2018 Periodic Review Groundwater Monitoring and Sampling Annual Report

815 River Road Site
Site Number B00178
City of North Tonawanda

Prepared for:
City of North Tonawanda

GHD | 285 Delaware Avenue Suite 500 Buffalo New York 14202 USA

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1. Site Background

1.1 Site Location and History

This one-acre parcel of land is located directly across from the City of North Tonawanda (City) Wastewater Treatment Plant (WWTP). The City acquired the 815 River Road parcel in 2000 through tax foreclosure. Prior to the City's acquisition of the property, a company that maintained school buses occupied this property. As part of this business, this company maintained fueling systems that included underground storage tanks (USTs) for gasoline and motor oil. City records indicated that the USTs were in place for over 40 years. Presently, the property is owned by Metzger Removal, Inc. as a C&D crushing/recycling operation. A Site location map is presented on Figure 1.

A previous Site investigation completed in January 2001 by Green Environmental Specialists, Inc. (Green) identified seven buried USTs. Analytical testing detected the presence of benzene in two USTs. Site reporting also indicated that the soil and groundwater surrounding the USTs may have been impacted through UST leakage. Shortly after the completion of Green's Site investigation, remedial construction was initiated by a private entity interested in remediating and developing the property for commercial/industrial use. Remedial activities resulted in the removal of four USTs.

In September 2002, an additional Site investigation was completed by Parsons Corporation to delineate the extent of contamination and provide tank closure of the four removed USTs from past remedial activities. The Site investigation identified an additional eight USTs.

1.2 Site Remediation Activities

Under a Site Interim Remedial Measure (IRM), UST removal and closure was provided. Demolition of an on-site building was necessary for proper UST closure and to allow access to impacted soils beneath the building. Impacted soils were excavated and removed from the Site for disposal to Tonawanda Landfill. During the removal of impacted soils and surface water, IRM construction was halted by the City due to a contract dispute. All Site activities were discontinued. Contract disputes could not be settled and construction contracts were terminated. The Site was left with an unfinished open excavation with the potential for additional impacted soils to be excavated. Reporting for the Site investigation and IRM activities was not provided to the City.

Stearns & Wheler, LLC was retained by the City to provide engineering services for an IRM that was conducted in November 2007 that included the excavation and disposal of 1,300 tons of impacted and staged soils. This IRM construction completed the excavation and removal of impacted soils that was halted by the City in 2004. The excavation followed the delineation of impacted soils as defined during the Site investigation. The removal of impacted soils extended to the south to a minor extent onto the adjacent property. IRM excavation limits were brought to within approximately 5 feet of the River Road Right-of-Way (ROW). Depth of excavation limits was to the top of clay. Excavated impacted soils were pre-approved for disposal at Modern Landfill and directly loaded into trucks from the excavation. No soils were staged on site. Confirmatory soil samples were collected from the previously impacted area. After confirmatory soil sampling, analytical test

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815 RIVER ROAD SITE

NORTH TONAWANDA, NEW YORK

FIGURE 1
SITE LOCATION

results were reported below the Restricted Commercial Use Soil Cleanup Objectives, and the excavation was backfilled.

1.3 Site Investigation/Remedial Alternatives Report

Stearns & Wheler, LLC was retained by the City to provide engineering services and perform a Site Investigation/Remedial Alternatives Report (SI/RAR). The SI/RAR was completed in January 2008 and selected institutional controls for both impacted soils and groundwater media. The completed 2007 IRM achieved the SI/RAR reported Restricted Commercial Soil Cleanup Objectives.

1.4 Institutional and Engineering Controls

Institutional controls were recommended as the most feasible and selected alternative as reported in the SI/RAR dated January 2008 and included the environmental easement for future redevelopment and ownership of the Site. The Site Management Plan (SMP) addresses the excavation procedures for the remaining soils for future redevelopment, and includes soil management, characterization, and disposal of excavated soils in accordance with the applicable New York State Department of Environmental Conservation (NYSDEC) regulations. The SMP is presented in Section 4.

In addition, the environmental easement imposes a deed restriction that requires compliance with the approved SMP and limits the future use of groundwater from the Site. Installation of potable wells at the Site is prohibited, as is any future use of groundwater at the Site. Annually, future owners are required to certify to the NYSDEC that the implemented remedy has been maintained in accordance with the SMP.

2. Groundwater Monitoring Activities

The Monitoring Plan includes the necessary actions required to maintain the Site. This Monitoring Plan includes a description of a long term environmental monitoring program, specific information on all of the equipment and materials used in any monitoring systems, contingencies for emergencies, and reporting requirements.

2.1 Site Hydrogeology

The presence of the Niagara River located to the west of the Site suggests that the river will act as the regional discharge zone. Locally, however, groundwater is possibly intercepted by the 36-inch diameter sanitary sewer line located along River Road. The top of the silty clay unit that is consistent throughout the Site has been logged and reported to range in depth between 4 to 5 feet. Standard sewer construction consists of a sewer pipe laid on gravel bedding material with the rest of the sewer trench filled with a gravel backfill. Since the sanitary sewer located along River Road is approximately 15 feet deep, the bottom of the sewer trench is deeper than the top of the silty clay unit. Any groundwater migrating from the Site should follow the top of clay and infiltrate into the gravel backfilled sewer trench. Once in the trench, groundwater can enter the sewer through infiltration and be transmitted to the City's WWTP for treatment.

2.2 Monitoring Requirements

Annual monitoring is performed on groundwater samples for a minimum period of 30 years or at a reduced frequency and period as approved by NYSDEC. Groundwater monitoring was initially conducted after the remediation was completed and thereafter on an annual basis upon NYSDEC request. Methods used are consistent with NYSDEC requirements. The extent and frequency of the sampling and analysis is evaluated by the NYSDEC periodically to determine if sampling points or analytes could be dropped from the monitoring program.

2.3 Groundwater Monitoring

The 2017 monitoring program at the 815 River Road Site consisted of one annual sampling event. Groundwater was sampled from monitoring wells MW-1 and MW-2 on March 21, 2019. The location of groundwater monitoring wells MW-1 and MW-2 are approximately 10 feet from the River Road curb line at the 815 River Road property. This sampling event represents the 6th event of the groundwater monitoring program. A Site plan is presented on Figure 2.

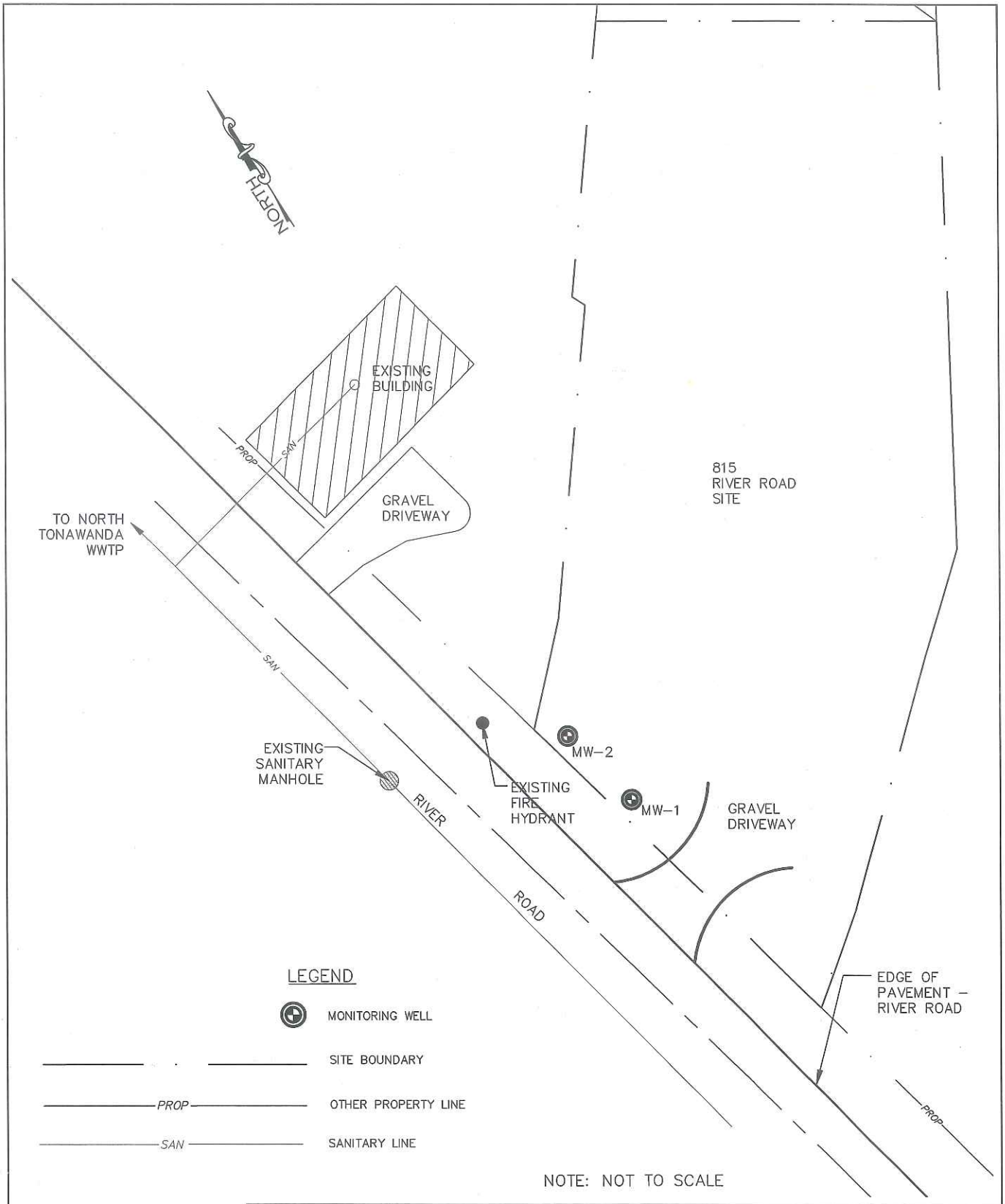
Groundwater sampling of monitoring wells MW-1 and MW-2 was collected using low-flow purging and sampling techniques. Prior to sampling, the monitoring wells were purged using a disposable bailer. Groundwater parameters of pH, specific conductance, dissolved oxygen (DO), temperature, and oxidation-reduction potential (ORP) were recorded. After the field parameters were recorded, groundwater samples were collected with a disposable bailer and transferred into sample containers provided by the testing laboratory. Groundwater elevation data was recorded. Purge water generated from each monitoring well was discharged to the ground. Groundwater Field Sampling Records are presented in Appendix A.

Several quality control samples, including a trip blank and a field duplicate were collected during the sampling event. Samples were delivered under chain of custody to Pace Analytical for analysis of Volatile Organic Compounds (VOCs) by USEPA SW-846 Method 8260. The specific sampling protocol to be used, including sample preservation techniques, QA/QC objectives, a description of chain-of-custody documentation, and analytical parameters are included in the SMP.

3. Groundwater Monitoring Results

3.1 2018 Groundwater Monitoring

This section includes analytical test results of the annual groundwater sampling event dated March 21, 2019 and represents groundwater monitoring for the 2018 reporting year. Test results are presented in Table 1 and Appendix B. Sampling field parameters are presented on Table 2. Included in this section are descriptions of the identification and distribution of constituents present in groundwater, and a comparison of historical data. Constituents are compared to the applicable NYSDEC Division of Water Technical and Operational Guidance Series (TOGS 1.1.1) Groundwater Standards and Guidance Values.



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815 RIVER ROAD SITE
NORTH TONAWANDA, NEW YORK

FIGURE 2
SITE PLAN

Table 1A
Monitoring Well MW-1
Volatile Organic Analytical Test Results
815 River Road Site

Volatile Compounds	NYSDEC TOGS 1.1.1 Water Quality Standards[1]	Units	07/16/07	07/25/12	10/20/15	10/21/16	10/25/17	03/21/19
1,1,1-Trichloroethane	5	µg/L	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	5	µg/L	ND	ND	ND	ND	ND	ND
1,1,2-Trichlo-1,2,2-trifluoroethane	5	µg/L	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	1	µg/L	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	5	µg/L	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	5	µg/L	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	5	µg/L	-	ND	**0.41J**	ND	ND	ND
1,2,4-Trichlorobenzene	5	µg/L	-	ND	ND	ND	ND	ND
1,2-Dibromo-3-Chloropropane DBCP	0.04	µg/L	-	ND	ND	ND	ND	ND
1,2-Dibromoethane (EDB)	NE	µg/L	-	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	3	µg/L	-	ND	ND	ND	ND	ND
1,2-Dichloroethane	0.6	µg/L	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	5	µg/L	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	3	µg/L	-	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	3	µg/L	-	ND	ND	ND	ND	ND
2-Hexanone	50	µg/L	ND	ND	ND	ND	ND	ND
Acetone	50	µg/L	ND	ND	**88.8**	ND	ND	ND
Benzene	1	µg/L	ND	ND	ND	ND	ND	ND
Bromoform	50	µg/L	ND	ND	ND	ND	ND	ND
Bromomethane	5	µg/L	ND	ND	ND	ND	ND	ND
Bromodichloromethane	50	µg/L	ND	ND	ND	ND	ND	ND
Bromochloromethane	5	µg/L	-	ND	ND	ND	ND	ND
Carbon disulfide	60	µg/L	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	5	µg/L	ND	ND	ND	ND	ND	ND
Chlorobenzene	5	µg/L	ND	ND	ND	ND	ND	ND
Chloroethane	5	µg/L	ND	ND	ND	ND	ND	ND
Chloroform	7	µg/L	ND	ND	ND	ND	ND	ND
Chloromethane	NE	µg/L	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	5	µg/L	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	0.40	µg/L	ND	ND	ND	ND	ND	ND
Cyclohexane	NE	µg/L	ND	**82**	ND	**8.64**	**29.10**	**39.10**
Dibromochloromethane	50	µg/L	ND	ND	-	-	-	-
Chlorodibromomethane	NE	µg/L	-	ND	ND	ND	ND	ND
Dichlorodifluoromethane	5	µg/L	-	ND	ND	ND	ND	ND
Ethylbenzene	5	µg/L	**2J**	**18**	**8.6**	**17.0**	**20.5**	**11.1**
Isopropylbenzene	5	µg/L	ND	**33**	**19.0**	**31.7**	**42.7**	**19.2**
Methyl acetate	NE	µg/L	-	ND	ND	ND	ND	ND
Methyl Ethyl Ketone (MEK)	50	µg/L	-	ND	ND	ND	ND	ND
Methylcyclohexane	NE	µg/L	ND	**15**	ND	ND	**20.5**	ND
Methylene chloride	5	µg/L	ND	ND	ND	ND	ND	ND
4-Methyl 2-Pentanone	NE	µg/L	-	-	ND	ND	ND	ND
Methyl-t-Butyl Ether (MTBE)	10	µg/L	-	ND	-	-	-	-
Methyl tert-butyl esther	NE	µg/L	-	ND	ND	ND	ND	ND
m,p-Xylene	5	µg/L	**4J**	-	-	-	-	-
o-Xylene	5	µg/L	ND	-	-	-	-	-
Styrene	5	µg/L	ND	ND	ND	ND	ND	ND
Tetrachloroethene	5	µg/L	ND	ND	ND	ND	ND	ND
Toluene	5	µg/L	ND	ND	ND	ND	ND	ND
Total Xylenes	5	µg/L	**4J**	ND	ND	ND	ND	**4.9**
trans-1, 2-Dichloroethene	5	µg/L	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	0.4	µg/L	ND	ND	ND	ND	ND	ND
Trichloroethene	5	µg/L	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	5	µg/L	-	ND	ND	ND	ND	ND
Vinyl Chloride	2	µg/L	ND	ND	ND	ND	ND	ND
Total VOCs		µg/L	6.0	148.0	28.0	57.3	112.8	74.3
Total VOCs		mg/L	0.006	0.148	0.028	0.057	0.113	0.074

1. New York State Department of Environmental Conservation (NYSDEC) Technical and Operational Guidance Series (TOGS) 1.1.1:
Ambient Water Quality Standards and Guidance Values (µg/L)

Bolded concentrations indicated the analyte was detected. Bolded and shaded concentrations indicate equal to or exceedance of TOGS 1.1.1 criteria.

