

Second VIRP Progress Report



**Former Duluth Dry
Cleaner Site**

3146 Main Street
Duluth, GA
HSI # 10892



Prepared for:
City of Duluth

3167 Main Street
Duluth, GA 30096



Prepared by:

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PG Certification

"I certify under penalty of law that this report and all attachments were prepared by me or under my direct supervision in accordance with the Voluntary Remediation Program Act (O.C.G.A. Section 12- 8-101, et seq.). I am a professional engineer/professional geologist who is registered with the Georgia State Board of Registration for Professional Engineers and Land Surveyors/Georgia State Board of Registration for Professional Geologists and I have the necessary experience and am in charge of the investigation and remediation of this release of regulated substances.

The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."



Katie T. Ross, P.G.
Project Manager

March 17, 2017



Registration No. 1776
State of Georgia

1.0 Introduction

Wenck Associates, Inc. (Wenck) was authorized by the City of Duluth to implement the Voluntary Investigation and Remediation Plan (VIRP), which was submitted in January 2016 and approved by the Georgia Environmental Protection Division (EPD) in a letter dated March 4, 2016. The site is currently owned by the City of Duluth. The site consists of one parcel located at the intersection of Main Street and Knox Drive in Duluth, Georgia (the Site). The location and topography features of the Site are presented on **Figure 1**. A Site Plan is presented as **Figure 2**.

This Second VIRP Progress Report provides a summary of the activities conducted at the Site from September 2016 through February 2017.

1.1 SUMMARY OF SITE ACTIVITIES

The following scope of services was performed by Wenck between September 2016 and February 2017:

- ▲ Installed one shallow well (MW-11) due west of the Site in the grass lot adjacent to the building to complete delineation of the shallow groundwater plume;
- ▲ Performed discreet sampling near MW-3 to evaluate the vertical groundwater profile;
- ▲ Performed slug testing and analysis to determine the hydraulic conductivity at three locations (MW-1, MW-3, and MW-4);
- ▲ Collected groundwater and soil gas samples to evaluate the vapor intrusion pathway for the building west of the former dry cleaner site;
- ▲ Performed site-wide groundwater sampling for volatile organic compounds (VOCs) from all wells; as well as geochemical parameters from select wells (MW-1, MW-5, and MW-6) in February 2017;
- ▲ Surveyed monitoring well MW-11; and
- ▲ Prepared this report.

2.0 Site Background

2.1 HISTORICAL ACTIVITIES

A dry cleaning business operated at the Site from 1975 to 1993. The dry cleaner closed in 1993 and the existing building was used to operate a woodworking shop from 1993 to 1998. As a result of the historic operation of a dry cleaner at the Site, a release of chlorinated VOCs from dry cleaning solvents, namely tetrachloroethene (PCE) and its daughter products, have impacted soil and groundwater. The VOCs have impacted onsite soil and groundwater and are migrating downgradient of the Site to the west northwest.

In 1998, the building was demolished and converted into a parking lot. In 2000, the City of Duluth purchased the Site. The Site was sold to EJT Downtown, LLC in 2007. The original discovery of the release occurred in 2008 during a Phase II Environmental Site Assessment (ESA) performed by Ahlberg Engineering, Inc., (AEI). Results of the Phase II indicated the presence of PCE and other compounds in soil and groundwater onsite in the vicinity of the former dry cleaning building.

The EPD determined that a release exceeding a reportable quantity had occurred at the Site based upon information provided in the April 4, 2008 release notification. The City of Duluth reacquired the property in 2014 and is now the current owner of the Site. Following the listing on the HSI, limited sub-surface investigations were conducted in 2010 by the US Army Corps of Engineers (USACE) and in 2015 by Wenck. These activities, along with the 2008 Phase II, are summarized in the January 2016 VIRP, which was approved by the EPD in March 2016.

2.2 SITE GEOLOGY AND HYDROGEOLOGY

According to the 2010 Brownfields Assessment, the uppermost hydrologic unit in the area of the Site is an unconfined surficial aquifer which is comprised of a saprolite-bedrock aquifer. The saprolite-bedrock aquifer is recharged by rainfall and discharges into streams in valley bottoms. The saprolite stores and transmits water in the pore spaces between the soils (clays, silts, and sands) that comprise the saprolite. The saprolite has a much higher storage capacity but lower transmissivity than the underlying bedrock. The bedrock stores and transmits water through secondary porosity features (fractures, joints, and faults). The bedrock can be capable of transmitting very large volumes of water; the transmissivity depends on the density and orientation of the secondary porosity features. Based on the local topography in the area of the Site, shallow groundwater is expected to flow in a westerly direction.

3.0 Investigation Activities

During the reporting period, one permanent monitoring well (MW-11) was installed on property owned by the City of Duluth. One (1) direct push soil boring (TW-1) was also performed west of the former dry cleaner site to collect groundwater and soil gas data to evaluate the vapor intrusion pathway for the west adjoining Downtown Development building.

Soil, soil gas, and groundwater sampling activities were performed in general accordance with the U.S. Environmental Protection Agency (EPA) Region 4 Science and Ecosystem Support Division (SESD) Quality System and Technical Procedures for soil sampling (SESDPROC-300-R3), soil gas sampling (SESDPROC-300-R3), and groundwater (SESDPROC-301-R3) sampling. Sampling activities also followed Wenck's standard operating procedures. Soil gas sampling was conducted in general accordance with EPA's Office of Solid Waste and Emergency Response (OSWER) *Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air* (OSWER Publication 9200.2-154, June 2015). Methods and procedures are described below.

3.1 GROUNDWATER

3.1.1 Monitoring Well Installation and Development

Monitoring well MW-11 was installed on November 14, 2016 to evaluate groundwater conditions and provide delineation southwest of the Site (**Figure 2**). The monitoring well was constructed as a threaded, two-inch diameter PVC well with 15 feet of screen installed from 25 to 40 feet below ground surface (bgs). The well was developed by purging at least five well volumes from the well. Well installation and development logs are presented in **Appendix A**.

3.1.2 Aquifer Testing

Single well response tests (slug tests) were performed on monitoring wells MW-1, MW-3 and MW-4 on November 20, 2016, to obtain hydraulic conductivity estimates.

The slug tests involved displacing a volume of water within the monitoring well by removing a slug of water (estimated volume of the bailer is one liter) and measuring the rate at which the water level recovered to static conditions. Removing the slug causes the water level inside the well to quickly drop, and then subsequently rise back to static water level over time, thus giving a "rising head test."

Data obtained during testing of monitoring wells were recorded on a pressure transducer and a laptop computer. The slug test data were analyzed using the method of Bouwer and Rice (1976 and 1986), which is appropriate for unconfined water table formations. Output records from the software used in the analysis are included in **Appendix B**. The calculations were made using the following simplifying assumptions:

1. Aquifer properties are consistent from the top of the shallow water table to the base of the well screened interval (i.e., homogeneous aquifer),

2. Correction for effective casing radius applied appropriate for the Bouwer and Rice (1976) Method,
3. Effective porosity of the gravel pack was estimated to be 30%, and
4. Anisotropy ratio (K_v/K_h) estimated to be 0.1.

The slug test results indicate that the hydraulic conductivity ranges from 1.33×10^{-4} cm/sec (MW-3) to 3.04×10^{-4} (MW-1), with an average hydraulic conductivity of approximately 2.13×10^{-4} cm/sec (0.60 ft/day).

3.1.3 Groundwater Sampling

Groundwater sampling was conducted on February 6 and February 13, 2017. Groundwater samples were collected from nine (9) monitoring wells (MW-1 through MW-8, and MW-11). Groundwater samples were not collected from off-site wells MW-9 and MW-10, which were previously installed by others as part of a real estate transaction.

Groundwater was purged using a peristaltic pump; however, due to a depressed water table, the water levels were at or beyond the limit of suction for collecting samples with a peristaltic pump. Therefore, several wells were purged using a bladder pump using low-flow techniques. The following field parameters were measured using direct reading instruments: dissolved oxygen (DO), pH, conductivity, water temperature, turbidity, and oxidation-reduction potential (ORP). The results of these measurements are presented in **Table 2**. Groundwater parameters during purging were considered stable when at least three (3) sets of readings were within the following ranges:

- ▲ pH (± 0.1 SU)
- ▲ SC ($\pm 10\%$)
- ▲ Temperature ($\pm 1^\circ\text{C}$)
- ▲ Turbidity (<10 NTU or $\pm 10\%$)
- ▲ DO ($\pm 0.2\text{mg/L}$ or 10% , whichever was greater)
- ▲ ORP (± 10 mV)

Field logs of the sampling activities, including the results of the field measurements, are provided in **Appendix C**.

The samples were collected in laboratory supplied bottles, placed in a cooler with ice, and submitted under chain-of-custody control to Pace Analytical Services, LLC (Pace) for laboratory analysis. Laboratory reports and chain-of-custody documentation are included in **Appendix D**.

3.1.4 Discreet Groundwater Sampling

One direct push boring was installed on November 14, 2016 in the vicinity of well MW-3. Discreet depth groundwater samples were collected to evaluate the vertical profile of groundwater impacts and to determine if vertical delineation would require installation of a well in bedrock. The groundwater samples were collected from depths of 50, 55, and 63 feet bgs. The deepest sample collected at 63 feet bgs was at top of rock.

The groundwater samples were collected from inside a geoprobe push-point sampler. When the target depth interval was encountered, the stainless steel push point sampler was

opened and groundwater was sampled using a peristaltic pump. The samples were collected in laboratory supplied bottles, placed in a cooler with ice, and submitted under chain-of-custody control to Analytical Environmental Services, Inc. (AES) for laboratory analysis. Laboratory reports and chain-of-custody documentation are included in **Appendix D**.

3.2 VAPOR INTRUSION PATHWAY SAMPLING

3.2.1 Soil Vapor and Groundwater Sampling

To evaluate the potential for vapor intrusion, a shallow groundwater and soil gas sample were collected at well TW-1. The direct push soil boring was advanced to the groundwater table and a temporary 1-inch diameter machine-slotted screen and riser were installed at a depth of 35.5 feet bgs. On November 14, 2016, a groundwater sample (TW-1) was collected with a peristaltic pump using the soda straw method. Upon collection of the groundwater sample, the temporary well was removed and the boring was abandoned using bentonite chips. The sample was collected in laboratory supplied bottles, placed in a cooler with ice, and submitted under chain-of-custody control to Analytical Environmental Services, Inc. (AES) for laboratory analysis. Laboratory reports and chain-of-custody documentation are included in **Appendix D**.

A soil boring was installed in the area immediately east of the Downtown Development building and adjacent to the temporary well (TW-1) location. A temporary vapor implant was installed at a depth of approximately 5 feet bgs. Dedicated Teflon tubing was connected to the implant and the annular space was filled with hydrated bentonite clay. The monitoring point was purged and a helium leak test was performed to confirm an adequate seal had been obtained. The implant was installed on November 14, 2016 and allowed to equilibrate for a minimum of 24 hours. A soil vapor sample (SV-1) was collected using a 400 milliliter (mL) SUMMA canister on November 15, 2016. Following collection of the soil gas sample, the vapor implant was removed and the boring was abandoned using bentonite chips.

The soil gas sample were submitted under chain-of-custody control to H&P Mobile Geochemistry (H&P) for laboratory analysis to determine concentrations of VOCs using EPA Method TO-15. Laboratory reports and chain-of-custody documentation are included in **Appendix D**.

3.3 SURVEYING

The newly installed well (MW-11) was surveyed on January 12, 2017 by Precision Planning, Inc., a licensed surveyor. The survey established the horizontal and vertical coordinates relative to North American horizontal (1923) and vertical (1983) datum.

3.4 DECONTAMINATION AND DISPOSAL ACTIVITIES

Investigation-derived waste (IDW), including soil cuttings, development and purge water, was drummed for off-site disposal. In total, two drums of soil cuttings and one drum of decontamination/purge water were disposed off-site by EQ Industrial Services on December 1, 2016. Purge water for the February sampling event was drummed and is scheduled for off-site disposal in late March 2017. IDW waste manifests documenting disposal are presented in **Appendix E**.

4.0 Findings

4.1 GROUNDWATER FLOW CHARACTERISTICS

Depth to groundwater at wells MW-1 through MW-8 and MW-11 was measured using a water level indicator. All measurements were recorded to the nearest 0.01 foot. Groundwater elevations were calculated using top of casing elevations presented in the VIRP and in this report. A summary of the depth to water and groundwater elevations is provided in **Table 1**.

Based on the current data, groundwater appears to be flowing to the northwest with an average hydraulic gradient of 0.016 feet/foot (**Figure 3**).

The average rate of groundwater seepage velocity was estimated to be 7.3 feet per year (ft/yr) using the following equation:

$$V_x = K_i / n_e$$

Where: V_x = average seepage velocity in feet per day (ft/day)

K = hydraulic conductivity (average: 0.60 ft/day derived from slug test data)

i = hydraulic gradient (0.016 foot per foot)

n_e = effective porosity (0.43; average from range of values: 0.35 to 0.50 (Fetter, 1993))

Seepage Velocity:

$$V_x = [(0.60) * (0.016) / 0.43] = 0.02 \text{ ft/day, or } 7.3 \text{ ft/yr}$$

4.2 ANALYTICAL RESULTS

Site-wide groundwater sampling was performed to evaluate conditions at the Site. Groundwater samples were also collected to evaluate the vertical groundwater profile and to evaluate the vapor intrusion pathway. The groundwater sample results are summarized in **Table 3**. Laboratory reports and supporting chain-of-custody documentation are included in **Appendix D**.

4.2.1 Site-Wide Groundwater Results

Groundwater sampling in February 2017 included collection of samples from nine (9) monitoring wells (MW-1 through MW-9, and MW-11). Groundwater samples were analyzed to determine concentrations of VOCs (EPA Method 8260B). Additionally, MW-1, MW-5 and MW-6 were analyzed for the following natural attenuation parameters:

- Sulfide
- Chloride;
- Nitrate (as N);

- Sulfate;
- Total Organic Carbon (TOC);
- Alkalinity as CaCO₃;
- Ferrous Iron;
- Methane;
- Ethane; and
- Ethene.

4.2.1.1 Volatile Organic Compounds

Detectable concentrations of VOCs were present in 6 of the 9 wells sampled (MW-1 through MW-6). Concentrations of VOCs were less than laboratory detection limits at MW-7, MW-8, and MW-11).

PCE was detected in monitoring wells MW-1 through MW-6 at concentrations above the Type 3 risk reduction standard (RRS) of 5 ug/L. PCE was detected at the highest concentration at well MW-1 at 13,000 ug/L and well MW-3 at 2,400 ug/L. Trichloroethene (TCE) was detected in monitoring wells MW-1, MW-2, MW-3, and MW-4. Concentrations of TCE at wells MW-1 and MW-2 were above the Type 3 RRS of 5 ug/L. Concentrations of PCE, TCE, and associated degradation products (cis-1,2-dichloroethene and trans-1,2-dichloroethene) were highest at wells MW-1 and MW-2 exhibited the maximum.

Cis-1,2-dichloroethene (cis-1,2-DCE) and vinyl chloride were detected in well MW-1 at concentrations of 2.8 ug/L and 670 ug/L, which are slightly below the Type 3 RRS for these compounds. The detected concentrations of VOCs in the remaining samples were less than applicable RRS. In addition, VOCs were not detected in newly installed delineation well MW-11.

The detected concentrations were generally consistent with previous observations at wells MW-1, MW-4, MW-5, and MW-6. PCE concentrations at well MW-2 during this event (660 ug/L) were less than the previous sampling event (2,200 ug/L). Conversely, PCE concentrations at well MW-3 during this event (2,400 ug/L) were higher than the previous sampling event (850 ug/L).

4.2.1.2 Natural Attenuation Parameters

Natural attenuation parameters were measured in upgradient, source area and downgradient portions of the groundwater plume (MW-6, MW-1 and MW-5). These included sulfide, chloride, nitrate as N, sulfate, TOC, alkalinity, dissolved gases (methane, ethane and ethene), and iron III.

In general, some geochemical parameters measured, such as pH, dissolved oxygen, and ORP, had values that were outside the ideal range of a reductive dechlorination scenario. However, the natural attenuation parameters monitored during the current reporting period do indicate that reductive dichlorination of PCE is occurring. This is supported by the presence of PCE breakdown products including TCE, cis-1,2-DCE, and vinyl chloride. Additionally, sulfate in upgradient well MW-6 was reported at 210 mg/L and was reduced to below the detection limit of 5 mg/L at wells MW-1 and MW-5. Additionally, TOC was slightly increased in well MW-1. The nitrate concentration was also highest at well MW-1. Chloride concentrations were highest at well MW-5 (21 mg/L). and were more than three times the background concentration at well MW-6 (4.5 mg/L) which demonstrates that dechlorination is occurring in the source area. It appears that based on the results of the natural

attenuation parameter analyses, reductive dechlorination is most likely due to sulfate-reducing bacteria.

4.2.2 Discreet Depth Groundwater Results

Detectable concentrations of VOCs were present in all three of the discreet depth groundwater samples (IW-MW3-50, IW-MW3-55, and IW-MW3-63) collected from the vicinity of MW-3. Concentrations of PCE were highest at 55 feet bgs at a concentration of 890 ug/L. At the deepest depth interval sampled (63 ft bgs), the PCE concentration had reduced to 290 ug/L. Concentrations of TCE, cis-1,2-DCE, and vinyl chloride exhibited similar concentration gradients with the highest concentrations in the 55 ft bgs interval, with lower concentrations at 63 ft bgs. TCE was reported at 48 ug/L at 55 ft and was reduced to 33 ug/L at 63 feet. Cis-1,2-DCE was present at generally similar concentrations at 55 and 63 ft bgs with reported concentrations of 25 ug/L and 23 ug/L, respectively. Vinyl chloride was also detected in the samples from 55 ft bgs (3.1 ug/L) and 63 ft bgs (2.7 ug/L). The vertical profile results indicate that the highest concentration of VOCs is around the 55 foot depth interval with concentrations decreasing with depth. During the next reporting period, a bedrock well will be installed near well MW-3 for vertical delineation purposes and will be screened at a depth greater than 63 ft bgs.

4.2.3 Vapor Pathway Groundwater and Soil Gas Results

PCE at a concentration of 51 ug/L was detected in the groundwater vapor sample collected from the temporary monitoring well (TW-1) location. Concentrations of the remaining VOCs from this sample were all less than laboratory detection limits. The groundwater results from TW-1 are summarized in **Table 3** and **Table 4**.

PCE was detected in soil vapor sample SV-1 at a concentration of 1,800 micrograms per cubic meter (ug/m³). The sample also contained detectable concentrations of several other VOCs including dichlorodifluoromethane (7.5 ug/m³), benzene (3.7 ug/m³), toluene (9.2 ug/m³), and 1,2,4-trimethylbenzene (5.5 ug/m³).

The soil gas and groundwater samples do not exceed the EPA Vapor Intrusion Screening levels (VISLs) for an analytes detected. In addition, the building immediately adjacent to TW-1 is constructed with an open-air parking garage that extends across the entire footprint of the building. The presence of this open-air structure makes the vapor intrusion pathway incomplete because any vapors migrating from the soil gas toward the building would mix with outdoor air which would prevent VOCs from entering the building.

The soil vapor results are summarized in **Table 4**, photographs of the parking garage are included in **Appendix F**. Laboratory reports and supporting chain-of-custody documentation are included in **Appendix D**.

4.3 EXTENT OF IMPACTS

Based on the analytical results, PCE and associated breakdown products are delineated in shallow groundwater to the north and west. PCE and daughter products are not present in wells MW-7, MW-8, MW-9, MW-10, or MW-11, which was recently installed to the west of the Site. PCE is only slightly above the Type 3 RRS to the east at well MW-6 with a concentration of 8.2 ug/L. Well MW-5 is located along the southwestern property boundary

with a PCE concentration of 30 ug/L. The vertical extent of the groundwater plume is currently unknown.

5.0 Recommendations and Schedule

Based on the most recent groundwater results, installation of one bedrock well clustered with MW-3 is recommended to determine the vertical extent of contamination. Activities planned for the next six-month reporting period (February 2017 through September 2017) include the following:

- ▲ Install one bedrock well (MW-12) clustered with MW-3 to determine the vertical extent of contamination;
- ▲ Perform site-wide groundwater sampling for VOCs and geochemical parameters (MW-1, MW-5 and MW-6) in September 2017;
- ▲ Survey the new monitoring well (MW-12);
- ▲ Update CSM and perform fate and transport modeling; and
- ▲ Prepare the Third VIRP Progress Report.

The Third VIRP Progress Report will be submitted by October 31, 2017.

Figures



CITY OF DULUTH - FORMER DRYCLEANER

USGS Topographic Map

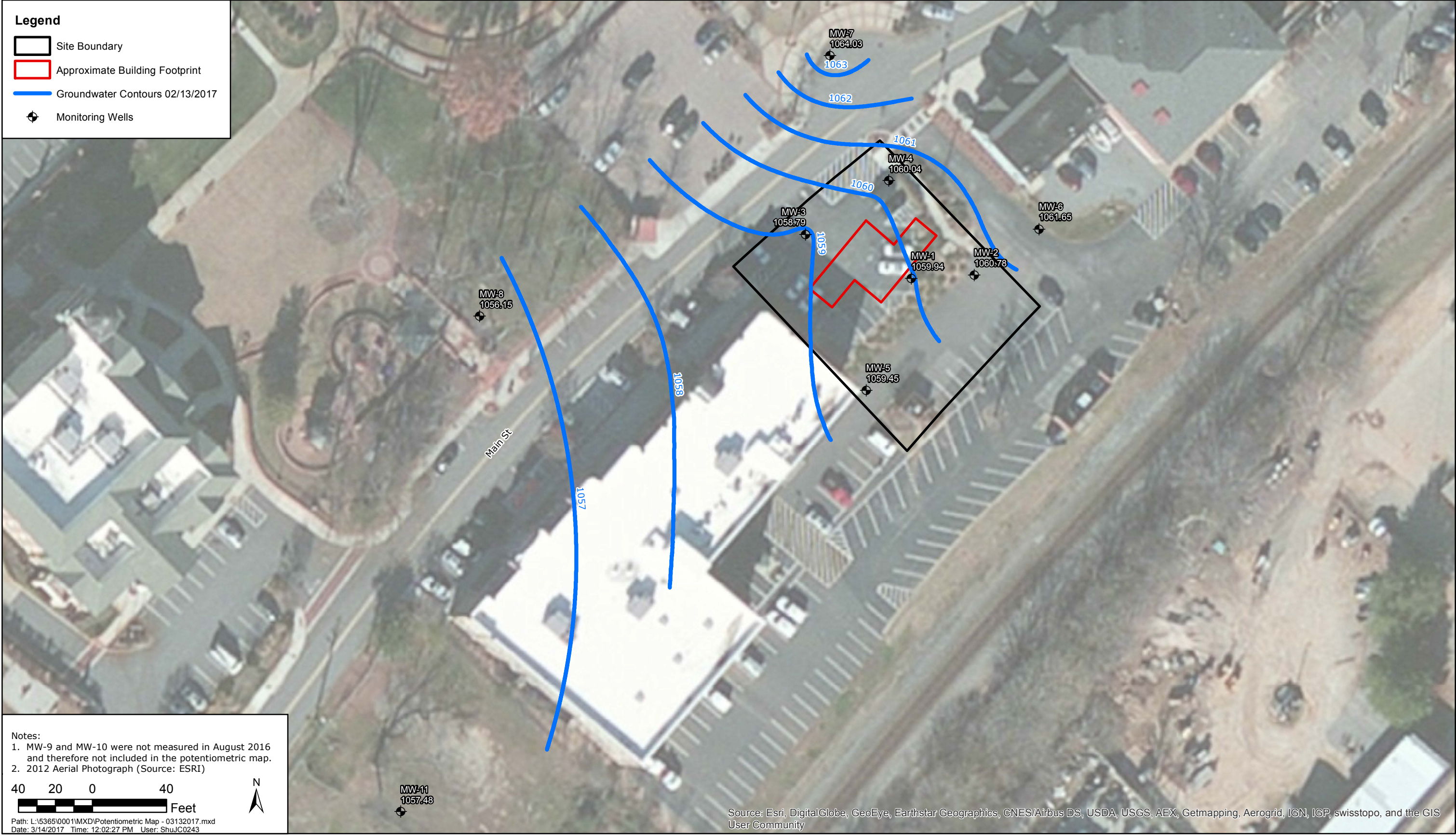


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MAR 2017

Figure 1





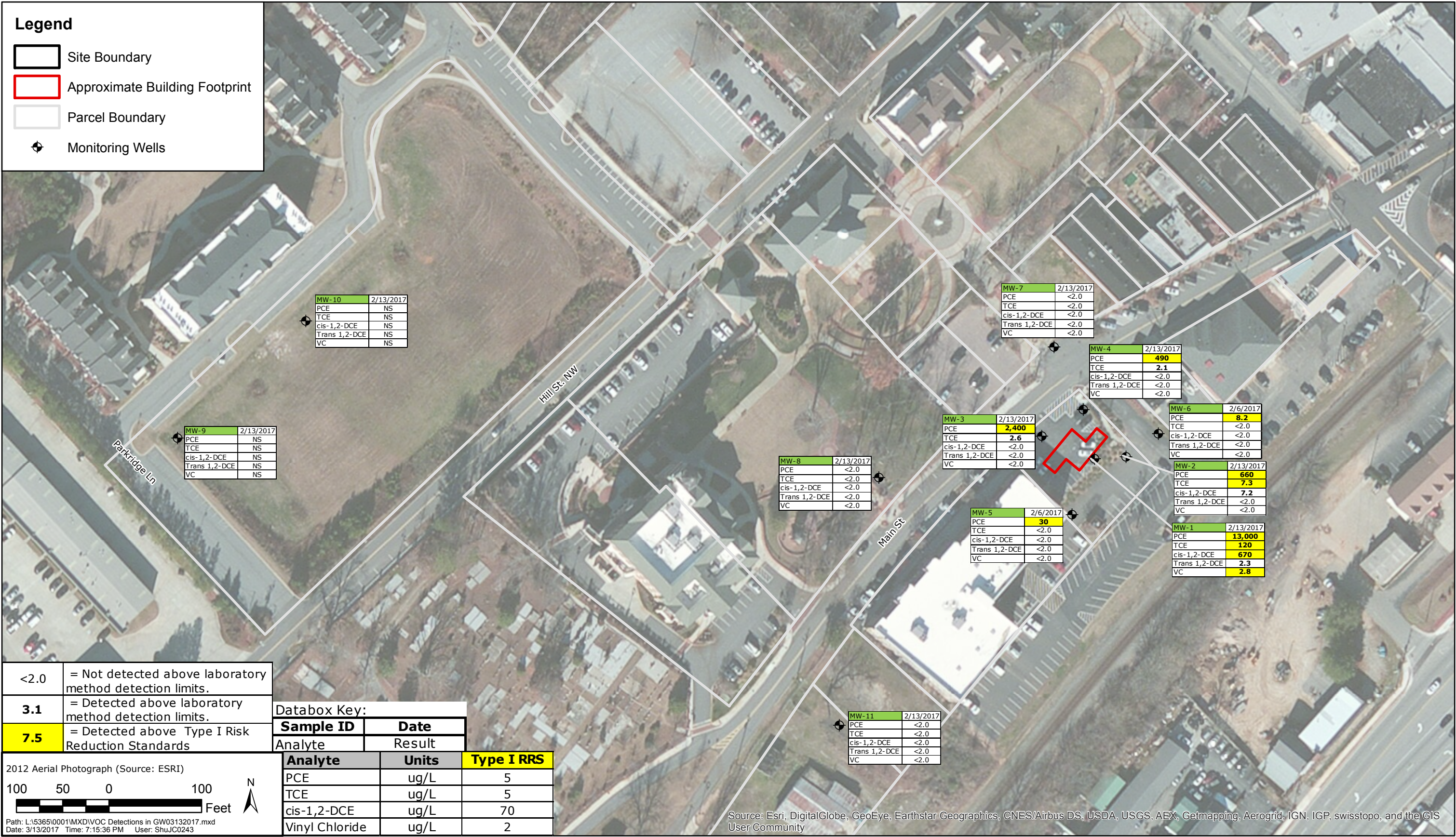
CITY OF DULUTH - FORMER DRYCLEANER

Potentiometric Map - February 2017



MAR 2017

Figure 3



Tables

TABLE 1
Summary of Groundwater Elevations

Former Duluth Dry Cleaner
3146 Main Street
Duluth, Fulton County, Georgia
GEPD HSI # 10892



Well Number	Date Measured	Top of Casing Elevation (feet)	Depth of Screened Interval (feet BLS)	Screened Interval Elevation (feet)	Water Depth (feet)	Corrected Groundwater Elevation (feet)
MW-1	10/6/2015	1092.80	30.18-40.18	1053.23-1063.23	31.75	1061.05
	10/5/2015				31.74	1061.06
	12/6/2015				30.19	1062.61
	8/1/2016				29.55	1063.25
	2/13/2017				32.86	1059.94
MW-2	10/6/2015	1086.01	19.55-29.55	1056.86-1066.86	24.38	1061.63
	10/5/2015				24.16	1061.85
	12/6/2015				22.2	1063.81
	7/31/2016				22.2	1063.81
	2/13/2017				25.23	1060.78
MW-3	10/6/2015	1093.63	30.52-45.52	1048.61-1063.61	33.57	1060.06
	10/5/2015				33.53	1060.10
	12/6/2015				32.55	1061.08
	8/1/2016				30.9	1062.73
	2/13/2017				34.84	1058.79
MW-4	10/6/2015	1092.91	29.64-39.64	1053.85-1043.85	33.78	1059.13
	10/5/2015				31.66	1061.25
	12/6/2015				30.2	1062.71
	8/1/2016				30.7	1062.21
	2/13/2017				32.87	1060.04
MW-5	7/29/2016	1085.33	20.15-30.15	1055.18-1045.18	22.81	1062.52
	2/6/2017				25.88	1059.45
MW-6	7/28/2016	1085.50	20.35-30.35	1055.15-1045.15	21.07	1064.43
	2/6/2017				23.85	1061.65
MW-7	7/29/2016	1092.78	25.45-35.45	1057.33-1047.33	25.90	1066.88
	2/13/2017				28.75	1064.03
MW-8	8/1/2016	1101.97	49.5-64.5	947.47-932.47	41.53	1060.44
	2/6/2017				45.82	1056.15
MW-9	1/11/2016	1072.07	15-25	1047.07-1037.07	13.10	1058.97
	2/13/2017				NS	---
MW-10	1/11/2016	1070.70	6-16	1054.7-1044.7	7.70	1082.18
	2/13/2017				NS	---
MW-11	2/13/2017	1089.88	25-40	1064.88-1049.88	32.40	1057.48

NOTES:

MW-9 & MW-10 were previously identified as MW-1 & MW-2 in PGC Phase II ESA.
MW-9 & MW-10 depths to groundwater & water level elevations were measured from ground surface on 1/11/16 by PCG.
NS = Not Sampled

TABLE 2
Summary of Groundwater Field and Natural Attenuation Parameters

Former Duluth Dry Cleaner
 3146 Main Street
 Duluth, Fulton County, Georgia
 GAEPD HSI # 10892



