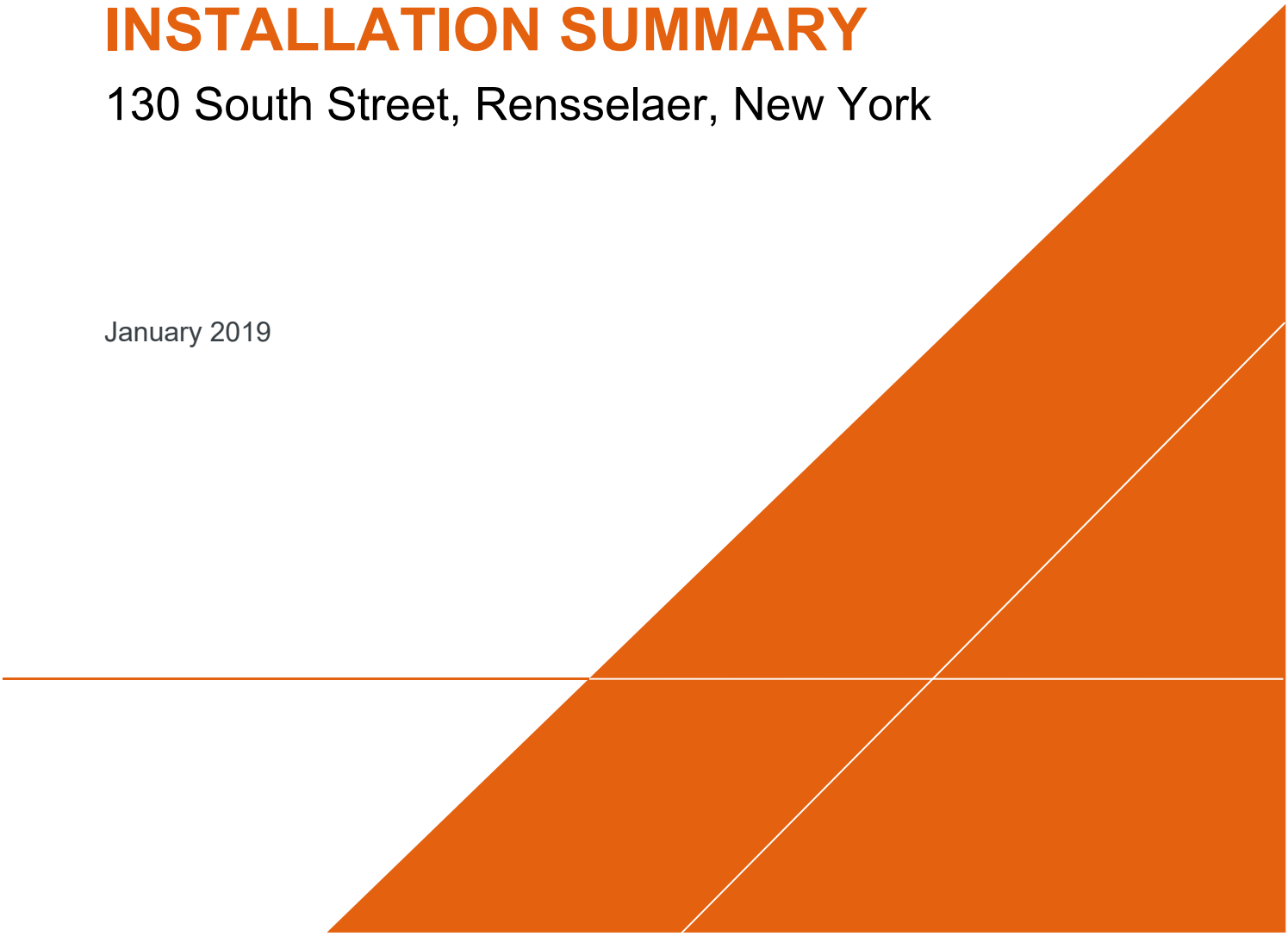
ARCADIS Design & Consultancy for natural and built assets

Ashland LLC

ERD SYSTEM OPTIMIZATION WELL INSTALLATION SUMMARY

130 South Street, Rensselaer, New York

January 2019



ERD SYSTEM OPTIMIZATION WELL INSTALLATION SUMMARY

130 South Street, Rensselaer, New York

Jason Nail
Senior Geologist

William M. Golla
Certified Project Manager

Prepared for:

Ashland LLC

Prepared by:

Arcadis U.S., Inc.
855 Route 146
Suite 210
Clifton Park
New York 12065
Tel 518 250 7300
Fax 518 250 7301

Our Ref.:

OH009019.RRTM

Date:

January 25, 2019

CONTENTS

Introduction 1
Background 1
Objectives 1
Field Activities 2
Utility Location and Clearance 2
Well Installation and Testing 2
Well Development 3
Baseline Sampling 3
Well Infrastructure Survey 3
Investigation Derived Waste Management 3
Path Forward 3
References 4

TABLE

Table 1. Well Construction Details

FIGURE

Figure 1. ERD System Optimization Injection Wells

APPENDICES

Appendix A Boring and Well Construction Logs
Appendix B Field Notes: Well Development
Appendix C Lab Reports and Chain-of-Custody Forms

INTRODUCTION

Corrective measures at the former Ashland LLC (Ashland) facility located at 130 South Street in Rensselaer, New York (site) currently include enhanced reductive dechlorination (ERD) of chlorinated volatile organic compounds (CVOCs) in groundwater. This report details well installation activities completed to optimize the ongoing ERD remedy by targeting CVOC mass identified in site characterization efforts that occurred in 2017 and 2018. The work described in this report was completed from September 26 to December 4, 2018 as outlined in the ERD System Optimization Work Plan (Arcadis 2018a), which the New York State Department of Environmental Conservation (NYSDEC) approved via email on September 24, 2018. Arcadis completed an injection event subsequent to the well installation activities documented in this report, as outlined in the ERD System Optimization Work Plan. A summary of the injection event and subsequent monitoring data and analysis will be presented in the project annual report under separate cover.

BACKGROUND

The United States Environmental Protection Agency (USEPA) approved the Corrective Measures Implementation Work Plan for the site in a letter dated March 16, 2010. Groundwater remediation activities aimed at addressing potential off-site migration of CVOCs in groundwater commenced in 2010 by implementing an ERD program along the downgradient site boundary. From 2010 to 2016, six injection events were completed as part of the approved remedy (Arcadis 2018b). Multiple supplemental investigations, including a limited scale injection event, were completed in 2017 to evaluate the presence of upgradient CVOCs sources at the site and provide supporting data for ERD program optimization, as needed. The ERD System Optimization Work Plan (Arcadis 2018a) provides detail on remedial activities completed in 2017.

