Rose & Westra
A Division of GZA

GEOTECHNICAL
ENVIRONMENTAL
ECOLOGICAL
WATER
CONSTRUCTION MANAGEMENT

The Widdicomb Building
601 Fifth Street NW
Suite 102
Grand Rapids, MI 49504
T: 616.956.6123
F: 616.288.3327
www.rosewestra.com
www.gza.com

Sent Via Email: hendershotta@michigan.gov

File No. 16.0062335.00
November 8, 2017

Ms. Abigail Hendershott
Acting District Supervisor – Remediation and Redevelopment Division
Michigan Department of Environmental Quality
350 Ottawa Avenue NW #10
Grand Rapids, MI 49503

Re: Wolverine World Wide, Inc. - Former Tannery
123 North Main Street, Rockford, Michigan

Dear Ms. Hendershott:

Pursuant to our December 2016 Scope of Work (revised August 2017) and Michigan Department of Environmental Quality's (MDEQ) November 2, 2017 letter to Wolverine World Wide, Inc. (Wolverine); Rose & Westra, a Division of GZA GeoEnvironmental, Inc. (R&W/GZA) provides the 2017 sampling data as well as interim work plan on behalf of Wolverine.

The following data transmittal and work plan presents the analytical results and preliminary data interpretations for samples collected in late August through mid-October 2017 as well as interim tasks to commence in November 2017. Some interpretations are based on more limited data sets than others and are, therefore, more preliminary in nature. This document is not intended to be a comprehensive data summary or substitute for the remedial investigation work plan MDEQ requested in its November 2, 2017 letter to Wolverine.

EXECUTIVE SUMMARY

Sampling Conducted at Site

In August through October 2017, R&W/GZA sampled 10 existing monitoring wells, collected 10 surface water samples and 19 "pore water" samples from and proximate to Wolverine's former tannery. Several other surface water samples were collected from the river some distance from the former tannery.

The objectives were:

- Collect and analyze annual groundwater samples from monitoring wells situated along the Rogue River and Rum Creek banks to assess groundwater quality variations and trends.

- Collect and analyze pore water samples from the Rogue River and Rum Creek banks to further assess ammonia venting from the groundwater to the surface water bodies, a continuation of the prior analysis of ammonia.

- Test groundwater, pore water, and surface water for perfluoroalkyl substances (PFAS), including but not limited to perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS).

The study met all objectives.

Refer to Rose & Westra, Inc.'s (R&W) April 27, 2016, *December 2015 Pore Water Investigation, Former Wolverine World Wide Tannery, 123 North Main Street, Rockford, Michigan* report for additional background and results of prior tannery investigations.

Results and Next Steps

The test results suggest the following:

- PFAS, including PFOA and PFOS, were measured in groundwater, pore water, and surface water samples. At Wolverine's request, R&W/GZA modified the prior work plan and tested samples from all 10 monitoring wells sampled for other constituents (i.e., tested more monitoring wells for PFAS than the work plan required). Groundwater samples from the monitoring wells ranged in concentration from 12,700 ng/l (approximately parts per trillion) to a single high spot of 490,000 ng/l for PFOA and PFOS which exceed the U.S. Environmental Protection Agency's (EPA) Drinking Water Health Advisory value (70 ng/l, approximately parts per trillion). This groundwater is not used for drinking water. Additionally, as stated in prior documents, Wolverine intends to place land use restrictions on the Site to prevent future use of groundwater for human consumption. Therefore, their presence in the groundwater at the Site does not pose an ingestion risk to human health.

- Because the horizontal and vertical extent of PFOA and PFOS in the groundwater is not known to the south, Wolverine proposes two new monitoring well nests along its southern property line.

- Sampling for inorganic constituents other than PFAS was done as part of the ongoing annual monitoring program. The results for those constituents are largely consistent with past testing and are summarized in the text of this report.

Next steps for further evaluation and interim remedy:

- Install two new monitoring well nests along the southern property line. We expect drilling to commence on or about November 20, 2017.

- Wolverine expects to begin removing hides, leather, other debris mixed with the hide material in November.

- Wolverine will submit a Work Plan to further characterize PFAS at the tannery site, Rogue River, and Rum Creek on or before November 27, 2017.

GROUNDWATER SAMPLING, TESTING, AND DATA SUMMARY

R&W/GZA measured groundwater elevations on August 31, 2017 (summarized on Table 1) and collected samples from 10 existing monitoring wells on August 31 and September 1, 2017 (refer to Figure 1). Excepting procedures to minimize potential cross-contamination with perfluoroalkyl substances PFAS, the groundwater samples were collected with the same techniques as prior years (refer the April 2016 Pore Water report and other submittals for more details about the sampling techniques and selected analytes.) The groundwater samples were tested for ammonia-nitrogen, arsenic, barium, cadmium, chromium (hexavalent and total), copper, iron, lead, silver, vanadium,

and zinc by Bio-Chem Laboratories, Inc. (Bio-Chem; Grand Rapids, Michigan.) These analytes had all been previously identified in groundwater at concentrations greater than GRCC.

Based on information presented to Wolverine in fall 2016, separate sample aliquots were collected and shipped to ALS Environmental (ALS; Kelso, Washington) which used a laboratory-modified US EPA Method 537 to test for 23 PFAS in the groundwater samples. The laboratory modifications allow ALS to report more analytes than Method 537 without modifications.

Attachment A presents the groundwater laboratory reports.

Table 2 presents CAS numbers, Part 201 GRCC (where available) and U.S. EPA's lifetime drinking water screening values PFAS are reported in ng/l (approximately parts per trillion): all other analytes are reported in µg/l (approximately parts per billion) on the tables and figures.

Excepting silver, all inorganic analytes were present in one or more wells at concentrations greater than GRCC. Tables 3a and 3b present time series results for the groundwater data. In general, the slight downward trends in groundwater concentrations continue, a few anomalies noted are:

- Total and hexavalent chromium were identified in TMW-101 in the 60 µg/l range. The does not appear significant for site characterization or environmental risk.

- Arsenic concentrations were lower, but ammonia concentrations were higher in TMW-110. This is discussed further below.

Ammonia concentrations in groundwater south of Rum Creek were all lower than (MW-5 and P-3) or within the range of prior data (MW-304A, TMW-105, P-2, and TMW-101). Ammonia concentrations in groundwater north of Rum Creek were greater than (MW-306A and TWM-110A) or within the range of prior data (MW-307A). The highest ammonia concentrations were north of Rum Creek (TMW-110 2,300,000 µg/l), along Rum Creek (MW-307A 37,000 µg/l) and near the former wastewater treatment plant (P-2 48,000 µg/l). Figure 1 summarizes the total ammonia concentration by well location.

Groundwater samples ranged in concentration from 12,700 ng/l (approximately parts per trillion) to a single high of 490,000 ng/l for PFOA and PFOS which exceed EPA's Drinking Water Health Advisory value. This groundwater is not used for drinking water. Additionally, as stated in prior documents, Wolverine intends to place land use restrictions on the Site to prevent future use of groundwater for human consumption. Therefore, their presence in the groundwater at the Site does not pose an ingestion risk to human health.

SURFACE WATER

R&W/GZA collected four surface water samples from Rum Creek and six from the Rogue River between September 13 through 15, 2017. Bio-Chem tested all 10 for ammonia and ALS tested the two background samples (SW-17-10 from Rum Creek and SW-17-4 from the Rogue River) for PFAS. Table 4 presents the pore water field measurements. Ammonia concentrations are reported as calculated unionized ammonia concentrations because aquatic toxicity (and therefore Part 201 GSI criteria) are based on unionized ammonia. Table 5 summarizes surface water and pore water ammonia concentrations. Figure 2 presents the areal extent of unioinized ammonia concentrations based on MDEQ's standard cold-water conditions (pH=8/T=68°F) and includes pore water results from 2015 for comparison.

Upstream/background ammonia concentrations were negligible. The highest unionized ammonia concentration in surface water was 4 µg/l at SW-17-1, northwest of TMW-110. This is significantly less than the Part 201 GSI value (29 µg/l) for cold water streams.

SW-17-10, the Rum Creek upstream/background sample contained PFOA and PFOS (6.3 and 13 ng/l, respectively.) SW-17-14, the Rogue River upstream/background sample contained PFOA and PFOS (4.4 and 7.6 ng/l, respectively.) Attachment B presents the laboratory reports for the surface water and pore water samples.

On October 17, 2017, R&W/GZA collected eight additional surface water samples from the Rogue River for PFAS testing only. These were collected upstream and downstream from the former tannery location (refer to Figure 4 and Table 6). One sample from was collected at locations SW-17-100 and SW-17-101 which are upstream from the tannery. While collected on different days and at different locations, the Rogue River upstream/background PFOA+PFOS concentrations varied between Samples SW-17-4 (12 ng/l) and SW-17-101 (6.7 ng/l). SW-17-4 could, however, be affected from groundwater venting from the northwesternmost area of the former tannery.

Because the Rogue River is deeper at the locations further from the former tannery, R&W/GZA collected two samples at locations SW-17-102, SW-17-103, and SW-17-104. Attachment C presents the laboratory reports for these eight samples.

While limited data is currently available, R&W/GZA estimated the PFOS flux from groundwater at the former tannery into the Rogue River. MDEQ's Surface Water Information System (SWIM) reports D90 Q10 low flows for Rum Creek and the Rogue River are 2,600,000 gallons per day (gpd) and 61,000,000 gpd, respectively. Table 7 summarizes calculated groundwater flux from the former tannery site to the streambeds:

Table 7
Estimated Groundwater Flux

Site Area	**Est. Flux (gpd)**
Rum Creek – North	130
Rogue River – North	130
Rum Creek – South	310
Rogue River – South	510
Rum Creek – Total	440
Rogue River – Total	640

Taking average PFOS concentrations for monitoring wells with the four geographic divisions presented in Table 7 and assuming the Rogue River is mixed at the Rockford Dam, the PFOA+PFOS flux from the former tannery site results in approximately 1.6 ng/l concentration increase in the Rogue River. The measured difference on October 17, 2017 between samples SW-17-101 and SW-17-102 (average of two samples) was 2.8 ng/l. Obviously, the actual flux and completely mixed, incremental PFOA+PFOS concentrations will vary significantly with actual surface water elevations (and therefore groundwater flux to the surface waters) and stream flows. Using the low flow conditions is, however,

conservative. R&W/GZA will revise these estimates as more groundwater and surface water monitoring data become available.

PORE WATER

From September 13 through 15, 2017 R&W/GZA collected 7 pore water samples from Rum Creek and 13 from the Rogue River. All samples were collected with the Henry Sampler and no samples were collected unless an upward hydraulic gradient was measured between the pore water and surface water.

In general, the highest pore water unionized ammonia concentrations occurred in the same areas identified in prior pore water sampling, i.e. Rum Creek, the Rogue River north of Rum Creek and the Rogue River west of the former wastewater treatment plant (see Figure 2). Higher unionized ammonia pore water concentrations were found at location PW-17-9 (300 to 450 µg/l) essentially between groundwater monitoring wells MW-306A and TMW-105. While prior attempts had been made, this area had not been successfully tested previously. Pore water samples from other areas were generally similar, i.e. within a factor of two for similar locations.

Nine pore water samples from Rogue River and six from Rum Creek were also tested for PFAS (Figure 3). The highest PFOA+PFOS pore water concentrations were in Rum Creek at PW-17-9 where the highest unionized ammonia concentrations were also measured. The highest pore water concentrations in the Rogue River are west of the former wastewater treatment plant. Interesting, lower PFOA+PFOS concentrations were at PW-17-7 southwest of TMW-101 which had the highest PFOA/PFOS concentration in the groundwater. The pore water and groundwater PFOA+PFOS concentrations suggest further investigation is warranted, particularly in groundwater south and southeast of TMW-101.

INTERIM WORK PLAN

R&W/GZA will coordinate and observe installing two new monitoring well nests along the southern property line. The monitoring wells will be installed and constructed using the same techniques are previous monitoring wells. We expect drilling to commence on or about November 20, 2017.

Recapping, Wolverine will perform the following actions:

- Install two new monitoring well nests along the southern property line. We expect drilling to commence on or about November 20, 2017.
- Wolverine expects to begin removing hides, leather, other debris mixed with the hide material in November.
- Wolverine will submit a Work Plan to further characterize PFAS at the tannery site, Rogue River, and Rum Creek on or before November 27, 2017.

Very truly yours,

Rose & Westra, a Division of GZA GeoEnvironmental, Inc.

Mark A. Westra
Associate Principal

Loretta J. Powers
Project Manager/Consultant Reviewer

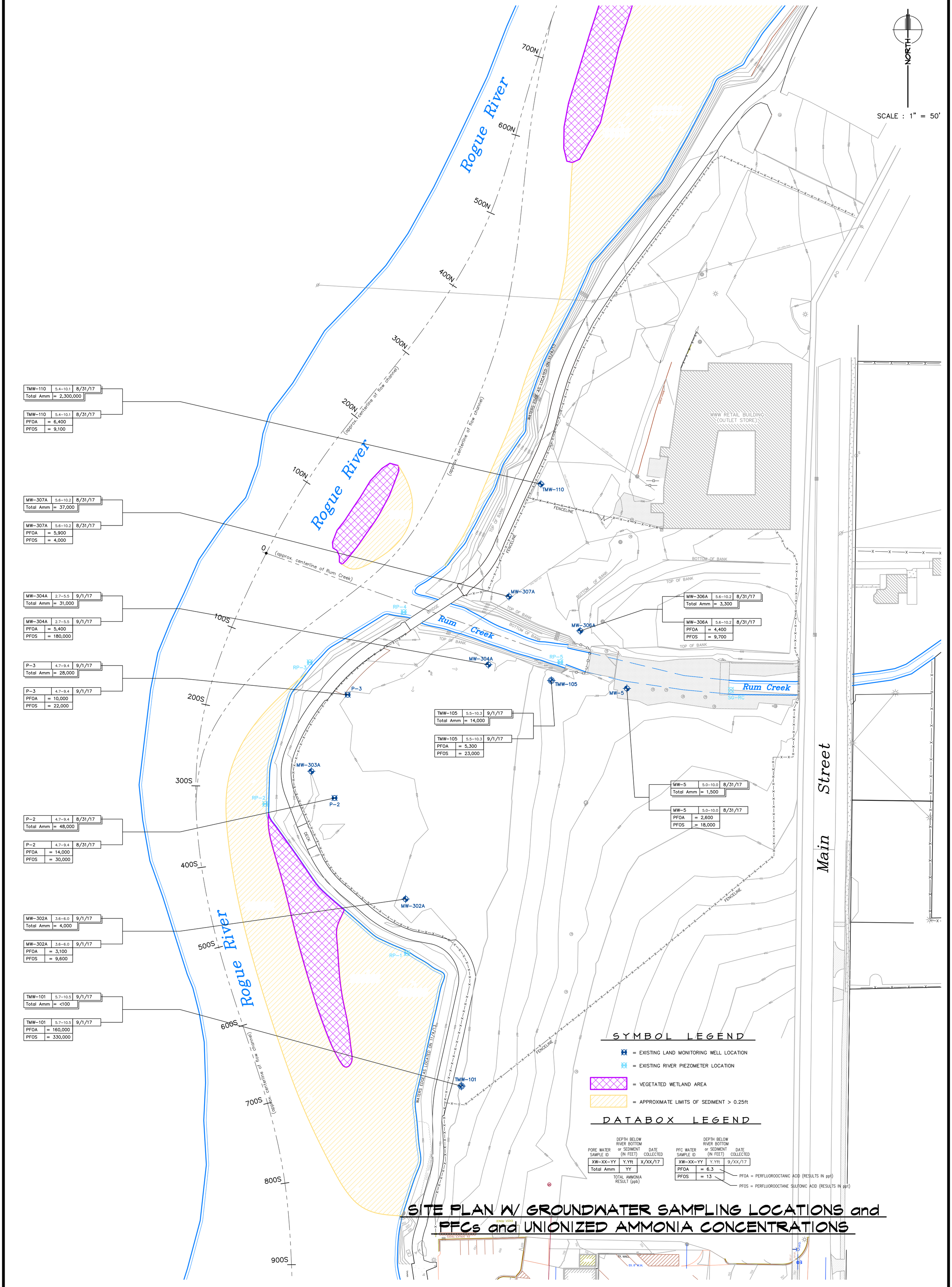
maw/ljp

Attachments

c/enc: Mr. Dave Latchana – Wolverine World Wide, Inc. *via email David.Latchana@wwwinc.com*
Mr. John V. Byl – Warner Norcross & Judd LLP *via email* jbyl@wnj.com

J:\62000\623xx\62335.00 WWW – Tannery\02Report\Interim_Submittal

Figures



SITE PLAN W/ GROUNDWATER SAMPLING LOCATIONS and PFCs and UNIONIZED AMMONIA CONCENTRATIONS

1 OF 3

PROJECT NO. 16.0062335.00

SHEET NO.

ROSE & WESTRA, INC.
ENVIRONMENTAL CONSULTANTS
Grand Rapids, Michigan

WOLVERINE WORLD WIDE
FORMER TANNERY, ROCKFORD, MICHIGAN
2017 INVESTIGATION

NO.	REVISIONS	BY	DATE

REVISED IN ACCORDANCE WITH CONSTRUCTION RECORDS

FILE NO.: 62335_GWI

DRAWN BY: KJB
DESIGN BY: MAW
DATE: 11/8/17

PW–15–10B	2.0ft	12/10/15
Cold Water	= 38	
PW–15–9A	0.5ft	12/10/15
Cold Water	= 35	
PW–15–9B	1.3ft	12/10/15
Cold Water	= 28	
SW–17–4	NA	9/13/17
Cold Water	= 2	
PW–17–3A	0.5	9/13/17
Cold Water	= 94	
PW–17–3B	1.5	9/13/17
Cold Water	= 87	
PW–17–2A	0.4	9/13/17
Cold Water	= 66	
PW–17–2B	1.4	9/13/17
Cold Water	= 41	
PW–17–1A	0.5	9/12/17
Cold Water	= 88	
PW–17–1B	1.6	9/12/17
Cold Water	= 32	
SW–17–1	NA	9/12/17
Cold Water	= 4	
PW–15–6B	1.8ft	12/9/15
Cold Water	= 46	
PW–15–7B	1.5ft	12/9/15
Cold Water	= 21	
PW–15–5B	1.5ft	12/8/15
Cold Water	= 160	
PW–15–4A	0.5ft	12/8/15
Cold Water	= 35	
PW–15–4B	1.8ft	12/8/15
Cold Water	= 34	
PW–17–12A	0.5	9/15/17
Cold Water	= 115	
SW–17–12A	NA	9/15/17
Cold Water	= 1	
PW–15–11(b)D	1.8ft	12/17/15
Cold Water	= 60	
PW–15–12B	0.5ft	12/10/15
Cold Water	= 171	
PW–15–13A	0.5ft	12/11/15
Cold Water	= 102	
PW–15–13B	1.5ft	12/11/15
Cold Water	= 106	
PW–17–5A	0.5	9/13/17
Cold Water	= 115	
PW–17–5B	1.9	9/13/17
Cold Water	= 186	
SW–17–5A	NA	9/13/17
Cold Water	= 2	
PW–15–28A	0.5ft	12/16/15
Cold Water	= 4	
PW–15–28AD	0.4ft	12/16/15
Cold Water	= 6	
PW–15–28B	1.4ft	12/16/15
Cold Water	= 4	
PW–17–6A	1.1	9/14/17
Cold Water	= 43	
PW–17–6B	2.1	9/14/17
Cold Water	= 60	
SW–17–6A	NA	9/14/17
Cold Water	= 0	
PW–15–17B	1.5ft	12/11/15
Cold Water	= 34	
PW–15–16B	1.5ft	12/11/15
Cold Water	= 41	
PW–15–19A	0.5ft	12/15/15
Cold Water	= 47	
PW–15–19B	1.5ft	12/15/15
Cold Water	= 54	
PW–15–23A	0.1ft	12/15/15
Cold Water	= 39	
PW–15–23B	0.4ft	12/15/15
Cold Water	= 36	
PW–15–24A	0.3ft	12/15/15
Cold Water	= 57	
PW–15–24B	0.7ft	12/15/15
Cold Water	= 64	
PW–15–27A	0.8ft	12/16/15
Cold Water	= 24	
PW–15–27B	0.8ft	12/16/15
Cold Water	= 34	
PW–17–7A	2.3	9/14/17
Cold Water	= 31	
PW–17–7B	3.3	9/14/17
Cold Water	= 37	
SW–17–7	NA	9/14/17
Cold Water	= 2	
PW–15–29A	0.5ft	12/16/15
Cold Water	= 58	
PW–15–29B	1.0ft	12/16/15
Cold Water	= 34	

PW–15–32B	2.0ft	12/17/15
Cold Water	= 230	
PW–17–11A	5.0	9/15/17
Cold Water	= 164	
SW–17–11A	NA	9/15/17
Cold Water	= 2	
PW–17–9A	1.6	9/15/17
Cold Water	= 307	
PW–17–9B	2.3	9/15/17
Cold Water	= 456	
SW–17–9	NA	9/15/17
Cold Water	= 3	
PW–15–30B	1.5ft	12/17/15
Cold Water	= 0	
PW–17–8A	5.5	9/14/17
Cold Water	= 22	
PW–17–8B	3.3	9/14/17
Cold Water	= 211	
PW–17–8C	5.7	9/14/17
Cold Water	= 33	
SW–17–8	NA	9/14/17
Cold Water	= 3	
SW–17–10	NA	9/15/17
Cold Water	= 1	

Rogue River

Rum Creek

Main Street

700N 600N 500N 400N 300N 200N 100N 0 100S 200S 300S 400S 500S 600S 700S 800S 900S

(approx. centerline of flow channel)

(approx. centerline of Rum Creek)

WATERS EDGE AS LOCATED ON 11/4/13

WWW RETAIL BUILDING (OUTLET STORE)

FENCELINE TOP OF BANK BOTTOM OF BANK BRIDGE DECK

PW–17–12 PW–15–11(b)–D PW–15–12A PW–15–12B PW–15–13A PW–15–13B PW–17–5A PW–17–5B PW–17–1A PW–17–1B PW–17–2A PW–17–2B PW–17–3A PW–17–3B PW–17–4A PW–17–4B PW–17–5A PW–17–5B PW–17–6A PW–17–6B PW–17–7A PW–17–7B PW–17–8A PW–17–8B PW–17–8C PW–15–4A PW–15–4B PW–15–5A PW–15–5B PW–15–6A PW–15–6B PW–15–7A PW–15–7B PW–15–8A PW–15–8B PW–15–9A PW–15–9B PW–15–10A PW–15–10B PW–15–16A PW–15–16B PW–15–17A PW–15–17B PW–15–19A PW–15–19B PW–15–23A PW–15–23B PW–15–24A PW–15–24B PW–15–27A PW–15–27B PW–15–28A PW–15–28B PW–15–29A PW–15–29B PW–15–30A PW–15–30B SW–17–4 SW–17–8 SW–17–10

RP–1 RP–2 RP–3 RP–4 RP–5 P–2 P–3

MW–302A MW–303A MW–304A MW–306A MW–307A TMW–101 TMW–105 TMW–110 MW–5

SCALE : 1” = 50’

NORTH

SYMBOL LEGEND

- = PORE WATER SAMPLING LOCATION
- = EXISTING LAND MONITORING WELL LOCATION
- = EXISTING RIVER PIEZOMETER LOCATION
- = VEGETATED WETLAND AREA
- = APPROXIMATE LIMITS OF SEDIMENT > 0.25ft

DATABOX LEGEND

PW = PORE WATER
SW = SURFACE WATER

WATER SAMPLE ID	DEPTH BELOW RIVER BOTTOM or SEDIMENT (IN FEET)	DATE COLLECTED
XW–XX–YY	Y.Yft	9/XX/17
Cold Water	YY	

UNIONIZED AMMONIA RESULT (ppb)

SITE PLAN W/ PORE WATER SAMPLING LOCATIONS and UNIONIZED AMMONIA CONCENTRATIONS

2 OF 3 SHEET NO.

16.0062335.00 PROJECT NO.

ROSE & WESTRA, INC.
ENVIRONMENTAL CONSULTANTS
Grand Rapids, Michigan

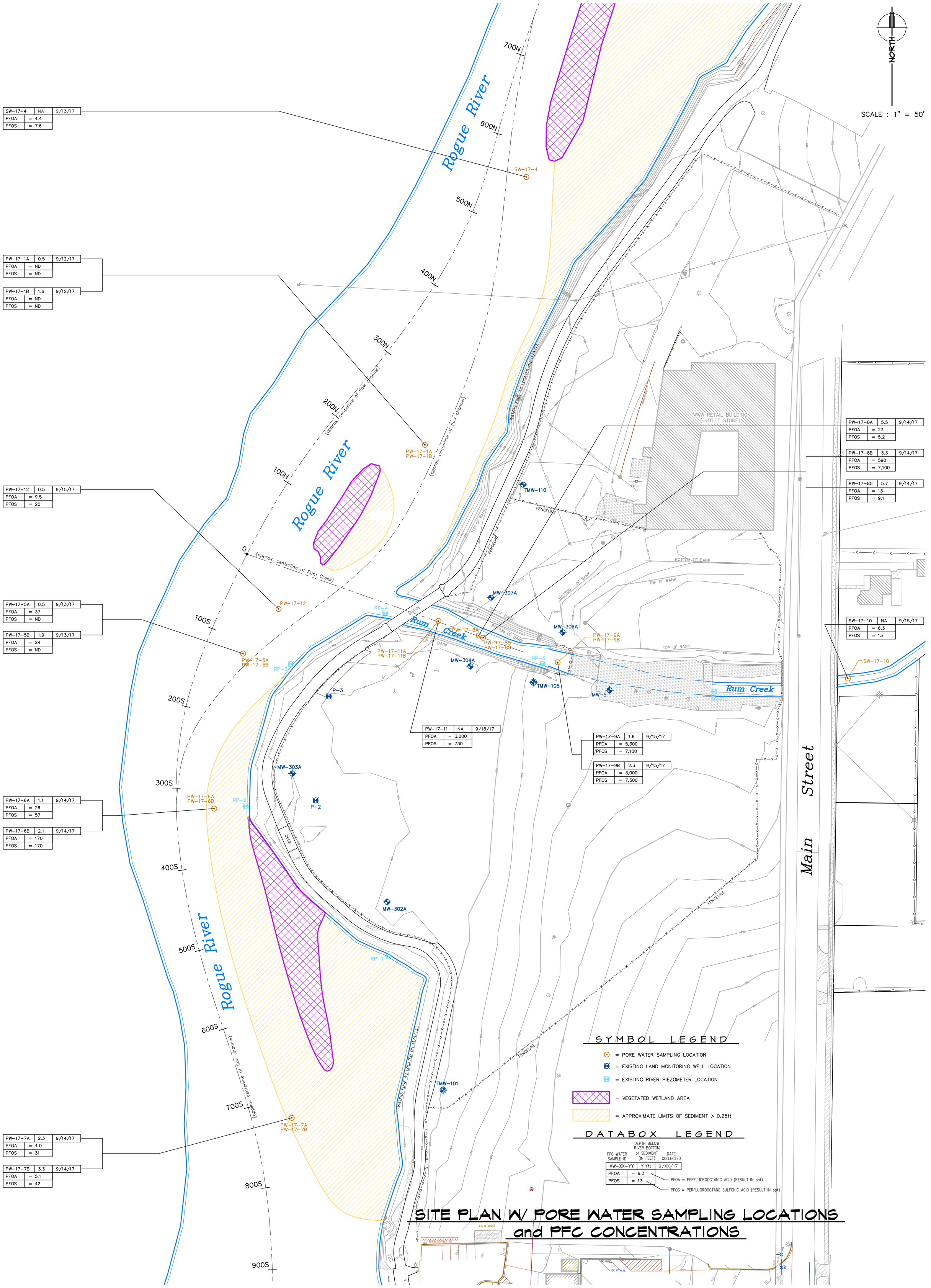
WOLVERINE WORLD WIDE
FORMER TANNERY, ROCKFORD, MICHIGAN
2017 INVESTIGATION

NO.	REVISIONS	BY	DATE

REVISED IN ACCORDANCE WITH CONSTRUCTION RECORDS

FILE NO.: 62335_PLAN4

DRAWN BY KJB
DESIGN BY MAW
DATE 11/8/17



SITE PLAN W/ PORE WATER SAMPLING LOCATIONS and PFC CONCENTRATIONS

3 OF 3 — SHEET NO.

16.0062335.00 — PROJECT NO.

ROSE & WESTRA, INC.
ENVIRONMENTAL CONSULTANTS
Grand Rapids, Michigan

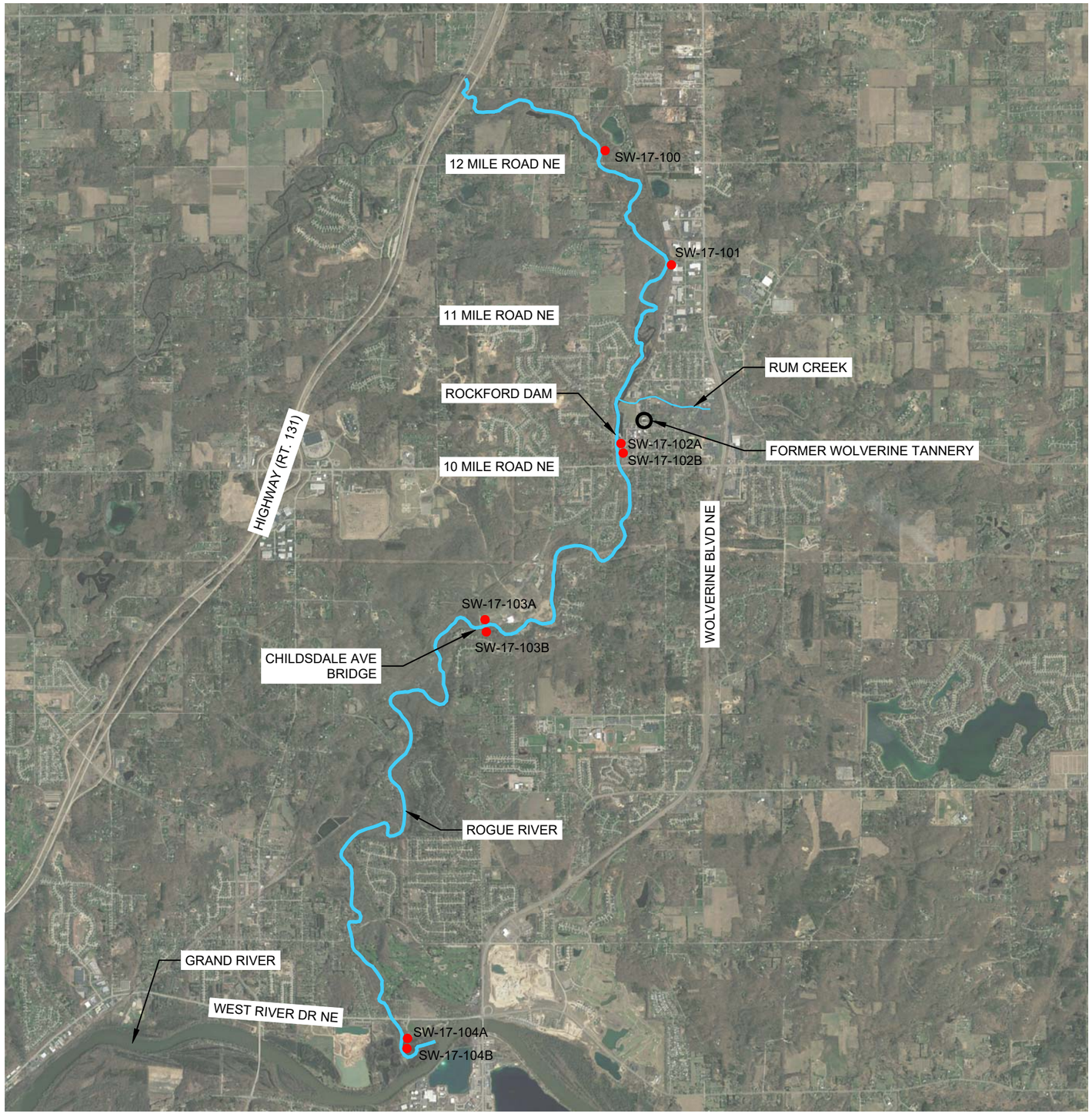
WOLVERINE WORLD WIDE
FORMER TANNERY, ROCKFORD, MICHIGAN
2017 INVESTIGATION

NO.	REVISIONS	BY	DATE

REVISED IN ACCORDANCE WITH CONSTRUCTION RECORDS

FILE NO.: 62335_PWT_PFC

DRAWN BY: KJB
DESIGN BY: MAW
DATE: 11/8/17



REFERENCE NOTES:

1. BASE MAP DEVELOPED FROM A GOOGLE PROFESSIONAL ELECTRONIC IMAGE FILE. DIGITAL AERIAL ORTHOPHOTOGRAPHY WAS PUBLISHED ON APRIL 2016.

LEGEND:

- SURFACE WATER SAMPLE
- ROGUE RIVER

ANALYTICAL SUMMARY

Sample Number	Sample Location	PFOS & PFOA (parts per trillion)
SW-17-100	North of 12 Mile Rd; ½ across from east side	6.2
SW-17-101	West of White Pine Trail observation deck; ½ across from east side	6.7
SW-17-102A&B	South of Bridge Street, ¼ across from west side	9.6 (ave)
SW-17-103A&B	East of Childsdale bridge, both sides of channel	14.8 (ave)
SW-17-104A&B	North of final bend before Grand River; ¾ across from east side	16.5 (ave)

N
W E
S

0 2000' 4000' 8000'
SCALE IN FEET: 1"=4000'

NO.	ISSUE/DESCRIPTION	BY	DATE

SURFACE WATER SAMPLES
ROGUE RIVER - ROCKFORD, MICHEGAN

2017 INVESTIGATION

PREPARED BY:
GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR:

PROJ MGR: MAW	REVIEWED BY: JTM	CHECKED BY: MEA	FIGURE 4
DESIGNED BY: -	DRAWN BY: GRB	SCALE: AS NOTED	
DATE: NOVEMBER 2017	PROJECT NO. 16.0062335.00	REVISION NO. 0	SHEET NO. 1 OF 1

Tables

TABLE 1
FORMER WWW TANNERY STATIC WATER LEVELS
August 31, 2017
123 North Main Street
Rockford, Michigan

Well Number	Top of Casing Elevation (USGS Datum)	Depth to Water	Static Water Elevation (USGS Datum)
P-1	693.78	2.91	690.87
P-2	693.43	2.39	691.04
P-3	693.80	2.61	691.19
P-4	693.87	2.82	691.05
P-5	699.66	5.78	693.88
MW-1	694.18	3.08	691.10
MW-2	694.42	3.44	690.98
MW-3	697.09	5.66	691.43
MW-4	697.40	5.92	691.48
MW-5	696.52	5.13	691.39
MW-301B	694.66	3.31	691.35
MW-302A	693.85	3.02	690.83
MW-302B	693.87	2.75	691.12
MW-303A	693.68	3.05	690.63
MW-303B	693.67	2.49	691.18
MW-303C	693.54	2.39	691.15
MW-304A	693.70	2.63	691.07
MW-304B	693.69	2.34	691.35
MW-305B	696.59	5.17	691.42
MW-305C	696.59	5.19	691.40
MW-306A	696.24	4.69	691.55
MW-306B	696.21	4.79	691.42
MW-307A	696.24	4.96	691.28
MW-307B	696.22	4.93	691.29
MW-308A	695.89	4.44	691.45
MW-308B	695.93	4.39	691.54
MW-308C	695.85	4.51	691.34
TMW-101	694.72	3.15	691.57
TMW-102	696.15	4.89	691.26
TMW-103	698.75	5.47	693.28
TMW-104	699.99	6.35	693.64
TMW-105	696.23	4.97	691.26
TMW-108	696.44	5.16	691.28
TMW-109	696.81	5.30	691.51
TMW-110	696.42	5.10	691.32
TMW-111	696.23	4.96	691.27

TABLE 2
SUMMARY of 2017 GROUNDWATER ANALYTICAL DATA
Former Wolverine Worldwide Tannery
123 North Main Street
Rockford, Michigan

	Hazardous Substance	Chemical Abstract Service (CAS) Number	Residential Drinking Water Criteria (DWC)	Non Residential Drinking Water Criteria (DWC)	Groundwater Surface Water Interface Criteria (GSIC)	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria (GVIAIC)	Groundwater Contact Criteria (GCC) (AA)	P-2	P-3	Dup-3 (P-3)	Dup-4 (P-3)	MW-5	MW-302A	MW-304A	MW-306A	MW-307A	Dup-2 (MW-307A)	TMW-101	TMW-105	TMW-110
								4.7-9.4 ft	4.7-9.3 ft	4.7-9.3 ft	4.7-9.3 ft	5.0-10.0 ft	3.6-6.0 ft	2.7-5.5 ft	5.6-10.2 ft	5.6-10.2 ft	5.6-10.2 ft	5.7-10.5 ft	5.5-10.3 ft	5.4-10.1 ft
								8/31/2017	9/1/2017	9/1/2017	9/1/2017	8/31/2017	9/1/2017	9/1/2017	8/31/2017	8/31/2017	8/31/2017	9/1/2017	9/1/2017	8/31/2017
Metals	Arsenic	7440382	10 (A)	10 (A)	10	NLV	4,300	<5.0	<5.0	<5.0	NT	<5.0	5.5	5.5	<5.0	<5.0	NT	<5.0	<5.0	***150***
	Barium (B)	7440393	2,000 (A)	2,000 (A)	670 (G)	NLV	14,000,000	120	150	150	NT	<100	190	190	130	<100	NT	<100	<100	**700**
	Cadmium (B)	7440439	5.0 (A)	5.0 (A)	3.0 (G,X)	NLV	190,000	<0.50	<0.50	<0.50	NT	<0.50	<0.50	<0.50	<0.50	**4.5**	NT	<0.50	<0.50	<0.50
	Chromium (VI)	18540299	100 (A)	100 (A)	11	NLV	460,000	<10	<10	<10	NT	<10	<10	<10	11	<10	NT	**63**	<10	<25
	Chromium (total) (B,H)	Varies	100 (A)	100 (A)	11	NLV	460,000	<10	<10	<10	NT	<10	<10	***140***	<10	***720***	NT	**64**	<10	***6,800***
	Copper (B)	7440508	1,000 (E)	1,000 (E)	13 (G)	NLV	7.4E+06	<4.0	<4.0	<4.0	NT	<4.0	<4.0	<4.0	<4.0	**33**	NT	<4.0	<4.0	<4.0
	Iron (B)	7439896	300 (E)	300 (E)	NA	NLV	5.8E+07	*14,000*	*13,000*	*14,000*	NT	*4,300*	*5,600*	*2,300*	*16,000*	*600*	NT	<200	*2,100*	*6,800*
	Lead (B) - Total	7439921	4.0 (L)	4.0 (L)	16 (G,X)	NLV	ID	<3.0	<3.0	<3.0	NT	<3.0	<3.0	<3.0	<3.0	*6.0*	NT	<3.0	*9.0*	<3.0
	Silver (B)	7440224	34	98	0.2 (M); 0.06	NLV	1.5E+06	<0.50	<0.50	<0.50	NT	<0.50	<0.50	<0.50	<0.50	<0.50	NT	<0.50	<0.50	<0.50
	Vanadium	7440622	4.5	62	27	NLV	970,000	<4.0	<4.0	<4.0	NT	<4.0	<4.0	16	<4.0	<4.0	NT	<4.0	<4.0	**36**
	Zinc (B)	7440666	2,400	5,000 (E)	170 (G)	NLV	1.1E+08	30	<20	<20	NT	<20	<20	<20	<20	**1,300**	NT	<20	<20	<20
Other	Ammonia	7664417	10,000 (N)	10,000 (N)	(CC)	3.2E+06	ID	*48,000*	*28,000*	*27,000*	NT	1,500	4,000	*31,000*	3,300	*37,000*	NT	<100	*14,000*	*2,300,000*
	Unionized Ammonia (calculation assumes 20°C)		NA	NA	29 (G)	NA	NA	**445**	**63**	**61**	NT	10	24	**443**	**58**	**83**	NT	1	**149**	**57,800**

Notes:

All units in µg/l (parts per billion).

Underline	= Value exceeds the Residential Drinking Water Criteria.
Italics	= Value exceeds the Non-Residential Drinking Water Criteria.
Bold	= Value exceeds the Groundwater Surface Water Interface Protection Criteria.
NA	= Criterion or value is not available or not applicable.
< XXX	= The concentration of the hazardous substance does not exceed its method detection limit (XXX).
ID	= Insufficient data to develop criterion.
NLV	= Hazardous substance is not likely to volatilize under most conditions.
NT	= Not Tested

(A)= Criterion is the state of Michigan drinking water standard established pursuant to Section 5 of 1976 PA 399, MCL 325.1005.

(B)= Background, as defined in MCL 324.20101(1)(e), may be substituted if higher than the calculated cleanup criterion. Background levels may be less than criteria for some inorganic compounds.†

(E)= Criterion is the aesthetic drinking water value, as required by Section 20120a(5) of NREPA. Health based criteria may be used under certain conditions. †

(G)= Groundwater surface water interface (GSI) criterion depends on the pH or water hardness, or both, of the receiving surface water. A hardness of 150 mg CaCO3/L was used to calculate this criteria.†

(H)= Valence-specific chromium data (Cr III and Cr VI) shall be compared to the corresponding valence-specific cleanup criteria. If analytical data are provided for total chromium only, they shall be compared to the cleanup criteria for Cr VI. Cr III soil cleanup criterion for protection of drinking water can only be used at sites where groundwater is prevented from being used as a public water supply†

(L)= Criteria for lead are derived using a biologically based model, as allowed for under section 20120a(9) of NREPA, and are not calculated using the algorithms and assumptions specified in pathway-specific rules.†

(M)= Calculated criterion is below the analytical target detection limit, therefore, the criterion defaults to the target detection limit.

(N)= Where leaching to groundwater is a relevant pathway, soil concentrations of all potential sources of nitrate-nitrogen shall not, when added together, exceed the nitrate drinking water protection criterion of 2.0E+5 µg/kg.

(X)= The groundwater surface water interface (GSI) criterion shown in the generic cleanup criteria tables is not protective for surface water that is used as a drinking water source or used for Great Lakes and connecting waters.†

(AA)= Use 10,000 µg/l where groundwater enters a structure through the use of a water well, sump or other device. Use 28,000 µg/l for all other uses.

(CC)= The GSI criterion shall are based on the toxicity of unionized ammonia (NH_3); the criteria are 29 µg/l and 53 µg/l for cold water and warm water respectively. This percent NH3 is a function of the pH and temperature of the receiving surface water.†

†Please refer to the Footnotes for Part 201 Generic Cleanup Criteria and Screening Levels, December 30, 2013 for a more complete description of the above items.

TABLE 2
SUMMARY of 2017 GROUNDWATER ANALYTICAL DATA
Former Wolverine Worldwide Tannery
123 North Main Street
Rockford, Michigan

Hazardous Substance		Chemical Abstract Service (CAS) Number	Residential Drinking Water Criteria (DWC)	Non Residential Drinking Water Criteria (DWC)	Groundwater Surface Water Interface Criteria (GSIC)	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria (GVIAIC)	Groundwater Contact Criteria (GCC) (AA)	Dup-1 (TMW-110)	FB-1	FB-2	EB-1	EB-2	EB-3	EB-4
								5.4-10.1 ft	-	-	-	-	-	-
								8/31/2017	8/31/2017	9/1/2017	8/31/2017	8/31/2017	9/1/2017	9/1/2017
Metals	Arsenic	7440382	10 (A)	10 (A)	10	NLV	4,300	***140***	NT	NT	<5.0	NT	<5.0	NT
	Barium (B)	7440393	2,000 (A)	2,000 (A)	670 (G)	NLV	14,000,000	**680**	NT	NT	<100	NT	<100	NT
	Cadmium (B)	7440439	5.0 (A)	5.0 (A)	3.0 (G,X)	NLV	190,000	1.0	NT	NT	<0.50	NT	<0.50	NT
	Chromium (VI)	18540299	100 (A)	100 (A)	11	NLV	460,000	<25	NT	NT	<10	NT	<10	NT
	Chromium (total) (B,H)	Varies	100 (A)	100 (A)	11	NLV	460,000	***6,800***	NT	NT	<10	NT	<10	NT
	Copper (B)	7440508	1,000 (E)	1,000 (E)	13 (G)	NLV	7.4E+06	<4.0	NT	NT	<4.0	NT	<4.0	NT
	Iron (B)	7439896	300 (E)	300 (E)	NA	NLV	5.8E+07	*6,600*	NT	NT	<200	NT	<200	NT
	Lead (B) - Total	7439921	4.0 (L)	4.0 (L)	16 (G,X)	NLV	ID	<3.0	NT	NT	<3.0	NT	<3.0	NT
	Silver (B)	7440224	34	98	0.2 (M); 0.06	NLV	1.5E+06	<0.50	NT	NT	<0.50	NT	<0.50	NT
	Vanadium	7440622	4.5	62	27	NLV	970,000	**34**	NT	NT	<4.0	NT	<4.0	NT
	Zinc (B)	7440666	2,400	5,000 (E)	170 (G)	NLV	1.1E+08	<20	NT	NT	<20	NT	<20	NT
Other	Ammonia	7664417	10,000 (N)	10,000 (N)	(CC)	3.2E+06	ID	*2,300,000*	NT	NT	<100	NT	<100	NT
	Unionized Ammonia (calculation assumes 20°C)		NA	NA	29 (G)	NA	NA	**57,800**	NT	NT	NT	NT	NT	NT

Notes:

All units in µg/l (parts per billion).

Underline = Value exceeds the Residential Drinking Water Criteria.

Italics = Value exceeds the Non-Residential Drinking Water Criteria.

Bold = Value exceeds the Groundwater Surface Water Interface Protection Criteria.

NA = Criterion or value is not available or not applicable.

< XXX = The concentration of the hazardous substance does not exceed its method detection limit (XXX).

ID = Insufficient data to develop criterion.

NLV = Hazardous substance is not likely to volatilize under most conditions.

NT = Not Tested

(A)= Criterion is the state of Michigan drinking water standard established pursuant to Section 5 of 1976 PA 399, MCL 325.1005.

(B)= Background, as defined in MCL 324.20101(1)(e), may be substituted if higher than the calculated cleanup criterion. Background levels may be less than criteria for some inorganic compounds.†

(E)= Criterion is the aesthetic drinking water value, as required by Section 20120a(5) of NREPA. Health based criteria may be used under certain conditions. †

(G)= Groundwater surface water interface (GSI) criterion depends on the pH or water hardness, or both, of the receiving surface water. A hardness of 150 mg CaCO3/L was used to calculate this criteria.†

(H)= Valence-specific chromium data (Cr III and Cr VI) shall be compared to the corresponding valence-specific cleanup criteria. If analytical data are provided for total chromium only, they shall be compared to the cleanup criteria for Cr VI. Cr III soil cleanup criterion for protection of drinking water can only be used at sites where groundwater is prevented from being used as a public water supply†

(L)= Criteria for lead are derived using a biologically based model, as allowed for under section 20120a(9) of NREPA, and are not calculated using the algorithms and assumptions specified in pathway-specific rules.†

(M)= Calculated criterion is below the analytical target detection limit, therefore, the criterion defaults to the target detection limit.

(N)= Where leaching to groundwater is a relevant pathway, soil concentrations of all potential sources of nitrate-nitrogen shall not, when added together, exceed the nitrate drinking water protection criterion of 2.0E+5 µg/kg.

(X)= The groundwater surface water interface (GSI) criterion shown in the generic cleanup criteria tables is not protective for surface water that is used as a drinking water source or used for Great Lakes and connecting waters.†

(AA)= Use 10,000 µg/l where groundwater enters a structure through the use of a water well, sump or other device. Use 28,000 µg/l for all other uses.

(CC)= The GSI criterion shall are based on the toxicity of unionized ammonia (NH_3); the criteria are 29 µg/l and 53 µg/l for cold water and warm water respectively. This percent NH3 is a function of the pH and temperature of the receiving surface water.†

†Please refer to the Footnotes for Part 201 Generic Cleanup Criteria and Screening Levels, December 30, 2013 for a more complete description of the above items.

TABLE 2
SUMMARY OF 2017 GROUNDWATER PFAS ANALYTICAL DATA
Former Wolverine
Worldwide Tannery
123 North Main Street
Rockford, Michigan

Hazardous Substance		Chemical Abstract Service (CAS) Number	Residential Drinking Water Criteria (DWC)	Non Residential Drinking Water Criteria (DWC)	Groundwater Surface Water Interface Criteria (GSIC)	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria (GVIAIC)	Groundwater Contact Criteria (GCC) (AA)	P-2	P-3	Dup-3 (P-3)	Dup-4 (P-3)	MW-5	MW-302A	MW-304A	MW-306A	MW-307A	Dup-2 (MW-307A)	TMW-101	TMW-105	TMW-110
								4.7-9.4 ft	4.7-9.3 ft	4.7-9.3 ft	4.7-9.3 ft	5.0-10.0 ft	3.6-6.0 ft	2.7-5.5 ft	5.6-10.2 ft	5.6-10.2 ft	5.6-10.2 ft	5.7-10.5 ft	5.5-10.3 ft	5.4-10.1 ft
								8/31/2017	9/1/2017	9/1/2017	9/1/2017	8/31/2017	9/1/2017	9/1/2017	8/31/2017	8/31/2017	8/31/2017	9/1/2017	9/1/2017	8/31/2017
PFAS	Perfluorooctanic acid	335-67-1	NA**	NA**	NA	NA	NA	**14,000**	**10,000**	NT	**11,000**	**2,600**	**3,100**	**5,400**	**4,400**	**5,900**	**5,900**	**160,000**	**5,300**	**6,400**
	Perfluorooctane sulfonic acid	1763231	NA**	NA**	NA	NA	NA	**30,000**	**22,000***	NT	**24,000***	**18,000**	**9,600***	**180,000***	**9,700**	**4,000**	**5,600**	**330,000***	**23,000***	**9,100**
	Other perfluoro compounds	Varies	Varies	Varies	Varies	Varies	Varies	17,000	20,000	NT	21,000	5,200	8,800	11,000	5,800	4,400	4,000	42,000	9,300	5,800

Notes :

All PFAS units in ng/l (parts per trillion).

* = Field blank FB-2 taken on 9/1/2017 had 8.2 ppt perfluorooctane sulfonic acid, which indicates that ambient conditions during sampling and/or laboratory analysis may have had a minor effect on these values.

ND = Not Detected

NT = Not Tested

** = US EPA Lifetime Screening Level PFOA + PFOS = 70 ng/l (ppt)

Bold = PFOA + PFOS concentration is >70 ppt

TABLE 2
SUMMARY OF 2017 GROUNDWATER PFAS ANALYTICAL DATA
Former Wolverine
Worldwide Tannery
123 North Main Street
Rockford, Michigan

Hazardous Substance		Chemical Abstract Service (CAS) Number	Residential Drinking Water Criteria (DWC)	Non Residential Drinking Water Criteria (DWC)	Groundwater Surface Water Interface Criteria (GSIC)	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria (GVIAIC)	Groundwater Contact Criteria (GCC) (AA)	Dup-1 (TMW-110)	FB-1	FB-2	EB-1	EB-2	EB-3	EB-4
								5.4-10.1 ft	-	-	-	-	-	-
								8/31/2017	8/31/2017	9/1/2017	8/31/2017	8/31/2017	9/1/2017	9/1/2017
PFAS	Perfluorooctanic acid	335-67-1	NA**	NA**	NA	NA	NA	NT	ND	ND	NT	ND	NT	ND
	Perfluorooctane sulfonic acid	1763231	NA**	NA**	NA	NA	NA	NT	ND	8.2	NT	ND	NT	ND
	Other perfluoro compounds	Varies	Varies	Varies	Varies	Varies	Varies	NT	ND	ND	NT	ND	NT	ND

Notes :

All PFAS units in ng/l (parts per trillion).

* = Field blank FB-2 taken on 9/1/2017 had 8.2 ppt perfluorooctane sulfonic acid, which indicates that ambient conditions during sampling and/or laboratory analysis may have had a minor effect on these values.

ND = Not Detected

NT = Not Tested

** = US EPA Lifetime Screening Level PFOA + PFOS = 70 ng/l (ppt)

Bold = PFOA + PFOS concentration is >70 ppt

TABLE 3A
SUMMARY NORTH STUDY AREA GROUNDWATER ANALYTICAL DATA
Former Wolverine World Wide Tannery
123 North Main Street
Rockford, Michigan

Notes :

All units in ug/L (parts per billion).

* Total chromium concentration not used for comparison with criteria, only chromium (III) and chromium (VI)

Underline	= Value exceeds the Residential Drinking Water Protection Criteria.
Italics	= Value exceeds the Non-residential Drinking Water Protection Criteria.
/XXX/	= Value exceeds the Groundwater Contact Protection Criteria.
< XXX	= The concentration of the hazardous substance does not exceed its method detection limit (XXX).
ID	= Insufficient data to develop criterion.
NA	= Criterion or value is not available or not applicable.
ND	= Not Detected
NLV	= Hazardous substance is not likely to volatilize under most conditions.
**	= Criteria for Formic Acid

(A)= Criterion is the state of Michigan drinking water standard established pursuant to Section 5 of 1976 PA 399, MCL 325.1005.

(B)= Background, as defined in MCL 324.20101(1)(e), may be substituted if higher than the calculated cleanup criterion†

(D)= Calculated criterion exceeds 100%, hence it is reduced to 100% or 1.0E+9 ppb.

(E)= Criterion is the aesthetic drinking water value, as required by Section 20120a(5) of NREPA. Health based criteria may be used under certain conditions†

(F)= Criterion is based on adverse impacts to plant life and phytotoxicity.

(G)= Groundwater surface water interface (GSI) criterion depends on the pH or water hardness, or both, of the receiving surface water. A hardness of 150 mg CaCO3/L was used to calculate this criteria†.

(H)= Valence-specific chromium data (Cr III and Cr VI) shall be compared to the corresponding valence-specific cleanup criteria. If analytical data are provided for total chromium only, they shall be compared to the cleanup criteria for Cr VI.
Cr III soil cleanup criterion for protection of drinking water can only be used at sites where groundwater is prevented from being used as a public water supply†

(I)= Hazardous substance may exhibit the characteristic of ignitability as defined in 40 C.F.R. §261.21 (revised as of July 1, 2001).

(L)= Criteria for lead are derived using a biologically based model, as allowed for under section 20120a(9) of NREPA, and are not calculated using the algorithms and assumptions specified in pathway-specific rules†.

(M)= Calculated criterion is below the analytical target detection limit, therefore, the criterion defaults to the target detection limit.

(N)= Where leaching to groundwater is a relevant pathway, soil concentrations of all potential sources of nitrate-nitrogen shall not, when added together, exceed the nitrate drinking water protection criterion of 2.0E+5 ug/kg.

(S)= Criterion defaults to the hazardous substance-specific water solubility limit.

(U)= Hazardous substance may exhibit the characteristic of corrosivity as defined in 40 C.F.R. §261.22 (revised as of July 1, 2001).

(X)= The groundwater surface water interface (GSI) criterion shown in the generic cleanup criteria tables is not protective for surface water that is used as a drinking water source or used for Great Lakes and connecting waters†.

(AA)= Use 10,000 ug/l where groundwater enters a structure through the use of a water well, sump or other device. Use 28,000 ug/l for all other uses.

(CC)= The generic soil GSI protection criteria for unionized ammonia are 580 ug/kg and 1,100 ug/kg for cold water and warm surface water respectively.

(EE)= The following are applicable generic GSI criteria as required by Section 20120e of the NREPA. Phosphorus: 1,000ug/l, total dissolved solids: 500,000 ug/l and dissolved oxygen cold receiving waters≥7,000 ug/l, warm receiving waters: ≥ 5.000 ug/l.†

(FF)= The chloride GSI criterion shall be 125 mg/l when the discharge is to surface waters of the state designated as public water supply sources or 50 mg/l when the discharge is to the Great Lakes or connecting waters.*

(HH)= The residential criterion for sodium is 230,000 ug/l in accordance with the Sodium Advisory Council recommendation and revised Groundwater Discharge Standards.

†Please refer to the Footnotes for Part 201 Criteria and Part 213 Risk-Based Screening Levels, December 30, 2013 for a more complete description of the above items.

TABLE 3A
SUMMARY NORTH STUDY AREA GROUNDWATER ANALTYICAL DATA
Former Wolverine World Wide Tannery
123 North Main Street
Rockford, Michigan

	Hazardous Substance	Chemical Abstract Service (CAS) Number	Residential Drinking Water Protection Criteria (DWPC)	Non Residential Drinking Water Criteria (DWPC)	Groundwater Surface Water Interface Criteria (GSIC)	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria (GVIAIC)	Non Residential Groundwater Volatilization to Indoor Air Inhalation Criteria (GVIAIC)	Groundwater Contact Criteria (GCC) (AA)	TMW-102 5.5-10.3 ft 6/5/2014	TMW-102 5.5-10.3 ft 9/29/2014	TMW-108 5.4-10.1 ft 6/4/2014	TMW-108 5.4-10.1 ft 9/30/2014	TMW-109 5.4-10.1 ft 6/4/2014	TMW-109 5.4-10.1 ft 9/29/2014	TMW-110 5.4-10.1 ft 6/4/2014	TMW-110 5.4-10.1 ft 9/29/2014	TMW-110 5.4-10.1 ft 12/4/2015	TMW-110 5.4-10.1 ft 1/28/2016	TMW-110 5.4-10.1 ft 8/31/2017	TMW-111 2.8-7.6 ft 6/4/2014
VOCs	Acetone	67641	730	2,100	1,700	1.0E+9 (D,S)	1.0E+9 (D,S)	31,000,000	<50	<50	<50	<50	<50	<50	630	<50	NT	NT	NT	<50
	N-Butylbenzene	104518	80	230	ID	ID	ID	5,900	<1.0	<1.0	<1.0	<1.0	1.7	<1.0	<1.0	<1.0	NT	NT	NT	<1.0
	sec-Butylbenzene	135988	80	230	ID	ID	ID	4,400	<1.0	<1.0	<1.0	<1.0	1.3	<1.0	<1.0	<1.0	NT	NT	NT	<1.0
	1,1-Dichloroethane	75343	880	2,500	740	1.00E+06	2.30E+06	2.40E+06	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NT	NT	NT	<1.0
	Dichlorodifluoromethane	75718	1,700	4,800	ID	220,000	3.0E+5(S)	3.0E+5(S)	<5.0	<5.0	20	100	<5.0	<5.0	<5.0	<5.0	NT	NT	NT	<5.0
	Isopropylbenzene	98828	800	2,300	28	56,000 (S)	56,000 (S)	56,000 (S)	<5.0	<5.0	<5.0	<5.0	8.6	<5.0	<5.0	<5.0	NT	NT	NT	<5.0
	Naphthalene	91203	520	1,500	11	31,000 (S)	31,000 (S)	31,000 (S)	<5.0	<5.0	<5.0	<5.0	**13**	<5.0	<5.0	<5.0	NT	NT	NT	<5.0
	N-Propylbenzene	103651	80	230	ID	ID	ID	15,000	<1.0	<1.0	<1.0	<1.0	19	<1.0	<1.0	<1.0	NT	NT	NT	<1.0
	Toluene	108883	790 (E)	790 (E)	270	5.3E+5 (S)	5.3E+5 (S)	5.3E+5 (S)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	6.0	4.0	NT	NT	NT	<1.0
	1,2,3-Trimethylbenzene	526738	NA	NA	NA	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	3.7	<1.0	<1.0	<1.0	NT	NT	NT	<1.0
	Xylenes	1330207	280 (E)	280 (E)	41	1.9E+5 (S)	1.9E+5 (S)	1.9E+5 (S)	<3.0	<3.0	<3.0	<3.0	7.2	<3.0	<3.0	<4.0	NT	NT	NT	<3.0
SVOCs	Varies	Varies	Varies	Varies	Varies	Varies	Varies	Varies	ND	ND	ND	ND	ND	ND	ND	ND	NT	NT	NT	ND
Metals	Antimony	7440360	6.0 (A)	6.0 (A)	130 (X)	NLV	NLV	68,000	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.1	NT	NT	NT	<2.0
	Arsenic	7440382	10 (A)	10 (A)	10	NLV	NLV	4,300	8.6	9.1	<5.0	<5.0	<5.0	<5.0	***74***	***72***	NT	NT	***150***	<5.0
	Barium (B)	7440393	2,000 (A)	2,000 (A)	670 (G)	NLV	NLV	1.40E+07	150	110	290	650	<100	<100	**680**	**800**	NT	NT	**700**	280
	Beryllium	7440417	4.0 (A)	4.0 (A)	67 (G)	NLV	NLV	290,000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NT	NT	NT	<1.0
	Boron (B)	7440428	500 (F)	500 (F)	7,200 (X)	NLV	NLV	6.20E+07	350	470	300	430	<300	330	<300	<300	NT	NT	NT	<300
	Cadmium (B)	7440439	5.0 (A)	5.0 (A)	3.0 (G,X)	NLV	NLV	190,000	<1.0	<1.0	1.4	<1.0	<1.0	<1.0	<1.0	<1.0	NT	NT	<0.50	<1.0
	Chromium (total) (B,H)	18540299	100 (A)	100 (A)	100 (G,X)	NLV	NLV	460,000	***3,400***	***1,300***	***790***	***220***	18	<10	***14,000***	***11,000***	NT	NT	***6,800***	25
	Chromium (VI)	18540299	100 (A)	100 (A)	11	NLV	NLV	460,000	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<50	<5.0	NT	NT	<25	9.1
	Cobalt	7440484	40	100	100	NLV	NLV	2.40E+06	<20	<20	<20	<20	<20	<20	<20	<20	NT	NT	NT	<20
	Copper (B)	7440508	1,000 (E)	1,000 (E)	13 (G)	NLV	NLV	7.40E+06	**15**	4.7	**15**	<4.0	<4.0	<4.0	4.2	<4.0	NT	NT	<4.0	<4.0
	Iron (B)	7439896	300 (E)	300 (E)	NA	NLV	NLV	5.80E+07	*10,000*	*5,000*	*6,900*	*22,000*	*3,800*	*2,300*	*10,000*	*11,000*	NT	NT	*6,800*	*440*
	Lead (B)	7439921	4.0 (L)	4.0 (L)	16 (G,X)	NLV	NLV	ID	***20***	***28***	*5.4*	<3.0	<3.0	<3.0	3.5	<3.0	NT	NT	<3.0	<3.0
	Magnesium (B)	7439954	400,000	1,100,000	NA	NLV	NLV	1.0E+9 (D)	16,000	20,000	29,000	60,000	6,700	5,300	28,000	31,000	NT	NT	NT	20,000
	Molybdenum (B)	7439987	73	210	3,200 (X)	NLV	NLV	970,000	<50	<50	<50	<50	<50	<50	<50	<50	NT	NT	NT	<50
	Nickel (B)	7440020	100 (A)	100 (A)	73 (G)	NLV	NLV	7.40E+07	<20	<20	<20	<20	<20	<20	21	<20	NT	NT	NT	<20
	Selenium (B)	7782492	50 (A)	50 (A)	5	NLV	NLV	970,000	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	NT	NT	NT	<5.0
	Silver (B)	7440224	34	98	0.2 (M); 0.06	NLV	NLV	1.50E+06	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	NT	NT	<0.50	<0.20
	Sodium	17341252	120,000	350,000	NA	NLV	NLV	1.0E+9 (D)	*380,000*	*440,000*	*620,000*	*1,400,000*	*290,000*	*360,000*	*440,000*	*540,000*	NT	NT	NT	*270,000*
	Titanium	7440326	NA	NA	NA	NA	NA	NA	<25	<25	<25	<25	32	<25	120	93	NT	NT	NT	<25
	Thallium (B)	7440280	2.0 (A)	2.0 (A)	3.7 (X)	NLV	NLV	13,000	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	NT	NT	NT	<2.0
	Vanadium	7440622	4.5	62	27	NLV	NLV	970,000	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	***79***	***46***	NT	NT	***36***	<4.0
	Zinc (B)	7440666	2,400	5,000 (E)	170 (G)	NLV	NLV	1.10E+08	<150	<150	**180**	**200**	<150	<150	<150	<150	NT	NT	<20	<150
Other	Acetate	71501	4,200	12,000	7,700 (G)	ID	ID	ID	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000	***53,000***	<5,000	NT	NT	NT	<5,000
	Formate as Acetate	NA	NA	NA	NA	NA	NA	NA	<10,000	<10,000	<10,000	<10,000	<10,000	<10,000	<10,000	<10,000	NT	NT	NT	<10,000
	Ammonia	7664417	10,000 (N)	10,000 (N)	(CC)	3.20E+06	7.10E+06	ID	*180,000*	*130,000*	*85,000*	*70,000*	590	450	730	*160,000*	*1,900,000*	*2,100,000*	*2,300,000*	480
	Unionized Ammonia (calculation assumes 20°C)		NA	NA	29 (G)	NA	NA	NA	**6,870**	**4,960**	**3,250**	**2,670**	23	17	28	**6,110**	NT	NT	NT	18
	Nitrate (B,N)	14797558	10,000 (A,N)	10,000 (A,N)	ID	NLV	NLV	3.10E+08	<100	430	2,700	*14,000*	320	<180	<100	<180	NT	NT	NT	<100
	Nitrite (B,N)	14797650	1,000 (A,N)	1,000 (A,N)	NA	NLV	NLV	ID	<100	<140	<100	<140	<100	<140	<100	<540	NT	NT	NT	<100
	Chloride	16887006	2.5E+5 (E)	2.5E+5 (E)	(FF)	NLV	NLV	ID	*630,000*	*760,000*	*1,200,000*	*2,500,000*	*260,000*	160,000	*880,000*	*960,000*	NT	NT	NT	*370,000*
	Cyanide, Available	NA	NA	NA	5.2	NA	NA	NA	3.5	<2.0	<2.0	<2.0	<2.0	<2.0	**9.2**	**7.2**	NT	NT	NT	<2.0
	Formate (Formic Acid [U,I])**	64186	10,000	29,000	ID	7.70E+06	1.50E+07	6.00E+08	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000	5,000	<5,000	NT	NT	NT	<5,000
	Phosphorus (Total)	7723140	63,000	240,000	(EE)	NLV	NLV	ID	150	<10	40	16	42	<10	330	820	NT	NT	NT	22
	Sulfate	14808798	2.5E+5 (E)	2.5E+5 (E)	NA	NLV	NLV	ID	11,000	8,900	51,000	100,000	180,000	170,000	14,000	<2,500	NT	NT	NT	40,000
	Sulfide	9073750	NA	NA	NA	NA	NA	NA	<1,000	<1,000	<4.000	<1,000	<1,000	<1,000	<2,000	<1,000	NT	NT	NT	<1,000

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TABLE 3A
SUMMARY NORTH STUDY AREA GROUNDWATER ANALTYICAL DATA
Former Wolverine World Wide Tannery
123 North Main Street
Rockford, Michigan

	Hazardous Substance	Chemical Abstract Service (CAS) Number	Residential Drinking Water Protection Criteria (DWPC)	Non Residential Drinking Water Criteria (DWPC)	Groundwater Surface Water Interface Criteria (GSIC)	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria (GVIAIC)	Non Residential Groundwater Volatilization to Indoor Air Inhalation Criteria (GVIAIC)	Groundwater Contact Criteria (GCC) (AA)	TMW-111 2.8-7.6 ft 9/29/2014	MW-306A 5.6-10.2 ft 6/5/2014	MW-306A 5.6-10.2 ft 9/30/2014	MW-306A 5.6-10.2 ft 8/31/2017	MW-306B 10.4-15.1 ft 6/5/2014	MW-306B 10.4-15.1 ft 9/30/2014	MW-307A 5.6-10.2 ft 6/4/2014	MW-307A 5.6-10.2 ft 9/29/2014	MW-307A 5.6-10.2 ft 8/31/2017	MW-307B 11.0-15.7 ft 6/4/2014	MW-307B 11.0-15.7 ft 9/29/2014	MW-308A 3.2-7.9 ft 6/4/2014
VOCs	Acetone	67641	730	2,100	1,700	1.0E+9 (D,S)	1.0E+9 (D,S)	31,000,000	<50	<50	<50	NT	<50	<50	<50	<50	NT	<50	<50	<50
	N-Butylbenzene	104518	80	230	ID	ID	ID	5,900	<1.0	<1.0	<1.0	NT	<1.0	<1.0	<1.0	<1.0	NT	<1.0	<1.0	<1.0
	sec-Butylbenzene	135988	80	230	ID	ID	ID	4,400	<1.0	<1.0	<1.0	NT	<1.0	<1.0	<1.0	<1.0	NT	<1.0	<1.0	<1.0
	1,1-Dichloroethane	75343	880	2,500	740	1.00E+06	2.30E+06	2.40E+06	2.0	<1.0	<1.0	NT	1.4	<1.0	<1.0	<1.0	NT	<1.0	<1.0	<1.0
	Dichlorodifluoromethane	75718	1,700	4,800	ID	220,000	3.0E+5(S)	3.0E+5(S)	<5.0	7.3	<5.0	NT	280	200	<5.0	<5.0	NT	<5.0	<5.0	8.2
	Isopropylbenzene	98828	800	2,300	28	56,000 (S)	56,000 (S)	56,000 (S)	<5.0	<5.0	<5.0	NT	<5.0	<5.0	<5.0	<5.0	NT	<5.0	<5.0	<5.0
	Naphthalene	91203	520	1,500	11	31,000 (S)	31,000 (S)	31,000 (S)	<5.0	<5.0	<5.0	NT	<5.0	<5.0	<5.0	<5.0	NT	<5.0	<5.0	<5.0
	N-Propylbenzene	103651	80	230	ID	ID	ID	15,000	<1.0	<1.0	<1.0	NT	<1.0	<1.0	<1.0	<1.0	NT	<1.0	<1.0	<1.0
	Toluene	108883	790 (E)	790 (E)	270	5.3E+5 (S)	5.3E+5 (S)	5.3E+5 (S)	<1.0	<1.0	<1.0	NT	<1.0	<1.0	<1.0	<1.0	NT	<1.0	<1.0	<1.0
	1,2,3-Trimethylbenzene	526738	NA	NA	NA	NA	NA	NA	<1.0	<1.0	<1.0	NT	<1.0	<1.0	<1.0	<1.0	NT	<1.0	<1.0	<1.0
	Xylenes	1330207	280 (E)	280 (E)	41	1.9E+5 (S)	1.9E+5 (S)	1.9E+5 (S)	<3.0	<3.0	<3.0	NT	<3.0	<3.0	<3.0	<3.0	NT	<3.0	<3.0	<3.0
SVOCs	Varies	Varies	Varies	Varies	Varies	Varies	Varies	Varies	ND	ND	ND	NT	ND	ND	ND	ND	NT	ND	ND	ND
Metals	Antimony	7440360	6.0 (A)	6.0 (A)	130 (X)	NLV	NLV	68,000	<2.0	<2.0	<2.0	NT	<2.0	<2.0	<2.0	<2.0	NT	<2.0	<2.0	<2.0
	Arsenic	7440382	10 (A)	10 (A)	10	NLV	NLV	4,300	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	Barium (B)	7440393	2,000 (A)	2,000 (A)	670 (G)	NLV	NLV	1.40E+07	240	110	140	130	190	410	100	<100	<100	<100	<100	100
	Beryllium	7440417	4.0 (A)	4.0 (A)	67 (G)	NLV	NLV	290,000	<1.0	<1.0	<1.0	NT	<1.0	<1.0	<1.0	<1.0	NT	<1.0	<1.0	<1.0
	Boron (B)	7440428	500 (F)	500 (F)	7,200 (X)	NLV	NLV	6.20E+07	<300	<300	330	NT	*1,300*	*2,000*	300	360	NT	430	*510*	<300
	Cadmium (B)	7440439	5.0 (A)	5.0 (A)	3.0 (G,X)	NLV	NLV	190,000	<1.0	<1.0	<1.0	<0.50	<1.0	<1.0	**4.1**	***5.6***	**4.5**	<1.0	<1.0	<1.0
	Chromium (total) (B,H)	18540299	100 (A)	100 (A)	100 (G,X)	NLV	NLV	460,000	11	18	<10	10	25	<10	***1,000***	***770***	***720***	16	<10	23
	Chromium (VI)	18540299	100 (A)	100 (A)	11	NLV	NLV	460,000	6.8	<5.0	<5.0	11	6.8	<5.0	<5.0	<5.0	<10	<5.0	<5.0	<5.0
	Cobalt	7440484	40	100	100	NLV	NLV	2.40E+06	<20	<20	<20	NT	<20	<20	<20	<20	NT	<20	<20	<20
	Copper (B)	7440508	1,000 (E)	1,000 (E)	13 (G)	NLV	NLV	7.40E+06	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	**34**	**41**	**33**	4.1	<4.0	<4.0
	Iron (B)	7439896	300 (E)	300 (E)	NA	NLV	NLV	5.80E+07	*1,800*	*7,900*	*14,000*	*16,000*	*7,200*	*8,500*	*670*	210	*600*	*1,300*	*1,600*	*15,000*
	Lead (B)	7439921	4.0 (L)	4.0 (L)	16 (G,X)	NLV	NLV	ID	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	*15*	*11*	*6.0*	<3.0	<3.0	<3.0
	Magnesium (B)	7439954	400,000	1,100,000	NA	NLV	NLV	1.0E+9 (D)	29,000	16,000	18,000	NT	61,000	75,000	18,000	22,000	NT	36,000	40,000	13,000
	Molybdenum (B)	7439987	73	210	3,200 (X)	NLV	NLV	970,000	<50	<50	<50	NT	<50	<50	<50	<50	NT	<50	<50	<50
	Nickel (B)	7440020	100 (A)	100 (A)	73 (G)	NLV	NLV	7.40E+07	<20	<20	<20	NT	<20	<20	<20	<20	NT	<20	<20	<20
	Selenium (B)	7782492	50 (A)	50 (A)	5	NLV	NLV	970,000	<5.0	<5.0	<5.0	NT	<5.0	<5.0	<5.0	<5.0	NT	<5.0	<5.0	<5.0
	Silver (B)	7440224	34	98	0.2 (M); 0.06	NLV	NLV	1.50E+06	<0.20	<0.20	<0.20	<0.50	<0.20	**0.38**	<0.20	<0.20	<0.50	<0.20	<0.20	<0.20
	Sodium	17341252	120,000	350,000	NA	NLV	NLV	1.0E+9 (D)	*370,000*	*240,000*	*360,000*	NT	*2,700,000*	*2,700,000*	*390,000*	*500,000*	NT	100,000	62,000	*610,000*
	Titanium	7440326	NA	NA	NA	NA	NA	NA	<25	<25	<25	NT	<25	<25	<25	<25	NT	<25	<25	<25
	Thallium (B)	7440280	2.0 (A)	2.0 (A)	3.7 (X)	NLV	NLV	13,000	<2.0	<2.0	<2.0	NT	<2.0	<2.0	<2.0	<2.0	NT	<2.0	<2.0	<2.0
	Vanadium	7440622	4.5	62	27	NLV	NLV	970,000	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
	Zinc (B)	7440666	2,400	5,000 (E)	170 (G)	NLV	NLV	1.10E+08	<150	<150	<150	<20	<150	<150	**1,400**	**1,400**	**1,300**	<150	<150	<150
Other	Acetate	71501	4,200	12,000	7,700 (G)	ID	ID	ID	<5,000	<5,000	<5,000	NT	<5,000	<5,000	<5,000	<5,000	NT	<5,000	<5,000	<5,000
	Formate as Acetate	NA	NA	NA	NA	NA	NA	NA	<10,000	<10,000	<10,000	NT	<10,000	<10,000	<10,000	<10,000	NT	<10,000	<10,000	<10,000
	Ammonia	7664417	10,000 (N)	10,000 (N)	(CC)	3.20E+06	7.10E+06	ID	610	2,000	1,900	3,300	*21,000*	*26,000*	*96,000*	*76,000*	*37,000*	730	690	3,000
	Unionized Ammonia (calculation assumes 20°C)		NA	NA	29 (G)	NA	NA	NA	23	**76**	**73**	NT	**802**	**993**	**3,670**	**2,900**	NT	28	26	**115**
	Nitrate (B,N)	14797558	10,000 (A,N)	10,000 (A,N)	ID	NLV	NLV	3.10E+08	<180	640	610	NT	<100	<700	4,300	*16,000*	NT	<100	<180	<100
	Nitrite (B,N)	14797650	1,000 (A,N)	1,000 (A,N)	NA	NLV	NLV	ID	<140	<100	<140	NT	<100	<540	<100	<140	NT	<100	<140	<100
	Chloride	16887006	2.5E+5 (E)	2.5E+5 (E)	(FF)	NLV	NLV	ID	*530,000*	*710,000*	*450,000*	NT	*4,400,000*	*5,000,000*	*660,000*	*760,000*	NT	160,000	140,000	*590,000*
	Cyanide, Available	NA	NA	NA	5.2	NA	NA	NA	<2.0	<2.0	<2.0	NT	<2.0	<2.0	<2.0	<2.0	NT	<2.0	<2.0	<2.0
	Formate (Formic Acid [U,I])**	64186	10,000	29,000	ID	7.70E+06	1.50E+07	6.00E+08	<5,000	<5,000	<5,000	NT	<5,000	<5,000	<5,000	<5,000	NT	<5,000	<5,000	<5,000
	Phosphorus (Total)	7723140	63,000	240,000	(EE)	NLV	NLV	ID	<10	45	39	NT	21	<10	55	11	NT	18	<10	32
	Sulfate	14808798	2.5E+5 (E)	2.5E+5 (E)	NA	NLV	NLV	ID	48,000	120,000	190,000	NT	*260,000*	*300,000*	35,000	7,600	NT	240,000	*370,000*	180,000
	Sulfide	9073750	NA	NA	NA	NA	NA	NA	4,900	<3,000	<1,000	NT	<2,000	<1,000	<5,000	<1,000	NT	<2,000	<1,000	<3,000

See Page 3 for notes

TABLE 3A
SUMMARY NORTH STUDY AREA GROUNDWATER ANALTYICAL DATA
Former Wolverine World Wide Tannery
123 North Main Street
Rockford, Michigan

	Hazardous Substance	Chemical Abstract Service (CAS) Number	Residential Drinking Water Protection Criteria (DWPC)	Non Residential Drinking Water Criteria (DWPC)	Groundwater Surface Water Interface Criteria (GSIC)	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria (GVIAIC)	Non Residential Groundwater Volatilization to Indoor Air Inhalation Criteria (GVIAIC)	Groundwater Contact Criteria (GCC) (AA)	MW-308A 3.2-7.9 ft 9/29/2014	MW-308B 15.9-20.6 ft 6/4/2014	MW-308B 15.9-20.6 ft 9/29/2014	MW-308C 21.3-26.0 ft 6/4/2014	MW-308C 21.3-26.0 ft 9/29/2014	Dup-1 (TMW-110) 5.4-10.1 ft 8/31/2017
VOCs	Acetone	67641	730	2,100	1,700	1.0E+9 (D,S)	1.0E+9 (D,S)	31,000,000	<50	<50	<50	<50	<50	NT
	N-Butylbenzene	104518	80	230	ID	ID	ID	5,900	<1.0	<1.0	<1.0	<1.0	<1.0	NT
	sec-Butylbenzene	135988	80	230	ID	ID	ID	4,400	<1.0	<1.0	<1.0	<1.0	<1.0	NT
	1,1-Dichloroethane	75343	880	2,500	740	1.00E+06	2.30E+06	2.40E+06	<1.0	<1.0	<1.0	<1.0	<1.0	NT
	Dichlorodifluoromethane	75718	1,700	4,800	ID	220,000	3.0E+5(S)	3.0E+5(S)	<5.0	<5.0	<5.0	<5.0	<5.0	NT
	Isopropylbenzene	98828	800	2,300	28	56,000 (S)	56,000 (S)	56,000 (S)	<5.0	<5.0	<5.0	<5.0	<5.0	NT
	Naphthalene	91203	520	1,500	11	31,000 (S)	31,000 (S)	31,000 (S)	<5.0	<5.0	<5.0	<5.0	<5.0	NT
	N-Propylbenzene	103651	80	230	ID	ID	ID	15,000	<1.0	<1.0	<1.0	<1.0	<1.0	NT
	Toluene	108883	790 (E)	790 (E)	270	5.3E+5 (S)	5.3E+5 (S)	5.3E+5 (S)	<1.0	<1.0	<1.0	<1.0	<1.0	NT
	1,2,3-Trimethylbenzene	526738	NA	NA	NA	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	NT
	Xylenes	1330207	280 (E)	280 (E)	41	1.9E+5 (S)	1.9E+5 (S)	1.9E+5 (S)	<3.0	<3.0	<3.0	<3.0	<3.0	NT
SVOCs	Varies	Varies	Varies	Varies	Varies	Varies	Varies	Varies	ND	ND	ND	ND	ND	NT
Metals	Antimony	7440360	6.0 (A)	6.0 (A)	130 (X)	NLV	NLV	68,000	<2.0	<2.0	<2.0	<2.0	<2.0	NT
	Arsenic	7440382	10 (A)	10 (A)	10	NLV	NLV	4,300	5.6	<5.0	<5.0	<5.0	<5.0	***140***
	Barium (B)	7440393	2,000 (A)	2,000 (A)	670 (G)	NLV	NLV	1.40E+07	110	<100	<100	<100	<100	**680**
	Beryllium	7440417	4.0 (A)	4.0 (A)	67 (G)	NLV	NLV	290,000	<1.0	<1.0	<1.0	<1.0	<1.0	NT
	Boron (B)	7440428	500 (F)	500 (F)	7,200 (X)	NLV	NLV	6.20E+07	<300	370	430	360	420	NT
	Cadmium (B)	7440439	5.0 (A)	5.0 (A)	3.0 (G,X)	NLV	NLV	190,000	<1.0	<1.0	<1.0	<1.0	<1.0	1.0
	Chromium (total) (B,H)	18540299	100 (A)	100 (A)	100 (G,X)	NLV	NLV	460,000	<10	16	<10	16	<10	***6,800***
	Chromium (VI)	18540299	100 (A)	100 (A)	11	NLV	NLV	460,000	<5.0	<5.0	<5.0	<5.0	<5.0	<25
	Cobalt	7440484	40	100	100	NLV	NLV	2.40E+06	<20	<20	<20	<20	<20	NT
	Copper (B)	7440508	1,000 (E)	1,000 (E)	13 (G)	NLV	NLV	7.40E+06	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
	Iron (B)	7439896	300 (E)	300 (E)	NA	NLV	NLV	5.80E+07	*15,000*	*1,400*	*1,600*	*1,300*	*3,500*	*6,600*
	Lead (B)	7439921	4.0 (L)	4.0 (L)	16 (G,X)	NLV	NLV	ID	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
	Magnesium (B)	7439954	400,000	1,100,000	NA	NLV	NLV	1.0E+9 (D)	12,000	28,000	32,000	26,000	32,000	NT
	Molybdenum (B)	7439987	73	210	3,200 (X)	NLV	NLV	970,000	<50	<50	<50	<50	<50	NT
	Nickel (B)	7440020	100 (A)	100 (A)	73 (G)	NLV	NLV	7.40E+07	<20	<20	<20	<20	<20	NT
	Selenium (B)	7782492	50 (A)	50 (A)	5	NLV	NLV	970,000	<5.0	<5.0	<5.0	<5.0	<5.0	NT
	Silver (B)	7440224	34	98	0.2 (M); 0.06	NLV	NLV	1.50E+06	<0.20	<0.20	<0.20	<0.20	<0.20	<0.50
	Sodium	17341252	120,000	350,000	NA	NLV	NLV	1.0E+9 (D)	*570,000*	80,000	48,000	46,000	60,000	NT
	Titanium	7440326	NA	NA	NA	NA	NA	NA	<25	<25	<25	<25	<25	NT
	Thallium (B)	7440280	2.0 (A)	2.0 (A)	3.7 (X)	NLV	NLV	13,000	<2.0	<2.0	<2.0	<2.0	<2.0	NT
	Vanadium	7440622	4.5	62	27	NLV	NLV	970,000	<4.0	<4.0	<4.0	<4.0	<4.0	**34**
	Zinc (B)	7440666	2,400	5,000 (E)	170 (G)	NLV	NLV	1.10E+08	<150	<150	<150	<150	<150	<20
Other	Acetate	71501	4,200	12,000	7,700 (G)	ID	ID	ID	<5,000	<5,000	<5,000	<5,000	<5,000	NT
	Formate as Acetate	NA	NA	NA	NA	NA	NA	NA	<10,000	<10,000	<10,000	<10,000	<10,000	NT
	Ammonia	7664417	10,000 (N)	10,000 (N)	(CC)	3.20E+06	7.10E+06	ID	5,300	460	2,600	520	560	*2,300,000*
	Unionized Ammonia (calculation assumes 20°C)		NA	NA	29 (G)	NA	NA	NA	**202**	18	**99**	20	21	NT
	Nitrate (B,N)	14797558	10,000 (A,N)	10,000 (A,N)	ID	NLV	NLV	3.10E+08	<180	<100	<180	<100	<180	NT
	Nitrite (B,N)	14797650	1,000 (A,N)	1,000 (A,N)	NA	NLV	NLV	ID	<140	<100	<140	<100	<140	NT
	Chloride	16887006	2.5E+5 (E)	2.5E+5 (E)	(FF)	NLV	NLV	ID	*380,000*	130,000	71,000	120,000	130,000	NT
	Cyanide, Available	NA	NA	NA	5.2	NA	NA	NA	<2.0	<2.0	<2.0	<2.0	<2.0	NT
	Formate (Formic Acid [U,I])**	64186	10,000	29,000	ID	7.70E+06	1.50E+07	6.00E+08	<5,000	<5,000	<5,000	<5,000	<5,000	NT
	Phosphorus (Total)	7723140	63,000	240,000	(EE)	NLV	NLV	ID	23	23	<10	16	<10	NT
	Sulfate	14808798	2.5E+5 (E)	2.5E+5 (E)	NA	NLV	NLV	ID	140,000	*330,000*	*340,000*	*310,000*	*310,000*	NT
	Sulfide	9073750	NA	NA	NA	NA	NA	NA	<1,000	<3,000	<1,000	<6,000	<1,000	NT

See Page 3 for notes

TABLE 3B
SUMMARY HISTORICAL GROUNDWATER ANALYTICAL DATA (South of Rum Creek)
123 North Main Street
Rockford, Michigan

Notes :

All units in ug/L (parts per billion).