Well ID	Date Sampled	Temperature °C	pH	Dissolved Oxygen mg/L	ORP mV	Conductivity µs/cm	Turbidity NTU	Sulfide (mg/L)	Chloride (mg/L)	Nitrate as N (mg/L)	Sulfate (mg/L)	Total Organic Carbon (mg/L)	Alkalinity as CaCO ₃ (mg/L)	Ferrous Iron (mg/L)	Methane/Ethane/Ethene (ug/L)
MW-1	10/6/2015	22.33	4.61	9.68	391	81	8.22	NA	NA	NA	NA	NA	NA	NA	NA
	8/1/2016	22.77	4.08	1.33	422	92	18.70	NA	NA	NA	NA	NA	NA	NA	NA
	2/13/2017	16.35	4.18	0	415	51	3.70	<1.0	3.3	4.5	<5.0	1.2	<10.0	0	<10.0
MW-2	10/6/2015	22.71	5.21	21.05	267	89	379.00	NA	NA	NA	NA	NA	NA	NA	NA
	7/31/2016	21.83	4.49	1.31	380	230	9.60	NA	NA	NA	NA	NA	NA	NA	NA
	2/13/2017	16.77	5.52	3	321	103	7.90	NA	NA	NA	NA	NA	NA	NA	NA
MW-3	10/6/2015	23.31	4.87	7.39	386	126	0.00	NA	NA	NA	NA	NA	NA	NA	NA
	8/1/2016	35.12	4.26	2.23	435	62	9.60	NA	NA	NA	NA	NA	NA	NA	NA
	2/13/2017	20.53	4.38	3	382	104	9.70	NA	NA	NA	NA	NA	NA	NA	NA
MW-4	10/6/2015	23.69	5.23	7.35	257	41	822.00	NA	NA	NA	NA	NA	NA	NA	NA
	8/1/2016	26.54	4.6	2.88	425	24	1.87	NA	NA	NA	NA	NA	NA	NA	NA
	8/1/2016	740.00	2.80	2.88	425	24	1.87	NA	NA	NA	NA	NA	NA	NA	NA
	2/13/2017	19.57	4.56	2.28	379	5.4	5.40	NA	NA	NA	NA	NA	NA	NA	NA
MW-5	7/29/2016	22.2	5.15	4.3	335	89	0.36	NA	NA	NA	NA	NA	NA	NA	NA
	2/6/2017	20.01	5.75	5.11	163	0.106	0	<1.0	21	0.24	<5.0	<1.0	11	NS	<10.0
MW-6	7/28/2016	24.82	4.78	446	395	146	12.20	NA	NA	NA	NA	NA	NA	NA	NA
	2/6/2017	20.3	4.48	6.98	352	180	10.6	<1.0	4.5	1.2	210	<1.0	<10.0	NS	<10.0
MW-7	7/29/2016	25.65	5.18	4.73	370	79	0.00	NA	NA	NA	NA	NA	NA	NA	NA
	2/13/2017	20.28	4.82	5.86	351	0.041	0	NA	NA	NA	NA	NA	NA	NA	NA
MW-8	8/1/2016	19.3	5.03	3.06	330	38	27	NA	NA	NA	NA	NA	NA	NA	NA
	2/6/2017	18.97	5.37	7.7	259	0.047	9.53	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 2
Summary of Groundwater Field and Natural Attenuation Parameters

Former Duluth Dry Cleaner
 3146 Main Street
 Duluth, Fulton County, Georgia
 GAEPD HSI # 10892



Well ID	Date Sampled	Temperature °C	pH	Dissolved Oxygen mg/L	ORP mV	Conductivity µs/cm	Turbidity NTU	Sulfide (mg/L)	Chloride (mg/L)	Nitrate as N (mg/L)	Sulfate (mg/L)	Total Organic Carbon (mg/L)	Alkalinity as CaCO ₃ (mg/L)	Ferrous Iron (mg/L)	Methane/Ethane/Ethene (ug/L)
MW-9	1/13/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	2/13/2017	NS	NS	NS	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA
MW-10	1/13/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	2/13/2017	NS	NS	NS	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA
MW-11	11/20/2016	17.36	4.58	0.96	349	131	53.4	NA	NA	NA	NA	NA	NA	NA	NA
	2/13/2017	18.9	4.57	4.55	358	226	6.2	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

All measurements recorded with Horiba U53 meter.
 MW-9 & MW-10 were previously identified as MW-1 & MW-2 in PGC Phase II ESA
 mg/L - milligrams per liter
 mV - millivolts
 µs/cm - microsiemens per centimeter
 NTU - nephelometric turbidity units
 NA = Not Analyzed for this parameter
 NS = Not Sampled

<1.0	= Analyte not detected above the laboratory detection limit
5.7	= Analyte detected above the laboratory detection limit

TABLE 3
Summary of Groundwater Analytical Results
Volatile Organic Compounds

Former Duluth Dry Cleaner
 3146 Main Street
 Duluth, Fulton County, Georgia
 GAEPD HSI # 10892



Well ID	Date Sampled	Tetrachloroethene (ug/L)	Trichloroethene (ug/L)	cis-1,2-Dichloroethene (ug/L)	trans-1,2-Dichloroethene (ug/L)	1,1,1,2-Tetrachloroethane (ug/L)	Benzene (ug/L)	Chloroform (ug/L)	Toluene (ug/L)	Vinyl Chloride (ug/L)
Type I/III RRS		5	5	70	100	700	5	80	1,000	2
MW-1	10/6/2015	15,000	120	540	<5.0	NA	10	13	16	2.4
	8/1/2016	14,000	99	440	2.2	5.9	10	10	16	<2.0
	2/13/2017	13,000	120	670	2.3	<2.0	<2.0	13	<2.0	2.8
MW-2	10/6/2015	1,100	7.6	8.0	<5.0	NA	7.8	<5.0	15	<2.0
	7/31/2016	2,200	12	5.7	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	2/13/2017	660	7.3	7.2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
MW-3	10/6/2015	1,500	<5.0	<5.0	<5.0	NA	<5.0	<5.0	<5.0	<2.0
	8/1/2016	850	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	2/13/2017	2,400	2.6	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
IW-MW3-50	11/14/2016	260	12	6.6	<5.0	<5.0	<5.0	<5.0	<5.0	<2.0
IW-MW3-55	11/14/2016	890	48	25.0	<5.0	<5.0	<5.0	<5.0	<5.0	3.1
IW-MW3-63	11/14/2016	290	33	23.0	<5.0	<5.0	<5.0	<5.0	<5.0	2.7
MW-4	10/6/2015	600	<5.0	<5.0	<5.0	NA	12	<5.0	23	<2.0
	8/1/2016	850	3.1	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	8/1/2016	740	2.8	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	2/13/2017	490	2.1	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
MW-5	7/29/2016	32	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	2/6/2017	30	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
MW-6	7/28/2016	7.5	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	2/6/2017	8.2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
MW-7	7/29/2016	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	2/13/2017	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
MW-8	8/1/2016	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	2/6/2017	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0

TABLE 3
Summary of Groundwater Analytical Results
Volatile Organic Compounds

Former Duluth Dry Cleaner
 3146 Main Street
 Duluth, Fulton County, Georgia
 GAEPD HSI # 10892



Well ID	Date Sampled	Tetrachloroethene (ug/L)	Trichloroethene (ug/L)	cis-1,2-Dichloroethene (ug/L)	trans-1,2-Dichloroethene (ug/L)	1,1,1,2-Tetrachloroethane (ug/L)	Benzene (ug/L)	Chloroform (ug/L)	Toluene (ug/L)	Vinyl Chloride (ug/L)
Type I/III RRS		5	5	70	100	700	5	80	1,000	2
MW-9	1/13/2016	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	2/13/2017	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-10	1/13/2016	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	2/13/2017	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-11	11/20/2016	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	2/13/2017	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
TW-1	11/14/2016	51.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<2.0

Notes:

MW-9 & MW-10 were previously identified as MW-1 & MW-2 in PGC Phase II ESA

<1.0	= Analyte not detected above the laboratory detection limit
5.7	= Analyte detected above the laboratory detection limit
190	= Exceeds Georgia Type I / III Risk Reduction Standards
NC	= No Criteria
NS	= Not Sampled

TABLE 4
Summary of Vapor Pathway Results

Former Duluth Dry Cleaner
 3146 Main Street
 Duluth, Fulton County, Georgia
 GAEPD HSI # 10892



Criteria and Sample Location	Date Sampled	Units	Dichloro- difluoromethane (F12)	Benzene	Toluene	Tetrachloroethene (PCE)	1,2,4- Trimethylbenzene
VISL Target Sub-Slab and Exterior Soil Gas Concentration	-	µg/m ³	15,000	520	730,000	5,800	1,000
SV-1 (vapor)	11/15/2016	µg/m ³	7.5	3.7	9.2	1,800	5.50
VISL Target Groundwater Concentration	-	µg/L	31	69	81,000	240	120
TW-1 (groundwater)	11/14/2016	µg/L	<5.0	<5.0	<5.0	51	NA

Notes:

<1.0	= Analyte not detected above the laboratory detection limit
5.7	= Analyte detected above the laboratory detection limit
190	= Exceeds Vapor Intrusion Screening Level (VISL)

All vapor results are micrograms per cubic meter (µg/m³).
 All groundwater results are micrograms per liter (µg/L).
 NA = Not Analyzed
 NS = Not Sampled
 VISLs calculated using Commercial Exposure Scenario with a 1.00E-5 Carcinogen Target Risk, and Target Hazard Quotient of 1.

Appendix A

Monitoring Well Installation and Development Logs



LOG OF BORING MW-11

Responsive partner. Exceptional outcomes.

(Page 1 of 1)

City of Duluth
Main St.
Project # 5365

Date Started : 11/14/2016
Date Completed : 11/14/2016
Hole Diameter : 8 inch
Drilling Method : HSA 4x8
Sampling Method : Dual Tube (4')

Drilling Contractor : Atlas Geo
Driller : David & Josh
Logged By : LM

Depth in Feet	Approx Surf Elev	USCS	GRAPHIC	DESCRIPTION	PID (PPM)	
0				sod		Concrete and Well Vault
4		CL		slightly moist, hard, dense, fine, red-brown, SILTY CLAY, some sand	0.0	
8		CL		slightly moist, stiff & crumbly, orange brown, SILTY CLAY, white/gold/black striations, (SAPROLITE)	0.0	
12		CL		slightly moist, hard & crumbly, fine, orange brown, SILTY CLAY, and sand, black/gold striations, (SAPROLITE)	0.0	
16		CL		moist, fine, med. stiff, yellow brown, SILTY CLAY, black/red striations, (SAPROLITE)	0.0	PVC Casing Bentonite Chips
20		CL			0.0	
24		CL		very moist, fine, med. soft, red brown, SILTY CLAY, yellow/brown striations, (SAPROLITE)	0.0	
28		CL		very moist, fine, med. soft, yellow-brown, SILTY CLAY, black/silver striations, (SAPROLITE)	0.0	
32		CL			0.0	Sand Pack
36		CL			0.0	2" Screen
40				EOB @ 40.15'	0.0	

Notes:

15ft screen

Water level (31.85') measured from TOC on 11/16/16.

Total Depth (40.15') measured from TOC on 11/16/16



Responsive partner.
Exceptional outcomes.

Well Development Record

Project Name:

City of Duluth, GA
Main Street

Date:

11/14/14

Address:

Weather Conditions:

Sunny 65

Field Technician(s):

E. McQuillen

Well ID:	MW-11@					
Unique Well ID	MW-9	Average Purging Rate (g/m)				
Casing Diameter (inches)	2 in	Volume Purged (gals.)				
Top of Casing Elev. (feet)		Purged Dry (Y/N)				
Depth to Water from TOC (feet)	31.70	Sampling Device				
Groundwater Elev. (feet)		Time Sample Collected				
Depth to Bottom of Well from TOC (feet)	40.15	Color				
Volume of Water in Well (gals.)	1.378	Odor				
3 Well Volumes (gals.)	4.132	Well Capped & Locked (Y/N) cap Y				
Purging Device	Waterspout II	Lock Key #				
Purging Start Time		Damage to Well? (Y/N) N				
Purging Stop Time		Free Product Present? (Y/N) N				
Volume Purged (gallons)	1	3	5	7	9	12
Stabilization Readings						
Time	12:35	12:50	13:05	13:20	13:35	13:50
Temperature (°C)	18.72	19.21	19.23	19.12	18.13	19.06
Specific Conductance (mS/cm)	.124	.135	.106	.064	.113	.108
pH	4.35	4.67	4.27	4.31	4.38	4.50
ORP (mV)	394	380	390	399	380	381
Dissolved Oxygen (mg/L)	2.32	3.00	2.93	2.90	3.01	3.44
Turbidity (NTU)	<1000	469	361	226	130	122

Comments:

One well volume = Water column in feet x 0.163 gallons/foot

Well development = purge 10 well volumes and turbidity is less than 50 NTU

Well purging before sampling = 3 to 5 well volumes

Responsive partner. Exceptional outcomes.

Project: <u>City of Duluth</u>		Project Number: <u>5365</u>	
Location: <u>3140 Main St</u>		Well ID: <u>MW-9@11</u>	
Date: <u>11/20/16</u>	Start Time at Well: <u>11:00 am</u>	End Time at Well: <u>1:40 pm</u>	
Sampler: <u>EMcullen</u>	Weather: <u>Sunny 40s</u>	Comments:	

WELL CHARACTERISTICS

Well Diameter (in): <u>2</u>	Well Screen Depth Interval: <u>40</u> (ft) to <u>25</u> (ft)	Initial Depth to Water (ft): <u>31.85</u>
Total Well Depth (ft): <u>40.15</u>	Well Capacity (gallons per foot): <u>8.8 x .163</u>	1 Well Volume (gallons): <u>1.353</u>
		3 Well Vol. (gal): <u>4.059</u>
		Total Vol. Purged (gal): <u>4.5 gals</u>

Well capacity (gallons per foot): 0.75" = 0.02; 1" = 0.04; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

PURGING DATA

Initial Depth of Tubing (ft): <u>33 ft</u>	Final Depth of Tubing (ft): <u>36 ft</u>	Total Purge Time:	Purge Equipment (circle one): <u>Electric</u> Submersible Pump <u>Peristaltic Pump</u> Other
Initial Purge Rate (gpm):	Final Purge Rate (gpm):	Purge Method (circle one): <u>Low Flow-Low Stress</u> Micro-purge	Meter(s) used (circle one): <u>YSI 556</u> <u>Lamotte 2020</u> <u>Horiba U53</u>

Reading Time	Total Volume Purged (gal)	Depth to Water (ft)	Temperature (°C)	Ph SU	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTUs)	Color/Odor	ORP (mV)
12:20	1	31.85	17.03	4.52	117	1.10	701	orange no odor	351
12:26	.75	32.11	16.90	4.48	117	1.19	723	orange no odor	356
12:32	1	32.82	17.85	4.45	121	1.61	545	orange no odor	357
12:40	1.5	33.14	17.85	4.59	129	1.84	390	light orange	344
12:46	2	33.91	17.99	4.58	132	1.50	248	light orange	340
12:50	2.5	34.11	17.43	4.29	53	0.89	94.7	clear	353
12:55	3	34.50	17.41	4.54	133	0.99	75.5	clear	342
1:00	3.25	34.98	17.41	4.55	130	0.91	62.5	clear	348
1:10	3.50	35.10	17.42	4.56	130	0.98	54.7	clear	348
1:15	4	35.31	17.31	4.58	130	0.98	54.1	clear	349
1:20	4.5	35.55	17.36	4.58	131	0.96	53.9	clear	349

Stabilization: Temperature - ± 0.1°; pH - ± 0.1; Conductivity - ± 5%; Dissolved Oxygen - ± 0.2 mg/L (or 10% saturation); Turbidity - ≤ 10 NTUs (or stable)

SAMPLING

Sampled by (print): <u>EMcullen</u>		Collection Method (circle one): <u>Straw method</u> <u>Vacuum Jug</u> Other		Time Sampling Initiated: <u>1:25</u>	Time Sampling Completed: <u>1:28</u>
Sample ID	Sample Time	Number of Containers	Volume	Preservative	Analysis/ EPA Method
<u>MW-9</u>	<u>1:25</u>	<u>2</u>	<u>40mL</u>	<u>HCl</u>	<u>VOC</u>

Notes:

Aquifer Testing Results

Data file for DataLogger.

=====

COMPANY : <Company name>

COMP.STATUS: Incompl.

DATE : 21/11/2016

TIME : 12:49:43

FILENAME : \\ATLANTA-DC1\Atlanta\Technical\5365 Duluth GA\0001\6 Well and Slug Test\CSV\pz-5_new_1

CREATED BY : SWS Diver-Office 7.0.2.0

===== BEGINNING OF DATA =====

[Logger settings]

Instrument type =Micro-Diver=15

Status =Started =0

Serial number =..00-T6158 215.

Instrument number =

=0

Location =pz-5_new

Sample period =T50

Sample method =LH

Number of channels =2

[Channel 1]

Identification =WATER HEAD

Reference level =400.000 cm

Range =1750.000 cm

Master level =0 m

Altitude =0 m

[Channel 2]

Identification =TEMPERATURE

Reference level =-20.000 °C

Range =100.000 °C

[Series settings]

Serial number =..00-T6158 215.

Instrument number =

Location =pz-5_new

Sample period =00 00:00:00 5

Sample method =LH

Start date / time =00:00:16 20/11/16

End date / time =00:49:10 21/11/16

[Channel 1 from data header]

Identification =WATER HEAD

Reference level =400.000 cm

Range =1750.000 cm

Master level =0 m

Altitude =0 m

[Channel 2 from data header]

Identification =TEMPERATURE

Reference level =-20.000 °C
Range =100.000 °C

Date/time Water hea Temperature[°C]

00:00.0	31.617	19.963
00:00.5	31.442	19.963
00:01.0	31.617	19.963
00:01.5	30.392	19.963
00:02.0	30.567	19.963
00:02.5	29.692	19.963
00:03.0	30.45	19.963
00:03.5	29.05	19.963
00:04.0	29.75	19.963
00:04.5	30.1	19.963
00:05.0	30.275	19.963
00:05.5	30.392	19.963
00:06.0	30.275	19.963
00:06.5	30.275	19.963
00:07.0	30.917	19.963
00:07.5	31.092	19.963
00:08.0	31.092	19.963
00:08.5	31.092	19.963
00:09.0	30.917	19.963
00:09.5	31.267	19.963
00:10.0	31.267	19.963
00:10.5	31.267	19.963
00:11.0	31.267	19.963
00:11.5	31.267	19.963
00:12.0	31.442	19.963
00:12.5	31.442	19.963
00:13.0	31.442	19.963
00:13.5	31.442	19.963
00:14.0	31.558	19.963
00:14.5	31.442	19.963
00:15.0	31.558	19.963
00:15.5	31.617	19.963
00:16.0	31.558	19.963
00:16.5	31.617	19.963
00:17.0	31.617	19.963
00:17.5	31.733	19.97
00:18.0	31.617	19.963
00:18.5	31.617	19.963
00:19.0	31.617	19.97
00:19.5	31.267	19.963
00:20.0	31.442	19.97
00:20.5	31.442	19.963

Data file for DataLogger.

=====

COMPANY : <Company name>

COMP.STATUS: Incompl.

DATE : 21/11/2016

TIME : 12:49:43

FILENAME : \\ATLANTA-DC1\Atlanta\Technical\5365 Duluth GA\0001\6 Well and Slug Test\CSV\pz-1_new_1

CREATED BY : SWS Diver-Office 7.0.2.0

===== BEGINNING OF DATA =====

[Logger settings]

Instrument type =Micro-Diver=15

Status =Started =0

Serial number =..00-T6144 215.

Instrument number =

=0

Location =pz-1_new

Sample period =T50

Sample method =LH

Number of channels =2

[Channel 1]

Identification =WATER HEAD

Reference level =400.000 cm

Range =1750.000 cm

Master level =0 m

Altitude =0 m

[Channel 2]

Identification =TEMPERATURE

Reference level =-20.000 °C

Range =100.000 °C

[Series settings]

Serial number =..00-T6144 215.

Instrument number =

Location =pz-1_new

Sample period =00 00:00:00 5

Sample method =LH

Start date / time =00:30:16 20/11/16

End date / time =00:35:11 21/11/16

[Channel 1 from data header]

Identification =WATER HEAD

Reference level =400.000 cm

Range =1750.000 cm

Master level =0 m

Altitude =0 m

[Channel 2 from data header]

Identification =TEMPERATURE

Reference level =-20.000 °C
Range =100.000 °C

Date/time Water hea Temperature[°C]

30:00.0	76.942	20
30:00.5	76.942	20
30:01.0	77.117	19.99
30:01.5	77.117	19.99
30:02.0	77.117	19.99
30:02.5	76.942	20
30:03.0	76.942	20
30:03.5	76.825	20
30:04.0	76.942	20
30:04.5	76.942	20
30:05.0	76.942	20
30:05.5	76.942	20
30:06.0	76.942	20
30:06.5	76.942	20
30:07.0	76.825	20
30:07.5	76.942	20
30:08.0	76.942	20
30:08.5	76.942	20
30:09.0	76.825	20
30:09.5	76.825	20
30:10.0	76.825	20
30:10.5	76.825	20
30:11.0	76.942	20
30:11.5	76.825	20
30:12.0	76.825	20
30:12.5	76.942	20
30:13.0	76.825	20
30:13.5	76.942	20
30:14.0	76.825	20
30:14.5	76.942	20
30:15.0	77.117	20
30:15.5	76.942	20
30:16.0	76.942	20
30:16.5	76.942	20
30:17.0	76.942	20
30:17.5	76.942	20
30:18.0	76.942	20
30:18.5	77	20
30:19.0	76.942	20
30:19.5	77.117	20
30:20.0	76.942	20
30:20.5	77.117	20

Data file for DataLogger.

=====

COMPANY : <Company name>

COMP.STATUS: Incompl.

DATE : 21/11/2016

TIME : 12:49:43

FILENAME : \\ATLANTA-DC1\Atlanta\Technical\5365 Duluth GA\0001\6 Well and Slug Test\CSV\pz-3_new_1

CREATED BY : SWS Diver-Office 7.0.2.0

===== BEGINNING OF DATA =====

[Logger settings]

Instrument type =Micro-Diver=15

Status =Started =0

Serial number =..00-T6141 215.

Instrument number =

=0

Location =pz-3_new

Sample period =T50

Sample method =LH

Number of channels =2

[Channel 1]

Identification =WATER HEAD

Reference level =400.000 cm

Range =1750.000 cm

Master level =0 m

Altitude =0 m

[Channel 2]

Identification =TEMPERATURE

Reference level =-20.000 °C

Range =100.000 °C

[Series settings]

Serial number =..00-T6141 215.

Instrument number =

Location =pz-3_new

Sample period =00 00:00:00 5

Sample method =LH

Start date / time =00:15:16 20/11/16

End date / time =00:58:10 21/11/16

[Channel 1 from data header]

Identification =WATER HEAD

Reference level =400.000 cm

Range =1750.000 cm

Master level =0 m

Altitude =0 m

[Channel 2 from data header]

Identification =TEMPERATURE

Reference level =-20.000 °C
Range =100.000 °C

Date/time Water hea Temperature[°C]

15:00.0	49.817	19.977
15:00.5	53.083	19.977
15:01.0	54.017	19.977
15:01.5	54.542	19.977
15:02.0	56.642	19.977
15:02.5	56.992	19.977
15:03.0	56.817	19.977
15:03.5	57.108	19.977
15:04.0	56.992	19.977
15:04.5	57.167	19.977
15:05.0	56.992	19.977
15:05.5	56.992	19.977
15:06.0	56.992	19.977
15:06.5	57.342	19.977
15:07.0	57.342	19.977
15:07.5	57.458	19.977
15:08.0	57.458	19.977
15:08.5	57.283	19.977
15:09.0	57.458	19.977
15:09.5	57.342	19.977
15:10.0	57.167	19.977
15:10.5	57.342	19.977
15:11.0	57.458	19.977
15:11.5	57.458	19.977
15:12.0	57.75	19.977
15:12.5	57.458	19.977
15:13.0	57.633	19.977
15:13.5	57.633	19.983
15:14.0	57.808	19.983
15:14.5	57.925	19.983
15:15.0	57.808	19.983
15:15.5	57.458	19.983
15:16.0	57.633	19.983
15:16.5	57.633	19.983
15:17.0	57.808	19.983
15:17.5	57.808	19.983
15:18.0	57.983	19.983
15:18.5	57.983	19.983
15:19.0	57.808	19.983
15:19.5	57.983	19.983
15:20.0	57.983	19.983
15:20.5	57.633	19.983

Monitoring Well Sampling Logs

GROUNDWATER SAMPLING LOG

WENCK ASSOCIATES, INC.

Page 1 of 1

Project: <u>City of Duluth</u>		Project Number: <u>B5365-0001</u>	
Site Name: <u>Main Street</u>		Site Location: <u>Main Street Duluth</u>	
Well ID: <u>MW-1</u>	Sample ID: <u>MW-1</u>	Date: <u>2/13/17</u>	

WELL CHARACTERISTICS

Well Diameter (in): <u>2</u>	Well Screen Depth Interval: <u>30.18</u> (ft) to <u>40.18</u> (ft)	Initial Depth to Water (ft): <u>32.86</u>	
Total Well Depth (ft): <u>39.8</u>	Well Capacity (gallons per foot): <u>0.16</u>	Well Volume (gallons): <u>1.1</u>	Well Volumes to be purged:

Well capacity (gallons per foot): 0.75" = 0.02; 1" = 0.04; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

PURGING DATA

Initial Depth of Tubing (ft): <u>35</u>	Final Depth of Tubing (ft): <u>35</u>	Time Purge Initiated: <u>2000</u> <u>2040</u>	Time Purge Ended: <u>2135</u>
Initial Purge Rate (gpm): <u>0.02</u>	Final Purge Rate (gpm): <u>0.01</u>	Total Volume Purged (gal): <u>1.55</u>	

Purge Method (circle one): Bailer Bladder Pump Electric Submersible Pump Peristaltic Pump Other (specify) _____

Time	Volume Purged (gal)	Depth to Water (ft)	Temperature (°C)	Ph	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTUs)	Color/ Odor	ORP (mV)
2053	0.2	33.40	16.06	4.06	55	0.27	95.4	clear	421
2100	0.3	33.42	16.48	4.04	55	0.00	82.1	"	428
2115	1.0	33.45	16.28	4.11	54	0.00	25.1	"	428
2130	1.5	33.47	16.38	4.19	51	0.00	17.2	"	415
2135	1.55	33.47	16.35	4.18	51	0.00	3.7	"	415

Stabilization Parameters: Temperature - ± 0.1°; pH - ± 0.1; Conductivity - ± 5%; Dissolved Oxygen - ± 0.2 mg/L (or 10% saturation); Turbidity - ≤ 10 NTUs (or stable)

SAMPLING

Sampled by (print): <u>J. McKinney</u>		Samplers Signature: <u>[Signature]</u>		Time Sampling Initiated: <u>2135</u>	Time Sampling Completed: <u>2205</u>	
Sample ID	Sample Time	Sample Matrix (soil, GW, etc.)	Number of Containers	Volume	Analysis/ EPA Method	Sample Type (G - Grab, C - Composite, Other (specify))
<u>MW1</u>	<u>2135</u>	<u>GW</u>	<u>3</u>	<u>40ml</u>	<u>VOC</u>	<u>G</u>
<u>MW1</u>	<u>2135</u>	<u>GW</u>	<u>1</u>	<u>100ml</u>	<u>Alkalinity</u>	<u>G</u>
<u>MW1</u>	<u>2135</u>	<u>GW</u>	<u>1</u>	<u>120ml</u>	<u>chloride nitrate sulfate</u>	<u>G</u>
<u>MW1</u>	<u>2135</u>	<u>GW</u>	<u>2</u>	<u>40ml</u>	<u>MEE</u>	<u>G</u>
<u>MW1</u>	<u>2135</u>	<u>GW</u>	<u>2</u>	<u>40ml</u>	<u>TOC</u>	<u>G</u>
Notes: <u>MW1 2135 GW 1 250ml sulfate G</u>						
<u>Ferrous Iron = 0</u>						

GROUNDWATER SAMPLING LOG

WENCK ASSOCIATES, INC.

Page 1 of 1

Project: <u>City of Duluth</u>		Project Number: <u>B 5365-0001</u>	
Site Name: <u>Main Street</u>		Site Location: <u>Main Street Duluth</u>	
Well ID: <u>mw-2</u>	Sample ID: <u>mw-2</u>	Date: <u>2/13/17</u>	

WELL CHARACTERISTICS

Well Diameter (in): <u>2</u>	Well Screen Depth Interval: <u>19.55</u> (ft) to <u>29.55</u> (ft)	Initial Depth to Water (ft): <u>25.23</u>	
Total Well Depth (ft): <u>29.25</u>	Well Capacity (gallons per foot): <u>0.16</u>	Well Volume (gallons): <u>0.64</u>	Well Volumes to be purged:
Well capacity (gallons per foot): 0.75" = 0.02; 1" = 0.04; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88			

PURGING DATA

Initial Depth of Tubing (ft): <u>27</u>	Final Depth of Tubing (ft): <u>27</u>	Time Purge Initiated: <u>1800</u>	Time Purge Ended: <u>1920</u>
Initial Purge Rate (gpm): <u>0.01</u>	Final Purge Rate (gpm): <u>0.01</u>	Total Volume Purged (gal): <u>0.75</u>	

Purge Method (circle one): Bailer Bladder Pump Electric Submersible Pump Peristaltic Pump Other (specify) _____

Time	Volume Purged (gal)	Depth to Water (ft)	Temperature (°C)	Ph	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTUs)	Color/Odor	ORP (mV)
1826	0.2	26.40	18.23	5.17	93	3.31	423	tan	335
1835	0.3	26.95	17.66	5.16	100	2.17	254	lt. tan	329
1845	0.4	27.20	17.55	5.14	102	2.58	180	lt. tan	334
1905	0.6	27.41	16.41	5.59	106	2.71	108	" "	317
1910	0.65	27.43	16.69	5.59	105	3.01	40.9	" "	315
1915	0.7	27.50	16.74	5.57	107	2.93	16.8	" "	316
1920	0.75	27.62	16.77	5.52	103	3.03	7.9	clear	321

Stabilization Parameters: Temperature - ± 0.1°; pH - ± 0.1; Conductivity - ± 5%; Dissolved Oxygen - ± 0.2 mg/L (or 10% saturation); Turbidity - ≤ 10 NTUs (or stable)

SAMPLING

Sampled by (print): <u>J. McKinney</u>		Samplers Signature: <u>[Signature]</u>			Time Sampling Initiated: <u>1920</u>	Time Sampling Completed: <u>1925</u>
Sample ID	Sample Time	Sample Matrix (soil, GW, etc.)	Number of Containers	Volume	Analysis/ EPA Method	Sample Type (G - Grab, C - Composite, Other (specify))
<u>mw-2</u>	<u>1920</u>	<u>GW</u>	<u>3</u>	<u>40 mL</u>	<u>VOC</u>	<u>G</u>

Notes:

Slow to recharge

GROUNDWATER SAMPLING LOG

WENCK ASSOCIATES, INC.

Page 1 of 1

Project: <u>City of Duluth</u>		Project Number: <u>135365-0001</u>	
Site Name: <u>Main Street</u>		Site Location: <u>Main St. Duluth</u>	
Well ID: <u>MW-3</u>	Sample ID: <u>MW-3</u>	Date: <u>2/13/17</u>	

WELL CHARACTERISTICS

Well Diameter (in): <u>2</u>	Well Screen Depth Interval: <u>30.62</u> (ft) to <u>45.52</u> (ft)	Initial Depth to Water (ft): <u>34.84</u>	
Total Well Depth (ft): <u>44.87</u>	Well Capacity (gallons per foot): <u>0.16</u>	Well Volume (gallons): <u>1.6</u>	Well Volumes to be purged:
Well capacity (gallons per foot): 0.75" = 0.02; 1" = 0.04; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88			

PURGING DATA

Initial Depth of Tubing (ft): <u>40</u>	Final Depth of Tubing (ft): <u>40</u>	Time Purge Initiated: <u>1500</u>	Time Purge Ended: <u>1550</u>
Initial Purge Rate (gpm): <u>0.01</u>	Final Purge Rate (gpm): <u>0.01</u>	Total Volume Purged (gal): <u>0.65</u>	

Purge Method (circle one): Bailer Bladder Pump Electric Submersible Pump Peristaltic Pump Other (specify) _____

Time	Volume Purged (gal)	Depth to Water (ft)	Temperature (°C)	Ph	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTUs)	Color/ Odor	ORP (mV)
1522	0.25	35.18	20.47	4.48	103	3.30	213	clear	378
1527	0.3	35.27	20.56	4.44	103	3.28	174	clear	385
1535	0.5	35.48	20.52	4.44	103	3.20	21.7	clear	365
1545	0.6	35.50	20.55	4.38	104	3.23	16.4	clear	376
1550	0.65	35.53	20.53	4.38	104	3.20	9.7	clear	382

Stabilization Parameters: Temperature - ± 0.1°; pH - ± 0.1; Conductivity - ± 5%; Dissolved Oxygen - ± 0.2 mg/L (or 10% saturation); Turbidity - ≤ 10 NTUs (or stable)

SAMPLING

Sampled by (print): <u>J. McKinney</u>		Samplers Signature: <u>[Signature]</u>			Time Sampling Initiated: <u>1550</u>	Time Sampling Completed: <u>1555</u>
Sample ID	Sample Time	Sample Matrix (soil, GW, etc.)	Number of Containers	Volume	Analysis/ EPA Method	Sample Type (G - Grab, C - Composite, Other (specify))
<u>MW-3</u>	<u>1550</u>	<u>GW</u>	<u>3</u>	<u>40 mL</u>	<u>VOC</u>	<u>G</u>

Notes:

GROUNDWATER SAMPLING LOG

WENCK ASSOCIATES, INC.