Arcadis presented the results of recent investigation and injection work to representatives of the NYSDEC, USEPA and New York State Department of Health (NYSDOH) via teleconference on August 22, 2018. The participants discussed a proposed path forward for system optimization based on the revised Conceptual Site Model (CSM) developed based on the results of the investigation and injection work. Following the meeting, Arcadis prepared the ERD System Optimization Work Plan (Arcadis 2018a) which detailed recent site characterization efforts, the updated CSM, and a proposed path forward for ERD system optimization. The NYSDEC approved the ERD System Optimization Work Plan on September 24, 2018 via email.

OBJECTIVES

The ERD System Optimization Work Plan established the following objectives to expand the injection well network and optimize the existing ERD system:

- Install 17 injection wells targeting CVOC source areas and mass flux zones as defined by elevated membrane interface probe (MIP) response and analytical data collected during the supplemental site investigation.

- Install one monitoring well to increase groundwater monitoring point resolution and assess the ERD system optimization injection event by evaluating localized ERD reagent delivery and treatment effectiveness.

FIELD ACTIVITIES

Utility Location and Clearance

Ground Penetrating Radar Systems, LLC. (GPRS) conducted electromagnetic, ground penetrating radar, and radio frequency detection geophysical techniques from September 26 to September 27, 2018. The techniques provided clearance of subsurface utilities and located potential buried pipelines, utilities (i.e. water supply, sewer, and storm), tanks, and drums in advance of drilling activities. Each drilling location was also hand cleared to five feet below ground surface (bgs) with a vacuum truck or hand auger as applicable prior to drilling.

Well Installation and Testing

Nothnagle Drilling Inc. (Nothnagle) installed 17 injection wells and one monitoring well using hollow stem auger drilling methods from October 1 to October 19, 2018 under supervision of an Arcadis field geologist. Experienced Arcadis field personnel logged soil lithologic properties and periodically screened soils with a photoionization detector (PID) during well installation to support the final screened interval decision. Approximate screened intervals for each well were presented in the ERD System Optimization Work Plan based on available site characterization data; however, following completion of drilling at each location, the Arcadis field geologist consulted with project technical leads to confirm the final screened interval. Figure 1 presents the locations of the newly installed wells.

Injection wells were constructed with 4-inch-diameter wire-wrapped 20-slot stainless-steel screen and Schedule 40 polyvinyl chloride (PVC) riser pipe. The injection well sand pack was completed using grade O silica sand to one foot above the top of the well screen, followed by a one-foot-thick fine sand pack. The remaining annular space was subsequently tremie grouted with neat cement to approximately six inches below ground surface. Likely traffic at the well location determined surface completion methods. Two injection wells (IW-B11 and IW-A09) are in potentially higher traffic areas and were completed using traffic-rated flush-mounted well monuments. The remaining wells are in areas with no anticipated vehicular traffic and were completed with above-grade stick-ups without protective casing to facilitate injection setup.

New monitoring well MW-25 was also installed during this field event using 2-inch 10-slot PVC screen, Schedule 40 PVC riser pipe, a traffic-rated flush-mounted well monument, and a locking well cap. The well sand pack was completed using grade OON silica sand to two feet above the top of the well screen, followed by a 7-foot-thick bentonite seal. The remaining annular space was subsequently tremie grouted with neat cement to approximately six inches below ground surface. Table 1 summarizes well construction details, including well screen intervals. Well construction and boring log details are provided in Appendix A.

Well Development

Following installation, injection wells were developed via a combination of jetting and standard surge and purge methods. Initially, jetting was the sole development method, but the process of introducing clean water to the well screen at a high velocity while simultaneously extracting water from the well yielded higher than expected investigation derived waste (IDW) water. The initial two injection wells were developed using jetting alone; subsequent injection wells were developed via jetting for approximately 15 minutes followed by surging and purging. Development was completed until turbidity fell below 50 nephelometric turbidity units (NTU) or 10 well volumes were purged, whichever came first. Monitoring well MW-25 was developed using standard surge and purge methodology. Arcadis collected field parameters including pH, conductivity, turbidity, and temperature during development as detailed in Appendix B.

Baseline Sampling

Arcadis collected a baseline sample from monitoring well MW-25 following development and submitted the sample for laboratory analysis of volatile organic compounds (VOCs), dissolved gases including ethene, ethane, and methane, and total organic carbon (TOC). Arcadis also collected field parameters including pH, dissolved oxygen (DO), oxidation-reduction potential (ORP), temperature, and depth to groundwater during sampling. Analytical data is provided in Appendix C.

Well Infrastructure Survey

On December 5, 2018, Thew Associates Land Surveyors surveyed the newly installed wells to the nearest 0.01-foot vertically and 0.1-foot horizontally, referenced to the North American Vertical Datum (NAVD) of 1988 and North American Datum (NAD) of 1983 respectively, as shown on Figure 1.

Investigation Derived Waste Management

Investigation derived waste generated during field activities included soil cuttings, decontamination water, purge water, personal protective equipment (PPE), and other disposable sampling materials. Soil cuttings derived from drilling were staged in a roll-off container on the southern portion of the site. Wastewater from decontamination procedures and purge water from the collection of groundwater samples were placed in properly labelled 55-gallon drums and stored on asphalt on the northern portion of the site. PPE (e.g., nitrile gloves, disposable supplies, paper, plastic) was treated as municipal waste. Arcadis coordinated the characterization and disposal of all containerized waste from well installation and development activities in accordance with waste hauler, waste handling facility, and state and federal requirements at the end of injection activities in December 2018.

PATH FORWARD

Arcadis began injection activities as outlined in the ERD System Optimization Work Plan following the completion of the well installation activities documented in this report. Arcadis began implementing the injection monitoring plan following completion of the injection event in the fourth quarter of 2018. Arcadis will summarize the injection event and present monitoring results within the project annual report.

Following completion of the injection monitoring plan, Arcadis will prepare a summary of the results and present a formal path forward for additional remedial activities at the site, as necessary.

REFERENCES

Arcadis. 2018a. ERD System Optimization Work Plan. Optimization of Enhanced Reductive Dechlorination Program. 130 South Street, Rensselaer, New York. September.

Arcadis. 2018b. 2017 Corrective Measures Implementation Annual Progress Report. 130 South Street, Rensselaer, New York. May 16.