Underline	= Value exceeds the Residential Drinking Water Criteria.
Italics	= Value exceeds the Non-residential Drinking Water Criteria.
Bold	= Value exceeds the Groundwater Surface Water Interface Protection Criteria.
/XXX/	= Value exceeds the Groundwater Contact Protection Criteria.
< XXX	= The concentration of the hazardous substance does not exceed its method detection limit (XXX).
ID	= Insufficient data to develop criterion.
NA	= Criterion or value is not available or not applicable.
NLV	= Hazardous substance is not likely to volatilize under most conditions.
*	= Criteria for Formic Acid
(A)	= Criterion is the state of Michigan drinking water standard established pursuant to section 5 of 1976 PA 399, MCL 325.1005.
(B)	= Background, as defined in MCL 324.20101(1)(e), may be substituted if higher than the calculated cleanup criterion.
(D)	= Calculated criterion exceeds 100%, hence it is reduced to 100% or 1.0E+9 ppb.
(E)	= Criterion is the aesthetic drinking water value, as required by section 20120a(5) of the act. Health based criteria may be used under certain conditions*
(F)	= Criterion is based on adverse impacts to plant life and phytotoxicity.
(G)	= Groundwater surface water interface (GSI) criterion depends on the pH or water hardness, or both, of the receiving surface water. A hardness of 150 mg CaCO3/L was used to calculate this criteria.*
(H)	= Valence-specific chromium data (Cr III and Cr VI) shall be compared to the corresponding valence-specific cleanup criteria. If analytical data are provided for total chromium only, they shall be compared to the cleanup criteria for Cr VI.
	= Cr III soil cleanup criterion for protection of drinking water can only be used at sites where groundwater is prevented from being used as a public water supply*
(I)	= Hazardous substance may exhibit the characteristic of ignitability as defined in 40 C.F.R. §261.21 (revised as of July 1, 2001).
(L)	= Criteria for lead are derived using a biologically based model, as allowed for under section 20120a(10) of the act, and are not calculated using the algorithms and assumptions specified in pathway-specific rules.*
(M)	= Calculated criterion is below the analytical target detection limit, therefore, the criterion defaults to the target detection limit.
(N)	= The concentrations of all potential sources of nitrate-nitrogen (e.g., ammonia-N, nitrite-N, nitrate-N) in groundwater that is used as a source of drinking water shall not, when added together, exceed the nitrate drinking water criterion of 10,000 ug/l.
(P)	= Amenable cyanide methods or method OIA-1677 shall be used to quantify cyanide concentrations for compliance with all groundwater criteria. Total cyanide methods or method OIA-1677 shall be used to quantify cyanide concentrations for compliance with soil criteria.
	Nonresidential direct contact criteria may not be protective of the potential for release of hydrogen cyanide gas.*
(R)	= Hazardous substance may exhibit the characteristic of reactivity as defined in 40 C.F.R. §261.23 (revised as of July 1, 2001).
(S)	= Criterion defaults to the hazardous substance-specific water solubility limit.
(U)	= Hazardous substance may exhibit the characteristic of corrosivity as defined in 40 C.F.R. §261.22 (revised as of July 1, 2001).
(V)	= Criterion is the aesthetic drinking water value, as required by section 20120(a)(5) of the act. Concentrations up to 200 mg/L may be acceptable.*
(X)	= The groundwater surface water interface (GSI) criterion shown in the generic cleanup criteria tables is not protective for surface water that is used as a drinking water source or used for Great Lakes and connecting waters.*
(Z)	= Mercury is typically measured as total mercury. The generic cleanup criteria, however, are based on data for different species of mercury.*
(AA)	= Comparison to these criteria may take into account an evaluation of whether the hazardous substances are adsorbed to particulates rather than dissolved in water and whether filtered groundwater samples were used to evaluate groundwater.
(CC)	= The GSI criterion shall are based on the toxicity of unionized ammonia (NH3); the cirtiera are 29 ug/L and 53 ug/L for cold water and warm water respectively. This percent NH3 is a function of the pH and temperature of the receiving surface water.*
	= The generic soil GSI protection criteria for unionized ammonia are 580 ug/kg and 1,100 ug/kg for cold water and warm surface water respectively.
(EE)	= See R 299.5750 of the Michigan Administrative Code for details.*
(FF)	= The chloride GSI criterion shall be 125 mg/l when the discharge is to surface waters of the state designated as public water supply sources or 50 mg/l when the discharge is to the Great Lakes or connecting waters.*
(HH)	= The residential criterion for sodium is 230,000 ug/l in accordance with the Sodium Advisory Council recommendation and revised Groundater Discharge Standards.

*Please refer to the Footnotes for Part 201 Criteria and Part 213 Risk-Based Screening Levels, December 4, 2013 for a more complete description of the above items.

Table 3B
SUMMARY HISTORICAL GROUNDWATER ANALTYICAL DATA (South of Rum Creek)
123 North Main Street
Rockford, Michigan

	Hazardous Substance	Chemical Abstract Service (CAS) Number	Residential Drinking Water Criteria (DWC)	Non Residential Drinking Water Criteria (DWC)	Groundwater Surface Water Interface Criteria (GSIC)	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria (GVIAIC)	Non Residential Groundwater Volatilization to Indoor Air Inhalation Criteria (GVIAIC)	Groundwater Contact Criteria (GCC) (AA)	P-1 3.8-8.5 ft 1/4/2012	P-1 3.8-8.5 ft 9/3/2013	P-1 3.8-8.5 ft 10/1/2014	P-2 4.7-9.4 ft 1/4/2012	P-2 4.7-9.4 ft 9/3/2013	P-2 4.7-9.4 ft 10/1/2014	P-2 4.7-9.4 ft 8/31/2017	P-3 4.7-9.3 ft 1/4/2012	P-3 4.7-9.3 ft 9/5/2013	P-3 4.7-9.3 ft 10/1/2014	P-3 4.7-9.3 ft 9/1/2017	P-4 2.4-7.1 ft 1/4/2012	P-4 2.4-7.1 ft 9/5/2013
VOCs	2-Butanone (MEK) (I)	78933	13,000	38,000	2,200	2.4E+8 (S)	2.4E+8 (S)	2.4E+8 (S)	NT	<10	NT	NT	<10	NT	NT	NT	<10	NT	NT	NT	<10
	1,1-Dichloroethane	75343	880	2,500	740	1.00E+06	2.30E+06	2.40E+06	NT	<1.0	NT	NT	<1.0	NT	NT	NT	<1.0	NT	NT	NT	<1.0
	1,1-Dichloroethylene (I)	75354	7.0 (A)	7.0 (A)	130	200	1,300	11,000	NT	<1.0	NT	NT	<1.0	NT	NT	NT	<1.0	NT	NT	NT	<1.0
	1,2-Dichlorobenzene	95501	600 (A)	600 (A)	13	1.6E+5 (S)	1.6E+5 (S)	1.6E+5 (S)	NT	<1.0	NT	NT	<1.0	NT	NT	NT	<1.0	NT	NT	NT	<1.0
	1,2-Dichloroethane	107062	5.0 (A)	5.0 (A)	360 (X)	9,600	59,000	19,000	NT	<1.0	NT	NT	<1.0	NT	NT	NT	<1.0	NT	NT	NT	<1.0
	Acetone	67641	730	2,100	1,700	1.0E+9 (D,S)	1.0E+9 (D,S)	31,000,000	NT	<50	NT	NT	<50	NT	NT	NT	<50	NT	NT	NT	<50
	Chlorobenzene	108907	100 (A)	100 (A)	25	210,000	4.7E+5 (S)	86,000	NT	<1.0	NT	NT	<1.0	NT	NT	NT	<1.0	NT	NT	NT	<1.0
	Di-isopropyl ether	108203	30	86	ID	8,000 (S)	8,000 (S)	8,000 (S)	NT	<1.0	NT	NT	<1.0	NT	NT	NT	<1.0	NT	NT	NT	0.40
	Ethylbenzene	100414	74 (E)	74 (E)	18	1.10E+05	1.7E+5 (S)	1.7E+5 (S)	NT	<1.0	NT	NT	<1.0	NT	NT	NT	<1.0	NT	NT	NT	<1.0
	2-Methylnaphthalene	91576	260	750	19	25,000 (S)	25,000 (S)	25,000 (S)	NT	<10	NT	NT	<10	NT	NT	NT	<10	NT	NT	NT	<10
	4-Methyl-2-pentanone (MIBK) (I)	108101	1,800	5,200	ID	2.0E+7 (S)	2.0E+7 (S)	1.3E+07	NT	<10	NT	NT	<10	NT	NT	NT	<10	NT	NT	NT	<10
	Naphthalene	91203	520	1,500	11	31,000 (S)	31,000 (S)	31,000 (S)	NT	<5.0	NT	NT	4.6	NT	NT	NT	<5.0	NT	NT	NT	<5.0
	Toluene	108883	790 (E)	790 (E)	270	5.3E+5 (S)	5.3E+5 (S)	5.3E+5 (S)	NT	<5.0	NT	NT	<5.0	NT	NT	NT	<5.0	NT	NT	NT	<5.0
	Trichlorofluoromethane	75694	2,600	7,300	NA	1.1E+6 (S)	1.1E+6 (S)	1.1E+6 (S)	NT	<5.0	NT	NT	<5.0	NT	NT	NT	<5.0	NT	NT	NT	<5.0
	1,2,4-Trimethylbenzene	95636	63 (E)	63 (E)	17	56,000 (S)	56,000 (S)	56,000 (S)	NT	<1.0	NT	NT	<1.0	NT	NT	NT	<1.0	NT	NT	NT	<1.0
	1,2,3-Trimethylbenzene	NA	NA	NA	NA	NA	NA	NA	NT	<1.0	NT	NT	<1.0	NT	NT	NT	<1.0	NT	NT	NT	<1.0
	1,3,5-Trimethylbenzene	108678	72 (E)	72 (E)	45	61,000 (S)	61,000 (S)	61,000 (S)	NT	<1.0	NT	NT	<1.0	NT	NT	NT	<1.0	NT	NT	NT	<1.0
	Vinyl chloride	75014	2.0 (A)	2.0 (A)	13 (X)	1,100	13,000	1,000	NT	<1.0	NT	NT	<1.0	NT	NT	NT	<1.0	NT	NT	NT	<1.0
	Xylenes	1330207	280 (E)	280 (E)	41	1.9E+5 (S)	1.9E+5 (S)	1.9E+5 (S)	NT	<3.0	NT	NT	<3.0	NT	NT	NT	<3.0	NT	NT	NT	<3.0
Semi-VOCs	Acenaphthene	83329	1300	3800	38	4,200 (S)	4,200 (S)	4,200 (S)	NT	<1.0	NT	NT	<1.0	NT	NT	NT	<1.0	NT	NT	NT	<1.0
	Bis (2 ethylhexyl) phthalate	117817	6.0 (A)	6.0 (A)	25	NLV	NLV	320 (AA)	NT	0.84	NT	NT	0.84	NT	NT	NT	0.73	NT	NT	NT	0.76
	Di-n-butyl phthalate	84742	880	2,500	9.7	NLV	NLV	11,000 (S)	NT	0.53	NT	NT	0.60	NT	NT	NT	0.27	NT	NT	NT	0.40
	Diethyl phthalate	84662	5,500	16,000	110	NLV	NLV	1.1E+6 (S)	NT	<3.0	NT	NT	<3.0	NT	NT	NT	<3.0	NT	NT	NT	<3.0
	Fluorene	86737	880	2,000 (S)	12	2,000 (S)	2,000 (S)	2,000 (S)	NT	<1.0	NT	NT	<1.0	NT	NT	NT	<1.0	NT	NT	NT	<1.0
	Naphthalene	91203	520	1,500	11	31,000 (S)	31,000 (S)	31,000 (S)	NT	<1.0	NT	NT	2.0	NT	NT	NT	<1.0	NT	NT	NT	<1.0
	Pyrene	129000	140 (S)	140 (S)	ID	140 (S)	140 (S)	140 (S)	NT	<1.0	NT	NT	<1.0	NT	NT	NT	<1.0	NT	NT	NT	<1.0
	Phenol	108952	4,400	13,000	450	NLV	NLV	2.90E+07	NT	<10	NT	NT	<10	NT	NT	NT	<10	NT	NT	NT	<10
	4-Chloro-3-methylphenol	59507	150	420	7.4	NLV	NLV	79,000	NT	<10	NT	NT	<10	NT	NT	NT	<10	NT	NT	NT	<10
Metals	Aluminum	7429905	50 (V)	50 (V)	NA	NLV	NLV	6.4E+07	NT	*84*	<50	NT	*140*	*180*	NT	NT	*230*	*120*	NT	NT	*460*
	Antimony	7440360	6.0 (A)	6.0 (A)	130 (X)	NLV	NLV	68,000	NT	<2.0	<2.0	NT	<2.0	<2.0	NT	NT	<2.0	<2.0	NT	NT	<2.0
	Arsenic	7440382	10 (A)	10 (A)	10	NLV	NLV	4,300	6.0	9.7	6.6	2.0	5.3	<5.0	<5.0	2.0	<5.0	<5.0	<5.0	<1	6.3
	Barium (B)	7440393	2,000 (A)	2,000 (A)	670 (G)	NLV	NLV	1.40E+07	NT	**830**	NT	NT	240	NT	120	NT	230	NT	150	NT	170
	Beryllium	7440417	4.0 (A)	4.0 (A)	67 (G)	NLV	NLV	290,000	NT	<1.0	NT	NT	<1.0	NT	NT	NT	<1.0	NT	NT	NT	<1.0
	Boron (B)	7440428	500 (F)	500 (F)	7,200 (X)	NLV	NLV	6.20E+07	NT	<300	<300	NT	410	430	NT	NT	330	370	NT	NT	*740*
	Cadmium (B)	7440439	5.0 (A)	5.0 (A)	3.0 (G,X)	NLV	NLV	190,000	NT	<1.0	NT	NT	<1.0	NT	<0.50	NT	2.6	NT	<0.50	NT	<1.0
	Chromium (total) (B,H)	18540299	100 (A)	100 (A)	100 (G,X)	NLV	NLV	460,000	NT	<10	<10	NT	<10	10	<10	NT	<10	13	<10	NT	47
	Chromium (VI)	18540299	100 (A)	100 (A)	11	NLV	NLV	460,000	NT	<5.0	46	NT	<5.0	<5.0	<10	NT	<5.0	<5.0	<10	NT	<5.0
	Cobalt	7440484	40	100	100	NLV	NLV	2.40E+06	NT	<20	NT	NT	<20	NT	NT	NT	<20	NT	NT	NT	<20
	Copper (B)	7440508	1,000 (E)	1,000 (E)	13 (G)	NLV	NLV	7.40E+06	NT	5.2	<4.0	NT	**29**	<4.0	<4.0	NT	7.1	<4.0	<4.0	NT	7.7
	Iron (B)	7439896	300 (E)	300 (E)	NA	NLV	NLV	5.80E+07	NT	*37,000*	*25,000*	NT	*23,000*	*21,000*	*14,000*	NT	*15,000*	*14,000*	13,000	NT	*7,800*
	Lead (B)	7439921	4.0 (L)	4.0 (L)	16 (G,X)	NLV	NLV	ID	NT	<3.0	<3.0	NT	<3.0	*11*	<3.0	NT	<3.0	<3.0	<3.0	NT	<50
	Magnesium (B)	7439954	400,000	1,100,000	NA	NLV	NLV	1.0E+9 (D)	NT	56,000	NT	NT	26,000	NT	NT	NT	19,000	NT	NT	NT	12,000
	Mercury (Total) (B,Z)	Varies	2.0 (A)	2.0 (A)	0.0013	56 (S)	56 (S)	56 (S)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	Molybdenum (B)	7439987	73	210	3,200 (X)	NLV	NLV	970,000	NT	<50	NT	NT	<50	NT	NT	NT	<50	NT	NT	NT	<50
	Nickel (B)	7440020	100 (A)	100 (A)	73 (G)	NLV	NLV	7.40E+07	NT	<20	NT	NT	<20	NT	NT	NT	<20	NT	NT	NT	<20
	Selenium (B)	7782492	50 (A)	50 (A)	5	NLV	NLV	970,000	NT	<5.0	<5.0	NT	<5.0	<5.0	NT	NT	<5.0	<5.0	NT	NT	<5.0
	Silver (B)	7440224	34	98	0.2 (M); 0.06	NLV	NLV	1.50E+06	NT	<5.0	<0.20	NT	<5.0	<0.20	<0.50	NT	<5.0	<0.20	<0.50	NT	<5.0
	Sodium	17341252	230,000 (HH)	350,000	NA	NLV	NLV	1.0E+9 (D)	NT	*1,700,000*	*970,000*	NT	*1,100,000*	*670,000*	NT	NT	*650,000*	*400,000*	NT	NT	*660,000*
	Titanium	7440326	NA	NA	NA	NA	NA	NA	NT	<25	NT	NT	<25	NT	NT	NT	<25	NT	NT	NT	190
	Thallium (B)	7440280	2.0 (A)	2.0 (A)	3.7 (X)	NLV	NLV	13,000	NT	<2.0	NT	NT	<2.0	NT	NT	NT	<2.0	NT	NT	NT	<2.0
	Vanadium	7440622	4.5	62	27	NLV	NLV	970,000	NT	<4.0	<4.0	NT	4.0	<4.0	<4.0	NT	4.0	<4.0	<4.0	NT	**30**
	Zinc (B)	7440666	2,400	5,000 (E)	170 (G)	NLV	NLV	1.10E+08	NT	<150	NT	NT	<150	NT	30	NT	<150	NT	<20	NT	<150
Other	Acetate	71501	4,200	12,000	7,700 (G)	ID	ID	ID	NT	<5,000	NT	NT	<5,000	NT	NT	NT	<5,000	NT	NT	NT	<5,000
	Ammonia	7664417	10,000 (N)	10,000 (N)	(CC)	3.20E+06	7.10E+06	ID	7,000	*13,000*	*13,000*	*46,000*	*69,000*	*62,000*	*48,000*	*31,000*	*39,000*	*36,000*	28,000	*31,000*	*42,000*
	Unionized Ammonia (calculation assumes 20°C)		NA	NA	29 (G)	NA	NA	NA	**267**	**496**	**496**	**1,760**	**2,630**	**2,370**	NT	**1,180**	**1,490**	**1,380**	NT	**1,180**	**1,600**
	Nitrate (B,N)	14797558	10,000 (A,N)	10,000 (A,N)	ID	NLV	NLV	3.10E+08	NT	<100	<180	NT	<100	<180	NT	NT	130	<180	NT	NT	100
	Nitrite (B,N)	14797650	1,000 (A,N)	1,000 (A,N)	NA	NLV	NLV	ID	NT	<100	<140	NT	<100	<140	NT	NT	<100	<140	NT	NT	<100
	Chloride	16887006	2.5E+5 (E)	2.5E+5 (E)	(FF)	NLV	NLV	ID	NT	190,000	*1,800,000*	NT	98,000	*1,000,000*	NT	NT	*580,000*	*370,000*	NT	NT	*340,000*
	Cyanide, Total (P,R)	57125	200 (A)	200 (A)	5.2	NLV	NLV	57,000	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	Cyanide, Available	NA	NA	NA	NA	NA	NA	NA	<2	<2.0	<2.0	<2	<2.0	<2.0	NT	<2	<20	<2.0	NT	<2	<20
	Formate (Formic Acid [U,I])*	64186	10,000	29,000	ID	7.70E+06	1.50E+07	6.00E+08	NT	<5,000	NT	NT	<5,000	NT	NT	NT	<5,000	NT	NT	NT	<5,000
	Phosphorus (Total)	7723140	63,000	240,000	(EE)	NLV	NLV	ID	NT	270	610	NT	2,000	1,600	NT	NT	2,500	2,100	NT	NT	2,400
	Sulfate	14808798	2.5E+5 (E)	2.5E+5 (E)	NA	NLV	NLV	ID	NT	20,000	29,000	NT	<2,500	<2,500	NT	NT	<2,500	<2,500	NT	NT	66,000
	Sulfide	9073750	NA	NA	NA	NA	NA	NA	NT	<1,000	NT	NT	<1,000	NT	NT	NT	<1,000	NT	NT	NT	<1.000

See Page 7 for notes

Table 3B
SUMMARY HISTORICAL GROUNDWATER ANALTYICAL DATA (South of Rum Creek)
123 North Main Street
Rockford, Michigan

	Hazardous Substance	Chemical Abstract Service (CAS) Number	Residential Drinking Water Criteria (DWC)	Non Residential Drinking Water Criteria (DWC)	Groundwater Surface Water Interface Criteria (GSIC)	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria (GVIAIC)	Non Residential Groundwater Volatilization to Indoor Air Inhalation Criteria (GVIAIC)	Groundwater Contact Criteria (GCC) (AA)	P-4 2.4-7.1 ft 9/30/2014	P-5 4.1-8.8 ft 9/4/2013	P-5 4.1-8.8 ft 10/1/2014	TMW-101 5.7-10.5 ft 1/22/2013	TMW-101 5.7-10.5 ft 9/3/2013	TMW-101 5.7-10.5 ft 10/2/2014	TMW-101 5.7-10.5 ft 9/1/2017	TMW-102 5.5-10.3 ft 1/22/2013	TMW-103 9.3-14.1 ft 1/24/2013	TMW-103 9.3-14.1 ft 9/4/2013	TMW-103 9.3-14.1 ft 9/30/2014	TMW-104 5.5-10.4 ft 1/22/2013	TMW-104 5.5-10.4 ft 9/4/2013
VOCs	2-Butanone (MEK) (I)	78933	13,000	38,000	2,200	2.4E+8 (S)	2.4E+8 (S)	2.4E+8 (S)	NT	<10	NT	NT	<10	NT	NT	NT	NT	<10	NT	NT	<10
	1,1-Dichloroethane	75343	880	2,500	740	1.00E+06	2.30E+06	2.40E+06	NT	<1.0	NT	NT	<1.0	NT	NT	NT	NT	<1.0	NT	NT	<1.0
	1,1-Dichloroethylene (I)	75354	7.0 (A)	7.0 (A)	130	200	1,300	11,000	NT	<1.0	NT	NT	<1.0	NT	NT	NT	NT	<1.0	NT	NT	<1.0
	1,2-Dichlorobenzene	95501	600 (A)	600 (A)	13	1.6E+5 (S)	1.6E+5 (S)	1.6E+5 (S)	NT	<1.0	NT	NT	<1.0	NT	NT	NT	NT	<1.0	NT	NT	<1.0
	1,2-Dichloroethane	107062	5.0 (A)	5.0 (A)	360 (X)	9,600	59,000	19,000	NT	0.56	NT	NT	<1.0	NT	NT	NT	NT	<1.0	NT	NT	<1.0
	Acetone	67641	730	2,100	1,700	1.0E+9 (D,S)	1.0E+9 (D,S)	31,000,000	NT	<50	NT	NT	<50	NT	NT	NT	NT	10	NT	NT	<10
	Chlorobenzene	108907	100 (A)	100 (A)	25	210,000	4.7E+5 (S)	86,000	NT	<1.0	NT	NT	<1.0	NT	NT	NT	NT	<1.0	NT	NT	<1.0
	Di-isopropyl ether	108203	30	86	ID	8,000 (S)	8,000 (S)	8,000 (S)	NT	<1.0	NT	NT	<1.0	NT	NT	NT	NT	<1.0	NT	NT	<1.0
	Ethylbenzene	100414	74 (E)	74 (E)	18	1.10E+05	1.7E+5 (S)	1.7E+5 (S)	NT	<1.0	NT	NT	<1.0	NT	NT	NT	NT	<1.0	NT	NT	<1.0
	2-Methylnaphthalene	91576	260	750	19	25,000 (S)	25,000 (S)	25,000 (S)	NT	<10	NT	NT	<10	NT	NT	NT	NT	<10	NT	NT	6.5
	4-Methyl-2-pentanone (MIBK) (I)	108101	1,800	5,200	ID	2.0E+7 (S)	2.0E+7 (S)	1.3E+07	NT	<10	NT	NT	<10	NT	NT	NT	NT	<10	NT	NT	<10
	Naphthalene	91203	520	1,500	11	31,000 (S)	31,000 (S)	31,000 (S)	NT	<5.0	NT	NT	<5.0	NT	NT	NT	NT	<5.0	NT	NT	<5.0
	Toluene	108883	790 (E)	790 (E)	270	5.3E+5 (S)	5.3E+5 (S)	5.3E+5 (S)	NT	<5.0	NT	NT	<5.0	NT	NT	NT	NT	<5.0	NT	NT	<5.0
	Trichlorofluoromethane	75694	2,600	7,300	NA	1.1E+6 (S)	1.1E+6 (S)	1.1E+6 (S)	NT	2.5	NT	NT	<5.0	NT	NT	NT	NT	<5.0	NT	NT	<5.0
	1,2,4-Trimethylbenzene	95636	63 (E)	63 (E)	17	56,000 (S)	56,000 (S)	56,000 (S)	NT	0.56	NT	NT	<1.0	NT	NT	NT	NT	<1.0	NT	NT	3.4
	1,2,3-Trimethylbenzene	NA	NA	NA	NA	NA	NA	NA	NT	0.40	NT	NT	<1.0	NT	NT	NT	NT	<1.0	NT	NT	<1.0
	1,3,5-Trimethylbenzene	108678	72 (E)	72 (E)	45	61,000 (S)	61,000 (S)	61,000 (S)	NT	<1.0	NT	NT	<1.0	NT	NT	NT	NT	<1.0	NT	NT	0.60
	Vinyl chloride	75014	2.0 (A)	2.0 (A)	13 (X)	1,100	13,000	1,000	NT	<1.0	NT	NT	<1.0	NT	NT	NT	NT	<1.0	NT	NT	<1.0
	Xylenes	1330207	280 (E)	280 (E)	41	1.9E+5 (S)	1.9E+5 (S)	1.9E+5 (S)	NT	1.7	NT	NT	<3.0	NT	NT	NT	NT	<3.0	NT	NT	<3.0
Semi-VOCs	Acenaphthene	83329	1300	3800	38	4,200 (S)	4,200 (S)	4,200 (S)	NT	<1.0	NT	NT	<1.0	NT	NT	NT	NT	<1.0	NT	NT	1.6
	Bis (2 ethylhexyl) phthalate	117817	6.0 (A)	6.0 (A)	25	NLV	NLV	320 (AA)	NT	0.90	NT	NT	0.96	NT	NT	NT	NT	1.0	NT	NT	1.2
	Di-n-butyl phthalate	84742	880	2,500	9.7	NLV	NLV	11,000 (S)	NT	0.28	NT	NT	0.56	NT	NT	NT	NT	0.37	NT	NT	<3.0
	Diethyl phthalate	84662	5,500	16,000	110	NLV	NLV	1.1E+6 (S)	NT	<3.0	NT	NT	<3.0	NT	NT	NT	NT	0.32	NT	NT	<3.0
	Fluorene	86737	880	2,000 (S)	12	2,000 (S)	2,000 (S)	2,000 (S)	NT	0.40	NT	NT	<1.0	NT	NT	NT	NT	<1.0	NT	NT	0.86
	Naphthalene	91203	520	1,500	11	31,000 (S)	31,000 (S)	31,000 (S)	NT	0.88	NT	NT	<1.0	NT	NT	NT	NT	<1.0	NT	NT	<1.0
	Pyrene	129000	140 (S)	140 (S)	ID	140 (S)	140 (S)	140 (S)	NT	<1.0	NT	NT	<1.0	NT	NT	NT	NT	<1.0	NT	NT	0.96
	Phenol	108952	4,400	13,000	450	NLV	NLV	2.90E+07	NT	<10	NT	NT	<10	NT	NT	NT	NT	<10	NT	NT	<10
	4-Chloro-3-methylphenol	59507	150	420	7.4	NLV	NLV	79,000	NT	6.6	NT	NT	<10	NT	NT	NT	NT	<10	NT	NT	<10
Metals	Aluminum	7429905	50 (V)	50 (V)	NA	NLV	NLV	6.4E+07	*130*	*120*	*360*	NT	*250*	<50	NT	NT	NT	*1100*	*6,600*	NT	*2,500*
	Antimony	7440360	6.0 (A)	6.0 (A)	130 (X)	NLV	NLV	68,000	<2.0	<2.0	<2.0	NT	<2.0	<2.0	NT	NT	NT	<2.0	<2.0	NT	<2.0
	Arsenic	7440382	10 (A)	10 (A)	10	NLV	NLV	4,300	<5.0	***15***	6.8	NT	<5.0	<5.0	<5.0	NT	NT	7.2	6.8	NT	<5.0
	Barium (B)	7440393	2,000 (A)	2,000 (A)	670 (G)	NLV	NLV	1.40E+07	NT	100	NT	NT	<100	NT	<100	NT	NT	<100	NT	NT	<100
	Beryllium	7440417	4.0 (A)	4.0 (A)	67 (G)	NLV	NLV	290,000	NT	<1.0	NT	NT	<1.0	NT	NT	NT	NT	<1.0	NT	NT	<1.0
	Boron (B)	7440428	500 (F)	500 (F)	7,200 (X)	NLV	NLV	6.20E+07	*620*	*680*	*830*	NT	350	<300	NT	NT	NT	<300	<300	NT	<300
	Cadmium (B)	7440439	5.0 (A)	5.0 (A)	3.0 (G,X)	NLV	NLV	190,000	NT	<1.0	NT	NT	<1.0	NT	<0.50	NT	NT	1.2	NT	NT	<1.0
	Chromium (total) (B,H)	18540299	100 (A)	100 (A)	100 (G,X)	NLV	NLV	460,000	15	<10	<10	NT	<10	<10	64	NT	NT	19	21	NT	<10
	Chromium (VI)	18540299	100 (A)	100 (A)	11	NLV	NLV	460,000	<5.0	<5.0	<5.0	NT	<5.0	5.1	**63**	NT	NT	<5.0	<5.0	NT	<5.0
	Cobalt	7440484	40	100	100	NLV	NLV	2.40E+06	NT	<20	NT	NT	<20	NT	NT	NT	NT	<20	NT	NT	<20
	Copper (B)	7440508	1,000 (E)	1,000 (E)	13 (G)	NLV	NLV	7.40E+06	<4.0	<4.0	<4.0	NT	**25**	<4.0	<4.0	NT	NT	**24**	5.6	NT	**26**
	Iron (B)	7439896	300 (E)	300 (E)	NA	NLV	NLV	5.80E+07	*2,100*	*4,000*	*2,600*	NT	*3,700*	*1,300*	<200	NT	NT	*1,400*	*9,800*	NT	*1,800*
	Lead (B)	7439921	4.0 (L)	4.0 (L)	16 (G,X)	NLV	NLV	ID	<3.0	<50	<3.0	NT	<3.0	<3.0	<3.0	NT	NT	<50	8.4	NT	<50
	Magnesium (B)	7439954	400,000	1,100,000	NA	NLV	NLV	1.0E+9 (D)	NT	21,000	NT	NT	15,000	NT	NT	NT	NT	12,000	NT	NT	6,200
	Mercury (Total) (B,Z)	Varies	2.0 (A)	2.0 (A)	0.0013	56 (S)	56 (S)	56 (S)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	Molybdenum (B)	7439987	73	210	3,200 (X)	NLV	NLV	970,000	NT	<50	NT	NT	<50	NT	NT	NT	NT	<50	NT	NT	<50
	Nickel (B)	7440020	100 (A)	100 (A)	73 (G)	NLV	NLV	7.40E+07	NT	28	NT	NT	<20	NT	NT	NT	NT	31	NT	NT	<20
	Selenium (B)	7782492	50 (A)	50 (A)	5	NLV	NLV	970,000	<5.0	<5.0	<5.0	NT	<5.0	<5.0	NT	NT	NT	<5.0	<5.0	NT	<5.0
	Silver (B)	7440224	34	98	0.2 (M); 0.06	NLV	NLV	1.50E+06	<0.20	<5.0	<0.20	NT	<0.2	<0.20	<0.50	NT	NT	<5.0	<0.20	NT	<5.0
	Sodium	17341252	230,000 (HH)	350,000	NA	NLV	NLV	1.0E+9 (D)	290,000	180,000	150,000	NT	39,000	47,000	NT	NT	NT	140,000	63,000	NT	*410,000*
	Titanium	7440326	NA	NA	NA	NA	NA	NA	NT	<25	NT	NT	<25	NT	NT	NT	NT	53	NT	NT	48
	Thallium (B)	7440280	2.0 (A)	2.0 (A)	3.7 (X)	NLV	NLV	13,000	NT	<2.0	NT	NT	<2.0	NT	NT	NT	NT	<2.0	NT	NT	*2.6*
	Vanadium	7440622	4.5	62	27	NLV	NLV	970,000	9.7	4.2	<4.0	NT	<4.0	<4.0	<4.0	NT	NT	*21*	*26*	NT	*15*
	Zinc (B)	7440666	2,400	5,000 (E)	170 (G)	NLV	NLV	1.10E+08	NT	<150	NT	NT	<150	NT	<20	NT	NT	<150	NT	NT	<150
Other	Acetate	71501	4,200	12,000	7,700 (G)	ID	ID	ID	NT	<5,000	NT	NT	<5,000	NT	NT	NT	NT	<5,000	NT	NT	<5,000
	Ammonia	7664417	10,000 (N)	10,000 (N)	(CC)	3.20E+06	7.10E+06	ID	*33,000*	2,900	1,400	1,000	35	<10	<100	*120,000*	3,500	1,600	1,700	550	370
	Unionized Ammonia (calculation assumes 20°C)		NA	NA	29 (G)	NA	NA	NA	**1,260**	**111**	**53**	**38**	1.3	<0.4	NT	**4,580**	**134**	**61**	**65**	21	14
	Nitrate (B,N)	14797558	10,000 (A,N)	10,000 (A,N)	ID	NLV	NLV	3.10E+08	<180	<100	<180	NT	<100	<180	NT	NT	NT	<100	<180	NT	<100
	Nitrite (B,N)	14797650	1,000 (A,N)	1,000 (A,N)	NA	NLV	NLV	ID	<140	<100	<140	NT	<100	<140	NT	NT	NT	<100	<140	NT	<100
	Chloride	16887006	2.5E+5 (E)	2.5E+5 (E)	(FF)	NLV	NLV	ID	160,000	41,000	42,000	NT	26,000	24,000	NT	NT	NT	80,000	22,000	NT	97,000
	Cyanide, Total (P,R)	57125	200 (A)	200 (A)	5.2	NLV	NLV	57,000	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	Cyanide, Available	NA	NA	NA	NA	NA	NA	NA	4.0	7.2	<2.0	NT	2.0	<2.0	NT	NT	NT	3.3	<2.0	NT	<2.0
	Formate (Formic Acid [U,I])*	64186	10,000	29,000	ID	7.70E+06	1.50E+07	6.00E+08	NT	<5,000	NT	NT	<5,000	NT	NT	NT	NT	<5,000	NT	NT	<5,000
	Phosphorus (Total)	7723140	63,000	240,000	(EE)	NLV	NLV	ID	940	69	16	NT	32	<10	NT	NT	NT	250	160	NT	98
	Sulfate	14808798	2.5E+5 (E)	2.5E+5 (E)	NA	NLV	NLV	ID	51,000	*690,000*	*680,000*	NT	85,000	63,000	NT	NT	NT	23,000	3,300	NT	22,000
	Sulfide	9073750	NA	NA	NA	NA	NA	NA	NT	<1,000	NT	NT	<1,000	NT	NT	NT	NT	1,000	NT	NT	<1,000

See Page 7 for notes

Table 3B
SUMMARY HISTORICAL GROUNDWATER ANALTYICAL DATA (South of Rum Creek)
123 North Main Street
Rockford, Michigan

	Hazardous Substance	Chemical Abstract Service (CAS) Number	Residential Drinking Water Criteria (DWC)	Non Residential Drinking Water Criteria (DWC)	Groundwater Surface Water Interface Criteria (GSIC)	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria (GVIAIC)	Non Residential Groundwater Volatilization to Indoor Air Inhalation Criteria (GVIAIC)	Groundwater Contact Criteria (GCC) (AA)	TMW-104 5.5-10.4 ft 10/2/2014	TMW-105 5.5-10.3 ft 9/5/2013	TMW-105 5.5-10.3 ft 9/30/2014	TMW-105 5.5-10.3 ft 9/1/2017	MW-301B 4.3-6.3 ft 9/3/2013	MW-301B 4.3-6.3 ft 10/2/2014	MW-302A 3.6-6.0 ft 9/3/2013	MW-302A 3.6-6.0 ft 10/1/2014	MW-302A 3.6-6.0 ft 9/1/2017	MW-302B 9.6-14.4 ft 9/3/2013	MW-302B 9.6-14.4 ft 10/1/2014	MW-303A 2.8-7.5 ft 9/5/2013	MW-303A 2.8-7.5 ft 10/1/2014
VOCs	2-Butanone (MEK) (I)	78933	13,000	38,000	2,200	2.4E+8 (S)	2.4E+8 (S)	2.4E+8 (S)	NT	<10	NT	NT	<10	NT	<10	NT	NT	<10	NT	<10	NT
	1,1-Dichloroethane	75343	880	2,500	740	1.00E+06	2.30E+06	2.40E+06	NT	<1.0	NT	NT	<1.0	NT	<1.0	NT	NT	<1.0	NT	<1.0	NT
	1,1-Dichloroethylene (I)	75354	7.0 (A)	7.0 (A)	130	200	1,300	11,000	NT	<1.0	NT	NT	<1.0	NT	<1.0	NT	NT	<1.0	NT	<1.0	NT
	1,2-Dichlorobenzene	95501	600 (A)	600 (A)	13	1.6E+5 (S)	1.6E+5 (S)	1.6E+5 (S)	NT	0.37	NT	NT	<1.0	NT	<1.0	NT	NT	<1.0	NT	<1.0	NT
	1,2-Dichloroethane	107062	5.0 (A)	5.0 (A)	360 (X)	9,600	59,000	19,000	NT	<1.0	NT	NT	<1.0	NT	<1.0	NT	NT	<1.0	NT	<1.0	NT
	Acetone	67641	730	2,100	1,700	1.0E+9 (D,S)	1.0E+9 (D,S)	31,000,000	NT	<50	NT	NT	<50	NT	52	NT	NT	<50	NT	<50	NT
	Chlorobenzene	108907	100 (A)	100 (A)	25	210,000	4.7E+5 (S)	86,000	NT	1.1	NT	NT	<1.0	NT	<1.0	NT	NT	<1.0	NT	<1.0	NT
	Di-isopropyl ether	108203	30	86	ID	8,000 (S)	8,000 (S)	8,000 (S)	NT	<1.0	NT	NT	<1.0	NT	<1.0	NT	NT	<1.0	NT	<1.0	NT
	Ethylbenzene	100414	74 (E)	74 (E)	18	1.10E+05	1.7E+5 (S)	1.7E+5 (S)	NT	<1.0	NT	NT	<1.0	NT	1.3	NT	NT	<1.0	NT	<1.0	NT
	2-Methylnaphthalene	91576	260	750	19	25,000 (S)	25,000 (S)	25,000 (S)	NT	<10	NT	NT	<10	NT	<10	NT	NT	<10	NT	<10	NT
	4-Methyl-2-pentanone (MIBK) (I)	108101	1,800	5,200	ID	2.0E+7 (S)	2.0E+7 (S)	1.3E+07	NT	<10	NT	NT	<10	NT	<10	NT	NT	<10	NT	<10	NT
	Naphthalene	91203	520	1,500	11	31,000 (S)	31,000 (S)	31,000 (S)	NT	<5.0	NT	NT	<5.0	NT	<5.0	NT	NT	<5.0	NT	<5.0	NT
	Toluene	108883	790 (E)	790 (E)	270	5.3E+5 (S)	5.3E+5 (S)	5.3E+5 (S)	NT	<5.0	NT	NT	<5.0	NT	48	NT	NT	<5.0	NT	<5.0	NT
	Trichlorofluoromethane	75694	2,600	7,300	NA	1.1E+6 (S)	1.1E+6 (S)	1.1E+6 (S)	NT	<5.0	NT	NT	<5.0	NT	<5.0	NT	NT	<5.0	NT	<5.0	NT
	1,2,4-Trimethylbenzene	95636	63 (E)	63 (E)	17	56,000 (S)	56,000 (S)	56,000 (S)	NT	<1.0	NT	NT	<1.0	NT	<1.0	NT	NT	<1.0	NT	<1.0	NT
	1,2,3-Trimethylbenzene	NA	NA	NA	NA	NA	NA	NA	NT	<1.0	NT	NT	<1.0	NT	<1.0	NT	NT	<1.0	NT	<1.0	NT
	1,3,5-Trimethylbenzene	108678	72 (E)	72 (E)	45	61,000 (S)	61,000 (S)	61,000 (S)	NT	<1.0	NT	NT	<1.0	NT	<1.0	NT	NT	<1.0	NT	<1.0	NT
	Vinyl chloride	75014	2.0 (A)	2.0 (A)	13 (X)	1,100	13,000	1,000	NT	<1.0	NT	NT	<1.0	NT	<1.0	NT	NT	<1.0	NT	<1.0	NT
	Xylenes	1330207	280 (E)	280 (E)	41	1.9E+5 (S)	1.9E+5 (S)	1.9E+5 (S)	NT	<3.0	NT	NT	<3.0	NT	<3.0	NT	NT	<3.0	NT	<3.0	NT
Semi-VOCs	Acenaphthene	83329	1300	3800	38	4,200 (S)	4,200 (S)	4,200 (S)	NT	<1.0	NT	NT	<1.0	NT	0.39	NT	NT	<1.0	NT	<1.0	<5.0
	Bis (2 ethylhexyl) phthalate	117817	6.0 (A)	6.0 (A)	25	NLV	NLV	320 (AA)	NT	<3.0	NT	NT	0.96	NT	0.84	NT	NT	0.82	NT	<3.0	NT
	Di-n-butyl phthalate	84742	880	2,500	9.7	NLV	NLV	11,000 (S)	NT	<3.0	NT	NT	0.30	NT	0.36	NT	NT	0.57	NT	<3.0	NT
	Diethyl phthalate	84662	5,500	16,000	110	NLV	NLV	1.1E+6 (S)	NT	<3.0	NT	NT	<3.0	NT	<3.0	NT	NT	<3.0	NT	<3.0	NT
	Fluorene	86737	880	2,000 (S)	12	2,000 (S)	2,000 (S)	2,000 (S)	NT	<1.0	NT	NT	<1.0	NT	<1.0	NT	NT	<1.0	NT	<1.0	<5.0
	Naphthalene	91203	520	1,500	11	31,000 (S)	31,000 (S)	31,000 (S)	NT	<1.0	NT	NT	<1.0	NT	0.53	NT	NT	<1.0	NT	<1.0	<5.0
	Pyrene	129000	140 (S)	140 (S)	ID	140 (S)	140 (S)	140 (S)	NT	<1.0	NT	NT	<1.0	NT	<1.0	NT	NT	<1.0	NT	<1.0	<5.0
	Phenol	108952	4,400	13,000	450	NLV	NLV	2.90E+07	NT	<10	NT	NT	<10	NT	<10	NT	NT	<10	NT	<10	NT
	4-Chloro-3-methylphenol	59507	150	420	7.4	NLV	NLV	79,000	NT	<10	NT	NT	<10	NT	<10	NT	NT	<10	NT	<10	NT
Metals	Aluminum	7429905	50 (V)	50 (V)	NA	NLV	NLV	6.4E+07	*130*	*180*	<50	NT	*100*	50	*250*	50	NT	*190*	<50	*520*	*62*
	Antimony	7440360	6.0 (A)	6.0 (A)	130 (X)	NLV	NLV	68,000	<2.0	<2.0/<5.0	<2.0	NT	<2.0	<2.0	<2.0	<2.0	NT	<2.0	<2.0	<2.0	<2.0
	Arsenic	7440382	10 (A)	10 (A)	10	NLV	NLV	4,300	<5.0	***12/12***	<5.0	<5.0	<5.0	<5.0	***28***	10	5.5	10	***14***	<5.0	<5.0
	Barium (B)	7440393	2,000 (A)	2,000 (A)	670 (G)	NLV	NLV	1.40E+07	NT	120/120	NT	<100	<100	NT	170	NT	190	350	NT	**710**	NT
	Beryllium	7440417	4.0 (A)	4.0 (A)	67 (G)	NLV	NLV	290,000	NT	<1.0/<2.0	NT	NT	<1.0	NT	<1.0	NT	NT	<1.0	NT	<1.0	NT
	Boron (B)	7440428	500 (F)	500 (F)	7,200 (X)	NLV	NLV	6.20E+07	<300	480	480	NT	370	300	310	<300	NT	<300	<300	<300	<300
	Cadmium (B)	7440439	5.0 (A)	5.0 (A)	3.0 (G,X)	NLV	NLV	190,000	NT	<1.0/<0.20	NT	<0.50	<1.0	NT	<1.0	NT	<0.50	<1.0	NT	<1.0	NT
	Chromium (total) (B,H)	18540299	100 (A)	100 (A)	100 (G,X)	NLV	NLV	460,000	<10	<10/7.1	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Chromium (VI)	18540299	100 (A)	100 (A)	11	NLV	NLV	460,000	<5.0	<5.0	<0.5	<10	<5.0	<5.0	8.9	<5.0	<10	<5.0	<5.0	<5.0	39
	Cobalt	7440484	40	100	100	NLV	NLV	2.40E+06	NT	<20/<5.0	NT	NT	<20	NT	<20	NT	NT	<20	NT	<20	NT
	Copper (B)	7440508	1,000 (E)	1,000 (E)	13 (G)	NLV	NLV	7.40E+06	<4.0	8.1/<4.0	<4.0	<4.0	**28**	5.1	**18**	<4.0	<4.0	6.3	<4.0	7.1	<4.0
	Iron (B)	7439896	300 (E)	300 (E)	NA	NLV	NLV	5.80E+07	*380*	*4,800*	*1,400*	*2,100*	*2,400*	*6,700*	*18,000*	*10,000*	*5,600*	*8,800*	*25,000*	*79,000*	*34,000*
	Lead (B)	7439921	4.0 (L)	4.0 (L)	16 (G,X)	NLV	NLV	ID	<3.0	*11/9.5*	*8.9*	*9.0*	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
	Magnesium (B)	7439954	400,000	1,100,000	NA	NLV	NLV	1.0E+9 (D)	NT	18,000	NT	NT	16,000	NT	12,000	NT	NT	14,000	NT	73,000	NT
	Mercury (Total) (B,Z)	Varies	2.0 (A)	2.0 (A)	0.0013	56 (S)	56 (S)	56 (S)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	Molybdenum (B)	7439987	73	210	3,200 (X)	NLV	NLV	970,000	NT	<50<5.0	NT	NT	<50	NT	<50	NT	NT	<50	NT	<50	NT
	Nickel (B)	7440020	100 (A)	100 (A)	73 (G)	NLV	NLV	7.40E+07	NT	<20/7.6	NT	NT	<20	NT	<20	NT	NT	<20	NT	<20	NT
	Selenium (B)	7782492	50 (A)	50 (A)	5	NLV	NLV	970,000	<5.0	<5.0/<5.0	<5.0	NT	<5.0	<5.0	<5.0	<5.0	NT	<5.0	<5.0	<5.0	<5.0
	Silver (B)	7440224	34	98	0.2 (M); 0.06	NLV	NLV	1.50E+06	<0.20	<0.20	<0.20	<0.50	<5.0	**9.4**	<5.0	<0.20	<0.50	<5.0	<0.20	<5.0	<0.20
	Sodium	17341252	230,000 (HH)	350,000	NA	NLV	NLV	1.0E+9 (D)	38,000	*900,000*	*650,000*	NT	140,000	*300,000*	*440,000*	130,000	NT	*1,200,000*	*810,000*	*1,500,000*	*580,000*
	Titanium	7440326	NA	NA	NA	NA	NA	NA	NT	<25	NT	NT	<25	NT	<25	NT	NT	26	NT	<25	NT
	Thallium (B)	7440280	2.0 (A)	2.0 (A)	3.7 (X)	NLV	NLV	13,000	NT	<2.0/<5.0	NT	NT	<2.0	NT	<2.0	NT	NT	<2.0	NT	<2.0	NT
	Vanadium	7440622	4.5	62	27	NLV	NLV	970,000	5.9	4.8/<4.0	<4.0	<4.0	<4.0	<4.0	5.6	<4.0	<4.0	4.2	<4.0	4.0	<4.0
	Zinc (B)	7440666	2,400	5,000 (E)	170 (G)	NLV	NLV	1.10E+08	NT	<150/15	NT	<20	<150	NT	<150	NT	<20	<150	NT	<150	NT
Other	Acetate	71501	4,200	12,000	7,700 (G)	ID	ID	ID	NT	<5,000	NT	NT	<5,000	NT	<5,000	NT	NT	<5,000	NT	<5,000	NT
	Ammonia	7664417	10,000 (N)	10,000 (N)	(CC)	3.20E+06	7.10E+06	ID	180	*52,000*	*54,000*	*14,000*	440	710	8,200	410	4,000	6,600	*12,000*	*66,000*	*30,000*
	Unionized Ammonia (calculation assumes 20°C)		NA	NA	29 (G)	NA	NA	NA	6.9	**1,990**	**2,060**	NT	17	27	**313**	16	NT	**252**	**458**	**2,520**	**1,150**
	Nitrate (B,N)	14797558	10,000 (A,N)	10,000 (A,N)	ID	NLV	NLV	3.10E+08	<180	<100	190	NT	<100	<180	<100	<180	NT	<100	<180	<100	<180
	Nitrite (B,N)	14797650	1,000 (A,N)	1,000 (A,N)	NA	NLV	NLV	ID	<140	<100	<140	NT	<100	<140	<100	<140	NT	<100	<140	<100	<140
	Chloride	16887006	2.5E+5 (E)	2.5E+5 (E)	(FF)	NLV	NLV	ID	120,000	*640,000*	*680,000*	NT	82,000	42,000	*380,000*	67,000	NT	*1,000,000*	*1,300,000*	*2,100,000*	*1,200,000*
	Cyanide, Total (P,R)	57125	200 (A)	200 (A)	5.2	NLV	NLV	57,000	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	Cyanide, Available	NA	NA	NA	NA	NA	NA	NA	<2.0	<20	<2.0	NT	<2.0	<2.0	<2.0	<2.0	NT	<2.0	<2.0	<20	<2.0
	Formate (Formic Acid [U,I])*	64186	10,000	29,000	ID	7.70E+06	1.50E+07	6.00E+08	NT	<5,000	NT	NT	<5,000	NT	<5,000	NT	NT	<5,000	NT	<5,000	NT
	Phosphorus (Total)	7723140	63,000	240,000	(EE)	NLV	NLV	ID	61	290	150	NT	21	<10	490	160	NT	44	280	1,900	240
	Sulfate	14808798	2.5E+5 (E)	2.5E+5 (E)	NA	NLV	NLV	ID	8,800	*300,000*	*260,000*	NT	91,000	140,000	12,000	140,000	NT	<2,500	<2,500	5,200	<2,500
	Sulfide	9073750	NA	NA	NA	NA	NA	NA	NT	<1,000	NT	NT	<1,000	NT	<1,000	NT	NT	<1,000	NT	<1,000	NT

See Page 7 for notes

Table 3B
SUMMARY HISTORICAL GROUNDWATER ANALTYICAL DATA (South of Rum Creek)
123 North Main Street
Rockford, Michigan

	Hazardous Substance	Chemical Abstract Service (CAS) Number	Residential Drinking Water Criteria (DWC)	Non Residential Drinking Water Criteria (DWC)	Groundwater Surface Water Interface Criteria (GSIC)	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria (GVIAIC)	Non Residential Groundwater Volatilization to Indoor Air Inhalation Criteria (GVIAIC)	Groundwater Contact Criteria (GCC) (AA)	MW-303B 10.1-14.9 ft 9/3/2013	MW-303B 10.1-14.9 ft 10/1/2014	MW-303C 17.2-22.0 ft 9/3/2013	MW-303C 17.2-22.0 ft 10/1/2014	MW-304A 2.7-5.5 ft 9/5/2013	MW-304A 2.7-5.5 ft 10/1/2014	MW-304A 2.7-5.5 ft 9/1/2017	MW-304B 10.3-15.0 ft 9/5/2013	MW-304B 10.3-15.0 ft 10/1/2014	MW-305B 12.1-16.8 ft 9/4/2013	MW-305B 12.1-16.8 ft 9/30/2014	MW-305C 20.1-24.8 ft 9/4/2013	MW-305C 20.1-24.8 ft 9/30/2014
VOCs	2-Butanone (MEK) (l)	78933	13,000	38,000	2,200	2.4E+8 (S)	2.4E+8 (S)	2.4E+8 (S)	<10	NT	<10	NT	<10	NT	NT	<10	NT	<10	NT	<10	NT
	1,1-Dichloroethane	75343	880	2,500	740	1.00E+06	2.30E+06	2.40E+06	<1.0	NT	<1.0	NT	<1.0	NT	NT	<1.0	NT	4.0	NT	2.0	NT
	1,1-Dichloroethylene (l)	75354	7.0 (A)	7.0 (A)	130	200	1,300	11,000	<1.0	NT	<1.0	NT	<1.0	NT	NT	<1.0	NT	1.5	NT	2.3	NT
	1,2-Dichlorobenzene	95501	600 (A)	600 (A)	13	1.6E+5 (S)	1.6E+5 (S)	1.6E+5 (S)	<1.0	NT	<1.0	NT	<1.0	NT	NT	<1.0	NT	<1.0	NT	<1.0	NT
	1,2-Dichloroethane	107062	5.0 (A)	5.0 (A)	360 (X)	9,600	59,000	19,000	<1.0	NT	<1.0	NT	<1.0	NT	NT	<1.0	NT	<1.0	NT	<1.0	NT
	Acetone	67641	730	2,100	1,700	1.0E+9 (D,S)	1.0E+9 (D,S)	31,000,000	<50	NT	<50	NT	<50	NT	NT	<50	NT	<50	NT	<50	NT
	Chlorobenzene	108907	100 (A)	100 (A)	25	210,000	4.7E+5 (S)	86,000	<1.0	NT	<1.0	NT	<1.0	NT	NT	<1.0	NT	<1.0	NT	<1.0	NT
	Di-isopropyl ether	108203	30	86	ID	8,000 (S)	8,000 (S)	8,000 (S)	<1.0	NT	<1.0	NT	0.55	NT	NT	<1.0	NT	<1.0	NT	<1.0	NT
	Ethylbenzene	100414	74 (E)	74 (E)	18	1.10E+05	1.7E+5 (S)	1.7E+5 (S)	<1.0	NT	<1.0	NT	<1.0	NT	NT	<1.0	NT	<1.0	NT	<1.0	NT
	2-Methylnaphthalene	91576	260	750	19	25,000 (S)	25,000 (S)	25,000 (S)	<10	NT	<10	NT	<10	NT	NT	<10	NT	<10	NT	<10	NT
	4-Methyl-2-pentanone (MIBK) (l)	108101	1,800	5,200	ID	2.0E+7 (S)	2.0E+7 (S)	1.3E+07	<10	NT	<10	NT	<10	NT	NT	<10	NT	<10	NT	<10	NT
	Naphthalene	91203	520	1,500	11	31,000 (S)	31,000 (S)	31,000 (S)	<5.0	NT	<5.0	NT	1.8	NT	NT	<5.0	NT	<5.0	NT	<5.0	NT
	Toluene	108883	790 (E)	790 (E)	270	5.3E+5 (S)	5.3E+5 (S)	5.3E+5 (S)	<5.0	NT	<5.0	NT	<5.0	NT	NT	<5.0	NT	<5.0	NT	<5.0	NT
	Trichlorofluoromethane	75694	2,600	7,300	NA	1.1E+6 (S)	1.1E+6 (S)	1.1E+6 (S)	<5.0	NT	<5.0	NT	<5.0	NT	NT	<5.0	NT	<5.0	NT	<5.0	NT
	1,2,4-Trimethylbenzene	95636	63 (E)	63 (E)	17	56,000 (S)	56,000 (S)	56,000 (S)	<1.0	NT	<1.0	NT	<1.0	NT	NT	<1.0	NT	<1.0	NT	<1.0	NT
	1,2,3-Trimethylbenzene	NA	NA	NA	NA	NA	NA	NA	<1.0	NT	<1.0	NT	<1.0	NT	NT	<1.0	NT	<1.0	NT	<1.0	NT
	1,3,5-Trimethylbenzene	108678	72 (E)	72 (E)	45	61,000 (S)	61,000 (S)	61,000 (S)	<1.0	NT	<1.0	NT	<1.0	NT	NT	<1.0	NT	<1.0	NT	<1.0	NT
	Vinyl chloride	75014	2.0 (A)	2.0 (A)	13 (X)	1,100	13,000	1,000	<1.0	NT	<1.0	NT	<1.0	NT	NT	<1.0	NT	0.37	NT	1.3	NT
	Xylenes	1330207	280 (E)	280 (E)	41	1.9E+5 (S)	1.9E+5 (S)	1.9E+5 (S)	<3.0	NT	<3.0	NT	<3.0	NT	NT	<3.0	NT	<3.0	NT	<3.0	NT
Semi-VOCs	Acenaphthene	83329	1300	3800	38	4,200 (S)	4,200 (S)	4,200 (S)	<1.0	NT	<1.0	NT	<1.0	NT	NT	<1.0	NT	<1.0	NT	<1.0	NT
	Bis (2 ethylhexyl) phthalate	117817	6.0 (A)	6.0 (A)	25	NLV	NLV	320 (AA)	0.85	NT	0.88	NT	0.85	NT	NT	<3.0	NT	<3.0	NT	0.74	NT
	Di-n-butyl phthalate	84742	880	2,500	9.7	NLV	NLV	11,000 (S)	<3.0	NT	0.28	NT	0.45	NT	NT	<3.0	NT	<3.0	NT	0.29	NT
	Diethyl phthalate	84662	5,500	16,000	110	NLV	NLV	1.1E+6 (S)	<3.0	NT	<3.0	NT	<3.0	NT	NT	<3.0	NT	<3.0	NT	<3.0	NT
	Fluorene	86737	880	2,000 (S)	12	2,000 (S)	2,000 (S)	2,000 (S)	<1.0	NT	<1.0	NT	<1.0	NT	NT	<1.0	NT	<1.0	NT	<1.0	NT
	Naphthalene	91203	520	1,500	11	31,000 (S)	31,000 (S)	31,000 (S)	<1.0	NT	<1.0	NT	<1.0	NT	NT	<1.0	NT	<1.0	NT	<1.0	NT
	Pyrene	129000	140 (S)	140 (S)	ID	140 (S)	140 (S)	140 (S)	<1.0	NT	<1.0	NT	<1.0	NT	NT	<1.0	NT	<1.0	NT	<1.0	NT
	Phenol	108952	4,400	13,000	450	NLV	NLV	2.90E+07	<10	NT	<10	NT	<10	NT	NT	<10	NT	<10	NT	<10	NT
	4-Chloro-3-methylphenol	59507	150	420	7.4	NLV	NLV	79,000	<10	NT	<10	NT	<10	NT	NT	<10	NT	<10	NT	<10	NT
Metals	Aluminum	7429905	50 (V)	50 (V)	NA	NLV	NLV	6.4E+07	*110*	*110*	*120*	*83*	*500*	*120*	NT	*140*	50	*230*	*100*	*370*	*100*
	Antimony	7440360	6.0 (A)	6.0 (A)	130 (X)	NLV	NLV	68,000	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	NT	<2.0/<5.0	<2.0	<2.0	<2.0	<2.0	<2.0
	Arsenic	7440382	10 (A)	10 (A)	10	NLV	NLV	4,300	<5.0	<5.0	<5.0	<5.0	***22***	5.3	5.5	<5.0/1.3	<5.0	<5.0	<5.0	<5.0	<5.0
	Barium (B)	7440393	2,000 (A)	2,000 (A)	670 (G)	NLV	NLV	1.40E+07	370	NT	120	NT	160	NT	190	<100/34	NT	120	NT	<100	NT
	Beryllium	7440417	4.0 (A)	4.0 (A)	67 (G)	NLV	NLV	290,000	<1.0	NT	<1.0	NT	<1.0	NT	NT	<1.0/<2.0	NT	<1.0	NT	<1.0	NT
	Boron (B)	7440428	500 (F)	500 (F)	7,200 (X)	NLV	NLV	6.20E+07	420	<300	*650*	*640*	*1,100*	*830*	NT	*1,300*	*1,600*	410	450	430	430
	Cadmium (B)	7440439	5.0 (A)	5.0 (A)	3.0 (G,X)	NLV	NLV	190,000	<1.0	NT	<1.0	NT	<1.0	NT	<0.50	<1.0/<0.2	NT	<1.0	NT	<1.0	NT
	Chromium (total) (B,H)	18540299	100 (A)	100 (A)	100 (G,X)	NLV	NLV	460,000	<10	<10	<10	<10	***250***	57	***140***	<10/<5.0	<10	<10	<10	<10	<10
	Chromium (VI)	18540299	100 (A)	100 (A)	11	NLV	NLV	460,000	<5.0	18	<5.0	<5.0	<5.0	<5.0	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	Cobalt	7440484	40	100	100	NLV	NLV	2.40E+06	<20	NT	<20	NT	<20	NT	NT	<20/<5.0	NT	<20	NT	<20	NT
	Copper (B)	7440508	1,000 (E)	1,000 (E)	13 (G)	NLV	NLV	7.40E+06	**20**	<4.0	9.9	<4.0	**15**	<4.0	<4.0	12/4.7	<4.0	**17**	<4.0	9.9	<4.0
	Iron (B)	7439896	300 (E)	300 (E)	NA	NLV	NLV	5.80E+07	*42,000*	**47,000**	*8,500*	*15,000*	*3,300*	*1,900*	*2,300*	*2,200*	*3,000*	*980*	*2,400*	*1,300*	*1,800*
	Lead (B)	7439921	4.0 (L)	4.0 (L)	16 (G,X)	NLV	NLV	ID	<3.0	<3.0	<3.0	<3.0	*5.0*	<3.0	<3.0	<3.0/<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
	Magnesium (B)	7439954	400,000	1,100,000	NA	NLV	NLV	1.0E+9 (D)	43,000	NT	34,000	NT	6,500	NT	NT	34,000	NT	29,000	NT	28,000	NT
	Mercury (Total) (B,Z)	Varies	2.0 (A)	2.0 (A)	0.0013	56 (S)	56 (S)	56 (S)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	Molybdenum (B)	7439987	73	210	3,200 (X)	NLV	NLV	970,000	<50	NT	<50	NT	<50	NT	NT	<50/<5.0	NT	<50	NT	<50	NT
	Nickel (B)	7440020	100 (A)	100 (A)	73 (G)	NLV	NLV	7.40E+07	<20	NT	<20	NT	<20	NT	NT	<20/8.6	NT	<20	NT	<20	NT
	Selenium (B)	7782492	50 (A)	50 (A)	5	NLV	NLV	970,000	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	NT	<5.0/<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	Silver (B)	7440224	34	98	0.2 (M); 0.06	NLV	NLV	1.50E+06	<5.0	<0.20	<5.0	<0.20	<5.0	3.4	<0.50	<0.20	<0.20	<5.0	19	<5.0	<0.20
	Sodium	17341252	230,000 (HH)	350,000	NA	NLV	NLV	1.0E+9 (D)	*1,100,000*	*620,000*	*880,000*	*460,000*	*450,000*	*570,000*	NT	190,000	*280,000*	*300,000*	230,000	170,000	160,000
	Titanium	7440326	NA	NA	NA	NA	NA	NA	<25	NT	<25	NT	150	NT	NT	<25	NT	<25	NT	<25	NT
	Thallium (B)	7440280	2.0 (A)	2.0 (A)	3.7 (X)	NLV	NLV	13,000	<2.0	NT	<2.0	NT	*3.3*	NT	NT	*2.5/<5.0*	NT	<2.0	NT	<2.0	NT
	Vanadium	7440622	4.5	62	27	NLV	NLV	970,000	<4.0	<4.0	<4.0	<4.0	*24*	4.3	*16*	*4.7/<4.0*	<4.0	4.4	<4.0	4.4	<4.0
	Zinc (B)	7440666	2,400	5,000 (E)	170 (G)	NLV	NLV	1.10E+08	<150	NT	<150	NT	<150	NT	<20	<150/<10	NT	<150	NT	<150	NT
Other	Acetate	71501	4,200	12,000	7,700 (G)	ID	ID	ID	<5,000	NT	<5,000	NT	<5,000	NT	NT	<5,000	NT	<5,000	NT	<5,000	NT
	Ammonia	7664417	10,000 (N)	10,000 (N)	(CC)	3.20E+06	7.10E+06	ID	*40,000*	*32,000*	*36,000*	*31,000*	*61,000*	*29,000*	*31,000*	*17,000*	*23,000*	7,700	3,600	9,800	*11,000*
	Unionized Ammonia (calculation assumes 20°C)		NA	NA	29 (G)	NA	NA	NA	**1,530**	**1,220**	**1,380**	**1,180**	**2,330**	**1,110**	NT	**649**	**878**	**294**	**137**	**374**	**420**
	Nitrate (B,N)	14797558	10,000 (A,N)	10,000 (A,N)	ID	NLV	NLV	3.10E+08	<100	<180	<100	<180	<100	<180	NT	<100	250	<100	<180	<100	330
	Nitrite (B,N)	14797650	1,000 (A,N)	1,000 (A,N)	NA	NLV	NLV	ID	<100	<140	<100	<140	<100	<140	NT	<100	<140	<100	<140	<100	<140
	Chloride	16887006	2.5E+5 (E)	2.5E+5 (E)	(FF)	NLV	NLV	ID	110,000	*1,200,000*	*820,000*	*610,000*	*270,000*	*410,000*	NT	120,000	220,000	250,000	200,000	140,000	180,000
	Cyanide, Total (P,R)	57125	200 (A)	200 (A)	5.2	NLV	NLV	57,000	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	Cyanide, Available	NA	NA	NA	NA	NA	NA	NA	<2.0	<2.0	<2.0	<2.0	<20	<2.0	NT	<20	<2.0	<20	<2.0	<20	<2.0
	Formate (Formic Acid [U,I])*	64186	10,000	29,000	ID	7.70E+06	1.50E+07	6.00E+08	<5,000	NT	<5,000	NT	<5,000	NT	NT	<5,000	NT	<5,000	NT	<5,000	NT
	Phosphorus (Total)	7723140	63,000	240,000	(EE)	NLV	NLV	ID	79	1,300	49	27	2,400	2,000	NT	320	350	45	<10	70	<10
	Sulfate	14808798	2.5E+5 (E)	2.5E+5 (E)	NA	NLV	NLV	ID	49,000	6,000	120,000	*310,000*	<2,500	7,300	NT	*690,000*	*820,000*	*330,000*	*310,000*	*320,000*	*330,000*
	Sulfide	9073750	NA	NA	NA	NA	NA	NA	<1,000	NT	<1,000	NT	<1,000	NT	NT	<1,000	NT	<1,000	NT	<1,000	NT

See Page 7 for notes

Table 3B
SUMMARY HISTORICAL GROUNDWATER ANALTYICAL DATA (South of Rum Creek)
123 North Main Street
Rockford, Michigan

