WENCK File #5365-0001
October 2018

Fifth 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

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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 Ross

Katie T. Ross, P.G.
Project Manager

October 30, 2018

Registration No. 1776
State of Georgia

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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 Detail Map is presented as **Figure 2**.

This Fifth VIRP Progress Report provides a summary of the activities conducted at the Site from May 2018 through October 2018.

1.1 SUMMARY OF SITE ACTIVITIES

The following scope of services was performed by Wenck between May 2018 and October 2018:

- Installed one deep monitoring well (MW-14) south of MW-3 to evaluate groundwater conditions and groundwater flow;
- Installed one shallow monitoring well (MW-15) southwest of MW-5 to evaluate groundwater conditions and groundwater flow;
- Surveyed top of casing elevations for the new monitoring wells (MW-14 and MW-15);
- Provided oversight of public and private utility location services and a property boundary survey;
- Performed select groundwater sampling for volatile organic compounds (VOCs) from two (2) wells (MW-3 and MW-14) in June 2018;
- Performed limited groundwater sampling for VOCs from eight (8) wells (MW-1 through MW-6, MW-8, and MW-13) in August 2018;
- Collected a surface soil sample at the historic DC-2 sample location; 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 ESA 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 EPD's Hazardous Site Inventory (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

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 groundwater elevations measured intermittently since October 2015, shallow groundwater flows to the northwest.

3.0 Site Activities

During the reporting period, two permanent monitoring wells (MW-14 and MW-15) were installed on property owned by the City of Duluth.

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 groundwater sampling (SESDPROC-301-R3) sampling. Methods and procedures are described below.

3.1 MONITORING WELL INSTALLATION

Monitoring well MW-14 was installed on May 14, 2018 to further evaluate groundwater conditions and groundwater flow evaluation (**Figure 2**). The monitoring well was intended to be screened in bedrock as per Georgia Environmental Protection Division's (EPD) request; however, no bedrock was encountered during drilling activities. The monitoring well was constructed as a threaded, two-inch diameter polyvinyl chloride (PVC) well with 10 feet of screen installed from 70 to 80 feet below ground surface (bgs). The well was developed by purging at least three well volumes on two (2) separate occasions from the well. The installation of MW-14 completes vertical delineation of contamination at the Site. The well installation and development logs are presented in **Appendix A.**

Monitoring well MW-15 was installed on October 1, 2018 to further evaluate groundwater conditions and groundwater flow evaluation (**Figure 2**). The monitoring well was constructed as a threaded, two-inch diameter PVC well with 10 feet of screen installed from 22 to 32 feet below ground surface (bgs). The well was developed by purging at least seven well volumes from the well. The well installation and development logs are presented in **Appendix A.**

3.2 GROUNDWATER SAMPLING

Select groundwater sampling was conducted on June 25 and 26, 2018. A limited groundwater sampling event was performed on August 20 and 21, 2018. After installation on October 1, monitoring well MW-15 was sampled on October 2, 2018.

Prior to sampling, depths to groundwater and total well depths were measured using a water level indicator. Previously marked reference points were used to ensure consistency of measurements. Depths were measured to the nearest 0.01 foot. Water level measurement results are presented in **Table 1.**

For the select groundwater sampling event in June 2018, groundwater samples were collected from two (2) monitoring wells (MW-3 and MW-14).

During the limited groundwater sampling event in August 2018, groundwater samples were collected from eight (8) monitoring wells (MW-1 through MW-6, MW-8, and MW-13). Previously non-detect wells (MW-7, MW-11, and MW-12) were not sampled during this groundwater sampling event. Off-site wells MW-9 and MW-10 were installed as part of a real estate transaction and were abandoned in 2017 during re-development of the property. Well

MW-14 was not sampled during this event due to a sample being collected during the select groundwater sampling event.

Groundwater was purged via 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 tabulated results of these field 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 (± 10%);
- DO (± 0.2mg/L or 10%, whichever was greater); and
- ORP (± 10 mV).

Field logs of the sampling activities are provided in **Appendix B**.

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 C**.

3.3 SOIL SAMPLING

On October 2, 2018, one soil sample was collected at the historical DC-2 sample location. Soil was collected via hand auger from the 1' interval and screened with a photoionization detector (PID) prior to sampling. The soil sample was collected in general accordance with the USEPA Region 4 Soil Sampling procedure SESDPROC-300-R3. The soil sample was analyzed for VOCs (EPA Method 8260B).

The sample was 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 C**.

3.4 MONITORING WELL SURVEY

The newly installed groundwater monitoring wells (MW-14 and MW-15) were surveyed on October 9, 2018 by Wenck staff. The survey established the top of casing elevations of both monitoring wells.

3.5 DECONTAMINATION AND DISPOSAL ACTIVITIES

Investigation-derived waste (IDW), including soil cuttings and development and purge water, was drummed for off-site disposal. In total, eight (8) drums of soil cuttings from the installation of MW-14 and two (2) drums of decontamination/development and purge water from the April 2018 sampling event and for the first development of MW-14 were disposed off-site by EQ Industrial Services on May 23, 2018. One (1) drum of decontamination/purge water for the second development of MW-14 and the June 2018 select sampling event was disposed off-site by EQ Industrial Services on July 11, 2018. One (1) drum of decontamination/purge water for the limited groundwater sampling event was disposed off-

site by EQ Industrial Services on August 24, 2018. Two (2) drums of soil cuttings from the installation of MW-15 and one (1) drum of decontamination/purge water for the development and sampling of MW-15 was disposed off-site by EQ Industrial Services on October 5, 2018. IDW waste manifests documenting disposal are presented in **Appendix D**.

4.0 Findings

4.1 GROUNDWATER FLOW CHARACTERISTICS

Depth to groundwater at all wells (MW-1 through MW-8 and MW-11 through MW-15) 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 west-southwest with an average hydraulic gradient of 0.018 feet/foot **(Figure 3)**.

4.2 ANALYTICAL RESULTS

Select wells were sampled to evaluate groundwater conditions at the Site in June, August, and October 2018. A soil sample was also collected in October 2018. The groundwater sample results are summarized in **Table 3**. Laboratory reports and supporting chain-of-custody documentation are included in **Appendix C**.

4.2.1 Groundwater Results

Groundwater sampling in June 2018 included the collection of samples from two (2) monitoring wells (MW-3 and MW-14). Groundwater sampling in August 2018 included collection of samples from eight (8) monitoring wells (MW-1 through MW-6, MW-8, and MW-13). Groundwater sampling in October 2018 included the collection of one sample from the newly installed MW-15. Groundwater samples were analyzed to determine concentrations of VOCs (EPA Method 8260B). With the exception of MW-13, all other wells are delineated to the Type 1 Risk Reduction Standard (RRS). Groundwater results for MW-13 are compared to the Type 2 RRS for delineation.

4.2.1.1 Volatile Organic Compounds

<u>June 2018</u>

Detectable concentrations of VOCs were present in both wells (MW-3 and MW-14). As shown on **Table 3,** two (2) constituents [PCE and trichloroethene (TCE)] were detected above the delineation criteria. Results are as follows:

- PCE exceeded the Type 1 risk reduction standard (RRS) at both wells with concentrations of 1,170 micrograms per liter (µg/L) at MW-3 and 207 µg/L at MW-14.
- TCE exceeded the Type 1 RRS at MW-14 with a concentration of 5.2 µg/L.

<u>August 2018</u>

Detectable concentrations of VOCs were present in 7 of the 8 wells sampled (MW-1 through MW-6 and MW-13). Concentrations of VOCs were less than laboratory detection limits at MW-8. Monitoring wells MW-7, MW-11, and MW-12 were not sampled during this reporting period. As shown on **Table 3,** three (3) constituents were detected above the delineation

criteria, including: PCE, TCE and cis-1,2-dichloroethene (cis-1,2-DCE). Results are as follows:

- PCE exceeded the Type 1 risk reduction standard (RRS) at wells MW-1 through MW-6 with a maximum concentration of 13,200 µg/L at MW-1. PCE is below the delineation criteria of 5 µg/L at MW-8. PCE was detected in MW-13 at 34.1 µg/L, which is below the Type 2 RRS of 40.6 µg/L.
- TCE exceeded the Type 1 RRS at two wells, MW-1 (101 µg/L) and MW-2 (8.1 µg/L).
- Cis-1,2-DCE exceeded the Type 1 RRS at one well, MW-1 (431 µg/L).

The highest concentrations of PCE were detected in MW-1 at 13,200 µg/L, MW-2 at 1,380 µg/L, MW-3 at 1,040 µg/L, and MW-4 at 1,030 µg/L. TCE was detected in monitoring wells MW-1, MW-2, MW-3, MW-4, and MW-14. Concentrations of TCE at wells MW-1, MW-2, and MW-14 were above the Type 1 RRS of 5 µg/L. Cis-1,2-DCE was detected in wells MW-1, MW-2, and MW-14. The concentration of cis-1,2-DCE at MW-1 was above the Type 1 RRS of 70 µg/L. Concentrations of PCE, TCE, and associated degradation product (cis-1,2-DCE) were highest at MW-1. Concentrations of other breakdown products, such as trans-1,2-dichloroethene and vinyl chloride were less than laboratory detection limits at all the wells sampled with the exception of MW-14, which had a concentration of vinyl chloride at 1.9 µg/L. The detected concentrations of VOCs in the remaining samples were less than applicable RRS.

The detected concentrations were generally consistent with previous observations at wells MW-5 and MW-13. PCE concentrations at all wells sampled during both the June 2018 (MW-3) and August 2018 events were greater than the previous reporting period sampling event (April 2018) concentrations. From the previous reporting period, the concentration of PCE detected in MW-6 µg/L increased slightly to 6.8 µg/L to exceed the Type 1 RRS. The concentration of PCE in MW-4 increased over 221 percent from 320 µg/L in April 2018 to 1,030 µg/L. TCE concentrations at wells MW-1, MW-2, and MW-3 during both the June 2018 (MW-3) and August 2018 were less than the previous reporting period sampling event (April 2018) concentrations. The detected cis-1,2-DCE concentration at well MW-1 during the August 2018 event (431 µg/L) was less than the previous sampling event (564 µg/L) in April 2018.

October 2018

As shown on **Table 3**, VOCs were not detected above laboratory detection limits in monitoring well MW-15.

4.2.2 Soil Results

Soil sampling in October 2018 included the collection of one soil sample from the historical DC-2 sample location. The sample (HA-1) was analyzed to determine concentrations of VOCs (EPA Method 8260B). Soil at the Site is delineated to the Type 1/3 RRS. This location was first sampled in 2008 and PCE was detected at a concentration of 1,600 micrograms per kilogram (µg/kg) at the 0-1’ interval. In May 2015, Wenck attempted to replicate this data but as PID screening showed no elevated levels of VOCs, a surface soil sample was not collected. No VOCs, with the exception of PCE, were detected above the laboratory detection limits for sample HA-1. PCE was detected at a concentration of 72 µg/kg, which is below the Type 1/3 RRS of 500 µg/kg.

4.3 EXTENT OF IMPACTS

A summary of constituents detected in groundwater at the Site since 2015 is provided in **Table 3**. June, August, and October 2018 groundwater conditions for the constituents above the EPD-approved Type 1 RRS and Type 2 RRS are provided on **Figure 4**.

Based on the analytical results, PCE and associated breakdown products are delineated in shallow groundwater to the north by wells MW-6, MW-7, MW-8 and MW-12, to the west by MW-11, to the east by MW-6, and to the south by MW-13. Well MW-13 meets the Type 2 RRS delineation criteria. Well MW-14 was installed south of MW-3 to complete delineation of the vertical extent of the groundwater plume. Monitoring well MW-15 was installed southwest of MW-5 to determine if off-site contamination at the southwest-adjoining property has occurred. No VOC constituents were detected above the laboratory reporting limits at the newly installed well MW-15.

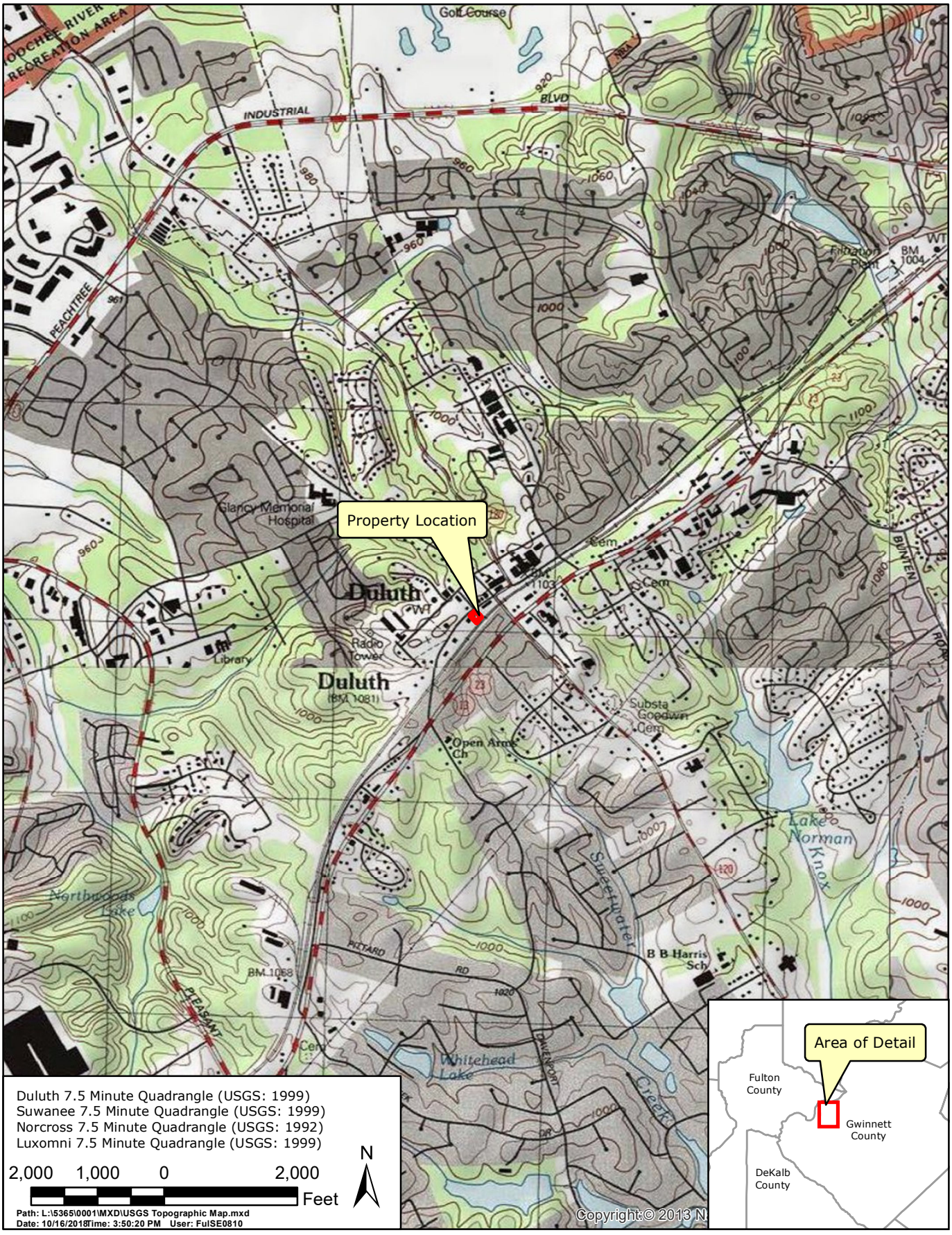
5.0 Recommendations and Schedule

Based on the most recent groundwater results, horizontal and vertical delineation to the Type 1 and 2 RRS (MW-13) is complete at the Site. Activities planned for the next six-month reporting period (November 2018 through April 2019) include the following:

- Perform site-wide groundwater sampling for VOCs in March 2019;
- Update the Conceptual Site Model; and
- Prepare the sixth VIRP Progress Report.

The Sixth VIRP Progress Report will be submitted to the EPD by April 30, 2019.

Figures



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Site Location Map

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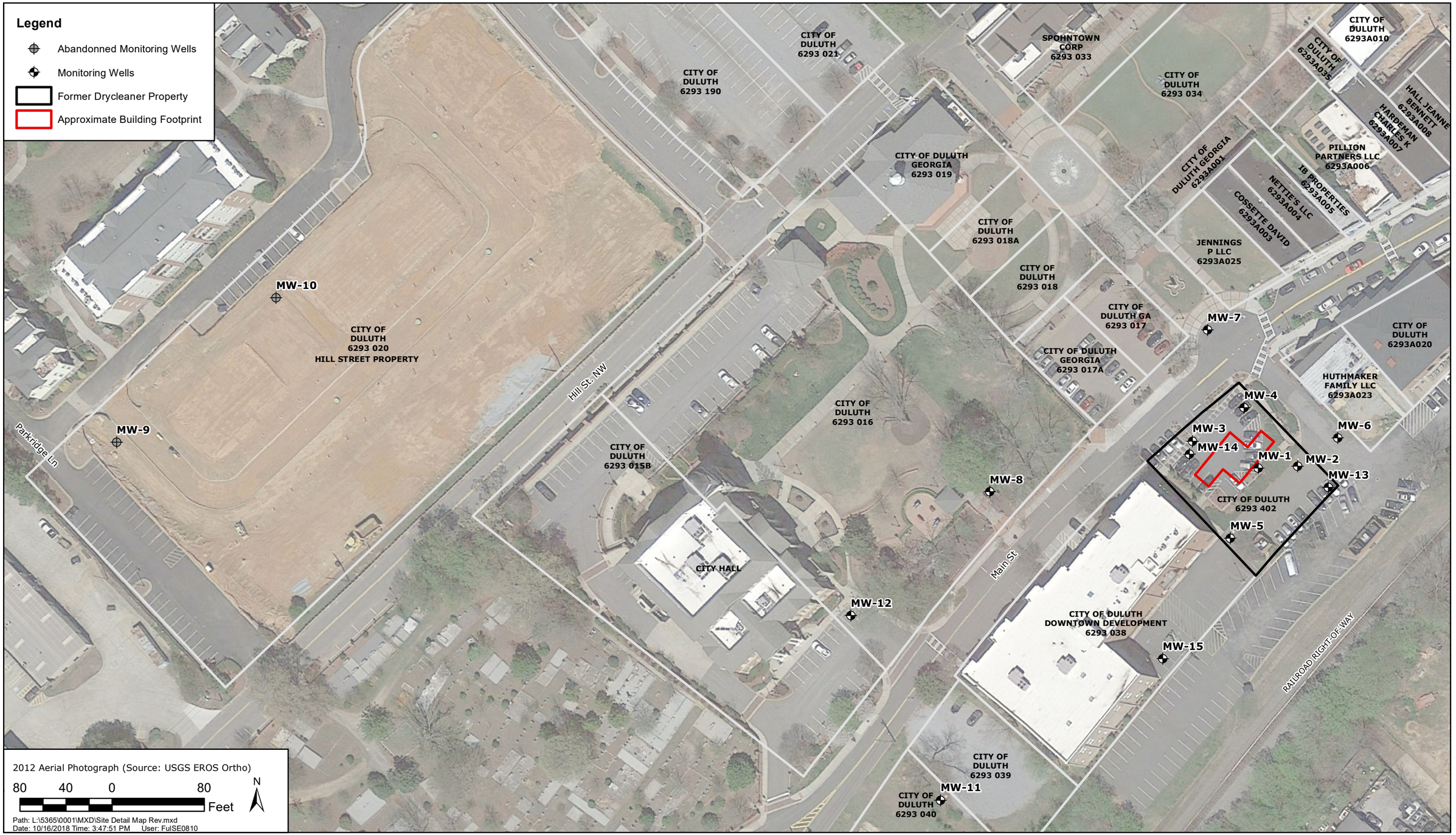
Figure 1



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Site Detail Map

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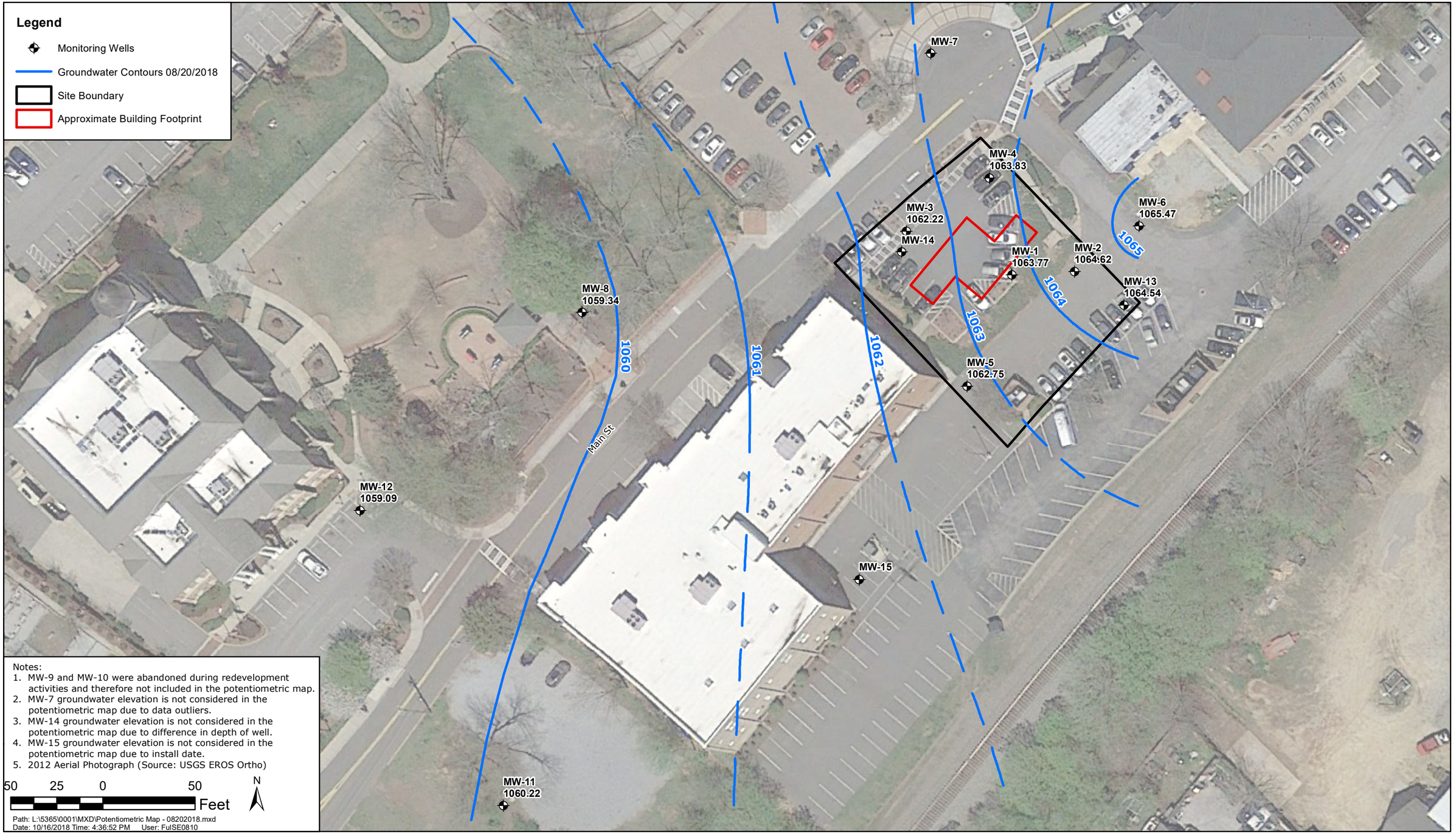
Figure 2



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Potentiometric Map - August 2018

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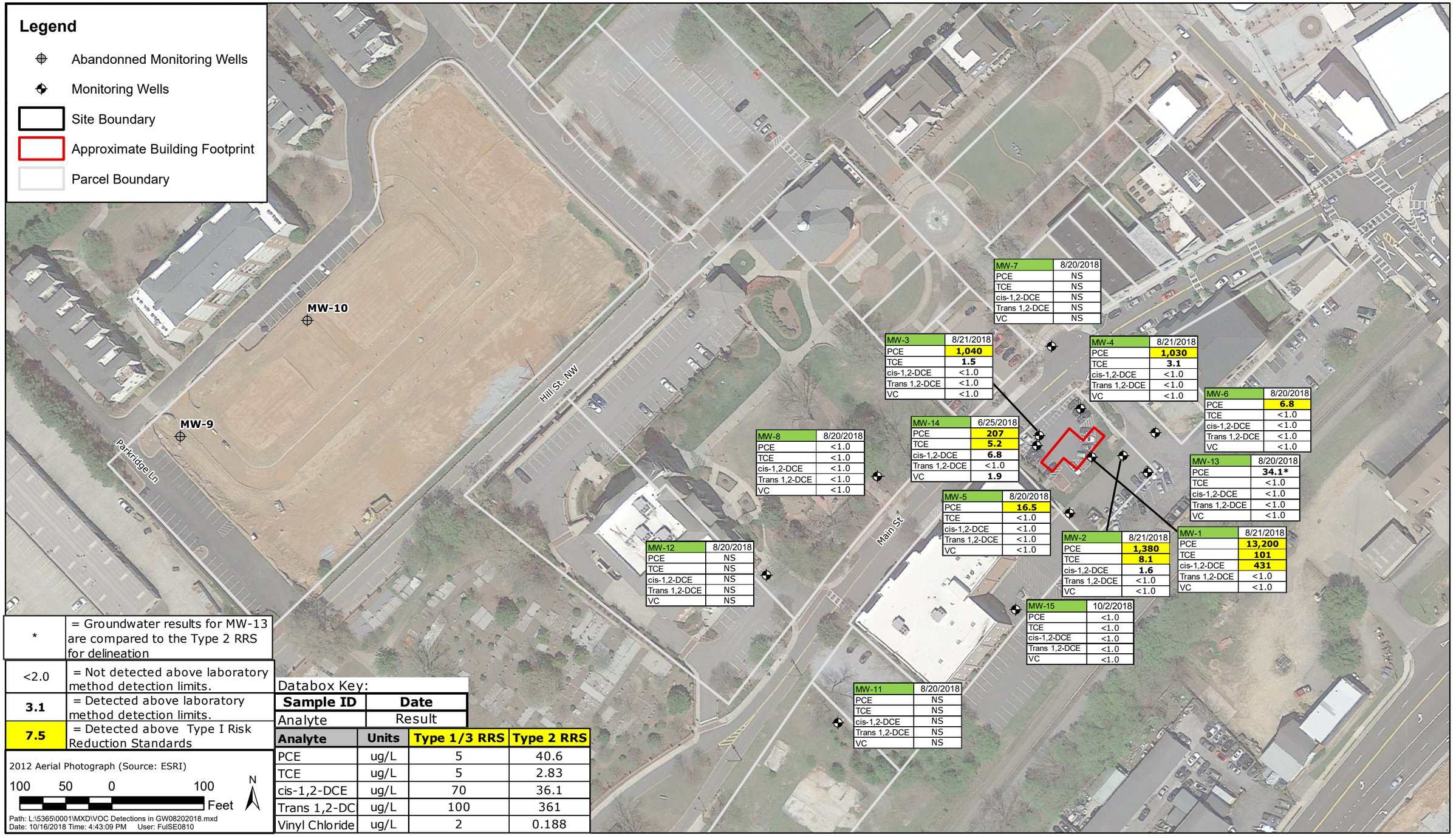
Figure 3



*	= Groundwater results for MW-13 are compared to the Type 2 RRS for delineation
<2.0	= Not detected above laboratory method detection limits.
3.1	= Detected above laboratory method detection limits.
7.5	= Detected above Type I Risk Reduction Standards

2012 Aerial Photograph (Source: ESRI)

100 50 0 100 Feet

N

Path: L:\5365\0001\MXD\VOC Detections in GW08202018.mxd
Date: 10/16/2018 Time: 4:43:09 PM User: FulSE0810

Databox Key:

Sample ID	**Date**
Analyte	Result

Analyte	Units	Type 1/3 RRS	Type 2 RRS
PCE	ug/L	5	40.6
TCE	ug/L	5	2.83
cis-1,2-DCE	ug/L	70	36.1
Trans 1,2-DC	ug/L	100	361
Vinyl Chloride	ug/L	2	0.188

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VOC Detections in Groundwater - June, August, and October 2018

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Figure 4

Tables

TABLE 1
Summary of Groundwater Elevations

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

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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
	9/18/2017				32.06	1060.74
	4/9/2018				31.47	1061.33
	8/20/2018				29.03	1063.77
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
	9/18/2017				24.42	1061.59
	4/9/2018				23.60	1062.41
	8/20/2018				21.39	1064.62
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
	9/18/2017				34.16	1059.47
	4/9/2018				34.83	1058.80
	8/20/2018				31.41	1062.22
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
	9/18/2017				31.96	1060.95
	4/9/2018				31.47	1061.44
	8/20/2018				29.08	1063.83
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
	9/18/2017				25.28	1060.05
	4/9/2018				24.46	1060.87
	8/20/2018				22.58	1062.75
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
	9/18/2017				22.93	1062.57
	4/9/2018				22.22	1063.28
	8/20/2018				20.03	1065.47

TABLE 1
Summary of Groundwater Elevations

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

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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-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
	9/18/2017				27.72	1065.06
	4/9/2018				NM	---
	8/20/2018				23.41	1069.37
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
	9/18/2017				45.78	1056.19
	4/9/2018				45.30	1056.67
	8/20/2018				42.63	1059.34
MW-9	1/11/2016	1072.07	15-25	1047.07-1037.07	13.10	1058.97
	2/13/2017				NM	---
					Well abandonned in 2017	
MW-10	1/11/2016	1070.70	6-16	1054.7-1044.7	7.70	1082.18
	2/13/2017				NM	---
					Well abandonned in 2017	
MW-11	2/13/2017	1089.88	25-40	1064.88-1049.88	32.40	1057.48
	9/18/2017				31.97	1057.91
	4/9/2018				NM	---
	8/20/2018				29.66	1060.22
MW-12	9/18/2017	1096.60	35-45	1061.6 - 1051.6	40.33	1056.27
	4/9/2018				NM	---
	8/20/2018				37.51	1059.09
MW-13	10/31/2017	1085.34	20-30	1065.34 - 1055.34	24.73	1060.61
	4/9/2018				22.77	1062.57
	8/20/2018				20.80	1064.54
MW-14	8/20/2018	1093.79	70-80	1023.79-1013.79	32.95	1060.84
MW-15	10/2/2018	1084.51	21.86-31.86	1062.65-1052.65	23.63	1060.88

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.
MW-9 & MW-10 were abandoned due to redevelopment activities in 2017.
NM = Not Measured

TABLE 2
Summary of Groundwater Field and Natural Attenuation Parameters

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

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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 CaCO3 (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
	9/19/2017	25.18	3.09	5.85	273	0.071	NA	<1.0	**3.8**	**7.0**	<5.0	**1.3**	<1.0	NA	<10.0
	4/10/2018	20.35	3.87	3.27	72	0.097	39.40	<1.0	**3.9**	**7.0**	<5.0	<1.0	<1.0	NA	<10.0
	8/21/2018	23.67	3.89	4.15	324	0.114	80.40	NA	NA	NA	NA	NA	NA	NA	NA
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
	9/19/2017	19.56	4.77	1.87	296	0.093	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/10/2018	19.60	4.66	2.41	223	0.111	37.20	NA	NA	NA	NA	NA	NA	NA	NA
	8/21/2018	23.05	4.28	3.28	274	0.286	6.50	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
	9/19/2017	18.56	3.91	4.65	386	0.110	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/10/2018	19.34	4.33	4.36	78	0.128	16.90	NA	NA	NA	NA	NA	NA	NA	NA
	6/26/2018	20.40	4.42	9.10	441	0.126	158.00	NA	NA	NA	NA	NA	NA	NA	NA
	8/21/2018	23.84	4.43	4.59	241	0.110	7.08	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
	9/19/2017	30.25	3.87	3.27	240	0.019	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/9/2018	17.24	4.58	4.29	27	0.031	106.00	NA	NA	NA	NA	NA	NA	NA	NA
	8/21/2018	23.36	4.07	5.40	296	0.032	178.00	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

WENCK
Responsive partner.
Exceptional outcomes.

