
0.5	0.399	

m =	0.7985
b =	-0.0002



Sample ID	Initial Absorbance	Background Abs	Blank Abs	pH 2 ± 0.5	Concentration (mg/L)
CCVH	0.32				0.4010
CCVL	0.039				0.0491
CCVLL	0.003				0.0040
CCB	-0.001				-0.0010
MBLK	-0.001				-0.0010
LCS	0.161				0.2019
1902761-01B	-0.001				-0.0010
1902761-01B MS	0.157				0.1969
192761-01B MSD	0.153				0.1919
1902761-02B	-0.002				-0.0023

Sample ID	Initial Absorbance	Background Abs	Blank Abs	pH 2 ± 0.5	Concentration (mg/L)
1902761-03B	-0.002				-0.0023
1902761-04B	0.013	0.015			-0.0023
1902761-05B	-0.002				-0.0023
CCVH	0.319				0.3997
CCVL	0.038				0.0478
CCB	-0.002				-0.0023
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003

Calibration Standard BPL:	3072-239-13	Sulfuric Acid BPL:	2049-168-6
Check Standard BPL:	3072-214-3	Phosphoric Acid:	2049-28-7
LCS/MS/MSD Std. BPL:	3072-239-13	Color Time:	
Coloring Reagent BPL:	3072-245-1	pH lot#:	

*A CCVH & CCVL (±10%) and CCB (1/2 < PQL) are to be analyzed every 10 samples and at the end of the run. A CCVLL (±40%) is to be analyzed once per analytical batch of 20 samples.
***Theoretical Yeilds**: CCVH: 0.4, CCVL: 0.05, CCVLL: 0.005, LCS (Waters): 0.2, LCS (Soils): 0.05

***Minimum QC Frequency**: MB, LCS & Insoluble MS1/PDS1 every 20 samples. MS/MSD every 10 non-QC sample.
[1]Soil samples are prepared via SW-846 Method 3060A.

File Name: 190215A

Hexavalent Chromium By Colorimetry

ALS Environmental

Sample ID	Initial Absorbance	Background Abs	Blank Abs	pH 2 ± 0.5	Concentration (mg/L)
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003

Sample ID	Initial Absorbance	Background Abs	Blank Abs	pH 2 ± 0.5	Concentration (mg/L)
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003

Sample ID	Initial Absorbance	Background Abs	Blank Abs	pH 2 ± 0.5	Concentration (mg/L)
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003

Sample ID	Initial Absorbance	Background Abs	Blank Abs	pH 2 ± 0.5	Concentration (mg/L)
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003

Digestion Vial: ______________________

Filter ID: ______________________

Reviewed By: ______________________

Reviewed Date: ______________________

*A CCVH & CCVL (±10%) and CCB (1/2 < PQL) are to be analyzed every 10 samples and at the end of the run. A CCVLL (±40%) is to be analyzed once per analytical batch of 20 samples.
***Theoretical Yeilds**: CCVH: 0.4, CCVL: 0.05, CCVLL: 0.005, LCS (Waters): 0.2, LCS (Soils): 0.05

***Minimum QC Frequency**: MB, LCS & Insoluble MS1/PDS1 every 20 samples. MS/MSD every 10 non-QC sample.
[1]Soil samples are prepared via SW-846 Method 3060A.

File Name: 190215A

Hexavalent Chromium By Colorimetry

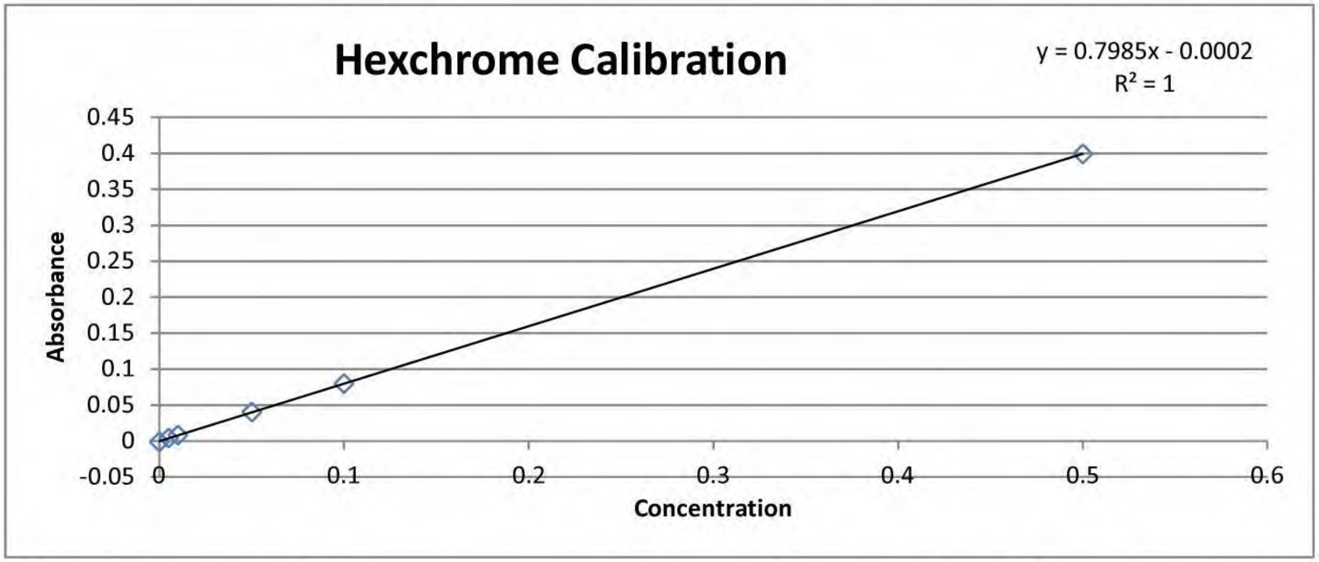
ALS Environmental

Spec ID:	SPEC03	Wavelength:	540 nm
Date/Time:	2/15/2019 15:00	Batch ID:	WETCHEM_190215

Analyst ID:	JEB
Method ID:	SW7196A/SM3500-Cr B
Matrix:	Water/Soil

Calibration Data Points		Cal. Date
Concentration	Absorbance	2/12/2019
0	-0.001	
0.005	0.004	
0.01	0.008	
0.05	0.04	
0.1	0.08	
0.5	0.399	

m =	0.7985
b =	-0.0002



Sample ID	Initial Absorbance	Background Abs	Blank Abs	pH 2 ± 0.5	Concentration (mg/L)
CCVH	0.314				0.3935
CCVL	0.04				0.0503
CCVLL	0.004				0.0053
CCB	0				0.0003
MBLK	0				0.0003
LCS	0.16				0.2006
1902809-01B	0.006	0.015			-0.0110
1902809-02B	0				0.0003
1902809-02B MS	0.156				0.1956
1902809-02B MSD	0.148				0.1856

Sample ID	Initial Absorbance	Background Abs	Blank Abs	pH 2 ± 0.5	Concentration (mg/L)
1902809-03B	0.01	0.02			-0.0123
CCVH	0.314				0.3935
CCVL	0.04				0.0503
CCB	0				0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003

Calibration Standard BPL:	3072-239-13	Sulfuric Acid BPL:	2049-168-6
Check Standard BPL:	3072-214-3	Phosphoric Acid:	2049-28-7
LCS/MS/MSD Std. BPL:	3072-239-13	Color Time:	16:00
Coloring Reagent BPL:	3072-245-1	pH lot#:	

*A CCVH & CCVL (±10%) and CCB (1/2 < PQL) are to be analyzed every 10 samples and at the end of the run. A CCVLL (±40%) is to be analyzed once per analytical batch of 20 samples.
***Theoretical Yeilds**: CCVH: 0.4, CCVL: 0.05, CCVLL: 0.005, LCS (Waters): 0.2, LCS (Soils): 0.05

***Minimum QC Frequency**: MB, LCS & Insoluble MS1/PDS1 every 20 samples. MS/MSD every 10 non-QC sample.
[1]Soil samples are prepared via SW-846 Method 3060A.

File Name: 190215B

Hexavalent Chromium By Colorimetry

ALS Environmental

Sample ID	Initial Absorbance	Background Abs	Blank Abs	pH 2 ± 0.5	Concentration (mg/L)
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003

Sample ID	Initial Absorbance	Background Abs	Blank Abs	pH 2 ± 0.5	Concentration (mg/L)
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003

Sample ID	Initial Absorbance	Background Abs	Blank Abs	pH 2 ± 0.5	Concentration (mg/L)
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003

Sample ID	Initial Absorbance	Background Abs	Blank Abs	pH 2 ± 0.5	Concentration (mg/L)
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003
Samp ID					0.0003

Digestion Vial: ______________________

Filter ID: ______________________

Reviewed By: ______________________

Reviewed Date: ______________________

*A CCVH & CCVL (±10%) and CCB (1/2 < PQL) are to be analyzed every 10 samples and at the end of the run. A CCVLL (±40%) is to be analyzed once per analytical batch of 20 samples.

***Theoretical Yeilds**: CCVH: 0.4, CCVL: 0.05, CCVLL: 0.005, LCS (Waters): 0.2, LCS (Soils): 0.05

***Minimum QC Frequency**: MB, LCS & Insoluble MS1/PDS1 every 20 samples. MS/MSD every 10 non-QC sample.

[1]Soil samples are prepared via SW-846 Method 3060A.

File Name: 190215B

Peak Table:Available CN

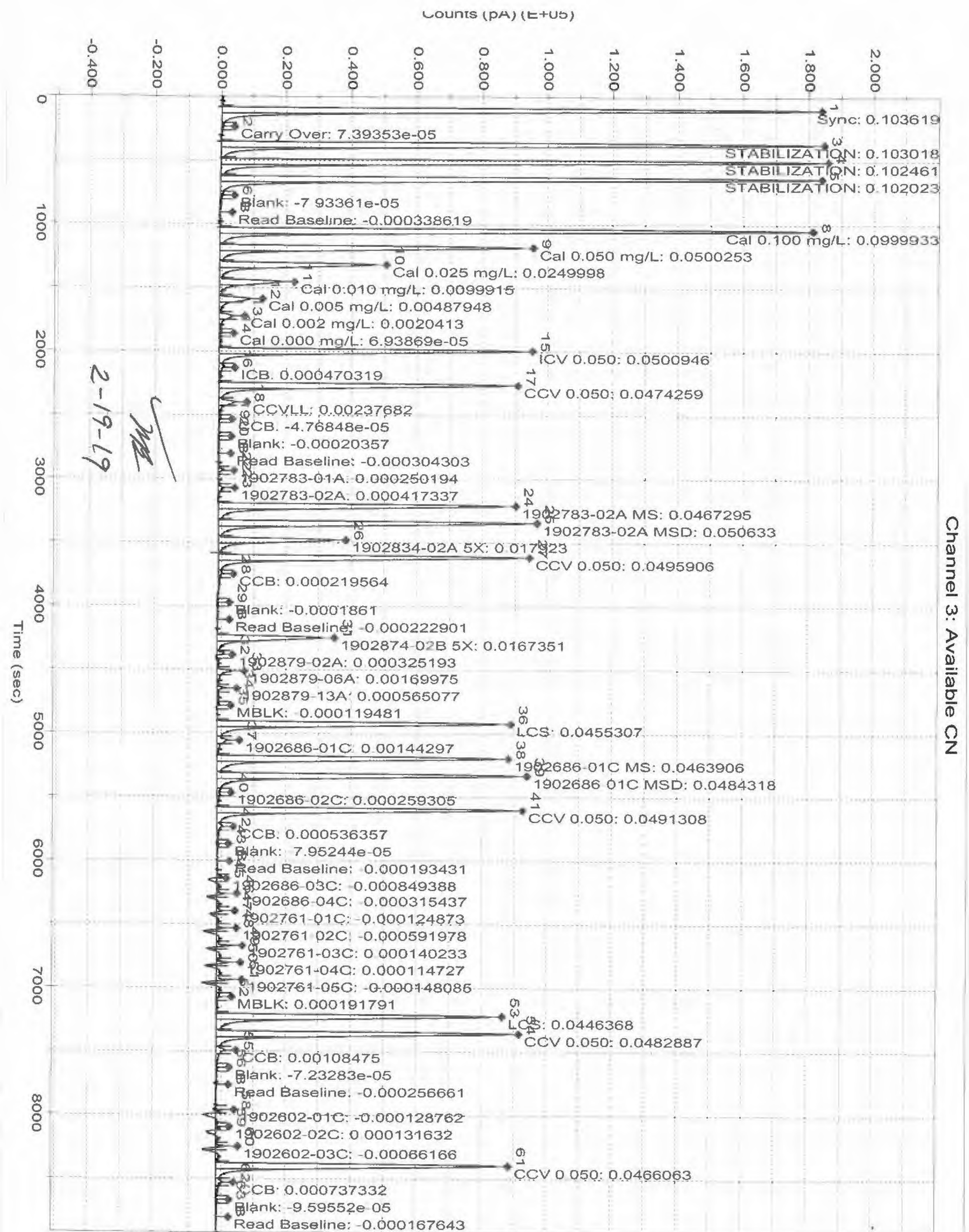
File name: C:\FLOW_4\RESULTS\WADCN\2019\A190219A.RST
Date: 19-Feb-19
Operator: MAB FS3100_190219 A rev JLB 2/19/19 FS3100_190219 B rev JLB 2/19/19