Page 1 of 1

Project: <u>City of Duluth</u>		Project Number: <u>B5365-0001</u>	
Site Name: <u>Main Street</u>		Site Location: <u>Main St. Duluth</u>	
Well ID: <u>mw-4</u>	Sample ID: <u>mw-4</u>	Date: <u>2/13/17</u>	

WELL CHARACTERISTICS

Well Diameter (in): <u>2</u>	Well Screen Depth Interval: <u>29.64</u> (ft) to <u>39.64</u> (ft)	Initial Depth to Water (ft): <u>32.87</u>	
Total Well Depth (ft): <u>39.20</u>	Well Capacity (gallons per foot): <u>0.16</u>	Well Volume (gallons): <u>1.0</u>	Well Volumes to be purged:
Well capacity (gallons per foot): 0.75" = 0.02; 1" = 0.04; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88			

PURGING DATA

Initial Depth of Tubing (ft): <u>36</u>	Final Depth of Tubing (ft): <u>37.5</u>	Time Purge Initiated: <u>1635</u>	Time Purge Ended: <u>1720</u>
Initial Purge Rate (gpm): <u>0.01</u>	Final Purge Rate (gpm): <u>0.02</u>	Total Volume Purged (gal): <u>0.6</u>	

Purge Method (circle one): Bladder Pump Electric Submersible Pump Peristaltic Pump Other (specify) _____

Time	Volume Purged (gal)	Depth to Water (ft)	Temperature (°C)	Ph	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTUs)	Color/Odor	ORP (mV)
1650	0.2	33.70	20.13	4.60	15	3.48	136	clear	364
1700	0.3	34.30	19.49	4.27	14	2.02	107	clear	367
1710	0.4	34.85	19.62	4.54	14	2.47	99.6	clear	372
1715	0.5	35.10	19.61	4.57	14	2.31	23.1	clear	375
1720	0.6	35.21	19.57	4.56	14	2.28	5.4	clear	379

Stabilization Parameters: Temperature - ± 0.1°; pH - ± 0.1; Conductivity - ± 5%; Dissolved Oxygen - ± 0.2 mg/L (or 10% saturation); Turbidity - ≤ 10 NTUs (or stable)

SAMPLING

Sampled by (print): <u>J. McKinney</u>		Samplers Signature: <u>[Signature]</u>			Time Sampling Initiated: <u>1725</u>	Time Sampling Completed: <u>1730</u>
Sample ID	Sample Time	Sample Matrix (soil, GW, etc.)	Number of Containers	Volume	Analysis/ EPA Method	Sample Type (G - Grab, C - Composite, Other (specify))
<u>mw-4</u>	<u>1725</u>	<u>GW</u>	<u>3</u>	<u>40ml</u>	<u>VOC</u>	<u>G</u>

Notes:

slow to recharge

Responsive partner. Exceptional outcomes.

Project: <u>City of Duluth</u>		Project Number: <u>B5365-0062</u>	
Location: <u>Main St.</u>		Well ID: <u>MW-5</u>	
Date: <u>2/6/17</u>	Start Time at Well: <u>12:00</u>	End Time at Well: <u>13:20</u>	
Sampler: <u>C. Mayo</u>	Weather: <u>58°, sprink.</u>	Comments:	

WELL CHARACTERISTICS

Well Diameter (in): <u>2</u>	Well Screen Depth Interval: <u>30</u> (ft) to <u>20</u> (ft)	Initial Depth to Water (ft): <u>25.88</u>
Total Well Depth (ft): <u>30</u>	Well Capacity (gallons per foot): <u>0.16</u>	1 Well Volume (gallons): <u>0.65</u>
		3 Well Vol. (gal): <u>1.97</u>
		Total Vol. Purged (gal): <u>2.5 gal</u>

Well capacity (gallons per foot): 0.75" = 0.02; 1" = 0.04; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

PURGING DATA

Initial Depth of Tubing (ft): <u>28</u>	Final Depth of Tubing (ft): <u>28'</u>	Total Purge Time: <u>35 min</u>	Purge Equipment (circle one): Bailer Bladder Pump Electric Submersible Pump <u>Peristaltic Pump</u> Other
Initial Purge Rate (gpm): <u>125 mL/min</u>	Final Purge Rate (gpm): <u>125 mL/min</u>	Purge Method (circle one): Low Flow-Low Stress Micro-purge	Meter(s) used (circle one): YSI 556 Lamotte 2020 <u>Horiba U53</u>

Reading Time	Total Volume Purged (gal)	Depth to Water (ft)	Temperature (°C)	Ph SU	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTUs)	Color/Odor	ORP (mV)
12:25	1 gal	26.41	19.09	5.57	.092	5.18	0.0	clear	213
12:35	1.5 gal	27.03	19.71	5.67	.110	4.18	0.0	clear	190
12:45	2.0 gal	27.16	20.04	5.87	.104	5.20	0.0	clear	161
12:57	2.5 gal	27.05	20.01	5.75	.104	5.11	0.0	clear	163

Stabilization: Temperature - ± 0.1°; pH - ± 0.1; Conductivity - ± 5%; Dissolved Oxygen - ± 0.2 mg/L (or 10% saturation); Turbidity - ≤ 10 NTUs (or stable)

SAMPLING

Sampled by (print): <u>C. Mayo</u>		Collection Method (circle one): Bailer Straw method Vacuum Jug Other			Time Sampling Initiated: <u>12:57</u>	Time Sampling Completed: <u>13:00</u>
Sample ID	Sample Time	Number of Containers	Volume	Preservative	Analysis/ EPA Method	Sample Type (G - Grab, C - Composite, Other (specify))
<u>MW-5</u>	<u>13:00</u>	<u>2 / 3</u>	<u>40ML</u>	<u>HCl</u>	<u>TDC / VOC</u>	<u>G</u>
↓	↓	<u>2</u>	<u>40ML</u>	<u>none</u>	<u>Ethane/ene/Meth</u>	↓
↓	↓	<u>1</u>	<u>120ML</u>	<u>none</u>	<u>Chloride/Nitrate/Sulfate</u>	↓
↓	↓	<u>1</u>	<u>250ML</u>	<u>ZnAc</u>	<u>Sulfide</u>	↓

Notes:
 MW-5 - MNA - 1 Mn - 250ml HNO₃ - Manganese
 TDC - 2 40ml HCl 1 pint - unpreserved - Alkalinity
 Ethane/Ethane/Methane - x2 40ml HCl unpres.
 Chloride Nitrate Sulfate - 120ml plastic
 Sulfide - 250ml - ZnAc.
 Alkalinity - 1 pt plastic

Responsive partner. Exceptional outcomes.

Project:		Project Number: <u>5305</u>	
Location:		Well ID: <u>MW-10 Six</u>	
Date: <u>2/04</u>	Start Time at Well: <u>11:45</u>	End Time at Well: <u>3:00</u>	
Sampler:	Weather: <u>sprinkle/overcast</u> <u>50s</u>		

WELL CHARACTERISTICS

Well Diameter (in): <u>2</u>	Well Screen Depth Interval: <u>30</u> (ft) to <u>20</u> (ft)	Initial Depth to Water (ft): <u>23.85</u>
Total Well Depth (ft): <u>30.20</u>	Well Capacity (gallons per foot): <u>6.35 x 105</u>	1 Well Volume (gallons): <u>1.05</u>
		3 Well Vol. (gal): <u>3.14</u>
		Total Vol. Purged (gal): <u>4.50</u>

Well capacity (gallons per foot): 0.75" = 0.02; 1" = 0.04; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

PURGING DATA

Initial Depth of Tubing (ft): <u>25</u>	Final Depth of Tubing (ft): <u>27</u>	Total Purge Time: <u>2hr</u>	Purge Equipment (circle one): Bailer Bladder Pump Electric Submersible Pump <u>Peristaltic Pump</u> Other (specify) _____	
Initial Purge Rate (gpm):	Final Purge Rate (gpm):	Purge Method (circle one): <u>Low Flow-Low Stress</u> Micro-purge	Meter(s) used (circle one): YSI 556 Lamotte 2020 <u>Horiba U53</u>	

Reading Time	Total Volume Purged (gal)	Depth to Water (ft)	Temperature (°C)	Ph SU	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTUs)	Color/ Odor	ORP (mV)
12:10	0.5	24.35	20.70	4.87	182	7.04	6.77	orange	273
12:29	1	24.80	20.11	4.17	141	7.84	10.3	clear	352
12:41	1.5	25.05	21.38	4.20	175	5.13	70.7	clear	350
12:50	2	25.35	21.05	4.25	170	5.02	55.4	clear	364
12:57	2.5	25.50	21.09	4.17	175	6.07	51.0	clear	368
13:12	3	25.05	21.05	4.29	182	4.90	30.0	clear	365
13:30	3.5	25.10	21.59	4.20	177	7.29	17.9	clear	383
13:45	4.0	25.15	20.68	4.40	179	4.08	16.2	clear	366
13:55	4.25	25.10	20.32	4.69	179	7.53	11.3	clear	328
14:05	4.50	25.00	20.28	4.48	180	6.98	10.0	clear	352

Stabilization: Temperature - ± 0.1°; pH - ± 0.1; Conductivity - ± 5%; Dissolved Oxygen - ± 0.2 mg/L (or 10% saturation); Turbidity - ≤ 10 NTUs (or stable)

SAMPLING

Sampled by (print): <u>L McMillen</u>		Collection Method (circle one): Bailer <u>Straw method</u> Vacuum Jug Other			Time Sampling Initiated: <u>14:10</u>	Time Sampling Completed: <u>14:45</u>
Sample ID: <u>MW-10</u>	Sample Time: <u>14:10</u>	Number of Containers: <u>2</u>	Volume: <u>Voa</u>	Preservative: <u>HCL</u>	Analysis/ EPA Method: <u>TOC</u>	Sample Type (G - Grab, C - Composite, Other (specify)) <u>G</u>
		<u>2</u>	<u>Voa</u>	<u>—</u>	<u>Met, Et, Hte</u>	
		<u>3</u>	<u>Voa</u>	<u>HCL</u>	<u>DO, VOC</u>	
		<u>1</u>	<u>120ml</u>	<u>—</u>	<u>Cl, N, Sate</u>	

Notes:

- 1 250 ZnAc Sulfide
- 1 250 HNO3 Mn
- 1 1Pt — Alkalinity

GROUNDWATER SAMPLING LOG

WENCK ASSOCIATES, INC.

Page 1 of 1

Project: <u>City of Duluth</u>		Project Number: <u>B5365-0001</u>	
Site Name: <u>Former Duluth Drycleaner</u>		Site Location: <u>Main St. Duluth GA</u>	
Well ID: <u>mw7</u>	Sample ID: <u>mw7</u>	Date: <u>2/13/17</u>	

WELL CHARACTERISTICS

Well Diameter (in): <u>2"</u>	Well Screen Depth Interval: <u>25.45</u> (ft) to <u>35.45</u> (ft)	Initial Depth to Water (ft): <u>28.75'</u>
Total Well Depth (ft): <u>35.5</u>	Well Capacity (gallons per foot): <u>0.16</u>	Well Volume (gallons): <u>6.75</u> ^{3m} <u>1.08</u>
Well Volumes to be purged:		
Well capacity (gallons per foot): 0.75" = 0.02; 1" = 0.04; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88		

PURGING DATA

Initial Depth of Tubing (ft): <u>31'</u>	Final Depth of Tubing (ft): <u>31</u>	Time Purge Initiated: <u>1030</u>	Time Purge Ended: <u>1135</u>
Initial Purge Rate (gpm): <u>0.05</u>	Final Purge Rate (gpm): <u>0.05</u>	Total Volume Purged (gal): <u>1.75</u>	

Purge Method (circle one): Bailer Bladder Pump Electric Submersible Pump Peristaltic Pump Other (specify) _____

Time	Volume Purged (gal)	Depth to Water (ft)	Temperature (°C)	Ph	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTUs)	Color/Odor	ORP (mV)
1105	0.25	29.15	19.58	4.11	8.051 ^{8.051}	27.74	0.4	clear	368
1109	0.50	29.30	19.68	4.36	8.050 ^{8.050}	16.02	0.0	"	362
1120	1.0	30.00	20.00	4.70	8.045 ^{8.045}	7.63	0.0	"	353
1125	1.25	29.79	20.18	4.81	8.042 ^{8.042}	5.99	0.0	"	351
1130	1.50	29.82	20.25	4.82	8.041 ^{8.041}	5.89	0.0	"	352
1135	1.75	29.87	20.28	4.82	8.041 ^{8.041}	5.86	0.0	"	351

Stabilization Parameters: Temperature - ± 0.1°; pH - ± 0.1; Conductivity - ± 5%; Dissolved Oxygen - ± 0.2 mg/L (or 10% saturation); Turbidity - ≤ 10 NTUs (or stable)

SAMPLING

Sampled by (print): <u>J. McKinney</u>		Samplers Signature: <u>[Signature]</u>			Time Sampling Initiated: <u>1135</u>	Time Sampling Completed: <u>1140</u>
Sample ID	Sample Time	Sample Matrix (soil, GW, etc.)	Number of Containers	Volume	Analysis/ EPA Method	Sample Type (G - Grab, C - Composite, Other (specify))
<u>mw7</u>	<u>1135</u>	<u>GW</u>	<u>3</u>	<u>3x40ml</u>	<u>VOC</u>	<u>G</u>

Notes:

[Signature]

GROUNDWATER SAMPLING LOG

WENCK ASSOCIATES, INC.

Page 1 of 1

Project: <u>City of Duluth</u>		Project Number: <u>135365-0001</u>	
Site Name: <u>Main Street</u>		Site Location: <u>Main Street Duluth</u>	
Well ID: <u>MW11</u>	Sample ID: <u>MW11</u>	Date: <u>2/13/17</u>	

WELL CHARACTERISTICS

Well Diameter (in): <u>2"</u>	Well Screen Depth Interval: <u>25</u> (ft) to <u>40</u> (ft)	Initial Depth to Water (ft): <u>32.40</u>	
Total Well Depth (ft): <u>40.35</u>	Well Capacity (gallons per foot): <u>0.16</u>	Well Volume (gallons): <u>1.3</u>	Well Volumes to be purged:
Well capacity (gallons per foot): 0.75" = 0.02; 1" = 0.04; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88			

PURGING DATA

Initial Depth of Tubing (ft): <u>36</u>	Final Depth of Tubing (ft):	Time Purge Initiated: <u>1230</u>	Time Purge Ended: <u>1350</u>
Initial Purge Rate (gpm): <u>0.05</u>	Final Purge Rate (gpm): <u>0.05</u>	Total Volume Purged (gal): <u>2.50</u>	

Purge Method (circle one): Bailer Bladder Pump Electric Submersible Pump Peristaltic Pump Other (specify)

Time	Volume Purged (gal)	Depth to Water (ft)	Temperature (°C)	pH	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTUs)	Color/Odor	ORP (mV)
1245	0.75	32.70	19.21	4.59	211	32.74	191	light brn	356
1300	1.0	32.76	19.13	4.58	215	4.63	110	clear	372
washed sediment out of flow-through cell									
1340	2.0	32.85	19.12	4.56	213	4.73	24.0	clear	339
1345	2.25	32.87	18.92	4.56	221	4.51	18.2	"	350
1350	2.50	32.90	18.90	4.57	226	4.55	6.2	"	358

Stabilization Parameters: Temperature - ± 0.1°; pH - ± 0.1; Conductivity - ± 5%; Dissolved Oxygen - ± 0.2 mg/L (or 10% saturation); Turbidity - ≤ 10 NTUs (or stable)

SAMPLING

Sampled by (print): <u>J. McKinney</u>		Samplers Signature: <u>[Signature]</u>		Time Sampling Initiated: <u>1350</u>		Time Sampling Completed: <u>1355</u>	
Sample ID	Sample Time	Sample Matrix (soil, GW, etc.)	Number of Containers	Volume	Analysis/ EPA Method	Sample Type (G - Grab, C - Composite, Other (specify))	
<u>MW11</u>	<u>1350</u>	<u>GW</u>	<u>3</u>	<u>40 mL</u>	<u>VOC</u>	<u>G</u>	

Notes:

Appendix D

Laboratory Reports and Chain-of-Custody Documentation



PACE ANALYTICAL SERVICES, LLC.

Environmental Monitoring & Laboratory Analysis
110 Technology Parkway, Peachtree Corners, GA 30092
(770) 734-4200 FAX (770) 734-4201

Laboratory Report

Prepared For:

WENCK Associates

1080 Holcomb Bridge Road, Building 100, Suite 190

Roswell, GA 30076

Attention: Ms. Katie T. Ross

Report Number: AAB0196

February 14, 2017

Project: Duluth, City of

Project #:B5365-001

We appreciate the opportunity to provide the analytical support for your project. The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Approved:

A handwritten signature in black ink, reading "Betsy McDaniel", written over a horizontal line.

Project Manager

This report may not be reproduced, except in full, without written approval from Pace Analytical Services, LLC. Pace Analytical Services, LLC. certifies that the following analytical results meet all requirements of the National Environmental Laboratory Accreditation Conference (NELAC). All test results relate only to the samples analyzed.



WENCK Associates
1080 Holcomb Bridge Road, Building 100, S
Roswell GA, 30076
Attention: Ms. Katie T. Ross

PACE ANALYTICAL SERVICES, LLC.

Environmental Monitoring & Laboratory Analysis
110 Technology Parkway, Peachtree Corners, GA 30092
(770) 734-4200 FAX (770) 734-4201

February 14, 2017

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-8	AAB0196-01	Water	02/06/17 10:55	02/06/17 16:55
MW-5	AAB0196-02	Water	02/06/17 13:00	02/06/17 16:55
MW-6	AAB0196-03	Water	02/06/17 14:10	02/06/17 16:55



PACE ANALYTICAL SERVICES, LLC.

Environmental Monitoring & Laboratory Analysis
110 Technology Parkway, Peachtree Corners, GA 30092
(770) 734-4200 FAX (770) 734-4201

WENCK Associates
1080 Holcomb Bridge Road, Building 100, S
Roswell GA, 30076
Attention: Ms. Katie T. Ross

February 14, 2017

Report No.: AAB0196

Client ID: MW-8

Date/Time Sampled: 2/6/2017 10:55:00AM

Matrix: Water

Project: Duluth, City of

Lab Number ID: AAB0196-01

Date/Time Received: 2/6/2017 4:55:00PM

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
Acetone	ND	100	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
Acrolein	ND	50	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
Acrylonitrile	ND	50	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
Allyl Chloride (3-Chloropropylene)	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
Benzene	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
Bromobenzene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
Bromochloromethane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
Bromodichloromethane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
Bromoform	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
Bromomethane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
n-Butylbenzene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
sec-Butylbenzene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
tert-Butylbenzene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
Carbon Disulfide	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
Carbon Tetrachloride	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
Chlorobenzene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
1-Chlorobutane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
Chloroethane	ND	5.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
Chloroform	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
Chloromethane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
2-Chlorotoluene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
4-Chlorotoluene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
Dibromochloromethane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
1,2-Dibromo-3-chloropropane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
1,2-Dibromoethane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
Dibromomethane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
1,2-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
1,3-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
1,4-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
trans-1,4-Dichloro-2-butene	ND	5.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
Dichlorodifluoromethane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
1,1-Dichloroethane	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
1,2-Dichloroethane	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
1,1-Dichloroethene	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
cis-1,2-Dichloroethene	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
trans-1,2-Dichloroethene	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG



PACE ANALYTICAL SERVICES, LLC.

Environmental Monitoring & Laboratory Analysis
110 Technology Parkway, Peachtree Corners, GA 30092
(770) 734-4200 FAX (770) 734-4201

WENCK Associates
1080 Holcomb Bridge Road, Building 100, S
Roswell GA, 30076
Attention: Ms. Katie T. Ross

February 14, 2017

Report No.: AAB0196

Client ID: MW-8

Date/Time Sampled: 2/6/2017 10:55:00AM

Matrix: Water

Project: Duluth, City of

Lab Number ID: AAB0196-01

Date/Time Received: 2/6/2017 4:55:00PM

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
1,2-Dichloropropane	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
1,3-Dichloropropane	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
2,2-Dichloropropane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
1,1-Dichloropropene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
cis-1,3-Dichloropropene	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
trans-1,3-Dichloropropene	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
Ethylbenzene	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
Ethyl Methacrylate	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
Hexachlorobutadiene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
p-Isopropyltoluene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
Hexachloroethane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
Iodomethane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
Isopropylbenzene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
Methacrylonitrile	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
Methyl Acrylate	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
Methyl Butyl Ketone (2-Hexanone)	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
Methylene Chloride	ND	5.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
Methyl Ethyl Ketone (2-Butanone)	ND	100	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
Methyl Methacrylate	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
4-Methyl-2-pentanone (MIBK)	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
Methyl-tert-Butyl Ether	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
Naphthalene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
2-Nitropropane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
Propionitrile (Ethyl Cyanide)	ND	20	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
n-Propylbenzene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
Styrene	ND	5.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
1,1,1,2-Tetrachloroethane	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
1,1,2,2-Tetrachloroethane	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
Tetrachloroethene	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
Tetrahydrofuran	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
Toluene	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
1,2,3-Trichlorobenzene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
1,2,4-Trichlorobenzene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
1,1,1-Trichloroethane	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
1,1,2-Trichloroethane	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
Trichloroethene	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG



PACE ANALYTICAL SERVICES, LLC.

Environmental Monitoring & Laboratory Analysis
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WENCK Associates
1080 Holcomb Bridge Road, Building 100, S
Roswell GA, 30076
Attention: Ms. Katie T. Ross

February 14, 2017

Report No.: AAB0196

Client ID: MW-8

Date/Time Sampled: 2/6/2017 10:55:00AM

Matrix: Water

Project: Duluth, City of

Lab Number ID: AAB0196-01

Date/Time Received: 2/6/2017 4:55:00PM

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
Trichlorofluoromethane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
1,2,3-Trichloropropane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
1,2,4-Trimethylbenzene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
1,3,5-Trimethylbenzene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
Vinyl Acetate	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
Vinyl Chloride	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
m+p-Xylene	ND	5.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
o-Xylene	ND	5.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
Xylenes, total	ND	5.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 18:54	7020202	JG
Surrogate: Dibromofluoromethane	93 %	80-120		EPA 8260B			2/07/17 11:00	2/8/17 18:54	7020202	
Surrogate: 1,2-Dichloroethane-d4	101 %	78-120		EPA 8260B			2/07/17 11:00	2/8/17 18:54	7020202	
Surrogate: Toluene-d8	100 %	80-120		EPA 8260B			2/07/17 11:00	2/8/17 18:54	7020202	
Surrogate: 4-Bromofluorobenzene	106 %	80-120		EPA 8260B			2/07/17 11:00	2/8/17 18:54	7020202	



PACE ANALYTICAL SERVICES, LLC.

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WENCK Associates
1080 Holcomb Bridge Road, Building 100, S
Roswell GA, 30076
Attention: Ms. Katie T. Ross

February 14, 2017

Report No.: AAB0196

Client ID: MW-5

Date/Time Sampled: 2/6/2017 1:00:00PM

Matrix: Water

Project: Duluth, City of

Lab Number ID: AAB0196-02

Date/Time Received: 2/6/2017 4:55:00PM

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
General Chemistry										
Alkalinity as CaCO ₃	11	10	mg/L	EPA 310.2		1	2/09/17 10:00	2/09/17 10:22	7020231	LPH
Sulfide	ND	1	mg/L	EPA 9030B/9034		1	2/10/17 14:00	2/10/17 16:00	7020305	DJS
Total Organic Carbon	ND	1.0	mg/L	EPA 9060A		1	2/08/17 13:00	2/09/17 20:23	7020198	djs
Inorganic Anions										
Chloride	21	1.0	mg/L	EPA 9056A		1	2/07/17 9:41	2/07/17 23:13	7020159	RLC
Sulfate	ND	5.0	mg/L	EPA 9056A		1	2/12/17 9:41	2/12/17 18:58	7020346	RLC
Nitrate as N	0.24	0.05	mg/L	EPA 9056A		1	2/07/17 9:41	2/07/17 23:13	7020159	RLC
Volatile Organic Compounds by EPA 8260										
Acetone	ND	100	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
Acrolein	ND	50	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
Acrylonitrile	ND	50	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
Allyl Chloride (3-Chloropropylene)	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
Benzene	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
Bromobenzene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
Bromochloromethane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
Bromodichloromethane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
Bromoform	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
Bromomethane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
n-Butylbenzene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
sec-Butylbenzene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
tert-Butylbenzene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
Carbon Disulfide	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
Carbon Tetrachloride	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
Chlorobenzene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
1-Chlorobutane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
Chloroethane	ND	5.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
Chloroform	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
Chloromethane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
2-Chlorotoluene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
4-Chlorotoluene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
Dibromochloromethane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
1,2-Dibromo-3-chloropropane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
1,2-Dibromoethane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
Dibromomethane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG



PACE ANALYTICAL SERVICES, LLC.

Environmental Monitoring & Laboratory Analysis
110 Technology Parkway, Peachtree Corners, GA 30092
(770) 734-4200 FAX (770) 734-4201

WENCK Associates
1080 Holcomb Bridge Road, Building 100, S
Roswell GA, 30076
Attention: Ms. Katie T. Ross

February 14, 2017

Report No.: AAB0196

Client ID: MW-5

Date/Time Sampled: 2/6/2017 1:00:00PM

Matrix: Water

Project: Duluth, City of

Lab Number ID: AAB0196-02

Date/Time Received: 2/6/2017 4:55:00PM

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
1,2-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
1,3-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
1,4-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
trans-1,4-Dichloro-2-butene	ND	5.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
Dichlorodifluoromethane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
1,1-Dichloroethane	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
1,2-Dichloroethane	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
1,1-Dichloroethene	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
cis-1,2-Dichloroethene	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
trans-1,2-Dichloroethene	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
1,2-Dichloropropane	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
1,3-Dichloropropane	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
2,2-Dichloropropane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
1,1-Dichloropropene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
cis-1,3-Dichloropropene	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
trans-1,3-Dichloropropene	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
Ethylbenzene	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
Ethyl Methacrylate	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
Hexachlorobutadiene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
p-Isopropyltoluene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
Hexachloroethane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
Iodomethane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
Isopropylbenzene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
Methacrylonitrile	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
Methyl Acrylate	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
Methyl Butyl Ketone (2-Hexanone)	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
Methylene Chloride	ND	5.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
Methyl Ethyl Ketone (2-Butanone)	ND	100	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
Methyl Methacrylate	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
4-Methyl-2-pentanone (MIBK)	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
Methyl-tert-Butyl Ether	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
Naphthalene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
2-Nitropropane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
Propionitrile (Ethyl Cyanide)	ND	20	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
n-Propylbenzene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
Styrene	ND	5.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG



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WENCK Associates
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Roswell GA, 30076
Attention: Ms. Katie T. Ross

February 14, 2017

Report No.: AAB0196

Client ID: MW-5

Date/Time Sampled: 2/6/2017 1:00:00PM

Matrix: Water

Project: Duluth, City of

Lab Number ID: AAB0196-02

Date/Time Received: 2/6/2017 4:55:00PM

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
1,1,1,2-Tetrachloroethane	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
1,1,2,2-Tetrachloroethane	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
Tetrachloroethene	30	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
Tetrahydrofuran	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
Toluene	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
1,2,3-Trichlorobenzene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
1,2,4-Trichlorobenzene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
1,1,1-Trichloroethane	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
1,1,2-Trichloroethane	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
Trichloroethene	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
Trichlorofluoromethane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
1,2,3-Trichloropropane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
1,2,4-Trimethylbenzene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
1,3,5-Trimethylbenzene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
Vinyl Acetate	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
Vinyl Chloride	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
m+p-Xylene	ND	5.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
o-Xylene	ND	5.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
Xylenes, total	ND	5.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:24	7020202	JG
Surrogate: Dibromofluoromethane	93 %	80-120		EPA 8260B			2/07/17 11:00	2/8/17 19:24	7020202	
Surrogate: 1,2-Dichloroethane-d4	99 %	78-120		EPA 8260B			2/07/17 11:00	2/8/17 19:24	7020202	
Surrogate: Toluene-d8	101 %	80-120		EPA 8260B			2/07/17 11:00	2/8/17 19:24	7020202	
Surrogate: 4-Bromofluorobenzene	107 %	80-120		EPA 8260B			2/07/17 11:00	2/8/17 19:24	7020202	



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WENCK Associates
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Roswell GA, 30076
Attention: Ms. Katie T. Ross

February 14, 2017

Report No.: AAB0196

Client ID: MW-6

Date/Time Sampled: 2/6/2017 2:10:00PM

Matrix: Water

Project: Duluth, City of

Lab Number ID: AAB0196-03

Date/Time Received: 2/6/2017 4:55:00PM

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
General Chemistry										
Alkalinity as CaCO ₃	ND	10	mg/L	EPA 310.2		1	2/09/17 10:00	2/09/17 10:24	7020231	LPH
Sulfide	ND	1	mg/L	EPA 9030B/9034		1	2/10/17 14:00	2/10/17 16:00	7020305	DJS
Total Organic Carbon	ND	1.0	mg/L	EPA 9060A		1	2/08/17 13:00	2/09/17 20:40	7020198	djs
Inorganic Anions										
Chloride	4.5	1.0	mg/L	EPA 9056A		1	2/07/17 9:41	2/08/17 0:18	7020159	RLC
Sulfate	210	25	mg/L	EPA 9056A		5	2/12/17 9:41	2/12/17 20:00	7020346	RLC
Nitrate as N	1.2	0.05	mg/L	EPA 9056A		1	2/07/17 9:41	2/08/17 0:18	7020159	RLC
Volatile Organic Compounds by EPA 8260										
Acetone	ND	100	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
Acrolein	ND	50	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
Acrylonitrile	ND	50	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
Allyl Chloride (3-Chloropropylene)	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
Benzene	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
Bromobenzene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
Bromochloromethane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
Bromodichloromethane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
Bromoform	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
Bromomethane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
n-Butylbenzene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
sec-Butylbenzene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
tert-Butylbenzene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
Carbon Disulfide	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
Carbon Tetrachloride	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
Chlorobenzene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
1-Chlorobutane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
Chloroethane	ND	5.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
Chloroform	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
Chloromethane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
2-Chlorotoluene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
4-Chlorotoluene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
Dibromochloromethane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
1,2-Dibromo-3-chloropropane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
1,2-Dibromoethane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
Dibromomethane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG



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Attention: Ms. Katie T. Ross

February 14, 2017

Report No.: AAB0196

Client ID: MW-6

Date/Time Sampled: 2/6/2017 2:10:00PM

Matrix: Water

Project: Duluth, City of

Lab Number ID: AAB0196-03

Date/Time Received: 2/6/2017 4:55:00PM

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
1,2-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
1,3-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
1,4-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
trans-1,4-Dichloro-2-butene	ND	5.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
Dichlorodifluoromethane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
1,1-Dichloroethane	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
1,2-Dichloroethane	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
1,1-Dichloroethene	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
cis-1,2-Dichloroethene	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
trans-1,2-Dichloroethene	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
1,2-Dichloropropane	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
1,3-Dichloropropane	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
2,2-Dichloropropane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
1,1-Dichloropropene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
cis-1,3-Dichloropropene	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
trans-1,3-Dichloropropene	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
Ethylbenzene	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
Ethyl Methacrylate	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
Hexachlorobutadiene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
p-Isopropyltoluene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
Hexachloroethane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
Iodomethane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
Isopropylbenzene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
Methacrylonitrile	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
Methyl Acrylate	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
Methyl Butyl Ketone (2-Hexanone)	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
Methylene Chloride	ND	5.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
Methyl Ethyl Ketone (2-Butanone)	ND	100	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
Methyl Methacrylate	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
4-Methyl-2-pentanone (MIBK)	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
Methyl-tert-Butyl Ether	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
Naphthalene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
2-Nitropropane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
Propionitrile (Ethyl Cyanide)	ND	20	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
n-Propylbenzene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
Styrene	ND	5.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG



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Attention: Ms. Katie T. Ross

February 14, 2017

Report No.: AAB0196

Client ID: MW-6

Date/Time Sampled: 2/6/2017 2:10:00PM

Matrix: Water

Project: Duluth, City of

Lab Number ID: AAB0196-03

Date/Time Received: 2/6/2017 4:55:00PM

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
1,1,1,2-Tetrachloroethane	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
1,1,2,2-Tetrachloroethane	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
Tetrachloroethene	8.2	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
Tetrahydrofuran	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
Toluene	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
1,2,3-Trichlorobenzene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
1,2,4-Trichlorobenzene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
1,1,1-Trichloroethane	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
1,1,2-Trichloroethane	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
Trichloroethene	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
Trichlorofluoromethane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
1,2,3-Trichloropropane	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
1,2,4-Trimethylbenzene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
1,3,5-Trimethylbenzene	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
Vinyl Acetate	ND	10	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
Vinyl Chloride	ND	2.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
m+p-Xylene	ND	5.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
o-Xylene	ND	5.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
Xylenes, total	ND	5.0	ug/L	EPA 8260B		1	2/07/17 11:00	2/08/17 19:53	7020202	JG
Surrogate: Dibromofluoromethane	95 %	80-120		EPA 8260B			2/07/17 11:00	2/8/17 19:53	7020202	
Surrogate: 1,2-Dichloroethane-d4	97 %	78-120		EPA 8260B			2/07/17 11:00	2/8/17 19:53	7020202	
Surrogate: Toluene-d8	100 %	80-120		EPA 8260B			2/07/17 11:00	2/8/17 19:53	7020202	
Surrogate: 4-Bromofluorobenzene	105 %	80-120		EPA 8260B			2/07/17 11:00	2/8/17 19:53	7020202	



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February 14, 2017

Report No.: AAB0196

General Chemistry - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 7020198 - EPA 9060A										
Blank (7020198-BLK1)					Prepared: 02/08/17 Analyzed: 02/09/17					
Total Organic Carbon	ND	1.0	mg/L							
LCS (7020198-BS1)					Prepared: 02/08/17 Analyzed: 02/09/17					
Total Organic Carbon	18.9	1.0	mg/L	20.000		94	88-112			
Matrix Spike (7020198-MS1)					Source: AAB0060-24 Prepared: 02/08/17 Analyzed: 02/09/17					
Total Organic Carbon	20.9	1.0	mg/L	20.000	2.3	93	67-141			
Matrix Spike Dup (7020198-MSD1)					Source: AAB0060-24 Prepared: 02/08/17 Analyzed: 02/09/17					
Total Organic Carbon	20.7	1.0	mg/L	20.000	2.3	92	67-141	0.9	16	
Batch 7020231 - EPA 310.2										
Blank (7020231-BLK1)					Prepared & Analyzed: 02/09/17					
Alkalinity as CaCO3	ND	10	mg/L							
LCS (7020231-BS1)					Prepared & Analyzed: 02/09/17					
Alkalinity as CaCO3	18	10	mg/L	20.000		90	90-110			
Matrix Spike (7020231-MS1)					Source: AAB0196-02 Prepared & Analyzed: 02/09/17					
Alkalinity as CaCO3	30	10	mg/L	20.000	11	92	90-110			
Batch 7020305 - EPA 9030										
Blank (7020305-BLK1)					Prepared & Analyzed: 02/10/17					
Sulfide	ND	1	mg/L							



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Report No.: AAB0196

General Chemistry - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 7020305 - EPA 9030										
LCS (7020305-BS1)					Prepared & Analyzed: 02/10/17					
Sulfide	6	1	mg/L	10.740		53	40-104			



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Report No.: AAB0196

Inorganic Anions - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 7020159 - EPA 300.0										
Blank (7020159-BLK1)					Prepared & Analyzed: 02/07/17					
Chloride	ND	0.10	mg/L							
Nitrate as N	ND	0.05	mg/L							
Sulfate	ND	5.0	mg/L							
LCS (7020159-BS1)					Prepared & Analyzed: 02/07/17					
Chloride	10.9	0.10	mg/L	10.010		109	90-110			
Nitrate as N	10.8	0.05	mg/L	10.020		108	90-110			
Sulfate	11.8	5.0	mg/L	10.020		117	90-110			
Matrix Spike (7020159-MS1)					Source: AAB0196-02		Prepared & Analyzed: 02/07/17			
Chloride	27.9	0.10	mg/L	10.010	20.9	69	90-110			QM-02
Nitrate as N	10.5	0.05	mg/L	10.020	0.24	102	90-110			
Sulfate	18.1	5.0	mg/L	10.020	9.91	81	90-110			QM-05
Matrix Spike (7020159-MS2)					Source: AAB0168-01		Prepared: 02/07/17 Analyzed: 02/08/17			
Chloride	32.7	0.10	mg/L	10.010	26.1	66	90-110			QM-02
Nitrate as N	11.2	0.05	mg/L	10.020	0.53	106	90-110			
Sulfate	34.5	5.0	mg/L	10.020	26.4	82	90-110			QM-05
Matrix Spike Dup (7020159-MSD1)					Source: AAB0196-02		Prepared & Analyzed: 02/07/17			
Chloride	27.7	0.10	mg/L	10.010	20.9	68	90-110	0.6	15	QM-02
Nitrate as N	10.5	0.05	mg/L	10.020	0.24	102	90-110	0.1	15	
Sulfate	17.0	5.0	mg/L	10.020	9.91	71	90-110	6	15	QM-05
Batch 7020346 - EPA 9056A										
Blank (7020346-BLK1)					Prepared & Analyzed: 02/12/17					
Chloride	ND	1.0	mg/L							
Sulfate	ND	5.0	mg/L							



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Report No.: AAB0196

Inorganic Anions - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 7020346 - EPA 9056A										
LCS (7020346-BS1)				Prepared & Analyzed: 02/12/17						
Chloride	10.4	1.0	mg/L	10.010		104	90-110			
Sulfate	10.7	5.0	mg/L	10.020		106	90-110			
Matrix Spike (7020346-MS1)				Source: AAB0196-02RE1		Prepared & Analyzed: 02/12/17				
Chloride	31.8	1.0	mg/L	10.010	23.5	82	90-110			
Sulfate	14.9	5.0	mg/L	10.020	3.94	110	90-110			
Matrix Spike Dup (7020346-MSD1)				Source: AAB0196-02RE1		Prepared & Analyzed: 02/12/17				
Chloride	31.6	1.0	mg/L	10.010	23.5	81	90-110	0.5	15	
Sulfate	14.4	5.0	mg/L	10.020	3.94	104	90-110	4	15	



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Report No.: AAB0196

Volatile Organic Compounds by EPA 8260 - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 7020202 - EPA 5030B										
Blank (7020202-BLK1)				Prepared & Analyzed: 02/08/17						
Acetone	ND	100	ug/L							
Acrolein	ND	50	ug/L							
Acrylonitrile	ND	50	ug/L							
Allyl Chloride (3-Chloropropylene)	ND	10	ug/L							
Benzene	ND	2.0	ug/L							
Bromobenzene	ND	10	ug/L							
Bromochloromethane	ND	10	ug/L							
Bromodichloromethane	ND	10	ug/L							
Bromoform	ND	10	ug/L							
Bromomethane	ND	10	ug/L							
n-Butylbenzene	ND	10	ug/L							
sec-Butylbenzene	ND	10	ug/L							
tert-Butylbenzene	ND	10	ug/L							
Carbon Disulfide	ND	10	ug/L							
Carbon Tetrachloride	ND	2.0	ug/L							
Chlorobenzene	ND	10	ug/L							
1-Chlorobutane	ND	10	ug/L							
Chloroethane	ND	5.0	ug/L							
Chloroform	ND	2.0	ug/L							
Chloromethane	ND	10	ug/L							
2-Chlorotoluene	ND	10	ug/L							
4-Chlorotoluene	ND	10	ug/L							
Dibromochloromethane	ND	10	ug/L							
1,2-Dibromo-3-chloropropane	ND	10	ug/L							
1,2-Dibromoethane	ND	10	ug/L							
Dibromomethane	ND	10	ug/L							
1,2-Dichlorobenzene	ND	10	ug/L							
1,3-Dichlorobenzene	ND	10	ug/L							
1,4-Dichlorobenzene	ND	10	ug/L							
trans-1,4-Dichloro-2-butene	ND	5.0	ug/L							
Dichlorodifluoromethane	ND	10	ug/L							
1,1-Dichloroethane	ND	2.0	ug/L							
1,2-Dichloroethane	ND	2.0	ug/L							
1,1-Dichloroethene	ND	2.0	ug/L							
cis-1,2-Dichloroethene	ND	2.0	ug/L							
trans-1,2-Dichloroethene	ND	2.0	ug/L							
1,2-Dichloropropane	ND	2.0	ug/L							
1,3-Dichloropropane	ND	2.0	ug/L							
2,2-Dichloropropane	ND	10	ug/L							
1,1-Dichloropropene	ND	10	ug/L							
cis-1,3-Dichloropropene	ND	2.0	ug/L							



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Volatile Organic Compounds by EPA 8260 - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 7020202 - EPA 5030B										
Blank (7020202-BLK1)				Prepared & Analyzed: 02/08/17						
trans-1,3-Dichloropropene	ND	2.0	ug/L							
Ethylbenzene	ND	2.0	ug/L							
Ethyl Methacrylate	ND	10	ug/L							
Hexachlorobutadiene	ND	10	ug/L							
p-Isopropyltoluene	ND	10	ug/L							
Hexachloroethane	ND	10	ug/L							
Iodomethane	ND	10	ug/L							
Isopropylbenzene	ND	10	ug/L							
Methacrylonitrile	ND	10	ug/L							
Methyl Acrylate	ND	10	ug/L							
Methyl Butyl Ketone (2-Hexanone)	ND	10	ug/L							
Methylene Chloride	ND	5.0	ug/L							
Methyl Ethyl Ketone (2-Butanone)	ND	100	ug/L							
Methyl Methacrylate	ND	10	ug/L							
4-Methyl-2-pentanone (MIBK)	ND	10	ug/L							
Methyl-tert-Butyl Ether	ND	10	ug/L							
Naphthalene	ND	10	ug/L							
2-Nitropropane	ND	10	ug/L							
Propionitrile (Ethyl Cyanide)	ND	20	ug/L							
n-Propylbenzene	ND	10	ug/L							
Styrene	ND	5.0	ug/L							
1,1,1,2-Tetrachloroethane	ND	2.0	ug/L							
1,1,2,2-Tetrachloroethane	ND	2.0	ug/L							
Tetrachloroethene	ND	2.0	ug/L							
Tetrahydrofuran	ND	10	ug/L							
Toluene	ND	2.0	ug/L							
1,2,3-Trichlorobenzene	ND	10	ug/L							
1,2,4-Trichlorobenzene	ND	10	ug/L							
1,1,1-Trichloroethane	ND	2.0	ug/L							
1,1,2-Trichloroethane	ND	2.0	ug/L							
Trichloroethene	ND	2.0	ug/L							
Trichlorofluoromethane	ND	10	ug/L							
1,2,3-Trichloropropane	ND	10	ug/L							
1,2,4-Trimethylbenzene	ND	10	ug/L							
1,3,5-Trimethylbenzene	ND	10	ug/L							
Vinyl Acetate	ND	10	ug/L							
Vinyl Chloride	ND	2.0	ug/L							
m+p-Xylene	ND	5.0	ug/L							
o-Xylene	ND	5.0	ug/L							
Xylenes, total	ND	5.0	ug/L							
Surrogate: Dibromofluoromethane	47		ug/L	50.000		94	80-120			



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February 14, 2017

Report No.: AAB0196

Volatile Organic Compounds by EPA 8260 - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 7020202 - EPA 5030B										
Blank (7020202-BLK1)				Prepared & Analyzed: 02/08/17						
Surrogate: 1,2-Dichloroethane-d4	50		ug/L	50.000		100	78-120			
Surrogate: Toluene-d8	50		ug/L	50.000		100	80-120			
Surrogate: 4-Bromofluorobenzene	51		ug/L	50.000		103	80-120			
LCS (7020202-BS1)				Prepared & Analyzed: 02/08/17						
Benzene	46	2.0	ug/L	50.000		91	67-134			
Chlorobenzene	46	10	ug/L	50.000		92	69-122			
1,1-Dichloroethene	44	2.0	ug/L	50.000		88	58-142			
Toluene	46	2.0	ug/L	50.000		91	68-127			
Trichloroethene	47	2.0	ug/L	50.000		95	72-132			
Surrogate: Dibromofluoromethane	46		ug/L	50.000		92	80-120			
Surrogate: 1,2-Dichloroethane-d4	48		ug/L	50.000		97	78-120			
Surrogate: Toluene-d8	51		ug/L	50.000		103	80-120			
Surrogate: 4-Bromofluorobenzene	53		ug/L	50.000		107	80-120			
Matrix Spike (7020202-MS1)				Source: AAB0196-01		Prepared & Analyzed: 02/08/17				
Benzene	51	2.0	ug/L	50.000	ND	101	67-134			
Chlorobenzene	49	10	ug/L	50.000	ND	99	69-122			
1,1-Dichloroethene	46	2.0	ug/L	50.000	ND	93	58-142			
Toluene	49	2.0	ug/L	50.000	ND	98	68-127			
Trichloroethene	51	2.0	ug/L	50.000	ND	102	72-132			
Surrogate: Dibromofluoromethane	47		ug/L	50.000		93	80-120			
Surrogate: 1,2-Dichloroethane-d4	50		ug/L	50.000		99	78-120			
Surrogate: Toluene-d8	50		ug/L	50.000		100	80-120			
Surrogate: 4-Bromofluorobenzene	53		ug/L	50.000		106	80-120			
Matrix Spike Dup (7020202-MSD1)				Source: AAB0196-01		Prepared & Analyzed: 02/08/17				
Benzene	49	2.0	ug/L	50.000	ND	97	67-134	4	9	
Chlorobenzene	47	10	ug/L	50.000	ND	95	69-122	4	13	
1,1-Dichloroethene	44	2.0	ug/L	50.000	ND	88	58-142	6	9	
Toluene	48	2.0	ug/L	50.000	ND	96	68-127	2	9	
Trichloroethene	50	2.0	ug/L	50.000	ND	99	72-132	3	11	
Surrogate: Dibromofluoromethane	47		ug/L	50.000		94	80-120			
Surrogate: 1,2-Dichloroethane-d4	49		ug/L	50.000		98	78-120			
Surrogate: Toluene-d8	51		ug/L	50.000		102	80-120			
Surrogate: 4-Bromofluorobenzene	52		ug/L	50.000		105	80-120			



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February 14, 2017

Laboratory Certifications

Code	Description	Number	Expires
GADW	Georgia DW Inorganics Eff: 07/01/2016	812	06/30/2017
GADWM	Georgia DW Microbiology Eff: 07/01/2015	812	03/09/2017
NC	North Carolina	381	12/31/2017
NELAC	FL DOH (Non-Pot. Water, Solids) Eff:: 07/01/2016	E87315	06/30/2017
NELDW	FL DOH NELAC (Drinking Water) Eff: 07/01/2016	E87315	06/30/2017
SC	South Carolina	98011001	06/30/2017
TX	Texas	T104704397-08-TX	03/31/2017
VA	Virginia	1340	12/14/2017



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February 14, 2017

Legend

Definition of Laboratory Terms

ND - None Detected at the Reporting Limit

TIC - Tentatively Identified Compound

CFU - Colony Forming Units

SOP - Method run per Pace Standard Operating Procedure

RL - Reporting Limit

DF - Dilution Factor

* - Analyte not included in the NELAC list of certified analytes.

Sample Information

N-Nitrosodiphenylamine breaks down to diphenylamine in the GCMS; both analytes are reported as N-Nitrosodiphenylamine. Pace is not NELAC certified for diphenylamine.

Phthalic acid and phthalic anhydride are reported as dimethyl phthalate

Maleic acid and maleic anhydride are reported as dimethyl malate

1,2-Diphenylhydrazine breaks down to azobenzene in the GCMS; both analytes are reported as azobenzene

Definition of Qualifiers

QM-05 The spike recovery was outside acceptance limits for the MS and/or MSD and/or PDS due to suspected matrix interference. Sample results for the QC batch were accepted based on acceptable LCS recoveries.

QM-02 The spike recovery is outside acceptance limits due to insignificant spike amount as compared to sample concentration.

Note: Unless otherwise noted, all results are reported on an as received basis.

CHAIN OF CUSTODY RECORD

[illegible]



PACE ANALYTICAL SERVICES, LLC.

Environmental Monitoring & Laboratory Analysis
110 Technology Parkway, Peachtree Corners, GA 30092
(770) 734-4200 FAX (770) 734-4201

LOG-IN CHECKLIST

Printed: 2/7/2017 11:21:22AM

Attn: Ms. Katie T. Ross

Client: WENCK Associates

Project: Duluth, City of

Date Received: 02/06/17 16:55

Work Order: AAB0196

Logged In By: Charles Hawks

OBSERVATIONS

#Samples: 3

#Containers: 25

Minimum Temp(C): 6.0

Maximum Temp(C): 6.0

Custody Seal(s) Used: No

CHECKLIST ITEMS

COC included with Samples	YES
Sample Container(s) Intact	YES
Chain of Custody Complete	YES
Sample Container(s) Match COC	YES
Custody seal Intact	N/A
Temperature in Compliance	YES
Sufficient Sample Volume for Analysis	YES
Zero Headspace Maintained for VOA Analyses	YES
Samples labeled preserved (If Applicable)	YES
Samples received within Allowable Hold Times	YES
Samples Received on Ice	YES
Preservation Confirmed	YES

Comments:

February 22, 2017

Eben Buchanan
Pace Analytical Atlanta
110 Technology Parkway
Peachtree Corners, GA 30092

RE: Project: AAB0196 WENCK ASSOCIATES
Pace Project No.: 92329071

Dear Eben Buchanan:

Enclosed are the analytical results for sample(s) received by the laboratory on February 08, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Melissa Sybert
melissa.sybert@pacelabs.com
Project Manager

Enclosures



REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

CERTIFICATIONS

Project: AAB0196 WENCK ASSOCIATES

Pace Project No.: 92329071

Charlotte Certification IDs

9800 Kinsey Ave. Ste 100, Huntersville, NC 28078
North Carolina Drinking Water Certification #: 37706
North Carolina Field Services Certification #: 5342
North Carolina Wastewater Certification #: 12

South Carolina Certification #: 99006001
Florida/NELAP Certification #: E87627
Kentucky UST Certification #: 84
Virginia/VELAP Certification #: 460221

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: AAB0196 WENCK ASSOCIATES

Pace Project No.: 92329071

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92329071001	MW-5	Water	02/06/17 14:10	02/08/17 09:40
92329071002	MW-6	Water	02/06/17 13:01	02/08/17 09:40

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: AAB0196 WENCK ASSOCIATES

Pace Project No.: 92329071

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92329071001	MW-5	RSK 175 Modified	WDV	3	PASI-C
92329071002	MW-6	RSK 175 Modified	WDV	3	PASI-C

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AAB0196 WENCK ASSOCIATES

Pace Project No.: 92329071

Sample: MW-5		Lab ID: 92329071001		Collected: 02/06/17 14:10		Received: 02/08/17 09:40		Matrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 Headspace		Analytical Method: RSK 175 Modified							
Ethane	ND	ug/L	10.0	10.0	1		02/20/17 13:43	74-84-0	N2
Ethene	ND	ug/L	10.0	10.0	1		02/20/17 13:43	74-85-1	N2
Methane	ND	ug/L	10.0	10.0	1		02/20/17 13:43	74-82-8	CL,L1, L3,N2, P2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AAB0196 WENCK ASSOCIATES

Pace Project No.: 92329071

Sample: MW-6		Lab ID: 92329071002		Collected: 02/06/17 13:01		Received: 02/08/17 09:40		Matrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 Headspace		Analytical Method: RSK 175 Modified							
Ethane	ND	ug/L	10.0	10.0	1		02/20/17 13:59	74-84-0	N2
Ethene	ND	ug/L	10.0	10.0	1		02/20/17 13:59	74-85-1	N2
Methane	ND	ug/L	10.0	10.0	1		02/20/17 13:59	74-82-8	CL,L1, L3,N2, P2

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AAB0196 WENCK ASSOCIATES

Pace Project No.: 92329071

QC Batch:	349351	Analysis Method:	RSK 175 Modified
QC Batch Method:	RSK 175 Modified	Analysis Description:	RSK 175 HEADSPACE
Associated Lab Samples:	92329071001, 92329071002		

METHOD BLANK: 1938188 Matrix: Water

Associated Lab Samples: 92329071001, 92329071002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	ND	10.0	10.0	02/20/17 13:28	
Ethene	ug/L	ND	10.0	10.0	02/20/17 13:28	
Methane	ug/L	ND	10.0	10.0	02/20/17 13:28	

LABORATORY CONTROL SAMPLE: 1938189

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Ethane	ug/L	658	615	93	70-130	
Ethene	ug/L	1120	1160	103	70-130	
Methane	ug/L	396	517	131	70-130 L1	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: AAB0196 WENCK ASSOCIATES

Pace Project No.: 92329071

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-C Pace Analytical Services - Charlotte

ANALYTE QUALIFIERS

CL	The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased low.
L1	Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.
L3	Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.
N2	The lab does not hold NELAC/TNI accreditation for this parameter.
P2	Re-extraction or re-analysis could not be performed due to insufficient sample amount.

REPORT OF LABORATORY ANALYSIS

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without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AAB0196 WENCK ASSOCIATES

Pace Project No.: 92329071

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92329071001	MW-5	RSK 175 Modified	349351		
92329071002	MW-6	RSK 175 Modified	349351		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

	Document Name: Sample Condition Upon Receipt (SCUR)	Document Revised: Sept. 21, 2016 Page 1 of 2
	Document No.: F-CAR-CS-033-Rev.01	Issuing Authority: Pace Quality Office

Laboratory receiving samples:

Asheville ☐
 Eden ☐
 Greenwood ☐
 Huntersville ☒
 Raleigh ☐
 Mechanicsville ☐

Sample Condition Upon Receipt Courier: ☐ Commercial ☐ Fed Ex ☐ Pace ☐ UPS ☐ USPS ☐ Other: _____ ☐ Client	Client Name: <u>Pace GA</u> Project #: WO# : 92329071  92329071
Custody Seal Present? ☐ Yes ☒ No Seals Intact? ☐ Yes ☒ No Packing Material: ☐ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other: _____ Thermometer: ☐ IR Gun ID: <u>T1603</u> Type of Ice: ☒ Wet ☐ Blue ☐ None ☒ Samples on ice, cooling process has begun Correction Factor: _____ Cooler Temp Corrected (°C): <u>1.8</u> Temp should be above freezing to 6°C USDA Regulated Soil (☐ N/A, water sample) Did samples originate in a quarantine zone within the United States: CA, NY, or SC (check maps)? ☐ Yes ☒ No Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☒ No	Date/Initials Person Examining Contents: <u>2/8/17 Kew</u> Biological Tissue Frozen? ☐ Yes ☐ No ☒ N/A

			Comments/Discrepancy:
Chain of Custody Present?	☒ Yes ☐ No ☐ N/A	1.	
Samples Arrived within Hold Time?	☒ Yes ☐ No ☐ N/A	2.	
Short Hold Time Analysis (<72 hr.)?	☐ Yes ☒ No ☐ N/A	3.	
Rush Turn Around Time Requested?	☒ Yes ☐ No ☐ N/A	4.	
Sufficient Volume?	☒ Yes ☐ No ☐ N/A	5.	
Correct Containers Used?	☒ Yes ☐ No ☐ N/A	6.	
-Pace Containers Used?	☒ Yes ☐ No ☐ N/A		
Containers Intact?	☒ Yes ☐ No ☐ N/A	7.	
Samples Field Filtered?	☐ Yes ☐ No ☒ N/A	8.	Note if sediment is visible in the dissolved container
Sample Labels Match COC?	☒ Yes ☐ No ☐ N/A	9.	
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>			
Headspace in VOA Vials (>5-6mm)?	☐ Yes ☒ No ☐ N/A	10.	
Trip Blank Present?	☐ Yes ☐ No ☒ N/A	11.	
Trip Blank Custody Seals Present?	☐ Yes ☐ No ☒ N/A		

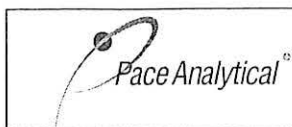
CLIENT NOTIFICATION/RESOLUTION

 Field Data Required? ☐ Yes ☒ No

Person Contacted: Eben Buchanan Date/Time: 2/8/17 11:50 AM
 Comments/Sample Discrepancy: Collection date is 2/6/17 for both samples.

Project Manager SCURF Review: MS Date: 2/8/17
 Project Manager SRF Review: MS Date: 2/8/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. Out of hold, incorrect preservative, out of temp, incorrect containers)



Document Name:
Sample Condition Upon Receipt(SCUR)
Document No.:
F-CAR-CS-033-Rev.01

Document Revised: Sept. 21, 2016
Page 2 of 2
Issuing Authority:
Pace Quality Office

*Check mark top half of box if pH and/or dechlorination is verified and within the acceptance range for preservation samples.

**Bottom half of box is to list number of bottles

Project

WO#: 92329071

PM: MSS

Due Date: 02/13/17

CLIENT: 93-PaceATL

Item#	BP4U-125 mL Plastic Unpreserved (N/A) (Cl-)	BP3U-250 mL Plastic Unpreserved (N/A)	BP2U-500 mL Plastic Unpreserved (N/A)	BP1U-1 liter Plastic Unpreserved (N/A)	BP3S-250 mL Plastic H2SO4 (pH < 2) (Cl-)	BP3N-250 mL plastic HNO3 (pH < 2)	BP3Z-250 mL Plastic ZN Acetate & NaOH (>9)	BP3C-250 mL Plastic NaOH (pH > 12) (Cl-)	WGFU-Wide-mouthed Glass jar Unpreserved	AG1U-1 liter Amber Unpreserved (N/A) (Cl-)	AG1H-1 liter Amber HCl (pH < 2)	AG3U-250 mL Amber Unpreserved (N/A) (Cl-)	AG1S-1 liter Amber H2SO4 (pH < 2)	AG3S-250 mL Amber H2SO4 (pH < 2)	AG3A(DG3A)-250 mL Amber NH4Cl (N/A)(Cl-)	DG9H-40 mL VOA HCl (N/A)	VG9T-40 mL VOA Na2S2O3 (N/A)	VG9U-40 mL VOA Unp (N/A)	DG9P-40 mL VOA H3PO4 (N/A)	VOAK (6 vials per kit)-5035 kit (N/A)	V/GK (3 vials per kit)-VPH/Gas kit (N/A)	SP5T-125 mL Sterile Plastic (N/A – lab)	SP2T-250 mL Sterile Plastic (N/A – lab)	BP3A-250 mL Plastic (NH2)2SO4 (9.3-9.7)	Cubitainer	VSGU-20 mL Scintillation vials (N/A)	GN
1																		2									
2																		2									
3																											
4																											
5																											
6																											
7																											
8																											
9																											
10																											
11																											
12																											

pH Adjustment Log for Preserved Samples

Sample ID	Type of Preservative	pH upon receipt	Date preservation adjusted	Time preservation adjusted	Amount of Preservative added	Lot #

Chain of Custody

Pace Analytical
Pace Analytical, LLC

Workorder: AAB0196

Workorder Name: Duluth, City of /85365-001

Owner Received Date: 2/6/2017

Results Requested By: 2/13/2017

Report To:
EBEN BUCHANAN
Pace Analytical Atlanta
110 Technology Parkway
Peachtree Corners, GA 30092
Phone (770)-734-4200

Subcontract To:
Trey Carter
Pace - Huntersville, NC
9800 Kinsey AVE STE 100
Huntersville, NC 28078
Telephone : 704-875-9092

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers	Cool	MEE RSK175	Requested Analysis	LAB USE ONLY
1	MW-5	Grab	02/16/2017 1410	AAB0196-002	GW		3	X		W1
2	MW-6	Grab	02/16/2017 1301	AAB0196-003	GW		3	X		W2
3										
4										
5										
6										
7										
8										
9										
10										
Transfers		Released By	Date/Time	Received By	Date/Time	Comments				
1		<i>Charles Hake</i>	2/17/17	<i>Charles Hake</i>						
2										
3										

Cooler Temperature on Receipt 1.8 °C Custody Seal Y or N N Received on Ice Y or N Y Sample Intact Y or N Y

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC
This chain of custody is considered complete as is since this information is available in the owner laboratory.

	Document Name:	Document Revised: Sept. 21, 2016
	Sample Condition Upon Receipt (SCUR)	Page 1 of 2
	Document No.: F-CAR-CS-033-Rev.01	Issuing Authority: Pace Quality Office

Laboratory receiving samples:

Asheville ☐ Eden ☐ Greenwood ☐ Huntersville ☒ Raleigh ☐ Mechanicsville ☐

Sample Condition Upon Receipt

Client Name:

Pace GA

Project #:

WO# : 92329071

PM: MSS

Due Date: 02/17/17

CLIENT: 93-PaceATL

Courier:

☐ Commercial

☒ Fed Ex

☐ UPS

☐ USPS

☐ Client

☐ Pace

☐ Other: _____

Custody Seal Present?

☐ Yes

☒ No

Seals Intact?

☐ Yes

☒ No

Packing Material:

☐ Bubble Wrap

☒ Bubble Bags

☐ None

☐ Other: _____

Thermometer:

☒ IR Gun ID: T1103

Type of Ice:

☒ Wet

☐ Blue

☐ None

☒ Samples on ice, cooling process has begun

Correction Factor:

Cooler Temp Corrected (°C):

2.4

Biological Tissue Frozen?

☐ Yes

☒ No

☐ N/A

Temp should be above freezing to 6°C

USDA Regulated Soil ☒ N/A, water sample

Did samples originate in a quarantine zone within the United States: CA, NY, or SC (check maps)?

☐ Yes ☒ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☒ No

			Comments/Discrepancy:
Chain of Custody Present?	☒ Yes ☐ No ☐ N/A	1.	
Samples Arrived within Hold Time?	☒ Yes ☐ No ☐ N/A	2.	
Short Hold Time Analysis (<72 hr.)?	☐ Yes ☒ No ☐ N/A	3.	
Rush Turn Around Time Requested?	☒ Yes ☐ No ☐ N/A	4.	
Sufficient Volume?	☒ Yes ☐ No ☐ N/A	5.	
Correct Containers Used?	☒ Yes ☐ No ☐ N/A	6.	
-Pace Containers Used?	☒ Yes ☐ No ☐ N/A		
Containers Intact?	☒ Yes ☐ No ☐ N/A	7.	
Samples Field Filtered?	☐ Yes ☐ No ☒ N/A	8.	Note if sediment is visible in the dissolved container
Sample Labels Match COC?	☐ Yes ☒ No ☐ N/A	9.	only received 2 hold vials for each sample
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>			
Headspace in VOA Vials (>5-6mm)?	☐ Yes ☒ No ☐ N/A	10.	
Trip Blank Present?	☐ Yes ☒ No ☐ N/A	11.	
Trip Blank Custody Seals Present?	☐ Yes ☐ No ☒ N/A		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? ☐ Yes ☐ No

Person Contacted: _____

Date/Time: _____

Comments/Sample

Discrepancy: _____

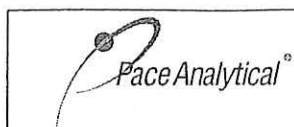
Project Manager SCURF Review: JY

Date: 2/18/17

Project Manager SRF Review: JY

Date: 2/21/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. Out of hold, incorrect preservative, out of temp, incorrect containers)



Document Name:
Sample Condition Upon Receipt(SCUR)
Document No.:
F-CAR-CS-033-Rev.01

Document Revised: Sept. 21, 2016
Page 2 of 2
Issuing Authority:
Pace Quality Office

*Check mark top half of box if pH and/or dechlorination is verified and within the acceptance range for preservation samples.