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 CaCO3 (mg/L)	Ferrous Iron (mg/L)	Methane/Ethane /Ethene (ug/L)
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**	NA	<10.0
	9/19/2017	26.6	4.86	1.94	200	0.084	NA	<1.0	**18**	**0.29**	**6**	<1.0	**12**	NA	<10.0
	4/9/2018	17.21	5.07	2.25	9	0.096	47.60	NA	NA	NA	NA	NA	NA	NA	NA
	8/20/2018	22.92	4.64	3.63	254	0.092	6.72	NA	NA	NA	NA	NA	NA	NA	NA
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	NA	<10.0
	9/19/2017	24.76	4.07	6.62	278	0.147	NA	<1.0	**7.9**	**0.8**	NA	<1.0	<1.0	NA	<10.0
	4/9/2018	20.01	4.25	4.65	317	0.165	21.00	NA	NA	NA	NA	NA	NA	NA	NA
	8/20/2018	21.22	4.08	4.52	334	0.143	49.50	NA	NA	NA	NA	NA	NA	NA	NA
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
	9/18/2017	23.70	3.70	4.62	273	0.047	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/9/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	8/20/2018	NA	NA	NA	NA	NA	NA	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
	9/18/2017	24.24	4.98	3.16	332	0.040	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/9/2018	16.64	4.87	5.92	264	0.040	90.40	<1.0	**5.20**	**2.30**	<5.0	<1.0	<1.0	NA	<10.0
	8/20/2018	18.25	4.90	5.38	318	0.040	17.40	NA	NA	NA	NA	NA	NA	NA	NA
MW-9	1/13/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	2/13/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Well abandonned in 2017													

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Summary of Groundwater Field and Natural Attenuation Parameters

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

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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 CaCO3 (mg/L)	Ferrous Iron (mg/L)	Methane/Ethane /Ethene (ug/L)
MW-10	1/13/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	2/13/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Well abandonned in 2017													
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
	9/18/2017	15.25	4.41	3.76	325	0.283	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/9/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	8/20/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-12	9/18/2017	24.12	3.88	4.94	252	0.087	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/9/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	8/20/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-13	10/31/2017	17.96	5.49	6.10	227	0.196	4.5	NA	NA	NA	NA	NA	NA	NA	NA
	4/9/2018	19.18	5.14	1.59	209	0.162	22.4	<1.0	**3.1**	**1.2**	**55.7**	<1.0	**8.5**	NA	<10.0
	8/20/2018	29.08	4.95	2.52	225	0.201	8.3	NA	NA	NA	NA	NA	NA	NA	NA
MW-14	6/25/2018	19.50	5.41	9.40	310	0.111	42.21	NA	NA	NA	NA	NA	NA	NA	NA
	8/20/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-15	10/2/2018	23.43	4.00	1.69	219	0.185	42.80	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

MW-9 & MW-10 were previously identified as MW-1 & MW-2 in PGC Phase II ESA
MW-9 & MW-10 were abandoned due to redevelopment activities in 2017.
mg/L - milligrams per liter
mV - millivolts
µs/cm - microsiemens per centimeter
NTU - nephelometric turbidity units
NA = Not Analyzed for this parameter

TABLE 3
Summary of Groundwater Analytical Results
Volatile Organic Compounds - Detections

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

WENCK
Responsive partner.
Exceptional outcomes.

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)
Delineation Criteria: Type 1/3 RRS		**5**	**5**	**70**	**100**	**700**	**5**	**80**	**1,000**	**2**
MW-13 Delineation Criteria: Type 2 RRS*		**40.6**	**2.83**	**36.1**	**361**	**5.74**	**NC**	**2.21**	**NC**	**0.188**
MW-1	10/6/2015	**15,000**	**120**	**540**	<5.0	NC	**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**
	9/19/2017	**6,900**	**110**	**620**	<2.0	**5.2**	<2.0	**12**	<2.0	<2.0
	4/10/2018	**11,200**	**119**	**564**	**3.2**	**3.3**	<1.0	**13.5**	<1.0	<1.0
	8/21/2018	**13,200**	**101**	**431**	<1.0	<1.0	<1.0	**11**	<1.0	<1.0
MW-2	10/6/2015	**1,100**	**7.6**	**8**	<5.0	NC	**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
	9/19/2017	**1,000**	**15**	**10**	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	4/10/2018	**911**	**13.8**	**6.2**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	8/21/2018	**1,380**	**8.1**	**1.6**	<1.0	<1.0	<1.0	**1.6**	<1.0	<1.0
MW-3	10/6/2015	**1,500**	<5.0	<5.0	<5.0	NC	<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
	9/19/2017	**680**	**2.3**	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	4/10/2018	**1,000**	**3**	**2**	<1.0	<1.0	<1.0	**1.1**	<1.0	<1.0
	6/26/2018	**1,170**	**2.7**	**2.3**	<1.0	<1.0	<1.0	**1.0**	<1.0	<1.0
	8/21/2018	**1,040**	**1.5**	<1.0	<1.0	<1.0	<1.0	**1.4**	<1.0	<1.0
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**	<5.0	<5.0	<5.0	<5.0	<5.0	**3.1**
IW-MW3-63	11/14/2016	**290**	**33**	**23**	<5.0	<5.0	<5.0	<5.0	<5.0	**2.7**
MW-4	10/6/2015	**600**	<5.0	<5.0	<5.0	NC	**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
	9/19/2017	**210**	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	4/9/2018	**320**	**2.3**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	8/21/2018	**1,030**	**3.1**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

TABLE 3
Summary of Groundwater Analytical Results
Volatile Organic Compounds - Detections

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

WENCK
Responsive partner.
Exceptional outcomes.

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)
Delineation Criteria: Type 1/3 RRS		**5**	**5**	**70**	**100**	**700**	**5**	**80**	**1,000**	**2**
MW-13 Delineation Criteria: Type 2 RRS*		**40.6**	**2.83**	**36.1**	**361**	**5.74**	**NC**	**2.21**	**NC**	**0.188**
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
	9/19/2017	**12**	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	4/9/2018	**8.8**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	8/20/2018	**16.5**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
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
	9/19/2017	**3.3**	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	4/9/2018	**4.3**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	8/20/2018	**6.8**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
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
	9/18/2017	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	4/9/2018	NS	NS	NS	NS	NS	NS	NS	NS	NS
	8/20/2018	NS	NS	NS	NS	NS	NS	NS	NS	NS
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
	9/18/2017	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	4/9/2018	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	8/20/2018	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
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
		Well abandonned in 2017								
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
		Well abandonned in 2017								

TABLE 3
Summary of Groundwater Analytical Results
Volatile Organic Compounds - Detections

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

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Exceptional outcomes.

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)
Delineation Criteria: Type 1/3 RRS		**5**	**5**	**70**	**100**	**700**	**5**	**80**	**1,000**	**2**
MW-13 Delineation Criteria: Type 2 RRS*		**40.6**	**2.83**	**36.1**	**361**	**5.74**	**NC**	**2.21**	**NC**	**0.188**
MW-11	11/20/2016	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<2.0
	2/13/2017	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	9/18/2017	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	4/9/2018	NS	NS	NS	NS	NS	NS	NS	NS	NS
	8/20/2018	NS	NS	NS	NS	NS	NS	NS	NS	NS
TW-1	11/14/2016	**51.0**	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<2.0
MW-12	9/18/2017	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	4/9/2018	NS	NS	NS	NS	NS	NS	NS	NS	NS
	8/20/2018	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-13*	10/31/2018	**14**	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	4/9/2018	**29**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	8/20/2018	**34.1**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-14	6/25/2018	**207**	**5.2**	**6.8**	<1.0	<1.0	<1.0	<1.0	<1.0	**1.9**
	8/20/2018	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-15	10/2/2018	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

Notes:

* Groundwater results from MW-13 are compared to the Type 2 RRS for delineation.
MW-9 & MW-10 were previously identified as MW-1 & MW-2 in PGC Phase II ESA
MW-9 & MW-10 were abandoned due to redevelopment activities in 2017.

<1.0	= Analyte not detected above the laboratory detection limit
5.7	= Analyte detected above the laboratory detection limit
190	= Exceeds the Delineation Criteria, which is the Type 1/3 RRS (except for MW-13)
NC	= Not Calculated
NS	= Not Sampled

Appendix A

Monitoring Well Installation and Development Log

WENCK

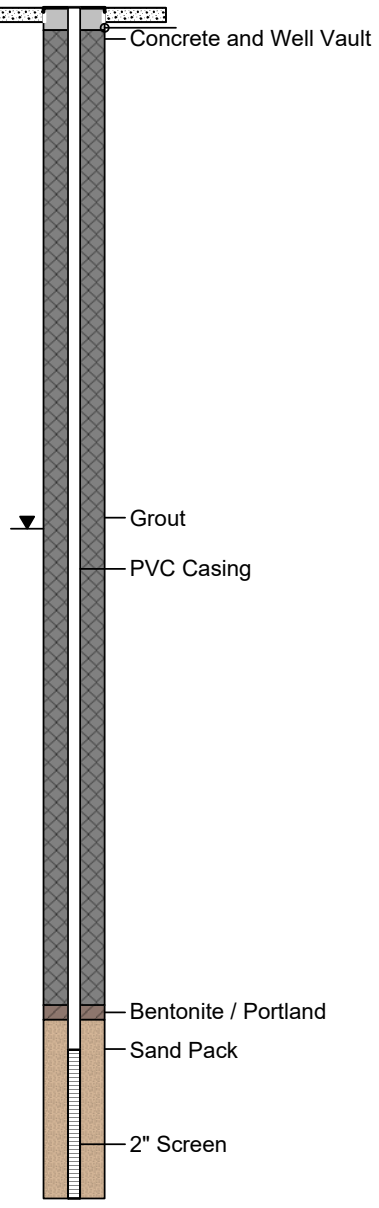
Responsive partner. Exceptional outcomes.

LOG OF BORING MW-14

City of Duluth
Subsurface Investigation
Main St.
Project # 5365

Date Started	: 05/14/18	Drilling Contractor	: Geo Lab
Date Completed	: 05/15/18	Driller	: Dan
Hole Diameter	: 8.5 inch	Logged By	: EMM
Drilling Method	: Geoprobe/ HSA		
Sampling Method	: Dual Tube (4')		

Depth in Feet	USCS	DESCRIPTION	PID (PPM)
0		Asphalt (FILL)	
	CL	Red-brown, slightly moist, SILTY CLAY, no odor, (FILL)	
5		Red-brown, slightly moist, SANDY SILT, no odor, (SAPROLITE)	0.7
10			0.3
15	ML		0.0
20			
25		Orange-brown, moist, SANDY SILT, no odor, (SAPROLITE)	0.0
30			
35	ML	Wet at 35 ft	1.0
40			
45		Orange-brown, moist to wet, SANDY SILT, no odor, (SAPROLITE)	
50	ML		0.2
55			
60		Orange-brown, dense, moist to wet, SANDY SILT, no odor, (SAPROLITE)	0.0
65			
70	ML		0.1
75			
80		EOB at 80.4 ft	



Notes:
2 inch, 10 ft pre-pack screen
Water level (34.56') measured from TOC on 05/21/18.

WENCK

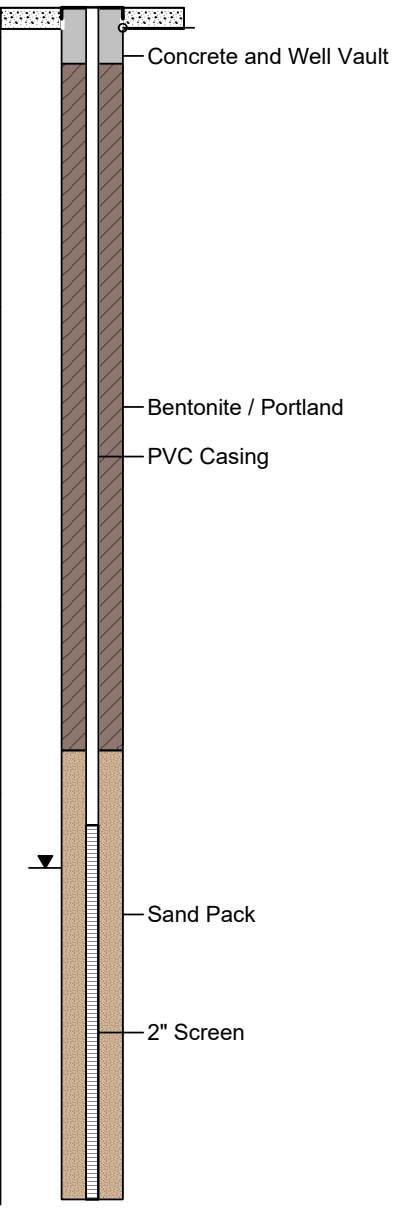
Responsive partner. Exceptional outcomes.

LOG OF BORING MW-15

City of Duluth
Subsurface Investigation
Main St.
Project # 5365

Date Started	: 10/1/18	Drilling Contractor	: Atlas Geo
Date Completed	: 10/1/18	Driller	: David H. and Brandon
Hole Diameter	: 8.5 inch	Logged By	: SEF
Drilling Method	: DTP and HSA		
Sampling Method	: Dual Tube (4')		

Depth in Feet	Approx Surf Elev	USCS	GRAPHIC	DESCRIPTION	PID (PPM)
0				Asphalt, crushed gravel at 0.5 ft (FILL)	
		CL		Red-orange, fine, stiff, dry, SILTY CLAY, micaceous, no odor, (FILL)	0.4
4		ML		Orange, fine, medium stiff, dry, SILTY CLAY, micaceous, no odor, (FILL)	
		CL		Brown, fine, very stiff, moist, CLAY, micaceous, no odor, (SAPROLITE)	0.0
8		CL		Orange-brown, fine, very stiff, dry, SILTY CLAY, micaceous, no odor, (SAPROLITE)	0.0
12				Medium stiff at 12 ft	
		CL		Brown-gold, fine, very stiff, dry, SILTY CLAY, trace pebble-sized quartz, black and grey striations, micaceous, no odor, (SAPROLITE)	0.0
16		CL		Brown, fine, soft, dry, SILTY CLAY, black, grey, and white striations, micaceous, no odor, (SAPROLITE)	0.0
20				Moist at 20 ft	
		CL		Brown-gold, fine, very soft, wet, SILTY CLAY, black, grey, and white striations, micaceous, no odor, (SAPROLITE)	0.0
24				Saturated at 23 ft	
				Heavy black striations at 26 ft	0.0
28					0.0
32				EOB at 32 ft	



Notes:
2 inch, 10 ft pre-pack screen
Water level (23.63') measured from TOC on 10/2/18.

Well Development Record

WENCK ASSOCIATES
Responsive partner. Exceptional outcomes.

Project Name: City of Duluth
Address: 5121 Main St
Weather Conditions: sunny 90s
Field Technician(s): E McCullen

Date: ~~05/20/18~~ 05/21/18

Well ID:			
Unique Well ID	MW-14	Average Purging Rate (g/m)	
Casing Diameter (inches)	2	Volume Purged (gals.)	25g 2.5
Top of Casing Elev. (feet)	TBD	Purged Dry (Y/N)	N
Depth to Water from TOC (feet)	34.56	Sampling Device	N/A
Groundwater Elev. (feet)	TBD	Time Sample Collected	N/A
Depth to Bottom of Well from TOC (feet)	80.40	Color	orange/brown
Volume of Water in Well (gals.)	7.405gal/45.8ft	Odor	N
3 Well Volumes (gals.)	22.40	Well Capped & Locked (Y/N)	Y
Purging Device	Waterra Hydrolift II	Lock Key #	
Purging Start Time	8:45a	Damage to Well? (Y/N)	N
Purging Stop Time	11:35a	Free Product Present? (Y/N)	N

Volume Purged (gallons)							
Stabilization Readings							
Time	NOT						
Temperature (°C)							
Specific Conductance (mS/cm)							
pH		COLLECTED					
ORP (mV)							
Dissolved Oxygen (mg/L)							
Turbidity (NTU)							

Comments:
One well volume = Water column in feet x 0.163 gallons/foot
Well development = purge 10 well volumes and turbidity is less then 50 NTU
Well purging before sampling = 3 to 5 well volumes

Well Development Record

WENCK ASSOCIATES
Responsive partner. Exceptional outcomes.

Project Name: City of Duluth **Date:** 6/11/18
Address: 3148 Main Street
Weather Conditions: Overcast 70s - 80s
Field Technician(s): SFuller & MRamirez

Well ID:			
Unique Well ID	MW-14	Average Purging Rate (g/m)	.264
Casing Diameter (inches)	2	Volume Purged (gals.)	28
Top of Casing Elev. (feet)	TBD	Purged Dry (Y/N)	N
Depth to Water from TOC (feet)	34.17	Sampling Device	—
Groundwater Elev. (feet)	TBD	Time Sample Collected	—
Depth to Bottom of Well from TOC (feet)	78.30	Color	brown
Volume of Water in Well (gals.)	7.193	Odor	N
3 Well Volumes (gals.)	21.579	Well Capped & Locked (Y/N)	Y/N
Purging Device Waterra Hydrolift II		Lock Key #	—
Purging Start Time	10:55	Damage to Well? (Y/N)	N
Purging Stop Time	12:44	Free Product Present? (Y/N)	N

Volume Purged (gallons)	7	14	21	28			
Stabilization Readings							
Time	11:22	11:48	12:14	12:40			
Temperature (°C)	30.34	23.47	22.99	21.64			
Specific Conductance (mS/cm)	0.023	0.097	0.091	0.095			
pH	5.04	4.99	5.30	5.18			
ORP (mV)	332	366	372	407			
Dissolved Oxygen (mg/L)	7.30	2.89	3.22	4.67			
Turbidity (NTU)	396	1,000+	1,000+	1,000+			
Well Volume	1	2	3	4			

Comments:
One well volume = Water column in feet x 0.163 gallons/foot
Well development = purge 10 well volumes and turbidity is less then 50 NTU
Well purging before sampling = 3 to 5 well volumes

Well Development Log

WENCK
Responsive partner.
Exceptional outcomes.

Project Name: City of Duluth **Date:** 10/1/2018
Address: 3150 Main Street
Weather Conditions: Clouds
Field Technician(s): SFuller

Well ID:			
Unique Well ID	MW-15	Average Purging Rate (g/m)	9/m
Casing Diameter (inches)	2	Volume Purged (gals.)	10.0
Top of Casing Elev. (feet)	TBD	Purged Dry (Y/N)	Y
Depth to Water from TOC (feet)	23.35	Sampling Device	YSI
Groundwater Elev. (feet)	TBD	Time Sample Collected	—
Depth to Bottom of Well from TOC (feet)	31.86	Color	chocolate milk
Volume of Water in Well (gals.)	1.38	Odor	NO
3 Well Volumes (gals.)	4.14	Well Capped & Locked (Y/N)	Y/N
Purging Device	Whale Pump	Lock Key #	—
Purging Start Time	12:45	Damage to Well? (Y/N)	N
Purging Stop Time	~~12:50~~ 1320	Free Product Present? (Y/N)	N

Volume Purged (gallons)	1.5	3.0	4.5	6.0	8.5	10.0	
Stabilization Readings							
Time	12:47	12:49	1301	1303	1316	1318	
Temperature (°C)	23.79	22.95	22.97	22.98	22.40	22.23	
Specific Conductance (mS/cm)	0.198	0.177	0.173	0.165	0.175	0.176	
pH	5.10	4.15	4.05	4.03	4.07	4.06	
ORP (mV)	209.6	312.9	359.6	372.2	374.8	377.4	
Dissolved Oxygen (mg/L)	11.59	13.17	13.00	6.11	5.00	4.26	
Turbidity (NTU)	1,000+ (out of range)	1,000+	1,000+	1,000+	1,000+	1,000+	

Comments:
One well volume = Water column in feet x 0.163 gallons/foot
Well development = purge 10 well volumes and turbidity is less then 50 NTU
Well purging before sampling = 3 to 5 well volumes

Purged dry @ 12:50, 3.5 gal purged, Resume at 1300
Purged dry @ 13:04, 8.0 gal purged, resume 13:14

Appendix B

Monitoring Well Sampling Logs

WENCK

Responsive partner. Exceptional outcomes.

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GROUNDWATER SAMPLING LOG

Project: City of Duluth		Project Number: B53605-0001	
Location: Main street		Well ID: MW-3	
Date: June 6/25 - 6/26, 18	Start Time at Well: 10:45		End Time at Well: 12:50a
Sampler: E.McCullen	Weather: Overcast		Comments:

WELL CHARACTERISTICS

Well Diameter (in): 2	Well Screen Depth Interval: 30 (ft) to 45 (ft)		Initial Depth to Water (ft): 32.70
Total Well Depth (ft): 44.87	Well Capacity (gallons per foot): 0.163	1 Well Volume (gallons): 1.99	3 Well Vol. (gal): 5.97
			Total Vol. Purged (gal): 7.5 L

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): 40	Final Depth of Tubing (ft): 40	Total Purge Time: 75min	Purge Equipment (circle one): Bailer (Bladder Pump) Electric Submersible Pump Peristaltic Pump Other (specify)_____
Initial Purge Rate (gpm): 0.1 L/M	Final Purge Rate (gpm): 0.1 L/M	Purge Method (circle one): (Low Flow-Low Stress) Micro-purge	Meter(s) used (circle one): (YSI 556) Lamotte 2020 Horiba U53

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)
11:15	0.5L	32.97	20.2	4.46	131	9.00	1026	Red	344
11:20	1L	33.08	20.3	4.34	131	9.00	676		373
11:25	1.5L	33.15	20.4	4.34	130	9.00	511		375
11:30	2.0L	33.18	20.4	4.36	129	9.01	463		380
11:35	2.5L	33.20	20.4	4.36	129	9.02	422		382
11:40	3.0L	33.22	20.4	4.37	128	9.02	385		387
11:45	3.5L	33.19	20.4	4.37	128	9.03	338		388
11:50	4.0L	33.21	20.4	4.38	127	9.04	315		390
11:55	4.5L	33.20	20.4	4.41	126	9.07	290		400
12:00	5.0L	33.20	20.4	4.42	124	9.09	275		405
12:05	5.5L	33.20	20.4	4.42	124	9.10	255		407

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): E.McCullen		Collection Method (circle one): Bailer Straw method Vacuum Jug Other			Time Sampling Initiated: 12:25	Time Sampling Completed: 12:30
Sample ID	Sample Time	Number of Containers	Volume	Preservative	Analysis/ EPA Method	Sample Type (G - Grab, C - Composite, Other (specify))
MW-03	12:30	3	40mL	HCl	VOC	G

Notes:

1L = .245gal

WENCK

Responsive partner. Exceptional outcomes.

GROUNDWATER SAMPLING LOG

Project: City of Duluth	Project Number: B53665-0001		
Location: Main Street	Well ID: MW-03		
Date: June 6/25/18 - 6/26/18	Start Time at Well: 10:45 a	End Time at Well: 12:50a	
Sampler: E McCullen	Weather: Overcast	Comments:	

WELL CHARACTERISTICS

Well Diameter (in): 2	Well Screen Depth Interval: 30 (ft) to 45 (ft)		Initial Depth to Water (ft): 32.70
Total Well Depth (ft): 44.87	Well Capacity (gallons per foot): 0.163	1 Well Volume (gallons): 1.99	3 Well Vol. (gal): 5.97
			Total Vol. Purged (gal): 7.5L

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): 40	Final Depth of Tubing (ft): 40	Total Purge Time: 75 Min	Purge Equipment (circle one): Bailer ~~Bladder Pump~~ Electric Submersible Pump Peristaltic Pump Other (specify)_____
Initial Purge Rate (gpm): 0.1 L/M	Final Purge Rate (gpm): 0.1 L/M	Purge Method (circle one): Low Flow-Low Stress Micro-purge	Meter(s) used (circle one): YSI 556 Lamotte 2020 Horiba U53

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	6.0	33.30	20.2	4.42	124	9.07	170	pink	410
12:15	6.5	33.27	20.2	4.42	124	9.08	165	"	411
12:20	7.0	33.27	20.4	4.42	126	9.10	160	"	412
12:25	7.5	33.30	20.4	4.42	126	9.10	158	"	411

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): E McCullen		Collection Method (circle one): Bailer Straw method Vacuum Jug Other			Time Sampling Initiated: 12:25	Time Sampling Completed: 12:30
Sample ID	Sample Time	Number of Containers	Volume	Preservative	Analysis/ EPA Method	Sample Type (G - Grab, C - Composite, Other (specify))
MW-03	12:30	3	40mL	HCl	VOC	G

Notes:
WLM no beep. only light. knob broken

WENCK

Page 1 of 2

GROUNDWATER SAMPLING LOG

Responsive partner. Exceptional outcomes.

Project: City of Duluth	Project Number: B53565-0001		
Location: Main Street	Well ID: MW-14		
Date: June 25/18	Start Time at Well: 8:00 pm	End Time at Well: 10:45	
Sampler: E McCullen	Weather: Overcast 70s	Comments:	

WELL CHARACTERISTICS

Well Diameter (in): 2	Well Screen Depth Interval: 10 (ft) to 20 (ft)		Initial Depth to Water (ft): 34.20
Total Well Depth (ft): 18.30	Well Capacity (gallons per foot): 0.163	1 Well Volume (gallons): 7.19	3 Well Vol. (gal): 21.57
			Total Vol. Purged (gal):

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): 14	Final Depth of Tubing (ft): 14	Total Purge Time: 80 min	Purge Equipment (circle one): Bailer (Bladder Pump) Electric Submersible Pump Peristaltic Pump Other (specify)_____
Initial Purge Rate (gpm): 0.1 L/M	Final Purge Rate (gpm): 0.1 L/M	Purge Method (circle one): (Low Flow-Low Stress) Micro-purge	Meter(s) used (circle one): (YSI 556) Lamotte 2020 Horiba U53

Reading Time	Total Volume Purged ~~(gal)~~ L	Depth to Water (ft)	Temperature (°C)	Ph SU	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTUs)	Color/ Odor	ORP (mV)
9:05	0.5	34.28	19.8	5.62	106	9.36	345	slight turb	248.0
9:10	1.0	34.36	19.6	5.69	105	9.42	1450	clear	256.8
9:15	1.5	34.57	19.5	6.01	104	9.46	2316	clear	257.9
9:20	2.0	34.68	19.5	5.81	105	9.47	2405		263.3
9:35	2.5	34.68	19.5	5.66	106	9.51	216		267.1
9:40	3.0	34.70	19.5	5.61	106	9.42	195		273.1
9:45	3.5	34.71	19.5	5.51	107	9.37	194		281.4
9:50	4.0	34.71	19.5	5.46	107	9.40	147		289.6
9:55	4.5	34.72	19.5	5.45	108	9.42	103		293.0
10:00	5.0	34.72	19.5	5.42	109	9.38	53.47		298.0
10:05	5.5	34.72	19.5	5.40	109	9.38	58.62		300.6

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): E McCullen		Collection Method (circle one): Bailer Straw method Vacuum Jug Other			Time Sampling Initiated: 10:30	Time Sampling Completed: 10:35
Sample ID	Sample Time	Number of Containers	Volume	Preservative	Analysis/ EPA Method	Sample Type (G - Grab, C - Composite, Other (specify))
MW-14		3	40mL	HCl	VOC	G

Notes:

WLM knob is broken was able to get light no beep

NTU on meter high but water clear stop + clean @ 9:20

WENCK

Responsive partner. Exceptional outcomes.

GROUNDWATER SAMPLING LOG

Project: Duluth GA	Project Number: B53605-0007		
Location: Main St	Well ID: MW-14		
Date: 9/25/18	Start Time at Well: ~~10:45~~ 8:00	End Time at Well: 10:45	
Sampler: EMcMillen	Weather: Overcast	Comments:	

WELL CHARACTERISTICS

Well Diameter (in): 2	Well Screen Depth Interval: 70 (ft) to 80 (ft)		Initial Depth to Water (ft): 34.20
Total Well Depth (ft): 78.30	Well Capacity (gallons per foot): 0.163	1 Well Volume (gallons): 7.19	3 Well Vol. (gal): 21.57
			Total Vol. Purged (gal): 80L

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): 74	Final Depth of Tubing (ft): 74	Total Purge Time: 80min	Purge Equipment (circle one): Bailer (Bladder Pump) Electric Submersible Pump Peristaltic Pump Other (specify)_____
Initial Purge Rate (gpm): 0.14M	Final Purge Rate (gpm): 0.14M	Purge Method (circle one): ~~Low Flow-Low Stress~~ Micro-purge	Meter(s) used (circle one): (YSI 556) Lamotte 2020 Horiba U53

Reading Time	Total Volume Purged ~~(gal)~~ L	Depth to Water (ft)	Temperature (°C)	Ph SU	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTUs)	Color/ Odor	ORP (mV)
10:10	6.0	34.73	19.5	5.40	110	9.38	55.00		300.6
10:15	6.5	34.73	19.5	5.40	111	9.41	53.10		303.2
10:20	7.0	34.73	19.5	5.40	110	9.41	47.00		305.7
10:25	7.5	34.73	19.5	5.41	111	9.40	39.12		308.1
10:30	8.0	34.73	19.5	5.41	111	9.40	42.21		309.6

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): EMcMillen		Collection Method (circle one): Bailer Straw method Vacuum Jug Other			Time Sampling Initiated: 10:30	Time Sampling Completed: 10:35
Sample ID	Sample Time	Number of Containers	Volume	Preservative	Analysis/ EPA Method	Sample Type (G - Grab, C - Composite, Other (specify))
MW-14	10:35	3	40mL	HCl	VOC	G

Notes:

1L = .245gal

WENCK

Responsive partner. Exceptional outcomes.

GROUNDWATER SAMPLING LOG

Project: City of Duluth	Project Number: 5365		
Location: Duluth, GA	Well ID: MW-1		
Date: 8/21/18	Start Time at Well: 11:00	End Time at Well: 1344	
Sampler: SEF	Weather: Overcast/rain 80s	Comments:	

WELL CHARACTERISTICS

Well Diameter (in): 2	Well Screen Depth Interval: 30.18 (ft) to 40.18 (ft)		Initial Depth to Water (ft): 29.26
Total Well Depth (ft): 39.8	Well Capacity (gallons per foot): 0.163	1 Well Volume (gallons): 1.71	3 Well Vol. (gal): 5.13
			Total Vol. Purged (gal): 9.0L

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): 35.75	Final Depth of Tubing (ft): 35.75	Total Purge Time: 106 min	Purge Equipment (circle one): Bailer Bladder Pump Electric Submersible Pump Peristaltic Pump Other (specify)_____
Initial Purge Rate (gpm): 0.14/m	Final Purge Rate (gpm): 0.14/m	Purge Method (circle one): Low Flow-Low Stress Micro-purge	Meter(s) used (circle one): YSI 556 Lamotte 2020 Horiba U53

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)
1134									
1139	0.5L	29.28	25.40	4.20	0.118	7.82	376	Orange/NO	297.8
1144	1.0L	29.35	24.04	3.15	0.112	5.06	549	" "	335.2
1149	1.5L	29.48	23.63	2.92	0.112	4.68	401	" "	350.8
1154	2.0L	29.52	23.85	3.05	0.112	4.43	389	" "	347.6
1159	2.5L	29.52	24.22	3.56	0.113	4.34	363	" "	326.1
1204	3.0L	29.52	23.43	3.57	0.111	4.45	303	" "	328.0
1209	3.5L	29.52	22.71	2.93	0.110	4.42	259	" "	368.5
1214	4.0L	29.52	22.66	3.14	0.109	4.37	220	" "	358.1
1219	4.5L	29.61	22.96	3.41	0.110	4.25	203	" "	346.6
1224	5.0L	29.74	23.16	3.58	0.110	4.23	168	" "	338.9
1229	5.5L	29.85	23.16	3.67	0.110	4.23	145	" "	334.1

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): SEF		Collection Method (circle one): Bailer Straw method Vacuum Jug Other			Time Sampling Initiated: 1310	Time Sampling Completed: 1320
Sample ID	Sample Time	Number of Containers	Volume	Preservative	Analysis/ EPA Method	Sample Type (G - Grab, C - Composite, Other (specify))
MW-1	1310	3	40ml	HCl	VOC	G
DUP-1		3	40ml	HCl	VOC	G

Notes:
Attempted to decrease purge rate but lowering throttle caused water to not make it up tubing.

WENCK

Responsive partner. Exceptional outcomes.

GROUNDWATER SAMPLING LOG

Project:	Project Number:	
Location:	Well ID: MW-1	
Date:	Start Time at Well:	End Time at Well:
Sampler:	Weather:	Comments:

WELL CHARACTERISTICS

Well Diameter (in):	Well Screen Depth Interval: _____ (ft) to _____ (ft)		Initial Depth to Water (ft):
Total Well Depth (ft):	Well Capacity (gallons per foot):	1 Well Volume (gallons):	3 Well Vol. (gal):
			Total Vol. Purged (gal):

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

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)
1234	6.0L	29.95	23.23	3.71	0.111	4.18	123	slt orgn/no	332.8
1239	6.5L	29.97	23.24	3.76	0.113	4.23	95.2	" "	330.8
1244	7.0L	30.01	23.31	3.79	0.115	4.19	86.6	" "	329.7
1249	7.5L	30.03	23.56	3.87	0.116	4.16	84.4	" "	325.5
1254	8.0L	30.03	23.62	3.87	0.116	4.14	75.7	" "	324.5
1259	8.5L	30.03	23.59	3.87	0.115	4.13	77.8	" "	324.9
1304	9.0L	30.03	23.67	3.89	0.114	4.15	80.4	" "	324.1
1310	S	a	M	P	1	e			

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):		Collection Method (circle one): Bailer Straw method Vacuum Jug Other			Time Sampling Initiated:	Time Sampling Completed:
Sample ID	Sample Time	Number of Containers	Volume	Preservative	Analysis/ EPA Method	Sample Type (G - Grab, C - Composite, Other (specify))

Notes:

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Responsive partner. Exceptional outcomes.