TABLE

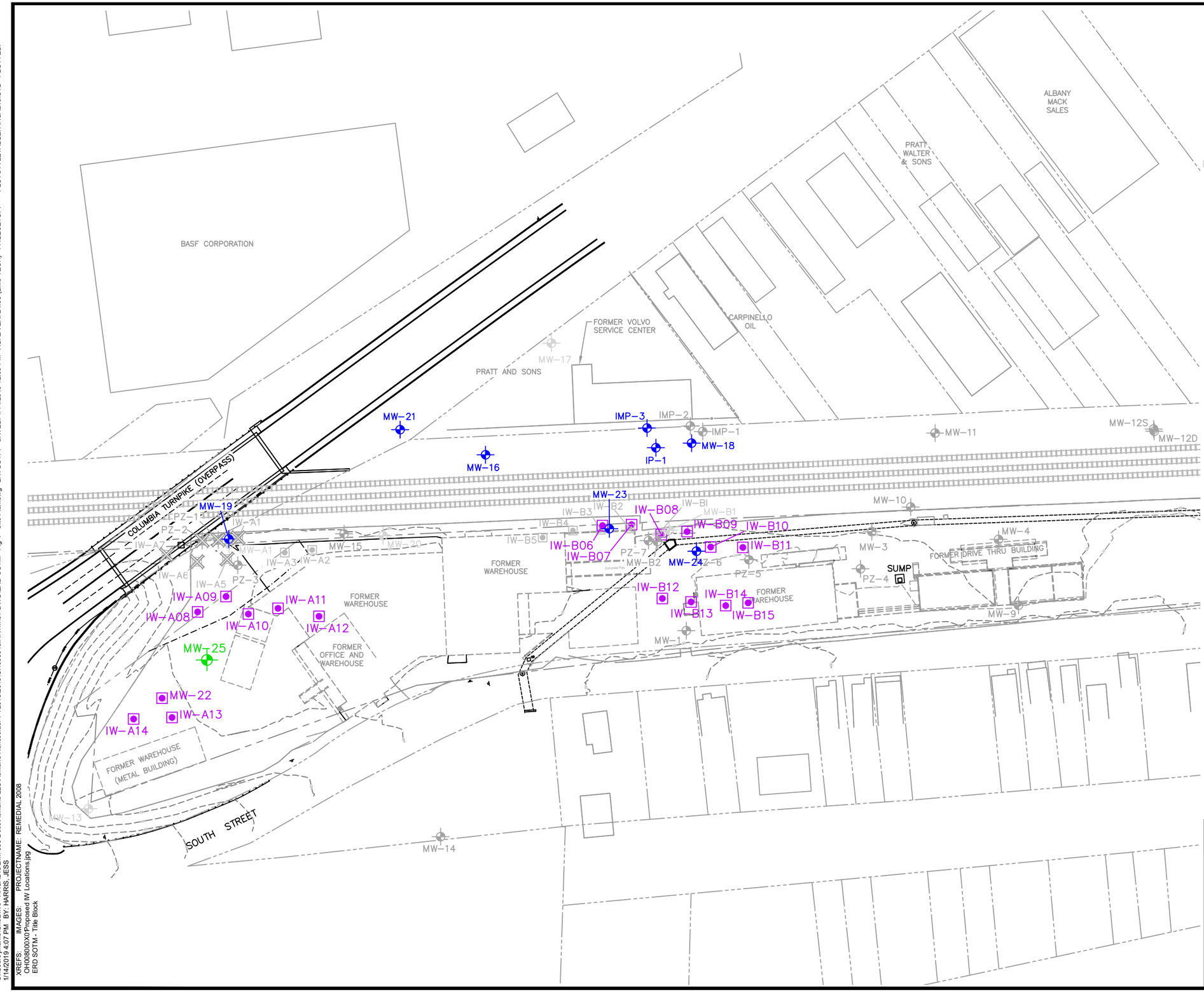
Table 1
Well Construction Details
Ashland LLC
130 South Street
Rensselaer, New York

Well ID	Ground Elevation (ft NGVD29)	TOC Elevation (ft NGVD29)	TOPVC Elevation (ft NGVD29)	Northing (ft NAD83)	Easting (ft NAD83)	Total Depth (ft bgs)	Screen Length (ft)	Screen Interval (ft bgs)	Screen Size (inch)	Screen Material	Slot Size
Injection Wells: Northern Source Area											
IW-B06	23.7	--	26.04	1,384,768.5	695,600.1	30.0	10.0	20.0 - 30.0	4	SS	0.020
IW-B07	23.9	--	26.07	1,384,797.7	695,605.3	30.0	10.0	20.0 - 30.0	4	SS	0.020
IW-B08	25.3	--	27.95	1,384,825.2	695,621.4	30.0	10.0	20.0 - 30.0	4	SS	0.020
IW-B09	25.4	--	27.40	1,384,851.6	695,623.9	30.0	10.0	20.0 - 30.0	4	SS	0.020
IW-B10	25.7	--	26.84	1,384,871.9	695,644.2	29.5	15.0	14.5 - 29.5	4	SS	0.020
IW-B11	25.7	25.79	25.48	1,384,903.8	695,651.5	30.0	15.0	15.0 - 30.0	4	SS	0.020
IW-B12	25.9	--	27.68	1,384,812.7	695,685.4	25.0	15.0	10.0 - 25.0	4	SS	0.020
IW-B13	25.9	--	29.01	1,384,835.6	695,690.9	21.5	15.0	6.5 - 21.5	4	SS	0.020
IW-B14	29.9	--	31.65	1,384,874.4	695,705.8	25.0	15.0	10.0 - 25.0	4	SS	0.020
IW-B15	29.9	--	31.89	1,384,897.3	695,707.9	25.0	15.0	10.0 - 25.0	4	SS	0.020
Injection Wells: Southern Source Area											
IW-A08	28.4	--	30.51	1,384,346.6	695,600.6	24.0	10.0	14.0 - 24.0	4	SS	0.020
IW-A09	27.4	27.42	--	1,384,378.1	695,591.2	25.0	10.0	15.0 - 25.0	4	SS	0.020
IW-A10	27.9	--	30.24	1,384,396.7	695,613.4	25.0	15.0	10.0 - 25.0	4	SS	0.020
IW-A11	32.1	--	33.88	1,384,427.5	695,613.9	30.0	15.0	15.0 - 30.0	4	SS	0.020
IW-A12	31.8	--	32.67	1,384,466.6	695,630.6	24.0	15.0	9.0 - 24.0	4	SS	0.020
IW-A13	31.1	--	33.71	1,384,298.8	695,700.4	15.0	10.0	5.0 - 15.0	4	SS	0.020
IW-A14	32.9	--	35.56	1,384,260.1	695,693.8	17.0	10.0	7.0 - 17.0	4	SS	0.020
Monitoring Well: Southern Source Area											
MW-25	28.5	28.47	28.13	1,384,345.7	695,650.4	17.0	10.0	7.0 - 17.0	2	Sch. 40 PVC	0.010

NOTES:
1) Coordinates and elevations shown are expressed in feet, referenced horizontally to the North American Datum of 1983 (NAD83) and projected on the New York State Plane Coordinate System (East Zone), and vertically to the National Geodetic Vertical Datum of 1929 (NGVD29), expressed in U.S. Survey Feet.