	Hazardous Substance	Chemical Abstract Service (CAS) Number	Residential Drinking Water Criteria (DWC)	Non Residential Drinking Water Criteria (DWC)	Groundwater Surface Water Interface Criteria (GSIC)	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria (GVIAIC)	Non Residential Groundwater Volatilization to Indoor Air Inhalation Criteria (GVIAIC)	Groundwater Contact Criteria (GCC) (AA)	MW-1 3.6-8.3 ft 7/5/2011	MW-1 3.6-8.3 ft 1/4/2012	MW-1 3.6-8.3 ft 9/5/2013	MW-1 3.6-8.3 ft 10/1/2014	MW-2 2.9-7.8 ft 7/5/2011	MW-2 2.9-7.8 ft 1/4/2012	MW-2 2.9-7.8 ft 9/5/2013	MW-2 2.9-7.8 ft 10/1/2014	MW-3 2.3-7.0 ft 7/5/2011	MW-3 2.3-7.0 ft 1/4/2012	MW-3 2.3-7.0 ft 9/4/2013	MW-3 2.3-7.0 ft 9/30/2014	MW-4 4.0-9.0 ft 1/4/2012
VOCs	2-Butanone (MEK) (I)	78933	13,000	38,000	2,200	2.4E+8 (S)	2.4E+8 (S)	2.4E+8 (S)	21	NT	NT	NT	<5	NT	NT	NT	<5	<5	NT	NT	<25
	1,1-Dichloroethane	75343	880	2,500	740	1.00E+06	2.30E+06	2.40E+06	<1	NT	NT	NT	<1	NT	NT	NT	<1	3	NT	NT	<1
	1,1-Dichloroethylene (I)	75354	7.0 (A)	7.0 (A)	130	200	1,300	11,000	<1	NT	NT	NT	<1	NT	NT	NT	<1	<1	NT	NT	<1
	1,2-Dichlorobenzene	95501	600 (A)	600 (A)	13	1.6E+5 (S)	1.6E+5 (S)	1.6E+5 (S)	<1	NT	NT	NT	<1	NT	NT	NT	<1	<1	NT	NT	<1
	1,2-Dichloroethane	107062	5.0 (A)	5.0 (A)	360 (X)	9,600	59,000	19,000	<1	NT	NT	NT	<1	NT	NT	NT	<1	<1	NT	NT	<1
	Acetone	67641	730	2,100	1,700	1.0E+9 (D,S)	1.0E+9 (D,S)	31,000,000	53	NT	NT	NT	<20	NT	NT	NT	<20	<20	NT	NT	<100
	Chlorobenzene	108907	100 (A)	100 (A)	25	210,000	4.7E+5 (S)	86,000	<1	NT	NT	NT	<1	NT	NT	NT	<1	<1	NT	NT	<1
	Di-isopropyl ether	108203	30	86	ID	8,000 (S)	8,000 (S)	8,000 (S)	<5	NT	NT	NT	<5	NT	NT	NT	<5	<5	NT	NT	<5
	Ethylbenzene	100414	74 (E)	74 (E)	18	1.10E+05	1.7E+5 (S)	1.7E+5 (S)	<1	NT	NT	NT	<1	NT	NT	NT	<1	<1	NT	NT	<1
	2-Methylnaphthalene	91576	260	750	19	25,000 (S)	25,000 (S)	25,000 (S)	<5	NT	NT	NT	<5	NT	NT	NT	<5	<5	NT	NT	<5
	4-Methyl-2-pentanone (MIBK) (I)	108101	1,800	5,200	ID	2.0E+7 (S)	2.0E+7 (S)	1.3E+07	19	NT	NT	NT	<5	NT	NT	NT	<5	<5	NT	NT	<25
	Naphthalene	91203	520	1,500	11	31,000 (S)	31,000 (S)	31,000 (S)	<5	NT	NT	NT	<5	NT	NT	NT	<5	<5	NT	NT	<5
	Toluene	108883	790 (E)	790 (E)	270	5.3E+5 (S)	5.3E+5 (S)	5.3E+5 (S)	<1	NT	NT	NT	<1	NT	NT	NT	<1	<1	NT	NT	<1
	Trichlorofluoromethane	75694	2,600	7,300	NA	1.1E+6 (S)	1.1E+6 (S)	1.1E+6 (S)	<1	NT	NT	NT	<1	NT	NT	NT	<1	<1	NT	NT	<1
	1,2,4-Trimethylbenzene	95636	63 (E)	63 (E)	17	56,000 (S)	56,000 (S)	56,000 (S)	<1	NT	NT	NT	<1	NT	NT	NT	<1	<1	NT	NT	<1
	1,2,3-Trimethylbenzene	NA	NA	NA	NA	NA	NA	NA	<1	NT	NT	NT	<1	NT	NT	NT	<1	<1	NT	NT	<1
	1,3,5-Trimethylbenzene	108678	72 (E)	72 (E)	45	61,000 (S)	61,000 (S)	61,000 (S)	<1	NT	NT	NT	<1	NT	NT	NT	<1	<1	NT	NT	<1
	Vinyl chloride	75014	2.0 (A)	2.0 (A)	13 (X)	1,100	13,000	1,000	<1	NT	NT	NT	<1	NT	NT	NT	<1	<1	NT	NT	<1
	Xylenes	1330207	280 (E)	280 (E)	41	1.9E+5 (S)	1.9E+5 (S)	1.9E+5 (S)	<3	NT	NT	NT	<3	NT	NT	NT	<3	<3	NT	NT	<3
Semi-VOCs	Acenaphthene	83329	1300	3800	38	4,200 (S)	4,200 (S)	4,200 (S)	<5	NT	NT	NT	<5	NT	NT	NT	<5	<5	NT	NT	<5
	Bis (2 ethylhexyl) phthalate	117817	6.0 (A)	6.0 (A)	25	NLV	NLV	320 (AA)	<5	NT	NT	NT	<5	NT	NT	NT	<5	<5	NT	NT	<5
	Di-n-butyl phthalate	84742	880	2,500	9.7	NLV	NLV	11,000 (S)	<5	NT	NT	NT	<5	NT	NT	NT	<5	<5	NT	NT	<5
	Diethyl phthalate	84662	5,500	16,000	110	NLV	NLV	1.1E+6 (S)	<5	NT	NT	NT	<5	NT	NT	NT	<5	<5	NT	NT	<5
	Fluorene	86737	880	2,000 (S)	12	2,000 (S)	2,000 (S)	2,000 (S)	<5	NT	NT	NT	<5	NT	NT	NT	<5	<5	NT	NT	<5
	Naphthalene	91203	520	1,500	11	31,000 (S)	31,000 (S)	31,000 (S)	<5	NT	NT	NT	<5	NT	NT	NT	<5	<5	NT	NT	<5
	Pyrene	129000	140 (S)	140 (S)	ID	140 (S)	140 (S)	140 (S)	<5	NT	NT	NT	<5	NT	NT	NT	<5	<5	NT	NT	<5
	Phenol	108952	4,400	13,000	450	NLV	NLV	2.90E+07	25	NT	NT	NT	<5	NT	NT	NT	<5	<5	NT	NT	12
	4-Chloro-3-methylphenol	59507	150	420	7.4	NLV	NLV	79,000	<5	NT	NT	NT	<5	NT	NT	NT	<5	<5	NT	NT	**9**
Metals	Aluminum	7429905	50 (V)	50 (V)	NA	NLV	NLV	6.4E+07	NT	NT	NT	NT	<50	NT	NT	NT	<50	NT	NT	NT	<50	NT
	Antimony	7440360	6.0 (A)	6.0 (A)	130 (X)	NLV	NLV	68,000	<2	NT	NT	NT	<2.0	<2	NT	NT	<2.0	<2	<2	NT	<2.0	<2
	Arsenic	7440382	10 (A)	10 (A)	10	NLV	NLV	4,300	***37***	***25***	NT	***35***	6	3	NT	NT	<5.0	<1	<1	NT	<5.0	***30***
	Barium (B)	7440393	2,000 (A)	2,000 (A)	670 (G)	NLV	NLV	1.40E+07	<100	NT	NT	NT	100	NT	NT	NT	<100	<100	NT	NT	<100
	Beryllium	7440417	4.0 (A)	4.0 (A)	67 (G)	NLV	NLV	290,000	<1	NT	NT	NT	<1	NT	NT	NT	<1	<1	NT	NT	<1
	Boron (B)	7440428	500 (F)	500 (F)	7,200 (X)	NLV	NLV	6.20E+07	100	NT	NT	<300	310	NT	NT	450	320	210	NT	330	360
	Cadmium (B)	7440439	5.0 (A)	5.0 (A)	3.0 (G,X)	NLV	NLV	190,000	<0.2	NT	NT	NT	<0.2	NT	NT	NT	<0.2	<0.2	NT	NT	0.3
	Chromium (total) (B,H)	18540299	100 (A)	100 (A)	100 (G,X)	NLV	NLV	460,000	<5	NT	NT	<10	<5	NT	NT	<10	<5	54	NT	<10	19
	Chromium (VI)	18540299	100 (A)	100 (A)	11	NLV	NLV	460,000	<5	NT	<5.0	<5.0	<5	NT	<5.0	<5.0	<5	**85**	<5.0	<5.0	10
	Cobalt	7440484	40	100	100	NLV	NLV	2.40E+06	<10	NT	NT	NT	<10	NT	NT	NT	<10	<10	NT	NT	<10
	Copper (B)	7440508	1,000 (E)	1,000 (E)	13 (G)	NLV	NLV	7.40E+06	<4	NT	NT	<4.0	<4	NT	NT	<4.0	<4	4	NT	<4.0	6
	Iron (B)	7439896	300 (E)	300 (E)	NA	NLV	NLV	5.80E+07	100	NT	NT	*630*	*430*	NT	NT	*1,600*	*920*	*490*	NT	*1,200*	*1,700*
	Lead (B)	7439921	4.0 (L)	4.0 (L)	16 (G,X)	NLV	NLV	ID	<3	NT	NT	<3.0	<3	NT	NT	<3.0	<3	<3	NT	<3.0	<3
	Magnesium (B)	7439954	400,000	1,100,000	NA	NLV	NLV	1.0E+9 (D)	2,000	NT	NT	NT	4,100	NT	NT	NT	26,000	28,000	NT	NT	28,000
	Mercury (Total) (B,Z)	Varies	2.0 (A)	2.0 (A)	0.0013	56 (S)	56 (S)	56 (S)	<0.2	NT	NT	NT	<0.2	NT	NT	NT	<0.2	NT	NT	NT	NT
	Molybdenum (B)	7439987	73	210	3,200 (X)	NLV	NLV	970,000	10	NT	NT	NT	<10	NT	NT	NT	<10	<10	NT	NT	50
	Nickel (B)	7440020	100 (A)	100 (A)	73 (G)	NLV	NLV	7.40E+07	<20	NT	NT	NT	<20	NT	NT	NT	<20	<20	NT	NT	30
	Selenium (B)	7782492	50 (A)	50 (A)	5	NLV	NLV	970,000	<5	NT	NT	<5.0	<5	NT	NT	<5.0	<5	<5	NT	<5.0	<5
	Silver (B)	7440224	34	98	0.2 (M); 0.06	NLV	NLV	1.50E+06	<0.2	NT	NT	<0.20	<0.2	NT	NT	<0.20	<0.2	<0.2	NT	<0.20	<0.2
	Sodium	17341252	230,000 (HH)	350,000	NA	NLV	NLV	1.0E+9 (D)	48,000	NT	NT	37,000	87,000	NT	NT	150,000	92,000	90,000	NT	44,000	310,000
	Titanium	7440326	NA	NA	NA	NA	NA	NA	<200	NT	NT	NT	<200	NT	NT	NT	<200	<200	NT	NT	<200
	Thallium (B)	7440280	2.0 (A)	2.0 (A)	3.7 (X)	NLV	NLV	13,000	<2	NT	NT	NT	<2	NT	NT	NT	<2	<2	NT	NT	<2
	Vanadium	7440622	4.5	62	27	NLV	NLV	970,000	<4	NT	NT	<4.0	<4	NT	NT	<4.0	<4	<4	NT	<4.0	9
	Zinc (B)	7440666	2,400	5,000 (E)	170 (G)	NLV	NLV	1.10E+08	10	NT	NT	NT	<10	NT	NT	NT	20	10	NT	NT	<10
Other	Acetate	71501	4,200	12,000	7,700 (G)	ID	ID	ID	2,600	NT	NT	NT	2,000	NT	NT	NT	6,000	3,800	NT	NT	1,300
	Ammonia	7664417	10,000 (N)	10,000 (N)	(CC)	3.20E+06	7.10E+06	ID	*14,000*	*12,000*	*16,000*	*15,000*	*20,000*	*23,000*	*33,000*	*23,000*	1,500	290	320	310	*28,000*
	Unionized Ammonia (calculation assumes 20°C)		NA	NA	29 (G)	NA	NA	NA	**535**	**458**	**611**	**573**	**764**	**878**	**1,260**	**878**	**57**	11	12	12	**1,070**
	Nitrate (B,N)	14797558	10,000 (A,N)	10,000 (A,N)	ID	NLV	NLV	3.10E+08	<50	NT	NT	<180	<50	NT	NT	<180	1,500	490	NT	320	<50
	Nitrite (B,N)	14797650	1,000 (A,N)	1,000 (A,N)	NA	NLV	NLV	ID	<50	NT	NT	<140	<50	NT	NT	<140	110	<50	NT	<140	780
	Chloride	16887006	2.5E+5 (E)	2.5E+5 (E)	(FF)	NLV	NLV	ID	86,000	NT	NT	19,000	39,000	NT	NT	89,000	50,000	130,000	NT	22,000	*480,000*
	Cyanide, Total (P,R)	57125	200 (A)	200 (A)	5.2	NLV	NLV	57,000	**7**	NT	NT	NT	**7**	NT	NT	NT	NT	NT	NT	NT	**16**
	Cyanide, Available	NA	NA	NA	NA	NA	NA	NA	NT	8	<20	<2.0	NT	<2	<20	<2.0	<5	<5	<2.0	<2.0	NT
	Formate (Formic Acid [U,I])*	64186	10,000	29,000	ID	7.70E+06	1.50E+07	6.00E+08	<100	NT	NT	NT	<100	NT	NT	NT	<100	<100	NT	NT	500
	Phosphorus (Total)	7723140	63,000	240,000	(EE)	NLV	NLV	ID	890	NT	NT	750	750	NT	NT	480	70	<10	NT	26	120
	Sulfate	14808798	2.5E+5 (E)	2.5E+5 (E)	NA	NLV	NLV	ID	36,000	NT	NT	72,000	86,000	NT	NT	4,600	*630,000*	*500,000*	NT	*330,000*	190,000
	Sulfide	9073750	NA	NA	NA	NA	NA	NA	<200	NT	NT	NT	<200	NT	NT	NT	<200	<200	NT	NT	<200

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Table 3B
SUMMARY HISTORICAL GROUNDWATER ANALTYICAL DATA (South of Rum Creek)
123 North Main Street
Rockford, Michigan

	Hazardous Substance	Chemical Abstract Service (CAS) Number	Residential Drinking Water Criteria (DWC)	Non Residential Drinking Water Criteria (DWC)	Groundwater Surface Water Interface Criteria (GSIC)	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria (GVIAIC)	Non Residential Groundwater Volatilization to Indoor Air Inhalation Criteria (GVIAIC)	Groundwater Contact Criteria (GCC) (AA)	MW-4 4.0-9.0 ft 9/4/2013	MW-4 4.0-9.0 ft 9/30/2014	MW-5 5.0-10.0 ft 1/4/2012	MW-5 5.0-10.0 ft 9/4/2013	MW-5 5.0-10.0 ft 9/30/2014	MW-5 5.0-10.0 ft 8/31/2017	Dupe -1 (MW-302B) 9/3/2013	Dupe-2 (MW-305C) 9/4/2013	Dupe-3 (MW-303A) 9/5/2013	Dup-3 (P-3) 9/1/2017
VOCs	2-Butanone (MEK) (I)	78933	13,000	38,000	2,200	2.4E+8 (S)	2.4E+8 (S)	2.4E+8 (S)	NT	NT	<5	NT	NT	NT	<10	<10	<10	NT
	1,1-Dichloroethane	75343	880	2,500	740	1.00E+06	2.30E+06	2.40E+06	NT	NT	2	NT	NT	NT	<1.0	2.0	<1.0	NT
	1,1-Dichloroethylene (I)	75354	7.0 (A)	7.0 (A)	130	200	1,300	11,000	NT	NT	<1	NT	NT	NT	<1.0	2.6	<1.0	NT
	1,2-Dichlorobenzene	95501	600 (A)	600 (A)	13	1.6E+5 (S)	1.6E+5 (S)	1.6E+5 (S)	NT	NT	<1	NT	NT	NT	<1.0	<1.0	<1.0	NT
	1,2-Dichloroethane	107062	5.0 (A)	5.0 (A)	360 (X)	9,600	59,000	19,000	NT	NT	<1	NT	NT	NT	<1.0	<1.0	<1.0	NT
	Acetone	67641	730	2,100	1,700	1.0E+9 (D,S)	1.0E+9 (D,S)	31,000,000	NT	NT	<20	NT	NT	NT	<50	<50	<50	NT
	Chlorobenzene	108907	100 (A)	100 (A)	25	210,000	4.7E+5 (S)	86,000	NT	NT	<1	NT	NT	NT	<1.0	<1.0	<1.0	NT
	Di-isopropyl ether	108203	30	86	ID	8,000 (S)	8,000 (S)	8,000 (S)	NT	NT	<5	NT	NT	NT	<1.0	<1.0	<1.0	NT
	Ethylbenzene	100414	74 (E)	74 (E)	18	1.10E+05	1.7E+5 (S)	1.7E+5 (S)	NT	NT	<1	NT	NT	NT	<1.0	<1.0	<1.0	NT
	2-Methylnaphthalene	91576	260	750	19	25,000 (S)	25,000 (S)	25,000 (S)	NT	NT	<5	NT	NT	NT	<10	<10	<10	NT
	4-Methyl-2-pentanone (MIBK) (I)	108101	1,800	5,200	ID	2.0E+7 (S)	2.0E+7 (S)	1.3E+07	NT	NT	<5	NT	NT	NT	<10	<10	<10	NT
	Naphthalene	91203	520	1,500	11	31,000 (S)	31,000 (S)	31,000 (S)	NT	NT	<5	NT	NT	NT	<5.0	<5.0	<5.0	NT
	Toluene	108883	790 (E)	790 (E)	270	5.3E+5 (S)	5.3E+5 (S)	5.3E+5 (S)	NT	NT	<1	NT	NT	NT	<5.0	<5.0	<5.0	NT
	Trichlorofluoromethane	75694	2,600	7,300	NA	1.1E+6 (S)	1.1E+6 (S)	1.1E+6 (S)	NT	NT	<1	NT	NT	NT	<5.0	<5.0	<5.0	NT
	1,2,4-Trimethylbenzene	95636	63 (E)	63 (E)	17	56,000 (S)	56,000 (S)	56,000 (S)	NT	NT	<1	NT	NT	NT	<1.0	<1.0	<1.0	NT
	1,2,3-Trimethylbenzene	NA	NA	NA	NA	NA	NA	NA	NT	NT	<1	NT	NT	NT	<1.0	<1.0	<1.0	NT
	1,3,5-Trimethylbenzene	108678	72 (E)	72 (E)	45	61,000 (S)	61,000 (S)	61,000 (S)	NT	NT	<1	NT	NT	NT	<1.0	<1.0	<1.0	NT
	Vinyl chloride	75014	2.0 (A)	2.0 (A)	13 (X)	1,100	13,000	1,000	NT	NT	<1	NT	NT	NT	<1.0	1.4	<1.0	NT
	Xylenes	1330207	280 (E)	280 (E)	41	1.9E+5 (S)	1.9E+5 (S)	1.9E+5 (S)	NT	NT	<3	NT	NT	NT	<3.0	<3.0	<3.0	NT
Semi-VOCs	Acenaphthene	83329	1300	3800	38	4,200 (S)	4,200 (S)	4,200 (S)	NT	<5.0	<5	NT	NT	NT	<1.0	<1.0	<1.0	NT
	Bis (2 ethylhexyl) phthalate	117817	6.0 (A)	6.0 (A)	25	NLV	NLV	320 (AA)	NT	<5.0	<5	NT	NT	NT	0.77	0.96	0.89	NT
	Di-n-butyl phthalate	84742	880	2,500	9.7	NLV	NLV	11,000 (S)	NT	<5.0	<5	NT	NT	NT	0.56	0.42	0.32	NT
	Diethyl phthalate	84662	5,500	16,000	110	NLV	NLV	1.1E+6 (S)	NT	<5.0	<5	NT	NT	NT	<3.0	<3.0	<3.0	NT
	Fluorene	86737	880	2,000 (S)	12	2,000 (S)	2,000 (S)	2,000 (S)	NT	<5.0	<5	NT	NT	NT	<1.0	<1.0	<1.0	NT
	Naphthalene	91203	520	1,500	11	31,000 (S)	31,000 (S)	31,000 (S)	NT	<5.0	<5	NT	NT	NT	<1.0	<1.0	<1.0	NT
	Pyrene	129000	140 (S)	140 (S)	ID	140 (S)	140 (S)	140 (S)	NT	<5.0	<5	NT	NT	NT	<1.0	<1.0	<1.0	NT
	Phenol	108952	4,400	13,000	450	NLV	NLV	2.90E+07	NT	<5.0	<5	NT	NT	NT	<10	<10	<10	NT
	4-Chloro-3-methylphenol	59507	150	420	7.4	NLV	NLV	79,000	NT	<5.0	<5	NT	NT	NT	<10	<10	<10	NT
Metals	Aluminum	7429905	50 (V)	50 (V)	NA	NLV	NLV	6.4E+07	NT	<50	NT	NT	<50	NT	*100*	*350*	*150*	NT
	Antimony	7440360	6.0 (A)	6.0 (A)	130 (X)	NLV	NLV	68,000	NT	<2.0	<2	NT	<2.0	NT	<2.0	<2.0	***610/<5.0***	NT
	Arsenic	7440382	10 (A)	10 (A)	10	NLV	NLV	4,300	NT	<5.0	2	NT	<5.0	<5.0	9.6	<5.0	***160/1.2***	<5.0
	Barium (B)	7440393	2,000 (A)	2,000 (A)	670 (G)	NLV	NLV	1.40E+07	NT	NT	<100	NT	NT	<100	360	<100	***140,000/790***	150
	Beryllium	7440417	4.0 (A)	4.0 (A)	67 (G)	NLV	NLV	290,000	NT	NT	<1	NT	NT	NT	<1.0	<1.0	***130/<2.0***	NT
	Boron (B)	7440428	500 (F)	500 (F)	7,200 (X)	NLV	NLV	6.20E+07	NT	<300	*770*	NT	420	NT	300	430	<300	NT
	Cadmium (B)	7440439	5.0 (A)	5.0 (A)	3.0 (G,X)	NLV	NLV	190,000	NT	NT	<0.2	NT	NT	<0.50	<1.0	<1.0	***230/<0.20***	<0.50
	Chromium (total) (B,H)	18540299	100 (A)	100 (A)	100 (G,X)	NLV	NLV	460,000	NT	<10	<5	NT	<10	<10	<10	<10	**190/<5.0**	<10
	Chromium (VI)	18540299	100 (A)	100 (A)	11	NLV	NLV	460,000	<5.0	<5.0	<5	<5.0	<5.0	<10	<5.0	<5.0	**52**	<10
	Cobalt	7440484	40	100	100	NLV	NLV	2.40E+06	NT	NT	<10	NT	NT	NT	<20	<20	50/<5.0	NT
	Copper (B)	7440508	1,000 (E)	1,000 (E)	13 (G)	NLV	NLV	7.40E+06	NT	<4.0	<4	NT	<4.0	<4.0	11	5.3	**160<4.0**	<4.0
	Iron (B)	7439896	300 (E)	300 (E)	NA	NLV	NLV	5.80E+07	NT	*3,400*	*9,800*	NT	*5,800*	*4,300*	*9,100*	*1,400*	*78,000*	14,000
	Lead (B)	7439921	4.0 (L)	4.0 (L)	16 (G,X)	NLV	NLV	ID	NT	<3.0	<3	NT	<3.0	<3.0	<3.0	<3.0	***420/<3.0***	<3.0
	Magnesium (B)	7439954	400,000	1,100,000	NA	NLV	NLV	1.0E+9 (D)	NT	NT	36,000	NT	NT	NT	15,000	28,000	75,000	NT
	Mercury (Total) (B,Z)	Varies	2.0 (A)	2.0 (A)	0.0013	56 (S)	56 (S)	56 (S)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	Molybdenum (B)	7439987	73	210	3,200 (X)	NLV	NLV	970,000	NT	NT	<10	NT	NT	NT	<50	<50	*760/<5.0*	NT
	Nickel (B)	7440020	100 (A)	100 (A)	73 (G)	NLV	NLV	7.40E+07	NT	NT	<20	NT	NT	NT	<20	<20	***300/13***	NT
	Selenium (B)	7782492	50 (A)	50 (A)	5	NLV	NLV	970,000	NT	<5.0	<5	NT	<5.0	NT	<5.0	<5.0	***52/<5.0***	NT
	Silver (B)	7440224	34	98	0.2 (M); 0.06	NLV	NLV	1.50E+06	NT	<0.20	<0.2	NT	<0.20	<0.50	<5.0	<5.0	<0.20	<0.50
	Sodium	17341252	230,000 (HH)	350,000	NA	NLV	NLV	1.0E+9 (D)	NT	220,000	140,000	NT	77,000	NT	*1,300,000*	160,000	*1,600,000*	NT
	Titanium	7440326	NA	NA	NA	NA	NA	NA	NT	NT	<200	NT	NT	NT	<25	<25	29	NT
	Thallium (B)	7440280	2.0 (A)	2.0 (A)	3.7 (X)	NLV	NLV	13,000	NT	NT	<2	NT	NT	NT	<2.0	<2.0	*740/<5.0*	NT
	Vanadium	7440622	4.5	62	27	NLV	NLV	970,000	NT	<4.0	<4	NT	<4.0	<4.0	4.0	4.1	**64/<4.0**	<4.0
	Zinc (B)	7440666	2,400	5,000 (E)	170 (G)	NLV	NLV	1.10E+08	NT	NT	<10	NT	NT	<20	<150	<150	**1,000/<10**	<20
Other	Acetate	71501	4,200	12,000	7,700 (G)	ID	ID	ID	NT	NT	1,300	NT	NT	NT	<5,000	<5,000	<5,000	NT
	Ammonia	7664417	10,000 (N)	10,000 (N)	(CC)	3.20E+06	7.10E+06	ID	5,800	5,800	4,200	5,200	2,500	1,500	6,600	7,200	*68,000*	*27,000*
	Unionized Ammonia (calculation assumes 20°C)		NA	NA	29 (G)	NA	NA	NA	**221**	**221**	**160**	**199**	**95**	NT	**252**	**275**	**2,600**	NT
	Nitrate (B,N)	14797558	10,000 (A,N)	10,000 (A,N)	ID	NLV	NLV	3.10E+08	NT	190	<50	NT	<180	NT	<100	<100	<100	NT
	Nitrite (B,N)	14797650	1,000 (A,N)	1,000 (A,N)	NA	NLV	NLV	ID	NT	<140	<50	NT	<140	NT	<100	<100	<100	NT
	Chloride	16887006	2.5E+5 (E)	2.5E+5 (E)	(FF)	NLV	NLV	ID	NT	*310,000*	97,000	NT	65,000	NT	*990,000*	140,000	*2,200,000*	NT
	Cyanide, Total (P,R)	57125	200 (A)	200 (A)	5.2	NLV	NLV	57,000	NT	NT	5	NT	NT	NT	NT	NT	NT	NT
	Cyanide, Available	NA	NA	NA	NA	NA	NA	NA	<2.0	<2.0	NT	<20	<2.0	NT	<2.0	<20	<20	NT
	Formate (Formic Acid [U,I])*	64186	10,000	29,000	ID	7.70E+06	1.50E+07	6.00E+08	NT	NT	<100	NT	NT	NT	<5,000	<5,000	<5,000	NT
	Phosphorus (Total)	7723140	63,000	240,000	(EE)	NLV	NLV	ID	NT	20	430	NT	490	NT	37	700	1,900	NT
	Sulfate	14808798	2.5E+5 (E)	2.5E+5 (E)	NA	NLV	NLV	ID	NT	210,000	*420,000*	NT	98,000	NT	<2,500	*310,000*	4,900	NT
	Sulfide	9073750	NA	NA	NA	NA	NA	NA	NT	NT	<200	NT	NT	NT	<1,000	<1,000	<1,000	NT

See Page 7 for notes

TABLE 4
2017 Pore Water Study Sample Information
Wolverine Worldwide
123 North Main Street
Rockford, Michigan

Attempt/Sample Location	Depth of River	Probe Depth (below sediment)	Estimated Sediment Thickness	Pore Water Pressure*	Surface Water Pressure*	Gradient	Gradient Direction	Reference Point	Reference Point	Reference Point	Time	Pore Water Temperature	Surface Water Temperature	Pore Water Conductivity	Surface Water Conductivity	Pore Water pH	Surface Water pH	Comments
	9/12/2017																	
1	2.3 ft	0.5 ft	~2.8 ft	-	-	-	-	-	-	-	-	NS	NS	NS	NS	NS	NS	No sample (yields no water)
2	3.2 ft	1.8 ft	~0.7 ft	-	-	-	-	-	-	-	-	NS	NS	NS	NS	NS	NS	No sample (yields no water)
PW-17-1A	2.2 ft	0.5 ft	~3.2 ft	6.0	2.8	3.2	Up	199.5ft from L17-4	70ft from L-3	26ft from L17-A	3:45 PM	15.9	15.5	1,023	604	6.92	8.51	Sample
PW-17-1B	2.2 ft	1.6 ft	~3.2 ft	7.2	6.8	0.4	Up	same as above	same as above		4:35 PM	15.9	15.7	638	602	7.24	8.56	Sample
	9/13/2017																	
4	2.6 ft	-	~2.0 ft	6.2	6.5	-0.3	Down	-	-	-	-	NS	NS	NS	NS	NS	NS	No sample (wrong gradient)
5	2.6 ft	-	~2.0 ft	-	-	-	Down	-	-	-	-	NS	NS	NS	NS	NS	NS	No sample (wrong gradient)
PW-17-2A	2.3 ft	0.4 ft	~1.5 ft	5.4	3.5	1.9	Up	141.5ft from L17-4	114.5ft from L-3	83.5ft from L17A	10:37 AM	15	12.8	1,243	611	6.72	7.92	Sample
PW-17-2B	2.3 ft	1.4 ft	~1.5 ft	10.0	0.2	9.8	Up	same as above	same as above		11:17 AM	14.8	12.8	1,069	610	6.67	8.04	Sample
PW-17-3A	3.2 ft	0.5 ft	~2.0 ft	6.8	6.1	0.7	Up	92.5ft from L17-4	155ft from L-3		12:16 PM	15.8	13.1	799	609	6.79	8.09	Sample
PW-17-3B	3.2 ft	1.5 ft	~2.0 ft	6.0	5.8	0.2	Up	same as above	same as above		12:50 PM	15.4	13.2	1,460	608	6.77	8.22	Sample
PW-17-5A	2.0 ft	0.5 ft	~2.7 ft	6.6	0.0	6.6	Up	129ft from L17-1	63.5ft from RP-3	76.5ft from L17-2	3:30 PM	16.9	14.7	1,703	603	6.71	8.20	Sample
6	2.0 ft	1.5 ft	~2.7 ft	6.6	6.9	-0.3	Down	-	-	-	-	NS	NS	NS	NS	NS	NS	No sample (wrong gradient)
7	2.0 ft	1.7 ft	~2.7 ft	4.0	5.3	-1.3	Down	-	-	-	-	NS	NS	NS	NS	NS	NS	No sample (wrong gradient)
PW-17-5B	2.0 ft	1.9 ft	~2.7 ft	0.5	0.2	0.3	Up	129ft from L17-1	63.5ft from RP-3	76.5ft from L17-2	4:20 PM	16.8	15.0	952	601	6.73	8.28	Sample
	9/14/2017																	
PW-17-6A	3.1 ft	1.1 ft	~0.3 ft	9.6	9.3	0.3	Up	114ft from L17-2	146ft from L17-3	38ft from RP-2	10:50 AM	16.3	14.8	719	612	7.17	7.49	Sample
PW-17-6B	3.1 ft	2.1 ft	~0.3 ft	11.3	10.8	0.5	Up	same as above	same as above	same as above	11:20 AM	16.4	14.9	1,624	616	6.88	7.80	Sample
8	3.8 ft	1.8 ft	~0.4 ft	7.9	7.8	0.1	Up				-	17.3	15.7	549	617	7.40	8.05	No sample (loose formation)
PW-17-7A	3.8 ft	2.3 ft	~0.4 ft	9.9	9.7	0.2	Up	121ft from L-7	121ft from L-8		12:20 PM	17.1	15.5	541	617	7.41	8.12	Sample
PW-17-7B	3.8 ft	3.3 ft	~0.4 ft	4.9	4.7	0.2	Up	same as above	same as above		12:50 PM	16.9	15.5	597	618	7.16	8.13	Sample
10	2.5 ft	2.5 ft	-	-	-	-	Down	-	-	-	-	NS	NS	NS	NS	NS	NS	No sample (wrong gradient)
11	3.5 ft	3.5 ft	-	-	-	-	Down	-	-	-	-	NS	NS	NS	NS	NS	NS	No sample (wrong gradient)
12	4.5 ft	4.5 ft	-	-	-	-	Down	-	-	-	-	NS	NS	NS	NS	NS	NS	No sample (wrong gradient)
13	5.0 ft	5.0 ft	-	-	-	-	Down	-	-	-	-	NS	NS	NS	NS	NS	NS	No sample (wrong gradient)
PW-17-8A	5.5 ft	5.5 ft	0 ft	9.0	8.2	0.8	Up	125.5ft from RP-4	79ft from RP-5		3:35 PM	16.7	15.1	1,672	608	7.16	8.42	Sample
14	6.2 ft	6.2 ft	0 ft	-	-	-	Even	-	-	-	-	NS	NS	NS	NS	NS	NS	No sample (wrong gradient)
15	2.8 ft	2.8 ft	0 ft	-	-	-	Down	-	-	-	-	NS	NS	NS	NS	NS	NS	No sample (wrong gradient)
PW-17-8B	3.3 ft	3.3 ft	0 ft	6.8	6.6	0.2	Up	3ft east of 8A	3ft east of 8A		4:25 PM	17.5	15.3	3,010	607	7.30	8.35	Sample
16	4.8 ft	4.8 ft	-	-	-	-	Down	-	-	-	-	NS	NS	NS	NS	NS	NS	No sample (wrong gradient)
PW-17-8C	0.9 ft	5.7 ft	0 ft	8.7	8.2	0.5	Up	3ft east of 8A	3ft east of 8A		5:00 PM	15.9	15.3	894	606	7.29	8.35	Sample
	9/15/2017																	
PW-17-9A	0.7 ft	1.6 ft	0 ft	4.8	4.6	0.2	Up	22.5ft from NW corner of bridge	21ft from SW corner of bridge	17.5ft from RP-5	9:05 AM	14.1	12.5	3,280	613	7.59	8.40	Sample
PW-17-9B	0.7 ft	2.3 ft	0 ft	16.2	15.9	0.3	Up	same as above	same as above	same as above	9:30 AM	14.1	12.5	1,822	613	7.62	8.39	Sample
19	0.8 ft	2.8 ft	0 ft	-	-	-	Down	-	-	-	-	NS	NS	NS	NS	NS	NS	No sample (wrong gradient)
20	0.8 ft	4.0 ft	0 ft	-	-	-	-	-	-	-	-	NS	NS	NS	NS	NS	NS	No sample (yields no water)
21	0.8 ft	4.7 ft	-	-	-	-	-	-	-	-	-	NS	NS	NS	NS	NS	NS	No sample (yields no water)
PW-17-11	0.8 ft	5.0 ft	0 ft	7.8	7.6	0.2	Up	62.5ft from RP-4	137ft from RP-5		10:15 AM	15.3	12.7	2,320	612	6.96	8.15	Sample
22	2.3 ft	0.5 ft	~2.4 ft	-	-	-	Down	-	-	-	-	NS	NS	NS	NS	NS	NS	No sample (wrong gradient)
PW-17-12	1.5 ft	0.5 ft	~3.0 ft	10.1	10.0	0.1	Up	59ft from L17-1	69.5ft from RP-3	45.5ft from L17B	11:10 AM	16.4	15.2	1,445	617	6.85	8.13	Sample

TABLE 4
2017 Pore Water Study Sample Information
Wolverine Worldwide
123 North Main Street
Rockford, Michigan

Notes:

All samples taken using Henry sampler

NS = Not sampled

PW = Pore Water

SW = Surface Water

All pore water measurements taken with a WTW 340i Multi-Parameter field meter

All surface water measurements taken with a YSI 556 MPS

TABLE 5
2017 ROGUE RIVER PORE WATER ANALYTICAL SUMMARY
123 North Main Street
Rockford, Michigan

	Hazardous Substance	Chemical Abstract Service (CAS) Number	Residential Drinking Water Criteria (DWC)	Non Residential Drinking Water Criteria (DWC)	Groundwater Surface Water Interface Criteria (GSIC)	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria (GVIAIC)	Groundwater Contact Criteria (GCC) (AA)	PW-17-1A	PW-17-1B	PW-17-2A	PW-17-2B	PW-17-3A	PW-17-3B	PW-17-5A	PW-Dup-1A (PW-17-5A)	PW-Dup-1P (PW-17-5A)	PW-17-5B	PW-17-6A	PW-Dup-2A (PW-17-6A)	PW-Dup-2P (PW-17-6A)
								0.5 ft	1.6 ft	0.4 ft	1.4 ft	0.5 ft	1.5 ft	0.5 ft	0.5 ft	0.5 ft	1.9. ft	1.1 ft	1.1 ft	1.1 ft
								9/12/2017	9/12/2017	9/13/2017	9/13/2017	9/13/2017	9/13/2017	9/13/2017	9/13/2017	9/13/2017	9/13/2017	9/14/2017	9/14/2017	9/14/2017
PFAS	Perfluorooctanic acid	335-67-1	NA*	NA*	NA	NA	NA	ND	ND	NT	NT	NT	NT	37	NT	32	24	26	NT	26
PFAS	Perfluorooctane sulfonic acid	1763231	NA*	NA*	NA	NA	NA	ND	ND	NT	NT	NT	NT	ND	NT	ND	ND	57	NT	60
PFAS	Other perfluoro compounds	Varies	NA	NA	NA	NA	NA	ND	ND	NT	NT	NT	NT	170	NT	160	190	30	NT	26

Notes :

All PFAS units in ng/l (parts per trillion).

* = US EPA Lifetime Screening level PFOA + PFOS = 70 ng/l (ppt)

NA = Criterion or value is not available or not applicable.

ND = Not Detected

NT = Not Tested

	Hazardous Substance	Chemical Abstract Service (CAS) Number	Residential Drinking Water Criteria (DWC)	Non Residential Drinking Water Criteria (DWC)	Groundwater Surface Water Interface Criteria (GSIC)	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria (GVIAIC)	Groundwater Contact Criteria (GCC) (AA)	PW-17-1A	PW-17-1B	PW-17-2A	PW-17-2B	PW-17-3A	PW-17-3B	PW-17-5A	PW-Dup-1A (PW-17-5A)	PW-Dup-1P (PW-17-5A)	PW-17-5B	PW-17-6A	PW-Dup-2A (PW-17-6A)	PW-Dup-2P (PW-17-6A)
								0.5 ft	1.6 ft	0.4 ft	1.4 ft	0.5 ft	1.5 ft	0.5 ft	0.5 ft	0.5 ft	1.9. ft	1.1 ft	1.1 ft	1.1 ft
								9/12/2017	9/12/2017	9/13/2017	9/13/2017	9/13/2017	9/13/2017	9/13/2017	9/13/2017	9/13/2017	9/13/2017	9/14/2017	9/14/2017	9/14/2017
Ammonia	Ammonia	7664417	10,000 (N)	10,000 (N)	(CC)	3.2E+06	ID	36,000	6,200	46,000	32,000	52,000	52,000	71,000	66,000	NT	110,000	9,600	9,700	NT
Ammonia	Unionized Ammonia (Field T and pH)	NA	NA	NA	NA	NA	NA	88	32	66	41	94	87	115	107	NT	186	43	43	NT
Ammonia	Unionized Ammonia (Std. T and pH)	NA	NA	NA	29	NA	NA	1,400	240	1,800	1,200	2,000	2,000	2,700	2,500	NT	4,200	370	370	NT

Notes:

All Ammonia units in ug/l (parts per billion)

(N)= Where leaching to groundwater is a relevant pathway, soil concentrations of all potential sources of nitrate-nitrogen shall not, when added together, exceed the nitrate drinking water protection criterion of 2.0E+5 µg/kg.

(AA)= Use 10,000 µg/l where groundwater enters a structure through the use of a water well, sump or other device. Use 28,000 µg/l for all other uses.

(CC)= The GSI criterion shall are based on the toxicity of unionized ammonia (NH_3); the criteria are 29 µg/l and 53 µg/l for cold water and warm water respectively. This percent NH3 is a function of the pH and temperature of the receiving surface water.†

NA = Criterion or value is not available or not applicable.

ND = Not Detected

NT = Not Tested

ID = Insufficient data to develop criterion.

†Please refer to the Footnotes for Part 201 Generic Cleanup Criteria and Screening Levels, December 30, 2013 for a more complete description of the above items.

TABLE 5
2017 ROGUE RIVER PORE WATER ANALYTICAL SUMMARY
123 North Main Street
Rockford, Michigan

	Hazardous Substance	Chemical Abstract Service (CAS) Number	Residential Drinking Water Criteria (DWC)	Non Residential Drinking Water Criteria (DWC)	Groundwater Surface Water Interface Criteria (GSIC)	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria (GVIAIC)	Groundwater Contact Criteria (GCC) (AA)	PW-17-6B	PW-17-7A	PW-17-7B	PW-17-8A	PW-17-8B	PW-17-8C	PW-17-9A	PW-Dup-3A PW-17-9A	PW-Dup-3P PW-17-9A	PW-17-9B	PW-17-11	PW-17-11A
								2.1 ft	2.3 ft	3.3 ft	5.5 ft	3.3 ft	5.7 ft	1.6 ft	1.6 ft	1.6 ft	2.3 ft	5.0 ft	5.0 ft
								9/14/2017	9/14/2017	9/14/2017	9/14/2017	9/14/2017	9/14/2017	9/15/2017	9/15/2017	9/15/2017	9/15/2017	9/15/2017	9/15/2017
PFAS	Perfluorooctanic acid	335-67-1	NA*	NA*	NA	NA	NA	170	4.0	5.1	23	590	13	5,300	NT	6,000	3,000	3,000	NT
PFAS	Perfluorooctane sulfonic acid	1763231	NA*	NA*	NA	NA	NA	170	31	42	5.2	7,100	9.1	7,100	NT	9,500	7,300	730	NT
PFAS	Other perfluoro compounds	Varies	NA	NA	NA	NA	NA	270	ND	ND	69.0	1,400	71	11,000	NT	11,000	5,600	9,900	NT

Notes :

All PFAS units in ng/l (parts per trillion).

* = US EPA Lifetime Screening level PFOA + PFOS = 70 ng/l (ppt)

NA = Criterion or value is not available or not applicable.

ND = Not Detected

NT = Not Tested

	Hazardous Substance	Chemical Abstract Service (CAS) Number	Residential Drinking Water Criteria (DWC)	Non Residential Drinking Water Criteria (DWC)	Groundwater Surface Water Interface Criteria (GSIC)	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria (GVIAIC)	Groundwater Contact Criteria (GCC) (AA)	PW-17-6B	PW-17-7A	PW-17-7B	PW-17-8A	PW-17-8B	PW-17-8C	PW-17-9A	PW-Dup-3A PW-17-9A	PW-Dup-3P PW-17-9A	PW-17-9B	PW-17-11	PW-17-11A
								2.1 ft	2.3 ft	3.3 ft	5.5 ft	3.3 ft	5.7 ft	1.6 ft	1.6 ft	1.6 ft	2.3 ft	5.0 ft	5.0 ft
								9/14/2017	9/14/2017	9/14/2017	9/14/2017	9/14/2017	9/14/2017	9/15/2017	9/15/2017	9/15/2017	9/15/2017	9/15/2017	9/15/2017
Ammonia	Ammonia	7664417	10,000 (N)	10,000 (N)	(CC)	3.2E+06	ID	26,000	3,800	8,000	4,800	32,000	5,800	31,000	32,000	NT	43,000	NT	64,000
Ammonia	Unionized Ammonia (Field T and pH)	NA	NA	NA	NA	NA	NA	60	31	37	22	211	33	307	317	NT	456	NT	164
Ammonia	Unionized Ammonia (Std. T and pH)	NA	NA	NA	29	NA	NA	1,000	150	310	180	1,200	220	1,200	1,200	NT	1,700	NT	2,500

Notes:

All Ammonia units in ug/l (parts per billion)

(N)= Where leaching to groundwater is a relevant pathway, soil concentrations of all potential sources of nitrate-nitrogen shall not, when added together, exceed the nitrate drinking water protection criterion of 2.0E+5 µg/kg.

(AA)= Use 10,000 µg/l where groundwater enters a structure through the use of a water well, sump or other device. Use 28,000 µg/l for all other uses.

(CC)= The GSI criterion shall are based on the toxicity of unionized ammonia (NH_3); the criteria are 29 µg/l and 53 µg/l for cold water and warm water respectively. This percent NH3 is a function of the pH and temperature of the receiving surface water.†

NA = Criterion or value is not available or not applicable.

ND = Not Detected

NT = Not Tested

ID = Insufficient data to develop criterion.

†Please refer to the Footnotes for Part 201 Generic Cleanup Criteria and Screening Levels, December 30, 2013 for a more complete description of the above items.

TABLE 5
2017 ROGUE RIVER PORE WATER ANALYTICAL SUMMARY
123 North Main Street
Rockford, Michigan

	Hazardous Substance	Chemical Abstract Service (CAS) Number	Residential Drinking Water Criteria (DWC)	Non Residential Drinking Water Criteria (DWC)	Groundwater Surface Water Interface Criteria (GSIC)	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria (GVIAIC)	Groundwater Contact Criteria (GCC) (AA)	PW-17-12	PW-17-12A	FB-17-1	FB-17-2	FB-17-3	FB-17-4	EQ-17-1A	EQ-17-1P	EQ-17-2A	EQ-17-2P	EQ-17-3A	EQ-17-3P
								0.5 ft	0.5 ft	-	-	-	-	-	-	-	-	-	-
								9/15/2017	9/15/2017	9/12/2017	9/13/2017	9/14/2017	9/15/2017	9/13/2017	9/13/2017	9/14/2017	9/14/2017	9/15/2017	9/15/2017
PFAS	Perfluorooctanic acid	335-67-1	NA*	NA*	NA	NA	NA	9.5	NT	ND	ND	ND	ND	NT	ND	NT	ND	NT	ND
PFAS	Perfluorooctane sulfonic acid	1763231	NA*	NA*	NA	NA	NA	20	NT	ND	ND	ND	ND	NT	ND	NT	ND	NT	ND
PFAS	Other perfluoro compounds	Varies	NA	NA	NA	NA	NA	ND	NT	ND	ND	ND	ND	NT	ND	NT	ND	NT	ND

Notes :

All PFAS units in ng/l (parts per trillion).

* = US EPA Lifetime Screening level PFOA + PFOS = 70 ng/l (ppt)

NA = Criterion or value is not available or not applicable.

ND = Not Detected

NT = Not Tested

	Hazardous Substance	Chemical Abstract Service (CAS) Number	Residential Drinking Water Criteria (DWC)	Non Residential Drinking Water Criteria (DWC)	Groundwater Surface Water Interface Criteria (GSIC)	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria (GVIAIC)	Groundwater Contact Criteria (GCC) (AA)	PW-17-12	PW-17-12A	FB-17-1	FB-17-2	FB-17-3	FB-17-4	EQ-17-1A	EQ-17-1P	EQ-17-2A	EQ-17-2P	EQ-17-3A	EQ-17-3P
								0.5 ft	0.5 ft	-	-	-	-	-	-	-	-	-	-
								9/15/2017	9/15/2017	9/12/2017	9/13/2017	9/14/2017	9/15/2017	9/13/2017	9/13/2017	9/14/2017	9/14/2017	9/15/2017	9/15/2017
Ammonia	Ammonia	7664417	10,000 (N)	10,000 (N)	(CC)	3.2E+06	ID	NT	53,000	NT	NT	NT	NT	<50	NT	<50	NT	<50	NT
Ammonia	Unionized Ammonia (Field T and pH)	NA	NA	NA	NA	NA	NA	NT	115	NT	NT	NT	NT	NA	NT	NA	NT	NA	NT
Ammonia	Unionized Ammonia (Std. T and pH)	NA	NA	NA	29	NA	NA	NT	2,000	NT	NT	NT	NT	<2	NT	<2	NT	<2	NT

Notes:

All Ammonia units in ug/l (parts per billion)

(N)= Where leaching to groundwater is a relevant pathway, soil concentrations of all potential sources of nitrate-nitrogen shall not, when added together, exceed the nitrate drinking water protection criterion of 2.0E+5 µg/kg.

(AA)= Use 10,000 µg/l where groundwater enters a structure through the use of a water well, sump or other device. Use 28,000 µg/l for all other uses.

(CC)= The GSI criterion shall are based on the toxicity of unionized ammonia (NH_3); the criteria are 29 µg/l and 53 µg/l for cold water and warm water respectively. This percent NH3 is a function of the pH and temperature of the receiving surface water.†

NA = Criterion or value is not available or not applicable.

ND = Not Detected

NT = Not Tested

ID = Insufficient data to develop criterion.

†Please refer to the Footnotes for Part 201 Generic Cleanup Criteria and Screening Levels, December 30, 2013 for a more complete description of the above items.

TABLE 6
OCTOBER 2017 ROGUE RIVER SURFACE WATER ANALYTICAL SUMMARY
Rockford, Michigan

Hazardous Substance		Chemical Abstract Service (CAS) Number	SW-17-100 1.5 ft 10/17/2017	SW-17-101 1.5 ft 10/17/2017	SW-17-102A 2.0 ft 10/17/2017	SW-17-102B 0.5 ft 10/17/2017	SW-17-103A 1.5 ft 10/17/2017	SW-17-103B 1.3 ft 10/17/2017	SW-17-104A 2.0 ft 10/17/2017	SW-17-104B 0.5 ft 10/17/2017	FB - 10/17/2017
PFAS	Perfluorooctanic acid	335-67-1	1.9	1.9	3.1	3.0	5.1	4.8	4.8	5.2	ND
	Perfluorooctane sulfonic acid	1763231	4.3	4.8	6.3	6.7	10	9.6	12	11	ND
	Other perfluoro compounds	Varies	ND	ND	ND	ND	13	ND	ND	ND	ND

Notes :

All PFAS units in ng/l (parts per trillion).

* = US EPA Lifetime Screening level PFOA + PFOS = 70 ng/l (ppt)

NA = Criterion or value is not available or not applicable.

ND = Not Detected

NT = Not Tested

Attachment A – Groundwater Lab Reports

ALS Environmental
ALS Group USA, Corp
1317 South 13th Avenue
Kelso, WA 98626
T : +1 360 577 7222
F : +1 360 636 1068
www.alsglobal.com

October 04, 2017

Analytical Report for Service Request No: K1709280

John Morehouse
Rose & Westra, a Division of GZA
601 Fifth Street NW, Suite 102
Grand Rapids, MI 49504

RE: Wolverine World Wide / 16.0062335.00

Dear John,

Enclosed are the results of the sample(s) submitted to our laboratory September 02, 2017
For your reference, these analyses have been assigned our service request number **K1709280.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3275. You may also contact me via email at Chris.Leaf@ALSGlobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Chris Leaf
Project Manager

ALS Environmental
ALS Group USA, Corp
1317 South 13th Avenue
Kelso, WA 98626
T : +1 360 577 7222
F : +1 360 636 1068
www.alsglobal.com

Table of Contents

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L14-51
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

ALS ENVIRONMENTAL

Client:	GZA GeoEnvironmental, Incorporated	**Service Request No.:**	K1709280
Project:	Wolverine World Wide/ 16.0062335.00	**Date Received:**	09/02/17
Sample Matrix:	Drinking Water		

Case Narrative

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Laboratory Control Sample (LCS), and Laboratory/Duplicate Laboratory Control Sample (LCS/DLCS).

Sample Receipt

Sixteen drinking water samples were received for analysis at ALS Environmental on 09/02/17. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4ºC upon receipt at the laboratory.

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Surrogate Exceptions:
The control criteria were exceeded for some of the surrogates in a few of the samples due to matrix interference. A re-extraction and re-analysis was performed, but produced similar results. The results of the original analysis were reported. No further corrective action was required.

Elevated Detection Limits:
Most sample required dilution due to the presence of elevated levels of target analyte. The reporting limits were adjusted to reflect the dilution.

Lab Control Sample Exceptions:
The spike recovery of a few compounds for Duplicate Laboratory Control Sample (LCS) KQ1712669-02 was outside the lower control criterion. The DLCS is for the Relative Percent Difference (RPD) evaluation. The RPD was within criterion. The error associated with reduced recovery may indicate a potential bias. No further corrective action was appropriate.

No other anomalies associated with the analysis of these samples were observed.

Approved by_____

Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

ALS Environmental

CHAIN OF CUSTODY
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SR# K1707280

COC Set____of____

COC#_____

1317 South 13th Ave, Kelso, WA 98626 Phone (360) 577-7222 / 800-695-7222 / FAX (360) 636-1068
www.alsglobal.com

Project Name: Wolverine World Wide	Project Number: 116.0062335.00
Project Manager: Mark Westra	
Company: GZA	
Address: 600 5th St, Grand Rapids, MI	
Phone #: 616-956-6123	email: mark.westra@gza.com
Sampler Signature	Sampler Printed Name

CLIENT SAMPLE ID	LABID	SAMPLING Date	SAMPLING Time	Matrix	NUMBER OF CONTAINERS	PFC/537M / PFOA Complete List	14D	1	2	3	4	5	Remarks
1. TMW-110		8/31	1233	W		X							
2. DUP-2		8/31	—	W		X							
3. MW-307A		8/31	1320	W		X							
4. MW-306A		8/31	1432	W		X							
5. MW-5		8/31	1453	W		X							
6. P-2		8/31	1552	W		X							
7. EB-1		8/31	1533	W		X							
8. EB-2		8/31	1548	W		X							
9. P-3		9/1	0844	W		X							
10. MW-304A		9/1	111	W		X							

Report Requirements

___ I. Routine Report: Method Blank, Surrogate, as required

___ II. Report Dup., MS, MSD as required

___ III. CLP Like Summary (no raw data)

___ IV. Data Validation Report

___ V. EDD

Invoice Information

P.O.#_____

Bill To:_____

Turnaround Requirements

___ 24 hr. ___ 48 hr.

___ 5 Day

X Standard

Requested Report Date

Circle which metals are to be analyzed

Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Special Instructions/Comments: PFC/537m/PFOA Complete list

*Indicate State Hydrocarbon Procedure: AK CA WI Northwest Other____(Circle One)

Relinquished By:	Received By:	Relinquished By:	Received By:	Relinquished By:	Received By:
Signature:	Signature: JM 9/1/17	Signature:	Signature:	Signature:	Signature:
Printed Name: Jack Markosky	Printed Name:	Printed Name:	Printed Name:	Printed Name:	Printed Name:
Firm:	Firm:	Firm:	Firm: 9/2/17 0840	Firm:	Firm:
Date/Time:	Date/Time:	Date/Time:	Date/Time:	Date/Time:	Date/Time:

ALS Environmental

CHAIN OF CUSTODY
82000

001

SR# K1709280

COC Set____of____

COC#_____

1317 South 13th Ave, Kelso, WA 98626 Phone (360) 577-7222 / 800-695-7222 / FAX (360) 636-1068
www.alsglobal.com

Project Name: Wolverine World Wide	Project Number:
Project Manager	
Company	
Address	
Phone #	email
Sampler Signature	Sampler Printed Name

CLIENT SAMPLE ID	LABID	SAMPLING Date	SAMPLING Time	Matrix	NUMBER OF CONTAINERS	PFC/537M / PFOA Complete List	14D	1	2	3	4	5	Remarks
1. DUP-4	1	9/1	—	W		X							
2. FB-8		9/1	0931	W		X							
3. TMW-105		9/1	1004	W		X							
4. TMW-308A		9/1	1111	W	X								
5. EB-4		9/1	1047	W		X							
6. TMW-102		9/1	1200	W	X								
7.													
8.													
9.													
10.													

Report Requirements

___ I. Routine Report: Method Blank, Surrogate, as required

___ II. Report Dup., MS, MSD as required

___ III. CLP Like Summary (no raw data)

___ IV. Data Validation Report

___ V. EDD

Invoice Information

P.O.#_____

Bill To:_____

Turnaround Requirements

___ 24 hr. ___ 48 hr.

___ 5 Day

___ Standard

Requested Report Date

Circle which metals are to be analyzed

Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Special Instructions/Comments: PFC | 537m | PFOA Complete List

*Indicate State Hydrocarbon Procedure: AK CA WI Northwest Other____(Circle One)

Relinquished By:	Received By:	Relinquished By:	Received By:	Relinquished By:	Received By:
Signature	Signature 9/1/17	Signature	Signature	Signature	Signature
Printed Name Jack Murkosky	Printed Name	Printed Name	Printed Name	Printed Name	Printed Name
Firm	Firm	Firm	Firm 9/2/17 0840	Firm	Firm
Date/Time	Date/Time	Date/Time	Date/Time	Date/Time	Date/Time

PC CV

Cooler Receipt and Preservation Form

Client G2A Service Request K17 09280

Received: 9/2/17 Opened: 9/2/17 By: [signature] Unloaded: 9/2/17 By: [signature]

1. Samples were received via? *USPS* (*Fed Ex*) *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) (*Cooler*) *Box* *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA Y (N) If yes, how many and where? _____
   If present, were custody seals intact? Y N If present, were they signed and dated? Y N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	Filed
-0.8	-0.8	—	—	0	308		770168740041	

4. Packing material: *Inserts* *Baggies* (*Bubble Wrap*) *Gel Packs* (*Wet Ice*) *Dry Ice* *Sleeves* _____
5. Were custody papers properly filled out (ink, signed, etc.)? NA (Y) N
6. Were samples received in good condition (temperature, unbroken)? *Indicate in the table below.* NA (Y) N
   If applicable, tissue samples were received: ***Frozen*** ***Partially Thawed*** ***Thawed***
7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA (Y) N
8. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA Y (N)
9. Were appropriate bottles/containers and volumes received for the tests indicated? NA (Y) N
10. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* (NA) Y N
11. Were VOA vials received without headspace? *Indicate in the table below.* (NA) Y N
12. Was C12/Res negative? (NA) Y N

Sample ID on Bottle	Sample ID on COC	Identified by:
TMW-101	TMW-102	elimination

Sample ID	Bottle Count Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: _____

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709280
Project:	Wolverine World Wide/16.0062335.00	**Date Collected:**	08/31/17 12:33
Sample Matrix:	Ground Water	**Date Received:**	09/02/17 08:40
Sample Name:	TMW-110	**Units:**	ng/L
Lab Code:	K1709280-001	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	ND U	8.3	1	09/07/17 13:50	9/5/17	
Perfluoropentanoic acid (PFPeA)	**280**	4.2	1	09/07/17 13:50	9/5/17	
Perfluorobutane sulfonic acid (PFBS)	**510**	4.2	1	09/07/17 13:50	9/5/17	
Perfluorohexanoic acid (PFHxA)	**1100**	4.2	1	09/07/17 13:50	9/5/17	
Perfluoroheptanoic acid (PFHpA)	**1200**	4.2	1	09/07/17 13:50	9/5/17	
Perfluorohexane sulfonic acid (PFHxS)	**1700**	1000	250	09/08/17 13:41	9/5/17	
Perfluorooctanoic acid (PFOA)	**6400**	420	250	09/08/17 13:41	9/5/17	*
Perfluoroheptane sulfonic acid (PFHpS)	**730**	4.2	1	09/08/17 00:56	9/5/17	
Perfluorononanoic acid (PFNA)	**240**	4.2	1	09/07/17 13:50	9/5/17	*
Perfluorooctane sulfonic acid (PFOS)	**9100**	1000	250	09/08/17 13:41	9/5/17	
Perfluorodecanoic acid (PFDA)	**52**	4.2	1	09/07/17 13:50	9/5/17	
Perfluoroundecanoic acid (PFUnDA)	**13**	4.2	1	09/07/17 13:50	9/5/17	
Perfluorooctane sulfonamide (FOSA)	**4.7**	4.2	1	09/07/17 13:50	9/5/17	
Perfluorododecanoic acid (PFDoDA)	ND U	4.2	1	09/07/17 13:50	9/5/17	*
Perfluorotridecanoic acid (PFTrDA)	ND U	4.2	1	09/07/17 13:50	9/5/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND U	4.2	1	09/07/17 13:50	9/5/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND U	4.2	1	09/07/17 13:50	9/5/17	
Perfluorotetradecanoic acid (PFTeDA)	ND U	4.2	1	09/07/17 13:50	9/5/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND U	4.2	1	09/07/17 13:50	9/5/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND U	4.2	1	09/07/17 13:50	9/5/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND U	4.2	1	09/07/17 13:50	9/5/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	**13**	4.2	1	09/07/17 13:50	9/5/17	
Perfluorodecane sulfonic acid (PFDS)	ND U	4.2	1	09/07/17 13:50	9/5/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	7	19 - 126	09/07/17 13:50	*
13C2-PFHxA	12	10 - 151	09/07/17 13:50	
18O2-PFHxS	102	20 - 128	09/08/17 13:41	
13C2-6:2 FTS	66	10 - 187	09/07/17 13:50	
13C4-PFOA	78	13 - 142	09/08/17 13:41	
13C5-PFNA	27	15 - 143	09/07/17 13:50	
13C4-PFOS	79	11 - 131	09/08/17 13:41	
13C2-PFDA	50	25 - 129	09/07/17 13:50	
13C2-PFUnDA	58	16 - 129	09/07/17 13:50	
13C2-PFDoDA	56	17 - 114	09/07/17 13:50	
D7-MeFOSE	46	32 - 113	09/07/17 13:50	
D9-EtFOSE	59	20 - 113	09/07/17 13:50	
D5-EtFOSA	48	19 - 103	09/07/17 13:50	
13C2-8:2 FTS	121	50 - 150	09/07/17 13:50	

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Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709280
Project:	Wolverine World Wide/16.0062335.00	**Date Collected:**	08/31/17 12:33
Sample Matrix:	Ground Water	**Date Received:**	09/02/17 08:40
Sample Name:	TMW-110	**Units:**	ng/L
Lab Code:	K1709280-001	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M			
Prep Method:	EPA 3535A			
13C2-PFTeDA	37	50 - 150	09/07/17 13:50	*
13C4-PFHpA	13	50 - 150	09/07/17 13:50	*
13C5-PFPeA	11	50 - 150	09/07/17 13:50	*
13C3-PFBS	29	50 - 150	09/07/17 13:50	*
13C8-FOSA	44	50 - 150	09/07/17 13:50	*

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Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709280
Project:	Wolverine World Wide/16.0062335.00	**Date Collected:**	08/31/17
Sample Matrix:	Ground Water	**Date Received:**	09/02/17 08:40
Sample Name:	DUP-2	**Units:**	ng/L
Lab Code:	K1709280-002	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result		MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	**99**		8.6	1	09/07/17 14:00	9/5/17	
Perfluoropentanoic acid (PFPeA)	**150**		4.3	1	09/07/17 14:00	9/5/17	
Perfluorobutane sulfonic acid (PFBS)	**700**		4.3	1	09/07/17 14:00	9/5/17	
Perfluorohexanoic acid (PFHxA)	**440**		4.3	1	09/07/17 14:00	9/5/17	
Perfluoroheptanoic acid (PFHpA)	**730**		4.3	1	09/07/17 14:00	9/5/17	
Perfluorohexane sulfonic acid (PFHxS)	**1200**		430	100	09/08/17 13:52	9/5/17	
Perfluorooctanoic acid (PFOA)	**5900**		170	100	09/08/17 13:52	9/5/17	*
Perfluoroheptane sulfonic acid (PFHpS)	**420**		4.3	1	09/08/17 01:07	9/5/17	
Perfluorononanoic acid (PFNA)	**190**		4.3	1	09/07/17 14:00	9/5/17	*
Perfluorooctane sulfonic acid (PFOS)	**5600**		430	100	09/08/17 13:52	9/5/17	
Perfluorodecanoic acid (PFDA)	**16**		4.3	1	09/07/17 14:00	9/5/17	
Perfluoroundecanoic acid (PFUnDA)	**14**		4.3	1	09/07/17 14:00	9/5/17	
Perfluorooctane sulfonamide (FOSA)	ND	U	4.3	1	09/07/17 14:00	9/5/17	
Perfluorododecanoic acid (PFDoDA)	ND	U	4.3	1	09/07/17 14:00	9/5/17	*
Perfluorotridecanoic acid (PFTrDA)	ND	U	4.3	1	09/07/17 14:00	9/5/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND	U	4.3	1	09/07/17 14:00	9/5/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND	U	4.3	1	09/07/17 14:00	9/5/17	
Perfluorotetradecanoic acid (PFTeDA)	ND	U	4.3	1	09/07/17 14:00	9/5/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND	U	4.3	1	09/07/17 14:00	9/5/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND	U	4.3	1	09/07/17 14:00	9/5/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND	U	4.3	1	09/07/17 14:00	9/5/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND	U	4.3	1	09/07/17 14:00	9/5/17	
Perfluorodecane sulfonic acid (PFDS)	ND	U	4.3	1	09/07/17 14:00	9/5/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	58	19 - 126	09/07/17 14:00	
13C2-PFHxA	47	10 - 151	09/07/17 14:00	
18O2-PFHxS	108	20 - 128	09/08/17 13:52	
13C2-6:2 FTS	56	10 - 187	09/07/17 14:00	
13C4-PFOA	75	13 - 142	09/08/17 13:52	
13C5-PFNA	65	15 - 143	09/07/17 14:00	
13C4-PFOS	74	11 - 131	09/08/17 13:52	
13C2-PFDA	95	25 - 129	09/07/17 14:00	
13C2-PFUnDA	88	16 - 129	09/07/17 14:00	
13C2-PFDoDA	76	17 - 114	09/07/17 14:00	
D7-MeFOSE	52	32 - 113	09/07/17 14:00	
D9-EtFOSE	63	20 - 113	09/07/17 14:00	
D5-EtFOSA	41	19 - 103	09/07/17 14:00	
13C2-8:2 FTS	145	50 - 150	09/07/17 14:00	

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Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709280
Project:	Wolverine World Wide/16.0062335.00	**Date Collected:**	08/31/17
Sample Matrix:	Ground Water	**Date Received:**	09/02/17 08:40
Sample Name:	DUP-2	**Units:**	ng/L
Lab Code:	K1709280-002	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M			
Prep Method:	EPA 3535A			
13C2-PFTeDA	54	50 - 150	09/07/17 14:00	
13C4-PFHpA	43	50 - 150	09/07/17 14:00	*
13C5-PFPeA	45	50 - 150	09/07/17 14:00	*
13C3-PFBS	43	50 - 150	09/07/17 14:00	*
13C8-FOSA	55	50 - 150	09/07/17 14:00	

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Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709280
Project:	Wolverine World Wide/16.0062335.00	**Date Collected:**	08/31/17 13:20
Sample Matrix:	Ground Water	**Date Received:**	09/02/17 08:40
Sample Name:	MW-307A	**Units:**	ng/L
Lab Code:	K1709280-003	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	**100**	8.8	1	09/07/17 14:11	9/5/17	
Perfluoropentanoic acid (PFPeA)	**160**	4.4	1	09/07/17 14:11	9/5/17	
Perfluorobutane sulfonic acid (PFBS)	**670**	4.4	1	09/07/17 14:11	9/5/17	
Perfluorohexanoic acid (PFHxA)	**500**	4.4	1	09/07/17 14:11	9/5/17	
Perfluoroheptanoic acid (PFHpA)	**760**	4.4	1	09/07/17 14:11	9/5/17	
Perfluorohexane sulfonic acid (PFHxS)	**1500**	440	100	09/08/17 14:02	9/5/17	
Perfluorooctanoic acid (PFOA)	**5900**	180	100	09/08/17 14:02	9/5/17	*
Perfluoroheptane sulfonic acid (PFHpS)	**490**	4.4	1	09/08/17 01:17	9/5/17	
Perfluorononanoic acid (PFNA)	**200**	4.4	1	09/07/17 14:11	9/5/17	*
Perfluorooctane sulfonic acid (PFOS)	**4000**	440	100	09/08/17 14:02	9/5/17	
Perfluorodecanoic acid (PFDA)	**16**	4.4	1	09/07/17 14:11	9/5/17	
Perfluoroundecanoic acid (PFUnDA)	**14**	4.4	1	09/07/17 14:11	9/5/17	
Perfluorooctane sulfonamide (FOSA)	ND U	4.4	1	09/07/17 14:11	9/5/17	
Perfluorododecanoic acid (PFDoDA)	ND U	4.4	1	09/07/17 14:11	9/5/17	*
Perfluorotridecanoic acid (PFTrDA)	ND U	4.4	1	09/07/17 14:11	9/5/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND U	4.4	1	09/07/17 14:11	9/5/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND U	4.4	1	09/07/17 14:11	9/5/17	
Perfluorotetradecanoic acid (PFTeDA)	ND U	4.4	1	09/07/17 14:11	9/5/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND U	4.4	1	09/07/17 14:11	9/5/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND U	4.4	1	09/07/17 14:11	9/5/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND U	4.4	1	09/07/17 14:11	9/5/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND U	4.4	1	09/07/17 14:11	9/5/17	
Perfluorodecane sulfonic acid (PFDS)	ND U	4.4	1	09/07/17 14:11	9/5/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	56	19 - 126	09/07/17 14:11	
13C2-PFHxA	43	10 - 151	09/07/17 14:11	
18O2-PFHxS	82	20 - 128	09/08/17 14:02	
13C2-6:2 FTS	62	10 - 187	09/07/17 14:11	
13C4-PFOA	75	13 - 142	09/08/17 14:02	
13C5-PFNA	68	15 - 143	09/07/17 14:11	
13C4-PFOS	97	11 - 131	09/08/17 14:02	
13C2-PFDA	96	25 - 129	09/07/17 14:11	
13C2-PFUnDA	93	16 - 129	09/07/17 14:11	
13C2-PFDoDA	87	17 - 114	09/07/17 14:11	
D7-MeFOSE	56	32 - 113	09/07/17 14:11	
D9-EtFOSE	70	20 - 113	09/07/17 14:11	
D5-EtFOSA	41	19 - 103	09/07/17 14:11	
13C2-8:2 FTS	161	50 - 150	09/07/17 14:11	*

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Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709280
Project:	Wolverine World Wide/16.0062335.00	**Date Collected:**	08/31/17 13:20
Sample Matrix:	Ground Water	**Date Received:**	09/02/17 08:40
Sample Name:	MW-307A	**Units:**	ng/L
Lab Code:	K1709280-003	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M			
Prep Method:	EPA 3535A			
13C2-PFTeDA	69	50 - 150	09/07/17 14:11	
13C4-PFHpA	40	50 - 150	09/07/17 14:11	*
13C5-PFPeA	45	50 - 150	09/07/17 14:11	*
13C3-PFBS	45	50 - 150	09/07/17 14:11	*
13C8-FOSA	62	50 - 150	09/07/17 14:11	

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Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709280
Project:	Wolverine World Wide/16.0062335.00	**Date Collected:**	08/31/17 14:32
Sample Matrix:	Ground Water	**Date Received:**	09/02/17 08:40
Sample Name:	MW-306A	**Units:**	ng/L
Lab Code:	K1709280-004	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result		MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	**310**		8.8	1	09/07/17 14:21	9/5/17	
Perfluoropentanoic acid (PFPeA)	**280**		4.4	1	09/07/17 14:21	9/5/17	
Perfluorobutane sulfonic acid (PFBS)	**1400**		88	20	09/12/17 17:58	9/5/17	
Perfluorohexanoic acid (PFHxA)	**670**		88	20	09/12/17 17:58	9/5/17	
Perfluoroheptanoic acid (PFHpA)	**710**		4.4	1	09/07/17 14:21	9/5/17	
Perfluorohexane sulfonic acid (PFHxS)	**1200**		88	20	09/12/17 17:58	9/5/17	
Perfluorooctanoic acid (PFOA)	**4400**		35	20	09/12/17 17:58	9/5/17	*
Perfluoroheptane sulfonic acid (PFHpS)	**270**		4.4	1	09/08/17 01:28	9/5/17	
Perfluorononanoic acid (PFNA)	**310**		4.4	1	09/07/17 14:21	9/5/17	*
Perfluorooctane sulfonic acid (PFOS)	**9700**		88	20	09/12/17 17:58	9/5/17	
Perfluorodecanoic acid (PFDA)	**93**		4.4	1	09/07/17 14:21	9/5/17	
Perfluoroundecanoic acid (PFUnDA)	**170**		4.4	1	09/07/17 14:21	9/5/17	
Perfluorooctane sulfonamide (FOSA)	**410**		4.4	1	09/07/17 14:21	9/5/17	
Perfluorododecanoic acid (PFDoDA)	ND	U	4.4	1	09/07/17 14:21	9/5/17	*
Perfluorotridecanoic acid (PFTrDA)	ND	U	4.4	1	09/07/17 14:21	9/5/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND	U	4.4	1	09/07/17 14:21	9/5/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND	U	4.4	1	09/07/17 14:21	9/5/17	
Perfluorotetradecanoic acid (PFTeDA)	ND	U	4.4	1	09/07/17 14:21	9/5/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND	U	4.4	1	09/07/17 14:21	9/5/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND	U	4.4	1	09/07/17 14:21	9/5/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND	U	4.4	1	09/07/17 14:21	9/5/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	**25**		4.4	1	09/07/17 14:21	9/5/17	
Perfluorodecane sulfonic acid (PFDS)	ND	U	4.4	1	09/07/17 14:21	9/5/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	87	19 - 126	09/07/17 14:21	
13C2-PFHxA	81	10 - 151	09/12/17 17:58	
18O2-PFHxS	59	20 - 128	09/12/17 17:58	
13C2-6:2 FTS	45	10 - 187	09/07/17 14:21	
13C4-PFOA	70	13 - 142	09/12/17 17:58	
13C5-PFNA	50	15 - 143	09/07/17 14:21	
13C4-PFOS	70	11 - 131	09/12/17 17:58	
13C2-PFDA	102	25 - 129	09/07/17 14:21	
13C2-PFUnDA	95	16 - 129	09/07/17 14:21	
13C2-PFDoDA	90	17 - 114	09/07/17 14:21	
D7-MeFOSE	56	32 - 113	09/07/17 14:21	
D9-EtFOSE	71	20 - 113	09/07/17 14:21	
D5-EtFOSA	40	19 - 103	09/07/17 14:21	
13C2-8:2 FTS	128	50 - 150	09/07/17 14:21	

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Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709280
Project:	Wolverine World Wide/16.0062335.00	**Date Collected:**	08/31/17 14:32
Sample Matrix:	Ground Water	**Date Received:**	09/02/17 08:40
Sample Name:	MW-306A	**Units:**	ng/L
Lab Code:	K1709280-004	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M		
Prep Method:	EPA 3535A		
13C2-PFTeDA	85	50 - 150	09/07/17 14:21
13C4-PFHpA	57	50 - 150	09/07/17 14:21
13C5-PFPeA	78	50 - 150	09/07/17 14:21
13C3-PFBS	72	50 - 150	09/12/17 17:58
13C8-FOSA	58	50 - 150	09/07/17 14:21

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Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709280
Project:	Wolverine World Wide/16.0062335.00	**Date Collected:**	08/31/17 14:53
Sample Matrix:	Ground Water	**Date Received:**	09/02/17 08:40
Sample Name:	MW-5	**Units:**	ng/L
Lab Code:	K1709280-005	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result		MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	**42**		8.6	1	09/07/17 14:32	9/5/17	
Perfluoropentanoic acid (PFPeA)	**59**		4.3	1	09/07/17 14:32	9/5/17	
Perfluorobutane sulfonic acid (PFBS)	**150**		4.3	1	09/07/17 14:32	9/5/17	
Perfluorohexanoic acid (PFHxA)	**290**		4.3	1	09/07/17 14:32	9/5/17	
Perfluoroheptanoic acid (PFHpA)	**310**		4.3	1	09/07/17 14:32	9/5/17	
Perfluorohexane sulfonic acid (PFHxS)	**980**		210	50	09/12/17 18:08	9/5/17	
Perfluorooctanoic acid (PFOA)	**2600**		86	50	09/12/17 18:08	9/5/17	*
Perfluoroheptane sulfonic acid (PFHpS)	**180**		4.3	1	09/08/17 01:38	9/5/17	
Perfluorononanoic acid (PFNA)	**180**		4.3	1	09/07/17 14:32	9/5/17	*
Perfluorooctane sulfonic acid (PFOS)	**18000**		210	50	09/12/17 18:08	9/5/17	
Perfluorodecanoic acid (PFDA)	**120**		4.3	1	09/07/17 14:32	9/5/17	
Perfluoroundecanoic acid (PFUnDA)	**830**		210	50	09/12/17 18:08	9/5/17	
Perfluorooctane sulfonamide (FOSA)	**2000**		210	50	09/12/17 18:08	9/5/17	
Perfluorododecanoic acid (PFDoDA)	**7.3**		4.3	1	09/07/17 14:32	9/5/17	*
Perfluorotridecanoic acid (PFTrDA)	**11**		4.3	1	09/07/17 14:32	9/5/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND	U	4.3	1	09/07/17 14:32	9/5/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND	U	4.3	1	09/07/17 14:32	9/5/17	
Perfluorotetradecanoic acid (PFTeDA)	ND	U	4.3	1	09/07/17 14:32	9/5/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND	U	4.3	1	09/07/17 14:32	9/5/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND	U	4.3	1	09/07/17 14:32	9/5/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND	U	4.3	1	09/07/17 14:32	9/5/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	**7.4**		4.3	1	09/07/17 14:32	9/5/17	
Perfluorodecane sulfonic acid (PFDS)	**69**		4.3	1	09/07/17 14:32	9/5/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	95	19 - 126	09/07/17 14:32	
13C2-PFHxA	90	10 - 151	09/07/17 14:32	
18O2-PFHxS	70	20 - 128	09/12/17 18:08	
13C2-6:2 FTS	59	10 - 187	09/07/17 14:32	
13C4-PFOA	70	13 - 142	09/12/17 18:08	
13C5-PFNA	42	15 - 143	09/07/17 14:32	
13C4-PFOS	73	11 - 131	09/12/17 18:08	
13C2-PFDA	101	25 - 129	09/07/17 14:32	
13C2-PFUnDA	80	16 - 129	09/12/17 18:08	
13C2-PFDoDA	86	17 - 114	09/07/17 14:32	
D7-MeFOSE	63	32 - 113	09/07/17 14:32	
D9-EtFOSE	77	20 - 113	09/07/17 14:32	
D5-EtFOSA	43	19 - 103	09/07/17 14:32	
13C2-8:2 FTS	123	50 - 150	09/07/17 14:32	

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Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709280
Project:	Wolverine World Wide/16.0062335.00	**Date Collected:**	08/31/17 14:53
Sample Matrix:	Ground Water	**Date Received:**	09/02/17 08:40
Sample Name:	MW-5	**Units:**	ng/L
Lab Code:	K1709280-005	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M		
Prep Method:	EPA 3535A		
13C2-PFTeDA	69	50 - 150	09/07/17 14:32
13C4-PFHpA	69	50 - 150	09/07/17 14:32
13C5-PFPeA	87	50 - 150	09/07/17 14:32
13C3-PFBS	58	50 - 150	09/07/17 14:32
13C8-FOSA	76	50 - 150	09/12/17 18:08

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Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709280
Project:	Wolverine World Wide/16.0062335.00	**Date Collected:**	08/31/17 15:52
Sample Matrix:	Ground Water	**Date Received:**	09/02/17 08:40
Sample Name:	P-2	**Units:**	ng/L
Lab Code:	K1709280-006	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result		MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	**970**		430	50	09/12/17 18:19	9/5/17	
Perfluoropentanoic acid (PFPeA)	**640**		4.3	1	09/07/17 14:42	9/5/17	
Perfluorobutane sulfonic acid (PFBS)	**5200**		210	50	09/12/17 18:19	9/5/17	
Perfluorohexanoic acid (PFHxA)	**1900**		210	50	09/12/17 18:19	9/5/17	
Perfluoroheptanoic acid (PFHpA)	**1700**		210	50	09/12/17 18:19	9/5/17	
Perfluorohexane sulfonic acid (PFHxS)	**4200**		210	50	09/12/17 18:19	9/5/17	
Perfluorooctanoic acid (PFOA)	**14000**		86	50	09/12/17 18:19	9/5/17	*
Perfluoroheptane sulfonic acid (PFHpS)	**1300**		210	50	09/12/17 18:19	9/5/17	
Perfluorononanoic acid (PFNA)	**410**		4.3	1	09/07/17 14:42	9/5/17	*
Perfluorooctane sulfonic acid (PFOS)	**30000**		210	50	09/12/17 18:19	9/5/17	
Perfluorodecanoic acid (PFDA)	**27**		4.3	1	09/07/17 14:42	9/5/17	
Perfluoroundecanoic acid (PFUnDA)	**5.5**		4.3	1	09/07/17 14:42	9/5/17	
Perfluorooctane sulfonamide (FOSA)	**160**		4.3	1	09/07/17 14:42	9/5/17	
Perfluorododecanoic acid (PFDoDA)	ND	U	4.3	1	09/07/17 14:42	9/5/17	*
Perfluorotridecanoic acid (PFTrDA)	ND	U	4.3	1	09/07/17 14:42	9/5/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND	U	4.3	1	09/07/17 14:42	9/5/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND	U	4.3	1	09/07/17 14:42	9/5/17	
Perfluorotetradecanoic acid (PFTeDA)	ND	U	4.3	1	09/07/17 14:42	9/5/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND	U	4.3	1	09/07/17 14:42	9/5/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND	U	4.3	1	09/07/17 14:42	9/5/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND	U	4.3	1	09/07/17 14:42	9/5/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	**41**		4.3	1	09/07/17 14:42	9/5/17	
Perfluorodecane sulfonic acid (PFDS)	ND	U	4.3	1	09/07/17 14:42	9/5/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	86	19 - 126	09/12/17 18:19	
13C2-PFHxA	90	10 - 151	09/12/17 18:19	
18O2-PFHxS	90	20 - 128	09/12/17 18:19	
13C2-6:2 FTS	34	10 - 187	09/07/17 14:42	
13C4-PFOA	78	13 - 142	09/12/17 18:19	
13C5-PFNA	45	15 - 143	09/07/17 14:42	
13C4-PFOS	60	11 - 131	09/12/17 18:19	
13C2-PFDA	99	25 - 129	09/07/17 14:42	
13C2-PFUnDA	87	16 - 129	09/07/17 14:42	
13C2-PFDoDA	78	17 - 114	09/07/17 14:42	
D7-MeFOSE	51	32 - 113	09/07/17 14:42	
D9-EtFOSE	64	20 - 113	09/07/17 14:42	
D5-EtFOSA	40	19 - 103	09/07/17 14:42	
13C2-8:2 FTS	169	50 - 150	09/07/17 14:42	*