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GROUNDWATER SAMPLING LOG

Project: Duluth	Project Number: 5365	
Location: Duluth, GA	Well ID: MW-2	
Date: 8-29-18	Start Time at Well: 0915	End Time at Well: 1020
Sampler: M. Padgett	Weather: Cloudy, 75°F	Comments:

WELL CHARACTERISTICS

Well Diameter (in): 2"	Well Screen Depth Interval: 19.55 (ft) to 29.55 (ft)	Initial Depth to Water (ft): 22.38	Damage to well: Y (N)	
Total Well Depth (ft): 29.55	Well Capacity (gallons per foot): 0.163	1 Well Volume (gallons): 1.17	3 Well Vol. (gal): 3.50	Well capped: (Y) N Well locked: (Y) N
Well Recharge is: very slow slow (moderate) fast		Bailed dry: Y (N) NA	Total Vol. Purged (gal): 5.5 gallons	Ferrous Iron (mg/L):

Well capacity (gallons per foot): **0.75"** = 0.02; **1"** = 0.04; **2"** = 0.163; **3"** = 0.37; **4"** = 0.653; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88

PURGING DATA

Initial Depth of Tubing (ft): 26'	Final Depth of Tubing (ft): 26'	Total Purge Time: 55 MINS	Purge Equipment (circle one): Bailer (Bladder Pump) Electric Submersible Pump Peristaltic Pump Other (specify)_____
Initial Purge Rate (gpm): 0.1	Final Purge Rate (gpm): 0.1	Purge Method (circle one): (Low Flow-Low Stress Micro-purge)	Meter(s) used (circle one): (YSI 556) Lamotte 2020 Horiba U53

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)
0920	0.5	22.54	21.13	4.41	0.294	3.51	118	Cloudy	250.1
0925	1.0	22.55	21.75	4.41	0.295	3.25	115	Cloudy	262.0
0930	1.5	22.56	22.10	4.38	0.294	3.11	74.2	Clear	267.6
0935	2.0	22.56	22.55	4.35	0.293	3.10	77.1	Clear	273.6
0940	2.5	22.56	23.02	4.33	0.290	3.20	40.2	Clear	277.4
0945	3.0	22.56	22.91	4.31	0.288	3.19	32.3	Clear	276.4
0950	3.5	22.56	22.94	4.29	0.286	3.17	23.6	Clear	276.5
0955	4.0	22.56	22.93	4.27	0.286	3.20	13.5	Clear	277.9
1000	4.5	22.56	22.98	4.27	0.286	3.21	8.98	Clear	278.1
1005	5.0	22.56	23.02	4.27	0.286	3.24	7.65	Clear	275.2
1010	5.5	22.56	23.05	4.28	0.286	3.28	6.50	Clear	273.6

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): Mark Padgett	Collection Method (circle one): Bailer (Straw method) Vacuum Jug Other	Time Sampling Initiated: 1015	Time Sampling Completed: 1020

Sample ID	Sample Time	Number of Containers	Volume	Preservative	Analysis/ EPA Method	Sample Type (G - Grab, C - Composite, Other (specify))
MW-2	1015	3	40 ml	HCl	VOCs-8260	G

Notes:

Equipment Cleaning Procedures:

potable water and phosphate-free soap

potable-water rinse

water rinse: distilled deionized

solvent rinse acetone hexane

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GROUNDWATER SAMPLING LOG

Project: Duluth	Project Number: 5365	
Location: Duluth, GA	Well ID: MW-3	
Date: 8-29-18	Start Time at Well: 1050	End Time at Well: 1140
Sampler: M. Padgett	Weather: Cloudy, 80°F	Comments:

WELL CHARACTERISTICS

Well Diameter (in): 2"	Well Screen Depth Interval: 30.52 (ft) to 45.52 (ft)		Initial Depth to Water (ft): 31.40	Damage to well: Y (N)
Total Well Depth (ft): 45.52	Well Capacity (gallons per foot): 0.163	1 Well Volume (gallons): 2.30	3 Well Vol. (gal): 6.90	Well capped: (Y) N Well locked: (Y) N
Well Recharge is: very slow slow (moderate) fast		Bailed dry: Y (N) NA	Total Vol. Purged (gal): 4.0	Ferrous Iron (mg/L): N/A

Well capacity (gallons per foot): **0.75"** = 0.02; **1"** = 0.04; **2"** = 0.163; **3"** = 0.37; **4"** = 0.653; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88

PURGING DATA

Initial Depth of Tubing (ft): 38'	Final Depth of Tubing (ft): 38'	Total Purge Time: 40 MINS	Purge Equipment (circle one): Bailer (Bladder Pump) Electric Submersible Pump Peristaltic Pump Other (specify)_____
Initial Purge Rate (gpm): 0.1	Final Purge Rate (gpm): 0.1	Purge Method (circle one): (Low Flow-Low Stress) Micro-purge	Meter(s) used (circle one): (YSI 556) Lamotte 2020 Horiba U53

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)
1055	0.5	31.62	22.76	5.03	0.112	5.33	27.0	clear	241.0
1100	1.0	31.64	22.14	4.68	0.108	4.57	12.9	clear	247.9
1105	1.5	31.66	22.47	4.47	0.108	5.17	11.1	clear	252.6
1110	2.0	31.67	23.05	4.53	0.109	4.84	10.2	clear	247.4
1115	2.5	31.68	23.56	4.53	0.109	4.66	8.34	clear	240.9
1120	3.0	31.68	23.77	4.47	0.110	4.65	6.77	clear	238.6
1125	3.5	31.68	23.82	4.45	0.110	4.64	7.52	clear	237.6
1130	4.0	31.68	23.84	4.43	0.110	4.59	7.08	clear	240.7

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): Mark Padgett		Collection Method (circle one): Bailer (Straw method) Vacuum Jug Other			Time Sampling Initiated: 1135	Time Sampling Completed: 1140
Sample ID	Sample Time	Number of Containers	Volume	Preservative	Analysis/ EPA Method	Sample Type (G - Grab, C - Composite, Other (specify))
MW-3	1135	3	40 ml	HCl	VOCs - 8260	G

Notes:

Equipment Cleaning Procedures:

potable water and phosphate-free soap

potable-water rinse

water rinse: distilled deionized

solvent rinse acetone hexane

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GROUNDWATER SAMPLING LOG

Project: City of Duluth		Project Number: 53165	
Location: Duluth, GA		Well ID: MW-4	
Date: 8/21/18	Start Time at Well: 0845		End Time at Well: 11:09
Sampler: SEF	Weather: Overcast 80s		Comments:

WELL CHARACTERISTICS

Well Diameter (in): 2	Well Screen Depth Interval: 29.64 (ft) to 39.64 (ft)		Initial Depth to Water (ft): 29.04
Total Well Depth (ft): 39.2	Well Capacity (gallons per foot): 0.163	1 Well Volume (gallons): 1.65	3 Well Vol. (gal): 4.95
			Total Vol. Purged (gal): 6.0L

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): 35.5	Final Depth of Tubing (ft): 35.5	Total Purge Time: 70min	Purge Equipment (circle one): Bailer (Bladder Pump) Electric Submersible Pump Peristaltic Pump Other (specify)_____
Initial Purge Rate (gpm): 0.1L/M	Final Purge Rate (gpm): 0.1L/M	Purge Method (circle one): ~~Low Flow-Low Stress~~ Micro-purge	Meter(s) used (circle one): YSI 556 Lamotte 2020 Horiba U53

9:20

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)
925	0.5L	29.18	23.21	4.26	0.036	5.91	310	orange/no	272.9
930	1.0L	29.35	23.95	3.96	0.036	5.28	277	" "	288.0
935	1.5L	29.49	24.25	4.16	0.036	5.99	304	" "	276.1
940	2.0L	29.48	24.17	4.19	0.036	5.93	303	" "	274.8
945	2.5L	29.65	23.68	4.19	0.036	5.84	229	" "	277.5
950	3.0L	29.73	23.77	4.11	0.034	5.55	229	" "	286.7
955	3.5L	29.80	23.68	4.14	0.034	5.67	224	" "	284.7
1000	4.0L	29.00	23.53	4.16	0.033	5.54	215	" "	287.9
1005	4.5L	30.10	23.33	4.11	0.033	5.52	186	" "	290.6
1010	5.0L	30.22	23.20	4.03	0.032	5.52	178	" "	295.9
1015	5.5L	30.25	23.24	3.98	0.032	5.52	179	" "	300.0

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): SEF		Collection Method (circle one): Bailer Straw method Vacuum Jug Other			Time Sampling Initiated: 1025	Time Sampling Completed: 1030
Sample ID	Sample Time	Number of Containers	Volume	Preservative	Analysis/ EPA Method	Sample Type (G - Grab, C - Composite, Other (specify))
MW-4	1025	3	40ml	HCl	VOC	G

Notes:
Attempted to lower throttle to accomadate draw down but slightest decrease caused water to stop coming up tubing.

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GROUNDWATER SAMPLING LOG

Project:	Project Number:	
Location:	Well ID: MW-4	
Date:	Start Time at Well:	End Time at Well:
Sampler:	Weather:	Comments:

WELL CHARACTERISTICS

Well Diameter (in):	Well Screen Depth Interval: _____ (ft) to _____ (ft)		Initial Depth to Water (ft):
Total Well Depth (ft):	Well Capacity (gallons per foot):	1 Well Volume (gallons):	3 Well Vol. (gal): Total Vol. Purged (gal):

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

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)
1020	6.0L	30.35	23.36	4.07	0.032	5.40	178	orange/no	296.0
1025	S	a	M	P	T	E			

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):		Collection Method (circle one): Bailer Straw method Vacuum Jug Other			Time Sampling Initiated:	Time Sampling Completed:
Sample ID	Sample Time	Number of Containers	Volume	Preservative	Analysis/ EPA Method	Sample Type (G - Grab, C - Composite, Other (specify))

Notes:

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GROUNDWATER SAMPLING LOG

Project: City of Duluth	Project Number: 5365	
Location: Duluth, GA	Well ID: MW-5	
Date: 6/20/16	Start Time at Well: 1100	End Time at Well: 1310
Sampler: SEF	Weather: Overcast 80s	Comments:

WELL CHARACTERISTICS

Well Diameter (in): 2	Well Screen Depth Interval: 20.15 (ft) to 30.15 (ft)		Initial Depth to Water (ft): 22.60
Total Well Depth (ft): 30	Well Capacity (gallons per foot): 0.163	1 Well Volume (gallons): 1.20	3 Well Vol. (gal): 3.6
			Total Vol. Purged (gal): 7.0L

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): 27	Final Depth of Tubing (ft): 27	Total Purge Time: 77 min	Purge Equipment (circle one): Bailer (Bladder Pump) Electric Submersible Pump Peristaltic Pump Other (specify)_____
Initial Purge Rate (gpm): 0.5L/m	Final Purge Rate (gpm): 0.5L/m	Purge Method (circle one): (Low Flow-Low Stress) Micro-purge	Meter(s) used (circle one): (YSI 556) Lamotte 2020 Horiba U53

1133

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)
1138	0.5L	20.60	23.62	4.21	0.109	4.36	67.4	Slt tur/no	256.9
1143	1.0L	20.61	23.88	4.08	0.110	4.38	56.9	" "	262.4
1148	1.5L	20.62	24.29	4.36	0.107	4.20	53.3	" "	249.6
1153	2.0L	20.64	24.71	4.64	0.105	4.03	40.5	" "	234.3
1158	2.5L	20.66	24.77	4.74	0.102	3.99	33.0	" "	231.0
1203	3.0L	20.69	23.81	4.71	0.097	3.91	29.7	dr/no	236.8
1208	3.5L	20.70	23.22	4.08	0.094	3.77	24.1	" "	277.3
1213	4.0L	20.72	23.12	3.95	0.093	3.73	14.8	" "	286.8
1218	4.5L	20.75	23.67	4.52	0.094	3.77	13.8	" "	263.0
1223	5.0L	20.76	23.35	4.55	0.093	3.77	12.7	" "	252.8
1228	5.5L	20.79	23.15	4.58	0.092	3.68	11.6	" "	252.5

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): SEF		Collection Method (circle one): Bailer Straw method Vacuum Jug Other			Time Sampling Initiated: 1245	Time Sampling Completed: 1250
Sample ID	Sample Time	Number of Containers	Volume	Preservative	Analysis/ EPA Method	Sample Type (G - Grab, C - Composite, Other (specify))
MW-5	1245	3	40ml	HCL	VOC	G

Notes:

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GROUNDWATER SAMPLING LOG

Project:	Project Number:	
Location:	Well ID: MW-5	
Date:	Start Time at Well:	End Time at Well:
Sampler:	Weather:	Comments:

WELL CHARACTERISTICS

Well Diameter (in):	Well Screen Depth Interval: _____ (ft) to _____ (ft)		Initial Depth to Water (ft):
Total Well Depth (ft):	Well Capacity (gallons per foot):	1 Well Volume (gallons):	3 Well Vol. (gal):
			Total Vol. Purged (gal):

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

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)
1233	6.0L	20.88	23.03	4.60	0.092	3.63	7.81	Clr/no	252.9
1238	6.5L	20.90	22.97	4.64	0.092	3.66	6.40	" "	253.9
1243	7.0L	20.90	22.92	4.64	0.092	3.63	6.72	" "	254.2
1245	5	α	Mu	P	(	e			

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):		Collection Method (circle one): Bailer Straw method Vacuum Jug Other			Time Sampling Initiated:	Time Sampling Completed:
Sample ID	Sample Time	Number of Containers	Volume	Preservative	Analysis/ EPA Method	Sample Type (G - Grab, C - Composite, Other (specify))

Notes:

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GROUNDWATER SAMPLING LOG

Project: Duluth	Project Number: 5365	
Location: Duluth, GA	Well ID: MW-6	
Date: 8-20-18	Start Time at Well: 1310	End Time at Well: 1410
Sampler: M. Padgett	Weather: Cloudy, 80°F	Comments:

WELL CHARACTERISTICS

Well Diameter (in):	Well Screen Depth Interval:	Initial Depth to Water (ft):
2"	20.35 (ft) to 30.35 (ft)	19.46

Total Well Depth (ft):	Well Capacity (gallons per foot):	1 Well Volume (gallons):	3 Well Vol. (gal):	Total Vol. Purged (gal):
30.35	0.163	1.78	5.32	5.0 gallons

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):	Final Depth of Tubing (ft):	Total Purge Time:	Purge Equipment (circle one): Bailer, Bladder Pump, Electric Submersible Pump, Peristaltic Pump, Other (specify)_____
25'	25'	55 MINS	

Initial Purge Rate (gpm):	Final Purge Rate (gpm):	Purge Method (circle one): Low Flow-Low Stress, Micro-purge	Meter(s) used (circle one): YSI 556, Lamotte 2020, Horiba U53
0.1	0.1	Low Flow-Low Stress	YSI 556

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)
1325	1.5	20.95	21.41	4.43	0.139	4.95	145	Cloudy	318.0
1330	2.0	20.97	21.35	4.38	0.138	4.86	116	Cloudy	321.6
1335	2.5	21.00	21.40	4.30	0.136	4.83	94.3	Clear	325.0
1340	3.0	21.03	21.25	4.25	0.136	4.73	55.6	Clear	327.8
1345	3.5	21.07	21.26	4.19	0.139	4.58	49.0	Clear	329.3
1350	4.0	21.10	21.22	4.14	0.141	4.56	50.0	Clear	332.1
1355	4.5	21.12	21.19	4.11	0.142	4.56	48.0	Clear	333.4
1400	5.0	21.13	21.22	4.08	0.143	4.52	49.5	Clear	333.6

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):	Collection Method (circle one): Bailer, Straw method, Vacuum Jug, Other	Time Sampling Initiated:	Time Sampling Completed:
Mark Padgett	Straw method	1405	1410

Sample ID	Sample Time	Number of Containers	Volume	Preservative	Analysis/ EPA Method	Sample Type (G - Grab, C - Composite, Other (specify))
MW-6	1405	3	40 ml	HCl	VOCs-8260	G

Notes:
Purge from 1310 to 1320 to let turbidity drop.

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GROUNDWATER SAMPLING LOG

Project: Duluth	Project Number:	
Location: Duluth, GA	Well ID: MW-8	
Date: 8-20-18	Start Time at Well: 1000	End Time at Well: 1220
Sampler: M. Padgett	Weather: Cloudy, 80°F	Comments:

WELL CHARACTERISTICS

Well Diameter (in): 2"	Well Screen Depth Interval: 49.5 (ft) to 64.5 (ft)		Initial Depth to Water (ft): 42.63
Total Well Depth (ft): 64.5	Well Capacity (gallons per foot): 0.163	1 Well Volume (gallons): 3.56	3 Well Vol. (gal): 10.69
			Total Vol. Purged (gal): 3.5

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): 57'	Final Depth of Tubing (ft): 57'	Total Purge Time: 35 MINS	Purge Equipment (circle one): Bailer Bladder Pump Electric Submersible Pump (Peristaltic Pump) Other (specify)_____
Initial Purge Rate (gpm): 0.1	Final Purge Rate (gpm): 0.1	Purge Method (circle one): (Low Flow-Low Stress) Micro-purge	Meter(s) used (circle one): (YSI 556) Lamotte 2020 Horiba U53

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)
1145	0.5	43.01	19.62	6.79	0.052	7.78	12.6	Clear	276.3
1150	1.0	43.01	18.95	5.58	0.046	6.55	13.3	Clear	292.6
1155	1.5	43.02	18.48	5.09	0.046	5.72	5.20	Clear	307.3
1200	2.0	43.03	18.33	4.97	0.044	5.46	16.30	Clear	308.3
1205	2.5	43.04	18.29	4.93	0.041	5.37	17.9	Clear	311.5
1210	3.0	43.05	18.26	4.91	0.040	5.43	17.1	Clear	316.0
1215	3.5	43.05	18.25	4.90	0.040	5.38	17.4	Clear	318.1

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): Mark Padgett		Collection Method (circle one): Bailer (Straw method) Vacuum Jug Other			Time Sampling Initiated: 1220	Time Sampling Completed: 1225
Sample ID	Sample Time	Number of Containers	Volume	Preservative	Analysis/ EPA Method	Sample Type (G - Grab, C - Composite, Other (specify))
MW-8	1220	3	40 ml	HCl	VOCs-8260	G

Notes:

- Tubing size and BP do not match. Call Pine at 1010
- Pine Brought correct tubing at 1130, resume sampling

WENCK

Responsive partner. Exceptional outcomes.

GROUNDWATER SAMPLING LOG

Project: City of Duluth		Project Number: 53165	
Location: Duluth, GA		Well ID: MW-13	
Date: 8/20/18	Start Time at Well: 1310		End Time at Well: 1530
Sampler: SEF	Weather: Overcast 80s		Comments:

WELL CHARACTERISTICS

Well Diameter (in):	Well Screen Depth Interval:		Initial Depth to Water (ft):
2	20 (ft) to 30 (ft)		20.80
Total Well Depth (ft):	**Well Capacity (gallons per foot):**	**1 Well Volume (gallons):**	**3 Well Vol. (gal):**
30	26.5	1.49	4.47
			Total Vol. Purged (gal): 7.0L

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):	Final Depth of Tubing (ft):	Total Purge Time:	Purge Equipment (circle one): Bailer (Bladder Pump) Electric Submersible Pump Peristaltic Pump Other (specify)_____
26.5	26.5	70 min	
Initial Purge Rate (gpm):	**Final Purge Rate (gpm):**	**Purge Method (circle one):**	**Meter(s) used (circle one):** YSI 556 Lamotte 2020 Horiba U53
0.1 L/m	0.1 L/m	Low Flow-Low Stress Micro-purge	

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)
1340									
1345	0.5L	20.82	24.75	4.95	0.193	4.80	58.6	clr/no	210.7
1350	1.0L	20.82	25.08	4.56	0.190	3.11	53.7	" "	231.9
1355	1.5L	20.83	25.60	3.99	0.191	2.95	47.2	" "	260.0
1400	2.0L	20.83	26.12	4.60	0.192	2.86	41.0	" "	230.6
1405	2.5L	20.85	26.63	4.79	0.193	2.42	31.0	" "	225.1
1410	3.0L	20.88	27.18	4.86	0.194	2.71	22.8	" "	222.6
1415	3.5L	20.90	27.43	4.87	0.195	2.71	18.6	" "	221.5
1420	4.0L	20.91	27.79	4.90	0.197	2.69	17.3	" "	222.3
1425	4.5L	20.92	28.12	4.91	0.197	2.71	16.0	" "	223.9
1430	5.0L	20.94	28.36	4.93	0.198	2.69	12.9	" "	221.8
1435	5.5L	20.95	28.61	4.92	0.199	2.67	10.9	" "	224.1

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): SEF		Collection Method (circle one): Bailer Straw method Vacuum Jug Other			Time Sampling Initiated: 1455	Time Sampling Completed: 1500
Sample ID	**Sample Time**	**Number of Containers**	**Volume**	**Preservative**	**Analysis/ EPA Method**	**Sample Type (G - Grab, C - Composite, Other (specify))**
MW-13	1455	3	40ml	HCL	VOC	G

Notes:

WENCK

Responsive partner. Exceptional outcomes.

GROUNDWATER SAMPLING LOG

Project:	Project Number:	
Location:	Well ID: MW-13	
Date:	Start Time at Well:	End Time at Well:
Sampler:	Weather:	Comments:

WELL CHARACTERISTICS

Well Diameter (in):	Well Screen Depth Interval: _____ (ft) to _____ (ft)		Initial Depth to Water (ft):
Total Well Depth (ft):	Well Capacity (gallons per foot):	1 Well Volume (gallons):	3 Well Vol. (gal):
			Total Vol. Purged (gal):

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

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)
1440	6.0L	20.97	28.83	4.94	0.209	2.61	9.78	clr/no	223.4
1445	6.5L	20.99	28.91	4.96	0.201	2.61	8.63	clr/no	225.4
1450	7.0L	21.03	29.06	4.95	0.201	2.52	8.27	" "	225.3
1455	5	a	lu	p	l	e			

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):		Collection Method (circle one): Bailer Straw method Vacuum Jug Other			Time Sampling Initiated:	Time Sampling Completed:
Sample ID	Sample Time	Number of Containers	Volume	Preservative	Analysis/ EPA Method	Sample Type (G - Grab, C - Composite, Other (specify))

Notes:

WENCK

Responsive partner. Exceptional outcomes.

GROUNDWATER SAMPLING LOG

Project: City of Duluth	Project Number: 5365-0001		
Location: Duluth, GA	Well ID: MW-15		
Date: 10/2/18	Start Time at Well: 9:10	End Time at Well: 1205	
Sampler: SEF	Weather: Overcast	Comments:	

WELL CHARACTERISTICS

Well Diameter (in): 2	Well Screen Depth Interval: 21.86 (ft) to 31.86 (ft)		Initial Depth to Water (ft): 23.63
Total Well Depth (ft): 31.86	Well Capacity (gallons per foot): 0.163	1 Well Volume (gallons): 1.33	3 Well Vol. (gal): 3.99
			Total Vol. Purged (gal): ~~6~~ 6.5L

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): 27.5	Final Depth of Tubing (ft): 27.5	Total Purge Time: 67 min	Purge Equipment (circle one): Bailer Bladder Pump Electric Submersible Pump Peristaltic Pump Other (specify)_____
Initial Purge Rate (gpm): 0.1L/m	Final Purge Rate (gpm): 0.1L/m	Purge Method (circle one): Low Flow-Low Stress Micro-purge	Meter(s) used (circle one): YSI 556 Lamotte 2020 Horiba U53

10:17

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)
10:22	0.5L	23.66	24.80	4.21	0.189	3.33	603	Brn/no	218.4
10:27	1.0L	23.69	23.82	4.07	0.183	3.07	349	" "	225.8
10:32	1.5L	23.75	23.42	3.93	0.181	2.80	232	" "	237.9
10:37	2.0L	23.78	23.38	3.91	0.181	2.73	179	" "	240.0
10:42	2.5L	23.78	23.30	3.95	0.180	2.61	136	dr/no	237.3
10:52	3.0L	23.75	24.13	4.07	0.182	3.54	83.5	" "	244.8
10:57	3.5L	23.78	23.49	4.03	0.181	2.62	74.6	" "	241.8
11:02	4.0L	23.80	23.36	4.00	0.183	2.20	60.4	" "	237.7
11:07	4.5L	23.80	23.40	3.99	0.184	2.08	51.6	" "	233.5
11:12	5.0L	23.80	23.40	4.00	0.185	1.92	50.9	" "	228.6
11:17	5.5L	23.80	23.35	4.00	0.185	1.88	45.6	" "	224.9

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): SEF		Collection Method (circle one): Bailer Straw method Vacuum Jug Other			Time Sampling Initiated: 11:35	Time Sampling Completed: 11:40
Sample ID	Sample Time	Number of Containers	Volume	Preservative	Analysis/ EPA Method	Sample Type (G - Grab, C - Composite, Other (specify))
MW-15	11:35	3	40ml	HCL	VOC	G

Notes:
10:44: Stop purge to clear flow through cell
10:47: Resume purging

21.3

WENCK

Responsive partner. Exceptional outcomes.

GROUNDWATER SAMPLING LOG

Project:	Project Number:	
Location:	Well ID: MW-15	
Date:	Start Time at Well:	End Time at Well:
Sampler:	Weather:	Comments:

WELL CHARACTERISTICS

Well Diameter (in):	Well Screen Depth Interval: _____ (ft) to _____ (ft)		Initial Depth to Water (ft):
Total Well Depth (ft):	Well Capacity (gallons per foot):	1 Well Volume (gallons):	3 Well Vol. (gal):
			Total Vol. Purged (gal):

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

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)
11:22	6.0L	23.80	23.38	4.00	0.185	1.79	42.1	Clr/no	221.6
11:27	6.5L	23.80	23.43	4.00	0.185	1.69	42.8	" "	218.6
11:35	S	a	M	P	I	E			

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):		Collection Method (circle one): Bailer Straw method Vacuum Jug Other			Time Sampling Initiated:	Time Sampling Completed:
Sample ID	Sample Time	Number of Containers	Volume	Preservative	Analysis/ EPA Method	Sample Type (G - Grab, C - Composite, Other (specify))

Notes:

Appendix C

Laboratory Reports and Chain-of-Custody Documentation
(Provided in the electronic copy of the report)

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

July 02, 2018

Katie Ross
WENCK Associates
1080 Holcomb Bridge Rd.
Roswell, GA 30076

RE: Project: City of Duluth - 5365
Pace Project No.: 266458

Dear Katie Ross:
Enclosed are the analytical results for sample(s) received by the laboratory on June 26, 2018. 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,

Eben Buchanan

Eben Buchanan
eben.buchanan@pacelabs.com
(770)734-4200
Project Manager

Enclosures

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

CERTIFICATIONS

Project: City of Duluth - 5365
Pace Project No.: 266458

Atlanta Certification IDs

110 Technology Parkway Peachtree Corners, GA 30092
Florida DOH Certification #: E87315
Georgia DW Inorganics Certification #: 812
Georgia DW Microbiology Certification #: 812
North Carolina Certification #: 381
South Carolina Certification #: 98011001
Texas Certification #: T104704397-08-TX
Virginia Certification #: 460204

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

SAMPLE SUMMARY

Project: City of Duluth - 5365
Pace Project No.: 266458

Lab ID	Sample ID	Matrix	Date Collected	Date Received
266458001	**MW-14**	Water	06/25/18 22:35	06/26/18 08:10
266458002	**MW-03**	Water	06/26/18 00:30	06/26/18 08:10
266458003	**Trip Blank**	Water	06/25/18 00:00	06/26/18 08:10

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

SAMPLE ANALYTE COUNT

Project: City of Duluth - 5365
Pace Project No.: 266458

Lab ID	Sample ID	Method	Analysts	Analytes Reported
266458001	**MW-14**	EPA 8260B	JHG	64
266458002	**MW-03**	EPA 8260B	JHG	64
266458003	**Trip Blank**	EPA 8260B	JHG	64

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - 5365
Pace Project No.: 266458

Sample: MW-14 **Lab ID: 266458001** Collected: 06/25/18 22:35 Received: 06/26/18 08:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		06/28/18 19:58	67-64-1	
Benzene	ND	ug/L	1.0	1		06/28/18 19:58	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		06/28/18 19:58	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		06/28/18 19:58	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		06/28/18 19:58	75-27-4	
Bromoform	ND	ug/L	1.0	1		06/28/18 19:58	75-25-2	
Bromomethane	ND	ug/L	2.0	1		06/28/18 19:58	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		06/28/18 19:58	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		06/28/18 19:58	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		06/28/18 19:58	108-90-7	
Chloroethane	ND	ug/L	1.0	1		06/28/18 19:58	75-00-3	
Chloroform	ND	ug/L	1.0	1		06/28/18 19:58	67-66-3	
Chloromethane	ND	ug/L	1.0	1		06/28/18 19:58	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		06/28/18 19:58	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		06/28/18 19:58	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		06/28/18 19:58	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		06/28/18 19:58	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	2.0	1		06/28/18 19:58	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		06/28/18 19:58	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		06/28/18 19:58	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		06/28/18 19:58	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		06/28/18 19:58	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		06/28/18 19:58	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		06/28/18 19:58	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		06/28/18 19:58	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		06/28/18 19:58	75-35-4	
cis-1,2-Dichloroethene	**6.8**	ug/L	1.0	1		06/28/18 19:58	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		06/28/18 19:58	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		06/28/18 19:58	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		06/28/18 19:58	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		06/28/18 19:58	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		06/28/18 19:58	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		06/28/18 19:58	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		06/28/18 19:58	10061-02-6	
Diisopropyl ether	ND	ug/L	10.0	1		06/28/18 19:58	108-20-3	
Ethylbenzene	ND	ug/L	1.0	1		06/28/18 19:58	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	10.0	1		06/28/18 19:58	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		06/28/18 19:58	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		06/28/18 19:58	99-87-6	
Methylene Chloride	ND	ug/L	1.0	1		06/28/18 19:58	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		06/28/18 19:58	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	10.0	1		06/28/18 19:58	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		06/28/18 19:58	91-20-3	
Styrene	ND	ug/L	1.0	1		06/28/18 19:58	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		06/28/18 19:58	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		06/28/18 19:58	79-34-5	
Tetrachloroethene	**207**	ug/L	10.0	10		06/29/18 14:58	127-18-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - 5365
Pace Project No.: 266458

Sample: MW-14 **Lab ID: 266458001** Collected: 06/25/18 22:35 Received: 06/26/18 08:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Toluene	ND	ug/L	1.0	1		06/28/18 19:58	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		06/28/18 19:58	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		06/28/18 19:58	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		06/28/18 19:58	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		06/28/18 19:58	79-00-5	
Trichloroethene	**5.2**	ug/L	1.0	1		06/28/18 19:58	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		06/28/18 19:58	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		06/28/18 19:58	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		06/28/18 19:58	108-05-4	
Vinyl chloride	**1.9**	ug/L	1.0	1		06/28/18 19:58	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		06/28/18 19:58	1330-20-7	
m&p-Xylene	ND	ug/L	1.0	1		06/28/18 19:58	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		06/28/18 19:58	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	101	%.	81-119	1		06/28/18 19:58	17060-07-0	
Dibromofluoromethane (S)	97	%.	82-114	1		06/28/18 19:58	1868-53-7	
4-Bromofluorobenzene (S)	107	%.	82-120	1		06/28/18 19:58	460-00-4	
Toluene-d8 (S)	100	%.	82-109	1		06/28/18 19:58	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - 5365
Pace Project No.: 266458

Sample: MW-03 **Lab ID: 266458002** Collected: 06/26/18 00:30 Received: 06/26/18 08:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		06/28/18 20:28	67-64-1	
Benzene	ND	ug/L	1.0	1		06/28/18 20:28	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		06/28/18 20:28	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		06/28/18 20:28	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		06/28/18 20:28	75-27-4	
Bromoform	ND	ug/L	1.0	1		06/28/18 20:28	75-25-2	
Bromomethane	ND	ug/L	2.0	1		06/28/18 20:28	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		06/28/18 20:28	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		06/28/18 20:28	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		06/28/18 20:28	108-90-7	
Chloroethane	ND	ug/L	1.0	1		06/28/18 20:28	75-00-3	
Chloroform	**1.0**	ug/L	1.0	1		06/28/18 20:28	67-66-3	
Chloromethane	ND	ug/L	1.0	1		06/28/18 20:28	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		06/28/18 20:28	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		06/28/18 20:28	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		06/28/18 20:28	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		06/28/18 20:28	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	2.0	1		06/28/18 20:28	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		06/28/18 20:28	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		06/28/18 20:28	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		06/28/18 20:28	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		06/28/18 20:28	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		06/28/18 20:28	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		06/28/18 20:28	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		06/28/18 20:28	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		06/28/18 20:28	75-35-4	
cis-1,2-Dichloroethene	**2.3**	ug/L	1.0	1		06/28/18 20:28	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		06/28/18 20:28	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		06/28/18 20:28	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		06/28/18 20:28	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		06/28/18 20:28	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		06/28/18 20:28	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		06/28/18 20:28	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		06/28/18 20:28	10061-02-6	
Diisopropyl ether	ND	ug/L	10.0	1		06/28/18 20:28	108-20-3	
Ethylbenzene	ND	ug/L	1.0	1		06/28/18 20:28	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	10.0	1		06/28/18 20:28	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		06/28/18 20:28	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		06/28/18 20:28	99-87-6	
Methylene Chloride	ND	ug/L	1.0	1		06/28/18 20:28	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		06/28/18 20:28	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	10.0	1		06/28/18 20:28	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		06/28/18 20:28	91-20-3	
Styrene	ND	ug/L	1.0	1		06/28/18 20:28	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		06/28/18 20:28	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		06/28/18 20:28	79-34-5	
Tetrachloroethene	**1170**	ug/L	100	100		06/29/18 16:31	127-18-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - 5365
Pace Project No.: 266458