-- = not available
bgs = below ground surface
ft = feet
PVC = polyvinyl chloride
Sch. = schedule
SS = stainless steel
TOC = top of casing
TOPVC = top of PVC riser

FIGURE



LEGEND:

- IMP-1/MW-1/PZ-1 — GROUNDWATER GAUGING WELL
- IP-1/IMP-3/MW-16 — PERFORMANCE MONITORING GROUNDWATER SAMPLING LOCATIONS
- IW-B1 — SHALLOW INJECTION WELL LOCATION (2010)
- SURFACE CONTOUR
- RAILROAD TRACK
- CULVERTED STREAM PIPE
- PROPERTY LINE
- FORMER BUILDINGS AND STRUCTURES
- IW-A14 — ERD SYSTEM OPTIMIZATION INJECTION WELL (2018)
- MW-21 — REMEDIAL OPTIMIZATION MONITORING WELL
- MW-25 — NEWLY INSTALLED MONITORING WELL (2018)
- INJECTION WELLS/PIEZOMETERS ABANDONED IN 2018

NOTES:

1. LOCATIONS AND TOPOGRAPHY EAST OF CSX RAILROAD PROPERTY AND WEST OF AND INCLUDING SOUTH STREET, SURVEYED BY THEW ASSOCIATES PE-LS, PLLC (OCTOBER 2008). TWO NEW MONITORING WELLS, MW-20 & MW-21, AND TEN NEW INJECTION WELLS, IW-A2 THRU IW-A7 & IW-B2 THRU IW-B5, WERE SURVEYED ON JULY 2, 2010 BY THEW ASSOCIATES. ONE NEW MONITORING WELL (MW-25) AND 17 NEW INJECTION WELLS (IW-A08 THROUGH IW-A14; IW-B06 THROUGH IW-B15) WERE SURVEYED ON DECEMBER 5, 2018 BY THEW ASSOCIATES, ALONG WITH THREE DUAL-PURPOSE MONITORING AND INJECTION WELLS INSTALLED IN 2017 (MW-22 THROUGH MW-24).
2. REFERENCED HORIZONTALLY TO THE NORTH AMERICAN DATUM OF 1983 (NAD83) AND PROJECTED ON THE NEW YORK STATE PLANE COORDINATE SYSTEM (EAST ZONE). VERTICAL REFERENCE TO NGVD 1929.
3. ASHLAND PROPERTY BOUNDARY ESTABLISHED BY THEW ASSOCIATES SURVEY AND DEED RESEARCH (OCTOBER 2008). OTHER PROPERTY LINES AND MAP FEATURES ARE FROM RENSSELAER COUNTY TAX MAPPING AND NEW YORK STATE CLEARING-HOUSE AERIAL PHOTOGRAPHY.
4. INJECTION WELL MW-22 WAS INSTALLED DURING THE 2017 LIMITED-SCALE INJECTION EVENT.

0 100' 200'

GRAPHIC SCALE

ASHLAND INC.
RENSSELAER, NEW YORK
ERD SYSTEM OPTIMIZATION REPORT

ERD SYSTEM OPTIMIZATION INJECTION WELLS

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FIGURE 1

CITY: SYRACUSE, NY DIV/GROUP: ENV/IM-DV DB: R. BASSETT, E. KRAHMER, R. ALLEN PM: W. GOLLA TM/TR: K. POTTER LYR:ON=*;OFF=REF; (FRZ)
C:\Users\jharris\OneDrive - ARCADIS\BIM 360 Docs\Ashland LLC\Ashland Rensselaer-FY2018\2019\OH009018.RRTM\01-DWG\ERD SOTM - Fig 1 - Site Plan.dwg LAYOUT: 1 SAVED: 1/14/2019 12:30 PM ACADVER: 21.0S (LMS TECH) PAGESETUP:---- PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 1/14/2019 4:07 PM BY: HARRIS, JESS
XREFS: IMAGES: PROJECTNAME: REMEDIAL 2008
OH008000X0\Proposed IW Locations.jpg
ERD SOTM - Title Block

APPENDIX A

Boring and Well Construction Logs

Date Start/Finish: 10/04/2018
Drilling Company: Nothnagle Drilling Inc.
Driller's Name: S. Loranty; B. Swartz
Drilling Method: HSA
Rig Type: Split Spoon

Northing: 1384346.6 ft NAD83
Easting: 695600.6 ft NAD83
Casing Elevation: 30.51 ft NGVD29
Surface Elevation: 28.36 ft NGVD29

Borehole Depth: 25 ft bgs
Well Diameter: 4 inches

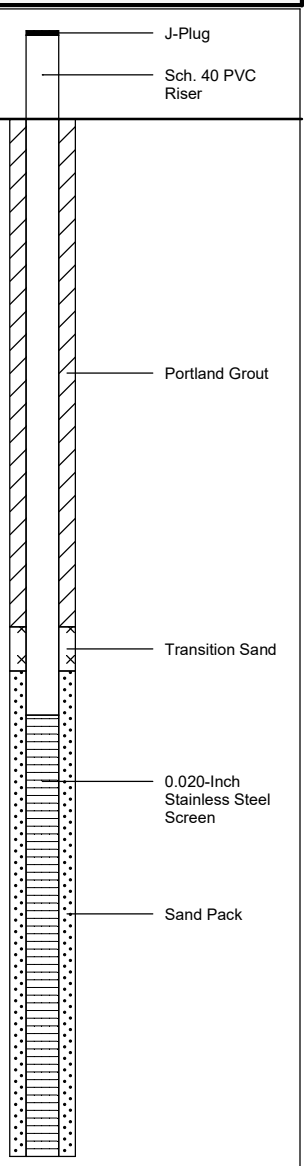
Descriptions By: J. Duquette

Well/Boring ID: **IW-A08**

Client: Ashland LLC

Location: 130 South Street
Rensselaer, New York.

DEPTH	ELEVATION	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
-2 to 0	30				
0					HAND CLEARED; NOT LOGGED
1 to 5	25				NO SPLIT SPOON.
6 to 16	20 to 15				
17		0.5	9.5		Sandy Clay; trace silt; moist, firm, dark gray.
18 to 21	10	1.1	15.1		Sand, coarse grained; some clay; some large gravel, angular; wet, soft, dark gray.
		1.2	22.5		
22			15.7		Sandy Clay; some small gravel, angular; wet, firm, dark gray.
23	5	1.55	7.3		
24			0.1		WEATHERED BEDROCK.
25					



Well/Boring Construction

Remarks: NAD83 = North American Datum of 1983; NGVD29 = National Geodetic Vertical Datum of 1929; bgs = below ground surface; dtw = depth to groundwater; ft = feet; HSA = hollow stem auger; HA = hand auger; NA = not available/not applicable.

