



Wood Environment & Infrastructure Solutions, Inc.
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May 10, 2019

Mr. Joseph T. Martella II, Senior Engineer
Rhode Island Department of Environmental Management
Office of Waste Management
Site Remediation Program
235 Promenade Street
Providence, Rhode Island 02908

**RE: Parcel C Groundwater Sampling
Former Gorham Manufacturing Facility
333 Adelaide Avenue, Providence, Rhode Island
Wood Project No. 3651180035**

Dear Mr. Martella:

This letter summarizes the April 11, 2019 collection and analysis of groundwater samples from monitoring well MW-D within Parcel C at the Former Gorham Manufacturing Site in Providence, Rhode Island (Figure 1). This activity was performed to supplement historic periodic groundwater testing done between July 2015 and September 2017. The groundwater sampling was conducted in accordance with the Remedial Action Work Plan (RAWP) dated March 11, 2015 and the corresponding Rhode Island Department of Environmental Management (RIDEM) July 9, 2015 Order of Approval (Order of Approval).

Background

Extensive groundwater investigations were previously conducted throughout the upland portions of the Former Gorham Manufacturing Site property, including Parcel C, and within the Mashapaug Inner and Outer Coves (MACTEC, 2006a). The groundwater investigations identified low levels of volatile organic compounds (VOCs) in groundwater immediately upgradient of and along the southern shore of the Inner Cove (Parcels C and C-1).

Based on 2006-2010 groundwater data, tetrachloroethylene and trichloroethylene (PCE/TCE) were present at low levels in groundwater from the northwestern corner of Parcel C. Groundwater and Inner Cove sediment data collected during the same period (2006-2010) demonstrated that a clear trend of decreasing contaminant concentrations within the groundwater had occurred over time (AMEC 2014, 2015).

RIDEM's Order of Approval required Textron to monitor Parcel C/C-1 groundwater following completion of the remedial action in December 2015, by sampling six wells (MW-235S, MW-236S, MW-237S, MW-D, MW-241, and MW-FS) until data from three consecutive sampling rounds demonstrate that Parcel C groundwater is compliant with RIDEM's GB Groundwater Objectives with no increasing concentrations of VOCs, and that Parcel C-1 groundwater is compliant with the Massachusetts Department of Environmental Protection (MassDEP) GW-3 Standards with no increasing concentrations of VOCs. The April 2016 sampling event confirmed that both MW-FS and MW-237S met the required criteria of three consecutive decreasing rounds of groundwater data and data below the MassDEP GW-3 Standards. These two wells



were eliminated from the groundwater monitoring program (April 2016 groundwater monitoring report). Three more wells were eliminated from monitoring following the July 2016 sampling round, including MW-235S, MW-236S, and MW-241, in accordance with the Order of Approval. The September and December 2016, March and September 2017, and April 2019 rounds of groundwater sampling were exclusive to the one remaining groundwater monitoring well MW-D located on Parcel C.

At the time of the Parcel C Closure Report submittal in May 2017, TCE and 1,1-dichloroethene (1,1-DCE) were the only analytes present above their respective GB Groundwater Objectives in MW-D. In 2016 and 2017, TCE had been detected at concentrations ranging from 1.4 milligrams per liter (mg/L) to 3.32 mg/l, above its GB Groundwater Objective of 0.54 mg/L. Concentrations of 1,1-DCE ranged from 0.002 mg/L to 0.0149 mg/l; some of these results exceeded the GB Groundwater Criteria of 0.007 mg/L. Concentration trends for both analytes were generally decreasing during 2017.

April 2019 Activities

On April 11, 2019, Wood sampled the one remaining groundwater monitoring well, MW-D (Figure 2), using the U.S. Environmental Protection Agency (USEPA) low-flow methodology. Sample collection included a duplicate groundwater sample from MW-D. The two samples were submitted under chain-of-custody control to an off-site laboratory for VOC analysis by USEPA Method 8260B. Field data records for this groundwater sampling event are included in **Appendix A**.

Groundwater Sampling Results

Table 1 summarizes the historic VOC concentrations detected in MW-D including the April 2019 groundwater sampling event. VOC concentrations detected in Parcel C (MW-D) are compared to the GB Groundwater Objectives, as well as the MassDEP GW-3 Standards. The analytical laboratory report for the April 2019 groundwater sampling event is included in **Appendix B**.

As shown in **Table 1**, all April 2019 VOC results, including those for 1,1-DCE and TCE, were below the GB Groundwater Objectives, continuing the decreasing trend observed in 2017.

Groundwater Monitoring Approach

Based on the extensive groundwater data collected, VOC concentrations within the northwestern area of Parcel C have been reduced. In 2016 and 2017, only MW-D continued to exhibit exceedances of GB Groundwater Objectives, in particular TCE and 1,1-DCE. By April 2019, concentrations of those analytes had reduced to below their respective criteria, likely as a result of continued biodegradation and natural attenuation in the groundwater.

The Parcel C/C-1 area is currently being used by the City of Providence School Department as a soccer field. No buildings are planned in the area of MW-D and it is currently located within the woods on the downhill side of a detention basin. The final Environmental Land Use Restrictions (ELUR) and Soil Management Plan (SMP) has been signed by the City of Providence and filed in the Providence Land Evidence Records. A copy of this signed ELUR and SMP was submitted to RIDEM for their records. The ELUR includes the provision preventing the use of the groundwater for potable and non-potable use, and that no subsurface structures can be constructed over the groundwater without prior approval from RIDEM.

Textron proposes to monitor the groundwater quality at MW-D on a semi-annual basis, pending continued compliance with RIDEM's GB Groundwater Objectives. The next scheduled sampling event is

scheduled for October 2019. A report will be prepared and submitted to the RIDEM in November 2019 to update the status of this one monitoring well.

Please contact Greg Simpson, Textron, (401-457-2635) or Herb Colby, Wood, (978-392-5312) if we can provide additional information or answer any questions concerning these groundwater monitoring data and planned future sampling of MW-D.

Sincerely,

Wood Environment & Infrastructure Solutions, Inc.



Herb Colby, PG
Senior Project Manager



Tim Regan, PE
Client Manager

Enclosures: Table 1 – Summary of Parcel C/C-1 Groundwater Results 1989 – 2019
 Figure 1 – Site Location Map
 Figure 2 – Parcel C/C-1 Site Map
 Appendix A – Field Data Record April 2019 Sampling Event
 Appendix B – Laboratory Report April 2019 Sampling Event

cc: Robert Azar, Deputy Director - Providence Planning & Development
 G. Simpson, Textron, Inc. (Electronic)
 Knight Memorial Library Repository
 Wood Project File



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Tables



Table 1

Groundwater Results MW-D/B-4 (1989 - 2019)
Former Gorham Manufacturing Site
Providence, RI

Table with columns for Location, Sample ID, MW-D, GMMWXX, MW-D, MW-D, GMMWD, MW-D, DUP-01, MW-D, MW-D, DUP-1, MW-D, Dup-01, MW-D, Dup-01, MW-D, Dup-01, MW-D, DUP-01, MW-D, DUP-1, MW-D, Dup-01, MW-D, DUP-1. Rows list various analytes such as 1,1,1,2-Tetrachloroethane, 1,1,1-Trichloroethane, etc., with corresponding units and results across multiple sampling dates.