Sample: MW-03 **Lab ID: 266458002** Collected: 06/26/18 00:30 Received: 06/26/18 08:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Toluene	ND	ug/L	1.0	1		06/28/18 20:28	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		06/28/18 20:28	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		06/28/18 20:28	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		06/28/18 20:28	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		06/28/18 20:28	79-00-5	
Trichloroethene	**2.7**	ug/L	1.0	1		06/28/18 20:28	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		06/28/18 20:28	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		06/28/18 20:28	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		06/28/18 20:28	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		06/28/18 20:28	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		06/28/18 20:28	1330-20-7	
m&p-Xylene	ND	ug/L	1.0	1		06/28/18 20:28	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		06/28/18 20:28	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%.	81-119	1		06/28/18 20:28	17060-07-0	
Dibromofluoromethane (S)	96	%.	82-114	1		06/28/18 20:28	1868-53-7	
4-Bromofluorobenzene (S)	103	%.	82-120	1		06/28/18 20:28	460-00-4	
Toluene-d8 (S)	100	%.	82-109	1		06/28/18 20:28	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - 5365
Pace Project No.: 266458

Sample: Trip Blank **Lab ID: 266458003** Collected: 06/25/18 00:00 Received: 06/26/18 08:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		06/28/18 16:29	67-64-1	
Benzene	ND	ug/L	1.0	1		06/28/18 16:29	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		06/28/18 16:29	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		06/28/18 16:29	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		06/28/18 16:29	75-27-4	
Bromoform	ND	ug/L	1.0	1		06/28/18 16:29	75-25-2	
Bromomethane	ND	ug/L	2.0	1		06/28/18 16:29	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		06/28/18 16:29	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		06/28/18 16:29	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		06/28/18 16:29	108-90-7	
Chloroethane	ND	ug/L	1.0	1		06/28/18 16:29	75-00-3	
Chloroform	ND	ug/L	1.0	1		06/28/18 16:29	67-66-3	
Chloromethane	ND	ug/L	1.0	1		06/28/18 16:29	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		06/28/18 16:29	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		06/28/18 16:29	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		06/28/18 16:29	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		06/28/18 16:29	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	2.0	1		06/28/18 16:29	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		06/28/18 16:29	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		06/28/18 16:29	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		06/28/18 16:29	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		06/28/18 16:29	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		06/28/18 16:29	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		06/28/18 16:29	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		06/28/18 16:29	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		06/28/18 16:29	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		06/28/18 16:29	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		06/28/18 16:29	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		06/28/18 16:29	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		06/28/18 16:29	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		06/28/18 16:29	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		06/28/18 16:29	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		06/28/18 16:29	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		06/28/18 16:29	10061-02-6	
Diisopropyl ether	ND	ug/L	10.0	1		06/28/18 16:29	108-20-3	
Ethylbenzene	ND	ug/L	1.0	1		06/28/18 16:29	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	10.0	1		06/28/18 16:29	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		06/28/18 16:29	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		06/28/18 16:29	99-87-6	
Methylene Chloride	ND	ug/L	1.0	1		06/28/18 16:29	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		06/28/18 16:29	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	10.0	1		06/28/18 16:29	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		06/28/18 16:29	91-20-3	
Styrene	ND	ug/L	1.0	1		06/28/18 16:29	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		06/28/18 16:29	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		06/28/18 16:29	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		06/28/18 16:29	127-18-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - 5365
Pace Project No.: 266458

Sample: Trip Blank **Lab ID: 266458003** Collected: 06/25/18 00:00 Received: 06/26/18 08:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Toluene	ND	ug/L	1.0	1		06/28/18 16:29	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		06/28/18 16:29	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		06/28/18 16:29	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		06/28/18 16:29	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		06/28/18 16:29	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		06/28/18 16:29	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		06/28/18 16:29	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		06/28/18 16:29	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		06/28/18 16:29	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		06/28/18 16:29	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		06/28/18 16:29	1330-20-7	
m&p-Xylene	ND	ug/L	1.0	1		06/28/18 16:29	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		06/28/18 16:29	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	101	%.	81-119	1		06/28/18 16:29	17060-07-0	
Dibromofluoromethane (S)	95	%.	82-114	1		06/28/18 16:29	1868-53-7	
4-Bromofluorobenzene (S)	106	%.	82-120	1		06/28/18 16:29	460-00-4	
Toluene-d8 (S)	103	%.	82-109	1		06/28/18 16:29	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

QUALITY CONTROL DATA

Project: City of Duluth - 5365
Pace Project No.: 266458

QC Batch: 8887 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260B MSV
Associated Lab Samples: 266458001, 266458002, 266458003

METHOD BLANK: 40761 Matrix: Water
Associated Lab Samples: 266458001, 266458002, 266458003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	06/28/18 15:00	
1,1,1-Trichloroethane	ug/L	ND	1.0	06/28/18 15:00	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	06/28/18 15:00	
1,1,2-Trichloroethane	ug/L	ND	1.0	06/28/18 15:00	
1,1-Dichloroethane	ug/L	ND	1.0	06/28/18 15:00	
1,1-Dichloroethene	ug/L	ND	1.0	06/28/18 15:00	
1,1-Dichloropropene	ug/L	ND	1.0	06/28/18 15:00	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	06/28/18 15:00	
1,2,3-Trichloropropane	ug/L	ND	1.0	06/28/18 15:00	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	06/28/18 15:00	
1,2-Dibromo-3-chloropropane	ug/L	ND	2.0	06/28/18 15:00	
1,2-Dibromoethane (EDB)	ug/L	ND	2.0	06/28/18 15:00	
1,2-Dichlorobenzene	ug/L	ND	1.0	06/28/18 15:00	
1,2-Dichloroethane	ug/L	ND	1.0	06/28/18 15:00	
1,2-Dichloropropane	ug/L	ND	1.0	06/28/18 15:00	
1,3-Dichlorobenzene	ug/L	ND	1.0	06/28/18 15:00	
1,3-Dichloropropane	ug/L	ND	1.0	06/28/18 15:00	
1,4-Dichlorobenzene	ug/L	ND	1.0	06/28/18 15:00	
2,2-Dichloropropane	ug/L	ND	1.0	06/28/18 15:00	
2-Butanone (MEK)	ug/L	ND	5.0	06/28/18 15:00	
2-Chlorotoluene	ug/L	ND	1.0	06/28/18 15:00	
2-Hexanone	ug/L	ND	5.0	06/28/18 15:00	
4-Chlorotoluene	ug/L	ND	1.0	06/28/18 15:00	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	06/28/18 15:00	
Acetone	ug/L	ND	25.0	06/28/18 15:00	
Benzene	ug/L	ND	1.0	06/28/18 15:00	
Bromobenzene	ug/L	ND	1.0	06/28/18 15:00	
Bromochloromethane	ug/L	ND	1.0	06/28/18 15:00	
Bromodichloromethane	ug/L	ND	1.0	06/28/18 15:00	
Bromoform	ug/L	ND	1.0	06/28/18 15:00	
Bromomethane	ug/L	ND	2.0	06/28/18 15:00	
Carbon tetrachloride	ug/L	ND	1.0	06/28/18 15:00	
Chlorobenzene	ug/L	ND	1.0	06/28/18 15:00	
Chloroethane	ug/L	ND	1.0	06/28/18 15:00	
Chloroform	ug/L	ND	1.0	06/28/18 15:00	
Chloromethane	ug/L	ND	1.0	06/28/18 15:00	
cis-1,2-Dichloroethene	ug/L	ND	1.0	06/28/18 15:00	
cis-1,3-Dichloropropene	ug/L	ND	1.0	06/28/18 15:00	
Dibromochloromethane	ug/L	ND	1.0	06/28/18 15:00	
Dibromomethane	ug/L	ND	1.0	06/28/18 15:00	
Dichlorodifluoromethane	ug/L	ND	1.0	06/28/18 15:00	

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

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

QUALITY CONTROL DATA

Project: City of Duluth - 5365
Pace Project No.: 266458

METHOD BLANK: 40761 Matrix: Water
Associated Lab Samples: 266458001, 266458002, 266458003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diisopropyl ether	ug/L	ND	10.0	06/28/18 15:00	
Ethylbenzene	ug/L	ND	1.0	06/28/18 15:00	
Hexachloro-1,3-butadiene	ug/L	ND	10.0	06/28/18 15:00	
m&p-Xylene	ug/L	ND	1.0	06/28/18 15:00	
Methyl-tert-butyl ether	ug/L	ND	10.0	06/28/18 15:00	
Methylene Chloride	ug/L	ND	1.0	06/28/18 15:00	
Naphthalene	ug/L	ND	1.0	06/28/18 15:00	
o-Xylene	ug/L	ND	1.0	06/28/18 15:00	
p-Isopropyltoluene	ug/L	ND	1.0	06/28/18 15:00	
Styrene	ug/L	ND	1.0	06/28/18 15:00	
Tetrachloroethene	ug/L	ND	1.0	06/28/18 15:00	
Toluene	ug/L	ND	1.0	06/28/18 15:00	
trans-1,2-Dichloroethene	ug/L	ND	1.0	06/28/18 15:00	
trans-1,3-Dichloropropene	ug/L	ND	1.0	06/28/18 15:00	
Trichloroethene	ug/L	ND	1.0	06/28/18 15:00	
Trichlorofluoromethane	ug/L	ND	1.0	06/28/18 15:00	
Vinyl acetate	ug/L	ND	2.0	06/28/18 15:00	
Vinyl chloride	ug/L	ND	1.0	06/28/18 15:00	
Xylene (Total)	ug/L	ND	2.0	06/28/18 15:00	
1,2-Dichloroethane-d4 (S)	%.	101	81-119	06/28/18 15:00	
4-Bromofluorobenzene (S)	%.	109	82-120	06/28/18 15:00	
Dibromofluoromethane (S)	%.	96	82-114	06/28/18 15:00	
Toluene-d8 (S)	%.	102	82-109	06/28/18 15:00	

LABORATORY CONTROL SAMPLE: 40762

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	48.0	96	68-137	
1,1,1-Trichloroethane	ug/L	50	51.3	103	72-134	
1,1,2,2-Tetrachloroethane	ug/L	50	50.7	101	51-158	
1,1,2-Trichloroethane	ug/L	50	50.7	101	78-131	
1,1-Dichloroethane	ug/L	50	50.2	100	69-151	
1,1-Dichloroethene	ug/L	50	50.2	100	64-158	
1,1-Dichloropropene	ug/L	50	49.1	98	70-133	
1,2,3-Trichlorobenzene	ug/L	50	46.8	94	73-130	
1,2,3-Trichloropropane	ug/L	50	46.9	94	78-133	
1,2,4-Trichlorobenzene	ug/L	50	47.0	94	51-163	
1,2-Dibromo-3-chloropropane	ug/L	50	47.9	96	58-124	
1,2-Dibromoethane (EDB)	ug/L	50	46.5	93	71-134	
1,2-Dichlorobenzene	ug/L	50	49.0	98	70-135	
1,2-Dichloroethane	ug/L	50	47.5	95	72-129	
1,2-Dichloropropane	ug/L	50	50.1	100	64-135	
1,3-Dichlorobenzene	ug/L	50	48.8	98	71-134	
1,3-Dichloropropane	ug/L	50	52.5	105	70-140	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

QUALITY CONTROL DATA

Project: City of Duluth - 5365
Pace Project No.: 266458

LABORATORY CONTROL SAMPLE: 40762

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,4-Dichlorobenzene	ug/L	50	47.0	94	70-131	
2,2-Dichloropropane	ug/L	50	47.0	94	34-170	
2-Butanone (MEK)	ug/L	100	109	109	52-143	
2-Chlorotoluene	ug/L	50	47.8	96	77-128	
2-Hexanone	ug/L	100	100	100	61-136	
4-Chlorotoluene	ug/L	50	52.1	104	79-126	
4-Methyl-2-pentanone (MIBK)	ug/L	100	99.2	99	71-129	
Acetone	ug/L	100	129	129	48-224	
Benzene	ug/L	50	46.2	92	68-132	
Bromobenzene	ug/L	50	49.2	98	75-122	
Bromochloromethane	ug/L	50	48.6	97	73-133	
Bromodichloromethane	ug/L	50	47.3	95	67-121	
Bromoform	ug/L	50	45.4	91	57-125	
Bromomethane	ug/L	50	52.0	104	35-156	
Carbon tetrachloride	ug/L	50	46.0	92	66-122	
Chlorobenzene	ug/L	50	47.9	96	71-126	
Chloroethane	ug/L	50	56.7	113	43-143	
Chloroform	ug/L	50	47.6	95	71-136	
Chloromethane	ug/L	50	51.5	103	47-123	
cis-1,2-Dichloroethene	ug/L	50	48.3	97	74-131	
cis-1,3-Dichloropropene	ug/L	50	45.8	92	78-120	
Dibromochloromethane	ug/L	50	45.8	92	65-115	
Dibromomethane	ug/L	50	50.5	101	79-129	
Dichlorodifluoromethane	ug/L	50	50.3	101	29-124	
Diisopropyl ether	ug/L	50	50.8	102	70-130	
Ethylbenzene	ug/L	50	50.0	100	68-129	
Hexachloro-1,3-butadiene	ug/L	50	54.9	110	58-142	
m&p-Xylene	ug/L	100	102	102	67-137	
Methyl-tert-butyl ether	ug/L	100	103	103	59-130	
Methylene Chloride	ug/L	50	51.7	103	61-147	
Naphthalene	ug/L	50	44.5	89	48-144	
o-Xylene	ug/L	50	54.3	109	52-141	
p-Isopropyltoluene	ug/L	50	51.9	104	58-137	
Styrene	ug/L	50	48.7	97	77-128	
Tetrachloroethene	ug/L	50	50.2	100	51-139	
Toluene	ug/L	50	47.8	96	60-133	
trans-1,2-Dichloroethene	ug/L	50	50.2	100	69-144	
trans-1,3-Dichloropropene	ug/L	50	45.2	90	74-128	
Trichloroethene	ug/L	50	48.7	97	73-126	
Trichlorofluoromethane	ug/L	50	55.0	110	55-132	
Vinyl acetate	ug/L	50	55.5	111	52-141	
Vinyl chloride	ug/L	50	54.6	109	50-133	
Xylene (Total)	ug/L	150	156	104	78-132	
1,2-Dichloroethane-d4 (S)	%.			101	81-119	
4-Bromofluorobenzene (S)	%.			99	82-120	
Dibromofluoromethane (S)	%.			102	82-114	
Toluene-d8 (S)	%.			102	82-109	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

QUALITY CONTROL DATA

Project: City of Duluth - 5365
Pace Project No.: 266458

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 40763 40764

Parameter	Units	266430001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,1,1,2-Tetrachloroethane	ug/L	ND	50	50	47.6	49.3	95	99	68-137	3	11	
1,1,1-Trichloroethane	ug/L	ND	50	50	51.2	54.9	102	110	66-142	7	11	
1,1,2,2-Tetrachloroethane	ug/L	ND	50	50	54.5	55.4	109	111	39-171	2	13	
1,1,2-Trichloroethane	ug/L	ND	50	50	55.2	56.0	110	112	73-136	2	12	
1,1-Dichloroethane	ug/L	ND	50	50	54.7	56.5	109	113	66-155	3	15	
1,1-Dichloroethene	ug/L	ND	50	50	48.1	51.1	96	102	33-181	6	34	
1,1-Dichloropropene	ug/L	ND	50	50	46.8	48.4	94	97	70-133	3	12	
1,2,3-Trichlorobenzene	ug/L	ND	50	50	47.0	50.0	94	100	73-130	6	22	
1,2,3-Trichloropropane	ug/L	ND	50	50	49.1	50.8	98	102	78-133	3	14	
1,2,4-Trichlorobenzene	ug/L	ND	50	50	44.4	47.9	89	96	44-164	8	13	
1,2-Dibromo-3-chloropropane	ug/L	ND	50	50	48.3	49.1	97	98	58-124	2	15	
1,2-Dibromoethane (EDB)	ug/L	ND	50	50	50.9	51.1	102	102	71-134	0	12	
1,2-Dichlorobenzene	ug/L	ND	50	50	50.0	52.4	100	105	69-135	5	10	
1,2-Dichloroethane	ug/L	ND	50	50	50.6	50.5	101	101	36-159	0	10	
1,2-Dichloropropane	ug/L	ND	50	50	56.0	55.8	112	112	68-132	0	11	
1,3-Dichlorobenzene	ug/L	ND	50	50	49.6	52.1	99	104	68-135	5	10	
1,3-Dichloropropane	ug/L	ND	50	50	59.0	59.1	118	118	70-138	0	10	
1,4-Dichlorobenzene	ug/L	ND	50	50	46.6	49.3	93	99	49-153	6	9	
2,2-Dichloropropane	ug/L	ND	50	50	46.4	48.8	93	98	34-170	5	9	
2-Butanone (MEK)	ug/L	ND	100	100	106	108	106	108	10-189	2	23	
2-Chlorotoluene	ug/L	ND	50	50	50.6	53.1	101	106	77-128	5	10	
2-Hexanone	ug/L	ND	100	100	101	99.2	101	99	40-135	2	18	
4-Chlorotoluene	ug/L	ND	50	50	52.1	55.9	104	112	79-126	7	10	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	100	100	99.7	97.8	100	98	30-177	2	10	
Acetone	ug/L	ND	100	100	104	99.7	104	100	44-223	4	14	
Benzene	ug/L	ND	50	50	47.7	49.1	95	98	66-139	3	10	
Bromobenzene	ug/L	ND	50	50	52.9	55.4	106	111	75-122	5	12	
Bromochloromethane	ug/L	ND	50	50	51.0	52.0	102	104	73-133	2	13	
Bromodichloromethane	ug/L	ND	50	50	46.4	47.8	93	96	57-120	3	13	
Bromoform	ug/L	ND	50	50	41.1	42.9	82	86	48-128	4	13	
Bromomethane	ug/L	ND	50	50	54.6	55.1	109	110	10-187	1	32	
Carbon tetrachloride	ug/L	ND	50	50	44.5	46.2	89	92	58-127	4	14	
Chlorobenzene	ug/L	ND	50	50	50.4	51.8	101	104	63-137	3	10	
Chloroethane	ug/L	ND	50	50	50.3	53.9	101	108	52-146	7	16	
Chloroform	ug/L	ND	50	50	49.2	49.7	98	99	74-137	1	9	
Chloromethane	ug/L	ND	50	50	51.6	55.3	103	111	41-127	7	10	
cis-1,2-Dichloroethene	ug/L	ND	50	50	47.8	49.5	96	99	71-138	4	16	
cis-1,3-Dichloropropene	ug/L	ND	50	50	48.0	48.4	96	97	32-145	1	12	
Dibromochloromethane	ug/L	ND	50	50	43.5	45.6	87	91	52-116	5	13	
Dibromomethane	ug/L	ND	50	50	54.5	54.8	109	110	79-129	0	14	
Dichlorodifluoromethane	ug/L	ND	50	50	41.8	46.3	84	93	36-126	10	15	
Diisopropyl ether	ug/L	ND	50	50	59.1	59.7	118	119	70-130	1	20	
Ethylbenzene	ug/L	ND	50	50	51.1	52.5	102	105	31-174	3	10	
Hexachloro-1,3-butadiene	ug/L	ND	50	50	58.7	60.9	117	122	58-142	4	11	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

QUALITY CONTROL DATA

Project: City of Duluth - 5365
Pace Project No.: 266458

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 40763 40764

Parameter	Units	266430001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
m&p-Xylene	ug/L	ND	100	100	105	107	105	107	27-179	2	10	
Methyl-tert-butyl ether	ug/L	ND	100	100	122	123	122	123	38-120	1	12	M1
Methylene Chloride	ug/L	ND	50	50	56.0	56.5	112	113	61-146	1	15	
Naphthalene	ug/L	ND	50	50	47.6	48.1	95	96	25-159	1	14	
o-Xylene	ug/L	ND	50	50	56.8	58.8	114	118	52-141	3	65	
p-Isopropyltoluene	ug/L	ND	50	50	48.8	51.5	98	103	59-134	5	9	
Styrene	ug/L	ND	50	50	46.1	44.2	92	88	77-128	4	14	
Tetrachloroethene	ug/L	ND	50	50	47.6	49.3	95	99	36-155	4	14	
Toluene	ug/L	ND	50	50	49.9	50.4	100	101	52-146	1	11	
trans-1,2-Dichloroethene	ug/L	ND	50	50	50.0	51.6	100	103	61-152	3	14	
trans-1,3-Dichloropropene	ug/L	ND	50	50	47.3	49.0	95	98	37-146	3	12	
Trichloroethene	ug/L	ND	50	50	46.9	48.0	94	96	61-141	2	12	
Trichlorofluoromethane	ug/L	ND	50	50	49.2	52.0	98	104	51-141	6	13	
Vinyl acetate	ug/L	ND	50	50	49.0	48.9	98	98	52-141	0	14	
Vinyl chloride	ug/L	ND	50	50	50.4	53.6	101	107	22-156	6	26	
Xylene (Total)	ug/L	ND	150	150	161	166	108	110	78-132	3	7	
1,2-Dichloroethane-d4 (S)	%.						102	101	81-119			
4-Bromofluorobenzene (S)	%.						96	99	82-120			
Dibromofluoromethane (S)	%.						101	100	82-114			
Toluene-d8 (S)	%.						102	100	82-109			

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

QUALIFIERS

Project: City of Duluth - 5365
Pace Project No.: 266458

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 - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

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.

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.

ANALYTE QUALIFIERS

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: City of Duluth - 5365
Pace Project No.: 266458

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
266458001	**MW-14**	EPA 8260B	8887		
266458002	**MW-03**	EPA 8260B	8887		
266458003	**Trip Blank**	EPA 8260B	8887		

CHAIN OF CUSTODY RECORD

Pace Analytical
www.pacelabs.com

Pace Analytical Services, LLC - Atlanta GA
110 TECHNOLOGY PARKWAY, PEACHTREE CORNERS, GA 30092
(770) 734-4200 : FAX (770) 734-4201

CLIENT NAME: Wenck

CLIENT ADDRESS/PHONE NUMBER/FAX NUMBER:
Roswell, GA

REPORT TO: KRoss@wenck.com | CC:

REQUESTED COMPLETION DATE: STANDARD | PO #:

PROJECT NAME/STATE: City of Duluth, GA

PROJECT #: JB53105-0001

ANALYSIS REQUESTED

Collection DATE	Collection TIME	MATRIX CODE*	COMP	GRAB	SAMPLE IDENTIFICATION	# of CONTAINERS		VOC								LAB ID NUMBER
CONTAINER TYPE:								V								
PRESERVATION:								1								
6/25/18	10:35p	GW		6	MW-14	3		X								
6/26/18	12:30a	GW		6	MW-03	3		X								
					Trip Blank	3		X								

CONTAINER TYPE: P - PLASTIC; A - AMBER GLASS; G - CLEAR GLASS; V - VOA VIAL; S - STERILE; O - OTHER

PRESERVATION: 1 - HCl, ≤6°C; 2 - H_2SO_4, ≤6°C; 3 - HNO_3; 4 - NaOH, ≤6°C; 5 - NaOH/ZnAc, ≤6°C; 6 - $Na_2S_2O_3$, ≤6°C; 7 - ≤6°C not frozen

*MATRIX CODES:
DW - DRINKING WATER; WW - WASTEWATER; GW - GROUNDWATER; SW - SURFACE WATER; ST - STORM WATER; W - WATER; S - SOIL; SL - SLUDGE; SD - SOLID; A - AIR; L - LIQUID; P - PRODUCT

REMARKS/ADDITIONAL INFORMATION

WO# : 266458
266458

SAMPLED BY AND TITLE: E McCullen | DATE/TIME: 06/26/18 8:10

RELINQUISHED BY: E McCullen | DATE/TIME: 06/26/18 8:10

RECEIVED BY: | DATE/TIME:

RELINQUISHED BY: | DATE/TIME:

RECEIVED BY LAB: M Rahman | DATE/TIME: 06/26/18 0810

SAMPLE SHIPPED VIA: UPS FED-EX USPS COURIER CLIENT OTHER FS

pH checked: Yes No NA | Ice: Yes No NA | Temperature: Min: 3.4 Max: | Custody Seal: Intact Broken Not Present N/A | # of Coolers | Cooler ID:

FOR LAB USE ONLY
LAB #:
Entered into LIMS:
Tracking #:

Sample Condition Upon Receipt

Pace Analytical

Client Name: Wenck

Project #

WO#: 266458

PM: EDB Due Date: 07/03/18

CLIENT: WENCK

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

Tracking #:

Custody Seal on Cooler/Box Present: ☑ yes ☐ no Seals intact: ☑ yes

Packing Material: ☐ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other

Thermometer Used 83 Type of Ice: (Wet) Blue None ☐ Samples on ice, cooling process has begun

Cooler Temperature 3.4 Biological Tissue is Frozen: Yes No

Date and Initials of person examining contents: 6/26/18 MR

Temp should be above freezing to 6°C

			Comments:	
Chain of Custody Present:	☑Yes	☐No ☐N/A	1.	
Chain of Custody Filled Out:	☑Yes	☐No ☐N/A	2.	
Chain of Custody Relinquished:	☑Yes	☐No ☐N/A	3.	
Sampler Name & Signature on COC:	☑Yes	☐No ☐N/A	4.	
Samples Arrived within Hold Time:	☑Yes	☐No ☐N/A	5.	
Short Hold Time Analysis (<72hr):	☐Yes	☑No ☐N/A	6.	
Rush Turn Around Time Requested:	☐Yes	☑No ☐N/A	7.	
Sufficient Volume:	☑Yes	☐No ☐N/A	8.	
Correct Containers Used:	☑Yes	☐No ☐N/A	9.	
-Pace Containers Used:	☑Yes	☐No ☐N/A		
Containers Intact:	☑Yes	☐No ☐N/A	10.	
Filtered volume received for Dissolved tests	☐Yes	☐No ☑N/A	11.	
Sample Labels match COC:	☑Yes	☐No ☐N/A	12.	
-Includes date/time/ID/Analysis Matrix: GW				
All containers needing preservation have been checked.	☐Yes	☐No ☑N/A	13.	
All containers needing preservation are found to be in compliance with EPA recommendation.	☑Yes	☐No ☐N/A		
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☑Yes	☐No	Initial when completed	Lot # of added preservative
Samples checked for dechlorination:	☐Yes	☐No ☑N/A	14.	
Headspace in VOA Vials (>6mm):	☐Yes	☑No ☐N/A	15.	
Trip Blank Present:	☑Yes	☐No ☐N/A	16.	
Trip Blank Custody Seals Present	☑Yes	☐No ☐N/A		
Pace Trip Blank Lot # (if purchased):				

Client Notification/ Resolution: Field Data Required? Y N

Person Contacted: Date/Time:

Comments/ Resolution:

Project Manager Review: **Date:**

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).

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

August 28, 2018

Katie Ross
WENCK Associates
1080 Holcomb Bridge Rd.
Roswell, GA 30076

RE: Project: City of Duluth - B5365-0001
Pace Project No.: 268432

Dear Katie Ross:
Enclosed are the analytical results for sample(s) received by the laboratory on August 21, 2018. 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,

Eben Buchanan

Eben Buchanan
eben.buchanan@pacelabs.com
(770)734-4200
Project Manager

Enclosures

cc: Rebecca Thornton, Pace Analytical Atlanta

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

CERTIFICATIONS

Project: City of Duluth - B5365-0001
Pace Project No.: 268432

Atlanta Certification IDs

110 Technology Parkway Peachtree Corners, GA 30092
Florida DOH Certification #: E87315
Georgia DW Inorganics Certification #: 812
Georgia DW Microbiology Certification #: 812
North Carolina Certification #: 381
South Carolina Certification #: 98011001
Texas Certification #: T104704397-08-TX
Virginia Certification #: 460204

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

SAMPLE SUMMARY

Project: City of Duluth - B5365-0001
Pace Project No.: 268432

Lab ID	Sample ID	Matrix	Date Collected	Date Received
268432001	**MW-1**	Water	08/21/18 13:10	08/21/18 14:15
268432002	**MW-2**	Water	08/21/18 10:15	08/21/18 14:15
268432003	**MW-3**	Water	08/21/18 11:35	08/21/18 14:15
268432004	**MW-4**	Water	08/21/18 10:25	08/21/18 14:15
268432005	**MW-5**	Water	08/20/18 12:45	08/21/18 14:15
268432006	**MW-6**	Water	08/20/18 14:05	08/21/18 14:15
268432007	**MW-8**	Water	08/20/18 12:20	08/21/18 14:15
268432008	**MW-13**	Water	08/20/18 14:55	08/21/18 14:15
268432009	**Dup-1**	Water	08/20/18 00:00	08/21/18 14:15
268432010	**Trip Blank**	Water	08/20/18 00:00	08/21/18 14:15

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

SAMPLE ANALYTE COUNT

Project: City of Duluth - B5365-0001
Pace Project No.: 268432

Lab ID	Sample ID	Method	Analysts	Analytes Reported
268432001	**MW-1**	EPA 8260B	JHG	64
268432002	**MW-2**	EPA 8260B	JHG	64
268432003	**MW-3**	EPA 8260B	JHG	64
268432004	**MW-4**	EPA 8260B	JHG	64
268432005	**MW-5**	EPA 8260B	JHG	64
268432006	**MW-6**	EPA 8260B	JHG	64
268432007	**MW-8**	EPA 8260B	JHG	64
268432008	**MW-13**	EPA 8260B	JHG	64
268432009	**Dup-1**	EPA 8260B	JHG	64
268432010	**Trip Blank**	EPA 8260B	JHG	64

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - B5365-0001
Pace Project No.: 268432

Sample: MW-1 **Lab ID: 268432001** Collected: 08/21/18 13:10 Received: 08/21/18 14:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		08/27/18 19:49	67-64-1	
Benzene	ND	ug/L	1.0	1		08/27/18 19:49	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		08/27/18 19:49	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		08/27/18 19:49	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		08/27/18 19:49	75-27-4	
Bromoform	ND	ug/L	1.0	1		08/27/18 19:49	75-25-2	
Bromomethane	ND	ug/L	2.0	1		08/27/18 19:49	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		08/27/18 19:49	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		08/27/18 19:49	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		08/27/18 19:49	108-90-7	
Chloroethane	ND	ug/L	1.0	1		08/27/18 19:49	75-00-3	
Chloroform	**11.0**	ug/L	1.0	1		08/27/18 19:49	67-66-3	
Chloromethane	ND	ug/L	1.0	1		08/27/18 19:49	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		08/27/18 19:49	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		08/27/18 19:49	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		08/27/18 19:49	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		08/27/18 19:49	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	2.0	1		08/27/18 19:49	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		08/27/18 19:49	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		08/27/18 19:49	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		08/27/18 19:49	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		08/27/18 19:49	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		08/27/18 19:49	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		08/27/18 19:49	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		08/27/18 19:49	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		08/27/18 19:49	75-35-4	
cis-1,2-Dichloroethene	**431**	ug/L	100	100		08/27/18 13:50	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		08/27/18 19:49	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		08/27/18 19:49	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		08/27/18 19:49	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		08/27/18 19:49	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		08/27/18 19:49	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		08/27/18 19:49	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		08/27/18 19:49	10061-02-6	
Diisopropyl ether	ND	ug/L	10.0	1		08/27/18 19:49	108-20-3	
Ethylbenzene	ND	ug/L	1.0	1		08/27/18 19:49	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	10.0	1		08/27/18 19:49	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		08/27/18 19:49	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		08/27/18 19:49	99-87-6	
Methylene Chloride	ND	ug/L	1.0	1		08/27/18 19:49	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		08/27/18 19:49	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	10.0	1		08/27/18 19:49	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		08/27/18 19:49	91-20-3	
Styrene	ND	ug/L	1.0	1		08/27/18 19:49	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		08/27/18 19:49	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		08/27/18 19:49	79-34-5	
Tetrachloroethene	**13200**	ug/L	100	100		08/27/18 13:50	127-18-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - B5365-0001
Pace Project No.: 268432

Sample: MW-1 **Lab ID: 268432001** Collected: 08/21/18 13:10 Received: 08/21/18 14:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Toluene	ND	ug/L	1.0	1		08/27/18 19:49	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		08/27/18 19:49	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		08/27/18 19:49	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		08/27/18 19:49	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		08/27/18 19:49	79-00-5	
Trichloroethene	**101**	ug/L	1.0	1		08/27/18 19:49	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		08/27/18 19:49	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		08/27/18 19:49	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		08/27/18 19:49	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		08/27/18 19:49	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		08/27/18 19:49	1330-20-7	
m&p-Xylene	ND	ug/L	1.0	1		08/27/18 19:49	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		08/27/18 19:49	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	101	%.	81-119	1		08/27/18 19:49	17060-07-0	
Dibromofluoromethane (S)	99	%.	82-114	1		08/27/18 19:49	1868-53-7	
4-Bromofluorobenzene (S)	104	%.	82-120	1		08/27/18 19:49	460-00-4	
Toluene-d8 (S)	97	%.	82-109	1		08/27/18 19:49	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - B5365-0001
Pace Project No.: 268432