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Date Start/Finish: 10/08/2018
Drilling Company: Nothnagle Drilling Inc.
Driller's Name: S. Loranty; B. Swartz
Drilling Method: HSA
Rig Type: Split Spoon

Northing: 1384712.6 ft NAD83
Easting: 695497.6 ft NAD83
Casing Elevation: 27.42 ft NGVD29
Surface Elevation: 27.42 ft NGVD29

Borehole Depth: 26 ft bgs
Well Diameter: 4 inches

Descriptions By: J. Duquette

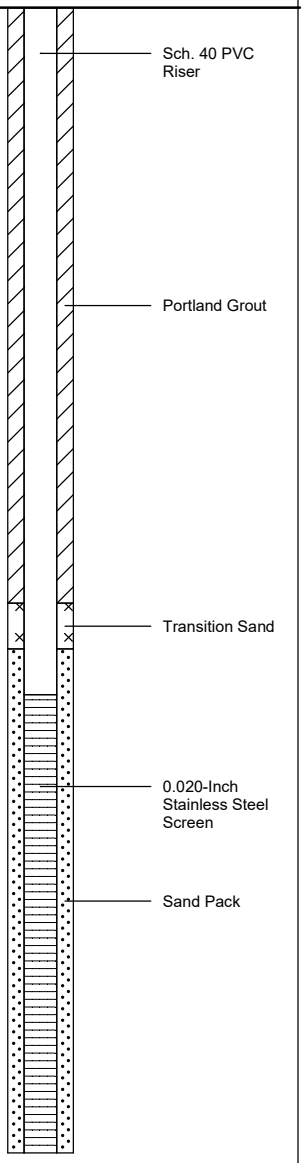
Well/Boring ID: **IW-A09**

Client: Ashland LLC

Location: 130 South Street
Rensselaer, New York.

DEPTH	ELEVATION	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
0					HAND CLEARED; NOT LOGGED.
1					
2	25				
3					
4					
5					NO SPLIT SPOON.
6					
7			1.4		
8	20				
9					
10		0.9	0.0		Sandy Clay; some gravel, subangular; wet, soft, dark brown.
11			8.4		Sandy Clay; some Gravel, large, angular; light brown.
12					
13	15	0.0	5.5		NO RECOVERY
14					
15		1.3	28.4		Sand, fine to coarse grained; some silt; some gravel, angular; wet, loose, dark gray.
16					
17		2.2			Clay; wet, soft, dark gray.
18	10		34.2		
19		0.7			
20					
21		0.6	2.4		Silt; some clay; some sand, fine to coarse grained; little gravel, small to large, subrounded; wet, soft, dark gray.
22					
23	5	0.55	13.4		
24					
25		0.0			NO RECOVERY
26					

Well/Boring Construction



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Remarks: NAD83 = North American Datum of 1983; NGVD29 = National Geodetic Vertical Datum of 1929; bgs = below ground surface; dtw = depth to groundwater; ft = feet; HSA = hollow stem auger; HA = hand auger; NA = not available/not applicable.

Date Start/Finish: 10/03/2018
Drilling Company: Nothnagle Drilling Inc.
Driller's Name: S. Loranty; B. Swartz
Drilling Method: HSA
Rig Type: Split Spoon

Northing: 1384396.7 ft NAD83
Easting: 695613.4 ft NAD83
Casing Elevation: 30.24 ft NGVD29
Surface Elevation: 27.91 ft NGVD29

Borehole Depth: 25 ft bgs
Well Diameter: 4 inches

Descriptions By: J. Duquette

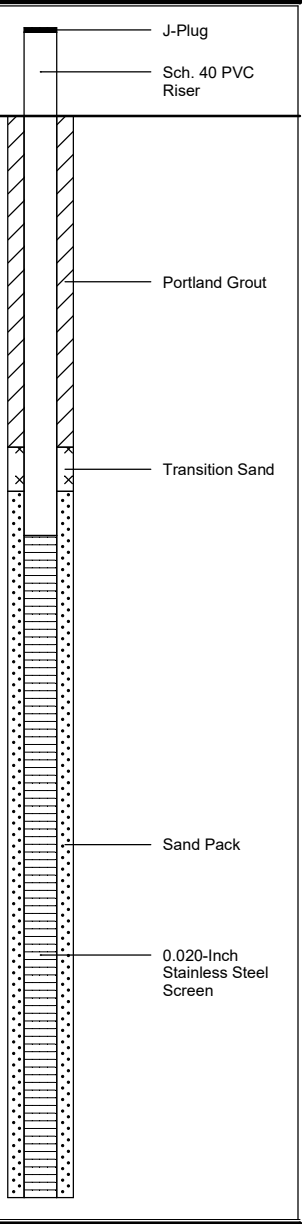
Well/Boring ID: **IW-A10**

Client: Ashland LLC

Location: 130 South Street
Rensselaer, New York.

DEPTH	ELEVATION	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
-2	30				
-1					
0					HAND CLEARED; NOT LOGGED.
1					
2					
3	25				
4					
5					NO SPLIT SPOON.
6					
7					
8	20				
9					
10					
11		0.0			NO RECOVERY; Rock in shoe.
12					Silty Clay; little gravel, small, angular; wet, hard, light brown.
13	15	6.6	2.1		
14					NO RECOVERY.
15		0.0			
16					Sandy Silt; some gravel, small, angular; wet, soft, grayish blue.
17		0.5	0.0		
18	10				Sand, coarse grained; some silt; wet, soft, grayish blue.
19		1.0	1.2		
20					
21		1.65	1.3		
22					Sandy Silt; some clay; wet, very stiff, grayish blue.
23	5	1.85	0.0		
24					Silty Clay; trace sand; wet, hard, grayish blue.
25		0.75	0.0		

Well/Boring Construction



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Remarks: NAD83 = North American Datum of 1983; NGVD29 = National Geodetic Vertical Datum of 1929; bgs = below ground surface; dtw = depth to groundwater; ft = feet; HSA = hollow stem auger; HA = hand auger; NA = not available/not applicable.

Date Start/Finish: 10/03/2018
Drilling Company: Nothnagle Drilling Inc.
Driller's Name: S. Loranty; B. Swartz
Drilling Method: HSA
Rig Type: Split Spoon

Northing: 1384427.5 ft NAD83
Easting: 695613.9 ft NAD83
Casing Elevation: 33.88 ft NGVD29
Surface Elevation: 32.13 ft NGVD29

Borehole Depth: 29 ft bgs
Well Diameter: 4 inches

Descriptions By: J. Duquette

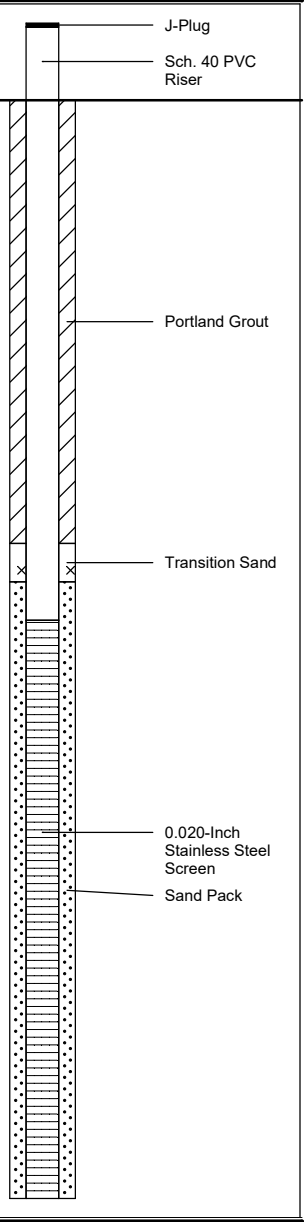
Well/Boring ID: **IW-A11**

Client: Ashland LLC

Location: 130 South Street
Rensselaer, New York.