Peak	Cup	Name	R	Type	Dil	Wt	Area	Calc. (mg/L)	Flags	
1	101	Sync	1	SYNC	1	1	5796942	0.10361		
2	900	Carry Over	1	CO	1	1	23689	0.00007		
3	101	STABILIZATION	1	BLNK	1	1	5767544	0.10301		
4	101	STABILIZATION	2	BLNK	1	1	5740274	0.10246		
5	101	STABILIZATION	3	BLNK	1	1	5718802	0.10202		
6	900	Blank	1	BLNK	1	1	13744	-0.00007	LO	
B	900	Read Baseline	1	RB	1	1	-3093	-0.00033	BL	
8	101	Cal 0.100 mg/L	1	C	1	1	5619020	0.09999		
9	102	Cal 0.050 mg/L	1	C	1	1	3011247	0.05002		
10	103	Cal 0.025 mg/L	1	C	1	1	1572637	0.02500		
11	104	Cal 0.010 mg/L	1	C	1	1	655701	0.00999		
12	105	Cal 0.005 mg/L	1	C	1	1	332705	0.00487		
13	106	Cal 0.002 mg/L	1	C	1	1	150847	0.00204		
14	107	Cal 0.000 mg/L	1	C	1	1	23394	0.00006		
15	108	ICV 0.050	1	U	1	1	3015090	0.05009		ok
16	109	ICB	1	U	1	1	49383	0.00047		
17	161	CCV 0.050	1	CCV	1	1	2866515	0.04742		ok
18	110	CCVLL	1	U	1	1	172443	0.00237		
19	162	CCB	1	U	1	1	15798	-0.00004	LO	
20	900	Blank	1	BLNK	1	1	5679	-0.00020	LO	
B	900	Read Baseline	1	RB	1	1	-863	-0.00030	BL	
22	116	1902783-01A	1	U	1	1	35118	0.00025		
23	117	1902783-02A	1	U	1	1	45950	0.00041		
24	118	1902783-02A MS	1	U	1	1	2827564	0.04672		ok
25	119	1902783-02A MS	1	U	1	1	3044937	0.05063		
26	120	1902834-02A 5X	1	U	5x 1	1	1145854	0.01792		
27	161	CCV 0.050	1	CCV	1	1	2987112	0.04959		ok
28	162	CCB	1	U	1	1	33133	0.00022		
29	900	Blank	1	BLNK	1	1	6813	-0.00018	LO	
B	900	Read Baseline	1	RB	1	1	4423	-0.00022	BL	
31	121	1902874-02B 5X	1	U	5x 1	1	1073264	0.01673		
32	122	1902879-02A	1	U	1	1	39979	0.00032		
33	123	1902879-06A	1	U	1	1	128837	0.00170		
34	124	1902879-13A	1	U	1	1	55519	0.00056		
35	111	MBLK	1	U	1	1	11138	-0.00011	LO	ok
36	112	LCS	1	U	1	1	2760346	0.04553		
37	127	1902686-01C	1	U	1	1	112271	0.00144		
38	128	1902686-01C MS	1	U	1	1	2808584	0.04639		ok
39	129	1902686-01C MS	1	U	1	1	2922645	0.04843		
40	130	1902686-02C	1	U	1	1	35709	0.00025		
41	161	CCV 0.050	1	CCV	1	1	2961556	0.04913		ok
42	162	CCB	1	U	1	1	53659	0.00053		
43	900	Blank	1	BLNK	1	1	13731	-0.00008	LO	
B	900	Read Baseline	1	RB	1	1	6337	-0.00019	BL	
45	131	1902686-03C	1	U	1	1	-36306	-0.00084	LO	
46	132	1902686-04C	1	U	1	1	-1587	-0.00031	LO	
47	133	1902761-01C	1	U	1	1	10788	-0.00012	LO	
48	134	1902761-02C	1	U	1	1	-19560	-0.00059	LO	
49	135	1902761-03C	1	U	1	1	27989	0.00014		
50	136	1902761-04C	1	U	1	1	26334	0.00011		
51	137	1902761-05C	1	U	1	1	9281	-0.00014	LO	
52	111	MBLK	1	U	1	1	31332	0.00019		ok
53	112	LCS	1	U	1	1	2710075	0.04463		

✓ MR 2-19-19

Peak	Cup	Name	R	Type	Dil	Wt	Area	Calc. (mg/L)	Flags
54	161	CCV 0.050	1	CCV	1	1	2914666	0.04828	ok
55	162	CCB	1	U	1	1	89135	0.00108	
56	900	Blank	1	BLNK	1	1	14198	-0.00007	LO
B	900	Read Baseline	1	RB	1	1	2231	-0.00025	BL
58	113	1902602-01C	1	U	1	1	10535	-0.00012	LO
59	114	1902602-02C	1	U	1	1	27431	0.00013	
60	115	1902602-03C	1	U	1	1	-24092	-0.00066	LO
61	161	CCV 0.050	1	CCV	1	1	2820667	0.04660	ok
62	162	CCB	1	U	1	1	66669	0.00073	
63	900	Blank	1	BLNK	1	1	12665	-0.00009	LO
B	900	Read Baseline	1	RB	1	1	8011	-0.00016	BL

√ JM
2-19-19



Counts (pA) (E+05)
-0.400
-0.200
0.000
0.200
0.400
0.600
0.800
1.000
1.200
1.400
1.600
1.800
2.000
Channel 3: Available CN
Time (sec)
0
1000
2000
3000
4000
5000
6000
7000
8000
Sync: 0.103619
Carry Over: 7.39353e-05
STABILIZATION: 0.103018
STABILIZATION: 0.102461
STABILIZATION: 0.102023
Blank: -7.93361e-05
Read Baseline: -0.000338619
Cal 0.100 mg/L: 0.0999933
Cal 0.050 mg/L: 0.0500253
Cal 0.025 mg/L: 0.0249998
Cal 0.010 mg/L: 0.0099915
Cal 0.005 mg/L: 0.00487948
Cal 0.002 mg/L: 0.0020413
Cal 0.000 mg/L: 6.93869e-05
ICV 0.050: 0.0500946
ICB: 0.000470319
CCV 0.050: 0.0474259
CCVLL: 0.00237682
CCB: -4.76848e-05
Blank: -0.00020357
Read Baseline: -0.000304303
1902783-01A: 0.000250194
1902783-02A: 0.000417337
1902783-02A MS: 0.0467295
1902783-02A MSD: 0.050633
1902834-02A 5X: 0.017323
CCV 0.050: 0.0495906
CCB: 0.000219564
Blank: -0.0001861
Read Baseline: -0.000222901
1902874-02B 5X: 0.0167351
1902879-02A: 0.000325193
1902879-06A: 0.00169975
1902879-13A: 0.000565077
MBLK: -0.000119481
LCS: 0.0455307
1902686-01C: 0.00144297
1902686-01C MS: 0.0463906
1902686-01C MSD: 0.0484318
1902686-02C: 0.000259305
CCV 0.050: 0.0491308
CCB: 0.000536357
Blank: 7.95244e-05
Read Baseline: -0.000193431
1902686-03C: -0.000849388
1902686-04C: -0.000315437
1902761-01C: -0.000124873
1902761-02C: -0.000591978
1902761-03C: 0.000140233
1902761-04C: 0.000114727
1902761-05C: -0.000148085
MBLK: 0.000191791
LCS: 0.0446368
CCV 0.050: 0.0482887
CCB: 0.00108475
Blank: -7.23283e-05
Read Baseline: -0.000256661
1902602-01C: -0.000128762
1902602-02C: 0.000131632
1902602-03C: -0.00066166
CCV 0.050: 0.0466063
CCB: 0.000737332
Blank: -9.59552e-05
Read Baseline: -0.000167643
2-19-19

Available CN:Calibration 1: Peak 8-64

File name: C:\FLOW_4\RESULTS\WADCN\2019\A190219A.RST
Date: 19-Feb-19
Operator: MAB

*	Name	Conc	Area
*	Cal 0.100 mg/L	0.100000	5619020.500000
*	Cal 0.050 mg/L	0.050000	3011247.250000
*	Cal 0.025 mg/L	0.025000	1572637.125000
*	Cal 0.010 mg/L	0.010000	655701.437500
*	Cal 0.005 mg/L	0.005000	332704.781250
*	Cal 0.002 mg/L	0.002000	150847.328125
*	Cal 0.000 mg/L	0.000000	23393.541016

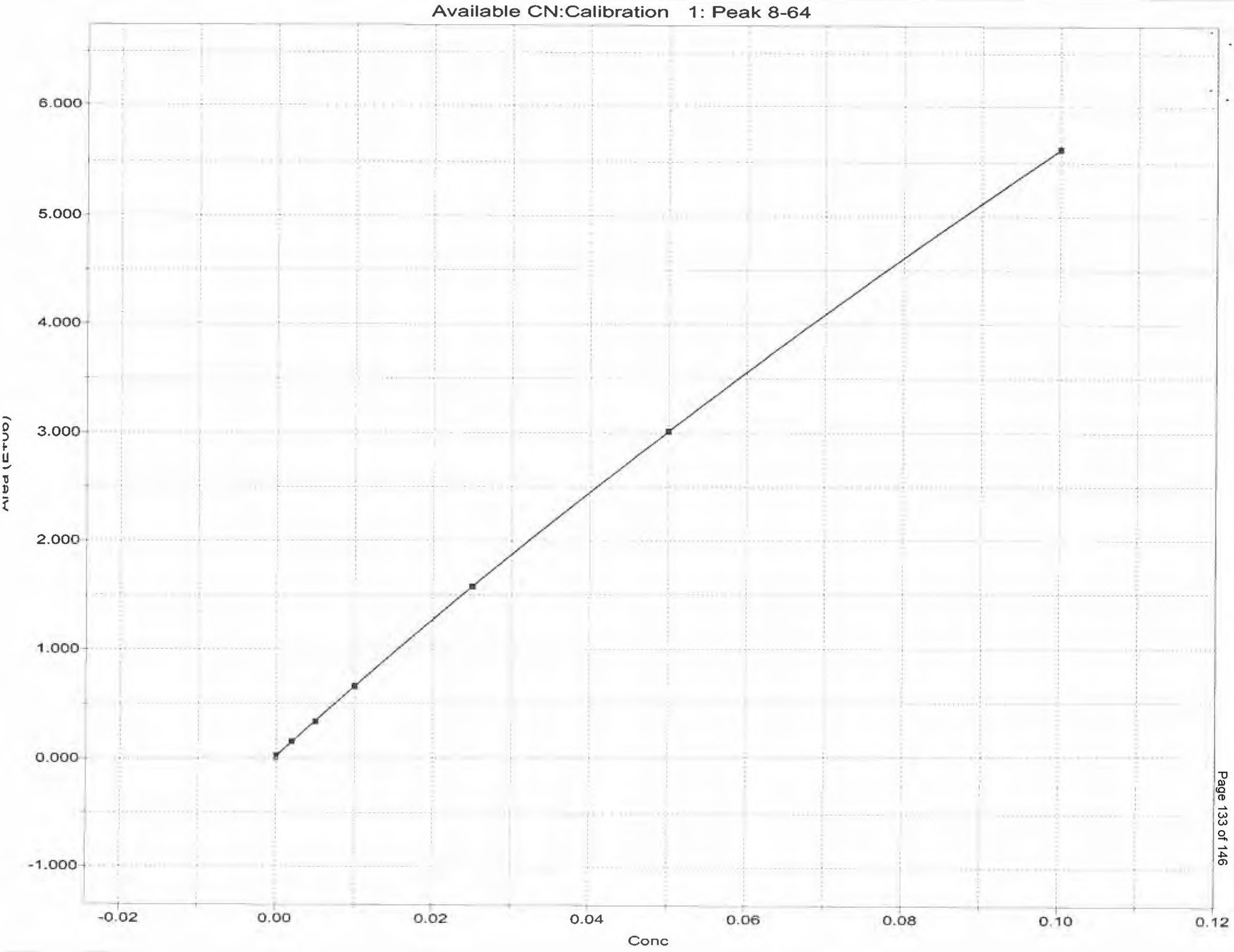
Calib Coef:
x=cyy+by+a
a: (intercept) -2.9101e-0
b: 1.5396e-0
c: 4.3632e-1

Corr Coef: 0.99999 ✓

Carryover: 0.409% ✓

No Drift Peaks

✓ MB
2-19-19


Available CN:Calibration 1: Peak 8-64
6.000
5.000
4.000
3.000
2.000
1.000
0.000
-1.000
-0.02
0.00
0.02
0.04
0.06
0.08
0.10
0.12
Conc

CN Available Reagent Identification Numbers

REAGENT	BPL#	EXP
1 M Sodium Hydroxide	3072-30-7	4-17-19
0.01M Sodium Hydroxide	3072-30-8	4-17-19
Ligand Reagent	3072-233-4	2-28-19
0.1M Sodium Hydroxide	3072-136-7	7-19-19
Alt. WAD Acid Reagent	3072-136-8	9-18-19
Sample Tubes lot #	1052582050505	N/A
KCN Std (curve)	3072-226-4	2-21-19
KCN Std (ICV)	3072-226-6	2-21-19
KCN Std (CCV)	3072-226-3	2-21-19
KCN Std (MS, MSD)	3072-226-1	2-21-19
Hg(II)Cn (LCS)	3072-226-7	2-21-19

Sample Table - a190219a.tbl

File name: C:\FLOW_4\A190219A.TBL
Date: 19-Feb-19

Cup	Name	Type	R	Dil	Wt	Vial
101	Sync	SYNC	1	1	1	
900	Carry Over	CO	1	1	1	
101	STABILIZATION	BLNK	3	1	1	
900	Blank	BLNK	1	1	1	
900	Read Baseline	RB	1	1	1	
101	Cal 0.100 mg/L	C	1	1	1	
102	Cal 0.050 mg/L	C	1	1	1	
103	Cal 0.025 mg/L	C	1	1	1	
104	Cal 0.010 mg/L	C	1	1	1	
105	Cal 0.005 mg/L	C	1	1	1	
106	Cal 0.002 mg/L	C	1	1	1	
107	Cal 0.000 mg/L	C	1	1	1	
108	ICV 0.050	U	1	1	1	
109	ICB	U	1	1	1	
161	CCV 0.050	CCV	1	1	1	
110	CCVLL	U	1	1	1	
162	CCB	U	1	1	1	
900	Blank	BLNK	1	1	1	
900	Read Baseline	RB	1	1	1	
111	MBLK	U	0	1	1	
112	LCS	U	0	1	1	
113	1902602-01C	U	0	1	1	
114	1902602-02C	U	0	1	1	
115	1902602-03C	U	0	1	1	
116	1902783-01A	U	1	1	1	
117	1902783-02A	U	1	1	1	
118	1902783-02A MS	U	1	1	1	
119	1902783-02A MSD	U	1	1	1	
120	1902834-02A 5X	U	1	1	1	
161	CCV 0.050	CCV	1	1	1	
162	CCB	U	1	1	1	
900	Blank	BLNK	1	1	1	
900	Read Baseline	RB	1	1	1	
121	1902874-02B 5X	U	1	1	1	
122	1902879-02A	U	1	1	1	
123	1902879-06A	U	1	1	1	
124	1902879-13A	U	1	1	1	
111	MBLK	U	0	1	1	
112	LCS	U	0	1	1	
127	1902686-01C	U	1	1	1	
128	1902686-02C	U	1	1	1	
129	1902686-03C	U	1	1	1	
130	1902686-04C	U	1	1	1	
161	CCV 0.050	CCV	1	1	1	
162	CCB	U	1	1	1	

Cup	Name	Type	R	Dil	Wt	Vial
900	Blank	BLNK	1	1	1	
900	Read Baseline	RB	1	1	1	
131	1902761-01C	U	1	1	1	
132	1902761-01C MS	U	1	1	1	
133	1902761-01C MSD	U	1	1	1	
134	1902761-02C	U	1	1	1	
135	1902761-03C	U	1	1	1	
136	1902761-04C	U	1	1	1	
137	1902761-05C	U	1	1	1	
161	CCV 0.050	CCV	1	1	1	
162	CCB	U	1	1	1	
900	Blank	BLNK	1	1	1	
900	Read Baseline	RB	1	1	1	