Sample: MW-2 **Lab ID: 268432002** Collected: 08/21/18 10:15 Received: 08/21/18 14:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		08/27/18 18:19	67-64-1	
Benzene	ND	ug/L	1.0	1		08/27/18 18:19	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		08/27/18 18:19	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		08/27/18 18:19	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		08/27/18 18:19	75-27-4	
Bromoform	ND	ug/L	1.0	1		08/27/18 18:19	75-25-2	
Bromomethane	ND	ug/L	2.0	1		08/27/18 18:19	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		08/27/18 18:19	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		08/27/18 18:19	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		08/27/18 18:19	108-90-7	
Chloroethane	ND	ug/L	1.0	1		08/27/18 18:19	75-00-3	
Chloroform	**1.6**	ug/L	1.0	1		08/27/18 18:19	67-66-3	
Chloromethane	ND	ug/L	1.0	1		08/27/18 18:19	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		08/27/18 18:19	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		08/27/18 18:19	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		08/27/18 18:19	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		08/27/18 18:19	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	2.0	1		08/27/18 18:19	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		08/27/18 18:19	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		08/27/18 18:19	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		08/27/18 18:19	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		08/27/18 18:19	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		08/27/18 18:19	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		08/27/18 18:19	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		08/27/18 18:19	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		08/27/18 18:19	75-35-4	
cis-1,2-Dichloroethene	**1.6**	ug/L	1.0	1		08/27/18 18:19	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		08/27/18 18:19	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		08/27/18 18:19	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		08/27/18 18:19	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		08/27/18 18:19	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		08/27/18 18:19	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		08/27/18 18:19	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		08/27/18 18:19	10061-02-6	
Diisopropyl ether	ND	ug/L	10.0	1		08/27/18 18:19	108-20-3	
Ethylbenzene	ND	ug/L	1.0	1		08/27/18 18:19	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	10.0	1		08/27/18 18:19	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		08/27/18 18:19	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		08/27/18 18:19	99-87-6	
Methylene Chloride	ND	ug/L	1.0	1		08/27/18 18:19	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		08/27/18 18:19	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	10.0	1		08/27/18 18:19	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		08/27/18 18:19	91-20-3	
Styrene	ND	ug/L	1.0	1		08/27/18 18:19	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		08/27/18 18:19	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		08/27/18 18:19	79-34-5	
Tetrachloroethene	**1380**	ug/L	50.0	50		08/27/18 14:50	127-18-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - B5365-0001
Pace Project No.: 268432

Sample: MW-2 **Lab ID: 268432002** Collected: 08/21/18 10:15 Received: 08/21/18 14:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Toluene	ND	ug/L	1.0	1		08/27/18 18:19	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		08/27/18 18:19	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		08/27/18 18:19	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		08/27/18 18:19	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		08/27/18 18:19	79-00-5	
Trichloroethene	**8.1**	ug/L	1.0	1		08/27/18 18:19	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		08/27/18 18:19	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		08/27/18 18:19	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		08/27/18 18:19	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		08/27/18 18:19	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		08/27/18 18:19	1330-20-7	
m&p-Xylene	ND	ug/L	1.0	1		08/27/18 18:19	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		08/27/18 18:19	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	104	%.	81-119	1		08/27/18 18:19	17060-07-0	
Dibromofluoromethane (S)	95	%.	82-114	1		08/27/18 18:19	1868-53-7	
4-Bromofluorobenzene (S)	100	%.	82-120	1		08/27/18 18:19	460-00-4	
Toluene-d8 (S)	99	%.	82-109	1		08/27/18 18:19	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - B5365-0001
Pace Project No.: 268432

Sample: MW-3 **Lab ID: 268432003** Collected: 08/21/18 11:35 Received: 08/21/18 14:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		08/27/18 18:49	67-64-1	
Benzene	ND	ug/L	1.0	1		08/27/18 18:49	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		08/27/18 18:49	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		08/27/18 18:49	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		08/27/18 18:49	75-27-4	
Bromoform	ND	ug/L	1.0	1		08/27/18 18:49	75-25-2	
Bromomethane	ND	ug/L	2.0	1		08/27/18 18:49	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		08/27/18 18:49	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		08/27/18 18:49	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		08/27/18 18:49	108-90-7	
Chloroethane	ND	ug/L	1.0	1		08/27/18 18:49	75-00-3	
Chloroform	**1.4**	ug/L	1.0	1		08/27/18 18:49	67-66-3	
Chloromethane	ND	ug/L	1.0	1		08/27/18 18:49	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		08/27/18 18:49	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		08/27/18 18:49	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		08/27/18 18:49	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		08/27/18 18:49	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	2.0	1		08/27/18 18:49	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		08/27/18 18:49	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		08/27/18 18:49	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		08/27/18 18:49	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		08/27/18 18:49	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		08/27/18 18:49	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		08/27/18 18:49	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		08/27/18 18:49	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		08/27/18 18:49	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		08/27/18 18:49	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		08/27/18 18:49	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		08/27/18 18:49	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		08/27/18 18:49	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		08/27/18 18:49	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		08/27/18 18:49	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		08/27/18 18:49	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		08/27/18 18:49	10061-02-6	
Diisopropyl ether	ND	ug/L	10.0	1		08/27/18 18:49	108-20-3	
Ethylbenzene	ND	ug/L	1.0	1		08/27/18 18:49	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	10.0	1		08/27/18 18:49	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		08/27/18 18:49	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		08/27/18 18:49	99-87-6	
Methylene Chloride	ND	ug/L	1.0	1		08/27/18 18:49	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		08/27/18 18:49	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	10.0	1		08/27/18 18:49	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		08/27/18 18:49	91-20-3	
Styrene	ND	ug/L	1.0	1		08/27/18 18:49	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		08/27/18 18:49	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		08/27/18 18:49	79-34-5	
Tetrachloroethene	**1040**	ug/L	50.0	50		08/27/18 15:20	127-18-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - B5365-0001
Pace Project No.: 268432

Sample: MW-3 **Lab ID: 268432003** Collected: 08/21/18 11:35 Received: 08/21/18 14:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Toluene	ND	ug/L	1.0	1		08/27/18 18:49	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		08/27/18 18:49	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		08/27/18 18:49	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		08/27/18 18:49	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		08/27/18 18:49	79-00-5	
Trichloroethene	**1.5**	ug/L	1.0	1		08/27/18 18:49	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		08/27/18 18:49	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		08/27/18 18:49	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		08/27/18 18:49	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		08/27/18 18:49	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		08/27/18 18:49	1330-20-7	
m&p-Xylene	ND	ug/L	1.0	1		08/27/18 18:49	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		08/27/18 18:49	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	100	%.	81-119	1		08/27/18 18:49	17060-07-0	
Dibromofluoromethane (S)	97	%.	82-114	1		08/27/18 18:49	1868-53-7	
4-Bromofluorobenzene (S)	104	%.	82-120	1		08/27/18 18:49	460-00-4	
Toluene-d8 (S)	100	%.	82-109	1		08/27/18 18:49	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - B5365-0001
Pace Project No.: 268432

Sample: MW-4 **Lab ID: 268432004** Collected: 08/21/18 10:25 Received: 08/21/18 14:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		08/27/18 19:19	67-64-1	
Benzene	ND	ug/L	1.0	1		08/27/18 19:19	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		08/27/18 19:19	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		08/27/18 19:19	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		08/27/18 19:19	75-27-4	
Bromoform	ND	ug/L	1.0	1		08/27/18 19:19	75-25-2	
Bromomethane	ND	ug/L	2.0	1		08/27/18 19:19	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		08/27/18 19:19	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		08/27/18 19:19	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		08/27/18 19:19	108-90-7	
Chloroethane	ND	ug/L	1.0	1		08/27/18 19:19	75-00-3	
Chloroform	ND	ug/L	1.0	1		08/27/18 19:19	67-66-3	
Chloromethane	ND	ug/L	1.0	1		08/27/18 19:19	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		08/27/18 19:19	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		08/27/18 19:19	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		08/27/18 19:19	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		08/27/18 19:19	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	2.0	1		08/27/18 19:19	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		08/27/18 19:19	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		08/27/18 19:19	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		08/27/18 19:19	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		08/27/18 19:19	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		08/27/18 19:19	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		08/27/18 19:19	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		08/27/18 19:19	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		08/27/18 19:19	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		08/27/18 19:19	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		08/27/18 19:19	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		08/27/18 19:19	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		08/27/18 19:19	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		08/27/18 19:19	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		08/27/18 19:19	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		08/27/18 19:19	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		08/27/18 19:19	10061-02-6	
Diisopropyl ether	ND	ug/L	10.0	1		08/27/18 19:19	108-20-3	
Ethylbenzene	ND	ug/L	1.0	1		08/27/18 19:19	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	10.0	1		08/27/18 19:19	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		08/27/18 19:19	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		08/27/18 19:19	99-87-6	
Methylene Chloride	ND	ug/L	1.0	1		08/27/18 19:19	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		08/27/18 19:19	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	10.0	1		08/27/18 19:19	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		08/27/18 19:19	91-20-3	
Styrene	ND	ug/L	1.0	1		08/27/18 19:19	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		08/27/18 19:19	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		08/27/18 19:19	79-34-5	
Tetrachloroethene	**1030**	ug/L	10.0	10		08/27/18 15:50	127-18-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - B5365-0001
Pace Project No.: 268432

Sample: MW-4 **Lab ID: 268432004** Collected: 08/21/18 10:25 Received: 08/21/18 14:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Toluene	ND	ug/L	1.0	1		08/27/18 19:19	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		08/27/18 19:19	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		08/27/18 19:19	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		08/27/18 19:19	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		08/27/18 19:19	79-00-5	
Trichloroethene	**3.1**	ug/L	1.0	1		08/27/18 19:19	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		08/27/18 19:19	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		08/27/18 19:19	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		08/27/18 19:19	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		08/27/18 19:19	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		08/27/18 19:19	1330-20-7	
m&p-Xylene	ND	ug/L	1.0	1		08/27/18 19:19	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		08/27/18 19:19	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	103	%.	81-119	1		08/27/18 19:19	17060-07-0	
Dibromofluoromethane (S)	96	%.	82-114	1		08/27/18 19:19	1868-53-7	
4-Bromofluorobenzene (S)	101	%.	82-120	1		08/27/18 19:19	460-00-4	
Toluene-d8 (S)	102	%.	82-109	1		08/27/18 19:19	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - B5365-0001
Pace Project No.: 268432

Sample: MW-5 **Lab ID: 268432005** Collected: 08/20/18 12:45 Received: 08/21/18 14:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		08/27/18 16:19	67-64-1	
Benzene	ND	ug/L	1.0	1		08/27/18 16:19	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		08/27/18 16:19	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		08/27/18 16:19	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		08/27/18 16:19	75-27-4	
Bromoform	ND	ug/L	1.0	1		08/27/18 16:19	75-25-2	
Bromomethane	ND	ug/L	2.0	1		08/27/18 16:19	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		08/27/18 16:19	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		08/27/18 16:19	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		08/27/18 16:19	108-90-7	
Chloroethane	ND	ug/L	1.0	1		08/27/18 16:19	75-00-3	
Chloroform	ND	ug/L	1.0	1		08/27/18 16:19	67-66-3	
Chloromethane	ND	ug/L	1.0	1		08/27/18 16:19	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		08/27/18 16:19	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		08/27/18 16:19	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		08/27/18 16:19	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		08/27/18 16:19	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	2.0	1		08/27/18 16:19	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		08/27/18 16:19	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		08/27/18 16:19	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		08/27/18 16:19	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		08/27/18 16:19	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		08/27/18 16:19	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		08/27/18 16:19	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		08/27/18 16:19	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		08/27/18 16:19	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		08/27/18 16:19	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		08/27/18 16:19	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		08/27/18 16:19	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		08/27/18 16:19	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		08/27/18 16:19	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		08/27/18 16:19	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		08/27/18 16:19	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		08/27/18 16:19	10061-02-6	
Diisopropyl ether	ND	ug/L	10.0	1		08/27/18 16:19	108-20-3	
Ethylbenzene	ND	ug/L	1.0	1		08/27/18 16:19	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	10.0	1		08/27/18 16:19	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		08/27/18 16:19	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		08/27/18 16:19	99-87-6	
Methylene Chloride	ND	ug/L	1.0	1		08/27/18 16:19	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		08/27/18 16:19	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	10.0	1		08/27/18 16:19	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		08/27/18 16:19	91-20-3	
Styrene	ND	ug/L	1.0	1		08/27/18 16:19	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		08/27/18 16:19	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		08/27/18 16:19	79-34-5	
Tetrachloroethene	**16.5**	ug/L	1.0	1		08/27/18 16:19	127-18-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - B5365-0001
Pace Project No.: 268432

Sample: MW-5 **Lab ID: 268432005** Collected: 08/20/18 12:45 Received: 08/21/18 14:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Toluene	ND	ug/L	1.0	1		08/27/18 16:19	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		08/27/18 16:19	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		08/27/18 16:19	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		08/27/18 16:19	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		08/27/18 16:19	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		08/27/18 16:19	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		08/27/18 16:19	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		08/27/18 16:19	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		08/27/18 16:19	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		08/27/18 16:19	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		08/27/18 16:19	1330-20-7	
m&p-Xylene	ND	ug/L	1.0	1		08/27/18 16:19	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		08/27/18 16:19	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	99	%.	81-119	1		08/27/18 16:19	17060-07-0	
Dibromofluoromethane (S)	93	%.	82-114	1		08/27/18 16:19	1868-53-7	
4-Bromofluorobenzene (S)	102	%.	82-120	1		08/27/18 16:19	460-00-4	
Toluene-d8 (S)	101	%.	82-109	1		08/27/18 16:19	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - B5365-0001
Pace Project No.: 268432

Sample: MW-6 **Lab ID: 268432006** Collected: 08/20/18 14:05 Received: 08/21/18 14:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		08/27/18 16:49	67-64-1	
Benzene	ND	ug/L	1.0	1		08/27/18 16:49	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		08/27/18 16:49	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		08/27/18 16:49	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		08/27/18 16:49	75-27-4	
Bromoform	ND	ug/L	1.0	1		08/27/18 16:49	75-25-2	
Bromomethane	ND	ug/L	2.0	1		08/27/18 16:49	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		08/27/18 16:49	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		08/27/18 16:49	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		08/27/18 16:49	108-90-7	
Chloroethane	ND	ug/L	1.0	1		08/27/18 16:49	75-00-3	
Chloroform	ND	ug/L	1.0	1		08/27/18 16:49	67-66-3	
Chloromethane	ND	ug/L	1.0	1		08/27/18 16:49	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		08/27/18 16:49	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		08/27/18 16:49	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		08/27/18 16:49	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		08/27/18 16:49	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	2.0	1		08/27/18 16:49	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		08/27/18 16:49	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		08/27/18 16:49	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		08/27/18 16:49	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		08/27/18 16:49	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		08/27/18 16:49	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		08/27/18 16:49	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		08/27/18 16:49	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		08/27/18 16:49	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		08/27/18 16:49	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		08/27/18 16:49	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		08/27/18 16:49	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		08/27/18 16:49	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		08/27/18 16:49	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		08/27/18 16:49	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		08/27/18 16:49	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		08/27/18 16:49	10061-02-6	
Diisopropyl ether	ND	ug/L	10.0	1		08/27/18 16:49	108-20-3	
Ethylbenzene	ND	ug/L	1.0	1		08/27/18 16:49	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	10.0	1		08/27/18 16:49	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		08/27/18 16:49	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		08/27/18 16:49	99-87-6	
Methylene Chloride	ND	ug/L	1.0	1		08/27/18 16:49	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		08/27/18 16:49	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	10.0	1		08/27/18 16:49	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		08/27/18 16:49	91-20-3	
Styrene	ND	ug/L	1.0	1		08/27/18 16:49	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		08/27/18 16:49	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		08/27/18 16:49	79-34-5	
Tetrachloroethene	**6.8**	ug/L	1.0	1		08/27/18 16:49	127-18-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - B5365-0001
Pace Project No.: 268432

Sample: MW-6 **Lab ID: 268432006** Collected: 08/20/18 14:05 Received: 08/21/18 14:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Toluene	ND	ug/L	1.0	1		08/27/18 16:49	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		08/27/18 16:49	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		08/27/18 16:49	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		08/27/18 16:49	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		08/27/18 16:49	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		08/27/18 16:49	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		08/27/18 16:49	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		08/27/18 16:49	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		08/27/18 16:49	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		08/27/18 16:49	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		08/27/18 16:49	1330-20-7	
m&p-Xylene	ND	ug/L	1.0	1		08/27/18 16:49	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		08/27/18 16:49	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	101	%.	81-119	1		08/27/18 16:49	17060-07-0	
Dibromofluoromethane (S)	95	%.	82-114	1		08/27/18 16:49	1868-53-7	
4-Bromofluorobenzene (S)	102	%.	82-120	1		08/27/18 16:49	460-00-4	
Toluene-d8 (S)	101	%.	82-109	1		08/27/18 16:49	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - B5365-0001
Pace Project No.: 268432

Sample: MW-8 **Lab ID: 268432007** Collected: 08/20/18 12:20 Received: 08/21/18 14:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		08/27/18 17:19	67-64-1	
Benzene	ND	ug/L	1.0	1		08/27/18 17:19	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		08/27/18 17:19	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		08/27/18 17:19	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		08/27/18 17:19	75-27-4	
Bromoform	ND	ug/L	1.0	1		08/27/18 17:19	75-25-2	
Bromomethane	ND	ug/L	2.0	1		08/27/18 17:19	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		08/27/18 17:19	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		08/27/18 17:19	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		08/27/18 17:19	108-90-7	
Chloroethane	ND	ug/L	1.0	1		08/27/18 17:19	75-00-3	
Chloroform	ND	ug/L	1.0	1		08/27/18 17:19	67-66-3	
Chloromethane	ND	ug/L	1.0	1		08/27/18 17:19	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		08/27/18 17:19	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		08/27/18 17:19	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		08/27/18 17:19	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		08/27/18 17:19	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	2.0	1		08/27/18 17:19	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		08/27/18 17:19	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		08/27/18 17:19	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		08/27/18 17:19	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		08/27/18 17:19	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		08/27/18 17:19	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		08/27/18 17:19	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		08/27/18 17:19	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		08/27/18 17:19	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		08/27/18 17:19	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		08/27/18 17:19	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		08/27/18 17:19	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		08/27/18 17:19	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		08/27/18 17:19	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		08/27/18 17:19	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		08/27/18 17:19	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		08/27/18 17:19	10061-02-6	
Diisopropyl ether	ND	ug/L	10.0	1		08/27/18 17:19	108-20-3	
Ethylbenzene	ND	ug/L	1.0	1		08/27/18 17:19	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	10.0	1		08/27/18 17:19	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		08/27/18 17:19	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		08/27/18 17:19	99-87-6	
Methylene Chloride	ND	ug/L	1.0	1		08/27/18 17:19	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		08/27/18 17:19	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	10.0	1		08/27/18 17:19	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		08/27/18 17:19	91-20-3	
Styrene	ND	ug/L	1.0	1		08/27/18 17:19	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		08/27/18 17:19	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		08/27/18 17:19	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		08/27/18 17:19	127-18-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - B5365-0001
Pace Project No.: 268432

Sample: MW-8 **Lab ID: 268432007** Collected: 08/20/18 12:20 Received: 08/21/18 14:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Toluene	ND	ug/L	1.0	1		08/27/18 17:19	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		08/27/18 17:19	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		08/27/18 17:19	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		08/27/18 17:19	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		08/27/18 17:19	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		08/27/18 17:19	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		08/27/18 17:19	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		08/27/18 17:19	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		08/27/18 17:19	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		08/27/18 17:19	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		08/27/18 17:19	1330-20-7	
m&p-Xylene	ND	ug/L	1.0	1		08/27/18 17:19	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		08/27/18 17:19	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	100	%.	81-119	1		08/27/18 17:19	17060-07-0	
Dibromofluoromethane (S)	93	%.	82-114	1		08/27/18 17:19	1868-53-7	
4-Bromofluorobenzene (S)	105	%.	82-120	1		08/27/18 17:19	460-00-4	
Toluene-d8 (S)	101	%.	82-109	1		08/27/18 17:19	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - B5365-0001
Pace Project No.: 268432

Sample: MW-13 **Lab ID: 268432008** Collected: 08/20/18 14:55 Received: 08/21/18 14:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		08/27/18 17:49	67-64-1	
Benzene	ND	ug/L	1.0	1		08/27/18 17:49	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		08/27/18 17:49	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		08/27/18 17:49	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		08/27/18 17:49	75-27-4	
Bromoform	ND	ug/L	1.0	1		08/27/18 17:49	75-25-2	
Bromomethane	ND	ug/L	2.0	1		08/27/18 17:49	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		08/27/18 17:49	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		08/27/18 17:49	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		08/27/18 17:49	108-90-7	
Chloroethane	ND	ug/L	1.0	1		08/27/18 17:49	75-00-3	
Chloroform	ND	ug/L	1.0	1		08/27/18 17:49	67-66-3	
Chloromethane	ND	ug/L	1.0	1		08/27/18 17:49	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		08/27/18 17:49	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		08/27/18 17:49	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		08/27/18 17:49	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		08/27/18 17:49	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	2.0	1		08/27/18 17:49	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		08/27/18 17:49	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		08/27/18 17:49	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		08/27/18 17:49	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		08/27/18 17:49	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		08/27/18 17:49	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		08/27/18 17:49	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		08/27/18 17:49	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		08/27/18 17:49	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		08/27/18 17:49	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		08/27/18 17:49	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		08/27/18 17:49	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		08/27/18 17:49	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		08/27/18 17:49	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		08/27/18 17:49	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		08/27/18 17:49	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		08/27/18 17:49	10061-02-6	
Diisopropyl ether	ND	ug/L	10.0	1		08/27/18 17:49	108-20-3	
Ethylbenzene	ND	ug/L	1.0	1		08/27/18 17:49	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	10.0	1		08/27/18 17:49	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		08/27/18 17:49	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		08/27/18 17:49	99-87-6	
Methylene Chloride	ND	ug/L	1.0	1		08/27/18 17:49	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		08/27/18 17:49	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	10.0	1		08/27/18 17:49	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		08/27/18 17:49	91-20-3	
Styrene	ND	ug/L	1.0	1		08/27/18 17:49	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		08/27/18 17:49	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		08/27/18 17:49	79-34-5	
Tetrachloroethene	**34.1**	ug/L	1.0	1		08/27/18 17:49	127-18-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - B5365-0001
Pace Project No.: 268432

Sample: MW-13 **Lab ID: 268432008** Collected: 08/20/18 14:55 Received: 08/21/18 14:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Toluene	ND	ug/L	1.0	1		08/27/18 17:49	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		08/27/18 17:49	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		08/27/18 17:49	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		08/27/18 17:49	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		08/27/18 17:49	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		08/27/18 17:49	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		08/27/18 17:49	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		08/27/18 17:49	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		08/27/18 17:49	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		08/27/18 17:49	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		08/27/18 17:49	1330-20-7	
m&p-Xylene	ND	ug/L	1.0	1		08/27/18 17:49	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		08/27/18 17:49	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%.	81-119	1		08/27/18 17:49	17060-07-0	
Dibromofluoromethane (S)	96	%.	82-114	1		08/27/18 17:49	1868-53-7	
4-Bromofluorobenzene (S)	100	%.	82-120	1		08/27/18 17:49	460-00-4	
Toluene-d8 (S)	99	%.	82-109	1		08/27/18 17:49	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - B5365-0001
Pace Project No.: 268432

Sample: Dup-1 **Lab ID: 268432009** Collected: 08/20/18 00:00 Received: 08/21/18 14:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		08/27/18 20:18	67-64-1	
Benzene	ND	ug/L	1.0	1		08/27/18 20:18	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		08/27/18 20:18	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		08/27/18 20:18	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		08/27/18 20:18	75-27-4	
Bromoform	ND	ug/L	1.0	1		08/27/18 20:18	75-25-2	
Bromomethane	ND	ug/L	2.0	1		08/27/18 20:18	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		08/27/18 20:18	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		08/27/18 20:18	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		08/27/18 20:18	108-90-7	
Chloroethane	ND	ug/L	1.0	1		08/27/18 20:18	75-00-3	
Chloroform	**10.8**	ug/L	1.0	1		08/27/18 20:18	67-66-3	
Chloromethane	ND	ug/L	1.0	1		08/27/18 20:18	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		08/27/18 20:18	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		08/27/18 20:18	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		08/27/18 20:18	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		08/27/18 20:18	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	2.0	1		08/27/18 20:18	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		08/27/18 20:18	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		08/27/18 20:18	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		08/27/18 20:18	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		08/27/18 20:18	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		08/27/18 20:18	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		08/27/18 20:18	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		08/27/18 20:18	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		08/27/18 20:18	75-35-4	
cis-1,2-Dichloroethene	**445**	ug/L	100	100		08/27/18 14:20	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		08/27/18 20:18	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		08/27/18 20:18	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		08/27/18 20:18	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		08/27/18 20:18	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		08/27/18 20:18	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		08/27/18 20:18	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		08/27/18 20:18	10061-02-6	
Diisopropyl ether	ND	ug/L	10.0	1		08/27/18 20:18	108-20-3	
Ethylbenzene	ND	ug/L	1.0	1		08/27/18 20:18	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	10.0	1		08/27/18 20:18	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		08/27/18 20:18	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		08/27/18 20:18	99-87-6	
Methylene Chloride	ND	ug/L	1.0	1		08/27/18 20:18	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		08/27/18 20:18	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	10.0	1		08/27/18 20:18	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		08/27/18 20:18	91-20-3	
Styrene	ND	ug/L	1.0	1		08/27/18 20:18	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		08/27/18 20:18	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		08/27/18 20:18	79-34-5	
Tetrachloroethene	**12800**	ug/L	100	100		08/27/18 14:20	127-18-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - B5365-0001
Pace Project No.: 268432

Sample: Dup-1 **Lab ID: 268432009** Collected: 08/20/18 00:00 Received: 08/21/18 14:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Toluene	ND	ug/L	1.0	1		08/27/18 20:18	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		08/27/18 20:18	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		08/27/18 20:18	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		08/27/18 20:18	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		08/27/18 20:18	79-00-5	
Trichloroethene	**95.1**	ug/L	1.0	1		08/27/18 20:18	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		08/27/18 20:18	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		08/27/18 20:18	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		08/27/18 20:18	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		08/27/18 20:18	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		08/27/18 20:18	1330-20-7	
m&p-Xylene	ND	ug/L	1.0	1		08/27/18 20:18	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		08/27/18 20:18	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	100	%.	81-119	1		08/27/18 20:18	17060-07-0	
Dibromofluoromethane (S)	99	%.	82-114	1		08/27/18 20:18	1868-53-7	
4-Bromofluorobenzene (S)	104	%.	82-120	1		08/27/18 20:18	460-00-4	
Toluene-d8 (S)	100	%.	82-109	1		08/27/18 20:18	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - B5365-0001
Pace Project No.: 268432

Sample: Trip Blank **Lab ID: 268432010** Collected: 08/20/18 00:00 Received: 08/21/18 14:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		08/27/18 11:21	67-64-1	
Benzene	ND	ug/L	1.0	1		08/27/18 11:21	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		08/27/18 11:21	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		08/27/18 11:21	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		08/27/18 11:21	75-27-4	
Bromoform	ND	ug/L	1.0	1		08/27/18 11:21	75-25-2	
Bromomethane	ND	ug/L	2.0	1		08/27/18 11:21	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		08/27/18 11:21	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		08/27/18 11:21	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		08/27/18 11:21	108-90-7	
Chloroethane	ND	ug/L	1.0	1		08/27/18 11:21	75-00-3	
Chloroform	ND	ug/L	1.0	1		08/27/18 11:21	67-66-3	
Chloromethane	ND	ug/L	1.0	1		08/27/18 11:21	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		08/27/18 11:21	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		08/27/18 11:21	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		08/27/18 11:21	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		08/27/18 11:21	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	2.0	1		08/27/18 11:21	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		08/27/18 11:21	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		08/27/18 11:21	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		08/27/18 11:21	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		08/27/18 11:21	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		08/27/18 11:21	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		08/27/18 11:21	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		08/27/18 11:21	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		08/27/18 11:21	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		08/27/18 11:21	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		08/27/18 11:21	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		08/27/18 11:21	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		08/27/18 11:21	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		08/27/18 11:21	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		08/27/18 11:21	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		08/27/18 11:21	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		08/27/18 11:21	10061-02-6	
Diisopropyl ether	ND	ug/L	10.0	1		08/27/18 11:21	108-20-3	
Ethylbenzene	ND	ug/L	1.0	1		08/27/18 11:21	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	10.0	1		08/27/18 11:21	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		08/27/18 11:21	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		08/27/18 11:21	99-87-6	
Methylene Chloride	ND	ug/L	1.0	1		08/27/18 11:21	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		08/27/18 11:21	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	10.0	1		08/27/18 11:21	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		08/27/18 11:21	91-20-3	
Styrene	ND	ug/L	1.0	1		08/27/18 11:21	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		08/27/18 11:21	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		08/27/18 11:21	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		08/27/18 11:21	127-18-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - B5365-0001
Pace Project No.: 268432

Sample: Trip Blank **Lab ID: 268432010** Collected: 08/20/18 00:00 Received: 08/21/18 14:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Toluene	ND	ug/L	1.0	1		08/27/18 11:21	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		08/27/18 11:21	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		08/27/18 11:21	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		08/27/18 11:21	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		08/27/18 11:21	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		08/27/18 11:21	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		08/27/18 11:21	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		08/27/18 11:21	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		08/27/18 11:21	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		08/27/18 11:21	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		08/27/18 11:21	1330-20-7	
m&p-Xylene	ND	ug/L	1.0	1		08/27/18 11:21	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		08/27/18 11:21	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	99	%.	81-119	1		08/27/18 11:21	17060-07-0	
Dibromofluoromethane (S)	96	%.	82-114	1		08/27/18 11:21	1868-53-7	
4-Bromofluorobenzene (S)	100	%.	82-120	1		08/27/18 11:21	460-00-4	
Toluene-d8 (S)	101	%.	82-109	1		08/27/18 11:21	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

QUALITY CONTROL DATA

Project: City of Duluth - B5365-0001
Pace Project No.: 268432

QC Batch: 12416 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260B MSV
Associated Lab Samples: 268432001, 268432002, 268432003, 268432004, 268432005, 268432006, 268432007, 268432008, 268432009, 268432010

METHOD BLANK: 55381 Matrix: Water
Associated Lab Samples: 268432001, 268432002, 268432003, 268432004, 268432005, 268432006, 268432007, 268432008, 268432009, 268432010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	08/27/18 10:51	
1,1,1-Trichloroethane	ug/L	ND	1.0	08/27/18 10:51	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	08/27/18 10:51	
1,1,2-Trichloroethane	ug/L	ND	1.0	08/27/18 10:51	
1,1-Dichloroethane	ug/L	ND	1.0	08/27/18 10:51	
1,1-Dichloroethene	ug/L	ND	1.0	08/27/18 10:51	
1,1-Dichloropropene	ug/L	ND	1.0	08/27/18 10:51	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	08/27/18 10:51	
1,2,3-Trichloropropane	ug/L	ND	1.0	08/27/18 10:51	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	08/27/18 10:51	
1,2-Dibromo-3-chloropropane	ug/L	ND	2.0	08/27/18 10:51	
1,2-Dibromoethane (EDB)	ug/L	ND	2.0	08/27/18 10:51	
1,2-Dichlorobenzene	ug/L	ND	1.0	08/27/18 10:51	
1,2-Dichloroethane	ug/L	ND	1.0	08/27/18 10:51	
1,2-Dichloropropane	ug/L	ND	1.0	08/27/18 10:51	
1,3-Dichlorobenzene	ug/L	ND	1.0	08/27/18 10:51	
1,3-Dichloropropane	ug/L	ND	1.0	08/27/18 10:51	
1,4-Dichlorobenzene	ug/L	ND	1.0	08/27/18 10:51	
2,2-Dichloropropane	ug/L	ND	1.0	08/27/18 10:51	
2-Butanone (MEK)	ug/L	ND	5.0	08/27/18 10:51	
2-Chlorotoluene	ug/L	ND	1.0	08/27/18 10:51	
2-Hexanone	ug/L	ND	5.0	08/27/18 10:51	
4-Chlorotoluene	ug/L	ND	1.0	08/27/18 10:51	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	08/27/18 10:51	
Acetone	ug/L	ND	25.0	08/27/18 10:51	
Benzene	ug/L	ND	1.0	08/27/18 10:51	
Bromobenzene	ug/L	ND	1.0	08/27/18 10:51	
Bromochloromethane	ug/L	ND	1.0	08/27/18 10:51	
Bromodichloromethane	ug/L	ND	1.0	08/27/18 10:51	
Bromoform	ug/L	ND	1.0	08/27/18 10:51	
Bromomethane	ug/L	ND	2.0	08/27/18 10:51	
Carbon tetrachloride	ug/L	ND	1.0	08/27/18 10:51	
Chlorobenzene	ug/L	ND	1.0	08/27/18 10:51	
Chloroethane	ug/L	ND	1.0	08/27/18 10:51	
Chloroform	ug/L	ND	1.0	08/27/18 10:51	
Chloromethane	ug/L	ND	1.0	08/27/18 10:51	
cis-1,2-Dichloroethene	ug/L	ND	1.0	08/27/18 10:51	
cis-1,3-Dichloropropene	ug/L	ND	1.0	08/27/18 10:51	
Dibromochloromethane	ug/L	ND	1.0	08/27/18 10:51	
Dibromomethane	ug/L	ND	1.0	08/27/18 10:51	