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Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709280
Project:	Wolverine World Wide/16.0062335.00	**Date Collected:**	08/31/17 15:52
Sample Matrix:	Ground Water	**Date Received:**	09/02/17 08:40
Sample Name:	P-2	**Units:**	ng/L
Lab Code:	K1709280-006	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M		
Prep Method:	EPA 3535A		
13C2-PFTeDA	52	50 - 150	09/07/17 14:42
13C4-PFHpA	92	50 - 150	09/12/17 18:19
13C5-PFPeA	66	50 - 150	09/07/17 14:42
13C3-PFBS	71	50 - 150	09/12/17 18:19
13C8-FOSA	56	50 - 150	09/07/17 14:42

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Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709280
Project:	Wolverine World Wide/16.0062335.00	**Date Collected:**	08/31/17 15:33
Sample Matrix:	Ground Water	**Date Received:**	09/02/17 08:40
Sample Name:	FB-1	**Units:**	ng/L
Lab Code:	K1709280-007	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	ND U	8.6	1	09/07/17 14:53	9/5/17	
Perfluoropentanoic acid (PFPeA)	ND U	4.3	1	09/07/17 14:53	9/5/17	
Perfluorobutane sulfonic acid (PFBS)	ND U	4.3	1	09/07/17 14:53	9/5/17	
Perfluorohexanoic acid (PFHxA)	ND U	4.3	1	09/07/17 14:53	9/5/17	
Perfluoroheptanoic acid (PFHpA)	ND U	4.3	1	09/07/17 14:53	9/5/17	
Perfluorohexane sulfonic acid (PFHxS)	ND U	4.3	1	09/07/17 14:53	9/5/17	
Perfluorooctanoic acid (PFOA)	ND U	1.7	1	09/07/17 14:53	9/5/17	*
Perfluoroheptane sulfonic acid (PFHpS)	ND U	4.3	1	09/08/17 01:59	9/5/17	
Perfluorononanoic acid (PFNA)	ND U	4.3	1	09/07/17 14:53	9/5/17	*
Perfluorooctane sulfonic acid (PFOS)	ND U	4.3	1	09/07/17 14:53	9/5/17	
Perfluorodecanoic acid (PFDA)	ND U	4.3	1	09/07/17 14:53	9/5/17	
Perfluoroundecanoic acid (PFUnDA)	ND U	4.3	1	09/07/17 14:53	9/5/17	
Perfluorooctane sulfonamide (FOSA)	ND U	4.3	1	09/07/17 14:53	9/5/17	
Perfluorododecanoic acid (PFDoDA)	ND U	4.3	1	09/07/17 14:53	9/5/17	*
Perfluorotridecanoic acid (PFTrDA)	ND U	4.3	1	09/07/17 14:53	9/5/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND U	4.3	1	09/07/17 14:53	9/5/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND U	4.3	1	09/07/17 14:53	9/5/17	
Perfluorotetradecanoic acid (PFTeDA)	ND U	4.3	1	09/07/17 14:53	9/5/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND U	4.3	1	09/07/17 14:53	9/5/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND U	4.3	1	09/07/17 14:53	9/5/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND U	4.3	1	09/07/17 14:53	9/5/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND U	4.3	1	09/07/17 14:53	9/5/17	
Perfluorodecane sulfonic acid (PFDS)	ND U	4.3	1	09/07/17 14:53	9/5/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	100	19 - 126	09/07/17 14:53	
13C2-PFHxA	96	10 - 151	09/07/17 14:53	
18O2-PFHxS	96	20 - 128	09/07/17 14:53	
13C2-6:2 FTS	88	10 - 187	09/07/17 14:53	
13C4-PFOA	105	13 - 142	09/07/17 14:53	
13C5-PFNA	97	15 - 143	09/07/17 14:53	
13C4-PFOS	86	11 - 131	09/07/17 14:53	
13C2-PFDA	108	25 - 129	09/07/17 14:53	
13C2-PFUnDA	101	16 - 129	09/07/17 14:53	
13C2-PFDoDA	101	17 - 114	09/07/17 14:53	
D7-MeFOSE	77	32 - 113	09/07/17 14:53	
D9-EtFOSE	95	20 - 113	09/07/17 14:53	
D5-EtFOSA	64	19 - 103	09/07/17 14:53	
13C2-8:2 FTS	105	50 - 150	09/07/17 14:53	

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Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709280
Project:	Wolverine World Wide/16.0062335.00	**Date Collected:**	08/31/17 15:33
Sample Matrix:	Ground Water	**Date Received:**	09/02/17 08:40
Sample Name:	FB-1	**Units:**	ng/L
Lab Code:	K1709280-007	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M			
Prep Method:	EPA 3535A			
13C2-PFTeDA		87	50 - 150	09/07/17 14:53
13C4-PFHpA		103	50 - 150	09/07/17 14:53
13C5-PFPeA		97	50 - 150	09/07/17 14:53
13C3-PFBS		65	50 - 150	09/07/17 14:53
13C8-FOSA		74	50 - 150	09/07/17 14:53

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Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709280
Project:	Wolverine World Wide/16.0062335.00	**Date Collected:**	08/31/17 15:48
Sample Matrix:	Ground Water	**Date Received:**	09/02/17 08:40
Sample Name:	EB-2	**Units:**	ng/L
Lab Code:	K1709280-008	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	ND U	8.6	1	09/07/17 15:03	9/5/17	
Perfluoropentanoic acid (PFPeA)	ND U	4.3	1	09/07/17 15:03	9/5/17	
Perfluorobutane sulfonic acid (PFBS)	ND U	4.3	1	09/07/17 15:03	9/5/17	
Perfluorohexanoic acid (PFHxA)	ND U	4.3	1	09/07/17 15:03	9/5/17	
Perfluoroheptanoic acid (PFHpA)	ND U	4.3	1	09/07/17 15:03	9/5/17	
Perfluorohexane sulfonic acid (PFHxS)	ND U	4.3	1	09/07/17 15:03	9/5/17	
Perfluorooctanoic acid (PFOA)	ND U	1.7	1	09/07/17 15:03	9/5/17	*
Perfluoroheptane sulfonic acid (PFHpS)	ND U	4.3	1	09/08/17 02:09	9/5/17	
Perfluorononanoic acid (PFNA)	ND U	4.3	1	09/07/17 15:03	9/5/17	*
Perfluorooctane sulfonic acid (PFOS)	ND U	4.3	1	09/07/17 15:03	9/5/17	
Perfluorodecanoic acid (PFDA)	ND U	4.3	1	09/07/17 15:03	9/5/17	
Perfluoroundecanoic acid (PFUnDA)	ND U	4.3	1	09/07/17 15:03	9/5/17	
Perfluorooctane sulfonamide (FOSA)	ND U	4.3	1	09/07/17 15:03	9/5/17	
Perfluorododecanoic acid (PFDoDA)	ND U	4.3	1	09/07/17 15:03	9/5/17	*
Perfluorotridecanoic acid (PFTrDA)	ND U	4.3	1	09/07/17 15:03	9/5/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND U	4.3	1	09/07/17 15:03	9/5/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND U	4.3	1	09/07/17 15:03	9/5/17	
Perfluorotetradecanoic acid (PFTeDA)	ND U	4.3	1	09/07/17 15:03	9/5/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND U	4.3	1	09/07/17 15:03	9/5/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND U	4.3	1	09/07/17 15:03	9/5/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND U	4.3	1	09/07/17 15:03	9/5/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND U	4.3	1	09/07/17 15:03	9/5/17	
Perfluorodecane sulfonic acid (PFDS)	ND U	4.3	1	09/07/17 15:03	9/5/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	79	19 - 126	09/07/17 15:03	
13C2-PFHxA	81	10 - 151	09/07/17 15:03	
18O2-PFHxS	65	20 - 128	09/07/17 15:03	
13C2-6:2 FTS	67	10 - 187	09/07/17 15:03	
13C4-PFOA	79	13 - 142	09/07/17 15:03	
13C5-PFNA	73	15 - 143	09/07/17 15:03	
13C4-PFOS	68	11 - 131	09/07/17 15:03	
13C2-PFDA	88	25 - 129	09/07/17 15:03	
13C2-PFUnDA	81	16 - 129	09/07/17 15:03	
13C2-PFDoDA	79	17 - 114	09/07/17 15:03	
D7-MeFOSE	62	32 - 113	09/07/17 15:03	
D9-EtFOSE	77	20 - 113	09/07/17 15:03	
D5-EtFOSA	42	19 - 103	09/07/17 15:03	
13C2-8:2 FTS	83	50 - 150	09/07/17 15:03	

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Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709280
Project:	Wolverine World Wide/16.0062335.00	**Date Collected:**	08/31/17 15:48
Sample Matrix:	Ground Water	**Date Received:**	09/02/17 08:40
Sample Name:	EB-2	**Units:**	ng/L
Lab Code:	K1709280-008	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M		
Prep Method:	EPA 3535A		
13C2-PFTeDA	73	50 - 150	09/07/17 15:03
13C4-PFHpA	81	50 - 150	09/07/17 15:03
13C5-PFPeA	75	50 - 150	09/07/17 15:03
13C3-PFBS	53	50 - 150	09/07/17 15:03
13C8-FOSA	59	50 - 150	09/07/17 15:03

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Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709280
Project:	Wolverine World Wide/16.0062335.00	**Date Collected:**	09/01/17 08:44
Sample Matrix:	Ground Water	**Date Received:**	09/02/17 08:40
Sample Name:	P-3	**Units:**	ng/L
Lab Code:	K1709280-009	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result		MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	**1500**		430	50	09/12/17 18:29	9/5/17	
Perfluoropentanoic acid (PFPeA)	**1400**		210	50	09/12/17 18:29	9/5/17	
Perfluorobutane sulfonic acid (PFBS)	**7000**		210	50	09/12/17 18:29	9/5/17	
Perfluorohexanoic acid (PFHxA)	**2800**		210	50	09/12/17 18:29	9/5/17	
Perfluoroheptanoic acid (PFHpA)	**2200**		210	50	09/12/17 18:29	9/5/17	
Perfluorohexane sulfonic acid (PFHxS)	**3500**		210	50	09/12/17 18:29	9/5/17	
Perfluorooctanoic acid (PFOA)	**10000**		86	50	09/12/17 18:29	9/5/17	*
Perfluoroheptane sulfonic acid (PFHpS)	**680**		4.3	1	09/08/17 02:20	9/5/17	
Perfluorononanoic acid (PFNA)	**430**		4.3	1	09/07/17 15:13	9/5/17	*
Perfluorooctane sulfonic acid (PFOS)	**22000**		210	50	09/12/17 18:29	9/5/17	
Perfluorodecanoic acid (PFDA)	**100**		4.3	1	09/07/17 15:13	9/5/17	
Perfluoroundecanoic acid (PFUnDA)	**140**		4.3	1	09/07/17 15:13	9/5/17	
Perfluorooctane sulfonamide (FOSA)	**130**		4.3	1	09/07/17 15:13	9/5/17	
Perfluorododecanoic acid (PFDoDA)	ND	U	4.3	1	09/07/17 15:13	9/5/17	*
Perfluorotridecanoic acid (PFTrDA)	ND	U	4.3	1	09/07/17 15:13	9/5/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND	U	4.3	1	09/07/17 15:13	9/5/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND	U	4.3	1	09/07/17 15:13	9/5/17	
Perfluorotetradecanoic acid (PFTeDA)	ND	U	4.3	1	09/07/17 15:13	9/5/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND	U	4.3	1	09/07/17 15:13	9/5/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND	U	4.3	1	09/07/17 15:13	9/5/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND	U	4.3	1	09/07/17 15:13	9/5/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	**77**		4.3	1	09/07/17 15:13	9/5/17	
Perfluorodecane sulfonic acid (PFDS)	ND	U	4.3	1	09/07/17 15:13	9/5/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	83	19 - 126	09/12/17 18:29	
13C2-PFHxA	98	10 - 151	09/12/17 18:29	
18O2-PFHxS	68	20 - 128	09/12/17 18:29	
13C2-6:2 FTS	41	10 - 187	09/07/17 15:13	
13C4-PFOA	76	13 - 142	09/12/17 18:29	
13C5-PFNA	42	15 - 143	09/07/17 15:13	
13C4-PFOS	73	11 - 131	09/12/17 18:29	
13C2-PFDA	96	25 - 129	09/07/17 15:13	
13C2-PFUnDA	96	16 - 129	09/07/17 15:13	
13C2-PFDoDA	89	17 - 114	09/07/17 15:13	
D7-MeFOSE	60	32 - 113	09/07/17 15:13	
D9-EtFOSE	75	20 - 113	09/07/17 15:13	
D5-EtFOSA	60	19 - 103	09/07/17 15:13	
13C2-8:2 FTS	181	50 - 150	09/07/17 15:13	*

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Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709280
Project:	Wolverine World Wide/16.0062335.00	**Date Collected:**	09/01/17 08:44
Sample Matrix:	Ground Water	**Date Received:**	09/02/17 08:40
Sample Name:	P-3	**Units:**	ng/L
Lab Code:	K1709280-009	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M		
Prep Method:	EPA 3535A		
13C2-PFTeDA	78	50 - 150	09/07/17 15:13
13C4-PFHpA	87	50 - 150	09/12/17 18:29
13C5-PFPeA	82	50 - 150	09/12/17 18:29
13C3-PFBS	76	50 - 150	09/12/17 18:29
13C8-FOSA	59	50 - 150	09/07/17 15:13

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Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709280
Project:	Wolverine World Wide/16.0062335.00	**Date Collected:**	09/01/17 11:11
Sample Matrix:	Ground Water	**Date Received:**	09/02/17 08:40
Sample Name:	MW-304A	**Units:**	ng/L
Lab Code:	K1709280-010	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result		MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	**540**		9.4	1	09/07/17 15:24	9/5/17	
Perfluoropentanoic acid (PFPeA)	**450**		4.7	1	09/07/17 15:24	9/5/17	
Perfluorobutane sulfonic acid (PFBS)	**2800**		230	50	09/12/17 19:11	9/5/17	
Perfluorohexanoic acid (PFHxA)	**1200**		230	50	09/12/17 19:11	9/5/17	
Perfluoroheptanoic acid (PFHpA)	**1100**		230	50	09/12/17 19:11	9/5/17	
Perfluorohexane sulfonic acid (PFHxS)	**1300**		230	50	09/12/17 19:11	9/5/17	
Perfluorooctanoic acid (PFOA)	**5400**		94	50	09/12/17 19:11	9/5/17	*
Perfluoroheptane sulfonic acid (PFHpS)	**750**		230	50	09/12/17 19:11	9/5/17	
Perfluorononanoic acid (PFNA)	**560**		4.7	1	09/07/17 15:24	9/5/17	*
Perfluorooctane sulfonic acid (PFOS)	**180000**		2300	500	09/08/17 14:55	9/5/17	
Perfluorodecanoic acid (PFDA)	**360**		4.7	1	09/07/17 15:24	9/5/17	
Perfluoroundecanoic acid (PFUnDA)	**780**		230	50	09/12/17 19:11	9/5/17	
Perfluorooctane sulfonamide (FOSA)	**800**		4.7	1	09/07/17 15:24	9/5/17	
Perfluorododecanoic acid (PFDoDA)	ND	U	4.7	1	09/07/17 15:24	9/5/17	*
Perfluorotridecanoic acid (PFTrDA)	**13**		4.7	1	09/07/17 15:24	9/5/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND	U	4.7	1	09/07/17 15:24	9/5/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND	U	4.7	1	09/07/17 15:24	9/5/17	
Perfluorotetradecanoic acid (PFTeDA)	ND	U	4.7	1	09/07/17 15:24	9/5/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND	U	4.7	1	09/07/17 15:24	9/5/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND	U	4.7	1	09/07/17 15:24	9/5/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND	U	4.7	1	09/07/17 15:24	9/5/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	**56**		4.7	1	09/07/17 15:24	9/5/17	
Perfluorodecane sulfonic acid (PFDS)	**160**		4.7	1	09/07/17 15:24	9/5/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	79	19 - 126	09/07/17 15:24	
13C2-PFHxA	89	10 - 151	09/12/17 19:11	
18O2-PFHxS	82	20 - 128	09/12/17 19:11	
13C2-6:2 FTS	59	10 - 187	09/07/17 15:24	
13C4-PFOA	75	13 - 142	09/12/17 19:11	
13C5-PFNA	21	15 - 143	09/07/17 15:24	
13C4-PFOS	36	11 - 131	09/08/17 14:55	
13C2-PFDA	82	25 - 129	09/07/17 15:24	
13C2-PFUnDA	85	16 - 129	09/12/17 19:11	
13C2-PFDoDA	77	17 - 114	09/07/17 15:24	
D7-MeFOSE	54	32 - 113	09/07/17 15:24	
D9-EtFOSE	68	20 - 113	09/07/17 15:24	
D5-EtFOSA	58	19 - 103	09/07/17 15:24	
13C2-8:2 FTS	154	50 - 150	09/07/17 15:24	*

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Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709280
Project:	Wolverine World Wide/16.0062335.00	**Date Collected:**	09/01/17 11:11
Sample Matrix:	Ground Water	**Date Received:**	09/02/17 08:40
Sample Name:	MW-304A	**Units:**	ng/L
Lab Code:	K1709280-010	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M			
Prep Method:	EPA 3535A			
13C2-PFTeDA	45	50 - 150	09/07/17 15:24	*
13C4-PFHpA	78	50 - 150	09/12/17 19:11	
13C5-PFPeA	64	50 - 150	09/07/17 15:24	
13C3-PFBS	74	50 - 150	09/12/17 19:11	
13C8-FOSA	54	50 - 150	09/07/17 15:24	

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Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709280
Project:	Wolverine World Wide/16.0062335.00	**Date Collected:**	09/01/17
Sample Matrix:	Ground Water	**Date Received:**	09/02/17 08:40
Sample Name:	DUP-4	**Units:**	ng/L
Lab Code:	K1709280-011	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result		MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	**1400**		430	50	09/12/17 18:50	9/5/17	
Perfluoropentanoic acid (PFPeA)	**1500**		210	50	09/12/17 18:50	9/5/17	
Perfluorobutane sulfonic acid (PFBS)	**7300**		210	50	09/12/17 18:50	9/5/17	
Perfluorohexanoic acid (PFHxA)	**2800**		210	50	09/12/17 18:50	9/5/17	
Perfluoroheptanoic acid (PFHpA)	**2600**		210	50	09/12/17 18:50	9/5/17	
Perfluorohexane sulfonic acid (PFHxS)	**4200**		210	50	09/12/17 18:50	9/5/17	
Perfluorooctanoic acid (PFOA)	**11000**		86	50	09/12/17 18:50	9/5/17	*
Perfluoroheptane sulfonic acid (PFHpS)	**560**		4.3	1	09/08/17 02:41	9/5/17	
Perfluorononanoic acid (PFNA)	**430**		4.3	1	09/07/17 15:34	9/5/17	*
Perfluorooctane sulfonic acid (PFOS)	**24000**		210	50	09/12/17 18:50	9/5/17	
Perfluorodecanoic acid (PFDA)	**110**		4.3	1	09/07/17 15:34	9/5/17	
Perfluoroundecanoic acid (PFUnDA)	**150**		4.3	1	09/07/17 15:34	9/5/17	
Perfluorooctane sulfonamide (FOSA)	**130**		4.3	1	09/07/17 15:34	9/5/17	
Perfluorododecanoic acid (PFDoDA)	ND	U	4.3	1	09/07/17 15:34	9/5/17	*
Perfluorotridecanoic acid (PFTrDA)	ND	U	4.3	1	09/07/17 15:34	9/5/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND	U	4.3	1	09/07/17 15:34	9/5/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND	U	4.3	1	09/07/17 15:34	9/5/17	
Perfluorotetradecanoic acid (PFTeDA)	ND	U	4.3	1	09/07/17 15:34	9/5/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND	U	4.3	1	09/07/17 15:34	9/5/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND	U	4.3	1	09/07/17 15:34	9/5/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND	U	4.3	1	09/07/17 15:34	9/5/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	**74**		4.3	1	09/07/17 15:34	9/5/17	
Perfluorodecane sulfonic acid (PFDS)	ND	U	4.3	1	09/07/17 15:34	9/5/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	92	19 - 126	09/12/17 18:50	
13C2-PFHxA	103	10 - 151	09/12/17 18:50	
18O2-PFHxS	59	20 - 128	09/12/17 18:50	
13C2-6:2 FTS	42	10 - 187	09/07/17 15:34	
13C4-PFOA	77	13 - 142	09/12/17 18:50	
13C5-PFNA	47	15 - 143	09/07/17 15:34	
13C4-PFOS	72	11 - 131	09/12/17 18:50	
13C2-PFDA	113	25 - 129	09/07/17 15:34	
13C2-PFUnDA	103	16 - 129	09/07/17 15:34	
13C2-PFDoDA	100	17 - 114	09/07/17 15:34	
D7-MeFOSE	66	32 - 113	09/07/17 15:34	
D9-EtFOSE	87	20 - 113	09/07/17 15:34	
D5-EtFOSA	76	19 - 103	09/07/17 15:34	
13C2-8:2 FTS	195	50 - 150	09/07/17 15:34	*

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Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709280
Project:	Wolverine World Wide/16.0062335.00	**Date Collected:**	09/01/17
Sample Matrix:	Ground Water	**Date Received:**	09/02/17 08:40
Sample Name:	DUP-4	**Units:**	ng/L
Lab Code:	K1709280-011	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M			
Prep Method:	EPA 3535A			
13C2-PFTeDA		81	50 - 150	09/07/17 15:34
13C4-PFHpA		80	50 - 150	09/12/17 18:50
13C5-PFPeA		84	50 - 150	09/12/17 18:50
13C3-PFBS		77	50 - 150	09/12/17 18:50
13C8-FOSA		71	50 - 150	09/07/17 15:34

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Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709280
Project:	Wolverine World Wide/16.0062335.00	**Date Collected:**	09/01/17 09:31
Sample Matrix:	Ground Water	**Date Received:**	09/02/17 08:40
Sample Name:	FB-2	**Units:**	ng/L
Lab Code:	K1709280-012	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result		MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	ND	U	8.6	1	09/07/17 15:45	9/5/17	
Perfluoropentanoic acid (PFPeA)	ND	U	4.3	1	09/07/17 15:45	9/5/17	
Perfluorobutane sulfonic acid (PFBS)	ND	U	4.3	1	09/07/17 15:45	9/5/17	
Perfluorohexanoic acid (PFHxA)	ND	U	4.3	1	09/07/17 15:45	9/5/17	
Perfluoroheptanoic acid (PFHpA)	ND	U	4.3	1	09/07/17 15:45	9/5/17	
Perfluorohexane sulfonic acid (PFHxS)	ND	U	4.3	1	09/07/17 15:45	9/5/17	
Perfluorooctanoic acid (PFOA)	ND	U	1.7	1	09/07/17 15:45	9/5/17	*
Perfluoroheptane sulfonic acid (PFHpS)	ND	U	4.3	1	09/08/17 02:51	9/5/17	
Perfluorononanoic acid (PFNA)	ND	U	4.3	1	09/07/17 15:45	9/5/17	*
Perfluorooctane sulfonic acid (PFOS)	**8.2**	**B**	4.3	1	09/07/17 15:45	9/5/17	
Perfluorodecanoic acid (PFDA)	ND	U	4.3	1	09/07/17 15:45	9/5/17	
Perfluoroundecanoic acid (PFUnDA)	ND	U	4.3	1	09/07/17 15:45	9/5/17	
Perfluorooctane sulfonamide (FOSA)	ND	U	4.3	1	09/07/17 15:45	9/5/17	
Perfluorododecanoic acid (PFDoDA)	ND	U	4.3	1	09/07/17 15:45	9/5/17	*
Perfluorotridecanoic acid (PFTrDA)	ND	U	4.3	1	09/07/17 15:45	9/5/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND	U	4.3	1	09/07/17 15:45	9/5/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND	U	4.3	1	09/07/17 15:45	9/5/17	
Perfluorotetradecanoic acid (PFTeDA)	ND	U	4.3	1	09/07/17 15:45	9/5/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND	U	4.3	1	09/07/17 15:45	9/5/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND	U	4.3	1	09/07/17 15:45	9/5/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND	U	4.3	1	09/07/17 15:45	9/5/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND	U	4.3	1	09/07/17 15:45	9/5/17	
Perfluorodecane sulfonic acid (PFDS)	ND	U	4.3	1	09/07/17 15:45	9/5/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	90	19 - 126	09/07/17 15:45	
13C2-PFHxA	88	10 - 151	09/07/17 15:45	
18O2-PFHxS	76	20 - 128	09/07/17 15:45	
13C2-6:2 FTS	74	10 - 187	09/07/17 15:45	
13C4-PFOA	89	13 - 142	09/07/17 15:45	
13C5-PFNA	82	15 - 143	09/07/17 15:45	
13C4-PFOS	75	11 - 131	09/07/17 15:45	
13C2-PFDA	90	25 - 129	09/07/17 15:45	
13C2-PFUnDA	88	16 - 129	09/07/17 15:45	
13C2-PFDoDA	92	17 - 114	09/07/17 15:45	
D7-MeFOSE	65	32 - 113	09/07/17 15:45	
D9-EtFOSE	78	20 - 113	09/07/17 15:45	
D5-EtFOSA	45	19 - 103	09/07/17 15:45	
13C2-8:2 FTS	94	50 - 150	09/07/17 15:45	

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Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709280
Project:	Wolverine World Wide/16.0062335.00	**Date Collected:**	09/01/17 09:31
Sample Matrix:	Ground Water	**Date Received:**	09/02/17 08:40
Sample Name:	FB-2	**Units:**	ng/L
Lab Code:	K1709280-012	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M			
Prep Method:	EPA 3535A			
13C2-PFTeDA		80	50 - 150	09/07/17 15:45
13C4-PFHpA		91	50 - 150	09/07/17 15:45
13C5-PFPeA		85	50 - 150	09/07/17 15:45
13C3-PFBS		61	50 - 150	09/07/17 15:45
13C8-FOSA		61	50 - 150	09/07/17 15:45

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Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709280
Project:	Wolverine World Wide/16.0062335.00	**Date Collected:**	09/01/17 10:04
Sample Matrix:	Ground Water	**Date Received:**	09/02/17 08:40
Sample Name:	TMW-105	**Units:**	ng/L
Lab Code:	K1709280-013	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result		MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	**330**		8.3	1	09/07/17 15:55	9/5/17	
Perfluoropentanoic acid (PFPeA)	**370**		4.2	1	09/07/17 15:55	9/5/17	
Perfluorobutane sulfonic acid (PFBS)	**2000**		83	20	09/14/17 17:07	9/5/17	
Perfluorohexanoic acid (PFHxA)	**980**		83	20	09/14/17 17:07	9/5/17	
Perfluoroheptanoic acid (PFHpA)	**950**		83	20	09/14/17 17:07	9/5/17	
Perfluorohexane sulfonic acid (PFHxS)	**1200**		83	20	09/14/17 17:07	9/5/17	
Perfluorooctanoic acid (PFOA)	**5300**		33	20	09/14/17 17:07	9/5/17	*
Perfluoroheptane sulfonic acid (PFHpS)	**570**		4.2	1	09/08/17 03:02	9/5/17	
Perfluorononanoic acid (PFNA)	**370**		4.2	1	09/07/17 15:55	9/5/17	*
Perfluorooctane sulfonic acid (PFOS)	**23000**		1000	250	09/08/17 15:16	9/5/17	
Perfluorodecanoic acid (PFDA)	**360**		4.2	1	09/07/17 15:55	9/5/17	
Perfluoroundecanoic acid (PFUnDA)	**500**		83	20	09/14/17 17:07	9/5/17	
Perfluorooctane sulfonamide (FOSA)	**1400**		83	20	09/14/17 17:07	9/5/17	
Perfluorododecanoic acid (PFDoDA)	**4.3**		4.2	1	09/07/17 15:55	9/5/17	*
Perfluorotridecanoic acid (PFTrDA)	ND	U	4.2	1	09/07/17 15:55	9/5/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	**7.5**		4.2	1	09/07/17 15:55	9/5/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND	U	4.2	1	09/07/17 15:55	9/5/17	
Perfluorotetradecanoic acid (PFTeDA)	ND	U	4.2	1	09/07/17 15:55	9/5/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND	U	4.2	1	09/07/17 15:55	9/5/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	**11**		4.2	1	09/07/17 15:55	9/5/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND	U	4.2	1	09/07/17 15:55	9/5/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	**11**		4.2	1	09/07/17 15:55	9/5/17	
Perfluorodecane sulfonic acid (PFDS)	**220**		4.2	1	09/07/17 15:55	9/5/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	101	19 - 126	09/07/17 15:55	
13C2-PFHxA	72	10 - 151	09/14/17 17:07	
18O2-PFHxS	73	20 - 128	09/14/17 17:07	
13C2-6:2 FTS	40	10 - 187	09/07/17 15:55	
13C4-PFOA	66	13 - 142	09/14/17 17:07	
13C5-PFNA	37	15 - 143	09/07/17 15:55	
13C4-PFOS	97	11 - 131	09/08/17 15:16	
13C2-PFDA	110	25 - 129	09/07/17 15:55	
13C2-PFUnDA	71	16 - 129	09/14/17 17:07	
13C2-PFDoDA	104	17 - 114	09/07/17 15:55	
D7-MeFOSE	74	32 - 113	09/07/17 15:55	
D9-EtFOSE	95	20 - 113	09/07/17 15:55	
D5-EtFOSA	82	19 - 103	09/07/17 15:55	
13C2-8:2 FTS	142	50 - 150	09/07/17 15:55	

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Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709280
Project:	Wolverine World Wide/16.0062335.00	**Date Collected:**	09/01/17 10:04
Sample Matrix:	Ground Water	**Date Received:**	09/02/17 08:40
Sample Name:	TMW-105	**Units:**	ng/L
Lab Code:	K1709280-013	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M		
Prep Method:	EPA 3535A		
13C2-PFTeDA	102	50 - 150	09/07/17 15:55
13C4-PFHpA	75	50 - 150	09/14/17 17:07
13C5-PFPeA	90	50 - 150	09/07/17 15:55
13C3-PFBS	67	50 - 150	09/14/17 17:07
13C8-FOSA	73	50 - 150	09/14/17 17:07

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Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709280
Project:	Wolverine World Wide/16.0062335.00	**Date Collected:**	09/01/17 11:11
Sample Matrix:	Ground Water	**Date Received:**	09/02/17 08:40
Sample Name:	TMW-302A	**Units:**	ng/L
Lab Code:	K1709280-014	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result		MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	**460**		8.6	1	09/07/17 16:06	9/5/17	
Perfluoropentanoic acid (PFPeA)	**250**		4.3	1	09/07/17 16:06	9/5/17	
Perfluorobutane sulfonic acid (PFBS)	**4500**		430	100	09/08/17 15:26	9/5/17	
Perfluorohexanoic acid (PFHxA)	**530**		430	100	09/08/17 15:26	9/5/17	
Perfluoroheptanoic acid (PFHpA)	**550**		4.3	1	09/07/17 16:06	9/5/17	
Perfluorohexane sulfonic acid (PFHxS)	**610**		430	100	09/08/17 15:26	9/5/17	
Perfluorooctanoic acid (PFOA)	**3100**		170	100	09/08/17 15:26	9/5/17	*
Perfluoroheptane sulfonic acid (PFHpS)	**170**		4.3	1	09/08/17 03:12	9/5/17	
Perfluorononanoic acid (PFNA)	**160**		4.3	1	09/07/17 16:06	9/5/17	*
Perfluorooctane sulfonic acid (PFOS)	**9600**		430	100	09/08/17 15:26	9/5/17	
Perfluorodecanoic acid (PFDA)	**82**		4.3	1	09/07/17 16:06	9/5/17	
Perfluoroundecanoic acid (PFUnDA)	**200**		4.3	1	09/07/17 16:06	9/5/17	
Perfluorooctane sulfonamide (FOSA)	**1200**		430	100	09/08/17 15:26	9/5/17	
Perfluorododecanoic acid (PFDoDA)	ND	U	4.3	1	09/07/17 16:06	9/5/17	*
Perfluorotridecanoic acid (PFTrDA)	**45**		4.3	1	09/07/17 16:06	9/5/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND	U	4.3	1	09/07/17 16:06	9/5/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND	U	4.3	1	09/07/17 16:06	9/5/17	
Perfluorotetradecanoic acid (PFTeDA)	ND	U	4.3	1	09/07/17 16:06	9/5/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND	U	4.3	1	09/07/17 16:06	9/5/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND	U	4.3	1	09/07/17 16:06	9/5/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND	U	4.3	1	09/07/17 16:06	9/5/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	**19**		4.3	1	09/07/17 16:06	9/5/17	
Perfluorodecane sulfonic acid (PFDS)	**40**		4.3	1	09/07/17 16:06	9/5/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	86	19 - 126	09/07/17 16:06	
13C2-PFHxA	97	10 - 151	09/08/17 15:26	
18O2-PFHxS	89	20 - 128	09/08/17 15:26	
13C2-6:2 FTS	77	10 - 187	09/07/17 16:06	
13C4-PFOA	86	13 - 142	09/08/17 15:26	
13C5-PFNA	54	15 - 143	09/07/17 16:06	
13C4-PFOS	109	11 - 131	09/08/17 15:26	
13C2-PFDA	116	25 - 129	09/07/17 16:06	
13C2-PFUnDA	107	16 - 129	09/07/17 16:06	
13C2-PFDoDA	96	17 - 114	09/07/17 16:06	
D7-MeFOSE	65	32 - 113	09/07/17 16:06	
D9-EtFOSE	85	20 - 113	09/07/17 16:06	
D5-EtFOSA	79	19 - 103	09/07/17 16:06	
13C2-8:2 FTS	178	50 - 150	09/07/17 16:06	*

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Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709280
Project:	Wolverine World Wide/16.0062335.00	**Date Collected:**	09/01/17 11:11
Sample Matrix:	Ground Water	**Date Received:**	09/02/17 08:40
Sample Name:	TMW-302A	**Units:**	ng/L
Lab Code:	K1709280-014	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M		
Prep Method:	EPA 3535A		
13C2-PFTeDA	78	50 - 150	09/07/17 16:06
13C4-PFHpA	59	50 - 150	09/07/17 16:06
13C5-PFPeA	79	50 - 150	09/07/17 16:06
13C3-PFBS	83	50 - 150	09/08/17 15:26
13C8-FOSA	79	50 - 150	09/08/17 15:26

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Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709280
Project:	Wolverine World Wide/16.0062335.00	**Date Collected:**	09/01/17 10:47
Sample Matrix:	Ground Water	**Date Received:**	09/02/17 08:40
Sample Name:	EB-4	**Units:**	ng/L
Lab Code:	K1709280-015	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	ND U	8.6	1	09/07/17 16:16	9/5/17	
Perfluoropentanoic acid (PFPeA)	ND U	4.3	1	09/07/17 16:16	9/5/17	
Perfluorobutane sulfonic acid (PFBS)	ND U	4.3	1	09/07/17 16:16	9/5/17	
Perfluorohexanoic acid (PFHxA)	ND U	4.3	1	09/07/17 16:16	9/5/17	
Perfluoroheptanoic acid (PFHpA)	ND U	4.3	1	09/07/17 16:16	9/5/17	
Perfluorohexane sulfonic acid (PFHxS)	ND U	4.3	1	09/07/17 16:16	9/5/17	
Perfluorooctanoic acid (PFOA)	ND U	1.7	1	09/07/17 16:16	9/5/17	*
Perfluoroheptane sulfonic acid (PFHpS)	ND U	4.3	1	09/08/17 03:23	9/5/17	
Perfluorononanoic acid (PFNA)	ND U	4.3	1	09/07/17 16:16	9/5/17	*
Perfluorooctane sulfonic acid (PFOS)	ND U	4.2	1	09/18/17 19:27	9/15/17	
Perfluorodecanoic acid (PFDA)	ND U	4.3	1	09/07/17 16:16	9/5/17	
Perfluoroundecanoic acid (PFUnDA)	ND U	4.3	1	09/07/17 16:16	9/5/17	
Perfluorooctane sulfonamide (FOSA)	ND U	4.3	1	09/07/17 16:16	9/5/17	
Perfluorododecanoic acid (PFDoDA)	ND U	4.3	1	09/07/17 16:16	9/5/17	*
Perfluorotridecanoic acid (PFTrDA)	ND U	4.3	1	09/07/17 16:16	9/5/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND U	4.3	1	09/07/17 16:16	9/5/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND U	4.3	1	09/07/17 16:16	9/5/17	
Perfluorotetradecanoic acid (PFTeDA)	ND U	4.3	1	09/07/17 16:16	9/5/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND U	4.3	1	09/07/17 16:16	9/5/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND U	4.3	1	09/07/17 16:16	9/5/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND U	4.3	1	09/07/17 16:16	9/5/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND U	4.3	1	09/07/17 16:16	9/5/17	
Perfluorodecane sulfonic acid (PFDS)	ND U	4.3	1	09/07/17 16:16	9/5/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	85	19 - 126	09/07/17 16:16	
13C2-PFHxA	73	10 - 151	09/07/17 16:16	
18O2-PFHxS	72	20 - 128	09/07/17 16:16	
13C2-6:2 FTS	67	10 - 187	09/07/17 16:16	
13C4-PFOA	82	13 - 142	09/07/17 16:16	
13C5-PFNA	75	15 - 143	09/07/17 16:16	
13C4-PFOS	82	11 - 131	09/18/17 19:27	
13C2-PFDA	85	25 - 129	09/07/17 16:16	
13C2-PFUnDA	79	16 - 129	09/07/17 16:16	
13C2-PFDoDA	75	17 - 114	09/07/17 16:16	
D7-MeFOSE	62	32 - 113	09/07/17 16:16	
D9-EtFOSE	78	20 - 113	09/07/17 16:16	
D5-EtFOSA	51	19 - 103	09/07/17 16:16	
13C2-8:2 FTS	88	50 - 150	09/07/17 16:16	

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Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709280
Project:	Wolverine World Wide/16.0062335.00	**Date Collected:**	09/01/17 10:47
Sample Matrix:	Ground Water	**Date Received:**	09/02/17 08:40
Sample Name:	EB-4	**Units:**	ng/L
Lab Code:	K1709280-015	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M		
Prep Method:	EPA 3535A		
13C2-PFTeDA	71	50 - 150	09/07/17 16:16
13C4-PFHpA	85	50 - 150	09/07/17 16:16
13C5-PFPeA	78	50 - 150	09/07/17 16:16
13C3-PFBS	55	50 - 150	09/07/17 16:16
13C8-FOSA	60	50 - 150	09/07/17 16:16

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Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709280
Project:	Wolverine World Wide/16.0062335.00	**Date Collected:**	09/01/17 12:00
Sample Matrix:	Ground Water	**Date Received:**	09/02/17 08:40
Sample Name:	TMW-102	**Units:**	ng/L
Lab Code:	K1709280-016	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result		MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	**560**		430	50	09/12/17 19:22	9/5/17	
Perfluoropentanoic acid (PFPeA)	**1700**		210	50	09/12/17 19:22	9/5/17	
Perfluorobutane sulfonic acid (PFBS)	**1100**		210	50	09/12/17 19:22	9/5/17	
Perfluorohexanoic acid (PFHxA)	**11000**		210	50	09/12/17 19:22	9/5/17	
Perfluoroheptanoic acid (PFHpA)	**11000**		210	50	09/12/17 19:22	9/5/17	
Perfluorohexane sulfonic acid (PFHxS)	**8500**		210	50	09/12/17 19:22	9/5/17	
Perfluorooctanoic acid (PFOA)	**160000**		860	500	09/08/17 15:37	9/5/17	*
Perfluoroheptane sulfonic acid (PFHpS)	**1300**		4.3	1	09/08/17 03:33	9/5/17	
Perfluorononanoic acid (PFNA)	**380**		4.3	1	09/07/17 16:27	9/5/17	*
Perfluorooctane sulfonic acid (PFOS)	**330000**		43000	10000	09/12/17 19:01	9/5/17	
Perfluorodecanoic acid (PFDA)	**99**		4.3	1	09/07/17 16:27	9/5/17	
Perfluoroundecanoic acid (PFUnDA)	**150**		4.3	1	09/07/17 16:27	9/5/17	
Perfluorooctane sulfonamide (FOSA)	**210**		4.3	1	09/07/17 16:27	9/5/17	
Perfluorododecanoic acid (PFDoDA)	ND	U	4.3	1	09/07/17 16:27	9/5/17	*
Perfluorotridecanoic acid (PFTrDA)	ND	U	4.3	1	09/07/17 16:27	9/5/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND	U	4.3	1	09/07/17 16:27	9/5/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND	U	4.3	1	09/07/17 16:27	9/5/17	
Perfluorotetradecanoic acid (PFTeDA)	ND	U	4.3	1	09/07/17 16:27	9/5/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND	U	4.3	1	09/07/17 16:27	9/5/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND	U	4.3	1	09/07/17 16:27	9/5/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND	U	4.3	1	09/07/17 16:27	9/5/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND	U	4.3	1	09/07/17 16:27	9/5/17	
Perfluorodecane sulfonic acid (PFDS)	**6400**		4.3	1	09/07/17 16:27	9/5/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	76	19 - 126	09/12/17 19:22	
13C2-PFHxA	76	10 - 151	09/12/17 19:22	
18O2-PFHxS	72	20 - 128	09/12/17 19:22	
13C2-6:2 FTS	12	10 - 187	09/07/17 16:27	
13C4-PFOA	84	13 - 142	09/08/17 15:37	
13C5-PFNA	9	15 - 143	09/07/17 16:27	*
13C4-PFOS	0	11 - 131	09/12/17 19:01	*
13C2-PFDA	76	25 - 129	09/07/17 16:27	
13C2-PFUnDA	81	16 - 129	09/07/17 16:27	
13C2-PFDoDA	81	17 - 114	09/07/17 16:27	
D7-MeFOSE	67	32 - 113	09/07/17 16:27	
D9-EtFOSE	82	20 - 113	09/07/17 16:27	
D5-EtFOSA	64	19 - 103	09/07/17 16:27	
13C2-8:2 FTS	60	50 - 150	09/07/17 16:27	

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Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709280
Project:	Wolverine World Wide/16.0062335.00	**Date Collected:**	09/01/17 12:00
Sample Matrix:	Ground Water	**Date Received:**	09/02/17 08:40
Sample Name:	TMW-102	**Units:**	ng/L
Lab Code:	K1709280-016	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M		
Prep Method:	EPA 3535A		
13C2-PFTeDA	73	50 - 150	09/07/17 16:27
13C4-PFHpA	85	50 - 150	09/12/17 19:22
13C5-PFPeA	76	50 - 150	09/12/17 19:22
13C3-PFBS	62	50 - 150	09/12/17 19:22
13C8-FOSA	63	50 - 150	09/07/17 16:27

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Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709280
Project:	Wolverine World Wide/16.0062335.00	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/L
Lab Code:	KQ1712669-03	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	ND U	10	1	09/07/17 13:18	9/5/17	
Perfluoropentanoic acid (PFPeA)	ND U	5.0	1	09/07/17 13:18	9/5/17	
Perfluorobutane sulfonic acid (PFBS)	ND U	5.0	1	09/07/17 13:18	9/5/17	
Perfluorohexanoic acid (PFHxA)	ND U	5.0	1	09/07/17 13:18	9/5/17	
Perfluoroheptanoic acid (PFHpA)	ND U	5.0	1	09/07/17 13:18	9/5/17	
Perfluorohexane sulfonic acid (PFHxS)	ND U	5.0	1	09/07/17 13:18	9/5/17	
Perfluorooctanoic acid (PFOA)	**2.3**	2.0	1	09/07/17 13:18	9/5/17	
Perfluoroheptane sulfonic acid (PFHpS)	ND U	5.0	1	09/08/17 00:25	9/5/17	
Perfluorononanoic acid (PFNA)	ND U	5.0	1	09/07/17 13:18	9/5/17	
Perfluorooctane sulfonic acid (PFOS)	**9.1**	5.0	1	09/07/17 13:18	9/5/17	
Perfluorodecanoic acid (PFDA)	ND U	5.0	1	09/07/17 13:18	9/5/17	
Perfluoroundecanoic acid (PFUnDA)	ND U	5.0	1	09/07/17 13:18	9/5/17	
Perfluorooctane sulfonamide (FOSA)	ND U	5.0	1	09/07/17 13:18	9/5/17	
Perfluorododecanoic acid (PFDoDA)	ND U	5.0	1	09/07/17 13:18	9/5/17	
Perfluorotridecanoic acid (PFTrDA)	ND U	5.0	1	09/07/17 13:18	9/5/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND U	5.0	1	09/07/17 13:18	9/5/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND U	5.0	1	09/07/17 13:18	9/5/17	
Perfluorotetradecanoic acid (PFTeDA)	ND U	5.0	1	09/07/17 13:18	9/5/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND U	5.0	1	09/07/17 13:18	9/5/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND U	5.0	1	09/07/17 13:18	9/5/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND U	5.0	1	09/07/17 13:18	9/5/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND U	5.0	1	09/07/17 13:18	9/5/17	
Perfluorodecane sulfonic acid (PFDS)	ND U	5.0	1	09/07/17 13:18	9/5/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	90	19 - 126	09/07/17 13:18	
13C2-PFHxA	80	10 - 151	09/07/17 13:18	
18O2-PFHxS	84	20 - 128	09/07/17 13:18	
13C2-6:2 FTS	65	10 - 187	09/07/17 13:18	
13C4-PFOA	86	13 - 142	09/07/17 13:18	
13C5-PFNA	92	15 - 143	09/07/17 13:18	
13C4-PFOS	73	11 - 131	09/07/17 13:18	
13C2-PFDA	90	25 - 129	09/07/17 13:18	
13C2-PFUnDA	85	16 - 129	09/07/17 13:18	
13C2-PFDoDA	94	17 - 114	09/07/17 13:18	
D7-MeFOSE	75	32 - 113	09/07/17 13:18	
D9-EtFOSE	90	20 - 113	09/07/17 13:18	
D5-EtFOSA	57	19 - 103	09/07/17 13:18	
13C2-8:2 FTS	94	50 - 150	09/07/17 13:18	

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Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709280
Project:	Wolverine World Wide/16.0062335.00	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/L
Lab Code:	KQ1712669-03	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M		
Prep Method:	EPA 3535A		
13C2-PFTeDA	88	50 - 150	09/07/17 13:18
13C4-PFHpA	92	50 - 150	09/07/17 13:18
13C5-PFPeA	86	50 - 150	09/07/17 13:18
13C3-PFBS	56	50 - 150	09/07/17 13:18
13C8-FOSA	71	50 - 150	09/07/17 13:18

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Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709280
Project:	Wolverine World Wide/16.0062335.00	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/L
Lab Code:	KQ1713303-04	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	ND U	10	1	09/18/17 17:32	9/15/17	
Perfluoropentanoic acid (PFPeA)	ND U	5.0	1	09/18/17 17:32	9/15/17	
Perfluorobutane sulfonic acid (PFBS)	ND U	5.0	1	09/18/17 17:32	9/15/17	
Perfluorohexanoic acid (PFHxA)	ND U	5.0	1	09/18/17 17:32	9/15/17	
Perfluoroheptanoic acid (PFHpA)	ND U	5.0	1	09/18/17 17:32	9/15/17	
Perfluorohexane sulfonic acid (PFHxS)	ND U	5.0	1	09/18/17 17:32	9/15/17	
Perfluorooctanoic acid (PFOA)	ND U	2.0	1	09/18/17 17:32	9/15/17	
Perfluoroheptane sulfonic acid (PFHpS)	ND U	5.0	1	09/18/17 17:32	9/15/17	
Perfluorononanoic acid (PFNA)	ND U	5.0	1	09/18/17 17:32	9/15/17	
Perfluorooctane sulfonic acid (PFOS)	ND U	5.0	1	09/18/17 17:32	9/15/17	
Perfluorodecanoic acid (PFDA)	ND U	5.0	1	09/18/17 17:32	9/15/17	
Perfluoroundecanoic acid (PFUnDA)	ND U	5.0	1	09/18/17 17:32	9/15/17	
Perfluorooctane sulfonamide (FOSA)	ND U	5.0	1	09/18/17 17:32	9/15/17	
Perfluorododecanoic acid (PFDoDA)	ND U	5.0	1	09/18/17 17:32	9/15/17	
Perfluorotridecanoic acid (PFTrDA)	ND U	5.0	1	09/18/17 17:32	9/15/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND U	5.0	1	09/20/17 20:14	9/15/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND U	5.0	1	09/18/17 17:32	9/15/17	
Perfluorotetradecanoic acid (PFTeDA)	ND U	5.0	1	09/18/17 17:32	9/15/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND U	5.0	1	09/18/17 17:32	9/15/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND U	5.0	1	09/18/17 17:32	9/15/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND U	5.0	1	09/18/17 17:32	9/15/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND U	5.0	1	09/18/17 17:32	9/15/17	
Perfluorodecane sulfonic acid (PFDS)	ND U	5.0	1	09/18/17 17:32	9/15/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	76	19 - 126	09/18/17 17:32	
13C2-PFHxA	73	10 - 151	09/18/17 17:32	
18O2-PFHxS	75	20 - 128	09/18/17 17:32	
13C2-6:2 FTS	79	10 - 187	09/18/17 17:32	
13C4-PFOA	72	13 - 142	09/18/17 17:32	
13C5-PFNA	77	15 - 143	09/18/17 17:32	
13C4-PFOS	78	11 - 131	09/18/17 17:32	
13C2-PFDA	85	25 - 129	09/18/17 17:32	
13C2-PFUnDA	83	16 - 129	09/18/17 17:32	
13C2-PFDoDA	73	17 - 114	09/18/17 17:32	
D7-MeFOSE	86	32 - 113	09/18/17 17:32	
D9-EtFOSE	92	20 - 113	09/18/17 17:32	
D5-EtFOSA	47	19 - 103	09/18/17 17:32	
13C2-8:2 FTS	107	50 - 150	09/18/17 17:32	

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Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709280
Project:	Wolverine World Wide/16.0062335.00	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/L
Lab Code:	KQ1713303-04	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M		
Prep Method:	EPA 3535A		
13C2-PFTeDA	80	50 - 150	09/18/17 17:32
13C4-PFHpA	89	50 - 150	09/18/17 17:32
13C5-PFPeA	82	50 - 150	09/18/17 17:32
13C3-PFBS	54	50 - 150	09/18/17 17:32
13C8-FOSA	78	50 - 150	09/18/17 17:32

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QA/QC Report

Client: GZA GeoEnvironmental, Incorporated **Service Request:** K1709280
Project: Wolverine World Wide/16.0062335.00
Sample Matrix: Ground Water

SURROGATE RECOVERY SUMMARY

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Extraction Method: EPA 3535A

Sample Name	Lab Code	13C2-6:2 FTS 10 - 187	13C2-8:2 FTS 50 - 150	13C2-PFDA 25 - 129
TMW-110	K1709280-001	66	121	50
DUP-2	K1709280-002	56	145	95
MW-307A	K1709280-003	62	161 *	96
MW-306A	K1709280-004	45	128	102
MW-5	K1709280-005	59	123	101
P-2	K1709280-006	34	169 *	99
FB-1	K1709280-007	88	105	108
EB-2	K1709280-008	67	83	88
P-3	K1709280-009	41	181 *	96
MW-304A	K1709280-010	59	154 *	82
DUP-4	K1709280-011	42	195 *	113
FB-2	K1709280-012	74	94	90
TMW-105	K1709280-013	40	142	110
TMW-302A	K1709280-014	77	178 *	116
EB-4	K1709280-015	67	88	85
TMW-102	K1709280-016	12	60	76
Batch QC	K1709580-001	81	111	66
Lab Control Sample	KQ1712669-01	64	87	85
Duplicate Lab Control Sample	KQ1712669-02	61	80	75
Method Blank	KQ1712669-03	65	94	90
Continuing Calibration Blank	KQ1712876-02	94	94	86
Continuing Calibration Blank	KQ1713054-02	69	71	79
Continuing Calibration Blank	KQ1713119-02	69	77	92
Batch QC	KQ1713303-01	79	110	65
Batch QC	KQ1713303-02	73	94	68
Lab Control Sample	KQ1713303-03	56	106	62
Method Blank	KQ1713303-04	79	107	85

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QA/QC Report

Client: GZA GeoEnvironmental, Incorporated **Service Request:** K1709280
Project: Wolverine World Wide/16.0062335.00
Sample Matrix: Ground Water

SURROGATE RECOVERY SUMMARY

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Extraction Method: EPA 3535A

Sample Name	Lab Code	13C2-PFDoDA 17 - 114	13C2-PFHxA 10 - 151	13C2-PFTeDA 50 - 150
TMW-110	K1709280-001	56	12	37 *
DUP-2	K1709280-002	76	47	54
MW-307A	K1709280-003	87	43	69
MW-306A	K1709280-004	90	81	85
MW-5	K1709280-005	86	90	69
P-2	K1709280-006	78	90	52
FB-1	K1709280-007	101	96	87
EB-2	K1709280-008	79	81	73
P-3	K1709280-009	89	98	78
MW-304A	K1709280-010	77	89	45 *
DUP-4	K1709280-011	100	103	81
FB-2	K1709280-012	92	88	80
TMW-105	K1709280-013	104	72	102
TMW-302A	K1709280-014	96	97	78
EB-4	K1709280-015	75	73	71
TMW-102	K1709280-016	81	76	73
Batch QC	K1709580-001	52	69	44 *
Lab Control Sample	KQ1712669-01	78	87	72
Duplicate Lab Control Sample	KQ1712669-02	74	70	65
Method Blank	KQ1712669-03	94	80	88
Continuing Calibration Blank	KQ1712876-02	89	85	98
Continuing Calibration Blank	KQ1713054-02	79	76	81
Continuing Calibration Blank	KQ1713119-02	89	89	94
Batch QC	KQ1713303-01	38	63	34 *
Batch QC	KQ1713303-02	54	69	47 *
Lab Control Sample	KQ1713303-03	53	68	81
Method Blank	KQ1713303-04	73	73	80

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QA/QC Report

Client: GZA GeoEnvironmental, Incorporated **Service Request:** K1709280
Project: Wolverine World Wide/16.0062335.00
Sample Matrix: Ground Water

SURROGATE RECOVERY SUMMARY

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Extraction Method: EPA 3535A

Sample Name	Lab Code	13C2-PFUnDA 16 - 129	13C3-PFBS 50 - 150	13C4-PFBA 19 - 126
TMW-110	K1709280-001	58	29 *	7 *
DUP-2	K1709280-002	88	43 *	58
MW-307A	K1709280-003	93	45 *	56
MW-306A	K1709280-004	95	72	87
MW-5	K1709280-005	80	58	95
P-2	K1709280-006	87	71	86
FB-1	K1709280-007	101	65	100
EB-2	K1709280-008	81	53	79
P-3	K1709280-009	96	76	83
MW-304A	K1709280-010	85	74	79
DUP-4	K1709280-011	103	77	92
FB-2	K1709280-012	88	61	90
TMW-105	K1709280-013	71	67	101
TMW-302A	K1709280-014	107	83	86
EB-4	K1709280-015	79	55	85
TMW-102	K1709280-016	81	62	76
Batch QC	K1709580-001	63	48 *	69
Lab Control Sample	KQ1712669-01	78	56	87
Duplicate Lab Control Sample	KQ1712669-02	73	52	77
Method Blank	KQ1712669-03	85	56	90
Continuing Calibration Blank	KQ1712876-02	91	90	87
Continuing Calibration Blank	KQ1713054-02	80	77	79
Continuing Calibration Blank	KQ1713119-02	91	88	86
Batch QC	KQ1713303-01	56	43 *	69
Batch QC	KQ1713303-02	67	45 *	71
Lab Control Sample	KQ1713303-03	57	39 *	63
Method Blank	KQ1713303-04	83	54	76

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QA/QC Report

Client: GZA GeoEnvironmental, Incorporated **Service Request:** K1709280
Project: Wolverine World Wide/16.0062335.00
Sample Matrix: Ground Water

SURROGATE RECOVERY SUMMARY

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Extraction Method: EPA 3535A

Sample Name	Lab Code	13C4-PFHpA 50 - 150	13C4-PFOA 13 - 142	13C4-PFOS 11 - 131
TMW-110	K1709280-001	13 *	78	79
DUP-2	K1709280-002	43 *	75	74
MW-307A	K1709280-003	40 *	75	97
MW-306A	K1709280-004	57	70	70
MW-5	K1709280-005	69	70	73
P-2	K1709280-006	92	78	60
FB-1	K1709280-007	103	105	86
EB-2	K1709280-008	81	79	68
P-3	K1709280-009	87	76	73
MW-304A	K1709280-010	78	75	36
DUP-4	K1709280-011	80	77	72
FB-2	K1709280-012	91	89	75
TMW-105	K1709280-013	75	66	97
TMW-302A	K1709280-014	59	86	109
EB-4	K1709280-015	85	82	82
TMW-102	K1709280-016	85	84	0 *
Batch QC	K1709580-001	60	79	68
Lab Control Sample	KQ1712669-01	79	81	73
Duplicate Lab Control Sample	KQ1712669-02	80	75	62
Method Blank	KQ1712669-03	92	86	73
Continuing Calibration Blank	KQ1712876-02	99	92	82
Continuing Calibration Blank	KQ1713054-02	86	74	79
Continuing Calibration Blank	KQ1713119-02	88	88	91
Batch QC	KQ1713303-01	66	68	64
Batch QC	KQ1713303-02	58	73	69
Lab Control Sample	KQ1713303-03	59	54	60
Method Blank	KQ1713303-04	89	72	78

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QA/QC Report

Client: GZA GeoEnvironmental, Incorporated **Service Request:** K1709280
Project: Wolverine World Wide/16.0062335.00
Sample Matrix: Ground Water

SURROGATE RECOVERY SUMMARY

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Extraction Method: EPA 3535A

Sample Name	Lab Code	13C5-PFNA 15 - 143	13C5-PFPeA 50 - 150	13C8-FOSA 50 - 150
TMW-110	K1709280-001	27	11 *	44 *
DUP-2	K1709280-002	65	45 *	55
MW-307A	K1709280-003	68	45 *	62
MW-306A	K1709280-004	50	78	58
MW-5	K1709280-005	42	87	76
P-2	K1709280-006	45	66	56
FB-1	K1709280-007	97	97	74
EB-2	K1709280-008	73	75	59
P-3	K1709280-009	42	82	59
MW-304A	K1709280-010	21	64	54
DUP-4	K1709280-011	47	84	71
FB-2	K1709280-012	82	85	61
TMW-105	K1709280-013	37	90	73
TMW-302A	K1709280-014	54	79	79
EB-4	K1709280-015	75	78	60
TMW-102	K1709280-016	9 *	76	63
Batch QC	K1709580-001	69	76	59
Lab Control Sample	KQ1712669-01	70	82	65
Duplicate Lab Control Sample	KQ1712669-02	66	73	58
Method Blank	KQ1712669-03	92	86	71
Continuing Calibration Blank	KQ1712876-02	89	96	86
Continuing Calibration Blank	KQ1713054-02	79	79	87
Continuing Calibration Blank	KQ1713119-02	93	87	100
Batch QC	KQ1713303-01	67	73	61
Batch QC	KQ1713303-02	68	75	65
Lab Control Sample	KQ1713303-03	59	68	60
Method Blank	KQ1713303-04	77	82	78

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QA/QC Report

Client: GZA GeoEnvironmental, Incorporated **Service Request:** K1709280
Project: Wolverine World Wide/16.0062335.00
Sample Matrix: Ground Water

SURROGATE RECOVERY SUMMARY

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Extraction Method: EPA 3535A

Sample Name	Lab Code	18O2-PFHxS 20 - 128	D5-EtFOSA 19 - 103	D7-MeFOSE 32 - 113
TMW-110	K1709280-001	102	48	46
DUP-2	K1709280-002	108	41	52
MW-307A	K1709280-003	82	41	56
MW-306A	K1709280-004	59	40	56
MW-5	K1709280-005	70	43	63
P-2	K1709280-006	90	40	51
FB-1	K1709280-007	96	64	77
EB-2	K1709280-008	65	42	62
P-3	K1709280-009	68	60	60
MW-304A	K1709280-010	82	58	54
DUP-4	K1709280-011	59	76	66
FB-2	K1709280-012	76	45	65
TMW-105	K1709280-013	73	82	74
TMW-302A	K1709280-014	89	79	65
EB-4	K1709280-015	72	51	62
TMW-102	K1709280-016	72	64	67
Batch QC	K1709580-001	58	52	67
Lab Control Sample	KQ1712669-01	67	60	70
Duplicate Lab Control Sample	KQ1712669-02	62	39	60
Method Blank	KQ1712669-03	84	57	75
Continuing Calibration Blank	KQ1712876-02	94	96	98
Continuing Calibration Blank	KQ1713054-02	79	96	83
Continuing Calibration Blank	KQ1713119-02	86	105 *	81
Batch QC	KQ1713303-01	63	59	82
Batch QC	KQ1713303-02	62	57	81
Lab Control Sample	KQ1713303-03	57	39	84
Method Blank	KQ1713303-04	75	47	86

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QA/QC Report

Client: GZA GeoEnvironmental, Incorporated **Service Request:** K1709280
Project: Wolverine World Wide/16.0062335.00
Sample Matrix: Ground Water

SURROGATE RECOVERY SUMMARY

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Extraction Method: EPA 3535A

Sample Name	Lab Code	D9-EtFOSE 20 - 113
TMW-110	K1709280-001	59
DUP-2	K1709280-002	63
MW-307A	K1709280-003	70
MW-306A	K1709280-004	71
MW-5	K1709280-005	77
P-2	K1709280-006	64
FB-1	K1709280-007	95
EB-2	K1709280-008	77
P-3	K1709280-009	75
MW-304A	K1709280-010	68
DUP-4	K1709280-011	87
FB-2	K1709280-012	78
TMW-105	K1709280-013	95
TMW-302A	K1709280-014	85
EB-4	K1709280-015	78
TMW-102	K1709280-016	82
Batch QC	K1709580-001	71
Lab Control Sample	KQ1712669-01	87
Duplicate Lab Control Sample	KQ1712669-02	74
Method Blank	KQ1712669-03	90
Continuing Calibration Blank	KQ1712876-02	121 *
Continuing Calibration Blank	KQ1713054-02	86
Continuing Calibration Blank	KQ1713119-02	84
Batch QC	KQ1713303-01	76
Batch QC	KQ1713303-02	78
Lab Control Sample	KQ1713303-03	70
Method Blank	KQ1713303-04	92

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QA/QC Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709280
Project:	Wolverine World Wide/16.0062335.00	**Date Collected:**	N/A
Sample Matrix:	Ground Water	**Date Received:**	N/A
		Date Analyzed:	09/18/17
		Date Extracted:	09/15/17

Duplicate Matrix Spike Summary
Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Sample Name:	Batch QC	**Units:**	ng/L
Lab Code:	K1709580-001	**Basis:**	NA
Analysis Method:	PFC/537M		
Prep Method:	EPA 3535A		

		Matrix Spike			Duplicate Matrix Spike					
		KQ1713303-01			KQ1713303-02					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perfluorobutanoic acid (PFBA)	5.2 J	142	139	98	144	139	100	76-136	1	30
Perfluoropentanoic acid (PFPeA)	2.8 J	132	139	93	130	139	92	50-150	<1	30
Perfluorobutane sulfonic acid (PFBS)	ND U	161	123	130	162	123	131	50-150	<1	30
Perfluorohexanoic acid (PFHxA)	4.5	140	139	98	149	139	104	68-141	6	30
Perfluoroheptanoic acid (PFHpA)	1.7 J	133	139	94	133	139	94	50-150	<1	30
Perfluorohexane sulfonic acid (PFHxS)	0.97 J	146	127	115	135	127	106	71-130	8	30
Perfluorooctanoic acid (PFOA)	3.5	142	139	100	139	139	97	72-130	3	30
Perfluoroheptane sulfonic acid (PFHpS)	ND U	170	132	129	164	132	124	69-148	4	30
Perfluorononanoic acid (PFNA)	ND U	152	139	110	154	139	111	77-127	1	30
Perfluorooctane sulfonic acid (PFOS)	2.4 J	142	129	108	145	129	110	74-135	2	30
Perfluorodecanoic acid (PFDA)	0.53 J	141	139	101	141	139	101	68-135	<1	30
Perfluoroundecanoic acid (PFUnDA)	0.79 J	129	139	93	132	139	95	66-131	2	30
Perfluorooctane sulfonamide (FOSA)	ND U	138	139	100	137	139	99	50-150	<1	30
Perfluorododecanoic acid (PFDoDA)	0.57 J	157	139	113	158	139	113	70-133	<1	30
Perfluorotridecanoic acid (PFTrDA)	0.83 J	137	139	98	153	139	110	50-150	11	30
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND U	124	139	89	115	139	83	10-183	8	30
N-Methyl perfluorooctane sulfonamidoethanol	ND U	164	139	118	167	139	120	37-166	1	30
Perfluorotetradecanoic acid (PFTeDA)	ND U	145	139	105	134	139	96	50-150	8	30
N-Ethyl perfluorooctane sulfonamidoethanol	ND U	141	139	102	143	139	103	54-159	1	30
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND U	156	139	113	164	139	118	69-146	5	30
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND U	131	133	98	136	133	102	50-150	4	30
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	1.5 J	128	132	96	128	132	96	74-132	<1	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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QA/QC Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709280
Project:	Wolverine World Wide/16.0062335.00	**Date Analyzed:**	09/18/17
Sample Matrix:	Ground Water	**Date Extracted:**	09/15/17

Lab Control Sample Summary
Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M	**Units:**	ng/L
Prep Method:	EPA 3535A	**Basis:**	NA
		Analysis Lot:	561684

Lab Control Sample
KQ1713303-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	160	159	101	74-132
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	157	160	98	50-150
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	209	167	125	69-146
N-Ethyl perfluorooctane sulfonamidoethanol	189	167	114	54-159
N-Methyl perfluorooctane sulfonamidoethanol	209	167	125	37-166
Perfluorobutane sulfonic acid (PFBS)	198	148	134	50-150
Perfluorobutanoic acid (PFBA)	165	167	99	76-136
Perfluorodecanoic acid (PFDA)	179	167	107	68-135
Perfluorododecanoic acid (PFDoDA)	198	167	119	70-133
Perfluoroheptane sulfonic acid (PFHpS)	168	159	106	69-148
Perfluoroheptanoic acid (PFHpA)	166	167	99	50-150
Perfluorohexane sulfonic acid (PFHxS)	164	152	108	71-130
Perfluorohexanoic acid (PFHxA)	159	167	95	68-141
Perfluorononanoic acid (PFNA)	168	167	101	77-127
Perfluorooctane sulfonamide (FOSA)	172	167	103	50-150
Perfluorooctane sulfonic acid (PFOS)	174	155	112	74-135
Perfluorooctanoic acid (PFOA)	159	167	95	72-130
Perfluoropentanoic acid (PFPeA)	157	167	94	50-150
Perfluorotetradecanoic acid (PFTeDA)	178	167	107	50-150
Perfluorotridecanoic acid (PFTrDA)	137	167	82	50-150
Perfluoroundecanoic acid (PFUnDA)	165	167	99	66-131

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QA/QC Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709280
Project:	Wolverine World Wide/16.0062335.00	**Date Analyzed:**	09/20/17
Sample Matrix:	Ground Water	**Date Extracted:**	09/15/17

Lab Control Sample Summary
Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M	**Units:**	ng/L
Prep Method:	EPA 3535A	**Basis:**	NA
		Analysis Lot:	562298

Lab Control Sample
KQ1713303-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
N-Methyl perfluorooctane sulfonamide (MeFOSA)	116	167	70	10-183

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QA/QC Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709280
Project:	Wolverine World Wide/16.0062335.00	**Date Analyzed:**	09/07/17
Sample Matrix:	Ground Water	**Date Extracted:**	09/05/17

Duplicate Lab Control Sample Summary
Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M	**Units:**	ng/L
Prep Method:	EPA 3535A	**Basis:**	NA
		Analysis Lot:	560663

	Lab Control Sample KQ1712669-01			Duplicate Lab Control Sample KQ1712669-02					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	171	159	108	179	159	113	74-132	4	30
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	162	160	101	178	160	112	50-150	9	30
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	157	167	94	180	167	108	69-146	14	30
N-Ethyl perfluorooctane sulfonamidoethanol	148	167	89	170	167	102	54-159	14	30
N-Methyl perfluorooctane sulfonamide (MeFOSA)	149	167	89	124	167	74	10-183	18	30
N-Methyl perfluorooctane sulfonamidoethanol	176	167	106	202	167	121	37-166	13	30
Perfluorobutane sulfonic acid (PFBS)	166	148	112	193	148	131	50-150	15	30
Perfluorobutanoic acid (PFBA)	169	167	101	198	167	119	76-136	16	30
Perfluorodecanoic acid (PFDA)	168	167	101	200	167	120	68-135	18	30
Perfluorododecanoic acid (PFDoDA)	195	167	117	229	167	137 *	70-133	16	30
Perfluoroheptanoic acid (PFHpA)	184	167	110	221	167	132	50-150	18	30
Perfluorohexane sulfonic acid (PFHxS)	157	152	103	184	152	121	71-130	16	30
Perfluorohexanoic acid (PFHxA)	178	167	107	195	167	117	68-141	9	30
Perfluorooctane sulfonamide (FOSA)	181	167	108	209	167	126	50-150	15	30
Perfluorooctane sulfonic acid (PFOS)	181	155	117	195	155	126	74-135	7	30
Perfluorooctanoic acid (PFOA)	193	167	116	219	167	132 *	72-130	13	30
Perfluoropentanoic acid (PFPeA)	174	167	105	208	167	125	50-150	17	30
Perfluorotetradecanoic acid (PFTeDA)	202	167	121	234	167	141	50-150	15	30
Perfluorotridecanoic acid (PFTrDA)	205	167	123	241	167	145	50-150	16	30
Perfluoroundecanoic acid (PFUnDA)	174	167	104	193	167	116	66-131	10	30

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709280
Project:	Wolverine World Wide/16.0062335.00	**Date Analyzed:**	09/08/17
Sample Matrix:	Ground Water	**Date Extracted:**	09/05/17

Duplicate Lab Control Sample Summary
Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M	**Units:**	ng/L
Prep Method:	EPA 3535A	**Basis:**	NA
		Analysis Lot:	560936

	Lab Control Sample KQ1712669-01			Duplicate Lab Control Sample KQ1712669-02					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perfluoroheptane sulfonic acid (PFHpS)	195	159	123	216	159	136	69-148	10	30
Perfluorononanoic acid (PFNA)	210	167	126	243	167	146 *	77-127	15	30

Bio-Chem LABORATORIES, INC.

1049 - 28th Street SE
Grand Rapids, MI 49508
Ph: 616/248-4900
Toll Free: 800/362-LABS
Fax: 616/248-4904

September 11, 2017

Mark Westra
Rose & Westra, Inc.
A Division of GZA
601 Fifth St NW
Grand Rapids, MI 49504

TEL: (616) 956-6123
FAX (616) 288-3327

RE: WWW

Dear Mark Westra:

Order No.: 1708159

BIO-CHEM Laboratories, Inc. received 7 samples on 8/31/2017 for the analyses presented in the following report.

There were no problems with the analyses and all data for associated QC met EPA or laboratory specifications except where noted in the Case Narrative.

If you have any questions regarding these tests results, please feel free to call.

Please note that unless otherwise instructed, residual samples will be held for sixty (60) days from the original report date. At that time, all non-hazardous samples will be disposed of in accordance with federal, state and local regulations and ordinances, and hazardous samples shall be returned to you. Please contact the laboratory within thirty (30) days if other arrangements for sample retention need to be made.

Sincerely,

Cindy Euwema

Cindy Euwema
Office Manager

Working with you to ensure a better tomorrow.

1708159

Bio Chem LABORATORIES, INC.

Chain of Custody

1049 28th Street SE • Grand Rapids, MI 49508
Ph: (616) 248-4900 • Toll Free: 800-362-LABS
Fax: (616) 248-4904

Firm Name: GRA	Turn around time: Standard	Project Number: 62335	
Firm Address: 601 5th St Ste. 102	Project Name: WWW	Date: 8/31 + 9/1	Date Due:
City, State, Zip: GR, MI	State Samples Taken From: MI		
Phone: 616-956-6123 Fax: —	Contact Person: Mark Westra		

Item No	Lab I.D.	Client Sample Number	Date Taken	Time Taken	Sample Description (sample type: water, soil, other)	Number of Containers	Analysis Desired (One per line): Ammonia N	Total + Hex Chrome	Metals						Remarks
1		TMW-110	8/31	1233 (EA)	Water	3	X	X	X						Metals = As, Ba, Cd, Cu, Fe, Pb, Ag, V, + Zn
2		MW-307A	8/31	1320	Water	3	X	X	X						
3		MW-306A	8/31	1430	Water	3	X	X	X						
4		DUP-1	8/31	—	Water	3	X	X	X						
5		MW-5	8/31	1453 (1348)	Water	3	X	X	X						
6		P-2	8/31	1552	Water	3	X	X	X						
7		EB-1	8/31	1543	Water	3	X	X	X						
8															
9															
10															

Released by	Received by	Date	Time
[signature]	Cindy Ewema	8-31-17	5:00

Laboratory use only

☐ Blue Ice ____°

☐ Regular Ice

☐ No Coolant

FRANKLIN PRESS 62578.2/17

BIO-CHEM Laboratories, Inc.

Date: *11-Sep-17*

CLIENT: Rose & Westra, Inc.
Project: WWW
Lab Order: 1708159

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collection Date	Date Received
1708159-01A	TMW-110	Aqueous	8/31/2017	8/31/2017
1708159-02A	MW-307A	Aqueous	8/31/2017	8/31/2017
1708159-03A	MW-306A	Aqueous	8/31/2017	8/31/2017
1708159-04A	DUP-1	Aqueous	8/31/2017	8/31/2017
1708159-05A	MW-5	Aqueous	8/31/2017	8/31/2017
1708159-06A	P-2	Aqueous	8/31/2017	8/31/2017
1708159-07A	EB-1	Aqueous	8/31/2017	8/31/2017

BIO-CHEM Laboratories, Inc.

Date: *11-Sep-17*

CLIENT: Rose & Westra, Inc.
Project: WWW
Lab Order: 1708159

CASE NARRATIVE

Samples are routinely analyzed using methods outlined in the following references:

(SW) Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, 3rd Ed.
(E) Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020.
(A) Standard Methods for the Examination of Water and Wastewater, APHA, 18th Ed.
(D) Annual Book of ASTM Standards.

Specific methods utilized for this project are provided in the analytical report and are identified by the reference document abbreviation ( ) followed by the method number.

All QA/QC and sample analyses met method, laboratory and/or regulatory data quality objectives unless otherwise specified below.

Comments for Method Hexavalent Chromium
Sample 1708159-01A and 1708159-04A

The reporting limits (PQLs) for this sample analysis are elevated due to sample matrix interferences.

BIO-CHEM Laboratories, Inc.

Date: *9/11/2017*

ANALYTICAL REPORT

CLIENT: Rose & Westra, Inc.
Lab Order: 1708159
Project: WWW
Lab Sample ID: 1708159-01A

Project Number: 62335
Client Sample ID: TMW-110
Collection Date: 8/31/2017
Matrix: AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Hexavalent Chromium								
1. Chromium, Hexavalent	SW7196A	< 25		25	µg/L	5	RHS	9/1/2017
Total Metal(s) by ICP								
1. Arsenic	SW6010B	150		5.0	µg/L	1	RHS	9/6/2017
2. Barium	SW6010B	700		100	µg/L	1	RHS	9/6/2017
3. Cadmium	SW6010B	< 0.50		0.50	µg/L	1	RHS	9/6/2017
4. Chromium	SW6010B	6,800		10	µg/L	1	RHS	9/6/2017
5. Copper	SW6010B	< 4.0		4.0	µg/L	1	RHS	9/6/2017
6. Iron	SW6010B	6,800		200	µg/L	1	RHS	9/6/2017
7. Lead	SW6010B	< 3.0		3.0	µg/L	1	RHS	9/6/2017
8. Silver	SW6010B	< 0.50		0.50	µg/L	1	RHS	9/6/2017
9. Vanadium	SW6010B	36		4.0	µg/L	1	RHS	9/6/2017
10. Zinc	SW6010B	< 20		20	µg/L	1	RHS	9/6/2017
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	2,300		0.10	mg/L	1	RHS	9/10/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

CLIENT: Rose & Westra, Inc. **Project Number:** 62335
Lab Order: 1708159 **Client Sample ID:** MW-307A
Project: WWW **Collection Date:** 8/31/2017
Lab Sample ID: 1708159-02A **Matrix:** AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Hexavalent Chromium								
1. Chromium, Hexavalent	SW7196A	< 10		10	µg/L	1	RHS	9/1/2017
Total Metal(s) by ICP								
1. Arsenic	SW6010B	< 5.0		5.0	µg/L	1	RHS	9/6/2017
2. Barium	SW6010B	< 100		100	µg/L	1	RHS	9/6/2017
3. Cadmium	SW6010B	4.5		0.50	µg/L	1	RHS	9/6/2017
4. Chromium	SW6010B	720		10	µg/L	1	RHS	9/6/2017
5. Copper	SW6010B	33		4.0	µg/L	1	RHS	9/6/2017
6. Iron	SW6010B	600		200	µg/L	1	RHS	9/6/2017
7. Lead	SW6010B	6.0		3.0	µg/L	1	RHS	9/6/2017
8. Silver	SW6010B	< 0.50		0.50	µg/L	1	RHS	9/6/2017
9. Vanadium	SW6010B	< 4.0		4.0	µg/L	1	RHS	9/6/2017
10. Zinc	SW6010B	1,300		20	µg/L	1	RHS	9/6/2017
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	37		0.10	mg/L	1	RHS	9/10/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

CLIENT: Rose & Westra, Inc. **Project Number:** 62335
Lab Order: 1708159 **Client Sample ID:** MW-306A
Project: WWW **Collection Date:** 8/31/2017
Lab Sample ID: 1708159-03A **Matrix:** AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Hexavalent Chromium								
1. Chromium, Hexavalent	SW7196A	11		10	µg/L	1	RHS	9/1/2017
Total Metal(s) by ICP								
1. Arsenic	SW6010B	< 5.0		5.0	µg/L	1	RHS	9/6/2017
2. Barium	SW6010B	130		100	µg/L	1	RHS	9/6/2017
3. Cadmium	SW6010B	< 0.50		0.50	µg/L	1	RHS	9/6/2017
4. Chromium	SW6010B	< 10		10	µg/L	1	RHS	9/6/2017
5. Copper	SW6010B	< 4.0		4.0	µg/L	1	RHS	9/6/2017
6. Iron	SW6010B	16,000		200	µg/L	1	RHS	9/6/2017
7. Lead	SW6010B	< 3.0		3.0	µg/L	1	RHS	9/6/2017
8. Silver	SW6010B	< 0.50		0.50	µg/L	1	RHS	9/6/2017
9. Vanadium	SW6010B	< 4.0		4.0	µg/L	1	RHS	9/6/2017
10. Zinc	SW6010B	< 20		20	µg/L	1	RHS	9/6/2017
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	3.3		0.10	mg/L	1	RHS	9/10/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

BIO-CHEM Laboratories, Inc.