Cup	Name	Comment
101	Sync	BPL#3072-226-4
900	Carry Over	
101	STABILIZATION	
900	Blank	
900	Read Baseline	
101	Cal 0.100 mg/L	BPL#3072-226-4
102	Cal 0.050 mg/L	BPL#3072-226-4 5ml to 5ml
103	Cal 0.025 mg/L	BPL#3072-226-4 2.5ml to 7.5ml
104	Cal 0.010 mg/L	BPL#3072-226-4 1.0ml to 9.0ml
105	Cal 0.005 mg/L	BPL#3072-226-4 0.5ml to 9.5ml
106	Cal 0.002 mg/L	BPL#3072-226-4 0.2ml to 9.8ml
107	Cal 0.000 mg/L	
108	ICV 0.050	BPL#3072-226-6
109	ICB	
161	CCV 0.050	BPL#3072-226-3
110	CCVLL	BPL#3072-226-4 0.2ml to 9.8ml
162	CCB	
900	Blank	
900	Read Baseline	
111	MBLK	
112	LCS	BPL#3072-68-7 0.125ml into 4.875
113	1902602-01C	
114	1902602-02C	
115	1902602-03C	
116	1902783-01A	
117	1902783-02A	
118	1902783-02A MS	BPL#3072-226-1 0.02ml to 4.98ml
119	1902783-02A MSD	BPL#3072-226-1 0.02ml to 4.98ml
120	1902834-02A 5X	
161	CCV 0.050	BPL#3072-226-3
162	CCB	
900	Blank	
900	Read Baseline	
121	1902874-02B 5X	
122	1902879-02A	
123	1902879-06A	
124	1902879-13A	
111	MBLK	
112	LCS	BPL#3072-68-7 0.125ml into 4.875
127	1902686-01C	
128	1902686-02C	
129	1902686-03C	
130	1902686-04C	
161	CCV 0.050	BPL#3072-226-3
162	CCB	
900	Blank	
900	Read Baseline	
131	1902761-01C	
132	1902761-01C MS	BPL#3072-226-1 0.02ml to 4.98ml

Cup	Name	Comment
133	1902761-01C MSD	BPL#3072-226-1 0.02ml to 4.98ml
134	1902761-02C	
135	1902761-03C	
136	1902761-04C	
137	1902761-05C	
161	CCV 0.050	BPL#3072-226-3
162	CCB	
900	Blank	
900	Read Baseline	

Peak Table:Available CN FS3100_190220 A

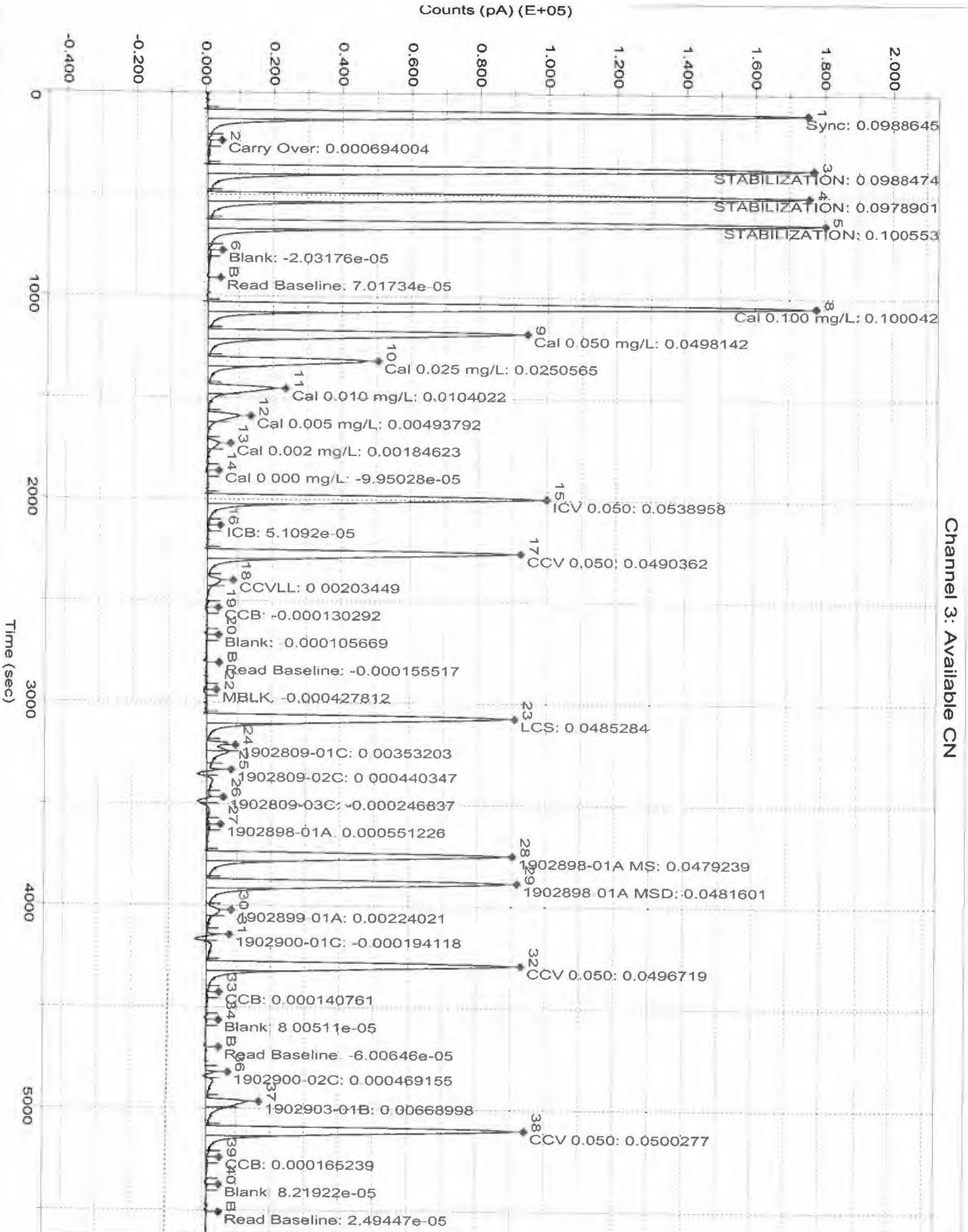
File name: C:\FLOW_4\RESULTS\WADCN\2019\A190220B.RST rev. 2/20/19

Date: 20-Feb-19

Operator: MAB

Peak	Cup	Name	R	Type	Dil	Wt	Area	Calc. (mg/L)	Flags
1	101	Sync	1	SYNC	1	1	5374370	0.09886	
2	900	Carry Over	1	CO	1	1	39418	0.00069	
3	101	STABILIZATION	1	BLNK	1	1	5373540	0.09884	
4	101	STABILIZATION	2	BLNK	1	1	5326953	0.09789	
5	101	STABILIZATION	3	BLNK	1	1	5456328	0.10055	
6	900	Blank	1	BLNK	1	1	-4628	-0.00002	LO
B	900	Read Baseline	1	RB	1	1	957	0.00007	BL
8	101	Cal 0.100 mg/L	1	C	1	1	5431573	0.10004	
9	102	Cal 0.050 mg/L	1	C	1	1	2865239	0.04981	
10	103	Cal 0.025 mg/L	1	C	1	1	1487561	0.02505	
11	104	Cal 0.010 mg/L	1	C	1	1	628705	0.01040	
12	105	Cal 0.005 mg/L	1	C	1	1	299132	0.00493	
13	106	Cal 0.002 mg/L	1	C	1	1	110263	0.00184	
14	107	Cal 0.000 mg/L	1	C	1	1	-9517	-0.00010	LO
15	108	ICV 0.050	1	U	1	1	3084457	0.05389	ok
16	109	ICB	1	U	1	1	-221	0.00005	
17	161	CCV 0.050	1	CCV	1	1	2823213	0.04903	ok
18	110	CCVLL	1	U	1	1	121814	0.00203	
19	162	CCB	1	U	1	1	-11418	-0.00013	LO
20	900	Blank	1	BLNK	1	1	-9898	-0.00010	LO
B	900	Read Baseline	1	RB	1	1	-12976	-0.00015	BL
22	111	MBLK	1	U	1	1	-29795	-0.00042	LO ok
23	112	LCS	1	U	1	1	2795742	0.04852	
24	113	1902809-01C	1	U	1	1	213466	0.00353	
25	114	1902809-02C	1	U	1	1	23788	0.00044	
26	115	1902809-03C	1	U	1	1	-18616	-0.00024	LO
27	116	1902898-01A	1	U	1	1	30622	0.00055	
28	117	1902898-01A MS	1	U	1	1	2762999	0.04792	ok
29	118	1902898-01A MS	1	U	1	1	2775799	0.04816	
30	119	1902899-01A	1	U	1	1	134430	0.00224	
31	120	1902900-01C	1	U	1	1	-15360	-0.00019	LO
32	161	CCV 0.050	1	CCV	1	1	2857556	0.04967	ok
33	162	CCB	1	U	1	1	5313	0.00014	
34	900	Blank	1	BLNK	1	1	1566	0.00008	
B	900	Read Baseline	1	RB	1	1	-7082	-0.00006	BL
36	121	1902900-02C	1	U	1	1	25564	0.00046	
37	122	1902903-01B	1	U	1	1	405386	0.00669	
38	161	CCV 0.050	1	CCV	1	1	2876759	0.05002	ok
39	162	CCB	1	U	1	1	6823	0.00016	
40	900	Blank	1	BLNK	1	1	1699	0.00008	
B	900	Read Baseline	1	RB	1	1	-1835	0.00002	BL

2-20-19


Channel 3: Available CN
Counts (pA) (E+05)
Time (sec)
Sync: 0.0988645
Carry Over: 0.000694004
STABILIZATION: 0.0988474
STABILIZATION: 0.0978901
STABILIZATION: 0.100553
Blank: -2.03176e-05
Read Baseline: 7.01734e-05
Cal 0.100 mg/L: 0.100042
Cal 0.050 mg/L: 0.0498142
Cal 0.025 mg/L: 0.0250565
Cal 0.010 mg/L: 0.0104022
Cal 0.005 mg/L: 0.00493792
Cal 0.002 mg/L: 0.00184623
Cal 0 000 mg/L: -9.95028e-05
ICV 0.050: 0.0538958
ICB: 5.1092e-05
CCV 0.050: 0.0490362
CCVLL: 0 00203449
CCB: -0.000130292
Blank: 0.000105669
Read Baseline: -0.000155517
MBLK: -0.000427812
LCS: 0.0485284
1902809-01C: 0.00353203
1902809-02C: 0 000440347
1902809-03C: -0.000246837
1902898-01A: 0.000551226
1902898-01A MS: 0.0479239
1902898 01A MSD: 0.0481601
1902899 01A: 0.00224021
1902900-01C: -0.000194118
CCV 0.050: 0.0496719
CCB: 0.000140761
Blank: 8.00511e-05
Read Baseline: -6.00646e-05
1902900-02C: 0.000469155
1902903-01B: 0.00668998
CCV 0.050: 0.0500277
CCB: 0.000165239
Blank: 8.21922e-05
Read Baseline: 2.49447e-05

Available CN:Calibration 1: Peak 8-41

File name: C:\FLOW_4\RESULTS\WADCN\2019\A190220B.RST
Date: 20-Feb-19
Operator: MAB

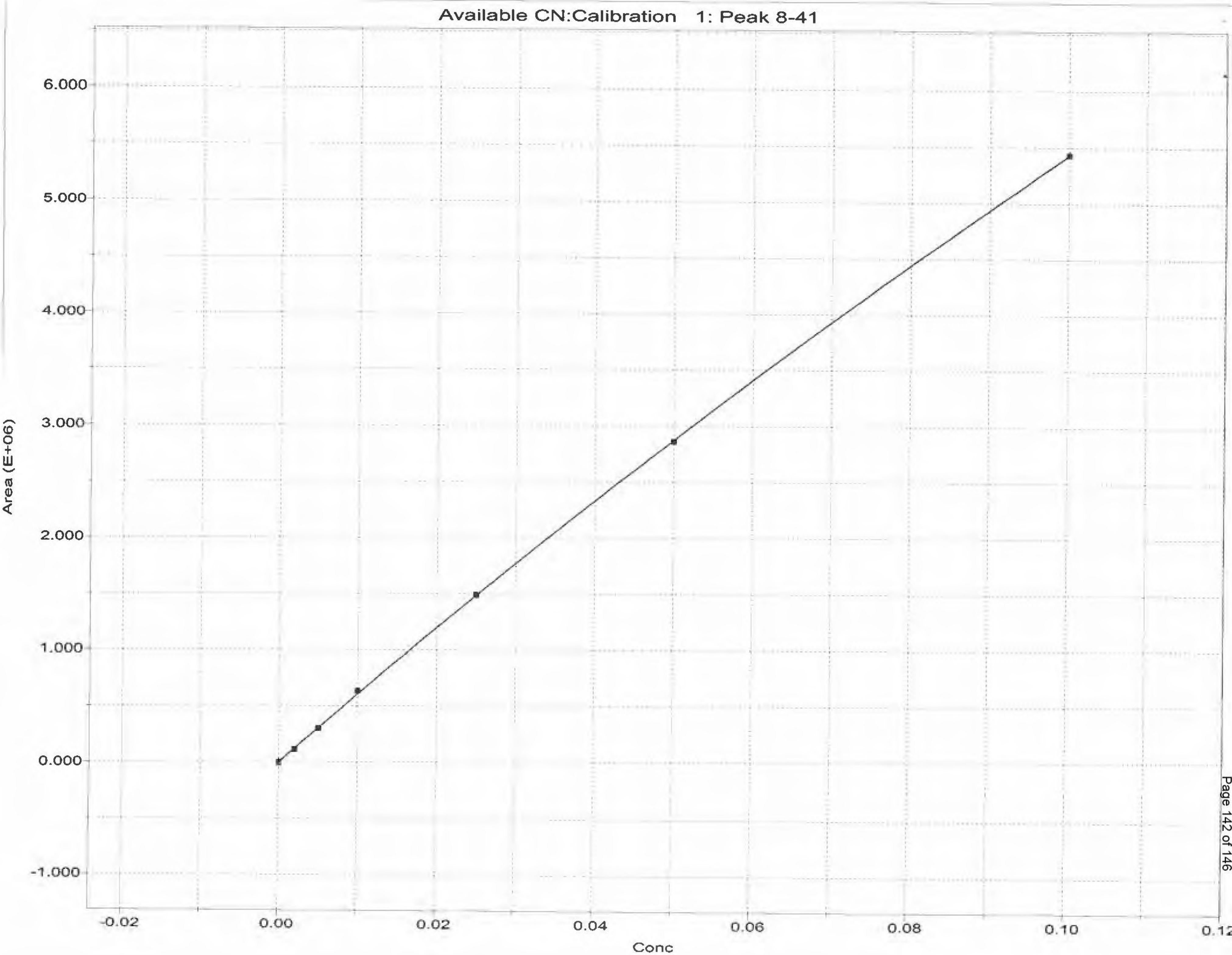
*	Name	Conc	Area
*	Cal 0.100 mg/L	0.100000	5431573.000000
*	Cal 0.050 mg/L	0.050000	2865239.250000
*	Cal 0.025 mg/L	0.025000	1487561.000000
*	Cal 0.010 mg/L	0.010000	628705.250000
*	Cal 0.005 mg/L	0.005000	299131.656250
*	Cal 0.002 mg/L	0.002000	110263.085938
*	Cal 0.000 mg/L	0.000000	-9517.125000

Calib Coef:
x=cyy+by+a
a: (intercept) 5.4669e-05
b: 1.6203e-08
c: 4.0602e-16

Corr Coef: 0.999985

Carryover: 0.733%

No Drift Peaks


Available CN:Calibration 1: Peak 8-41
Area (E+06)
6.000
5.000
4.000
3.000
2.000
1.000
0.000
-1.000
-0.02
0.00
0.02
0.04
0.06
0.08
0.10
0.12
Conc