Table 1
Groundwater Results MW-D/B-4 (1989 - 2019)
Former Gorham Manufacturing Site
Providence, RI

Location:				MW-D/B-4																MW-D/B-4									
Sample ID:				MW-D	GMMWXX DXXX01XX	MW-D	MW-D	GMMWD	MW-D	DUP-01	MW-D	MW-D	DUP-1	MW-D	Dup-01	MW-D	Dup-01	MW-D	DUP-01	MW-D	DUP-1	MW-D	DUP-1	MW-D	DUP-1				
Sample Date:				4/13/1989	9/21/1994	10/15/1997	12/9/1998	2/19/2010	7/15/2015		12/17/2015	2/10/2016		4/28/2016		7/6/2016		9/26/2016		12/9/2016		3/27/2017		9/7/2017		4/11/2019			
Analyte	Units	RI GB	GW 3	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q

Notes:
mg/L - milligrams per liter
NA - No Standard Established
U - Not detected at indicated value
J - Estimated Value
D - Dilution
Yellow highlighted cells exceed the applicable GB Criteria

Prepared by: AN 5/6/19
Reviewed by: HC 5/7/19



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Figures





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Location of Site



SITE LOCATION MAP

Former Gorham
Manufacturing Site

333 Adelaide Avenue
Providence, Rhode Island

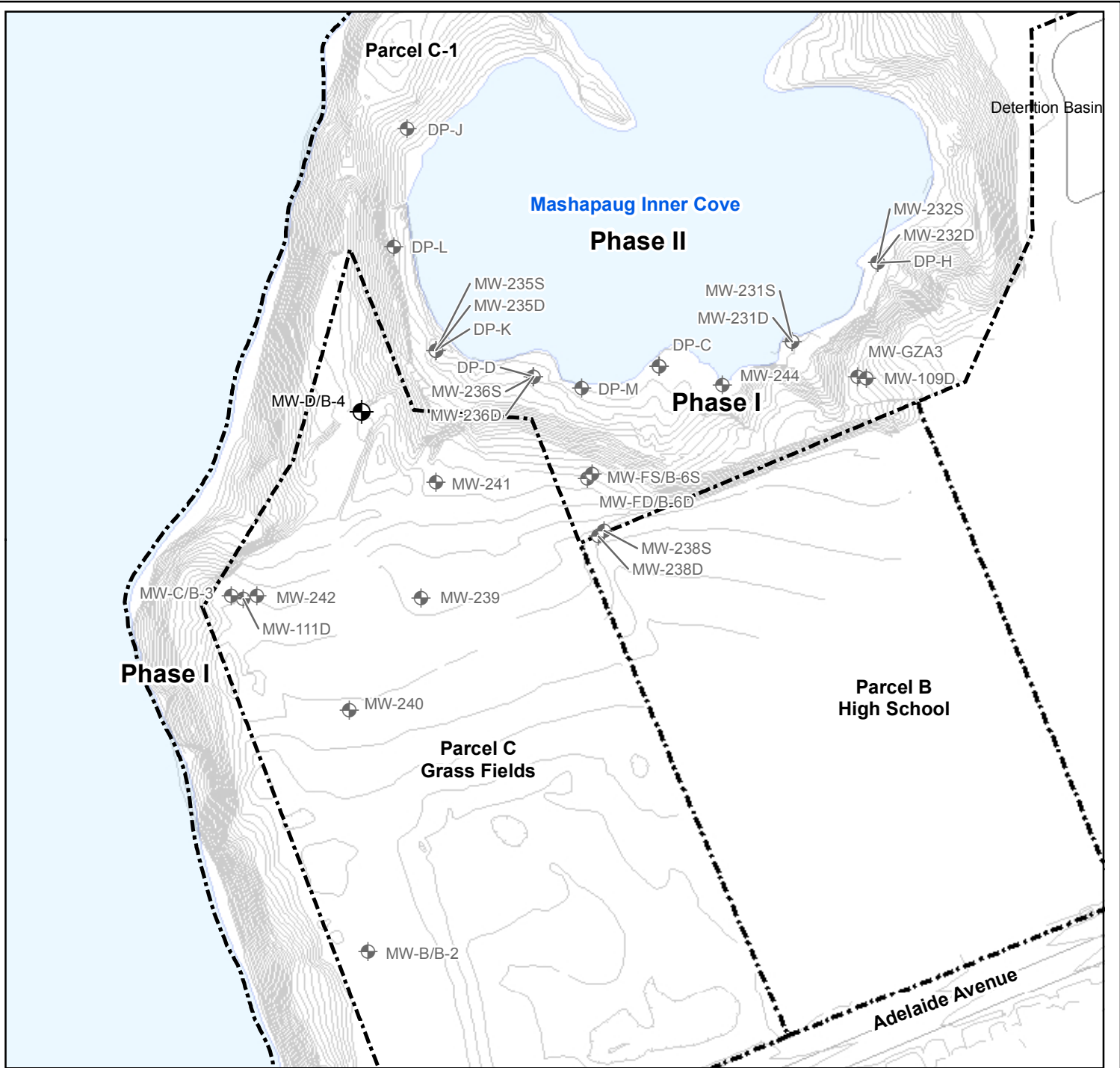
Notes & Sources



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Chelmsford, MA 01824
(978) 692-9090

FIGURE

1



**PARCEL C:
MW-D**

Former Gorham
Manufacturing Site

333 Adelaide Avenue
Providence, Rhode Island

Legend	
	Existing Monitoring Well
	Abandoned Monitoring Well
	Approximate Site Boundary
	Mashapaug Pond
	Elevation Contour



Notes & Sources

0 140
Feet

N

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FIGURE
2

Appendix A

Field Data Record April 2019 Sampling Event

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT: Textura Oakham WELL ID: MW-10
 SAMPLE ID: MW-10 SITE TYPE: Industrial RIDEM DATE: 4-11-19
 TIME START: 1000 END: 1115 JOB NUMBER: 3651180075 BOTTLE TIME: 11:10

WATER LEVEL / PUMP SETTINGS
 QC SAMPLE COLLECTED: dup-1
 INITIAL DEPTH TO WATER: 20.73 FT.
 FINAL DEPTH TO WATER: 20.73 FT.
 DRAWDOWN VOLUME: 0 GAL.
 TOTAL VOL. PURGED: 3.0 GAL.
 MEASUREMENT POINT: TOP OF WELL RISER
 TOP OF PROTECTIVE CASING
 OTHER _____
 PROTECTIVE CASING STICKUP (FROM GROUND): FT.
 PROTECTIVE CASING / WELL DIFFERENCE: FT.
 WELL DEPTH (TOR): 33.78 FT.
 SCREEN LENGTH: 10 FT.
 RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: 0.01
 REFILL TIMER SETTING: SEC.
 PID AMBIENT AIR: PPMV
 PID WELL MOUTH: PPMV
 PRESSURE TO PUMP: PSI
 PROTECTIVE CASING / WELL DIFFERENCE: FT.
 WELL DIAMETER: 2 IN.
 WELL INTEGRITY: YES NO N/A
 CASING:
 LOCKED:
 COLLAR:
 DISCHARGE TIMER SETTING: SEC.

PURGE DATA

TIME (5 min.)	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (uS/cm) (3%)	pH (units) (+/- 0.1)	DISS. O2 (mg/L) (10%) (>0.5)	TURBIDITY (NTU) (10%) (>5)	ORP (mV) (+/- 10 mV)	SAMPLE DEPTH	COMMENTS
1000	20.73	180							30	
1010	20.73	180	12.11	545	6.21	1.27	136	91		Orange Fla. Industrial
1015	20.73	180	11.99	312	6.16	1.67	57.7	68		
1030	20.73	180	11.98	372	6.21	1.88	26.6	59		
1040	20.73	180	12.15	385	6.21	1.50	16.4	58		
1050	20.73	180	12.22	390	6.32	1.82	7.40	55		
1055	20.73	180	12.05	386	6.29	1.59	7.97	54		
1100	20.73	180	12.02	392	6.30	1.50	7.18	54		
1105	20.73	180	12.00	395	6.29	1.58	7.52	53	✓	
1110	collect	sample								

EQUIPMENT DOCUMENTATION

TYPE OF PUMP: QED BLADDER SIMCO BLADDER GEOPUMP
 TYPE OF TUBING: TEFLON OR TEFLON LINED HIGH DENSITY POLYETHYLENE LDPE
 TYPE OF PUMP MATERIAL: POLYVINYL CHLORIDE STAINLESS STEEL SILICON (Dedicated)
 TYPE OF BLADDER MATERIAL: TEFLON OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
<input checked="" type="checkbox"/> UCL	8260	HCL	3XVOL	<input checked="" type="checkbox"/>
<input type="checkbox"/>				<input type="checkbox"/>
<input type="checkbox"/>				<input type="checkbox"/>
<input type="checkbox"/>				<input type="checkbox"/>
<input type="checkbox"/>				<input type="checkbox"/>
<input type="checkbox"/>				<input type="checkbox"/>
<input type="checkbox"/>				<input type="checkbox"/>
<input type="checkbox"/>				<input type="checkbox"/>
<input type="checkbox"/>				<input type="checkbox"/>
<input type="checkbox"/>				<input type="checkbox"/>

PURGE OBSERVATIONS
 PURGE WATER CONTAINERIZED: YES NO
 NUMBER OF GALLONS GENERATED: 3.0
 SIGNATURE: [Signature]

NOTES: Collect Dup-1

 Prepared by: _____
 Checked by: _____

Appendix B

Laboratory Report, April 2019 Sampling Event



CERTIFICATE OF ANALYSIS

Denise King
Wood Environment and Infrastructure Solutions, Inc
271 Mill Road
Chelmsford, MA 01824

RE: Textron Gorham - Groundwater (3651170068)
ESS Laboratory Work Order Number: 1904369

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED

By ESS Laboratory at 3:31 pm, Apr 18, 2019

Analytical Summary

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.



CERTIFICATE OF ANALYSIS

Client Name: Wood Environment and Infrastructure Solutions, In
Client Project ID: Textron Gorham - Groundwater

ESS Laboratory Work Order: 1904369

SAMPLE RECEIPT

The following samples were received on April 11, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
1904369-01	MW-D	Ground Water	8260B
1904369-02	DUP-1	Ground Water	8260B



CERTIFICATE OF ANALYSIS

Client Name: Wood Environment and Infrastructure Solutions, In
Client Project ID: Textron Gorham - Groundwater

ESS Laboratory Work Order: 1904369

PROJECT NARRATIVE

No unusual observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)



CERTIFICATE OF ANALYSIS

Client Name: Wood Environment and Infrastructure Solutions, In
Client Project ID: Textron Gorham - Groundwater

ESS Laboratory Work Order: 1904369

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

- 1010A - Flashpoint
- 6010C - ICP
- 6020A - ICP MS
- 7010 - Graphite Furnace
- 7196A - Hexavalent Chromium
- 7470A - Aqueous Mercury
- 7471B - Solid Mercury
- 8011 - EDB/DBCP/TCP
- 8015C - GRO/DRO
- 8081B - Pesticides
- 8082A - PCB
- 8100M - TPH
- 8151A - Herbicides
- 8260B - VOA
- 8270D - SVOA
- 8270D SIM - SVOA Low Level
- 9014 - Cyanide
- 9038 - Sulfate
- 9040C - Aqueous pH
- 9045D - Solid pH (Corrosivity)
- 9050A - Specific Conductance
- 9056A - Anions (IC)
- 9060A - TOC
- 9095B - Paint Filter
- MADEP 04-1.1 - EPH
- MADEP 18-2.1 - VPH

Prep Methods

- 3005A - Aqueous ICP Digestion
- 3020A - Aqueous Graphite Furnace / ICP MS Digestion
- 3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
- 3060A - Solid Hexavalent Chromium Digestion
- 3510C - Separatory Funnel Extraction
- 3520C - Liquid / Liquid Extraction
- 3540C - Manual Soxhlet Extraction
- 3541 - Automated Soxhlet Extraction
- 3546 - Microwave Extraction
- 3580A - Waste Dilution
- 5030B - Aqueous Purge and Trap
- 5030C - Aqueous Purge and Trap
- 5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.



CERTIFICATE OF ANALYSIS

Client Name: Wood Environment and Infrastructure Solutions, In
Client Project ID: Textron Gorham - Groundwater
Client Sample ID: MW-D
Date Sampled: 04/11/19 11:10
Percent Solids: N/A
Initial Volume: 5
Final Volume: 5
Extraction Method: 5030B

ESS Laboratory Work Order: 1904369
ESS Laboratory Sample ID: 1904369-01
Sample Matrix: Ground Water
Units: mg/L
Analyst: MD

8260B Volatile Organic Compounds

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
1,1,1-Trichloroethane	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
1,1,2,2-Tetrachloroethane	ND (0.0005)		8260B		1	04/16/19 21:27	C9D0292	CD91625
1,1,2-Trichloroethane	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
1,1-Dichloroethane	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
1,1-Dichloroethene	0.0018 (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
1,1-Dichloropropene	ND (0.0020)		8260B		1	04/16/19 21:27	C9D0292	CD91625
1,2,3-Trichlorobenzene	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
1,2,3-Trichloropropane	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
1,2,4-Trichlorobenzene	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
1,2,4-Trimethylbenzene	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
1,2-Dibromo-3-Chloropropane	ND (0.0050)		8260B		1	04/16/19 21:27	C9D0292	CD91625
1,2-Dibromoethane	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
1,2-Dichlorobenzene	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
1,2-Dichloroethane	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
1,2-Dichloropropane	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
1,3,5-Trimethylbenzene	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
1,3-Dichlorobenzene	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
1,3-Dichloropropane	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
1,4-Dichlorobenzene	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
1,4-Dioxane - Screen	ND (0.500)		8260B		1	04/16/19 21:27	C9D0292	CD91625
1-Chlorohexane	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
2,2-Dichloropropane	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
2-Butanone	ND (0.0100)		8260B		1	04/16/19 21:27	C9D0292	CD91625
2-Chlorotoluene	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
2-Hexanone	ND (0.0100)		8260B		1	04/16/19 21:27	C9D0292	CD91625
4-Chlorotoluene	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
4-Isopropyltoluene	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
4-Methyl-2-Pentanone	ND (0.0250)		8260B		1	04/16/19 21:27	C9D0292	CD91625
Acetone	ND (0.0100)		8260B		1	04/16/19 21:27	C9D0292	CD91625
Benzene	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
Bromobenzene	ND (0.0020)		8260B		1	04/16/19 21:27	C9D0292	CD91625



CERTIFICATE OF ANALYSIS

Client Name: Wood Environment and Infrastructure Solutions, In
Client Project ID: Textron Gorham - Groundwater
Client Sample ID: MW-D
Date Sampled: 04/11/19 11:10
Percent Solids: N/A
Initial Volume: 5
Final Volume: 5
Extraction Method: 5030B

ESS Laboratory Work Order: 1904369
ESS Laboratory Sample ID: 1904369-01
Sample Matrix: Ground Water
Units: mg/L
Analyst: MD

8260B Volatile Organic Compounds

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
Bromodichloromethane	ND (0.0006)		8260B		1	04/16/19 21:27	C9D0292	CD91625
Bromoform	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
Bromomethane	ND (0.0020)		8260B		1	04/16/19 21:27	C9D0292	CD91625
Carbon Disulfide	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
Carbon Tetrachloride	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
Chlorobenzene	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
Chloroethane	ND (0.0020)		8260B		1	04/16/19 21:27	C9D0292	CD91625
Chloroform	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
Chloromethane	ND (0.0020)		8260B		1	04/16/19 21:27	C9D0292	CD91625
cis-1,2-Dichloroethene	0.0268 (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
cis-1,3-Dichloropropene	ND (0.0004)		8260B		1	04/16/19 21:27	C9D0292	CD91625
Dibromochloromethane	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
Dibromomethane	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
Dichlorodifluoromethane	ND (0.0020)		8260B		1	04/16/19 21:27	C9D0292	CD91625
Diethyl Ether	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
Di-isopropyl ether	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
Ethyl tertiary-butyl ether	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
Ethylbenzene	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
Hexachlorobutadiene	ND (0.0006)		8260B		1	04/16/19 21:27	C9D0292	CD91625
Hexachloroethane	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
Isopropylbenzene	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
Methyl tert-Butyl Ether	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
Methylene Chloride	ND (0.0020)		8260B		1	04/16/19 21:27	C9D0292	CD91625
Naphthalene	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
n-Butylbenzene	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
n-Propylbenzene	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
sec-Butylbenzene	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
Styrene	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
tert-Butylbenzene	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
Tertiary-amyl methyl ether	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
Tetrachloroethene	0.0016 (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625



CERTIFICATE OF ANALYSIS

Client Name: Wood Environment and Infrastructure Solutions, In
Client Project ID: Textron Gorham - Groundwater
Client Sample ID: MW-D
Date Sampled: 04/11/19 11:10
Percent Solids: N/A
Initial Volume: 5
Final Volume: 5
Extraction Method: 5030B

ESS Laboratory Work Order: 1904369
ESS Laboratory Sample ID: 1904369-01
Sample Matrix: Ground Water
Units: mg/L
Analyst: MD

8260B Volatile Organic Compounds

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Tetrahydrofuran	ND (0.0050)		8260B		1	04/16/19 21:27	C9D0292	CD91625
Toluene	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
trans-1,2-Dichloroethene	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
trans-1,3-Dichloropropene	ND (0.0004)		8260B		1	04/16/19 21:27	C9D0292	CD91625
Trichloroethene	0.464 (0.0100)		8260B		10	04/17/19 11:59	C9D0292	CD91625
Trichlorofluoromethane	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
Vinyl Acetate	ND (0.0050)		8260B		1	04/16/19 21:27	C9D0292	CD91625
Vinyl Chloride	0.0015 (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
Xylene O	ND (0.0010)		8260B		1	04/16/19 21:27	C9D0292	CD91625
Xylene P,M	ND (0.0020)		8260B		1	04/16/19 21:27	C9D0292	CD91625
Xylenes (Total)	ND (0.0020)		8260B		1	04/16/19 21:27		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>118 %</i>		<i>70-130</i>
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>97 %</i>		<i>70-130</i>
<i>Surrogate: Dibromofluoromethane</i>	<i>107 %</i>		<i>70-130</i>
<i>Surrogate: Toluene-d8</i>	<i>100 %</i>		<i>70-130</i>



CERTIFICATE OF ANALYSIS

Client Name: Wood Environment and Infrastructure Solutions, In
Client Project ID: Textron Gorham - Groundwater
Client Sample ID: DUP-1
Date Sampled: 04/11/19 00:00
Percent Solids: N/A
Initial Volume: 5
Final Volume: 5
Extraction Method: 5030B

ESS Laboratory Work Order: 1904369
ESS Laboratory Sample ID: 1904369-02
Sample Matrix: Ground Water
Units: mg/L
Analyst: MD

8260B Volatile Organic Compounds

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
1,1,1-Trichloroethane	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
1,1,2,2-Tetrachloroethane	ND (0.0005)		8260B		1	04/16/19 21:52	C9D0292	CD91625
1,1,2-Trichloroethane	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
1,1-Dichloroethane	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
1,1-Dichloroethene	0.0016 (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
1,1-Dichloropropene	ND (0.0020)		8260B		1	04/16/19 21:52	C9D0292	CD91625
1,2,3-Trichlorobenzene	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
1,2,3-Trichloropropane	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
1,2,4-Trichlorobenzene	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
1,2,4-Trimethylbenzene	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
1,2-Dibromo-3-Chloropropane	ND (0.0050)		8260B		1	04/16/19 21:52	C9D0292	CD91625
1,2-Dibromoethane	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
1,2-Dichlorobenzene	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
1,2-Dichloroethane	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
1,2-Dichloropropane	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
1,3,5-Trimethylbenzene	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
1,3-Dichlorobenzene	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
1,3-Dichloropropane	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
1,4-Dichlorobenzene	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
1,4-Dioxane - Screen	ND (0.500)		8260B		1	04/16/19 21:52	C9D0292	CD91625
1-Chlorohexane	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
2,2-Dichloropropane	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
2-Butanone	ND (0.0100)		8260B		1	04/16/19 21:52	C9D0292	CD91625
2-Chlorotoluene	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
2-Hexanone	ND (0.0100)		8260B		1	04/16/19 21:52	C9D0292	CD91625
4-Chlorotoluene	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
4-Isopropyltoluene	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
4-Methyl-2-Pentanone	ND (0.0250)		8260B		1	04/16/19 21:52	C9D0292	CD91625
Acetone	ND (0.0100)		8260B		1	04/16/19 21:52	C9D0292	CD91625
Benzene	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
Bromobenzene	ND (0.0020)		8260B		1	04/16/19 21:52	C9D0292	CD91625



CERTIFICATE OF ANALYSIS

Client Name: Wood Environment and Infrastructure Solutions, In
Client Project ID: Textron Gorham - Groundwater
Client Sample ID: DUP-1
Date Sampled: 04/11/19 00:00
Percent Solids: N/A
Initial Volume: 5
Final Volume: 5
Extraction Method: 5030B

ESS Laboratory Work Order: 1904369
ESS Laboratory Sample ID: 1904369-02
Sample Matrix: Ground Water
Units: mg/L
Analyst: MD

8260B Volatile Organic Compounds

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
Bromodichloromethane	ND (0.0006)		8260B		1	04/16/19 21:52	C9D0292	CD91625
Bromoform	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
Bromomethane	ND (0.0020)		8260B		1	04/16/19 21:52	C9D0292	CD91625
Carbon Disulfide	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
Carbon Tetrachloride	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
Chlorobenzene	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
Chloroethane	ND (0.0020)		8260B		1	04/16/19 21:52	C9D0292	CD91625
Chloroform	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
Chloromethane	ND (0.0020)		8260B		1	04/16/19 21:52	C9D0292	CD91625
cis-1,2-Dichloroethene	0.0251 (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
cis-1,3-Dichloropropene	ND (0.0004)		8260B		1	04/16/19 21:52	C9D0292	CD91625
Dibromochloromethane	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
Dibromomethane	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
Dichlorodifluoromethane	ND (0.0020)		8260B		1	04/16/19 21:52	C9D0292	CD91625
Diethyl Ether	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
Di-isopropyl ether	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
Ethyl tertiary-butyl ether	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
Ethylbenzene	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
Hexachlorobutadiene	ND (0.0006)		8260B		1	04/16/19 21:52	C9D0292	CD91625
Hexachloroethane	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
Isopropylbenzene	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
Methyl tert-Butyl Ether	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
Methylene Chloride	ND (0.0020)		8260B		1	04/16/19 21:52	C9D0292	CD91625
Naphthalene	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
n-Butylbenzene	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
n-Propylbenzene	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
sec-Butylbenzene	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
Styrene	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
tert-Butylbenzene	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
Tertiary-amyl methyl ether	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
Tetrachloroethene	0.0016 (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625



CERTIFICATE OF ANALYSIS

Client Name: Wood Environment and Infrastructure Solutions, In
Client Project ID: Textron Gorham - Groundwater
Client Sample ID: DUP-1
Date Sampled: 04/11/19 00:00
Percent Solids: N/A
Initial Volume: 5
Final Volume: 5
Extraction Method: 5030B

ESS Laboratory Work Order: 1904369
ESS Laboratory Sample ID: 1904369-02
Sample Matrix: Ground Water
Units: mg/L
Analyst: MD

8260B Volatile Organic Compounds

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Tetrahydrofuran	ND (0.0050)		8260B		1	04/16/19 21:52	C9D0292	CD91625
Toluene	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
trans-1,2-Dichloroethene	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
trans-1,3-Dichloropropene	ND (0.0004)		8260B		1	04/16/19 21:52	C9D0292	CD91625
Trichloroethene	0.473 (0.0100)		8260B		10	04/17/19 12:25	C9D0292	CD91625
Trichlorofluoromethane	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
Vinyl Acetate	ND (0.0050)		8260B		1	04/16/19 21:52	C9D0292	CD91625
Vinyl Chloride	0.0014 (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
Xylene O	ND (0.0010)		8260B		1	04/16/19 21:52	C9D0292	CD91625
Xylene P,M	ND (0.0020)		8260B		1	04/16/19 21:52	C9D0292	CD91625
Xylenes (Total)	ND (0.0020)		8260B		1	04/16/19 21:52		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>117 %</i>		<i>70-130</i>
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>96 %</i>		<i>70-130</i>
<i>Surrogate: Dibromofluoromethane</i>	<i>105 %</i>		<i>70-130</i>
<i>Surrogate: Toluene-d8</i>	<i>100 %</i>		<i>70-130</i>



CERTIFICATE OF ANALYSIS

Client Name: Wood Environment and Infrastructure Solutions, In
Client Project ID: Textron Gorham - Groundwater

ESS Laboratory Work Order: 1904369

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8260B Volatile Organic Compounds

Batch CD91625 - 5030B

Blank

1,1,1,2-Tetrachloroethane	ND	0.0010	mg/L							
1,1,1-Trichloroethane	ND	0.0010	mg/L							
1,1,2,2-Tetrachloroethane	ND	0.0005	mg/L							
1,1,2-Trichloroethane	ND	0.0010	mg/L							
1,1-Dichloroethane	ND	0.0010	mg/L							
1,1-Dichloroethene	ND	0.0010	mg/L							
1,1-Dichloropropene	ND	0.0020	mg/L							
1,2,3-Trichlorobenzene	ND	0.0010	mg/L							
1,2,3-Trichloropropane	ND	0.0010	mg/L							
1,2,4-Trichlorobenzene	ND	0.0010	mg/L							
1,2,4-Trimethylbenzene	ND	0.0010	mg/L							
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/L							
1,2-Dibromoethane	ND	0.0010	mg/L							
1,2-Dichlorobenzene	ND	0.0010	mg/L							
1,2-Dichloroethane	ND	0.0010	mg/L							
1,2-Dichloropropane	ND	0.0010	mg/L							
1,3,5-Trimethylbenzene	ND	0.0010	mg/L							
1,3-Dichlorobenzene	ND	0.0010	mg/L							
1,3-Dichloropropane	ND	0.0010	mg/L							
1,4-Dichlorobenzene	ND	0.0010	mg/L							
1,4-Dioxane - Screen	ND	0.500	mg/L							
1-Chlorohexane	ND	0.0010	mg/L							
2,2-Dichloropropane	ND	0.0010	mg/L							
2-Butanone	ND	0.0100	mg/L							
2-Chlorotoluene	ND	0.0010	mg/L							
2-Hexanone	ND	0.0100	mg/L							
4-Chlorotoluene	ND	0.0010	mg/L							
4-Isopropyltoluene	ND	0.0010	mg/L							
4-Methyl-2-Pentanone	ND	0.0250	mg/L							
Acetone	ND	0.0100	mg/L							
Benzene	ND	0.0010	mg/L							
Bromobenzene	ND	0.0020	mg/L							
Bromochloromethane	ND	0.0010	mg/L							
Bromodichloromethane	ND	0.0006	mg/L							
Bromoform	ND	0.0010	mg/L							
Bromomethane	ND	0.0020	mg/L							
Carbon Disulfide	ND	0.0010	mg/L							
Carbon Tetrachloride	ND	0.0010	mg/L							
Chlorobenzene	ND	0.0010	mg/L							
Chloroethane	ND	0.0020	mg/L							
Chloroform	ND	0.0010	mg/L							
Chloromethane	ND	0.0020	mg/L							
cis-1,2-Dichloroethene	ND	0.0010	mg/L							
cis-1,3-Dichloropropene	ND	0.0004	mg/L							



CERTIFICATE OF ANALYSIS

Client Name: Wood Environment and Infrastructure Solutions, In
Client Project ID: Textron Gorham - Groundwater

ESS Laboratory Work Order: 1904369

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8260B Volatile Organic Compounds

Batch CD91625 - 5030B

Dibromochloromethane	ND	0.0010	mg/L							
Dibromomethane	ND	0.0010	mg/L							
Dichlorodifluoromethane	ND	0.0020	mg/L							
Diethyl Ether	ND	0.0010	mg/L							
Di-isopropyl ether	ND	0.0010	mg/L							
Ethyl tertiary-butyl ether	ND	0.0010	mg/L							
Ethylbenzene	ND	0.0010	mg/L							
Hexachlorobutadiene	ND	0.0006	mg/L							
Hexachloroethane	ND	0.0010	mg/L							
Isopropylbenzene	ND	0.0010	mg/L							
Methyl tert-Butyl Ether	ND	0.0010	mg/L							
Methylene Chloride	ND	0.0020	mg/L							
Naphthalene	ND	0.0010	mg/L							
n-Butylbenzene	ND	0.0010	mg/L							
n-Propylbenzene	ND	0.0010	mg/L							
sec-Butylbenzene	ND	0.0010	mg/L							
Styrene	ND	0.0010	mg/L							
tert-Butylbenzene	ND	0.0010	mg/L							
Tertiary-amyl methyl ether	ND	0.0010	mg/L							
Tetrachloroethene	ND	0.0010	mg/L							
Tetrahydrofuran	ND	0.0050	mg/L							
Toluene	ND	0.0010	mg/L							
trans-1,2-Dichloroethene	ND	0.0010	mg/L							
trans-1,3-Dichloropropene	ND	0.0004	mg/L							
Trichloroethene	ND	0.0010	mg/L							
Trichlorofluoromethane	ND	0.0010	mg/L							
Vinyl Acetate	ND	0.0050	mg/L							
Vinyl Chloride	ND	0.0010	mg/L							
Xylene O	ND	0.0010	mg/L							
Xylene P,M	ND	0.0020	mg/L							
Surrogate: 1,2-Dichloroethane-d4	0.0289		mg/L	0.02500		116	70-130			
Surrogate: 4-Bromofluorobenzene	0.0241		mg/L	0.02500		96	70-130			
Surrogate: Dibromofluoromethane	0.0251		mg/L	0.02500		100	70-130			
Surrogate: Toluene-d8	0.0247		mg/L	0.02500		99	70-130			

LCS

1,1,1,2-Tetrachloroethane	9.72		ug/L	10.00		97	70-130			
1,1,1-Trichloroethane	10.1		ug/L	10.00		101	70-130			
1,1,2,2-Tetrachloroethane	9.61		ug/L	10.00		96	70-130			
1,1,2-Trichloroethane	9.94		ug/L	10.00		99	70-130			
1,1-Dichloroethane	9.79		ug/L	10.00		98	70-130			
1,1-Dichloroethene	9.42		ug/L	10.00		94	70-130			
1,1-Dichloropropene	10.1		ug/L	10.00		101	70-130			
1,2,3-Trichlorobenzene	10.6		ug/L	10.00		106	70-130			
1,2,3-Trichloropropane	9.28		ug/L	10.00		93	70-130			
1,2,4-Trichlorobenzene	10.4		ug/L	10.00		104	70-130			



CERTIFICATE OF ANALYSIS

Client Name: Wood Environment and Infrastructure Solutions, Inc
Client Project ID: Textron Gorham - Groundwater

ESS Laboratory Work Order: 1904369

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8260B Volatile Organic Compounds

Batch CD91625 - 5030B

1,2,4-Trimethylbenzene	9.78		ug/L	10.00		98	70-130			
1,2-Dibromo-3-Chloropropane	8.82		ug/L	10.00		88	70-130			
1,2-Dibromoethane	9.90		ug/L	10.00		99	70-130			
1,2-Dichlorobenzene	8.98		ug/L	10.00		90	70-130			
1,2-Dichloroethane	10.7		ug/L	10.00		107	70-130			
1,2-Dichloropropane	9.58		ug/L	10.00		96	70-130			
1,3,5-Trimethylbenzene	9.59		ug/L	10.00		96	70-130			
1,3-Dichlorobenzene	9.12		ug/L	10.00		91	70-130			
1,3-Dichloropropane	10.0		ug/L	10.00		100	70-130			
1,4-Dichlorobenzene	9.28		ug/L	10.00		93	70-130			
1,4-Dioxane - Screen	209		ug/L	200.0		105	0-332			
1-Chlorohexane	9.33		ug/L	10.00		93	70-130			
2,2-Dichloropropane	9.56		ug/L	10.00		96	70-130			
2-Butanone	50.0		ug/L	50.00		100	70-130			
2-Chlorotoluene	9.25		ug/L	10.00		92	70-130			
2-Hexanone	49.4		ug/L	50.00		99	70-130			
4-Chlorotoluene	9.42		ug/L	10.00		94	70-130			
4-Isopropyltoluene	9.74		ug/L	10.00		97	70-130			
4-Methyl-2-Pentanone	47.4		ug/L	50.00		95	70-130			
Acetone	43.9		ug/L	50.00		88	70-130			
Benzene	9.60		ug/L	10.00		96	70-130			
Bromobenzene	9.17		ug/L	10.00		92	70-130			
Bromochloromethane	9.77		ug/L	10.00		98	70-130			
Bromodichloromethane	9.41		ug/L	10.00		94	70-130			
Bromoform	9.06		ug/L	10.00		91	70-130			
Bromomethane	7.49		ug/L	10.00		75	70-130			
Carbon Disulfide	9.02		ug/L	10.00		90	70-130			
Carbon Tetrachloride	10.0		ug/L	10.00		100	70-130			
Chlorobenzene	9.39		ug/L	10.00		94	70-130			
Chloroethane	9.07		ug/L	10.00		91	70-130			
Chloroform	10.2		ug/L	10.00		102	70-130			
Chloromethane	11.9		ug/L	10.00		119	70-130			
cis-1,2-Dichloroethene	9.56		ug/L	10.00		96	70-130			
cis-1,3-Dichloropropene	9.49		ug/L	10.00		95	70-130			
Dibromochloromethane	8.88		ug/L	10.00		89	70-130			
Dibromomethane	10.1		ug/L	10.00		101	70-130			
Dichlorodifluoromethane	9.45		ug/L	10.00		94	70-130			
Diethyl Ether	9.50		ug/L	10.00		95	70-130			
Di-isopropyl ether	9.74		ug/L	10.00		97	70-130			
Ethyl tertiary-butyl ether	9.30		ug/L	10.00		93	70-130			
Ethylbenzene	9.58		ug/L	10.00		96	70-130			
Hexachlorobutadiene	11.1		ug/L	10.00		111	70-130			
Hexachloroethane	8.48		ug/L	10.00		85	70-130			
Isopropylbenzene	9.30		ug/L	10.00		93	70-130			
Methyl tert-Butyl Ether	9.89		ug/L	10.00		99	70-130			



CERTIFICATE OF ANALYSIS

Client Name: Wood Environment and Infrastructure Solutions, Inc
Client Project ID: Textron Gorham - Groundwater

ESS Laboratory Work Order: 1904369

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8260B Volatile Organic Compounds

Batch CD91625 - 5030B

Methylene Chloride	9.77		ug/L	10.00		98	70-130			
Naphthalene	11.2		ug/L	10.00		112	70-130			
n-Butylbenzene	10.4		ug/L	10.00		104	70-130			
n-Propylbenzene	9.38		ug/L	10.00		94	70-130			
sec-Butylbenzene	9.64		ug/L	10.00		96	70-130			
Styrene	9.42		ug/L	10.00		94	70-130			
tert-Butylbenzene	9.30		ug/L	10.00		93	70-130			
Tertiary-amyl methyl ether	9.36		ug/L	10.00		94	70-130			
Tetrachloroethene	8.09		ug/L	10.00		81	70-130			
Tetrahydrofuran	9.68		ug/L	10.00		97	70-130			
Toluene	10.1		ug/L	10.00		101	70-130			
trans-1,2-Dichloroethene	8.99		ug/L	10.00		90	70-130			
trans-1,3-Dichloropropene	9.19		ug/L	10.00		92	70-130			
Trichloroethene	9.76		ug/L	10.00		98	70-130			
Trichlorofluoromethane	10.6		ug/L	10.00		106	70-130			
Vinyl Acetate	12.9		ug/L	10.00		129	70-130			
Vinyl Chloride	9.80		ug/L	10.00		98	70-130			
Xylene O	9.72		ug/L	10.00		97	70-130			
Xylene P,M	20.0		ug/L	20.00		100	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0271		mg/L	0.02500		108	70-130			
Surrogate: 4-Bromofluorobenzene	0.0264		mg/L	0.02500		106	70-130			
Surrogate: Dibromofluoromethane	0.0260		mg/L	0.02500		104	70-130			
Surrogate: Toluene-d8	0.0247		mg/L	0.02500		99	70-130			

LCS Dup

1,1,1,2-Tetrachloroethane	9.84		ug/L	10.00		98	70-130	1	25	
1,1,1-Trichloroethane	10.5		ug/L	10.00		105	70-130	4	25	
1,1,2,2-Tetrachloroethane	9.80		ug/L	10.00		98	70-130	2	25	
1,1,2-Trichloroethane	9.92		ug/L	10.00		99	70-130	0.2	25	
1,1-Dichloroethane	10.3		ug/L	10.00		103	70-130	5	25	
1,1-Dichloroethene	9.88		ug/L	10.00		99	70-130	5	25	
1,1-Dichloropropene	10.6		ug/L	10.00		106	70-130	5	25	
1,2,3-Trichlorobenzene	10.8		ug/L	10.00		108	70-130	2	25	
1,2,3-Trichloropropane	9.36		ug/L	10.00		94	70-130	0.9	25	
1,2,4-Trichlorobenzene	10.9		ug/L	10.00		109	70-130	4	25	
1,2,4-Trimethylbenzene	10.1		ug/L	10.00		101	70-130	3	25	
1,2-Dibromo-3-Chloropropane	9.06		ug/L	10.00		91	70-130	3	25	
1,2-Dibromoethane	10.2		ug/L	10.00		102	70-130	2	25	
1,2-Dichlorobenzene	9.24		ug/L	10.00		92	70-130	3	25	
1,2-Dichloroethane	10.9		ug/L	10.00		109	70-130	3	25	
1,2-Dichloropropane	10.1		ug/L	10.00		101	70-130	5	25	
1,3,5-Trimethylbenzene	10.1		ug/L	10.00		101	70-130	5	25	
1,3-Dichlorobenzene	9.43		ug/L	10.00		94	70-130	3	25	
1,3-Dichloropropane	10.5		ug/L	10.00		105	70-130	4	25	
1,4-Dichlorobenzene	9.52		ug/L	10.00		95	70-130	3	25	
1,4-Dioxane - Screen	200		ug/L	200.0		100	0-332	4	200	



CERTIFICATE OF ANALYSIS

Client Name: Wood Environment and Infrastructure Solutions, Inc
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ESS Laboratory Work Order: 1904369

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8260B Volatile Organic Compounds

Batch CD91625 - 5030B

1-Chlorohexane	9.90		ug/L	10.00		99	70-130	6	25	
2,2-Dichloropropane	9.94		ug/L	10.00		99	70-130	4	25	
2-Butanone	50.8		ug/L	50.00		102	70-130	2	25	
2-Chlorotoluene	9.55		ug/L	10.00		96	70-130	3	25	
2-Hexanone	48.8		ug/L	50.00		98	70-130	1	25	
4-Chlorotoluene	9.73		ug/L	10.00		97	70-130	3	25	
4-Isopropyltoluene	10.1		ug/L	10.00		101	70-130	4	25	
4-Methyl-2-Pentanone	48.2		ug/L	50.00		96	70-130	2	25	
Acetone	43.3		ug/L	50.00		87	70-130	1	25	
Benzene	10.1		ug/L	10.00		101	70-130	5	25	
Bromobenzene	9.55		ug/L	10.00		96	70-130	4	25	
Bromochloromethane	10.1		ug/L	10.00		101	70-130	3	25	
Bromodichloromethane	9.60		ug/L	10.00		96	70-130	2	25	
Bromoform	8.99		ug/L	10.00		90	70-130	0.8	25	
Bromomethane	7.52		ug/L	10.00		75	70-130	0.4	25	
Carbon Disulfide	9.62		ug/L	10.00		96	70-130	6	25	
Carbon Tetrachloride	10.6		ug/L	10.00		106	70-130	5	25	
Chlorobenzene	9.76		ug/L	10.00		98	70-130	4	25	
Chloroethane	9.39		ug/L	10.00		94	70-130	3	25	
Chloroform	10.7		ug/L	10.00		107	70-130	5	25	
Chloromethane	11.7		ug/L	10.00		117	70-130	1	25	
cis-1,2-Dichloroethene	10.1		ug/L	10.00		101	70-130	5	25	
cis-1,3-Dichloropropene	9.66		ug/L	10.00		97	70-130	2	25	
Dibromochloromethane	9.16		ug/L	10.00		92	70-130	3	25	
Dibromomethane	10.4		ug/L	10.00		104	70-130	3	25	
Dichlorodifluoromethane	9.69		ug/L	10.00		97	70-130	3	25	
Diethyl Ether	9.78		ug/L	10.00		98	70-130	3	25	
Di-isopropyl ether	10.2		ug/L	10.00		102	70-130	4	25	
Ethyl tertiary-butyl ether	9.67		ug/L	10.00		97	70-130	4	25	
Ethylbenzene	10.0		ug/L	10.00		100	70-130	5	25	
Hexachlorobutadiene	11.0		ug/L	10.00		110	70-130	0.5	25	
Hexachloroethane	8.53		ug/L	10.00		85	70-130	0.6	25	
Isopropylbenzene	9.71		ug/L	10.00		97	70-130	4	25	
Methyl tert-Butyl Ether	10.3		ug/L	10.00		103	70-130	4	25	
Methylene Chloride	10.2		ug/L	10.00		102	70-130	5	25	
Naphthalene	11.2		ug/L	10.00		112	70-130	0.3	25	
n-Butylbenzene	10.7		ug/L	10.00		107	70-130	3	25	
n-Propylbenzene	9.81		ug/L	10.00		98	70-130	4	25	
sec-Butylbenzene	10.1		ug/L	10.00		101	70-130	4	25	
Styrene	9.72		ug/L	10.00		97	70-130	3	25	
tert-Butylbenzene	9.83		ug/L	10.00		98	70-130	6	25	
Tertiary-amyl methyl ether	9.76		ug/L	10.00		98	70-130	4	25	
Tetrachloroethene	8.65		ug/L	10.00		86	70-130	7	25	
Tetrahydrofuran	9.59		ug/L	10.00		96	70-130	0.9	25	
Toluene	10.5		ug/L	10.00		105	70-130	4	25	



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Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8260B Volatile Organic Compounds

Batch CD91625 - 5030B

trans-1,2-Dichloroethene	9.74		ug/L	10.00		97	70-130	8	25	
trans-1,3-Dichloropropene	9.55		ug/L	10.00		96	70-130	4	25	
Trichloroethene	10.4		ug/L	10.00		104	70-130	6	25	
Trichlorofluoromethane	11.1		ug/L	10.00		111	70-130	5	25	
Vinyl Acetate	12.7		ug/L	10.00		127	70-130	2	25	
Vinyl Chloride	9.88		ug/L	10.00		99	70-130	0.8	25	
Xylene O	10.2		ug/L	10.00		102	70-130	5	25	
Xylene P,M	20.8		ug/L	20.00		104	70-130	4	25	
Surrogate: 1,2-Dichloroethane-d4	0.0272		mg/L	0.02500		109	70-130			
Surrogate: 4-Bromofluorobenzene	0.0260		mg/L	0.02500		104	70-130			
Surrogate: Dibromofluoromethane	0.0260		mg/L	0.02500		104	70-130			
Surrogate: Toluene-d8	0.0247		mg/L	0.02500		99	70-130			



CERTIFICATE OF ANALYSIS

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Notes and Definitions

- U Analyte included in the analysis, but not detected
- D Diluted.
- ND Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- MDL Method Detection Limit
- MRL Method Reporting Limit
- LOD Limit of Detection
- LOQ Limit of Quantitation
- DL Detection Limit
- I/V Initial Volume
- F/V Final Volume
- § Subcontracted analysis; see attached report
- 1 Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
- 2 Range result excludes concentrations of target analytes eluting in that range.
- 3 Range result excludes the concentration of the C9-C10 aromatic range.
- Avg Results reported as a mathematical average.
- NR No Recovery
- [CALC] Calculated Analyte
- SUB Subcontracted analysis; see attached report
- RL Reporting Limit
- EDL Estimated Detection Limit
- MF Membrane Filtration
- MPN Most Probably Number
- TNTC Too numerous to Count
- CFU Colony Forming Units



CERTIFICATE OF ANALYSIS

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ESS Laboratory Work Order: 1904369

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179

<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750

http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutOfStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002

<http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002

<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424

<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313

<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006

http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752

<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>

ESS Laboratory Sample and Cooler Receipt Checklist

Client: WOOD - KPB/HDM

ESS Project ID: 1904369

Date Received: 4/11/2019

Project Due Date: 4/18/2019

Days for Project: 5 Day

Shipped/Delivered Via: Client

- 1. Air bill manifest present? No
Air No.: NA
- 2. Were custody seals present? No
- 3. Is radiation count <100 CPM? Yes
- 4. Is a Cooler Present? Yes
Temp: 5.9 Iced with: Ice
- 5. Was COC signed and dated by client? Yes

- 6. Does COC match bottles? Yes
- 7. Is COC complete and correct? Yes
- 8. Were samples received intact? Yes
- 9. Were labs informed about short holds & rushes? Yes / No / NA
- 10. Were any analyses received outside of hold time? Yes / No

- 11. Any Subcontracting needed? Yes / No
ESS Sample IDs: _____
Analysis: _____
TAT: _____

- 12. Were VOAs received? Yes / No
a. Air bubbles in aqueous VOAs? Yes / No
b. Does methanol cover soil completely? Yes / No / NA

- 13. Are the samples properly preserved? Yes / No
a. If metals preserved upon receipt: Date: _____ Time: _____ By: _____
b. Low Level VOA vials frozen: Date: _____ Time: _____ By: _____

Sample Receiving Notes:

- 14. Was there a need to contact Project Manager? Yes / No
a. Was there a need to contact the client? Yes / No
Who was contacted? _____ Date: _____ Time: _____ By: _____

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608.3 Pesticides)
01	333469	Yes	No	Yes	VOA Vial - HCl	HCl	
01	333470	Yes	No	Yes	VOA Vial - HCl	HCl	
01	333471	Yes	No	Yes	VOA Vial - HCl	HCl	
02	333466	Yes	No	Yes	VOA Vial - HCl	HCl	
02	333467	Yes	No	Yes	VOA Vial - HCl	HCl	
02	333468	Yes	No	Yes	VOA Vial - HCl	HCl	

2nd Review

All containers scanned into storage/lab
Are barcode labels on correct containers?
Are all necessary stickers attached?

Initials: WA
 Yes / No
 Yes / No

Completed By: [Signature] Date & Time: 4/11/19 14:53
Reviewed By: [Signature] Date & Time: 4/11/19 15:40
Delivered By: [Signature] Date & Time: 4/11/19 15:40

ESS Laboratory

Division of Thielsch Engineering, Inc.
 185 Frances Avenue, Cranston RI 02910
 Tel. (401) 461-7181 Fax (401) 461-4486
 www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab #	1904369
Reporting Limits	<input type="checkbox"/> Data Checker <input type="checkbox"/> Excel <input type="checkbox"/> Other (Please Specify →)

Turn Time	5	Days
Regulatory State	Is this project for any of the following? <input type="radio"/> CT RCP <input type="radio"/> MA MCP <input checked="" type="radio"/> RGP	

Company Name		Project #	Project Name	
Ward E+I			Textron Go-horn	
Contact Person		Address		
Herb Colby		271 Mill Rd.		
City	State	Zip Code	PO #	
Chelmsford	MA	01824		
Telephone Number	FAX Number	Email Address		
978 692-9090		Herb.Colby@wardplc.com		

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Analysis												
1	4/11/19	1110	GW	water	MW-D	X												
2	4/11/19	—	GW	water	Dup-1	X												

Container Type:	AC-Air Cassette	AG-Amber Glass	B-BOD Bottle	C-Cubitainer	J-Jar	O-Other	P-Poly	S-Sterile	V-Vial	V		
Container Volume:	1-100 mL	2-2.5 gal	3-250 mL	4-300 mL	5-500 mL	6-1L	7-VOA	8-2 oz	9-4 oz	10-8 oz	11-Other*	7
Preservation Code:	1-Non Preserved	2-HCl	3-H2SO4	4-HNO3	5-NaOH	6-Methanol	7-Na2S2O3	8-ZnAce, NaOH	9-NH4Cl	10-DIH2O	11-Other*	2
Number of Containers per Sample:										3		

Laboratory Use Only

Cooler Present: yes Drop Off
 Seals Intact: ✓ Pickup
 Cooler Temperature: 5.9 °C 12

Sampled by: Mark Maggiora

Comments: Please specify "Other" preservative and containers types in this space

Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)
<u>Mark Maggiora</u> 4/11/19 1330	<u>Mark Maggiora</u> 4/11/19 1330		
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)