Date: *9/11/2017*

ANALYTICAL REPORT

CLIENT: Rose & Westra, Inc.
Lab Order: 1708159
Project: WWW
Lab Sample ID: 1708159-04A

Project Number: 62335
Client Sample ID: DUP-1
Collection Date: 8/31/2017
Matrix: AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Hexavalent Chromium								
1. Chromium, Hexavalent	SW7196A	< 25		25	µg/L	5	RHS	9/1/2017
Total Metal(s) by ICP								
1. Arsenic	SW6010B	140		5.0	µg/L	1	RHS	9/6/2017
2. Barium	SW6010B	680		100	µg/L	1	RHS	9/6/2017
3. Cadmium	SW6010B	1.0		0.50	µg/L	1	RHS	9/6/2017
4. Chromium	SW6010B	6,800		10	µg/L	1	RHS	9/6/2017
5. Copper	SW6010B	< 4.0		4.0	µg/L	1	RHS	9/6/2017
6. Iron	SW6010B	6,600		200	µg/L	1	RHS	9/6/2017
7. Lead	SW6010B	< 3.0		3.0	µg/L	1	RHS	9/6/2017
8. Silver	SW6010B	< 0.50		0.50	µg/L	1	RHS	9/6/2017
9. Vanadium	SW6010B	34		4.0	µg/L	1	RHS	9/6/2017
10. Zinc	SW6010B	< 20		20	µg/L	1	RHS	9/6/2017
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	2,300		0.10	mg/L	1	RHS	9/10/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

CLIENT: Rose & Westra, Inc. **Project Number:** 62335
Lab Order: 1708159 **Client Sample ID:** MW-5
Project: WWW **Collection Date:** 8/31/2017
Lab Sample ID: 1708159-05A **Matrix:** AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Hexavalent Chromium								
1. Chromium, Hexavalent	SW7196A	< 10		10	µg/L	1	RHS	9/1/2017
Total Metal(s) by ICP								
1. Arsenic	SW6010B	< 5.0		5.0	µg/L	1	RHS	9/6/2017
2. Barium	SW6010B	< 100		100	µg/L	1	RHS	9/6/2017
3. Cadmium	SW6010B	< 0.50		0.50	µg/L	1	RHS	9/6/2017
4. Chromium	SW6010B	< 10		10	µg/L	1	RHS	9/6/2017
5. Copper	SW6010B	< 4.0		4.0	µg/L	1	RHS	9/6/2017
6. Iron	SW6010B	4,300		200	µg/L	1	RHS	9/6/2017
7. Lead	SW6010B	< 3.0		3.0	µg/L	1	RHS	9/6/2017
8. Silver	SW6010B	< 0.50		0.50	µg/L	1	RHS	9/6/2017
9. Vanadium	SW6010B	< 4.0		4.0	µg/L	1	RHS	9/6/2017
10. Zinc	SW6010B	< 20		20	µg/L	1	RHS	9/6/2017
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	1.5		0.10	mg/L	1	RHS	9/10/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

BIO-CHEM Laboratories, Inc.

Date: *9/11/2017*

ANALYTICAL REPORT

CLIENT: Rose & Westra, Inc.
Lab Order: 1708159
Project: WWW
Lab Sample ID: 1708159-06A

Project Number: 62335
Client Sample ID: P-2
Collection Date: 8/31/2017
Matrix: AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Hexavalent Chromium								
1. Chromium, Hexavalent	SW7196A	< 10		10	µg/L	1	RHS	9/1/2017
Total Metal(s) by ICP								
1. Arsenic	SW6010B	< 5.0		5.0	µg/L	1	RHS	9/6/2017
2. Barium	SW6010B	120		100	µg/L	1	RHS	9/6/2017
3. Cadmium	SW6010B	< 0.50		0.50	µg/L	1	RHS	9/6/2017
4. Chromium	SW6010B	< 10		10	µg/L	1	RHS	9/6/2017
5. Copper	SW6010B	< 4.0		4.0	µg/L	1	RHS	9/6/2017
6. Iron	SW6010B	14,000		200	µg/L	1	RHS	9/6/2017
7. Lead	SW6010B	< 3.0		3.0	µg/L	1	RHS	9/6/2017
8. Silver	SW6010B	< 0.50		0.50	µg/L	1	RHS	9/6/2017
9. Vanadium	SW6010B	< 4.0		4.0	µg/L	1	RHS	9/6/2017
10. Zinc	SW6010B	30		20	µg/L	1	RHS	9/6/2017
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	48		0.10	mg/L	1	RHS	9/10/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

BIO-CHEM Laboratories, Inc.

Date: *9/11/2017*

ANALYTICAL REPORT

CLIENT: Rose & Westra, Inc.
Lab Order: 1708159
Project: WWW
Lab Sample ID: 1708159-07A

Project Number: 62335
Client Sample ID: EB-1
Collection Date: 8/31/2017
Matrix: AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Hexavalent Chromium								
1. Chromium, Hexavalent	SW7196A	< 10		10	µg/L	1	RHS	9/1/2017
Total Metal(s) by ICP								
1. Arsenic	SW6010B	< 5.0		5.0	µg/L	1	RHS	9/6/2017
2. Barium	SW6010B	< 100		100	µg/L	1	RHS	9/6/2017
3. Cadmium	SW6010B	< 0.50		0.50	µg/L	1	RHS	9/6/2017
4. Chromium	SW6010B	< 10		10	µg/L	1	RHS	9/6/2017
5. Copper	SW6010B	< 4.0		4.0	µg/L	1	RHS	9/6/2017
6. Iron	SW6010B	< 200		200	µg/L	1	RHS	9/6/2017
7. Lead	SW6010B	< 3.0		3.0	µg/L	1	RHS	9/6/2017
8. Silver	SW6010B	< 0.50		0.50	µg/L	1	RHS	9/6/2017
9. Vanadium	SW6010B	< 4.0		4.0	µg/L	1	RHS	9/6/2017
10. Zinc	SW6010B	< 20		20	µg/L	1	RHS	9/6/2017
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	< 0.10		0.10	mg/L	1	RHS	9/10/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

BIO-CHEM Laboratories, Inc.

9/11/2017

Lab Order: 1708159
Client: Rose & Westra, Inc.
Project: WWW

ANALYTICAL DETAIL REPORT

Sample ID	Client Sample ID	Matrix	Test Name	Date Sampled	TCLP/SPLP Date	Prep Date	QC Batch	Analysis Date	Analytical Batch
1708159-01A	TMW-110	Aqueous	Ammonia Nitrogen	8/31/2017			R88219	9/10/2017	POTENTIAL_170910A
	TMW-110	Aqueous	Hexavalent Chromium	8/31/2017			R88166	9/1/2017	SPEC_A_170901A
	TMW-110	Aqueous	Total Metal(s) by ICP	8/31/2017		9/3/2017	41119	9/6/2017	MTL_G_ICP_170906E
1708159-02A	MW-307A	Aqueous	Ammonia Nitrogen	8/31/2017			R88219	9/10/2017	POTENTIAL_170910A
	MW-307A	Aqueous	Hexavalent Chromium	8/31/2017			R88166	9/1/2017	SPEC_A_170901A
	MW-307A	Aqueous	Total Metal(s) by ICP	8/31/2017		9/3/2017	41119	9/6/2017	MTL_G_ICP_170906E
1708159-03A	MW-306A	Aqueous	Ammonia Nitrogen	8/31/2017			R88219	9/10/2017	POTENTIAL_170910A
	MW-306A	Aqueous	Hexavalent Chromium	8/31/2017			R88166	9/1/2017	SPEC_A_170901A
	MW-306A	Aqueous	Total Metal(s) by ICP	8/31/2017		9/3/2017	41119	9/6/2017	MTL_G_ICP_170906E
1708159-04A	DUP-1	Aqueous	Ammonia Nitrogen	8/31/2017			R88219	9/10/2017	POTENTIAL_170910A
	DUP-1	Aqueous	Hexavalent Chromium	8/31/2017			R88166	9/1/2017	SPEC_A_170901A
	DUP-1	Aqueous	Total Metal(s) by ICP	8/31/2017		9/3/2017	41119	9/6/2017	MTL_G_ICP_170906E
1708159-05A	MW-5	Aqueous	Ammonia Nitrogen	8/31/2017			R88219	9/10/2017	POTENTIAL_170910A
	MW-5	Aqueous	Hexavalent Chromium	8/31/2017			R88166	9/1/2017	SPEC_A_170901A
	MW-5	Aqueous	Total Metal(s) by ICP	8/31/2017		9/3/2017	41119	9/6/2017	MTL_G_ICP_170906E
1708159-06A	P-2	Aqueous	Ammonia Nitrogen	8/31/2017			R88219	9/10/2017	POTENTIAL_170910A
	P-2	Aqueous	Hexavalent Chromium	8/31/2017			R88166	9/1/2017	SPEC_A_170901A
	P-2	Aqueous	Total Metal(s) by ICP	8/31/2017		9/3/2017	41119	9/6/2017	MTL_G_ICP_170906E
1708159-07A	EB-1	Aqueous	Ammonia Nitrogen	8/31/2017			R88219	9/10/2017	POTENTIAL_170910A
	EB-1	Aqueous	Hexavalent Chromium	8/31/2017			R88166	9/1/2017	SPEC_A_170901A
	EB-1	Aqueous	Total Metal(s) by ICP	8/31/2017		9/3/2017	41119	9/6/2017	MTL_G_ICP_170906E

Bio-Chem LABORATORIES, INC.

1049 - 28th Street SE
Grand Rapids, MI 49508
Ph: 616/248-4900
Toll Free: 800/362-LABS
Fax: 616/248-4904

September 11, 2017

Mark Westra
Rose & Westra, Inc.
A Division of GZA
601 Fifth St NW
Grand Rapids, MI 49504

TEL: (616) 956-6123
FAX (616) 288-3327

RE: Wolverine

Dear Mark Westra:

Order No.: 1709005

BIO-CHEM Laboratories, Inc. received 7 samples on 9/1/2017 for the analyses presented in the following report.

There were no problems with the analyses and all data for associated QC met EPA or laboratory specifications except where noted in the Case Narrative.

If you have any questions regarding these tests results, please feel free to call.

Please note that unless otherwise instructed, residual samples will be held for sixty (60) days from the original report date. At that time, all non-hazardous samples will be disposed of in accordance with federal, state and local regulations and ordinances, and hazardous samples shall be returned to you. Please contact the laboratory within thirty (30) days if other arrangements for sample retention need to be made.

Sincerely,

Cindy Euwema

Cindy Euwema
Office Manager

Working with you to ensure a better tomorrow.

1709005

Bio Chem LABORATORIES, INC.

Chain of Custody

1049 28th Street SE • Grand Rapids, MI 49508
Ph: (616) 248-4900 • Toll Free: 800-362-LABS
Fax: (616) 248-4904

Project Number: 42335

Firm Name: GZA
Turn around time: Standard
Date: 9/1/17
Date Due:

Firm Address: 601 5th St NW Ste 102
Project Name: Wolverine

City, State, Zip: Grand Rapids, MI
State Samples Taken From: MI

Phone: 616-956-6123
Fax:
Contact Person: Mark Westra

Item No	Lab I.D.	Client Sample Number	Date Taken	Time Taken	Sample Description (sample type: water, soil, other)	Number of Containers	Analysis Desired (One per line): Metals	Total + Hex Chrome	Ammonia-N						Remarks
1		P-3	9/1	0844	Water	3	X	X	X						Metals =
2		MW-304A	9/1	0923	Water	3	X	X	X						As, Ba, Cd, Cu, Cr
3		TMW-105	9/1	1004	Water	3	X	X	X						Fe, Pb, Ag, V, Zn
4		MW-302A	9/1	1111	Water	3	X	X	X						
5		EB-3	9/1	1005	Water	3	X	X	X			MN			
6		Dup-3	9/1	—	Water	3	X	X	X						
7		TMW-102	9/1	1200	Water	3	X	X	X						
8															
9															
10															

Released by	Received by	Date	Time
Jack Markoski	Cindy Emmema	9-1-17	1:40

Laboratory use only

- [X] Blue Ice ____°
- [ ] Regular Ice
- [ ] No Coolant

Drop Off

FRANKLIN PRESS 62578.2/17

BIO-CHEM Laboratories, Inc.

Date: *11-Sep-17*

CLIENT: Rose & Westra, Inc.
Project: Wolverine
Lab Order: 1709005

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collection Date	Date Received
1709005-01A	P-3	Aqueous	9/1/2017	9/1/2017
1709005-02A	MW-304A	Aqueous	9/1/2017	9/1/2017
1709005-03A	TMW-105	Aqueous	9/1/2017	9/1/2017
1709005-04A	MW-302A	Aqueous	9/1/2017	9/1/2017
1709005-05A	EB-3	Aqueous	9/1/2017	9/1/2017
1709005-06A	DUP-3	Aqueous	9/1/2017	9/1/2017
1709005-07A	TMW-102	Aqueous	9/1/2017	9/1/2017

BIO-CHEM Laboratories, Inc.

Date: *11-Sep-17*

CLIENT: Rose & Westra, Inc.
Project: Wolverine
Lab Order: 1709005

CASE NARRATIVE

Samples are routinely analyzed using methods outlined in the following references:

(SW) Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, 3rd Ed.
(E) Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020.
(A) Standard Methods for the Examination of Water and Wastewater, APHA, 18th Ed.
(D) Annual Book of ASTM Standards.

Specific methods utilized for this project are provided in the analytical report and are identified by the reference document abbreviation ( ) followed by the method number.

All QA/QC and sample analyses met method, laboratory and/or regulatory data quality objectives unless otherwise specified below.

No data qualifications required.

BIO-CHEM Laboratories, Inc.

Date: *9/11/2017*

ANALYTICAL REPORT

CLIENT: Rose & Westra, Inc.
Lab Order: 1709005
Project: Wolverine
Lab Sample ID: 1709005-01A

Project Number: 62335
Client Sample ID: P-3
Collection Date: 9/1/2017
Matrix: AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Hexavalent Chromium								
1. Chromium, Hexavalent	SW7196A	< 10		10	µg/L	1	RHS	9/1/2017
Total Metal(s) by ICP								
1. Arsenic	SW6010B	< 5.0		5.0	µg/L	1	RHS	9/6/2017
2. Barium	SW6010B	150		100	µg/L	1	RHS	9/6/2017
3. Cadmium	SW6010B	< 0.50		0.50	µg/L	1	RHS	9/6/2017
4. Chromium	SW6010B	< 10		10	µg/L	1	RHS	9/6/2017
5. Copper	SW6010B	< 4.0		4.0	µg/L	1	RHS	9/6/2017
6. Iron	SW6010B	13,000		200	µg/L	1	RHS	9/6/2017
7. Lead	SW6010B	< 3.0		3.0	µg/L	1	RHS	9/6/2017
8. Silver	SW6010B	< 0.50		0.50	µg/L	1	RHS	9/6/2017
9. Vanadium	SW6010B	< 4.0		4.0	µg/L	1	RHS	9/6/2017
10. Zinc	SW6010B	< 20		20	µg/L	1	RHS	9/6/2017
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	28		0.10	mg/L	1	RHS	9/11/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

CLIENT: Rose & Westra, Inc. **Project Number:** 62335
Lab Order: 1709005 **Client Sample ID:** MW-304A
Project: Wolverine **Collection Date:** 9/1/2017
Lab Sample ID: 1709005-02A **Matrix:** AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Hexavalent Chromium								
1. Chromium, Hexavalent	SW7196A	< 10		10	µg/L	1	RHS	9/1/2017
Total Metal(s) by ICP								
1. Arsenic	SW6010B	5.5		5.0	µg/L	1	RHS	9/6/2017
2. Barium	SW6010B	190		100	µg/L	1	RHS	9/6/2017
3. Cadmium	SW6010B	< 0.50		0.50	µg/L	1	RHS	9/6/2017
4. Chromium	SW6010B	140		10	µg/L	1	RHS	9/6/2017
5. Copper	SW6010B	< 4.0		4.0	µg/L	1	RHS	9/6/2017
6. Iron	SW6010B	2,300		200	µg/L	1	RHS	9/6/2017
7. Lead	SW6010B	< 3.0		3.0	µg/L	1	RHS	9/6/2017
8. Silver	SW6010B	< 0.50		0.50	µg/L	1	RHS	9/6/2017
9. Vanadium	SW6010B	16		4.0	µg/L	1	RHS	9/6/2017
10. Zinc	SW6010B	< 20		20	µg/L	1	RHS	9/6/2017
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	31		0.10	mg/L	1	RHS	9/11/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

CLIENT: Rose & Westra, Inc. **Project Number:** 62335
Lab Order: 1709005 **Client Sample ID:** TMW-105
Project: Wolverine **Collection Date:** 9/1/2017
Lab Sample ID: 1709005-03A **Matrix:** AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Hexavalent Chromium								
1. Chromium, Hexavalent	SW7196A	< 10		10	µg/L	1	RHS	9/1/2017
Total Metal(s) by ICP								
1. Arsenic	SW6010B	< 5.0		5.0	µg/L	1	RHS	9/6/2017
2. Barium	SW6010B	< 100		100	µg/L	1	RHS	9/6/2017
3. Cadmium	SW6010B	< 0.50		0.50	µg/L	1	RHS	9/6/2017
4. Chromium	SW6010B	< 10		10	µg/L	1	RHS	9/6/2017
5. Copper	SW6010B	< 4.0		4.0	µg/L	1	RHS	9/6/2017
6. Iron	SW6010B	2,100		200	µg/L	1	RHS	9/6/2017
7. Lead	SW6010B	9.0		3.0	µg/L	1	RHS	9/6/2017
8. Silver	SW6010B	< 0.50		0.50	µg/L	1	RHS	9/6/2017
9. Vanadium	SW6010B	< 4.0		4.0	µg/L	1	RHS	9/6/2017
10. Zinc	SW6010B	< 20		20	µg/L	1	RHS	9/6/2017
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	14		0.10	mg/L	1	RHS	9/11/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

CLIENT: Rose & Westra, Inc. **Project Number:** 62335
Lab Order: 1709005 **Client Sample ID:** MW-302A
Project: Wolverine **Collection Date:** 9/1/2017
Lab Sample ID: 1709005-04A **Matrix:** AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Hexavalent Chromium								
1. Chromium, Hexavalent	SW7196A	< 10		10	µg/L	1	RHS	9/1/2017
Total Metal(s) by ICP								
1. Arsenic	SW6010B	5.5		5.0	µg/L	1	RHS	9/6/2017
2. Barium	SW6010B	190		100	µg/L	1	RHS	9/6/2017
3. Cadmium	SW6010B	< 0.50		0.50	µg/L	1	RHS	9/6/2017
4. Chromium	SW6010B	< 10		10	µg/L	1	RHS	9/6/2017
5. Copper	SW6010B	< 4.0		4.0	µg/L	1	RHS	9/6/2017
6. Iron	SW6010B	5,600		200	µg/L	1	RHS	9/6/2017
7. Lead	SW6010B	< 3.0		3.0	µg/L	1	RHS	9/6/2017
8. Silver	SW6010B	< 0.50		0.50	µg/L	1	RHS	9/6/2017
9. Vanadium	SW6010B	< 4.0		4.0	µg/L	1	RHS	9/6/2017
10. Zinc	SW6010B	< 20		20	µg/L	1	RHS	9/6/2017
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	4.0		0.10	mg/L	1	RHS	9/11/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

CLIENT: Rose & Westra, Inc. **Project Number:** 62335
Lab Order: 1709005 **Client Sample ID:** EB-3
Project: Wolverine **Collection Date:** 9/1/2017
Lab Sample ID: 1709005-05A **Matrix:** AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Hexavalent Chromium								
1. Chromium, Hexavalent	SW7196A	< 10		10	µg/L	1	RHS	9/1/2017
Total Metal(s) by ICP								
1. Arsenic	SW6010B	< 5.0		5.0	µg/L	1	RHS	9/6/2017
2. Barium	SW6010B	< 100		100	µg/L	1	RHS	9/6/2017
3. Cadmium	SW6010B	< 0.50		0.50	µg/L	1	RHS	9/6/2017
4. Chromium	SW6010B	< 10		10	µg/L	1	RHS	9/6/2017
5. Copper	SW6010B	< 4.0		4.0	µg/L	1	RHS	9/6/2017
6. Iron	SW6010B	< 200		200	µg/L	1	RHS	9/6/2017
7. Lead	SW6010B	< 3.0		3.0	µg/L	1	RHS	9/6/2017
8. Silver	SW6010B	< 0.50		0.50	µg/L	1	RHS	9/6/2017
9. Vanadium	SW6010B	< 4.0		4.0	µg/L	1	RHS	9/6/2017
10. Zinc	SW6010B	< 20		20	µg/L	1	RHS	9/6/2017
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	< 0.10		0.10	mg/L	1	RHS	9/11/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

BIO-CHEM Laboratories, Inc.

Date: *9/11/2017*

ANALYTICAL REPORT

CLIENT: Rose & Westra, Inc.
Lab Order: 1709005
Project: Wolverine
Lab Sample ID: 1709005-06A

Project Number: 62335
Client Sample ID: DUP-3
Collection Date: 9/1/2017
Matrix: AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Hexavalent Chromium								
1. Chromium, Hexavalent	SW7196A	< 10		10	µg/L	1	RHS	9/1/2017
Total Metal(s) by ICP								
1. Arsenic	SW6010B	< 5.0		5.0	µg/L	1	RHS	9/6/2017
2. Barium	SW6010B	150		100	µg/L	1	RHS	9/6/2017
3. Cadmium	SW6010B	< 0.50		0.50	µg/L	1	RHS	9/6/2017
4. Chromium	SW6010B	< 10		10	µg/L	1	RHS	9/6/2017
5. Copper	SW6010B	< 4.0		4.0	µg/L	1	RHS	9/6/2017
6. Iron	SW6010B	14,000		200	µg/L	1	RHS	9/6/2017
7. Lead	SW6010B	< 3.0		3.0	µg/L	1	RHS	9/6/2017
8. Silver	SW6010B	< 0.50		0.50	µg/L	1	RHS	9/6/2017
9. Vanadium	SW6010B	< 4.0		4.0	µg/L	1	RHS	9/6/2017
10. Zinc	SW6010B	< 20		20	µg/L	1	RHS	9/6/2017
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	27		0.10	mg/L	1	RHS	9/11/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

BIO-CHEM Laboratories, Inc.

Date: *9/11/2017*

ANALYTICAL REPORT

CLIENT: Rose & Westra, Inc.
Lab Order: 1709005
Project: Wolverine
Lab Sample ID: 1709005-07A

Project Number: 62335
Client Sample ID: TMW-102
Collection Date: 9/1/2017
Matrix: AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Hexavalent Chromium								
1. Chromium, Hexavalent	SW7196A	63		10	µg/L	1	RHS	9/1/2017
Total Metal(s) by ICP								
1. Arsenic	SW6010B	< 5.0		5.0	µg/L	1	RHS	9/6/2017
2. Barium	SW6010B	< 100		100	µg/L	1	RHS	9/6/2017
3. Cadmium	SW6010B	< 0.50		0.50	µg/L	1	RHS	9/6/2017
4. Chromium	SW6010B	64		10	µg/L	1	RHS	9/6/2017
5. Copper	SW6010B	< 4.0		4.0	µg/L	1	RHS	9/6/2017
6. Iron	SW6010B	< 200		200	µg/L	1	RHS	9/6/2017
7. Lead	SW6010B	< 3.0		3.0	µg/L	1	RHS	9/6/2017
8. Silver	SW6010B	< 0.50		0.50	µg/L	1	RHS	9/6/2017
9. Vanadium	SW6010B	< 4.0		4.0	µg/L	1	RHS	9/6/2017
10. Zinc	SW6010B	< 20		20	µg/L	1	RHS	9/6/2017
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	< 0.10		0.10	mg/L	1	RHS	9/11/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

BIO-CHEM Laboratories, Inc.

Lab Order: 1709005
Client: Rose & Westra, Inc.
Project: Wolverine

ANALYTICAL DETAIL REPORT

Sample ID	Client Sample ID	Matrix	Test Name	Date Sampled	TCLP/SPLP Date	Prep Date	QC Batch	Analysis Date	Analytical Batch
1709005-01A	P-3	Aqueous	Ammonia Nitrogen	9/1/2017			R88226	9/11/2017	POTENTIAL_170911A
	P-3	Aqueous	Hexavalent Chromium	9/1/2017		9/1/2017	41118	9/1/2017	SPEC_A_170901B
	P-3	Aqueous	Total Metal(s) by ICP	9/1/2017		9/3/2017	41119	9/6/2017	MTL_G_ICP_170906E
1709005-02A	MW-304A	Aqueous	Ammonia Nitrogen	9/1/2017			R88226	9/11/2017	POTENTIAL_170911A
	MW-304A	Aqueous	Hexavalent Chromium	9/1/2017		9/1/2017	41118	9/1/2017	SPEC_A_170901B
	MW-304A	Aqueous	Total Metal(s) by ICP	9/1/2017		9/3/2017	41119	9/6/2017	MTL_G_ICP_170906E
1709005-03A	TMW-105	Aqueous	Ammonia Nitrogen	9/1/2017			R88226	9/11/2017	POTENTIAL_170911A
	TMW-105	Aqueous	Hexavalent Chromium	9/1/2017		9/1/2017	41118	9/1/2017	SPEC_A_170901B
	TMW-105	Aqueous	Total Metal(s) by ICP	9/1/2017		9/3/2017	41119	9/6/2017	MTL_G_ICP_170906E
1709005-04A	MW-302A	Aqueous	Ammonia Nitrogen	9/1/2017			R88226	9/11/2017	POTENTIAL_170911A
	MW-302A	Aqueous	Hexavalent Chromium	9/1/2017		9/1/2017	41118	9/1/2017	SPEC_A_170901B
	MW-302A	Aqueous	Total Metal(s) by ICP	9/1/2017		9/3/2017	41119	9/6/2017	MTL_G_ICP_170906E
1709005-05A	EB-3	Aqueous	Ammonia Nitrogen	9/1/2017			R88226	9/11/2017	POTENTIAL_170911A
	EB-3	Aqueous	Hexavalent Chromium	9/1/2017		9/1/2017	41118	9/1/2017	SPEC_A_170901B
	EB-3	Aqueous	Total Metal(s) by ICP	9/1/2017		9/3/2017	41119	9/6/2017	MTL_G_ICP_170906E
1709005-06A	DUP-3	Aqueous	Ammonia Nitrogen	9/1/2017			R88226	9/11/2017	POTENTIAL_170911A
	DUP-3	Aqueous	Hexavalent Chromium	9/1/2017		9/1/2017	41118	9/1/2017	SPEC_A_170901B
	DUP-3	Aqueous	Total Metal(s) by ICP	9/1/2017		9/3/2017	41119	9/6/2017	MTL_G_ICP_170906E
1709005-07A	TMW-102	Aqueous	Ammonia Nitrogen	9/1/2017			R88226	9/11/2017	POTENTIAL_170911A
	TMW-102	Aqueous	Hexavalent Chromium	9/1/2017		9/1/2017	41118	9/1/2017	SPEC_A_170901B
	TMW-102	Aqueous	Total Metal(s) by ICP	9/1/2017		9/3/2017	41119	9/6/2017	MTL_G_ICP_170906E

Attachment B – Pore Water and Surface Water Lab Report

ALS Environmental
ALS Group USA, Corp
1317 South 13th Avenue
Kelso, WA 98626
T : +1 360 577 7222
F : +1 360 636 1068
www.alsglobal.com

October 18, 2017

Analytical Report for Service Request No: K1709828

John Morehouse
Rose & Westra, a Division of GZA
601 Fifth Street NW, Suite 102
Grand Rapids, MI 49504

RE: WWW / 16.0062335.50

Dear John,

Enclosed are the results of the sample(s) submitted to our laboratory September 15, 2017
For your reference, these analyses have been assigned our service request number **K1709828.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3275. You may also contact me via email at Chris.Leaf@ALSGlobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Chris Leaf
Project Manager

ALS Environmental
ALS Group USA, Corp
1317 South 13th Avenue
Kelso, WA 98626
T : +1 360 577 7222
F : +1 360 636 1068
www.alsglobal.com

Table of Contents

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L14-51
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

ALS ENVIRONMENTAL

Client:	GZA GeoEnvironmental, Incorporated	**Service Request No.:**	K1709967
Project:	WWW/16.0062335.50	**Date Received:**	09/15/17
Sample Matrix:	Drinking Water		

Case Narrative

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Laboratory Control Sample (LCS), and Laboratory/Duplicate Laboratory Control Sample (LCS/DLCS).

Sample Receipt

Sixteen water samples were received for analysis at ALS Environmental on 09/15/17. The samples were received in good condition and consistent with the accompanying chain of custody except as noted as listed on the cooler receipt and preservation form included in this report. The samples were stored in a refrigerator at 4ºC upon receipt at the laboratory.

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Surrogate Exceptions:
The upper control criterion was exceeded for 113C2-6:2 FTS in samples PW-DUP-1P and PW-17-5B. No target analytes were detected in the sample. The error associated with an elevated recovery equated to a high bias. The quality of the sample data was not significantly affected. No further corrective action was appropriate.

The upper control criterion was exceeded for 13C2-P6:2 FTS and 13C2-PFDA in sample PW-17-5A. No target analytes were detected in the sample. The error associated with an elevated recovery equated to a high bias. The quality of the sample data was not significantly affected. No further corrective action was appropriate.

The recovery of 13C2-PFBS in samples PW-17-1A, SW-17-4 and Method Blank KQ1713886-03 was outside the control limits listed in the results summary. The limits are default values temporarily in use until sufficient data points are generated to calculate statistical control limits. Based on the method and historic data, the recoveries observed were in the range expected for this procedure. No further corrective action was taken.

The recovery of 13C2-8:2 FTS in samples PW-17-1B, SW-DUP-1P, PW-DUP-1P, PW-17-5B, FB-17-2, PW-17-6A, PW-DUP-2P, PW-17-7A, PW-17-7B and FB-17-3 was outside the control limits listed in the results summary. The limits are default values temporarily in use until sufficient data points are generated to calculate statistical control limits. Based on the method and historic data, the recoveries observed were in the range expected for this procedure. No further corrective action was taken.

The recovery of 13C2-8:2 FTS and 13C2-PFTeDA in samples PW-17-5A and Method Blank KQ17138806-03 was outside the control limits listed in the results summary. The limits are default values temporarily in use until sufficient data points are generated to calculate statistical control limits. Based on the method and historic data, the recoveries observed were in the range expected for this procedure. No further corrective action was taken.

No other anomalies associated with the analysis of these samples were observed.

Approved by_____

Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

ALS Environmental

CHAIN OF CUSTODY
82535

001

SR# K1709828

COC Set____of____

COC#__________

1317 South 13th Ave, Kelso, WA 98626 Phone (360) 577-7222 / 800-695-7222 / FAX (360) 636-1068
www.alsglobal.com

Project Name: WWW	Project Number: 16.0062335.50
Project Manager: Mark Westra	
Company: Rose & Westra, GZA	
Address: 601 Fifth St NW Grand Rapids, MI	
Phone #: 616 295 6802	email: mark.westra@gza.com
Sampler Signature: [signature]	Sampler Printed Name: Jack Markosky

Analyses: NUMBER OF CONTAINERS; PFC/537M / PFOA (Complete list) — 14D; 1; 2; 3; 4; 5; Remarks

CLIENT SAMPLE ID	LABID	SAMPLING Date	SAMPLING Time	Matrix	NUMBER OF CONTAINERS	PFC/537M / PFOA	1	2	3	4	5	Remarks
1. PW-17-1A		9/12/17	3:45	W	2	X						
2. PW-17-1B		9/12/17	4:35	W	2	X						
3. SW-DUP-1P		9/13/17		W	2	X						
4. PW-DUP-1P		9/13/17		W	2	X						
5. SW-17-4		9/13/17	2:40	W	2	X						
6. PW-17-5B		9/13/17	4:20	W	2	X						
7. PW-17-5A		9/13/17	3:30	W	2	X						
8. FB-17-1		9/12/17	5:00	W	1	X						
9. FB-17-2		9/13/17	3:30	W	1	X						
10. EQ-17-1P		9/13/17	5:40	W	2	X						

Report Requirements

X I. Routine Report: Method Blank, Surrogate, as required

___ II. Report Dup., MS, MSD as required

___ III. CLP Like Summary (no raw data)

___ IV. Data Validation Report

___ V. EDD

Invoice Information

P.O.#______

Bill To: R/W GZA Grand Rapids

Turnaround Requirements

___ 24 hr. ___ 48 hr.

___ 5 Day

X Standard

Requested Report Date

Circle which metals are to be analyzed

Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

*Indicate State Hydrocarbon Procedure: AK CA WI Northwest Other____(Circle One)

Special Instructions/Comments: Analyze complete PFC list - pls return cooler

	Relinquished By:	Received By:	Relinquished By:	Received By:	Relinquished By:	Received By:
Signature	[signature]	Kristi Morrow [signature]				
Printed Name	Jack Markosky					
Firm	R&W / GZA	ALS				
Date/Time	9/14/17 6:30 PM	9-15-17 1045				

Dropped off @ FedEx

ALS Environmental

CHAIN OF CUSTODY
82535

001

SR# K1709828

COC Set____of____

COC#_____

1317 South 13th Ave, Kelso, WA 98626 Phone (360) 577-7222 / 800-695-7222 / FAX (360) 636-1068
www.alsglobal.com

Project Name: 16.0062335.50	Project Number: 16.0062335.50
Project Manager: Mark Westra	
Company: Rose & Westra / GZA	
Address: 601 Fifth st. NW St. 102 Grand Rapids, MI	
Phone #: 616 295 6802	email: mark.westra@gza.com
Sampler Signature:	Sampler Printed Name: Jack Markosky

CLIENT SAMPLE ID	LABID	SAMPLING Date	Time	Matrix	NUMBER OF CONTAINERS	PFC/537M / PFOA (grab)	14D	1	2	3	4	5	Remarks
1. PW-17-6A		9/14/17	10:50	H_2O	2	X							
2. PW-17-6B		9/14/17	11:20	H_2O	2	X							
3. PW-DUP-2P		9/14/17		H_2O	2	X							
4. PW-17-7A		9/14/17	12:20	H_2O	2	X							
5. PW-17-7B		9/14/17	12:50	H_2O	2	X							
6. FB-17-3		9/14/17	12:30	H_2O	1	X							
7.													
8.													
9.													
10.													

Report Requirements

- X I. Routine Report: Method Blank, Surrogate, as required
- __ II. Report Dup., MS, MSD as required
- __ III. CLP Like Summary (no raw data)
- __ IV. Data Validation Report
- __ V. EDD

Invoice Information

P.O.#_____

Bill To: RW / GZA Grand Rapids

Turnaround Requirements

__ 24 hr. __ 48 hr.
__ 5 Day
X Standard

Requested Report Date

Circle which metals are to be analyzed

Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Special Instructions/Comments: Analyze complete PFC list - pls return cooler

*Indicate State Hydrocarbon Procedure: AK CA WI Northwest Other____(Circle One)

Relinquished By:	Received By:	Relinquished By:	Received By:	Relinquished By:	Received By:
Signature:	Signature:	Signature	Signature	Signature	Signature
Printed Name: Jack Markosky	Printed Name:	Printed Name	Printed Name	Printed Name	Printed Name
Firm: RW / GZA	Firm:	Firm	Firm	Firm	Firm
Time: 9/14/17 6:30 PM	Date/Time: 9-15-17 1045	Date/Time	Date/Time	Date/Time	Date/Time

tripped off @ Fedex

PC 412

Cooler Receipt and Preservation Form

Client GZA Service Request *K17* 09828

Received: 9-15-17 Opened: 9-15-17 By: [illegible] Unloaded: 9-15-17 By: [illegible]

1. Samples were received via? *USPS* *Fed Ex* *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) *Cooler* *Box* *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA Y N If yes, how many and where? 1 Front
   If present, were custody seals intact? Y N If present, were they signed and dated? Y N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	Filed
-0.3	-0.4	2.6	2.5	-0.1	356		7702 6269 6540	

4. Packing material: *Inserts* *Baggies* *Bubble Wrap* *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves* _____
5. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
6. Were samples received in good condition (temperature, unbroken)? *Indicate in the table below.* NA Y N
   If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*
7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA Y N
8. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA Y N
9. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
10. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N
11. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
12. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: Rec'd "PW-Dup-1P" in a bag with "PW-Dup-2P" Placed with the PW-Dup-2P Sample Set; that's how they arrived. (Together)

7/25/16 *Page ____ of ____*

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709828
Project:	WWW/16.0062335.50	**Date Collected:**	09/12/17 03:45
Sample Matrix:	Water	**Date Received:**	09/15/17 10:45
Sample Name:	PW-17-1A	**Units:**	ng/L
Lab Code:	K1709828-001	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	ND U	8.8	1	09/27/17 14:45	9/26/17	
Perfluoropentanoic acid (PFPeA)	ND U	4.4	1	09/27/17 14:45	9/26/17	
Perfluorobutane sulfonic acid (PFBS)	ND U	4.4	1	09/27/17 14:45	9/26/17	
Perfluorohexanoic acid (PFHxA)	ND U	4.4	1	09/27/17 14:45	9/26/17	
Perfluoroheptanoic acid (PFHpA)	ND U	4.4	1	09/27/17 14:45	9/26/17	
Perfluorohexane sulfonic acid (PFHxS)	ND U	4.4	1	09/27/17 14:45	9/26/17	
Perfluorooctanoic acid (PFOA)	ND U	1.8	1	09/27/17 14:45	9/26/17	
Perfluoroheptane sulfonic acid (PFHpS)	ND U	4.4	1	09/27/17 14:45	9/26/17	
Perfluorononanoic acid (PFNA)	ND U	4.4	1	09/27/17 14:45	9/26/17	
Perfluorooctane sulfonic acid (PFOS)	ND U	4.4	1	09/27/17 14:45	9/26/17	
Perfluorodecanoic acid (PFDA)	ND U	4.4	1	09/27/17 14:45	9/26/17	
Perfluoroundecanoic acid (PFUnDA)	ND U	4.4	1	09/27/17 14:45	9/26/17	
Perfluorooctane sulfonamide (FOSA)	ND U	4.4	1	09/27/17 14:45	9/26/17	
Perfluorododecanoic acid (PFDoDA)	ND U	4.4	1	09/27/17 14:45	9/26/17	
Perfluorotridecanoic acid (PFTrDA)	ND U	4.4	1	09/27/17 14:45	9/26/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND U	4.4	1	09/27/17 14:45	9/26/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND U	4.4	1	09/27/17 14:45	9/26/17	
Perfluorotetradecanoic acid (PFTeDA)	ND U	4.4	1	09/27/17 14:45	9/26/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND U	4.4	1	09/27/17 14:45	9/26/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND U	4.4	1	09/27/17 14:45	9/26/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND U	4.4	1	09/27/17 14:45	9/26/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND U	4.4	1	09/27/17 14:45	9/26/17	
Perfluorodecane sulfonic acid (PFDS)	ND U	4.4	1	09/27/17 14:45	9/26/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	93	19 - 126	09/27/17 14:45	
13C2-PFHxA	88	10 - 151	09/27/17 14:45	
18O2-PFHxS	68	20 - 128	09/27/17 14:45	
13C2-6:2 FTS	125	10 - 187	09/27/17 14:45	
13C4-PFOA	115	13 - 142	09/27/17 14:45	
13C5-PFNA	90	15 - 143	09/27/17 14:45	
13C4-PFOS	87	11 - 131	09/27/17 14:45	
13C2-PFDA	99	25 - 129	09/27/17 14:45	
13C2-PFUnDA	77	16 - 129	09/27/17 14:45	
13C2-PFDoDA	72	17 - 114	09/27/17 14:45	
D7-MeFOSE	70	32 - 113	09/27/17 14:45	
D9-EtFOSE	68	20 - 113	09/27/17 14:45	
D5-EtFOSA	29	19 - 103	09/27/17 14:45	
13C2-8:2 FTS	149	50 - 150	09/27/17 14:45	

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709828
Project:	WWW/16.0062335.50	**Date Collected:**	09/12/17 03:45
Sample Matrix:	Water	**Date Received:**	09/15/17 10:45
Sample Name:	PW-17-1A	**Units:**	ng/L
Lab Code:	K1709828-001	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M			
Prep Method:	EPA 3535A			
13C2-PFTeDA	83	50 - 150	09/27/17 14:45	
13C4-PFHpA	89	50 - 150	09/27/17 14:45	
13C5-PFPeA	101	50 - 150	09/27/17 14:45	
13C3-PFBS	48	50 - 150	09/27/17 14:45	*
13C8-FOSA	69	50 - 150	09/27/17 14:45	

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709828
Project:	WWW/16.0062335.50	**Date Collected:**	09/12/17 04:35
Sample Matrix:	Water	**Date Received:**	09/15/17 10:45
Sample Name:	PW-17-1B	**Units:**	ng/L
Lab Code:	K1709828-002	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	ND U	8.6	1	09/27/17 14:56	9/26/17	
Perfluoropentanoic acid (PFPeA)	ND U	4.3	1	09/27/17 14:56	9/26/17	
Perfluorobutane sulfonic acid (PFBS)	ND U	4.3	1	09/27/17 14:56	9/26/17	
Perfluorohexanoic acid (PFHxA)	ND U	4.3	1	09/27/17 14:56	9/26/17	
Perfluoroheptanoic acid (PFHpA)	ND U	4.3	1	09/27/17 14:56	9/26/17	
Perfluorohexane sulfonic acid (PFHxS)	ND U	4.3	1	09/27/17 14:56	9/26/17	
Perfluorooctanoic acid (PFOA)	ND U	1.7	1	09/27/17 14:56	9/26/17	
Perfluoroheptane sulfonic acid (PFHpS)	ND U	4.3	1	09/27/17 14:56	9/26/17	
Perfluorononanoic acid (PFNA)	ND U	4.3	1	09/27/17 14:56	9/26/17	
Perfluorooctane sulfonic acid (PFOS)	ND U	4.3	1	09/27/17 14:56	9/26/17	
Perfluorodecanoic acid (PFDA)	ND U	4.3	1	09/27/17 14:56	9/26/17	
Perfluoroundecanoic acid (PFUnDA)	ND U	4.3	1	09/27/17 14:56	9/26/17	
Perfluorooctane sulfonamide (FOSA)	ND U	4.3	1	09/27/17 14:56	9/26/17	
Perfluorododecanoic acid (PFDoDA)	ND U	4.3	1	09/27/17 14:56	9/26/17	
Perfluorotridecanoic acid (PFTrDA)	ND U	4.3	1	09/27/17 14:56	9/26/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND U	4.3	1	09/27/17 14:56	9/26/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND U	4.3	1	09/27/17 14:56	9/26/17	
Perfluorotetradecanoic acid (PFTeDA)	ND U	4.3	1	09/27/17 14:56	9/26/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND U	4.3	1	09/27/17 14:56	9/26/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND U	4.3	1	09/27/17 14:56	9/26/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND U	4.3	1	09/27/17 14:56	9/26/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND U	4.3	1	09/27/17 14:56	9/26/17	
Perfluorodecane sulfonic acid (PFDS)	ND U	4.3	1	09/27/17 14:56	9/26/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	105	19 - 126	09/27/17 14:56	
13C2-PFHxA	121	10 - 151	09/27/17 14:56	
18O2-PFHxS	86	20 - 128	09/27/17 14:56	
13C2-6:2 FTS	92	10 - 187	09/27/17 14:56	
13C4-PFOA	136	13 - 142	09/27/17 14:56	
13C5-PFNA	91	15 - 143	09/27/17 14:56	
13C4-PFOS	85	11 - 131	09/27/17 14:56	
13C2-PFDA	127	25 - 129	09/27/17 14:56	
13C2-PFUnDA	98	16 - 129	09/27/17 14:56	
13C2-PFDoDA	87	17 - 114	09/27/17 14:56	
D7-MeFOSE	88	32 - 113	09/27/17 14:56	
D9-EtFOSE	80	20 - 113	09/27/17 14:56	
D5-EtFOSA	50	19 - 103	09/27/17 14:56	
13C2-8:2 FTS	251	50 - 150	09/27/17 14:56	*

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709828
Project:	WWW/16.0062335.50	**Date Collected:**	09/12/17 04:35
Sample Matrix:	Water	**Date Received:**	09/15/17 10:45
Sample Name:	PW-17-1B	**Units:**	ng/L
Lab Code:	K1709828-002	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M			
Prep Method:	EPA 3535A			
13C2-PFTeDA		104	50 - 150	09/27/17 14:56
13C4-PFHpA		107	50 - 150	09/27/17 14:56
13C5-PFPeA		112	50 - 150	09/27/17 14:56
13C3-PFBS		60	50 - 150	09/27/17 14:56
13C8-FOSA		83	50 - 150	09/27/17 14:56

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709828
Project:	WWW/16.0062335.50	**Date Collected:**	09/13/17
Sample Matrix:	Water	**Date Received:**	09/15/17 10:45
Sample Name:	SW-DUP-1P	**Units:**	ng/L
Lab Code:	K1709828-003	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result		MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	ND	U	8.3	1	09/26/17 10:11	9/25/17	
Perfluoropentanoic acid (PFPeA)	ND	U	4.2	1	09/26/17 10:11	9/25/17	
Perfluorobutane sulfonic acid (PFBS)	ND	U	4.2	1	09/26/17 10:11	9/25/17	
Perfluorohexanoic acid (PFHxA)	ND	U	4.2	1	09/26/17 10:11	9/25/17	
Perfluoroheptanoic acid (PFHpA)	ND	U	4.2	1	09/26/17 10:11	9/25/17	
Perfluorohexane sulfonic acid (PFHxS)	ND	U	4.2	1	09/26/17 10:11	9/25/17	
Perfluorooctanoic acid (PFOA)	**4.5**		1.7	1	09/26/17 10:11	9/25/17	
Perfluoroheptane sulfonic acid (PFHpS)	ND	U	4.2	1	09/26/17 10:11	9/25/17	
Perfluorononanoic acid (PFNA)	ND	U	4.2	1	09/26/17 10:11	9/25/17	
Perfluorooctane sulfonic acid (PFOS)	**7.4**		4.2	1	09/26/17 10:11	9/25/17	
Perfluorodecanoic acid (PFDA)	ND	U	4.2	1	09/26/17 10:11	9/25/17	
Perfluoroundecanoic acid (PFUnDA)	ND	U	4.2	1	09/26/17 10:11	9/25/17	
Perfluorooctane sulfonamide (FOSA)	ND	U	4.2	1	09/26/17 10:11	9/25/17	
Perfluorododecanoic acid (PFDoDA)	ND	U	4.2	1	09/26/17 10:11	9/25/17	
Perfluorotridecanoic acid (PFTrDA)	ND	U	4.2	1	09/26/17 10:11	9/25/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND	U	4.2	1	09/26/17 10:11	9/25/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND	U	4.2	1	09/26/17 10:11	9/25/17	
Perfluorotetradecanoic acid (PFTeDA)	ND	U	4.2	1	09/26/17 10:11	9/25/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND	U	4.2	1	09/26/17 10:11	9/25/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND	U	4.2	1	09/26/17 10:11	9/25/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND	U	4.2	1	09/26/17 10:11	9/25/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND	U	4.2	1	09/26/17 10:11	9/25/17	
Perfluorodecane sulfonic acid (PFDS)	ND	U	4.2	1	09/26/17 10:11	9/25/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	89	19 - 126	09/26/17 10:11	
13C2-PFHxA	73	10 - 151	09/26/17 10:11	
18O2-PFHxS	77	20 - 128	09/26/17 10:11	
13C2-6:2 FTS	72	10 - 187	09/26/17 10:11	
13C4-PFOA	77	13 - 142	09/26/17 10:11	
13C5-PFNA	70	15 - 143	09/26/17 10:11	
13C4-PFOS	76	11 - 131	09/26/17 10:11	
13C2-PFDA	113	25 - 129	09/26/17 10:11	
13C2-PFUnDA	84	16 - 129	09/26/17 10:11	
13C2-PFDoDA	79	17 - 114	09/26/17 10:11	
D7-MeFOSE	70	32 - 113	09/26/17 10:11	
D9-EtFOSE	67	20 - 113	09/26/17 10:11	
D5-EtFOSA	46	19 - 103	09/26/17 10:11	
13C2-8:2 FTS	268	50 - 150	09/26/17 10:11	*

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709828
Project:	WWW/16.0062335.50	**Date Collected:**	09/13/17
Sample Matrix:	Water	**Date Received:**	09/15/17 10:45
Sample Name:	SW-DUP-1P	**Units:**	ng/L
Lab Code:	K1709828-003	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M			
Prep Method:	EPA 3535A			
13C2-PFTeDA		88	50 - 150	09/26/17 10:11
13C4-PFHpA		96	50 - 150	09/26/17 10:11
13C5-PFPeA		96	50 - 150	09/26/17 10:11
13C3-PFBS		50	50 - 150	09/26/17 10:11
13C8-FOSA		75	50 - 150	09/26/17 10:11

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709828
Project:	WWW/16.0062335.50	**Date Collected:**	09/13/17
Sample Matrix:	Water	**Date Received:**	09/15/17 10:45
Sample Name:	PW-DUP-1P	**Units:**	ng/L
Lab Code:	K1709828-004	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result		MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	**13**		8.6	1	09/27/17 15:06	9/26/17	
Perfluoropentanoic acid (PFPeA)	**22**		4.3	1	09/27/17 15:06	9/26/17	
Perfluorobutane sulfonic acid (PFBS)	**11**		4.3	1	09/27/17 15:06	9/26/17	
Perfluorohexanoic acid (PFHxA)	**81**		4.3	1	09/27/17 15:06	9/26/17	
Perfluoroheptanoic acid (PFHpA)	**22**		4.3	1	09/27/17 15:06	9/26/17	
Perfluorohexane sulfonic acid (PFHxS)	**8.9**		4.3	1	09/27/17 15:06	9/26/17	
Perfluorooctanoic acid (PFOA)	**32**		1.7	1	09/28/17 20:37	9/26/17	
Perfluoroheptane sulfonic acid (PFHpS)	ND	U	4.3	1	09/27/17 15:06	9/26/17	
Perfluorononanoic acid (PFNA)	ND	U	4.3	1	09/27/17 15:06	9/26/17	
Perfluorooctane sulfonic acid (PFOS)	ND	U	4.3	1	09/28/17 20:37	9/26/17	
Perfluorodecanoic acid (PFDA)	ND	U	4.3	1	09/27/17 15:06	9/26/17	
Perfluoroundecanoic acid (PFUnDA)	ND	U	4.3	1	09/27/17 15:06	9/26/17	
Perfluorooctane sulfonamide (FOSA)	ND	U	4.3	1	09/27/17 15:06	9/26/17	
Perfluorododecanoic acid (PFDoDA)	ND	U	4.3	1	09/27/17 15:06	9/26/17	
Perfluorotridecanoic acid (PFTrDA)	ND	U	4.3	1	09/27/17 15:06	9/26/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND	U	4.3	1	09/27/17 15:06	9/26/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND	U	4.3	1	09/27/17 15:06	9/26/17	
Perfluorotetradecanoic acid (PFTeDA)	ND	U	4.3	1	09/27/17 15:06	9/26/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND	U	4.3	1	09/27/17 15:06	9/26/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND	U	4.3	1	09/27/17 15:06	9/26/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND	U	4.3	1	09/27/17 15:06	9/26/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND	U	4.3	1	09/27/17 15:06	9/26/17	
Perfluorodecane sulfonic acid (PFDS)	ND	U	4.3	1	09/27/17 15:06	9/26/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	106	19 - 126	09/27/17 15:06	
13C2-PFHxA	100	10 - 151	09/27/17 15:06	
18O2-PFHxS	95	20 - 128	09/27/17 15:06	
13C2-6:2 FTS	202	10 - 187	09/27/17 15:06	*
13C4-PFOA	108	13 - 142	09/28/17 20:37	
13C5-PFNA	104	15 - 143	09/27/17 15:06	
13C4-PFOS	75	11 - 131	09/28/17 20:37	
13C2-PFDA	114	25 - 129	09/27/17 15:06	
13C2-PFUnDA	92	16 - 129	09/27/17 15:06	
13C2-PFDoDA	76	17 - 114	09/27/17 15:06	
D7-MeFOSE	76	32 - 113	09/27/17 15:06	
D9-EtFOSE	65	20 - 113	09/27/17 15:06	
D5-EtFOSA	42	19 - 103	09/27/17 15:06	
13C2-8:2 FTS	224	50 - 150	09/27/17 15:06	*

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709828
Project:	WWW/16.0062335.50	**Date Collected:**	09/13/17
Sample Matrix:	Water	**Date Received:**	09/15/17 10:45
Sample Name:	PW-DUP-1P	**Units:**	ng/L
Lab Code:	K1709828-004	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M			
Prep Method:	EPA 3535A			
13C2-PFTeDA		68	50 - 150	09/27/17 15:06
13C4-PFHpA		120	50 - 150	09/27/17 15:06
13C5-PFPeA		113	50 - 150	09/27/17 15:06
13C3-PFBS		59	50 - 150	09/27/17 15:06
13C8-FOSA		74	50 - 150	09/27/17 15:06

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709828
Project:	WWW/16.0062335.50	**Date Collected:**	09/13/17 02:40
Sample Matrix:	Water	**Date Received:**	09/15/17 10:45
Sample Name:	SW-17-4	**Units:**	ng/L
Lab Code:	K1709828-005	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result		MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	ND	U	8.3	1	09/26/17 10:21	9/25/17	
Perfluoropentanoic acid (PFPeA)	ND	U	4.2	1	09/26/17 10:21	9/25/17	
Perfluorobutane sulfonic acid (PFBS)	ND	U	4.2	1	09/26/17 10:21	9/25/17	
Perfluorohexanoic acid (PFHxA)	ND	U	4.2	1	09/26/17 10:21	9/25/17	
Perfluoroheptanoic acid (PFHpA)	ND	U	4.2	1	09/26/17 10:21	9/25/17	
Perfluorohexane sulfonic acid (PFHxS)	ND	U	4.2	1	09/26/17 10:21	9/25/17	
Perfluorooctanoic acid (PFOA)	**4.4**		1.7	1	09/26/17 10:21	9/25/17	
Perfluoroheptane sulfonic acid (PFHpS)	ND	U	4.2	1	09/26/17 10:21	9/25/17	
Perfluorononanoic acid (PFNA)	ND	U	4.2	1	09/26/17 10:21	9/25/17	
Perfluorooctane sulfonic acid (PFOS)	**7.6**		4.2	1	09/26/17 10:21	9/25/17	
Perfluorodecanoic acid (PFDA)	ND	U	4.2	1	09/26/17 10:21	9/25/17	
Perfluoroundecanoic acid (PFUnDA)	ND	U	4.2	1	09/26/17 10:21	9/25/17	
Perfluorooctane sulfonamide (FOSA)	ND	U	4.2	1	09/26/17 10:21	9/25/17	
Perfluorododecanoic acid (PFDoDA)	ND	U	4.2	1	09/26/17 10:21	9/25/17	
Perfluorotridecanoic acid (PFTrDA)	ND	U	4.2	1	09/26/17 10:21	9/25/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND	U	4.2	1	09/26/17 10:21	9/25/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND	U	4.2	1	09/26/17 10:21	9/25/17	
Perfluorotetradecanoic acid (PFTeDA)	ND	U	4.2	1	09/26/17 10:21	9/25/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND	U	4.2	1	09/26/17 10:21	9/25/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND	U	4.2	1	09/26/17 10:21	9/25/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND	U	4.2	1	09/26/17 10:21	9/25/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND	U	4.2	1	09/26/17 10:21	9/25/17	
Perfluorodecane sulfonic acid (PFDS)	ND	U	4.2	1	09/26/17 10:21	9/25/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	84	19 - 126	09/26/17 10:21	
13C2-PFHxA	80	10 - 151	09/26/17 10:21	
18O2-PFHxS	62	20 - 128	09/26/17 10:21	
13C2-6:2 FTS	85	10 - 187	09/26/17 10:21	
13C4-PFOA	76	13 - 142	09/26/17 10:21	
13C5-PFNA	72	15 - 143	09/26/17 10:21	
13C4-PFOS	75	11 - 131	09/26/17 10:21	
13C2-PFDA	92	25 - 129	09/26/17 10:21	
13C2-PFUnDA	78	16 - 129	09/26/17 10:21	
13C2-PFDoDA	78	17 - 114	09/26/17 10:21	
D7-MeFOSE	69	32 - 113	09/26/17 10:21	
D9-EtFOSE	63	20 - 113	09/26/17 10:21	
D5-EtFOSA	52	19 - 103	09/26/17 10:21	
13C2-8:2 FTS	138	50 - 150	09/26/17 10:21	

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709828
Project:	WWW/16.0062335.50	**Date Collected:**	09/13/17 02:40
Sample Matrix:	Water	**Date Received:**	09/15/17 10:45
Sample Name:	SW-17-4	**Units:**	ng/L
Lab Code:	K1709828-005	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M			
Prep Method:	EPA 3535A			
13C2-PFTeDA	84	50 - 150	09/26/17 10:21	
13C4-PFHpA	81	50 - 150	09/26/17 10:21	
13C5-PFPeA	90	50 - 150	09/26/17 10:21	
13C3-PFBS	48	50 - 150	09/26/17 10:21	*
13C8-FOSA	72	50 - 150	09/26/17 10:21	

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709828
Project:	WWW/16.0062335.50	**Date Collected:**	09/13/17 04:20
Sample Matrix:	Water	**Date Received:**	09/15/17 10:45
Sample Name:	PW-17-5B	**Units:**	ng/L
Lab Code:	K1709828-006	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result		MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	**17**		8.6	1	09/27/17 15:17	9/26/17	
Perfluoropentanoic acid (PFPeA)	**32**		4.3	1	09/27/17 15:17	9/26/17	
Perfluorobutane sulfonic acid (PFBS)	**15**		4.3	1	09/27/17 15:17	9/26/17	
Perfluorohexanoic acid (PFHxA)	**92**		4.3	1	09/27/17 15:17	9/26/17	
Perfluoroheptanoic acid (PFHpA)	**26**		4.3	1	09/27/17 15:17	9/26/17	
Perfluorohexane sulfonic acid (PFHxS)	ND	U	4.3	1	09/27/17 15:17	9/26/17	
Perfluorooctanoic acid (PFOA)	**24**		1.7	1	09/27/17 15:17	9/26/17	
Perfluoroheptane sulfonic acid (PFHpS)	ND	U	4.3	1	09/27/17 15:17	9/26/17	
Perfluorononanoic acid (PFNA)	ND	U	4.3	1	09/27/17 15:17	9/26/17	
Perfluorooctane sulfonic acid (PFOS)	ND	U	4.3	1	09/27/17 15:17	9/26/17	
Perfluorodecanoic acid (PFDA)	ND	U	4.3	1	09/27/17 15:17	9/26/17	
Perfluoroundecanoic acid (PFUnDA)	ND	U	4.3	1	09/27/17 15:17	9/26/17	
Perfluorooctane sulfonamide (FOSA)	ND	U	4.3	1	09/27/17 15:17	9/26/17	
Perfluorododecanoic acid (PFDoDA)	ND	U	4.3	1	09/27/17 15:17	9/26/17	
Perfluorotridecanoic acid (PFTrDA)	ND	U	4.3	1	09/27/17 15:17	9/26/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND	U	4.3	1	09/27/17 15:17	9/26/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND	U	4.3	1	09/27/17 15:17	9/26/17	
Perfluorotetradecanoic acid (PFTeDA)	ND	U	4.3	1	09/27/17 15:17	9/26/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND	U	4.3	1	09/27/17 15:17	9/26/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND	U	4.3	1	09/28/17 20:48	9/26/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND	U	4.3	1	09/27/17 15:17	9/26/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	**9.3**		4.3	1	09/28/17 20:48	9/26/17	
Perfluorodecane sulfonic acid (PFDS)	ND	U	4.3	1	09/27/17 15:17	9/26/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	105	19 - 126	09/27/17 15:17	
13C2-PFHxA	97	10 - 151	09/27/17 15:17	
18O2-PFHxS	90	20 - 128	09/27/17 15:17	
13C2-6:2 FTS	228	10 - 187	09/28/17 20:48	*
13C4-PFOA	137	13 - 142	09/27/17 15:17	
13C5-PFNA	99	15 - 143	09/27/17 15:17	
13C4-PFOS	85	11 - 131	09/27/17 15:17	
13C2-PFDA	103	25 - 129	09/27/17 15:17	
13C2-PFUnDA	87	16 - 129	09/27/17 15:17	
13C2-PFDoDA	69	17 - 114	09/27/17 15:17	
D7-MeFOSE	55	32 - 113	09/27/17 15:17	
D9-EtFOSE	53	20 - 113	09/27/17 15:17	
D5-EtFOSA	19	19 - 103	09/28/17 20:48	
13C2-8:2 FTS	233	50 - 150	09/27/17 15:17	*

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709828
Project:	WWW/16.0062335.50	**Date Collected:**	09/13/17 04:20
Sample Matrix:	Water	**Date Received:**	09/15/17 10:45
Sample Name:	PW-17-5B	**Units:**	ng/L
Lab Code:	K1709828-006	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M		
Prep Method:	EPA 3535A		
13C2-PFTeDA	61	50 - 150	09/27/17 15:17
13C4-PFHpA	113	50 - 150	09/27/17 15:17
13C5-PFPeA	108	50 - 150	09/27/17 15:17
13C3-PFBS	55	50 - 150	09/27/17 15:17
13C8-FOSA	61	50 - 150	09/27/17 15:17

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709828
Project:	WWW/16.0062335.50	**Date Collected:**	09/13/17 03:30
Sample Matrix:	Water	**Date Received:**	09/15/17 10:45
Sample Name:	PW-17-5A	**Units:**	ng/L
Lab Code:	K1709828-007	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	**13**	8.6	1	09/27/17 15:27	9/26/17	
Perfluoropentanoic acid (PFPeA)	**24**	4.3	1	09/27/17 15:27	9/26/17	
Perfluorobutane sulfonic acid (PFBS)	**12**	4.3	1	09/27/17 15:27	9/26/17	
Perfluorohexanoic acid (PFHxA)	**94**	4.3	1	09/27/17 15:27	9/26/17	
Perfluoroheptanoic acid (PFHpA)	**24**	4.3	1	09/27/17 15:27	9/26/17	
Perfluorohexane sulfonic acid (PFHxS)	**7.4**	4.3	1	09/27/17 15:27	9/26/17	
Perfluorooctanoic acid (PFOA)	**37**	1.7	1	09/28/17 20:58	9/26/17	
Perfluoroheptane sulfonic acid (PFHpS)	ND U	4.3	1	09/27/17 15:27	9/26/17	
Perfluorononanoic acid (PFNA)	ND U	4.3	1	09/27/17 15:27	9/26/17	
Perfluorooctane sulfonic acid (PFOS)	ND U	4.3	1	09/27/17 15:27	9/26/17	
Perfluorodecanoic acid (PFDA)	ND U	4.3	1	09/27/17 15:27	9/26/17	
Perfluoroundecanoic acid (PFUnDA)	ND U	4.3	1	09/27/17 15:27	9/26/17	
Perfluorooctane sulfonamide (FOSA)	ND U	4.3	1	09/27/17 15:27	9/26/17	
Perfluorododecanoic acid (PFDoDA)	ND U	4.3	1	09/27/17 15:27	9/26/17	
Perfluorotridecanoic acid (PFTrDA)	ND U	4.3	1	09/27/17 15:27	9/26/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND U	4.3	1	09/27/17 15:27	9/26/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND U	4.3	1	09/27/17 15:27	9/26/17	
Perfluorotetradecanoic acid (PFTeDA)	ND U	4.3	1	09/27/17 15:27	9/26/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND U	4.3	1	09/27/17 15:27	9/26/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND U	4.3	1	09/27/17 15:27	9/26/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND U	4.3	1	09/27/17 15:27	9/26/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND U	4.3	1	09/27/17 15:27	9/26/17	
Perfluorodecane sulfonic acid (PFDS)	ND U	4.3	1	09/27/17 15:27	9/26/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	112	19 - 126	09/27/17 15:27	
13C2-PFHxA	93	10 - 151	09/27/17 15:27	
18O2-PFHxS	98	20 - 128	09/27/17 15:27	
13C2-6:2 FTS	224	10 - 187	09/27/17 15:27	*
13C4-PFOA	109	13 - 142	09/28/17 20:58	
13C5-PFNA	127	15 - 143	09/27/17 15:27	
13C4-PFOS	99	11 - 131	09/27/17 15:27	
13C2-PFDA	133	25 - 129	09/27/17 15:27	*
13C2-PFUnDA	105	16 - 129	09/27/17 15:27	
13C2-PFDoDA	87	17 - 114	09/27/17 15:27	
D7-MeFOSE	64	32 - 113	09/27/17 15:27	
D9-EtFOSE	60	20 - 113	09/27/17 15:27	
D5-EtFOSA	19	19 - 103	09/27/17 15:27	
13C2-8:2 FTS	298	50 - 150	09/27/17 15:27	*

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709828
Project:	WWW/16.0062335.50	**Date Collected:**	09/13/17 03:30
Sample Matrix:	Water	**Date Received:**	09/15/17 10:45
Sample Name:	PW-17-5A	**Units:**	ng/L
Lab Code:	K1709828-007	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M			
Prep Method:	EPA 3535A			
13C2-PFTeDA	39	50 - 150	09/27/17 15:27	*
13C4-PFHpA	134	50 - 150	09/27/17 15:27	
13C5-PFPeA	115	50 - 150	09/27/17 15:27	
13C3-PFBS	59	50 - 150	09/27/17 15:27	
13C8-FOSA	75	50 - 150	09/27/17 15:27	

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709828
Project:	WWW/16.0062335.50	**Date Collected:**	09/12/17 05:00
Sample Matrix:	Water	**Date Received:**	09/15/17 10:45
Sample Name:	FB-17-1	**Units:**	ng/L
Lab Code:	K1709828-008	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	ND U	8.8	1	09/26/17 10:32	9/25/17	
Perfluoropentanoic acid (PFPeA)	ND U	4.4	1	09/26/17 10:32	9/25/17	
Perfluorobutane sulfonic acid (PFBS)	ND U	4.4	1	09/26/17 10:32	9/25/17	
Perfluorohexanoic acid (PFHxA)	ND U	4.4	1	09/26/17 10:32	9/25/17	
Perfluoroheptanoic acid (PFHpA)	ND U	4.4	1	09/26/17 10:32	9/25/17	
Perfluorohexane sulfonic acid (PFHxS)	ND U	4.4	1	09/26/17 10:32	9/25/17	
Perfluorooctanoic acid (PFOA)	ND U	1.8	1	09/26/17 10:32	9/25/17	
Perfluoroheptane sulfonic acid (PFHpS)	ND U	4.4	1	09/26/17 10:32	9/25/17	
Perfluorononanoic acid (PFNA)	ND U	4.4	1	09/26/17 10:32	9/25/17	
Perfluorooctane sulfonic acid (PFOS)	ND U	4.4	1	09/26/17 10:32	9/25/17	
Perfluorodecanoic acid (PFDA)	ND U	4.4	1	09/26/17 10:32	9/25/17	
Perfluoroundecanoic acid (PFUnDA)	ND U	4.4	1	09/26/17 10:32	9/25/17	
Perfluorooctane sulfonamide (FOSA)	ND U	4.4	1	09/26/17 10:32	9/25/17	
Perfluorododecanoic acid (PFDoDA)	ND U	4.4	1	09/26/17 10:32	9/25/17	
Perfluorotridecanoic acid (PFTrDA)	ND U	4.4	1	09/26/17 10:32	9/25/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND U	4.4	1	09/26/17 10:32	9/25/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND U	4.4	1	09/26/17 10:32	9/25/17	
Perfluorotetradecanoic acid (PFTeDA)	ND U	4.4	1	09/26/17 10:32	9/25/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND U	4.4	1	09/26/17 10:32	9/25/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND U	4.4	1	09/26/17 10:32	9/25/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND U	4.4	1	09/26/17 10:32	9/25/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND U	4.4	1	09/26/17 10:32	9/25/17	
Perfluorodecane sulfonic acid (PFDS)	ND U	4.4	1	09/26/17 10:32	9/25/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	85	19 - 126	09/26/17 10:32	
13C2-PFHxA	79	10 - 151	09/26/17 10:32	
18O2-PFHxS	68	20 - 128	09/26/17 10:32	
13C2-6:2 FTS	75	10 - 187	09/26/17 10:32	
13C4-PFOA	74	13 - 142	09/26/17 10:32	
13C5-PFNA	75	15 - 143	09/26/17 10:32	
13C4-PFOS	82	11 - 131	09/26/17 10:32	
13C2-PFDA	92	25 - 129	09/26/17 10:32	
13C2-PFUnDA	79	16 - 129	09/26/17 10:32	
13C2-PFDoDA	77	17 - 114	09/26/17 10:32	
D7-MeFOSE	77	32 - 113	09/26/17 10:32	
D9-EtFOSE	71	20 - 113	09/26/17 10:32	
D5-EtFOSA	55	19 - 103	09/26/17 10:32	
13C2-8:2 FTS	137	50 - 150	09/26/17 10:32	

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709828
Project:	WWW/16.0062335.50	**Date Collected:**	09/12/17 05:00
Sample Matrix:	Water	**Date Received:**	09/15/17 10:45
Sample Name:	FB-17-1	**Units:**	ng/L
Lab Code:	K1709828-008	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M
Prep Method:	EPA 3535A

13C2-PFTeDA	86	50 - 150	09/26/17 10:32
13C4-PFHpA	92	50 - 150	09/26/17 10:32
13C5-PFPeA	92	50 - 150	09/26/17 10:32
13C3-PFBS	50	50 - 150	09/26/17 10:32
13C8-FOSA	75	50 - 150	09/26/17 10:32

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709828
Project:	WWW/16.0062335.50	**Date Collected:**	09/13/17 03:30
Sample Matrix:	Water	**Date Received:**	09/15/17 10:45
Sample Name:	FB-17-2	**Units:**	ng/L
Lab Code:	K1709828-009	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	ND U	8.6	1	09/26/17 10:42	9/25/17	
Perfluoropentanoic acid (PFPeA)	ND U	4.3	1	09/26/17 10:42	9/25/17	
Perfluorobutane sulfonic acid (PFBS)	ND U	4.3	1	09/26/17 10:42	9/25/17	
Perfluorohexanoic acid (PFHxA)	ND U	4.3	1	09/26/17 10:42	9/25/17	
Perfluoroheptanoic acid (PFHpA)	ND U	4.3	1	09/26/17 10:42	9/25/17	
Perfluorohexane sulfonic acid (PFHxS)	ND U	4.3	1	09/26/17 10:42	9/25/17	
Perfluorooctanoic acid (PFOA)	ND U	1.7	1	09/26/17 10:42	9/25/17	
Perfluoroheptane sulfonic acid (PFHpS)	ND U	4.3	1	09/26/17 10:42	9/25/17	
Perfluorononanoic acid (PFNA)	ND U	4.3	1	09/26/17 10:42	9/25/17	
Perfluorooctane sulfonic acid (PFOS)	ND U	4.3	1	09/26/17 10:42	9/25/17	
Perfluorodecanoic acid (PFDA)	ND U	4.3	1	09/26/17 10:42	9/25/17	
Perfluoroundecanoic acid (PFUnDA)	ND U	4.3	1	09/26/17 10:42	9/25/17	
Perfluorooctane sulfonamide (FOSA)	ND U	4.3	1	09/26/17 10:42	9/25/17	
Perfluorododecanoic acid (PFDoDA)	ND U	4.3	1	09/26/17 10:42	9/25/17	
Perfluorotridecanoic acid (PFTrDA)	ND U	4.3	1	09/26/17 10:42	9/25/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND U	4.3	1	09/26/17 10:42	9/25/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND U	4.3	1	09/26/17 10:42	9/25/17	
Perfluorotetradecanoic acid (PFTeDA)	ND U	4.3	1	09/26/17 10:42	9/25/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND U	4.3	1	09/26/17 10:42	9/25/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND U	4.3	1	09/26/17 10:42	9/25/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND U	4.3	1	09/26/17 10:42	9/25/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND U	4.3	1	09/26/17 10:42	9/25/17	
Perfluorodecane sulfonic acid (PFDS)	ND U	4.3	1	09/26/17 10:42	9/25/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	92	19 - 126	09/26/17 10:42	
13C2-PFHxA	82	10 - 151	09/26/17 10:42	
18O2-PFHxS	72	20 - 128	09/26/17 10:42	
13C2-6:2 FTS	89	10 - 187	09/26/17 10:42	
13C4-PFOA	85	13 - 142	09/26/17 10:42	
13C5-PFNA	80	15 - 143	09/26/17 10:42	
13C4-PFOS	85	11 - 131	09/26/17 10:42	
13C2-PFDA	125	25 - 129	09/26/17 10:42	
13C2-PFUnDA	94	16 - 129	09/26/17 10:42	
13C2-PFDoDA	84	17 - 114	09/26/17 10:42	
D7-MeFOSE	85	32 - 113	09/26/17 10:42	
D9-EtFOSE	78	20 - 113	09/26/17 10:42	
D5-EtFOSA	60	19 - 103	09/26/17 10:42	
13C2-8:2 FTS	277	50 - 150	09/26/17 10:42	*

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709828
Project:	WWW/16.0062335.50	**Date Collected:**	09/13/17 03:30
Sample Matrix:	Water	**Date Received:**	09/15/17 10:45
Sample Name:	FB-17-2	**Units:**	ng/L
Lab Code:	K1709828-009	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M			
Prep Method:	EPA 3535A			
13C2-PFTeDA		98	50 - 150	09/26/17 10:42
13C4-PFHpA		105	50 - 150	09/26/17 10:42
13C5-PFPeA		100	50 - 150	09/26/17 10:42
13C3-PFBS		55	50 - 150	09/26/17 10:42
13C8-FOSA		83	50 - 150	09/26/17 10:42

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709828
Project:	WWW/16.0062335.50	**Date Collected:**	09/13/17 05:40
Sample Matrix:	Water	**Date Received:**	09/15/17 10:45
Sample Name:	EQ-17-1P	**Units:**	ng/L
Lab Code:	K1709828-010	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result		MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	ND	U	8.6	1	09/26/17 10:53	9/25/17	
Perfluoropentanoic acid (PFPeA)	ND	U	4.3	1	09/26/17 10:53	9/25/17	
Perfluorobutane sulfonic acid (PFBS)	ND	U	4.3	1	09/26/17 10:53	9/25/17	
Perfluorohexanoic acid (PFHxA)	ND	U	4.3	1	09/26/17 10:53	9/25/17	
Perfluoroheptanoic acid (PFHpA)	ND	U	4.3	1	09/26/17 10:53	9/25/17	
Perfluorohexane sulfonic acid (PFHxS)	ND	U	4.3	1	09/26/17 10:53	9/25/17	
Perfluorooctanoic acid (PFOA)	ND	U	1.7	1	09/26/17 10:53	9/25/17	
Perfluoroheptane sulfonic acid (PFHpS)	ND	U	4.3	1	09/26/17 10:53	9/25/17	
Perfluorononanoic acid (PFNA)	ND	U	4.3	1	09/26/17 10:53	9/25/17	
Perfluorooctane sulfonic acid (PFOS)	ND	U	4.3	1	09/26/17 10:53	9/25/17	
Perfluorodecanoic acid (PFDA)	ND	U	4.3	1	09/26/17 10:53	9/25/17	
Perfluoroundecanoic acid (PFUnDA)	ND	U	4.3	1	09/26/17 10:53	9/25/17	
Perfluorooctane sulfonamide (FOSA)	ND	U	4.3	1	09/26/17 10:53	9/25/17	
Perfluorododecanoic acid (PFDoDA)	ND	U	4.3	1	09/26/17 10:53	9/25/17	
Perfluorotridecanoic acid (PFTrDA)	ND	U	4.3	1	09/26/17 10:53	9/25/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND	U	4.3	1	09/26/17 10:53	9/25/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND	U	4.3	1	09/26/17 10:53	9/25/17	
Perfluorotetradecanoic acid (PFTeDA)	ND	U	4.3	1	09/26/17 10:53	9/25/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND	U	4.3	1	09/26/17 10:53	9/25/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND	U	4.3	1	09/26/17 10:53	9/25/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND	U	4.3	1	09/26/17 10:53	9/25/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND	U	4.3	1	09/26/17 10:53	9/25/17	
Perfluorodecane sulfonic acid (PFDS)	ND	U	4.3	1	09/26/17 10:53	9/25/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	93	19 - 126	09/26/17 10:53	
13C2-PFHxA	97	10 - 151	09/26/17 10:53	
18O2-PFHxS	83	20 - 128	09/26/17 10:53	
13C2-6:2 FTS	72	10 - 187	09/26/17 10:53	
13C4-PFOA	98	13 - 142	09/26/17 10:53	
13C5-PFNA	89	15 - 143	09/26/17 10:53	
13C4-PFOS	87	11 - 131	09/26/17 10:53	
13C2-PFDA	107	25 - 129	09/26/17 10:53	
13C2-PFUnDA	90	16 - 129	09/26/17 10:53	
13C2-PFDoDA	86	17 - 114	09/26/17 10:53	
D7-MeFOSE	82	32 - 113	09/26/17 10:53	
D9-EtFOSE	84	20 - 113	09/26/17 10:53	
D5-EtFOSA	53	19 - 103	09/26/17 10:53	
13C2-8:2 FTS	149	50 - 150	09/26/17 10:53	