CN Available Reagent Identification Numbers

REAGENT	BPL#	EXP
1 M Sodium Hydroxide	3072-30-7	4-17-19
0.01M Sodium Hydroxide	3072-30-8	4-17-19
Ligand Reagent	3072-233-4	2-28-19
0.1M Sodium Hydroxide	3072-136-7	7-19-19
Alt. WAD Acid Reagent	3072-136-8	9-18-19
Sample Tubes lot #	1052582050505	N/A
KCN Std (curve)	3072-226-4	2-21-19
KCN Std (ICV)	3072-226-6	2-21-19
KCN Std (CCV)	3072-226-3	2-21-19
KCN Std (MS, MSD)	3072-226-1	2-21-19
Hg(II)Cn (LCS)	3072-226-7	2-21-19

Sample Table - a190220a.tbl

File name: C:\FLOW_4\A190220A.TBL
Date: 20-Feb-19

Cup	Name	Type	R	Dil	Wt	Vial
101	Sync	SYNC	1	1	1	
900	Carry Over	CO	1	1	1	
101	STABILIZATION	BLNK	3	1	1	
900	Blank	BLNK	1	1	1	
900	Read Baseline	RB	1	1	1	
101	Cal 0.100 mg/L	C	1	1	1	
102	Cal 0.050 mg/L	C	1	1	1	
103	Cal 0.025 mg/L	C	1	1	1	
104	Cal 0.010 mg/L	C	1	1	1	
105	Cal 0.005 mg/L	C	1	1	1	
106	Cal 0.002 mg/L	C	1	1	1	
107	Cal 0.000 mg/L	C	1	1	1	
108	ICV 0.050	U	1	1	1	
109	ICB	U	1	1	1	
161	CCV 0.050	CCV	1	1	1	
110	CCVLL	U	1	1	1	
162	CCB	U	1	1	1	
900	Blank	BLNK	1	1	1	
900	Read Baseline	RB	1	1	1	
111	MBLK	U	0	1	1	
112	LCS	U	0	1	1	
113	1902809-01C	U	0	1	1	
114	1902809-02C	U	0	1	1	
115	1902809-03C	U	0	1	1	
116	1902898-01A	U	1	1	1	
117	1902898-01A MS	U	1	1	1	
118	1902898-01A MSD	U	1	1	1	
119	1902899-01A	U	1	1	1	
120	1902900-01C	U	1	1	1	
161	CCV 0.050	CCV	1	1	1	
162	CCB	U	1	1	1	
900	Blank	BLNK	1	1	1	
900	Read Baseline	RB	1	1	1	
121	1902900-02C	U	1	1	1	
122	1902903-01B	U	1	1	1	
161	CCV 0.050	CCV	1	1	1	
162	CCB	U	1	1	1	
900	Blank	BLNK	1	1	1	
900	Read Baseline	RB	1	1	1	

Sample Table - a190220a.tbl

File name: C:\FLOW_4\A190220A.TBL
Date: 20-Feb-19

Cup Name Comment

Cup	Name	Comment
900	Carry Over	
101	STABILIZATION	
900	Blank	
900	Read Baseline	
101	Cal 0.100 mg/L	BPL#3072-226-4
102	Cal 0.050 mg/L	BPL#3072-226-4 5ml to 5ml
103	Cal 0.025 mg/L	BPL#3072-226-4 2.5ml to 7.5ml
104	Cal 0.010 mg/L	BPL#3072-226-4 1.0ml to 9.0ml
105	Cal 0.005 mg/L	BPL#3072-226-4 0.5ml to 9.5ml
106	Cal 0.002 mg/L	BPL#3072-226-4 0.2ml to 9.8ml
107	Cal 0.000 mg/L	
108	ICV 0.050	BPL#3072-226-6
109	ICB	
161	CCV 0.050	BPL#3072-226-3
110	CCVLL	BPL#3072-226-4 0.2ml to 9.8ml
162	CCB	
900	Blank	
900	Read Baseline	
111	MBLK	
112	LCS	BPL#3072-68-7 0.125ml into 4.875
113	1902809-01C	
114	1902809-02C	
115	1902809-03C	
116	1902898-01A	
117	1902898-01A MS	BPL#3072-226-1 0.02ml to 4.98ml
118	1902898-01A MSD	BPL#3072-226-1 0.02ml to 4.98ml
119	1902899-01A	COMPOSITE
120	1902900-01C	
161	CCV 0.050	BPL#3072-226-3
162	CCB	
900	Blank	
900	Read Baseline	
121	1902900-02C	
122	1902903-01B	
161	CCV 0.050	BPL#3072-226-3
162	CCB	
900	Blank	
900	Read Baseline	

Section IV

ATTACHMENTS

-Previously Issued Report(s)

25-Feb-2019

Nisreen Saikaly
Shealy Environmental Services, Inc.
106 Vantage Point Dr.
West Columbia, SC 29169

Re: **16.0062677.81** Work Order: **1902602**

Dear Nisreen,

ALS Environmental received 3 samples on 13-Feb-2019 11:20 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 12.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

Electronically approved by: Chad Whelton

Chad Whelton
Project Manager

Client: Shealy Environmental Services, Inc.
Project: 16.0062677.81
Work Order: **1902602**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1902602-01	MW-WV-8S	Aqueous		2/12/2019 13:05	2/13/2019 11:20	☐
1902602-02	MW-WV-8M	Aqueous		2/12/2019 15:27	2/13/2019 11:20	☐
1902602-03	MW-WV-12S	Aqueous		2/12/2019 12:10	2/13/2019 11:20	☐

ALS Group, USA

Date: 25-Feb-19

Client: Shealy Environmental Services, Inc.
Project: 16.0062677.81
Work Order: 1902602

Case Narrative

Samples for the above noted Work Order were received on 02/13/2019. The attached "Sample Receipt Checklist" documents the status of custody seals, container integrity, preservation, and temperature compliance.

Samples were analyzed according to the analytical methodology previously transmitted in the "Work Order Acknowledgement". Methodologies are also documented in the "Analytical Result" section for each sample. Quality control results are listed in the "QC Report" section. Sample association for the reported quality control is located at the end of each batch summary. If applicable, results are appropriately qualified in the Analytical Result and QC Report sections. The "Qualifiers" section documents the various qualifiers, units, and acronyms utilized in reporting. A copy of the laboratory's scope of accreditation is available upon request.

With the following exceptions, all sample analyses achieved analytical criteria.

ALS Group, USA

Date: 25-Feb-19

Client: Shealy Environmental Services, Inc.
Project: 16.0062677.81
WorkOrder: **1902602**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
Hr	BOD/CBOD - Sample was reset outside Hold Time, value should be considered estimated.
J	Analyte is present at an estimated concentration between the MDL and Report Limit
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

Units Reported	Description
µg/L	Micrograms per Liter
mg/L	Milligrams per Liter

ALS Group, USA

Date: *25-Feb-19*

Client: Shealy Environmental Services, Inc.
Project: 16.0062677.81 **Work Order:** 1902602
Sample ID: MW-WV-8S **Lab ID:** 1902602-01
Collection Date: 2/12/2019 01:05 PM **Matrix:** AQUEOUS

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ACIDS BY HPLC			**SW8300M**			Analyst: **KYM**
Acetic Acid	ND		25	mg/L	1	2/16/2019 03:02 AM
Formic Acid	ND		25	mg/L	1	2/16/2019 03:02 AM
CYANIDE, AVAILABLE			**OIA 1677**			Analyst: **MB**
Cyanide, Available	ND		2.0	µg/L	1	2/19/2019 11:00 AM
CHROMIUM, HEXAVALENT			**SW7196A**			Analyst: **JEB**
Chromium, Hexavalent	ND		0.0050	mg/L	1	2/13/2019 11:55 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Feb-19*

Client: Shealy Environmental Services, Inc.
Project: 16.0062677.81 **Work Order:** 1902602
Sample ID: MW-WV-8M **Lab ID:** 1902602-02
Collection Date: 2/12/2019 03:27 PM **Matrix:** AQUEOUS

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ACIDS BY HPLC			**SW8300M**			Analyst: **KYM**
Acetic Acid	ND		25	mg/L	1	2/16/2019 03:15 AM
Formic Acid	ND		25	mg/L	1	2/16/2019 03:15 AM
CYANIDE, AVAILABLE			**OIA 1677**			Analyst: **MB**
Cyanide, Available	ND		2.0	µg/L	1	2/19/2019 11:00 AM
CHROMIUM, HEXAVALENT			**SW7196A**			Analyst: **JEB**
Chromium, Hexavalent	ND		0.0050	mg/L	1	2/13/2019 11:55 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Feb-19*

Client: Shealy Environmental Services, Inc.
Project: 16.0062677.81 **Work Order:** 1902602
Sample ID: MW-WV-12S **Lab ID:** 1902602-03
Collection Date: 2/12/2019 12:10 PM **Matrix:** AQUEOUS

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ACIDS BY HPLC			**SW8300M**			Analyst: **KYM**
Acetic Acid	ND		25	mg/L	1	2/16/2019 03:41 AM
Formic Acid	ND		25	mg/L	1	2/16/2019 03:41 AM
CYANIDE, AVAILABLE			**OIA 1677**			Analyst: **MB**
Cyanide, Available	ND		2.0	µg/L	1	2/19/2019 11:00 AM
CHROMIUM, HEXAVALENT			**SW7196A**			Analyst: **JEB**
Chromium, Hexavalent	ND		0.0050	mg/L	1	2/13/2019 11:55 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 25-Feb-19

Client: Shealy Environmental Services, Inc.
Work Order: 1902602
Project: 16.0062677.81

QC BATCH REPORT

Batch ID: **R255028** Instrument ID **HPLC2** Method: **SW8300M**

MBLK Sample ID: **MBLKW1-R255028** Units: **mg/L** Analysis Date: **2/16/2019 01:18 AM**
Client ID: Run ID: **HPLC2_190215B** SeqNo: **5525157** Prep Date: **2/15/2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acetic Acid	ND	5.0								
Formic Acid	ND	5.0								

LCS Sample ID: **LCSW1-R255028** Units: **mg/L** Analysis Date: **2/16/2019 01:31 AM**
Client ID: Run ID: **HPLC2_190215B** SeqNo: **5525158** Prep Date: **2/15/2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acetic Acid	521	5.0	500	0	104	80-120	0			
Formic Acid	520	5.0	500	0	104	80-120	0			

MS Sample ID: **1902686-01A MS** Units: **mg/L** Analysis Date: **2/16/2019 01:44 AM**
Client ID: Run ID: **HPLC2_190215B** SeqNo: **5525159** Prep Date: **2/15/2019** DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acetic Acid	1008	10	1000	0	101	75-125	0			
Formic Acid	999.2	10	1000	0	99.9	75-125	0			

MSD Sample ID: **1902686-01A MSD** Units: **mg/L** Analysis Date: **2/16/2019 01:57 AM**
Client ID: Run ID: **HPLC2_190215B** SeqNo: **5525160** Prep Date: **2/15/2019** DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acetic Acid	1026	10	1000	0	103	75-125	1008	1.77	20	
Formic Acid	997.5	10	1000	0	99.7	75-125	999.2	0.17	20	

The following samples were analyzed in this batch: 1902602-01A 1902602-02A 1902602-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Shealy Environmental Services, Inc.
Work Order: 1902602
Project: 16.0062677.81

QC BATCH REPORT

Batch ID: **R254804** Instrument ID **WETCHEM** Method: **SW7196A**

MBLK Sample ID: **MB-R254804-R254804** Units: **mg/L** Analysis Date: **2/13/2019 11:55 AM**
Client ID: Run ID: **WETCHEM_190213I** SeqNo: **5519050** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	ND	0.0050								

LCS Sample ID: **LCS-R254804-R254804** Units: **mg/L** Analysis Date: **2/13/2019 11:55 AM**
Client ID: Run ID: **WETCHEM_190213I** SeqNo: **5519051** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.2006	0.0050	0.2	0	100	91-113	0			

MS Sample ID: **1902602-01B MS** Units: **mg/L** Analysis Date: **2/13/2019 11:55 AM**
Client ID: **MW-WV-8S** Run ID: **WETCHEM_190213I** SeqNo: **5519053** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.1956	0.0050	0.2	0.0015	97	91-113	0			

MSD Sample ID: **1902602-01B MSD** Units: **mg/L** Analysis Date: **2/13/2019 11:55 AM**
Client ID: **MW-WV-8S** Run ID: **WETCHEM_190213I** SeqNo: **5519054** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.1906	0.0050	0.2	0.0015	94.6	91-113	0.1956	2.59	10	

The following samples were analyzed in this batch: 1902602-01B 1902602-02B 1902602-03B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Shealy Environmental Services, Inc.
Work Order: 1902602
Project: 16.0062677.81

QC BATCH REPORT

Batch ID: **R255121** Instrument ID **FS3100** Method: **OIA 1677**

MBLK Sample ID: **MB-R255121-R255121** Units: **µg/L** Analysis Date: **2/19/2019 11:00 AM**
Client ID: Run ID: **FS3100_190219A** SeqNo: **5527983** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Available	ND	2.0								

LCS Sample ID: **LCS-R255121-R255121** Units: **µg/L** Analysis Date: **2/19/2019 11:00 AM**
Client ID: Run ID: **FS3100_190219A** SeqNo: **5527984** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Available	44.63	2.0	50	0	89.3	82-132	0			

MS Sample ID: **1902783-02A MS** Units: **µg/L** Analysis Date: **2/19/2019 11:00 AM**
Client ID: Run ID: **FS3100_190219A** SeqNo: **5527990** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Available	46.72	2.0	50	0.41	92.6	82-130	0			

MSD Sample ID: **1902783-02A MSD** Units: **µg/L** Analysis Date: **2/19/2019 11:00 AM**
Client ID: Run ID: **FS3100_190219A** SeqNo: **5527991** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Available	50.63	2.0	50	0.41	100	82-130	46.72	8.03	11	

The following samples were analyzed in this batch: 1902602-01C 1902602-02C 1902602-03C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

1902602

SHEALY

Chain of Custody Record

Shealy Environmental Services, Inc.
106 Vantage Point Drive
West Columbia, South Carolina 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111
www.shealylab.com

Number

Client	Rose and Westra / GZA
Address	601 Fifth Street NW, Suite 102
City	Grand Rapids
State	MI
Zip Code	49504
Project Name	~~16.0062335.52 T-3~~ 16.0062677.81
Project Number	16.0062~~335.52 T-3~~ 677.81
P.O No.	
Report to Contact	Lori Powers
Telephone No. / E-mail	616-956-6123 loretta.powers@gza.com
Quote No.	20986
Page	1 of 1
Sampler's Signature	X [signature]
Printed Name	Jen Martin
Laboratory Lot Number	