NE = NYSDEC TOGS 1.1.1 water quality standard not established.

ND = The analyte was analyzed for but not detected. The associated value is the analyte quantitation limit.

J = The analyte was positively identified; however, the associated numerical value is an estimated concentration only.

- = The analyte was not sampled for.

Synonyms: Chlorodibromomethane = Dichlorobromoethane

Synonyms: 4-Methyl 2-Pentanone = Methyl Isobutyl Ketone

Synonyms: Methyl Ethyl Ketone (MEK) = 2-Butanone

Acetone not included in Total VOCs at direction of DEC.

Table 1B
Monitoring Well MW-2
Volatile Organic Analytical Test Results
815 River Road Site

Volatile Compounds	NYSDEC TOGS 1.1.1 Water Quality Standards[1]	Units	07/16/07	07/25/12	10/20/15	10/21/16	10/25/17	03/21/19
1,1,1-Trichloroethane	5	µg/L	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	5	µg/L	ND	ND	ND	ND	ND	ND
1,1,2-Trichlo-1,2,2-trifluoroethane	5	µg/L	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	1	µg/L	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	5	µg/L	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	5	µg/L	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	5	µg/L	-	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	5	µg/L	-	ND	ND	ND	ND	ND
1,2-Dibromo-3-Chloropropane DBCP	0.04	µg/L	-	ND	ND	ND	ND	ND
1,2-Dibromoethane (EDB)	NE	µg/L	-	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	3	µg/L	-	ND	ND	ND	ND	ND
1,2-Dichloroethane	0.6	µg/L	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	5	µg/L	**40J**	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	3	µg/L	-	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	3	µg/L	-	ND	ND	ND	ND	ND
2-Hexanone	50	µg/L	ND	ND	ND	ND	ND	ND
Acetone	50	µg/L	ND	ND	**188J**	ND	ND	ND
Benzene	1	µg/L	**140**	**560**	**151**	**280J6**	**207**	**269**
Bromoform	50	µg/L	ND	ND	ND	ND	ND	ND
Bromomethane	5	µg/L	ND	ND	ND	ND	ND	ND
Bromodichloromethane	50	µg/L	ND	ND	ND	ND	ND	ND
Bromochloromethane	5	µg/L	-	ND	ND	ND	ND	ND
Carbon disulfide	60	µg/L	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	5	µg/L	ND	ND	ND	ND	ND	ND
Chlorobenzene	5	µg/L	ND	ND	ND	ND	ND	ND
Chloroethane	5	µg/L	ND	ND	ND	ND	ND	ND
Chloroform	7	µg/L	ND	ND	ND	ND	ND	ND
Chloromethane	NE	µg/L	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	5	µg/L	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	0.40	µg/L	ND	ND	ND	ND	ND	ND
Cyclohexane	NE	µg/L	ND	**210**	**71.2**	**169**	**111J6**	**336**
Dibromochloromethane	50	µg/L	ND	ND	-	-	-	-
Chlorodibromomethane	NE	µg/L	-	ND	ND	ND	ND	ND
Dichlorodifluoromethane	5	µg/L	-	ND	ND	ND	ND	ND
Ethylbenzene	5	µg/L	**460**	**1,500**	**878V**	**2030**	**2050**	**2000**
Isopropylbenzene	5	µg/L	ND	**220**	**115**	**277J6**	**247**	**237**
Methyl acetate	NE	µg/L	-	ND	ND	ND	ND	ND
Methyl Ethyl Ketone (MEK)	50	µg/L	-	ND	ND	ND	ND	ND
Methylcyclohexane	NE	µg/L	ND	**15**	**19.8**	**58.9**	**43.3J6**	ND
Methylene chloride	5	µg/L	ND	ND	ND	ND	ND	ND
4-Methyl 2-Pentanone	NE	µg/L	-	-	ND	ND	ND	ND
Methyl-t-Butyl Ether (MTBE)	10	µg/L	-	ND	-	-	-	-
Methyl tert-butyl esther	NE	µg/L	-	ND	ND	ND	ND	ND
m,p-Xylene	5	µg/L	**480**	-	-	-	-	-
o-Xylene	5	µg/L	**40J**	-	-	-	-	-
Styrene	5	µg/L	ND	ND	ND	ND	ND	ND
Tetrachloroethene	5	µg/L	ND	ND	ND	ND	ND	ND
Toluene	5	µg/L	**70J**	ND	**19.1J**	**39.4**	**13.4**	**42.7**
Total Xylenes	5	µg/L	-	**840**	**424**	**620**	**99**	**655**
trans-1, 2-Dichloroethene	5	µg/L	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	0.4	µg/L	ND	ND	ND	ND	ND	ND
Trichloroethene	5	µg/L	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	5	µg/L	-	ND	ND	ND	ND	ND
Vinyl Chloride	2	µg/L	ND	ND	ND	ND	ND	ND
Total VOCs		µg/L	1,230.0	3,345.0	1,866.1	3,474.3	2,771.1	3,539.7
Total VOCs		mg/L	1.230	3.345	1.866	3.474	2.771	3.540

1. New York State Department of Environmental Conservation (NYSDEC) Technical and Operational Guidance Series (TOGS) 1.1.1:
Ambient Water Quality Standards and Guidance Values (µg/L)

Bolded concentrations indicated the analyte was detected. Bolded and shaded concentrations indicate equal to or exceedance of TOGS 1.1.1 criteria.

NE = NYSDEC TOGS 1.1.1 water quality standard not established.

ND = The analyte was analyzed for but not detected. The associated value is the analyte quantitation limit.

J = The analyte was positively identified; however, the associated numerical value is an estimated concentration only.

J6 = The sample matrix interfered with the ability to make any accurate determination; spike value is low.

V = The sample concentration is too high to evaluate accurate spike recoveries.

- = The analyte was not sampled for.

Synonyms: Chlorodibromomethane = Dichlorobromoethane

Synonyms: 4-Methyl 2-Pentanone = Methyl Isobutyl Ketone

Synonyms: Methyl Ethyl Ketone (MEK) = 2-Butanone

Table 2 Field Groundwater Parameters

Parameter	Monitoring Well Location	
	MW-1	MW-2
Temperature (°C)	6.8	6.5
pH	6.10	6.28
Conductivity (mS/cm)	3.28	2.97
Dissolved Oxygen (mg/L)	5.04	4.24
Turbidity (NTUs)(1)	276	254
ORP (mV)	-17	-82

The Data Usability Summary Report completed by Vali-Data of WNY, LLC is presented in Appendix C. The QA/QC measurements examined for the data were within method-specified or laboratory-derived limits. No data were rejected as a result of the data validation.

Groundwater in the southwest corner of the Site has been impacted with concentrations of VOCs. VOC concentrations were detected in groundwater collected from monitoring wells MW-1 and MW-2 that exceed groundwater standards. VOC concentrations detected in groundwater from the sampling conducted in 2007, 2012, 2015, 2016, 2017 and the 2018 sampling event completed on March 21, 2019 were compared to determine a trending anaylsis.

3.2 Monitoring Well MW-1 Test Results

Groundwater test results from monitoring well MW-1 detected the following total VOC concentrations from 2007, 2012, 2015, 2016, 2017, and 2018.

2007	6.0 µg/L
2012	148.0 µg/L
2015	28.0 µg/L
2016	57.3 µg/L
2017	112.8 µg/L
2018	74.3 µg/L

Groundwater monitoring for the reporting years of 2012, 2015, 2016, 2017 and 2018 detected VOC concentrations that exceeded the groundwater standard for the following parameters: ethylbenzene and isopropylbenzene. A trending graph shows an upward trend since 2015 to 2017 and a decreasing trend for 2018 of detected VOCs as presented on Figure 3.

Concentrations of cyclohexane were detected in 2012, 2016, 2017, and 2018. Concentrations of methylcyclohexane were detected in 2012 and 2017. No groundwater quality standard is established for cyclohexane and methylcyclohexane.

3.3 Monitoring Well MW-2 Test Results

Groundwater test results from monitoring well MW-2 detected the following total VOC concentrations from 2007, 2012, 2015, 2016, 2017, and 2018.

2007	1,230.0 µg/L
2012	3,345.0 µg/L
2015	1,866.1 µg/L
2016	3,474.3 µg/L
2017	2,771.1 µg/L
2018	3,694.0 µg/L

Groundwater monitoring for the reporting years of 2012, 2015, 2016, 2017 and 2018 detected VOC concentrations that exceeded the groundwater standard. A trending graph shows a generally stationary trend from 2016 to 2018 of detected VOCs with the exception of total xylenes as presented on Figure 4.

- Compounds that exceeded the groundwater standard in 2015, 2016, 2017, and 2018 included: benzene, ethylbenzene, isopropylbenzene, toluene, total xylenes. Compounds that exceeded the groundwater standard from the 2012 sampling event included: benzene, ethylbenzene, isopropylbenzene, and total xylenes.
- Detected compounds from 2018 groundwater monitoring that decreased in concentrations from the 2017 sampling event included: ethylbenzene and isopropylbenzene.
- Detected compounds from the 2017 sampling event that increased in concentrations from the 2016 sampling event included: benzene, toluene and total xylenes.

Concentrations of cyclcohexane were detected in 2015, 2016, 2017, and 2018. Concentrations of methylcyclohexane was detected in 2015, 2016, and 2017. No groundwater quality standard is established for cyclcohexane and methylcyclohexane. At the request of NYSDEC, acetone was not included in this analysis as reported in 2015 since this compound is a common laboratory contaminant.

4. Soil Management Plan

The objective of the SMP is to set guidelines for management of soil material during any future activities, which would breach the cover system at the Site. The SMP addresses environmental concerns related to soil management and has been reviewed and approved by the NYSDEC.

FIGURE 3
Groundwater VOC Concentrations in MW-1 vs. Time

815 River Road Site - North Tonawanda, NY
2018 Periodic Review Report

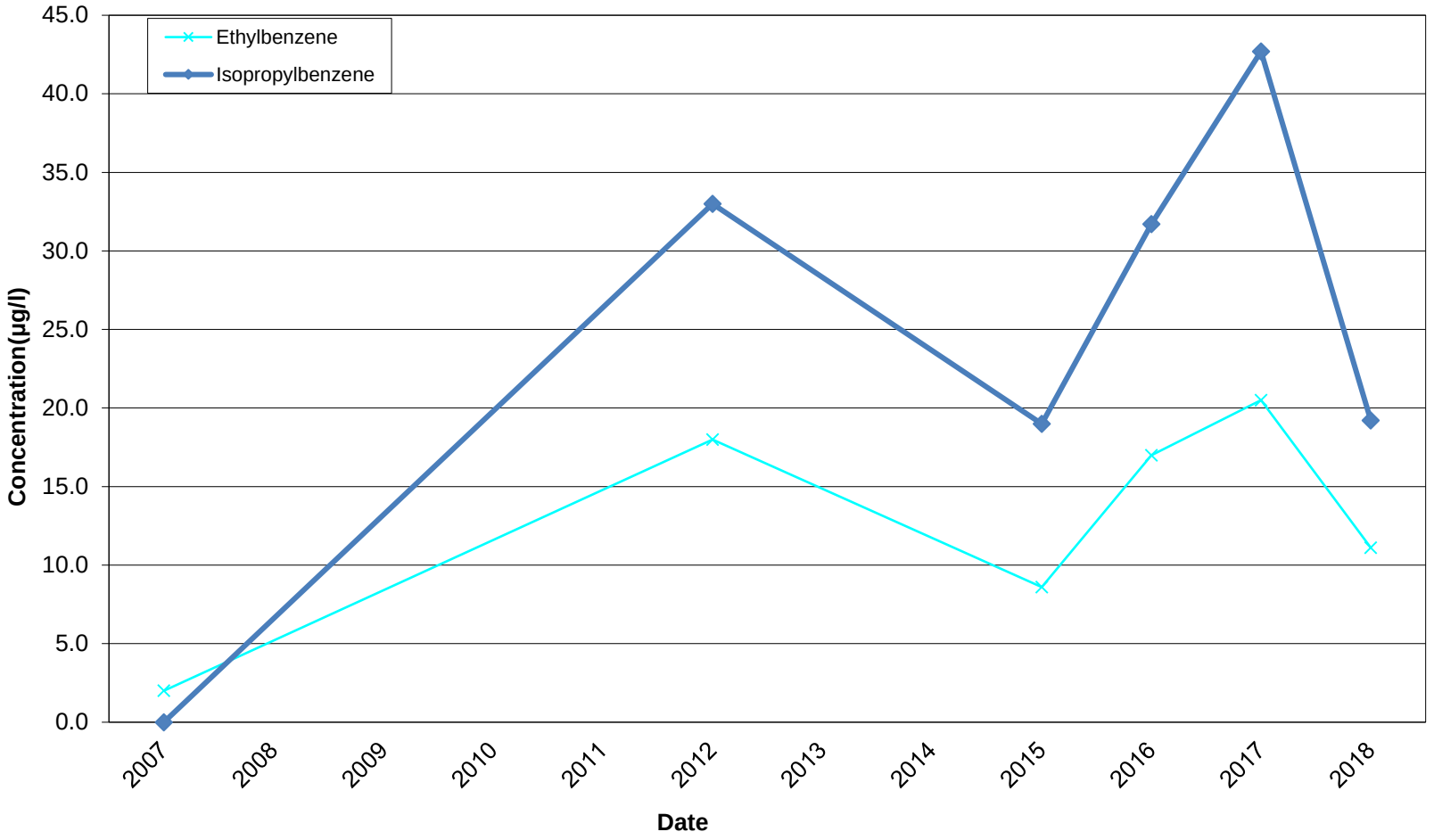
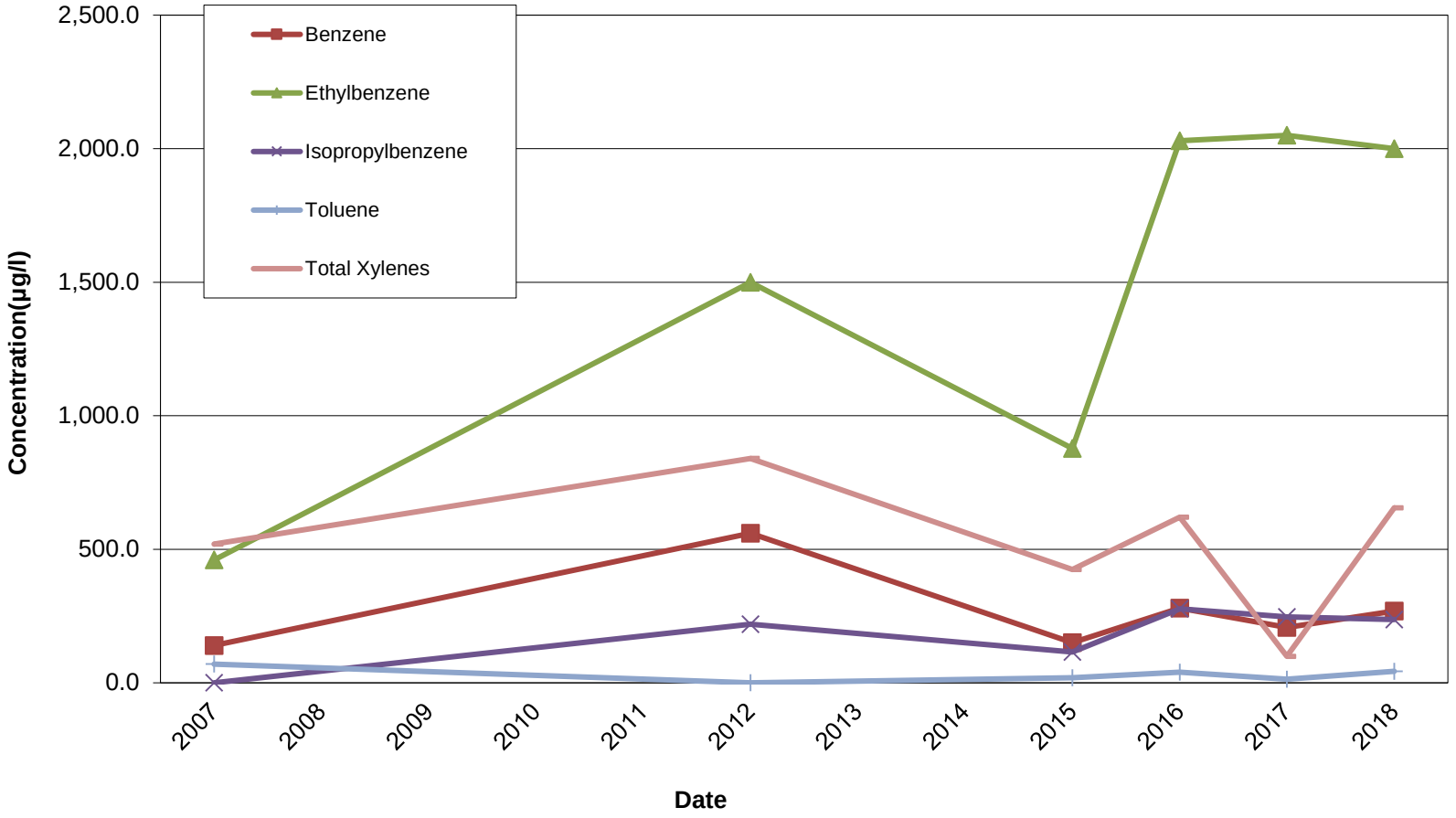


FIGURE 4
Groundwater VOC Concentrations in MW-2 vs. Time

815 River Road Site - North Tonawanda, NY
2018 Periodic Review Report



4.1 Nature and Extent of Contamination

Based on data obtained from previous investigations and the IRM remediation completed at the Site, a Final Engineering Report for the 815 River Road Site Remediation dated June 2008 was completed by Stearns & Wheler, LLC.

During Site investigation activities, impacted soils were identified. The impacted soil area was excavated, removed, and disposed off-Site during an IRM completed in 2007. Impacted soils were sampled and categorized to preliminarily delineate the extent of the contamination and for waste characterization for off-Site disposal. The impacted soils were excavated to the top of clay which was defined ranging between 9 to 11 feet.

The impacted soil contained concentrations of both volatile and semi-volatile compounds. All concentrations reported during the 2007 IRM were below the Restricted Commercial Use Soil Cleanup Objectives. VOC parameters with the highest concentrations included xylene and ethylbenzene. Semi-volatile compounds were detected to a lesser degree including naphthalene. The potential exposure pathways include inhalation, absorption, ingestion, and contact. Health effects from exposure to these chemical compounds are eye, skin, and respiratory irritants.

The constituents of potential concern for soil consist primarily of residual VOCs and poly aromatic hydrocarbons (PAHs). Results of groundwater sampling indicate that constituents in the soil/fill material have impacted groundwater quality with low concentrations of volatile and semi-volatile compounds. Groundwater in the southwest corner of the Site has been impacted with low concentrations of benzene, 1,2-dichloropropane, toluene, xylene, and ethylbenzene. Analytical test results indicated that groundwater standards have exceeded groundwater standards.

Groundwater in this portion of the Site presumably flows toward the 36-inch diameter sanitary sewer line that runs down the east side of River Road. As stated in Section 2.1 Site Hydrogeology, since the sanitary sewer located along River Road is approximately 15 feet deep, the bottom of the sewer trench is deeper than the top of silty clay unit. Any groundwater migrating from the Site should follow the top of clay and infiltrate into the gravel backfilled sewer trench. Once in the trench, groundwater can enter the sewer through infiltration and could be transmitted to the City's WWTP for treatment.

Deed restrictions enacted by the City, prohibits the installation of potable wells on the property.

4.2 Contemplated Use

As part of the redevelopment project, the property has been identified for industrial/commercial usage. Residential redevelopment will not be permitted. Deed restrictions will require compliance with the SMP. The future use of Site groundwater is prohibited.

4.3 Purpose and Description of Surface Cover System

The purpose of the surface cover system is to eliminate the potential for human contact with fill material and eliminate the potential for contaminated runoff from the property. The cover system consists of existing non-impacted fill soils overlaying the remaining impacted soils located within the River Road ROW. Soil borings completed near the River Road ROW have been logged to report

3-6 feet of non-impacted soil overlaying the residually impacted soils. The existing non-impacted soils provide a cover system for any residually impacted materials within the River Road ROW.

4.4 Management of Soil/Fill and Long-Term Maintenance

The purpose of this section is to provide environmental guidelines for management of subsurface soils/fill and the long-term maintenance of the cover system during any future intrusive work which breaches the cover system. The SMP includes the following conditions:

- Any breach of the cover system within the River Road ROW of a width of 33 feet, including for the purposes of construction or utilities work, must be replaced or repaired using an acceptable borrow source free of industrial and/or other potential sources of chemical or petroleum contamination. The repaired area must be covered with clean soil and reseeded or covered with impervious product such as concrete or asphalt to prevent erosion in the future.
- The cover system must be maintained within the River Road ROW since residual impacted soils above NYSDEC Part 375 Unrestricted Use Cleanup Objectives may be present.
- Control surface erosion and run-off from the entire property at all times, including during construction activities. This includes proper maintenance of the fill cover established on the property.
- Site soil that is excavated and is intended to be removed from the property must be managed, characterized, and properly disposed of in accordance with NYSDEC regulations and directives.
- Soil excavated at the Site may be reused as backfill material on-Site provided it contains no visual or olfactory evidence of contamination, and is placed beneath a cover system component of 2-3 feet of clean fill from an acceptable source area.
- Any off-Site fill material brought to the Site for filling and grading purposes shall be from an acceptable borrow source free of industrial and/or other potential sources of chemical or petroleum contamination.
- Prior to any construction activities, workers shall be notified of the Site conditions with clear instructions regarding how the work is to proceed. Invasive work performed at the property will be performed in accordance with all applicable local, state, and federal regulations to protect worker health and safety.
- An annual report will contain certification that the institutional controls put in place, pursuant to Operation, Monitoring, and Maintenance Plan (OM&M), are still in place, have not been altered and are still effective; that the remedy and protective cover have been maintained; and that the conditions at the Site are fully protective of public health and the environment. Inspection will be documented and a letter will be submitted to the NYSDEC. The Site designated representative has included the signed IC - EC Certification as presented in Appendix D.

4.5 Excavated and Stockpiled Soil/Fill Disposal

Every effort will be made to keep excavated soils on Site. The proper management of the remaining impacted subsurface soils located within the River Road ROW and other possibly impacted Site

soils must be provided. Soil/fill that is excavated as part of redevelopment that cannot be used as fill below the cover system will be characterized prior to transportation off-Site for disposal at a permitted facility. For excavated soil/fill with visual evidence of contamination (i.e., staining or elevated photoionization detector (PID) measurements), one composite sample and a duplicate sample will be collected for each 100 cubic yards of stockpiled soil/fill. For excavated soil/fill that does not exhibit visual evidence of contamination but must be sent for off-Site disposal, one composite sample and a duplicate sample will be collected for each 2,000 cubic yards of stockpiled soil, and a minimum of one sample will be collected for volumes less than 2,000 cubic yards.

The composite sample will be collected from five locations within each stockpile. A duplicate composite sample will also be collected. PID measurements will be recorded for each of the five individual locations. One grab sample will be collected from the individual location with the highest PID measurement. If none of the five individual sample locations exhibit PID readings, one location will be selected at random. The composite sample will be analyzed by a NYSDOH ELAP-certified laboratory for pH (EPA Method 9045C) and Target Compound List (TCL) semi-volatile organic compounds (SVOCs). The grab sample will be analyzed for TCL VOCs.

Additional characterization sampling for off-Site disposal may be required by the disposal facility. To potentially reduce off-Site disposal requirements/costs, the owner or Site developer may also choose to characterize each stockpile individually. If the analytical results indicate that concentrations exceed the standards for Resource Conservation and Recovery Act (RCRA) characteristics, the material will be considered a hazardous waste and must be properly disposed off-Site at a permitted disposal facility within 90 days of excavation. If analytical results indicate that the soil is not a hazardous waste, the material will be properly disposed off-Site at a non-hazardous waste facility. Stockpiled soil cannot be transported on or off-Site until analytical results are received.

4.6 Subgrade Materials

Subgrade material used to backfill excavations or placed to increase Site grades or elevation shall meet the following criteria.

- Subgrade material stockpiled on the surface for re-use must be placed on a liner material or other suitable surface to avoid the commingling of this material with clean topsoil or other surface materials. Stockpiled subgrade material should also be managed to prevent erosion and runoff of precipitation waters which may contact this material.
- Excavated on-Site soil/fill which appears to be visually impacted shall be sampled and analyzed. If backfill materials are suspect, then analytical testing will be required. If soils or soil mixtures are used as backfill materials, they will be sampled for VOCs, SVOCs, pesticides and Polychlorinated Biphenols (PCBs), and metals, and compared to limits listed under Restricted Commercial on Table 3: Imported Backfill Limits.
- Any off-Site fill material brought to the Site for filling and grading purposes shall be from an acceptable borrow source free of industrial and/or other potential sources of chemical or petroleum contamination. A letter will be required from the backfill supplier certifying material is clean from any hazardous and/or solid waste materials.

Table 3
Imported Backfill Limits

	Unrestricted	Residential	Restricted - Residential	**Restricted - Commercial or Industrial**	Ecological Limit For Sites Which Have Ecological Resources
METALS					
Arsenic	13	16	16	**16**	13
Barium	350	350	400	**400**	433
Beryllium	7.2	14	47	**47**	10
Cadmium	2.5	2.5	4.3	**7.5**	4
Chromium, Hexavalent[1]	1	19	19	**19**	1
Chromium, Trivalent[1]	30	36	180	**1500**	41
Copper	50	270	270	**270**	50
Cyanide	27	27	27	**27**	NS[2]
Lead	63	400	400	**450**	63
Manganese	1600	2000	2000	**2000**	1600
Mercury (total)	0.18	0.73	0.73	**0.73**	0.18
Nickel	30	130	130	**130**	30
Selenium	3.9	4	4	**4**	3.9
Silver	2	8.3	8.3	**8.3**	2
Zinc	109	2200	2480	**2480**	109
PCBs/PESTICIDES					
2,4,5-TP Acid (Silvex)	3.8	3.8	3.8	**3.8**	NS[2]
4,4'-DDE	0.0033	1.8	8.9	**17**	0.0033
4,4'-DDT	0.0033	1.7	7.9	**47**	0.0033
4,4'-DDD	0.0033	2.6	13	**14**	0.0033
Aldrin	0.005	0.019	0.097	**0.19**	0.14
Alpha-BHC	0.02	0.02	0.02	**0.02**	0.04
Beta-BHC	0.036	0.072	0.09	**0.09**	0.6
Chlordane (alpha)	0.094	0.91	2.9	**2.9**	1.3
Delta-BHC	0.04	0.25	0.25	**0.25**	0.04
Dibenzofuran	7	14	59	**210**	NS[2]
Dieldrin	0.005	0.039	0.1	**0.1**	0.006
Endosulfan I	2.4	4.8	24	**102**	NS[2]
Endosulfan II	2.4	4.8	24	**102**	NS[2]
Endosulfan sulfate	2.4	4.8	24	**200**	NS[2]
Endrin	0.014	0.06	0.06	**0.06**	0.014
Heptachlor	0.042	0.38	0.38	**0.38**	0.14
Lindane	0.1	0.1	0.1	**0.1**	6
Polychlorinated biphenyls	0.1	1	1	**1**	1
SEMIVOLATILE ORGANIC COMPOUNDS					
Acenaphthene	20	98	98	**98**	20
Acenaphthylene	100	100	100	**107**	NS[2]
Anthracene	100	100	100	**500**	NS[2]
Benzo(a)anthracene	1	1	1	**1**	NS[2]
Benzo(a)pyrene	1	1	1	**1**	2.6
Benzo(b)fluoranthene	1	1	1	**1.7**	NS[2]
Benzo(g,h,i)perylene	100	100	100	**500**	NS[2]
Benzo(k)fluoranthene	0.8	1	1.7	**1.7**	NS[2]
Chrysene	1	1	1	**1**	NS[2]
Dibenz(a,h)anthracene	0.33	0.33	0.33	**0.56**	NS[2]
Fluoranthene	100	100	100	**500**	NS[2]
Fluorene	30	100	100	**386**	30
Indeno(1,2,3-cd)pyrene	0.5	0.5	0.5	**5.6**	NS[2]
m-Cresol(s)	0.33	0.33	0.33	**0.33**	NS[2]
Naphthalene	12	12	12	**12**	NS[2]
SEMIVOLATILE ORGANIC COMPOUNDS					
o-Cresol(s)	0.33	0.33	0.33	**0.33**	NS[2]

Table 3
Imported Backfill Limits

	Unrestricted	Residential	Restricted - Residential	**Restricted - Commercial or Industrial**	Ecological Limit For Sites Which Have Ecological Resources
p-Cresol(s)	0.33	0.33	0.33	**0.33**	NS[2]
Pentachlorophenol	0.8	0.8	0.8	**0.8**	0.8
Phenanthrene	100	100	100	**500**	NS[2]
Phenol	0.33	0.33	0.33	**0.33**	30
Pyrene	100	100	100	**500**	NS[2]
VOLATILE ORGANIC COMPOUNDS					
1,1,1-Trichloroethane	0.68	0.68	0.68	**0.68**	NS[2]
1,1-Dichloroethane	0.27	0.27	0.27	**0.27**	NS[2]
1,1-Dichloroethene	0.33	0.33	0.33	**0.33**	NS[2]
1,2-Dichlorobenzene	1.1	1.1	1.1	**1.1**	NS[2]
1,2-Dichloroethane	0.02	0.02	0.02	**0.02**	10
1,2-Dichloroethene(cis)	0.25	0.25	0.25	**0.25**	NS[2]
1,2-Dichloroethene(trans)	0.19	0.19	0.19	**0.19**	NS[2]
1,3-Dichlorobenzene	2.4	2.4	2.4	**2.4**	NS[2]
1,4-Dichlorobenzene	1.8	1.8	1.8	**1.8**	20
1,4-Dioxane	0.1	0.1	0.1	**0.1**	0.1
Acetone	0.05	0.05	0.05	**0.05**	2.2
Benzene	0.06	0.06	0.06	**0.06**	70
Butylbenzene	12	12	12	**12**	NS[2]
Carbon tetrachloride	0.76	0.76	0.76	**0.76**	NS[2]
Chlorobenzene	1.1	1.1	1.1	**1.1**	40
Chloroform	0.37	0.37	0.37	**0.37**	12
Ethylbenzene	1	1	1	**1**	NS[2]
Hexachlorobenzene	0.33	0.33	1.2	**3.2**	NS[2]
Methyl ethyl ketone	0.12	0.12	0.12	**0.12**	100
Methyl tert-butyl ether	0.93	0.93	0.93	**0.93**	NS[2]
Methylene chloride	0.05	0.05	0.05	**0.05**	12
Propylbenzene-n	3.9	3.9	3.9	**3.9**	NS[2]
Sec-Butylbenzene	11	11	11	**11**	NS[2]
Tert-Butylbenzene	5.9	5.9	5.9	**5.9**	NS[2]
Tetrachloroethene	1.3	1.3	1.3	**1.3**	2
Toluene	0.7	0.7	0.7	**0.7**	36
Trichloroethene	0.47	0.47	0.47	**0.47**	2
Trimethylbenzene-1,2,4	3.6	3.6	3.6	**3.6**	NS[2]
Trimethylbenzene-1,3,5	8.4	8.4	8.4	**8.4**	NS[2]
Vinyl chloride	0.02	0.02	0.02	**0.02**	NS[2]
Xylene (mixed)	0.26	1.6	1.6	**1.6**	0.26

Notes:

1) The SCO for Hexavalent or Trivalent Chromium is considered to be met if the analysis for the total species of this contaminant is below the specific SCO for Hexavalent Chromium.

2) NS = Not Specified. Protection of ecological resources for SCOs were not developed for contaminants identified in the above table with "NS". Where such contaminants appear in the above table, the applicant may be required by the Department to calculate a protection of ecological resources SCO.

- Off-Site soils intended for use as Site backfill cannot otherwise be defined as a solid waste in accordance with 6 NYCRR Part 360-2(a).
- If the contractor designates a source as "virgin" soil, it shall be further documented in writing to be native soil material from areas not having supported any known prior industrial or commercial development or agricultural use.
- Virgin soils should be subject to collection of one representative composite sample per source. The sample should be analyzed for TCL VOCs, SVOCs, pesticides, PCBs, and TAL metals. The soil will be acceptable for use as backfill provided that all parameters meet the Imported Backfill Limits.
- Non-virgin soils will be tested via collection of one composite sample per 500 cubic yards of material from each source area. If more than 1,000 cubic yards of soil are borrowed from a given off-Site non-virgin soil source area and both samples of the first 1,000 cubic yards meet Table 3 Limits, the sample collection frequency will be reduced to one composite for every 2,500 cubic yards of additional soils from the same source, up to 5,000 cubic yards. For borrow sources greater than 5,000 cubic yards, sampling frequency may be reduced to one sample per 5,000 cubic yards, provided all earlier samples met the imported backfill limits.

4.7 Site Usage

The Site is presently used by Metzger Removal, Inc. as a C&D crushing/recycling operation. Concrete, brick and other materials are hauled to the Site from demolition sites in the surrounding area, and stockpiled for the crushing operation. After crushing, conveyors collect the crushed material and stage in stockpiles. No excavation took place at the Site during the period between 2012 and 2018.

5. Conclusions

5.1 Results

Analytical testing from the 2018 groundwater monitoring detected the following VOCs in groundwater sampled from monitoring wells MW-1 and MW-2: benzene (MW-2), ethylbenzene (MW-1 and MW-2), isopropylbenzene (MW-1 and MW-2), toluene (MW-2), and total xylenes (MW-2) at concentrations that were equal to or exceeded the groundwater standard.

Trend analysis of total VOCs comparing Site historical analytical test results as reported in 2007, 2012, 2015, 2016, 2017, and 2018 indicates that total VOC concentrations shows an upward trend since 2015 to 2017 and decreasing in 2018 in groundwater from monitoring well MW-1.

Total VOC concentrations in groundwater from monitoring well MW-2 show a downward trend from 2016 to 2017 and increasing in 2018 with the exception of ethylbenezene.

The concentrations of ethylbenzene at monitoring well MW-1 have fluctuated over the reported six reporting periods. In 2007, the concentration of ethylbenzene was detected at an estimated 2 µg/L concentration, which is below the groundwater standard. Test results from the most recent 2018

groundwater monitoring detected the concentration of ethylbenzene at 11.1 µg/L, which represents a decrease from the previous year.

Concentrations of isopropylbenzene at monitoring well MW-1 have similarly fluctuated over the reported six sampling events. Isopropylbenzene was not detected at monitoring well MW-1 in 2007. Test results from the 2012 sampling event detected concentrations of isopropylbenzene at 33 µg/L. Test results from the most recent 2018 groundwater monitoring detected the concentration of isopropylbenzene at 19.2 µg/L, which represents a decrease from the previous year.

Concentrations of benzene at monitoring well MW-2 have fluctuated over the six reporting periods of 2007, 2012, 2015, 2016, 2017, and 2018. The following concentrations of benzene and corresponding percent annual increases and decreases were detected in groundwater:

2007	140 µg/L	NA
2012	560 µg/L	300% increase
2015	151 µg/L	73% decrease
2016	280 µg/L	85% increase
2017	207 µg/L	26% decrease
2018	269 µg/L	30% increase

Concentrations of ethylbenzene at monitoring well MW-2 have fluctuated over the six reporting periods of 2007, 2012, 2015, 2016, 2017, and 2018. The following concentrations of ethylbenzene and corresponding annual percent increases and decreases were detected in groundwater:

2007	460 µg/L	NA
2012	1,500 µg/L	226% increase
2015	878 µg/L	41% decrease
2016	2,030 µg/L	131% increase
2017	2,050 µg/L	1% increase
2018	2,000 µg/L	2% decrease

Concentrations of isopropylbenzene at monitoring well MW-2 have fluctuated over the six reporting periods of 2007, 2012, 2015, 2016, 2017, and 2018. The following concentrations of isopropylbenzene and corresponding annual percent increases and decreases were detected in groundwater:

2007	ND	NA
2012	220 µg/L	-
2015	115 µg/L	48% decrease
2016	277 µg/L	141% increase

2017	247 µg/L	11% decrease
2018	237 µg/L	4% decrease

Concentrations of toluene at monitoring well MW-2 have fluctuated over the six reporting periods of 2007, 2012, 2015, 2016, 2017, and 2018. The following concentrations of toluene and corresponding annual percent increases and decreases were detected in groundwater:

2007	70 µg/L	NA
2012	ND	100% decrease
2015	19.1 µg/L	-
2016	39.4 µg/L	106% increase
2017	13.4 µg/L	66% decrease
2018	42.7 µg/L	218% increase

Concentrations of total xylenes at monitoring well MW-2 have fluctuated over the six reporting periods of 2007, 2012, 2015, 2016, 2017, and 2018. The following concentrations of total xylenes and corresponding annual percent increases and decreases were detected in groundwater:

2007	520 µg/L	NA
2012	840 µg/L	62% increase
2015	424 µg/L	50% decrease
2016	620 µg/L	46% increase
2017	99 µg/L	84% decrease
2018	655 µg/L	561% increase

5.2 Future Abatement

An Interim Remedial Measure (IRM) was completed in November 2007 that included the excavation and disposal of 1,300 tons of impacted and staged soils. The excavation followed the delineation of impacted soils as defined in the site investigation report. IRM excavation limits at the southwest corner of the impacted area extended to the approximate bounds of the River Road ROW. The excavation of impacted material near the ROW was limited due to the close proximity of utilities and NYSDOT Route 265 (River Road) pavement. Excavation was not scaled back to a standard angle of repose for the reason of removing as much impacted soil as possible. Depth of excavation limits was to the top of clay ranging in depth from 10.5 to 11.5-feet. Confirmatory soil samples were collected prior to backfill.

During the IRM, it was evident that impacted soils remained at the final location of the southwest excavated wall. Impacted soils were excavated as far as possible to the River Road ROW. No further excavation could be advanced without putting in jeopardy utilities and the River Road pavement. The City remediated the property to the River Road ROW and no further remediation or removal of impacted soils could take place.

Wells were installed knowing that groundwater would be impacted and that groundwater test results could be above groundwater standards as reported in 2015, 2016, 2017, and 2018 Periodic Review. Groundwater Monitoring and Sampling Annual Reporting detected a number of VOCs in groundwater equal to or exceeding the groundwater standard. As reported, local groundwater movement at the site is toward the Niagara River and the City's combined interceptor River Road sewer. This sewer should act as an interceptor of groundwater ultimately discharging to the City's WWTP and current carbon treatment.

The site was remediated to the extent practically possible. The remaining impacted soils appear to be located at and under the River Road ROW, which is not City property. The impacted groundwater is the result of the presence of impacted soils located at the River Road ROW.

No future abatement is proposed at this time since impacted soils are not located on formerly City-owned property.

Appendices

Appendix A
Groundwater Sampling Field Logs

GHD INC.
GROUNDWATER FIELD SAMPLING RECORD

SITE 815 River Road DATE 03/21/19

Sampler: Dave Rowlinson SAMPLE ID MW-1 (Nearest to Driveway)

Depth of well (from top of casing).....	14.33 ft	EL	562.71
Initial static water level (from top of casing)....	3.7 ft	EL	573.3
Top of PVC Casing Elevation	577.04		

Evacuation Method:

Peristaltic		Centrifugal		1 in. casing:		ft. of water x .09 =	gallons
Airlift		Pos. Displ.		2 in. casing:	10.6	ft. of water x .16 =	1.70 gallons
Bailer	X	>>> No. of bails		3 in. casing:		ft. of water x .36 =	gallons

Well Volume Calculation

Volume of water removed 5.10 gals.

> 3 volumes: **yes** no

dry: yes **no**

Field Tests:

Temp:	6.8	C
pH	6.1	
Conductivity	3.28	mS/cm
DO	5.04	mg/L
Turbidity	276	NTUs
Oxidation Reduction Potential (ORP)	-17	mV

Sampling: Time: 11:30 AM

Sampling Method:

Peristaltic Pump	
Disposable Bailer	X
Disposable Tubing	

Observations:

Weather/Temperature:

Physical Appearance and Odor of Sample: Slight chemical odor; clear then grayish color, turbid.

Comments: Well pad is intact and the stickup protective cover is in good condition.

GHD INC.
GROUNDWATER FIELD SAMPLING RECORD

SITE 815 River Road DATE 03/21/19

Sampler: Dave Rowlinson SAMPLE ID MW-2

Depth of well (from top of casing).....	14.33 ft	EL	562.71
Initial static water level (from top of casing)....	4.5 ft	EL	572.5
Top of PVC Casing Elevation	577.04		

Evacuation Method:

Peristaltic		Centrifugal		1 in. casing:		ft. of water x .09 =	gallons
Airlift		Pos. Displ.		2 in. casing:	9.8	ft. of water x .16 =	1.57 gallons
Bailer	X	>>> No. of bails		3 in. casing:		ft. of water x .36 =	gallons

Well Volume Calculation

Volume of water removed 4.72 gals.

> 3 volumes: **yes** no

dry: yes **no**

Field Tests:

Temp:	6.5	C
pH	6.28	
Conductivity	2.97	mS/cm
DO	4.24	mg/L
Turbidity	254	NTUs
Oxidation Reduction Potential (ORP)	-82	mV

Sampling: Time: 12:30 PM

Sampling Method:

Peristaltic Pump	
Disposable Bailer	X
Disposable Tubing	

Observations:

Weather/Temperature:

Physical Appearance and Odor of Sample: Distinct chemical odor; clear then grey color, very turbid

Comments: Well pad is intact and the stickup protective cover is in good condition.

Appendix B
Analytical Test Results

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

April 01, 2019

GHD

Sample Delivery Group:	L1081324
Samples Received:	03/22/2019
Project Number:	11110868-400
Description:	815 River Road Site
Site:	N. TONAWANDA, NY
Report To:	Mr. Dave Rowlinson 285 Delaware Ave. Suite 500 Buffalo, NY 14202

Entire Report Reviewed By:

T. Alan Harvill
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace National is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

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MW-1 L1081324-01 GW

Collected by: D. Rowlinson | Collected date/time: 03/21/19 11:30 | Received date/time: 03/22/19 08:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1255298	1	03/26/19 18:51	03/26/19 18:51	JCP	Mt. Juliet, TN

MW-2 L1081324-02 GW

Collected by: D. Rowlinson | Collected date/time: 03/21/19 12:30 | Received date/time: 03/22/19 08:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1255298	1	03/26/19 19:11	03/26/19 19:11	JCP	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1257326	50	03/29/19 15:19	03/29/19 15:19	ADM	Mt. Juliet, TN

FD @ MW-1 L1081324-03 GW

Collected by: D. Rowlinson | Collected date/time: 03/21/19 11:30 | Received date/time: 03/22/19 08:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1255298	1	03/26/19 19:30	03/26/19 19:30	JCP	Mt. Juliet, TN

TRIP BLANK L1081324-04 GW

Collected by: D. Rowlinson | Collected date/time: 03/21/19 00:00 | Received date/time: 03/22/19 08:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1255298	1	03/26/19 16:35	03/26/19 16:35	JCP	Mt. Juliet, TN

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

T. Alan Harvill
Project Manager

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Acetone	U		10.0	50.0	1	03/26/2019 18:51	WG1255298
Benzene	U		0.331	1.00	1	03/26/2019 18:51	WG1255298
Bromochloromethane	U		0.520	1.00	1	03/26/2019 18:51	WG1255298
Bromodichloromethane	U		0.380	1.00	1	03/26/2019 18:51	WG1255298
Bromoform	U		0.469	1.00	1	03/26/2019 18:51	WG1255298
Bromomethane	U		0.866	5.00	1	03/26/2019 18:51	WG1255298
Carbon disulfide	U		0.275	1.00	1	03/26/2019 18:51	WG1255298
Carbon tetrachloride	U		0.379	1.00	1	03/26/2019 18:51	WG1255298
Chlorobenzene	U		0.348	1.00	1	03/26/2019 18:51	WG1255298
Chlorodibromomethane	U		0.327	1.00	1	03/26/2019 18:51	WG1255298
Chloroethane	U		0.453	5.00	1	03/26/2019 18:51	WG1255298
Chloroform	U		0.324	5.00	1	03/26/2019 18:51	WG1255298
Chloromethane	U		0.276	2.50	1	03/26/2019 18:51	WG1255298
Cyclohexane	39.1		0.390	1.00	1	03/26/2019 18:51	WG1255298
1,2-Dibromo-3-Chloropropane	U		1.33	5.00	1	03/26/2019 18:51	WG1255298
1,2-Dibromoethane	U		0.381	1.00	1	03/26/2019 18:51	WG1255298
1,2-Dichlorobenzene	U		0.349	1.00	1	03/26/2019 18:51	WG1255298
1,3-Dichlorobenzene	U		0.220	1.00	1	03/26/2019 18:51	WG1255298
1,4-Dichlorobenzene	U		0.274	1.00	1	03/26/2019 18:51	WG1255298
Dichlorodifluoromethane	U		0.551	5.00	1	03/26/2019 18:51	WG1255298
1,1-Dichloroethane	U		0.259	1.00	1	03/26/2019 18:51	WG1255298
1,2-Dichloroethane	U		0.361	1.00	1	03/26/2019 18:51	WG1255298
1,1-Dichloroethene	U		0.398	1.00	1	03/26/2019 18:51	WG1255298
cis-1,2-Dichloroethene	U		0.260	1.00	1	03/26/2019 18:51	WG1255298
trans-1,2-Dichloroethene	U		0.396	1.00	1	03/26/2019 18:51	WG1255298
1,2-Dichloropropane	U		0.306	1.00	1	03/26/2019 18:51	WG1255298
cis-1,3-Dichloropropene	U		0.418	1.00	1	03/26/2019 18:51	WG1255298
trans-1,3-Dichloropropene	U		0.419	1.00	1	03/26/2019 18:51	WG1255298
Ethylbenzene	11.1		0.384	1.00	1	03/26/2019 18:51	WG1255298
2-Hexanone	U		3.82	10.0	1	03/26/2019 18:51	WG1255298
Isopropylbenzene	19.2		0.326	1.00	1	03/26/2019 18:51	WG1255298
2-Butanone (MEK)	U		3.93	10.0	1	03/26/2019 18:51	WG1255298
Methyl Acetate	U		4.30	20.0	1	03/26/2019 18:51	WG1255298
Methyl Cyclohexane	U		0.380	1.00	1	03/26/2019 18:51	WG1255298
Methylene Chloride	U		1.00	5.00	1	03/26/2019 18:51	WG1255298
4-Methyl-2-pentanone (MIBK)	U		2.14	10.0	1	03/26/2019 18:51	WG1255298
Methyl tert-butyl ether	U		0.367	1.00	1	03/26/2019 18:51	WG1255298
Styrene	U		0.307	1.00	1	03/26/2019 18:51	WG1255298
1,1,2,2-Tetrachloroethane	U		0.130	1.00	1	03/26/2019 18:51	WG1255298
Tetrachloroethene	U		0.372	1.00	1	03/26/2019 18:51	WG1255298
Toluene	U		0.412	1.00	1	03/26/2019 18:51	WG1255298
1,2,3-Trichlorobenzene	U		0.230	1.00	1	03/26/2019 18:51	WG1255298
1,2,4-Trichlorobenzene	U		0.355	1.00	1	03/26/2019 18:51	WG1255298
1,1,1-Trichloroethane	U		0.319	1.00	1	03/26/2019 18:51	WG1255298
1,1,2-Trichloroethane	U		0.383	1.00	1	03/26/2019 18:51	WG1255298
Trichloroethene	U		0.398	1.00	1	03/26/2019 18:51	WG1255298
Trichlorofluoromethane	U		1.20	5.00	1	03/26/2019 18:51	WG1255298
1,1,2-Trichlorotrifluoroethane	U		0.303	1.00	1	03/26/2019 18:51	WG1255298
Vinyl chloride	U		0.259	1.00	1	03/26/2019 18:51	WG1255298
Xylenes, Total	4.91		1.06	3.00	1	03/26/2019 18:51	WG1255298
(S) Toluene-d8	*112*			*80.0-120*		*03/26/2019 18:51*	WG1255298
(S) a,a,a-Trifluorotoluene	*78.3*	J2		*80.0-120*		*03/26/2019 18:51*	WG1255298
(S) 4-Bromofluorobenzene	*113*			*77.0-126*		*03/26/2019 18:51*	WG1255298
(S) 1,2-Dichloroethane-d4	*109*			*70.0-130*		*03/26/2019 18:51*	WG1255298

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Acetone	U		500	2500	50	03/29/2019 15:19	WG1257326
Benzene	269		16.6	50.0	50	03/29/2019 15:19	WG1257326
Bromochloromethane	U		26.0	50.0	50	03/29/2019 15:19	WG1257326
Bromodichloromethane	U		19.0	50.0	50	03/29/2019 15:19	WG1257326
Bromoform	U		0.469	1.00	1	03/26/2019 19:11	WG1255298
Bromomethane	U		43.3	250	50	03/29/2019 15:19	WG1257326
Carbon disulfide	U		13.8	50.0	50	03/29/2019 15:19	WG1257326
Carbon tetrachloride	U		19.0	50.0	50	03/29/2019 15:19	WG1257326
Chlorobenzene	U		0.348	1.00	1	03/26/2019 19:11	WG1255298
Chlorodibromomethane	U		0.327	1.00	1	03/26/2019 19:11	WG1255298
Chloroethane	U		22.6	250	50	03/29/2019 15:19	WG1257326
Chloroform	U		16.2	250	50	03/29/2019 15:19	WG1257326
Chloromethane	U		13.8	125	50	03/29/2019 15:19	WG1257326
Cyclohexane	336		19.5	50.0	50	03/29/2019 15:19	WG1257326
1,2-Dibromo-3-Chloropropane	U		1.33	5.00	1	03/26/2019 19:11	WG1255298
1,2-Dibromoethane	U		0.381	1.00	1	03/26/2019 19:11	WG1255298
1,2-Dichlorobenzene	U		0.349	1.00	1	03/26/2019 19:11	WG1255298
1,3-Dichlorobenzene	U		0.220	1.00	1	03/26/2019 19:11	WG1255298
1,4-Dichlorobenzene	U		0.274	1.00	1	03/26/2019 19:11	WG1255298
Dichlorodifluoromethane	U		27.6	250	50	03/29/2019 15:19	WG1257326
1,1-Dichloroethane	U		13.0	50.0	50	03/29/2019 15:19	WG1257326
1,2-Dichloroethane	U		18.0	50.0	50	03/29/2019 15:19	WG1257326
1,1-Dichloroethene	U		19.9	50.0	50	03/29/2019 15:19	WG1257326
cis-1,2-Dichloroethene	U		13.0	50.0	50	03/29/2019 15:19	WG1257326
trans-1,2-Dichloroethene	U		19.8	50.0	50	03/29/2019 15:19	WG1257326
1,2-Dichloropropane	U		15.3	50.0	50	03/29/2019 15:19	WG1257326
cis-1,3-Dichloropropene	U		20.9	50.0	50	03/29/2019 15:19	WG1257326
trans-1,3-Dichloropropene	U		0.419	1.00	1	03/26/2019 19:11	WG1255298
Ethylbenzene	2000		19.2	50.0	50	03/29/2019 15:19	WG1257326
2-Hexanone	U		3.82	10.0	1	03/26/2019 19:11	WG1255298
Isopropylbenzene	237		16.3	50.0	50	03/29/2019 15:19	WG1257326
2-Butanone (MEK)	U		196	500	50	03/29/2019 15:19	WG1257326
Methyl Acetate	U		215	1000	50	03/29/2019 15:19	WG1257326
Methyl Cyclohexane	U		19.0	50.0	50	03/29/2019 15:19	WG1257326
Methylene Chloride	U		50.0	250	50	03/29/2019 15:19	WG1257326
4-Methyl-2-pentanone (MIBK)	U		2.14	10.0	1	03/26/2019 19:11	WG1255298
Methyl tert-butyl ether	U		18.4	50.0	50	03/29/2019 15:19	WG1257326
Styrene	U		0.307	1.00	1	03/26/2019 19:11	WG1255298
1,1,2,2-Tetrachloroethane	U		0.130	1.00	1	03/26/2019 19:11	WG1255298
Tetrachloroethene	U		0.372	1.00	1	03/26/2019 19:11	WG1255298
Toluene	42.7		0.412	1.00	1	03/26/2019 19:11	WG1255298
1,2,3-Trichlorobenzene	U		0.230	1.00	1	03/26/2019 19:11	WG1255298
1,2,4-Trichlorobenzene	U		0.355	1.00	1	03/26/2019 19:11	WG1255298
1,1,1-Trichloroethane	U		16.0	50.0	50	03/29/2019 15:19	WG1257326
1,1,2-Trichloroethane	U		0.383	1.00	1	03/26/2019 19:11	WG1255298
Trichloroethene	U		19.9	50.0	50	03/29/2019 15:19	WG1257326
Trichlorofluoromethane	U		60.0	250	50	03/29/2019 15:19	WG1257326
1,1,2-Trichlorotrifluoroethane	U		15.2	50.0	50	03/29/2019 15:19	WG1257326
Vinyl chloride	U		13.0	50.0	50	03/29/2019 15:19	WG1257326
Xylenes, Total	655		53.0	150	50	03/29/2019 15:19	WG1257326
(S) Toluene-d8	*87.9*			*80.0-120*		*03/26/2019 19:11*	WG1255298
(S) Toluene-d8	*98.1*			*80.0-120*		*03/29/2019 15:19*	WG1257326
(S) a,a,a-Trifluorotoluene	*39.7*	J2		*80.0-120*		*03/26/2019 19:11*	WG1255298
(S) a,a,a-Trifluorotoluene	*92.8*			*80.0-120*		*03/29/2019 15:19*	WG1257326
(S) 4-Bromofluorobenzene	*82.9*			*77.0-126*		*03/26/2019 19:11*	WG1255298
(S) 4-Bromofluorobenzene	*94.1*			*77.0-126*		*03/29/2019 15:19*	WG1257326

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
(S) 1,2-Dichloroethane-d4	*113*			*70.0-130*		*03/26/2019 19:11*	WG1255298
(S) 1,2-Dichloroethane-d4	*112*			*70.0-130*		*03/29/2019 15:19*	WG1257326

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Acetone	U		10.0	50.0	1	03/26/2019 19:30	WG1255298
Benzene	U		0.331	1.00	1	03/26/2019 19:30	WG1255298
Bromochloromethane	U		0.520	1.00	1	03/26/2019 19:30	WG1255298
Bromodichloromethane	U		0.380	1.00	1	03/26/2019 19:30	WG1255298
Bromoform	U		0.469	1.00	1	03/26/2019 19:30	WG1255298
Bromomethane	U		0.866	5.00	1	03/26/2019 19:30	WG1255298
Carbon disulfide	U		0.275	1.00	1	03/26/2019 19:30	WG1255298
Carbon tetrachloride	U		0.379	1.00	1	03/26/2019 19:30	WG1255298
Chlorobenzene	U		0.348	1.00	1	03/26/2019 19:30	WG1255298
Chlorodibromomethane	U		0.327	1.00	1	03/26/2019 19:30	WG1255298
Chloroethane	U		0.453	5.00	1	03/26/2019 19:30	WG1255298
Chloroform	U		0.324	5.00	1	03/26/2019 19:30	WG1255298
Chloromethane	U		0.276	2.50	1	03/26/2019 19:30	WG1255298
Cyclohexane	44.2		0.390	1.00	1	03/26/2019 19:30	WG1255298
1,2-Dibromo-3-Chloropropane	U		1.33	5.00	1	03/26/2019 19:30	WG1255298
1,2-Dibromoethane	U		0.381	1.00	1	03/26/2019 19:30	WG1255298
1,2-Dichlorobenzene	U		0.349	1.00	1	03/26/2019 19:30	WG1255298
1,3-Dichlorobenzene	U		0.220	1.00	1	03/26/2019 19:30	WG1255298
1,4-Dichlorobenzene	U		0.274	1.00	1	03/26/2019 19:30	WG1255298
Dichlorodifluoromethane	U		0.551	5.00	1	03/26/2019 19:30	WG1255298
1,1-Dichloroethane	U		0.259	1.00	1	03/26/2019 19:30	WG1255298
1,2-Dichloroethane	U		0.361	1.00	1	03/26/2019 19:30	WG1255298
1,1-Dichloroethene	U		0.398	1.00	1	03/26/2019 19:30	WG1255298
cis-1,2-Dichloroethene	U		0.260	1.00	1	03/26/2019 19:30	WG1255298
trans-1,2-Dichloroethene	U		0.396	1.00	1	03/26/2019 19:30	WG1255298
1,2-Dichloropropane	U		0.306	1.00	1	03/26/2019 19:30	WG1255298
cis-1,3-Dichloropropene	U		0.418	1.00	1	03/26/2019 19:30	WG1255298
trans-1,3-Dichloropropene	U		0.419	1.00	1	03/26/2019 19:30	WG1255298
Ethylbenzene	10.5		0.384	1.00	1	03/26/2019 19:30	WG1255298
2-Hexanone	U		3.82	10.0	1	03/26/2019 19:30	WG1255298
Isopropylbenzene	15.4		0.326	1.00	1	03/26/2019 19:30	WG1255298
2-Butanone (MEK)	U		3.93	10.0	1	03/26/2019 19:30	WG1255298
Methyl Acetate	U		4.30	20.0	1	03/26/2019 19:30	WG1255298
Methyl Cyclohexane	U		0.380	1.00	1	03/26/2019 19:30	WG1255298
Methylene Chloride	U		1.00	5.00	1	03/26/2019 19:30	WG1255298
4-Methyl-2-pentanone (MIBK)	U		2.14	10.0	1	03/26/2019 19:30	WG1255298
Methyl tert-butyl ether	U		0.367	1.00	1	03/26/2019 19:30	WG1255298
Styrene	U		0.307	1.00	1	03/26/2019 19:30	WG1255298
1,1,2,2-Tetrachloroethane	U		0.130	1.00	1	03/26/2019 19:30	WG1255298
Tetrachloroethene	U		0.372	1.00	1	03/26/2019 19:30	WG1255298
Toluene	U		0.412	1.00	1	03/26/2019 19:30	WG1255298
1,2,3-Trichlorobenzene	U		0.230	1.00	1	03/26/2019 19:30	WG1255298
1,2,4-Trichlorobenzene	U		0.355	1.00	1	03/26/2019 19:30	WG1255298
1,1,1-Trichloroethane	U		0.319	1.00	1	03/26/2019 19:30	WG1255298
1,1,2-Trichloroethane	8.30		0.383	1.00	1	03/26/2019 19:30	WG1255298
Trichloroethene	U		0.398	1.00	1	03/26/2019 19:30	WG1255298
Trichlorofluoromethane	U		1.20	5.00	1	03/26/2019 19:30	WG1255298
1,1,2-Trichlorotrifluoroethane	U		0.303	1.00	1	03/26/2019 19:30	WG1255298
Vinyl chloride	U		0.259	1.00	1	03/26/2019 19:30	WG1255298
Xylenes, Total	5.42		1.06	3.00	1	03/26/2019 19:30	WG1255298
(S) Toluene-d8	*111*			*80.0-120*		*03/26/2019 19:30*	WG1255298
(S) a,a,a-Trifluorotoluene	*76.3*	J2		*80.0-120*		*03/26/2019 19:30*	WG1255298
(S) 4-Bromofluorobenzene	*118*			*77.0-126*		*03/26/2019 19:30*	WG1255298
(S) 1,2-Dichloroethane-d4	*108*			*70.0-130*		*03/26/2019 19:30*	WG1255298