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709828
Project:	WWW/16.0062335.50	**Date Collected:**	09/13/17 05:40
Sample Matrix:	Water	**Date Received:**	09/15/17 10:45
Sample Name:	EQ-17-1P	**Units:**	ng/L
Lab Code:	K1709828-010	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M			
Prep Method:	EPA 3535A			
13C2-PFTeDA		90	50 - 150	09/26/17 10:53
13C4-PFHpA		104	50 - 150	09/26/17 10:53
13C5-PFPeA		99	50 - 150	09/26/17 10:53
13C3-PFBS		52	50 - 150	09/26/17 10:53
13C8-FOSA		84	50 - 150	09/26/17 10:53

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709828
Project:	WWW/16.0062335.50	**Date Collected:**	09/14/17 10:50
Sample Matrix:	Water	**Date Received:**	09/15/17 10:45
Sample Name:	PW-17-6A	**Units:**	ng/L
Lab Code:	K1709828-011	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result		MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	ND	U	8.3	1	09/27/17 15:38	9/26/17	
Perfluoropentanoic acid (PFPeA)	ND	U	4.2	1	09/27/17 15:38	9/26/17	
Perfluorobutane sulfonic acid (PFBS)	**15**		4.2	1	09/27/17 15:38	9/26/17	
Perfluorohexanoic acid (PFHxA)	**4.9**		4.2	1	09/27/17 15:38	9/26/17	
Perfluoroheptanoic acid (PFHpA)	ND	U	4.2	1	09/27/17 15:38	9/26/17	
Perfluorohexane sulfonic acid (PFHxS)	**10**		4.2	1	09/27/17 15:38	9/26/17	
Perfluorooctanoic acid (PFOA)	**26**		1.7	1	09/27/17 15:38	9/26/17	
Perfluoroheptane sulfonic acid (PFHpS)	ND	U	4.2	1	09/27/17 15:38	9/26/17	
Perfluorononanoic acid (PFNA)	ND	U	4.2	1	09/27/17 15:38	9/26/17	
Perfluorooctane sulfonic acid (PFOS)	**57**		4.2	1	09/27/17 15:38	9/26/17	
Perfluorodecanoic acid (PFDA)	ND	U	4.2	1	09/27/17 15:38	9/26/17	
Perfluoroundecanoic acid (PFUnDA)	ND	U	4.2	1	09/27/17 15:38	9/26/17	
Perfluorooctane sulfonamide (FOSA)	ND	U	4.2	1	09/27/17 15:38	9/26/17	
Perfluorododecanoic acid (PFDoDA)	ND	U	4.2	1	09/27/17 15:38	9/26/17	
Perfluorotridecanoic acid (PFTrDA)	ND	U	4.2	1	09/27/17 15:38	9/26/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND	U	4.2	1	09/27/17 15:38	9/26/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND	U	4.2	1	09/27/17 15:38	9/26/17	
Perfluorotetradecanoic acid (PFTeDA)	ND	U	4.2	1	09/27/17 15:38	9/26/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND	U	4.2	1	09/27/17 15:38	9/26/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND	U	4.2	1	09/27/17 15:38	9/26/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND	U	4.2	1	09/27/17 15:38	9/26/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND	U	4.2	1	09/27/17 15:38	9/26/17	
Perfluorodecane sulfonic acid (PFDS)	ND	U	4.2	1	09/27/17 15:38	9/26/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	101	19 - 126	09/27/17 15:38	
13C2-PFHxA	105	10 - 151	09/27/17 15:38	
18O2-PFHxS	93	20 - 128	09/27/17 15:38	
13C2-6:2 FTS	102	10 - 187	09/27/17 15:38	
13C4-PFOA	133	13 - 142	09/27/17 15:38	
13C5-PFNA	89	15 - 143	09/27/17 15:38	
13C4-PFOS	85	11 - 131	09/27/17 15:38	
13C2-PFDA	110	25 - 129	09/27/17 15:38	
13C2-PFUnDA	82	16 - 129	09/27/17 15:38	
13C2-PFDoDA	75	17 - 114	09/27/17 15:38	
D7-MeFOSE	75	32 - 113	09/27/17 15:38	
D9-EtFOSE	77	20 - 113	09/27/17 15:38	
D5-EtFOSA	59	19 - 103	09/27/17 15:38	
13C2-8:2 FTS	155	50 - 150	09/27/17 15:38	*

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709828
Project:	WWW/16.0062335.50	**Date Collected:**	09/14/17 10:50
Sample Matrix:	Water	**Date Received:**	09/15/17 10:45
Sample Name:	PW-17-6A	**Units:**	ng/L
Lab Code:	K1709828-011	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M
Prep Method:	EPA 3535A

13C2-PFTeDA	77	50 - 150	09/27/17 15:38
13C4-PFHpA	106	50 - 150	09/27/17 15:38
13C5-PFPeA	108	50 - 150	09/27/17 15:38
13C3-PFBS	58	50 - 150	09/27/17 15:38
13C8-FOSA	75	50 - 150	09/27/17 15:38

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709828
Project:	WWW/16.0062335.50	**Date Collected:**	09/14/17 11:20
Sample Matrix:	Water	**Date Received:**	09/15/17 10:45
Sample Name:	PW-17-6B	**Units:**	ng/L
Lab Code:	K1709828-012	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	**11**	8.6	1	09/27/17 15:48	9/26/17	
Perfluoropentanoic acid (PFPeA)	**7.1**	4.3	1	09/27/17 15:48	9/26/17	
Perfluorobutane sulfonic acid (PFBS)	**110**	4.3	1	09/27/17 15:48	9/26/17	
Perfluorohexanoic acid (PFHxA)	**33**	4.3	1	09/27/17 15:48	9/26/17	
Perfluoroheptanoic acid (PFHpA)	**27**	4.3	1	09/27/17 15:48	9/26/17	
Perfluorohexane sulfonic acid (PFHxS)	**57**	4.3	1	09/27/17 15:48	9/26/17	
Perfluorooctanoic acid (PFOA)	**170**	1.7	1	09/27/17 15:48	9/26/17	
Perfluoroheptane sulfonic acid (PFHpS)	**18**	4.3	1	09/27/17 15:48	9/26/17	
Perfluorononanoic acid (PFNA)	**5.5**	4.3	1	09/27/17 15:48	9/26/17	
Perfluorooctane sulfonic acid (PFOS)	**170**	4.3	1	09/27/17 15:48	9/26/17	
Perfluorodecanoic acid (PFDA)	ND U	4.3	1	09/27/17 15:48	9/26/17	
Perfluoroundecanoic acid (PFUnDA)	ND U	4.3	1	09/27/17 15:48	9/26/17	
Perfluorooctane sulfonamide (FOSA)	**4.7**	4.3	1	09/27/17 15:48	9/26/17	
Perfluorododecanoic acid (PFDoDA)	ND U	4.3	1	09/27/17 15:48	9/26/17	
Perfluorotridecanoic acid (PFTrDA)	ND U	4.3	1	09/27/17 15:48	9/26/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND U	4.3	1	09/27/17 15:48	9/26/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND U	4.3	1	09/27/17 15:48	9/26/17	
Perfluorotetradecanoic acid (PFTeDA)	ND U	4.3	1	09/27/17 15:48	9/26/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND U	4.3	1	09/27/17 15:48	9/26/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND U	4.3	1	09/27/17 15:48	9/26/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND U	4.3	1	09/27/17 15:48	9/26/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND U	4.3	1	09/27/17 15:48	9/26/17	
Perfluorodecane sulfonic acid (PFDS)	ND U	4.3	1	09/27/17 15:48	9/26/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	105	19 - 126	09/27/17 15:48	
13C2-PFHxA	88	10 - 151	09/27/17 15:48	
18O2-PFHxS	96	20 - 128	09/27/17 15:48	
13C2-6:2 FTS	114	10 - 187	09/27/17 15:48	
13C4-PFOA	136	13 - 142	09/27/17 15:48	
13C5-PFNA	99	15 - 143	09/27/17 15:48	
13C4-PFOS	87	11 - 131	09/27/17 15:48	
13C2-PFDA	102	25 - 129	09/27/17 15:48	
13C2-PFUnDA	82	16 - 129	09/27/17 15:48	
13C2-PFDoDA	71	17 - 114	09/27/17 15:48	
D7-MeFOSE	66	32 - 113	09/27/17 15:48	
D9-EtFOSE	64	20 - 113	09/27/17 15:48	
D5-EtFOSA	30	19 - 103	09/27/17 15:48	
13C2-8:2 FTS	132	50 - 150	09/27/17 15:48	

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709828
Project:	WWW/16.0062335.50	**Date Collected:**	09/14/17 11:20
Sample Matrix:	Water	**Date Received:**	09/15/17 10:45
Sample Name:	PW-17-6B	**Units:**	ng/L
Lab Code:	K1709828-012	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M		
Prep Method:	EPA 3535A		
13C2-PFTeDA	56	50 - 150	09/27/17 15:48
13C4-PFHpA	119	50 - 150	09/27/17 15:48
13C5-PFPeA	112	50 - 150	09/27/17 15:48
13C3-PFBS	60	50 - 150	09/27/17 15:48
13C8-FOSA	65	50 - 150	09/27/17 15:48

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709828
Project:	WWW/16.0062335.50	**Date Collected:**	09/14/17
Sample Matrix:	Water	**Date Received:**	09/15/17 10:45
Sample Name:	PW-DUP-2P	**Units:**	ng/L
Lab Code:	K1709828-013	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result		MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	ND	U	8.8	1	09/27/17 15:59	9/26/17	
Perfluoropentanoic acid (PFPeA)	ND	U	4.4	1	09/27/17 15:59	9/26/17	
Perfluorobutane sulfonic acid (PFBS)	**13**		4.4	1	09/27/17 15:59	9/26/17	
Perfluorohexanoic acid (PFHxA)	ND	U	4.4	1	09/27/17 15:59	9/26/17	
Perfluoroheptanoic acid (PFHpA)	**5.0**		4.4	1	09/27/17 15:59	9/26/17	
Perfluorohexane sulfonic acid (PFHxS)	**7.9**		4.4	1	09/27/17 15:59	9/26/17	
Perfluorooctanoic acid (PFOA)	**26**		1.8	1	09/27/17 15:59	9/26/17	
Perfluoroheptane sulfonic acid (PFHpS)	ND	U	4.4	1	09/27/17 15:59	9/26/17	
Perfluorononanoic acid (PFNA)	ND	U	4.4	1	09/27/17 15:59	9/26/17	
Perfluorooctane sulfonic acid (PFOS)	**60**		4.4	1	09/27/17 15:59	9/26/17	
Perfluorodecanoic acid (PFDA)	ND	U	4.4	1	09/27/17 15:59	9/26/17	
Perfluoroundecanoic acid (PFUnDA)	ND	U	4.4	1	09/27/17 15:59	9/26/17	
Perfluorooctane sulfonamide (FOSA)	ND	U	4.4	1	09/27/17 15:59	9/26/17	
Perfluorododecanoic acid (PFDoDA)	ND	U	4.4	1	09/27/17 15:59	9/26/17	
Perfluorotridecanoic acid (PFTrDA)	ND	U	4.4	1	09/27/17 15:59	9/26/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND	U	4.4	1	09/27/17 15:59	9/26/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND	U	4.4	1	09/27/17 15:59	9/26/17	
Perfluorotetradecanoic acid (PFTeDA)	ND	U	4.4	1	09/27/17 15:59	9/26/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND	U	4.4	1	09/27/17 15:59	9/26/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND	U	4.4	1	09/27/17 15:59	9/26/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND	U	4.4	1	09/27/17 15:59	9/26/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND	U	4.4	1	09/27/17 15:59	9/26/17	
Perfluorodecane sulfonic acid (PFDS)	ND	U	4.4	1	09/27/17 15:59	9/26/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	102	19 - 126	09/27/17 15:59	
13C2-PFHxA	112	10 - 151	09/27/17 15:59	
18O2-PFHxS	83	20 - 128	09/27/17 15:59	
13C2-6:2 FTS	98	10 - 187	09/27/17 15:59	
13C4-PFOA	140	13 - 142	09/27/17 15:59	
13C5-PFNA	91	15 - 143	09/27/17 15:59	
13C4-PFOS	83	11 - 131	09/27/17 15:59	
13C2-PFDA	117	25 - 129	09/27/17 15:59	
13C2-PFUnDA	86	16 - 129	09/27/17 15:59	
13C2-PFDoDA	75	17 - 114	09/27/17 15:59	
D7-MeFOSE	75	32 - 113	09/27/17 15:59	
D9-EtFOSE	71	20 - 113	09/27/17 15:59	
D5-EtFOSA	42	19 - 103	09/27/17 15:59	
13C2-8:2 FTS	199	50 - 150	09/27/17 15:59	*

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709828
Project:	WWW/16.0062335.50	**Date Collected:**	09/14/17
Sample Matrix:	Water	**Date Received:**	09/15/17 10:45
Sample Name:	PW-DUP-2P	**Units:**	ng/L
Lab Code:	K1709828-013	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M			
Prep Method:	EPA 3535A			
13C2-PFTeDA		83	50 - 150	09/27/17 15:59
13C4-PFHpA		99	50 - 150	09/27/17 15:59
13C5-PFPeA		109	50 - 150	09/27/17 15:59
13C3-PFBS		59	50 - 150	09/27/17 15:59
13C8-FOSA		72	50 - 150	09/27/17 15:59

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709828
Project:	WWW/16.0062335.50	**Date Collected:**	09/14/17 12:20
Sample Matrix:	Water	**Date Received:**	09/15/17 10:45
Sample Name:	PW-17-7A	**Units:**	ng/L
Lab Code:	K1709828-014	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	ND U	8.6	1	09/27/17 16:09	9/26/17	
Perfluoropentanoic acid (PFPeA)	ND U	4.3	1	09/27/17 16:09	9/26/17	
Perfluorobutane sulfonic acid (PFBS)	ND U	4.3	1	09/27/17 16:09	9/26/17	
Perfluorohexanoic acid (PFHxA)	ND U	4.3	1	09/27/17 16:09	9/26/17	
Perfluoroheptanoic acid (PFHpA)	ND U	4.3	1	09/27/17 16:09	9/26/17	
Perfluorohexane sulfonic acid (PFHxS)	ND U	4.3	1	09/27/17 16:09	9/26/17	
Perfluorooctanoic acid (PFOA)	**4.0**	1.7	1	09/27/17 16:09	9/26/17	
Perfluoroheptane sulfonic acid (PFHpS)	ND U	4.3	1	09/27/17 16:09	9/26/17	
Perfluorononanoic acid (PFNA)	ND U	4.3	1	09/27/17 16:09	9/26/17	
Perfluorooctane sulfonic acid (PFOS)	**31**	4.3	1	09/27/17 16:09	9/26/17	
Perfluorodecanoic acid (PFDA)	ND U	4.3	1	09/27/17 16:09	9/26/17	
Perfluoroundecanoic acid (PFUnDA)	ND U	4.3	1	09/27/17 16:09	9/26/17	
Perfluorooctane sulfonamide (FOSA)	ND U	4.3	1	09/27/17 16:09	9/26/17	
Perfluorododecanoic acid (PFDoDA)	ND U	4.3	1	09/27/17 16:09	9/26/17	
Perfluorotridecanoic acid (PFTrDA)	ND U	4.3	1	09/27/17 16:09	9/26/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND U	4.3	1	09/27/17 16:09	9/26/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND U	4.3	1	09/27/17 16:09	9/26/17	
Perfluorotetradecanoic acid (PFTeDA)	ND U	4.3	1	09/27/17 16:09	9/26/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND U	4.3	1	09/27/17 16:09	9/26/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND U	4.3	1	09/27/17 16:09	9/26/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND U	4.3	1	09/27/17 16:09	9/26/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND U	4.3	1	09/27/17 16:09	9/26/17	
Perfluorodecane sulfonic acid (PFDS)	ND U	4.3	1	09/27/17 16:09	9/26/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	89	19 - 126	09/27/17 16:09	
13C2-PFHxA	102	10 - 151	09/27/17 16:09	
18O2-PFHxS	73	20 - 128	09/27/17 16:09	
13C2-6:2 FTS	96	10 - 187	09/27/17 16:09	
13C4-PFOA	123	13 - 142	09/27/17 16:09	
13C5-PFNA	85	15 - 143	09/27/17 16:09	
13C4-PFOS	77	11 - 131	09/27/17 16:09	
13C2-PFDA	99	25 - 129	09/27/17 16:09	
13C2-PFUnDA	80	16 - 129	09/27/17 16:09	
13C2-PFDoDA	72	17 - 114	09/27/17 16:09	
D7-MeFOSE	75	32 - 113	09/27/17 16:09	
D9-EtFOSE	67	20 - 113	09/27/17 16:09	
D5-EtFOSA	45	19 - 103	09/27/17 16:09	
13C2-8:2 FTS	262	50 - 150	09/27/17 16:09	*

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709828
Project:	WWW/16.0062335.50	**Date Collected:**	09/14/17 12:20
Sample Matrix:	Water	**Date Received:**	09/15/17 10:45
Sample Name:	PW-17-7A	**Units:**	ng/L
Lab Code:	K1709828-014	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M		
Prep Method:	EPA 3535A		
13C2-PFTeDA	86	50 - 150	09/27/17 16:09
13C4-PFHpA	87	50 - 150	09/27/17 16:09
13C5-PFPeA	95	50 - 150	09/27/17 16:09
13C3-PFBS	53	50 - 150	09/27/17 16:09
13C8-FOSA	67	50 - 150	09/27/17 16:09

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709828
Project:	WWW/16.0062335.50	**Date Collected:**	09/14/17 12:50
Sample Matrix:	Water	**Date Received:**	09/15/17 10:45
Sample Name:	PW-17-7B	**Units:**	ng/L
Lab Code:	K1709828-015	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	ND U	8.6	1	09/27/17 16:19	9/26/17	
Perfluoropentanoic acid (PFPeA)	ND U	4.3	1	09/27/17 16:19	9/26/17	
Perfluorobutane sulfonic acid (PFBS)	ND U	4.3	1	09/27/17 16:19	9/26/17	
Perfluorohexanoic acid (PFHxA)	ND U	4.3	1	09/27/17 16:19	9/26/17	
Perfluoroheptanoic acid (PFHpA)	ND U	4.3	1	09/27/17 16:19	9/26/17	
Perfluorohexane sulfonic acid (PFHxS)	ND U	4.3	1	09/27/17 16:19	9/26/17	
Perfluorooctanoic acid (PFOA)	**5.1**	1.7	1	09/27/17 16:19	9/26/17	
Perfluoroheptane sulfonic acid (PFHpS)	ND U	4.3	1	09/27/17 16:19	9/26/17	
Perfluorononanoic acid (PFNA)	ND U	4.3	1	09/27/17 16:19	9/26/17	
Perfluorooctane sulfonic acid (PFOS)	**42**	4.3	1	09/27/17 16:19	9/26/17	
Perfluorodecanoic acid (PFDA)	ND U	4.3	1	09/27/17 16:19	9/26/17	
Perfluoroundecanoic acid (PFUnDA)	ND U	4.3	1	09/27/17 16:19	9/26/17	
Perfluorooctane sulfonamide (FOSA)	ND U	4.3	1	09/27/17 16:19	9/26/17	
Perfluorododecanoic acid (PFDoDA)	ND U	4.3	1	09/27/17 16:19	9/26/17	
Perfluorotridecanoic acid (PFTrDA)	ND U	4.3	1	09/27/17 16:19	9/26/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND U	4.3	1	09/27/17 16:19	9/26/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND U	4.3	1	09/27/17 16:19	9/26/17	
Perfluorotetradecanoic acid (PFTeDA)	ND U	4.3	1	09/27/17 16:19	9/26/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND U	4.3	1	09/27/17 16:19	9/26/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND U	4.3	1	09/27/17 16:19	9/26/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND U	4.3	1	09/27/17 16:19	9/26/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND U	4.3	1	09/27/17 16:19	9/26/17	
Perfluorodecane sulfonic acid (PFDS)	ND U	4.3	1	09/27/17 16:19	9/26/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	93	19 - 126	09/27/17 16:19	
13C2-PFHxA	110	10 - 151	09/27/17 16:19	
18O2-PFHxS	83	20 - 128	09/27/17 16:19	
13C2-6:2 FTS	96	10 - 187	09/27/17 16:19	
13C4-PFOA	130	13 - 142	09/27/17 16:19	
13C5-PFNA	88	15 - 143	09/27/17 16:19	
13C4-PFOS	81	11 - 131	09/27/17 16:19	
13C2-PFDA	109	25 - 129	09/27/17 16:19	
13C2-PFUnDA	90	16 - 129	09/27/17 16:19	
13C2-PFDoDA	79	17 - 114	09/27/17 16:19	
D7-MeFOSE	80	32 - 113	09/27/17 16:19	
D9-EtFOSE	75	20 - 113	09/27/17 16:19	
D5-EtFOSA	56	19 - 103	09/27/17 16:19	
13C2-8:2 FTS	239	50 - 150	09/27/17 16:19	*

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709828
Project:	WWW/16.0062335.50	**Date Collected:**	09/14/17 12:50
Sample Matrix:	Water	**Date Received:**	09/15/17 10:45
Sample Name:	PW-17-7B	**Units:**	ng/L
Lab Code:	K1709828-015	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M			
Prep Method:	EPA 3535A			
13C2-PFTeDA		92	50 - 150	09/27/17 16:19
13C4-PFHpA		95	50 - 150	09/27/17 16:19
13C5-PFPeA		103	50 - 150	09/27/17 16:19
13C3-PFBS		56	50 - 150	09/27/17 16:19
13C8-FOSA		73	50 - 150	09/27/17 16:19

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709828
Project:	WWW/16.0062335.50	**Date Collected:**	09/14/17 12:30
Sample Matrix:	Water	**Date Received:**	09/15/17 10:45
Sample Name:	FB-17-3	**Units:**	ng/L
Lab Code:	K1709828-016	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	ND U	8.8	1	09/26/17 11:03	9/25/17	
Perfluoropentanoic acid (PFPeA)	ND U	4.4	1	09/26/17 11:03	9/25/17	
Perfluorobutane sulfonic acid (PFBS)	ND U	4.4	1	09/26/17 11:03	9/25/17	
Perfluorohexanoic acid (PFHxA)	ND U	4.4	1	09/26/17 11:03	9/25/17	
Perfluoroheptanoic acid (PFHpA)	ND U	4.4	1	09/26/17 11:03	9/25/17	
Perfluorohexane sulfonic acid (PFHxS)	ND U	4.4	1	09/26/17 11:03	9/25/17	
Perfluorooctanoic acid (PFOA)	ND U	1.8	1	09/26/17 11:03	9/25/17	
Perfluoroheptane sulfonic acid (PFHpS)	ND U	4.4	1	09/26/17 11:03	9/25/17	
Perfluorononanoic acid (PFNA)	ND U	4.4	1	09/26/17 11:03	9/25/17	
Perfluorooctane sulfonic acid (PFOS)	ND U	4.4	1	09/26/17 11:03	9/25/17	
Perfluorodecanoic acid (PFDA)	ND U	4.4	1	09/26/17 11:03	9/25/17	
Perfluoroundecanoic acid (PFUnDA)	ND U	4.4	1	09/26/17 11:03	9/25/17	
Perfluorooctane sulfonamide (FOSA)	ND U	4.4	1	09/26/17 11:03	9/25/17	
Perfluorododecanoic acid (PFDoDA)	ND U	4.4	1	09/26/17 11:03	9/25/17	
Perfluorotridecanoic acid (PFTrDA)	ND U	4.4	1	09/26/17 11:03	9/25/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND U	4.4	1	09/26/17 11:03	9/25/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND U	4.4	1	09/26/17 11:03	9/25/17	
Perfluorotetradecanoic acid (PFTeDA)	ND U	4.4	1	09/26/17 11:03	9/25/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND U	4.4	1	09/26/17 11:03	9/25/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND U	4.4	1	09/26/17 11:03	9/25/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND U	4.4	1	09/26/17 11:03	9/25/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND U	4.4	1	09/26/17 11:03	9/25/17	
Perfluorodecane sulfonic acid (PFDS)	ND U	4.4	1	09/26/17 11:03	9/25/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	91	19 - 126	09/26/17 11:03	
13C2-PFHxA	85	10 - 151	09/26/17 11:03	
18O2-PFHxS	69	20 - 128	09/26/17 11:03	
13C2-6:2 FTS	89	10 - 187	09/26/17 11:03	
13C4-PFOA	80	13 - 142	09/26/17 11:03	
13C5-PFNA	84	15 - 143	09/26/17 11:03	
13C4-PFOS	79	11 - 131	09/26/17 11:03	
13C2-PFDA	110	25 - 129	09/26/17 11:03	
13C2-PFUnDA	89	16 - 129	09/26/17 11:03	
13C2-PFDoDA	84	17 - 114	09/26/17 11:03	
D7-MeFOSE	85	32 - 113	09/26/17 11:03	
D9-EtFOSE	78	20 - 113	09/26/17 11:03	
D5-EtFOSA	47	19 - 103	09/26/17 11:03	
13C2-8:2 FTS	225	50 - 150	09/26/17 11:03	*

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709828
Project:	WWW/16.0062335.50	**Date Collected:**	09/14/17 12:30
Sample Matrix:	Water	**Date Received:**	09/15/17 10:45
Sample Name:	FB-17-3	**Units:**	ng/L
Lab Code:	K1709828-016	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M
Prep Method:	EPA 3535A

13C2-PFTeDA	95	50 - 150	09/26/17 11:03
13C4-PFHpA	98	50 - 150	09/26/17 11:03
13C5-PFPeA	98	50 - 150	09/26/17 11:03
13C3-PFBS	51	50 - 150	09/26/17 11:03
13C8-FOSA	81	50 - 150	09/26/17 11:03

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709828
Project:	WWW/16.0062335.50	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/L
Lab Code:	KQ1713886-03	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	ND U	10	1	09/26/17 09:29	9/25/17	
Perfluoropentanoic acid (PFPeA)	ND U	5.0	1	09/26/17 09:29	9/25/17	
Perfluorobutane sulfonic acid (PFBS)	ND U	5.0	1	09/26/17 09:29	9/25/17	
Perfluorohexanoic acid (PFHxA)	ND U	5.0	1	09/26/17 09:29	9/25/17	
Perfluoroheptanoic acid (PFHpA)	ND U	5.0	1	09/26/17 09:29	9/25/17	
Perfluorohexane sulfonic acid (PFHxS)	ND U	5.0	1	09/26/17 09:29	9/25/17	
Perfluorooctanoic acid (PFOA)	ND U	2.0	1	09/26/17 09:29	9/25/17	
Perfluoroheptane sulfonic acid (PFHpS)	ND U	5.0	1	09/26/17 09:29	9/25/17	
Perfluorononanoic acid (PFNA)	ND U	5.0	1	09/26/17 09:29	9/25/17	
Perfluorooctane sulfonic acid (PFOS)	ND U	5.0	1	09/26/17 09:29	9/25/17	
Perfluorodecanoic acid (PFDA)	ND U	5.0	1	09/26/17 09:29	9/25/17	
Perfluoroundecanoic acid (PFUnDA)	ND U	5.0	1	09/26/17 09:29	9/25/17	
Perfluorooctane sulfonamide (FOSA)	ND U	5.0	1	09/26/17 09:29	9/25/17	
Perfluorododecanoic acid (PFDoDA)	ND U	5.0	1	09/26/17 09:29	9/25/17	
Perfluorotridecanoic acid (PFTrDA)	ND U	5.0	1	09/26/17 09:29	9/25/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND U	5.0	1	09/26/17 09:29	9/25/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND U	5.0	1	09/26/17 09:29	9/25/17	
Perfluorotetradecanoic acid (PFTeDA)	ND U	5.0	1	09/26/17 09:29	9/25/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND U	5.0	1	09/26/17 09:29	9/25/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND U	5.0	1	09/26/17 09:29	9/25/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND U	5.0	1	09/26/17 09:29	9/25/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND U	5.0	1	09/26/17 09:29	9/25/17	
Perfluorodecane sulfonic acid (PFDS)	ND U	5.0	1	09/26/17 09:29	9/25/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	76	19 - 126	09/26/17 09:29	
13C2-PFHxA	67	10 - 151	09/26/17 09:29	
18O2-PFHxS	58	20 - 128	09/26/17 09:29	
13C2-6:2 FTS	71	10 - 187	09/26/17 09:29	
13C4-PFOA	72	13 - 142	09/26/17 09:29	
13C5-PFNA	66	15 - 143	09/26/17 09:29	
13C4-PFOS	71	11 - 131	09/26/17 09:29	
13C2-PFDA	94	25 - 129	09/26/17 09:29	
13C2-PFUnDA	76	16 - 129	09/26/17 09:29	
13C2-PFDoDA	68	17 - 114	09/26/17 09:29	
D7-MeFOSE	60	32 - 113	09/26/17 09:29	
D9-EtFOSE	63	20 - 113	09/26/17 09:29	
D5-EtFOSA	43	19 - 103	09/26/17 09:29	
13C2-8:2 FTS	195	50 - 150	09/26/17 09:29	*

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709828
Project:	WWW/16.0062335.50	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/L
Lab Code:	KQ1713886-03	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M			
Prep Method:	EPA 3535A			
13C2-PFTeDA	63	50 - 150	09/26/17 09:29	
13C4-PFHpA	87	50 - 150	09/26/17 09:29	
13C5-PFPeA	84	50 - 150	09/26/17 09:29	
13C3-PFBS	43	50 - 150	09/26/17 09:29	*
13C8-FOSA	69	50 - 150	09/26/17 09:29	

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709828
Project:	WWW/16.0062335.50	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/L
Lab Code:	KQ1713927-03	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	ND U	10	1	09/27/17 14:14	9/26/17	
Perfluoropentanoic acid (PFPeA)	ND U	5.0	1	09/27/17 14:14	9/26/17	
Perfluorobutane sulfonic acid (PFBS)	ND U	5.0	1	09/27/17 14:14	9/26/17	
Perfluorohexanoic acid (PFHxA)	ND U	5.0	1	09/27/17 14:14	9/26/17	
Perfluoroheptanoic acid (PFHpA)	ND U	5.0	1	09/27/17 14:14	9/26/17	
Perfluorohexane sulfonic acid (PFHxS)	ND U	5.0	1	09/27/17 14:14	9/26/17	
Perfluorooctanoic acid (PFOA)	ND U	2.0	1	09/27/17 14:14	9/26/17	
Perfluoroheptane sulfonic acid (PFHpS)	ND U	5.0	1	09/27/17 14:14	9/26/17	
Perfluorononanoic acid (PFNA)	ND U	5.0	1	09/27/17 14:14	9/26/17	
Perfluorooctane sulfonic acid (PFOS)	ND U	5.0	1	09/27/17 14:14	9/26/17	
Perfluorodecanoic acid (PFDA)	ND U	5.0	1	09/27/17 14:14	9/26/17	
Perfluoroundecanoic acid (PFUnDA)	ND U	5.0	1	09/27/17 14:14	9/26/17	
Perfluorooctane sulfonamide (FOSA)	ND U	5.0	1	09/27/17 14:14	9/26/17	
Perfluorododecanoic acid (PFDoDA)	ND U	5.0	1	09/27/17 14:14	9/26/17	
Perfluorotridecanoic acid (PFTrDA)	ND U	5.0	1	09/27/17 14:14	9/26/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND U	5.0	1	09/27/17 14:14	9/26/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND U	5.0	1	09/27/17 14:14	9/26/17	
Perfluorotetradecanoic acid (PFTeDA)	ND U	5.0	1	09/27/17 14:14	9/26/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND U	5.0	1	09/27/17 14:14	9/26/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND U	5.0	1	09/27/17 14:14	9/26/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND U	5.0	1	09/27/17 14:14	9/26/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND U	5.0	1	09/27/17 14:14	9/26/17	
Perfluorodecane sulfonic acid (PFDS)	ND U	5.0	1	09/27/17 14:14	9/26/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	94	19 - 126	09/27/17 14:14	
13C2-PFHxA	98	10 - 151	09/27/17 14:14	
18O2-PFHxS	72	20 - 128	09/27/17 14:14	
13C2-6:2 FTS	84	10 - 187	09/27/17 14:14	
13C4-PFOA	117	13 - 142	09/27/17 14:14	
13C5-PFNA	87	15 - 143	09/27/17 14:14	
13C4-PFOS	91	11 - 131	09/27/17 14:14	
13C2-PFDA	105	25 - 129	09/27/17 14:14	
13C2-PFUnDA	84	16 - 129	09/27/17 14:14	
13C2-PFDoDA	83	17 - 114	09/27/17 14:14	
D7-MeFOSE	77	32 - 113	09/27/17 14:14	
D9-EtFOSE	79	20 - 113	09/27/17 14:14	
D5-EtFOSA	49	19 - 103	09/27/17 14:14	
13C2-8:2 FTS	119	50 - 150	09/27/17 14:14	

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709828
Project:	WWW/16.0062335.50	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/L
Lab Code:	KQ1713927-03	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M			
Prep Method:	EPA 3535A			
13C2-PFTeDA		85	50 - 150	09/27/17 14:14
13C4-PFHpA		91	50 - 150	09/27/17 14:14
13C5-PFPeA		103	50 - 150	09/27/17 14:14
13C3-PFBS		64	50 - 150	09/27/17 14:14
13C8-FOSA		77	50 - 150	09/27/17 14:14

Client: GZA GeoEnvironmental, Incorporated **Service Request:** K1709828
Project: WWW/16.0062335.50
Sample Matrix: Water

SURROGATE RECOVERY SUMMARY

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Extraction Method: EPA 3535A

Sample Name	Lab Code	13C2-6:2 FTS 10 - 187	13C2-8:2 FTS 50 - 150	13C2-PFDA 25 - 129
PW-17-1A	K1709828-001	125	149	99
PW-17-1B	K1709828-002	92	251 *	127
SW-DUP-1P	K1709828-003	72	268 *	113
PW-DUP-1P	K1709828-004	202 *	224 *	114
SW-17-4	K1709828-005	85	138	92
PW-17-5B	K1709828-006	228 *	233 *	103
PW-17-5A	K1709828-007	224 *	298 *	133 *
FB-17-1	K1709828-008	75	137	92
FB-17-2	K1709828-009	89	277 *	125
EQ-17-1P	K1709828-010	72	149	107
PW-17-6A	K1709828-011	102	155 *	110
PW-17-6B	K1709828-012	114	132	102
PW-DUP-2P	K1709828-013	98	199 *	117
PW-17-7A	K1709828-014	96	262 *	99
PW-17-7B	K1709828-015	96	239 *	109
FB-17-3	K1709828-016	89	225 *	110
Lab Control Sample	KQ1713886-01	78	147	110
Duplicate Lab Control Sample	KQ1713886-02	73	144	105
Method Blank	KQ1713886-03	71	195 *	94
Lab Control Sample	KQ1713927-01	94	121	92
Duplicate Lab Control Sample	KQ1713927-02	88	120	97
Method Blank	KQ1713927-03	84	119	105

Client: GZA GeoEnvironmental, Incorporated **Service Request:** K1709828

Project: WWW/16.0062335.50

Sample Matrix: Water

SURROGATE RECOVERY SUMMARY

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M

Extraction Method: EPA 3535A

Sample Name	Lab Code	13C2-PFDoDA 17 - 114	13C2-PFHxA 10 - 151	13C2-PFTeDA 50 - 150
PW-17-1A	K1709828-001	72	88	83
PW-17-1B	K1709828-002	87	121	104
SW-DUP-1P	K1709828-003	79	73	88
PW-DUP-1P	K1709828-004	76	100	68
SW-17-4	K1709828-005	78	80	84
PW-17-5B	K1709828-006	69	97	61
PW-17-5A	K1709828-007	87	93	39 *
FB-17-1	K1709828-008	77	79	86
FB-17-2	K1709828-009	84	82	98
EQ-17-1P	K1709828-010	86	97	90
PW-17-6A	K1709828-011	75	105	77
PW-17-6B	K1709828-012	71	88	56
PW-DUP-2P	K1709828-013	75	112	83
PW-17-7A	K1709828-014	72	102	86
PW-17-7B	K1709828-015	79	110	92
FB-17-3	K1709828-016	84	85	95
Lab Control Sample	KQ1713886-01	75	83	90
Duplicate Lab Control Sample	KQ1713886-02	76	87	98
Method Blank	KQ1713886-03	68	67	63
Lab Control Sample	KQ1713927-01	95	129	122
Duplicate Lab Control Sample	KQ1713927-02	74	92	98
Method Blank	KQ1713927-03	83	98	85

Client: GZA GeoEnvironmental, Incorporated **Service Request:** K1709828
Project: WWW/16.0062335.50
Sample Matrix: Water

SURROGATE RECOVERY SUMMARY

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Extraction Method: EPA 3535A

Sample Name	Lab Code	13C2-PFUnDA 16 - 129	13C3-PFBS 50 - 150	13C4-PFBA 19 - 126
PW-17-1A	K1709828-001	77	48 *	93
PW-17-1B	K1709828-002	98	60	105
SW-DUP-1P	K1709828-003	84	50	89
PW-DUP-1P	K1709828-004	92	59	106
SW-17-4	K1709828-005	78	48 *	84
PW-17-5B	K1709828-006	87	55	105
PW-17-5A	K1709828-007	105	59	112
FB-17-1	K1709828-008	79	50	85
FB-17-2	K1709828-009	94	55	92
EQ-17-1P	K1709828-010	90	52	93
PW-17-6A	K1709828-011	82	58	101
PW-17-6B	K1709828-012	82	60	105
PW-DUP-2P	K1709828-013	86	59	102
PW-17-7A	K1709828-014	80	53	89
PW-17-7B	K1709828-015	90	56	93
FB-17-3	K1709828-016	89	51	91
Lab Control Sample	KQ1713886-01	87	51	91
Duplicate Lab Control Sample	KQ1713886-02	83	52	92
Method Blank	KQ1713886-03	76	43 *	76
Lab Control Sample	KQ1713927-01	104	74	116
Duplicate Lab Control Sample	KQ1713927-02	78	63	94
Method Blank	KQ1713927-03	84	64	94

Client: GZA GeoEnvironmental, Incorporated **Service Request:** K1709828
Project: WWW/16.0062335.50
Sample Matrix: Water

SURROGATE RECOVERY SUMMARY

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Extraction Method: EPA 3535A

Sample Name	Lab Code	13C4-PFHpA 50 - 150	13C4-PFOA 13 - 142	13C4-PFOS 11 - 131
PW-17-1A	K1709828-001	89	115	87
PW-17-1B	K1709828-002	107	136	85
SW-DUP-1P	K1709828-003	96	77	76
PW-DUP-1P	K1709828-004	120	108	75
SW-17-4	K1709828-005	81	76	75
PW-17-5B	K1709828-006	113	137	85
PW-17-5A	K1709828-007	134	109	99
FB-17-1	K1709828-008	92	74	82
FB-17-2	K1709828-009	105	85	85
EQ-17-1P	K1709828-010	104	98	87
PW-17-6A	K1709828-011	106	133	85
PW-17-6B	K1709828-012	119	136	87
PW-DUP-2P	K1709828-013	99	140	83
PW-17-7A	K1709828-014	87	123	77
PW-17-7B	K1709828-015	95	130	81
FB-17-3	K1709828-016	98	80	79
Lab Control Sample	KQ1713886-01	95	76	81
Duplicate Lab Control Sample	KQ1713886-02	108	82	86
Method Blank	KQ1713886-03	87	72	71
Lab Control Sample	KQ1713927-01	117	142	76
Duplicate Lab Control Sample	KQ1713927-02	96	101	85
Method Blank	KQ1713927-03	91	117	91

Client: GZA GeoEnvironmental, Incorporated **Service Request:** K1709828
Project: WWW/16.0062335.50
Sample Matrix: Water

SURROGATE RECOVERY SUMMARY

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Extraction Method: EPA 3535A

Sample Name	Lab Code	13C5-PFNA 15 - 143	13C5-PFPeA 50 - 150	13C8-FOSA 50 - 150
PW-17-1A	K1709828-001	90	101	69
PW-17-1B	K1709828-002	91	112	83
SW-DUP-1P	K1709828-003	70	96	75
PW-DUP-1P	K1709828-004	104	113	74
SW-17-4	K1709828-005	72	90	72
PW-17-5B	K1709828-006	99	108	61
PW-17-5A	K1709828-007	127	115	75
FB-17-1	K1709828-008	75	92	75
FB-17-2	K1709828-009	80	100	83
EQ-17-1P	K1709828-010	89	99	84
PW-17-6A	K1709828-011	89	108	75
PW-17-6B	K1709828-012	99	112	65
PW-DUP-2P	K1709828-013	91	109	72
PW-17-7A	K1709828-014	85	95	67
PW-17-7B	K1709828-015	88	103	73
FB-17-3	K1709828-016	84	98	81
Lab Control Sample	KQ1713886-01	72	101	78
Duplicate Lab Control Sample	KQ1713886-02	73	99	79
Method Blank	KQ1713886-03	66	84	69
Lab Control Sample	KQ1713927-01	94	126	92
Duplicate Lab Control Sample	KQ1713927-02	82	105	68
Method Blank	KQ1713927-03	87	103	77

Client: GZA GeoEnvironmental, Incorporated **Service Request:** K1709828
Project: WWW/16.0062335.50
Sample Matrix: Water

SURROGATE RECOVERY SUMMARY

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Extraction Method: EPA 3535A

Sample Name	Lab Code	18O2-PFHxS 20 - 128	D5-EtFOSA 19 - 103	D7-MeFOSE 32 - 113
PW-17-1A	K1709828-001	68	29	70
PW-17-1B	K1709828-002	86	50	88
SW-DUP-1P	K1709828-003	77	46	70
PW-DUP-1P	K1709828-004	95	42	76
SW-17-4	K1709828-005	62	52	69
PW-17-5B	K1709828-006	90	19	55
PW-17-5A	K1709828-007	98	19	64
FB-17-1	K1709828-008	68	55	77
FB-17-2	K1709828-009	72	60	85
EQ-17-1P	K1709828-010	83	53	82
PW-17-6A	K1709828-011	93	59	75
PW-17-6B	K1709828-012	96	30	66
PW-DUP-2P	K1709828-013	83	42	75
PW-17-7A	K1709828-014	73	45	75
PW-17-7B	K1709828-015	83	56	80
FB-17-3	K1709828-016	69	47	85
Lab Control Sample	KQ1713886-01	69	54	77
Duplicate Lab Control Sample	KQ1713886-02	77	59	78
Method Blank	KQ1713886-03	58	43	60
Lab Control Sample	KQ1713927-01	90	67	99
Duplicate Lab Control Sample	KQ1713927-02	72	48	77
Method Blank	KQ1713927-03	72	49	77

Client: GZA GeoEnvironmental, Incorporated **Service Request:** K1709828
Project: WWW/16.0062335.50
Sample Matrix: Water

SURROGATE RECOVERY SUMMARY

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Extraction Method: EPA 3535A

Sample Name	Lab Code	D9-EtFOSE 20 - 113
PW-17-1A	K1709828-001	68
PW-17-1B	K1709828-002	80
SW-DUP-1P	K1709828-003	67
PW-DUP-1P	K1709828-004	65
SW-17-4	K1709828-005	63
PW-17-5B	K1709828-006	53
PW-17-5A	K1709828-007	60
FB-17-1	K1709828-008	71
FB-17-2	K1709828-009	78
EQ-17-1P	K1709828-010	84
PW-17-6A	K1709828-011	77
PW-17-6B	K1709828-012	64
PW-DUP-2P	K1709828-013	71
PW-17-7A	K1709828-014	67
PW-17-7B	K1709828-015	75
FB-17-3	K1709828-016	78
Lab Control Sample	KQ1713886-01	74
Duplicate Lab Control Sample	KQ1713886-02	83
Method Blank	KQ1713886-03	63
Lab Control Sample	KQ1713927-01	93
Duplicate Lab Control Sample	KQ1713927-02	72
Method Blank	KQ1713927-03	79

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709828
Project:	WWW/16.0062335.50	**Date Analyzed:**	09/26/17
Sample Matrix:	Water	**Date Extracted:**	09/25/17

Duplicate Lab Control Sample Summary
Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M	**Units:**	ng/L
Prep Method:	EPA 3535A	**Basis:**	NA
		Analysis Lot:	563188

	Lab Control Sample KQ1713886-01			Duplicate Lab Control Sample KQ1713886-02					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	165	159	104	180	159	113	74-132	9	30
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	134	160	84	129	160	81	50-150	4	30
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	169	167	101	162	167	97	69-146	4	30
N-Ethyl perfluorooctane sulfonamidoethanol	152	167	91	141	167	85	54-159	8	30
N-Methyl perfluorooctane sulfonamide (MeFOSA)	111	167	66	120	167	72	10-183	8	30
N-Methyl perfluorooctane sulfonamidoethanol	162	167	97	164	167	98	37-166	1	30
Perfluorobutane sulfonic acid (PFBS)	190	148	129	184	148	124	50-150	4	30
Perfluorobutanoic acid (PFBA)	167	167	100	167	167	100	76-136	<1	30
Perfluorodecanoic acid (PFDA)	166	167	100	165	167	99	68-135	<1	30
Perfluorododecanoic acid (PFDoDA)	164	167	98	163	167	98	70-133	<1	30
Perfluoroheptane sulfonic acid (PFHpS)	142	159	90	140	159	88	69-148	1	30
Perfluoroheptanoic acid (PFHpA)	157	167	94	164	167	98	50-150	5	30
Perfluorohexane sulfonic acid (PFHxS)	147	152	97	143	152	94	71-130	3	30
Perfluorohexanoic acid (PFHxA)	180	167	108	187	167	112	68-141	4	30
Perfluorononanoic acid (PFNA)	212	167	127	204	167	123	77-127	4	30
Perfluorooctane sulfonamide (FOSA)	125	167	75	126	167	75	50-150	<1	30
Perfluorooctane sulfonic acid (PFOS)	125	155	81	119	155	77	74-135	5	30
Perfluorooctanoic acid (PFOA)	202	167	121	192	167	115	72-130	5	30
Perfluoropentanoic acid (PFPeA)	155	167	93	159	167	96	50-150	3	30
Perfluorotetradecanoic acid (PFTeDA)	191	167	115	188	167	113	50-150	2	30
Perfluorotridecanoic acid (PFTrDA)	163	167	98	147	167	88	50-150	11	30
Perfluoroundecanoic acid (PFUnDA)	159	167	96	153	167	92	66-131	4	30

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709828
Project:	WWW/16.0062335.50	**Date Analyzed:**	09/27/17
Sample Matrix:	Water	**Date Extracted:**	09/26/17

Duplicate Lab Control Sample Summary
Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M	**Units:**	ng/L
Prep Method:	EPA 3535A	**Basis:**	NA
		Analysis Lot:	563483

	Lab Control Sample KQ1713927-01			Duplicate Lab Control Sample KQ1713927-02					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	130	159	82	122	159	77	74-132	6	30
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	147	167	88	153	167	92	69-146	4	30
N-Ethyl perfluorooctane sulfonamidoethanol	127	167	76	130	167	78	54-159	3	30
N-Methyl perfluorooctane sulfonamide (MeFOSA)	103	167	62	97.5	167	59	10-183	5	30
N-Methyl perfluorooctane sulfonamidoethanol	133	167	80	143	167	86	37-166	7	30
Perfluorobutane sulfonic acid (PFBS)	139	148	94	149	148	101	50-150	7	30
Perfluorobutanoic acid (PFBA)	144	167	86	143	167	86	76-136	<1	30
Perfluorododecanoic acid (PFDoDA)	149	167	90	154	167	92	70-133	3	30
Perfluoroheptane sulfonic acid (PFHpS)	145	159	91	138	159	87	69-148	5	30
Perfluoroheptanoic acid (PFHpA)	134	167	80	143	167	86	50-150	6	30
Perfluorohexane sulfonic acid (PFHxS)	130	152	86	139	152	91	71-130	6	30
Perfluorohexanoic acid (PFHxA)	158	167	95	166	167	100	68-141	5	30
Perfluorononanoic acid (PFNA)	174	167	104	165	167	99	77-127	5	30
Perfluorooctane sulfonamide (FOSA)	112	167	67	117	167	70	50-150	4	30
Perfluorooctanoic acid (PFOA)	149	167	90	154	167	92	72-130	3	30
Perfluoropentanoic acid (PFPeA)	135	167	81	134	167	80	50-150	<1	30
Perfluorotetradecanoic acid (PFTeDA)	161	167	97	165	167	99	50-150	2	30
Perfluorotridecanoic acid (PFTrDA)	123	167	74	121	167	73	50-150	<1	30
Perfluoroundecanoic acid (PFUnDA)	134	167	80	131	167	79	66-131	2	30

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709828
Project:	WWW/16.0062335.50	**Date Analyzed:**	09/28/17 - 09/27/17
Sample Matrix:	Water	**Date Extracted:**	09/26/17

Duplicate Lab Control Sample Summary
Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M	**Units:**	ng/L
Prep Method:	EPA 3535A	**Basis:**	NA
		Analysis Lot:	563891

	Lab Control Sample KQ1713927-01			Duplicate Lab Control Sample KQ1713927-02					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	105	160	66	115	160	72	50-150	9	30
Perfluorodecanoic acid (PFDA)	141	167	85	134	167	81	68-135	5	30
Perfluorooctane sulfonic acid (PFOS)	153	155	99	116	155	75	74-135	27	30

ALS Environmental
ALS Group USA, Corp
1317 South 13th Avenue
Kelso, WA 98626
T : +1 360 577 7222
F : +1 360 636 1068
www.alsglobal.com

October 04, 2017

Analytical Report for Service Request No: K1709951

John Morehouse
Rose & Westra, a Division of GZA
601 Fifth Street NW, Suite 102
Grand Rapids, MI 49504

RE: WWW / 16.0062335

Dear John,

Enclosed are the results of the sample(s) submitted to our laboratory September 19, 2017
For your reference, these analyses have been assigned our service request number **K1709951.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3275. You may also contact me via email at Chris.Leaf@ALSGlobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Chris Leaf
Project Manager

ALS Environmental
ALS Group USA, Corp
1317 South 13th Avenue
Kelso, WA 98626
T : +1 360 577 7222
F : +1 360 636 1068
www.alsglobal.com

Table of Contents

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L14-51
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

ALS ENVIRONMENTAL

Client:	GZA GeoEnvironmental, Incorporated	**Service Request No.:**	K1709951
Project:	WWW/ 16.0062335	**Date Received:**	09/19/17
Sample Matrix:	Groundwater		

Case Narrative

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Laboratory Control Sample (LCS), and Laboratory/Duplicate Laboratory Control Sample (LCS/DLCS).

Sample Receipt

Thirteen ground water samples were received for analysis at ALS Environmental on 09/19/17. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4ºC upon receipt at the laboratory.

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Surrogate Exceptions:
The upper control criterion was exceeded for 13C2-8:2 FTS in samples PW-17-SB, PW-DUP-3P, SW-DUP-3P, WQ-17-2P, SW-17-10, PW-17-11, PW-17-12 and Method Blank KQ1710886-03 . No target analytes were detected in the sample. The error associated with an elevated recovery equated to a high bias. The quality of the sample data was not significantly affected. No further corrective action was appropriate.

The recovery of 13C3-PFBS in samples EQ-17-3P and Method Blank KQ1713866-3 was outside the control limits listed in the results summary. The limits are default values temporarily in use until sufficient data points are generated to calculate statistical control limits. Based on the method and historic data, the recoveries observed were in the range expected for this procedure. No further corrective action was taken.

No other anomalies associated with the analysis of these samples were observed.

Approved by_____

Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

ALS Environmental

1317 South 13th Ave, Kelso, WA 98626 Phone (360) 577-7222 / 800-695-7222 / FAX (360) 636-1068
www.alsglobal.com

CHAIN OF CUSTODY
82535

001

SR# K1709951

COC Set____of____

COC#_____

Project Name	WWW
Project Number	16.0062335
Project Manager	Mark Westra
Company	Rose & Westra, GZA
Address	601 Fifth St NW, Grand Rapids, MI
Phone #	616 295 6802
email	Mark.westra@gza.com
Sampler Signature	
Sampler Printed Name	Jack Markosky

CLIENT SAMPLE ID	LABID	SAMPLING Date	SAMPLING Time	Matrix	NUMBER OF CONTAINERS	14D PFC/537M / PFOA (complete list)	1	2	3	4	5	Remarks
1. PW-17-8A		9/14/17	3:35	H_2O	2	X						
2. PW-17-8B		9/14/17	4:25	H_2O	2	X						
3. PW-17-8C		9/14/17	5:00	H_2O	2	X						
4. EQ-17-3P		9/15/17	12:00	H_2O	2	X						
5. PW-DUP-3P		9/15/17		H_2O	2	X						
6. SW-DUP-3P		9/15/17		H_2O	2	X						
7. PW-17-9A		9/15/17	9:05	H_2O	2	X						
8. EQ-17-2P		9/14/17	5:30	H_2O	2	X						
9. PW-17-9B		9/15/17	9:30	H_2O	2	X						
10. FB-17-4		9/15/17	11:45	H_2O	1	X						

Report Requirements

X I. Routine Report: Method Blank, Surrogate, as required

___ II. Report Dup., MS, MSD as required

___ III. CLP Like Summary (no raw data)

___ IV. Data Validation Report

___ V. EDD

Invoice Information

P.O.#_____

Bill To: RW GZA Grand Rapids

Turnaround Requirements

___ 24 hr. ___ 48 hr.

___ 5 Day

X Standard

Requested Report Date

Circle which metals are to be analyzed

Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Special Instructions/Comments: Analyze complete PFC list

*Indicate State Hydrocarbon Procedure: AK CA WI Northwest Other____(Circle One)

Relinquished By:	Received By:	Relinquished By:	Received By:	Relinquished By:	Received By:
Signature	Signature	Signature	Signature	Signature	Signature
Printed Name: Jack Markosky	Printed Name: A Morrow	Printed Name	Printed Name	Printed Name	Printed Name
Firm: RW/GZA	Firm: ALS 9/19/17 0920	Firm	Firm	Firm	Firm
Date/Time	Date/Time	Date/Time	Date/Time	Date/Time	Date/Time

ALS Environmental

CHAIN OF CUSTODY
82535

001

SR# K1709961

COC Set____of____

COC#_____

1317 South 13th Ave, Kelso, WA 98626 Phone (360) 577-7222 / 800-695-7222 / FAX (360) 636-1068
www.alsglobal.com

Project Name	WWW
Project Number	16.0062335.00
Project Manager	Mark Westra
Company	Rose & Westra, GZA
Address	601 Fifth St. NW, Grand Rapids, MI
Phone #	616 295 6802
email	mark.westra@gza.com
Sampler Signature	Jack Markosky
Sampler Printed Name	Jack Markosky

CLIENT SAMPLE ID	LABID	SAMPLING Date	SAMPLING Time	Matrix	NUMBER OF CONTAINERS	14D PFC/537M / PFOA Complete list	1	2	3	4	5	Remarks
1. SW-17-10		9/15/17	12:25	H_2O	2	X						
2. PW-17-11		9/15/17	10:15	H_2O	2	X						
3. PW-17-12		9/15/17	11:10	H_2O	2	X						
4.												
5.												
6.												
7.												
8.												
9.												
10.												

Report Requirements

- X I. Routine Report: Method Blank, Surrogate, as required
- ___ II. Report Dup., MS, MSD as required
- ___ III. CLP Like Summary (no raw data)
- ___ IV. Data Validation Report
- ___ V. EDD

Invoice Information

P.O.#_____

Bill To: R&W GZA Grand Rapids

Turnaround Requirements

- ___ 24 hr.
- ___ 48 hr.
- ___ 5 Day
- X Standard

Requested Report Date

Circle which metals are to be analyzed

Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Special Instructions/Comments: Analyze complete PFC list

*Indicate State Hydrocarbon Procedure: AK CA WI Northwest Other____(Circle One)

Relinquished By:	Received By:	Relinquished By:	Received By:	Relinquished By:	Received By:
Signature: Jack Markosky	Signature: R Morrow	Signature	Signature	Signature	Signature
Printed Name: Jack Markosky	Printed Name: HCS	Printed Name	Printed Name	Printed Name	Printed Name
Firm: R&W / GZA	Firm: 9/19/17 0920	Firm	Firm	Firm	Firm
Date/Time: 9/15/17 5:00	Date/Time:	Date/Time	Date/Time	Date/Time	Date/Time

Dropped @ FedEx

PC CV

Cooler Receipt and Preservation Form

Client GZA Service Request K17 09951

Received: 9/19/17 Opened: 9/19/17 By: KM Unloaded: 9/19/17 By: KM

1. Samples were received via? *USPS* (*Fed Ex*) *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) (*Cooler*) *Box* *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA (Y) N If yes, how many and where? 1 Front
   If present, were custody seals intact? (Y) N If present, were they signed and dated? (Y) N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	Filed
-0.3	—	1.0	—	0	360		7702 8515 7745	

4. Packing material: *Inserts* (*Baggies*) *Bubble Wrap* *Gel Packs* (*Wet Ice*) *Dry Ice* *Sleeves* _____
5. Were custody papers properly filled out (ink, signed, etc.)? NA (Y) N
6. Were samples received in good condition (temperature, unbroken)? *Indicate in the table below.* NA (Y) N
   If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*
7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA (Y) N
8. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA (Y) N
9. Were appropriate bottles/containers and volumes received for the tests indicated? NA (Y) N
10. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* (NA) Y N
11. Were VOA vials received without headspace? *Indicate in the table below.* (NA) Y N
12. Was C12/Res negative? (NA) Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: _____

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709951
Project:	WWW/16.0062335	**Date Collected:**	09/14/17 03:35
Sample Matrix:	Ground Water	**Date Received:**	09/19/17 09:20
Sample Name:	PW-17-8A	**Units:**	ng/L
Lab Code:	K1709951-001	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	ND U	8.8	1	09/27/17 16:30	9/26/17	
Perfluoropentanoic acid (PFPeA)	**6.4**	4.4	1	09/27/17 16:30	9/26/17	
Perfluorobutane sulfonic acid (PFBS)	**12**	4.4	1	09/27/17 16:30	9/26/17	
Perfluorohexanoic acid (PFHxA)	**26**	4.4	1	09/27/17 16:30	9/26/17	
Perfluoroheptanoic acid (PFHpA)	**8.5**	4.4	1	09/27/17 16:30	9/26/17	
Perfluorohexane sulfonic acid (PFHxS)	**16**	4.4	1	09/27/17 16:30	9/26/17	
Perfluorooctanoic acid (PFOA)	**23**	1.8	1	09/27/17 16:30	9/26/17	
Perfluoroheptane sulfonic acid (PFHpS)	ND U	4.4	1	09/27/17 16:30	9/26/17	
Perfluorononanoic acid (PFNA)	ND U	4.4	1	09/27/17 16:30	9/26/17	
Perfluorooctane sulfonic acid (PFOS)	**5.2**	4.4	1	09/27/17 16:30	9/26/17	
Perfluorodecanoic acid (PFDA)	ND U	4.4	1	09/27/17 16:30	9/26/17	
Perfluoroundecanoic acid (PFUnDA)	ND U	4.4	1	09/27/17 16:30	9/26/17	
Perfluorooctane sulfonamide (FOSA)	ND U	4.4	1	09/27/17 16:30	9/26/17	
Perfluorododecanoic acid (PFDoDA)	ND U	4.4	1	09/27/17 16:30	9/26/17	
Perfluorotridecanoic acid (PFTrDA)	ND U	4.4	1	09/27/17 16:30	9/26/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND U	4.4	1	09/27/17 16:30	9/26/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND U	4.4	1	09/27/17 16:30	9/26/17	
Perfluorotetradecanoic acid (PFTeDA)	ND U	4.4	1	09/27/17 16:30	9/26/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND U	4.4	1	09/27/17 16:30	9/26/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND U	4.4	1	09/27/17 16:30	9/26/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND U	4.4	1	09/27/17 16:30	9/26/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND U	4.4	1	09/27/17 16:30	9/26/17	
Perfluorodecane sulfonic acid (PFDS)	ND U	4.4	1	09/27/17 16:30	9/26/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	102	19 - 126	09/27/17 16:30	
13C2-PFHxA	110	10 - 151	09/27/17 16:30	
18O2-PFHxS	89	20 - 128	09/27/17 16:30	
13C2-6:2 FTS	77	10 - 187	09/27/17 16:30	
13C4-PFOA	130	13 - 142	09/27/17 16:30	
13C5-PFNA	93	15 - 143	09/27/17 16:30	
13C4-PFOS	86	11 - 131	09/27/17 16:30	
13C2-PFDA	111	25 - 129	09/27/17 16:30	
13C2-PFUnDA	93	16 - 129	09/27/17 16:30	
13C2-PFDoDA	85	17 - 114	09/27/17 16:30	
D7-MeFOSE	87	32 - 113	09/27/17 16:30	
D9-EtFOSE	83	20 - 113	09/27/17 16:30	
D5-EtFOSA	63	19 - 103	09/27/17 16:30	
13C2-8:2 FTS	126	50 - 150	09/27/17 16:30	

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709951
Project:	WWW/16.0062335	**Date Collected:**	09/14/17 03:35
Sample Matrix:	Ground Water	**Date Received:**	09/19/17 09:20
Sample Name:	PW-17-8A	**Units:**	ng/L
Lab Code:	K1709951-001	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M			
Prep Method:	EPA 3535A			
13C2-PFTeDA		102	50 - 150	09/27/17 16:30
13C4-PFHpA		102	50 - 150	09/27/17 16:30
13C5-PFPeA		110	50 - 150	09/27/17 16:30
13C3-PFBS		60	50 - 150	09/27/17 16:30
13C8-FOSA		79	50 - 150	09/27/17 16:30

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709951
Project:	WWW/16.0062335	**Date Collected:**	09/14/17 04:25
Sample Matrix:	Ground Water	**Date Received:**	09/19/17 09:20
Sample Name:	PW-17-8B	**Units:**	ng/L
Lab Code:	K1709951-002	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result		MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	**94**		24	1	09/27/17 16:40	9/26/17	
Perfluoropentanoic acid (PFPeA)	**98**		12	1	09/27/17 16:40	9/26/17	
Perfluorobutane sulfonic acid (PFBS)	**210**		12	1	09/27/17 16:40	9/26/17	
Perfluorohexanoic acid (PFHxA)	**300**		12	1	09/27/17 16:40	9/26/17	
Perfluoroheptanoic acid (PFHpA)	**150**		12	1	09/27/17 16:40	9/26/17	
Perfluorohexane sulfonic acid (PFHxS)	**310**		12	1	09/27/17 16:40	9/26/17	
Perfluorooctanoic acid (PFOA)	**590**		4.8	1	09/27/17 16:40	9/26/17	
Perfluoroheptane sulfonic acid (PFHpS)	**160**		12	1	09/27/17 16:40	9/26/17	
Perfluorononanoic acid (PFNA)	**51**		12	1	09/27/17 16:40	9/26/17	
Perfluorooctane sulfonic acid (PFOS)	**7100**		600	50	09/28/17 21:08	9/26/17	
Perfluorodecanoic acid (PFDA)	**18**		12	1	09/27/17 16:40	9/26/17	
Perfluoroundecanoic acid (PFUnDA)	ND	U	12	1	09/27/17 16:40	9/26/17	
Perfluorooctane sulfonamide (FOSA)	ND	U	12	1	09/27/17 16:40	9/26/17	
Perfluorododecanoic acid (PFDoDA)	ND	U	12	1	09/27/17 16:40	9/26/17	
Perfluorotridecanoic acid (PFTrDA)	ND	U	12	1	09/27/17 16:40	9/26/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND	U	12	1	09/27/17 16:40	9/26/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND	U	12	1	09/27/17 16:40	9/26/17	
Perfluorotetradecanoic acid (PFTeDA)	ND	U	12	1	09/27/17 16:40	9/26/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND	U	12	1	09/27/17 16:40	9/26/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND	U	12	1	09/27/17 16:40	9/26/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND	U	12	1	09/27/17 16:40	9/26/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND	U	12	1	09/27/17 16:40	9/26/17	
Perfluorodecane sulfonic acid (PFDS)	ND	U	12	1	09/27/17 16:40	9/26/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	100	19 - 126	09/27/17 16:40	
13C2-PFHxA	88	10 - 151	09/27/17 16:40	
18O2-PFHxS	97	20 - 128	09/27/17 16:40	
13C2-6:2 FTS	98	10 - 187	09/27/17 16:40	
13C4-PFOA	131	13 - 142	09/27/17 16:40	
13C5-PFNA	82	15 - 143	09/27/17 16:40	
13C4-PFOS	82	11 - 131	09/28/17 21:08	
13C2-PFDA	119	25 - 129	09/27/17 16:40	
13C2-PFUnDA	91	16 - 129	09/27/17 16:40	
13C2-PFDoDA	86	17 - 114	09/27/17 16:40	
D7-MeFOSE	84	32 - 113	09/27/17 16:40	
D9-EtFOSE	77	20 - 113	09/27/17 16:40	
D5-EtFOSA	46	19 - 103	09/27/17 16:40	
13C2-8:2 FTS	276	50 - 150	09/27/17 16:40	*

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709951
Project:	WWW/16.0062335	**Date Collected:**	09/14/17 04:25
Sample Matrix:	Ground Water	**Date Received:**	09/19/17 09:20
Sample Name:	PW-17-8B	**Units:**	ng/L
Lab Code:	K1709951-002	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M			
Prep Method:	EPA 3535A			
13C2-PFTeDA		121	50 - 150	09/27/17 16:40
13C4-PFHpA		114	50 - 150	09/27/17 16:40
13C5-PFPeA		106	50 - 150	09/27/17 16:40
13C3-PFBS		63	50 - 150	09/27/17 16:40
13C8-FOSA		77	50 - 150	09/27/17 16:40

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709951
Project:	WWW/16.0062335	**Date Collected:**	09/14/17 05:00
Sample Matrix:	Ground Water	**Date Received:**	09/19/17 09:20
Sample Name:	PW-17-8C	**Units:**	ng/L
Lab Code:	K1709951-003	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	ND U	8.6	1	09/27/17 16:51	9/26/17	
Perfluoropentanoic acid (PFPeA)	**7.0**	4.3	1	09/27/17 16:51	9/26/17	
Perfluorobutane sulfonic acid (PFBS)	**13**	4.3	1	09/27/17 16:51	9/26/17	
Perfluorohexanoic acid (PFHxA)	**32**	4.3	1	09/27/17 16:51	9/26/17	
Perfluoroheptanoic acid (PFHpA)	**9.4**	4.3	1	09/27/17 16:51	9/26/17	
Perfluorohexane sulfonic acid (PFHxS)	**10**	4.3	1	09/27/17 16:51	9/26/17	
Perfluorooctanoic acid (PFOA)	**13**	1.7	1	09/27/17 16:51	9/26/17	
Perfluoroheptane sulfonic acid (PFHpS)	ND U	4.3	1	09/27/17 16:51	9/26/17	
Perfluorononanoic acid (PFNA)	ND U	4.3	1	09/27/17 16:51	9/26/17	
Perfluorooctane sulfonic acid (PFOS)	**9.1**	4.3	1	09/27/17 16:51	9/26/17	
Perfluorodecanoic acid (PFDA)	ND U	4.3	1	09/27/17 16:51	9/26/17	
Perfluoroundecanoic acid (PFUnDA)	ND U	4.3	1	09/27/17 16:51	9/26/17	
Perfluorooctane sulfonamide (FOSA)	ND U	4.3	1	09/27/17 16:51	9/26/17	
Perfluorododecanoic acid (PFDoDA)	ND U	4.3	1	09/27/17 16:51	9/26/17	
Perfluorotridecanoic acid (PFTrDA)	ND U	4.3	1	09/27/17 16:51	9/26/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND U	4.3	1	09/27/17 16:51	9/26/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND U	4.3	1	09/27/17 16:51	9/26/17	
Perfluorotetradecanoic acid (PFTeDA)	ND U	4.3	1	09/27/17 16:51	9/26/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND U	4.3	1	09/27/17 16:51	9/26/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND U	4.3	1	09/27/17 16:51	9/26/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND U	4.3	1	09/27/17 16:51	9/26/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND U	4.3	1	09/27/17 16:51	9/26/17	
Perfluorodecane sulfonic acid (PFDS)	ND U	4.3	1	09/27/17 16:51	9/26/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	102	19 - 126	09/27/17 16:51	
13C2-PFHxA	90	10 - 151	09/27/17 16:51	
18O2-PFHxS	101	20 - 128	09/27/17 16:51	
13C2-6:2 FTS	87	10 - 187	09/27/17 16:51	
13C4-PFOA	119	13 - 142	09/27/17 16:51	
13C5-PFNA	95	15 - 143	09/27/17 16:51	
13C4-PFOS	88	11 - 131	09/27/17 16:51	
13C2-PFDA	103	25 - 129	09/27/17 16:51	
13C2-PFUnDA	95	16 - 129	09/27/17 16:51	
13C2-PFDoDA	88	17 - 114	09/27/17 16:51	
D7-MeFOSE	88	32 - 113	09/27/17 16:51	
D9-EtFOSE	86	20 - 113	09/27/17 16:51	
D5-EtFOSA	69	19 - 103	09/27/17 16:51	
13C2-8:2 FTS	125	50 - 150	09/27/17 16:51	

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709951
Project:	WWW/16.0062335	**Date Collected:**	09/14/17 05:00
Sample Matrix:	Ground Water	**Date Received:**	09/19/17 09:20
Sample Name:	PW-17-8C	**Units:**	ng/L
Lab Code:	K1709951-003	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M			
Prep Method:	EPA 3535A			
13C2-PFTeDA		118	50 - 150	09/27/17 16:51
13C4-PFHpA		129	50 - 150	09/27/17 16:51
13C5-PFPeA		109	50 - 150	09/27/17 16:51
13C3-PFBS		59	50 - 150	09/27/17 16:51
13C8-FOSA		82	50 - 150	09/27/17 16:51

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Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709951
Project:	WWW/16.0062335	**Date Collected:**	09/15/17 12:00
Sample Matrix:	Water	**Date Received:**	09/19/17 09:20
Sample Name:	EQ-17-3P	**Units:**	ng/L
Lab Code:	K1709951-004	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	ND U	8.6	1	09/26/17 11:14	9/25/17	
Perfluoropentanoic acid (PFPeA)	ND U	4.3	1	09/26/17 11:14	9/25/17	
Perfluorobutane sulfonic acid (PFBS)	ND U	4.3	1	09/26/17 11:14	9/25/17	
Perfluorohexanoic acid (PFHxA)	ND U	4.3	1	09/26/17 11:14	9/25/17	
Perfluoroheptanoic acid (PFHpA)	ND U	4.3	1	09/26/17 11:14	9/25/17	
Perfluorohexane sulfonic acid (PFHxS)	ND U	4.3	1	09/26/17 11:14	9/25/17	
Perfluorooctanoic acid (PFOA)	ND U	1.7	1	09/26/17 11:14	9/25/17	
Perfluoroheptane sulfonic acid (PFHpS)	ND U	4.3	1	09/26/17 11:14	9/25/17	
Perfluorononanoic acid (PFNA)	ND U	4.3	1	09/26/17 11:14	9/25/17	
Perfluorooctane sulfonic acid (PFOS)	ND U	4.3	1	09/26/17 11:14	9/25/17	
Perfluorodecanoic acid (PFDA)	ND U	4.3	1	09/26/17 11:14	9/25/17	
Perfluoroundecanoic acid (PFUnDA)	ND U	4.3	1	09/26/17 11:14	9/25/17	
Perfluorooctane sulfonamide (FOSA)	ND U	4.3	1	09/26/17 11:14	9/25/17	
Perfluorododecanoic acid (PFDoDA)	ND U	4.3	1	09/26/17 11:14	9/25/17	
Perfluorotridecanoic acid (PFTrDA)	ND U	4.3	1	09/26/17 11:14	9/25/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND U	4.3	1	09/26/17 11:14	9/25/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND U	4.3	1	09/26/17 11:14	9/25/17	
Perfluorotetradecanoic acid (PFTeDA)	ND U	4.3	1	09/26/17 11:14	9/25/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND U	4.3	1	09/26/17 11:14	9/25/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND U	4.3	1	09/26/17 11:14	9/25/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND U	4.3	1	09/26/17 11:14	9/25/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND U	4.3	1	09/26/17 11:14	9/25/17	
Perfluorodecane sulfonic acid (PFDS)	ND U	4.3	1	09/26/17 11:14	9/25/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	90	19 - 126	09/26/17 11:14	
13C2-PFHxA	84	10 - 151	09/26/17 11:14	
18O2-PFHxS	73	20 - 128	09/26/17 11:14	
13C2-6:2 FTS	81	10 - 187	09/26/17 11:14	
13C4-PFOA	85	13 - 142	09/26/17 11:14	
13C5-PFNA	81	15 - 143	09/26/17 11:14	
13C4-PFOS	71	11 - 131	09/26/17 11:14	
13C2-PFDA	108	25 - 129	09/26/17 11:14	
13C2-PFUnDA	88	16 - 129	09/26/17 11:14	
13C2-PFDoDA	77	17 - 114	09/26/17 11:14	
D7-MeFOSE	76	32 - 113	09/26/17 11:14	
D9-EtFOSE	77	20 - 113	09/26/17 11:14	
D5-EtFOSA	49	19 - 103	09/26/17 11:14	
13C2-8:2 FTS	125	50 - 150	09/26/17 11:14	

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709951
Project:	WWW/16.0062335	**Date Collected:**	09/15/17 12:00
Sample Matrix:	Water	**Date Received:**	09/19/17 09:20
Sample Name:	EQ-17-3P	**Units:**	ng/L
Lab Code:	K1709951-004	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M			
Prep Method:	EPA 3535A			
13C2-PFTeDA	80	50 - 150	09/26/17 11:14	
13C4-PFHpA	106	50 - 150	09/26/17 11:14	
13C5-PFPeA	96	50 - 150	09/26/17 11:14	
13C3-PFBS	44	50 - 150	09/26/17 11:14	*
13C8-FOSA	82	50 - 150	09/26/17 11:14	

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Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709951
Project:	WWW/16.0062335	**Date Collected:**	09/15/17
Sample Matrix:	Ground Water	**Date Received:**	09/19/17 09:20
Sample Name:	PW-DUP-3P	**Units:**	ng/L
Lab Code:	K1709951-005	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result		MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	**970**		24	1	09/27/17 17:01	9/26/17	
Perfluoropentanoic acid (PFPeA)	**920**		12	1	09/27/17 17:01	9/26/17	
Perfluorobutane sulfonic acid (PFBS)	**2500**		12	1	09/27/17 17:01	9/26/17	
Perfluorohexanoic acid (PFHxA)	**4100**		600	50	09/28/17 21:19	9/26/17	
Perfluoroheptanoic acid (PFHpA)	**1400**		600	50	09/28/17 21:19	9/26/17	
Perfluorohexane sulfonic acid (PFHxS)	**910**		12	1	09/27/17 17:01	9/26/17	
Perfluorooctanoic acid (PFOA)	**6000**		240	50	09/28/17 21:19	9/26/17	
Perfluoroheptane sulfonic acid (PFHpS)	**160**		12	1	09/27/17 17:01	9/26/17	
Perfluorononanoic acid (PFNA)	**150**		12	1	09/27/17 17:01	9/26/17	
Perfluorooctane sulfonic acid (PFOS)	**9500**		600	50	09/28/17 21:19	9/26/17	
Perfluorodecanoic acid (PFDA)	**55**		12	1	09/27/17 17:01	9/26/17	
Perfluoroundecanoic acid (PFUnDA)	**73**		12	1	09/27/17 17:01	9/26/17	
Perfluorooctane sulfonamide (FOSA)	**110**		12	1	09/27/17 17:01	9/26/17	
Perfluorododecanoic acid (PFDoDA)	ND	U	12	1	09/27/17 17:01	9/26/17	
Perfluorotridecanoic acid (PFTrDA)	ND	U	12	1	09/27/17 17:01	9/26/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND	U	12	1	09/27/17 17:01	9/26/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND	U	12	1	09/27/17 17:01	9/26/17	
Perfluorotetradecanoic acid (PFTeDA)	ND	U	12	1	09/27/17 17:01	9/26/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND	U	12	1	09/27/17 17:01	9/26/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND	U	12	1	09/27/17 17:01	9/26/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND	U	12	1	09/27/17 17:01	9/26/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	**30**		12	1	09/27/17 17:01	9/26/17	
Perfluorodecane sulfonic acid (PFDS)	ND	U	12	1	09/27/17 17:01	9/26/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	110	19 - 126	09/27/17 17:01	
13C2-PFHxA	96	10 - 151	09/28/17 21:19	
18O2-PFHxS	94	20 - 128	09/27/17 17:01	
13C2-6:2 FTS	58	10 - 187	09/27/17 17:01	
13C4-PFOA	84	13 - 142	09/28/17 21:19	
13C5-PFNA	89	15 - 143	09/27/17 17:01	
13C4-PFOS	64	11 - 131	09/28/17 21:19	
13C2-PFDA	124	25 - 129	09/27/17 17:01	
13C2-PFUnDA	106	16 - 129	09/27/17 17:01	
13C2-PFDoDA	94	17 - 114	09/27/17 17:01	
D7-MeFOSE	104	32 - 113	09/27/17 17:01	
D9-EtFOSE	95	20 - 113	09/27/17 17:01	
D5-EtFOSA	73	19 - 103	09/27/17 17:01	
13C2-8:2 FTS	244	50 - 150	09/27/17 17:01	*

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709951
Project:	WWW/16.0062335	**Date Collected:**	09/15/17
Sample Matrix:	Ground Water	**Date Received:**	09/19/17 09:20
Sample Name:	PW-DUP-3P	**Units:**	ng/L
Lab Code:	K1709951-005	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M			
Prep Method:	EPA 3535A			
13C2-PFTeDA		122	50 - 150	09/27/17 17:01
13C4-PFHpA		108	50 - 150	09/28/17 21:19
13C5-PFPeA		113	50 - 150	09/27/17 17:01
13C3-PFBS		55	50 - 150	09/27/17 17:01
13C8-FOSA		90	50 - 150	09/27/17 17:01