Sample ID / Description (Containers for each sample may be combined on one line)	Date	Time	G=Grab C=Composite	Aqueous	Solid	Non-Aqueous		Unpres.	H2SO4	HNO3	HCl	NaOH/Zn Acetate	NaOH	MeOH	Acetic Acid	Formic Acid	Available Cyanide	Hexavalent Chromium (7199)						Remarks / Cooler I.D. ALS Water
MW-WV ~~8~~ 8S	2/12/19	1305	G	x				4					1		x	x	x	x						
MW-WV-8M	|	1527	|	|				|					|		|	|	|	|						
MW-WV-12S	|	1210	|	|				|					|		|	|	|	|						

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

Sample Disposal
☐ Return to Client ☒ Disposal by Lab

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

QC Requirements

	Date	Time		Date	Time
1. Relinquished by Jen Martin	2/13/19	1000	1. Received by [signature]	2/13/19	1000
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by [signature]	2/13/19	1120	4. Laboratory Received by [signature]		

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

LAB USE ONLY
Received on Ice (Check) ☐ Y ☐ N ☐ Ice Pack
Receipt Temp. 3.0 °C SR2 P415

Document Number: ME002OW-01

ALS Group, USA

Sample Receipt Checklist

Client Name: **SHEALYENV** Date/Time Received: **13-Feb-19 11:20**

Work Order: **1902602** Received by: **DS**

Checklist completed by Diane Shaw (eSignature) 13-Feb-19 (Date) Reviewed by: Chad Whelton (eSignature) 13-Feb-19 (Date)

Matrices: Aqueous
Carrier name: ALSHN

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Sample(s) received on ice?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	3.0/3.0 c	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	2/13/2019 11:29:28 AM		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:	-		

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

25-Feb-2019

Nisreen Saikaly
Shealy Environmental Services, Inc.
106 Vantage Point Dr.
West Columbia, SC 29169

Re: **16.0062677.81** Work Order: **1902761**

Dear Nisreen,

ALS Environmental received 5 samples on 15-Feb-2019 10:30 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 14.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

Electronically approved by: Chad Whelton

Chad Whelton
Project Manager

ALS Group, USA

Date: 25-Feb-19

Client: Shealy Environmental Services, Inc.
Project: 16.0062677.81
Work Order: **1902761**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1902761-01	MW-WV-11D	Aqueous		2/14/2019 10:45	2/15/2019 10:30	☐
1902761-02	MW-WV-11S	Aqueous		2/14/2019 10:55	2/15/2019 10:30	☐
1902761-03	MW-WV-5D	Aqueous		2/14/2019 14:45	2/15/2019 10:30	☐
1902761-04	MW-WV-5S	Aqueous		2/14/2019 16:10	2/15/2019 10:30	☐
1902761-05	MW-WV-5D-Dup	Aqueous		2/14/2019 14:45	2/15/2019 10:30	☐

ALS Group, USA

Date: 25-Feb-19

Client: Shealy Environmental Services, Inc.
Project: 16.0062677.81
Work Order: 1902761

Case Narrative

Samples for the above noted Work Order were received on 02/15/2019. The attached "Sample Receipt Checklist" documents the status of custody seals, container integrity, preservation, and temperature compliance.

Samples were analyzed according to the analytical methodology previously transmitted in the "Work Order Acknowledgement". Methodologies are also documented in the "Analytical Result" section for each sample. Quality control results are listed in the "QC Report" section. Sample association for the reported quality control is located at the end of each batch summary. If applicable, results are appropriately qualified in the Analytical Result and QC Report sections. The "Qualifiers" section documents the various qualifiers, units, and acronyms utilized in reporting. A copy of the laboratory's scope of accreditation is available upon request.

With the following exceptions, all sample analyses achieved analytical criteria.

Client:	Shealy Environmental Services, Inc.	
Project:	16.0062677.81	
WorkOrder:	**1902761**	

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
Hr	BOD/CBOD - Sample was reset outside Hold Time, value should be considered estimated.
J	Analyte is present at an estimated concentration between the MDL and Report Limit
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

Units Reported	Description
µg/L	Micrograms per Liter
mg/L	Milligrams per Liter

ALS Group, USA

Date: *25-Feb-19*

Client: Shealy Environmental Services, Inc.
Project: 16.0062677.81 **Work Order:** 1902761
Sample ID: MW-WV-11D **Lab ID:** 1902761-01
Collection Date: 2/14/2019 10:45 AM **Matrix:** AQUEOUS

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ACIDS BY HPLC			**SW8300M**			Analyst: **KYM**
Acetic Acid	ND		25	mg/L	1	2/16/2019 03:54 AM
Formic Acid	ND		25	mg/L	1	2/16/2019 03:54 AM
CYANIDE, AVAILABLE			**OIA 1677**			Analyst: **MB**
Cyanide, Available	ND		2.0	µg/L	1	2/19/2019 11:00 AM
CHROMIUM, HEXAVALENT			**SW7196A**			Analyst: **JEB**
Chromium, Hexavalent	ND		0.0050	mg/L	1	2/15/2019 10:40 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Feb-19*

Client: Shealy Environmental Services, Inc.
Project: 16.0062677.81 **Work Order:** 1902761
Sample ID: MW-WV-11S **Lab ID:** 1902761-02
Collection Date: 2/14/2019 10:55 AM **Matrix:** AQUEOUS

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ACIDS BY HPLC			**SW8300M**			Analyst: **KYM**
Acetic Acid	ND		25	mg/L	1	2/16/2019 04:07 AM
Formic Acid	ND		25	mg/L	1	2/16/2019 04:07 AM
CYANIDE, AVAILABLE			**OIA 1677**			Analyst: **MB**
Cyanide, Available	ND		2.0	µg/L	1	2/19/2019 11:00 AM
CHROMIUM, HEXAVALENT			**SW7196A**			Analyst: **JEB**
Chromium, Hexavalent	ND		0.0050	mg/L	1	2/15/2019 10:40 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Feb-19*

Client: Shealy Environmental Services, Inc.
Project: 16.0062677.81 **Work Order:** 1902761
Sample ID: MW-WV-5D **Lab ID:** 1902761-03
Collection Date: 2/14/2019 02:45 PM **Matrix:** AQUEOUS

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ACIDS BY HPLC			**SW8300M**			Analyst: **KYM**
Acetic Acid	ND		25	mg/L	1	2/16/2019 04:20 AM
Formic Acid	ND		25	mg/L	1	2/16/2019 04:20 AM
CYANIDE, AVAILABLE			**OIA 1677**			Analyst: **MB**
Cyanide, Available	ND		2.0	µg/L	1	2/19/2019 11:00 AM
CHROMIUM, HEXAVALENT			**SW7196A**			Analyst: **JEB**
Chromium, Hexavalent	ND		0.0050	mg/L	1	2/15/2019 10:40 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Feb-19*

Client: Shealy Environmental Services, Inc.
Project: 16.0062677.81 **Work Order:** 1902761
Sample ID: MW-WV-5S **Lab ID:** 1902761-04
Collection Date: 2/14/2019 04:10 PM **Matrix:** AQUEOUS

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ACIDS BY HPLC			**SW8300M**			Analyst: **KYM**
Acetic Acid	ND		25	mg/L	1	2/16/2019 04:33 AM
Formic Acid	ND		25	mg/L	1	2/16/2019 04:33 AM
CYANIDE, AVAILABLE			**OIA 1677**			Analyst: **MB**
Cyanide, Available	ND		2.0	µg/L	1	2/19/2019 11:00 AM
CHROMIUM, HEXAVALENT			**SW7196A**			Analyst: **JEB**
Chromium, Hexavalent	ND		0.0050	mg/L	1	2/15/2019 10:40 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Feb-19*

Client:	Shealy Environmental Services, Inc.		
Project:	16.0062677.81	**Work Order:**	1902761
Sample ID:	MW-WV-5D-Dup	**Lab ID:**	1902761-05
Collection Date:	2/14/2019 02:45 PM	**Matrix:**	AQUEOUS

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ACIDS BY HPLC			**SW8300M**			Analyst: **KYM**
Acetic Acid	ND		25	mg/L	1	2/16/2019 04:46 AM
Formic Acid	ND		25	mg/L	1	2/16/2019 04:46 AM
CYANIDE, AVAILABLE			**OIA 1677**			Analyst: **MB**
Cyanide, Available	ND		2.0	µg/L	1	2/19/2019 11:00 AM
CHROMIUM, HEXAVALENT			**SW7196A**			Analyst: **JEB**
Chromium, Hexavalent	ND		0.0050	mg/L	1	2/15/2019 10:40 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Shealy Environmental Services, Inc.
Work Order: 1902761
Project: 16.0062677.81

QC BATCH REPORT

Batch ID: **R255028** Instrument ID **HPLC2** Method: **SW8300M**

MBLK	Sample ID: **MBLKW1-R255028**		Units: **mg/L**		Analysis Date: **2/16/2019 01:18 AM**
Client ID:	Run ID: **HPLC2_190215B**		SeqNo: **5525157**	Prep Date: **2/15/2019**	DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acetic Acid	ND	5.0								
Formic Acid	ND	5.0								

LCS	Sample ID: **LCSW1-R255028**		Units: **mg/L**		Analysis Date: **2/16/2019 01:31 AM**
Client ID:	Run ID: **HPLC2_190215B**		SeqNo: **5525158**	Prep Date: **2/15/2019**	DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acetic Acid	521	5.0	500	0	104	80-120	0			
Formic Acid	520	5.0	500	0	104	80-120	0			

MS	Sample ID: **1902686-01A MS**		Units: **mg/L**		Analysis Date: **2/16/2019 01:44 AM**
Client ID:	Run ID: **HPLC2_190215B**		SeqNo: **5525159**	Prep Date: **2/15/2019**	DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acetic Acid	1008	10	1000	0	101	75-125	0			
Formic Acid	999.2	10	1000	0	99.9	75-125	0			

MSD	Sample ID: **1902686-01A MSD**		Units: **mg/L**		Analysis Date: **2/16/2019 01:57 AM**
Client ID:	Run ID: **HPLC2_190215B**		SeqNo: **5525160**	Prep Date: **2/15/2019**	DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acetic Acid	1026	10	1000	0	103	75-125	1008	1.77	20	
Formic Acid	997.5	10	1000	0	99.7	75-125	999.2	0.17	20	

The following samples were analyzed in this batch:

1902761-01A	1902761-02A	1902761-03A
1902761-04A	1902761-05A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Shealy Environmental Services, Inc.
Work Order: 1902761
Project: 16.0062677.81

QC BATCH REPORT

Batch ID: **R254950** Instrument ID **WETCHEM** Method: **SW7196A**

MBLK Sample ID: **MB-R254950-R254950** Units: **mg/L** Analysis Date: **2/15/2019 10:40 AM**
Client ID: Run ID: **WETCHEM_190215H** SeqNo: **5523666** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	ND	0.0050								

LCS Sample ID: **LCS-R254950-R254950** Units: **mg/L** Analysis Date: **2/15/2019 10:40 AM**
Client ID: Run ID: **WETCHEM_190215H** SeqNo: **5523667** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.2019	0.0050	0.2	0	101	91-113	0			

MS Sample ID: **1902761-01B MS** Units: **mg/L** Analysis Date: **2/15/2019 10:40 AM**
Client ID: **MW-WV-11D** Run ID: **WETCHEM_190215H** SeqNo: **5523669** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.1969	0.0050	0.2	-0.001	99	91-113	0			

MSD Sample ID: **1902761-01B MSD** Units: **mg/L** Analysis Date: **2/15/2019 10:40 AM**
Client ID: **MW-WV-11D** Run ID: **WETCHEM_190215H** SeqNo: **5523670** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.1919	0.0050	0.2	-0.001	96.4	91-113	0.1969	2.57	10	

The following samples were analyzed in this batch:

1902761-01B	1902761-02B	1902761-03B
1902761-04B	1902761-05B	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Shealy Environmental Services, Inc.
Work Order: 1902761
Project: 16.0062677.81

QC BATCH REPORT

Batch ID: **R255122** Instrument ID **FS3100** Method: **OIA 1677**

MBLK Sample ID: **MB-R255122-R255122** Units: **µg/L** Analysis Date: **2/19/2019 11:00 AM**
Client ID: Run ID: **FS3100_190219B** SeqNo: **5528000** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Available	ND	2.0								

LCS Sample ID: **LCS-R255122-R255122** Units: **µg/L** Analysis Date: **2/19/2019 11:00 AM**
Client ID: Run ID: **FS3100_190219B** SeqNo: **5528001** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Available	45.53	2.0	50	0	91.1	82-132	0			

MS Sample ID: **1902686-01C MS** Units: **µg/L** Analysis Date: **2/19/2019 11:00 AM**
Client ID: Run ID: **FS3100_190219B** SeqNo: **5528003** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Available	46.39	2.0	50	1.44	89.9	82-130	0			

MSD Sample ID: **1902686-01C MSD** Units: **µg/L** Analysis Date: **2/19/2019 11:00 AM**
Client ID: Run ID: **FS3100_190219B** SeqNo: **5528004** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Available	48.43	2.0	50	1.44	94	82-130	46.39	4.3	11	

The following samples were analyzed in this batch:

1902761-01C	1902761-02C	1902761-03C
1902761-04C	1902761-05C	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

1902761

Shealy Environmental Services, Inc.
106 Vantage Point Drive
West Columbia, South Carolina 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111
www.shealylab.com

SHEALY

Chain of Custody Record

Number

Client: **Rose and Westra / GZA**	Report to Contact: Leslie Nelson	Telephone No. / E-mail: 616-956-6123 leslie.nelson@gza.com
Address: 601 Fifth Street NW, Suite 102	Sampler's Signature: X	Quote No.: 20986
City: Grand Rapids; State: MI; Zip Code: 49504	Printed Name: Jen Martin	Page 1 of 1
Project Name: 16.0062677.81		Laboratory Lot Number
Project Number: 16.0062677.81	P.O No.	