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

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

QUALITY CONTROL DATA

Project: City of Duluth - B5365-0001
Pace Project No.: 268432

METHOD BLANK: 55381 Matrix: Water
Associated Lab Samples: 268432001, 268432002, 268432003, 268432004, 268432005, 268432006, 268432007, 268432008, 268432009, 268432010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dichlorodifluoromethane	ug/L	ND	1.0	08/27/18 10:51	
Diisopropyl ether	ug/L	ND	10.0	08/27/18 10:51	
Ethylbenzene	ug/L	ND	1.0	08/27/18 10:51	
Hexachloro-1,3-butadiene	ug/L	ND	10.0	08/27/18 10:51	
m&p-Xylene	ug/L	ND	1.0	08/27/18 10:51	
Methyl-tert-butyl ether	ug/L	ND	10.0	08/27/18 10:51	
Methylene Chloride	ug/L	ND	1.0	08/27/18 10:51	
Naphthalene	ug/L	ND	1.0	08/27/18 10:51	
o-Xylene	ug/L	ND	1.0	08/27/18 10:51	
p-Isopropyltoluene	ug/L	ND	1.0	08/27/18 10:51	
Styrene	ug/L	ND	1.0	08/27/18 10:51	
Tetrachloroethene	ug/L	ND	1.0	08/27/18 10:51	
Toluene	ug/L	ND	1.0	08/27/18 10:51	
trans-1,2-Dichloroethene	ug/L	ND	1.0	08/27/18 10:51	
trans-1,3-Dichloropropene	ug/L	ND	1.0	08/27/18 10:51	
Trichloroethene	ug/L	ND	1.0	08/27/18 10:51	
Trichlorofluoromethane	ug/L	ND	1.0	08/27/18 10:51	
Vinyl acetate	ug/L	ND	2.0	08/27/18 10:51	
Vinyl chloride	ug/L	ND	1.0	08/27/18 10:51	
Xylene (Total)	ug/L	ND	2.0	08/27/18 10:51	
1,2-Dichloroethane-d4 (S)	%.	98	81-119	08/27/18 10:51	
4-Bromofluorobenzene (S)	%.	104	82-120	08/27/18 10:51	
Dibromofluoromethane (S)	%.	92	82-114	08/27/18 10:51	
Toluene-d8 (S)	%.	100	82-109	08/27/18 10:51	

LABORATORY CONTROL SAMPLE: 55382

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	49.4	99	68-137	
1,1,1-Trichloroethane	ug/L	50	48.2	96	72-134	
1,1,2,2-Tetrachloroethane	ug/L	50	52.3	105	51-158	
1,1,2-Trichloroethane	ug/L	50	53.7	107	78-131	
1,1-Dichloroethane	ug/L	50	52.4	105	69-151	
1,1-Dichloroethene	ug/L	50	53.9	108	64-158	
1,1-Dichloropropene	ug/L	50	48.4	97	70-133	
1,2,3-Trichlorobenzene	ug/L	50	49.1	98	73-130	
1,2,3-Trichloropropane	ug/L	50	47.5	95	78-133	
1,2,4-Trichlorobenzene	ug/L	50	49.4	99	51-163	
1,2-Dibromo-3-chloropropane	ug/L	50	48.4	97	58-124	
1,2-Dibromoethane (EDB)	ug/L	50	49.9	100	71-134	
1,2-Dichlorobenzene	ug/L	50	53.7	107	70-135	
1,2-Dichloroethane	ug/L	50	50.9	102	72-129	
1,2-Dichloropropane	ug/L	50	54.0	108	64-135	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

QUALITY CONTROL DATA

Project: City of Duluth - B5365-0001
Pace Project No.: 268432

LABORATORY CONTROL SAMPLE: 55382

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,3-Dichlorobenzene	ug/L	50	51.4	103	71-134	
1,3-Dichloropropane	ug/L	50	51.9	104	70-140	
1,4-Dichlorobenzene	ug/L	50	48.4	97	70-131	
2,2-Dichloropropane	ug/L	50	49.0	98	34-170	
2-Butanone (MEK)	ug/L	100	118	118	52-143	
2-Chlorotoluene	ug/L	50	53.8	108	77-128	
2-Hexanone	ug/L	100	113	113	61-136	
4-Chlorotoluene	ug/L	50	51.1	102	79-126	
4-Methyl-2-pentanone (MIBK)	ug/L	100	102	102	71-129	
Acetone	ug/L	100	155	155	48-224	
Benzene	ug/L	50	49.9	100	68-132	
Bromobenzene	ug/L	50	50.5	101	75-122	
Bromochloromethane	ug/L	50	54.7	109	73-133	
Bromodichloromethane	ug/L	50	49.2	98	67-121	
Bromoform	ug/L	50	45.8	92	57-125	
Bromomethane	ug/L	50	50.1	100	35-156	
Carbon tetrachloride	ug/L	50	54.2	108	66-122	
Chlorobenzene	ug/L	50	49.7	99	71-126	
Chloroethane	ug/L	50	52.9	106	43-143	
Chloroform	ug/L	50	48.2	96	71-136	
Chloromethane	ug/L	50	51.1	102	47-123	
cis-1,2-Dichloroethene	ug/L	50	50.2	100	74-131	
cis-1,3-Dichloropropene	ug/L	50	48.9	98	78-120	
Dibromochloromethane	ug/L	50	48.3	97	65-115	
Dibromomethane	ug/L	50	50.0	100	79-129	
Dichlorodifluoromethane	ug/L	50	43.5	87	29-124	
Diisopropyl ether	ug/L	50	52.4	105	70-130	
Ethylbenzene	ug/L	50	50.2	100	68-129	
Hexachloro-1,3-butadiene	ug/L	50	54.3	109	58-142	
m&p-Xylene	ug/L	100	104	104	67-137	
Methyl-tert-butyl ether	ug/L	100	111	111	59-130	
Methylene Chloride	ug/L	50	50.8	102	61-147	
Naphthalene	ug/L	50	46.7	93	48-144	
o-Xylene	ug/L	50	49.7	99	52-141	
p-Isopropyltoluene	ug/L	50	53.2	106	58-137	
Styrene	ug/L	50	50.9	102	77-128	
Tetrachloroethene	ug/L	50	56.3	113	51-139	
Toluene	ug/L	50	49.2	98	60-133	
trans-1,2-Dichloroethene	ug/L	50	52.5	105	69-144	
trans-1,3-Dichloropropene	ug/L	50	46.7	93	74-128	
Trichloroethene	ug/L	50	53.3	107	73-126	
Trichlorofluoromethane	ug/L	50	50.3	101	55-132	
Vinyl acetate	ug/L	50	52.8	106	52-141	
Vinyl chloride	ug/L	50	50.9	102	50-133	
Xylene (Total)	ug/L	150	153	102	78-132	
1,2-Dichloroethane-d4 (S)	%.			99	81-119	
4-Bromofluorobenzene (S)	%.			100	82-120	

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

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

QUALITY CONTROL DATA

Project: City of Duluth - B5365-0001
Pace Project No.: 268432

LABORATORY CONTROL SAMPLE: 55382

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromofluoromethane (S)	%.			100	82-114	
Toluene-d8 (S)	%.			99	82-109	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 55383 55384

Parameter	Units	268432009 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,1,1,2-Tetrachloroethane	ug/L	ND	5000	5000	4860	4950	97	99	68-137	2	11	
1,1,1-Trichloroethane	ug/L	ND	5000	5000	4800	4830	96	97	66-142	1	11	
1,1,2,2-Tetrachloroethane	ug/L	ND	5000	5000	5590	5470	112	109	39-171	2	13	
1,1,2-Trichloroethane	ug/L	ND	5000	5000	5510	5790	110	116	73-136	5	12	
1,1-Dichloroethane	ug/L	ND	5000	5000	5580	5440	112	109	66-155	3	15	
1,1-Dichloroethene	ug/L	ND	5000	5000	5420	5550	108	111	33-181	2	34	
1,1-Dichloropropene	ug/L	ND	5000	5000	4640	4580	93	92	70-133	1	12	
1,2,3-Trichlorobenzene	ug/L	ND	5000	5000	4640	4700	93	94	73-130	1	22	
1,2,3-Trichloropropane	ug/L	ND	5000	5000	4580	4670	92	93	78-133	2	14	
1,2,4-Trichlorobenzene	ug/L	ND	5000	5000	4420	4350	88	87	44-164	2	13	
1,2-Dibromo-3-chloropropane	ug/L	ND	5000	5000	4310	4410	86	88	58-124	2	15	
1,2-Dibromoethane (EDB)	ug/L	ND	5000	5000	5150	5360	103	107	71-134	4	12	
1,2-Dichlorobenzene	ug/L	ND	5000	5000	5090	5110	102	102	69-135	0	10	
1,2-Dichloroethane	ug/L	ND	5000	5000	5400	5400	108	108	36-159	0	10	
1,2-Dichloropropane	ug/L	ND	5000	5000	5650	5860	113	117	68-132	4	11	
1,3-Dichlorobenzene	ug/L	ND	5000	5000	5110	4970	102	99	68-135	3	10	
1,3-Dichloropropane	ug/L	ND	5000	5000	5640	5740	113	115	70-138	2	10	
1,4-Dichlorobenzene	ug/L	ND	5000	5000	4660	4590	93	92	49-153	1	9	
2,2-Dichloropropane	ug/L	ND	5000	5000	4110	4120	82	82	34-170	0	9	
2-Butanone (MEK)	ug/L	ND	10000	10000	10200	10400	102	104	10-189	2	23	
2-Chlorotoluene	ug/L	ND	5000	5000	5370	5200	107	104	77-128	3	10	
2-Hexanone	ug/L	ND	10000	10000	9820	10100	98	101	40-135	3	18	
4-Chlorotoluene	ug/L	ND	5000	5000	4900	4890	98	98	79-126	0	10	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	10000	10000	9790	9980	98	100	30-177	2	10	
Acetone	ug/L	ND	10000	10000	10400	10700	104	107	44-223	3	14	
Benzene	ug/L	ND	5000	5000	5090	5130	102	103	66-139	1	10	
Bromobenzene	ug/L	ND	5000	5000	5210	5120	104	102	75-122	2	12	
Bromochloromethane	ug/L	ND	5000	5000	5410	5480	108	110	73-133	1	13	
Bromodichloromethane	ug/L	ND	5000	5000	4760	4920	95	98	57-120	3	13	
Bromoform	ug/L	ND	5000	5000	4470	4400	89	88	48-128	2	13	
Bromomethane	ug/L	ND	5000	5000	4920	5290	98	106	10-187	7	32	
Carbon tetrachloride	ug/L	ND	5000	5000	5100	5200	102	104	58-127	2	14	
Chlorobenzene	ug/L	ND	5000	5000	5110	5050	102	101	63-137	1	10	
Chloroethane	ug/L	ND	5000	5000	4510	4740	90	95	52-146	5	16	
Chloroform	ug/L	10.8	5000	5000	4770	4950	95	99	74-137	4	9	
Chloromethane	ug/L	ND	5000	5000	5410	5540	108	111	41-127	2	10	
cis-1,2-Dichloroethene	ug/L	445	5000	5000	5920	5700	110	105	71-138	4	16	

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

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

QUALITY CONTROL DATA

Project: City of Duluth - B5365-0001
Pace Project No.: 268432

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 55383 55384

Parameter	Units	268432009 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
cis-1,3-Dichloropropene	ug/L	ND	5000	5000	4610	4830	92	97	32-145	5	12	
Dibromochloromethane	ug/L	ND	5000	5000	4690	4810	94	96	52-116	3	13	
Dibromomethane	ug/L	ND	5000	5000	5070	5310	101	106	79-129	5	14	
Dichlorodifluoromethane	ug/L	ND	5000	5000	4480	4510	90	90	36-126	1	15	
Diisopropyl ether	ug/L	ND	5000	5000	5450	5460	109	109	70-130	0	20	
Ethylbenzene	ug/L	ND	5000	5000	5150	5070	103	101	31-174	1	10	
Hexachloro-1,3-butadiene	ug/L	ND	5000	5000	5600	5190	112	104	58-142	8	11	
m&p-Xylene	ug/L	ND	10000	10000	10500	10300	105	103	27-179	2	10	
Methyl-tert-butyl ether	ug/L	ND	10000	10000	10300	10600	103	106	38-120	3	12	
Methylene Chloride	ug/L	ND	5000	5000	5280	5280	106	106	61-146	0	15	
Naphthalene	ug/L	ND	5000	5000	4750	4890	95	98	25-159	3	14	
o-Xylene	ug/L	ND	5000	5000	5170	5200	103	104	52-141	1	65	
p-Isopropyltoluene	ug/L	ND	5000	5000	4790	4650	96	93	59-134	3	9	
Styrene	ug/L	ND	5000	5000	5220	5130	104	103	77-128	2	14	
Tetrachloroethene	ug/L	12800	5000	5000	18500	18700	113	118	36-155	1	14	
Toluene	ug/L	ND	5000	5000	5020	5140	100	103	52-146	2	11	
trans-1,2-Dichloroethene	ug/L	ND	5000	5000	5440	5530	109	111	61-152	2	14	
trans-1,3-Dichloropropene	ug/L	ND	5000	5000	4390	4600	88	92	37-146	5	12	
Trichloroethene	ug/L	95.1	5000	5000	5070	5210	100	102	61-141	3	12	
Trichlorofluoromethane	ug/L	ND	5000	5000	4920	4810	98	96	51-141	2	13	
Vinyl acetate	ug/L	ND	5000	5000	5920	5860	118	117	52-141	1	14	
Vinyl chloride	ug/L	ND	5000	5000	5010	5100	100	102	22-156	2	26	
Xylene (Total)	ug/L	ND	15000	15000	15700	15500	105	104	78-132	1	7	
1,2-Dichloroethane-d4 (S)	%.						99	96	81-119			
4-Bromofluorobenzene (S)	%.						100	99	82-120			
Dibromofluoromethane (S)	%.						103	103	82-114			
Toluene-d8 (S)	%.						100	99	82-109			

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

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

QUALIFIERS

Project: City of Duluth - B5365-0001
Pace Project No.: 268432

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 - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

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.

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.

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: City of Duluth - B5365-0001
Pace Project No.: 268432

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
268432001	**MW-1**	EPA 8260B	12416		
268432002	**MW-2**	EPA 8260B	12416		
268432003	**MW-3**	EPA 8260B	12416		
268432004	**MW-4**	EPA 8260B	12416		
268432005	**MW-5**	EPA 8260B	12416		
268432006	**MW-6**	EPA 8260B	12416		
268432007	**MW-8**	EPA 8260B	12416		
268432008	**MW-13**	EPA 8260B	12416		
268432009	**Dup-1**	EPA 8260B	12416		
268432010	**Trip Blank**	EPA 8260B	12416		

CHAIN OF CUSTODY RECORD

Pace Analytical
www.pacelabs.com

Pace Analytical Services, LLC - Atlanta GA
110 TECHNOLOGY PARKWAY, PEACHTREE CORNERS, GA 30092
(770) 734-4200 : FAX (770) 734-4201

CLIENT NAME: Wenck

CLIENT ADDRESS/PHONE NUMBER/FAX NUMBER:
1080 Holcomb Bridge Road

REPORT TO: kross@wenck.com
CC: sfuller@wenck.com

REQUESTED COMPLETION DATE: Standard
PO #:

PROJECT NAME/STATE: Duluth

PROJECT #: B5365-0001

ANALYSIS REQUESTED

Collection DATE	Collection TIME	MATRIX CODE*	COMP	GRAB	SAMPLE IDENTIFICATION	# of CONTAINERS	VOCs - 8260	LAB ID NUMBER
8-21-18	1310	GW		X	MW-1	3	X	
8-21-18	1015	GW		X	MW-2	3	X	
8-21-18	1135	GW		X	MW-3	3	X	
8-21-18	1025	GW		X	MW-4	3	X	
8-20-18	1245	GW		X	MW-5	3	X	
8-20-18	1405	GW		X	MW-6	3	X	
8-20-18	1220	GW		X	MW-8	3	X	
8-20-18	1455	GW		X	MW-13	3	X	
—	—	GW		X	DUP-1	3	X	
				X	Trip Blank	3	X	

CONTAINER TYPE: P - PLASTIC; A - AMBER GLASS; G - CLEAR GLASS; V - VOA VIAL; S - STERILE; O - OTHER

PRESERVATION: 1 - HCl, ≤6°C; 2 - H_2SO_4, ≤6°C; 3 - HNO_3; 4 - NaOH, ≤6°C; 5 - NaOH/ZnAc, ≤6°C; 6 - $Na_2S_2O_3$, ≤6°C; 7 - ≤6°C not frozen

*MATRIX CODES: DW - DRINKING WATER; WW - WASTEWATER; GW - GROUNDWATER; SW - SURFACE WATER; ST - STORM WATER; S - SOIL; SL - SLUDGE; SD - SOLID; A - AIR; L - LIQUID; W - WATER; P - PRODUCT

REMARKS/ADDITIONAL INFORMATION

WO# : 268432

268432

SAMPLED BY AND TITLE: Mark Padgett	DATE/TIME: 8-21-18 1400	RELINQUISHED BY: Mark Padgett	DATE/TIME: 8-21-18 1400
RECEIVED BY: Shannon Fuller	DATE/TIME: 8/21/18 14:00	RELINQUISHED BY: Shannon Fuller	DATE/TIME: 8/21/18 14:15
RECEIVED BY LAB: MLaMman	DATE/TIME: 08/21/18 1415	SAMPLE SHIPPED VIA: UPS FED-EX USPS COURIER CLIENT OTHER FS	
pH checked: Yes No NA	Ice: Yes No NA	Temperature: Min: 5.0 Max:	Custody Seal: Intact Broken Not Present N/A; # of Coolers; Cooler ID:

FOR LAB USE ONLY
LAB #:
Entered into LIMS:
Tracking #:

Sample Condition Upon Receipt

Face Analytical

Client Name: Wenck

Project #

WO#: 268432

PM: EDB **Due Date: 08/28/18**

CLIENT: WENCK

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

Tracking #:

Custody Seal on Cooler/Box Present: ☒ yes ☐ no Seals intact: ☒ yes ☐

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

Thermometer Used 83 Type of Ice: (Wet) Blue None ☐ Samples on ice, cooling process has begun

Cooler Temperature 5.0 Biological Tissue is Frozen: Yes No

Date and Initials of person examining contents: 8/21/18 MP

Temp should be above freezing to 6°C

				Comments:
Chain of Custody Present:	☒Yes	☐No	☐N/A	1.
Chain of Custody Filled Out:	☒Yes	☐No	☐N/A	2.
Chain of Custody Relinquished:	☒Yes	☐No	☐N/A	3.
Sampler Name & Signature on COC:	☒Yes	☐No	☐N/A	4.
Samples Arrived within Hold Time:	☒Yes	☐No	☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes	☒No	☐N/A	6.
Rush Turn Around Time Requested:	☐Yes	☒No	☐N/A	7.
Sufficient Volume:	☒Yes	☐No	☐N/A	8.
Correct Containers Used:	☒Yes	☐No	☐N/A	9.
-Pace Containers Used:	☒Yes	☐No	☐N/A	
Containers Intact:	☒Yes	☐No	☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes	☐No	☒N/A	11.
Sample Labels match COC:	☒Yes	☐No	☐N/A	12.
-Includes date/time/ID/Analysis Matrix: GW				
All containers needing preservation have been checked.	☐Yes	☐No	☒N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☒Yes	☐No	☐N/A	
exceptions: (VOA), coliform, TOC, O&G, WI-DRO (water)	☐Yes	☐No		Initial when completed / Lot # of added preservative
Samples checked for dechlorination:	☐Yes	☐No	☒N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes	☒No	☐N/A	15.
Trip Blank Present:	☒Yes	☐No	☐N/A	16.
Trip Blank Custody Seals Present	☐Yes	☐No	☐N/A	
Pace Trip Blank Lot # (if purchased):				

Client Notification/ Resolution: Field Data Required? Y N

Person Contacted: Date/Time:

Comments/ Resolution:

Project Manager Review: **Date:**

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).

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

October 09, 2018

Katie Ross
WENCK Associates
1080 Holcomb Bridge Rd.
Roswell, GA 30076

RE: Project: City of Duluth - 5365
Pace Project No.: 269938

Dear Katie Ross:
Enclosed are the analytical results for sample(s) received by the laboratory on October 02, 2018. 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,

Eben Buchanan

Eben Buchanan
eben.buchanan@pacelabs.com
(770)734-4200
Project Manager

Enclosures

cc: Rebecca Thornton, Pace Analytical Atlanta

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

CERTIFICATIONS

Project: City of Duluth - 5365
Pace Project No.: 269938

Atlanta Certification IDs

110 Technology Parkway Peachtree Corners, GA 30092
Florida DOH Certification #: E87315
Georgia DW Inorganics Certification #: 812
Georgia DW Microbiology Certification #: 812
North Carolina Certification #: 381
South Carolina Certification #: 98011001
Texas Certification #: T104704397-08-TX
Virginia Certification #: 460204

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

SAMPLE SUMMARY

Project: City of Duluth - 5365
Pace Project No.: 269938

Lab ID	Sample ID	Matrix	Date Collected	Date Received
269938001	**MW-15-4**	Solid	10/01/18 11:50	10/02/18 13:22
269938002	**HA-1**	Solid	10/01/18 15:10	10/02/18 13:22
269938003	**MW-15**	Water	10/02/18 11:35	10/02/18 13:22
269938004	**Trip Blank**	Water	10/01/18 00:00	10/02/18 13:22

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

SAMPLE ANALYTE COUNT

Project: City of Duluth - 5365
Pace Project No.: 269938

Lab ID	Sample ID	Method	Analysts	Analytes Reported
269938001	**MW-15-4**	EPA 8260B	JHG	73
		Pace SOP #204	JPT	1
269938002	**HA-1**	EPA 8260B	JHG	73
		Pace SOP #204	JPT	1
269938003	**MW-15**	EPA 8260B	LIH	64
269938004	**Trip Blank**	EPA 8260B	LIH	64

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - 5365
Pace Project No.: 269938

Sample: MW-15-4 **Lab ID: 269938001** Collected: 10/01/18 11:50 Received: 10/02/18 13:22 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035	Analytical Method: EPA 8260B Preparation Method: EPA 5035							
Acetone	ND	mg/kg	0.12	1	10/04/18 14:35	10/04/18 17:52	67-64-1	
Acrolein	ND	mg/kg	0.059	1	10/04/18 14:35	10/04/18 17:52	107-02-8	
Acrylonitrile	ND	mg/kg	0.059	1	10/04/18 14:35	10/04/18 17:52	107-13-1	
Benzene	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	71-43-2	
Bromobenzene	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	108-86-1	
Bromochloromethane	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	74-97-5	
Bromodichloromethane	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	75-27-4	
Bromoform	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	75-25-2	
Bromomethane	ND	mg/kg	0.012	1	10/04/18 14:35	10/04/18 17:52	74-83-9	
2-Butanone (MEK)	ND	mg/kg	0.12	1	10/04/18 14:35	10/04/18 17:52	78-93-3	
n-Butylbenzene	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	104-51-8	
sec-Butylbenzene	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	135-98-8	
tert-Butylbenzene	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	98-06-6	
Carbon disulfide	ND	mg/kg	0.012	1	10/04/18 14:35	10/04/18 17:52	75-15-0	
Carbon tetrachloride	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	56-23-5	
Chlorobenzene	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	108-90-7	
Chloroethane	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	75-00-3	
Chloroform	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	67-66-3	
Chloromethane	ND	mg/kg	0.012	1	10/04/18 14:35	10/04/18 17:52	74-87-3	
2-Chlorotoluene	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	95-49-8	
4-Chlorotoluene	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	106-43-4	
1,2-Dibromo-3-chloropropane	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	96-12-8	
Dibromochloromethane	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	124-48-1	
1,2-Dibromoethane (EDB)	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	106-93-4	
Dibromomethane	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	74-95-3	
1,2-Dichlorobenzene	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	95-50-1	
1,3-Dichlorobenzene	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	541-73-1	
1,4-Dichlorobenzene	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	106-46-7	
Dichlorodifluoromethane	ND	mg/kg	0.012	1	10/04/18 14:35	10/04/18 17:52	75-71-8	
1,1-Dichloroethane	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	75-34-3	
1,2-Dichloroethane	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	107-06-2	
1,1-Dichloroethene	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	75-35-4	
cis-1,2-Dichloroethene	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	156-59-2	
trans-1,2-Dichloroethene	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	156-60-5	
1,2-Dichloropropane	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	78-87-5	
1,3-Dichloropropane	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	142-28-9	
2,2-Dichloropropane	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	594-20-7	
1,1-Dichloropropene	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	563-58-6	
cis-1,3-Dichloropropene	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	10061-01-5	
trans-1,3-Dichloropropene	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	10061-02-6	
Diisopropyl ether	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	108-20-3	
Ethylbenzene	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	100-41-4	
2-Hexanone	ND	mg/kg	0.059	1	10/04/18 14:35	10/04/18 17:52	591-78-6	
Isopropylbenzene (Cumene)	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	98-82-8	
p-Isopropyltoluene	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	99-87-6	
Methylene Chloride	ND	mg/kg	0.023	1	10/04/18 14:35	10/04/18 17:52	75-09-2	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - 5365
Pace Project No.: 269938

Sample: MW-15-4 **Lab ID: 269938001** Collected: 10/01/18 11:50 Received: 10/02/18 13:22 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035	Analytical Method: EPA 8260B Preparation Method: EPA 5035							
4-Methyl-2-pentanone (MIBK)	ND	mg/kg	0.059	1	10/04/18 14:35	10/04/18 17:52	108-10-1	
Methyl-tert-butyl ether	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	1634-04-4	
Naphthalene	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	91-20-3	
n-Propylbenzene	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	103-65-1	
Styrene	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	100-42-5	
1,1,1,2-Tetrachloroethane	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	630-20-6	
1,1,2,2-Tetrachloroethane	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	79-34-5	
Tetrachloroethene	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	127-18-4	
Toluene	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	108-88-3	
1,2,3-Trichlorobenzene	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	87-61-6	
1,2,4-Trichlorobenzene	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	120-82-1	
1,1,1-Trichloroethane	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	71-55-6	
1,1,2-Trichloroethane	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	79-00-5	
Trichloroethene	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	79-01-6	
Trichlorofluoromethane	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	75-69-4	
1,2,3-Trichloropropane	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	96-18-4	
1,2,4-Trimethylbenzene	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	95-63-6	
1,3,5-Trimethylbenzene	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	108-67-8	
Vinyl acetate	ND	mg/kg	0.012	1	10/04/18 14:35	10/04/18 17:52	108-05-4	
Vinyl chloride	ND	mg/kg	0.012	1	10/04/18 14:35	10/04/18 17:52	75-01-4	
Xylene (Total)	ND	mg/kg	0.012	1	10/04/18 14:35	10/04/18 17:52	1330-20-7	
m&p-Xylene	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	179601-23-1	
o-Xylene	ND	mg/kg	0.0059	1	10/04/18 14:35	10/04/18 17:52	95-47-6	
Surrogates								
Dibromofluoromethane (S)	108	%.	73-114	1	10/04/18 14:35	10/04/18 17:52	1868-53-7	
Toluene-d8 (S)	102	%.	85-109	1	10/04/18 14:35	10/04/18 17:52	2037-26-5	
4-Bromofluorobenzene (S)	111	%.	77-124	1	10/04/18 14:35	10/04/18 17:52	460-00-4	
1,2-Dichloroethane-d4 (S)	110	%.	69-133	1	10/04/18 14:35	10/04/18 17:52	17060-07-0	
Percent Moisture	Analytical Method: Pace SOP #204							
Percent Moisture	**17.1**	%	0.10	1		10/03/18 16:04		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - 5365
Pace Project No.: 269938

Sample: HA-1 **Lab ID: 269938002** Collected: 10/01/18 15:10 Received: 10/02/18 13:22 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035	Analytical Method: EPA 8260B Preparation Method: EPA 5035							
Acetone	ND	mg/kg	0.13	1	10/04/18 14:35	10/04/18 18:17	67-64-1	
Acrolein	ND	mg/kg	0.063	1	10/04/18 14:35	10/04/18 18:17	107-02-8	
Acrylonitrile	ND	mg/kg	0.063	1	10/04/18 14:35	10/04/18 18:17	107-13-1	
Benzene	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	71-43-2	
Bromobenzene	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	108-86-1	
Bromochloromethane	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	74-97-5	
Bromodichloromethane	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	75-27-4	
Bromoform	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	75-25-2	
Bromomethane	ND	mg/kg	0.013	1	10/04/18 14:35	10/04/18 18:17	74-83-9	
2-Butanone (MEK)	ND	mg/kg	0.13	1	10/04/18 14:35	10/04/18 18:17	78-93-3	
n-Butylbenzene	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	104-51-8	
sec-Butylbenzene	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	135-98-8	
tert-Butylbenzene	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	98-06-6	
Carbon disulfide	ND	mg/kg	0.013	1	10/04/18 14:35	10/04/18 18:17	75-15-0	
Carbon tetrachloride	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	56-23-5	
Chlorobenzene	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	108-90-7	
Chloroethane	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	75-00-3	
Chloroform	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	67-66-3	
Chloromethane	ND	mg/kg	0.013	1	10/04/18 14:35	10/04/18 18:17	74-87-3	
2-Chlorotoluene	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	95-49-8	
4-Chlorotoluene	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	106-43-4	
1,2-Dibromo-3-chloropropane	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	96-12-8	
Dibromochloromethane	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	124-48-1	
1,2-Dibromoethane (EDB)	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	106-93-4	
Dibromomethane	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	74-95-3	
1,2-Dichlorobenzene	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	95-50-1	
1,3-Dichlorobenzene	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	541-73-1	
1,4-Dichlorobenzene	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	106-46-7	
Dichlorodifluoromethane	ND	mg/kg	0.013	1	10/04/18 14:35	10/04/18 18:17	75-71-8	
1,1-Dichloroethane	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	75-34-3	
1,2-Dichloroethane	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	107-06-2	
1,1-Dichloroethene	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	75-35-4	
cis-1,2-Dichloroethene	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	156-59-2	
trans-1,2-Dichloroethene	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	156-60-5	
1,2-Dichloropropane	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	78-87-5	
1,3-Dichloropropane	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	142-28-9	
2,2-Dichloropropane	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	594-20-7	
1,1-Dichloropropene	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	563-58-6	
cis-1,3-Dichloropropene	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	10061-01-5	
trans-1,3-Dichloropropene	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	10061-02-6	
Diisopropyl ether	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	108-20-3	
Ethylbenzene	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	100-41-4	
2-Hexanone	ND	mg/kg	0.063	1	10/04/18 14:35	10/04/18 18:17	591-78-6	
Isopropylbenzene (Cumene)	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	98-82-8	
p-Isopropyltoluene	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	99-87-6	
Methylene Chloride	ND	mg/kg	0.025	1	10/04/18 14:35	10/04/18 18:17	75-09-2	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - 5365
Pace Project No.: 269938

Sample: HA-1 **Lab ID: 269938002** Collected: 10/01/18 15:10 Received: 10/02/18 13:22 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035	Analytical Method: EPA 8260B Preparation Method: EPA 5035							
4-Methyl-2-pentanone (MIBK)	ND	mg/kg	0.063	1	10/04/18 14:35	10/04/18 18:17	108-10-1	
Methyl-tert-butyl ether	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	1634-04-4	
Naphthalene	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	91-20-3	
n-Propylbenzene	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	103-65-1	
Styrene	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	100-42-5	
1,1,1,2-Tetrachloroethane	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	630-20-6	
1,1,2,2-Tetrachloroethane	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	79-34-5	
Tetrachloroethene	**0.072**	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	127-18-4	
Toluene	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	108-88-3	
1,2,3-Trichlorobenzene	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	87-61-6	
1,2,4-Trichlorobenzene	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	120-82-1	
1,1,1-Trichloroethane	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	71-55-6	
1,1,2-Trichloroethane	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	79-00-5	
Trichloroethene	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	79-01-6	
Trichlorofluoromethane	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	75-69-4	
1,2,3-Trichloropropane	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	96-18-4	
1,2,4-Trimethylbenzene	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	95-63-6	
1,3,5-Trimethylbenzene	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	108-67-8	
Vinyl acetate	ND	mg/kg	0.013	1	10/04/18 14:35	10/04/18 18:17	108-05-4	
Vinyl chloride	ND	mg/kg	0.013	1	10/04/18 14:35	10/04/18 18:17	75-01-4	
Xylene (Total)	ND	mg/kg	0.013	1	10/04/18 14:35	10/04/18 18:17	1330-20-7	
m&p-Xylene	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	179601-23-1	
o-Xylene	ND	mg/kg	0.0063	1	10/04/18 14:35	10/04/18 18:17	95-47-6	
Surrogates								
Dibromofluoromethane (S)	107	%.	73-114	1	10/04/18 14:35	10/04/18 18:17	1868-53-7	
Toluene-d8 (S)	103	%.	85-109	1	10/04/18 14:35	10/04/18 18:17	2037-26-5	
4-Bromofluorobenzene (S)	111	%.	77-124	1	10/04/18 14:35	10/04/18 18:17	460-00-4	
1,2-Dichloroethane-d4 (S)	110	%.	69-133	1	10/04/18 14:35	10/04/18 18:17	17060-07-0	
Percent Moisture	Analytical Method: Pace SOP #204							
Percent Moisture	**19.4**	%	0.10	1		10/03/18 16:06		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - 5365
Pace Project No.: 269938