**Bottom half of box is to list number of bottles

Project #

WO#: 92329071

PM: MSS

Due Date: 02/21/17

CLIENT: 93-PaceATL

Item#	BP4U-125 mL Plastic Unpreserved (N/A) (Cl-)	BP3U-250 mL Plastic Unpreserved (N/A)	BP2U-500 mL Plastic Unpreserved (N/A)	BP1U-1 liter Plastic Unpreserved (N/A)	BP3S-250 mL Plastic H2SO4 (pH < 2) (Cl-)	BP3N-250 mL plastic HNO3 (pH < 2)	BP3Z-250 mL Plastic ZN Acetate & NaOH (>9)	BP3C-250 mL Plastic NaOH (pH > 12) (Cl-)	WGFU-Wide-mouthed Glass jar Unpreserved	AG1U-1 liter Amber Unpreserved (N/A) (Cl-)	AG1H-1 liter Amber HCl (pH < 2)	AG3U-250 mL Amber Unpreserved (N/A) (Cl-)	AG1S-1 liter Amber H2SO4 (pH < 2)	AG3S-250 mL Amber H2SO4 (pH < 2)	AG3A(DG3A)-250 mL Amber NH4Cl (N/A)(Cl-)	DG9H-40 mL VOA HCl (N/A)	VG9T-40 mL VOA Na2S2O3 (N/A)	VG9U-40 mL VOA Unp (N/A)	DG9P-40 mL VOA H3PO4 (N/A)	VOAK (6 vials per kit)-5035 kit (N/A)	V/GK (3 vials per kit)-VPH/Gas kit (N/A)	SP5T-125 mL Sterile Plastic (N/A – lab)	SP2T-250 mL Sterile Plastic (N/A – lab)	BP3A-250 mL Plastic (NH2)2SO4 (9.3-9.7)	Cubitainer	VSGU-20 mL Scintillation vials (N/A)	GN	
1																2												
2																2												
3																												
4																												
5																												
6																												
7																												
8																												
9																												
10																												
11																												
12																												

pH Adjustment Log for Preserved Samples

Sample ID	Type of Preservative	pH upon receipt	Date preservation adjusted	Time preservation adjusted	Amount of Preservative added	Lot #

Chain of Custody



Worker: AAB0196

Worker Name: Duluth, City of /BS365-001

Owner Received Date: 2/6/2017

Results Requested By: 2/13/2017

Report To:

Subcontract To:

Requested Analysis

EBEN BUCHANAN
Pace Analytical Atlanta
110 Technology Parkway
Peachtree Corners, GA 30092
Phone (770)-734-4200

Trey Carter
Pace - Huntersville, NC
9800 Kinsey AVE STE 100
Huntersville, NC 28078
Telephone : 704-875-9092

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers	Cool	MEE RSK175	LAB USE ONLY
1	MW-5	Grab	02/16/2017 1410	AAB0196-002	GW		3	X	92329071 LAB USE ONLY
2	MW-6	Grab	02/16/2017 1301	AAB0196-003	GW		3	X	002
3									
4									
5									
6									
7									
8									
9									
10									
Transfers	Released By		Date/Time	Received By		Date/Time			Comments
1									
2									
3									

Cooler Temperature on Receipt

24 °C

Custody Seal Y or N

Received on Tick or N

Sample Intact Y or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC
This chain of custody is considered complete as is since this information is available in the owner laboratory.



PACE ANALYTICAL SERVICES, LLC.

Environmental Monitoring & Laboratory Analysis
110 Technology Parkway, Peachtree Corners, GA 30092
(770) 734-4200 FAX (770) 734-4201

Laboratory Report

Prepared For:

WENCK Associates

1080 Holcomb Bridge Road, Building 100, Suite 190

Roswell, GA 30076

Attention: Ms. Katie T. Ross

Report Number: AAB0498

February 21, 2017

Project: Duluth, City of

Project #:B5365-0001

We appreciate the opportunity to provide the analytical support for your project. The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Approved:

A handwritten signature in black ink, reading "Betsy McDaniel", written over a horizontal line.

Project Manager

This report may not be reproduced, except in full, without written approval from Pace Analytical Services, LLC. Pace Analytical Services, LLC. certifies that the following analytical results meet all requirements of the National Environmental Laboratory Accreditation Conference (NELAC). All test results relate only to the samples analyzed.



WENCK Associates
1080 Holcomb Bridge Road, Building 100, S
Roswell GA, 30076
Attention: Ms. Katie T. Ross

PACE ANALYTICAL SERVICES, LLC.

Environmental Monitoring & Laboratory Analysis
110 Technology Parkway, Peachtree Corners, GA 30092
(770) 734-4200 FAX (770) 734-4201

February 21, 2017

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-7	AAB0498-01	Ground Water	02/13/17 11:35	02/14/17 12:00
MW-11	AAB0498-02	Ground Water	02/13/17 13:50	02/14/17 12:00
MW-3	AAB0498-03	Ground Water	02/13/17 15:50	02/14/17 12:00
MW-4	AAB0498-04	Ground Water	02/13/17 17:25	02/14/17 12:00
MW-2	AAB0498-05	Ground Water	02/13/17 19:20	02/14/17 12:00
MW-1	AAB0498-06	Ground Water	02/13/17 21:35	02/14/17 12:00



PACE ANALYTICAL SERVICES, LLC.

Environmental Monitoring & Laboratory Analysis
110 Technology Parkway, Peachtree Corners, GA 30092
(770) 734-4200 FAX (770) 734-4201

WENCK Associates
1080 Holcomb Bridge Road, Building 100, S
Roswell GA, 30076
Attention: Ms. Katie T. Ross

February 21, 2017

Report No.: AAB0498

Client ID: MW-7

Date/Time Sampled: 2/13/2017 11:35:00AM

Matrix: Ground Water

Project: Duluth, City of

Lab Number ID: AAB0498-01

Date/Time Received: 2/14/2017 12:00:00PM

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
Acetone	ND	100	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
Acrolein	ND	50	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
Acrylonitrile	ND	50	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
Allyl Chloride (3-Chloropropylene)	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
Benzene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
Bromobenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
Bromochloromethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
Bromodichloromethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
Bromoform	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
Bromomethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
n-Butylbenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
sec-Butylbenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
tert-Butylbenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
Carbon Disulfide	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
Carbon Tetrachloride	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
Chlorobenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
1-Chlorobutane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
Chloroethane	ND	5.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
Chloroform	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
Chloromethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
2-Chlorotoluene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
4-Chlorotoluene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
Dibromochloromethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
1,2-Dibromo-3-chloropropane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
1,2-Dibromoethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
Dibromomethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
1,2-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
1,3-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
1,4-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
trans-1,4-Dichloro-2-butene	ND	5.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
Dichlorodifluoromethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
1,1-Dichloroethane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
1,2-Dichloroethane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
1,1-Dichloroethene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
cis-1,2-Dichloroethene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
trans-1,2-Dichloroethene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH



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Report No.: AAB0498

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Date/Time Sampled: 2/13/2017 11:35:00AM

Matrix: Ground Water

Project: Duluth, City of

Lab Number ID: AAB0498-01

Date/Time Received: 2/14/2017 12:00:00PM

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
1,2-Dichloropropane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
1,3-Dichloropropane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
2,2-Dichloropropane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
1,1-Dichloropropene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
cis-1,3-Dichloropropene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
trans-1,3-Dichloropropene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
Ethylbenzene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
Ethyl Methacrylate	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
Hexachlorobutadiene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
p-Isopropyltoluene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
Hexachloroethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
Iodomethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
Isopropylbenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
Methacrylonitrile	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
Methyl Acrylate	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
Methyl Butyl Ketone (2-Hexanone)	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
Methylene Chloride	ND	5.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
Methyl Ethyl Ketone (2-Butanone)	ND	100	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
Methyl Methacrylate	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
4-Methyl-2-pentanone (MIBK)	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
Methyl-tert-Butyl Ether	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
Naphthalene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
2-Nitropropane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
Propionitrile (Ethyl Cyanide)	ND	20	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
n-Propylbenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
Styrene	ND	5.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
1,1,1,2-Tetrachloroethane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
1,1,2,2-Tetrachloroethane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
Tetrachloroethene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
Tetrahydrofuran	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
Toluene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
1,2,3-Trichlorobenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
1,2,4-Trichlorobenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
1,1,1-Trichloroethane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
1,1,2-Trichloroethane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
Trichloroethene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH



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Project: Duluth, City of

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Date/Time Received: 2/14/2017 12:00:00PM

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
Trichlorofluoromethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
1,2,3-Trichloropropane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
1,2,4-Trimethylbenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
1,3,5-Trimethylbenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
Vinyl Acetate	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
Vinyl Chloride	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
m+p-Xylene	ND	5.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
o-Xylene	ND	5.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
Xylenes, total	ND	5.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 10:51	7020439	LIH
Surrogate: Dibromofluoromethane	98 %	80-120		EPA 8260B			2/15/17 9:00	2/15/17 10:51	7020439	
Surrogate: 1,2-Dichloroethane-d4	107 %	78-120		EPA 8260B			2/15/17 9:00	2/15/17 10:51	7020439	
Surrogate: Toluene-d8	104 %	80-120		EPA 8260B			2/15/17 9:00	2/15/17 10:51	7020439	
Surrogate: 4-Bromofluorobenzene	105 %	80-120		EPA 8260B			2/15/17 9:00	2/15/17 10:51	7020439	



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February 21, 2017

Report No.: AAB0498

Client ID: MW-11

Date/Time Sampled: 2/13/2017 1:50:00PM

Matrix: Ground Water

Project: Duluth, City of

Lab Number ID: AAB0498-02

Date/Time Received: 2/14/2017 12:00:00PM

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
Acetone	ND	100	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
Acrolein	ND	50	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
Acrylonitrile	ND	50	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
Allyl Chloride (3-Chloropropylene)	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
Benzene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
Bromobenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
Bromochloromethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
Bromodichloromethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
Bromoform	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
Bromomethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
n-Butylbenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
sec-Butylbenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
tert-Butylbenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
Carbon Disulfide	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
Carbon Tetrachloride	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
Chlorobenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
1-Chlorobutane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
Chloroethane	ND	5.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
Chloroform	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
Chloromethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
2-Chlorotoluene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
4-Chlorotoluene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
Dibromochloromethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
1,2-Dibromo-3-chloropropane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
1,2-Dibromoethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
Dibromomethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
1,2-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
1,3-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
1,4-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
trans-1,4-Dichloro-2-butene	ND	5.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
Dichlorodifluoromethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
1,1-Dichloroethane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
1,2-Dichloroethane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
1,1-Dichloroethene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
cis-1,2-Dichloroethene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
trans-1,2-Dichloroethene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH



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Matrix: Ground Water

Project: Duluth, City of

Lab Number ID: AAB0498-02

Date/Time Received: 2/14/2017 12:00:00PM

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
1,2-Dichloropropane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
1,3-Dichloropropane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
2,2-Dichloropropane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
1,1-Dichloropropene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
cis-1,3-Dichloropropene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
trans-1,3-Dichloropropene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
Ethylbenzene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
Ethyl Methacrylate	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
Hexachlorobutadiene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
p-Isopropyltoluene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
Hexachloroethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
Iodomethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
Isopropylbenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
Methacrylonitrile	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
Methyl Acrylate	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
Methyl Butyl Ketone (2-Hexanone)	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
Methylene Chloride	ND	5.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
Methyl Ethyl Ketone (2-Butanone)	ND	100	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
Methyl Methacrylate	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
4-Methyl-2-pentanone (MIBK)	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
Methyl-tert-Butyl Ether	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
Naphthalene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
2-Nitropropane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
Propionitrile (Ethyl Cyanide)	ND	20	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
n-Propylbenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
Styrene	ND	5.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
1,1,1,2-Tetrachloroethane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
1,1,2,2-Tetrachloroethane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
Tetrachloroethene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
Tetrahydrofuran	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
Toluene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
1,2,3-Trichlorobenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
1,2,4-Trichlorobenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
1,1,1-Trichloroethane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
1,1,2-Trichloroethane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
Trichloroethene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH



PACE ANALYTICAL SERVICES, LLC.

Environmental Monitoring & Laboratory Analysis
110 Technology Parkway, Peachtree Corners, GA 30092
(770) 734-4200 FAX (770) 734-4201

WENCK Associates
1080 Holcomb Bridge Road, Building 100, S
Roswell GA, 30076
Attention: Ms. Katie T. Ross

February 21, 2017

Report No.: AAB0498

Client ID: MW-11

Date/Time Sampled: 2/13/2017 1:50:00PM

Matrix: Ground Water

Project: Duluth, City of

Lab Number ID: AAB0498-02

Date/Time Received: 2/14/2017 12:00:00PM

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
Trichlorofluoromethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
1,2,3-Trichloropropane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
1,2,4-Trimethylbenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
1,3,5-Trimethylbenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
Vinyl Acetate	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
Vinyl Chloride	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
m+p-Xylene	ND	5.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
o-Xylene	ND	5.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
Xylenes, total	ND	5.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:17	7020439	LIH
Surrogate: Dibromofluoromethane	99 %	80-120		EPA 8260B			2/15/17 9:00	2/15/17 11:17	7020439	
Surrogate: 1,2-Dichloroethane-d4	106 %	78-120		EPA 8260B			2/15/17 9:00	2/15/17 11:17	7020439	
Surrogate: Toluene-d8	105 %	80-120		EPA 8260B			2/15/17 9:00	2/15/17 11:17	7020439	
Surrogate: 4-Bromofluorobenzene	108 %	80-120		EPA 8260B			2/15/17 9:00	2/15/17 11:17	7020439	



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WENCK Associates
1080 Holcomb Bridge Road, Building 100, S
Roswell GA, 30076
Attention: Ms. Katie T. Ross

February 21, 2017

Report No.: AAB0498

Project: Duluth, City of

Client ID: MW-3

Lab Number ID: AAB0498-03

Date/Time Sampled: 2/13/2017 3:50:00PM

Date/Time Received: 2/14/2017 12:00:00PM

Matrix: Ground Water

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
Acetone	ND	100	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
Acrolein	ND	50	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
Acrylonitrile	ND	50	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
Allyl Chloride (3-Chloropropylene)	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
Benzene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
Bromobenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
Bromochloromethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
Bromodichloromethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
Bromoform	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
Bromomethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
n-Butylbenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
sec-Butylbenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
tert-Butylbenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
Carbon Disulfide	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
Carbon Tetrachloride	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
Chlorobenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
1-Chlorobutane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
Chloroethane	ND	5.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
Chloroform	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
Chloromethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
2-Chlorotoluene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
4-Chlorotoluene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
Dibromochloromethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
1,2-Dibromo-3-chloropropane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
1,2-Dibromoethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
Dibromomethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
1,2-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
1,3-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
1,4-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
trans-1,4-Dichloro-2-butene	ND	5.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
Dichlorodifluoromethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
1,1-Dichloroethane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
1,2-Dichloroethane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
1,1-Dichloroethene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
cis-1,2-Dichloroethene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
trans-1,2-Dichloroethene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH



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WENCK Associates
1080 Holcomb Bridge Road, Building 100, S
Roswell GA, 30076
Attention: Ms. Katie T. Ross

February 21, 2017

Report No.: AAB0498

Client ID: MW-3

Date/Time Sampled: 2/13/2017 3:50:00PM

Matrix: Ground Water

Project: Duluth, City of

Lab Number ID: AAB0498-03

Date/Time Received: 2/14/2017 12:00:00PM

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
1,2-Dichloropropane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
1,3-Dichloropropane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
2,2-Dichloropropane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
1,1-Dichloropropene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
cis-1,3-Dichloropropene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
trans-1,3-Dichloropropene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
Ethylbenzene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
Ethyl Methacrylate	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
Hexachlorobutadiene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
p-Isopropyltoluene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
Hexachloroethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
Iodomethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
Isopropylbenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
Methacrylonitrile	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
Methyl Acrylate	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
Methyl Butyl Ketone (2-Hexanone)	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
Methylene Chloride	ND	5.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
Methyl Ethyl Ketone (2-Butanone)	ND	100	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
Methyl Methacrylate	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
4-Methyl-2-pentanone (MIBK)	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
Methyl-tert-Butyl Ether	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
Naphthalene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
2-Nitropropane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
Propionitrile (Ethyl Cyanide)	ND	20	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
n-Propylbenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
Styrene	ND	5.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
1,1,1,2-Tetrachloroethane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
1,1,2,2-Tetrachloroethane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
Tetrachloroethene	2400	200	ug/L	EPA 8260B		100	2/15/17 9:00	2/15/17 13:23	7020439	LIH
Tetrahydrofuran	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
Toluene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
1,2,3-Trichlorobenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
1,2,4-Trichlorobenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
1,1,1-Trichloroethane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
1,1,2-Trichloroethane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
Trichloroethene	2.6	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH



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WENCK Associates
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Attention: Ms. Katie T. Ross

February 21, 2017

Report No.: AAB0498

Client ID: MW-3

Date/Time Sampled: 2/13/2017 3:50:00PM

Matrix: Ground Water

Project: Duluth, City of

Lab Number ID: AAB0498-03

Date/Time Received: 2/14/2017 12:00:00PM

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
Trichlorofluoromethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
1,2,3-Trichloropropane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
1,2,4-Trimethylbenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
1,3,5-Trimethylbenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
Vinyl Acetate	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
Vinyl Chloride	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
m+p-Xylene	ND	5.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
o-Xylene	ND	5.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
Xylenes, total	ND	5.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 11:42	7020439	LIH
Surrogate: Dibromofluoromethane	98 %	80-120		EPA 8260B			2/15/17 9:00	2/15/17 11:42	7020439	
Surrogate: Dibromofluoromethane	98 %	80-120		EPA 8260B			2/15/17 9:00	2/15/17 13:23	7020439	
Surrogate: 1,2-Dichloroethane-d4	108 %	78-120		EPA 8260B			2/15/17 9:00	2/15/17 13:23	7020439	
Surrogate: 1,2-Dichloroethane-d4	107 %	78-120		EPA 8260B			2/15/17 9:00	2/15/17 11:42	7020439	
Surrogate: Toluene-d8	102 %	80-120		EPA 8260B			2/15/17 9:00	2/15/17 13:23	7020439	
Surrogate: Toluene-d8	103 %	80-120		EPA 8260B			2/15/17 9:00	2/15/17 11:42	7020439	
Surrogate: 4-Bromofluorobenzene	107 %	80-120		EPA 8260B			2/15/17 9:00	2/15/17 13:23	7020439	
Surrogate: 4-Bromofluorobenzene	106 %	80-120		EPA 8260B			2/15/17 9:00	2/15/17 11:42	7020439	



PACE ANALYTICAL SERVICES, LLC.

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WENCK Associates
1080 Holcomb Bridge Road, Building 100, S
Roswell GA, 30076
Attention: Ms. Katie T. Ross

February 21, 2017

Report No.: AAB0498

Client ID: MW-4

Date/Time Sampled: 2/13/2017 5:25:00PM

Matrix: Ground Water

Project: Duluth, City of

Lab Number ID: AAB0498-04

Date/Time Received: 2/14/2017 12:00:00PM

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
Acetone	ND	100	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
Acrolein	ND	50	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
Acrylonitrile	ND	50	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
Allyl Chloride (3-Chloropropylene)	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
Benzene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
Bromobenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
Bromochloromethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
Bromodichloromethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
Bromoform	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
Bromomethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
n-Butylbenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
sec-Butylbenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
tert-Butylbenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
Carbon Disulfide	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
Carbon Tetrachloride	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
Chlorobenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
1-Chlorobutane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
Chloroethane	ND	5.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
Chloroform	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
Chloromethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
2-Chlorotoluene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
4-Chlorotoluene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
Dibromochloromethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
1,2-Dibromo-3-chloropropane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
1,2-Dibromoethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
Dibromomethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
1,2-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
1,3-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
1,4-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
trans-1,4-Dichloro-2-butene	ND	5.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
Dichlorodifluoromethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
1,1-Dichloroethane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
1,2-Dichloroethane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
1,1-Dichloroethene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
cis-1,2-Dichloroethene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
trans-1,2-Dichloroethene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH



PACE ANALYTICAL SERVICES, LLC.

Environmental Monitoring & Laboratory Analysis
110 Technology Parkway, Peachtree Corners, GA 30092
(770) 734-4200 FAX (770) 734-4201

WENCK Associates
1080 Holcomb Bridge Road, Building 100, S
Roswell GA, 30076
Attention: Ms. Katie T. Ross

February 21, 2017

Report No.: AAB0498

Client ID: MW-4

Date/Time Sampled: 2/13/2017 5:25:00PM

Matrix: Ground Water

Project: Duluth, City of

Lab Number ID: AAB0498-04

Date/Time Received: 2/14/2017 12:00:00PM

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
1,2-Dichloropropane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
1,3-Dichloropropane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
2,2-Dichloropropane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
1,1-Dichloropropene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
cis-1,3-Dichloropropene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
trans-1,3-Dichloropropene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
Ethylbenzene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
Ethyl Methacrylate	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
Hexachlorobutadiene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
p-Isopropyltoluene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
Hexachloroethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
Iodomethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
Isopropylbenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
Methacrylonitrile	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
Methyl Acrylate	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
Methyl Butyl Ketone (2-Hexanone)	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
Methylene Chloride	ND	5.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
Methyl Ethyl Ketone (2-Butanone)	ND	100	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
Methyl Methacrylate	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
4-Methyl-2-pentanone (MIBK)	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
Methyl-tert-Butyl Ether	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
Naphthalene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
2-Nitropropane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
Propionitrile (Ethyl Cyanide)	ND	20	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
n-Propylbenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
Styrene	ND	5.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
1,1,1,2-Tetrachloroethane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
1,1,2,2-Tetrachloroethane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
Tetrachloroethene	490	20	ug/L	EPA 8260B		10	2/15/17 9:00	2/15/17 13:48	7020439	LIH
Tetrahydrofuran	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
Toluene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
1,2,3-Trichlorobenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
1,2,4-Trichlorobenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
1,1,1-Trichloroethane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
1,1,2-Trichloroethane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
Trichloroethene	2.1	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH



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WENCK Associates
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Roswell GA, 30076
Attention: Ms. Katie T. Ross

February 21, 2017

Report No.: AAB0498

Client ID: MW-4

Date/Time Sampled: 2/13/2017 5:25:00PM

Matrix: Ground Water

Project: Duluth, City of

Lab Number ID: AAB0498-04

Date/Time Received: 2/14/2017 12:00:00PM

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
Trichlorofluoromethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
1,2,3-Trichloropropane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
1,2,4-Trimethylbenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
1,3,5-Trimethylbenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
Vinyl Acetate	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
Vinyl Chloride	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
m+p-Xylene	ND	5.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
o-Xylene	ND	5.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
Xylenes, total	ND	5.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:07	7020439	LIH
Surrogate: Dibromofluoromethane	97 %	80-120		EPA 8260B			2/15/17 9:00	2/15/17 13:48	7020439	
Surrogate: Dibromofluoromethane	95 %	80-120		EPA 8260B			2/15/17 9:00	2/15/17 12:07	7020439	
Surrogate: 1,2-Dichloroethane-d4	109 %	78-120		EPA 8260B			2/15/17 9:00	2/15/17 13:48	7020439	
Surrogate: 1,2-Dichloroethane-d4	107 %	78-120		EPA 8260B			2/15/17 9:00	2/15/17 12:07	7020439	
Surrogate: Toluene-d8	103 %	80-120		EPA 8260B			2/15/17 9:00	2/15/17 13:48	7020439	
Surrogate: Toluene-d8	103 %	80-120		EPA 8260B			2/15/17 9:00	2/15/17 12:07	7020439	
Surrogate: 4-Bromofluorobenzene	107 %	80-120		EPA 8260B			2/15/17 9:00	2/15/17 13:48	7020439	
Surrogate: 4-Bromofluorobenzene	108 %	80-120		EPA 8260B			2/15/17 9:00	2/15/17 12:07	7020439	



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WENCK Associates
1080 Holcomb Bridge Road, Building 100, S
Roswell GA, 30076
Attention: Ms. Katie T. Ross

February 21, 2017

Report No.: AAB0498

Client ID: MW-2

Date/Time Sampled: 2/13/2017 7:20:00PM

Matrix: Ground Water

Project: Duluth, City of

Lab Number ID: AAB0498-05

Date/Time Received: 2/14/2017 12:00:00PM

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
Acetone	ND	100	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
Acrolein	ND	50	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
Acrylonitrile	ND	50	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
Allyl Chloride (3-Chloropropylene)	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
Benzene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
Bromobenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
Bromochloromethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
Bromodichloromethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
Bromoform	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
Bromomethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
n-Butylbenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
sec-Butylbenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
tert-Butylbenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
Carbon Disulfide	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
Carbon Tetrachloride	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
Chlorobenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
1-Chlorobutane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
Chloroethane	ND	5.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
Chloroform	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
Chloromethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
2-Chlorotoluene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
4-Chlorotoluene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
Dibromochloromethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
1,2-Dibromo-3-chloropropane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
1,2-Dibromoethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
Dibromomethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
1,2-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
1,3-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
1,4-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
trans-1,4-Dichloro-2-butene	ND	5.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
Dichlorodifluoromethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
1,1-Dichloroethane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
1,2-Dichloroethane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
1,1-Dichloroethene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
cis-1,2-Dichloroethene	7.2	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
trans-1,2-Dichloroethene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH



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Attention: Ms. Katie T. Ross

February 21, 2017

Report No.: AAB0498

Client ID: MW-2

Date/Time Sampled: 2/13/2017 7:20:00PM

Matrix: Ground Water

Project: Duluth, City of

Lab Number ID: AAB0498-05

Date/Time Received: 2/14/2017 12:00:00PM

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
1,2-Dichloropropane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
1,3-Dichloropropane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
2,2-Dichloropropane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
1,1-Dichloropropene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
cis-1,3-Dichloropropene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
trans-1,3-Dichloropropene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
Ethylbenzene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
Ethyl Methacrylate	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
Hexachlorobutadiene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
p-Isopropyltoluene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
Hexachloroethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
Iodomethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
Isopropylbenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
Methacrylonitrile	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
Methyl Acrylate	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
Methyl Butyl Ketone (2-Hexanone)	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
Methylene Chloride	ND	5.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
Methyl Ethyl Ketone (2-Butanone)	ND	100	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
Methyl Methacrylate	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
4-Methyl-2-pentanone (MIBK)	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
Methyl-tert-Butyl Ether	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
Naphthalene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
2-Nitropropane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
Propionitrile (Ethyl Cyanide)	ND	20	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
n-Propylbenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
Styrene	ND	5.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
1,1,1,2-Tetrachloroethane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
1,1,2,2-Tetrachloroethane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
Tetrachloroethene	660	20	ug/L	EPA 8260B		10	2/15/17 9:00	2/15/17 14:13	7020439	LIH
Tetrahydrofuran	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
Toluene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
1,2,3-Trichlorobenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
1,2,4-Trichlorobenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
1,1,1-Trichloroethane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
1,1,2-Trichloroethane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
Trichloroethene	7.3	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH



PACE ANALYTICAL SERVICES, LLC.

Environmental Monitoring & Laboratory Analysis
110 Technology Parkway, Peachtree Corners, GA 30092
(770) 734-4200 FAX (770) 734-4201

WENCK Associates
1080 Holcomb Bridge Road, Building 100, S
Roswell GA, 30076
Attention: Ms. Katie T. Ross

February 21, 2017

Report No.: AAB0498

Client ID: MW-2

Date/Time Sampled: 2/13/2017 7:20:00PM

Matrix: Ground Water

Project: Duluth, City of

Lab Number ID: AAB0498-05

Date/Time Received: 2/14/2017 12:00:00PM

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
Trichlorofluoromethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
1,2,3-Trichloropropane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
1,2,4-Trimethylbenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
1,3,5-Trimethylbenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
Vinyl Acetate	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
Vinyl Chloride	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
m+p-Xylene	ND	5.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
o-Xylene	ND	5.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
Xylenes, total	ND	5.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:33	7020439	LIH
Surrogate: Dibromofluoromethane	94 %	80-120		EPA 8260B			2/15/17 9:00	2/15/17 12:33	7020439	
Surrogate: Dibromofluoromethane	97 %	80-120		EPA 8260B			2/15/17 9:00	2/15/17 14:13	7020439	
Surrogate: 1,2-Dichloroethane-d4	109 %	78-120		EPA 8260B			2/15/17 9:00	2/15/17 14:13	7020439	
Surrogate: 1,2-Dichloroethane-d4	108 %	78-120		EPA 8260B			2/15/17 9:00	2/15/17 12:33	7020439	
Surrogate: Toluene-d8	105 %	80-120		EPA 8260B			2/15/17 9:00	2/15/17 14:13	7020439	
Surrogate: Toluene-d8	104 %	80-120		EPA 8260B			2/15/17 9:00	2/15/17 12:33	7020439	
Surrogate: 4-Bromofluorobenzene	103 %	80-120		EPA 8260B			2/15/17 9:00	2/15/17 14:13	7020439	
Surrogate: 4-Bromofluorobenzene	108 %	80-120		EPA 8260B			2/15/17 9:00	2/15/17 12:33	7020439	



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WENCK Associates
1080 Holcomb Bridge Road, Building 100, S
Roswell GA, 30076
Attention: Ms. Katie T. Ross

February 21, 2017

Report No.: AAB0498

Client ID: MW-1

Date/Time Sampled: 2/13/2017 9:35:00PM

Matrix: Ground Water

Project: Duluth, City of

Lab Number ID: AAB0498-06

Date/Time Received: 2/14/2017 12:00:00PM

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
General Chemistry										
Alkalinity as CaCO ₃	ND	10	mg/L	EPA 310.2		1	2/20/17 10:00	2/20/17 14:45	7020562	LPH
Sulfide	ND	1	mg/L	EPA 9030B/9034		1	2/20/17 12:00	2/20/17 16:30	7020564	DJS
Total Organic Carbon	1.2	1.0	mg/L	EPA 9060A		1	2/20/17 10:30	2/20/17 13:56	7020543	djs
Inorganic Anions										
Chloride	3.3	1.0	mg/L	EPA 9056A		1	2/14/17 11:00	2/14/17 18:09	7020381	RLC
Sulfate	ND	5.0	mg/L	EPA 9056A	J	1	2/14/17 11:00	2/14/17 18:09	7020381	RLC
Nitrate as N	4.5	0.05	mg/L	EPA 9056A		1	2/14/17 11:00	2/14/17 18:09	7020381	RLC
Volatile Organic Compounds by EPA 8260										
Acetone	ND	100	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
Acrolein	ND	50	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
Acrylonitrile	ND	50	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
Allyl Chloride (3-Chloropropylene)	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
Benzene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
Bromobenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
Bromochloromethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
Bromodichloromethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
Bromoform	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
Bromomethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
n-Butylbenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
sec-Butylbenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
tert-Butylbenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
Carbon Disulfide	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
Carbon Tetrachloride	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
Chlorobenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
1-Chlorobutane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
Chloroethane	ND	5.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
Chloroform	13	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
Chloromethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
2-Chlorotoluene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
4-Chlorotoluene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
Dibromochloromethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
1,2-Dibromo-3-chloropropane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
1,2-Dibromoethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
Dibromomethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH



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WENCK Associates
1080 Holcomb Bridge Road, Building 100, S
Roswell GA, 30076
Attention: Ms. Katie T. Ross

February 21, 2017

Report No.: AAB0498

Client ID: MW-1

Date/Time Sampled: 2/13/2017 9:35:00PM

Matrix: Ground Water

Project: Duluth, City of

Lab Number ID: AAB0498-06

Date/Time Received: 2/14/2017 12:00:00PM

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
1,2-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
1,3-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
1,4-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
trans-1,4-Dichloro-2-butene	ND	5.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
Dichlorodifluoromethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
1,1-Dichloroethane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
1,2-Dichloroethane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
1,1-Dichloroethene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
cis-1,2-Dichloroethene	670	20	ug/L	EPA 8260B		10	2/15/17 9:00	2/15/17 15:03	7020439	LIH
trans-1,2-Dichloroethene	2.3	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
1,2-Dichloropropane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
1,3-Dichloropropane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
2,2-Dichloropropane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
1,1-Dichloropropene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
cis-1,3-Dichloropropene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
trans-1,3-Dichloropropene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
Ethylbenzene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
Ethyl Methacrylate	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
Hexachlorobutadiene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
p-Isopropyltoluene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
Hexachloroethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
Iodomethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
Isopropylbenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
Methacrylonitrile	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
Methyl Acrylate	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
Methyl Butyl Ketone (2-Hexanone)	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
Methylene Chloride	ND	5.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
Methyl Ethyl Ketone (2-Butanone)	ND	100	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
Methyl Methacrylate	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
4-Methyl-2-pentanone (MIBK)	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
Methyl-tert-Butyl Ether	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
Naphthalene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
2-Nitropropane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
Propionitrile (Ethyl Cyanide)	ND	20	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
n-Propylbenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
Styrene	ND	5.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH



PACE ANALYTICAL SERVICES, LLC.