Analysis (Attach list if more space is needed)

Sample ID / Description (Containers for each sample may be combined on one line)	Date	Time	G=Grab C=Composite	Aqueous	Solid	Non-Aqueous		Unpres.	H2SO4	HNO3	HCl	NaOH/Zn Acetate	NaOH	MeOH	Acetic Acid	Formic Acid	Available Cyanide	Hexavalent Chromium (7199)						Remarks / Cooler I.D. ALS Water
MW-WV-11D	2/14/19	1045	G	x				5					1		x	x	x	x						
MW-WV-11S		1055																						
MW-WV-5D		1445																						
MW-WV-5S		1610																						
MW-WV-5D-Dup		1445																						

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

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

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

QC Requirements

Relinquished by	Date	Time	Received by	Date	Time
1. Relinquished by: Jen Martin	2/15/19	0900	1. Received by:	2/15/19	0900
2. Relinquished by:	2/15/19	1030	2. Received by:		
3. Relinquished by:			3. Received by:		
4. Relinquished by:			4. Laboratory Received by:		

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

LAB USE ONLY
Received on Ice (Check) [ ] Y [ ] N [ ] Ice Pack
Receipt Temp. 2.8 °C SRZ

2

Document Number: ME002OW-01

ALS Group, USA

Sample Receipt Checklist

Client Name: **SHEALYENV** Date/Time Received: **15-Feb-19 10:30**

Work Order: **1902761** Received by: **DS**

Checklist completed by Diane Shaw (eSignature) 15-Feb-19 (Date) Reviewed by: Chad Whelton (eSignature) 15-Feb-19 (Date)

Matrices: Aqueous
Carrier name: ALSHN

Shipping container/cooler in good condition?	Yes ✔	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ✔
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ✔
Chain of custody present?	Yes ✔	No ☐	
Chain of custody signed when relinquished and received?	Yes ✔	No ☐	
Chain of custody agrees with sample labels?	Yes ✔	No ☐	
Samples in proper container/bottle?	Yes ✔	No ☐	
Sample containers intact?	Yes ✔	No ☐	
Sufficient sample volume for indicated test?	Yes ✔	No ☐	
All samples received within holding time?	Yes ✔	No ☐	
Container/Temp Blank temperature in compliance?	Yes ✔	No ☐	
Sample(s) received on ice?	Yes ✔	No ☐	
Temperature(s)/Thermometer(s):	2.8/2.8 c	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	2/15/2019 10:40:03 AM		
Water - VOA vials have zero headspace?	Yes ✔	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ✔	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ✔	N/A ☐
pH adjusted by:	-		

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

25-Feb-2019

Nisreen Saikaly
Shealy Environmental Services, Inc.
106 Vantage Point Dr.
West Columbia, SC 29169

Re: **16.0062677.81** Work Order: **1902809**

Dear Nisreen,

ALS Environmental received 3 samples on 15-Feb-2019 02:32 PM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 12.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

Electronically approved by: Chad Whelton

Chad Whelton
Project Manager

ALS Group, USA Date: 25-Feb-19

Client: Shealy Environmental Services, Inc.
Project: 16.0062677.81
Work Order: **1902809**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1902809-01	MW-WV-3S	Aqueous		2/15/2019 10:17	2/15/2019 14:32	☐
1902809-02	MW-WV-3D	Aqueous		2/15/2019 11:20	2/15/2019 14:32	☐
1902809-03	MW-WV-8D	Aqueous		2/15/2019 12:00	2/15/2019 14:32	☐

ALS Group, USA

Date: 25-Feb-19

Client: Shealy Environmental Services, Inc.
Project: 16.0062677.81
Work Order: 1902809

Case Narrative

Samples for the above noted Work Order were received on 02/15/2019. The attached "Sample Receipt Checklist" documents the status of custody seals, container integrity, preservation, and temperature compliance.

Samples were analyzed according to the analytical methodology previously transmitted in the "Work Order Acknowledgement". Methodologies are also documented in the "Analytical Result" section for each sample. Quality control results are listed in the "QC Report" section. Sample association for the reported quality control is located at the end of each batch summary. If applicable, results are appropriately qualified in the Analytical Result and QC Report sections. The "Qualifiers" section documents the various qualifiers, units, and acronyms utilized in reporting. A copy of the laboratory's scope of accreditation is available upon request.

With the following exceptions, all sample analyses achieved analytical criteria.

ALS Group, USA

Date: 25-Feb-19

Client: Shealy Environmental Services, Inc.
Project: 16.0062677.81
WorkOrder: **1902809**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
Hr	BOD/CBOD - Sample was reset outside Hold Time, value should be considered estimated.
J	Analyte is present at an estimated concentration between the MDL and Report Limit
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

Units Reported	Description
µg/L	Micrograms per Liter
mg/L	Milligrams per Liter

ALS Group, USA

Date: *25-Feb-19*

Client:	Shealy Environmental Services, Inc.		
Project:	16.0062677.81	**Work Order:**	1902809
Sample ID:	MW-WV-3S	**Lab ID:**	1902809-01
Collection Date:	2/15/2019 10:17 AM	**Matrix:**	AQUEOUS

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ACIDS BY HPLC			**SW8300M**			Analyst: **KYM**
Acetic Acid	ND		25	mg/L	1	2/16/2019 04:59 AM
Formic Acid	ND		25	mg/L	1	2/16/2019 04:59 AM
CYANIDE, AVAILABLE			**OIA 1677**			Analyst: **MB**
Cyanide, Available	**3.5**		**2.0**	**µg/L**	1	2/20/2019 01:00 PM
CHROMIUM, HEXAVALENT			**SW7196A**			Analyst: **JEB**
Chromium, Hexavalent	ND		0.0050	mg/L	1	2/15/2019 03:00 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Feb-19*

Client: Shealy Environmental Services, Inc.
Project: 16.0062677.81 **Work Order:** 1902809
Sample ID: MW-WV-3D **Lab ID:** 1902809-02
Collection Date: 2/15/2019 11:20 AM **Matrix:** AQUEOUS

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ACIDS BY HPLC			**SW8300M**			Analyst: **KYM**
Acetic Acid	ND		25	mg/L	1	2/16/2019 05:12 AM
Formic Acid	ND		25	mg/L	1	2/16/2019 05:12 AM
CYANIDE, AVAILABLE			**OIA 1677**			Analyst: **MB**
Cyanide, Available	ND		2.0	µg/L	1	2/20/2019 01:00 PM
CHROMIUM, HEXAVALENT			**SW7196A**			Analyst: **JEB**
Chromium, Hexavalent	ND		0.0050	mg/L	1	2/15/2019 03:00 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Feb-19*

Client: Shealy Environmental Services, Inc.
Project: 16.0062677.81 **Work Order:** 1902809
Sample ID: MW-WV-8D **Lab ID:** 1902809-03
Collection Date: 2/15/2019 12:00 PM **Matrix:** AQUEOUS

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ACIDS BY HPLC			**SW8300M**			Analyst: **KYM**
Acetic Acid	ND		25	mg/L	1	2/16/2019 05:25 AM
Formic Acid	ND		25	mg/L	1	2/16/2019 05:25 AM
CYANIDE, AVAILABLE			**OIA 1677**			Analyst: **MB**
Cyanide, Available	ND		2.0	µg/L	1	2/20/2019 01:00 PM
CHROMIUM, HEXAVALENT			**SW7196A**			Analyst: **JEB**
Chromium, Hexavalent	ND		0.0050	mg/L	1	2/15/2019 03:00 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 25-Feb-19

Client: Shealy Environmental Services, Inc.
Work Order: 1902809
Project: 16.0062677.81

QC BATCH REPORT

Batch ID: **R255028** Instrument ID **HPLC2** Method: **SW8300M**

MBLK Sample ID: **MBLKW1-R255028** Units: **mg/L** Analysis Date: **2/16/2019 01:18 AM**
Client ID: Run ID: **HPLC2_190215B** SeqNo: **5525157** Prep Date: **2/15/2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acetic Acid	ND	5.0								
Formic Acid	ND	5.0								

LCS Sample ID: **LCSW1-R255028** Units: **mg/L** Analysis Date: **2/16/2019 01:31 AM**
Client ID: Run ID: **HPLC2_190215B** SeqNo: **5525158** Prep Date: **2/15/2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acetic Acid	521	5.0	500	0	104	80-120	0			
Formic Acid	520	5.0	500	0	104	80-120	0			

MS Sample ID: **1902686-01A MS** Units: **mg/L** Analysis Date: **2/16/2019 01:44 AM**
Client ID: Run ID: **HPLC2_190215B** SeqNo: **5525159** Prep Date: **2/15/2019** DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acetic Acid	1008	10	1000	0	101	75-125	0			
Formic Acid	999.2	10	1000	0	99.9	75-125	0			

MSD Sample ID: **1902686-01A MSD** Units: **mg/L** Analysis Date: **2/16/2019 01:57 AM**
Client ID: Run ID: **HPLC2_190215B** SeqNo: **5525160** Prep Date: **2/15/2019** DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acetic Acid	1026	10	1000	0	103	75-125	1008	1.77	20	
Formic Acid	997.5	10	1000	0	99.7	75-125	999.2	0.17	20	

The following samples were analyzed in this batch: 1902809-01A 1902809-02A 1902809-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Shealy Environmental Services, Inc.
Work Order: 1902809
Project: 16.0062677.81

QC BATCH REPORT

Batch ID: **R254983** Instrument ID **WETCHEM** Method: **SW7196A**

MBLK Sample ID: **MB-R254983-R254983** Units: **mg/L** Analysis Date: **2/15/2019 03:00 PM**
Client ID: Run ID: **WETCHEM_190215P** SeqNo: **5524277** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	ND	0.0050								

LCS Sample ID: **LCS-R254983-R254983** Units: **mg/L** Analysis Date: **2/15/2019 03:00 PM**
Client ID: Run ID: **WETCHEM_190215P** SeqNo: **5524278** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.2006	0.0050	0.2	0	100	91-113	0			

MS Sample ID: **1902809-02B MS** Units: **mg/L** Analysis Date: **2/15/2019 03:00 PM**
Client ID: **MW-WV-3D** Run ID: **WETCHEM_190215P** SeqNo: **5524281** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.1956	0.0050	0.2	0.0003	97.6	91-113	0			

MSD Sample ID: **1902809-02BMSD** Units: **mg/L** Analysis Date: **2/15/2019 03:00 PM**
Client ID: **MW-WV-3D** Run ID: **WETCHEM_190215P** SeqNo: **5524282** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.1856	0.0050	0.2	0.0003	92.6	91-113	0.1956	5.25	10	

The following samples were analyzed in this batch: 1902809-01B 1902809-02B 1902809-03B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Shealy Environmental Services, Inc.
Work Order: 1902809
Project: 16.0062677.81

QC BATCH REPORT

Batch ID: **R255206** Instrument ID **FS3100** Method: **OIA 1677**

MBLK	Sample ID: **MB-R255206-R255206**			Units: **µg/L**		Analysis Date: **2/20/2019 01:00 PM**				
Client ID:	Run ID: **FS3100_190220A**			SeqNo: **5530132**		Prep Date:		DF: **1**		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Available	ND	2.0								

LCS	Sample ID: **LCS-R255206-R255206**			Units: **µg/L**		Analysis Date: **2/20/2019 01:00 PM**				
Client ID:	Run ID: **FS3100_190220A**			SeqNo: **5530133**		Prep Date:		DF: **1**		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Available	48.52	2.0	50	0	97	82-132	0			

MS	Sample ID: **1902898-01A MS**			Units: **µg/L**		Analysis Date: **2/20/2019 01:00 PM**				
Client ID:	Run ID: **FS3100_190220A**			SeqNo: **5530138**		Prep Date:		DF: **1**		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Available	47.92	2.0	50	0.55	94.7	82-130	0			

MSD	Sample ID: **1902898-01A MSD**			Units: **µg/L**		Analysis Date: **2/20/2019 01:00 PM**				
Client ID:	Run ID: **FS3100_190220A**			SeqNo: **5530139**		Prep Date:		DF: **1**		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Available	48.16	2.0	50	0.55	95.2	82-130	47.92	0.5	11	

The following samples were analyzed in this batch: 1902809-01C 1902809-02C 1902809-03C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

1902809

Shealy Environmental Services, Inc.
106 Vantage Point Drive
West Columbia, South Carolina 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111
www.shealylab.com

SHEALY

Chain of Custody Record

Number

Client	Rose and Westra / GZA
Address	601 Fifth Street NW, Suite 102
City	Grand Rapids
State	MI
Zip Code	49504
Project Name	16.0062677.81
Project Number	16.0062677.81
P.O No.	
Report to Contact	Leslie Nelson
Sampler's Signature	X [signature]
Printed Name	Jen Martin
Telephone No. / E-mail	616-956-6123 leslie.nelson@gza.com
Quote No.	20986
Page	1 of 1
Analysis (Attach list if more space is needed)	
Laboratory Lot Number	

Sample ID / Description (Containers for each sample may be combined on one line)	Date	Time	G=Grab C=Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	Matrix:	Unpres.	H2SO4	HNO3	HCl	NaOH/Zn Acetate	NaOH	MeOH	Acetic Acid	Formic Acid	Available Cyanide	Hexavalent Chromium (7199)						Remarks / Cooler I.D. ALS Water
MW-WV-3S	2.15.19	1017	G	x				4					1		x	x	x	x						
MW-WV-3D	2.15.19	1120	G	X				4					1		X	X	X	X						
MW-WV-8D	2.15.19	1200	G	X				4					1		X	X	X	X						

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

Sample Disposal
☐ Return to Client ☒ Disposal by Lab

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

QC Requirements

Relinquished by	Date	Time	Received by	Date	Time
1. Relinquished by Jen Martin	2/15/19	1432	1. Received by [signature]	2/15/19	1432
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by			4. Laboratory Received by		

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

LAB USE ONLY
Received on Ice (Check) ☐ Y ☐ N ☐ Ice Pack

Receipt Temp. 3.4 °C SRZ PU15

Document Number: ME002OW-01

ALS Group, USA

Sample Receipt Checklist

Client Name: **SHEALYENV** Date/Time Received: **15-Feb-19 14:32**

Work Order: **1902809** Received by: **KRW**

Checklist completed by Keith Wierenga (eSignature) 15-Feb-19 (Date) Reviewed by: Chad Whelton (eSignature) 15-Feb-19 (Date)

Matrices: Water

Carrier name: Client

Shipping container/cooler in good condition?	Yes ✔	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ✔
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ✔
Chain of custody present?	Yes ✔	No ☐	
Chain of custody signed when relinquished and received?	Yes ✔	No ☐	
Chain of custody agrees with sample labels?	Yes ✔	No ☐	
Samples in proper container/bottle?	Yes ✔	No ☐	
Sample containers intact?	Yes ✔	No ☐	
Sufficient sample volume for indicated test?	Yes ✔	No ☐	
All samples received within holding time?	Yes ✔	No ☐	
Container/Temp Blank temperature in compliance?	Yes ✔	No ☐	
Sample(s) received on ice?	Yes ✔	No ☐	
Temperature(s)/Thermometer(s):	3.4/3.4 C	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	2/15/2019 2:57:19 PM		
Water - VOA vials have zero headspace?	Yes ✔	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ✔	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ✔	N/A ☐
pH adjusted by:	-		

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

28-Feb-2019

Nisreen Saikaly
Shealy Environmental Services, Inc.
106 Vantage Point Dr.
West Columbia, SC 29169

Re: **16.0062677.80 T-1** Work Order: **1902900**

Dear Nisreen,

ALS Environmental received 7 samples on 19-Feb-2019 through 22-Feb-2019 for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 26.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

Electronically approved by: Chad Whelton

Chad Whelton
Project Manager

Report of Laboratory Analysis

ALS Group, USA

Date: 28-Feb-19

Client: Shealy Environmental Services, Inc.
Project: 16.0062677.80 T-1
Work Order: **1902900**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1902900-01	MW-WV-2S	Aqueous		2/18/2019 12:25	2/19/2019 11:40	☐
1902900-02	MW-WV-2D	Aqueous		2/18/2019 13:40	2/19/2019 11:40	☐
1902900-03	MW-WV-6S	Aqueous		2/19/2019 11:15	2/20/2019 10:55	☐
1902900-04	MW-WV-6D	Aqueous		2/19/2019 12:25	2/20/2019 10:55	☐
1902900-05	MW-WV-1	Aqueous		2/20/2019 14:50	2/21/2019 10:00	☐
1902900-06	MW-WV-9	Aqueous		2/21/2019 11:30	2/22/2019 10:40	☐
1902900-07	MW-WV-4	Aqueous		2/21/2019 14:55	2/22/2019 10:40	☐

Client:	Shealy Environmental Services, Inc.
Project:	16.0062677.80 T-1
Work Order:	1902900

Case Narrative

Samples for the above noted Work Order were received on 02/19/2019. The attached "Sample Receipt Checklist" documents the status of custody seals, container integrity, preservation, and temperature compliance.