Sample: MW-15 **Lab ID: 269938003** Collected: 10/02/18 11:35 Received: 10/02/18 13:22 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		10/09/18 01:00	67-64-1	
Benzene	ND	ug/L	1.0	1		10/09/18 01:00	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		10/09/18 01:00	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		10/09/18 01:00	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		10/09/18 01:00	75-27-4	
Bromoform	ND	ug/L	1.0	1		10/09/18 01:00	75-25-2	
Bromomethane	ND	ug/L	2.0	1		10/09/18 01:00	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		10/09/18 01:00	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		10/09/18 01:00	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		10/09/18 01:00	108-90-7	
Chloroethane	ND	ug/L	1.0	1		10/09/18 01:00	75-00-3	
Chloroform	ND	ug/L	1.0	1		10/09/18 01:00	67-66-3	
Chloromethane	ND	ug/L	1.0	1		10/09/18 01:00	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		10/09/18 01:00	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		10/09/18 01:00	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		10/09/18 01:00	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		10/09/18 01:00	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	2.0	1		10/09/18 01:00	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		10/09/18 01:00	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		10/09/18 01:00	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		10/09/18 01:00	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		10/09/18 01:00	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		10/09/18 01:00	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		10/09/18 01:00	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		10/09/18 01:00	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		10/09/18 01:00	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		10/09/18 01:00	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		10/09/18 01:00	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		10/09/18 01:00	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		10/09/18 01:00	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		10/09/18 01:00	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		10/09/18 01:00	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		10/09/18 01:00	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		10/09/18 01:00	10061-02-6	
Diisopropyl ether	ND	ug/L	10.0	1		10/09/18 01:00	108-20-3	
Ethylbenzene	ND	ug/L	1.0	1		10/09/18 01:00	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	10.0	1		10/09/18 01:00	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		10/09/18 01:00	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		10/09/18 01:00	99-87-6	
Methylene Chloride	ND	ug/L	1.0	1		10/09/18 01:00	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		10/09/18 01:00	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	10.0	1		10/09/18 01:00	1634-04-4	L1
Naphthalene	ND	ug/L	1.0	1		10/09/18 01:00	91-20-3	
Styrene	ND	ug/L	1.0	1		10/09/18 01:00	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		10/09/18 01:00	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		10/09/18 01:00	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		10/09/18 01:00	127-18-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - 5365
Pace Project No.: 269938

Sample: MW-15 **Lab ID: 269938003** Collected: 10/02/18 11:35 Received: 10/02/18 13:22 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Toluene	ND	ug/L	1.0	1		10/09/18 01:00	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		10/09/18 01:00	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		10/09/18 01:00	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		10/09/18 01:00	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		10/09/18 01:00	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		10/09/18 01:00	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		10/09/18 01:00	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		10/09/18 01:00	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		10/09/18 01:00	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		10/09/18 01:00	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		10/09/18 01:00	1330-20-7	
m&p-Xylene	ND	ug/L	1.0	1		10/09/18 01:00	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		10/09/18 01:00	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	96	%.	81-119	1		10/09/18 01:00	17060-07-0	
Dibromofluoromethane (S)	95	%.	82-114	1		10/09/18 01:00	1868-53-7	
4-Bromofluorobenzene (S)	110	%.	82-120	1		10/09/18 01:00	460-00-4	
Toluene-d8 (S)	103	%.	82-109	1		10/09/18 01:00	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - 5365
Pace Project No.: 269938

Sample: Trip Blank **Lab ID: 269938004** Collected: 10/01/18 00:00 Received: 10/02/18 13:22 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		10/09/18 01:26	67-64-1	
Benzene	ND	ug/L	1.0	1		10/09/18 01:26	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		10/09/18 01:26	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		10/09/18 01:26	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		10/09/18 01:26	75-27-4	
Bromoform	ND	ug/L	1.0	1		10/09/18 01:26	75-25-2	
Bromomethane	ND	ug/L	2.0	1		10/09/18 01:26	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		10/09/18 01:26	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		10/09/18 01:26	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		10/09/18 01:26	108-90-7	
Chloroethane	ND	ug/L	1.0	1		10/09/18 01:26	75-00-3	
Chloroform	ND	ug/L	1.0	1		10/09/18 01:26	67-66-3	
Chloromethane	ND	ug/L	1.0	1		10/09/18 01:26	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		10/09/18 01:26	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		10/09/18 01:26	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		10/09/18 01:26	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		10/09/18 01:26	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	2.0	1		10/09/18 01:26	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		10/09/18 01:26	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		10/09/18 01:26	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		10/09/18 01:26	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		10/09/18 01:26	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		10/09/18 01:26	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		10/09/18 01:26	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		10/09/18 01:26	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		10/09/18 01:26	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		10/09/18 01:26	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		10/09/18 01:26	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		10/09/18 01:26	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		10/09/18 01:26	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		10/09/18 01:26	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		10/09/18 01:26	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		10/09/18 01:26	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		10/09/18 01:26	10061-02-6	
Diisopropyl ether	ND	ug/L	10.0	1		10/09/18 01:26	108-20-3	
Ethylbenzene	ND	ug/L	1.0	1		10/09/18 01:26	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	10.0	1		10/09/18 01:26	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		10/09/18 01:26	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		10/09/18 01:26	99-87-6	
Methylene Chloride	ND	ug/L	1.0	1		10/09/18 01:26	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		10/09/18 01:26	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	10.0	1		10/09/18 01:26	1634-04-4	L1
Naphthalene	ND	ug/L	1.0	1		10/09/18 01:26	91-20-3	
Styrene	ND	ug/L	1.0	1		10/09/18 01:26	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		10/09/18 01:26	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		10/09/18 01:26	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		10/09/18 01:26	127-18-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: City of Duluth - 5365
Pace Project No.: 269938

Sample: Trip Blank **Lab ID: 269938004** Collected: 10/01/18 00:00 Received: 10/02/18 13:22 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Toluene	ND	ug/L	1.0	1		10/09/18 01:26	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		10/09/18 01:26	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		10/09/18 01:26	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		10/09/18 01:26	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		10/09/18 01:26	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		10/09/18 01:26	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		10/09/18 01:26	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		10/09/18 01:26	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		10/09/18 01:26	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		10/09/18 01:26	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		10/09/18 01:26	1330-20-7	
m&p-Xylene	ND	ug/L	1.0	1		10/09/18 01:26	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		10/09/18 01:26	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	98	%.	81-119	1		10/09/18 01:26	17060-07-0	
Dibromofluoromethane (S)	94	%.	82-114	1		10/09/18 01:26	1868-53-7	
4-Bromofluorobenzene (S)	112	%.	82-120	1		10/09/18 01:26	460-00-4	
Toluene-d8 (S)	103	%.	82-109	1		10/09/18 01:26	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

QUALITY CONTROL DATA

Project: City of Duluth - 5365
Pace Project No.: 269938

QC Batch: 14789 Analysis Method: EPA 8260B
QC Batch Method: EPA 5035 Analysis Description: 8260 MSV 5035
Associated Lab Samples: 269938001, 269938002

METHOD BLANK: 65992 Matrix: Solid
Associated Lab Samples: 269938001, 269938002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	mg/kg	ND	0.0050	10/04/18 17:27	
1,1,1-Trichloroethane	mg/kg	ND	0.0050	10/04/18 17:27	
1,1,2,2-Tetrachloroethane	mg/kg	ND	0.0050	10/04/18 17:27	
1,1,2-Trichloroethane	mg/kg	ND	0.0050	10/04/18 17:27	
1,1-Dichloroethane	mg/kg	ND	0.0050	10/04/18 17:27	
1,1-Dichloroethene	mg/kg	ND	0.0050	10/04/18 17:27	
1,1-Dichloropropene	mg/kg	ND	0.0050	10/04/18 17:27	
1,2,3-Trichlorobenzene	mg/kg	ND	0.0050	10/04/18 17:27	
1,2,3-Trichloropropane	mg/kg	ND	0.0050	10/04/18 17:27	
1,2,4-Trichlorobenzene	mg/kg	ND	0.0050	10/04/18 17:27	
1,2,4-Trimethylbenzene	mg/kg	ND	0.0050	10/04/18 17:27	
1,2-Dibromo-3-chloropropane	mg/kg	ND	0.0050	10/04/18 17:27	
1,2-Dibromoethane (EDB)	mg/kg	ND	0.0050	10/04/18 17:27	
1,2-Dichlorobenzene	mg/kg	ND	0.0050	10/04/18 17:27	
1,2-Dichloroethane	mg/kg	ND	0.0050	10/04/18 17:27	
1,2-Dichloropropane	mg/kg	ND	0.0050	10/04/18 17:27	
1,3,5-Trimethylbenzene	mg/kg	ND	0.0050	10/04/18 17:27	
1,3-Dichlorobenzene	mg/kg	ND	0.0050	10/04/18 17:27	
1,3-Dichloropropane	mg/kg	ND	0.0050	10/04/18 17:27	
1,4-Dichlorobenzene	mg/kg	ND	0.0050	10/04/18 17:27	
2,2-Dichloropropane	mg/kg	ND	0.0050	10/04/18 17:27	
2-Butanone (MEK)	mg/kg	ND	0.10	10/04/18 17:27	
2-Chlorotoluene	mg/kg	ND	0.0050	10/04/18 17:27	
2-Hexanone	mg/kg	ND	0.050	10/04/18 17:27	
4-Chlorotoluene	mg/kg	ND	0.0050	10/04/18 17:27	
4-Methyl-2-pentanone (MIBK)	mg/kg	ND	0.050	10/04/18 17:27	
Acetone	mg/kg	ND	0.10	10/04/18 17:27	
Acrolein	mg/kg	ND	0.050	10/04/18 17:27	
Acrylonitrile	mg/kg	ND	0.050	10/04/18 17:27	
Benzene	mg/kg	ND	0.0050	10/04/18 17:27	
Bromobenzene	mg/kg	ND	0.0050	10/04/18 17:27	
Bromochloromethane	mg/kg	ND	0.0050	10/04/18 17:27	
Bromodichloromethane	mg/kg	ND	0.0050	10/04/18 17:27	
Bromoform	mg/kg	ND	0.0050	10/04/18 17:27	
Bromomethane	mg/kg	ND	0.010	10/04/18 17:27	
Carbon disulfide	mg/kg	ND	0.010	10/04/18 17:27	
Carbon tetrachloride	mg/kg	ND	0.0050	10/04/18 17:27	
Chlorobenzene	mg/kg	ND	0.0050	10/04/18 17:27	
Chloroethane	mg/kg	ND	0.0050	10/04/18 17:27	
Chloroform	mg/kg	ND	0.0050	10/04/18 17:27	
Chloromethane	mg/kg	ND	0.010	10/04/18 17:27	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(770)734-4200

QUALITY CONTROL DATA

Project: City of Duluth - 5365
Pace Project No.: 269938

METHOD BLANK: 65992 Matrix: Solid
Associated Lab Samples: 269938001, 269938002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
cis-1,2-Dichloroethene	mg/kg	ND	0.0050	10/04/18 17:27	
cis-1,3-Dichloropropene	mg/kg	ND	0.0050	10/04/18 17:27	
Dibromochloromethane	mg/kg	ND	0.0050	10/04/18 17:27	
Dibromomethane	mg/kg	ND	0.0050	10/04/18 17:27	
Dichlorodifluoromethane	mg/kg	ND	0.010	10/04/18 17:27	
Diisopropyl ether	mg/kg	ND	0.0050	10/04/18 17:27	
Ethylbenzene	mg/kg	ND	0.0050	10/04/18 17:27	
Isopropylbenzene (Cumene)	mg/kg	ND	0.0050	10/04/18 17:27	
m&p-Xylene	mg/kg	ND	0.0050	10/04/18 17:27	
Methyl-tert-butyl ether	mg/kg	ND	0.0050	10/04/18 17:27	
Methylene Chloride	mg/kg	ND	0.020	10/04/18 17:27	
n-Butylbenzene	mg/kg	ND	0.0050	10/04/18 17:27	
n-Propylbenzene	mg/kg	ND	0.0050	10/04/18 17:27	
Naphthalene	mg/kg	ND	0.0050	10/04/18 17:27	
o-Xylene	mg/kg	ND	0.0050	10/04/18 17:27	
p-Isopropyltoluene	mg/kg	ND	0.0050	10/04/18 17:27	
sec-Butylbenzene	mg/kg	ND	0.0050	10/04/18 17:27	
Styrene	mg/kg	ND	0.0050	10/04/18 17:27	
tert-Butylbenzene	mg/kg	ND	0.0050	10/04/18 17:27	
Tetrachloroethene	mg/kg	ND	0.0050	10/04/18 17:27	
Toluene	mg/kg	ND	0.0050	10/04/18 17:27	
trans-1,2-Dichloroethene	mg/kg	ND	0.0050	10/04/18 17:27	
trans-1,3-Dichloropropene	mg/kg	ND	0.0050	10/04/18 17:27	
Trichloroethene	mg/kg	ND	0.0050	10/04/18 17:27	
Trichlorofluoromethane	mg/kg	ND	0.0050	10/04/18 17:27	
Vinyl acetate	mg/kg	ND	0.010	10/04/18 17:27	
Vinyl chloride	mg/kg	ND	0.010	10/04/18 17:27	
Xylene (Total)	mg/kg	ND	0.010	10/04/18 17:27	
1,2-Dichloroethane-d4 (S)	%.	104	69-133	10/04/18 17:27	
4-Bromofluorobenzene (S)	%.	106	77-124	10/04/18 17:27	
Dibromofluoromethane (S)	%.	104	73-114	10/04/18 17:27	
Toluene-d8 (S)	%.	101	85-109	10/04/18 17:27	

METHOD BLANK: 65996 Matrix: Solid
Associated Lab Samples: 269938001, 269938002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	mg/kg	ND	0.25	10/04/18 17:03	
1,1,1-Trichloroethane	mg/kg	ND	0.25	10/04/18 17:03	
1,1,2,2-Tetrachloroethane	mg/kg	ND	0.25	10/04/18 17:03	
1,1,2-Trichloroethane	mg/kg	ND	0.25	10/04/18 17:03	
1,1-Dichloroethane	mg/kg	ND	0.25	10/04/18 17:03	
1,1-Dichloroethene	mg/kg	ND	0.25	10/04/18 17:03	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: City of Duluth - 5365
Pace Project No.: 269938

METHOD BLANK: 65996 Matrix: Solid
Associated Lab Samples: 269938001, 269938002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1-Dichloropropene	mg/kg	ND	0.25	10/04/18 17:03	
1,2,3-Trichlorobenzene	mg/kg	ND	0.25	10/04/18 17:03	
1,2,3-Trichloropropane	mg/kg	ND	0.25	10/04/18 17:03	
1,2,4-Trichlorobenzene	mg/kg	ND	0.25	10/04/18 17:03	
1,2,4-Trimethylbenzene	mg/kg	ND	0.25	10/04/18 17:03	
1,2-Dibromo-3-chloropropane	mg/kg	ND	0.25	10/04/18 17:03	
1,2-Dibromoethane (EDB)	mg/kg	ND	0.25	10/04/18 17:03	
1,2-Dichlorobenzene	mg/kg	ND	0.25	10/04/18 17:03	
1,2-Dichloroethane	mg/kg	ND	0.25	10/04/18 17:03	
1,2-Dichloropropane	mg/kg	ND	0.25	10/04/18 17:03	
1,3,5-Trimethylbenzene	mg/kg	ND	0.25	10/04/18 17:03	
1,3-Dichlorobenzene	mg/kg	ND	0.25	10/04/18 17:03	
1,3-Dichloropropane	mg/kg	ND	0.25	10/04/18 17:03	
1,4-Dichlorobenzene	mg/kg	ND	0.25	10/04/18 17:03	
2,2-Dichloropropane	mg/kg	ND	0.25	10/04/18 17:03	
2-Butanone (MEK)	mg/kg	ND	5.0	10/04/18 17:03	
2-Chlorotoluene	mg/kg	ND	0.25	10/04/18 17:03	
2-Hexanone	mg/kg	ND	2.5	10/04/18 17:03	
4-Chlorotoluene	mg/kg	ND	0.25	10/04/18 17:03	
4-Methyl-2-pentanone (MIBK)	mg/kg	ND	2.5	10/04/18 17:03	
Acetone	mg/kg	ND	5.0	10/04/18 17:03	
Acrolein	mg/kg	ND	2.5	10/04/18 17:03	
Acrylonitrile	mg/kg	ND	2.5	10/04/18 17:03	
Benzene	mg/kg	ND	0.25	10/04/18 17:03	
Bromobenzene	mg/kg	ND	0.25	10/04/18 17:03	
Bromochloromethane	mg/kg	ND	0.25	10/04/18 17:03	
Bromodichloromethane	mg/kg	ND	0.25	10/04/18 17:03	
Bromoform	mg/kg	ND	0.25	10/04/18 17:03	
Bromomethane	mg/kg	ND	0.50	10/04/18 17:03	
Carbon disulfide	mg/kg	ND	0.50	10/04/18 17:03	
Carbon tetrachloride	mg/kg	ND	0.25	10/04/18 17:03	
Chlorobenzene	mg/kg	ND	0.25	10/04/18 17:03	
Chloroethane	mg/kg	ND	0.25	10/04/18 17:03	
Chloroform	mg/kg	ND	0.25	10/04/18 17:03	
Chloromethane	mg/kg	ND	0.50	10/04/18 17:03	
cis-1,2-Dichloroethene	mg/kg	ND	0.25	10/04/18 17:03	
cis-1,3-Dichloropropene	mg/kg	ND	0.25	10/04/18 17:03	
Dibromochloromethane	mg/kg	ND	0.25	10/04/18 17:03	
Dibromomethane	mg/kg	ND	0.25	10/04/18 17:03	
Dichlorodifluoromethane	mg/kg	ND	0.50	10/04/18 17:03	
Diisopropyl ether	mg/kg	ND	0.25	10/04/18 17:03	
Ethylbenzene	mg/kg	ND	0.25	10/04/18 17:03	
Isopropylbenzene (Cumene)	mg/kg	ND	0.25	10/04/18 17:03	
m&p-Xylene	mg/kg	ND	0.25	10/04/18 17:03	
Methyl-tert-butyl ether	mg/kg	ND	0.25	10/04/18 17:03	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: City of Duluth - 5365
Pace Project No.: 269938

METHOD BLANK: 65996 Matrix: Solid
Associated Lab Samples: 269938001, 269938002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methylene Chloride	mg/kg	ND	1.0	10/04/18 17:03	
n-Butylbenzene	mg/kg	ND	0.25	10/04/18 17:03	
n-Propylbenzene	mg/kg	ND	0.25	10/04/18 17:03	
Naphthalene	mg/kg	ND	0.25	10/04/18 17:03	
o-Xylene	mg/kg	ND	0.25	10/04/18 17:03	
p-Isopropyltoluene	mg/kg	ND	0.25	10/04/18 17:03	
sec-Butylbenzene	mg/kg	ND	0.25	10/04/18 17:03	
Styrene	mg/kg	ND	0.25	10/04/18 17:03	
tert-Butylbenzene	mg/kg	ND	0.25	10/04/18 17:03	
Tetrachloroethene	mg/kg	ND	0.25	10/04/18 17:03	
Toluene	mg/kg	ND	0.25	10/04/18 17:03	
trans-1,2-Dichloroethene	mg/kg	ND	0.25	10/04/18 17:03	
trans-1,3-Dichloropropene	mg/kg	ND	0.25	10/04/18 17:03	
Trichloroethene	mg/kg	ND	0.25	10/04/18 17:03	
Trichlorofluoromethane	mg/kg	ND	0.25	10/04/18 17:03	
Vinyl acetate	mg/kg	ND	0.50	10/04/18 17:03	
Vinyl chloride	mg/kg	ND	0.50	10/04/18 17:03	
Xylene (Total)	mg/kg	ND	0.50	10/04/18 17:03	
1,2-Dichloroethane-d4 (S)	%.	103	69-133	10/04/18 17:03	
4-Bromofluorobenzene (S)	%.	105	77-124	10/04/18 17:03	
Dibromofluoromethane (S)	%.	105	73-114	10/04/18 17:03	
Toluene-d8 (S)	%.	100	85-109	10/04/18 17:03	

LABORATORY CONTROL SAMPLE: 65993

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	mg/kg	.05	0.051	103	61-133	
1,1,1-Trichloroethane	mg/kg	.05	0.058	115	71-149	
1,1,2,2-Tetrachloroethane	mg/kg	.05	0.052	104	70-134	
1,1,2-Trichloroethane	mg/kg	.05	0.057	114	74-139	
1,1-Dichloroethane	mg/kg	.05	0.057	114	81-140	
1,1-Dichloroethene	mg/kg	.05	0.054	109	68-150	
1,1-Dichloropropene	mg/kg	.05	0.054	107	71-139	
1,2,3-Trichlorobenzene	mg/kg	.05	0.054	107	40-164	
1,2,3-Trichloropropane	mg/kg	.05	0.052	103	72-141	
1,2,4-Trichlorobenzene	mg/kg	.05	0.055	109	49-147	
1,2,4-Trimethylbenzene	mg/kg	.05	0.046	92	64-137	
1,2-Dibromo-3-chloropropane	mg/kg	.05	0.051	101	80-134	
1,2-Dibromoethane (EDB)	mg/kg	.05	0.058	116	70-143	
1,2-Dichlorobenzene	mg/kg	.05	0.049	97	59-162	
1,2-Dichloroethane	mg/kg	.05	0.057	114	69-135	
1,2-Dichloropropane	mg/kg	.05	0.058	116	68-147	
1,3,5-Trimethylbenzene	mg/kg	.05	0.053	106	68-138	
1,3-Dichlorobenzene	mg/kg	.05	0.050	100	67-152	

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

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

QUALITY CONTROL DATA

Project: City of Duluth - 5365
Pace Project No.: 269938

LABORATORY CONTROL SAMPLE: 65993

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,3-Dichloropropane	mg/kg	.05	0.056	112	67-143	
1,4-Dichlorobenzene	mg/kg	.05	0.052	105	72-138	
2,2-Dichloropropane	mg/kg	.05	0.058	116	56-162	
2-Butanone (MEK)	mg/kg	.1	0.13	130	52-163	
2-Chlorotoluene	mg/kg	.05	0.052	104	69-142	
2-Hexanone	mg/kg	.1	0.13	125	60-186	
4-Chlorotoluene	mg/kg	.05	0.051	102	64-137	
4-Methyl-2-pentanone (MIBK)	mg/kg	.1	0.11	108	80-129	
Acetone	mg/kg	.1	0.15	150	52-160	
Acrolein	mg/kg	.1	0.11	109	42-183	
Acrylonitrile	mg/kg	.2	0.23	114	63-133	
Benzene	mg/kg	.05	0.058	115	70-141	
Bromobenzene	mg/kg	.05	0.048	96	70-143	
Bromochloromethane	mg/kg	.05	0.060	120	74-141	
Bromodichloromethane	mg/kg	.05	0.055	110	68-125	
Bromoform	mg/kg	.05	0.055	110	65-140	
Bromomethane	mg/kg	.05	0.055	110	41-148	
Carbon disulfide	mg/kg	.1	0.10	100	72-138	
Carbon tetrachloride	mg/kg	.05	0.057	114	57-146	
Chlorobenzene	mg/kg	.05	0.054	108	65-133	
Chloroethane	mg/kg	.05	0.051	102	48-143	
Chloroform	mg/kg	.05	0.056	112	72-138	
Chloromethane	mg/kg	.05	0.051	102	41-147	
cis-1,2-Dichloroethene	mg/kg	.05	0.059	117	71-142	
cis-1,3-Dichloropropene	mg/kg	.05	0.060	120	69-129	
Dibromochloromethane	mg/kg	.05	0.058	115	64-122	
Dibromomethane	mg/kg	.05	0.056	113	68-147	
Dichlorodifluoromethane	mg/kg	.05	0.048	97	18-147	
Diisopropyl ether	mg/kg	.05	0.057	114	62-144	
Ethylbenzene	mg/kg	.05	0.050	101	70-143	
Isopropylbenzene (Cumene)	mg/kg	.05	0.048	97	65-140	
m&p-Xylene	mg/kg	.1	0.10	104	80-120	
Methyl-tert-butyl ether	mg/kg	.1	0.11	109	80-126	
Methylene Chloride	mg/kg	.05	0.061	121	71-136	
n-Butylbenzene	mg/kg	.05	0.053	105	46-179	
n-Propylbenzene	mg/kg	.05	0.051	102	65-150	
Naphthalene	mg/kg	.05	0.056	112	47-167	
o-Xylene	mg/kg	.05	0.052	104	70-141	
p-Isopropyltoluene	mg/kg	.05	0.049	99	70-134	
sec-Butylbenzene	mg/kg	.05	0.050	99	70-141	
Styrene	mg/kg	.05	0.056	111	68-134	
tert-Butylbenzene	mg/kg	.05	0.047	93	66-142	
Tetrachloroethene	mg/kg	.05	0.053	105	59-144	
Toluene	mg/kg	.05	0.056	112	62-142	
trans-1,2-Dichloroethene	mg/kg	.05	0.059	118	71-138	
trans-1,3-Dichloropropene	mg/kg	.05	0.060	119	68-131	
Trichloroethene	mg/kg	.05	0.052	104	65-152	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

QUALITY CONTROL DATA

Project: City of Duluth - 5365
Pace Project No.: 269938

LABORATORY CONTROL SAMPLE: 65993

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Trichlorofluoromethane	mg/kg	.05	0.048	96	64-133	
Vinyl acetate	mg/kg	.05	0.058	116	36-122	
Vinyl chloride	mg/kg	.05	0.052	104	53-141	
Xylene (Total)	mg/kg	.15	0.16	104	61-122	
1,2-Dichloroethane-d4 (S)	%.			102	69-133	
4-Bromofluorobenzene (S)	%.			102	77-124	
Dibromofluoromethane (S)	%.			107	73-114	
Toluene-d8 (S)	%.			101	85-109	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 65994 65995

Parameter	Units	269969002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,1,1,2-Tetrachloroethane	mg/kg	ND	3.1	3.1	3.2	3.2	103	103	30-131	1	26	
1,1,1-Trichloroethane	mg/kg	ND	3.1	3.1	3.6	3.6	115	115	42-146	0	25	
1,1,2,2-Tetrachloroethane	mg/kg	ND	3.1	3.1	3.4	3.4	109	111	25-144	2	18	
1,1,2-Trichloroethane	mg/kg	ND	3.1	3.1	3.6	3.8	116	122	52-130	5	26	
1,1-Dichloroethane	mg/kg	ND	3.1	3.1	3.7	3.7	120	121	52-145	1	24	
1,1-Dichloroethene	mg/kg	ND	3.1	3.1	3.4	3.4	111	110	39-154	1	27	
1,1-Dichloropropene	mg/kg	ND	3.1	3.1	3.5	3.4	112	111	45-137	1	26	
1,2,3-Trichlorobenzene	mg/kg	ND	3.1	3.1	3.3	3.2	106	104	32-136	1	21	
1,2,3-Trichloropropane	mg/kg	ND	3.1	3.1	3.1	3.1	100	101	26-154	1	34	
1,2,4-Trichlorobenzene	mg/kg	ND	3.1	3.1	3.1	3.0	100	98	21-130	3	28	
1,2,4-Trimethylbenzene	mg/kg	ND	3.1	3.1	2.8	2.7	89	88	13-152	1	31	
1,2-Dibromo-3-chloropropane	mg/kg	ND	3.1	3.1	3.4	3.2	111	102	42-120	8	81	
1,2-Dibromoethane (EDB)	mg/kg	ND	3.1	3.1	3.6	3.8	116	122	39-139	4	29	
1,2-Dichlorobenzene	mg/kg	ND	3.1	3.1	3.0	3.0	96	97	10-182	2	64	
1,2-Dichloroethane	mg/kg	ND	3.1	3.1	3.9	3.9	125	125	58-118	0	23	M1
1,2-Dichloropropane	mg/kg	ND	3.1	3.1	3.5	3.7	114	119	51-136	5	24	
1,3,5-Trimethylbenzene	mg/kg	ND	3.1	3.1	3.1	3.1	101	99	22-146	2	31	
1,3-Dichlorobenzene	mg/kg	ND	3.1	3.1	3.0	3.0	97	98	15-161	1	42	
1,3-Dichloropropane	mg/kg	ND	3.1	3.1	3.6	3.8	117	122	45-134	3	27	
1,4-Dichlorobenzene	mg/kg	ND	3.1	3.1	3.2	3.2	103	103	15-164	0	36	
2,2-Dichloropropane	mg/kg	ND	3.1	3.1	3.5	3.5	114	112	29-149	2	27	
2-Butanone (MEK)	mg/kg	ND	6.2	6.2	6J	6.1J	96	98	22-158		30	
2-Chlorotoluene	mg/kg	ND	3.1	3.1	3.0	3.1	98	99	16-156	2	33	
2-Hexanone	mg/kg	ND	6.2	6.2	6.4	6.6	104	107	10-198	3	50	
4-Chlorotoluene	mg/kg	ND	3.1	3.1	3.0	3.0	96	97	11-151	0	35	
4-Methyl-2-pentanone (MIBK)	mg/kg	ND	6.2	6.2	7.1	7.4	114	119	29-135	4	33	
Acetone	mg/kg	ND	6.2	6.2	5.2J	4.9J	84	79	59-136		27	
Acrolein	mg/kg	ND	6.2	6.2	7.1	7.2	115	116	23-177	0	22	
Acrylonitrile	mg/kg	ND	12.4	12.4	15.5	15.7	125	127	38-130	1	23	
Benzene	mg/kg	ND	3.1	3.1	3.7	3.7	118	119	42-140	1	25	
Bromobenzene	mg/kg	ND	3.1	3.1	3.0	3.0	98	97	18-156	1	34	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

QUALITY CONTROL DATA

Project: City of Duluth - 5365
Pace Project No.: 269938

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 65994 65995

Parameter	Units	269969002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Bromochloromethane	mg/kg	ND	3.1	3.1	3.6	3.5	115	114	59-127	0	22	
Bromodichloromethane	mg/kg	ND	3.1	3.1	3.3	3.4	107	111	39-123	4	24	
Bromoform	mg/kg	ND	3.1	3.1	3.3	3.3	105	107	30-136	2	22	
Bromomethane	mg/kg	ND	3.1	3.1	1.2	1.5	40	47	10-164	17	31	
Carbon disulfide	mg/kg	ND	6.2	6.2	6.0	6.0	97	97	55-135	1	24	
Carbon tetrachloride	mg/kg	ND	3.1	3.1	3.4	3.4	111	110	33-136	0	27	
Chlorobenzene	mg/kg	ND	3.1	3.1	3.3	3.3	107	106	28-144	2	31	
Chloroethane	mg/kg	ND	3.1	3.1	1.4	1.4	45	45	10-163	0	30	
Chloroform	mg/kg	ND	3.1	3.1	3.6	3.6	117	115	52-131	3	23	
Chloromethane	mg/kg	ND	3.1	3.1	2.9	2.7	94	88	28-149	6	28	
cis-1,2-Dichloroethene	mg/kg	ND	3.1	3.1	3.7	3.6	119	117	50-134	1	23	
cis-1,3-Dichloropropene	mg/kg	ND	3.1	3.1	3.7	3.8	119	123	39-125	3	28	
Dibromochloromethane	mg/kg	ND	3.1	3.1	3.5	3.6	112	115	32-118	3	29	
Dibromomethane	mg/kg	ND	3.1	3.1	3.5	3.5	111	113	50-133	2	22	
Dichlorodifluoromethane	mg/kg	ND	3.1	3.1	3.1	3.0	100	98	10-158	3	44	
Diisopropyl ether	mg/kg	ND	3.1	3.1	3.8	3.9	124	126	44-135	1	29	
Ethylbenzene	mg/kg	ND	3.1	3.1	3.2	3.1	103	101	13-164	2	33	
Isopropylbenzene (Cumene)	mg/kg	ND	3.1	3.1	3.0	3.0	98	97	13-156	1	33	
m&p-Xylene	mg/kg	ND	6.2	6.2	6.5	6.4	104	103	34-120	1	100	
Methyl-tert-butyl ether	mg/kg	ND	6.2	6.2	7.3	7.2	118	117	73-131	1	36	
Methylene Chloride	mg/kg	ND	3.1	3.1	4.0	4.0	128	129	53-138	0	26	
n-Butylbenzene	mg/kg	ND	3.1	3.1	3.1	3.0	99	97	21-161	2	34	
n-Propylbenzene	mg/kg	ND	3.1	3.1	3.0	2.9	97	94	16-158	2	34	
Naphthalene	mg/kg	ND	3.1	3.1	3.5	3.4	114	111	31-150	3	30	
o-Xylene	mg/kg	ND	3.1	3.1	3.3	3.3	107	107	13-160	0	29	
p-Isopropyltoluene	mg/kg	ND	3.1	3.1	2.9	2.8	93	92	10-164	1	33	
sec-Butylbenzene	mg/kg	ND	3.1	3.1	2.9	2.9	95	95	12-164	0	34	
Styrene	mg/kg	ND	3.1	3.1	3.5	3.5	114	113	16-151	1	33	
tert-Butylbenzene	mg/kg	ND	3.1	3.1	2.8	2.8	89	89	10-160	0	33	
Tetrachloroethene	mg/kg	ND	3.1	3.1	3.2	3.1	102	102	33-141	1	32	
Toluene	mg/kg	ND	3.1	3.1	3.5	3.6	113	116	32-145	2	31	
trans-1,2-Dichloroethene	mg/kg	ND	3.1	3.1	3.7	3.7	118	118	43-144	0	26	
trans-1,3-Dichloropropene	mg/kg	ND	3.1	3.1	3.7	3.8	120	123	30-130	3	33	
Trichloroethene	mg/kg	ND	3.1	3.1	3.2	3.2	102	105	16-172	3	30	
Trichlorofluoromethane	mg/kg	ND	3.1	3.1	3.9	3.8	126	122	14-149	3	32	
Vinyl acetate	mg/kg	ND	3.1	3.1	3.8	3.9	124	126	10-120	1	74	M1
Vinyl chloride	mg/kg	ND	3.1	3.1	2.9	2.8	95	89	40-140	6	28	
Xylene (Total)	mg/kg	ND	9.2	9.2	9.8	9.7	105	105	19-120	1	28	
1,2-Dichloroethane-d4 (S)	%.						108	110	69-133			
4-Bromofluorobenzene (S)	%.						102	103	77-124			
Dibromofluoromethane (S)	%.						111	107	73-114			
Toluene-d8 (S)	%.						102	101	85-109			