DEPTH	ELEVATION	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
0	30				HAND CLEARED.
5	25		0.0		NO SPLIT SPOON.
15	15	0.95	0.0		Sandy Clay; some gravel, small to medium, angular; wet, medium stiff, light brown.
		0.90			
20	10	1.15	0.0		Clay; trace sand, coarse grained; wet, medium stiff, grayish brown.
		1.85			
		1.55			
25	5	0.95	0.0		Clay; some gravel, small, angular; wet, very stiff, grayish brown.
		1.25	0.0		Sand, coarse grained; and Gravel, angular; dark gray.
29			0.0		WEATHERED BEDROCK; Refusal at 29.0 ft bgs.

Well/Boring Construction



Remarks: NAD83 = North American Datum of 1983; NGVD29 = National Geodetic Vertical Datum of 1929; bgs = below ground surface; dtw = depth to groundwater; ft = feet; HSA = hollow stem auger; HA = hand auger; NA = not available/not applicable.

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Date Start/Finish: 10/04/2018
Drilling Company: Nothnagle Drilling Inc.
Driller's Name: S. Loranty; B. Swartz
Drilling Method: HSA
Rig Type: Split Spoon

Northing: 1384466.6 ft NAD83
Easting: 695630.6 ft NAD83
Casing Elevation: 32.67 ft NGVD29
Surface Elevation: 31.77 ft NGVD29

Borehole Depth: 24 ft bgs
Well Diameter: 4 inches

Descriptions By: J. Duquette

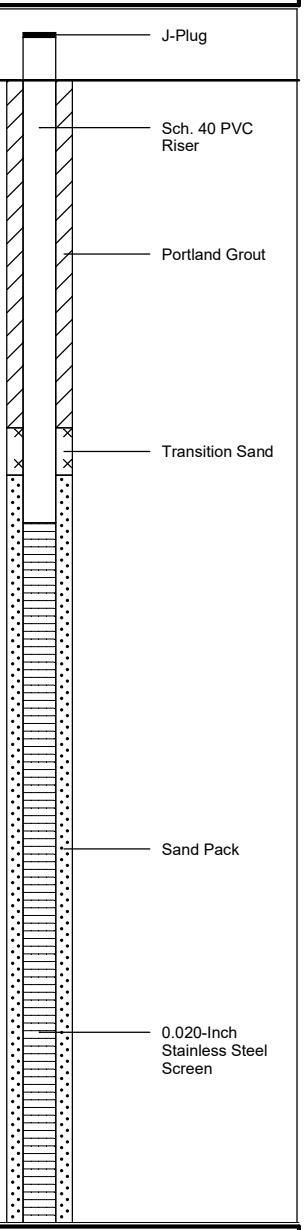
Well/Boring ID: **IW-A12**

Client: Ashland LLC

Location: 130 South Street
Rensselaer, New York.

DEPTH	ELEVATION	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
0	30				HAND CLEARED, NOT LOGGED.
5	25				NO SPLIT SPOON.
15	15	0.55	0.0		Silty Clay; some gravel, small, angular; wet, medium stiff, grayish brown.
17		0.65	0.0		Sandy Clay and Gravel, subangular; wet, grayish brown.
19		1.65	0.4		Sandy Clay; some gravel, subangular; wet, soft, light brown.
20			0.0		Clay; some silt; wet, stiff, dark grayish brown.
22	10	1.0	0.0		
23					REFUSAL; NO RECOVERY.

Well/Boring Construction



ARCADIS Design & Consultancy for natural and built assets

Remarks: NAD83 = North American Datum of 1983; NGVD29 = National Geodetic Vertical Datum of 1929; bgs = below ground surface; dtw = depth to groundwater; ft = feet; HSA = hollow stem auger; HA = hand auger; NA = not available/not applicable.

Date Start/Finish: 10/02/2018
Drilling Company: Nothnagle Drilling Inc.
Driller's Name: S. Loranty; B. Swartz
Drilling Method: HSA
Rig Type: Split Spoon

Northing: 1384298.8 ft NAD83
Easting: 695700.4 ft NAD83
Casing Elevation: 33.71 ft NGVD29
Surface Elevation: 31.08 ft NGVD29

Borehole Depth: 17 ft bgs
Well Diameter: 4 inches

Descriptions By: J. Duquette

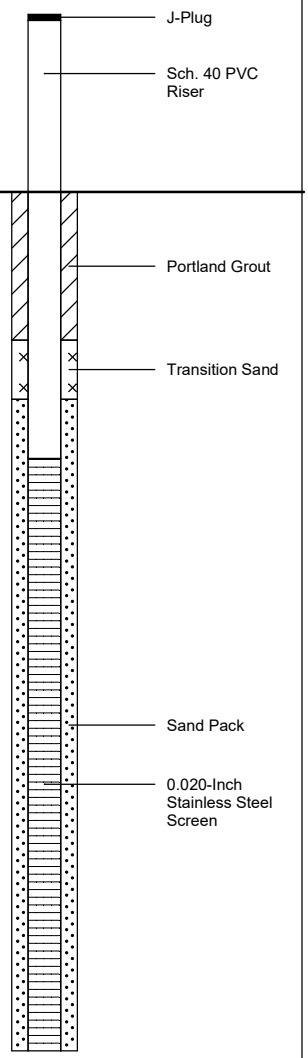
Well/Boring ID: **IW-A13**

Client: Ashland LLC

Location: 130 South Street
Rensselaer, New York.

DEPTH	ELEVATION	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
0	30				HAND CLEARED, NOT LOGGED.
5	25	0.8	0.0		Sand, coarse grained; some clay; some gravel, angular; wet, stiff, dark gray.
7		0.3	0.0		Sand, coarse grained; and Gravel, small to medium, subangular; wet, soft, dark gray.
10		0.95			
11	20	0.95	0.0		Sand, coarse grained; little clay, little gravel, small, angular; wet, soft, brown.
12			1.7		Clay; little silt; little gravel, small, angular; wet, hard, light brown.
13			1.1		Sand, fine to medium grained; some silt; some clay; wet, stiff, gray.
14			8.7		Clay; some silt; trace sand; wet, hard, light brown.
15					BEDROCK.
16	15	0.1	0.0		

Well/Boring Construction



Remarks: NAD83 = North American Datum of 1983; NGVD29 = National Geodetic Vertical Datum of 1929; bgs = below ground surface; dtw = depth to groundwater; ft = feet; HSA = hollow stem auger; HA = hand auger; NA = not available/not applicable.