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709951
Project:	WWW/16.0062335	**Date Collected:**	09/15/17
Sample Matrix:	Water	**Date Received:**	09/19/17 09:20
Sample Name:	SW-DUP-3P	**Units:**	ng/L
Lab Code:	K1709951-006	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result		MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	ND	U	8.3	1	09/26/17 11:24	9/25/17	
Perfluoropentanoic acid (PFPeA)	ND	U	4.2	1	09/26/17 11:24	9/25/17	
Perfluorobutane sulfonic acid (PFBS)	**4.8**		4.2	1	09/26/17 11:24	9/25/17	
Perfluorohexanoic acid (PFHxA)	ND	U	4.2	1	09/26/17 11:24	9/25/17	
Perfluoroheptanoic acid (PFHpA)	ND	U	4.2	1	09/26/17 11:24	9/25/17	
Perfluorohexane sulfonic acid (PFHxS)	ND	U	4.2	1	09/26/17 11:24	9/25/17	
Perfluorooctanoic acid (PFOA)	**6.6**		1.7	1	09/26/17 11:24	9/25/17	
Perfluoroheptane sulfonic acid (PFHpS)	ND	U	4.2	1	09/26/17 11:24	9/25/17	
Perfluorononanoic acid (PFNA)	ND	U	4.2	1	09/26/17 11:24	9/25/17	
Perfluorooctane sulfonic acid (PFOS)	**12**		4.2	1	09/26/17 11:24	9/25/17	
Perfluorodecanoic acid (PFDA)	ND	U	4.2	1	09/26/17 11:24	9/25/17	
Perfluoroundecanoic acid (PFUnDA)	ND	U	4.2	1	09/26/17 11:24	9/25/17	
Perfluorooctane sulfonamide (FOSA)	ND	U	4.2	1	09/26/17 11:24	9/25/17	
Perfluorododecanoic acid (PFDoDA)	ND	U	4.2	1	09/26/17 11:24	9/25/17	
Perfluorotridecanoic acid (PFTrDA)	ND	U	4.2	1	09/26/17 11:24	9/25/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND	U	4.2	1	09/26/17 11:24	9/25/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND	U	4.2	1	09/26/17 11:24	9/25/17	
Perfluorotetradecanoic acid (PFTeDA)	ND	U	4.2	1	09/26/17 11:24	9/25/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND	U	4.2	1	09/26/17 11:24	9/25/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND	U	4.2	1	09/26/17 11:24	9/25/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND	U	4.2	1	09/26/17 11:24	9/25/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND	U	4.2	1	09/26/17 11:24	9/25/17	
Perfluorodecane sulfonic acid (PFDS)	ND	U	4.2	1	09/26/17 11:24	9/25/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	102	19 - 126	09/26/17 11:24	
13C2-PFHxA	101	10 - 151	09/26/17 11:24	
18O2-PFHxS	72	20 - 128	09/26/17 11:24	
13C2-6:2 FTS	75	10 - 187	09/26/17 11:24	
13C4-PFOA	90	13 - 142	09/26/17 11:24	
13C5-PFNA	91	15 - 143	09/26/17 11:24	
13C4-PFOS	87	11 - 131	09/26/17 11:24	
13C2-PFDA	112	25 - 129	09/26/17 11:24	
13C2-PFUnDA	90	16 - 129	09/26/17 11:24	
13C2-PFDoDA	99	17 - 114	09/26/17 11:24	
D7-MeFOSE	82	32 - 113	09/26/17 11:24	
D9-EtFOSE	78	20 - 113	09/26/17 11:24	
D5-EtFOSA	35	19 - 103	09/26/17 11:24	
13C2-8:2 FTS	175	50 - 150	09/26/17 11:24	*

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709951
Project:	WWW/16.0062335	**Date Collected:**	09/15/17
Sample Matrix:	Water	**Date Received:**	09/19/17 09:20
Sample Name:	SW-DUP-3P	**Units:**	ng/L
Lab Code:	K1709951-006	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M			
Prep Method:	EPA 3535A			
13C2-PFTeDA		82	50 - 150	09/26/17 11:24
13C4-PFHpA		96	50 - 150	09/26/17 11:24
13C5-PFPeA		107	50 - 150	09/26/17 11:24
13C3-PFBS		60	50 - 150	09/26/17 11:24
13C8-FOSA		85	50 - 150	09/26/17 11:24

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709951
Project:	WWW/16.0062335	**Date Collected:**	09/15/17 09:05
Sample Matrix:	Ground Water	**Date Received:**	09/19/17 09:20
Sample Name:	PW-17-9A	**Units:**	ng/L
Lab Code:	K1709951-007	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result		MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	**950**		24	1	09/27/17 17:12	9/26/17	
Perfluoropentanoic acid (PFPeA)	**900**		12	1	09/27/17 17:12	9/26/17	
Perfluorobutane sulfonic acid (PFBS)	**2400**		12	1	09/27/17 17:12	9/26/17	
Perfluorohexanoic acid (PFHxA)	**4100**		600	50	09/28/17 21:29	9/26/17	
Perfluoroheptanoic acid (PFHpA)	**1500**		600	50	09/28/17 21:29	9/26/17	
Perfluorohexane sulfonic acid (PFHxS)	**920**		12	1	09/27/17 17:12	9/26/17	
Perfluorooctanoic acid (PFOA)	**5300**		240	50	09/28/17 21:29	9/26/17	
Perfluoroheptane sulfonic acid (PFHpS)	**220**		12	1	09/27/17 17:12	9/26/17	
Perfluorononanoic acid (PFNA)	**170**		12	1	09/27/17 17:12	9/26/17	
Perfluorooctane sulfonic acid (PFOS)	**7100**		600	50	09/28/17 21:29	9/26/17	
Perfluorodecanoic acid (PFDA)	**60**		12	1	09/27/17 17:12	9/26/17	
Perfluoroundecanoic acid (PFUnDA)	**68**		12	1	09/27/17 17:12	9/26/17	
Perfluorooctane sulfonamide (FOSA)	**110**		12	1	09/27/17 17:12	9/26/17	
Perfluorododecanoic acid (PFDoDA)	ND	U	12	1	09/27/17 17:12	9/26/17	
Perfluorotridecanoic acid (PFTrDA)	ND	U	12	1	09/27/17 17:12	9/26/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND	U	12	1	09/27/17 17:12	9/26/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND	U	12	1	09/27/17 17:12	9/26/17	
Perfluorotetradecanoic acid (PFTeDA)	ND	U	12	1	09/27/17 17:12	9/26/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND	U	12	1	09/27/17 17:12	9/26/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND	U	12	1	09/27/17 17:12	9/26/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND	U	12	1	09/27/17 17:12	9/26/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	**37**		12	1	09/27/17 17:12	9/26/17	
Perfluorodecane sulfonic acid (PFDS)	ND	U	12	1	09/27/17 17:12	9/26/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	105	19 - 126	09/27/17 17:12	
13C2-PFHxA	91	10 - 151	09/28/17 21:29	
18O2-PFHxS	83	20 - 128	09/27/17 17:12	
13C2-6:2 FTS	60	10 - 187	09/27/17 17:12	
13C4-PFOA	85	13 - 142	09/28/17 21:29	
13C5-PFNA	81	15 - 143	09/27/17 17:12	
13C4-PFOS	79	11 - 131	09/28/17 21:29	
13C2-PFDA	110	25 - 129	09/27/17 17:12	
13C2-PFUnDA	100	16 - 129	09/27/17 17:12	
13C2-PFDoDA	82	17 - 114	09/27/17 17:12	
D7-MeFOSE	102	32 - 113	09/27/17 17:12	
D9-EtFOSE	89	20 - 113	09/27/17 17:12	
D5-EtFOSA	64	19 - 103	09/27/17 17:12	
13C2-8:2 FTS	124	50 - 150	09/27/17 17:12	

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709951
Project:	WWW/16.0062335	**Date Collected:**	09/15/17 09:05
Sample Matrix:	Ground Water	**Date Received:**	09/19/17 09:20
Sample Name:	PW-17-9A	**Units:**	ng/L
Lab Code:	K1709951-007	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M			
Prep Method:	EPA 3535A			
13C2-PFTeDA		97	50 - 150	09/27/17 17:12
13C4-PFHpA		97	50 - 150	09/28/17 21:29
13C5-PFPeA		108	50 - 150	09/27/17 17:12
13C3-PFBS		55	50 - 150	09/27/17 17:12
13C8-FOSA		88	50 - 150	09/27/17 17:12

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709951
Project:	WWW/16.0062335	**Date Collected:**	09/14/17 05:30
Sample Matrix:	Water	**Date Received:**	09/19/17 09:20
Sample Name:	EQ-17-2P	**Units:**	ng/L
Lab Code:	K1709951-008	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	ND U	8.6	1	09/26/17 11:34	9/25/17	
Perfluoropentanoic acid (PFPeA)	ND U	4.3	1	09/26/17 11:34	9/25/17	
Perfluorobutane sulfonic acid (PFBS)	ND U	4.3	1	09/26/17 11:34	9/25/17	
Perfluorohexanoic acid (PFHxA)	ND U	4.3	1	09/26/17 11:34	9/25/17	
Perfluoroheptanoic acid (PFHpA)	ND U	4.3	1	09/26/17 11:34	9/25/17	
Perfluorohexane sulfonic acid (PFHxS)	ND U	4.3	1	09/26/17 11:34	9/25/17	
Perfluorooctanoic acid (PFOA)	ND U	1.7	1	09/26/17 11:34	9/25/17	
Perfluoroheptane sulfonic acid (PFHpS)	ND U	4.3	1	09/26/17 11:34	9/25/17	
Perfluorononanoic acid (PFNA)	ND U	4.3	1	09/26/17 11:34	9/25/17	
Perfluorooctane sulfonic acid (PFOS)	ND U	4.3	1	09/26/17 11:34	9/25/17	
Perfluorodecanoic acid (PFDA)	ND U	4.3	1	09/26/17 11:34	9/25/17	
Perfluoroundecanoic acid (PFUnDA)	ND U	4.3	1	09/26/17 11:34	9/25/17	
Perfluorooctane sulfonamide (FOSA)	ND U	4.3	1	09/26/17 11:34	9/25/17	
Perfluorododecanoic acid (PFDoDA)	ND U	4.3	1	09/26/17 11:34	9/25/17	
Perfluorotridecanoic acid (PFTrDA)	ND U	4.3	1	09/26/17 11:34	9/25/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND U	4.3	1	09/26/17 11:34	9/25/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND U	4.3	1	09/26/17 11:34	9/25/17	
Perfluorotetradecanoic acid (PFTeDA)	ND U	4.3	1	09/26/17 11:34	9/25/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND U	4.3	1	09/26/17 11:34	9/25/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND U	4.3	1	09/26/17 11:34	9/25/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND U	4.3	1	09/26/17 11:34	9/25/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND U	4.3	1	09/26/17 11:34	9/25/17	
Perfluorodecane sulfonic acid (PFDS)	ND U	4.3	1	09/26/17 11:34	9/25/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	92	19 - 126	09/26/17 11:34	
13C2-PFHxA	94	10 - 151	09/26/17 11:34	
18O2-PFHxS	78	20 - 128	09/26/17 11:34	
13C2-6:2 FTS	72	10 - 187	09/26/17 11:34	
13C4-PFOA	89	13 - 142	09/26/17 11:34	
13C5-PFNA	84	15 - 143	09/26/17 11:34	
13C4-PFOS	83	11 - 131	09/26/17 11:34	
13C2-PFDA	114	25 - 129	09/26/17 11:34	
13C2-PFUnDA	89	16 - 129	09/26/17 11:34	
13C2-PFDoDA	82	17 - 114	09/26/17 11:34	
D7-MeFOSE	80	32 - 113	09/26/17 11:34	
D9-EtFOSE	73	20 - 113	09/26/17 11:34	
D5-EtFOSA	47	19 - 103	09/26/17 11:34	
13C2-8:2 FTS	182	50 - 150	09/26/17 11:34	*

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709951
Project:	WWW/16.0062335	**Date Collected:**	09/14/17 05:30
Sample Matrix:	Water	**Date Received:**	09/19/17 09:20
Sample Name:	EQ-17-2P	**Units:**	ng/L
Lab Code:	K1709951-008	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M			
Prep Method:	EPA 3535A			
13C2-PFTeDA		95	50 - 150	09/26/17 11:34
13C4-PFHpA		105	50 - 150	09/26/17 11:34
13C5-PFPeA		100	50 - 150	09/26/17 11:34
13C3-PFBS		52	50 - 150	09/26/17 11:34
13C8-FOSA		81	50 - 150	09/26/17 11:34

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709951
Project:	WWW/16.0062335	**Date Collected:**	09/15/17 09:30
Sample Matrix:	Ground Water	**Date Received:**	09/19/17 09:20
Sample Name:	PW-17-9B	**Units:**	ng/L
Lab Code:	K1709951-009	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result		MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	**470**		24	1	09/27/17 17:22	9/26/17	
Perfluoropentanoic acid (PFPeA)	**360**		12	1	09/27/17 17:22	9/26/17	
Perfluorobutane sulfonic acid (PFBS)	**1200**		12	1	09/27/17 17:22	9/26/17	
Perfluorohexanoic acid (PFHxA)	**1700**		600	50	09/28/17 21:40	9/26/17	
Perfluoroheptanoic acid (PFHpA)	**760**		12	1	09/27/17 17:22	9/26/17	
Perfluorohexane sulfonic acid (PFHxS)	**620**		12	1	09/27/17 17:22	9/26/17	
Perfluorooctanoic acid (PFOA)	**3000**		240	50	09/28/17 21:40	9/26/17	
Perfluoroheptane sulfonic acid (PFHpS)	**150**		12	1	09/27/17 17:22	9/26/17	
Perfluorononanoic acid (PFNA)	**120**		12	1	09/27/17 17:22	9/26/17	
Perfluorooctane sulfonic acid (PFOS)	**7300**		600	50	09/28/17 21:40	9/26/17	
Perfluorodecanoic acid (PFDA)	**55**		12	1	09/27/17 17:22	9/26/17	
Perfluoroundecanoic acid (PFUnDA)	**88**		12	1	09/27/17 17:22	9/26/17	
Perfluorooctane sulfonamide (FOSA)	**100**		12	1	09/27/17 17:22	9/26/17	
Perfluorododecanoic acid (PFDoDA)	ND	U	12	1	09/27/17 17:22	9/26/17	
Perfluorotridecanoic acid (PFTrDA)	ND	U	12	1	09/27/17 17:22	9/26/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND	U	12	1	09/27/17 17:22	9/26/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND	U	12	1	09/27/17 17:22	9/26/17	
Perfluorotetradecanoic acid (PFTeDA)	ND	U	12	1	09/27/17 17:22	9/26/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND	U	12	1	09/27/17 17:22	9/26/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND	U	12	1	09/27/17 17:22	9/26/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND	U	12	1	09/27/17 17:22	9/26/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND	U	12	1	09/27/17 17:22	9/26/17	
Perfluorodecane sulfonic acid (PFDS)	ND	U	12	1	09/27/17 17:22	9/26/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	101	19 - 126	09/27/17 17:22	
13C2-PFHxA	89	10 - 151	09/28/17 21:40	
18O2-PFHxS	86	20 - 128	09/27/17 17:22	
13C2-6:2 FTS	62	10 - 187	09/27/17 17:22	
13C4-PFOA	86	13 - 142	09/28/17 21:40	
13C5-PFNA	76	15 - 143	09/27/17 17:22	
13C4-PFOS	92	11 - 131	09/28/17 21:40	
13C2-PFDA	110	25 - 129	09/27/17 17:22	
13C2-PFUnDA	95	16 - 129	09/27/17 17:22	
13C2-PFDoDA	88	17 - 114	09/27/17 17:22	
D7-MeFOSE	86	32 - 113	09/27/17 17:22	
D9-EtFOSE	80	20 - 113	09/27/17 17:22	
D5-EtFOSA	48	19 - 103	09/27/17 17:22	
13C2-8:2 FTS	135	50 - 150	09/27/17 17:22	

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709951
Project:	WWW/16.0062335	**Date Collected:**	09/15/17 09:30
Sample Matrix:	Ground Water	**Date Received:**	09/19/17 09:20
Sample Name:	PW-17-9B	**Units:**	ng/L
Lab Code:	K1709951-009	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M			
Prep Method:	EPA 3535A			
13C2-PFTeDA		122	50 - 150	09/27/17 17:22
13C4-PFHpA		96	50 - 150	09/27/17 17:22
13C5-PFPeA		106	50 - 150	09/27/17 17:22
13C3-PFBS		55	50 - 150	09/27/17 17:22
13C8-FOSA		81	50 - 150	09/27/17 17:22

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709951
Project:	WWW/16.0062335	**Date Collected:**	09/15/17 11:45
Sample Matrix:	Water	**Date Received:**	09/19/17 09:20
Sample Name:	FB-17-4	**Units:**	ng/L
Lab Code:	K1709951-010	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	ND U	8.8	1	09/26/17 11:45	9/25/17	
Perfluoropentanoic acid (PFPeA)	ND U	4.4	1	09/26/17 11:45	9/25/17	
Perfluorobutane sulfonic acid (PFBS)	ND U	4.4	1	09/26/17 11:45	9/25/17	
Perfluorohexanoic acid (PFHxA)	ND U	4.4	1	09/26/17 11:45	9/25/17	
Perfluoroheptanoic acid (PFHpA)	ND U	4.4	1	09/26/17 11:45	9/25/17	
Perfluorohexane sulfonic acid (PFHxS)	ND U	4.4	1	09/26/17 11:45	9/25/17	
Perfluorooctanoic acid (PFOA)	ND U	1.8	1	09/26/17 11:45	9/25/17	
Perfluoroheptane sulfonic acid (PFHpS)	ND U	4.4	1	09/26/17 11:45	9/25/17	
Perfluorononanoic acid (PFNA)	ND U	4.4	1	09/26/17 11:45	9/25/17	
Perfluorooctane sulfonic acid (PFOS)	ND U	4.4	1	09/26/17 11:45	9/25/17	
Perfluorodecanoic acid (PFDA)	ND U	4.4	1	09/26/17 11:45	9/25/17	
Perfluoroundecanoic acid (PFUnDA)	ND U	4.4	1	09/26/17 11:45	9/25/17	
Perfluorooctane sulfonamide (FOSA)	ND U	4.4	1	09/26/17 11:45	9/25/17	
Perfluorododecanoic acid (PFDoDA)	ND U	4.4	1	09/26/17 11:45	9/25/17	
Perfluorotridecanoic acid (PFTrDA)	ND U	4.4	1	09/26/17 11:45	9/25/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND U	4.4	1	09/26/17 11:45	9/25/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND U	4.4	1	09/26/17 11:45	9/25/17	
Perfluorotetradecanoic acid (PFTeDA)	ND U	4.4	1	09/26/17 11:45	9/25/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND U	4.4	1	09/26/17 11:45	9/25/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND U	4.4	1	09/26/17 11:45	9/25/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND U	4.4	1	09/26/17 11:45	9/25/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND U	4.4	1	09/26/17 11:45	9/25/17	
Perfluorodecane sulfonic acid (PFDS)	ND U	4.4	1	09/26/17 11:45	9/25/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	92	19 - 126	09/26/17 11:45	
13C2-PFHxA	91	10 - 151	09/26/17 11:45	
18O2-PFHxS	68	20 - 128	09/26/17 11:45	
13C2-6:2 FTS	85	10 - 187	09/26/17 11:45	
13C4-PFOA	86	13 - 142	09/26/17 11:45	
13C5-PFNA	87	15 - 143	09/26/17 11:45	
13C4-PFOS	85	11 - 131	09/26/17 11:45	
13C2-PFDA	103	25 - 129	09/26/17 11:45	
13C2-PFUnDA	94	16 - 129	09/26/17 11:45	
13C2-PFDoDA	84	17 - 114	09/26/17 11:45	
D7-MeFOSE	83	32 - 113	09/26/17 11:45	
D9-EtFOSE	80	20 - 113	09/26/17 11:45	
D5-EtFOSA	66	19 - 103	09/26/17 11:45	
13C2-8:2 FTS	143	50 - 150	09/26/17 11:45	

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709951
Project:	WWW/16.0062335	**Date Collected:**	09/15/17 11:45
Sample Matrix:	Water	**Date Received:**	09/19/17 09:20
Sample Name:	FB-17-4	**Units:**	ng/L
Lab Code:	K1709951-010	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M			
Prep Method:	EPA 3535A			
13C2-PFTeDA		99	50 - 150	09/26/17 11:45
13C4-PFHpA		92	50 - 150	09/26/17 11:45
13C5-PFPeA		100	50 - 150	09/26/17 11:45
13C3-PFBS		58	50 - 150	09/26/17 11:45
13C8-FOSA		85	50 - 150	09/26/17 11:45

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709951
Project:	WWW/16.0062335	**Date Collected:**	09/15/17 12:25
Sample Matrix:	Water	**Date Received:**	09/19/17 09:20
Sample Name:	SW-17-10	**Units:**	ng/L
Lab Code:	K1709951-011	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result		MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	ND	U	8.6	1	09/26/17 11:55	9/25/17	
Perfluoropentanoic acid (PFPeA)	ND	U	4.3	1	09/26/17 11:55	9/25/17	
Perfluorobutane sulfonic acid (PFBS)	ND	U	4.3	1	09/26/17 11:55	9/25/17	
Perfluorohexanoic acid (PFHxA)	ND	U	4.3	1	09/26/17 11:55	9/25/17	
Perfluoroheptanoic acid (PFHpA)	ND	U	4.3	1	09/26/17 11:55	9/25/17	
Perfluorohexane sulfonic acid (PFHxS)	ND	U	4.3	1	09/26/17 11:55	9/25/17	
Perfluorooctanoic acid (PFOA)	**6.3**		1.7	1	09/26/17 11:55	9/25/17	
Perfluoroheptane sulfonic acid (PFHpS)	ND	U	4.3	1	09/26/17 11:55	9/25/17	
Perfluorononanoic acid (PFNA)	ND	U	4.3	1	09/26/17 11:55	9/25/17	
Perfluorooctane sulfonic acid (PFOS)	**13**		4.3	1	09/26/17 11:55	9/25/17	
Perfluorodecanoic acid (PFDA)	ND	U	4.3	1	09/26/17 11:55	9/25/17	
Perfluoroundecanoic acid (PFUnDA)	ND	U	4.3	1	09/26/17 11:55	9/25/17	
Perfluorooctane sulfonamide (FOSA)	ND	U	4.3	1	09/26/17 11:55	9/25/17	
Perfluorododecanoic acid (PFDoDA)	ND	U	4.3	1	09/26/17 11:55	9/25/17	
Perfluorotridecanoic acid (PFTrDA)	ND	U	4.3	1	09/26/17 11:55	9/25/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND	U	4.3	1	09/26/17 11:55	9/25/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND	U	4.3	1	09/26/17 11:55	9/25/17	
Perfluorotetradecanoic acid (PFTeDA)	ND	U	4.3	1	09/26/17 11:55	9/25/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND	U	4.3	1	09/26/17 11:55	9/25/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND	U	4.3	1	09/26/17 11:55	9/25/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND	U	4.3	1	09/26/17 11:55	9/25/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND	U	4.3	1	09/26/17 11:55	9/25/17	
Perfluorodecane sulfonic acid (PFDS)	ND	U	4.3	1	09/26/17 11:55	9/25/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	93	19 - 126	09/26/17 11:55	
13C2-PFHxA	97	10 - 151	09/26/17 11:55	
18O2-PFHxS	64	20 - 128	09/26/17 11:55	
13C2-6:2 FTS	61	10 - 187	09/26/17 11:55	
13C4-PFOA	84	13 - 142	09/26/17 11:55	
13C5-PFNA	84	15 - 143	09/26/17 11:55	
13C4-PFOS	83	11 - 131	09/26/17 11:55	
13C2-PFDA	107	25 - 129	09/26/17 11:55	
13C2-PFUnDA	87	16 - 129	09/26/17 11:55	
13C2-PFDoDA	86	17 - 114	09/26/17 11:55	
D7-MeFOSE	84	32 - 113	09/26/17 11:55	
D9-EtFOSE	78	20 - 113	09/26/17 11:55	
D5-EtFOSA	65	19 - 103	09/26/17 11:55	
13C2-8:2 FTS	253	50 - 150	09/26/17 11:55	*

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709951
Project:	WWW/16.0062335	**Date Collected:**	09/15/17 12:25
Sample Matrix:	Water	**Date Received:**	09/19/17 09:20
Sample Name:	SW-17-10	**Units:**	ng/L
Lab Code:	K1709951-011	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M		
Prep Method:	EPA 3535A		
13C2-PFTeDA	90	50 - 150	09/26/17 11:55
13C4-PFHpA	82	50 - 150	09/26/17 11:55
13C5-PFPeA	99	50 - 150	09/26/17 11:55
13C3-PFBS	56	50 - 150	09/26/17 11:55
13C8-FOSA	82	50 - 150	09/26/17 11:55

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709951
Project:	WWW/16.0062335	**Date Collected:**	09/15/17 10:15
Sample Matrix:	Ground Water	**Date Received:**	09/19/17 09:20
Sample Name:	PW-17-11	**Units:**	ng/L
Lab Code:	K1709951-012	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result		MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	**460**		8.6	1	09/27/17 17:33	9/26/17	
Perfluoropentanoic acid (PFPeA)	**570**		4.3	1	09/27/17 17:33	9/26/17	
Perfluorobutane sulfonic acid (PFBS)	**1100**		4.3	1	09/27/17 17:33	9/26/17	
Perfluorohexanoic acid (PFHxA)	**2400**		210	50	09/28/17 21:50	9/26/17	
Perfluoroheptanoic acid (PFHpA)	**1000**		210	50	09/28/17 21:50	9/26/17	
Perfluorohexane sulfonic acid (PFHxS)	**3800**		210	50	09/29/17 17:07	9/26/17	
Perfluorooctanoic acid (PFOA)	**3000**		86	50	09/28/17 21:50	9/26/17	
Perfluoroheptane sulfonic acid (PFHpS)	**410**		4.3	1	09/27/17 17:33	9/26/17	
Perfluorononanoic acid (PFNA)	**120**		4.3	1	09/27/17 17:33	9/26/17	
Perfluorooctane sulfonic acid (PFOS)	**730**		210	50	09/28/17 21:50	9/26/17	
Perfluorodecanoic acid (PFDA)	ND	U	4.3	1	09/27/17 17:33	9/26/17	
Perfluoroundecanoic acid (PFUnDA)	ND	U	4.3	1	09/27/17 17:33	9/26/17	
Perfluorooctane sulfonamide (FOSA)	ND	U	4.3	1	09/27/17 17:33	9/26/17	
Perfluorododecanoic acid (PFDoDA)	ND	U	4.3	1	09/27/17 17:33	9/26/17	
Perfluorotridecanoic acid (PFTrDA)	ND	U	4.3	1	09/27/17 17:33	9/26/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND	U	4.3	1	09/27/17 17:33	9/26/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND	U	4.3	1	09/27/17 17:33	9/26/17	
Perfluorotetradecanoic acid (PFTeDA)	ND	U	4.3	1	09/27/17 17:33	9/26/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND	U	4.3	1	09/27/17 17:33	9/26/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND	U	4.3	1	09/27/17 17:33	9/26/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND	U	4.3	1	09/27/17 17:33	9/26/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	**6.6**		4.3	1	09/27/17 17:33	9/26/17	
Perfluorodecane sulfonic acid (PFDS)	ND	U	4.3	1	09/27/17 17:33	9/26/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	118	19 - 126	09/27/17 17:33	
13C2-PFHxA	97	10 - 151	09/28/17 21:50	
18O2-PFHxS	78	20 - 128	09/29/17 17:07	
13C2-6:2 FTS	68	10 - 187	09/27/17 17:33	
13C4-PFOA	87	13 - 142	09/28/17 21:50	
13C5-PFNA	113	15 - 143	09/27/17 17:33	
13C4-PFOS	82	11 - 131	09/28/17 21:50	
13C2-PFDA	115	25 - 129	09/27/17 17:33	
13C2-PFUnDA	88	16 - 129	09/27/17 17:33	
13C2-PFDoDA	82	17 - 114	09/27/17 17:33	
D7-MeFOSE	74	32 - 113	09/27/17 17:33	
D9-EtFOSE	70	20 - 113	09/27/17 17:33	
D5-EtFOSA	54	19 - 103	09/27/17 17:33	
13C2-8:2 FTS	228	50 - 150	09/27/17 17:33	*

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709951
Project:	WWW/16.0062335	**Date Collected:**	09/15/17 10:15
Sample Matrix:	Ground Water	**Date Received:**	09/19/17 09:20
Sample Name:	PW-17-11	**Units:**	ng/L
Lab Code:	K1709951-012	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M			
Prep Method:	EPA 3535A			
13C2-PFTeDA		114	50 - 150	09/27/17 17:33
13C4-PFHpA		93	50 - 150	09/28/17 21:50
13C5-PFPeA		110	50 - 150	09/27/17 17:33
13C3-PFBS		58	50 - 150	09/27/17 17:33
13C8-FOSA		72	50 - 150	09/27/17 17:33

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709951
Project:	WWW/16.0062335	**Date Collected:**	09/15/17 11:10
Sample Matrix:	Ground Water	**Date Received:**	09/19/17 09:20
Sample Name:	PW-17-12	**Units:**	ng/L
Lab Code:	K1709951-013	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result		MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	ND	U	8.6	1	09/27/17 17:43	9/26/17	
Perfluoropentanoic acid (PFPeA)	ND	U	4.3	1	09/27/17 17:43	9/26/17	
Perfluorobutane sulfonic acid (PFBS)	ND	U	4.3	1	09/27/17 17:43	9/26/17	
Perfluorohexanoic acid (PFHxA)	ND	U	4.3	1	09/27/17 17:43	9/26/17	
Perfluoroheptanoic acid (PFHpA)	ND	U	4.3	1	09/27/17 17:43	9/26/17	
Perfluorohexane sulfonic acid (PFHxS)	ND	U	4.3	1	09/27/17 17:43	9/26/17	
Perfluorooctanoic acid (PFOA)	**9.5**		1.7	1	09/27/17 17:43	9/26/17	
Perfluoroheptane sulfonic acid (PFHpS)	ND	U	4.3	1	09/27/17 17:43	9/26/17	
Perfluorononanoic acid (PFNA)	ND	U	4.3	1	09/27/17 17:43	9/26/17	
Perfluorooctane sulfonic acid (PFOS)	**20**		4.3	1	09/27/17 17:43	9/26/17	
Perfluorodecanoic acid (PFDA)	ND	U	4.3	1	09/27/17 17:43	9/26/17	
Perfluoroundecanoic acid (PFUnDA)	ND	U	4.3	1	09/27/17 17:43	9/26/17	
Perfluorooctane sulfonamide (FOSA)	ND	U	4.3	1	09/27/17 17:43	9/26/17	
Perfluorododecanoic acid (PFDoDA)	ND	U	4.3	1	09/27/17 17:43	9/26/17	
Perfluorotridecanoic acid (PFTrDA)	ND	U	4.3	1	09/27/17 17:43	9/26/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND	U	4.3	1	09/27/17 17:43	9/26/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND	U	4.3	1	09/27/17 17:43	9/26/17	
Perfluorotetradecanoic acid (PFTeDA)	ND	U	4.3	1	09/27/17 17:43	9/26/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND	U	4.3	1	09/27/17 17:43	9/26/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND	U	4.3	1	09/27/17 17:43	9/26/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND	U	4.3	1	09/27/17 17:43	9/26/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND	U	4.3	1	09/27/17 17:43	9/26/17	
Perfluorodecane sulfonic acid (PFDS)	ND	U	4.3	1	09/27/17 17:43	9/26/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	102	19 - 126	09/27/17 17:43	
13C2-PFHxA	98	10 - 151	09/27/17 17:43	
18O2-PFHxS	89	20 - 128	09/27/17 17:43	
13C2-6:2 FTS	169	10 - 187	09/27/17 17:43	
13C4-PFOA	124	13 - 142	09/27/17 17:43	
13C5-PFNA	109	15 - 143	09/27/17 17:43	
13C4-PFOS	94	11 - 131	09/27/17 17:43	
13C2-PFDA	106	25 - 129	09/27/17 17:43	
13C2-PFUnDA	88	16 - 129	09/27/17 17:43	
13C2-PFDoDA	84	17 - 114	09/27/17 17:43	
D7-MeFOSE	71	32 - 113	09/27/17 17:43	
D9-EtFOSE	70	20 - 113	09/27/17 17:43	
D5-EtFOSA	40	19 - 103	09/27/17 17:43	
13C2-8:2 FTS	196	50 - 150	09/27/17 17:43	*

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709951
Project:	WWW/16.0062335	**Date Collected:**	09/15/17 11:10
Sample Matrix:	Ground Water	**Date Received:**	09/19/17 09:20
Sample Name:	PW-17-12	**Units:**	ng/L
Lab Code:	K1709951-013	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M			
Prep Method:	EPA 3535A			
13C2-PFTeDA		107	50 - 150	09/27/17 17:43
13C4-PFHpA		108	50 - 150	09/27/17 17:43
13C5-PFPeA		106	50 - 150	09/27/17 17:43
13C3-PFBS		59	50 - 150	09/27/17 17:43
13C8-FOSA		76	50 - 150	09/27/17 17:43

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709951
Project:	WWW/16.0062335	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/L
Lab Code:	KQ1713886-03	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	ND U	10	1	09/26/17 09:29	9/25/17	
Perfluoropentanoic acid (PFPeA)	ND U	5.0	1	09/26/17 09:29	9/25/17	
Perfluorobutane sulfonic acid (PFBS)	ND U	5.0	1	09/26/17 09:29	9/25/17	
Perfluorohexanoic acid (PFHxA)	ND U	5.0	1	09/26/17 09:29	9/25/17	
Perfluoroheptanoic acid (PFHpA)	ND U	5.0	1	09/26/17 09:29	9/25/17	
Perfluorohexane sulfonic acid (PFHxS)	ND U	5.0	1	09/26/17 09:29	9/25/17	
Perfluorooctanoic acid (PFOA)	ND U	2.0	1	09/26/17 09:29	9/25/17	
Perfluoroheptane sulfonic acid (PFHpS)	ND U	5.0	1	09/26/17 09:29	9/25/17	
Perfluorononanoic acid (PFNA)	ND U	5.0	1	09/26/17 09:29	9/25/17	
Perfluorooctane sulfonic acid (PFOS)	ND U	5.0	1	09/26/17 09:29	9/25/17	
Perfluorodecanoic acid (PFDA)	ND U	5.0	1	09/26/17 09:29	9/25/17	
Perfluoroundecanoic acid (PFUnDA)	ND U	5.0	1	09/26/17 09:29	9/25/17	
Perfluorooctane sulfonamide (FOSA)	ND U	5.0	1	09/26/17 09:29	9/25/17	
Perfluorododecanoic acid (PFDoDA)	ND U	5.0	1	09/26/17 09:29	9/25/17	
Perfluorotridecanoic acid (PFTrDA)	ND U	5.0	1	09/26/17 09:29	9/25/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND U	5.0	1	09/26/17 09:29	9/25/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND U	5.0	1	09/26/17 09:29	9/25/17	
Perfluorotetradecanoic acid (PFTeDA)	ND U	5.0	1	09/26/17 09:29	9/25/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND U	5.0	1	09/26/17 09:29	9/25/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND U	5.0	1	09/26/17 09:29	9/25/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND U	5.0	1	09/26/17 09:29	9/25/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND U	5.0	1	09/26/17 09:29	9/25/17	
Perfluorodecane sulfonic acid (PFDS)	ND U	5.0	1	09/26/17 09:29	9/25/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	76	19 - 126	09/26/17 09:29	
13C2-PFHxA	67	10 - 151	09/26/17 09:29	
18O2-PFHxS	58	20 - 128	09/26/17 09:29	
13C2-6:2 FTS	71	10 - 187	09/26/17 09:29	
13C4-PFOA	72	13 - 142	09/26/17 09:29	
13C5-PFNA	66	15 - 143	09/26/17 09:29	
13C4-PFOS	71	11 - 131	09/26/17 09:29	
13C2-PFDA	94	25 - 129	09/26/17 09:29	
13C2-PFUnDA	76	16 - 129	09/26/17 09:29	
13C2-PFDoDA	68	17 - 114	09/26/17 09:29	
D7-MeFOSE	60	32 - 113	09/26/17 09:29	
D9-EtFOSE	63	20 - 113	09/26/17 09:29	
D5-EtFOSA	43	19 - 103	09/26/17 09:29	
13C2-8:2 FTS	195	50 - 150	09/26/17 09:29	*

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709951
Project:	WWW/16.0062335	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/L
Lab Code:	KQ1713886-03	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M			
Prep Method:	EPA 3535A			
13C2-PFTeDA	63	50 - 150	09/26/17 09:29	
13C4-PFHpA	87	50 - 150	09/26/17 09:29	
13C5-PFPeA	84	50 - 150	09/26/17 09:29	
13C3-PFBS	43	50 - 150	09/26/17 09:29	*
13C8-FOSA	69	50 - 150	09/26/17 09:29	

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709951
Project:	WWW/16.0062335	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/L
Lab Code:	KQ1713927-03	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	ND U	10	1	09/27/17 14:14	9/26/17	
Perfluoropentanoic acid (PFPeA)	ND U	5.0	1	09/27/17 14:14	9/26/17	
Perfluorobutane sulfonic acid (PFBS)	ND U	5.0	1	09/27/17 14:14	9/26/17	
Perfluorohexanoic acid (PFHxA)	ND U	5.0	1	09/27/17 14:14	9/26/17	
Perfluoroheptanoic acid (PFHpA)	ND U	5.0	1	09/27/17 14:14	9/26/17	
Perfluorohexane sulfonic acid (PFHxS)	ND U	5.0	1	09/27/17 14:14	9/26/17	
Perfluorooctanoic acid (PFOA)	ND U	2.0	1	09/27/17 14:14	9/26/17	
Perfluoroheptane sulfonic acid (PFHpS)	ND U	5.0	1	09/27/17 14:14	9/26/17	
Perfluorononanoic acid (PFNA)	ND U	5.0	1	09/27/17 14:14	9/26/17	
Perfluorooctane sulfonic acid (PFOS)	ND U	5.0	1	09/27/17 14:14	9/26/17	
Perfluorodecanoic acid (PFDA)	ND U	5.0	1	09/27/17 14:14	9/26/17	
Perfluoroundecanoic acid (PFUnDA)	ND U	5.0	1	09/27/17 14:14	9/26/17	
Perfluorooctane sulfonamide (FOSA)	ND U	5.0	1	09/27/17 14:14	9/26/17	
Perfluorododecanoic acid (PFDoDA)	ND U	5.0	1	09/27/17 14:14	9/26/17	
Perfluorotridecanoic acid (PFTrDA)	ND U	5.0	1	09/27/17 14:14	9/26/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND U	5.0	1	09/27/17 14:14	9/26/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND U	5.0	1	09/27/17 14:14	9/26/17	
Perfluorotetradecanoic acid (PFTeDA)	ND U	5.0	1	09/27/17 14:14	9/26/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND U	5.0	1	09/27/17 14:14	9/26/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND U	5.0	1	09/27/17 14:14	9/26/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND U	5.0	1	09/27/17 14:14	9/26/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND U	5.0	1	09/27/17 14:14	9/26/17	
Perfluorodecane sulfonic acid (PFDS)	ND U	5.0	1	09/27/17 14:14	9/26/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	94	19 - 126	09/27/17 14:14	
13C2-PFHxA	98	10 - 151	09/27/17 14:14	
18O2-PFHxS	72	20 - 128	09/27/17 14:14	
13C2-6:2 FTS	84	10 - 187	09/27/17 14:14	
13C4-PFOA	117	13 - 142	09/27/17 14:14	
13C5-PFNA	87	15 - 143	09/27/17 14:14	
13C4-PFOS	91	11 - 131	09/27/17 14:14	
13C2-PFDA	105	25 - 129	09/27/17 14:14	
13C2-PFUnDA	84	16 - 129	09/27/17 14:14	
13C2-PFDoDA	83	17 - 114	09/27/17 14:14	
D7-MeFOSE	77	32 - 113	09/27/17 14:14	
D9-EtFOSE	79	20 - 113	09/27/17 14:14	
D5-EtFOSA	49	19 - 103	09/27/17 14:14	
13C2-8:2 FTS	119	50 - 150	09/27/17 14:14	

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709951
Project:	WWW/16.0062335	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/L
Lab Code:	KQ1713927-03	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M		
Prep Method:	EPA 3535A		
13C2-PFTeDA	85	50 - 150	09/27/17 14:14
13C4-PFHpA	91	50 - 150	09/27/17 14:14
13C5-PFPeA	103	50 - 150	09/27/17 14:14
13C3-PFBS	64	50 - 150	09/27/17 14:14
13C8-FOSA	77	50 - 150	09/27/17 14:14

Client: GZA GeoEnvironmental, Incorporated **Service Request:** K1709951
Project: WWW/16.0062335
Sample Matrix: Ground Water

SURROGATE RECOVERY SUMMARY

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Extraction Method: EPA 3535A

Sample Name	Lab Code	13C2-6:2 FTS 10 - 187	13C2-8:2 FTS 50 - 150	13C2-PFDA 25 - 129
PW-17-8A	K1709951-001	77	126	111
PW-17-8B	K1709951-002	98	276 *	119
PW-17-8C	K1709951-003	87	125	103
PW-DUP-3P	K1709951-005	58	244 *	124
PW-17-9A	K1709951-007	60	124	110
PW-17-9B	K1709951-009	62	135	110
PW-17-11	K1709951-012	68	228 *	115
PW-17-12	K1709951-013	169	196 *	106
Lab Control Sample	KQ1713927-01	94	121	92
Duplicate Lab Control Sample	KQ1713927-02	88	120	97
Method Blank	KQ1713927-03	84	119	105

Client: GZA GeoEnvironmental, Incorporated **Service Request:** K1709951
Project: WWW/16.0062335
Sample Matrix: Ground Water

SURROGATE RECOVERY SUMMARY

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Extraction Method: EPA 3535A

Sample Name	Lab Code	13C2-PFDoDA 17 - 114	13C2-PFHxA 10 - 151	13C2-PFTeDA 50 - 150
PW-17-8A	K1709951-001	85	110	102
PW-17-8B	K1709951-002	86	88	121
PW-17-8C	K1709951-003	88	90	118
PW-DUP-3P	K1709951-005	94	96	122
PW-17-9A	K1709951-007	82	91	97
PW-17-9B	K1709951-009	88	89	122
PW-17-11	K1709951-012	82	97	114
PW-17-12	K1709951-013	84	98	107
Lab Control Sample	KQ1713927-01	95	129	122
Duplicate Lab Control Sample	KQ1713927-02	74	92	98
Method Blank	KQ1713927-03	83	98	85

Client: GZA GeoEnvironmental, Incorporated **Service Request:** K1709951
Project: WWW/16.0062335
Sample Matrix: Ground Water

SURROGATE RECOVERY SUMMARY

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Extraction Method: EPA 3535A

Sample Name	Lab Code	13C2-PFUnDA 16 - 129	13C3-PFBS 50 - 150	13C4-PFBA 19 - 126
PW-17-8A	K1709951-001	93	60	102
PW-17-8B	K1709951-002	91	63	100
PW-17-8C	K1709951-003	95	59	102
PW-DUP-3P	K1709951-005	106	55	110
PW-17-9A	K1709951-007	100	55	105
PW-17-9B	K1709951-009	95	55	101
PW-17-11	K1709951-012	88	58	118
PW-17-12	K1709951-013	88	59	102
Lab Control Sample	KQ1713927-01	104	74	116
Duplicate Lab Control Sample	KQ1713927-02	78	63	94
Method Blank	KQ1713927-03	84	64	94

Client: GZA GeoEnvironmental, Incorporated **Service Request:** K1709951

Project: WWW/16.0062335

Sample Matrix: Ground Water

SURROGATE RECOVERY SUMMARY

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M

Extraction Method: EPA 3535A

Sample Name	Lab Code	13C4-PFHpA 50 - 150	13C4-PFOA 13 - 142	13C4-PFOS 11 - 131
PW-17-8A	K1709951-001	102	130	86
PW-17-8B	K1709951-002	114	131	82
PW-17-8C	K1709951-003	129	119	88
PW-DUP-3P	K1709951-005	108	84	64
PW-17-9A	K1709951-007	97	85	79
PW-17-9B	K1709951-009	96	86	92
PW-17-11	K1709951-012	93	87	82
PW-17-12	K1709951-013	108	124	94
Lab Control Sample	KQ1713927-01	117	142	76
Duplicate Lab Control Sample	KQ1713927-02	96	101	85
Method Blank	KQ1713927-03	91	117	91

Client: GZA GeoEnvironmental, Incorporated **Service Request:** K1709951
Project: WWW/16.0062335
Sample Matrix: Ground Water

SURROGATE RECOVERY SUMMARY

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Extraction Method: EPA 3535A

Sample Name	Lab Code	13C5-PFNA 15 - 143	13C5-PFPeA 50 - 150	13C8-FOSA 50 - 150
PW-17-8A	K1709951-001	93	110	79
PW-17-8B	K1709951-002	82	106	77
PW-17-8C	K1709951-003	95	109	82
PW-DUP-3P	K1709951-005	89	113	90
PW-17-9A	K1709951-007	81	108	88
PW-17-9B	K1709951-009	76	106	81
PW-17-11	K1709951-012	113	110	72
PW-17-12	K1709951-013	109	106	76
Lab Control Sample	KQ1713927-01	94	126	92
Duplicate Lab Control Sample	KQ1713927-02	82	105	68
Method Blank	KQ1713927-03	87	103	77

Client: GZA GeoEnvironmental, Incorporated **Service Request:** K1709951
Project: WWW/16.0062335
Sample Matrix: Ground Water

SURROGATE RECOVERY SUMMARY

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Extraction Method: EPA 3535A

Sample Name	Lab Code	18O2-PFHxS 20 - 128	D5-EtFOSA 19 - 103	D7-MeFOSE 32 - 113
PW-17-8A	K1709951-001	89	63	87
PW-17-8B	K1709951-002	97	46	84
PW-17-8C	K1709951-003	101	69	88
PW-DUP-3P	K1709951-005	94	73	104
PW-17-9A	K1709951-007	83	64	102
PW-17-9B	K1709951-009	86	48	86
PW-17-11	K1709951-012	78	54	74
PW-17-12	K1709951-013	89	40	71
Lab Control Sample	KQ1713927-01	90	67	99
Duplicate Lab Control Sample	KQ1713927-02	72	48	77
Method Blank	KQ1713927-03	72	49	77

QA/QC Report

Client: GZA GeoEnvironmental, Incorporated **Service Request:** K1709951
Project: WWW/16.0062335
Sample Matrix: Ground Water

SURROGATE RECOVERY SUMMARY

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Extraction Method: EPA 3535A

Sample Name	Lab Code	D9-EtFOSE 20 - 113
PW-17-8A	K1709951-001	83
PW-17-8B	K1709951-002	77
PW-17-8C	K1709951-003	86
PW-DUP-3P	K1709951-005	95
PW-17-9A	K1709951-007	89
PW-17-9B	K1709951-009	80
PW-17-11	K1709951-012	70
PW-17-12	K1709951-013	70
Lab Control Sample	KQ1713927-01	93
Duplicate Lab Control Sample	KQ1713927-02	72
Method Blank	KQ1713927-03	79

Client: GZA GeoEnvironmental, Incorporated **Service Request:** K1709951
Project: WWW/16.0062335
Sample Matrix: Water

SURROGATE RECOVERY SUMMARY

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Extraction Method: EPA 3535A

Sample Name	Lab Code	13C2-6:2 FTS 10 - 187	13C2-8:2 FTS 50 - 150	13C2-PFDA 25 - 129
EQ-17-3P	K1709951-004	81	125	108
SW-DUP-3P	K1709951-006	75	175 *	112
EQ-17-2P	K1709951-008	72	182 *	114
FB-17-4	K1709951-010	85	143	103
SW-17-10	K1709951-011	61	253 *	107
Lab Control Sample	KQ1713886-01	78	147	110
Duplicate Lab Control Sample	KQ1713886-02	73	144	105
Method Blank	KQ1713886-03	71	195 *	94

Client: GZA GeoEnvironmental, Incorporated **Service Request:** K1709951
Project: WWW/16.0062335
Sample Matrix: Water

SURROGATE RECOVERY SUMMARY

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Extraction Method: EPA 3535A

Sample Name	Lab Code	13C2-PFDoDA 17 - 114	13C2-PFHxA 10 - 151	13C2-PFTeDA 50 - 150
EQ-17-3P	K1709951-004	77	84	80
SW-DUP-3P	K1709951-006	99	101	82
EQ-17-2P	K1709951-008	82	94	95
FB-17-4	K1709951-010	84	91	99
SW-17-10	K1709951-011	86	97	90
Lab Control Sample	KQ1713886-01	75	83	90
Duplicate Lab Control Sample	KQ1713886-02	76	87	98
Method Blank	KQ1713886-03	68	67	63

Client: GZA GeoEnvironmental, Incorporated **Service Request:** K1709951
Project: WWW/16.0062335
Sample Matrix: Water

SURROGATE RECOVERY SUMMARY

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Extraction Method: EPA 3535A

Sample Name	Lab Code	13C2-PFUnDA 16 - 129	13C3-PFBS 50 - 150	13C4-PFBA 19 - 126
EQ-17-3P	K1709951-004	88	44 *	90
SW-DUP-3P	K1709951-006	90	60	102
EQ-17-2P	K1709951-008	89	52	92
FB-17-4	K1709951-010	94	58	92
SW-17-10	K1709951-011	87	56	93
Lab Control Sample	KQ1713886-01	87	51	91
Duplicate Lab Control Sample	KQ1713886-02	83	52	92
Method Blank	KQ1713886-03	76	43 *	76

Client: GZA GeoEnvironmental, Incorporated **Service Request:** K1709951
Project: WWW/16.0062335
Sample Matrix: Water

SURROGATE RECOVERY SUMMARY

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Extraction Method: EPA 3535A

Sample Name	Lab Code	13C4-PFHpA 50 - 150	13C4-PFOA 13 - 142	13C4-PFOS 11 - 131
EQ-17-3P	K1709951-004	106	85	71
SW-DUP-3P	K1709951-006	96	90	87
EQ-17-2P	K1709951-008	105	89	83
FB-17-4	K1709951-010	92	86	85
SW-17-10	K1709951-011	82	84	83
Lab Control Sample	KQ1713886-01	95	76	81
Duplicate Lab Control Sample	KQ1713886-02	108	82	86
Method Blank	KQ1713886-03	87	72	71

Client: GZA GeoEnvironmental, Incorporated **Service Request:** K1709951
Project: WWW/16.0062335
Sample Matrix: Water

SURROGATE RECOVERY SUMMARY

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Extraction Method: EPA 3535A

Sample Name	Lab Code	13C5-PFNA 15 - 143	13C5-PFPeA 50 - 150	13C8-FOSA 50 - 150
EQ-17-3P	K1709951-004	81	96	82
SW-DUP-3P	K1709951-006	91	107	85
EQ-17-2P	K1709951-008	84	100	81
FB-17-4	K1709951-010	87	100	85
SW-17-10	K1709951-011	84	99	82
Lab Control Sample	KQ1713886-01	72	101	78
Duplicate Lab Control Sample	KQ1713886-02	73	99	79
Method Blank	KQ1713886-03	66	84	69

Client: GZA GeoEnvironmental, Incorporated **Service Request:** K1709951
Project: WWW/16.0062335
Sample Matrix: Water

SURROGATE RECOVERY SUMMARY

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Extraction Method: EPA 3535A

Sample Name	Lab Code	18O2-PFHxS 20 - 128	D5-EtFOSA 19 - 103	D7-MeFOSE 32 - 113
EQ-17-3P	K1709951-004	73	49	76
SW-DUP-3P	K1709951-006	72	35	82
EQ-17-2P	K1709951-008	78	47	80
FB-17-4	K1709951-010	68	66	83
SW-17-10	K1709951-011	64	65	84
Lab Control Sample	KQ1713886-01	69	54	77
Duplicate Lab Control Sample	KQ1713886-02	77	59	78
Method Blank	KQ1713886-03	58	43	60

Client: GZA GeoEnvironmental, Incorporated **Service Request:** K1709951
Project: WWW/16.0062335
Sample Matrix: Water

SURROGATE RECOVERY SUMMARY

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Extraction Method: EPA 3535A

Sample Name	Lab Code	D9-EtFOSE 20 - 113
EQ-17-3P	K1709951-004	77
SW-DUP-3P	K1709951-006	78
EQ-17-2P	K1709951-008	73
FB-17-4	K1709951-010	80
SW-17-10	K1709951-011	78
Lab Control Sample	KQ1713886-01	74
Duplicate Lab Control Sample	KQ1713886-02	83
Method Blank	KQ1713886-03	63

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709951
Project:	WWW/16.0062335	**Date Analyzed:**	09/26/17
Sample Matrix:	Water	**Date Extracted:**	09/25/17

Duplicate Lab Control Sample Summary
Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M	**Units:**	ng/L
Prep Method:	EPA 3535A	**Basis:**	NA
		Analysis Lot:	563188

	Lab Control Sample KQ1713886-01			Duplicate Lab Control Sample KQ1713886-02					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	165	159	104	180	159	113	74-132	9	30
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	134	160	84	129	160	81	50-150	4	30
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	169	167	101	162	167	97	69-146	4	30
N-Ethyl perfluorooctane sulfonamidoethanol	152	167	91	141	167	85	54-159	8	30
N-Methyl perfluorooctane sulfonamide (MeFOSA)	111	167	66	120	167	72	10-183	8	30
N-Methyl perfluorooctane sulfonamidoethanol	162	167	97	164	167	98	37-166	1	30
Perfluorobutane sulfonic acid (PFBS)	190	148	129	184	148	124	50-150	4	30
Perfluorobutanoic acid (PFBA)	167	167	100	167	167	100	76-136	<1	30
Perfluorodecanoic acid (PFDA)	166	167	100	165	167	99	68-135	<1	30
Perfluorododecanoic acid (PFDoDA)	164	167	98	163	167	98	70-133	<1	30
Perfluoroheptane sulfonic acid (PFHpS)	142	159	90	140	159	88	69-148	1	30
Perfluoroheptanoic acid (PFHpA)	157	167	94	164	167	98	50-150	5	30
Perfluorohexane sulfonic acid (PFHxS)	147	152	97	143	152	94	71-130	3	30
Perfluorohexanoic acid (PFHxA)	180	167	108	187	167	112	68-141	4	30
Perfluorononanoic acid (PFNA)	212	167	127	204	167	123	77-127	4	30
Perfluorooctane sulfonamide (FOSA)	125	167	75	126	167	75	50-150	<1	30
Perfluorooctane sulfonic acid (PFOS)	125	155	81	119	155	77	74-135	5	30
Perfluorooctanoic acid (PFOA)	202	167	121	192	167	115	72-130	5	30
Perfluoropentanoic acid (PFPeA)	155	167	93	159	167	96	50-150	3	30
Perfluorotetradecanoic acid (PFTeDA)	191	167	115	188	167	113	50-150	2	30
Perfluorotridecanoic acid (PFTrDA)	163	167	98	147	167	88	50-150	11	30
Perfluoroundecanoic acid (PFUnDA)	159	167	96	153	167	92	66-131	4	30

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709951
Project:	WWW/16.0062335	**Date Analyzed:**	09/27/17
Sample Matrix:	Ground Water	**Date Extracted:**	09/26/17

Duplicate Lab Control Sample Summary
Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M	**Units:**	ng/L
Prep Method:	EPA 3535A	**Basis:**	NA
		Analysis Lot:	563483

	Lab Control Sample KQ1713927-01			Duplicate Lab Control Sample KQ1713927-02					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	130	159	82	122	159	77	74-132	6	30
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	147	167	88	153	167	92	69-146	4	30
N-Ethyl perfluorooctane sulfonamidoethanol	127	167	76	130	167	78	54-159	3	30
N-Methyl perfluorooctane sulfonamide (MeFOSA)	103	167	62	97.5	167	59	10-183	5	30
N-Methyl perfluorooctane sulfonamidoethanol	133	167	80	143	167	86	37-166	7	30
Perfluorobutane sulfonic acid (PFBS)	139	148	94	149	148	101	50-150	7	30
Perfluorobutanoic acid (PFBA)	144	167	86	143	167	86	76-136	<1	30
Perfluorododecanoic acid (PFDoDA)	149	167	90	154	167	92	70-133	3	30
Perfluoroheptane sulfonic acid (PFHpS)	145	159	91	138	159	87	69-148	5	30
Perfluoroheptanoic acid (PFHpA)	134	167	80	143	167	86	50-150	6	30
Perfluorohexane sulfonic acid (PFHxS)	130	152	86	139	152	91	71-130	6	30
Perfluorohexanoic acid (PFHxA)	158	167	95	166	167	100	68-141	5	30
Perfluorononanoic acid (PFNA)	174	167	104	165	167	99	77-127	5	30
Perfluorooctane sulfonamide (FOSA)	112	167	67	117	167	70	50-150	4	30
Perfluorooctanoic acid (PFOA)	149	167	90	154	167	92	72-130	3	30
Perfluoropentanoic acid (PFPeA)	135	167	81	134	167	80	50-150	<1	30
Perfluorotetradecanoic acid (PFTeDA)	161	167	97	165	167	99	50-150	2	30
Perfluorotridecanoic acid (PFTrDA)	123	167	74	121	167	73	50-150	<1	30
Perfluoroundecanoic acid (PFUnDA)	134	167	80	131	167	79	66-131	2	30

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1709951
Project:	WWW/16.0062335	**Date Analyzed:**	09/28/17 - 09/27/17
Sample Matrix:	Ground Water	**Date Extracted:**	09/26/17

Duplicate Lab Control Sample Summary
Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M	**Units:**	ng/L
Prep Method:	EPA 3535A	**Basis:**	NA
		Analysis Lot:	563891

	Lab Control Sample KQ1713927-01			Duplicate Lab Control Sample KQ1713927-02					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	105	160	66	115	160	72	50-150	9	30
Perfluorodecanoic acid (PFDA)	141	167	85	134	167	81	68-135	5	30
Perfluorooctane sulfonic acid (PFOS)	153	155	99	116	155	75	74-135	27	30

Bio-Chem LABORATORIES, INC.

1049 - 28th Street SE
Grand Rapids, MI 49508
Ph: 616/248-4900
Toll Free: 800/362-LABS
Fax: 616/248-4904

September 25, 2017

Mark Westra
Rose & Westra, Inc.
A Division of GZA
601 Fifth St NW
Grand Rapids, MI 49504

TEL: (616) 956-6123
FAX (616) 288-3327

RE: 16.0062335.50

Dear Mark Westra:

Order No.: 1709060

BIO-CHEM Laboratories, Inc. received 41 samples on 9/15/2017 for the analyses presented in the following report.

There were no problems with the analyses and all data for associated QC met EPA or laboratory specifications except where noted in the Case Narrative.

If you have any questions regarding these tests results, please feel free to call.

Please note that unless otherwise instructed, residual samples will be held for sixty (60) days from the original report date. At that time, all non-hazardous samples will be disposed of in accordance with federal, state and local regulations and ordinances, and hazardous samples shall be returned to you. Please contact the laboratory within thirty (30) days if other arrangements for sample retention need to be made.

Sincerely,

Cindy Euwema

Cindy Euwema
Office Manager

Working with you to ensure a better tomorrow.

1709060 1 of 4

Bio Chem LABORATORIES, INC.

Chain of Custody

1049 28th Street SE • Grand Rapids, MI 49508
Ph: (616) 248-4900 • Toll Free: 800-362-LABS
Fax: (616) 248-4904

Project Number

Date | Date Due

Firm Name: ROSE & WESTRA / GZA
Turn around time: STD.
Firm Address: 601 5th ST NW
Project Name: 16.0062335.90
City, State, Zip: GRAND RAPIDS, MI
State Samples Taken From
Phone | Fax
Contact Person: MARK WESTRA

Item No	Lab I.D.	Client Sample Number	Date Taken	Time Taken	Sample Description (sample type: water, soil, other)	Number of Containers	Analysis Desired (One per line): Ammonia								Remarks
1	01	PW-17-1A	9/12/17	3:45pm	water	1	X								
2	02	PW-17-1B	"	4:35pm	"	1	X								
3	03	SW-17-1	"	3:45pm	"	1	X								
4	04	PW-DUP-1A	9/13/17	X	"	1	X								
5	05	SW-DUP-1A	"	X	"	1	X								
6	06	EQ-17-1A	"	5:40pm	"	1	X								
7	07	PW-17-2A	"	10:37 am	"	1	X								
8	08	PW-17-2B	"	~~10:17~~ 11:17am	"	1	X								
9	09	PW-17-3A	"	12:16pm	"	1	X								
10	10	PW-17-3B	"	12:50pm	"	1	X								

Released by	Received by	Date	Time
Kurt J Blackmore	Jack Markosky	9/15	1 pm
Jack Markosky	Cindy Emmema	9/15	2:20pm

Laboratory use only

☐ Blue Ice ____°

☑ Regular Ice

☐ No Coolant

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1709060 2 OF 4

Bio Chem LABORATORIES, INC.

Chain of Custody

1049 28th Street SE • Grand Rapids, MI 49508
Ph: (616) 248-4900 • Toll Free: 800-362-LABS
Fax: (616) 248-4904

Firm Name P&W/GZA	Turn around time STD	Project Number	
Firm Address	Project Name 16.0062334.50	Date	Date Due
City, State, Zip	State Samples Taken From		
Phone / Fax	Contact Person Mark Westra		

Item No	Lab I.D.	Client Sample Number	Date Taken	Time Taken	Sample Description (sample type: water, soil, other)	Number of Containers	Analysis Desired (One per line): Ammonia	Remarks
1	11	SW-17-4	9/13/17	2:40 pm	water	1	+	
2	12	PW-17-5A	"	3:30 pm		1	+	
3	13	PW-17-5B	"	4:20 pm		1	+	
4	14	SW-17-5A	"	3:30 pm		1	+	
5	15 PW	~~SW~~-17-6A	9/14/17	10:50 am		1	+	
6	16 PW	~~SW~~-17-6B	"	11:20 am		1	+	
7	17	SW-17-6A	"	10:50 am		1	+	
8	18	PW-DUP-2(A)	"	X		1	+	
9	19	PW-17-7A	"	12:20 pm		1	+	
10	20	PW-17-7B	"	12:50 pm		1	+	

Released by	Received by	Date	Time
Kelly Blackmore	Jack Markosky	9/15	1 pm
Jim Malley	Cindy Ewwema	9/15	2:20 pm

* (11) 21 | EQ-17-2A | 9-14-17 | 5:30 | (1) X

Laboratory use only

☐ Blue Ice ____°

☐ Regular Ice

☐ No Coolant

- Add per attached

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1709060 3 of 4

Bio-Chem LABORATORIES, INC.

Chain of Custody

1049 28th Street SE • Grand Rapids, MI 49508
Ph: (616) 248-4900 • Toll Free: 800-362-LABS
Fax: (616) 248-4904

Firm Name: P&W / GZA	Turn around time: Std.	Project Number	
Firm Address	Project Name: 16.0062336.50	Date	Date Due
City, State, Zip	State Samples Taken From		
Phone / Fax	Contact Person: Mark Westra		

Item No	Lab I.D.	Client Sample Number	Date Taken	Time Taken	Sample Description (sample type: water, soil, other)	Number of Containers	Analysis Desired (One per line): Ammonia	Remarks
1	22	SW-17-7	9/14/17	12:20	water	1	+	
2	23	PW-17-8A	"	3:35		1	+	
3	24	SW-17-8	"	3:35		1	+	
4	25	PW-17-8B	"	4:25		1	+	
5	26	PW-17-8C	"	5:00		1	+	
6	27	PW-17-9A	9/15/17	9:05		1	+	
7	28	PW-17-9B	"	9:30		1	+	
8	29	SW-17-9	"	9:15		1	+	
9	30	PW-DUP-3	"	X		1	+	
10	31	EQ-17-3(A)	"	12:00		1	+	

Released by	Received by	Date	Time
Kyle J Blackburn	Jack Markosky	9/15	1pm
Jack Markosky	Cindy Emmendorfer	9/15	2:20pm

Laboratory use only

- ☐ Blue Ice ____°
- ☐ Regular Ice
- ☐ No Coolant

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1709060 4 of 4

Bio-Chem LABORATORIES, INC.

Chain of Custody

1049 28th Street SE • Grand Rapids, MI 49508
Ph: (616) 248-4900 • Toll Free: 800-362-LABS
Fax: (616) 248-4904

Firm Name: RFW/ GZA	Turn around time: STD.
Firm Address:	Project Name: 16.0062335.50
City, State, Zip:	State Samples Taken From:
Phone: / Fax:	Contact Person: Mark WESTRA
Project Number:	
Date:	Date Due:

Analysis Desired (One per line): Titration; Ammonia

Item No	Lab I.D.	Client Sample Number	Date Taken	Time Taken	Sample Description (sample type: water, soil, other)	Number of Containers	Titration	Ammonia								Remarks
1	(38)	PW-17-11(T)	9/19/17	10:15	water	1	X									
2	32	PW-17-11(A)	|	10:15	|	1		X								
3	(39)	SW-17-11(T)	|	"	|	1	X									
4	33	SW-17-11(A)	|	"	|	1		X								
5	(40)	PW-17-12(T)	|	11:10	|	1	X									
6	34	PW-17-12(A)	|	11:10	|	1		X								
7	(41)	SW-17-12(T)	|	11:15	|	1	X									
8	35	SW-17-12(A)	|	11:15	|	1		X								
9	36	SW-17-10	|	12:25	|	1		X								
10	37	SW-DUP-3	|	X	|	1		X								

Released by	Received by	Date	Time
[signature]	Jack Markosky	9/15	1pm
[signature]	Cindy Euwema	9/15	2:20 pm

Laboratory use only

☐ Blue Ice _____ °

☐ Regular Ice

☐ No Coolant

Gmail by Google

Cindy Euwema <ceuwema@bio-chem.com>

The 41st bottle

2 messages

Jack Markosky <Jack.Markosky@gza.com> Fri, Sep 15, 2017 at 2:35 PM
To: "ceuwema@bio-chem.com" <ceuwema@bio-chem.com>

Hi Cindy,

Kirk thinks he might have forgotten to put a surface water dup. on the COC. Regardless, if it's a 250 ml or 125 ml, it needs to be analyzed for ammonia.

Have a great weekend!

Jack Markosky
Engineer II
GZA | 4328 3 Mile Rd. NW #200 | Grand Rapids, MI 49534
c: 616 295 6802 | Jack.Markosky@gza.com | www.gza.com

Proactive by Design. Since 1964.

Cindy Euwema <ceuwema@bio-chem.com> Fri, Sep 15, 2017 at 3:08 PM
To: Jack Markosky <Jack.Markosky@gza.com>, Kirk Blackmore <kjblackmore@rosewestra.com>

Jack/Kirk,

I have attached the COC with the amendment, I wrote the sample name on the bottle on page 2 (it was a EQ-17-2A). I do not see a sample with a name of SW-Dup-2.

I will add Ammonia to the sample, unless otherwise requested not to.

Thanks,

Cindy Euwema
Bio-Chem Laboratories, Inc.
1049 28th St SE
Grand Rapids, MI 49508
Phone: (616) 248-4900
Fax: (616) 248-4904
email: ceuwema@bio-chem.com

[Quoted text hidden]

BIO-CHEM Laboratories, Inc.

Date: *25-Sep-17*

CLIENT: Rose & Westra, Inc.
Project: 16.0062335.50
Lab Order: 1709060

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collection Date	Date Received
1709060-01A	PW-17-1A	Aqueous	9/12/2017	9/15/2017
1709060-02A	PW-17-1B	Aqueous	9/12/2017	9/15/2017
1709060-03A	SW-17-1	Aqueous	9/12/2017	9/15/2017
1709060-04A	PW-DUP-1A	Aqueous	9/13/2017	9/15/2017
1709060-05A	SW-DUP-1A	Aqueous	9/13/2017	9/15/2017
1709060-06A	EQ-17-1A	Aqueous	9/13/2017	9/15/2017
1709060-07A	PW-17-2A	Aqueous	9/13/2017	9/15/2017
1709060-08A	PW-17-2B	Aqueous	9/13/2017	9/15/2017
1709060-09A	PW-17-3A	Aqueous	9/13/2017	9/15/2017
1709060-10A	PW-17-3B	Aqueous	9/13/2017	9/15/2017
1709060-11A	SW-17-4	Aqueous	9/13/2017	9/15/2017
1709060-12A	PW-17-5A	Aqueous	9/12/2017	9/15/2017
1709060-13A	PW-17-5B	Aqueous	9/13/2017	9/15/2017
1709060-14A	SW-17-5A	Aqueous	9/13/2017	9/15/2017
1709060-15A	PW-17-6A	Aqueous	9/14/2017	9/15/2017
1709060-16A	PW-17-6B	Aqueous	9/14/2017	9/15/2017
1709060-17A	SW-17-6A	Aqueous	9/14/2017	9/15/2017
1709060-18A	PW-DUP-2A	Aqueous	9/14/2017	9/15/2017
1709060-19A	PW-17-7A	Aqueous	9/14/2017	9/15/2017
1709060-20A	PW-17-7B	Aqueous	9/14/2017	9/15/2017
1709060-21A	EQ-17-2A	Aqueous	9/14/2017	9/15/2017
1709060-22A	SW-17-7	Aqueous	9/14/2017	9/15/2017
1709060-23A	PW-17-8A	Aqueous	9/14/2017	9/15/2017
1709060-24A	SW-17-8	Aqueous	9/14/2017	9/15/2017
1709060-25A	PW-17-8B	Aqueous	9/14/2017	9/15/2017
1709060-26A	PW-17-8C	Aqueous	9/14/2017	9/15/2017
1709060-27A	PW-17-9A	Aqueous	9/15/2017	9/15/2017
1709060-28A	PW-17-9B	Aqueous	9/15/2017	9/15/2017
1709060-29A	SW-17-9	Aqueous	9/15/2017	9/15/2017
1709060-30A	PW-DUP-3	Aqueous	9/15/2017	9/15/2017
1709060-31A	EQ-17-3A	Aqueous	9/15/2017	9/15/2017
1709060-32A	PW-17-11A	Aqueous	9/15/2017	9/15/2017
1709060-33A	SW-17-11A	Aqueous	9/15/2017	9/15/2017
1709060-34A	PW-17-12A	Aqueous	9/15/2017	9/15/2017
1709060-35A	SW-17-12A	Aqueous	9/15/2017	9/15/2017
1709060-36A	SW-17-10	Aqueous	9/15/2017	9/15/2017
1709060-37A	SW-DUP-3	Aqueous	9/15/2017	9/15/2017
1709060-38A	PW-17-11 (T)	Aqueous	9/15/2017	9/15/2017

CLIENT:	Rose & Westra, Inc.
Project:	16.0062335.50
Lab Order:	1709060

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collection Date	Date Received
1709060-39A	SW-17-11 (T)	Aqueous	9/15/2017	9/15/2017
1709060-40A	PW-17-12 (T)	Aqueous	9/15/2017	9/15/2017
1709060-41A	SW-17-12 (T)	Aqueous	9/15/2017	9/15/2017

BIO-CHEM Laboratories, Inc.

Date: *25-Sep-17*

CLIENT: Rose & Westra, Inc.
Project: 16.0062335.50
Lab Order: 1709060

CASE NARRATIVE

Samples are routinely analyzed using methods outlined in the following references:

(SW) Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, 3rd Ed.
(E) Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020.
(A) Standard Methods for the Examination of Water and Wastewater, APHA, 18th Ed.
(D) Annual Book of ASTM Standards.

Specific methods utilized for this project are provided in the analytical report and are identified by the reference document abbreviation ( ) followed by the method number.

All QA/QC and sample analyses met method, laboratory and/or regulatory data quality objectives unless otherwise specified below.

No data qualifications required.

BIO-CHEM Laboratories, Inc.