Samples were analyzed according to the analytical methodology previously transmitted in the "Work Order Acknowledgement". Methodologies are also documented in the "Analytical Result" section for each sample. Quality control results are listed in the "QC Report" section. Sample association for the reported quality control is located at the end of each batch summary. If applicable, results are appropriately qualified in the Analytical Result and QC Report sections. The "Qualifiers" section documents the various qualifiers, units, and acronyms utilized in reporting. A copy of the laboratory's scope of accreditation is available upon request.

With the following exceptions, all sample analyses achieved analytical criteria.

Wet Chemistry:

Batch R255306, Method CNAV_1677_W, Samples 1902900-03C and -04C: These samples froze and did not maintain thermal preservation requirements throughout the storage process, and results are considered estimated.

ALS Group, USA

Date: 28-Feb-19

Client: Shealy Environmental Services, Inc.
Project: 16.0062677.80 T-1
WorkOrder: **1902900**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
Hr	BOD/CBOD - Sample was reset outside Hold Time, value should be considered estimated.
J	Analyte is present at an estimated concentration between the MDL and Report Limit
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

Units Reported	Description
µg/L	Micrograms per Liter
mg/L	Milligrams per Liter

ALS Group, USA

Date: *28-Feb-19*

Client: Shealy Environmental Services, Inc.
Project: 16.0062677.80 T-1 **Work Order:** 1902900
Sample ID: MW-WV-2S **Lab ID:** 1902900-01
Collection Date: 2/18/2019 12:25 PM **Matrix:** AQUEOUS

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ACIDS BY HPLC			**SW8300M**			Analyst: **KYM**
Acetic Acid	ND		25	mg/L	1	2/20/2019 06:01 PM
Formic Acid	ND		25	mg/L	1	2/20/2019 06:01 PM
CYANIDE, AVAILABLE			**OIA 1677**			Analyst: **MB**
Cyanide, Available	ND		2.0	µg/L	1	2/20/2019 01:00 PM
CHROMIUM, HEXAVALENT			**SW7196A**			Analyst: **JEB**
Chromium, Hexavalent	ND		0.0050	mg/L	1	2/19/2019 12:20 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	Shealy Environmental Services, Inc.		
Project:	16.0062677.80 T-1	**Work Order:**	1902900
Sample ID:	MW-WV-2D	**Lab ID:**	1902900-02
Collection Date:	2/18/2019 01:40 PM	**Matrix:**	AQUEOUS

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ACIDS BY HPLC			**SW8300M**			Analyst: **KYM**
Acetic Acid	ND		25	mg/L	1	2/20/2019 06:14 PM
Formic Acid	ND		25	mg/L	1	2/20/2019 06:14 PM
CYANIDE, AVAILABLE			**OIA 1677**			Analyst: **MB**
Cyanide, Available	ND		2.0	µg/L	1	2/20/2019 01:00 PM
CHROMIUM, HEXAVALENT			**SW7196A**			Analyst: **JEB**
Chromium, Hexavalent	ND		0.0050	mg/L	1	2/19/2019 12:20 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *28-Feb-19*

Client: Shealy Environmental Services, Inc.
Project: 16.0062677.80 T-1 **Work Order:** 1902900
Sample ID: MW-WV-6S **Lab ID:** 1902900-03
Collection Date: 2/19/2019 11:15 AM **Matrix:** AQUEOUS

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ACIDS BY HPLC			**SW8300M**			Analyst: **KYM**
Acetic Acid	ND		25	mg/L	1	2/20/2019 06:27 PM
Formic Acid	ND		25	mg/L	1	2/20/2019 06:27 PM
CYANIDE, AVAILABLE			**OIA 1677**			Analyst: **MB**
Cyanide, Available	**5.5**		**2.0**	**µg/L**	1	2/21/2019 03:30 PM
CHROMIUM, HEXAVALENT			**SW7196A**			Analyst: **JSH**
Chromium, Hexavalent	ND		0.0050	mg/L	1	2/20/2019 09:45 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *28-Feb-19*

Client: Shealy Environmental Services, Inc.
Project: 16.0062677.80 T-1 **Work Order:** 1902900
Sample ID: MW-WV-6D **Lab ID:** 1902900-04
Collection Date: 2/19/2019 12:25 PM **Matrix:** AQUEOUS

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ACIDS BY HPLC			**SW8300M**			Analyst: **KYM**
Acetic Acid	ND		25	mg/L	1	2/20/2019 06:40 PM
Formic Acid	ND		25	mg/L	1	2/20/2019 06:40 PM
CYANIDE, AVAILABLE			**OIA 1677**			Analyst: **MB**
Cyanide, Available	**6.0**		**2.0**	**µg/L**	1	2/21/2019 03:30 PM
CHROMIUM, HEXAVALENT			**SW7196A**			Analyst: **JSH**
Chromium, Hexavalent	ND		0.0050	mg/L	1	2/20/2019 09:45 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *28-Feb-19*

Client: Shealy Environmental Services, Inc.
Project: 16.0062677.80 T-1 **Work Order:** 1902900
Sample ID: MW-WV-1 **Lab ID:** 1902900-05
Collection Date: 2/20/2019 02:50 PM **Matrix:** AQUEOUS

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ACIDS BY HPLC			**SW8300M**			Analyst: **KYM**
Acetic Acid	ND		25	mg/L	1	2/26/2019 04:35 AM
Formic Acid	ND		25	mg/L	1	2/26/2019 04:35 AM
CYANIDE, AVAILABLE			**OIA 1677**			Analyst: **MB**
Cyanide, Available	**3.0**		**2.0**	**µg/L**	1	2/21/2019 03:30 PM
CHROMIUM, HEXAVALENT			**SW7196A**			Analyst: **JEB**
Chromium, Hexavalent	ND		0.0050	mg/L	1	2/21/2019 11:30 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *28-Feb-19*

Client: Shealy Environmental Services, Inc.
Project: 16.0062677.80 T-1 **Work Order:** 1902900
Sample ID: MW-WV-9 **Lab ID:** 1902900-06
Collection Date: 2/21/2019 11:30 AM **Matrix:** AQUEOUS

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ACIDS BY HPLC			**SW8300M**			Analyst: **KYM**
Acetic Acid	ND		25	mg/L	1	2/26/2019 04:48 AM
Formic Acid	ND		25	mg/L	1	2/26/2019 04:48 AM
CYANIDE, AVAILABLE			**OIA 1677**			Analyst: **MB**
Cyanide, Available	**2.8**		**2.0**	**µg/L**	1	2/27/2019 04:00 PM
CHROMIUM, HEXAVALENT			**SW7196A**			Analyst: **JEB**
Chromium, Hexavalent	ND		0.0050	mg/L	1	2/22/2019 11:00 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *28-Feb-19*

Client: Shealy Environmental Services, Inc.
Project: 16.0062677.80 T-1 **Work Order:** 1902900
Sample ID: MW-WV-4 **Lab ID:** 1902900-07
Collection Date: 2/21/2019 02:55 PM **Matrix:** AQUEOUS

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ACIDS BY HPLC			**SW8300M**			Analyst: **KYM**
Acetic Acid	ND		25	mg/L	1	2/26/2019 05:01 AM
Formic Acid	ND		25	mg/L	1	2/26/2019 05:01 AM
CYANIDE, AVAILABLE			**OIA 1677**			Analyst: **MB**
Cyanide, Available	ND		2.0	µg/L	1	2/27/2019 04:00 PM
CHROMIUM, HEXAVALENT			**SW7196A**			Analyst: **JEB**
Chromium, Hexavalent	ND		0.0050	mg/L	1	2/22/2019 11:00 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

QC BATCH REPORT

Batch ID: **R255579** Instrument ID **HPLC2** Method: **SW8300M**

MBLK Sample ID: **MBLKW1-R255579** Units: **mg/L** Analysis Date: **2/20/2019 05:10 PM**
Client ID: Run ID: **HPLC2_190220A** SeqNo: **5538814** Prep Date: **2/20/2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acetic Acid	ND	5.0								
Formic Acid	ND	5.0								

LCS Sample ID: **LCSW1-R255579** Units: **mg/L** Analysis Date: **2/20/2019 05:23 PM**
Client ID: Run ID: **HPLC2_190220A** SeqNo: **5538815** Prep Date: **2/20/2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acetic Acid	509.6	5.0	500	0	102	80-120	0			
Formic Acid	490.8	5.0	500	0	98.2	80-120	0			

MS Sample ID: **1902900-01A MS** Units: **mg/L** Analysis Date: **2/20/2019 05:35 PM**
Client ID: **MW-WV-2S** Run ID: **HPLC2_190220A** SeqNo: **5538816** Prep Date: **2/20/2019** DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acetic Acid	1027	10	1000	0	103	75-125	0			
Formic Acid	964.2	10	1000	0	96.4	75-125	0			

MSD Sample ID: **1902900-01A MSD** Units: **mg/L** Analysis Date: **2/20/2019 05:48 PM**
Client ID: **MW-WV-2S** Run ID: **HPLC2_190220A** SeqNo: **5538817** Prep Date: **2/20/2019** DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acetic Acid	1028	10	1000	0	103	75-125	1027	0.015	20	
Formic Acid	1007	10	1000	0	101	75-125	964.2	4.31	20	

The following samples were analyzed in this batch:

1902900-01A 1902900-02A 1902900-03A
1902900-04A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Shealy Environmental Services, Inc.
Work Order: 1902900
Project: 16.0062677.80 T-1

QC BATCH REPORT

Batch ID: **R255583** Instrument ID **HPLC2** Method: **SW8300M**

MBLK Sample ID: **MBLKW1-R255583** Units: **mg/L** Analysis Date: **2/26/2019 03:43 AM**
Client ID: Run ID: **HPLC2_190225B** SeqNo: **5538890** Prep Date: **2/25/2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acetic Acid	ND	5.0								
Formic Acid	ND	5.0								

LCS Sample ID: **LCSW1-R255583** Units: **mg/L** Analysis Date: **2/26/2019 03:56 AM**
Client ID: Run ID: **HPLC2_190225B** SeqNo: **5538891** Prep Date: **2/25/2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acetic Acid	507	5.0	500	0	101	80-120	0			
Formic Acid	510.7	5.0	500	0	102	80-120	0			

MS Sample ID: **1902900-05A MS** Units: **mg/L** Analysis Date: **2/26/2019 04:09 AM**
Client ID: **MW-WV-1** Run ID: **HPLC2_190225B** SeqNo: **5538892** Prep Date: **2/25/2019** DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acetic Acid	1019	10	1000	0	102	75-125	0			
Formic Acid	1008	10	1000	0	101	75-125	0			

MSD Sample ID: **1902900-05A MSD** Units: **mg/L** Analysis Date: **2/26/2019 04:22 AM**
Client ID: **MW-WV-1** Run ID: **HPLC2_190225B** SeqNo: **5538893** Prep Date: **2/25/2019** DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acetic Acid	1018	10	1000	0	102	75-125	1019	0.147	20	
Formic Acid	1007	10	1000	0	101	75-125	1008	0.053	20	

The following samples were analyzed in this batch: 1902900-05A 1902900-06A 1902900-07A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Shealy Environmental Services, Inc.
Work Order: 1902900
Project: 16.0062677.80 T-1

QC BATCH REPORT

Batch ID: **R255102** Instrument ID **WETCHEM** Method: **SW7196A**

MBLK Sample ID: **MB-R255102-R255102** Units: **mg/L** Analysis Date: **2/19/2019 12:20 PM**
Client ID: Run ID: **WETCHEM_190219E** SeqNo: **5527484** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	ND	0.0050								

LCS Sample ID: **LCS-R255102-R255102** Units: **mg/L** Analysis Date: **2/19/2019 12:20 PM**
Client ID: Run ID: **WETCHEM_190219E** SeqNo: **5527485** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.2069	0.0050	0.2	0	103	91-113	0			

MS Sample ID: **1902900-01B MS** Units: **mg/L** Analysis Date: **2/19/2019 12:20 PM**
Client ID: **MW-WV-2S** Run ID: **WETCHEM_190219E** SeqNo: **5527487** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.1919	0.0050	0.2	0.0028	94.6	91-113	0			

MSD Sample ID: **1902900-01B MSD** Units: **mg/L** Analysis Date: **2/19/2019 12:20 PM**
Client ID: **MW-WV-2S** Run ID: **WETCHEM_190219E** SeqNo: **5527488** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.1981	0.0050	0.2	0.0028	97.6	91-113	0.1919	3.18	10	

The following samples were analyzed in this batch: 1902900-01B 1902900-02B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Shealy Environmental Services, Inc.
Work Order: 1902900
Project: 16.0062677.80 T-1

QC BATCH REPORT

Batch ID: **R255157** Instrument ID **WETCHEM** Method: **SW7196A**

MBLK Sample ID: **MB-R255157-R255157** Units: **mg/L** Analysis Date: **2/20/2019 09:45 AM**
Client ID: Run ID: **WETCHEM_190220D** SeqNo: **5529079** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	ND	0.0050								

LCS Sample ID: **LCS-R255157-R255157** Units: **mg/L** Analysis Date: **2/20/2019 09:45 AM**
Client ID: Run ID: **WETCHEM_190220D** SeqNo: **5529080** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.2006	0.0050	0.2	0	100	91-113	0			

MS Sample ID: **1902941-01C MS** Units: **mg/L** Analysis Date: **2/20/2019 09:45 AM**
Client ID: Run ID: **WETCHEM_190220D** SeqNo: **5529082** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.1681	0.0050	0.2	0.0391	64.5	91-113	0			S

MSD Sample ID: **1902941-01C MSD** Units: **mg/L** Analysis Date: **2/20/2019 09:45 AM**
Client ID: Run ID: **WETCHEM_190220D** SeqNo: **5529083** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.1718	0.0050	0.2	0.0391	66.4	91-113	0.1681	2.18	10	S

The following samples were analyzed in this batch: 1902900-03B 1902900-04B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Shealy Environmental Services, Inc.
Work Order: 1902900
Project: 16.0062677.80 T-1

QC BATCH REPORT

Batch ID: **R255206** Instrument ID **FS3100** Method: **OIA 1677**

MBLK Sample ID: **MB-R255206-R255206** Units: **µg/L** Analysis Date: **2/20/2019 01:00 PM**
Client ID: Run ID: **FS3100_190220A** SeqNo: **5530132** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Available	ND	2.0								

LCS Sample ID: **LCS-R255206-R255206** Units: **µg/L** Analysis Date: **2/20/2019 01:00 PM**
Client ID: Run ID: **FS3100_190220A** SeqNo: **5530133** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Available	48.52	2.0	50	0	97	82-132	0			

MS Sample ID: **1902898-01A MS** Units: **µg/L** Analysis Date: **2/20/2019 01:00 PM**
Client ID: Run ID: **FS3100_190220A** SeqNo: **5530138** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Available	47.92	2.0	50	0.55	94.7	82-130	0			