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Date Start/Finish: 10/02/2018
Drilling Company: Nothnagle Drilling Inc.
Driller's Name: S. Loranty; B. Swartz
Drilling Method: HSA
Rig Type: Split Spoon

Northing: 1384260.1
Easting: 695693.8
Casing Elevation: 35.56 ft NGVD29
Surface Elevation: 32.93 ft NGVD29

Borehole Depth: 17 ft bgs
Well Diameter: 4 inches

Descriptions By: J. Duquette

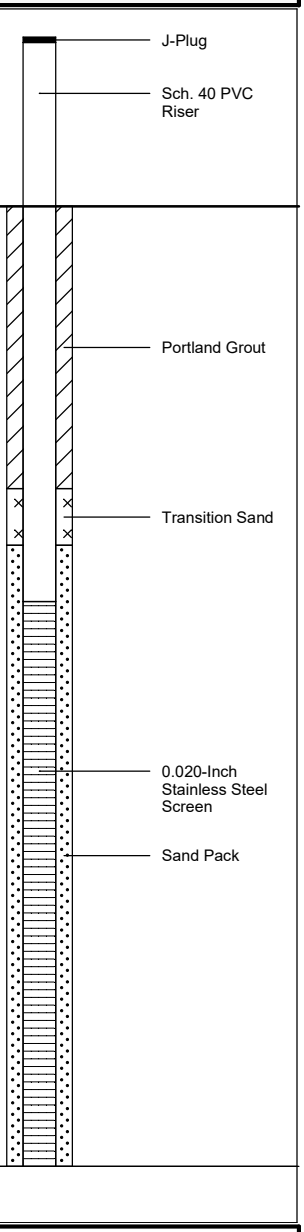
Well/Boring ID: **IW-A14**

Client: Ashland LLC

Location: 130 South Street
Rensselaer, New York.

DEPTH	ELEVATION	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
-3					
-2	35				
-1					
0					HAND CLEARED; NOT LOGGED.
1					
2					
3	30				
4					
5					
6		0.5	21.7		Clay; some gravel, moist, light brown.
7		0.1	31.4		
8	25				NOT LOGGED.
9					
10		1.7	46.1		Clay; trace silt; moist, reddish brown.
11					
12		0.0			NO RECOVERY.
13	20				
14		1.8	1.9		Clay; trace silty sand; wet, hard, gray.
					Silty Sand, fine grained; trace clay; wet, hard, red.
15					Silty Clay; dark brown.
16		1.55	22.4		Silty Clay and Gravel, small to medium, rounded; stiff, dark gray.
17					
18	15	0.45	32.4		Silty Sand; some clay; some gravel, small to large, subrounded; wet, hard, dark gray

Well/Boring Construction



Remarks: NAD83 = North American Datum of 1983; NGVD29 = National Geodetic Vertical Datum of 1929; bgs = below ground surface; dtw = depth to groundwater; ft = feet; HSA = hollow stem auger; HA = hand auger; NA = not available/not applicable.

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Date Start/Finish: 10/10/2018
Drilling Company: Nothnagle Drilling Inc.
Driller's Name: T. Mangefrida; A. Farrell
Drilling Method: HSA
Rig Type: Split Spoon

Northing: 1384768.5 ft NAD83
Easting: 695600.1 ft NAD83
Casing Elevation: 26.04 ft NGVD29
Surface Elevation: 23.71 ft NGVD29

Borehole Depth: 31 ft bgs
Well Diameter: 4 inches

Descriptions By: E. Sousa

Well/Boring ID: **IW-B06**

Client: Ashland LLC

Location: 130 South Street
Rensselaer, New York.

DEPTH	ELEVATION	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
-2	25					J-Plug
-1						
0					HAND CLEARED; NOT LOGGED.	Sch. 40 PVC Riser
1						
2						
3	20					
4						
5					NO SPLIT SPOON.	
6						
7						
8	15					Portland Grout
9						
10						
11						
12						
13	10					
14						

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Remarks: NAD83 = North American Datum of 1983; NGVD29 = National Geodetic Vertical Datum of 1929; bgs = below ground surface; dtw = depth to groundwater; ft = feet; HSA = hollow stem auger; HA = hand auger; NA = not available/not applicable.

Date Start/Finish: 10/10/2018
Drilling Company: Nothnagle Drilling Inc.
Driller's Name: T. Mangefrida; A. Farrell
Drilling Method: HSA
Rig Type: Split Spoon

Northing: 1384768.5 ft NAD83
Easting: 695600.1 ft NAD83
Casing Elevation: 26.04 ft NGVD29
Surface Elevation: 23.71 ft NGVD29

Borehole Depth: 31 ft bgs
Well Diameter: 4 inches

Descriptions By: E. Sousa

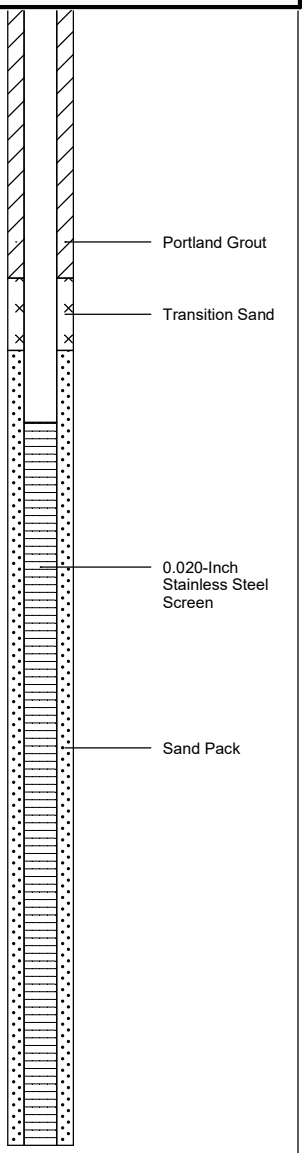
Well/Boring ID: **IW-B06**

Client: Ashland LLC

Location: 130 South Street
Rensselaer, New York.

DEPTH	ELEVATION	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
15					
16		2.0	0.0		Silty Clay; soft, wet, gray; at 18.0 ft bgs, 1.0 inch thick layer of coarse sand and small angular gravel.
17					
18		2.0	0.0		
	5				
19					
20		1.1	0.0		Silty Clay; some gravel, small to medium, angular; soft, wet, gray.
21					
22		2.0	61.5		Sand, fine to medium grained; trace silt; wet, very stiff, gray.
23					
	0				
24		1.4	53.8		
25					
26		1.4	116.3		Silty Sand, fine to medium grained; wet, very stiff, gray.
27					
28		0.9	14.0		
	-5				
29					
30		1.2	1.6		Sand, medium to coarse grained; little gravel, small, angular to round; wet, medium stiff, gray.
31					

Well/Boring Construction



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Date Start/Finish: 10/10/2018
Drilling Company: Nothnagle Drilling Inc.
Driller's Name: T. Mangefrida; A. Farrell
Drilling Method: HSA
Rig Type: Split Spoon

Northing: 1384797.7 ft NAD83
Easting: 695605.3 ft NAD83
Casing Elevation: 26.07 ft NGVD29
Surface Elevation: 23.91 ft NGVD29

Borehole Depth: 30 ft bgs
Well Diameter: 4 inches

Descriptions By: E. Sousa

Well/Boring ID: **IW-B07**

Client: Ashland LLC

Location: 130 South Street
Rensselaer, New York.