Date: *9/25/2017*

ANALYTICAL REPORT

CLIENT:	Rose & Westra, Inc.	**Project Number:**	16.0062335.50
Lab Order:	1709060	**Client Sample ID:**	PW-17-1A
Project:	16.0062335.50	**Collection Date:**	9/12/2017
Lab Sample ID:	1709060-01A	**Matrix:**	AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	36		0.050	mg/L	1	RHS	9/22/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

CLIENT: Rose & Westra, Inc.
Lab Order: 1709060
Project: 16.0062335.50
Lab Sample ID: 1709060-02A

Project Number: 16.0062335.50
Client Sample ID: PW-17-1B
Collection Date: 9/12/2017
Matrix: AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	6.2		0.050	mg/L	1	RHS	9/22/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

CLIENT:	Rose & Westra, Inc.	**Project Number:**	16.0062335.50
Lab Order:	1709060	**Client Sample ID:**	SW-17-1
Project:	16.0062335.50	**Collection Date:**	9/12/2017
Lab Sample ID:	1709060-03A	**Matrix:**	AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	< 0.050		0.050	mg/L	1	RHS	9/22/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

CLIENT: Rose & Westra, Inc.
Lab Order: 1709060
Project: 16.0062335.50
Lab Sample ID: 1709060-04A

Project Number: 16.0062335.50
Client Sample ID: PW-DUP-1A
Collection Date: 9/13/2017
Matrix: AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	66		0.050	mg/L	1	RHS	9/22/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

CLIENT:	Rose & Westra, Inc.	**Project Number:**	16.0062335.50
Lab Order:	1709060	**Client Sample ID:**	SW-DUP-1A
Project:	16.0062335.50	**Collection Date:**	9/13/2017
Lab Sample ID:	1709060-05A	**Matrix:**	AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	< 0.050		0.050	mg/L	1	RHS	9/22/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

CLIENT:	Rose & Westra, Inc.	**Project Number:**	16.0062335.50
Lab Order:	1709060	**Client Sample ID:**	EQ-17-1A
Project:	16.0062335.50	**Collection Date:**	9/13/2017
Lab Sample ID:	1709060-06A	**Matrix:**	AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	< 0.050		0.050	mg/L	1	RHS	9/22/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

CLIENT: Rose & Westra, Inc.
Lab Order: 1709060
Project: 16.0062335.50
Lab Sample ID: 1709060-07A

Project Number: 16.0062335.50
Client Sample ID: PW-17-2A
Collection Date: 9/13/2017
Matrix: AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	46		0.050	mg/L	1	RHS	9/22/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

CLIENT: Rose & Westra, Inc.
Lab Order: 1709060
Project: 16.0062335.50
Lab Sample ID: 1709060-08A

Project Number: 16.0062335.50
Client Sample ID: PW-17-2B
Collection Date: 9/13/2017
Matrix: AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	32		0.050	mg/L	1	RHS	9/22/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

CLIENT: Rose & Westra, Inc.
Lab Order: 1709060
Project: 16.0062335.50
Lab Sample ID: 1709060-09A

Project Number: 16.0062335.50
Client Sample ID: PW-17-3A
Collection Date: 9/13/2017
Matrix: AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	52		0.050	mg/L	1	RHS	9/22/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

CLIENT: Rose & Westra, Inc.
Lab Order: 1709060
Project: 16.0062335.50
Lab Sample ID: 1709060-10A

Project Number: 16.0062335.50
Client Sample ID: PW-17-3B
Collection Date: 9/13/2017
Matrix: AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	52		0.050	mg/L	1	RHS	9/22/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

CLIENT:	Rose & Westra, Inc.	**Project Number:**	16.0062335.50
Lab Order:	1709060	**Client Sample ID:**	SW-17-4
Project:	16.0062335.50	**Collection Date:**	9/13/2017
Lab Sample ID:	1709060-11A	**Matrix:**	AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	< 0.050		0.050	mg/L	1	RHS	9/22/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

CLIENT: Rose & Westra, Inc.
Lab Order: 1709060
Project: 16.0062335.50
Lab Sample ID: 1709060-12A

Project Number: 16.0062335.50
Client Sample ID: PW-17-5A
Collection Date: 9/12/2017
Matrix: AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	71		0.050	mg/L	1	RHS	9/22/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

CLIENT:	Rose & Westra, Inc.	**Project Number:**	16.0062335.50
Lab Order:	1709060	**Client Sample ID:**	PW-17-5B
Project:	16.0062335.50	**Collection Date:**	9/13/2017
Lab Sample ID:	1709060-13A	**Matrix:**	AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	110		0.050	mg/L	1	RHS	9/22/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

CLIENT: Rose & Westra, Inc.
Lab Order: 1709060
Project: 16.0062335.50
Lab Sample ID: 1709060-14A

Project Number: 16.0062335.50
Client Sample ID: SW-17-5A
Collection Date: 9/13/2017
Matrix: AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	< 0.050		0.050	mg/L	1	RHS	9/22/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

CLIENT:	Rose & Westra, Inc.	**Project Number:**	16.0062335.50
Lab Order:	1709060	**Client Sample ID:**	PW-17-6A
Project:	16.0062335.50	**Collection Date:**	9/14/2017
Lab Sample ID:	1709060-15A	**Matrix:**	AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	9.6		0.050	mg/L	1	RHS	9/22/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

CLIENT:	Rose & Westra, Inc.	**Project Number:**	16.0062335.50
Lab Order:	1709060	**Client Sample ID:**	PW-17-6B
Project:	16.0062335.50	**Collection Date:**	9/14/2017
Lab Sample ID:	1709060-16A	**Matrix:**	AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	26		0.050	mg/L	1	RHS	9/22/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

CLIENT: Rose & Westra, Inc.
Lab Order: 1709060
Project: 16.0062335.50
Lab Sample ID: 1709060-17A

Project Number: 16.0062335.50
Client Sample ID: SW-17-6A
Collection Date: 9/14/2017
Matrix: AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	< 0.050		0.050	mg/L	1	RHS	9/22/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

CLIENT:	Rose & Westra, Inc.	**Project Number:**	16.0062335.50
Lab Order:	1709060	**Client Sample ID:**	PW-DUP-2A
Project:	16.0062335.50	**Collection Date:**	9/14/2017
Lab Sample ID:	1709060-18A	**Matrix:**	AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	9.7		0.050	mg/L	1	RHS	9/22/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

CLIENT:	Rose & Westra, Inc.	**Project Number:**	16.0062335.50
Lab Order:	1709060	**Client Sample ID:**	PW-17-7A
Project:	16.0062335.50	**Collection Date:**	9/14/2017
Lab Sample ID:	1709060-19A	**Matrix:**	AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	3.8		0.050	mg/L	1	RHS	9/22/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

CLIENT: Rose & Westra, Inc.
Lab Order: 1709060
Project: 16.0062335.50
Lab Sample ID: 1709060-20A

Project Number: 16.0062335.50
Client Sample ID: PW-17-7B
Collection Date: 9/14/2017
Matrix: AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	8.0		0.050	mg/L	1	RHS	9/22/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

CLIENT:	Rose & Westra, Inc.	**Project Number:**	16.0062335.50
Lab Order:	1709060	**Client Sample ID:**	EQ-17-2A
Project:	16.0062335.50	**Collection Date:**	9/14/2017
Lab Sample ID:	1709060-21A	**Matrix:**	AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	< 0.050		0.050	mg/L	1	RHS	9/22/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

CLIENT:	Rose & Westra, Inc.	**Project Number:**	16.0062335.50
Lab Order:	1709060	**Client Sample ID:**	SW-17-7
Project:	16.0062335.50	**Collection Date:**	9/14/2017
Lab Sample ID:	1709060-22A	**Matrix:**	AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	< 0.050		0.050	mg/L	1	RHS	9/22/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

CLIENT:	Rose & Westra, Inc.	**Project Number:**	16.0062335.50
Lab Order:	1709060	**Client Sample ID:**	PW-17-8A
Project:	16.0062335.50	**Collection Date:**	9/14/2017
Lab Sample ID:	1709060-23A	**Matrix:**	AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	4.8		0.050	mg/L	1	RHS	9/22/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

CLIENT:	Rose & Westra, Inc.	**Project Number:**	16.0062335.50
Lab Order:	1709060	**Client Sample ID:**	SW-17-8
Project:	16.0062335.50	**Collection Date:**	9/14/2017
Lab Sample ID:	1709060-24A	**Matrix:**	AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	< 0.050		0.050	mg/L	1	RHS	9/22/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

CLIENT: Rose & Westra, Inc.
Lab Order: 1709060
Project: 16.0062335.50
Lab Sample ID: 1709060-25A

Project Number: 16.0062335.50
Client Sample ID: PW-17-8B
Collection Date: 9/14/2017
Matrix: AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	32		0.050	mg/L	1	RHS	9/22/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

CLIENT:	Rose & Westra, Inc.	**Project Number:**	16.0062335.50
Lab Order:	1709060	**Client Sample ID:**	PW-17-8C
Project:	16.0062335.50	**Collection Date:**	9/14/2017
Lab Sample ID:	1709060-26A	**Matrix:**	AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	5.8		0.050	mg/L	1	RHS	9/22/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

CLIENT: Rose & Westra, Inc.
Lab Order: 1709060
Project: 16.0062335.50
Lab Sample ID: 1709060-27A

Project Number: 16.0062335.50
Client Sample ID: PW-17-9A
Collection Date: 9/15/2017
Matrix: AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	31		0.050	mg/L	1	RHS	9/22/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

CLIENT:	Rose & Westra, Inc.	**Project Number:**	16.0062335.50
Lab Order:	1709060	**Client Sample ID:**	PW-17-9B
Project:	16.0062335.50	**Collection Date:**	9/15/2017
Lab Sample ID:	1709060-28A	**Matrix:**	AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	43		0.050	mg/L	1	RHS	9/22/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

CLIENT: Rose & Westra, Inc.
Lab Order: 1709060
Project: 16.0062335.50
Lab Sample ID: 1709060-29A

Project Number: 16.0062335.50
Client Sample ID: SW-17-9
Collection Date: 9/15/2017
Matrix: AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	< 0.050		0.050	mg/L	1	RHS	9/22/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

CLIENT:	Rose & Westra, Inc.	**Project Number:**	16.0062335.50
Lab Order:	1709060	**Client Sample ID:**	PW-DUP-3
Project:	16.0062335.50	**Collection Date:**	9/15/2017
Lab Sample ID:	1709060-30A	**Matrix:**	AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	32		0.050	mg/L	1	RHS	9/22/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

CLIENT:	Rose & Westra, Inc.	**Project Number:**	16.0062335.50
Lab Order:	1709060	**Client Sample ID:**	EQ-17-3A
Project:	16.0062335.50	**Collection Date:**	9/15/2017
Lab Sample ID:	1709060-31A	**Matrix:**	AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	< 0.050		0.050	mg/L	1	RHS	9/22/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

CLIENT: Rose & Westra, Inc.
Lab Order: 1709060
Project: 16.0062335.50
Lab Sample ID: 1709060-32A

Project Number: 16.0062335.50
Client Sample ID: PW-17-11A
Collection Date: 9/15/2017
Matrix: AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	64		0.050	mg/L	1	RHS	9/22/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

CLIENT: Rose & Westra, Inc.
Lab Order: 1709060
Project: 16.0062335.50
Lab Sample ID: 1709060-33A

Project Number: 16.0062335.50
Client Sample ID: SW-17-11A
Collection Date: 9/15/2017
Matrix: AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	< 0.050		0.050	mg/L	1	RHS	9/22/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

CLIENT: Rose & Westra, Inc.
Lab Order: 1709060
Project: 16.0062335.50
Lab Sample ID: 1709060-34A

Project Number: 16.0062335.50
Client Sample ID: PW-17-12A
Collection Date: 9/15/2017
Matrix: AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	53		0.050	mg/L	1	RHS	9/22/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

CLIENT: Rose & Westra, Inc.
Lab Order: 1709060
Project: 16.0062335.50
Lab Sample ID: 1709060-35A

Project Number: 16.0062335.50
Client Sample ID: SW-17-12A
Collection Date: 9/15/2017
Matrix: AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	< 0.025		0.025	mg/L	1	RHS	9/25/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

CLIENT: Rose & Westra, Inc.
Lab Order: 1709060
Project: 16.0062335.50
Lab Sample ID: 1709060-36A

Project Number: 16.0062335.50
Client Sample ID: SW-17-10
Collection Date: 9/15/2017
Matrix: AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	< 0.025		0.025	mg/L	1	RHS	9/25/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

CLIENT:	Rose & Westra, Inc.	**Project Number:**	16.0062335.50
Lab Order:	1709060	**Client Sample ID:**	SW-DUP-3
Project:	16.0062335.50	**Collection Date:**	9/15/2017
Lab Sample ID:	1709060-37A	**Matrix:**	AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date
Ammonia Nitrogen								
1. Nitrogen, Ammonia (As N)	E350.3	< 0.025		0.025	mg/L	1	RHS	9/25/2017

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

CLIENT:	Rose & Westra, Inc.	**Project Number:**	16.0062335.50
Lab Order:	1709060	**Client Sample ID:**	PW-17-11 (T)
Project:	16.0062335.50	**Collection Date:**	9/15/2017
Lab Sample ID:	1709060-38A	**Matrix:**	AQUEOUS

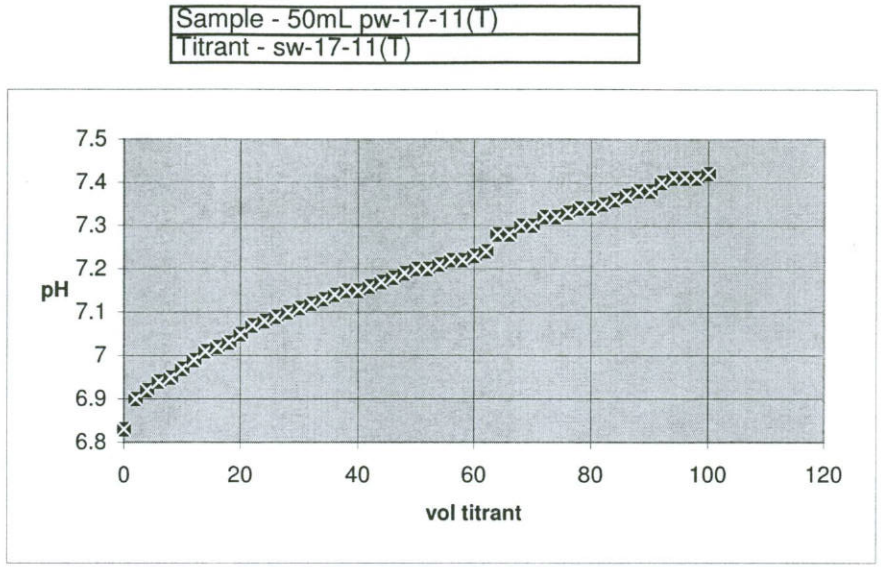
Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

vol titrant	pH
0	6.83
2	6.9
4	6.92
6	6.94
8	6.95
10	6.97
12	6.99
14	7.01
16	7.02
18	7.03
20	7.05
22	7.07
24	7.08
26	7.09
28	7.1
30	7.11
32	7.12
34	7.13
36	7.14
38	7.15
40	7.15
42	7.16
44	7.17
46	7.18
48	7.19
50	7.2
52	7.2
54	7.21
56	7.22
58	7.22
60	7.23
62	7.24
64	7.28
66	7.28
68	7.3
70	7.3
72	7.32
74	7.32
76	7.33
78	7.34
80	7.34
82	7.35
84	7.36
86	7.37
88	7.38
90	7.38
92	7.4
94	7.41
96	7.41
98	7.41
100	7.42



CLIENT:	Rose & Westra, Inc.	**Project Number:**	16.0062335.50
Lab Order:	1709060	**Client Sample ID:**	SW-17-11 (T)
Project:	16.0062335.50	**Collection Date:**	9/15/2017
Lab Sample ID:	1709060-39A	**Matrix:**	AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

CLIENT:	Rose & Westra, Inc.	**Project Number:**	16.0062335.50
Lab Order:	1709060	**Client Sample ID:**	PW-17-12 (T)
Project:	16.0062335.50	**Collection Date:**	9/15/2017
Lab Sample ID:	1709060-40A	**Matrix:**	AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date

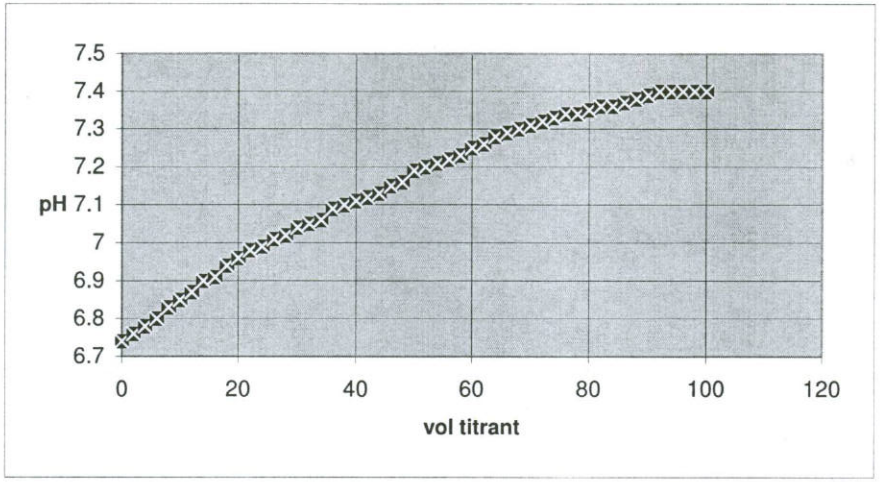
Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

vol titrant	pH
0	6.74
2	6.76
4	6.78
6	6.8
8	6.83
10	6.85
12	6.87
14	6.9
16	6.91
18	6.94
20	6.96
22	6.98
24	6.99
26	7.01
28	7.02
30	7.04
32	7.05
34	7.06
36	7.09
38	7.1
40	7.11
42	7.12
44	7.13
46	7.15
48	7.16
50	7.19
52	7.2
54	7.21
56	7.22
58	7.23
60	7.25
62	7.26
64	7.28
66	7.29
68	7.3
70	7.31
72	7.32
74	7.33
76	7.34
78	7.34
80	7.35
82	7.36
84	7.36
86	7.37
88	7.38
90	7.39
92	7.4
94	7.4
96	7.4
98	7.4
100	7.4

Sample - 50mL pw-17-12(T)
Titrant - sw-17-12(T)



CLIENT:	Rose & Westra, Inc.	**Project Number:**	16.0062335.50
Lab Order:	1709060	**Client Sample ID:**	SW-17-12 (T)
Project:	16.0062335.50	**Collection Date:**	9/15/2017
Lab Sample ID:	1709060-41A	**Matrix:**	AQUEOUS

Analyses	Method Ref.	Result	Q	PQL	Units	DF	Analyst	Date

Definitions: PQL - Practical Quantitation Limit
DF - Dilution Factor

Qualifiers (Q): J - Detected below PQL but above MDL: Estimated
S - Spike Recovery Outside Acceptance Limits
B - Analyte detected in associated Method Blank
N - See case narrative for explanation

Note: The sample results reported are based on the sample aliquot(s) tested.

Lab Order: 1709060
Client: Rose & Westra, Inc.
Project: 16.0062335.50

ANALYTICAL DETAIL REPORT

Sample ID	Client Sample ID	Matrix	Test Name	Date Sampled	TCLP/SPLP Date	Prep Date	QC Batch	Analysis Date	Analytical Batch
1709060-01A	PW-17-1A	Aqueous	Ammonia Nitrogen	9/12/2017			R88310	9/22/2017	POTENTIAL_170922A
1709060-02A	PW-17-1B	Aqueous	Ammonia Nitrogen	9/12/2017			R88310	9/22/2017	POTENTIAL_170922A
1709060-03A	SW-17-1	Aqueous	Ammonia Nitrogen	9/12/2017			R88310	9/22/2017	POTENTIAL_170922A
1709060-04A	PW-DUP-1A	Aqueous	Ammonia Nitrogen	9/13/2017			R88310	9/22/2017	POTENTIAL_170922A
1709060-05A	SW-DUP-1A	Aqueous	Ammonia Nitrogen	9/13/2017			R88310	9/22/2017	POTENTIAL_170922A
1709060-06A	EQ-17-1A	Aqueous	Ammonia Nitrogen	9/13/2017			R88310	9/22/2017	POTENTIAL_170922A
1709060-07A	PW-17-2A	Aqueous	Ammonia Nitrogen	9/13/2017			R88310	9/22/2017	POTENTIAL_170922A
1709060-08A	PW-17-2B	Aqueous	Ammonia Nitrogen	9/13/2017			R88310	9/22/2017	POTENTIAL_170922A
1709060-09A	PW-17-3A	Aqueous	Ammonia Nitrogen	9/13/2017			R88310	9/22/2017	POTENTIAL_170922A
1709060-10A	PW-17-3B	Aqueous	Ammonia Nitrogen	9/13/2017			R88310	9/22/2017	POTENTIAL_170922A
1709060-11A	SW-17-4	Aqueous	Ammonia Nitrogen	9/13/2017			R88310	9/22/2017	POTENTIAL_170922A
1709060-12A	PW-17-5A	Aqueous	Ammonia Nitrogen	9/12/2017			R88310	9/22/2017	POTENTIAL_170922A
1709060-13A	PW-17-5B	Aqueous	Ammonia Nitrogen	9/13/2017			R88310	9/22/2017	POTENTIAL_170922A
1709060-14A	SW-17-5A	Aqueous	Ammonia Nitrogen	9/13/2017			R88310	9/22/2017	POTENTIAL_170922A
1709060-15A	PW-17-6A	Aqueous	Ammonia Nitrogen	9/14/2017			R88310	9/22/2017	POTENTIAL_170922A
1709060-16A	PW-17-6B	Aqueous	Ammonia Nitrogen	9/14/2017			R88310	9/22/2017	POTENTIAL_170922A
1709060-17A	SW-17-6A	Aqueous	Ammonia Nitrogen	9/14/2017			R88310	9/22/2017	POTENTIAL_170922A
1709060-18A	PW-DUP-2A	Aqueous	Ammonia Nitrogen	9/14/2017			R88310	9/22/2017	POTENTIAL_170922A
1709060-19A	PW-17-7A	Aqueous	Ammonia Nitrogen	9/14/2017			R88310	9/22/2017	POTENTIAL_170922A
1709060-20A	PW-17-7B	Aqueous	Ammonia Nitrogen	9/14/2017			R88310	9/22/2017	POTENTIAL_170922A
1709060-21A	EQ-17-2A	Aqueous	Ammonia Nitrogen	9/14/2017			R88310	9/22/2017	POTENTIAL_170922A
1709060-22A	SW-17-7	Aqueous	Ammonia Nitrogen	9/14/2017			R88310	9/22/2017	POTENTIAL_170922A
1709060-23A	PW-17-8A	Aqueous	Ammonia Nitrogen	9/14/2017			R88310	9/22/2017	POTENTIAL_170922A
1709060-24A	SW-17-8	Aqueous	Ammonia Nitrogen	9/14/2017			R88310	9/22/2017	POTENTIAL_170922A
1709060-25A	PW-17-8B	Aqueous	Ammonia Nitrogen	9/14/2017			R88310	9/22/2017	POTENTIAL_170922A
1709060-26A	PW-17-8C	Aqueous	Ammonia Nitrogen	9/14/2017			R88310	9/22/2017	POTENTIAL_170922A

Lab Order: 1709060
Client: Rose & Westra, Inc.
Project: 16.0062335.50

ANALYTICAL DETAIL REPORT

Sample ID	Client Sample ID	Matrix	Test Name	Date Sampled	TCLP/SPLP Date	Prep Date	QC Batch	Analysis Date	Analytical Batch
1709060-27A	PW-17-9A	Aqueous	Ammonia Nitrogen	9/15/2017			R88310	9/22/2017	POTENTIAL_170922A
1709060-28A	PW-17-9B	Aqueous	Ammonia Nitrogen	9/15/2017			R88310	9/22/2017	POTENTIAL_170922A
1709060-29A	SW-17-9	Aqueous	Ammonia Nitrogen	9/15/2017			R88310	9/22/2017	POTENTIAL_170922A
1709060-30A	PW-DUP-3	Aqueous	Ammonia Nitrogen	9/15/2017			R88310	9/22/2017	POTENTIAL_170922A
1709060-31A	EQ-17-3A	Aqueous	Ammonia Nitrogen	9/15/2017			R88310	9/22/2017	POTENTIAL_170922A
1709060-32A	PW-17-11A	Aqueous	Ammonia Nitrogen	9/15/2017			R88310	9/22/2017	POTENTIAL_170922A
1709060-33A	SW-17-11A	Aqueous	Ammonia Nitrogen	9/15/2017			R88310	9/22/2017	POTENTIAL_170922A
1709060-34A	PW-17-12A	Aqueous	Ammonia Nitrogen	9/15/2017			R88310	9/22/2017	POTENTIAL_170922A
1709060-35A	SW-17-12A	Aqueous	Ammonia Nitrogen	9/15/2017			R88337	9/25/2017	POTENTIAL_170925A
1709060-36A	SW-17-10	Aqueous	Ammonia Nitrogen	9/15/2017			R88337	9/25/2017	POTENTIAL_170925A
1709060-37A	SW-DUP-3	Aqueous	Ammonia Nitrogen	9/15/2017			R88337	9/25/2017	POTENTIAL_170925A

Appendix C – October 2017
Rogue River Lab Report

ALS Environmental
ALS Group USA, Corp
1317 South 13th Avenue
Kelso, WA 98626
T : +1 360 577 7222
F : +1 360 636 1068
www.alsglobal.com

October 23, 2017

Analytical Report for Service Request No: K1711313

John Morehouse
Rose & Westra, a Division of GZA
601 Fifth Street NW, Suite 102
Grand Rapids, MI 49504

RE: 16.0062335.00 / 16.0062335.00

Dear John,

Enclosed are the results of the sample(s) submitted to our laboratory October 18, 2017
For your reference, these analyses have been assigned our service request number **K1711313.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3275. You may also contact me via email at Chris.Leaf@ALSGlobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Chris Leaf
Project Manager

ALS Environmental
ALS Group USA, Corp
1317 South 13th Avenue
Kelso, WA 98626
T : +1 360 577 7222
F : +1 360 636 1068
www.alsglobal.com

Table of Contents

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

ALS ENVIRONMENTAL

Client:	GZA GeoEnvironmental, Incorporated	**Service Request No.:**	K1711313
Project:	16.0062335.00	**Date Received:**	10/18/17
Sample Matrix:	Surface Water and Water		

Case Narrative

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Laboratory Control Sample (LCS), and Laboratory/Duplicate Laboratory Control Sample (LCS/DLCS).

Sample Receipt

Nine samples were received for analysis at ALS Environmental on 10/18/17. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4ºC upon receipt at the laboratory.

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Surrogate Exceptions:
The recovery of 13C3-PFBS in samples SW-17-10, SW-17-102A, SW-17-103A, SW-17-103B, Lab Control Sample KQ1715643-01 and Duplicate Lab Control Sample KQ1715643-02 was outside the control limits listed in the results summary. The limits are default values temporarily in use until sufficient data points are generated to calculate statistical control limits. Based on the method and historic data, the recoveries observed were in the range expected for this procedure. No further corrective action was taken.

The recovery of 13C2-PFTeDA and 13C3-PFBS in Method Blank KQ1715643-03 was outside the control limits listed in the results summary. The limits are default values temporarily in use until sufficient data points are generated to calculate statistical control limits. Based on the method and historic data, the recoveries observed were in the range expected for this procedure. No further corrective action was taken.

No other anomalies associated with the analysis of these samples were observed.

Approved by_____

Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

ALS Environmental

CHAIN OF CUSTODY 82535

001

SR# K1711313

COC Set____of____

COC#____________

1317 South 13th Ave, Kelso, WA 98626 Phone (360) 577-7222 / 800-695-7222 / FAX (360) 636-1068
www.alsglobal.com

Project Name: 16.0062335.00	Project Number: 16.0062335.00
Project Manager: Lori Powers	
Company: Rose-Westra / GZA	
Address: 601 Fifth St NW Suite 102 Grand Rapids, MI 49504	
Phone #: 616.791.7100	email: Lorette.Powers@GZA.com
Sampler Signature: [signature]	Sampler Printed Name: Jack Markosky

CLIENT SAMPLE ID	LABID	SAMPLING Date	SAMPLING Time	Matrix	NUMBER OF CONTAINERS	14D PFC/537M / PFOA Complete List	1	2	3	4	5	Remarks
1. SW-17-100		10/6/17	3:01	H2O	2	x						
2. SW-17-101		10/6/17	3:18	H2O	2	x						
3. SW-17-102 A		10/6/17	3:34	H2O	2	x						
4. SW-17-102 B		10/6/17	3:36	H2O	2	x						
5. SW-17-103 A		10/6/17	4:04	H2O	2	x						
6. SW-17-103 B		10/6/17	4:09	H2O	2	x						
7. SW-17-104 A		10/6/17	4:31	H2O	2	x						
8. SW-17-104 B		10/6/17	4:34	H2O	2	x						
9. FB-00		10/6/17	3:37	H2O	1	x						
10.												

Report Requirements

- X I. Routine Report: Method Blank, Surrogate, as required
- ___ II. Report Dup., MS, MSD as required
- ___ III. CLP Like Summary (no raw data)
- ___ IV. Data Validation Report
- ___ V. EDD

Invoice Information

P.O.#__________

Bill To: RW/GZA Grand Rapids

Turnaround Requirements

___ 24 hr. ___ 48 hr.
___ 5 Day
X Standard

Requested Report Date

Circle which metals are to be analyzed

Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

*Indicate State Hydrocarbon Procedure: AK CA WI Northwest Other_____(Circle One)

Special Instructions/Comments: Analyze Complete PFC list. Please return cooler

	Relinquished By:	Received By:	Relinquished By:	Received By:	Relinquished By:	Received By:
Signature	[signature]	[signature]				
Printed Name	Jack Markosky	CODY GRAUER				
Firm	RW/GZA	ALS				
Date/Time	10/17/17 6:00	10/18/17 0940				

PC CV

Cooler Receipt and Preservation Form

Client Rose Westra/G2A Service Request *K17* 11313

Received: 10/18/17 Opened: 10/18/17 By: CG Unloaded: 10/18/17 By: CG

1. Samples were received via? *USPS* (*Fed Ex*) *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) (*Cooler*) *Box* *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA (Y) N If yes, how many and where? 1 Front
   If present, were custody seals intact? (Y) N If present, were they signed and dated? (Y) N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	Filed
0.1	0.1	1.7	1.7	0.0	391	82535	7705 2232 7351	

4. Packing material: *Inserts* (*Baggies*) (*Bubble Wrap*) *Gel Packs* (*Wet Ice*) *Dry Ice* *Sleeves* _____
5. Were custody papers properly filled out (ink, signed, etc.)? NA (Y) N
6. Were samples received in good condition (temperature, unbroken)? *Indicate in the table below.* NA (Y) N
   If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*
7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA (Y) N
8. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA (Y) N
9. Were appropriate bottles/containers and volumes received for the tests indicated? NA (Y) N
10. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* (NA) Y N
11. Were VOA vials received without headspace? *Indicate in the table below.* (NA) Y N
12. Was C12/Res negative? (NA) Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: _____

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1711313
Project:	16.0062335.00/16.0062335.00	**Date Collected:**	10/17/17 03:01
Sample Matrix:	Surface Water	**Date Received:**	10/18/17 09:40
Sample Name:	SW-17-100	**Units:**	ng/L
Lab Code:	K1711313-001	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	ND U	8.1	1	10/20/17 19:33	10/20/17	
Perfluoropentanoic acid (PFPeA)	ND U	4.1	1	10/20/17 19:33	10/20/17	
Perfluorobutane sulfonic acid (PFBS)	ND U	4.1	1	10/20/17 19:33	10/20/17	
Perfluorohexanoic acid (PFHxA)	ND U	4.1	1	10/20/17 19:33	10/20/17	
Perfluoroheptanoic acid (PFHpA)	ND U	4.1	1	10/20/17 19:33	10/20/17	
Perfluorohexane sulfonic acid (PFHxS)	ND U	4.1	1	10/20/17 19:33	10/20/17	
Perfluorooctanoic acid (PFOA)	**1.9**	1.6	1	10/20/17 19:33	10/20/17	
Perfluoroheptane sulfonic acid (PFHpS)	ND U	4.1	1	10/20/17 19:33	10/20/17	
Perfluorononanoic acid (PFNA)	ND U	4.1	1	10/20/17 19:33	10/20/17	
Perfluorooctane sulfonic acid (PFOS)	**4.3**	4.1	1	10/20/17 19:33	10/20/17	
Perfluorodecanoic acid (PFDA)	ND U	4.1	1	10/20/17 19:33	10/20/17	
Perfluoroundecanoic acid (PFUnDA)	ND U	4.1	1	10/20/17 19:33	10/20/17	
Perfluorooctane sulfonamide (FOSA)	ND U	4.1	1	10/20/17 19:33	10/20/17	
Perfluorododecanoic acid (PFDoDA)	ND U	4.1	1	10/20/17 19:33	10/20/17	
Perfluorotridecanoic acid (PFTrDA)	ND U	4.1	1	10/20/17 19:33	10/20/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND U	4.1	1	10/20/17 19:33	10/20/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND U	4.1	1	10/20/17 19:33	10/20/17	
Perfluorotetradecanoic acid (PFTeDA)	ND U	4.1	1	10/20/17 19:33	10/20/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND U	4.1	1	10/20/17 19:33	10/20/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND U	4.1	1	10/20/17 19:33	10/20/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND U	4.1	1	10/20/17 19:33	10/20/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND U	4.1	1	10/20/17 19:33	10/20/17	
Perfluorodecane sulfonic acid (PFDS)	ND U	4.1	1	10/20/17 19:33	10/20/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	92	19 - 126	10/20/17 19:33	
13C2-PFHxA	79	10 - 151	10/20/17 19:33	
18O2-PFHxS	80	20 - 128	10/20/17 19:33	
13C2-6:2 FTS	59	10 - 187	10/20/17 19:33	
13C4-PFOA	74	13 - 142	10/20/17 19:33	
13C5-PFNA	84	15 - 143	10/20/17 19:33	
13C4-PFOS	82	11 - 131	10/20/17 19:33	
13C2-PFDA	78	25 - 129	10/20/17 19:33	
13C2-PFUnDA	78	16 - 129	10/20/17 19:33	
13C2-PFDoDA	77	17 - 114	10/20/17 19:33	
D7-MeFOSE	71	32 - 113	10/20/17 19:33	
D9-EtFOSE	74	20 - 113	10/20/17 19:33	
D5-EtFOSA	59	19 - 103	10/20/17 19:33	
13C2-8:2 FTS	68	50 - 150	10/20/17 19:33	

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1711313
Project:	16.0062335.00/16.0062335.00	**Date Collected:**	10/17/17 03:01
Sample Matrix:	Surface Water	**Date Received:**	10/18/17 09:40
Sample Name:	SW-17-100	**Units:**	ng/L
Lab Code:	K1711313-001	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M		
Prep Method:	EPA 3535A		
13C2-PFTeDA	61	50 - 150	10/20/17 19:33
13C4-PFHpA	81	50 - 150	10/20/17 19:33
13C5-PFPeA	82	50 - 150	10/20/17 19:33
13C3-PFBS	50	50 - 150	10/20/17 19:33
13C8-FOSA	87	50 - 150	10/20/17 19:33

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1711313
Project:	16.0062335.00/16.0062335.00	**Date Collected:**	10/17/17 03:18
Sample Matrix:	Surface Water	**Date Received:**	10/18/17 09:40
Sample Name:	SW-17-101	**Units:**	ng/L
Lab Code:	K1711313-002	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	ND U	8.1	1	10/20/17 19:44	10/20/17	
Perfluoropentanoic acid (PFPeA)	ND U	4.1	1	10/20/17 19:44	10/20/17	
Perfluorobutane sulfonic acid (PFBS)	ND U	4.1	1	10/20/17 19:44	10/20/17	
Perfluorohexanoic acid (PFHxA)	ND U	4.1	1	10/20/17 19:44	10/20/17	
Perfluoroheptanoic acid (PFHpA)	ND U	4.1	1	10/20/17 19:44	10/20/17	
Perfluorohexane sulfonic acid (PFHxS)	ND U	4.1	1	10/20/17 19:44	10/20/17	
Perfluorooctanoic acid (PFOA)	**1.9**	1.6	1	10/20/17 19:44	10/20/17	
Perfluoroheptane sulfonic acid (PFHpS)	ND U	4.1	1	10/20/17 19:44	10/20/17	
Perfluorononanoic acid (PFNA)	ND U	4.1	1	10/20/17 19:44	10/20/17	
Perfluorooctane sulfonic acid (PFOS)	**4.8**	4.1	1	10/20/17 19:44	10/20/17	
Perfluorodecanoic acid (PFDA)	ND U	4.1	1	10/20/17 19:44	10/20/17	
Perfluoroundecanoic acid (PFUnDA)	ND U	4.1	1	10/20/17 19:44	10/20/17	
Perfluorooctane sulfonamide (FOSA)	ND U	4.1	1	10/20/17 19:44	10/20/17	
Perfluorododecanoic acid (PFDoDA)	ND U	4.1	1	10/20/17 19:44	10/20/17	
Perfluorotridecanoic acid (PFTrDA)	ND U	4.1	1	10/20/17 19:44	10/20/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND U	4.1	1	10/20/17 19:44	10/20/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND U	4.1	1	10/20/17 19:44	10/20/17	
Perfluorotetradecanoic acid (PFTeDA)	ND U	4.1	1	10/20/17 19:44	10/20/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND U	4.1	1	10/20/17 19:44	10/20/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND U	4.1	1	10/20/17 19:44	10/20/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND U	4.1	1	10/20/17 19:44	10/20/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND U	4.1	1	10/20/17 19:44	10/20/17	
Perfluorodecane sulfonic acid (PFDS)	ND U	4.1	1	10/20/17 19:44	10/20/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	86	19 - 126	10/20/17 19:44	
13C2-PFHxA	66	10 - 151	10/20/17 19:44	
18O2-PFHxS	69	20 - 128	10/20/17 19:44	
13C2-6:2 FTS	50	10 - 187	10/20/17 19:44	
13C4-PFOA	80	13 - 142	10/20/17 19:44	
13C5-PFNA	71	15 - 143	10/20/17 19:44	
13C4-PFOS	80	11 - 131	10/20/17 19:44	
13C2-PFDA	73	25 - 129	10/20/17 19:44	
13C2-PFUnDA	77	16 - 129	10/20/17 19:44	
13C2-PFDoDA	71	17 - 114	10/20/17 19:44	
D7-MeFOSE	63	32 - 113	10/20/17 19:44	
D9-EtFOSE	62	20 - 113	10/20/17 19:44	
D5-EtFOSA	47	19 - 103	10/20/17 19:44	
13C2-8:2 FTS	63	50 - 150	10/20/17 19:44	

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1711313
Project:	16.0062335.00/16.0062335.00	**Date Collected:**	10/17/17 03:18
Sample Matrix:	Surface Water	**Date Received:**	10/18/17 09:40
Sample Name:	SW-17-101	**Units:**	ng/L
Lab Code:	K1711313-002	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M			
Prep Method:	EPA 3535A			
13C2-PFTeDA	57	50 - 150	10/20/17 19:44	
13C4-PFHpA	65	50 - 150	10/20/17 19:44	
13C5-PFPeA	78	50 - 150	10/20/17 19:44	
13C3-PFBS	47	50 - 150	10/20/17 19:44	*
13C8-FOSA	75	50 - 150	10/20/17 19:44	

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1711313
Project:	16.0062335.00/16.0062335.00	**Date Collected:**	10/17/17 03:34
Sample Matrix:	Surface Water	**Date Received:**	10/18/17 09:40
Sample Name:	SW-17-102A	**Units:**	ng/L
Lab Code:	K1711313-003	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	ND U	8.1	1	10/20/17 19:54	10/20/17	
Perfluoropentanoic acid (PFPeA)	ND U	4.1	1	10/20/17 19:54	10/20/17	
Perfluorobutane sulfonic acid (PFBS)	ND U	4.1	1	10/20/17 19:54	10/20/17	
Perfluorohexanoic acid (PFHxA)	ND U	4.1	1	10/20/17 19:54	10/20/17	
Perfluoroheptanoic acid (PFHpA)	ND U	4.1	1	10/20/17 19:54	10/20/17	
Perfluorohexane sulfonic acid (PFHxS)	ND U	4.1	1	10/20/17 19:54	10/20/17	
Perfluorooctanoic acid (PFOA)	**3.1**	1.6	1	10/20/17 19:54	10/20/17	
Perfluoroheptane sulfonic acid (PFHpS)	ND U	4.1	1	10/20/17 19:54	10/20/17	
Perfluorononanoic acid (PFNA)	ND U	4.1	1	10/20/17 19:54	10/20/17	
Perfluorooctane sulfonic acid (PFOS)	**6.3**	4.1	1	10/20/17 19:54	10/20/17	
Perfluorodecanoic acid (PFDA)	ND U	4.1	1	10/20/17 19:54	10/20/17	
Perfluoroundecanoic acid (PFUnDA)	ND U	4.1	1	10/20/17 19:54	10/20/17	
Perfluorooctane sulfonamide (FOSA)	ND U	4.1	1	10/20/17 19:54	10/20/17	
Perfluorododecanoic acid (PFDoDA)	ND U	4.1	1	10/20/17 19:54	10/20/17	
Perfluorotridecanoic acid (PFTrDA)	ND U	4.1	1	10/20/17 19:54	10/20/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND U	4.1	1	10/20/17 19:54	10/20/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND U	4.1	1	10/20/17 19:54	10/20/17	
Perfluorotetradecanoic acid (PFTeDA)	ND U	4.1	1	10/20/17 19:54	10/20/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND U	4.1	1	10/20/17 19:54	10/20/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND U	4.1	1	10/20/17 19:54	10/20/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND U	4.1	1	10/20/17 19:54	10/20/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND U	4.1	1	10/20/17 19:54	10/20/17	
Perfluorodecane sulfonic acid (PFDS)	ND U	4.1	1	10/20/17 19:54	10/20/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	86	19 - 126	10/20/17 19:54	
13C2-PFHxA	66	10 - 151	10/20/17 19:54	
18O2-PFHxS	83	20 - 128	10/20/17 19:54	
13C2-6:2 FTS	48	10 - 187	10/20/17 19:54	
13C4-PFOA	74	13 - 142	10/20/17 19:54	
13C5-PFNA	78	15 - 143	10/20/17 19:54	
13C4-PFOS	79	11 - 131	10/20/17 19:54	
13C2-PFDA	68	25 - 129	10/20/17 19:54	
13C2-PFUnDA	73	16 - 129	10/20/17 19:54	
13C2-PFDoDA	69	17 - 114	10/20/17 19:54	
D7-MeFOSE	60	32 - 113	10/20/17 19:54	
D9-EtFOSE	66	20 - 113	10/20/17 19:54	
D5-EtFOSA	53	19 - 103	10/20/17 19:54	
13C2-8:2 FTS	58	50 - 150	10/20/17 19:54	

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1711313
Project:	16.0062335.00/16.0062335.00	**Date Collected:**	10/17/17 03:34
Sample Matrix:	Surface Water	**Date Received:**	10/18/17 09:40
Sample Name:	SW-17-102A	**Units:**	ng/L
Lab Code:	K1711313-003	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M			
Prep Method:	EPA 3535A			
13C2-PFTeDA	62	50 - 150	10/20/17 19:54	
13C4-PFHpA	74	50 - 150	10/20/17 19:54	
13C5-PFPeA	77	50 - 150	10/20/17 19:54	
13C3-PFBS	46	50 - 150	10/20/17 19:54	*
13C8-FOSA	74	50 - 150	10/20/17 19:54	

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1711313
Project:	16.0062335.00/16.0062335.00	**Date Collected:**	10/17/17 03:36
Sample Matrix:	Surface Water	**Date Received:**	10/18/17 09:40
Sample Name:	SW-17-102B	**Units:**	ng/L
Lab Code:	K1711313-004	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	ND U	8.1	1	10/20/17 20:05	10/20/17	
Perfluoropentanoic acid (PFPeA)	ND U	4.1	1	10/20/17 20:05	10/20/17	
Perfluorobutane sulfonic acid (PFBS)	ND U	4.1	1	10/20/17 20:05	10/20/17	
Perfluorohexanoic acid (PFHxA)	ND U	4.1	1	10/20/17 20:05	10/20/17	
Perfluoroheptanoic acid (PFHpA)	ND U	4.1	1	10/20/17 20:05	10/20/17	
Perfluorohexane sulfonic acid (PFHxS)	ND U	4.1	1	10/20/17 20:05	10/20/17	
Perfluorooctanoic acid (PFOA)	**3.0**	1.6	1	10/20/17 20:05	10/20/17	
Perfluoroheptane sulfonic acid (PFHpS)	ND U	4.1	1	10/20/17 20:05	10/20/17	
Perfluorononanoic acid (PFNA)	ND U	4.1	1	10/20/17 20:05	10/20/17	
Perfluorooctane sulfonic acid (PFOS)	**6.7**	4.1	1	10/20/17 20:05	10/20/17	
Perfluorodecanoic acid (PFDA)	ND U	4.1	1	10/20/17 20:05	10/20/17	
Perfluoroundecanoic acid (PFUnDA)	ND U	4.1	1	10/20/17 20:05	10/20/17	
Perfluorooctane sulfonamide (FOSA)	ND U	4.1	1	10/20/17 20:05	10/20/17	
Perfluorododecanoic acid (PFDoDA)	ND U	4.1	1	10/20/17 20:05	10/20/17	
Perfluorotridecanoic acid (PFTrDA)	ND U	4.1	1	10/20/17 20:05	10/20/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND U	4.1	1	10/20/17 20:05	10/20/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND U	4.1	1	10/20/17 20:05	10/20/17	
Perfluorotetradecanoic acid (PFTeDA)	ND U	4.1	1	10/20/17 20:05	10/20/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND U	4.1	1	10/20/17 20:05	10/20/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND U	4.1	1	10/20/17 20:05	10/20/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND U	4.1	1	10/20/17 20:05	10/20/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND U	4.1	1	10/20/17 20:05	10/20/17	
Perfluorodecane sulfonic acid (PFDS)	ND U	4.1	1	10/20/17 20:05	10/20/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	90	19 - 126	10/20/17 20:05	
13C2-PFHxA	69	10 - 151	10/20/17 20:05	
18O2-PFHxS	74	20 - 128	10/20/17 20:05	
13C2-6:2 FTS	51	10 - 187	10/20/17 20:05	
13C4-PFOA	79	13 - 142	10/20/17 20:05	
13C5-PFNA	83	15 - 143	10/20/17 20:05	
13C4-PFOS	81	11 - 131	10/20/17 20:05	
13C2-PFDA	73	25 - 129	10/20/17 20:05	
13C2-PFUnDA	72	16 - 129	10/20/17 20:05	
13C2-PFDoDA	72	17 - 114	10/20/17 20:05	
D7-MeFOSE	59	32 - 113	10/20/17 20:05	
D9-EtFOSE	67	20 - 113	10/20/17 20:05	
D5-EtFOSA	48	19 - 103	10/20/17 20:05	
13C2-8:2 FTS	63	50 - 150	10/20/17 20:05	

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1711313
Project:	16.0062335.00/16.0062335.00	**Date Collected:**	10/17/17 03:36
Sample Matrix:	Surface Water	**Date Received:**	10/18/17 09:40
Sample Name:	SW-17-102B	**Units:**	ng/L
Lab Code:	K1711313-004	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M
Prep Method:	EPA 3535A

13C2-PFTeDA	58	50 - 150	10/20/17 20:05
13C4-PFHpA	70	50 - 150	10/20/17 20:05
13C5-PFPeA	78	50 - 150	10/20/17 20:05
13C3-PFBS	59	50 - 150	10/20/17 20:05
13C8-FOSA	80	50 - 150	10/20/17 20:05

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1711313
Project:	16.0062335.00/16.0062335.00	**Date Collected:**	10/17/17 04:04
Sample Matrix:	Surface Water	**Date Received:**	10/18/17 09:40
Sample Name:	SW-17-103A	**Units:**	ng/L
Lab Code:	K1711313-005	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	ND U	8.1	1	10/20/17 20:15	10/20/17	
Perfluoropentanoic acid (PFPeA)	ND U	4.1	1	10/20/17 20:15	10/20/17	
Perfluorobutane sulfonic acid (PFBS)	ND U	4.1	1	10/20/17 20:15	10/20/17	
Perfluorohexanoic acid (PFHxA)	**13**	4.1	1	10/20/17 20:15	10/20/17	
Perfluoroheptanoic acid (PFHpA)	ND U	4.1	1	10/20/17 20:15	10/20/17	
Perfluorohexane sulfonic acid (PFHxS)	ND U	4.1	1	10/20/17 20:15	10/20/17	
Perfluorooctanoic acid (PFOA)	**5.1**	1.6	1	10/20/17 20:15	10/20/17	
Perfluoroheptane sulfonic acid (PFHpS)	ND U	4.1	1	10/20/17 20:15	10/20/17	
Perfluorononanoic acid (PFNA)	ND U	4.1	1	10/20/17 20:15	10/20/17	
Perfluorooctane sulfonic acid (PFOS)	**10**	4.1	1	10/20/17 20:15	10/20/17	
Perfluorodecanoic acid (PFDA)	ND U	4.1	1	10/20/17 20:15	10/20/17	
Perfluoroundecanoic acid (PFUnDA)	ND U	4.1	1	10/20/17 20:15	10/20/17	
Perfluorooctane sulfonamide (FOSA)	ND U	4.1	1	10/20/17 20:15	10/20/17	
Perfluorododecanoic acid (PFDoDA)	ND U	4.1	1	10/20/17 20:15	10/20/17	
Perfluorotridecanoic acid (PFTrDA)	ND U	4.1	1	10/20/17 20:15	10/20/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND U	4.1	1	10/20/17 20:15	10/20/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND U	4.1	1	10/20/17 20:15	10/20/17	
Perfluorotetradecanoic acid (PFTeDA)	ND U	4.1	1	10/20/17 20:15	10/20/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND U	4.1	1	10/20/17 20:15	10/20/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND U	4.1	1	10/20/17 20:15	10/20/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND U	4.1	1	10/20/17 20:15	10/20/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND U	4.1	1	10/20/17 20:15	10/20/17	
Perfluorodecane sulfonic acid (PFDS)	ND U	4.1	1	10/20/17 20:15	10/20/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	92	19 - 126	10/20/17 20:15	
13C2-PFHxA	70	10 - 151	10/20/17 20:15	
18O2-PFHxS	84	20 - 128	10/20/17 20:15	
13C2-6:2 FTS	52	10 - 187	10/20/17 20:15	
13C4-PFOA	81	13 - 142	10/20/17 20:15	
13C5-PFNA	80	15 - 143	10/20/17 20:15	
13C4-PFOS	88	11 - 131	10/20/17 20:15	
13C2-PFDA	75	25 - 129	10/20/17 20:15	
13C2-PFUnDA	82	16 - 129	10/20/17 20:15	
13C2-PFDoDA	76	17 - 114	10/20/17 20:15	
D7-MeFOSE	67	32 - 113	10/20/17 20:15	
D9-EtFOSE	68	20 - 113	10/20/17 20:15	
D5-EtFOSA	48	19 - 103	10/20/17 20:15	
13C2-8:2 FTS	69	50 - 150	10/20/17 20:15	

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1711313
Project:	16.0062335.00/16.0062335.00	**Date Collected:**	10/17/17 04:04
Sample Matrix:	Surface Water	**Date Received:**	10/18/17 09:40
Sample Name:	SW-17-103A	**Units:**	ng/L
Lab Code:	K1711313-005	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M			
Prep Method:	EPA 3535A			
13C2-PFTeDA	63	50 - 150	10/20/17 20:15	
13C4-PFHpA	75	50 - 150	10/20/17 20:15	
13C5-PFPeA	82	50 - 150	10/20/17 20:15	
13C3-PFBS	49	50 - 150	10/20/17 20:15	*
13C8-FOSA	80	50 - 150	10/20/17 20:15	

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1711313
Project:	16.0062335.00/16.0062335.00	**Date Collected:**	10/17/17 04:09
Sample Matrix:	Surface Water	**Date Received:**	10/18/17 09:40
Sample Name:	SW-17-103B	**Units:**	ng/L
Lab Code:	K1711313-006	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	ND U	8.1	1	10/20/17 20:25	10/20/17	
Perfluoropentanoic acid (PFPeA)	ND U	4.1	1	10/20/17 20:25	10/20/17	
Perfluorobutane sulfonic acid (PFBS)	ND U	4.1	1	10/20/17 20:25	10/20/17	
Perfluorohexanoic acid (PFHxA)	ND U	4.1	1	10/20/17 20:25	10/20/17	
Perfluoroheptanoic acid (PFHpA)	ND U	4.1	1	10/20/17 20:25	10/20/17	
Perfluorohexane sulfonic acid (PFHxS)	ND U	4.1	1	10/20/17 20:25	10/20/17	
Perfluorooctanoic acid (PFOA)	**4.8**	1.6	1	10/20/17 20:25	10/20/17	
Perfluoroheptane sulfonic acid (PFHpS)	ND U	4.1	1	10/20/17 20:25	10/20/17	
Perfluorononanoic acid (PFNA)	ND U	4.1	1	10/20/17 20:25	10/20/17	
Perfluorooctane sulfonic acid (PFOS)	**9.6**	4.1	1	10/20/17 20:25	10/20/17	
Perfluorodecanoic acid (PFDA)	ND U	4.1	1	10/20/17 20:25	10/20/17	
Perfluoroundecanoic acid (PFUnDA)	ND U	4.1	1	10/20/17 20:25	10/20/17	
Perfluorooctane sulfonamide (FOSA)	ND U	4.1	1	10/20/17 20:25	10/20/17	
Perfluorododecanoic acid (PFDoDA)	ND U	4.1	1	10/20/17 20:25	10/20/17	
Perfluorotridecanoic acid (PFTrDA)	ND U	4.1	1	10/20/17 20:25	10/20/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND U	4.1	1	10/20/17 20:25	10/20/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND U	4.1	1	10/20/17 20:25	10/20/17	
Perfluorotetradecanoic acid (PFTeDA)	ND U	4.1	1	10/20/17 20:25	10/20/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND U	4.1	1	10/20/17 20:25	10/20/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND U	4.1	1	10/20/17 20:25	10/20/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND U	4.1	1	10/20/17 20:25	10/20/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND U	4.1	1	10/20/17 20:25	10/20/17	
Perfluorodecane sulfonic acid (PFDS)	ND U	4.1	1	10/20/17 20:25	10/20/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	87	19 - 126	10/20/17 20:25	
13C2-PFHxA	70	10 - 151	10/20/17 20:25	
18O2-PFHxS	77	20 - 128	10/20/17 20:25	
13C2-6:2 FTS	51	10 - 187	10/20/17 20:25	
13C4-PFOA	72	13 - 142	10/20/17 20:25	
13C5-PFNA	78	15 - 143	10/20/17 20:25	
13C4-PFOS	77	11 - 131	10/20/17 20:25	
13C2-PFDA	71	25 - 129	10/20/17 20:25	
13C2-PFUnDA	78	16 - 129	10/20/17 20:25	
13C2-PFDoDA	73	17 - 114	10/20/17 20:25	
D7-MeFOSE	58	32 - 113	10/20/17 20:25	
D9-EtFOSE	54	20 - 113	10/20/17 20:25	
D5-EtFOSA	38	19 - 103	10/20/17 20:25	
13C2-8:2 FTS	67	50 - 150	10/20/17 20:25	

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1711313
Project:	16.0062335.00/16.0062335.00	**Date Collected:**	10/17/17 04:09
Sample Matrix:	Surface Water	**Date Received:**	10/18/17 09:40
Sample Name:	SW-17-103B	**Units:**	ng/L
Lab Code:	K1711313-006	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M			
Prep Method:	EPA 3535A			
13C2-PFTeDA	55	50 - 150	10/20/17 20:25	
13C4-PFHpA	81	50 - 150	10/20/17 20:25	
13C5-PFPeA	77	50 - 150	10/20/17 20:25	
13C3-PFBS	44	50 - 150	10/20/17 20:25	*
13C8-FOSA	74	50 - 150	10/20/17 20:25	

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1711313
Project:	16.0062335.00/16.0062335.00	**Date Collected:**	10/17/17 04:31
Sample Matrix:	Surface Water	**Date Received:**	10/18/17 09:40
Sample Name:	SW-17-104A	**Units:**	ng/L
Lab Code:	K1711313-007	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	ND U	8.1	1	10/20/17 20:36	10/20/17	
Perfluoropentanoic acid (PFPeA)	ND U	4.1	1	10/20/17 20:36	10/20/17	
Perfluorobutane sulfonic acid (PFBS)	ND U	4.1	1	10/20/17 20:36	10/20/17	
Perfluorohexanoic acid (PFHxA)	ND U	4.1	1	10/20/17 20:36	10/20/17	
Perfluoroheptanoic acid (PFHpA)	ND U	4.1	1	10/20/17 20:36	10/20/17	
Perfluorohexane sulfonic acid (PFHxS)	ND U	4.1	1	10/20/17 20:36	10/20/17	
Perfluorooctanoic acid (PFOA)	**4.8**	1.6	1	10/20/17 20:36	10/20/17	
Perfluoroheptane sulfonic acid (PFHpS)	ND U	4.1	1	10/20/17 20:36	10/20/17	
Perfluorononanoic acid (PFNA)	ND U	4.1	1	10/20/17 20:36	10/20/17	
Perfluorooctane sulfonic acid (PFOS)	**12**	4.1	1	10/20/17 20:36	10/20/17	
Perfluorodecanoic acid (PFDA)	ND U	4.1	1	10/20/17 20:36	10/20/17	
Perfluoroundecanoic acid (PFUnDA)	ND U	4.1	1	10/20/17 20:36	10/20/17	
Perfluorooctane sulfonamide (FOSA)	ND U	4.1	1	10/20/17 20:36	10/20/17	
Perfluorododecanoic acid (PFDoDA)	ND U	4.1	1	10/20/17 20:36	10/20/17	
Perfluorotridecanoic acid (PFTrDA)	ND U	4.1	1	10/20/17 20:36	10/20/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND U	4.1	1	10/20/17 20:36	10/20/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND U	4.1	1	10/20/17 20:36	10/20/17	
Perfluorotetradecanoic acid (PFTeDA)	ND U	4.1	1	10/20/17 20:36	10/20/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND U	4.1	1	10/20/17 20:36	10/20/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND U	4.1	1	10/20/17 20:36	10/20/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND U	4.1	1	10/20/17 20:36	10/20/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND U	4.1	1	10/20/17 20:36	10/20/17	
Perfluorodecane sulfonic acid (PFDS)	ND U	4.1	1	10/20/17 20:36	10/20/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	92	19 - 126	10/20/17 20:36	
13C2-PFHxA	77	10 - 151	10/20/17 20:36	
18O2-PFHxS	74	20 - 128	10/20/17 20:36	
13C2-6:2 FTS	53	10 - 187	10/20/17 20:36	
13C4-PFOA	87	13 - 142	10/20/17 20:36	
13C5-PFNA	86	15 - 143	10/20/17 20:36	
13C4-PFOS	84	11 - 131	10/20/17 20:36	
13C2-PFDA	75	25 - 129	10/20/17 20:36	
13C2-PFUnDA	80	16 - 129	10/20/17 20:36	
13C2-PFDoDA	81	17 - 114	10/20/17 20:36	
D7-MeFOSE	66	32 - 113	10/20/17 20:36	
D9-EtFOSE	70	20 - 113	10/20/17 20:36	
D5-EtFOSA	56	19 - 103	10/20/17 20:36	
13C2-8:2 FTS	64	50 - 150	10/20/17 20:36	

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1711313
Project:	16.0062335.00/16.0062335.00	**Date Collected:**	10/17/17 04:31
Sample Matrix:	Surface Water	**Date Received:**	10/18/17 09:40
Sample Name:	SW-17-104A	**Units:**	ng/L
Lab Code:	K1711313-007	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M		
Prep Method:	EPA 3535A		
13C2-PFTeDA	65	50 - 150	10/20/17 20:36
13C4-PFHpA	67	50 - 150	10/20/17 20:36
13C5-PFPeA	82	50 - 150	10/20/17 20:36
13C3-PFBS	59	50 - 150	10/20/17 20:36
13C8-FOSA	87	50 - 150	10/20/17 20:36

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1711313
Project:	16.0062335.00/16.0062335.00	**Date Collected:**	10/17/17 04:34
Sample Matrix:	Surface Water	**Date Received:**	10/18/17 09:40
Sample Name:	SW-17-104B	**Units:**	ng/L
Lab Code:	K1711313-008	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	ND U	8.1	1	10/20/17 20:46	10/20/17	
Perfluoropentanoic acid (PFPeA)	ND U	4.1	1	10/20/17 20:46	10/20/17	
Perfluorobutane sulfonic acid (PFBS)	ND U	4.1	1	10/20/17 20:46	10/20/17	
Perfluorohexanoic acid (PFHxA)	ND U	4.1	1	10/20/17 20:46	10/20/17	
Perfluoroheptanoic acid (PFHpA)	ND U	4.1	1	10/20/17 20:46	10/20/17	
Perfluorohexane sulfonic acid (PFHxS)	ND U	4.1	1	10/20/17 20:46	10/20/17	
Perfluorooctanoic acid (PFOA)	**5.2**	1.6	1	10/20/17 20:46	10/20/17	
Perfluoroheptane sulfonic acid (PFHpS)	ND U	4.1	1	10/20/17 20:46	10/20/17	
Perfluorononanoic acid (PFNA)	ND U	4.1	1	10/20/17 20:46	10/20/17	
Perfluorooctane sulfonic acid (PFOS)	**11**	4.1	1	10/20/17 20:46	10/20/17	
Perfluorodecanoic acid (PFDA)	ND U	4.1	1	10/20/17 20:46	10/20/17	
Perfluoroundecanoic acid (PFUnDA)	ND U	4.1	1	10/20/17 20:46	10/20/17	
Perfluorooctane sulfonamide (FOSA)	ND U	4.1	1	10/20/17 20:46	10/20/17	
Perfluorododecanoic acid (PFDoDA)	ND U	4.1	1	10/20/17 20:46	10/20/17	
Perfluorotridecanoic acid (PFTrDA)	ND U	4.1	1	10/20/17 20:46	10/20/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND U	4.1	1	10/20/17 20:46	10/20/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND U	4.1	1	10/20/17 20:46	10/20/17	
Perfluorotetradecanoic acid (PFTeDA)	ND U	4.1	1	10/20/17 20:46	10/20/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND U	4.1	1	10/20/17 20:46	10/20/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND U	4.1	1	10/20/17 20:46	10/20/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND U	4.1	1	10/20/17 20:46	10/20/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND U	4.1	1	10/20/17 20:46	10/20/17	
Perfluorodecane sulfonic acid (PFDS)	ND U	4.1	1	10/20/17 20:46	10/20/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	98	19 - 126	10/20/17 20:46	
13C2-PFHxA	82	10 - 151	10/20/17 20:46	
18O2-PFHxS	86	20 - 128	10/20/17 20:46	
13C2-6:2 FTS	55	10 - 187	10/20/17 20:46	
13C4-PFOA	79	13 - 142	10/20/17 20:46	
13C5-PFNA	91	15 - 143	10/20/17 20:46	
13C4-PFOS	95	11 - 131	10/20/17 20:46	
13C2-PFDA	81	25 - 129	10/20/17 20:46	
13C2-PFUnDA	81	16 - 129	10/20/17 20:46	
13C2-PFDoDA	80	17 - 114	10/20/17 20:46	
D7-MeFOSE	75	32 - 113	10/20/17 20:46	
D9-EtFOSE	76	20 - 113	10/20/17 20:46	
D5-EtFOSA	55	19 - 103	10/20/17 20:46	
13C2-8:2 FTS	69	50 - 150	10/20/17 20:46	

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1711313
Project:	16.0062335.00/16.0062335.00	**Date Collected:**	10/17/17 04:34
Sample Matrix:	Surface Water	**Date Received:**	10/18/17 09:40
Sample Name:	SW-17-104B	**Units:**	ng/L
Lab Code:	K1711313-008	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M		
Prep Method:	EPA 3535A		
13C2-PFTeDA	66	50 - 150	10/20/17 20:46
13C4-PFHpA	86	50 - 150	10/20/17 20:46
13C5-PFPeA	87	50 - 150	10/20/17 20:46
13C3-PFBS	55	50 - 150	10/20/17 20:46
13C8-FOSA	88	50 - 150	10/20/17 20:46

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1711313
Project:	16.0062335.00/16.0062335.00	**Date Collected:**	10/17/17 03:37
Sample Matrix:	Water	**Date Received:**	10/18/17 09:40
Sample Name:	FB-00	**Units:**	ng/L
Lab Code:	K1711313-009	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	ND U	8.1	1	10/20/17 20:57	10/20/17	
Perfluoropentanoic acid (PFPeA)	ND U	4.1	1	10/20/17 20:57	10/20/17	
Perfluorobutane sulfonic acid (PFBS)	ND U	4.1	1	10/20/17 20:57	10/20/17	
Perfluorohexanoic acid (PFHxA)	ND U	4.1	1	10/20/17 20:57	10/20/17	
Perfluoroheptanoic acid (PFHpA)	ND U	4.1	1	10/20/17 20:57	10/20/17	
Perfluorohexane sulfonic acid (PFHxS)	ND U	4.1	1	10/20/17 20:57	10/20/17	
Perfluorooctanoic acid (PFOA)	ND U	1.6	1	10/20/17 20:57	10/20/17	
Perfluoroheptane sulfonic acid (PFHpS)	ND U	4.1	1	10/20/17 20:57	10/20/17	
Perfluorononanoic acid (PFNA)	ND U	4.1	1	10/20/17 20:57	10/20/17	
Perfluorooctane sulfonic acid (PFOS)	ND U	4.1	1	10/20/17 20:57	10/20/17	
Perfluorodecanoic acid (PFDA)	ND U	4.1	1	10/20/17 20:57	10/20/17	
Perfluoroundecanoic acid (PFUnDA)	ND U	4.1	1	10/20/17 20:57	10/20/17	
Perfluorooctane sulfonamide (FOSA)	ND U	4.1	1	10/20/17 20:57	10/20/17	
Perfluorododecanoic acid (PFDoDA)	ND U	4.1	1	10/20/17 20:57	10/20/17	
Perfluorotridecanoic acid (PFTrDA)	ND U	4.1	1	10/20/17 20:57	10/20/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND U	4.1	1	10/20/17 20:57	10/20/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND U	4.1	1	10/20/17 20:57	10/20/17	
Perfluorotetradecanoic acid (PFTeDA)	ND U	4.1	1	10/20/17 20:57	10/20/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND U	4.1	1	10/20/17 20:57	10/20/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND U	4.1	1	10/20/17 20:57	10/20/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND U	4.1	1	10/20/17 20:57	10/20/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND U	4.1	1	10/20/17 20:57	10/20/17	
Perfluorodecane sulfonic acid (PFDS)	ND U	4.1	1	10/20/17 20:57	10/20/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	97	19 - 126	10/20/17 20:57	
13C2-PFHxA	95	10 - 151	10/20/17 20:57	
18O2-PFHxS	82	20 - 128	10/20/17 20:57	
13C2-6:2 FTS	72	10 - 187	10/20/17 20:57	
13C4-PFOA	81	13 - 142	10/20/17 20:57	
13C5-PFNA	89	15 - 143	10/20/17 20:57	
13C4-PFOS	90	11 - 131	10/20/17 20:57	
13C2-PFDA	82	25 - 129	10/20/17 20:57	
13C2-PFUnDA	86	16 - 129	10/20/17 20:57	
13C2-PFDoDA	81	17 - 114	10/20/17 20:57	
D7-MeFOSE	75	32 - 113	10/20/17 20:57	
D9-EtFOSE	76	20 - 113	10/20/17 20:57	
D5-EtFOSA	60	19 - 103	10/20/17 20:57	
13C2-8:2 FTS	76	50 - 150	10/20/17 20:57	

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1711313
Project:	16.0062335.00/16.0062335.00	**Date Collected:**	10/17/17 03:37
Sample Matrix:	Water	**Date Received:**	10/18/17 09:40
Sample Name:	FB-00	**Units:**	ng/L
Lab Code:	K1711313-009	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M		
Prep Method:	EPA 3535A		
13C2-PFTeDA	72	50 - 150	10/20/17 20:57
13C4-PFHpA	81	50 - 150	10/20/17 20:57
13C5-PFPeA	88	50 - 150	10/20/17 20:57
13C3-PFBS	63	50 - 150	10/20/17 20:57
13C8-FOSA	82	50 - 150	10/20/17 20:57

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1711313
Project:	16.0062335.00/16.0062335.00	**Date Collected:**	NA
Sample Matrix:	Surface Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/L
Lab Code:	KQ1715643-03	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutanoic acid (PFBA)	ND U	10	1	10/20/17 18:51	10/20/17	
Perfluoropentanoic acid (PFPeA)	ND U	5.0	1	10/20/17 18:51	10/20/17	
Perfluorobutane sulfonic acid (PFBS)	ND U	5.0	1	10/20/17 18:51	10/20/17	
Perfluorohexanoic acid (PFHxA)	ND U	5.0	1	10/20/17 18:51	10/20/17	
Perfluoroheptanoic acid (PFHpA)	ND U	5.0	1	10/20/17 18:51	10/20/17	
Perfluorohexane sulfonic acid (PFHxS)	ND U	5.0	1	10/20/17 18:51	10/20/17	
Perfluorooctanoic acid (PFOA)	ND U	2.0	1	10/20/17 18:51	10/20/17	
Perfluoroheptane sulfonic acid (PFHpS)	ND U	5.0	1	10/20/17 18:51	10/20/17	
Perfluorononanoic acid (PFNA)	ND U	5.0	1	10/20/17 18:51	10/20/17	
Perfluorooctane sulfonic acid (PFOS)	ND U	5.0	1	10/20/17 18:51	10/20/17	
Perfluorodecanoic acid (PFDA)	ND U	5.0	1	10/20/17 18:51	10/20/17	
Perfluoroundecanoic acid (PFUnDA)	ND U	5.0	1	10/20/17 18:51	10/20/17	
Perfluorooctane sulfonamide (FOSA)	ND U	5.0	1	10/20/17 18:51	10/20/17	
Perfluorododecanoic acid (PFDoDA)	ND U	5.0	1	10/20/17 18:51	10/20/17	
Perfluorotridecanoic acid (PFTrDA)	ND U	5.0	1	10/20/17 18:51	10/20/17	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND U	5.0	1	10/20/17 18:51	10/20/17	
N-Methyl perfluorooctane sulfonamidoethanol	ND U	5.0	1	10/20/17 18:51	10/20/17	
Perfluorotetradecanoic acid (PFTeDA)	ND U	5.0	1	10/20/17 18:51	10/20/17	
N-Ethyl perfluorooctane sulfonamidoethanol	ND U	5.0	1	10/20/17 18:51	10/20/17	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND U	5.0	1	10/20/17 18:51	10/20/17	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND U	5.0	1	10/20/17 18:51	10/20/17	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND U	5.0	1	10/20/17 18:51	10/20/17	
Perfluorodecane sulfonic acid (PFDS)	ND U	5.0	1	10/20/17 18:51	10/20/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C4-PFBA	59	19 - 126	10/20/17 18:51	
13C2-PFHxA	59	10 - 151	10/20/17 18:51	
18O2-PFHxS	53	20 - 128	10/20/17 18:51	
13C2-6:2 FTS	54	10 - 187	10/20/17 18:51	
13C4-PFOA	50	13 - 142	10/20/17 18:51	
13C5-PFNA	54	15 - 143	10/20/17 18:51	
13C4-PFOS	55	11 - 131	10/20/17 18:51	
13C2-PFDA	50	25 - 129	10/20/17 18:51	
13C2-PFUnDA	49	16 - 129	10/20/17 18:51	
13C2-PFDoDA	48	17 - 114	10/20/17 18:51	
D7-MeFOSE	43	32 - 113	10/20/17 18:51	
D9-EtFOSE	46	20 - 113	10/20/17 18:51	
D5-EtFOSA	39	19 - 103	10/20/17 18:51	
13C2-8:2 FTS	53	50 - 150	10/20/17 18:51	

Analytical Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1711313
Project:	16.0062335.00/16.0062335.00	**Date Collected:**	NA
Sample Matrix:	Surface Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/L
Lab Code:	KQ1715643-03	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M			
Prep Method:	EPA 3535A			
13C2-PFTeDA	44	50 - 150	10/20/17 18:51	*
13C4-PFHpA	53	50 - 150	10/20/17 18:51	
13C5-PFPeA	55	50 - 150	10/20/17 18:51	
13C3-PFBS	40	50 - 150	10/20/17 18:51	*
13C8-FOSA	51	50 - 150	10/20/17 18:51	

Client: GZA GeoEnvironmental, Incorporated **Service Request:** K1711313

Project: 16.0062335.00/16.0062335.00

Sample Matrix: Surface Water

SURROGATE RECOVERY SUMMARY

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M

Extraction Method: EPA 3535A

Sample Name	Lab Code	13C2-6:2 FTS 10 - 187	13C2-8:2 FTS 50 - 150	13C2-PFDA 25 - 129
SW-17-100	K1711313-001	59	68	78
SW-17-101	K1711313-002	50	63	73
SW-17-102A	K1711313-003	48	58	68
SW-17-102B	K1711313-004	51	63	73
SW-17-103A	K1711313-005	52	69	75
SW-17-103B	K1711313-006	51	67	71
SW-17-104A	K1711313-007	53	64	75
SW-17-104B	K1711313-008	55	69	81
Lab Control Sample	KQ1715643-01	64	73	78
Duplicate Lab Control Sample	KQ1715643-02	56	64	66
Method Blank	KQ1715643-03	54	53	50
Continuing Calibration Blank	KQ1715723-02	91	96	96
Continuing Calibration Blank	KQ1715740-02	75	84	100

Client: GZA GeoEnvironmental, Incorporated **Service Request:** K1711313

Project: 16.0062335.00/16.0062335.00

Sample Matrix: Surface Water

SURROGATE RECOVERY SUMMARY

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M

Extraction Method: EPA 3535A

Sample Name	Lab Code	13C2-PFDoDA 17 - 114	13C2-PFHxA 10 - 151	13C2-PFTeDA 50 - 150
SW-17-100	K1711313-001	77	79	61
SW-17-101	K1711313-002	71	66	57
SW-17-102A	K1711313-003	69	66	62
SW-17-102B	K1711313-004	72	69	58
SW-17-103A	K1711313-005	76	70	63
SW-17-103B	K1711313-006	73	70	55
SW-17-104A	K1711313-007	81	77	65
SW-17-104B	K1711313-008	80	82	66
Lab Control Sample	KQ1715643-01	74	82	69
Duplicate Lab Control Sample	KQ1715643-02	64	69	62
Method Blank	KQ1715643-03	48	59	44 *
Continuing Calibration Blank	KQ1715723-02	95	93	89
Continuing Calibration Blank	KQ1715740-02	90	96	82

Client: GZA GeoEnvironmental, Incorporated **Service Request:** K1711313

Project: 16.0062335.00/16.0062335.00

Sample Matrix: Surface Water

SURROGATE RECOVERY SUMMARY

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M

Extraction Method: EPA 3535A

Sample Name	Lab Code	13C2-PFUnDA 16 - 129	13C3-PFBS 50 - 150	13C4-PFBA 19 - 126
SW-17-100	K1711313-001	78	50	92
SW-17-101	K1711313-002	77	47 *	86
SW-17-102A	K1711313-003	73	46 *	86
SW-17-102B	K1711313-004	72	59	90
SW-17-103A	K1711313-005	82	49 *	92
SW-17-103B	K1711313-006	78	44 *	87
SW-17-104A	K1711313-007	80	59	92
SW-17-104B	K1711313-008	81	55	98
Lab Control Sample	KQ1715643-01	77	59	93
Duplicate Lab Control Sample	KQ1715643-02	68	49 *	83
Method Blank	KQ1715643-03	49	40 *	59
Continuing Calibration Blank	KQ1715723-02	98	93	94
Continuing Calibration Blank	KQ1715740-02	102	94	98

Client: GZA GeoEnvironmental, Incorporated **Service Request:** K1711313

Project: 16.0062335.00/16.0062335.00

Sample Matrix: Surface Water

SURROGATE RECOVERY SUMMARY

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M

Extraction Method: EPA 3535A

Sample Name	Lab Code	13C4-PFHpA 50 - 150	13C4-PFOA 13 - 142	13C4-PFOS 11 - 131
SW-17-100	K1711313-001	81	74	82
SW-17-101	K1711313-002	65	80	80
SW-17-102A	K1711313-003	74	74	79
SW-17-102B	K1711313-004	70	79	81
SW-17-103A	K1711313-005	75	81	88
SW-17-103B	K1711313-006	81	72	77
SW-17-104A	K1711313-007	67	87	84
SW-17-104B	K1711313-008	86	79	95
Lab Control Sample	KQ1715643-01	83	72	82
Duplicate Lab Control Sample	KQ1715643-02	74	67	76
Method Blank	KQ1715643-03	53	50	55
Continuing Calibration Blank	KQ1715723-02	100	92	90
Continuing Calibration Blank	KQ1715740-02	99	100	92

Client: GZA GeoEnvironmental, Incorporated **Service Request:** K1711313

Project: 16.0062335.00/16.0062335.00

Sample Matrix: Surface Water

SURROGATE RECOVERY SUMMARY

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M

Extraction Method: EPA 3535A

Sample Name	Lab Code	13C5-PFNA 15 - 143	13C5-PFPeA 50 - 150	13C8-FOSA 50 - 150
SW-17-100	K1711313-001	84	82	87
SW-17-101	K1711313-002	71	78	75
SW-17-102A	K1711313-003	78	77	74
SW-17-102B	K1711313-004	83	78	80
SW-17-103A	K1711313-005	80	82	80
SW-17-103B	K1711313-006	78	77	74
SW-17-104A	K1711313-007	86	82	87
SW-17-104B	K1711313-008	91	87	88
Lab Control Sample	KQ1715643-01	81	84	74
Duplicate Lab Control Sample	KQ1715643-02	77	74	63
Method Blank	KQ1715643-03	54	55	51
Continuing Calibration Blank	KQ1715723-02	95	94	102
Continuing Calibration Blank	KQ1715740-02	93	101	98

Client: GZA GeoEnvironmental, Incorporated **Service Request:** K1711313

Project: 16.0062335.00/16.0062335.00

Sample Matrix: Surface Water

SURROGATE RECOVERY SUMMARY

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M

Extraction Method: EPA 3535A

Sample Name	Lab Code	18O2-PFHxS 20 - 128	D5-EtFOSA 19 - 103	D7-MeFOSE 32 - 113
SW-17-100	K1711313-001	80	59	71
SW-17-101	K1711313-002	69	47	63
SW-17-102A	K1711313-003	83	53	60
SW-17-102B	K1711313-004	74	48	59
SW-17-103A	K1711313-005	84	48	67
SW-17-103B	K1711313-006	77	38	58
SW-17-104A	K1711313-007	74	56	66
SW-17-104B	K1711313-008	86	55	75
Lab Control Sample	KQ1715643-01	81	62	72
Duplicate Lab Control Sample	KQ1715643-02	69	49	64
Method Blank	KQ1715643-03	53	39	43
Continuing Calibration Blank	KQ1715723-02	97	104 *	86
Continuing Calibration Blank	KQ1715740-02	92	109 *	83

Client: GZA GeoEnvironmental, Incorporated **Service Request:** K1711313

Project: 16.0062335.00/16.0062335.00

Sample Matrix: Surface Water

SURROGATE RECOVERY SUMMARY

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M

Extraction Method: EPA 3535A

Sample Name	Lab Code	D9-EtFOSE 20 - 113
SW-17-100	K1711313-001	74
SW-17-101	K1711313-002	62
SW-17-102A	K1711313-003	66
SW-17-102B	K1711313-004	67
SW-17-103A	K1711313-005	68
SW-17-103B	K1711313-006	54
SW-17-104A	K1711313-007	70
SW-17-104B	K1711313-008	76
Lab Control Sample	KQ1715643-01	79
Duplicate Lab Control Sample	KQ1715643-02	67
Method Blank	KQ1715643-03	46
Continuing Calibration Blank	KQ1715723-02	91
Continuing Calibration Blank	KQ1715740-02	83

Client: GZA GeoEnvironmental, Incorporated **Service Request:** K1711313

Project: 16.0062335.00/16.0062335.00

Sample Matrix: Water

SURROGATE RECOVERY SUMMARY

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M

Extraction Method: EPA 3535A

Sample Name	Lab Code	13C2-6:2 FTS 10 - 187	13C2-8:2 FTS 50 - 150	13C2-PFDA 25 - 129
FB-00	K1711313-009	72	76	82

Client: GZA GeoEnvironmental, Incorporated **Service Request:** K1711313
Project: 16.0062335.00/16.0062335.00
Sample Matrix: Water

SURROGATE RECOVERY SUMMARY

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Extraction Method: EPA 3535A

Sample Name	Lab Code	13C2-PFDoDA 17 - 114	13C2-PFHxA 10 - 151	13C2-PFTeDA 50 - 150
FB-00	K1711313-009	81	95	72

Client: GZA GeoEnvironmental, Incorporated **Service Request:** K1711313
Project: 16.0062335.00/16.0062335.00
Sample Matrix: Water

SURROGATE RECOVERY SUMMARY

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Extraction Method: EPA 3535A

Sample Name	Lab Code	13C2-PFUnDA 16 - 129	13C3-PFBS 50 - 150	13C4-PFBA 19 - 126
FB-00	K1711313-009	86	63	97

Client: GZA GeoEnvironmental, Incorporated **Service Request:** K1711313
Project: 16.0062335.00/16.0062335.00
Sample Matrix: Water

SURROGATE RECOVERY SUMMARY

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Extraction Method: EPA 3535A

Sample Name	Lab Code	13C4-PFHpA 50 - 150	13C4-PFOA 13 - 142	13C4-PFOS 11 - 131
FB-00	K1711313-009	81	81	90

Client: GZA GeoEnvironmental, Incorporated **Service Request:** K1711313
Project: 16.0062335.00/16.0062335.00
Sample Matrix: Water

SURROGATE RECOVERY SUMMARY

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Extraction Method: EPA 3535A

Sample Name	Lab Code	13C5-PFNA 15 - 143	13C5-PFPeA 50 - 150	13C8-FOSA 50 - 150
FB-00	K1711313-009	89	88	82

Client: GZA GeoEnvironmental, Incorporated **Service Request:** K1711313
Project: 16.0062335.00/16.0062335.00
Sample Matrix: Water

SURROGATE RECOVERY SUMMARY

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Extraction Method: EPA 3535A

Sample Name	Lab Code	18O2-PFHxS 20 - 128	D5-EtFOSA 19 - 103	D7-MeFOSE 32 - 113
FB-00	K1711313-009	82	60	75

Client: GZA GeoEnvironmental, Incorporated **Service Request:** K1711313

Project: 16.0062335.00/16.0062335.00

Sample Matrix: Water

SURROGATE RECOVERY SUMMARY

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M

Extraction Method: EPA 3535A

Sample Name	Lab Code	D9-EtFOSE 20 - 113
FB-00	K1711313-009	76

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1711313
Project:	16.0062335.00/16.0062335.00	**Date Analyzed:**	10/20/17
Sample Matrix:	Surface Water	**Date Extracted:**	10/20/17

Duplicate Lab Control Sample Summary
Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M	**Units:**	ng/L
Prep Method:	EPA 3535A	**Basis:**	NA
		Analysis Lot:	566854

	Lab Control Sample KQ1715643-01			Duplicate Lab Control Sample KQ1715643-02					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	146	159	92	167	159	105	74-132	14	30
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	128	160	80	153	160	96	50-150	18	30
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	147	167	88	185	167	111	69-146	23	30
N-Ethyl perfluorooctane sulfonamidoethanol	149	167	90	184	167	110	54-159	21	30
N-Methyl perfluorooctane sulfonamide (MeFOSA)	138	167	83	154	167	93	10-183	11	30
N-Methyl perfluorooctane sulfonamidoethanol	147	167	88	172	167	103	37-166	16	30
Perfluorobutane sulfonic acid (PFBS)	135	148	92	172	148	116	50-150	24	30
Perfluorobutanoic acid (PFBA)	157	167	94	181	167	109	76-136	14	30
Perfluorodecanoic acid (PFDA)	162	167	97	182	167	109	68-135	11	30
Perfluorododecanoic acid (PFDoDA)	157	167	94	191	167	115	70-133	20	30
Perfluoroheptanoic acid (PFHpA)	149	167	89	185	167	111	50-150	22	30
Perfluorohexane sulfonic acid (PFHxS)	142	152	93	165	152	108	71-130	15	30
Perfluorohexanoic acid (PFHxA)	151	167	91	173	167	104	68-141	13	30
Perfluorononanoic acid (PFNA)	159	167	96	168	167	101	77-127	6	30
Perfluorooctane sulfonamide (FOSA)	123	167	74	146	167	87	50-150	17	30
Perfluorooctane sulfonic acid (PFOS)	116	155	75	134	155	86	74-135	14	30
Perfluorooctanoic acid (PFOA)	182	167	109	204	167	122	72-130	11	30
Perfluoropentanoic acid (PFPeA)	160	167	96	182	167	109	50-150	13	30
Perfluorotetradecanoic acid (PFTeDA)	184	167	110	214	167	128	50-150	15	30
Perfluorotridecanoic acid (PFTrDA)	182	167	109	205	167	123	50-150	12	30
Perfluoroundecanoic acid (PFUnDA)	155	167	93	183	167	110	66-131	17	30

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	GZA GeoEnvironmental, Incorporated	**Service Request:**	K1711313
Project:	16.0062335.00/16.0062335.00	**Date Analyzed:**	10/21/17
Sample Matrix:	Surface Water	**Date Extracted:**	10/20/17

Duplicate Lab Control Sample Summary
Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method:	PFC/537M	**Units:**	ng/L
Prep Method:	EPA 3535A	**Basis:**	NA
		Analysis Lot:	566936

	Lab Control Sample KQ1715643-01			Duplicate Lab Control Sample KQ1715643-02					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perfluoroheptane sulfonic acid (PFHpS)	128	159	81	170	159	107	69-148	28	30