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

QUALITY CONTROL DATA

Project: City of Duluth - 5365
Pace Project No.: 269938

QC Batch: 14901 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260B MSV
Associated Lab Samples: 269938003, 269938004

METHOD BLANK: 66836 Matrix: Water
Associated Lab Samples: 269938003, 269938004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	10/08/18 18:39	
1,1,1-Trichloroethane	ug/L	ND	1.0	10/08/18 18:39	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	10/08/18 18:39	
1,1,2-Trichloroethane	ug/L	ND	1.0	10/08/18 18:39	
1,1-Dichloroethane	ug/L	ND	1.0	10/08/18 18:39	
1,1-Dichloroethene	ug/L	ND	1.0	10/08/18 18:39	
1,1-Dichloropropene	ug/L	ND	1.0	10/08/18 18:39	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	10/08/18 18:39	
1,2,3-Trichloropropane	ug/L	ND	1.0	10/08/18 18:39	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	10/08/18 18:39	
1,2-Dibromo-3-chloropropane	ug/L	ND	2.0	10/08/18 18:39	
1,2-Dibromoethane (EDB)	ug/L	ND	2.0	10/08/18 18:39	
1,2-Dichlorobenzene	ug/L	ND	1.0	10/08/18 18:39	
1,2-Dichloroethane	ug/L	ND	1.0	10/08/18 18:39	
1,2-Dichloropropane	ug/L	ND	1.0	10/08/18 18:39	
1,3-Dichlorobenzene	ug/L	ND	1.0	10/08/18 18:39	
1,3-Dichloropropane	ug/L	ND	1.0	10/08/18 18:39	
1,4-Dichlorobenzene	ug/L	ND	1.0	10/08/18 18:39	
2,2-Dichloropropane	ug/L	ND	1.0	10/08/18 18:39	
2-Butanone (MEK)	ug/L	ND	5.0	10/08/18 18:39	
2-Chlorotoluene	ug/L	ND	1.0	10/08/18 18:39	
2-Hexanone	ug/L	ND	5.0	10/08/18 18:39	
4-Chlorotoluene	ug/L	ND	1.0	10/08/18 18:39	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	10/08/18 18:39	
Acetone	ug/L	ND	25.0	10/08/18 18:39	
Benzene	ug/L	ND	1.0	10/08/18 18:39	
Bromobenzene	ug/L	ND	1.0	10/08/18 18:39	
Bromochloromethane	ug/L	ND	1.0	10/08/18 18:39	
Bromodichloromethane	ug/L	ND	1.0	10/08/18 18:39	
Bromoform	ug/L	ND	1.0	10/08/18 18:39	
Bromomethane	ug/L	ND	2.0	10/08/18 18:39	
Carbon tetrachloride	ug/L	ND	1.0	10/08/18 18:39	
Chlorobenzene	ug/L	ND	1.0	10/08/18 18:39	
Chloroethane	ug/L	ND	1.0	10/08/18 18:39	
Chloroform	ug/L	ND	1.0	10/08/18 18:39	
Chloromethane	ug/L	ND	1.0	10/08/18 18:39	
cis-1,2-Dichloroethene	ug/L	ND	1.0	10/08/18 18:39	
cis-1,3-Dichloropropene	ug/L	ND	1.0	10/08/18 18:39	
Dibromochloromethane	ug/L	ND	1.0	10/08/18 18:39	
Dibromomethane	ug/L	ND	1.0	10/08/18 18:39	
Dichlorodifluoromethane	ug/L	ND	1.0	10/08/18 18:39	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

QUALITY CONTROL DATA

Project: City of Duluth - 5365
Pace Project No.: 269938

METHOD BLANK: 66836 Matrix: Water
Associated Lab Samples: 269938003, 269938004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diisopropyl ether	ug/L	ND	10.0	10/08/18 18:39	
Ethylbenzene	ug/L	ND	1.0	10/08/18 18:39	
Hexachloro-1,3-butadiene	ug/L	ND	10.0	10/08/18 18:39	
m&p-Xylene	ug/L	ND	1.0	10/08/18 18:39	
Methyl-tert-butyl ether	ug/L	ND	10.0	10/08/18 18:39	
Methylene Chloride	ug/L	ND	1.0	10/08/18 18:39	
Naphthalene	ug/L	ND	1.0	10/08/18 18:39	
o-Xylene	ug/L	ND	1.0	10/08/18 18:39	
p-Isopropyltoluene	ug/L	ND	1.0	10/08/18 18:39	
Styrene	ug/L	ND	1.0	10/08/18 18:39	
Tetrachloroethene	ug/L	ND	1.0	10/08/18 18:39	
Toluene	ug/L	ND	1.0	10/08/18 18:39	
trans-1,2-Dichloroethene	ug/L	ND	1.0	10/08/18 18:39	
trans-1,3-Dichloropropene	ug/L	ND	1.0	10/08/18 18:39	
Trichloroethene	ug/L	ND	1.0	10/08/18 18:39	
Trichlorofluoromethane	ug/L	ND	1.0	10/08/18 18:39	
Vinyl acetate	ug/L	ND	2.0	10/08/18 18:39	
Vinyl chloride	ug/L	ND	1.0	10/08/18 18:39	
Xylene (Total)	ug/L	ND	2.0	10/08/18 18:39	
1,2-Dichloroethane-d4 (S)	%.	96	81-119	10/08/18 18:39	
4-Bromofluorobenzene (S)	%.	109	82-120	10/08/18 18:39	
Dibromofluoromethane (S)	%.	99	82-114	10/08/18 18:39	
Toluene-d8 (S)	%.	94	82-109	10/08/18 18:39	

LABORATORY CONTROL SAMPLE: 66837

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	46.1	92	68-137	
1,1,1-Trichloroethane	ug/L	50	51.1	102	72-134	
1,1,2,2-Tetrachloroethane	ug/L	50	59.7	119	51-158	
1,1,2-Trichloroethane	ug/L	50	52.8	106	78-131	
1,1-Dichloroethane	ug/L	50	71.4	143	69-151	
1,1-Dichloroethene	ug/L	50	46.4	93	64-158	
1,1-Dichloropropene	ug/L	50	52.9	106	70-133	
1,2,3-Trichlorobenzene	ug/L	50	54.3	109	73-130	
1,2,3-Trichloropropane	ug/L	50	51.3	103	78-133	
1,2,4-Trichlorobenzene	ug/L	50	53.9	108	51-163	
1,2-Dibromo-3-chloropropane	ug/L	50	55.4	111	58-124	
1,2-Dibromoethane (EDB)	ug/L	50	50.6	101	71-134	
1,2-Dichlorobenzene	ug/L	50	59.5	119	70-135	
1,2-Dichloroethane	ug/L	50	57.2	114	72-129	
1,2-Dichloropropane	ug/L	50	57.8	116	64-135	
1,3-Dichlorobenzene	ug/L	50	61.8	124	71-134	
1,3-Dichloropropane	ug/L	50	54.6	109	70-140	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

QUALITY CONTROL DATA

Project: City of Duluth - 5365
Pace Project No.: 269938

LABORATORY CONTROL SAMPLE: 66837

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,4-Dichlorobenzene	ug/L	50	55.8	112	70-131	
2,2-Dichloropropane	ug/L	50	48.9	98	34-170	
2-Butanone (MEK)	ug/L	100	92.5	93	52-143	
2-Chlorotoluene	ug/L	50	61.6	123	77-128	
2-Hexanone	ug/L	100	91.3	91	61-136	
4-Chlorotoluene	ug/L	50	53.2	106	79-126	
4-Methyl-2-pentanone (MIBK)	ug/L	100	94.9	95	71-129	
Acetone	ug/L	100	80.8	81	48-224	
Benzene	ug/L	50	56.3	113	68-132	
Bromobenzene	ug/L	50	56.3	113	75-122	
Bromochloromethane	ug/L	50	47.8	96	73-133	
Bromodichloromethane	ug/L	50	46.3	93	67-121	
Bromoform	ug/L	50	54.1	108	57-125	
Bromomethane	ug/L	50	38.7	77	35-156	
Carbon tetrachloride	ug/L	50	50.3	101	66-122	
Chlorobenzene	ug/L	50	56.2	112	71-126	
Chloroethane	ug/L	50	37.7	75	43-143	
Chloroform	ug/L	50	49.7	99	71-136	
Chloromethane	ug/L	50	36.8	74	47-123	
cis-1,2-Dichloroethene	ug/L	50	49.0	98	74-131	
cis-1,3-Dichloropropene	ug/L	50	48.3	97	78-120	
Dibromochloromethane	ug/L	50	46.6	93	65-115	
Dibromomethane	ug/L	50	52.4	105	79-129	
Dichlorodifluoromethane	ug/L	50	54.6	109	29-124	
Diisopropyl ether	ug/L	50	49.9	100	70-130	
Ethylbenzene	ug/L	50	57.9	116	68-129	
Hexachloro-1,3-butadiene	ug/L	50	61.0	122	58-142	
m&p-Xylene	ug/L	100	100	100	67-137	
Methyl-tert-butyl ether	ug/L	100	148	148	59-130	L1
Methylene Chloride	ug/L	50	49.1	98	61-147	
Naphthalene	ug/L	50	58.2	116	48-144	
o-Xylene	ug/L	50	53.1	106	52-141	
p-Isopropyltoluene	ug/L	50	58.5	117	58-137	
Styrene	ug/L	50	49.7	99	77-128	
Tetrachloroethene	ug/L	50	58.4	117	51-139	
Toluene	ug/L	50	57.6	115	60-133	
trans-1,2-Dichloroethene	ug/L	50	47.6	95	69-144	
trans-1,3-Dichloropropene	ug/L	50	45.1	90	74-128	
Trichloroethene	ug/L	50	49.2	98	73-126	
Trichlorofluoromethane	ug/L	50	51.2	102	55-132	
Vinyl acetate	ug/L	50	48.7	97	52-141	
Vinyl chloride	ug/L	50	41.5	83	50-133	
Xylene (Total)	ug/L	150	153	102	78-132	
1,2-Dichloroethane-d4 (S)	%.			100	81-119	
4-Bromofluorobenzene (S)	%.			101	82-120	
Dibromofluoromethane (S)	%.			108	82-114	
Toluene-d8 (S)	%.			99	82-109	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

QUALITY CONTROL DATA

Project: City of Duluth - 5365
Pace Project No.: 269938

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:		66838			66839							
Parameter	Units	269714017 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,1,1,2-Tetrachloroethane	ug/L	ND	50	50	42.4	37.8	85	76	68-137	11	11	
1,1,1-Trichloroethane	ug/L	ND	50	50	50.5	46.6	101	93	66-142	8	11	
1,1,2,2-Tetrachloroethane	ug/L	ND	50	50	46.5	39.2	93	78	39-171	17	13	R1
1,1,2-Trichloroethane	ug/L	ND	50	50	41.1	34.6	82	69	73-136	17	12	M1,R1
1,1-Dichloroethane	ug/L	ND	50	50	50.9	45.5	102	91	66-155	11	15	
1,1-Dichloroethene	ug/L	ND	50	50	28.0	24.0	56	48	33-181	16	34	
1,1-Dichloropropene	ug/L	ND	50	50	53.0	42.7	106	85	70-133	21	12	R1
1,2,3-Trichlorobenzene	ug/L	ND	50	50	54.0	44.7	108	89	73-130	19	22	
1,2,3-Trichloropropane	ug/L	ND	50	50	39.3	33.4	79	67	78-133	16	14	M1,R1
1,2,4-Trichlorobenzene	ug/L	ND	50	50	50.0	43.7	100	87	44-164	13	13	
1,2-Dibromo-3-chloropropane	ug/L	ND	50	50	48.4	41.9	97	84	58-124	14	15	
1,2-Dibromoethane (EDB)	ug/L	ND	50	50	43.1	36.9	86	74	71-134	15	12	R1
1,2-Dichlorobenzene	ug/L	ND	50	50	53.6	44.2	107	88	69-135	19	10	R1
1,2-Dichloroethane	ug/L	ND	50	50	46.4	39.9	93	80	36-159	15	10	R1
1,2-Dichloropropane	ug/L	ND	50	50	46.2	39.2	92	78	68-132	16	11	R1
1,3-Dichlorobenzene	ug/L	ND	50	50	53.6	47.2	107	94	68-135	13	10	R1
1,3-Dichloropropane	ug/L	ND	50	50	42.1	36.4	84	73	70-138	15	10	R1
1,4-Dichlorobenzene	ug/L	ND	50	50	47.5	41.2	95	82	49-153	14	9	R1
2,2-Dichloropropane	ug/L	ND	50	50	39.5	36.2	79	72	34-170	9	9	
2-Butanone (MEK)	ug/L	ND	100	100	67.7	54.8	68	55	10-189	21	23	
2-Chlorotoluene	ug/L	ND	50	50	53.2	50.2	106	100	77-128	6	10	
2-Hexanone	ug/L	ND	100	100	67.2	58.1	67	58	40-135	15	18	
4-Chlorotoluene	ug/L	ND	50	50	45.8	40.6	92	81	79-126	12	10	R1
4-Methyl-2-pentanone (MIBK)	ug/L	ND	100	100	67.3	56.0	67	56	30-177	18	10	R1
Acetone	ug/L	ND	100	100	40.1	37.2	40	37	44-223	7	14	M1
Benzene	ug/L	ND	50	50	47.3	42.2	94	84	66-139	11	10	R1
Bromobenzene	ug/L	ND	50	50	47.7	43.2	95	86	75-122	10	12	
Bromochloromethane	ug/L	ND	50	50	47.1	41.3	94	83	73-133	13	13	
Bromodichloromethane	ug/L	ND	50	50	39.6	34.8	79	70	57-120	13	13	
Bromoform	ug/L	ND	50	50	53.9	46.7	108	93	48-128	14	13	R1
Bromomethane	ug/L	ND	50	50	14.7	15.7	29	31	10-187	6	32	
Carbon tetrachloride	ug/L	ND	50	50	54.4	47.1	109	94	58-127	14	14	
Chlorobenzene	ug/L	ND	50	50	48.2	43.3	96	87	63-137	11	10	R1
Chloroethane	ug/L	ND	50	50	18.3	16.0	37	32	52-146	14	16	M1
Chloroform	ug/L	ND	50	50	44.7	38.7	89	77	74-137	14	9	R1
Chloromethane	ug/L	ND	50	50	23.0	21.1	46	42	41-127	9	10	
cis-1,2-Dichloroethene	ug/L	3.0	50	50	46.6	41.2	87	76	71-138	12	16	
cis-1,3-Dichloropropene	ug/L	ND	50	50	37.2	32.7	74	65	32-145	13	12	R1
Dibromochloromethane	ug/L	ND	50	50	43.9	36.2	88	72	52-116	19	13	R1
Dibromomethane	ug/L	ND	50	50	48.3	43.6	97	87	79-129	10	14	
Dichlorodifluoromethane	ug/L	ND	50	50	63.3	58.2	127	116	36-126	8	15	M1
Diisopropyl ether	ug/L	ND	50	50	39.0	34.2	78	68	70-130	13	20	M1
Ethylbenzene	ug/L	ND	50	50	48.8	43.2	98	86	31-174	12	10	R1
Hexachloro-1,3-butadiene	ug/L	ND	50	50	64.1	54.3	128	109	58-142	17	11	R1

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REPORT OF LABORATORY ANALYSIS

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(770)734-4200

QUALITY CONTROL DATA

Project: City of Duluth - 5365
Pace Project No.: 269938

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 66838 66839

Parameter	Units	269714017 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
m&p-Xylene	ug/L	5.4	100	100	85.7	74.4	80	69	27-179	14	10	R1
Methyl-tert-butyl ether	ug/L	ND	100	100	82.8	73.9	83	74	38-120	11	12	
Methylene Chloride	ug/L	ND	50	50	23.4	20.9	47	42	61-146	11	15	M1
Naphthalene	ug/L	ND	50	50	51.1	46.6	102	93	25-159	9	14	
o-Xylene	ug/L	ND	50	50	43.6	38.8	87	78	52-141	12	65	
p-Isopropyltoluene	ug/L	ND	50	50	49.8	42.7	100	85	59-134	15	9	R1
Styrene	ug/L	ND	50	50	40.8	35.9	82	72	77-128	13	14	M1
Tetrachloroethene	ug/L	ND	50	50	55.1	48.1	110	96	36-155	14	14	
Toluene	ug/L	3.0	50	50	48.3	43.4	91	81	52-146	11	11	
trans-1,2-Dichloroethene	ug/L	ND	50	50	26.5	23.6	53	47	61-152	11	14	M1
trans-1,3-Dichloropropene	ug/L	ND	50	50	35.2	30.7	70	61	37-146	14	12	R1
Trichloroethene	ug/L	4.1	50	50	45.2	39.8	82	71	61-141	13	12	R1
Trichlorofluoromethane	ug/L	ND	50	50	40.1	35.0	80	70	51-141	13	13	
Vinyl acetate	ug/L	ND	50	50	36.9	32.4	74	65	52-141	13	14	
Vinyl chloride	ug/L	ND	50	50	24.0	22.8	48	46	22-156	5	26	
Xylene (Total)	ug/L	5.4	150	150	129	113	83	72	78-132	13	7	RS
1,2-Dichloroethane-d4 (S)	%.						97	95	81-119			
4-Bromofluorobenzene (S)	%.						102	102	82-120			
Dibromofluoromethane (S)	%.						112	114	82-114			
Toluene-d8 (S)	%.						91	91	82-109			

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

QUALITY CONTROL DATA

Project: City of Duluth - 5365
Pace Project No.: 269938

QC Batch: 14676
QC Batch Method: Pace SOP #204
Analysis Method: Pace SOP #204
Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 269938001, 269938002

SAMPLE DUPLICATE: 65518

Parameter	Units	269938001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	17.1	16.3	5	10	

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REPORT OF LABORATORY ANALYSIS

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(770)734-4200

QUALIFIERS

Project: City of Duluth - 5365
Pace Project No.: 269938

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 - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

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.

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.

ANALYTE QUALIFIERS

L1	Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
R1	RPD value was outside control limits.
RS	The RPD value in one of the constituent analytes was outside the control limits.

Pace Analytical Services, LLC
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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: City of Duluth - 5365
Pace Project No.: 269938

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
269938001	**MW-15-4**	EPA 5035	14789	EPA 8260B	14792
269938002	**HA-1**	EPA 5035	14789	EPA 8260B	14792
269938003	**MW-15**	EPA 8260B	14901		
269938004	**Trip Blank**	EPA 8260B	14901		
269938001	**MW-15-4**	Pace SOP #204	14676		
269938002	**HA-1**	Pace SOP #204	14676		

Pace Analytical®
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: of

264469

Section A Required Client Information:

Company: Wenck
Address: 080 Holcomb Bridge Rd Bldg 100 Ste 190
Email To: Katie Ross
Phone: Fax:
Requested Due Date/TAT: Standard

Section B Required Project Information:

Report To: KROSS@WENCK.COM
Copy To: SFULLER@WENCK.COM
Purchase Order No.:
Project Name: City of Duluth
Project Number: 5365-0001

Section C Invoice Information:

Attention:
Company Name:
Address:
Pace Quote Reference:
Pace Project Manager:
Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE:

Section D Required Client Information

Matrix Codes MATRIX / CODE

Drinking Water	DW
Water	WT
Waste Water	WW
Product	P
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Tissue	TS
Other	OT

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Requested Analysis Filtered (Y/N) Y/N	Analysis Test: VOCs	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-15-4	SL	G	10/1/18	11:50				4									Y	✓		
2	HA-1	SL	G	10/1/18	15:10				4									Y	✓		
3	MW-15	WT	G	10/2/18	11:35				3									Y	✓		
4	Trip Blank								3									Y	✓		
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					

WO# : 269938

269938

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	Shannon Fuller	10/2/18	13:22	M Rahman	10/02/18	1322	
							4.4
							Y
							Y
							Y

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY):

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-C-010-rev.00, 09Nov2017

Sample Condition Upon Receipt

Pace Analytical

Client Name: Wenck

Project #

WO#: 269938

PM: EDB Due Date: 10/09/18

CLIENT: WENCK

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

Tracking #:

Custody Seal on Cooler/Box Present: ☑ yes ☐ no Seals intact: ☑ yes ☐

Packing Material: ☐ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other

Thermometer Used 8.3 Type of Ice: (Wet) Blue None ☐ Samples on ice, cooling process has begun

Cooler Temperature 4.4 Biological Tissue is Frozen: Yes No

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 10/02/18 MK

Comments:

Chain of Custody Present:	☑Yes ☐No ☐N/A	1.	
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.	
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.	
Sampler Name & Signature on COC:	☐Yes ☑No ☐N/A	4.	
Samples Arrived within Hold Time:	☑Yes ☐No ☐N/A	5.	
Short Hold Time Analysis (<72hr):	☐Yes ☑No ☐N/A	6.	
Rush Turn Around Time Requested:	☐Yes ☑No ☐N/A	7.	
Sufficient Volume:	☑Yes ☐No ☐N/A	8.	
Correct Containers Used:	☑Yes ☐No ☐N/A	9.	
-Pace Containers Used:	☑Yes ☐No ☐N/A		
Containers Intact:	☑Yes ☐No ☐N/A	10.	
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.	
Sample Labels match COC:	☑Yes ☐No ☐N/A	12.	
-Includes date/time/ID/Analysis Matrix: SL/W			
All containers needing preservation have been checked.	☑Yes ☐No ☐N/A	13.	
All containers needing preservation are found to be in compliance with EPA recommendation.	☑Yes ☐No ☐N/A		
exceptions: (VOA), coliform, TOC, O&G, WI-DRO (water)	☑Yes ☐No	Initial when completed	Lot # of added preservative
Samples checked for dechlorination:	☐Yes ☐No ☑N/A	14.	
Headspace in VOA Vials (>6mm):	☐Yes ☑No ☐N/A	15.	
Trip Blank Present:	☑Yes ☐No ☐N/A	16.	
Trip Blank Custody Seals Present	☑Yes ☐No ☐N/A		
Pace Trip Blank Lot # (if purchased):			

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: Date/Time:

Comments/ Resolution:

Project Manager Review: **Date:**

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)

Appendix D

IDW Disposal Manifests

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
CES OG	1	(800) 275-0029	018839650 JJK

GENERATOR

5. Generator's Name and Mailing Address
CITY OF DULUTH
3146 MAIN STREET
DULUTH, GA 30096
Generator's Phone:

Generator's Site Address (if different than mailing address)

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 & PROCESSIN
5600 FULTON INDUSTRIAL BLVD,SW
ATLANTA, GA 30336
Facility's Phone: (404) 494-3520
U.S. EPA ID Number
GAR 000 039 776

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
	1. NON-HAZARDOUS, NON-DOT REGULATED MATERIAL (SOIL)	003	DM	04400	P	
	2. NON-HAZARDOUS, NON-DOT REGULATED MATERIAL (WATER)	002	DM	00110	G	
	3.					
	4.					

14. Special Handling Instructions and Additional Information
1. G151843EQATL / ID# SOIL 2. G150854EQATL / DECON WATER [T:14.01.58829.1]

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: Mark Probett - Asst Fire Chief of Duluth
Signature: Mark Probett
Month: 05 Day: 23 Year: 18

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: QUINTIN Douglas
Signature:
Month: 05 Day: 23 Year: 18

Transporter 2 Printed/Typed Name:
Signature:
Month: Day: Year:

DESIGNATED FACILITY

18. Discrepancy

18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

18b. Alternate Facility (or Generator)
U.S. EPA ID Number
Facility's Phone:

18c. Signature of Alternate Facility (or Generator)
Month: Day: Year:

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Printed/Typed Name:
Signature:
Month: Day: Year:

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

GENERATOR'S INITIAL CC

US ECOLOGY

Pick-Up Report

Site Code:
EPA ID: CESQG
Address: CITY OF DULUTH
3146 MAIN STREET
DULUTH, GA 30096
Manifest: 018839650

Date: 05/23/2018
Time In: 10:50:02
Time Out: 10:54:14
Route/Trip #: 58929
Tractor/Trailer#: 32888

Waste Type/Approval	Quantity of Containers	Size	CCID	Comments
IDW SOIL/(G151643EQATL)	8	8 DM55		
DECON WATER/(G150654EQATL)	2	2 DM55		

Additional Information:

I hereby agree that the above listed services and quantities are accurate.

Representative: Mark Padgett (Printed) Mark Padgett (Signature) Geologist (Title)

US Ecology Representative: Quinton Douglas (Printed) (Signature)

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Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number: CES OG
2. Page 1 of: 1
3. Emergency Response Phone: (800) 275-0629
4. Manifest Tracking Number: 018516844 JJK

GENERATOR

5. Generator's Name and Mailing Address: CITY OF DULUTH
3146 MAIN STREET
DULUTH, GA 30096
Generator's Phone:

Generator's Site Address (if different than mailing address)

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 & PROCESSIN
5600 FULTON INDUSTRIAL BLVD,SW
ATLANTA, GA 30336
Facility's Phone: (404) 494-3520
U.S. EPA ID Number: GAR 000 039 776

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
	1. NON-HAZARDOUS, NON-DOT REGULATED MATERIAL (WATER)	001	DM	00055	G	
	2.					
	3.					
	4.					

14. Special Handling Instructions and Additional Information
1. G150954EOATL / DECON WATER [T:14.04.60124.1]

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: Shannon Fullen on b/o The City of Duluth
Signature: Shannon Fullen on b/o The City of Duluth
Month: 07 Day: 11 Year: 18

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: CHRIS LOPEZ
Signature:
Month: 07 Day: 11 Year: 18

Transporter 2 Printed/Typed Name:
Signature:
Month: Day: Year:

DESIGNATED FACILITY

18. Discrepancy

18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

18b. Alternate Facility (or Generator)
U.S. EPA ID Number
Facility's Phone:

18c. Signature of Alternate Facility (or Generator)
Month: Day: Year:

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.
H141			

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Printed/Typed Name:
Signature:
Month: Day: Year:

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

GENERATOR'S INITIAL COPY

US ECOLOGY

Pick-Up Report

Site Code:
EPA ID: CESQG
Address: CITY OF DULUTH
3146 MAIN STREET
DULUTH, GA 30096
Manifest: 018516844JJK

Date: 07/11/2018
Time In: 12:13:06
Time Out: 12:18:31
Route/Trip #: 60124
Tractor/Trailer#: 50054

Waste Type/Approval	Quantity of Containers	Size	CCID	Comments
DECON WATER/(G150854EQATL)	1	1 DM55		

1000

Additional Information:

I hereby agree that the above listed services and quantities are accurate.

Representative: Shannon Fuller on b/o City of Dulath Shannon Fuller on b/o City of Duluth Geologist
(Printed) (Signature) (Title)

US Ecology Representative: Chris Logan
(Printed) (Signature)

US ECOLOGY

Pick-Up Report

Site Code:
EPA ID: GESQG
Address: CITY OF DULUTH
3146 MAIN STREET
DULUTH, GA 30096
Manifest: 20558102

Date: 08/24/2018
Time In: 11:11:24
Time Out: 11:20:43
Route/Trip #: 61336
Tractor/Trailer#:

Waste Type/Approval	Quantity of Containers	Size	CCID	Comments
DECON WATER/(G150854EQATL)	1	1 DM55		

Additional Information:

I hereby agree that the above listed services and quantities are accurate.

Representative: MARIO RAMIREZ (Printed) (Signature) CITY OF DULUTH (Title)

US Ecology Representative: Stanley Peters (Printed) Stanley Peters (Signature)

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US ECOLOGY

BILL OF LADING

BOL: 20558102
Trip: 61336

Offeror: CITY OF DULUTH
3146 MAIN STREET
DULUTH, GA 30096
EPA ID: CESQG

Emergency Response Telephone Number: (800) 275-6629

Receiving Facility: EQIS ATLANTA TRANSFER & PROCESSING
5600 FULTON INDUSTRIAL BLVD.SW
ATLANTA, GA 30336
EPA ID: GAR000039776
Phone: (404) 494-3520

	HM	DOT Shipping Name / Additional Information	# of Containers	Type of Container	Quantity	Unit
1		NON-HAZARDOUS, NON-DOT REGULATED MATERIAL (WATER) G150854EQATL / DECON WATER	1	DM	55	G

This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

Offeror Signature: _____ **Date:** 08/24/2018

Transporter Signature: Stanley Peters **Date:** 08/24/2018

Receiving Facility Signature: _____ **Date:** _____

NON-HAZARDOUS WASTE MANIFEST

1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Waste Tracking Number
CE5 0G	1	(800) 275-8620	0204501

GENERATOR

5. Generator's Name and Mailing Address: CITY OF DULUTH
3146 MAIN STREET
DULUTH, GA 30096
Generator's Phone:

Generator's Site Address (if different than mailing address)

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 & PROCESSIN
5600 FULTON INDUSTRIAL BLVD,SW
ATLANTA, GA 30336
Facility's Phone: (404) 494-3520
U.S. EPA ID Number: GAR 000 039 776

	9. Waste Shipping Name and Description	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	
1	NON-HAZARDOUS, NON-DOT REGULATED MATERIAL (SOIL)	002	DM	00900	P	
2	NON-HAZARDOUS, NON-DOT REGULATED MATERIAL (WATER)	001	DM	00055	G	
3.						
4.						

13. Special Handling Instructions and Additional Information
1. G151643EQATL / IDW SOIL 2. G150854EQATL / DECON WATER (T-14 04 62249.1)

14. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Generator's/Offeror's Printed/Typed Name: Shannon Fuller on b/o the City of Duluth — Signature: Shannon Fuller — Month: 10 — Day: 05 — Year: 18

INT'L

15. International Shipments ☐ Import to U.S. ☐ Export from U.S. — Port of entry/exit:
Transporter Signature (for exports only): — Date leaving U.S.:

TRANSPORTER

16. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: Stanley Peters — Signature: Stanley Peters — Month: 10 — Day: 05 — Year: 18

Transporter 2 Printed/Typed Name — Signature — Month — Day — Year

DESIGNATED FACILITY

17. Discrepancy

17a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

17b. Alternate Facility (or Generator) — U.S. EPA ID Number
Facility's Phone:

17c. Signature of Alternate Facility (or Generator) — Month — Day — Year

H141 H141

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

GENERATOR'S/SHIPPER'S INITIAL COPY

US ECOLOGY

Pick-Up Report

Site Code:
EPA ID: CESQG
Address: CITY OF DULUTH
3146 MAIN STREET
DULUTH, GA 30096
Manifest: 0204501

Date: 10/05/2018
Time In: 09:19:06
Time Out: 09:21:47
Route/Trip #: 62249
Tractor/Trailer#:

Waste Type/Approval	Quantity of Containers	Size	CCID	Comments
IDW SOIL/(G151643EQATL)	2	2 DM55		
DECON WATER/(G150654EQATL)	1	1 DM55		

Additional Information:

I hereby agree that the above listed services and quantities are accurate.

Representative: Stanley Peters Stanley Peters on b/o the City of Duluth
(Printed) (Signature) (Title)

US Ecology Representative: Stanley Peters Stanley Peters
(Printed) (Signature)

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