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WENCK Associates
1080 Holcomb Bridge Road, Building 100, S
Roswell GA, 30076
Attention: Ms. Katie T. Ross

February 21, 2017

Report No.: AAB0498

Client ID: MW-1

Date/Time Sampled: 2/13/2017 9:35:00PM

Matrix: Ground Water

Project: Duluth, City of

Lab Number ID: AAB0498-06

Date/Time Received: 2/14/2017 12:00:00PM

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
1,1,1,2-Tetrachloroethane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
1,1,2,2-Tetrachloroethane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
Tetrachloroethene	13000	400	ug/L	EPA 8260B		200	2/15/17 9:00	2/15/17 15:29	7020439	LIH
Tetrahydrofuran	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
Toluene	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
1,2,3-Trichlorobenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
1,2,4-Trichlorobenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
1,1,1-Trichloroethane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
1,1,2-Trichloroethane	ND	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
Trichloroethene	120	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
Trichlorofluoromethane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
1,2,3-Trichloropropane	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
1,2,4-Trimethylbenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
1,3,5-Trimethylbenzene	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
Vinyl Acetate	ND	10	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
Vinyl Chloride	2.8	2.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
m+p-Xylene	ND	5.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
o-Xylene	ND	5.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
Xylenes, total	ND	5.0	ug/L	EPA 8260B		1	2/15/17 9:00	2/15/17 12:58	7020439	LIH
Surrogate: Dibromofluoromethane	99 %	80-120		EPA 8260B			2/15/17 9:00	2/15/17 12:58	7020439	
Surrogate: Dibromofluoromethane	95 %	80-120		EPA 8260B			2/15/17 9:00	2/15/17 15:29	7020439	
Surrogate: Dibromofluoromethane	101 %	80-120		EPA 8260B			2/15/17 9:00	2/15/17 15:03	7020439	
Surrogate: 1,2-Dichloroethane-d4	108 %	78-120		EPA 8260B			2/15/17 9:00	2/15/17 15:29	7020439	
Surrogate: 1,2-Dichloroethane-d4	108 %	78-120		EPA 8260B			2/15/17 9:00	2/15/17 15:03	7020439	
Surrogate: 1,2-Dichloroethane-d4	111 %	78-120		EPA 8260B			2/15/17 9:00	2/15/17 12:58	7020439	
Surrogate: Toluene-d8	103 %	80-120		EPA 8260B			2/15/17 9:00	2/15/17 15:03	7020439	
Surrogate: Toluene-d8	103 %	80-120		EPA 8260B			2/15/17 9:00	2/15/17 12:58	7020439	
Surrogate: Toluene-d8	103 %	80-120		EPA 8260B			2/15/17 9:00	2/15/17 15:29	7020439	
Surrogate: 4-Bromofluorobenzene	105 %	80-120		EPA 8260B			2/15/17 9:00	2/15/17 15:29	7020439	
Surrogate: 4-Bromofluorobenzene	106 %	80-120		EPA 8260B			2/15/17 9:00	2/15/17 15:03	7020439	
Surrogate: 4-Bromofluorobenzene	108 %	80-120		EPA 8260B			2/15/17 9:00	2/15/17 12:58	7020439	



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February 21, 2017

Report No.: AAB0498

General Chemistry - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 7020543 - EPA 9060A										
Blank (7020543-BLK1)					Prepared & Analyzed: 02/20/17					
Total Organic Carbon	ND	1.0	mg/L							
LCS (7020543-BS1)					Prepared & Analyzed: 02/20/17					
Total Organic Carbon	19.2	1.0	mg/L	20.000		96	88-112			
Matrix Spike (7020543-MS1)					Source: AAB0118-25RE1		Prepared & Analyzed: 02/20/17			
Total Organic Carbon	242	10.0	mg/L	200.00	75.8	83	67-141			
Matrix Spike Dup (7020543-MSD1)					Source: AAB0118-25RE1		Prepared & Analyzed: 02/20/17			
Total Organic Carbon	243	10.0	mg/L	200.00	75.8	84	67-141	0.3	16	
Batch 7020562 - EPA 310.2										
Blank (7020562-BLK1)					Prepared & Analyzed: 02/20/17					
Alkalinity as CaCO ₃	ND	10	mg/L							
LCS (7020562-BS1)					Prepared & Analyzed: 02/20/17					
Alkalinity as CaCO ₃	21	10	mg/L	20.000		106	90-110			
Matrix Spike (7020562-MS1)					Source: AAB0498-06		Prepared & Analyzed: 02/20/17			
Alkalinity as CaCO ₃	16	10	mg/L	20.000	ND	82	90-110			QM-05
Batch 7020564 - EPA 9030										
Blank (7020564-BLK1)					Prepared & Analyzed: 02/20/17					
Sulfide	ND	1	mg/L							



WENCK Associates
1080 Holcomb Bridge Road, Building 100, S
Roswell GA, 30076
Attention: Ms. Katie T. Ross

PACE ANALYTICAL SERVICES, LLC.

Environmental Monitoring & Laboratory Analysis
110 Technology Parkway, Peachtree Corners, GA 30092
(770) 734-4200 FAX (770) 734-4201

February 21, 2017

Report No.: AAB0498

General Chemistry - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 7020564 - EPA 9030										
LCS (7020564-BS1)										
Prepared & Analyzed: 02/20/17										
Sulfide	5	1	mg/L	8.7360		60	40-104			



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February 21, 2017

Report No.: AAB0498

Inorganic Anions - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 7020381 - EPA 9056A										
Blank (7020381-BLK1)					Prepared & Analyzed: 02/14/17					
Chloride	ND	0.10	mg/L							
Nitrate as N	ND	0.05	mg/L							
Sulfate	ND	1.0	mg/L							
LCS (7020381-BS1)					Prepared & Analyzed: 02/14/17					
Chloride	10.4	0.10	mg/L	10.010		104	90-110			
Nitrate as N	10.5	0.05	mg/L	10.020		105	90-110			
Sulfate	10.6	1.0	mg/L	10.020		105	90-110			
Matrix Spike (7020381-MS1)					Source: AAB0324-19 Prepared & Analyzed: 02/14/17					
Chloride	16.0	0.10	mg/L	10.010	5.47	105	90-110			
Nitrate as N	10.2	0.05	mg/L	10.020	0.10	101	90-110			
Sulfate	23.9	1.0	mg/L	10.020	13.7	102	90-110			
Matrix Spike (7020381-MS2)					Source: AAB0495-01 Prepared & Analyzed: 02/14/17					
Chloride	13.5	0.10	mg/L	10.010	3.17	103	90-110			
Nitrate as N	10.3	0.05	mg/L	10.020	ND	103	90-110			
Sulfate	12.9	1.0	mg/L	10.020	2.48	104	90-110			
Matrix Spike Dup (7020381-MSD1)					Source: AAB0324-19 Prepared & Analyzed: 02/14/17					
Chloride	15.9	0.10	mg/L	10.010	5.47	104	90-110	0.4	15	
Nitrate as N	10.2	0.05	mg/L	10.020	0.10	101	90-110	0.02	15	
Sulfate	23.9	1.0	mg/L	10.020	13.7	102	90-110	0.1	15	



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February 21, 2017

Report No.: AAB0498

Volatile Organic Compounds by EPA 8260 - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 7020439 - EPA 5030B										
Blank (7020439-BLK1)				Prepared & Analyzed: 02/15/17						
Acetone	ND	100	ug/L							
Acrolein	ND	50	ug/L							
Acrylonitrile	ND	50	ug/L							
Allyl Chloride (3-Chloropropylene)	ND	10	ug/L							
Benzene	ND	2.0	ug/L							
Bromobenzene	ND	10	ug/L							
Bromochloromethane	ND	10	ug/L							
Bromodichloromethane	ND	10	ug/L							
Bromoform	ND	10	ug/L							
Bromomethane	ND	10	ug/L							
n-Butylbenzene	ND	10	ug/L							
sec-Butylbenzene	ND	10	ug/L							
tert-Butylbenzene	ND	10	ug/L							
Carbon Disulfide	ND	10	ug/L							
Carbon Tetrachloride	ND	2.0	ug/L							
Chlorobenzene	ND	10	ug/L							
1-Chlorobutane	ND	10	ug/L							
Chloroethane	ND	5.0	ug/L							
Chloroform	ND	2.0	ug/L							
Chloromethane	ND	10	ug/L							
2-Chlorotoluene	ND	10	ug/L							
4-Chlorotoluene	ND	10	ug/L							
Dibromochloromethane	ND	10	ug/L							
1,2-Dibromo-3-chloropropane	ND	10	ug/L							
1,2-Dibromoethane	ND	10	ug/L							
Dibromomethane	ND	10	ug/L							
1,2-Dichlorobenzene	ND	10	ug/L							
1,3-Dichlorobenzene	ND	10	ug/L							
1,4-Dichlorobenzene	ND	10	ug/L							
trans-1,4-Dichloro-2-butene	ND	5.0	ug/L							
Dichlorodifluoromethane	ND	10	ug/L							
1,1-Dichloroethane	ND	2.0	ug/L							
1,2-Dichloroethane	ND	2.0	ug/L							
1,1-Dichloroethene	ND	2.0	ug/L							
cis-1,2-Dichloroethene	ND	2.0	ug/L							
trans-1,2-Dichloroethene	ND	2.0	ug/L							
1,2-Dichloropropane	ND	2.0	ug/L							
1,3-Dichloropropane	ND	2.0	ug/L							
2,2-Dichloropropane	ND	10	ug/L							
1,1-Dichloropropene	ND	10	ug/L							
cis-1,3-Dichloropropene	ND	2.0	ug/L							



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February 21, 2017

Report No.: AAB0498

Volatile Organic Compounds by EPA 8260 - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 7020439 - EPA 5030B										
Blank (7020439-BLK1)				Prepared & Analyzed: 02/15/17						
trans-1,3-Dichloropropene	ND	2.0	ug/L							
Ethylbenzene	ND	2.0	ug/L							
Ethyl Methacrylate	ND	10	ug/L							
Hexachlorobutadiene	ND	10	ug/L							
p-Isopropyltoluene	ND	10	ug/L							
Hexachloroethane	ND	10	ug/L							
Iodomethane	ND	10	ug/L							
Isopropylbenzene	ND	10	ug/L							
Methacrylonitrile	ND	10	ug/L							
Methyl Acrylate	ND	10	ug/L							
Methyl Butyl Ketone (2-Hexanone)	ND	10	ug/L							
Methylene Chloride	ND	5.0	ug/L							
Methyl Ethyl Ketone (2-Butanone)	ND	100	ug/L							
Methyl Methacrylate	ND	10	ug/L							
4-Methyl-2-pentanone (MIBK)	ND	10	ug/L							
Methyl-tert-Butyl Ether	ND	10	ug/L							
Naphthalene	ND	10	ug/L							
2-Nitropropane	ND	10	ug/L							
Propionitrile (Ethyl Cyanide)	ND	20	ug/L							
n-Propylbenzene	ND	10	ug/L							
Styrene	ND	5.0	ug/L							
1,1,1,2-Tetrachloroethane	ND	2.0	ug/L							
1,1,2,2-Tetrachloroethane	ND	2.0	ug/L							
Tetrachloroethene	ND	2.0	ug/L							
Tetrahydrofuran	ND	10	ug/L							
Toluene	ND	2.0	ug/L							
1,2,3-Trichlorobenzene	ND	10	ug/L							
1,2,4-Trichlorobenzene	ND	10	ug/L							
1,1,1-Trichloroethane	ND	2.0	ug/L							
1,1,2-Trichloroethane	ND	2.0	ug/L							
Trichloroethene	ND	2.0	ug/L							
Trichlorofluoromethane	ND	10	ug/L							
1,2,3-Trichloropropane	ND	10	ug/L							
1,2,4-Trimethylbenzene	ND	10	ug/L							
1,3,5-Trimethylbenzene	ND	10	ug/L							
Vinyl Acetate	ND	10	ug/L							
Vinyl Chloride	ND	2.0	ug/L							
m+p-Xylene	ND	5.0	ug/L							
o-Xylene	ND	5.0	ug/L							
Xylenes, total	ND	5.0	ug/L							
Surrogate: Dibromofluoromethane	50		ug/L	50.000		100	80-120			



PACE ANALYTICAL SERVICES, LLC.

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Attention: Ms. Katie T. Ross

February 21, 2017

Report No.: AAB0498

Volatile Organic Compounds by EPA 8260 - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 7020439 - EPA 5030B										
Blank (7020439-BLK1)				Prepared & Analyzed: 02/15/17						
Surrogate: 1,2-Dichloroethane-d4	53		ug/L	50.000		107	78-120			
Surrogate: Toluene-d8	52		ug/L	50.000		104	80-120			
Surrogate: 4-Bromofluorobenzene	52		ug/L	50.000		105	80-120			
LCS (7020439-BS1)				Prepared & Analyzed: 02/15/17						
Benzene	48		ug/L	50.000		96	67-134			
Chlorobenzene	51		ug/L	50.000		102	69-122			
1,1-Dichloroethene	42		ug/L	50.000		84	58-142			
Toluene	52		ug/L	50.000		103	68-127			
Trichloroethene	51		ug/L	50.000		102	72-132			
Surrogate: Dibromofluoromethane	50		ug/L	50.000		100	80-120			
Surrogate: 1,2-Dichloroethane-d4	53		ug/L	50.000		105	78-120			
Surrogate: Toluene-d8	51		ug/L	50.000		102	80-120			
Surrogate: 4-Bromofluorobenzene	52		ug/L	50.000		104	80-120			
Matrix Spike (7020439-MS1)				Source: AAB0498-02		Prepared & Analyzed: 02/15/17				
Benzene	48		ug/L	50.000	0.0	97	67-134			
Chlorobenzene	51		ug/L	50.000	0.0	101	69-122			
1,1-Dichloroethene	45		ug/L	50.000	0.0	90	58-142			
Toluene	51		ug/L	50.000	0.0	102	68-127			
Trichloroethene	53		ug/L	50.000	0.0	105	72-132			
Surrogate: Dibromofluoromethane	48		ug/L	50.000		96	80-120			
Surrogate: 1,2-Dichloroethane-d4	55		ug/L	50.000		111	78-120			
Surrogate: Toluene-d8	52		ug/L	50.000		104	80-120			
Surrogate: 4-Bromofluorobenzene	52		ug/L	50.000		104	80-120			
Matrix Spike Dup (7020439-MSD1)				Source: AAB0498-02		Prepared & Analyzed: 02/15/17				
Benzene	49		ug/L	50.000	0.0	97	67-134	0.3	9	
Chlorobenzene	52		ug/L	50.000	0.0	103	69-122	2	13	
1,1-Dichloroethene	47		ug/L	50.000	0.0	94	58-142	4	9	
Toluene	52		ug/L	50.000	0.0	105	68-127	3	9	
Trichloroethene	55		ug/L	50.000	0.0	111	72-132	5	11	
Surrogate: Dibromofluoromethane	49		ug/L	50.000		97	80-120			
Surrogate: 1,2-Dichloroethane-d4	55		ug/L	50.000		110	78-120			
Surrogate: Toluene-d8	52		ug/L	50.000		103	80-120			
Surrogate: 4-Bromofluorobenzene	53		ug/L	50.000		106	80-120			



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(770) 734-4200 FAX (770) 734-4201

February 21, 2017

Laboratory Certifications

Code	Description	Number	Expires
GADW	Georgia DW Inorganics Eff: 07/01/2016	812	06/30/2017
GADWM	Georgia DW Microbiology Eff: 07/01/2015	812	03/09/2017
NC	North Carolina	381	12/31/2017
NELAC	FL DOH (Non-Pot. Water, Solids) Eff:: 07/01/2016	E87315	06/30/2017
NELDW	FL DOH NELAC (Drinking Water) Eff: 07/01/2016	E87315	06/30/2017
SC	South Carolina	98011001	06/30/2017
TX	Texas	T104704397-08-TX	03/31/2017
VA	Virginia	1340	12/14/2017



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February 21, 2017

Legend

Definition of Laboratory Terms

ND - None Detected at the Reporting Limit

TIC - Tentatively Identified Compound

CFU - Colony Forming Units

SOP - Method run per Pace Standard Operating Procedure

RL - Reporting Limit

DF - Dilution Factor

* - Analyte not included in the NELAC list of certified analytes.

Sample Information

N-Nitrosodiphenylamine breaks down to diphenylamine in the GCMS; both analytes are reported as N-Nitrosodiphenylamine. Pace is not NELAC certified for diphenylamine.

Phthalic acid and phthalic anhydride are reported as dimethyl phthalate

Maleic acid and maleic anhydride are reported as dimethyl malate

1,2-Diphenylhydrazine breaks down to azobenzene in the GCMS; both analytes are reported as azobenzene

Definition of Qualifiers

QM-05 The spike recovery was outside acceptance limits for the MS and/or MSD and/or PDS due to suspected matrix interference. Sample results for the QC batch were accepted based on acceptable LCS recoveries.

J Estimated value less than Reporting Limit (RL) but greater than Method Detection Limit(MDL) (CLP J-Flag).

Note: Unless otherwise noted, all results are reported on an as received basis.

ANALYTICAL SERVICES, INC.
ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
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LOG-IN CHECKLIST

Printed: 2/15/2017 11:27:00AM

Attn: Ms. Katie T. Ross

Client: WENCK Associates

Project: Duluth, City of

Date Received: 02/14/17 12:00

Work Order: AAB0498

Logged In By: Charles Hawks

OBSERVATIONS

#Samples: 6

#Containers: 25

Minimum Temp(C): 2.0

Maximum Temp(C): 2.0

Custody Seal(s) Used: No

CHECKLIST ITEMS

COC included with Samples	YES
Sample Container(s) Intact	YES
Chain of Custody Complete	YES
Sample Container(s) Match COC	YES
Custody seal Intact	N/A
Temperature in Compliance	YES
Sufficient Sample Volume for Analysis	YES
Zero Headspace Maintained for VOA Analyses	YES
Samples labeled preserved (If Applicable)	YES
Samples received within Allowable Hold Times	YES
Samples Received on Ice	YES
Preservation Confirmed	YES

Comments:

February 17, 2017

Eben Buchanan
Pace Analytical Atlanta
110 Technology Parkway
Peachtree Corners, GA 30092

RE: Project: AAB0498 WENCK ASSOCIATES
Pace Project No.: 92329950

Dear Eben Buchanan:

Enclosed are the analytical results for sample(s) received by the laboratory on February 15, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Melissa Sybert
melissa.sybert@pacelabs.com
Project Manager

Enclosures



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: AAB0498 WENCK ASSOCIATES

Pace Project No.: 92329950

Charlotte Certification IDs

9800 Kinsey Ave. Ste 100, Huntersville, NC 28078
North Carolina Drinking Water Certification #: 37706
North Carolina Field Services Certification #: 5342
North Carolina Wastewater Certification #: 12

South Carolina Certification #: 99006001
Florida/NELAP Certification #: E87627
Kentucky UST Certification #: 84
Virginia/VELAP Certification #: 460221

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: AAB0498 WENCK ASSOCIATES

Pace Project No.: 92329950

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92329950001	MW1 AAB0498	Water	02/13/17 21:35	02/15/17 09:39

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: AAB0498 WENCK ASSOCIATES

Pace Project No.: 92329950

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92329950001	MW1 AAB0498	RSK 175 Modified	WDV	3	PASI-C

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AAB0498 WENCK ASSOCIATES

Pace Project No.: 92329950

Sample: MW1 AAB0498		Lab ID: 92329950001		Collected: 02/13/17 21:35		Received: 02/15/17 09:39		Matrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 Headspace		Analytical Method: RSK 175 Modified							
Ethane	ND	ug/L	10.0	10.0	1		02/16/17 11:35	74-84-0	
Ethene	ND	ug/L	10.0	10.0	1		02/16/17 11:35	74-85-1	
Methane	ND	ug/L	10.0	10.0	1		02/16/17 11:35	74-82-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AAB0498 WENCK ASSOCIATES

Pace Project No.: 92329950

QC Batch:	348588	Analysis Method:	RSK 175 Modified
QC Batch Method:	RSK 175 Modified	Analysis Description:	RSK 175 HEADSPACE
Associated Lab Samples:	92329950001		

METHOD BLANK: 1934104 Matrix: Water

Associated Lab Samples: 92329950001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	ND	10.0	10.0	02/16/17 10:49	
Ethene	ug/L	ND	10.0	10.0	02/16/17 10:49	
Methane	ug/L	ND	10.0	10.0	02/16/17 10:49	

LABORATORY CONTROL SAMPLE: 1934105

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Ethane	ug/L	658	676	103	70-130	
Ethene	ug/L	1120	1030	92	70-130	
Methane	ug/L	396	405	102	70-130	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: AAB0498 WENCK ASSOCIATES

Pace Project No.: 92329950

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-C Pace Analytical Services - Charlotte

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AAB0498 WENCK ASSOCIATES

Pace Project No.: 92329950

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92329950001	MW1 AAB0498	RSK 175 Modified	348588		

REPORT OF LABORATORY ANALYSIS

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	Document Name: Sample Condition Upon Receipt(SCUR)	Document Revised: Sept. 21, 2016 Page 1 of 2
	Document No.: F-CAR-CS-033-Rev.01	Issuing Authority: Pace Quality Office

Laboratory receiving samples:

Asheville ☐
 Eden ☐
 Greenwood ☐
 Huntersville ☒
 Raleigh ☐
 Mechanicsville ☐

Sample Condition Upon Receipt
Client Name:
Pace GA
Project #:
WO# : 92329950

Courier:
☐ Commercial
☐ Fed Ex
☐ Pace
☐ UPS
☐ USPS
☐ Other: _____
☐ Client



Custody Seal Present? ☐ Yes ☒ No
Seals Intact? ☒ Yes ☐ No

Date/Initials Person Examining Contents: 2-15-17 kw

Packing Material: ☐ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other: _____

Thermometer:
☐ IR Gun ID: T1603
Type of Ice: ☒ Wet ☐ Blue ☐ None ☐ Samples on ice, cooling process has begun

Correction Factor: **Cooler Temp Corrected (°C):** 3.3

Biological Tissue Frozen? ☐ Yes ☐ No ☐ N/A

Temp should be above freezing to 6°C

USDA Regulated Soil (☐ N/A, water sample)

Did samples originate in a quarantine zone within the United States: CA, NY, or SC (check maps)?

☐ Yes ☐ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☒ No

	Comments/Discrepancy:
Chain of Custody Present? ☒ Yes ☐ No ☐ N/A	1.
Samples Arrived within Hold Time? ☐ Yes ☐ No ☐ N/A	2.
Short Hold Time Analysis (<72 hr.)? ☐ Yes ☒ No ☐ N/A	3.
Rush Turn Around Time Requested? ☐ Yes ☐ No ☐ N/A	4.
Sufficient Volume? ☒ Yes ☐ No ☐ N/A	5.
Correct Containers Used? ☒ Yes ☐ No ☐ N/A	6.
-Pace Containers Used? ☒ Yes ☐ No ☐ N/A	
Containers Intact? ☒ Yes ☐ No ☐ N/A	7.
Samples Field Filtered? ☐ Yes ☐ No ☐ N/A	8. Note if sediment is visible in the dissolved container
Sample Labels Match COC? ☒ Yes ☐ No ☐ N/A	9.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	
Headspace in VOA Vials (>5-6mm)? ☐ Yes ☒ No ☐ N/A	10.
Trip Blank Present? ☐ Yes ☐ No ☒ N/A	11.
Trip Blank Custody Seals Present? ☐ Yes ☐ No ☒ N/A	

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? ☐ Yes ☐ No

Person Contacted: _____ Date/Time: _____
 Comments/Sample _____
 Discrepancy: _____

Project Manager SCURF Review: MS

Date: 2/15/17

Project Manager SRF Review: MS

Date: 2/15/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. Out of hold, incorrect preservative, out of temp, incorrect containers)



Document Name:
Sample Condition Upon Receipt(SCUR)
Document No.:
F-CAR-CS-033-Rev.01

Document Revised: Sept. 21, 2016
Page 2 of 2
Issuing Authority:
Pace Quality Office

*Check mark top half of box if pH and/or dechlorination is verified and within the acceptance range for preservation samples.

**Bottom half of box is to list number of bottles

Project #

W0#: 92329950

PM: MSS

Due Date: 02/21/17

CLIENT: 93-PaceATL

Item#	BP4U-125 mL Plastic Unpreserved (N/A) (Cl-)	BP3U-250 mL Plastic Unpreserved (N/A)	BP2U-500 mL Plastic Unpreserved (N/A)	BP1U-1 liter Plastic Unpreserved (N/A)	BP3S-250 mL Plastic H2SO4 (pH < 2) (Cl-)	BP3N-250 mL plastic HNO3 (pH < 2)	BP3Z-250 mL Plastic ZN Acetate & NaOH (>9)	BP3C-250 mL Plastic NaOH (pH > 12) (Cl-)	WGFU-Wide-mouthed Glass jar Unpreserved	AG1U-1 liter Amber Unpreserved (N/A) (Cl-)	AG1H-1 liter Amber HCl (pH < 2)	AG3U-250 mL Amber Unpreserved (N/A) (Cl-)	AG1S-1 liter Amber H2SO4 (pH < 2)	AG3S-250 mL Amber H2SO4 (pH < 2)	AG3A(DG3A)-250 mL Amber NH4Cl (N/A)(Cl-)	DG9H-40 mL VOA HCl (N/A)	VG9T-40 mL VOA Na2SO3 (N/A)	VG9U-40 mL VOA Unp (N/A)	DG9P-40 mL VOA H3PO4 (N/A)	VOAK (6 vials per kit)-5035 kit (N/A)	V/GK (3 vials per kit)-VPH/Gas kit (N/A)	SP5T-125 mL Sterile Plastic (N/A - lab)	SP2T-250 mL Sterile Plastic (N/A - lab)	BP3A-250 mL Plastic (NH2)2SO4 (9.3-9.7)	Cubitainer	VSGU-20 mL Scintillation vials (N/A)	GN
1																		2									
2																											
3																											
4																											
5																											
6																											
7																											
8																											
9																											
10																											
11																											
12																											

pH Adjustment Log for Preserved Samples

Sample ID	Type of Preservative	pH upon receipt	Date preservation adjusted	Time preservation adjusted	Amount of Preservative added	Lot #

Chain of Custody



Results Requested By: 2/21/2017

Owner Received Date:

Workorder Name: Duluth Main Street/GA

Workorder: AAB0498

Report To: Subcontract To:

Eben Buchanan
Pace Analytical Atlanta
110 Technology Parkway
Peachtree Corners, GA 30092
Phone (770)-734-4200

Trey Carter
Pace - Huntersville, NC
9800 Kinney AVE STE 100
Huntersville, NC 28078
Telephone : 704-875-9092

Preserved Containers

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Cool	MEE R	LAB USE ONLY
1	MW1	G	2/13/2017 21:35	AAB0498-06	GW	3	X	087
2								
3								
4								
5								
6								
7								
8								
9								
10								
Transfers	Released By	Date/Time	Received By	Date/Time	Comments			
1	Charles Hunt	2/14/17 1:20	Kenneth Pace	2-15-17 9:31				
2								
3								

Cooler Temperature on Receipt 3.3 °C Custody Seal Y or N Received on Ice Y or N Sample Intact Y or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC

This chain of custody is considered complete as is since this information is available in the owner laboratory.

CHAIN OF CUSTODY RECORD

AS

ANALYTICAL SERVICES, INC.
ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
1110 TECHNOLOGY PARKWAY NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201 • www.asi-lab.com

PAGE: 7 OF 7

CLIENT NAME: CK

CLIENT NAME: WACK
CLIENT ADDRESS: PHONE NUMBER FAX NUMBER
10801 Heilman Bridge Road
Bldg 100 Ste B40
Parsippany NJ 07054-3006
078-987-5840

ATTENTION:	Ross
CC:	Kristen Rivera

REQUESTED COMPLETION DATE:	PO #:
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PROJECT NAME/STATE

PROJECT NAME/STATE
Dwight Main Street / GA

PROJECT #. B5369-0001

DATE	TIME	MATRIX CODE*	C P	G O	R N	A B	SAMPLE IDENTIFICATION
2/13/17	1135	GW				X	MW-7
2/13/17	1350	GW				X	MW-11
2/13/17	1550	GW				X	MW-3
2/13/17	1755	GW				X	MW-4
2/13/17	1920	GW				X	MW-2
2/13/17	2155	GW				X	MW-1

Dispersives

SAMPLED BY AND TITLE	DATE/TIME
Simoney, J. B.	2/14/17 9:30 am
RECEIVED BY	DATE/TIME
K. Ross	2-13-14 11:35
ENTERED	DATE/TIME
2/14/17	12:00
ENTERED	DATE/TIME
2/14/17	12:00

[illegible]

30 November 2016

Mr. Jim Fineis
Atlas Geo-Sampling Company
120 Nottaway Lane
Alpharetta, GA 30009



H&P Project: AG112116-13
Client Project: Wenck Duluth

Dear Mr. Jim Fineis:

Enclosed is the analytical report for the above referenced project. The data herein applies to samples as received by H&P Mobile Geochemistry, Inc. on 21-Nov-16 which were analyzed in accordance with the attached Chain of Custody record(s).

The results for all sample analyses and required QA/QC analyses are presented in the following sections and summarized in the documents:

- Sample Summary
- Case Narrative (if applicable)
- Sample Results
- Quality Control Summary
- Notes and Definitions / Appendix
- Chain of Custody
- Sampling Logs (if applicable)

Unless otherwise noted, I certify that all analyses were performed and reviewed in compliance with our Quality Systems Manual and Standard Operating Procedures. This report shall not be reproduced, except in full, without the written approval of H&P Mobile Geochemistry, Inc.

We at H&P Mobile Geochemistry, Inc. sincerely appreciate the opportunity to provide analytical services to you on this project. If you have any questions or concerns regarding this analytical report, please contact me at your convenience at 760-804-9678.

Sincerely,



Janis La Roux
Laboratory Director

H&P Mobile Geochemistry, Inc. is certified under the California ELAP, the National Environmental Laboratory Accreditation Conference (NELAC) and the Department of Defense Accreditation Programs.