MSD Sample ID: **1902898-01A MSD** Units: **µg/L** Analysis Date: **2/20/2019 01:00 PM**
Client ID: Run ID: **FS3100_190220A** SeqNo: **5530139** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Available	48.16	2.0	50	0.55	95.2	82-130	47.92	0.5	11	

The following samples were analyzed in this batch: 1902900-01C 1902900-02C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Shealy Environmental Services, Inc.
Work Order: 1902900
Project: 16.0062677.80 T-1

QC BATCH REPORT

Batch ID: **R255260** Instrument ID **WETCHEM** Method: **SW7196A**

MBLK Sample ID: **MB-R255260-R255260** Units: **mg/L** Analysis Date: **2/21/2019 11:30 AM**
Client ID: Run ID: **WETCHEM_190221L** SeqNo: **5531698** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	ND	0.0050								

LCS Sample ID: **LCS-R255260-R255260** Units: **mg/L** Analysis Date: **2/21/2019 11:30 AM**
Client ID: Run ID: **WETCHEM_190221L** SeqNo: **5531699** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.2056	0.0050	0.2	0	103	91-113	0			

MS Sample ID: **1902900-05B MS** Units: **mg/L** Analysis Date: **2/21/2019 11:30 AM**
Client ID: **MW-WV-1** Run ID: **WETCHEM_190221L** SeqNo: **5531701** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.1455	0.0050	0.2	-0.0398	92.6	91-113	0			

MSD Sample ID: **1902900-05B MSD** Units: **mg/L** Analysis Date: **2/21/2019 11:30 AM**
Client ID: **MW-WV-1** Run ID: **WETCHEM_190221L** SeqNo: **5531702** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.1468	0.0050	0.2	-0.0398	93.3	91-113	0.1455	0.889	10	

The following samples were analyzed in this batch: 1902900-05B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Shealy Environmental Services, Inc.
Work Order: 1902900
Project: 16.0062677.80 T-1

QC BATCH REPORT

Batch ID: **R255306** Instrument ID **FS3100** Method: **OIA 1677**

MBLK Sample ID: **MB-R255306-R255306** Units: **µg/L** Analysis Date: **2/21/2019 03:30 PM**
Client ID: Run ID: **FS3100_190221A** SeqNo: **5532799** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Available	ND	2.0								

LCS Sample ID: **LCS-R255306-R255306** Units: **µg/L** Analysis Date: **2/21/2019 03:30 PM**
Client ID: Run ID: **FS3100_190221A** SeqNo: **5532800** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Available	46.33	2.0	50	0	92.7	82-132	0			

MS Sample ID: **1902952-02B MS** Units: **µg/L** Analysis Date: **2/21/2019 03:30 PM**
Client ID: Run ID: **FS3100_190221A** SeqNo: **5532806** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Available	68.54	2.0	50	19.2	98.7	82-130	0			

MSD Sample ID: **1902952-02B MSD** Units: **µg/L** Analysis Date: **2/21/2019 03:30 PM**
Client ID: Run ID: **FS3100_190221A** SeqNo: **5532807** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Available	70.36	2.0	50	19.2	102	82-130	68.54	2.62	11	

The following samples were analyzed in this batch: 1902900-03C 1902900-04C 1902900-05C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Shealy Environmental Services, Inc.
Work Order: 1902900
Project: 16.0062677.80 T-1

QC BATCH REPORT

Batch ID: **R255333** Instrument ID **WETCHEM** Method: **SW7196A**

MBLK Sample ID: **MB-R255333-R255333** Units: **mg/L** Analysis Date: **2/22/2019 11:00 AM**
Client ID: Run ID: **WETCHEM_190222C** SeqNo: **5533293** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	ND	0.0050								

LCS Sample ID: **LCS-R255333-R255333** Units: **mg/L** Analysis Date: **2/22/2019 11:00 AM**
Client ID: Run ID: **WETCHEM_190222C** SeqNo: **5533294** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.2006	0.0050	0.2	0	100	91-113	0			

MS Sample ID: **19021072-01C MS** Units: **mg/L** Analysis Date: **2/22/2019 11:00 AM**
Client ID: Run ID: **WETCHEM_190222C** SeqNo: **5533296** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.2056	0.0050	0.2	0.0053	100	91-113	0			

MSD Sample ID: **19021072-01C MSD** Units: **mg/L** Analysis Date: **2/22/2019 11:00 AM**
Client ID: Run ID: **WETCHEM_190222C** SeqNo: **5533297** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.2031	0.0050	0.2	0.0053	98.9	91-113	0.2056	1.22	10	

The following samples were analyzed in this batch: 1902900-06B 1902900-07B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Shealy Environmental Services, Inc.
Work Order: 1902900
Project: 16.0062677.80 T-1

QC BATCH REPORT

Batch ID: **R255634** Instrument ID **FS3100** Method: **OIA 1677**

MBLK Sample ID: **MB-R255634-R255634** Units: **µg/L** Analysis Date: **2/27/2019 04:00 PM**
Client ID: Run ID: **FS3100_190227B** SeqNo: **5539929** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Available	ND	2.0								

LCS Sample ID: **LCS-R255634-R255634** Units: **µg/L** Analysis Date: **2/27/2019 04:00 PM**
Client ID: Run ID: **FS3100_190227B** SeqNo: **5539930** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Available	44.88	2.0	50	0	89.8	82-132	0			

MS Sample ID: **19021325-03CMS** Units: **µg/L** Analysis Date: **2/27/2019 04:00 PM**
Client ID: Run ID: **FS3100_190227B** SeqNo: **5539937** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Available	50.34	2.0	50	-0.26	101	82-130	0			

MSD Sample ID: **19021325-03CMSD** Units: **µg/L** Analysis Date: **2/27/2019 04:00 PM**
Client ID: Run ID: **FS3100_190227B** SeqNo: **5539938** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Available	52.78	2.0	50	-0.26	106	82-130	50.34	4.73	11	

The following samples were analyzed in this batch: 1902900-06C 1902900-07C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

1902900

SHEALY

Chain of Custody Record

Shealy Environmental Services, Inc.
106 Vantage Point Drive
West Columbia, South Carolina 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111
www.shealylab.com

Number

Client	Report to Contact	Telephone No. / E-mail	Quote No.
Rose and Westra / GZA	Leslie Nelson	616-956-6123 leslie.nelson@gza.com	20986
Address: 601 Fifth Street NW, Suite 102	Sampler's Signature: X [signature]	Analysis (Attach list if more space is needed)	Page 1 of 1
City: Grand Rapids; State: MI; Zip Code: 49504	Printed Name: Jack Markosky		Laboratory Lot Number
Project Name: 16.00~~62335.02 T-2~~ 62677.80 T-1			
Project Number: 16.00~~62335.02 T-2~~ 62677.80 T-1	P.O No.		

Sample ID / Description (Containers for each sample may be combined on one line)	Date	Time	G=Grab C=Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	Matrix:	No of Containers by Preservative Type: Unpres.	H_2SO_4	HNO_3	HCl	NaOH/Zn Acetate	NaOH	MeOH	Acetic Acid	Formic Acid	Available Cyanide	Hexavalent Chromium (7199)						Remarks / Cooler I.D. ALS Water
MW-WV2S	2/19/2019	1225	G	x				4					1		x	x	x	x						
MW-WV2D	2/19/2019	1340	G	x				4					1		x	x	x	x						

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

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

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

QC Requirements

Relinquished by	Date	Time	Received by	Date	Time
1. Relinquished by Jack Markosky	2/19/2019	1100	1. Received by [signature]	2/19/19	1100
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by [signature]	2/19/19	1140	4. Laboratory Received by [signature]		

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

LAB USE ONLY
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Document Number: ME002OW-01

1902900

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Chain of Custody Record

Shealy Environmental Services, Inc.
106 Vantage Point Drive
West Columbia, South Carolina 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111
www.shealylab.com

Number

Client: **Rose and Westra / GZA**	Report to Contact: Leslie Nelson	Telephone No. / E-mail: 616-956-6123 leslie.nelson@gza.com	Quote No.: 20986
Address: 601 Fifth Street NW, Suite 102	Sampler's Signature: X	Analysis (Attach list if more space is needed)	Page: 1 of 1
City: Grand Rapids; State: MI; Zip Code: 49504	Printed Name: Jack Markosky		Laboratory Lot Number
Project Name: 16.0062335.02 T-2 62677.80 T-1			
Project Number: 16.0062335.02 T-2 62677.80 T-1; P.O No.			

Sample ID / Description (Containers for each sample may be combined on one line)	Date	Time	G=Grab C=Composite	Matrix: Aqueous	Solid	Non-Aqueous		No of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH/Zn Acetate	NaOH	MeOH	Acetic Acid	Formic Acid	Available Cyanide	Hexavalent Chromium (7199)						Remarks / Cooler I.D. ALS Water
MW-WV-2S	2/18/2019	1225	G	x				4					1		x	x	x	x						
MW-WV-2D	2/18/2019	1340	G	x				4					1		x	x	x	x						

Turn Around Time Required (Prior lab approval required for expedited TAT): ☒ Standard ☐ Rush (Please Specify)

Sample Disposal: ☐ Return to Client ☒ Disposal by Lab

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

QC Requirements

	Date	Time		Date	Time
1. Relinquished by Jack Markosky	2/19/2019	1100	1. Received by	2/19/19	1100
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by	2/19/19	1140	4. Laboratory Received by		

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

LAB USE ONLY
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Receipt Temp. 3.0 °C SR2

0

Document Number: ME002OW-01

1902900

SHEALY

Chain of Custody Record

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West Columbia, South Carolina 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111
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Number

Client: **Rose and Westra / GZA**	Report to Contact: Leslie Nelson	Telephone No. / E-mail: 616-956-6123 leslie.nelson@gza.com	Quote No.: 20986
Address: 601 Fifth Street NW, Suite 102	Sampler's Signature: X	Analysis (Attach list if more space is needed)	Page 1 of 1
City: Grand Rapids; State: MI; Zip Code: 49504	Printed Name: Jack Markosky		Laboratory Lot Number
Project Name: 16.0062677.80 T-1			
Project Number: 16.0062677.80 T-1; P.O No.:			

	Sample ID / Description (Containers for each sample may be combined on one line)	Date	Time	G=Grab C=Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	Matrix	Containers: Unpres.	H2SO4	HNO3	HCl	NaOH/Zn Acetate	NaOH	MeOH	Acetic Acid	Formic Acid	Available Cyanide	Hexavalent Chromium (7199)						Remarks / Cooler I.D. ALS Water
-3	MW-WV-6S	2/19/2019	1115	G	x				4					1		x	x	x	x						
4	MW-WV-6D	2/19/2019	1225	G	x				4					1		x	x	x	x						

Turn Around Time Required (Prior lab approval required for expedited TAT): ☒ Standard ☐ Rush (Please Specify)

Sample Disposal: ☐ Return to Client ☒ Disposal by Lab

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

QC Requirements

Relinquished by	Date	Time	Received by	Date	Time
1. Relinquished by Jack Markosky	2/20/2019	900	1. Received by	2/20/19	0900
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by	2/20/19	1055	4. Laboratory Received by		

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

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2

Document Number: ME002OW-01

1902900

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Chain of Custody Record

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West Columbia, South Carolina 29172
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Number

Client: **Rose and Westra / GZA**	Report to Contact: Leslie Nelson	Telephone No. / E-mail: 616-956-6123 leslie.nelson@gza.com	Quote No.: 20986
Address: 601 Fifth Street NW, Suite 102	Sampler's Signature: X	Analysis (Attach list if more space is needed)	Page 1 of 1
City: Grand Rapids; State: MI; Zip Code: 49504	Printed Name: Jack Markosky		Laboratory Lot Number
Project Name: 16.0062677.80 T-1			
Project Number: 16.0062677.80 T-1; P.O No.:			

	Sample ID / Description (Containers for each sample may be combined on one line)	Date	Time	G=Grab C=Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	Matrix:	No of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH/Zn Acetate	NaOH	MeOH	Acetic Acid	Formic Acid	Available Cyanide	Hexavalent Chromium (7199)					Remarks / Cooler I.D. ALS Water
5	MW-WV-1	2/20/2019	1450	G	x				4					1		x	x	x	x					

Turn Around Time Required (Prior lab approval required for expedited TAT): ☒ Standard ☐ Rush (Please Specify)	Sample Disposal: ☐ Return to Client ☒ Disposal by Lab	Possible Hazard Identification (List any known hazards in the remarks): ☒ Non-Hazardous ☐ Flammable ☐ Skin Irritant ☐ SDS provided ☐ Unknown	QC Requirements

Relinquished by	Date	Time	Received by	Date	Time
1. Relinquished by Jack Markosky	2/21/2019	0830	1. Received by	2/21/19	0830
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by	2/21/19	1000	4. Laboratory Received by		

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

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Receipt Temp. 3.4 °C SR2 PH15

1902900

SHEALY

Chain of Custody Record

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West Columbia, South Carolina 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111
www.shealylab.com

Number

Client: **Rose and Westra / GZA**	Report to Contact: Leslie Nelson	Telephone No. / E-mail: 616-956-6123 leslie.nelson@gza.com	Quote No.: 20986
Address: 601 Fifth Street NW, Suite 102	Sampler's Signature: X	Analysis (Attach list if more space is needed)	Page 1 of 1
City: Grand Rapids, State: MI, Zip Code: 49504	Printed Name: Jack Markosky		Laboratory Lot Number
Project Name: 16.0062677.80 T-1			
Project Number: 16.0062677.80 T-1	P.O No.		

	Sample ID / Description (Containers for each sample may be combined on one line)	Date	Time	G=Grab C=Composite	Matrix: Aqueous	Solid	Non-Aqueous		Unpres.	H2SO4	HNO3	HCl	NaOH/Zn Acetate	NaOH	MeOH	Acetic Acid	Formic Acid	Available Cyanide	Hexavalent Chromium (7199)						Remarks / Cooler I.D. ALS Water
6	MW-WV-9	2/21/2019	1130	G	x				4					1		x	x	x	x						
7	MW-WV-4	2/21/2019	1455	G	x				4					1		x	x	x	x						

Turn Around Time Required (Prior lab approval required for expedited TAT): ☒ Standard ☐ Rush (Please Specify)

Sample Disposal: ☐ Return to Client ☒ Disposal by Lab

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

QC Requirements

	Date	Time		Date	Time
1. Relinquished by Jack Markosky	2/22/2019	0900	1. Received by	2/22/19	0900
2. Relinquished by	2/22/19	1040	2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by			4. Laboratory Received by		

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

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Receipt Temp. 2.0 °C 8R2

2 pH 15

Document Number: ME002OW-01

ALS Group, USA

Sample Receipt Checklist

Client Name: **SHEALYENV** Date/Time Received: **19-Feb-19 11:40**

Work Order: **1902900** Received by: **DS**

Checklist completed by Diane Shaw 19-Feb-19 Reviewed by: Chad Whelton 19-Feb-19
eSignature Date eSignature Date

Matrices: Aqueous
Carrier name: ALSHN

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Sample(s) received on ice?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	3.0/3.0 c	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:			
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:	-		

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction: