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December 19, 2019

Mr. Craig Zeller, P.E.
U.S. EPA, Region 4
Remedial Project Manager
61 Forsyth Street, S.W.
Atlanta, Georgia 30303
zeller.craig@epa.gov

Subject: **Interim Northern Area ISCO Remedial Action Objective Value Technical Memorandum**
CTS of Asheville, Inc. Superfund Site
235 Mills Gap Road, Asheville, Buncombe County, North Carolina
EPA ID: NCD003149556
Consent Decree – Civil Action No. 1:16-cv-380
Wood Project 6252-16-2012

Dear Mr. Zeller:

This Technical Memorandum describes the calculated interim remedial action objective (RAO) value for the in-situ chemical oxidation (ISCO) remediation in the Northern Area of the CTS of Asheville, Inc. Superfund Site (Site). As described in the CTS of Asheville, Inc. Superfund Site Remedial Design Work Plan, dated April 19, 2017, the interim RAO for the ISCO in the Northern Area is 95 percent removal of trichloroethene (TCE) from groundwater. Wood Environment & Infrastructure Solutions, Inc. prepared this Technical Memorandum on behalf of CTS Corporation to comply with the *Consent Decree for Interim Remedial Design/Remedial Action at the CTS of Asheville, Inc. Superfund Site* between the United States of America and CTS Corporation, Mills Gap Road Associates, and Northrop Grumman Systems Corporation (entered on March 7, 2017).

Background

A Technical Memorandum concerning the RAO (RAO Tech Memo) was submitted to USEPA on September 13, 2017. The RAO Tech Memo presented the methodology for determining successful achievement of the RAO. The RAO Tech Memo proposed using a 'population of data' approach, where the arithmetic average TCE concentration in groundwater in the ISCO Northern Area would be determined from baseline samples, and 5 percent of the arithmetic average TCE concentration would be calculated (i.e., 95 percent TCE removal). This concentration would become the target average concentration for groundwater in the ISCO Northern Area. The proposed RAO determination method was approved by United States Environmental Protection Agency (USEPA) in email correspondence dated October 11, 2017.

An ISCO Remedial Action Work Plan (RAWP), dated August 19, 2019, describes the sampling procedures for the collection/analysis of groundwater samples to be used in the calculation of the interim RAO. The RAWP was approved by USEPA on August 26, 2019.

Interim RAO Determination

Sample collection procedures and results used for determination of the interim RAO value are described below. A summary of the collected samples is included in Table 1, and the sample locations are depicted in Figure 1.

Between October 1 and 9, 2019, ten new groundwater monitoring wells were installed in the ISCO Northern Area. The depths to groundwater in the new monitoring wells and existing groundwater monitoring wells MW-6, MW-6A, MW-7A, MW-19 and MW-19A were measured on October 16, 2019. Well construction details, depth to groundwater measurements, and groundwater elevations are summarized in Table 2.

Groundwater samples were collected from the 15 performance monitoring wells between October 16 and 18, 2019. Except for monitoring wells MW-6 and MW-6A, the depth to groundwater was sufficiently shallow to collect groundwater via low-flow purging/sampling using a peristaltic pump. Groundwater samples from monitoring wells MW-6 and MW-6A were collected using a decontaminated submersible pump. Water quality parameters (temperature, pH, conductivity, dissolved oxygen, oxidation reduction potential, and turbidity) were measured during purging. Copies of the groundwater sampling field data records are attached (Attachment 1).

The groundwater samples were submitted for analysis of TCE, cis-1,2-dichloroethene, trans-1,2-dichloroethene, and vinyl chloride according to USEPA Method 8260. The laboratory report is attached (Attachment 2) and the results are summarized in Table 3 and Figure 2. Data validation was completed using project objectives described in the ISCO RAWP Quality Assurance Project Plan and USEPA Region 4 guidelines. A summary of the data validation process and findings is presented in Attachment 3.

TCE concentrations in the groundwater samples ranged from 3,460 micrograms per liter (µg/L) to 47,300 µg/L. Two duplicate groundwater samples were collected. Using the average concentration from a parent and duplicate pair, the average TCE concentration for the dataset is 21,390 µg/L. The resulting calculated interim groundwater RAO, which is 5 percent of the average TCE concentration, is 1,070 µg/L.

The calculated interim RAO value is presented in the following table:

Media	Interim RAO TCE Concentration
Groundwater	1,070 µg/L

Closing

If you have questions regarding this Technical Memorandum, please contact us at (828) 252-8130.

Sincerely,

Wood Environment & Infrastructure Solutions, Inc.

Susan E. Avritt, P.E., L.G.
Senior Engineer

Matthew E. Wallace, P.E.
Principal Engineer

NORTH CAROLINA PROFESSIONAL SEAL 24933 12/19/19 ENGINEER MATTHEW E. WALLACE

SEA/MEW:sea

cc: Andrew Warren, CTS Corporation
Jane Story, Jones Day
Beth Hartzell, NCDEQ
Kurt Batsel, Northrop Grumman Systems Corporation
William Clarke, Roberts & Stevens, P.A

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1 ISCO Treatment Area and Monitoring Well Locations
2 Baseline Groundwater Analytical Results

Attachments

1 Groundwater Sampling Field Data Records
2 Analytical Report
3 Data Validation Report

TABLES

TABLE 1
ISCO Baseline Sampling: Sample Summary
CTS of Asheville, Inc. Superfund Site
Asheville, North Carolina
Wood Project 6252-16-2012

Sample ID	Date	Associated QC Samples
MW-6	10/16/2019	TB-39. EB-09
MW-6A	10/16/2019	TB-39. EB-09
MW-7A	10/17/2019	TB-39
MW-19	10/16/2019	TB-39
MW-19A	10/16/2019	TB-39
MW-33	10/17/2019	TB-39
MW-33A	10/17/2019	TB-39
MW-34	10/17/2019	TB-39, FD-41
MW-34A	10/17/2019	TB-39
MW-35	10/18/2019	TB-39
MW-35A	10/18/2019	TB-39
MW-36	10/16/2019	TB-39
MW-36A	10/16/2019	TB-39
MW-37	10/17/2019	TB-39, FD-42
MW-37A	10/17/2019	TB-39

Prepared By: SEA 10/22/19
Checked By: GLH 11/07/19

TABLE 2
Monitoring Well Construction Details
CTS of Asheville, Inc. Superfund Site
Asheville, North Carolina
Wood Project 6252-16-2012

Monitoring Well	Installation Date	Well Depth (bgs)	Screened Interval (bgs)	Ground Surface Elevation	Top of Casing Elevation	Depth to Groundwater 10/16/2019 (btoc)	Groundwater Elevation
MW-6	6/16/2008	47.2	37.2 - 46.8	2,421.53	2,421.35	30.49	2,390.86
MW-6A	9/15/2008	80.7	75.6 - 80.4	2,421.71	2,421.21	28.63	2,392.58
MW-7A	3/6/2009	71.5	66.8 - 71.3	2,412.04	2,411.79	15.74	2,396.05
MW-19	11/30/2017	45.2	40.0 - 44.8	2,415.50	2,415.19	18.11	2,397.08
MW-19A	11/30/2017	64.9	59.7 - 64.5	2,415.54	2,415.36	18.43	2,396.93
MW-33	10/3/2019	45.4	40.3 - 45.1	2,410.20	2,409.79	13.75	2,396.04
MW-33A	10/4/2019	64.9	59.7 - 64.5	2,410.16	2,409.78	14.03	2,395.75
MW-34	10/1/2019	50.6	45.4 - 50.2	2,419.00	2,418.53	23.82	2,394.71
MW-34A	10/1/2019	65.2	60.1 - 64.9	2,418.90	2,418.56	23.10	2,395.46
MW-35	10/3/2019	50.3	45.2 - 50.0	2,412.07	2,411.60	15.33	2,396.27
MW-35A	10/3/2019	60.4	55.2 - 60.0	2,411.99	2,411.49	15.33	2,396.16
MW-36	10/2/2019	55.3	50.1 - 54.9	2,419.17	2,418.78	22.45	2,396.33
MW-36A	10/2/2019	70.4	65.2 - 70.0	2,419.05	2,418.68	23.03	2,395.65
MW-37	10/9/2019	40.1	35.0 - 39.8	2,418.04	2,417.67	21.80	2,395.87
MW-37A	10/7/2019	60.2	55.1 - 59.9	2,418.04	2,417.65	21.63	2,396.02

Notes:

1. bgs - below ground surface; btoc - below top of casing
2. Elevations are in feet relative to mean sea level.

Prepared By: SEA 11/07/19
Checked By: GLH 11/07/19

TABLE 3
Baseline Groundwater Analytical Results
CTS of Asheville, Inc. Superfund Site
Asheville, North Carolina
Wood Project 6252-16-2012

Sample ID	Date	TCE Concentration
MW-6	10/16/2019	15,200
MW-6A	10/16/2019	47,300
MW-7A	10/17/2019	11,500
MW-19	10/16/2019	3,460
MW-19A	10/16/2019	12,400
MW-33	10/17/2019	32,000
MW-33A	10/17/2019	41,200
MW-34	10/17/2019	32,600
FD-41 (MW-34)	10/17/2019	33,100
MW-34A	10/17/2019	31,900
MW-35	10/18/2019	9,970
MW-35A	10/18/2019	11,500
MW-36	10/16/2019	16,800
MW-36A	10/16/2019	36,100
MW-37	10/17/2019	8,910
FD-42 (MW-37)	10/17/2019	10,900
MW-37A	10/17/2019	8,770

Notes:

1. Concentrations are in micrograms per liter (µg/L)
2. TCE - trichloroethene, according to USEPA Method 8260

Prepared By: SEA 11/07/19
Checked By: GLH 11/07/19

FIGURES

Wood Environment & Infrastructure Solutions, Inc.
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ISCO Treatment Area
and Monitoring Well Locations
CTS of Asheville, Inc. Superfund Site
Asheville, North Carolina

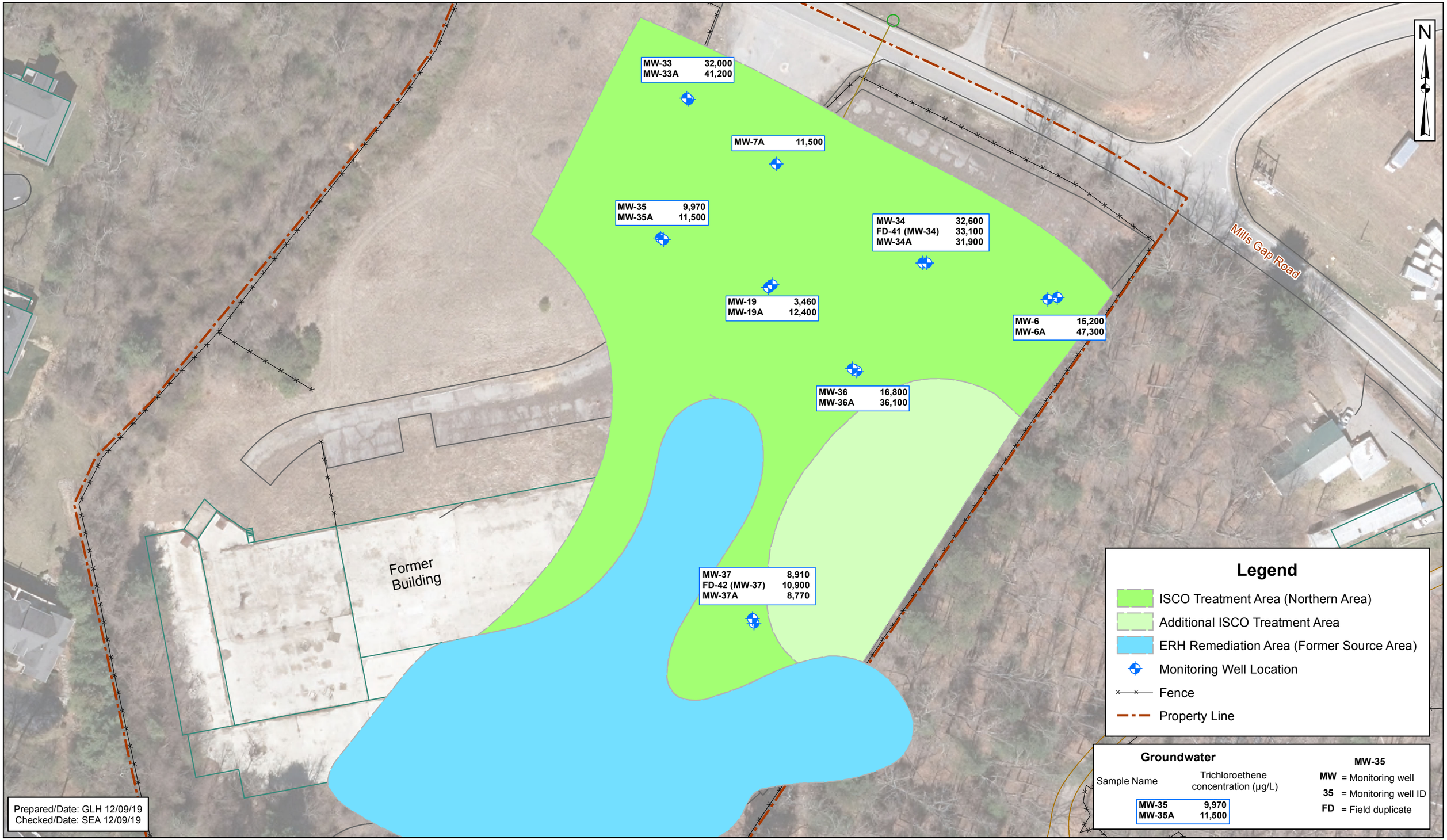
1 inch = 60 feet

0 60 120 Feet

PROJ.: 6252162012

LOCATION: P:\CTS - Mills Gap\GIS\ISCO\RAO MEMO

Figure
1



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Baseline Groundwater Analytical Results
CTS of Asheville, Inc. Superfund Site
Asheville, North Carolina

1 inch = 60 feet

0 60 120 Feet

PROJ.: 6252162012

LOCATION: P:\CTS - Mills Gap\GIS\ISCO\RAO MEMO

Figure
2

ATTACHMENT 1

GROUNDWATER SAMPLING FIELD DATA RECORDS

FIELD INSTRUMENT CALIBRATION RECORD

Project Name: CTS of Asheville, Inc. Superfund Site

Project Number: 6252-16-2012.06

Date: 10/16/19

Name: Rodney Clark

Water Quality Meter Calibration

		Standard Value		Meter Value		Acceptance Criteria
Manufacturer: YSI	pH:	4	SU (low)	pH: 4.00	SU	+/- 10% of standard
Model No.: ProPlus	pH:	7	SU (med)	pH: 7.00	SU	+/- 10% of standard
Unit ID: 1585	pH:	10	SU (high)	pH:	SU	+/- 10% of standard
	Conductivity:	1.413	mS/cm	Conductivity: 1.417	mS/cm	+/- 10% of standard
	ORP:	200	mV	ORP: 201.8	mV	+/- 10% of standard

Turbidity Meter Calibration

	Standard Value		Meter Value		Acceptance Criteria
Manufacturer: Hanna	<0.10	NTU (low)	0.10	NTU	+/- 10% of standard
Model No. HI 98703	15	NTU (med)	14.9	NTU	+/- 10% of standard
Unit ID: 1226	100	NTU (high)	101	NTU	+/- 10% of standard
	750	NTU (high)	752	NTU	+/- 10% of standard

Photoionization Detector

				Acceptance Criteria
Manufacturer:	Background:	ppmv	Meter: ppmv	within 5 ppmv of Zero
Model No.:	Span Gas:	ppmv	Meter: ppmv	+/- 10% of standard
Unit ID:				

Calibration Sources

	Source	Value		Lot Number	Expiration Date
pH (low)	Eastern Solutions	4	SU	7906528	7/2021
pH (med)	Eastern Solutions	7	SU	7907206	7/2021
pH (high)	Eastern Solutions	10	SU	7906076	6/2021
Conductivity	Eastern Solutions	1.413	mS/cm	2903E09	3/2021
ORP:	Eastern Solutions	200	mV	7904082	1/2020
Turbidity (low)	Hanna	<0.10	NTU	4365	5/2021
Turbidity (med):	Hanna	15	NTU	4366	11/2020
Turbidity (high):	Hanna	100	NTU	4367	11/2020
Turbidity (high):	Hanna	750	NTU	4361	10/2020
PID gas:			ppmv		

NOTES:

If a meter reading is not within acceptance criteria, clean or replace probe and re-calibrate, or use a different meter if available. If project requirements necessitate use of the instrument, clearly document on all data sheets and log book entries that the parameter was not calibrated to the acceptance criteria.

FIELD INSTRUMENT CALIBRATION RECORD

Project Name: CTS of Asheville, Inc. Superfund Site

Project Number: 6252-16-2012.06

Date: 10/17/19

Name: Rodney Clark

Water Quality Meter Calibration

Manufacturer: YSI

Model No.: ProPlus

Unit ID: 1585

	Standard Value		Meter Value		Acceptance Criteria
pH:	4	SU (low)	pH: 4.01	SU	+/- 10% of standard
pH:	7	SU (med)	pH: 7.00	SU	+/- 10% of standard
pH:	10	SU (high)	pH: 10.02	SU	+/- 10% of standard
Conductivity:	1.413	mS/cm	Conductivity: 1.418	mS/cm	+/- 10% of standard
ORP:	200	mV	ORP: 205	mV	+/- 10% of standard

Turbidity Meter Calibration

Manufacturer: Hanna

Model No. HI 98703

Unit ID: 1226

Standard Value		Meter Value		Acceptance Criteria
<0.10	NTU (low)	0.09	NTU	+/- 10% of standard
15	NTU (med)	14.9	NTU	+/- 10% of standard
100	NTU (high)	101	NTU	+/- 10% of standard
750	NTU (high)	748	NTU	+/- 10% of standard

Photoionization Detector

Manufacturer: _____

Model No.: _____

Unit ID: _____

				Acceptance Criteria
Background:	ppmv	Meter:	ppmv	within 5 ppmv of Zero
Span Gas:	ppmv	Meter:	ppmv	+/- 10% of standard

Calibration Sources

	Source	Value		Lot Number	Expiration Date
pH (low)	Eastern Solutions	4	SU	7906528	7/2021
pH (med)	Eastern Solutions	7	SU	7907206	7/2021
pH (high)	Eastern Solutions	10	SU	7906076	6/2021
Conductivity	Eastern Solutions	1.413	mS/cm	2903E09	3/2021
ORP:	Eastern Solutions	200	mV	7904082	1/2020
Turbidity (low)	Hanna	<0.10	NTU	4365	5/2021
Turbidity (med):	Hanna	15	NTU	4366	11/2020
Turbidity (high):	Hanna	100	NTU	4367	11/2020
Turbidity (high):	Hanna	750	NTU	4361	10/2020
PID gas:			ppmv		

NOTES:

If a meter reading is not within acceptance criteria, clean or replace probe and re-calibrate, or use a different meter if available. If project requirements necessitate use of the instrument, clearly document on all data sheets and log book entries that the parameter was not calibrated to the acceptance criteria.

FIELD INSTRUMENT CALIBRATION RECORD

Project Name: CTS of Asheville, Inc. Superfund Site

Project Number: 6252-16-2012.06

Date: 10/18/19

Name: Rodney Clark

Water Quality Meter Calibration

Manufacturer: YSI

Model No.: ProPlus

Unit ID: 1585

	Standard Value		Meter Value		Acceptance Criteria
pH:	4	SU (low)	pH: 4.02	SU	+/- 10% of standard
pH:	7	SU (med)	pH: 7.00	SU	+/- 10% of standard
pH:	10	SU (high)	pH: 10.04	SU	+/- 10% of standard
Conductivity:	1.413	mS/cm	Conductivity: 1.485 (1.426)	mS/cm	+/- 10% of standard
ORP:	200	mV	ORP: 227.1	mV	+/- 10% of standard

AMC 10/18/19

Recalibrated

Turbidity Meter Calibration

Manufacturer: Hanna

Model No. HI 98703

Unit ID: 1226

Standard Value		Meter Value		Acceptance Criteria
<0.10	NTU (low)	0.09	NTU	+/- 10% of standard
15	NTU (med)	14.7	NTU	+/- 10% of standard
100	NTU (high)	100	NTU	+/- 10% of standard
750	NTU (high)	751	NTU	+/- 10% of standard

Photoionization Detector

Manufacturer: _____

Model No.: _____

Unit ID: _____

				Acceptance Criteria
Background:	_____	ppmv	Meter: _____ ppmv	within 5 ppmv of Zero
Span Gas:	_____	ppmv	Meter: _____ ppmv	+/- 10% of standard

Calibration Sources

	Source	Value		Lot Number	Expiration Date
pH (low)	Eastern Solutions	4	SU	7906528	7/2021
pH (med)	Eastern Solutions	7	SU	7907206	7/2021
pH (high)	Eastern Solutions	10	SU	7906076	6/2021
Conductivity	Eastern Solutions	1.413	mS/cm	2903E09	3/2021
ORP:	Eastern Solutions	200	mV	7904082	1/2020
Turbidity (low)	Hanna	<0.10	NTU	4365	5/2021
Turbidity (med):	Hanna	15	NTU	4366	11/2020
Turbidity (high):	Hanna	100	NTU	4367	11/2020
Turbidity (high):	Hanna	750	NTU	4361	10/2020
PID gas:			ppmv		

NOTES:

If a meter reading is not within acceptance criteria, clean or replace probe and re-calibrate, or use a different meter if available. If project requirements necessitate use of the instrument, clearly document on all data sheets and log book entries that the parameter was not calibrated to the acceptance criteria.

FIELD DATA RECORD - GROUNDWATER SAMPLING

PROJECT CTS of Asheville, Inc. Superfund Site **PROJECT NUMBER** 6252-16-2012.06 **DATE** 10/16/19

MONITORING WELL MW-6 **TIME** 09:30

QC SAMPLES EB-09 @ 09:45 **TRIP BLANK** TB-39

WATER LEVEL / PUMP DATA

INITIAL DTW 30.49 ft (toc) **FINAL DTW** 33.65 ft (toc)

SCREENED INTERVAL 37.2-46.8 ft (bgs) **DEPTH OF INTAKE** ~42.0 ft (toc)

PUMP TYPE

- ☐ Peristaltic
- ☑ Variable-speed submersible
- ☐ Bladder

Mega Monsoon

AMOUNT PURGED ~8 gal.

PURGE DATA

TIME	Depth to Water (ft)	PURGE RATE (L/min)	TEMP (C°)	CONDUCTIVITY (mS/cm)	pH	DO (mg/L)	TURBIDITY (NTU)	ORP (mV)	Perm (mg/L)	COMMENTS
09:02	32.65	~1	16.7	42.6	4.75	8.54	191	320.6	NA	
09:06	32.87	~1	16.8	40.0	4.77	5.60	35.5	332.4	NA	
09:10	33.15	~1	16.7	40.2	4.75	5.21	26.3	338.4	NA	
09:14	33.40	~1	16.7	40.2	4.77	5.12	13.4	335.4	NA	
09:18	33.43	~1	16.6	39.9	4.73	5.02	6.23	342.3	NA	
09:22	33.88	~1	16.6	39.8	4.76	5.03	5.56	341.9	NA	
09:26	33.73	~1	16.6	39.7	4.75	4.93	4.38	338.9	NA	
09:30	33.65	~1	16.6	39.7	4.74	4.89	4.41	340.1	NA	

ANALYSES: EPA 8260 (TCE, cis-1,2-DCE, trans-1,2-DCE, vinyl chloride)

NOTES: Perm = potassium permanganate

SIGNATURE:

FIELD DATA RECORD - GROUNDWATER SAMPLING

PROJECT CTS of Asheville, Inc. Superfund Site | **PROJECT NUMBER** 6252-16-2012.06 | **DATE** 10/16/19

MONITORING WELL MW-6A | **TIME** 10:45

QC SAMPLES EB-09 @ 09:45 | **TRIP BLANK** TB-39

WATER LEVEL / PUMP DATA

INITIAL DTW 28.63 ft (toc) | **FINAL DTW** 41.15 ft (toc)

SCREENED INTERVAL 75.6-80.4 ft (bgs) | **DEPTH OF INTAKE** ~78.0 ft (toc)

PUMP TYPE

- ☐ Peristaltic
- ☑ Variable-speed submersible
- ☐ Bladder Megamonsoon

AMOUNT PURGED ~5 gal.

PURGE DATA

TIME	Depth to Water (ft)	PURGE RATE (L/min)	TEMP (C°)	CONDUCTIVITY us (mS/cm)	pH	DO (mg/L)	TURBIDITY (NTU)	ORP (mV)	Perm (mg/L)	COMMENTS
10:12	35.18	~1	15.8	97.3	6.57	4.93	27.2	-505.5	NA	Flow rate slows as WL drops
10:16	38.13	~1	16.1	97.4	6.59	5.04	28.3	-512.3	NA	Have to increase pump speed
10:20	38.30	~1	16.4	97.2	6.58	4.41	29.8	-512.6	NA	
10:24	39.22	~0.5	16.7	96.1	6.61	1.67	19.9	82.6	NA	Sudden change in ORP/DO
10:28	40.58	~0.5	16.5	96.7	6.58	0.26	14.0	58.3	NA	
10:32	41.11	~0.5	16.6	97.2	6.62	0.33	12.3	46.0	NA	
10:36	41.13	~0.3	16.7	97.3	6.63	0.28	11.7	40.3	NA	
10:40	41.15	~0.3	16.6	99.0	6.62	0.31	8.37	34.3	NA	
10:44	41.15	~0.2	16.7	99.3	6.63	0.33	10.2	30.5	NA	

ANALYSES: EPA 8260 (TCE, cis-1,2-DCE, trans-1,2-DCE, vinyl chloride)

NOTES: Perm = potassium permanganate

SIGNATURE:

FIELD DATA RECORD - GROUNDWATER SAMPLING

PROJECT	CTS of Asheville, Inc. Superfund Site	**PROJECT NUMBER**	6252-16-2012.06	**DATE**	10/16/19
MONITORING WELL	MW-19			**TIME**	13:30
QC SAMPLES	NA	**TRIP BLANK**	TB-39		

WATER LEVEL / PUMP DATA 18.11

INITIAL DTW	~~18.31~~ RMC 10/16/19 ft (toc)	**FINAL DTW**	18.57 ft (toc)	**AMOUNT PURGED**	~ 1.5 gal.
SCREENED INTERVAL	40.0-44.8 ft (bgs)	**DEPTH OF INTAKE**	42.4 ft (toc)		

PUMP TYPE

- [x] Peristaltic
- [ ] Variable-speed submersible
- [ ] Bladder

PURGE DATA

TIME	Depth to Water (ft)	PURGE RATE (L/min)	TEMP (C°)	CONDUCTIVITY (mS/cm)	pH	DO (mg/L)	TURBIDITY (NTU)	ORP (mV)	Perm (mg/L)	COMMENTS
13:05	~~18.49~~	0.2	17.5	~~72.8~~	5.52	5.95	8.74	~~167.9~~	NA	
~~13:10~~	18.57	0.2	~~17.4~~	~~70.2~~	5.48	0.61	5.41	~~187.6~~	NA	Slow flow rate
13:14	18.55	0.1	17.4	68.7	5.42	0.42	2.83	196.4	NA	
13:18	18.53	0.1	17.5	67.1	5.37	0.32	4.81	204.1	NA	
13:22	18.55	0.1	17.6	66.1	5.35	0.28	4.63	206.2	NA	
13:26	18.55	0.1	17.6	65.5	5.34	0.25	3.31	207.6	NA	
13:30	18.57	0.1	17.5	65.1	5.33	0.24	4.59	209.3	NA	

ANALYSES: EPA 8260 (TCE, cis-1,2-DCE, trans-1,2-DCE, vinyl chloride)

NOTES: Perm = potassium permanganate

SIGNATURE:

FIELD DATA RECORD - GROUNDWATER SAMPLING

PROJECT CTS of Asheville, Inc. Superfund Site | **PROJECT NUMBER** 6252-16-2012.06 | **DATE** 10/16/19

MONITORING WELL MW-19A | **TIME** 14:15

QC SAMPLES NA | **TRIP BLANK** TB-39

WATER LEVEL / PUMP DATA

INITIAL DTW 18.43 ft (toc) | **FINAL DTW** 21.35 ft (toc)

SCREENED INTERVAL 59.7-64.5 ft (bgs) | **DEPTH OF INTAKE** ~62.1 ft (toc)

PUMP TYPE
- [x] Peristaltic
- [ ] Variable-speed submersible
- [ ] Bladder

AMOUNT PURGED ~1.5 gal.

PURGE DATA

TIME	Depth to Water (ft)	PURGE RATE (L/min)	TEMP (C°)	CONDUCTIVITY (mS/cm)	pH	DO (mg/L)	TURBIDITY (NTU)	ORP (mV)	Perm (mg/L)	COMMENTS
13:41	19.87	0.2	17.6	241.8	6.84	0.49	7.65	-64.5	NA	
13:44	20.05	0.2	17.5	238.9	6.88	0.33	4.41	-92.1	NA	
13:47	21.15	0.2	17.5	236.1	6.90	0.24	3.05	-88.5	NA	
13:51	21.34	0.2	17.3	230.3	6.85	0.20	4.31	-82.4	NA	
13:55	21.35	0.2	17.2	218.2	6.75	0.20	2.85	-78.4	NA	
13:59	21.35	0.2	17.2	214.9	6.72	0.20	2.41	-75.9	NA	
14:05	21.35	0.2	17.2	211.3	6.70	0.20	2.09	-74.3	NA	
14:10	21.35	0.2	17.2	210.9	6.70	0.20	2.01	-75.3	NA	

ANALYSES: EPA 8260 (TCE, cis-1,2-DCE, trans-1,2-DCE, vinyl chloride)

NOTES: Perm = potassium permanganate

SIGNATURE:

FIELD DATA RECORD - GROUNDWATER SAMPLING

PROJECT CTS of Asheville, Inc. Superfund Site **PROJECT NUMBER** 6252-16-2012.06 **DATE** 10/16/19

MONITORING WELL MW-36 **TIME** 15:35

QC SAMPLES NA **TRIP BLANK** TB-39

WATER LEVEL / PUMP DATA

INITIAL DTW 22.45 ft (toc) **FINAL DTW** 24.00 ft (toc)

SCREENED INTERVAL 50.1-54.9 ft (bgs) **DEPTH OF INTAKE** 52.5 ft (toc)

PUMP TYPE

- [x] Peristaltic
- [ ] Variable-speed submersible
- [ ] Bladder

AMOUNT PURGED ~1.5 gal.

PURGE DATA

TIME	Depth to Water (ft)	PURGE RATE (L/min)	TEMP (C°)	CONDUCTIVITY (mS/cm)	pH	DO (mg/L)	TURBIDITY (NTU)	ORP (mV)	Perm (mg/L)	COMMENTS
15:05	23.51	0.2	19.8	90.2	5.49	1.01	2.08	107.7	NA	
15:09	23.85	0.2	18.6	85.1	5.40	0.39	22.1	133.5	NA	
15:13	24.00	0.2	18.5	84.0	5.42	0.32	35.3	152.6	NA	Slow flow rate
15:17	23.97	0.2	18.4	84.3	5.40	0.37	26.3	160.6	NA	
15:21	23.93	0.2	18.4	83.6	5.39	0.45	23.1	167.4	NA	
15:25	23.95	0.2	18.3	83.1	5.39	0.38	17.6	169.3	NA	
15:29	23.98	0.2	18.2	82.5	5.39	0.37	10.9	170.8	NA	
15:33	24.00	0.2	18.2	82.0	5.39	0.35	8.25	173.4	NA	
15:35	24.00	0.2	18.3	81.7	5.39	0.33	7.65	176.2	NA	

ANALYSES: EPA 8260 (TCE, cis-1,2-DCE, trans-1,2-DCE, vinyl chloride)

NOTES: Perm = potassium permanganate

SIGNATURE:

FIELD DATA RECORD - GROUNDWATER SAMPLING

PROJECT	CTS of Asheville, Inc. Superfund Site	**PROJECT NUMBER**	6252-16-2012.06	**DATE**	10/16/19
MONITORING WELL	MW-36A			**TIME**	15:20
QC SAMPLES	MS/MSD	**TRIP BLANK**	TB-39		

WATER LEVEL / PUMP DATA

INITIAL DTW	23.07 ft (toc)	**FINAL DTW**	23.12 ft (toc)	**SCREENED INTERVAL**	65.2-70.9 ft (bgs)
DEPTH OF INTAKE	67.6 ft (toc)				

PUMP TYPE

- [x] Peristaltic
- [ ] Variable-speed submersible
- [ ] Bladder

AMOUNT PURGED: ~1.5 gal.

PURGE DATA

TIME	Depth to Water (ft)	PURGE RATE (L/min)	TEMP (C°)	CONDUCTIVITY (mS/cm)	pH	DO (mg/L)	TURBIDITY (NTU)	ORP (mV)	Perm (mg/L)	COMMENTS
15:51	23.11	0.2	18.1	129.3	6.31	0.60	77.8	-66.9	NA	
15:56	23.12	0.2	18.2	120.3	6.25	0.41	38.6	-227.4	NA	
16:00	23.12	0.2	18.1	116.3	6.22	0.38	28.5	-255.8	NA	
16:04	23.12	0.2	18.3	114.9	6.21	0.37	22.3	-266.9	NA	
16:08	23.12	0.2	18.4	110.5	6.19	0.33	17.5	-259.3	NA	
16:12	23.12	0.2	18.5	108.5	6.17	0.30	10.2	-274.1	NA	
16:16	23.12	0.2	17.9	110.6	6.15	0.40	8.96	-56.4	NA	
1620	23.12	0.2	18.0	108.8	6.14	0.38	7.53	-57.8	NA	

ANALYSES: EPA 8260 (TCE, cis-1,2-DCE, trans-1,2-DCE, vinyl chloride)

NOTES: Perm = potassium permanganate

SIGNATURE:

FIELD DATA RECORD - GROUNDWATER SAMPLING

PROJECT CTS of Asheville, Inc. Superfund Site | **PROJECT NUMBER** 6252-16-2012.06 | **DATE** 10/17/19

MONITORING WELL MW-34 | **TIME** 09:35

QC SAMPLES FD-41 | **TRIP BLANK** TB-39

WATER LEVEL / PUMP DATA

INITIAL DTW 23.82 ft (toc) | **FINAL DTW** 25.01 ft (toc)

SCREENED INTERVAL 45.4 - 50.2 ft (bgs) | **DEPTH OF INTAKE** 47.8 ft (toc)

PUMP TYPE

- [x] Peristaltic
- [ ] Variable-speed submersible
- [ ] Bladder

AMOUNT PURGED ~ 2 gal.

PURGE DATA

TIME	Depth to Water (ft)	PURGE RATE (L/min)	TEMP (C°)	CONDUCTIVITY (mS/cm)	pH	DO (mg/L)	TURBIDITY (NTU)	ORP (mV)	Perm (mg/L)	COMMENTS
08:50	24.50	0.2	16.4	67.6	5.29	2.54	16.2	209.5	NA	
08:54	24.63	0.2	16.5	63.5	5.29	0.71	21.3	209.9	NA	
08:58	24.70	0.2	16.4	62.4	5.29	2.34	19.6	210.0	NA	
09:02	24.83	0.2	16.4	59.3	5.28	2.04	12.3	209.6	NA	
09:06	24.92	0.2	16.4	57.7	5.28	0.44	6.77	212.0	NA	
09:10	25.00	0.2	16.3	58.1	5.27	0.38	5.39	210.9	NA	
09:14	25.01	0.2	16.3	57.8	5.27	0.37	4.86	213.0	NA	
09:18	25.01	0.2	16.4	57.6	5.27	0.36	5.05	217.9	NA	
09:22	25.01	0.2	16.4	57.6	5.26	0.33	4.35	218.6	NA	
09:26	25.01	0.2	16.5	57.3	5.27	0.33	3.21	219.8	NA	

ANALYSES: EPA 8260 (TCE, cis-1,2-DCE, trans-1,2-DCE, vinyl chloride)

NOTES: Perm = potassium permanganate

SIGNATURE:

FIELD DATA RECORD - GROUNDWATER SAMPLING

PROJECT CTS of Asheville, Inc. Superfund Site | **PROJECT NUMBER** 6252-16-2012.06 | **DATE** 10/17/19

MONITORING WELL MW-34A | **TIME** 10:25

QC SAMPLES NA | **TRIP BLANK** TB-39

WATER LEVEL / PUMP DATA

INITIAL DTW 23.10 ft (toc) | **FINAL DTW** 23.60 ft (toc)

SCREENED INTERVAL ~~45.4 - 50.4~~ 60.1 - 64.9 ft (bgs) RMC 10/17/19 | **DEPTH OF INTAKE** 62.5 ft (toc)

PUMP TYPE
- [x] Peristaltic
- [ ] Variable-speed submersible
- [ ] Bladder

AMOUNT PURGED ~~7.0~~ 1.5 gal. RMC 10/17/19

PURGE DATA

TIME	Depth to Water (ft)	PURGE RATE (L/min)	TEMP (C°)	CONDUCTIVITY (mS/cm)	pH	DO (mg/L)	TURBIDITY (NTU)	ORP (mV)	Perm (mg/L)	COMMENTS
09:52	23.41	0.2	16.3	64.3	5.83	0.46	110	146.8	NA	
09:56	23.60	0.2	16.0	62.1	5.81	0.36	93.9	150.3	NA	
10:00	23.60	0.2	15.9	59.7	5.80	0.31	87.5	152.2	NA	
10:04	23.60	0.2	15.9	59.4	5.79	0.28	55.6	152.5	NA	
10:08	23.65	0.2	16.1	59.3	5.79	0.25	33.2	150.9	NA	
10:12	23.60	0.2	16.0	58.5	5.77	0.22	27.1	153.6	NA	
10:16	23.60	0.2	16.1	58.8	5.78	0.21	13.3	157.7	NA	
10:20	23.62	0.2	16.2	58.2	5.77	0.21	10.7	160.2	NA	
10:24	23.60	0.2	16.1	58.3	5.78	0.19	8.63	163.6	NA	

ANALYSES: EPA 8260 (TCE, cis-1,2-DCE, trans-1,2-DCE, vinyl chloride)

NOTES: Perm = potassium permanganate

SIGNATURE:

FIELD DATA RECORD - GROUNDWATER SAMPLING

PROJECT CTS of Asheville, Inc. Superfund Site | **PROJECT NUMBER** 6252-16-2012.06 | **DATE** 10/17/19

MONITORING WELL MW-7A | **TIME** 11:45

QC SAMPLES NA | **TRIP BLANK** TB-39

WATER LEVEL / PUMP DATA

INITIAL DTW 15.74 ft (toc) | **FINAL DTW** 17.85 ft (toc)

SCREENED INTERVAL 66.8 – 71.3 ft (bgs) | **DEPTH OF INTAKE** 69.2 ft (toc)

PUMP TYPE
- [x] Peristaltic
- [ ] Variable-speed submersible
- [ ] Bladder

AMOUNT PURGED ~1.5 gal.

PURGE DATA

TIME	Depth to Water (ft)	PURGE RATE (L/min)	TEMP (C°)	CONDUCTIVITY (mS/cm)	pH	DO (mg/L)	TURBIDITY (NTU)	ORP (mV)	Perm (mg/L)	COMMENTS
11:15	16.35	0.2	15.8	135.0	6.88	2.97	47.6	163.8	NA	
11:19	17.20	0.2	16.0	147.2	8.12	1.05	33.1	154.3	NA	
11:23	17.40	0.2	16.1	147.7	8.19	0.99	28.3	121.8	NA	Slight Purple tint
11:27	17.85	0.2	16.1	155.6	8.40	0.70	13.4	111.5	NA	
11:31	17.86	0.2	16.0	164.3	8.31	0.67	8.85	254.7	NA	
11:35	17.84	0.2	15.9	171.5	8.05	0.72	7.91	427.9	NA	
11:39	17.85	0.2	15.9	180.3	7.59	0.88	6.55	488.9	NA	
11:45	17.85	0.2	15.9	184.9	7.34	0.93	5.42	519.4	NA	
11:45	17.85	0.2	15.9	184.6	7.26	1.04	4.59	529.6	NA	

ANALYSES: EPA 8260 (TCE, cis-1,2-DCE, trans-1,2-DCE, vinyl chloride)

NOTES: Perm = potassium permanganate

SIGNATURE:

FIELD DATA RECORD - GROUNDWATER SAMPLING

PROJECT CTS of Asheville, Inc. Superfund Site **PROJECT NUMBER** 6252-16-2012.06 **DATE** 10/17/19

MONITORING WELL MW-37 **TIME** 14:15

QC SAMPLES FD-42 **TRIP BLANK** TB-39

WATER LEVEL / PUMP DATA

INITIAL DTW 21.80 ft (toc) **FINAL DTW** 22.10 ft (toc)

SCREENED INTERVAL ~~25~~ 35.0 - 39.8 ft (bgs) RMC 10/17/19 **DEPTH OF INTAKE** 32.4 ft (toc)

PUMP TYPE
- [x] Peristaltic
- [ ] Variable-speed submersible
- [ ] Bladder

AMOUNT PURGED ~1.0 gal.

Use copper coil in ice bath

PURGE DATA

TIME	Depth to Water (ft)	PURGE RATE (L/min)	TEMP (C°)	CONDUCTIVITY (mS/cm)	pH	DO (mg/L)	TURBIDITY (NTU)	ORP (mV)	Perm (mg/L)	COMMENTS
13:39	21.89	0.2	14.3	118.9	5.17	0.63	LLO ERR	505.0	NA	Touched bottom, Turbid @ start
13:43	22.20	0.2	21.7	122.3	5.15	0.92	25.5	458.4	NA	
13:47	22.22	0.2	6.8	115.1	5.15	0.79	12.7	406.1	NA	
13:51	22.22	0.2	13.6	117.7	5.10	0.58	13.5	410.4	NA	
13:55	22.22	0.2	18.3	120.8	5.12	0.49	14.9	411.7	NA	
13:59	22.22	0.1	11.0	118.1	5.12	0.65	10.9	400.9	NA	Try to stabilize temp by slow flow rate
14:03	22.13	0.1	13.5	123.4	5.13	0.57	9.34	395.8	NA	
14:07	22.10	0.1	13.1	118.5	5.11	0.60	7.39	241.7	NA	
14:15	22.10	0.2	12.9	118.9	5.11	0.58	5.85	233.5	NA	

ANALYSES: EPA 8260 (TCE, cis-1,2-DCE, trans-1,2-DCE, vinyl chloride)

NOTES: Perm = potassium permanganate Slight petroleum-like odor **SIGNATURE:**

FIELD DATA RECORD - GROUNDWATER SAMPLING

PROJECT CTS of Asheville, Inc. Superfund Site | **PROJECT NUMBER** 6252-16-2012.06 | **DATE** 10/17/19

MONITORING WELL MW-37A | **TIME** 15:15

QC SAMPLES N/A | **TRIP BLANK** TB-39

WATER LEVEL / PUMP DATA

INITIAL DTW 21.63 ft (toc) | **FINAL DTW** 21.85 ft (toc)

SCREENED INTERVAL 55.1-59.9 ft (bgs) | **DEPTH OF INTAKE** 57.5 ft (toc)

PUMP TYPE

- [x] Peristaltic
- [ ] Variable-speed submersible
- [ ] Bladder Use Copper coil in Ice Bath

AMOUNT PURGED ~1.0 gal.

PURGE DATA

TIME	Depth to Water (ft)	PURGE RATE (L/min)	TEMP (C°)	CONDUCTIVITY (mS/cm)	pH	DO (mg/L)	TURBIDITY (NTU)	ORP (mV)	Perm (mg/L)	COMMENTS
14:30	21.89	0.2	5.8	196.8	5.52	1.37	50.1	316.5	NA	
14:34	21.83	0.1	5.8	205.7	5.56	1.34	63.5	~~305.0~~ 311.6 RMC 10/17/19	NA	Slow flow rate
14:39	21.83	0.1	5.7	214.5	5.60	0.96	70.9	286.0	NA	
14:43	21.85	0.1	5.7	214.0	5.62	0.71	36.2	260.0	NA	
14:47	21.85	0.1	5.8	214.1	5.63	0.68	32.0	246.8	NA	
15:01	21.85	0.1	5.4	214.4	5.63	0.43	28.5	241.1	NA	
15:05	21.85	0.1	5.4	211.6	5.63	0.42	23.7	235.4	NA	
15:09	21.85	0.1	5.3	212.1	5.62	0.39	15.0	234.1	NA	
15:14	21.85	0.1	5.3	211.6	5.62	0.40	10.5	233.8	NA	

ANALYSES: EPA 8260 (TCE, cis-1,2-DCE, trans-1,2-DCE, vinyl chloride)

NOTES: Perm = potassium permanganate

SIGNATURE:

FIELD DATA RECORD - GROUNDWATER SAMPLING

PROJECT CTS of Asheville, Inc. Superfund Site | **PROJECT NUMBER** 6252-16-2012.06 | **DATE** 10/17/19

MONITORING WELL MW-33 | **TIME** 16:19

QC SAMPLES NA | **TRIP BLANK** TB-39

WATER LEVEL / PUMP DATA

INITIAL DTW 13.75 ft (toc) | **FINAL DTW** 14.20 ft (toc)

SCREENED INTERVAL 40.3-45.1 ft (bgs) | **DEPTH OF INTAKE** 42.7 ft (toc)

PUMP TYPE
- [x] Peristaltic
- [ ] Variable-speed submersible
- [ ] Bladder

AMOUNT PURGED ~1.0 gal.

PURGE DATA

TIME	Depth to Water (ft)	PURGE RATE (L/min)	TEMP (C°)	CONDUCTIVITY (mS/cm)	pH	DO (mg/L)	TURBIDITY (NTU)	ORP (mV)	Perm (mg/L)	COMMENTS
15:40	14.20	0.2	16.3	82.6	5.64	4.25	234	271.8	NA	Slow flow rate
15:44	14.15	0.1	16.5	86.2	5.65	0.99	131	285.9	NA	
15:48	14.15	0.1	16.3	84.8	5.64	0.97	108	289.6	NA	
15:52	14.20	0.1	16.5	82.5	5.62	0.90	77.6	293.0	NA	
15:56	14.20	0.1	16.3	80.1	5.59	0.89	50.4	302.4	NA	
16:00	14.20	0.1	16.3	80.4	5.59	1.01	38.7	304.2	NA	
16:04	14.20	0.1	16.3	80.3	5.59	0.99	29.3	305.6	NA	
16:08	14.20	0.1	16.3	80.2	5.59	0.98	24.9	309.3	NA	

ANALYSES: EPA 8260 (TCE, cis-1,2-DCE, trans-1,2-DCE, vinyl chloride)

NOTES: Perm = potassium permanganate

SIGNATURE:

FIELD DATA RECORD - GROUNDWATER SAMPLING

PROJECT CTS of Asheville, Inc. Superfund Site **PROJECT NUMBER** 6252-16-2012.06 **DATE** 10/17/19

MONITORING WELL MW-33A **TIME** 17:10

QC SAMPLES NA **TRIP BLANK** TB-39

WATER LEVEL / PUMP DATA

INITIAL DTW 14.03 ft (toc) **FINAL DTW** 14.75 ft (toc)

SCREENED INTERVAL 59.7-61.5 ft (bgs) **DEPTH OF INTAKE** 62.1 ft (toc)

PUMP TYPE

- [x] Peristaltic
- [ ] Variable-speed submersible
- [ ] Bladder

AMOUNT PURGED ~ 1 gal.

PURGE DATA

TIME	Depth to Water (ft)	PURGE RATE (L/min)	TEMP (C°)	CONDUCTIVITY (mS/cm)	pH	DO (mg/L)	TURBIDITY (NTU)	ORP (mV)	Perm (mg/L)	COMMENTS
16:35	14.53	0.2	16.4	164.3	6.36	1.00	143	-19.3	NA	
16:39	14.63	0.1	16.5	164.2	6.39	0.86	79.7	-76.1	NA	Slow flow rate
16:43	14.75	0.1	16.4	168.9	6.40	0.77	65.8	-105.1	NA	
16:47	14.75	0.1	16.3	168.6	6.40	0.68	45.4	-118.6	NA	
16:51	14.75	0.1	16.3	163.2	6.39	0.62	26.3	-127.6	NA	
16:55	14.75	0.1	16.3	161.5	6.39	0.53	17.5	-138.9	NA	
16:59	14.75	0.1	16.3	160.0	6.38	0.51	12.5	-144.1	NA	
17:03	14.75	0.1	16.3	156.9	6.37	0.48	10.3	-150.8	NA	
17:08	14.75	0.1	16.3	155.3	6.37	0.46	8.08	-153.5	NA	

ANALYSES: EPA 8260 (TCE, cis-1,2-DCE, trans-1,2-DCE, vinyl chloride)

NOTES: Perm = potassium permanganate

SIGNATURE:

FIELD DATA RECORD - GROUNDWATER SAMPLING

PROJECT CTS of Asheville, Inc. Superfund Site | **PROJECT NUMBER** 6252-16-2012.06 | **DATE** 10/18/19

MONITORING WELL MW-35 | **TIME** 10:00

QC SAMPLES NA | **TRIP BLANK** TB-39

WATER LEVEL / PUMP DATA

INITIAL DTW 15.33 ~~15.58~~ ft (toc) | **FINAL DTW** 10/18/19 15.58 ft (toc)

SCREENED INTERVAL 45.2-50.0 ft (bgs) | **DEPTH OF INTAKE** 47.6 ft (toc)

PUMP TYPE
- [x] Peristaltic
- [ ] Variable-speed submersible
- [ ] Bladder

AMOUNT PURGED ~~2~~ 1.0 gal. 10/18/19

PURGE DATA

TIME	Depth to Water (ft)	PURGE RATE (L/min)	TEMP (C°)	CONDUCTIVITY (mS/cm)	pH	DO (mg/L)	TURBIDITY (NTU)	ORP (mV)	Perm (mg/L)	COMMENTS
09:26	15.58	0.1	15.4	205.2	5.72	0.51	35.6	225.7	NA	
09:30	15.58	0.1	14.8	192.6	5.69	0.99	19.0	228.8	NA	
09:34	15.58	0.1	14.8	198.6	5.70	0.89	18.9	229.1	NA	
09:38	15.58	0.1	15.2	200.5	5.71	0.59	15.5	228.2	NA	
09:42	15.58	0.1	15.4	202.5	5.70	0.48	13.6	227.7	NA	
09:46	15.58	0.1	15.2	205.3	5.71	0.43	10.7	226.9	NA	
09:50	15.58	0.1	15.4	208.6	5.68	0.43	8.84	229.9	NA	
09:55	15.58	0.1	15.3	210.3	5.65	0.43	7.33	230.1	NA	

ANALYSES: EPA 8260 (TCE, cis-1,2-DCE, trans-1,2-DCE, vinyl chloride)

NOTES: Perm = potassium permanganate

SIGNATURE:

FIELD DATA RECORD - GROUNDWATER SAMPLING

PROJECT CTS of Asheville, Inc. Superfund Site | **PROJECT NUMBER** 6252-16-2012.06 | **DATE** 10/18/19

MONITORING WELL MW-35A | **TIME** 10:40

QC SAMPLES NA | **TRIP BLANK** TB-39

WATER LEVEL / PUMP DATA

INITIAL DTW 15.33 ft (toc) | **FINAL DTW** 15.65 ft (toc)

SCREENED INTERVAL 55.2-60 ft (bgs) | **DEPTH OF INTAKE** 57.6 ft (toc)

PUMP TYPE

- [x] Peristaltic
- [ ] Variable-speed submersible
- [ ] Bladder

AMOUNT PURGED ~1 gal.

PURGE DATA

TIME	Depth to Water (ft)	PURGE RATE (L/min)	TEMP (C°)	CONDUCTIVITY (mS/cm)	pH	DO (mg/L)	TURBIDITY (NTU)	ORP (mV)	Perm (mg/L)	COMMENTS
10:02	15.70	0.2	15.5	204.8	6.14	1.42	>1000	192.9	NA	Slow flow rate
10:06	15.63	0.1	14.8	210.3	6.16	0.93	338	85.9	NA	
10:10	15.63	0.1	14.7	213.5	6.19	0.57	179	68.1	NA	
10:14	15.63	0.1	15.3	205.2	6.18	0.37	88.6	35.0	NA	
10:18	15.63	0.1	15.4	203.0	6.17	0.29	53.4	29.6	NA	
10:22	15.65	0.1	15.2	205.7	6.17	0.32	39.3	26.9	NA	
10:26	15.65	0.1	15.0	209.7	6.18	0.28	28.6	13.9	NA	
10:30	15.65	0.1	15.1	212.1	6.18	0.25	18.5	6.3	NA	
10:34	15.65	0.1	15.0	213.4	6.17	0.23	14.8	2.5	NA	
10:38	15.65	0.1	15.0	215.6	6.17	0.20	10.2	-0.5	NA	

ANALYSES: EPA 8260 (TCE, cis-1,2-DCE, trans-1,2-DCE, vinyl chloride)

NOTES: Perm = potassium permanganate

SIGNATURE:

ATTACHMENT 2

ANALYTICAL REPORT

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(704)875-9092

October 25, 2019

Susan Avritt
Wood E&S
1308 Patton Avenue
Asheville, NC 28806

RE: Project: CTS of Asheville
Pace Project No.: 92450302

Dear Susan Avritt:
Enclosed are the analytical results for sample(s) received by the laboratory on October 18, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Taylor Ezell
taylor.ezell@pacelabs.com
(704)875-9092
Project Manager

Enclosures

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
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CERTIFICATIONS

Project: CTS of Asheville
Pace Project No.: 92450302

Charlotte Certification IDs

9800 Kincey Ave. Ste 100, Huntersville, NC 28078
Louisiana/NELAP Certification # LA170028
North Carolina Drinking Water Certification #: 37706
North Carolina Field Services Certification #: 5342
North Carolina Wastewater Certification #: 12
South Carolina Certification #: 99006001
Florida/NELAP Certification #: E87627
Kentucky UST Certification #: 84
Virginia/VELAP Certification #: 460221

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SAMPLE SUMMARY

Project: CTS of Asheville
Pace Project No.: 92450302

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92450302001	**MW-6**	Water	10/16/19 09:30	10/18/19 13:05
92450302002	**MW-6A**	Water	10/16/19 10:45	10/18/19 13:05
92450302003	**EB-09**	Water	10/16/19 09:45	10/18/19 13:05
92450302004	**MW-19**	Water	10/16/19 13:30	10/18/19 13:05
92450302005	**MW-19A**	Water	10/16/19 14:15	10/18/19 13:05
92450302006	**MW-36**	Water	10/16/19 15:35	10/18/19 13:05
92450302007	**MW-36A**	Water	10/16/19 16:20	10/18/19 13:05
92450302008	**MW-34**	Water	10/17/19 09:35	10/18/19 13:05
92450302009	**MW-34A**	Water	10/17/19 10:25	10/18/19 13:05
92450302010	**MW-7A**	Water	10/17/19 11:45	10/18/19 13:05
92450302011	**MW-37**	Water	10/17/19 14:15	10/18/19 13:05
92450302012	**MW-37A**	Water	10/17/19 15:15	10/18/19 13:05
92450302013	**MW-33**	Water	10/17/19 16:15	10/18/19 13:05
92450302014	**MW-33A**	Water	10/17/19 17:10	10/18/19 13:05
92450302015	**FD-41**	Water	10/17/19 00:00	10/18/19 13:05
92450302016	**FD-42**	Water	10/17/19 00:00	10/18/19 13:05
92450302017	**MW-35**	Water	10/18/19 10:00	10/18/19 13:05
92450302018	**MW-35A**	Water	10/18/19 10:40	10/18/19 13:05
92450302019	**TB-39**	Water	10/18/19 00:00	10/18/19 13:05

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SAMPLE ANALYTE COUNT

Project: CTS of Asheville
Pace Project No.: 92450302

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92450302001	**MW-6**	EPA 8260D	SAS	7	PASI-C
92450302002	**MW-6A**	EPA 8260D	SAS	7	PASI-C
92450302003	**EB-09**	EPA 8260D	SAS	7	PASI-C
92450302004	**MW-19**	EPA 8260D	SAS	7	PASI-C
92450302005	**MW-19A**	EPA 8260D	SAS	7	PASI-C
92450302006	**MW-36**	EPA 8260D	SAS	7	PASI-C
92450302007	**MW-36A**	EPA 8260D	SAS	7	PASI-C
92450302008	**MW-34**	EPA 8260D	SAS	7	PASI-C
92450302009	**MW-34A**	EPA 8260D	SAS	7	PASI-C
92450302010	**MW-7A**	EPA 8260D	SAS	7	PASI-C
92450302011	**MW-37**	EPA 8260D	SAS	7	PASI-C
92450302012	**MW-37A**	EPA 8260D	SAS	7	PASI-C
92450302013	**MW-33**	EPA 8260D	SAS	7	PASI-C
92450302014	**MW-33A**	EPA 8260D	SAS	7	PASI-C
92450302015	**FD-41**	EPA 8260D	SAS	7	PASI-C
92450302016	**FD-42**	EPA 8260D	SAS	7	PASI-C
92450302017	**MW-35**	EPA 8260D	SAS	7	PASI-C
92450302018	**MW-35A**	EPA 8260D	SAS	7	PASI-C
92450302019	**TB-39**	EPA 8260D	SAS	7	PASI-C

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SUMMARY OF DETECTION

Project: CTS of Asheville
Pace Project No.: 92450302

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92450302001	**MW-6**					
EPA 8260D	Trichloroethene	15200	ug/L	100	10/25/19 00:59	
92450302002	**MW-6A**					
EPA 8260D	Trichloroethene	47300	ug/L	500	10/25/19 03:36	
92450302004	**MW-19**					
EPA 8260D	cis-1,2-Dichloroethene	930	ug/L	25.0	10/24/19 23:33	
EPA 8260D	Trichloroethene	3460	ug/L	25.0	10/24/19 23:33	
92450302005	**MW-19A**					
EPA 8260D	cis-1,2-Dichloroethene	5180	ug/L	100	10/25/19 00:42	
EPA 8260D	Trichloroethene	12400	ug/L	100	10/25/19 00:42	
92450302006	**MW-36**					
EPA 8260D	Trichloroethene	16800	ug/L	100	10/25/19 01:17	
92450302007	**MW-36A**					
EPA 8260D	Trichloroethene	36100	ug/L	250	10/25/19 03:01	
92450302008	**MW-34**					
EPA 8260D	Trichloroethene	32600	ug/L	200	10/25/19 01:34	
92450302009	**MW-34A**					
EPA 8260D	Trichloroethene	31900	ug/L	200	10/25/19 01:52	
92450302010	**MW-7A**					
EPA 8260D	cis-1,2-Dichloroethene	53.1J	ug/L	125	10/25/19 16:23	
EPA 8260D	Trichloroethene	11500	ug/L	125	10/25/19 16:23	
92450302011	**MW-37**					
EPA 8260D	cis-1,2-Dichloroethene	451	ug/L	50.0	10/24/19 23:50	
EPA 8260D	Trichloroethene	8910	ug/L	50.0	10/24/19 23:50	
92450302012	**MW-37A**					
EPA 8260D	cis-1,2-Dichloroethene	601	ug/L	50.0	10/25/19 00:07	
EPA 8260D	Trichloroethene	8770	ug/L	50.0	10/25/19 00:07	
92450302013	**MW-33**					
EPA 8260D	Trichloroethene	32000	ug/L	200	10/25/19 02:26	
92450302014	**MW-33A**					
EPA 8260D	Trichloroethene	41200	ug/L	250	10/25/19 03:18	
92450302015	**FD-41**					
EPA 8260D	Trichloroethene	33100	ug/L	200	10/25/19 02:44	
92450302016	**FD-42**					
EPA 8260D	cis-1,2-Dichloroethene	549	ug/L	100	10/25/19 16:40	
EPA 8260D	Trichloroethene	10900	ug/L	100	10/25/19 16:40	
92450302017	**MW-35**					
EPA 8260D	Trichloroethene	9970	ug/L	100	10/25/19 16:57	

REPORT OF LABORATORY ANALYSIS

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SUMMARY OF DETECTION

Project: CTS of Asheville
Pace Project No.: 92450302

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92450302018	**MW-35A**					
EPA 8260D	Trichloroethene	11500	ug/L	100	10/25/19 16:05	

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: CTS of Asheville
Pace Project No.: 92450302

Method: **EPA 8260D**
Description: 8260D MSV Low Level
Client: Wood E&I - Asheville
Date: October 25, 2019

General Information:
19 samples were analyzed for EPA 8260D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

QC Batch: 505796

L1: Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.

- LCS (Lab ID: 2717125)
  - Vinyl chloride

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 505625

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 92450302007

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

- MSD (Lab ID: 2716393)
  - Vinyl chloride

QC Batch: 505796

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 92450302010

M0: Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

- MSD (Lab ID: 2717127)
  - Vinyl chloride

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PROJECT NARRATIVE

Project: CTS of Asheville
Pace Project No.: 92450302

Method: **EPA 8260D**
Description: 8260D MSV Low Level
Client: Wood E&I - Asheville
Date: October 25, 2019

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: CTS of Asheville
Pace Project No.: 92450302

Sample: MW-6 **Lab ID: 92450302001** Collected: 10/16/19 09:30 Received: 10/18/19 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260D MSV Low Level	Analytical Method: EPA 8260D								
cis-1,2-Dichloroethene	ND	ug/L	100	29.1	100		10/25/19 00:59	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	100	25.4	100		10/25/19 00:59	156-60-5	
Trichloroethene	**15200**	ug/L	100	22.0	100		10/25/19 00:59	79-01-6	
Vinyl chloride	ND	ug/L	100	24.2	100		10/25/19 00:59	75-01-4	v1
Surrogates									
4-Bromofluorobenzene (S)	101	%	70-130		100		10/25/19 00:59	460-00-4	
1,2-Dichloroethane-d4 (S)	107	%	70-130		100		10/25/19 00:59	17060-07-0	
Toluene-d8 (S)	101	%	70-130		100		10/25/19 00:59	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: CTS of Asheville
Pace Project No.: 92450302

Sample: MW-6A **Lab ID: 92450302002** Collected: 10/16/19 10:45 Received: 10/18/19 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260D MSV Low Level	Analytical Method: EPA 8260D								
cis-1,2-Dichloroethene	ND	ug/L	500	146	500		10/25/19 03:36	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	500	127	500		10/25/19 03:36	156-60-5	
Trichloroethene	**47300**	ug/L	500	110	500		10/25/19 03:36	79-01-6	
Vinyl chloride	ND	ug/L	500	121	500		10/25/19 03:36	75-01-4	v1
Surrogates									
4-Bromofluorobenzene (S)	102	%	70-130		500		10/25/19 03:36	460-00-4	
1,2-Dichloroethane-d4 (S)	108	%	70-130		500		10/25/19 03:36	17060-07-0	
Toluene-d8 (S)	100	%	70-130		500		10/25/19 03:36	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: CTS of Asheville
Pace Project No.: 92450302

Sample: EB-09 **Lab ID: 92450302003** Collected: 10/16/19 09:45 Received: 10/18/19 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260D MSV Low Level	Analytical Method: EPA 8260D								
cis-1,2-Dichloroethene	ND	ug/L	1.0	0.29	1		10/24/19 22:23	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	0.25	1		10/24/19 22:23	156-60-5	
Trichloroethene	ND	ug/L	1.0	0.22	1		10/24/19 22:23	79-01-6	
Vinyl chloride	ND	ug/L	1.0	0.24	1		10/24/19 22:23	75-01-4	v1
Surrogates									
4-Bromofluorobenzene (S)	102	%	70-130		1		10/24/19 22:23	460-00-4	
1,2-Dichloroethane-d4 (S)	105	%	70-130		1		10/24/19 22:23	17060-07-0	
Toluene-d8 (S)	100	%	70-130		1		10/24/19 22:23	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: CTS of Asheville
Pace Project No.: 92450302

Sample: MW-19 **Lab ID: 92450302004** Collected: 10/16/19 13:30 Received: 10/18/19 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260D MSV Low Level	Analytical Method: EPA 8260D								
cis-1,2-Dichloroethene	**930**	ug/L	25.0	7.3	25		10/24/19 23:33	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	25.0	6.4	25		10/24/19 23:33	156-60-5	
Trichloroethene	**3460**	ug/L	25.0	5.5	25		10/24/19 23:33	79-01-6	
Vinyl chloride	ND	ug/L	25.0	6.0	25		10/24/19 23:33	75-01-4	v1
Surrogates									
4-Bromofluorobenzene (S)	101	%	70-130		25		10/24/19 23:33	460-00-4	
1,2-Dichloroethane-d4 (S)	103	%	70-130		25		10/24/19 23:33	17060-07-0	
Toluene-d8 (S)	100	%	70-130		25		10/24/19 23:33	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: CTS of Asheville
Pace Project No.: 92450302

Sample: MW-19A **Lab ID: 92450302005** Collected: 10/16/19 14:15 Received: 10/18/19 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260D MSV Low Level	Analytical Method: EPA 8260D								
cis-1,2-Dichloroethene	**5180**	ug/L	100	29.1	100		10/25/19 00:42	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	100	25.4	100		10/25/19 00:42	156-60-5	
Trichloroethene	**12400**	ug/L	100	22.0	100		10/25/19 00:42	79-01-6	
Vinyl chloride	ND	ug/L	100	24.2	100		10/25/19 00:42	75-01-4	v1
Surrogates									
4-Bromofluorobenzene (S)	100	%	70-130		100		10/25/19 00:42	460-00-4	
1,2-Dichloroethane-d4 (S)	107	%	70-130		100		10/25/19 00:42	17060-07-0	
Toluene-d8 (S)	98	%	70-130		100		10/25/19 00:42	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: CTS of Asheville
Pace Project No.: 92450302

Sample: MW-36 **Lab ID: 92450302006** Collected: 10/16/19 15:35 Received: 10/18/19 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260D MSV Low Level	Analytical Method: EPA 8260D								
cis-1,2-Dichloroethene	ND	ug/L	100	29.1	100		10/25/19 01:17	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	100	25.4	100		10/25/19 01:17	156-60-5	
Trichloroethene	**16800**	ug/L	100	22.0	100		10/25/19 01:17	79-01-6	
Vinyl chloride	ND	ug/L	100	24.2	100		10/25/19 01:17	75-01-4	v1
Surrogates									
4-Bromofluorobenzene (S)	103	%	70-130		100		10/25/19 01:17	460-00-4	
1,2-Dichloroethane-d4 (S)	107	%	70-130		100		10/25/19 01:17	17060-07-0	
Toluene-d8 (S)	99	%	70-130		100		10/25/19 01:17	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: CTS of Asheville
Pace Project No.: 92450302

Sample: MW-36A **Lab ID: 92450302007** Collected: 10/16/19 16:20 Received: 10/18/19 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260D MSV Low Level	Analytical Method: EPA 8260D								
cis-1,2-Dichloroethene	ND	ug/L	250	72.8	250		10/25/19 03:01	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	250	63.5	250		10/25/19 03:01	156-60-5	
Trichloroethene	**36100**	ug/L	250	55.0	250		10/25/19 03:01	79-01-6	
Vinyl chloride	ND	ug/L	250	60.5	250		10/25/19 03:01	75-01-4	M1,v1
Surrogates									
4-Bromofluorobenzene (S)	102	%	70-130		250		10/25/19 03:01	460-00-4	
1,2-Dichloroethane-d4 (S)	108	%	70-130		250		10/25/19 03:01	17060-07-0	
Toluene-d8 (S)	98	%	70-130		250		10/25/19 03:01	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: CTS of Asheville
Pace Project No.: 92450302

Sample: MW-34 **Lab ID: 92450302008** Collected: 10/17/19 09:35 Received: 10/18/19 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260D MSV Low Level	Analytical Method: EPA 8260D								
cis-1,2-Dichloroethene	ND	ug/L	200	58.2	200		10/25/19 01:34	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	200	50.8	200		10/25/19 01:34	156-60-5	
Trichloroethene	**32600**	ug/L	200	44.0	200		10/25/19 01:34	79-01-6	
Vinyl chloride	ND	ug/L	200	48.4	200		10/25/19 01:34	75-01-4	v1
Surrogates									
4-Bromofluorobenzene (S)	101	%	70-130		200		10/25/19 01:34	460-00-4	
1,2-Dichloroethane-d4 (S)	107	%	70-130		200		10/25/19 01:34	17060-07-0	
Toluene-d8 (S)	100	%	70-130		200		10/25/19 01:34	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: CTS of Asheville
Pace Project No.: 92450302

Sample: MW-34A **Lab ID: 92450302009** Collected: 10/17/19 10:25 Received: 10/18/19 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260D MSV Low Level	Analytical Method: EPA 8260D								
cis-1,2-Dichloroethene	ND	ug/L	200	58.2	200		10/25/19 01:52	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	200	50.8	200		10/25/19 01:52	156-60-5	
Trichloroethene	**31900**	ug/L	200	44.0	200		10/25/19 01:52	79-01-6	
Vinyl chloride	ND	ug/L	200	48.4	200		10/25/19 01:52	75-01-4	v1
Surrogates									
4-Bromofluorobenzene (S)	102	%	70-130		200		10/25/19 01:52	460-00-4	
1,2-Dichloroethane-d4 (S)	107	%	70-130		200		10/25/19 01:52	17060-07-0	
Toluene-d8 (S)	100	%	70-130		200		10/25/19 01:52	2037-26-5	

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ANALYTICAL RESULTS

Project: CTS of Asheville
Pace Project No.: 92450302

Sample: MW-7A **Lab ID: 92450302010** Collected: 10/17/19 11:45 Received: 10/18/19 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260D MSV Low Level	Analytical Method: EPA 8260D								
cis-1,2-Dichloroethene	**53.1J**	ug/L	125	36.4	125		10/25/19 16:23	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	125	31.8	125		10/25/19 16:23	156-60-5	
Trichloroethene	**11500**	ug/L	125	27.5	125		10/25/19 16:23	79-01-6	
Vinyl chloride	ND	ug/L	125	30.2	125		10/25/19 16:23	75-01-4	L1,M0, v1
Surrogates									
4-Bromofluorobenzene (S)	100	%	70-130		125		10/25/19 16:23	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%	70-130		125		10/25/19 16:23	17060-07-0	
Toluene-d8 (S)	99	%	70-130		125		10/25/19 16:23	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CTS of Asheville
Pace Project No.: 92450302

Sample: MW-37 **Lab ID: 92450302011** Collected: 10/17/19 14:15 Received: 10/18/19 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260D MSV Low Level	Analytical Method: EPA 8260D								
cis-1,2-Dichloroethene	**451**	ug/L	50.0	14.6	50		10/24/19 23:50	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	50.0	12.7	50		10/24/19 23:50	156-60-5	
Trichloroethene	**8910**	ug/L	50.0	11.0	50		10/24/19 23:50	79-01-6	
Vinyl chloride	ND	ug/L	50.0	12.1	50		10/24/19 23:50	75-01-4	v1
Surrogates									
4-Bromofluorobenzene (S)	99	%	70-130		50		10/24/19 23:50	460-00-4	
1,2-Dichloroethane-d4 (S)	105	%	70-130		50		10/24/19 23:50	17060-07-0	
Toluene-d8 (S)	100	%	70-130		50		10/24/19 23:50	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: CTS of Asheville
Pace Project No.: 92450302

Sample: MW-37A **Lab ID: 92450302012** Collected: 10/17/19 15:15 Received: 10/18/19 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260D MSV Low Level	Analytical Method: EPA 8260D								
cis-1,2-Dichloroethene	**601**	ug/L	50.0	14.6	50		10/25/19 00:07	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	50.0	12.7	50		10/25/19 00:07	156-60-5	
Trichloroethene	**8770**	ug/L	50.0	11.0	50		10/25/19 00:07	79-01-6	
Vinyl chloride	ND	ug/L	50.0	12.1	50		10/25/19 00:07	75-01-4	v1
Surrogates									
4-Bromofluorobenzene (S)	101	%	70-130		50		10/25/19 00:07	460-00-4	
1,2-Dichloroethane-d4 (S)	106	%	70-130		50		10/25/19 00:07	17060-07-0	
Toluene-d8 (S)	97	%	70-130		50		10/25/19 00:07	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: CTS of Asheville
Pace Project No.: 92450302

Sample: MW-33 **Lab ID: 92450302013** Collected: 10/17/19 16:15 Received: 10/18/19 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260D MSV Low Level	Analytical Method: EPA 8260D								
cis-1,2-Dichloroethene	ND	ug/L	200	58.2	200		10/25/19 02:26	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	200	50.8	200		10/25/19 02:26	156-60-5	
Trichloroethene	**32000**	ug/L	200	44.0	200		10/25/19 02:26	79-01-6	
Vinyl chloride	ND	ug/L	200	48.4	200		10/25/19 02:26	75-01-4	v1
Surrogates									
4-Bromofluorobenzene (S)	101	%	70-130		200		10/25/19 02:26	460-00-4	
1,2-Dichloroethane-d4 (S)	106	%	70-130		200		10/25/19 02:26	17060-07-0	
Toluene-d8 (S)	100	%	70-130		200		10/25/19 02:26	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: CTS of Asheville
Pace Project No.: 92450302

Sample: MW-33A **Lab ID: 92450302014** Collected: 10/17/19 17:10 Received: 10/18/19 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260D MSV Low Level	Analytical Method: EPA 8260D								
cis-1,2-Dichloroethene	ND	ug/L	250	72.8	250		10/25/19 03:18	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	250	63.5	250		10/25/19 03:18	156-60-5	
Trichloroethene	**41200**	ug/L	250	55.0	250		10/25/19 03:18	79-01-6	
Vinyl chloride	ND	ug/L	250	60.5	250		10/25/19 03:18	75-01-4	v1
Surrogates									
4-Bromofluorobenzene (S)	103	%	70-130		250		10/25/19 03:18	460-00-4	
1,2-Dichloroethane-d4 (S)	106	%	70-130		250		10/25/19 03:18	17060-07-0	
Toluene-d8 (S)	99	%	70-130		250		10/25/19 03:18	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: CTS of Asheville
Pace Project No.: 92450302

Sample: FD-41 **Lab ID: 92450302015** Collected: 10/17/19 00:00 Received: 10/18/19 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260D MSV Low Level	Analytical Method: EPA 8260D								
cis-1,2-Dichloroethene	ND	ug/L	200	58.2	200		10/25/19 02:44	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	200	50.8	200		10/25/19 02:44	156-60-5	
Trichloroethene	**33100**	ug/L	200	44.0	200		10/25/19 02:44	79-01-6	
Vinyl chloride	ND	ug/L	200	48.4	200		10/25/19 02:44	75-01-4	v1
Surrogates									
4-Bromofluorobenzene (S)	102	%	70-130		200		10/25/19 02:44	460-00-4	
1,2-Dichloroethane-d4 (S)	105	%	70-130		200		10/25/19 02:44	17060-07-0	
Toluene-d8 (S)	100	%	70-130		200		10/25/19 02:44	2037-26-5	

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ANALYTICAL RESULTS

Project: CTS of Asheville
Pace Project No.: 92450302

Sample: FD-42 **Lab ID: 92450302016** Collected: 10/17/19 00:00 Received: 10/18/19 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260D MSV Low Level	Analytical Method: EPA 8260D								
cis-1,2-Dichloroethene	**549**	ug/L	100	29.1	100		10/25/19 16:40	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	100	25.4	100		10/25/19 16:40	156-60-5	
Trichloroethene	**10900**	ug/L	100	22.0	100		10/25/19 16:40	79-01-6	
Vinyl chloride	ND	ug/L	100	24.2	100		10/25/19 16:40	75-01-4	L1,v1
Surrogates									
4-Bromofluorobenzene (S)	100	%	70-130		100		10/25/19 16:40	460-00-4	
1,2-Dichloroethane-d4 (S)	104	%	70-130		100		10/25/19 16:40	17060-07-0	
Toluene-d8 (S)	98	%	70-130		100		10/25/19 16:40	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: CTS of Asheville
Pace Project No.: 92450302

Sample: MW-35 **Lab ID: 92450302017** Collected: 10/18/19 10:00 Received: 10/18/19 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260D MSV Low Level	Analytical Method: EPA 8260D								
cis-1,2-Dichloroethene	ND	ug/L	100	29.1	100		10/25/19 16:57	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	100	25.4	100		10/25/19 16:57	156-60-5	
Trichloroethene	**9970**	ug/L	100	22.0	100		10/25/19 16:57	79-01-6	
Vinyl chloride	ND	ug/L	100	24.2	100		10/25/19 16:57	75-01-4	L1,v1
Surrogates									
4-Bromofluorobenzene (S)	100	%	70-130		100		10/25/19 16:57	460-00-4	
1,2-Dichloroethane-d4 (S)	105	%	70-130		100		10/25/19 16:57	17060-07-0	
Toluene-d8 (S)	100	%	70-130		100		10/25/19 16:57	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: CTS of Asheville
Pace Project No.: 92450302

Sample: MW-35A **Lab ID: 92450302018** Collected: 10/18/19 10:40 Received: 10/18/19 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260D MSV Low Level	Analytical Method: EPA 8260D								
cis-1,2-Dichloroethene	ND	ug/L	100	29.1	100		10/25/19 16:05	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	100	25.4	100		10/25/19 16:05	156-60-5	
Trichloroethene	**11500**	ug/L	100	22.0	100		10/25/19 16:05	79-01-6	
Vinyl chloride	ND	ug/L	100	24.2	100		10/25/19 16:05	75-01-4	L1,v1
Surrogates									
4-Bromofluorobenzene (S)	101	%	70-130		100		10/25/19 16:05	460-00-4	
1,2-Dichloroethane-d4 (S)	106	%	70-130		100		10/25/19 16:05	17060-07-0	
Toluene-d8 (S)	100	%	70-130		100		10/25/19 16:05	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: CTS of Asheville
Pace Project No.: 92450302

Sample: TB-39 **Lab ID: 92450302019** Collected: 10/18/19 00:00 Received: 10/18/19 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260D MSV Low Level	Analytical Method: EPA 8260D								
cis-1,2-Dichloroethene	ND	ug/L	1.0	0.29	1		10/25/19 12:55	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	0.25	1		10/25/19 12:55	156-60-5	
Trichloroethene	ND	ug/L	1.0	0.22	1		10/25/19 12:55	79-01-6	
Vinyl chloride	ND	ug/L	1.0	0.24	1		10/25/19 12:55	75-01-4	L1,v1
Surrogates									
4-Bromofluorobenzene (S)	101	%	70-130		1		10/25/19 12:55	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%	70-130		1		10/25/19 12:55	17060-07-0	
Toluene-d8 (S)	101	%	70-130		1		10/25/19 12:55	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: CTS of Asheville
Pace Project No.: 92450302

QC Batch: 505625 Analysis Method: EPA 8260D
QC Batch Method: EPA 8260D Analysis Description: 8260D MSV Low Level
Associated Lab Samples: 92450302001, 92450302002, 92450302003, 92450302004, 92450302005, 92450302006, 92450302007, 92450302008, 92450302009, 92450302011, 92450302012, 92450302013, 92450302014, 92450302015

METHOD BLANK: 2716356 Matrix: Water
Associated Lab Samples: 92450302001, 92450302002, 92450302003, 92450302004, 92450302005, 92450302006, 92450302007, 92450302008, 92450302009, 92450302011, 92450302012, 92450302013, 92450302014, 92450302015

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
cis-1,2-Dichloroethene	ug/L	ND	1.0	0.29	10/24/19 21:14	
trans-1,2-Dichloroethene	ug/L	ND	1.0	0.25	10/24/19 21:14	
Trichloroethene	ug/L	ND	1.0	0.22	10/24/19 21:14	
Vinyl chloride	ug/L	ND	1.0	0.24	10/24/19 21:14	v1
1,2-Dichloroethane-d4 (S)	%	104	70-130		10/24/19 21:14	
4-Bromofluorobenzene (S)	%	104	70-130		10/24/19 21:14	
Toluene-d8 (S)	%	101	70-130		10/24/19 21:14	

LABORATORY CONTROL SAMPLE: 2716357

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
cis-1,2-Dichloroethene	ug/L	50	53.1	106	70-130	
trans-1,2-Dichloroethene	ug/L	50	53.9	108	70-130	
Trichloroethene	ug/L	50	50.7	101	70-130	
Vinyl chloride	ug/L	50	62.5	125	70-131	v1
1,2-Dichloroethane-d4 (S)	%			99	70-130	
4-Bromofluorobenzene (S)	%			102	70-130	
Toluene-d8 (S)	%			101	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2716392 2716393

Parameter	Units	92450302007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
cis-1,2-Dichloroethene	ug/L	ND	5000	5000	6020	6180	120	124	70-141	3	30	
trans-1,2-Dichloroethene	ug/L	ND	5000	5000	6220	6340	124	127	70-146	2	30	
Trichloroethene	ug/L	36100	5000	5000	41800	42200	113	121	70-147	1	30	
Vinyl chloride	ug/L	ND	5000	5000	7580	7870	152	157	70-156	4	30	M1,v1
1,2-Dichloroethane-d4 (S)	%						101	101	70-130			
4-Bromofluorobenzene (S)	%						102	102	70-130			
Toluene-d8 (S)	%						101	101	70-130			

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: CTS of Asheville
Pace Project No.: 92450302

QC Batch: 505796 Analysis Method: EPA 8260D
QC Batch Method: EPA 8260D Analysis Description: 8260D MSV Low Level
Associated Lab Samples: 92450302010, 92450302016, 92450302017, 92450302018, 92450302019

METHOD BLANK: 2717124 Matrix: Water
Associated Lab Samples: 92450302010, 92450302016, 92450302017, 92450302018, 92450302019

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
cis-1,2-Dichloroethene	ug/L	ND	1.0	0.29	10/25/19 12:38	
trans-1,2-Dichloroethene	ug/L	ND	1.0	0.25	10/25/19 12:38	
Trichloroethene	ug/L	ND	1.0	0.22	10/25/19 12:38	
Vinyl chloride	ug/L	ND	1.0	0.24	10/25/19 12:38	v1
1,2-Dichloroethane-d4 (S)	%	105	70-130		10/25/19 12:38	
4-Bromofluorobenzene (S)	%	102	70-130		10/25/19 12:38	
Toluene-d8 (S)	%	102	70-130		10/25/19 12:38	

LABORATORY CONTROL SAMPLE: 2717125

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
cis-1,2-Dichloroethene	ug/L	50	53.7	107	70-130	
trans-1,2-Dichloroethene	ug/L	50	55.4	111	70-130	
Trichloroethene	ug/L	50	51.7	103	70-130	
Vinyl chloride	ug/L	50	69.5	139	70-131	L1,v1
1,2-Dichloroethane-d4 (S)	%			100	70-130	
4-Bromofluorobenzene (S)	%			102	70-130	
Toluene-d8 (S)	%			103	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2717126 2717127

Parameter	Units	92450302010 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
cis-1,2-Dichloroethene	ug/L	53.1J	2500	2500	2710	3080	106	121	70-141	13	30	
trans-1,2-Dichloroethene	ug/L	ND	2500	2500	2720	3090	109	124	70-146	13	30	
Trichloroethene	ug/L	11500	2500	2500	14400	15000	114	140	70-147	4	30	
Vinyl chloride	ug/L	ND	2500	2500	3560	4010	142	160	70-156	12	30	M0,v1
1,2-Dichloroethane-d4 (S)	%						98	99	70-130			
4-Bromofluorobenzene (S)	%						99	100	70-130			
Toluene-d8 (S)	%						98	99	70-130			

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

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: CTS of Asheville
Pace Project No.: 92450302

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether.

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

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

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

TNI - The NELAC Institute.

LABORATORIES

PASI-C	Pace Analytical Services - Charlotte

ANALYTE QUALIFIERS

L1	Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.
M0	Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
v1	The continuing calibration verification was above the method acceptance limit. Any detection for the analyte in the associated samples may have a high bias.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CTS of Asheville
Pace Project No.: 92450302

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92450302001	**MW-6**	EPA 8260D	505625		
92450302002	**MW-6A**	EPA 8260D	505625		
92450302003	**EB-09**	EPA 8260D	505625		
92450302004	**MW-19**	EPA 8260D	505625		
92450302005	**MW-19A**	EPA 8260D	505625		
92450302006	**MW-36**	EPA 8260D	505625		
92450302007	**MW-36A**	EPA 8260D	505625		
92450302008	**MW-34**	EPA 8260D	505625		
92450302009	**MW-34A**	EPA 8260D	505625		
92450302010	**MW-7A**	EPA 8260D	505796		
92450302011	**MW-37**	EPA 8260D	505625		
92450302012	**MW-37A**	EPA 8260D	505625		
92450302013	**MW-33**	EPA 8260D	505625		
92450302014	**MW-33A**	EPA 8260D	505625		
92450302015	**FD-41**	EPA 8260D	505625		
92450302016	**FD-42**	EPA 8260D	505796		
92450302017	**MW-35**	EPA 8260D	505796		
92450302018	**MW-35A**	EPA 8260D	505796		
92450302019	**TB-39**	EPA 8260D	505796		

Pace Analytical®	Document Name: Sample Condition Upon Receipt(SCUR)	Document Revised: February 7, 2018 Page 1 of 2
	Document No.: F-CAR-CS-033-Rev.06	Issuing Authority: Pace Carolinas Quality Office

Laboratory receiving samples:
Asheville ☒ Eden ☐ Greenwood ☐ Huntersville ☐ Raleigh ☐ Mechanicsville ☐

Sample Condition Upon Receipt

Client Name: Wood E&I **Project #:**

WO# : 92450302

92450302

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

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

Date/Initials Person Examining Contents: JD 10/18/19

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

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

Thermometer: ☒ IR Gun ID: 93706 Type of Ice: ☒ Wet ☐ Blue ☐ None

Cooler Temp (°C): 1.9 Correction Factor: Add/Subtract (°C) 0.0

Cooler Temp Corrected (°C): 1.9

Temp should be above freezing to 6°C
☐ Samples out of temp criteria. Samples on ice, cooling process has begun

USDA Regulated Soil (☒ N/A, water sample)
Did samples originate in a quarantine zone within the United States: CA, NY, or SC (check maps)? ☐ Yes ☐ No

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

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

Field Data Required? ☐ Yes ☒ No

COMMENTS/SAMPLE DISCREPANCY

Lot ID of split containers:

CLIENT NOTIFICATION/RESOLUTION

Person contacted: _____ Date/Time: _____

Project Manager SCURF Review: TE Date: 10/22

Project Manager SRF Review: TE Date: 10/22

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

Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC, LLHg

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

Project # **WO# : 92450302**

PM: PTE Due Date: 10/25/19

CLIENT: 92-AMEC A

Item#	BP4U-125 mL Plastic Unpreserved (N/A) (Cl-)	BP3U-250 mL Plastic Unpreserved (N/A)	BP2U-500 mL Plastic Unpreserved (N/A)	BP1U-1 liter Plastic Unpreserved (N/A)	BP4S-125 mL Plastic H2SO4 (pH < 2) (Cl-)	BP3N-250 mL plastic HNO3 (pH < 2)	BP4Z-125 mL Plastic ZN Acetate & NaOH (>9)	BP4C-125 mL Plastic NaOH (pH > 12) (Cl-)	WGFU-Wide-mouthed Glass jar Unpreserved	AG1U-1 liter Amber Unpreserved (N/A) (Cl-)	AG1H-1 liter Amber HCl (pH < 2)	AG3U-250 mL Amber Unpreserved (N/A)(Cl-)	AG1S-1 liter Amber H2SO4 (pH < 2)	AG3S-250 mL Amber H2SO4 (pH < 2)	AG3A(DG3A)-250 mL Amber NH4Cl (N/A)(Cl-)	DG9H-40 mL VOA HCl (N/A)	VG9T-40 mL VOA Na2S2O3 (N/A)	VG9U-40 mL VOA Una (N/A)	DG9P-40 mL VOA H3PO4 (N/A)	VOAK (6 vials per kit)-5035 kit (N/A)	V/GK (3 vials per kit)-VPH/Gas kit (N/A)	SPST-125 mL Sterile Plastic (N/A – lab)	SP2T-250 mL Sterile Plastic (N/A – lab)		BP3A-250 mL Plastic (NH2)2SO4 (9.3-9.7)	AG0U-100 mL Amber Unpreserved vials (N/A)	VSGU-20 mL Scintillation vials (N/A)	DG9U-40 mL Amber Unpreserved vials (N/A)
1																3												
2																3												
3																3												
4																3												
5																3												
6																3												
7																9												
8																3												
9																3												
10																3												
11																3												
12																3												

pH Adjustment Log for Preserved Samples

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

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

1/2

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

Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC, LLHg

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

Project #

Item#	BP4U-125 mL Plastic Unpreserved (N/A) (Cl-)	BP3U-250 mL Plastic Unpreserved (N/A)	BP2U-500 mL Plastic Unpreserved (N/A)	BP1U-1 liter Plastic Unpreserved (N/A)	BP4S-125 mL Plastic H2SO4 (pH < 2) (Cl-)	BP3N-250 mL plastic HNO3 (pH < 2)	BP4Z-125 mL Plastic ZN Acetate & NaOH (>9)	BP4C-125 mL Plastic NaOH (pH > 12) (Cl-)	WGFU-Wide-mouthed Glass jar Unpreserved	AG1U-1 liter Amber Unpreserved (N/A) (Cl-)	AG1H-1 liter Amber HCl (pH < 2)	AG3U-250 mL Amber Unpreserved (N/A) (Cl-)	AG1S-1 liter Amber H2SO4 (pH < 2)	AG3S-250 mL Amber H2SO4 (pH < 2)	AG3A(DG3A)-250 mL Amber NH4Cl (N/A)(Cl-)	DG9H-40 mL VOA HCl (N/A)	VG9T-40 mL VOA Na2S2O3 (N/A)	VG9U-40 mL VOA Unp (N/A)	DG9P-40 mL VOA H3PO4 (N/A)	VOAK (6 vials per kit)-5035 kit (N/A)	V/GK (3 vials per kit)-VPH/Gas kit (N/A)	SP5T-125 mL Sterile Plastic (N/A – lab)	SP2T-250 mL Sterile Plastic (N/A – lab)		BP3A-250 mL Plastic (NH2)2SO4 (9.3-9.7)	AG0U-100 mL Amber Unpreserved vials (N/A)	VSGU-20 mL Scintillation vials (N/A)	DG9U-40 mL Amber Unpreserved vials (N/A)
1																3												
2																3												
3																3												
4																3												
5																3												
6																3												
7																2												
8																												
9																												
10																												
11																												
12																												

pH Adjustment Log for Preserved Samples

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

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

2/2

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

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

Page : 1 Of 2

Section A	Section B	Section C
Required Client Information:	Required Project Information:	Invoice Information:
Company: Wood E&I - Asheville	Report To: Susan Avritt	Attention:
Address: 1308 Patton Avenue	Copy To:	Company Name:
Asheville, NC 28806		Address:
Email: susan.avritt@woodplc.com	Purchase Order #:	Pace Quote:
Phone: NONE Fax:	Project Name: CTS of Asheville	Pace Project Manager: taylor.ezell@pacelabs.com,
Requested Due Date: Standard TAT	Project #: 625216 2012.06	Pace Profile #: 3900-3

Regulatory Agency: —

State / Location: NC

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analysis Test (Y/N)	Trip BLANK	VOC Short List	Residual Chlorine (Y/N)	924503
1	MW-6					10/16/19	09:30		3				✓							✓		001
2	MW-6A					10/16/19	10:45		3				✓							✓		002
3	EB-09					10/16/19	09:45		3				✓							✓		003
4	MW-19					10/16/19	13:30		3				✓							✓		004
5	MW-19A					10/16/19	14:15		3				✓							✓		005
6	MW-36					10/16/19	15:35		3				✓							✓		006
7	MW-36A					10/16/19	16:20		9				✓							✓		MS/MSD 007
8	MW-34					10/17/19	09:35		3				✓							✓		008
9	MW-34A					10/17/19	10:25		3				✓							✓		009
10	MW-7A					10/17/19	11:45		3				✓							✓		010
11	MW-37					10/17/19	14:15		3				✓							✓		011
12	MW-37A					10/17/19	15:15		3				✓							✓		012

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
Level IV Reporting		10/18/19	13:05	Lori Patton/Pace	10/18/19	1305	1.9	Y	Y	Y
Baseline Event										

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: RODNEY M. CLARK

SIGNATURE of SAMPLER: DATE Signed: 10/18/19

CHAIN-OF-CUSTODY / Analytical Request Document

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

Page : 2 Of 2

Section A — Required Client Information:

Company: Wood E&I - Asheville
Address: 1308 Patton Avenue
Asheville, NC 28806
Email: susan.avritt@woodplc.com
Phone: NONE Fax:
Requested Due Date: Standard Turn

Section B — Required Project Information:

Report To: Susan Avritt
Copy To:
Purchase Order #:
Project Name: CTS of Asheville
Project #: 62521620 12.05

Section C — Invoice Information:

Attention:
Company Name:
Address:
Pace Quote:
Pace Project Manager: taylor.ezell@pacelabs.com,
Pace Profile #: 3900-3

Regulatory Agency
State / Location: NC

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analysis Test (Y/N)	Trip BLANK	VOC Short List	Residual Chlorine (Y/N)	9245030J
1	MW-33					10/17/19	16:15		3				V							J		013
2	MW-33A					10/17/19	17:10		3				V							V		014
3	FD-41					10/17/19	0:00		3				V							V		015
4	FD-42					10/17/19	0:00		3				V							V		016
5	MW-35					10/18/19	10:00		3				V							J		017
6	MW-35A					10/18/19	10:40		3				V							V		018
7	TIB-39					lab prep			2				V						✓	✓		019
8																						
9																						
10																						
11																						
12																						

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

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Level IV Reporting Baseline Event		10/18/19	13:05	Kami Patton/Pace	10/18/19	1305	1c	4 J	4 J	4 J

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: RODNEY M. CLARK

SIGNATURE of SAMPLER: [signature] DATE Signed: 10/18/19

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

ATTACHMENT 3

DATA VALIDATION REPORT

DATA VALIDATION REPORT
ISCO Interim Remedial Action Baseline Groundwater Sampling
CTS of Asheville, Inc. Superfund Site
Asheville, North Carolina

Introduction

Groundwater samples were collected at the CTS of Asheville, Inc. Superfund Site in Asheville, North Carolina in October 2019 and submitted for off-site laboratory analysis. Groundwater samples were analyzed by Pace Analytical Services, LLC, located in Huntersville, North Carolina. All sample results were reported in the Sample Delivery Group (SDG) 92450302.

A listing of samples included in this Data Validation Report is presented in Table 3.1. Data were evaluated using project quality control limits summarized in Table 3.2. A summary of the final validated analytical results is presented in Table 3.3 and a summary of qualification actions is presented in Table 3.4. Samples were analyzed by the following method:

- Volatile organic compounds (VOCs) by USEPA Method 8260D (project list only)

Data validation was completed based on general procedures in the USEPA Region 4 Data Validation Standard Operating Procedures (SOP) for Organic Analysis (USEPA, 2016), Method 8260D, and the CTS of Asheville In-Situ Chemical Oxidation Remedial Action Work Plan (Wood, 2019). Data validation included the following evaluations:

- lab report narrative
- sample collection and chain of custody
- data package completeness
- holding times
- instrument tuning
- initial and continuing calibrations
- QC blanks
- system monitoring compound recovery
- laboratory control samples
- laboratory duplicates
- field duplicates
- internal standard response and retention time
- data transcription
- raw data and calculation checks
- electronic data reporting
- data qualification

The following laboratory or data validation qualifiers are used in the final data presentation:

U = target analyte is not detected at the reported detection limit
J = estimated value
J+ = estimated value and potentially biased high

Results are interpreted to be usable as reported by the laboratory unless discussed in the following section.

Data Validation Results

Data validation observations are discussed below.

Initial Calibration Verification (ICV)
The percent difference (29) for vinyl chloride exceeded the precision goal of 20. Reporting limits for vinyl chloride in all samples were qualified estimated (UJ). Qualified results are included in Table 3.3 with reason code ICV%D.

Continuing Calibration Verification (CCV)
The percent difference (37, 41) for vinyl chloride in both CCVs exceeded the precision goal of 20. Reporting limits for vinyl chloride in all samples were qualified estimated (UJ). Qualified results are included in Table 3.4 with reason code CCV%D.

Reporting Limits
All samples were analyzed at dilutions due to concentrations of target compounds. Reporting limits for compounds that were not detected are elevated due to the dilution. Actual reporting limits for each sample are listed on Table 3.3.

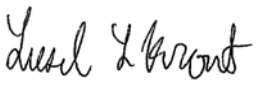
Field Duplicates
A summary of field duplicate results for the sampling of MW-34/FD-41 and MW-37/FD-42 is presented in Table 3.5. Good agreement was observed for all target analytes. Relative percent differences between results were less than the QAPP-specified control limit.

References

Wood Environment & Infrastructure Solutions, Inc. (Wood), 2019. "In-Situ Chemical Oxidation Remedial Action Work Plan: Appendix C Quality Assurance Project Plan;" August 19, 2019.

USEPA Region 4, 2016. "Data Validation Standard Operating Procedures for Contract Laboratory Organic Data Using Gas Chromatograph/Mass Spectrometer and Gas Chromatograph/ Electron Capture Detector"; Science and Ecosystem Support Division, Quality Assurance Section, QAS-SOP-0025, Revision 0.0, 2/16/2016.

Data Validator: Liesel Krout



Date: 11/11/2019

Reviewed By: Chris Ricardi, NRCC-EAC

Date: 11/22/2019

TABLE 3.1
Data Validation Report: Sample Summary
CTS of Asheville, Inc. Superfund Site
Asheville, North Carolina
Wood Project 6252-16-2012

Sample Delivery Group	Sample Location	Field Sample ID	Sample Date	Lab ID	QC Code
92450302	MW-19	MW-19	10/16/2019	92450302004	FS
92450302	MW-19A	MW-19A	10/16/2019	92450302005	FS
92450302	MW-33	MW-33	10/17/2019	92450302013	FS
92450302	MW-33A	MW-33A	10/17/2019	92450302014	FS
92450302	MW-34	FD-41	10/17/2019	92450302015	FD
92450302	MW-34	MW-34	10/17/2019	92450302008	FS
92450302	MW-34A	MW-34A	10/17/2019	92450302009	FS
92450302	MW-35	MW-35	10/18/2019	92450302017	FS
92450302	MW-35A	MW-35A	10/18/2019	92450302018	FS
92450302	MW-36	MW-36	10/16/2019	92450302006	FS
92450302	MW-36A	MW-36A	10/16/2019	92450302007	FS
92450302	MW-37	FD-42	10/17/2019	92450302016	FD
92450302	MW-37	MW-37	10/17/2019	92450302011	FS
92450302	MW-37A	MW-37A	10/17/2019	92450302012	FS
92450302	MW-6	MW-6	10/16/2019	92450302001	FS
92450302	MW-6A	MW-6A	10/16/2019	92450302002	FS
92450302	MW-7A	MW-7A	10/17/2019	92450302010	FS
92450302	QC	EB-09	10/16/2019	92450302003	EB
92450302	QC	TB-39	10/18/2019	92450302019	TB

QC Codes:
FS = Field sample, FD = Field duplicate, TB = Trip blank, EB = equipment blank

Prepared By: WCG 11/06/19
Checked By: LLK 11/13/19

TABLE 3.2
Data Validation Report: Project Quality Control Limits
CTS of Asheville, Inc. Superfund Site
Asheville, North Carolina
Wood Project 6252-16-2012

Parameter	QC Test	Water %R	Water RPD
VOC	Surrogate	70-130	---
	LCS/LCSD	70-130	30
	MS/MSD	70-130	30
	Field Duplicate	---	30

Notes:
LCS = laboratory control sample
LCSD = laboratory control sample duplicate
MS = matrix spike
MSD = matrix spike duplicate
%R = percent recovery
RPD = relative percent difference

Prepared By: LLK 11/06/19
Checked by: CSR 11/22/19

TABLE 3.3
Data Validation Report: Summary of Results
CTS of Asheville, Inc. Superfund Site
Asheville, North Carolina
Wood Project 6252-16-2012

	Sample Delivery Group		92450302		92450302		92450302		92450302		92450302	
	Sample Location		MW-19		MW-19A		MW-33		MW-33A		MW-34	
	Sample Date		10/16/2019		10/16/2019		10/17/2019		10/17/2019		10/17/2019	
	Field Sample ID		MW-19		MW-19A		MW-33		MW-33A		FD-41	
Method	**Parameter**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
EPA 8260D	cis-1,2-Dichloroethene	ug/L	930		5,180		200	U	250	U	200	U
EPA 8260D	trans-1,2-Dichloroethene	ug/L	25.0	U	100	U	200	U	250	U	200	U
EPA 8260D	Trichloroethene	ug/L	3,460		12,400		32,000		41,200		33,100	
EPA 8260D	Vinyl chloride	ug/L	25.0	UJ	100	UJ	200	UJ	250	UJ	200	UJ

	Sample Delivery Group		92450302		92450302		92450302		92450302		92450302	
	Sample Location		MW-34		MW-34A		MW-35		MW-35A		MW-36	
	Sample Date		10/17/2019		10/17/2019		10/18/2019		10/18/2019		10/16/2019	
	Field Sample ID		MW-34		MW-34A		MW-35		MW-35A		MW-36	
Method	**Parameter**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
EPA 8260D	cis-1,2-Dichloroethene	ug/L	200	U	200	U	100	U	100	U	100	U
EPA 8260D	trans-1,2-Dichloroethene	ug/L	200	U	200	U	100	U	100	U	100	U
EPA 8260D	Trichloroethene	ug/L	32,600		31,900		9,970		11,500		16,800	
EPA 8260D	Vinyl chloride	ug/L	200	UJ	200	UJ	100	UJ	100	UJ	100	UJ

TABLE 3.3
Data Validation Report: Summary of Results
CTS of Asheville, Inc. Superfund Site
Asheville, North Carolina
Wood Project 6252-16-2012

	Sample Delivery Group		92450302		92450302		92450302		92450302		92450302	
	Sample Location		MW-36A		MW-37		MW-37		MW-37A		MW-6	
	Sample Date		10/16/2019		10/17/2019		10/17/2019		10/17/2019		10/16/2019	
	Field Sample ID		MW-36A		FD-42		MW-37		MW-37A		MW-6	
Method	**Parameter**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
EPA 8260D	cis-1,2-Dichloroethene	ug/L	250	U	549		451		601		100	U
EPA 8260D	trans-1,2-Dichloroethene	ug/L	250	U	100	U	50.0	U	50.0	U	100	U
EPA 8260D	Trichloroethene	ug/L	36,100		10,900		8,910		8,770		15,200	
EPA 8260D	Vinyl chloride	ug/L	250	UJ	100	UJ	50.0	UJ	50.0	UJ	100	UJ

	Sample Delivery Group		92450302		92450302		92450302		92450302	
	Sample Location		MW-6A		MW-7A		QC		QC	
	Sample Date		10/16/2019		10/17/2019		10/16/2019		10/18/2019	
	Field Sample ID		MW-6A		MW-7A		EB-09		TB-39	
Method	**Parameter**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
EPA 8260D	cis-1,2-Dichloroethene	ug/L	500	U	53	J	1.0	U	1.0	U
EPA 8260D	trans-1,2-Dichloroethene	ug/L	500	U	125	U	1.0	U	1.0	U
EPA 8260D	Trichloroethene	ug/L	47,300		11,500		1.0	U	1.0	U
EPA 8260D	Vinyl chloride	ug/L	500	UJ	125	UJ	1.0	U	1.0	U

Notes:

ug/L = microgram per liter

U = not detected at the detection limit

J = estimated concentration

Prepared By: WCG 11/13/19

Checked By: LLK 11/13/19

TABLE 3.4
Data Validation Report: Summary of Qualification Actions
CTS of Asheville, Inc. Superfund Site
Asheville, North Carolina
Wood Project 6252-16-2012

Sample Delivery Group	Method	Lab Sample ID	Sample Date	Field Sample ID	Analyte	Lab Result	Lab Qualifier	Final Result	Final Qualifier	Validation Reason Code
92450302	EPA 8260D	92450302015	10/17/2019	FD-41	Vinyl chloride	200	U,v1	200	UJ	ICV%D, CCV%D
92450302	EPA 8260D	92450302016	10/17/2019	FD-42	Vinyl chloride	100	U,L1,v1	100	UJ	ICV%D, CCV%D
92450302	EPA 8260D	92450302004	10/16/2019	MW-19	Vinyl chloride	25.0	U,v1	25	UJ	ICV%D, CCV%D
92450302	EPA 8260D	92450302005	10/16/2019	MW-19A	Vinyl chloride	100	U,v1	100	UJ	ICV%D, CCV%D
92450302	EPA 8260D	92450302013	10/17/2019	MW-33	Vinyl chloride	200	U,v1	200	UJ	ICV%D, CCV%D
92450302	EPA 8260D	92450302014	10/17/2019	MW-33A	Vinyl chloride	250	U,v1	250	UJ	ICV%D, CCV%D
92450302	EPA 8260D	92450302008	10/17/2019	MW-34	Vinyl chloride	200	U,v1	200	UJ	ICV%D, CCV%D
92450302	EPA 8260D	92450302009	10/17/2019	MW-34A	Vinyl chloride	200	U,v1	200	UJ	ICV%D, CCV%D
92450302	EPA 8260D	92450302017	10/18/2019	MW-35	Vinyl chloride	100	U,L1,v1	100	UJ	ICV%D, CCV%D
92450302	EPA 8260D	92450302018	10/18/2019	MW-35A	Vinyl chloride	100	U,L1,v1	100	UJ	ICV%D, CCV%D
92450302	EPA 8260D	92450302006	10/16/2019	MW-36	Vinyl chloride	100	U,v1	100	UJ	ICV%D, CCV%D
92450302	EPA 8260D	92450302007	10/16/2019	MW-36A	Vinyl chloride	250	U,v1,M1	250	UJ	ICV%D, CCV%D
92450302	EPA 8260D	92450302011	10/17/2019	MW-37	Vinyl chloride	50.0	U,v1	50	UJ	ICV%D, CCV%D
92450302	EPA 8260D	92450302012	10/17/2019	MW-37A	Vinyl chloride	50.0	U,v1	50	UJ	ICV%D, CCV%D
92450302	EPA 8260D	92450302001	10/16/2019	MW-6	Vinyl chloride	100	U,v1	100	UJ	ICV%D, CCV%D
92450302	EPA 8260D	92450302002	10/16/2019	MW-6A	Vinyl chloride	500	U,v1	500	UJ	ICV%D, CCV%D
92450302	EPA 8260D	92450302010	10/17/2019	MW-7A	Vinyl chloride	125	U,L1,v1,M0	125	UJ	ICV%D, CCV%D

Notes:

Units = micrograms pwer liter (µg/L)

U = not detected at the detection limit

J = estimated concentration

CCV%D = continuing calibration percent difference

ICV%D = initial calibration verification

Prepared By: WCG 11/13/19

Checked By: LLK 11/13/19

TABLE 3.5
Data Validation Report: Field Duplicate RPD Results
CTS of Asheville, Inc. Superfund Site
Asheville, North Carolina
Wood Project 6252-16-2012

Sample ID	Constituent	Field Sample Result	Flag	Duplicate Sample Result	Flag	RPD (%)
MW-34/FD-41	cis-1,2-Dichloroethene	200	U	200	U	0.0
MW-34/FD-41	trans-1,2-Dichloroethene	200	U	200	U	NC
MW-34/FD-41	Trichloroethene	32,600		33,100		1.5
MW-34/FD-41	Vinyl chloride	200	UJ	200	UJ	NC
MW-37/FD-42	cis-1,2-Dichloroethene	451		549		19.6
MW-37/FD-42	trans-1,2-Dichloroethene	50.0	U	100	U	NC
MW-37/FD-42	Trichloroethene	8,910		10,900		20.1
MW-37/FD-42	Vinyl chloride	50.0	UJ	100	UJ	NC

Notes:

1. Concentrations are in micrograms per liter (ug/L).
2. RPD - relative percent difference (between duplicate results).
3. U - constituent not detected at the reported detection limit.
4. J - estimated concentration.
5. NC - not calculated; results non-detect or below reporting limit.

Prepared By: LLK 11/13/19
Checked By: CSR 11/22/19