Atlas Geo-Sampling Company
120 Nottaway Lane
Alpharetta, GA 30009

Project: AG112116-13
Project Number: Wenck Duluth
Project Manager: Mr. Jim Fineis

Reported:
30-Nov-16 13:54

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SV-1	E611091-01	Vapor	15-Nov-16	21-Nov-16

Atlas Geo-Sampling Company
120 Nottaway Lane
Alpharetta, GA 30009

Project: AG112116-13
Project Number: Wenck Duluth
Project Manager: Mr. Jim Fineis

Reported:
30-Nov-16 13:54

DETECTIONS SUMMARY

Sample ID: SV-1

Laboratory ID: E611091-01

Analyte	Result	Reporting	Units	Method	Notes
		Limit			
Dichlorodifluoromethane (F12)	7.5	5.0	ug/m3	EPA TO-15	
Benzene	3.7	3.2	ug/m3	EPA TO-15	
Toluene	9.2	3.8	ug/m3	EPA TO-15	
Tetrachloroethene	1800	6.9	ug/m3	EPA TO-15	
1,2,4-Trimethylbenzene	5.5	5.0	ug/m3	EPA TO-15	

Atlas Geo-Sampling Company
120 Nottaway Lane
Alpharetta, GA 30009

Project: AG112116-13
Project Number: Wenck Duluth
Project Manager: Mr. Jim Fineis

Reported:
30-Nov-16 13:54

Volatile Organic Compounds by EPA TO-15

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
SV-1 (E611091-01) Vapor Sampled: 15-Nov-16 Received: 21-Nov-16									
Dichlorodifluoromethane (F12)	7.5	5.0	ug/m3	1	EK62812	28-Nov-16	28-Nov-16	EPA TO-15	
Chloromethane	ND	2.1	"	"	"	"	"	"	
Dichlorotetrafluoroethane (F114)	ND	7.1	"	"	"	"	"	"	
Vinyl chloride	ND	2.6	"	"	"	"	"	"	
Bromomethane	ND	16	"	"	"	"	"	"	
Chloroethane	ND	8.0	"	"	"	"	"	"	
Trichlorofluoromethane (F11)	ND	5.6	"	"	"	"	"	"	
1,1-Dichloroethene	ND	4.0	"	"	"	"	"	"	
1,1,2-Trichlorotrifluoroethane (F113)	ND	7.7	"	"	"	"	"	"	
Methylene chloride (Dichloromethane)	ND	3.5	"	"	"	"	"	"	
Carbon disulfide	ND	6.3	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	8.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	4.1	"	"	"	"	"	"	
2-Butanone (MEK)	ND	30	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	4.0	"	"	"	"	"	"	
Chloroform	ND	4.9	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	5.5	"	"	"	"	"	"	
1,2-Dichloroethane (EDC)	ND	4.1	"	"	"	"	"	"	
Benzene	3.7	3.2	"	"	"	"	"	"	
Carbon tetrachloride	ND	6.4	"	"	"	"	"	"	
Trichloroethene	ND	5.5	"	"	"	"	"	"	
1,2-Dichloropropane	ND	9.4	"	"	"	"	"	"	
Bromodichloromethane	ND	6.8	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	4.6	"	"	"	"	"	"	
4-Methyl-2-pentanone (MIBK)	ND	8.3	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	4.6	"	"	"	"	"	"	
Toluene	9.2	3.8	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	5.5	"	"	"	"	"	"	
2-Hexanone (MBK)	ND	8.3	"	"	"	"	"	"	
Dibromochloromethane	ND	8.6	"	"	"	"	"	"	
Tetrachloroethene	1800	6.9	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	7.8	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	7.0	"	"	"	"	"	"	
Chlorobenzene	ND	4.7	"	"	"	"	"	"	
Ethylbenzene	ND	4.4	"	"	"	"	"	"	
m,p-Xylene	ND	8.8	"	"	"	"	"	"	
Styrene	ND	4.3	"	"	"	"	"	"	
o-Xylene	ND	4.4	"	"	"	"	"	"	

Atlas Geo-Sampling Company
120 Nottaway Lane
Alpharetta, GA 30009

Project: AG112116-13
Project Number: Wenck Duluth
Project Manager: Mr. Jim Fineis

Reported:
30-Nov-16 13:54

Volatile Organic Compounds by EPA TO-15

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
SV-1 (E611091-01) Vapor Sampled: 15-Nov-16 Received: 21-Nov-16									
Bromoform	ND	10	ug/m3	1	EK62812	28-Nov-16	28-Nov-16	EPA TO-15	
1,1,2,2-Tetrachloroethane	ND	7.0	"	"	"	"	"	"	
4-Ethyltoluene	ND	5.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	5.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	5.5	5.0	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	12	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	12	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	12	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	38	"	"	"	"	"	"	
Hexachlorobutadiene	ND	54	"	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		96.8 %	76-134		"	"	"	"	
Surrogate: Toluene-d8		99.4 %	78-125		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		96.2 %	77-127		"	"	"	"	

Atlas Geo-Sampling Company
120 Nottaway Lane
Alpharetta, GA 30009

Project: AG112116-13
Project Number: Wenck Duluth
Project Manager: Mr. Jim Fineis

Reported:
30-Nov-16 13:54

Volatile Organic Compounds by EPA TO-15 - Quality Control
H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch EK62812 - TO-15

Blank (EK62812-BLK1)

Prepared & Analyzed: 28-Nov-16

Dichlorodifluoromethane (F12)	ND	5.0	ug/m3
Chloromethane	ND	2.1	"
Dichlorotetrafluoroethane (F114)	ND	7.1	"
Vinyl chloride	ND	2.6	"
Bromomethane	ND	16	"
Chloroethane	ND	8.0	"
Trichlorofluoromethane (F11)	ND	5.6	"
1,1-Dichloroethene	ND	4.0	"
1,1,2-Trichlorotrifluoroethane (F113)	ND	7.7	"
Methylene chloride (Dichloromethane)	ND	3.5	"
Carbon disulfide	ND	6.3	"
trans-1,2-Dichloroethene	ND	8.0	"
1,1-Dichloroethane	ND	4.1	"
2-Butanone (MEK)	ND	30	"
cis-1,2-Dichloroethene	ND	4.0	"
Chloroform	ND	4.9	"
1,1,1-Trichloroethane	ND	5.5	"
1,2-Dichloroethane (EDC)	ND	4.1	"
Benzene	ND	3.2	"
Carbon tetrachloride	ND	6.4	"
Trichloroethene	ND	5.5	"
1,2-Dichloropropane	ND	9.4	"
Bromodichloromethane	ND	6.8	"
cis-1,3-Dichloropropene	ND	4.6	"
4-Methyl-2-pentanone (MIBK)	ND	8.3	"
trans-1,3-Dichloropropene	ND	4.6	"
Toluene	ND	3.8	"
1,1,2-Trichloroethane	ND	5.5	"
2-Hexanone (MBK)	ND	8.3	"
Dibromochloromethane	ND	8.6	"
Tetrachloroethene	ND	6.9	"
1,2-Dibromoethane (EDB)	ND	7.8	"
1,1,1,2-Tetrachloroethane	ND	7.0	"
Chlorobenzene	ND	4.7	"

Atlas Geo-Sampling Company
120 Nottaway Lane
Alpharetta, GA 30009

Project: AG112116-13
Project Number: Wenck Duluth
Project Manager: Mr. Jim Fineis

Reported:
30-Nov-16 13:54

Volatile Organic Compounds by EPA TO-15 - Quality Control
H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch EK62812 - TO-15

Blank (EK62812-BLK1)

Prepared & Analyzed: 28-Nov-16

Ethylbenzene	ND	4.4	ug/m3
m,p-Xylene	ND	8.8	"
Styrene	ND	4.3	"
o-Xylene	ND	4.4	"
Bromoform	ND	10	"
1,1,2,2-Tetrachloroethane	ND	7.0	"
4-Ethyltoluene	ND	5.0	"
1,3,5-Trimethylbenzene	ND	5.0	"
1,2,4-Trimethylbenzene	ND	5.0	"
1,3-Dichlorobenzene	ND	12	"
1,4-Dichlorobenzene	ND	12	"
1,2-Dichlorobenzene	ND	12	"
1,2,4-Trichlorobenzene	ND	38	"
Hexachlorobutadiene	ND	54	"

Surrogate: 1,2-Dichloroethane-d4	45.4	"	42.9	106	76-134
Surrogate: Toluene-d8	40.9	"	41.4	98.9	78-125
Surrogate: 4-Bromofluorobenzene	72.9	"	72.9	100	77-127

LCS (EK62812-BS1)

Prepared & Analyzed: 28-Nov-16

Dichlorodifluoromethane (F12)	19	5.0	ug/m3	20.2	95.1	59-128
Vinyl chloride	9.5	2.6	"	10.4	91.2	64-127
Chloroethane	8.9	8.0	"	10.7	83.1	63-127
Trichlorofluoromethane (F11)	21	5.6	"	22.6	94.7	62-126
1,1-Dichloroethene	15	4.0	"	16.2	91.9	61-133
1,1,2-Trichlorotrifluoroethane (F113)	28	7.7	"	31.0	90.7	66-126
Methylene chloride (Dichloromethane)	14	3.5	"	14.2	97.3	62-115
trans-1,2-Dichloroethene	14	8.0	"	16.2	89.6	67-124
1,1-Dichloroethane	15	4.1	"	16.5	89.0	68-126
cis-1,2-Dichloroethene	15	4.0	"	16.0	91.0	70-121
Chloroform	18	4.9	"	19.8	91.8	68-123
1,1,1-Trichloroethane	21	5.5	"	22.2	95.0	68-125
1,2-Dichloroethane (EDC)	15	4.1	"	16.5	90.2	65-128
Benzene	12	3.2	"	13.0	95.1	69-119

Atlas Geo-Sampling Company
120 Nottaway Lane
Alpharetta, GA 30009

Project: AG112116-13
Project Number: Wenck Duluth
Project Manager: Mr. Jim Fineis

Reported:
30-Nov-16 13:54

Volatile Organic Compounds by EPA TO-15 - Quality Control
H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch EK62812 - TO-15

LCS (EK62812-BS1)

Prepared & Analyzed: 28-Nov-16

Carbon tetrachloride	23	6.4	ug/m3	25.6		91.3	68-132			
Trichloroethene	20	5.5	"	21.9		91.7	71-123			
Toluene	14	3.8	"	15.4		90.9	66-119			
1,1,2-Trichloroethane	20	5.5	"	22.2		89.5	73-119			
Tetrachloroethene	25	6.9	"	27.6		92.3	66-124			
1,1,1,2-Tetrachloroethane	26	7.0	"	28.0		91.3	67-129			
Ethylbenzene	17	4.4	"	17.7		94.5	70-124			
m,p-Xylene	32	8.8	"	35.4		89.9	61-134			
o-Xylene	16	4.4	"	17.7		89.3	67-125			
1,1,2,2-Tetrachloroethane	23	7.0	"	28.0		81.6	65-127			

Surrogate: 1,2-Dichloroethane-d4	41.3		"	42.9		96.4	76-134			
Surrogate: Toluene-d8	40.9		"	41.4		98.9	78-125			
Surrogate: 4-Bromofluorobenzene	75.1		"	72.9		103	77-127			

LCS Dup (EK62812-BS1)

Prepared & Analyzed: 28-Nov-16

Dichlorodifluoromethane (F12)	24	5.0	ug/m3	20.2		117	59-128	20.7	25	
Vinyl chloride	11	2.6	"	10.4		109	64-127	17.9	25	
Chloroethane	11	8.0	"	10.7		101	63-127	19.8	25	
Trichlorofluoromethane (F11)	26	5.6	"	22.6		114	62-126	18.8	25	
1,1-Dichloroethene	18	4.0	"	16.2		112	61-133	20.0	25	
1,1,2-Trichlorotrifluoroethane (F113)	34	7.7	"	31.0		110	66-126	18.9	25	
Methylene chloride (Dichloromethane)	16	3.5	"	14.2		115	62-115	16.9	25	QL-1H
trans-1,2-Dichloroethene	18	8.0	"	16.2		110	67-124	20.0	25	
1,1-Dichloroethane	18	4.1	"	16.5		107	68-126	18.8	25	
cis-1,2-Dichloroethene	18	4.0	"	16.0		112	70-121	20.6	25	
Chloroform	22	4.9	"	19.8		112	68-123	19.6	25	
1,1,1-Trichloroethane	25	5.5	"	22.2		114	68-125	17.8	25	
1,2-Dichloroethane (EDC)	18	4.1	"	16.5		109	65-128	19.0	25	
Benzene	15	3.2	"	13.0		115	69-119	19.2	25	
Carbon tetrachloride	29	6.4	"	25.6		112	68-132	19.9	25	
Trichloroethene	24	5.5	"	21.9		108	71-123	16.6	25	
Toluene	17	3.8	"	15.4		110	66-119	19.0	25	
1,1,2-Trichloroethane	24	5.5	"	22.2		109	73-119	20.0	25	

Atlas Geo-Sampling Company
120 Nottaway Lane
Alpharetta, GA 30009

Project: AG112116-13
Project Number: Wenck Duluth
Project Manager: Mr. Jim Fineis

Reported:
30-Nov-16 13:54

Volatile Organic Compounds by EPA TO-15 - Quality Control
H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch EK62812 - TO-15

LCS Dup (EK62812-bsd1)

Prepared & Analyzed: 28-Nov-16

Tetrachloroethene	31	6.9	ug/m3	27.6		111	66-124	18.0	25	
1,1,1,2-Tetrachloroethane	31	7.0	"	28.0		112	67-129	20.3	25	
Ethylbenzene	20	4.4	"	17.7		111	70-124	16.2	25	
m,p-Xylene	37	8.8	"	35.4		106	61-134	16.0	25	
o-Xylene	19	4.4	"	17.7		105	67-125	16.6	25	
1,1,2,2-Tetrachloroethane	27	7.0	"	28.0		98.1	65-127	18.3	25	
Surrogate: 1,2-Dichloroethane-d4	42.9		"	42.9		100	76-134			
Surrogate: Toluene-d8	41.5		"	41.4		100	78-125			
Surrogate: 4-Bromofluorobenzene	75.1		"	72.9		103	77-127			

Atlas Geo-Sampling Company
120 Nottaway Lane
Alpharetta, GA 30009

Project: AG112116-13
Project Number: Wenck Duluth
Project Manager: Mr. Jim Fineis

Reported:
30-Nov-16 13:54

Notes and Definitions

QL-1H The LCS and/or LCSD recoveries fell above the established control specifications for this analyte. Any result for this compound is qualified and should be considered biased high.

LCC Leak Check Compound

ND Analyte NOT DETECTED at or above the reporting limit

MDL Method Detection Limit

%REC Percent Recovery

RPD Relative Percent Difference

Appendix

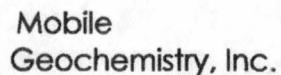
H&P Mobile Geochemistry, Inc. is approved as an Environmental Testing Laboratory and Mobile Laboratory in accordance with the DoD-ELAP and the ISO 17025 programs, certification number L15-279-R1

H&P is approved by the State of Arizona as an Environmental Testing Laboratory and Mobile Laboratory, certification numbers AZM758 and AZ0779.

H&P is approved by the State of California as an Environmental Laboratory and Mobile Laboratory in conformance with the Environmental Laboratory Accreditation Program (ELAP) for the category of Volatile and Semi-Volatile Organic Chemistry of Hazardous Waste, certification numbers 2740, 2741, 2743, 2744, 2745, 2754 & 2930.

H&P is approved by the State of Florida Department of Health under the National Environmental Laboratory Accreditation Conference (NELAC) certification number E871100.

The complete list of stationary and mobile laboratory certifications along with the fields of testing (FOTs) and analyte lists are available at www.handpmg.com/about/certifications.



2470 Impala Drive, Carlsbad, CA 92010
 & Field Office - Signal Hill, CA
 W handpmg.com E info@handpmg.com
 P 760.804.9678 F 760.804.9159

DATE: 11-25-16
Page 1 of 1

Sample Receipt (Lab Use Only)	
Date Rec'd: 11/21/16	Control #: 161078.01
H&P Project # AG112116-13	
Lab Work Order # 6611091	
Sample Intact: ☒ Yes ☐ No ☐ See Notes Below	
Receipt Gauge ID: 11167	Temp: RT
Outside Lab:	
Receipt Notes/Tracking #: 121348381326284556	
Summa canister #531 was an error on the COC; corrected to #064 per Jim Fineis	
Lab PM Initials: SRN	

*Approval constitutes as authorization to proceed with analysis and acceptance of conditions on back



ANALYTICAL ENVIRONMENTAL SERVICES, INC.

November 21, 2016

Katie Ross
Wenck Associates
1080 Holcomb Bridge Rd, Bldg 100, Stc
Roswell GA 30076

TEL: (678) 987-5840
FAX:

RE: City of Duluth, GA

Dear Katie Ross:

Order No: 1611E75

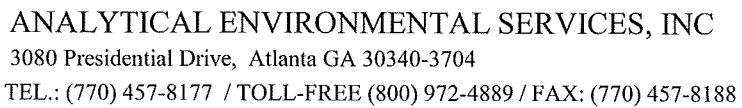
Analytical Environmental Services, Inc. received 5 samples on 11/15/2016 4:50:00 PM for the analyses presented in following report.

No problems were encountered during the analyses. Additionally, all results for the associated Quality Control samples were within EPA and/or AES established limits. Any discrepancies associated with the analyses contained herein will be noted and submitted in the form of a project Case Narrative.

AES's accreditations are as follows:

- NELAC/Florida State Laboratory ID E87582 for analysis of Non-Potable Water, Solid & Chemical Materials, and Drinking Water Microbiology, effective 07/01/16-06/30/17.
- NELAC/Louisiana Agency Interest No. 100818 for or analysis of Non-Potable Water and Solid & Chemical Materials, effective 07/01/16-06/30/17.
- NELAC/Texas Certificate No. T104704509-16-6 for or analysis of Non-Potable Water and Solid & Chemical Materials, effective 03/01/16-02/28/17.
- AIHA-LAP, LLC Laboratory ID: 100671 for Industrial Hygiene samples (Organics, Metals, PCM Asbestos, Gravimetric), Environmental Lead (Paint, Soil, Dust Wipes, Air), and Environmental Microbiology (Fungal) Direct Examination, effective until 09/01/17.

Chris Pafford
Project Manager



Work Order: 1011E75

Date: 11/14/10 Page 1 of 1

COMPANY: Wenck		ADDRESS: Roswell, GA						ANALYSIS REQUESTED VOC										Visit our website www.aesatlanta.com to check on the status of your results, place bottle orders, etc.		No # of Containers
PHONE:		FAX:																		
SAMPLED BY: E McCullen		SIGNATURE: [Signature]																		
#	SAMPLE ID	SAMPLED		Grab	Composite	Matrix (See codes)	PRESERVATION (See codes)										REMARKS			
		DATE	TIME																	
1	IW-MW3-50	11/14/10	10:15	X		GW	2											GW	2	
2	IW-MW3-55	11/14/10	11:00	X		GW	2												2	
3	IW-MW3-63	11/14/10	2:03	X		GW	2												2	
4	TW-1	11/14/10	3:50	X		GW	2												2	
5																				
6																				
7																				
8																				
9																				
10																				
11																				
12																				
13																				
14																				
RELINQUISHED BY: [Signature]		DATE/TIME: 11/15/10 10:50		RECEIVED BY: Jenni Kelly		DATE/TIME: 11/15/10 4:50 pm		PROJECT INFORMATION										RECEIPT		
2:				2:				PROJECT NAME: City of Duluth, GA										Total # of Containers	8	
3:				3:				PROJECT #: 5365										Turnaround Time Request		
								SITE ADDRESS: Main St										☒ Standard 5 Business Days		
								SEND REPORT TO: KROSS@wenck.com										☐ 2 Business Day Rush		
								INVOICE TO: (IF DIFFERENT FROM ABOVE)										☐ Next Business Day Rush		
								QUOTE #:										☐ Same Day Rush (auth req.)		
								PO#:										☐ Other _____		
SPECIAL INSTRUCTIONS/COMMENTS:				SHIPMENT METHOD:														STATE PROGRAM (if any): _____		
				OUT / / VIA:														E-mail? Fax?		
				IN CLIENT FedEx UPS MAIL COURIER														DATA PACKAGE: I ☐ II ☐ III ☐ IV ☐		
				GREYHOUND OTHER _____																

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water WW = Waste Water W = Water (Blanks) DW = Drinking Water (Blanks) O = Other (specify)

PRESERVATIVE CODES: H+I = Hydrochloric acid + ice I = Ice only N = Nitric acid S+I = Sulfuric acid + ice S/M+I = Sodium Bisulfate/Methanol + ice O = Other (specify) NA = None

Client: Wenck Associates
Project: City of Duluth, GA
Lab ID: 1611E75

Case Narrative

Sample Receiving Nonconformance:

Sample information on the Chain of Custody did not match that on the sample bottle labels. Sample 003 "IW-MW3-63" had a collection time of "2:03" on the COC, but the bottle label indicates "12:03." Samples logged in using the information provided by the COC.

A trip blank was provided but not listed on the Chain of Custody. Trip blank was analyzed at no cost to the client

Analytical Environmental Services, Inc
Date: 21-Nov-16

Client: Wenck Associates
Project Name: City of Duluth, GA
Lab ID: 1611E75-001

Client Sample ID: IW-MW3-50
Collection Date: 11/14/2016 10:15:00 AM
Matrix: Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				(SW5030B)				
1,1,1-Trichloroethane	BRL	5.0		ug/L	233191	1	11/19/2016 22:50	NP
1,1,2,2-Tetrachloroethane	BRL	5.0		ug/L	233191	1	11/19/2016 22:50	NP
1,1,2-Trichloroethane	BRL	5.0		ug/L	233191	1	11/19/2016 22:50	NP
1,1-Dichloroethane	BRL	5.0		ug/L	233191	1	11/19/2016 22:50	NP
1,1-Dichloroethene	BRL	5.0		ug/L	233191	1	11/19/2016 22:50	NP
1,2,4-Trichlorobenzene	BRL	5.0		ug/L	233191	1	11/19/2016 22:50	NP
1,2-Dibromo-3-chloropropane	BRL	5.0		ug/L	233191	1	11/19/2016 22:50	NP
1,2-Dibromoethane	BRL	5.0		ug/L	233191	1	11/19/2016 22:50	NP
1,2-Dichlorobenzene	BRL	5.0		ug/L	233191	1	11/19/2016 22:50	NP
1,2-Dichloroethane	BRL	5.0		ug/L	233191	1	11/19/2016 22:50	NP
1,2-Dichloropropane	BRL	5.0		ug/L	233191	1	11/19/2016 22:50	NP
1,3-Dichlorobenzene	BRL	5.0		ug/L	233191	1	11/19/2016 22:50	NP
1,4-Dichlorobenzene	BRL	5.0		ug/L	233191	1	11/19/2016 22:50	NP
2-Butanone	BRL	50		ug/L	233191	1	11/19/2016 22:50	NP
2-Hexanone	BRL	10		ug/L	233191	1	11/19/2016 22:50	NP
4-Methyl-2-pentanone	BRL	10		ug/L	233191	1	11/19/2016 22:50	NP
Acetone	BRL	50		ug/L	233191	1	11/19/2016 22:50	NP
Benzene	BRL	5.0		ug/L	233191	1	11/19/2016 22:50	NP
Bromodichloromethane	BRL	5.0		ug/L	233191	1	11/19/2016 22:50	NP
Bromoform	BRL	5.0		ug/L	233191	1	11/19/2016 22:50	NP
Bromomethane	BRL	5.0		ug/L	233191	1	11/19/2016 22:50	NP
Carbon disulfide	BRL	5.0		ug/L	233191	1	11/19/2016 22:50	NP
Carbon tetrachloride	BRL	5.0		ug/L	233191	1	11/19/2016 22:50	NP
Chlorobenzene	BRL	5.0		ug/L	233191	1	11/19/2016 22:50	NP
Chloroethane	BRL	10		ug/L	233191	1	11/19/2016 22:50	NP
Chloroform	BRL	5.0		ug/L	233191	1	11/19/2016 22:50	NP
Chloromethane	BRL	10		ug/L	233191	1	11/19/2016 22:50	NP
cis-1,2-Dichloroethene	6.6	5.0		ug/L	233191	1	11/19/2016 22:50	NP
cis-1,3-Dichloropropene	BRL	5.0		ug/L	233191	1	11/19/2016 22:50	NP
Cyclohexane	BRL	5.0		ug/L	233191	1	11/19/2016 22:50	NP
Dibromochloromethane	BRL	5.0		ug/L	233191	1	11/19/2016 22:50	NP
Dichlorodifluoromethane	BRL	10		ug/L	233191	1	11/19/2016 22:50	NP
Ethylbenzene	BRL	5.0		ug/L	233191	1	11/19/2016 22:50	NP
Freon-113	BRL	10		ug/L	233191	1	11/19/2016 22:50	NP
Isopropylbenzene	BRL	5.0		ug/L	233191	1	11/19/2016 22:50	NP
m,p-Xylene	BRL	5.0		ug/L	233191	1	11/19/2016 22:50	NP
Methyl acetate	BRL	5.0		ug/L	233191	1	11/19/2016 22:50	NP
Methyl tert-butyl ether	BRL	5.0		ug/L	233191	1	11/19/2016 22:50	NP
Methylcyclohexane	BRL	5.0		ug/L	233191	1	11/19/2016 22:50	NP
Methylene chloride	BRL	5.0		ug/L	233191	1	11/19/2016 22:50	NP
o-Xylene	BRL	5.0		ug/L	233191	1	11/19/2016 22:50	NP

Qualifiers: * Value exceeds maximum contaminant level
 BRL Below reporting limit
 H Holding times for preparation or analysis exceeded
 N Analyte not NELAC certified
 B Analyte detected in the associated method blank
 > Greater than Result value

E Estimated (value above quantitation range)
 S Spike Recovery outside limits due to matrix
 Narr See case narrative
 NC Not confirmed
 < Less than Result value
 J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc

Date: 21-Nov-16

Client: Wenck Associates
 Project Name: City of Duluth, GA
 Lab ID: 1611E75-001

Client Sample ID: IW-MW3-50
 Collection Date: 11/14/2016 10:15:00 AM
 Matrix: Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				(SW5030B)				
Styrene	BRL	5.0		ug/L	233191	1	11/19/2016 22:50	NP
Tetrachloroethene	260	250		ug/L	233191	50	11/18/2016 12:43	NP
Toluene	BRL	5.0		ug/L	233191	1	11/19/2016 22:50	NP
trans-1,2-Dichloroethene	BRL	5.0		ug/L	233191	1	11/19/2016 22:50	NP
trans-1,3-Dichloropropene	BRL	5.0		ug/L	233191	1	11/19/2016 22:50	NP
Trichloroethene	12	5.0		ug/L	233191	1	11/19/2016 22:50	NP
Trichlorofluoromethane	BRL	5.0		ug/L	233191	1	11/19/2016 22:50	NP
Vinyl chloride	BRL	2.0		ug/L	233191	1	11/19/2016 22:50	NP
Surr: 4-Bromofluorobenzene	83.4	66.1-129		%REC	233191	50	11/18/2016 12:43	NP
Surr: 4-Bromofluorobenzene	94.4	66.1-129		%REC	233191	1	11/19/2016 22:50	NP
Surr: Dibromofluoromethane	113	83.6-123		%REC	233191	50	11/18/2016 12:43	NP
Surr: Dibromofluoromethane	102	83.6-123		%REC	233191	1	11/19/2016 22:50	NP
Surr: Toluene-d8	90.6	81.8-118		%REC	233191	50	11/18/2016 12:43	NP
Surr: Toluene-d8	99.6	81.8-118		%REC	233191	1	11/19/2016 22:50	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value

- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc
Date: 21-Nov-16

Client: Wenck Associates
Project Name: City of Duluth, GA
Lab ID: 1611E75-002

Client Sample ID: IW-MW3-55
Collection Date: 11/14/2016 11:00:00 AM
Matrix: Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				(SW5030B)				
1,1,1-Trichloroethane	BRL	5.0		ug/L	233191	1	11/19/2016 23:37	NP
1,1,2,2-Tetrachloroethane	BRL	5.0		ug/L	233191	1	11/19/2016 23:37	NP
1,1,2-Trichloroethane	BRL	5.0		ug/L	233191	1	11/19/2016 23:37	NP
1,1-Dichloroethane	BRL	5.0		ug/L	233191	1	11/19/2016 23:37	NP
1,1-Dichloroethene	BRL	5.0		ug/L	233191	1	11/19/2016 23:37	NP
1,2,4-Trichlorobenzene	BRL	5.0		ug/L	233191	1	11/19/2016 23:37	NP
1,2-Dibromo-3-chloropropane	BRL	5.0		ug/L	233191	1	11/19/2016 23:37	NP
1,2-Dibromoethane	BRL	5.0		ug/L	233191	1	11/19/2016 23:37	NP
1,2-Dichlorobenzene	BRL	5.0		ug/L	233191	1	11/19/2016 23:37	NP
1,2-Dichloroethane	BRL	5.0		ug/L	233191	1	11/19/2016 23:37	NP
1,2-Dichloropropane	BRL	5.0		ug/L	233191	1	11/19/2016 23:37	NP
1,3-Dichlorobenzene	BRL	5.0		ug/L	233191	1	11/19/2016 23:37	NP
1,4-Dichlorobenzene	BRL	5.0		ug/L	233191	1	11/19/2016 23:37	NP
2-Butanone	BRL	50		ug/L	233191	1	11/19/2016 23:37	NP
2-Hexanone	BRL	10		ug/L	233191	1	11/19/2016 23:37	NP
4-Methyl-2-pentanone	BRL	10		ug/L	233191	1	11/19/2016 23:37	NP
Acetone	BRL	50		ug/L	233191	1	11/19/2016 23:37	NP
Benzene	BRL	5.0		ug/L	233191	1	11/19/2016 23:37	NP
Bromodichloromethane	BRL	5.0		ug/L	233191	1	11/19/2016 23:37	NP
Bromoform	BRL	5.0		ug/L	233191	1	11/19/2016 23:37	NP
Bromomethane	BRL	5.0		ug/L	233191	1	11/19/2016 23:37	NP
Carbon disulfide	BRL	5.0		ug/L	233191	1	11/19/2016 23:37	NP
Carbon tetrachloride	BRL	5.0		ug/L	233191	1	11/19/2016 23:37	NP
Chlorobenzene	BRL	5.0		ug/L	233191	1	11/19/2016 23:37	NP
Chloroethane	BRL	10		ug/L	233191	1	11/19/2016 23:37	NP
Chloroform	BRL	5.0		ug/L	233191	1	11/19/2016 23:37	NP
Chloromethane	BRL	10		ug/L	233191	1	11/19/2016 23:37	NP
cis-1,2-Dichloroethene	25	5.0		ug/L	233191	1	11/19/2016 23:37	NP
cis-1,3-Dichloropropene	BRL	5.0		ug/L	233191	1	11/19/2016 23:37	NP
Cyclohexane	BRL	5.0		ug/L	233191	1	11/19/2016 23:37	NP
Dibromochloromethane	BRL	5.0		ug/L	233191	1	11/19/2016 23:37	NP
Dichlorodifluoromethane	BRL	10		ug/L	233191	1	11/19/2016 23:37	NP
Ethylbenzene	BRL	5.0		ug/L	233191	1	11/19/2016 23:37	NP
Freon-113	BRL	10		ug/L	233191	1	11/19/2016 23:37	NP
Isopropylbenzene	BRL	5.0		ug/L	233191	1	11/19/2016 23:37	NP
m,p-Xylene	BRL	5.0		ug/L	233191	1	11/19/2016 23:37	NP
Methyl acetate	BRL	5.0		ug/L	233191	1	11/19/2016 23:37	NP
Methyl tert-butyl ether	BRL	5.0		ug/L	233191	1	11/19/2016 23:37	NP
Methylcyclohexane	BRL	5.0		ug/L	233191	1	11/19/2016 23:37	NP
Methylene chloride	BRL	5.0		ug/L	233191	1	11/19/2016 23:37	NP
o-Xylene	BRL	5.0		ug/L	233191	1	11/19/2016 23:37	NP

Qualifiers: * Value exceeds maximum contaminant level
 BRL Below reporting limit
 H Holding times for preparation or analysis exceeded
 N Analyte not NELAC certified
 B Analyte detected in the associated method blank
 > Greater than Result value

E Estimated (value above quantitation range)
 S Spike Recovery outside limits due to matrix
 Narr See case narrative
 NC Not confirmed
 < Less than Result value
 J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc

Date: 21-Nov-16

Client: Wenck Associates	Client Sample ID: IW-MW3-55
Project Name: City of Duluth, GA	Collection Date: 11/14/2016 11:00:00 AM
Lab ID: 1611E75-002	Matrix: Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				(SW5030B)				
Styrene	BRL	5.0		ug/L	233191	1	11/19/2016 23:37	NP
Tetrachloroethene	890	250		ug/L	233191	50	11/18/2016 13:09	NP
Toluene	BRL	5.0		ug/L	233191	1	11/19/2016 23:37	NP
trans-1,2-Dichloroethene	BRL	5.0		ug/L	233191	1	11/19/2016 23:37	NP
trans-1,3-Dichloropropene	BRL	5.0		ug/L	233191	1	11/19/2016 23:37	NP
Trichloroethene	48	5.0		ug/L	233191	1	11/19/2016 23:37	NP
Trichlorofluoromethane	BRL	5.0		ug/L	233191	1	11/19/2016 23:37	NP
Vinyl chloride	3.1	2.0		ug/L	233191	1	11/19/2016 23:37	NP
Surr: 4-Bromofluorobenzene	84.6	66.1-129		%REC	233191	50	11/18/2016 13:09	NP
Surr: 4-Bromofluorobenzene	94.1	66.1-129		%REC	233191	1	11/19/2016 23:37	NP
Surr: Dibromofluoromethane	111	83.6-123		%REC	233191	50	11/18/2016 13:09	NP
Surr: Dibromofluoromethane	102	83.6-123		%REC	233191	1	11/19/2016 23:37	NP
Surr: Toluene-d8	89.8	81.8-118		%REC	233191	50	11/18/2016 13:09	NP
Surr: Toluene-d8	99.9	81.8-118		%REC	233191	1	11/19/2016 23:37	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value

- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc
Date: 21-Nov-16

Client: Wenck Associates
Project Name: City of Duluth, GA
Lab ID: 1611E75-003

Client Sample ID: IW-MW3-63
Collection Date: 11/14/2016 2:03:00 PM
Matrix: Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				(SW5030B)				
1,1,1-Trichloroethane	BRL	5.0		ug/L	233191	1	11/19/2016 23:14	NP
1,1,2,2-Tetrachloroethane	BRL	5.0		ug/L	233191	1	11/19/2016 23:14	NP
1,1,2-Trichloroethane	BRL	5.0		ug/L	233191	1	11/19/2016 23:14	NP
1,1-Dichloroethane	BRL	5.0		ug/L	233191	1	11/19/2016 23:14	NP
1,1-Dichloroethene	BRL	5.0		ug/L	233191	1	11/19/2016 23:14	NP
1,2,4-Trichlorobenzene	BRL	5.0		ug/L	233191	1	11/19/2016 23:14	NP
1,2-Dibromo-3-chloropropane	BRL	5.0		ug/L	233191	1	11/19/2016 23:14	NP
1,2-Dibromoethane	BRL	5.0		ug/L	233191	1	11/19/2016 23:14	NP
1,2-Dichlorobenzene	BRL	5.0		ug/L	233191	1	11/19/2016 23:14	NP
1,2-Dichloroethane	BRL	5.0		ug/L	233191	1	11/19/2016 23:14	NP
1,2-Dichloropropane	BRL	5.0		ug/L	233191	1	11/19/2016 23:14	NP
1,3-Dichlorobenzene	BRL	5.0		ug/L	233191	1	11/19/2016 23:14	NP
1,4-Dichlorobenzene	BRL	5.0		ug/L	233191	1	11/19/2016 23:14	NP
2-Butanone	BRL	50		ug/L	233191	1	11/19/2016 23:14	NP
2-Hexanone	BRL	10		ug/L	233191	1	11/19/2016 23:14	NP
4-Methyl-2-pentanone	BRL	10		ug/L	233191	1	11/19/2016 23:14	NP
Acetone	BRL	50		ug/L	233191	1	11/19/2016 23:14	NP
Benzene	BRL	5.0		ug/L	233191	1	11/19/2016 23:14	NP
Bromodichloromethane	BRL	5.0		ug/L	233191	1	11/19/2016 23:14	NP
Bromoform	BRL	5.0		ug/L	233191	1	11/19/2016 23:14	NP
Bromomethane	BRL	5.0		ug/L	233191	1	11/19/2016 23:14	NP
Carbon disulfide	BRL	5.0		ug/L	233191	1	11/19/2016 23:14	NP
Carbon tetrachloride	BRL	5.0		ug/L	233191	1	11/19/2016 23:14	NP
Chlorobenzene	BRL	5.0		ug/L	233191	1	11/19/2016 23:14	NP
Chloroethane	BRL	10		ug/L	233191	1	11/19/2016 23:14	NP
Chloroform	BRL	5.0		ug/L	233191	1	11/19/2016 23:14	NP
Chloromethane	BRL	10		ug/L	233191	1	11/19/2016 23:14	NP
cis-1,2-Dichloroethene	23	5.0		ug/L	233191	1	11/19/2016 23:14	NP
cis-1,3-Dichloropropene	BRL	5.0		ug/L	233191	1	11/19/2016 23:14	NP
Cyclohexane	BRL	5.0		ug/L	233191	1	11/19/2016 23:14	NP
Dibromochloromethane	BRL	5.0		ug/L	233191	1	11/19/2016 23:14	NP
Dichlorodifluoromethane	BRL	10		ug/L	233191	1	11/19/2016 23:14	NP
Ethylbenzene	BRL	5.0		ug/L	233191	1	11/19/2016 23:14	NP
Freon-113	BRL	10		ug/L	233191	1	11/19/2016 23:14	NP
Isopropylbenzene	BRL	5.0		ug/L	233191	1	11/19/2016 23:14	NP
m,p-Xylene	BRL	5.0		ug/L	233191	1	11/19/2016 23:14	NP
Methyl acetate	BRL	5.0		ug/L	233191	1	11/19/2016 23:14	NP
Methyl tert-butyl ether	BRL	5.0		ug/L	233191	1	11/19/2016 23:14	NP
Methylcyclohexane	BRL	5.0		ug/L	233191	1	11/19/2016 23:14	NP
Methylene chloride	BRL	5.0		ug/L	233191	1	11/19/2016 23:14	NP
o-Xylene	BRL	5.0		ug/L	233191	1	11/19/2016 23:14	NP

Qualifiers: * Value exceeds maximum contaminant level
 BRL Below reporting limit
 H Holding times for preparation or analysis exceeded
 N Analyte not NELAC certified
 B Analyte detected in the associated method blank
 > Greater than Result value

E Estimated (value above quantitation range)
 S Spike Recovery outside limits due to matrix
 Narr See case narrative
 NC Not confirmed
 < Less than Result value
 J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc
Date: 21-Nov-16

Client:	Wenck Associates	Client Sample ID:	IW-MW3-63
Project Name:	City of Duluth, GA	Collection Date:	11/14/2016 2:03:00 PM
Lab ID:	1611E75-003	Matrix:	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				(SW5030B)				
Styrene	BRL	5.0		ug/L	233191	1	11/19/2016 23:14	NP
Tetrachloroethene	290	50		ug/L	233191	10	11/21/2016 11:31	NP
Toluene	BRL	5.0		ug/L	233191	1	11/19/2016 23:14	NP
trans-1,2-Dichloroethene	BRL	5.0		ug/L	233191	1	11/19/2016 23:14	NP
trans-1,3-Dichloropropene	BRL	5.0		ug/L	233191	1	11/19/2016 23:14	NP
Trichloroethene	33	5.0		ug/L	233191	1	11/19/2016 23:14	NP
Trichlorofluoromethane	BRL	5.0		ug/L	233191	1	11/19/2016 23:14	NP
Vinyl chloride	2.7	2.0		ug/L	233191	1	11/19/2016 23:14	NP
Surr: 4-Bromofluorobenzene	90.3	66.1-129		%REC	233191	1	11/19/2016 23:14	NP
Surr: 4-Bromofluorobenzene	90.5	66.1-129		%REC	233191	10	11/21/2016 11:31	NP
Surr: Dibromofluoromethane	103	83.6-123		%REC	233191	1	11/19/2016 23:14	NP
Surr: Dibromofluoromethane	103	83.6-123		%REC	233191	10	11/21/2016 11:31	NP
Surr: Toluene-d8	85.9	81.8-118		%REC	233191	10	11/21/2016 11:31	NP
Surr: Toluene-d8	99.5	81.8-118		%REC	233191	1	11/19/2016 23:14	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value

- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc
Date: 21-Nov-16

Client: Wenck Associates	Client Sample ID: TW-1
Project Name: City of Duluth, GA	Collection Date: 11/14/2016 3:50:00 PM
Lab ID: 1611E75-004	Matrix: Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				(SW5030B)				
1,1,1-Trichloroethane	BRL	5.0		ug/L	233191	1	11/20/2016 00:00	NP
1,1,2,2-Tetrachloroethane	BRL	5.0		ug/L	233191	1	11/20/2016 00:00	NP
1,1,2-Trichloroethane	BRL	5.0		ug/L	233191	1	11/20/2016 00:00	NP
1,1-Dichloroethane	BRL	5.0		ug/L	233191	1	11/20/2016 00:00	NP
1,1-Dichloroethene	BRL	5.0		ug/L	233191	1	11/20/2016 00:00	NP
1,2,4-Trichlorobenzene	BRL	5.0		ug/L	233191	1	11/20/2016 00:00	NP
1,2-Dibromo-3-chloropropane	BRL	5.0		ug/L	233191	1	11/20/2016 00:00	NP
1,2-Dibromoethane	BRL	5.0		ug/L	233191	1	11/20/2016 00:00	NP
1,2-Dichlorobenzene	BRL	5.0		ug/L	233191	1	11/20/2016 00:00	NP
1,2-Dichloroethane	BRL	5.0		ug/L	233191	1	11/20/2016 00:00	NP
1,2-Dichloropropane	BRL	5.0		ug/L	233191	1	11/20/2016 00:00	NP
1,3-Dichlorobenzene	BRL	5.0		ug/L	233191	1	11/20/2016 00:00	NP
1,4-Dichlorobenzene	BRL	5.0		ug/L	233191	1	11/20/2016 00:00	NP
2-Butanone	BRL	50		ug/L	233191	1	11/20/2016 00:00	NP
2-Hexanone	BRL	10		ug/L	233191	1	11/20/2016 00:00	NP
4-Methyl-2-pentanone	BRL	10		ug/L	233191	1	11/20/2016 00:00	NP
Acetone	BRL	50		ug/L	233191	1	11/20/2016 00:00	NP
Benzene	BRL	5.0		ug/L	233191	1	11/20/2016 00:00	NP
Bromodichloromethane	BRL	5.0		ug/L	233191	1	11/20/2016 00:00	NP
Bromoform	BRL	5.0		ug/L	233191	1	11/20/2016 00:00	NP
Bromomethane	BRL	5.0		ug/L	233191	1	11/20/2016 00:00	NP
Carbon disulfide	BRL	5.0		ug/L	233191	1	11/20/2016 00:00	NP
Carbon tetrachloride	BRL	5.0		ug/L	233191	1	11/20/2016 00:00	NP
Chlorobenzene	BRL	5.0		ug/L	233191	1	11/20/2016 00:00	NP
Chloroethane	BRL	10		ug/L	233191	1	11/20/2016 00:00	NP
Chloroform	BRL	5.0		ug/L	233191	1	11/20/2016 00:00	NP
Chloromethane	BRL	10		ug/L	233191	1	11/20/2016 00:00	NP
cis-1,2-Dichloroethene	BRL	5.0		ug/L	233191	1	11/20/2016 00:00	NP
cis-1,3-Dichloropropene	BRL	5.0		ug/L	233191	1	11/20/2016 00:00	NP
Cyclohexane	BRL	5.0		ug/L	233191	1	11/20/2016 00:00	NP
Dibromochloromethane	BRL	5.0		ug/L	233191	1	11/20/2016 00:00	NP
Dichlorodifluoromethane	BRL	10		ug/L	233191	1	11/20/2016 00:00	NP
Ethylbenzene	BRL	5.0		ug/L	233191	1	11/20/2016 00:00	NP
Freon-113	BRL	10		ug/L	233191	1	11/20/2016 00:00	NP
Isopropylbenzene	BRL	5.0		ug/L	233191	1	11/20/2016 00:00	NP
m,p-Xylene	BRL	5.0		ug/L	233191	1	11/20/2016 00:00	NP
Methyl acetate	BRL	5.0		ug/L	233191	1	11/20/2016 00:00	NP
Methyl tert-butyl ether	BRL	5.0		ug/L	233191	1	11/20/2016 00:00	NP
Methylcyclohexane	BRL	5.0		ug/L	233191	1	11/20/2016 00:00	NP
Methylene chloride	BRL	5.0		ug/L	233191	1	11/20/2016 00:00	NP
o-Xylene	BRL	5.0		ug/L	233191	1	11/20/2016 00:00	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value

- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc
Date: 21-Nov-16

Client:	Wenck Associates	Client Sample ID:	TW-1
Project Name:	City of Duluth, GA	Collection Date:	11/14/2016 3:50:00 PM
Lab ID:	1611E75-004	Matrix:	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				(SW5030B)				
Styrene	BRL	5.0		ug/L	233191	1	11/20/2016 00:00	NP
Tetrachloroethene	51	5.0		ug/L	233191	1	11/20/2016 00:00	NP
Toluene	BRL	5.0		ug/L	233191	1	11/20/2016 00:00	NP
trans-1,2-Dichloroethene	BRL	5.0		ug/L	233191	1	11/20/2016 00:00	NP
trans-1,3-Dichloropropene	BRL	5.0		ug/L	233191	1	11/20/2016 00:00	NP
Trichloroethene	BRL	5.0		ug/L	233191	1	11/20/2016 00:00	NP
Trichlorofluoromethane	BRL	5.0		ug/L	233191	1	11/20/2016 00:00	NP
Vinyl chloride	BRL	2.0		ug/L	233191	1	11/20/2016 00:00	NP
Surr: 4-Bromofluorobenzene	91.1	66.1-129		%REC	233191	1	11/20/2016 00:00	NP
Surr: Dibromofluoromethane	104	83.6-123		%REC	233191	1	11/20/2016 00:00	NP
Surr: Toluene-d8	98.9	81.8-118		%REC	233191	1	11/20/2016 00:00	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value

- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc
Date: 21-Nov-16

Client: Wenck Associates
Project Name: City of Duluth, GA
Lab ID: 1611E75-005

Client Sample ID: TRIP BLANK
Collection Date: 11/15/2016
Matrix: Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				(SW5030B)				
1,1,1-Trichloroethane	BRL	5.0		ug/L	233191	1	11/18/2016 10:33	NP
1,1,2,2-Tetrachloroethane	BRL	5.0		ug/L	233191	1	11/18/2016 10:33	NP
1,1,2-Trichloroethane	BRL	5.0		ug/L	233191	1	11/18/2016 10:33	NP
1,1-Dichloroethane	BRL	5.0		ug/L	233191	1	11/18/2016 10:33	NP
1,1-Dichloroethene	BRL	5.0		ug/L	233191	1	11/18/2016 10:33	NP
1,2,4-Trichlorobenzene	BRL	5.0		ug/L	233191	1	11/18/2016 10:33	NP
1,2-Dibromo-3-chloropropane	BRL	5.0		ug/L	233191	1	11/18/2016 10:33	NP
1,2-Dibromoethane	BRL	5.0		ug/L	233191	1	11/18/2016 10:33	NP
1,2-Dichlorobenzene	BRL	5.0		ug/L	233191	1	11/18/2016 10:33	NP
1,2-Dichloroethane	BRL	5.0		ug/L	233191	1	11/18/2016 10:33	NP
1,2-Dichloropropane	BRL	5.0		ug/L	233191	1	11/18/2016 10:33	NP
1,3-Dichlorobenzene	BRL	5.0		ug/L	233191	1	11/18/2016 10:33	NP
1,4-Dichlorobenzene	BRL	5.0		ug/L	233191	1	11/18/2016 10:33	NP
2-Butanone	BRL	50		ug/L	233191	1	11/18/2016 10:33	NP
2-Hexanone	BRL	10		ug/L	233191	1	11/18/2016 10:33	NP
4-Methyl-2-pentanone	BRL	10		ug/L	233191	1	11/18/2016 10:33	NP
Acetone	BRL	50		ug/L	233191	1	11/18/2016 10:33	NP
Benzene	BRL	5.0		ug/L	233191	1	11/18/2016 10:33	NP
Bromodichloromethane	BRL	5.0		ug/L	233191	1	11/18/2016 10:33	NP
Bromoform	BRL	5.0		ug/L	233191	1	11/18/2016 10:33	NP
Bromomethane	BRL	5.0		ug/L	233191	1	11/18/2016 10:33	NP
Carbon disulfide	BRL	5.0		ug/L	233191	1	11/18/2016 10:33	NP
Carbon tetrachloride	BRL	5.0		ug/L	233191	1	11/18/2016 10:33	NP
Chlorobenzene	BRL	5.0		ug/L	233191	1	11/18/2016 10:33	NP
Chloroethane	BRL	10		ug/L	233191	1	11/18/2016 10:33	NP
Chloroform	BRL	5.0		ug/L	233191	1	11/18/2016 10:33	NP
Chloromethane	BRL	10		ug/L	233191	1	11/18/2016 10:33	NP
cis-1,2-Dichloroethene	BRL	5.0		ug/L	233191	1	11/18/2016 10:33	NP
cis-1,3-Dichloropropene	BRL	5.0		ug/L	233191	1	11/18/2016 10:33	NP
Cyclohexane	BRL	5.0		ug/L	233191	1	11/18/2016 10:33	NP
Dibromochloromethane	BRL	5.0		ug/L	233191	1	11/18/2016 10:33	NP
Dichlorodifluoromethane	BRL	10		ug/L	233191	1	11/18/2016 10:33	NP
Ethylbenzene	BRL	5.0		ug/L	233191	1	11/18/2016 10:33	NP
Freon-113	BRL	10		ug/L	233191	1	11/18/2016 10:33	NP
Isopropylbenzene	BRL	5.0		ug/L	233191	1	11/18/2016 10:33	NP
m,p-Xylene	BRL	5.0		ug/L	233191	1	11/18/2016 10:33	NP
Methyl acetate	BRL	5.0		ug/L	233191	1	11/18/2016 10:33	NP
Methyl tert-butyl ether	BRL	5.0		ug/L	233191	1	11/18/2016 10:33	NP
Methylcyclohexane	BRL	5.0		ug/L	233191	1	11/18/2016 10:33	NP
Methylene chloride	BRL	5.0		ug/L	233191	1	11/18/2016 10:33	NP
o-Xylene	BRL	5.0		ug/L	233191	1	11/18/2016 10:33	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value

- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc

Date: 21-Nov-16

Client: Wenck Associates
 Project Name: City of Duluth, GA
 Lab ID: 1611E75-005

Client Sample ID: TRIP BLANK
 Collection Date: 11/15/2016
 Matrix: Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				(SW5030B)				
Styrene	BRL	5.0		ug/L	233191	1	11/18/2016 10:33	NP
Tetrachloroethene	BRL	5.0		ug/L	233191	1	11/18/2016 10:33	NP
Toluene	BRL	5.0		ug/L	233191	1	11/18/2016 10:33	NP
trans-1,2-Dichloroethene	BRL	5.0		ug/L	233191	1	11/18/2016 10:33	NP
trans-1,3-Dichloropropene	BRL	5.0		ug/L	233191	1	11/18/2016 10:33	NP
Trichloroethene	BRL	5.0		ug/L	233191	1	11/18/2016 10:33	NP
Trichlorofluoromethane	BRL	5.0		ug/L	233191	1	11/18/2016 10:33	NP
Vinyl chloride	BRL	2.0		ug/L	233191	1	11/18/2016 10:33	NP
Surr: 4-Bromofluorobenzene	85.5	66.1-129		%REC	233191	1	11/18/2016 10:33	NP
Surr: Dibromofluoromethane	111	83.6-123		%REC	233191	1	11/18/2016 10:33	NP
Surr: Toluene-d8	91.5	81.8-118		%REC	233191	1	11/18/2016 10:33	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value

- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc.

Sample/Cooler Receipt Checklist

Client WENCK Work Order Number 1611ETS

Checklist completed by Ros Masd Date 11/15/2014
Signature Date

Carrier name: FedEx ☐ UPS ☐ Courier ☐ Client ☒ US Mail ☐ Other ☐

Shipping container/cooler in good condition? Yes ☒ No ☐ Not Present ☐

Custody seals intact on shipping container/cooler? Yes ☐ No ☐ Not Present ☒

Custody seals intact on sample bottles? Yes ☐ No ☐ Not Present ☒

Container/Temp Blank temperature in compliance? ($0^{\circ} \leq 6^{\circ}C$)* Yes ☒ No ☐

Cooler #1 0.6°C Cooler #2 ☐ Cooler #3 ☐ Cooler #4 ☐ Cooler #5 ☐ Cooler #6 ☐

Chain of custody present? Yes ☒ No ☐

Chain of custody signed when relinquished and received? Yes ☒ No ☐

Chain of custody agrees with sample labels? Yes ☐ No ☒

Samples in proper container/bottle? Yes ☒ No ☐

Sample containers intact? Yes ☒ No ☐

Sufficient sample volume for indicated test? Yes ☒ No ☐

All samples received within holding time? Yes ☒ No ☐

Was TAT marked on the COC? Yes ☒ No ☐

Proceed with Standard TAT as per project history? Yes ☐ No ☐ Not Applicable ☒

Water - VOA vials have zero headspace? No VOA vials submitted ☐ Yes ☒ No ☐

Water - pH acceptable upon receipt? Yes ☒ No ☐ Not Applicable ☐

Adjusted? ☐ Checked by ☐

Sample Condition: Good ☒ Other(Explain) ☐

(For diffusive samples or AIHA lead) Is a known blank included? Yes ☐ No ☒

See Case Narrative for resolution of the Non-Conformance.

* Samples do not have to comply with the given range for certain parameters.

\\Aes_server\\1\\Sample Receipt\\My Documents\\COCs and pH Adjustment Sheet\\Sample_Cooler_Recipt_Checklist_Rev1.rtf

Client: Wenck Associates
 Project Name: City of Duluth, GA
 Workorder: 1611E75

ANALYTICAL QC SUMMARY REPORT

BatchID: 233191

Sample ID: MB-233191	Client ID:				Units: ug/L	Prep Date: 11/17/2016	Run No: 330223				
SampleType: MBLK	TestCode: TCL VOLATILE ORGANICS SW8260B				BatchID: 233191	Analysis Date: 11/17/2016	Seq No: 7177555				
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual

1,1,1-Trichloroethane	BRL	5.0
1,1,2,2-Tetrachloroethane	BRL	5.0
1,1,2-Trichloroethane	BRL	5.0
1,1-Dichloroethane	BRL	5.0
1,1-Dichloroethene	BRL	5.0
1,2,4-Trichlorobenzene	BRL	5.0
1,2-Dibromo-3-chloropropane	BRL	5.0
1,2-Dibromoethane	BRL	5.0
1,2-Dichlorobenzene	BRL	5.0
1,2-Dichloroethane	BRL	5.0
1,2-Dichloropropane	BRL	5.0
1,3-Dichlorobenzene	BRL	5.0
1,4-Dichlorobenzene	BRL	5.0
2-Butanone	BRL	50
2-Hexanone	BRL	10
4-Methyl-2-pentanone	BRL	10
Acetone	BRL	50
Benzene	BRL	5.0
Bromodichloromethane	BRL	5.0
Bromoform	BRL	5.0
Bromomethane	BRL	5.0
Carbon disulfide	BRL	5.0
Carbon tetrachloride	BRL	5.0
Chlorobenzene	BRL	5.0
Chloroethane	BRL	10
Chloroform	BRL	5.0
Chloromethane	BRL	10

Qualifiers:	>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
	BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
	J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
	Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wenck Associates
 Project Name: City of Duluth, GA
 Workorder: 1611E75

ANALYTICAL QC SUMMARY REPORT

BatchID: 233191

Sample ID: MB-233191	Client ID:					Units: ug/L	Prep Date: 11/17/2016		Run No: 330223		
SampleType: MBLK	TestCode: TCL VOLATILE ORGANICS	SW8260B				BatchID: 233191	Analysis Date: 11/17/2016		Seq No: 7177555		
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
cis-1,2-Dichloroethene	BRL	5.0									
cis-1,3-Dichloropropene	BRL	5.0									
Cyclohexane	BRL	5.0									
Dibromochloromethane	BRL	5.0									
Dichlorodifluoromethane	BRL	10									
Ethylbenzene	BRL	5.0									
Freon-113	BRL	10									
Isopropylbenzene	BRL	5.0									
m,p-Xylene	BRL	5.0									
Methyl acetate	BRL	5.0									
Methyl tert-butyl ether	BRL	5.0									
Methylcyclohexane	BRL	5.0									
Methylene chloride	BRL	5.0									
o-Xylene	BRL	5.0									
Styrene	BRL	5.0									
Tetrachloroethene	BRL	5.0									
Toluene	BRL	5.0									
trans-1,2-Dichloroethene	BRL	5.0									
trans-1,3-Dichloropropene	BRL	5.0									
Trichloroethene	BRL	5.0									
Trichlorofluoromethane	BRL	5.0									
Vinyl chloride	BRL	2.0									
Surr: 4-Bromofluorobenzene	46.44	0	50.00		92.9	66.1	129				
Surr: Dibromofluoromethane	51.56	0	50.00		103	83.6	123				
Surr: Toluene-d8	49.75	0	50.00		99.5	81.8	118				

Qualifiers:	>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
	BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
	J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
	Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wenck Associates
Project Name: City of Duluth, GA
Workorder: 1611E75

ANALYTICAL QC SUMMARY REPORT**BatchID: 233191**

Sample ID: LCS-233191	Client ID:					Units: ug/L	Prep Date: 11/17/2016	Run No: 330223			
SampleType: LCS	TestCode: TCL VOLATILE ORGANICS SW8260B					BatchID: 233191	Analysis Date: 11/17/2016	Seq No: 7177554			
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual

1,1-Dichloroethene	56.73	5.0	50.00		113	68	139				
Benzene	53.84	5.0	50.00		108	74	125				
Chlorobenzene	51.00	5.0	50.00		102	75.7	123				
Toluene	54.46	5.0	50.00		109	75.9	126				
Trichloroethene	52.80	5.0	50.00		106	70.6	129				
Surr: 4-Bromofluorobenzene	45.81	0	50.00		91.6	66.1	129				
Surr: Dibromofluoromethane	51.17	0	50.00		102	83.6	123				
Surr: Toluene-d8	48.80	0	50.00		97.6	81.8	118				

Sample ID: 1611C80-007AMS	Client ID:					Units: ug/L	Prep Date: 11/17/2016	Run No: 330223			
SampleType: MS	TestCode: TCL VOLATILE ORGANICS SW8260B					BatchID: 233191	Analysis Date: 11/18/2016	Seq No: 7177682			
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual

1,1-Dichloroethene	28070	2500	25000		112	64.3	149				
Benzene	27490	2500	25000	1140	105	71.6	132				
Chlorobenzene	24890	2500	25000		99.5	73.1	126				
Toluene	57470	2500	25000	31290	105	72.5	135				
Trichloroethene	25950	2500	25000		104	70.2	132				
Surr: 4-Bromofluorobenzene	22650	0	25000		90.6	66.1	129				
Surr: Dibromofluoromethane	25430	0	25000		102	83.6	123				
Surr: Toluene-d8	24920	0	25000		99.7	81.8	118				

Sample ID: 1611C80-007AMSD	Client ID:				Units: ug/L	Prep Date: 11/17/2016	Run No: 330223				
SampleType: MSD	TestCode: TCL VOLATILE ORGANICS SW8260B				BatchID: 233191	Analysis Date: 11/18/2016	Seq No: 7177683				
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual

1,1-Dichloroethene	26500	2500	25000		106	64.3	149	28070	5.74	30.8	
Benzene	26290	2500	25000	1140	101	71.6	132	27490	4.48	20.7	

Qualifiers:	>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
	BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
	J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
	Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wenck Associates
Project Name: City of Duluth, GA
Workorder: 1611E75

ANALYTICAL QC SUMMARY REPORT

BatchID: 233191

Sample ID: 1611C80-007AMSD	Client ID:					Units: ug/L	Prep Date: 11/17/2016	Run No: 330223			
SampleType: MSD	TestCode: TCL VOLATILE ORGANICS SW8260B					BatchID: 233191	Analysis Date: 11/18/2016	Seq No: 7177683			
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Chlorobenzene	23990	2500	25000		96.0	73.1	126	24890	3.66	26.6	
Toluene	55760	2500	25000	31290	97.9	72.5	135	57470	3.03	23.2	
Trichloroethene	24890	2500	25000		99.6	70.2	132	25950	4.15	27.7	
Surr: 4-Bromofluorobenzene	23590	0	25000		94.3	66.1	129	22650	0	0	
Surr: Dibromofluoromethane	24920	0	25000		99.7	83.6	123	25430	0	0	
Surr: Toluene-d8	24640	0	25000		98.6	81.8	118	24920	0	0	

Qualifiers:	>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
	BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
	J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
	Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

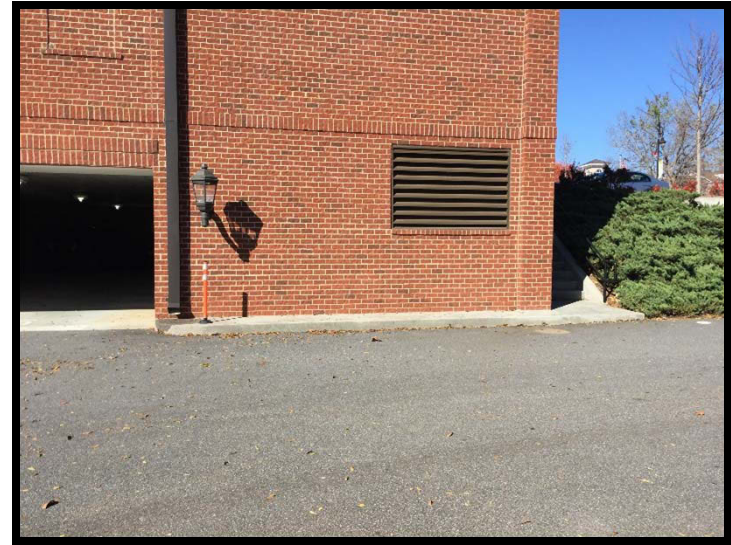
IDW Disposal Manifests

NON-HAZARDOUS WASTE MANIFEST		1. Generator ID Number CES 00	2. Page 1 of 1	3. Emergency Response Phone (404) 731-0215	4. Waste Tracking Number 096114
5. Generator's Name and Mailing Address 3145 MAIN STREET DULUTH, GA 30096			Generator's Site Address (if different than mailing address)		
Generator's Phone:					
6. Transporter 1 Company Name EQ INDUSTRIAL SERVICES			U.S. EPA ID Number MIK 435 642 742		
7. Transporter 2 Company Name			U.S. EPA ID Number		
8. Designated Facility Name and Site Address EQIS ATLANTA TRANSFER & PROCESSII 5600 FULTON INDUSTRIAL BLVD, SW ATLANTA, GA 30336			U.S. EPA ID Number GAR 000 039 776		
Facility's Phone: (404) 494-3520					
9. Waste Shipping Name and Description		10. Containers		11. Total Quantity	12. Unit Wt./Vol.
		No.	Type		
1. NON-HAZARDOUS, NON-DOT REGULATED MATERIAL (SOIL)		2	DM	115	P
2. NON-HAZARDOUS, NON-DOT REGULATED MATERIAL (SOIL)		1	DM	105	P
3.					
4.					
13. Special Handling Instructions and Additional Information 1. G151043EGATE / IDW SOIL 2. G151043EGATL / IDW SOIL					
14. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.					
Generator's/Officer's Printed/Typed Name			Signature		Month Day Year 12 01 11
15. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit: Date leaving U.S.:					
16. Transporter Acknowledgment of Receipt of Materials					
Transporter 1 Printed/Typed Name			Signature		Month Day Year 12 01 11
Transporter 2 Printed/Typed Name			Signature		Month Day Year
17. Discrepancy					
17a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection					
17b. Alternate Facility (or Generator) Manifest Reference Number: U.S. EPA ID Number					
Facility's Phone:					
17c. Signature of Alternate Facility (or Generator) Month Day Year					
NONE NONE					
18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a					
Printed/Typed Name			Signature		Month Day Year

Vapor Sampling Photo Log



1. View of eastern wall of building, where soil vapor was collected



2. View facing south wall of building at entrance to open air parking deck



3. View of parking deck entrance at south wall of building.



4. View of parking deck interior facing south to deck exit



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