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Acetone	U		10.0	50.0	1	03/26/2019 16:35	WG1255298
Benzene	U		0.331	1.00	1	03/26/2019 16:35	WG1255298
Bromochloromethane	U		0.520	1.00	1	03/26/2019 16:35	WG1255298
Bromodichloromethane	U		0.380	1.00	1	03/26/2019 16:35	WG1255298
Bromoform	U		0.469	1.00	1	03/26/2019 16:35	WG1255298
Bromomethane	U		0.866	5.00	1	03/26/2019 16:35	WG1255298
Carbon disulfide	U		0.275	1.00	1	03/26/2019 16:35	WG1255298
Carbon tetrachloride	U		0.379	1.00	1	03/26/2019 16:35	WG1255298
Chlorobenzene	U		0.348	1.00	1	03/26/2019 16:35	WG1255298
Chlorodibromomethane	U		0.327	1.00	1	03/26/2019 16:35	WG1255298
Chloroethane	U		0.453	5.00	1	03/26/2019 16:35	WG1255298
Chloroform	U		0.324	5.00	1	03/26/2019 16:35	WG1255298
Chloromethane	U		0.276	2.50	1	03/26/2019 16:35	WG1255298
Cyclohexane	U		0.390	1.00	1	03/26/2019 16:35	WG1255298
1,2-Dibromo-3-Chloropropane	U		1.33	5.00	1	03/26/2019 16:35	WG1255298
1,2-Dibromoethane	U		0.381	1.00	1	03/26/2019 16:35	WG1255298
1,2-Dichlorobenzene	U		0.349	1.00	1	03/26/2019 16:35	WG1255298
1,3-Dichlorobenzene	U		0.220	1.00	1	03/26/2019 16:35	WG1255298
1,4-Dichlorobenzene	U		0.274	1.00	1	03/26/2019 16:35	WG1255298
Dichlorodifluoromethane	U		0.551	5.00	1	03/26/2019 16:35	WG1255298
1,1-Dichloroethane	U		0.259	1.00	1	03/26/2019 16:35	WG1255298
1,2-Dichloroethane	U		0.361	1.00	1	03/26/2019 16:35	WG1255298
1,1-Dichloroethene	U		0.398	1.00	1	03/26/2019 16:35	WG1255298
cis-1,2-Dichloroethene	U		0.260	1.00	1	03/26/2019 16:35	WG1255298
trans-1,2-Dichloroethene	U		0.396	1.00	1	03/26/2019 16:35	WG1255298
1,2-Dichloropropane	U		0.306	1.00	1	03/26/2019 16:35	WG1255298
cis-1,3-Dichloropropene	U		0.418	1.00	1	03/26/2019 16:35	WG1255298
trans-1,3-Dichloropropene	U		0.419	1.00	1	03/26/2019 16:35	WG1255298
Ethylbenzene	U		0.384	1.00	1	03/26/2019 16:35	WG1255298
2-Hexanone	U		3.82	10.0	1	03/26/2019 16:35	WG1255298
Isopropylbenzene	U		0.326	1.00	1	03/26/2019 16:35	WG1255298
2-Butanone (MEK)	U		3.93	10.0	1	03/26/2019 16:35	WG1255298
Methyl Acetate	U		4.30	20.0	1	03/26/2019 16:35	WG1255298
Methyl Cyclohexane	U		0.380	1.00	1	03/26/2019 16:35	WG1255298
Methylene Chloride	U		1.00	5.00	1	03/26/2019 16:35	WG1255298
4-Methyl-2-pentanone (MIBK)	U		2.14	10.0	1	03/26/2019 16:35	WG1255298
Methyl tert-butyl ether	U		0.367	1.00	1	03/26/2019 16:35	WG1255298
Styrene	U		0.307	1.00	1	03/26/2019 16:35	WG1255298
1,1,2,2-Tetrachloroethane	U		0.130	1.00	1	03/26/2019 16:35	WG1255298
Tetrachloroethene	U		0.372	1.00	1	03/26/2019 16:35	WG1255298
Toluene	U		0.412	1.00	1	03/26/2019 16:35	WG1255298
1,2,3-Trichlorobenzene	U		0.230	1.00	1	03/26/2019 16:35	WG1255298
1,2,4-Trichlorobenzene	U		0.355	1.00	1	03/26/2019 16:35	WG1255298
1,1,1-Trichloroethane	U		0.319	1.00	1	03/26/2019 16:35	WG1255298
1,1,2-Trichloroethane	U		0.383	1.00	1	03/26/2019 16:35	WG1255298
Trichloroethene	U		0.398	1.00	1	03/26/2019 16:35	WG1255298
Trichlorofluoromethane	U		1.20	5.00	1	03/26/2019 16:35	WG1255298
1,1,2-Trichlorotrifluoroethane	U		0.303	1.00	1	03/26/2019 16:35	WG1255298
Vinyl chloride	U		0.259	1.00	1	03/26/2019 16:35	WG1255298
Xylenes, Total	U		1.06	3.00	1	03/26/2019 16:35	WG1255298
(S) Toluene-d8	*99.4*			*80.0-120*		*03/26/2019 16:35*	WG1255298
(S) a,a,a-Trifluorotoluene	*96.7*			*80.0-120*		*03/26/2019 16:35*	WG1255298
(S) 4-Bromofluorobenzene	*94.8*			*77.0-126*		*03/26/2019 16:35*	WG1255298
(S) 1,2-Dichloroethane-d4	*108*			*70.0-130*		*03/26/2019 16:35*	WG1255298

Method Blank (MB)

(MB) R3395975-4 03/26/19 16:09

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Acetone	U		10.0	50.0
Benzene	U		0.331	1.00
Bromodichloromethane	U		0.380	1.00
Bromochloromethane	U		0.520	1.00
Bromoform	U		0.469	1.00
Bromomethane	U		0.866	5.00
Carbon disulfide	U		0.275	1.00
Carbon tetrachloride	U		0.379	1.00
Chlorobenzene	U		0.348	1.00
Chlorodibromomethane	U		0.327	1.00
Chloroethane	U		0.453	5.00
Chloroform	U		0.324	5.00
Chloromethane	U		0.276	2.50
Cyclohexane	U		0.390	1.00
1,2-Dibromo-3-Chloropropane	U		1.33	5.00
1,2-Dibromoethane	U		0.381	1.00
1,2-Dichlorobenzene	U		0.349	1.00
1,3-Dichlorobenzene	U		0.220	1.00
1,4-Dichlorobenzene	U		0.274	1.00
Dichlorodifluoromethane	U		0.551	5.00
1,1-Dichloroethane	U		0.259	1.00
1,2-Dichloroethane	U		0.361	1.00
cis-1,2-Dichloroethene	U		0.260	1.00
1,1-Dichloroethene	U		0.398	1.00
trans-1,2-Dichloroethene	U		0.396	1.00
1,2-Dichloropropane	U		0.306	1.00
cis-1,3-Dichloropropene	U		0.418	1.00
trans-1,3-Dichloropropene	U		0.419	1.00
Ethylbenzene	U		0.384	1.00
2-Hexanone	U		3.82	10.0
Isopropylbenzene	U		0.326	1.00
2-Butanone (MEK)	U		3.93	10.0
Methyl Acetate	U		4.30	20.0
Methyl Cyclohexane	U		0.380	1.00
Methylene Chloride	U		1.00	5.00
4-Methyl-2-pentanone (MIBK)	U		2.14	10.0
Methyl tert-butyl ether	U		0.367	1.00
Styrene	U		0.307	1.00
1,1,2,2-Tetrachloroethane	U		0.130	1.00
Toluene	U		0.412	1.00

Method Blank (MB)

(MB) R3395975-4 03/26/19 16:09

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
1,1,2-Trichlorotrifluoroethane	U		0.303	1.00
1,2,3-Trichlorobenzene	U		0.230	1.00
1,2,4-Trichlorobenzene	U		0.355	1.00
Tetrachloroethene	U		0.372	1.00
1,1,2-Trichloroethane	U		0.383	1.00
Trichlorofluoromethane	U		1.20	5.00
1,1,1-Trichloroethane	U		0.319	1.00
Trichloroethene	U		0.398	1.00
Vinyl chloride	U		0.259	1.00
Xylenes, Total	U		1.06	3.00
(S) a,a,a-Trifluorotoluene	*98.0*			*80.0-120*
(S) Toluene-d8	*99.1*			*80.0-120*
(S) 4-Bromofluorobenzene	*94.3*			*77.0-126*
(S) 1,2-Dichloroethane-d4	*106*			*70.0-130*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3395975-1 03/26/19 14:17 • (LCSD) R3395975-2 03/26/19 14:51

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Acetone	125	148	145	118	116	19.0-160			1.70	27
Benzene	25.0	25.2	24.4	101	97.5	70.0-123			3.42	20
Bromodichloromethane	25.0	25.0	24.3	100	97.1	75.0-120			2.95	20
Bromochloromethane	25.0	26.4	25.2	105	101	76.0-122			4.46	20
Bromoform	25.0	24.9	26.1	99.6	104	68.0-132			4.72	20
Bromomethane	25.0	23.7	23.2	95.0	93.0	10.0-160			2.09	25
Carbon disulfide	25.0	24.2	23.3	96.7	93.3	61.0-128			3.56	20
Carbon tetrachloride	25.0	28.2	27.2	113	109	68.0-126			3.62	20
Chlorobenzene	25.0	26.1	26.0	104	104	80.0-121			0.290	20
Chlorodibromomethane	25.0	25.5	26.7	102	107	77.0-125			4.53	20
Chloroethane	25.0	24.4	23.8	97.7	95.2	47.0-150			2.57	20
Chloroform	25.0	25.7	25.0	103	100	73.0-120			2.83	20
Chloromethane	25.0	26.3	25.5	105	102	41.0-142			3.17	20
Cyclohexane	25.0	25.7	24.7	103	98.7	71.0-124			3.99	20
1,2-Dibromo-3-Chloropropane	25.0	23.2	25.4	93.0	101	58.0-134			8.77	20
1,2-Dibromoethane	25.0	26.4	26.7	106	107	80.0-122			1.16	20
1,2-Dichlorobenzene	25.0	25.4	26.6	101	106	79.0-121			4.60	20
1,3-Dichlorobenzene	25.0	24.6	25.9	98.4	104	79.0-120			5.17	20
1,4-Dichlorobenzene	25.0	25.1	26.1	100	104	79.0-120			3.97	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3395975-1 03/26/19 14:17 • (LCSD) R3395975-2 03/26/19 14:51

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Dichlorodifluoromethane	25.0	28.1	27.5	112	110	51.0-149			2.13	20
cis-1,2-Dichloroethene	25.0	25.1	24.7	100	98.7	73.0-120			1.70	20
trans-1,2-Dichloroethene	25.0	26.6	25.8	107	103	73.0-120			3.17	20
1,2-Dichloropropane	25.0	27.0	26.3	108	105	77.0-125			2.56	20
cis-1,3-Dichloropropene	25.0	26.0	25.4	104	101	80.0-123			2.59	20
trans-1,3-Dichloropropene	25.0	26.6	27.2	106	109	78.0-124			2.37	20
Ethylbenzene	25.0	26.7	26.6	107	106	79.0-123			0.501	20
2-Hexanone	125	141	145	113	116	67.0-149			2.52	20
1,1-Dichloroethane	25.0	26.8	25.9	107	104	70.0-126			3.39	20
1,2-Dichloroethane	25.0	27.0	26.2	108	105	70.0-128			2.98	20
Isopropylbenzene	25.0	26.0	25.8	104	103	76.0-127			0.796	20
1,1-Dichloroethene	25.0	25.3	24.6	101	98.6	71.0-124			2.57	20
2-Butanone (MEK)	125	149	146	119	117	44.0-160			1.80	20
Methyl Acetate	125	144	143	115	114	57.0-148			0.743	20
Methyl Cyclohexane	25.0	24.3	22.4	97.4	89.7	68.0-126			8.19	20
Methylene Chloride	25.0	25.6	25.1	102	100	67.0-120			2.22	20
4-Methyl-2-pentanone (MIBK)	125	142	146	114	117	68.0-142			3.06	20
Methyl tert-butyl ether	25.0	24.7	24.6	98.7	98.4	68.0-125			0.328	20
Styrene	25.0	26.4	26.3	106	105	73.0-130			0.500	20
1,1,2,2-Tetrachloroethane	25.0	25.6	27.4	102	110	65.0-130			7.13	20
Toluene	25.0	24.4	24.9	97.5	99.7	79.0-120			2.20	20
1,1,2-Trichlorotrifluoroethane	25.0	27.0	26.0	108	104	69.0-132			3.77	20
1,2,3-Trichlorobenzene	25.0	23.9	24.5	95.7	97.9	50.0-138			2.23	20
1,2,4-Trichlorobenzene	25.0	25.1	25.0	100	100	57.0-137			0.219	20
1,1,2-Trichloroethane	25.0	24.8	25.6	99.2	102	80.0-120			2.99	20
Trichlorofluoromethane	25.0	26.7	26.0	107	104	59.0-147			2.92	20
Vinyl chloride	25.0	26.5	25.6	106	103	67.0-131			3.17	20
Xylenes, Total	75.0	76.7	77.2	102	103	79.0-123			0.650	20
Tetrachloroethene	25.0	26.1	26.4	104	106	72.0-132			1.08	20
1,1,1-Trichloroethane	25.0	27.2	26.1	109	104	73.0-124			4.07	20
Trichloroethene	25.0	24.7	24.1	98.9	96.5	78.0-124			2.44	20
(S) a,a,a-Trifluorotoluene				*96.1*	*97.9*	*80.0-120*				
(S) Toluene-d8				*99.1*	*103*	*80.0-120*				
(S) 4-Bromofluorobenzene				*95.9*	*96.1*	*77.0-126*				
(S) 1,2-Dichloroethane-d4				*107*	*106*	*70.0-130*				

L1081324-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1081324-02 03/26/19 19:11 • (MS) R3395975-5 03/26/19 23:07 • (MSD) R3395975-6 03/26/19 23:27

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Acetone	125	U	291	285	233	228	1	10.0-160	J5	J5	1.83	35
Benzene	25.0	101	107	111	25.4	39.9	1	17.0-158			3.33	27
Bromodichloromethane	25.0	U	10.6	12.1	42.4	48.3	1	31.0-150			12.9	27
Bromochloromethane	25.0	U	11.0	12.8	43.9	51.0	1	38.0-142			15.1	26
Bromoform	25.0	U	19.9	21.8	79.6	87.1	1	29.0-150			8.95	29
Bromomethane	25.0	U	10.4	12.0	41.7	47.9	1	10.0-160			13.9	38
Carbon disulfide	25.0	U	10.1	11.2	40.4	44.9	1	10.0-156			10.6	28
Carbon tetrachloride	25.0	U	11.3	12.9	45.1	51.5	1	23.0-159			13.4	28
Chlorobenzene	25.0	U	21.6	23.2	86.6	92.9	1	33.0-152			7.09	27
Chlorodibromomethane	25.0	U	22.6	24.3	90.4	97.4	1	37.0-149			7.40	27
Chloroethane	25.0	U	10.6	12.1	42.5	48.5	1	10.0-160			13.2	30
Chloroform	25.0	U	17.2	19.9	68.7	79.8	1	29.0-154			14.9	28
Chloromethane	25.0	U	19.1	20.3	76.4	81.0	1	10.0-160			5.86	29
Cyclohexane	25.0	146	151	152	21.1	24.4	1	19.0-160			0.544	23
1,2-Dibromo-3-Chloropropane	25.0	U	22.4	24.0	89.5	96.0	1	22.0-151			7.04	34
1,2-Dibromoethane	25.0	U	23.3	24.7	93.2	98.9	1	34.0-147			5.89	27
1,2-Dichlorobenzene	25.0	U	25.7	27.3	103	109	1	34.0-149			5.71	28
1,3-Dichlorobenzene	25.0	U	24.7	26.9	98.6	108	1	36.0-146			8.63	27
1,4-Dichlorobenzene	25.0	U	24.9	26.8	99.6	107	1	35.0-142			7.29	27
Dichlorodifluoromethane	25.0	U	14.2	15.0	56.9	60.0	1	10.0-160			5.44	29
cis-1,2-Dichloroethene	25.0	U	13.7	15.0	54.7	59.8	1	10.0-160			8.88	27
trans-1,2-Dichloroethene	25.0	U	11.4	12.9	45.5	51.7	1	17.0-153			12.7	27
1,2-Dichloropropane	25.0	U	13.3	15.0	53.2	60.2	1	30.0-156			12.3	27
cis-1,3-Dichloropropene	25.0	U	10.9	12.4	43.4	49.5	1	34.0-149			13.1	28
trans-1,3-Dichloropropene	25.0	U	22.4	24.3	89.6	97.2	1	32.0-149			8.12	28
Ethylbenzene	25.0	1570	1500	1340	0.000	0.000	1	30.0-155	E V	E V	10.8	27
2-Hexanone	125	U	123	129	98.8	103	1	21.0-160			4.34	29
Isopropylbenzene	25.0	204	209	190	20.6	0.000	1	28.0-157	E V	V	9.76	27
1,1-Dichloroethane	25.0	U	11.6	12.8	46.2	51.2	1	25.0-158			10.1	27
1,2-Dichloroethane	25.0	U	11.5	12.8	45.8	51.1	1	29.0-151			10.9	27
2-Butanone (MEK)	125	U	83.2	92.1	66.5	73.7	1	10.0-160			10.2	32
1,1-Dichloroethene	25.0	U	11.8	12.9	47.1	51.6	1	11.0-160			9.07	29
Methyl Acetate	125	U	55.3	57.4	44.2	45.9	1	18.0-151			3.71	30
Methyl Cyclohexane	25.0	U	60.4	57.7	242	231	1	11.0-160	J5	J5	4.53	24
Methylene Chloride	25.0	U	11.0	12.3	44.0	49.2	1	23.0-144			11.1	28
4-Methyl-2-pentanone (MIBK)	125	U	124	131	99.5	105	1	29.0-160			5.55	29
Methyl tert-butyl ether	25.0	U	9.95	10.6	39.8	42.5	1	28.0-150			6.41	29
Styrene	25.0	U	22.0	25.0	88.0	99.9	1	33.0-155			12.7	28
1,1,2,2-Tetrachloroethane	25.0	U	27.4	29.2	110	117	1	33.0-150			6.38	28
Toluene	25.0	42.7	62.7	61.3	80.3	74.5	1	26.0-154			2.33	28

L1081324-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1081324-02 03/26/19 19:11 • (MS) R3395975-5 03/26/19 23:07 • (MSD) R3395975-6 03/26/19 23:27

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
1,1,2-Trichlorotrifluoroethane	25.0	U	12.2	13.3	48.9	53.1	1	23.0-160			8.17	30
1,2,3-Trichlorobenzene	25.0	U	22.0	23.4	87.9	93.7	1	17.0-150			6.33	36
1,2,4-Trichlorobenzene	25.0	U	22.4	23.8	89.4	95.4	1	24.0-150			6.40	33
1,1,2-Trichloroethane	25.0	U	25.8	27.2	103	109	1	35.0-147			5.63	27
Trichlorofluoromethane	25.0	U	11.0	12.1	44.1	48.4	1	17.0-160			9.44	31
Vinyl chloride	25.0	U	12.1	13.7	48.3	54.9	1	10.0-160			12.7	27
Xylenes, Total	75.0	627	651	516	31.1	0.000	1	29.0-154	E V	E V	23.1	28
Tetrachloroethene	25.0	U	23.5	25.0	93.9	99.8	1	10.0-160			6.09	27
1,1,1-Trichloroethane	25.0	U	11.9	13.1	47.5	52.6	1	23.0-160			10.3	28
Trichloroethene	25.0	U	10.6	12.1	42.3	48.2	1	10.0-160			13.1	25
(S) a,a,a-Trifluorotoluene					*39.8*	*44.2*		*80.0-120*	J2	J2		
(S) Toluene-d8					*89.8*	*92.4*		*80.0-120*				
(S) 4-Bromofluorobenzene					*79.1*	*81.9*		*77.0-126*				
(S) 1,2-Dichloroethane-d4					*109*	*115*		*70.0-130*				

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3396681-4 03/29/19 09:26

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Acetone	U		10.0	50.0
Benzene	U		0.331	1.00
Bromodichloromethane	U		0.380	1.00
Bromochloromethane	U		0.520	1.00
Bromomethane	U		0.866	5.00
Carbon disulfide	U		0.275	1.00
Carbon tetrachloride	U		0.379	1.00
Chloroethane	U		0.453	5.00
Chloroform	U		0.324	5.00
Chloromethane	U		0.276	2.50
Cyclohexane	U		0.390	1.00
Dichlorodifluoromethane	U		0.551	5.00
1,1-Dichloroethane	U		0.259	1.00
1,2-Dichloroethane	U		0.361	1.00
1,1-Dichloroethene	U		0.398	1.00
cis-1,2-Dichloroethene	U		0.260	1.00
trans-1,2-Dichloroethene	U		0.396	1.00
1,2-Dichloropropane	U		0.306	1.00
cis-1,3-Dichloropropene	U		0.418	1.00
Ethylbenzene	U		0.384	1.00
Isopropylbenzene	U		0.326	1.00
2-Butanone (MEK)	U		3.93	10.0
Methyl Acetate	U		4.30	20.0
Methyl Cyclohexane	U		0.380	1.00
Methylene Chloride	U		1.00	5.00
Methyl tert-butyl ether	U		0.367	1.00
1,1,2-Trichlorotrifluoroethane	U		0.303	1.00
1,1,1-Trichloroethane	U		0.319	1.00
Trichloroethene	U		0.398	1.00
Trichlorofluoromethane	U		1.20	5.00
Vinyl chloride	U		0.259	1.00
Xylenes, Total	U		1.06	3.00
(S) Toluene-d8	*102*			*80.0-120*
(S) a,a,a-Trifluorotoluene	*95.0*			*80.0-120*
(S) 4-Bromofluorobenzene	*93.4*			*77.0-126*
(S) 1,2-Dichloroethane-d4	*104*			*70.0-130*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3396681-1 03/29/19 08:08 • (LCSD) R3396681-2 03/29/19 08:27

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Acetone	125	169	165	135	132	19.0-160			2.40	27
Benzene	25.0	26.1	26.0	104	104	70.0-123			0.583	20
Bromodichloromethane	25.0	26.9	26.8	108	107	75.0-120			0.325	20
Bromochloromethane	25.0	27.5	26.9	110	108	76.0-122			2.09	20
Bromomethane	25.0	22.6	22.6	90.4	90.4	10.0-160			0.0620	25
Carbon disulfide	25.0	21.3	20.9	85.1	83.6	61.0-128			1.72	20
Carbon tetrachloride	25.0	28.8	27.6	115	110	68.0-126			4.35	20
Chloroethane	25.0	24.5	23.3	97.9	93.4	47.0-150			4.77	20
Chloroform	25.0	27.2	26.8	109	107	73.0-120			1.43	20
Chloromethane	25.0	25.2	24.4	101	97.4	41.0-142			3.33	20
Cyclohexane	25.0	24.5	23.6	98.1	94.6	71.0-124			3.69	20
Dichlorodifluoromethane	25.0	24.9	24.4	99.7	97.7	51.0-149			2.08	20
1,1-Dichloroethane	25.0	28.2	27.9	113	112	70.0-126			0.957	20
1,2-Dichloroethane	25.0	27.9	27.7	111	111	70.0-128			0.482	20
1,1-Dichloroethene	25.0	25.2	24.7	101	98.9	71.0-124			1.78	20
cis-1,2-Dichloroethene	25.0	25.9	26.2	104	105	73.0-120			1.02	20
trans-1,2-Dichloroethene	25.0	27.1	26.3	108	105	73.0-120			2.82	20
1,2-Dichloropropane	25.0	28.4	28.3	113	113	77.0-125			0.277	20
cis-1,3-Dichloropropene	25.0	27.9	27.3	112	109	80.0-123			2.20	20
Ethylbenzene	25.0	27.9	28.1	112	112	79.0-123			0.686	20
Isopropylbenzene	25.0	27.5	27.1	110	109	76.0-127			1.46	20
2-Butanone (MEK)	125	161	159	129	127	44.0-160			1.24	20
Methyl Acetate	125	150	146	120	117	57.0-148			3.12	20
Methyl Cyclohexane	25.0	23.4	23.1	93.7	92.3	68.0-126			1.57	20
Methylene Chloride	25.0	27.2	26.5	109	106	67.0-120			2.66	20
Methyl tert-butyl ether	25.0	26.7	25.8	107	103	68.0-125			3.44	20
1,1,2-Trichlorotrifluoroethane	25.0	27.3	26.3	109	105	69.0-132			3.57	20
1,1,1-Trichloroethane	25.0	27.4	27.2	110	109	73.0-124			0.859	20
Trichloroethene	25.0	24.7	24.3	98.8	97.3	78.0-124			1.55	20
Trichlorofluoromethane	25.0	26.1	26.0	105	104	59.0-147			0.629	20
Vinyl chloride	25.0	25.4	24.7	102	98.8	67.0-131			2.96	20
Xylenes, Total	75.0	80.8	80.9	108	108	79.0-123			0.124	20
(S) Toluene-d8				*99.4*	*98.9*	*80.0-120*				
(S) a,a,a-Trifluorotoluene				*94.1*	*93.8*	*80.0-120*				
(S) 4-Bromofluorobenzene				*101*	*99.0*	*77.0-126*				
(S) 1,2-Dichloroethane-d4				*108*	*105*	*70.0-130*				

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Abbreviations and Definitions

MDL	Method Detection Limit.
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J2	Surrogate recovery limits have been exceeded; values are outside lower control limits.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
V	The sample concentration is too high to evaluate accurate spike recoveries.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

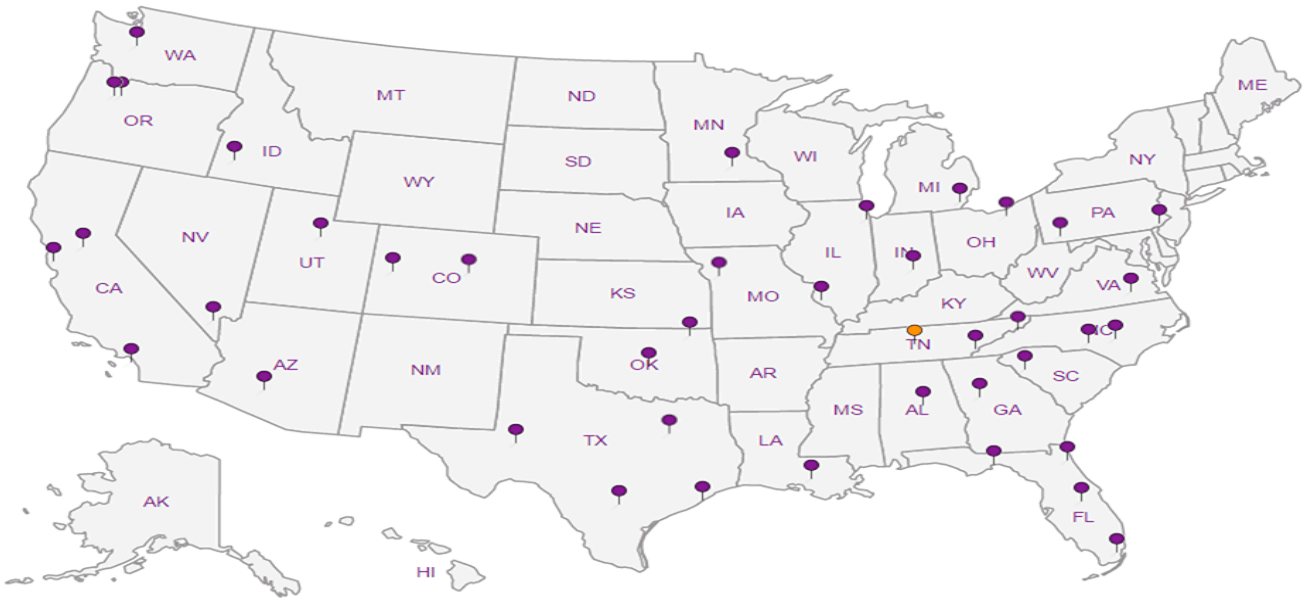
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



GHD

285 Delaware Ave.
Suite 500
Buffalo, NY 14202

Billing Information:
Mr. Dave Rowlinson
285 Delaware Ave.
Suite 500
Buffalo, NY 14202

Report to: Mr. Dave Rowlinson

Email To: dave.rowlinson@ghd.com

Project Description: 815 River Road Site

City/State Collected: No Tonawanda

Phone: 716-748-6624
Fax:

Client Project # 11110868-200-400

Lab Project # STEARNSANY-RIVERRD

Collected by (print): D Rowlinson

Site/Facility ID # N. TONAWANDA, NY

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Pres Chk

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	V8260TCLC 40mlAmb-HCl	V8260TCLC 40mlAmb-HCl-Blk	Remarks	Sample # (lab only)
MW-1	G	GW		03-21-19	11:30	2	X			01
MW-2		GW			12:30	2	X			02
FD@MW-1		GW			11:30	2	X			03
MS@MW-2		GW			12:30	2	X			02
MSD@MW-2		GW			12:30	2	X			02
		GW				2	X			
		GW				2	X			
TRIP BLANK		GW				1		X		04

Chain of Custody Page ___ of ___

Pace Analytical®
National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# 681324

F192

Acctnum: STEARNSANY
Template: T80569
Prelogin: P699395
TSR: 364 - T. Alan Harvill
PB: 3/14/19 mc
Shipped Via: FedEX Ground

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS ✓ FedEx __ Courier __ _____

Tracking # 4874 1080 4556

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N

RAD SCREEN: <0.5 mR/hr

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
David Rowlinson	03-21-19	3:00pm	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes / No
HCL / MeoH
TBR
1

Temp: 4.6 °C Bottles Received: 4.6+0=4.6 3 1013

Date: 3/22/19 Time: 0830

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Appendix C
Data Usability Report

Data Usability Summary Report

Vali-Data of WNY, LLC
1514 Davis Rd.
West Falls, NY 14170

815 River Rd.
Pace Analytical SDG#L1081324
April 18, 2019
Sampling dates: 3/21/2019

Prepared by:
Jodi Zimmerman
Vali-Data of WNY, LLC
1514 Davis Rd.
West Falls, NY 14170

DELIVERABLES

This Data Usability Summary Report (DUSR) was prepared by evaluating the analytical data package for GHD, project located at 815 River Rd., Pace Analytical SDG#L1081324 submitted to Vali-Data of WNY, LLC on April 3, 2019. This DUSR has been prepared in general compliance with NYSDEC Analytical Services Protocols and USEPA National Functional Guidelines. The laboratory performed the analysis using USEPA method Volatile Organics (8260C).

VOLATILE ORGANIC COMPOUNDS

The following items/criteria were reviewed for this analytical suite:

-Data Completeness
-Narrative and Data Reporting Forms
-Chain of Custody and Traffic Reports
-Holding Times
-Internal Standard (IS) Area Performance
-Surrogate Spike Recoveries
-Method Blank
-Field Duplicate Sample Precision
-Laboratory Control Samples
-MS/MSD
-Compound Quantitation
-Initial Calibration
-Continuing Calibration
-GC/MS Performance Check

The items listed above were technically in compliance with the method and SOP criteria with the exceptions discussed in the text below. The data have been reviewed according to the procedures outlined above and qualified accordingly.

OVERALL EVALUATION OF DATA AND POTENTIAL USABILITY ISSUES
The data are acceptable for use except where qualified below Internal Standard and MS/MSD.

Sample; MW-2 was diluted due to high target analyte concentration.

DATA COMPLETENESS
All criteria were met.

NARRATIVE AND DATA REPORTING FORMS
All criteria were met.

CHAIN OF CUSTODY AND TRAFFIC REPORTS
All criteria were met.

HOLDING TIMES
All holding times were met.

INTERNAL STANDARD (IS)
All criteria were met except the area of Fluorobenzene was outside QC limits, high in MW-2(undiluted) and MW-2MS/MSD. Associated target analytes detected in these samples should be qualified as estimated low.

SURROGATE SPIKE RECOVERIES
All criteria were met.

METHOD BLANK
All criteria were met.

FIELD DUPLICATE SAMPLE PRECISION
All criteria were met except 1,1,2-Trichloroethane was detected in FD @ MW-1 but was not detected in MW-1.

LABORATORY CONTROL SAMPLES
All criteria were met.

MS/MSD
All criteria were met except the %Rec of Acetone and Methylcyclohexane was outside QC limits, high in MW-2MS/MSD. These target analytes should be qualified as estimated high in MW-2 and MW-2MS/MSD, if detected.
The %Rec of Benzene, 1,1-Dichloroethene and Trichloroethene was outside ASP QC limits, low in MW-2MS/MSD. These target analytes should be qualified as estimated in MW-2 and MW-2MS/MSD.
The concentration of Ethylbenzene and total Xylenes in MW-2MS/MSD and Isopropylbenzene in MW-2MS exceeded the calibration range. These target analytes are qualified with an 'E'.

COMPOUND QUANTITATION
All criteria were met.

INITIAL CALIBRATION
All criteria were met.

CONTINUING CALIBRATION
All criteria were met.

GC/MS PERFORMANCE CHECK

All criteria were met.

Appendix D
IC-EC Certification

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Division of Environmental Remediation
625 Broadway, 11th Floor, Albany, NY 12233-7020
P: (518)402-9543 | F: (518)402-9547
www.dec.ny.gov

12/19/2018

Dale Marshall, P.E.
City Engineer
City of North Tonawanda
City Hall
216 Payne Ave.
North Tonawanda, NY 14120-5493

Re: Reminder Notice: Site Management Periodic Review Report and IC/EC Certification Submittal
Site Name: 815 River Road Investigation
Site No.: B00178
Site Address: 815 River Road
North Tonawanda, NY 14120

Dear Dale Marshall, P.E.:

This letter serves as a reminder that sites in active Site Management (SM) require the submittal of a periodic progress report. This report, referred to as the Periodic Review Report (PRR), must document the implementation of, and compliance with, site-specific SM requirements. Section 6.3(b) of DER-10 *Technical Guidance for Site Investigation and Remediation* (available online at http://www.dec.ny.gov/regulations/67386.html) provides guidance regarding the information that must be included in the PRR. Further, if the site is comprised of multiple parcels, then you as the Certifying Party must arrange to submit one PRR for all parcels that comprise the site. The PRR must be received by the Department no later than **March 03, 2019**. Guidance on the content of a PRR is enclosed.

Site Management is defined in regulation (6 NYCRR 375-1.2(at)) and in Chapter 6 of DER-10. Depending on when the remedial program for your site was completed, SM may be governed by multiple documents (e.g., Operation, Maintenance, and Monitoring Plan; Soil Management Plan) or one comprehensive Site Management Plan.

A Site Management Plan (SMP) may contain one or all of the following elements, as applicable to the site: a plan to maintain institutional controls and/or engineering controls ("IC/EC Plan"); a plan for monitoring the performance and effectiveness of the selected remedy ("Monitoring Plan"); and/or a plan for the operation and maintenance of the selected remedy ("O&M Plan"). Additionally, the technical requirements for SM are stated in the decision document (e.g., Record of Decision) and, in some cases, the legal agreement directing the remediation of the site (e.g., order on consent, voluntary agreement, etc.).

When you submit the PRR (by the due date above), include the enclosed forms documenting that all SM requirements are being met. The Institutional Controls (ICs) portion of the form (Box 6) must be signed by you or your designated representative. If you cannot certify that all SM requirements are being met, you must submit a Corrective Measures Work Plan that identifies the actions to be taken to restore compliance. The work plan must include a schedule to be approved by the Department. The Periodic Review process will not be considered complete until all necessary corrective measures are completed and all required controls are certified. Instructions for completing the certifications are enclosed.

All site-related documents and data, including the PRR, must be submitted in electronic format to the Department of Environmental Conservation. The required format for documents is an Adobe PDF file with optical character recognition and no password protection. Data must be submitted as an electronic data deliverable (EDD) according to the instructions on the following webpage:

https://www.dec.ny.gov/chemical/62440.html

Documents may be submitted to the project manager either through electronic mail or by using the Department's file transfer service at the following webpage:

https://fts.dec.state.ny.us/fts/

The Department will not approve the PRR unless all documents and data generated in support of the PRR have been submitted using the required formats and protocols.

You may contact Brian Sadowski, the Project Manager, at 716-851-7220 or brian.sadowski@dec.ny.gov with any questions or concerns about the site. Please notify the project manager before conducting inspections or field work. You may also write to the project manager at the following address:

New York State Department of Environmental Conservation
270 Michigan Ave
Buffalo, NY 14203-2915

Enclosures

PRR General Guidance
Certification Form Instructions
Certification Forms

ec: w/ enclosures
Brian Sadowski, Project Manager
Stanley Radon, Hazardous Waste Remediation Supervisor, Region 9

GHD - David Rowlinson - Dave.Rowlinson@ghd.com

Enclosure 1

Certification Instructions

I. Verification of Site Details (Box 1 and Box 2):

Answer the three questions in the Verification of Site Details Section. The Owner and/or Qualified Environmental Professional (QEP) may include handwritten changes and/or other supporting documentation, as necessary.

II. Certification of Institutional Controls/ Engineering Controls (IC/ECs)(Boxes 3, 4, and 5)

1.1.1. Review the listed IC/ECs, confirming that all existing controls are listed, and that all existing controls are still applicable. If there is a control that is no longer applicable the Owner / Remedial Party should petition the Department separately to request approval to remove the control.

2. In Box 5, complete certifications for all Plan components, as applicable, by checking the corresponding checkbox.

3. If you cannot certify "YES" for each Control listed in Box 3 & Box 4, sign and date the form in Box 5. Attach supporting documentation that explains why the **Certification** cannot be rendered, as well as a plan of proposed corrective measures, and an associated schedule for completing the corrective measures. Note that this **Certification** form must be submitted even if an IC or EC cannot be certified; however, the certification process will not be considered complete until corrective action is completed.

If the Department concurs with the explanation, the proposed corrective measures, and the proposed schedule, a letter authorizing the implementation of those corrective measures will be issued by the Department's Project Manager. Once the corrective measures are complete, a new Periodic Review Report (with IC/EC Certification) must be submitted within 45 days to the Department. If the Department has any questions or concerns regarding the PRR and/or completion of the IC/EC Certification, the Project Manager will contact you.

III. IC/EC Certification by Signature (Box 6 and Box 7**):**

If you certified "YES" for each Control, please complete and sign the IC/EC Certifications page as follows:

- For the Institutional Controls on the use of the property, the certification statement in Box 6 shall be completed and may be made by the property owner or designated representative.

- For the Engineering Controls, the certification statement in Box 7 must be completed by a Professional Engineer or Qualified Environmental Professional, as noted on the form.

Enclosure 2
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Site Management Periodic Review Report Notice
Institutional and Engineering Controls Certification Form

Site Details **Box 1**

Site No. B00178

Site Name 815 River Road Investigation

Site Address: 815 River Road Zip Code: 14120
City/Town: North Tonawanda
County: Niagara
Site Acreage: 0.857

Reporting Period: February 01, 2018 to February 01, 2019

	YES	NO
1. Is the information above correct?	X	☐
If NO, include handwritten above or on a separate sheet.		
2. Has some or all of the site property been sold, subdivided, merged, or undergone a tax map amendment during this Reporting Period?	☐	X
3. Has there been any change of use at the site during this Reporting Period (see 6NYCRR 375-1.11(d))?	☐	X
4. Have any federal, state, and/or local permits (e.g., building, discharge) been issued for or at the property during this Reporting Period?	☐	X
If you answered YES to questions 2 thru 4, include documentation or evidence that documentation has been previously submitted with this certification form.		
5. Is the site currently undergoing development?	☐	X

Box 2

	YES	NO
6. Is the current site use consistent with the use(s) listed below? Commercial and Industrial	X	☐
7. Are all ICs/ECs in place and functioning as designed?	X	☐

IF THE ANSWER TO EITHER QUESTION 6 OR 7 IS NO, sign and date below and DO NOT COMPLETE THE REST OF THIS FORM. Otherwise continue.

A Corrective Measures Work Plan must be submitted along with this form to address these issues.

Signature of Owner, Remedial Party or Designated Representative Date

SITE NO. B00178 **Box 3**

Description of Institutional Controls

Parcel	Owner	Institutional Control
181.12-1-19	Metzger Removal, Inc.	Ground Water Use Restriction Site Management Plan Soil Management Plan Monitoring Plan Landuse Restriction IC/EC Plan

An Environmental Easement was filed with the Niagara County Clerk's Office on November 17, 2014. The Controlled Property may be used for commercial and industrial use as long as the following long-term institutional controls are employed: (1) restrict the use of site groundwater as a source of potable or process water without necessary water quality treatment as determined by the NYSDOH or Niagara County Department of Health; (2) all future activities on the property that will disturb remaining contaminated material must be conducted in accordance with the Site Management Plan; and (3) monitoring to assess the performance and effectiveness of the remedy must be conducted as defined in the Site management Plan.

Box 4

Description of Engineering Controls

None Required

Not Applicable/No EC's

Box 5

Periodic Review Report (PRR) Certification Statements

1. I certify by checking "YES" below that:

   a) the Periodic Review report and all attachments were prepared under the direction of, and reviewed by, the party making the certification;

   b) to the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program, and generally accepted engineering practices; and the information presented is accurate and compete.

YES	NO
X	☐

2. If this site has an IC/EC Plan (or equivalent as required in the Decision Document), for each Institutional or Engineering control listed in Boxes 3 and/or 4, I certify by checking "YES" below that all of the following statements are true:

   (a) the Institutional Control and/or Engineering Control(s) employed at this site is unchanged since the date that the Control was put in-place, or was last approved by the Department;

   (b) nothing has occurred that would impair the ability of such Control, to protect public health and the environment;

   (c) access to the site will continue to be provided to the Department, to evaluate the remedy, including access to evaluate the continued maintenance of this Control;

   (d) nothing has occurred that would constitute a violation or failure to comply with the Site Management Plan for this Control; and

   (e) if a financial assurance mechanism is required by the oversight document for the site, the mechanism remains valid and sufficient for its intended purpose established in the document.

YES	NO
X	☐

IF THE ANSWER TO QUESTION 2 IS NO, sign and date below and DO NOT COMPLETE THE REST OF THIS FORM. Otherwise continue.

A Corrective Measures Work Plan must be submitted along with this form to address these issues.

_____ _____

Signature of Owner, Remedial Party or Designated Representative | Date

IC CERTIFICATIONS
SITE NO. B00178

Box 6

SITE OWNER OR DESIGNATED REPRESENTATIVE SIGNATURE

I certify that all information and statements in Boxes 1,2, and 3 are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

I Dale W. Marshall (print name) at 216 Payne Payne, N. Tonawanda, NY 14120. (print business address)

am certifying as City Engineer (Owner or Remedial Party)

for the Site named in the Site Details Section of this form.

Dale W Marshall PE — 4/23/19

Signature of Owner, Remedial Party, or Designated Representative Rendering Certification — Date

IC/EC CERTIFICATIONS

Box 7

Professional Engineer Signature

I certify that all information in Boxes 4 and 5 are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

I David Britton at GHD 285 Delaware Ave, Buffalo NY 14202
print name print business address

am certifying as a Professional Engineer for the City N. Tonawanda
(Owner or Remedial Party)

Signature of Professional Engineer, for the Owner or Remedial Party, Rendering Certification

Stamp (Required for PE)

5-14-2019
Date

Enclosure 3
Periodic Review Report (PRR) General Guidance

I. Executive Summary: (1/2-page or less)
   A. Provide a brief summary of site, nature and extent of contamination, and remedial history.
   B. Effectiveness of the Remedial Program - Provide overall conclusions regarding;
      1. progress made during the reporting period toward meeting the remedial objectives for the site
      2. the ultimate ability of the remedial program to achieve the remedial objectives for the site.
   C. Compliance
      1. Identify any areas of non-compliance regarding the major elements of the Site Management Plan (SMP, i.e., the Institutional/Engineering Control (IC/EC) Plan, the Monitoring Plan, and the Operation & Maintenance (O&M) Plan).
      2. Propose steps to be taken and a schedule to correct any areas of non-compliance.
   D. Recommendations
      1. recommend whether any changes to the SMP are needed
      2. recommend any changes to the frequency for submittal of PRRs (increase, decrease)
      3. recommend whether the requirements for discontinuing site management have been met.

II. Site Overview (one page or less)
   A. Describe the site location, boundaries (figure), significant features, surrounding area, and the nature and extent of contamination prior to site remediation.
   B. Describe the chronology of the main features of the remedial program for the site, the components of the selected remedy, cleanup goals, site closure criteria, and any significant changes to the selected remedy that have been made since remedy selection.

III. Evaluate Remedy Performance, Effectiveness, and Protectiveness
   Using tables, graphs, charts and bulleted text to the extent practicable, describe the effectiveness of the remedy in achieving the remedial goals for the site. Base findings, recommendations, and conclusions on objective data. Evaluations and should be presented simply and concisely.

IV. IC/EC Plan Compliance Report (if applicable)
   A. IC/EC Requirements and Compliance
      1. Describe each control, its objective, and how performance of the control is evaluated.
      2. Summarize the status of each goal (whether it is fully in place and its effectiveness).
      3. Corrective Measures: describe steps proposed to address any deficiencies in ICECs.
      4. Conclusions and recommendations for changes.
   B. IC/EC Certification
      1. The certification must be complete (even if there are IC/EC deficiencies), and certified by the appropriate party as set forth in a Department-approved certification form(s).

V. Monitoring Plan Compliance Report (if applicable)
   A. Components of the Monitoring Plan (tabular presentations preferred) - Describe the requirements of the monitoring plan by media (i.e., soil, groundwater, sediment, etc.) and by any remedial technologies being used at the site.
   B. Summary of Monitoring Completed During Reporting Period - Describe the monitoring tasks actually completed during this PRR reporting period. Tables and/or figures should be used to show all data.
   C. Comparisons with Remedial Objectives - Compare the results of all monitoring with the remedial objectives for the site. Include trend analyses where possible.
   D. Monitoring Deficiencies - Describe any ways in which monitoring did not fully comply with the monitoring plan.
   E. Conclusions and Recommendations for Changes - Provide overall conclusions regarding the monitoring completed and the resulting evaluations regarding remedial effectiveness.

VI. Operation & Maintenance (O&M) Plan Compliance Report (if applicable)
   A. Components of O&M Plan - Describe the requirements of the O&M plan including required activities, frequencies, recordkeeping, etc.
   B. Summary of O&M Completed During Reporting Period - Describe the O&M tasks actually completed during this PRR reporting period.
   C. Evaluation of Remedial Systems - Based upon the results of the O&M activities completed, evaluated

the ability of each component of the remedy subject to O&M requirements to perform as designed/expected.

D. O&M Deficiencies - Identify any deficiencies in complying with the O&M plan during this PRR reporting period.

E. Conclusions and Recommendations for Improvements - Provide an overall conclusion regarding O&M for the site and identify any suggested improvements requiring changes in the O&M Plan.

VII. Overall PRR Conclusions and Recommendations

A. Compliance with SMP - For each component of the SMP (i.e., IC/EC, monitoring, O&M), summarize;
   1. whether all requirements of each plan were met during the reporting period
   2. any requirements not met
   3. proposed plans and a schedule for coming into full compliance.

B. Performance and Effectiveness of the Remedy - Based upon your evaluation of the components of the SMP, form conclusions about the performance of each component and the ability of the remedy to achieve the remedial objectives for the site.

C. Future PRR Submittals
   1. Recommend, with supporting justification, whether the frequency of the submittal of PRRs should be changed (either increased or decreased).
   2. If the requirements for site closure have been achieved, contact the Departments Project Manager for the site to determine what, if any, additional documentation is needed to support a decision to discontinue site management.

VIII. Additional Guidance

Additional guidance regarding the preparation and submittal of an acceptable PRR can be obtained from the Departments Project Manager for the site.

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