DEPTH	ELEVATION	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
-2						J-Plug
-1	25					
0					HAND CLEARED; NOT LOGGED.	Sch. 40 PVC Riser
1						
2						
3						
4	20					
5					NO SPLIT SPOON.	
6						
7						
8						
9	15					Portland Grout
10						
11						
12						
13						
14	10					

Remarks: NAD83 = North American Datum of 1983; NGVD29 = National Geodetic Vertical Datum of 1929; bgs = below ground surface; dtw = depth to groundwater; ft = feet; HSA = hollow stem auger; HA = hand auger; NA = not available/not applicable.

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Project: OH009019.RRTM Template: boring_well HSA 2007
Data File:IW-B07.dat Date: 1/16/2019 Created/Edited by: J. Pryor

Date Start/Finish: 10/10/2018
Drilling Company: Nothnagle Drilling Inc.
Driller's Name: T. Mangefrida; A. Farrell
Drilling Method: HSA
Rig Type: Split Spoon

Northing: 1384797.7 ft NAD83
Easting: 695605.3 ft NAD83
Casing Elevation: 26.07 ft NGVD29
Surface Elevation: 23.91 ft NGVD29

Borehole Depth: 30 ft bgs
Well Diameter: 4 inches

Descriptions By: E. Sousa

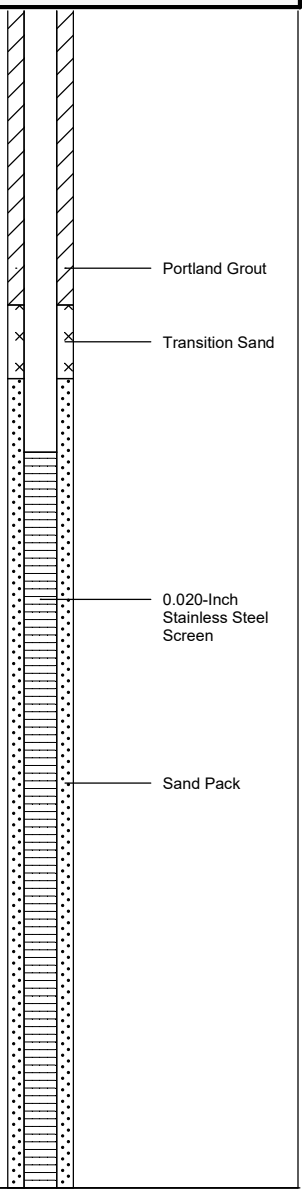
Well/Boring ID: **IW-B07**

Client: Ashland LLC

Location: 130 South Street
Rensselaer, New York.

DEPTH	ELEVATION	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
14					Sand, fine to medium grained; some gravel, small, angular; trace silt; moist, loose, brown.
15		2.0	0.0		Silty Clay; moist, soft, gray.
16					
17		2.0	0.0		Silty Clay; moist to wet, soft, gray.
18					
19	5	0.9	0.0		
20					
21		1.6	0.4		Silty Sand, fine grained; and Gravel, small, angular; wet, soft, gray.
					Sand, fine to medium grained; some silt; some gravel, small, angular, gray.
22					
23		1.4	8.1		Sand, fine grained; medium stiff, wet, gray.
24	0				
25		2.0	5.3		Silty Sand, fine grained; medium stiff, wet, gray.
					Sand, fine grained; medium stiff, wet, gray.
26					
27		2.0	2.4		Sand, medium to coarse grained; and Gravel, medium, subangular; wet, loose, soft, gray.
28					
29	-5	0.3	4.6		Sand, fine to medium grained; trace silt; trace gravel, small, angular; wet, soft, gray.
30					

Well/Boring Construction



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Date Start/Finish: 10/10/2018
Drilling Company: Nothnagle Drilling Inc.
Driller's Name: T. Mangefrida; A. Farrell
Drilling Method: HSA
Rig Type: Split Spoon

Northing: 1384825.2 ft NAD83
Easting: 695621.4 ft NAD83
Casing Elevation: 27.95 ft NGVD29
Surface Elevation: 25.28 ft NGVD29

Borehole Depth: 30 ft bgs
Well Diameter: 4 inches

Descriptions By: E. Sousa

Well/Boring ID: **IW-B08**

Client: Ashland LLC

Location: 130 South Street
Rensselaer, New York.

DEPTH	ELEVATION	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
-3						J-Plug
-2	30					Sch. 40 PVC Riser
-1						
0					HAND CLEARED; NOT LOGGED.	
1						
2						
3	25					
4						
5					NO SPLIT SPOON.	
6						
7						
8	20					
9						Portland Grout
10						
11						
12						
13	15					

ARCADIS Design & Consultancy for natural and built assets

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Date Start/Finish: 10/10/2018
Drilling Company: Nothnagle Drilling Inc.
Driller's Name: T. Mangefrida; A. Farrell
Drilling Method: HSA
Rig Type: Split Spoon

Northing: 1384825.2 ft NAD83
Easting: 695621.4 ft NAD83
Casing Elevation: 27.95 ft NGVD29
Surface Elevation: 25.28 ft NGVD29

Borehole Depth: 30 ft bgs
Well Diameter: 4 inches

Descriptions By: E. Sousa

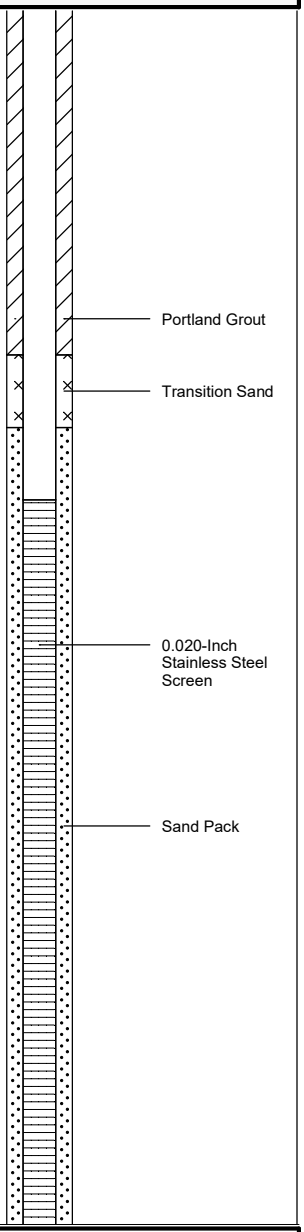
Well/Boring ID: **IW-B08**

Client: Ashland LLC

Location: 130 South Street
Rensselaer, New York.

DEPTH	ELEVATION	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
14					Silty Sand, medium to coarse grained; some gravel, small, angular; wet, soft, gray.
15		1.6	0.0		Silty Clay; wet, soft, gray.
16					
17		2.0	0.0		
18	10				Silty Sand, fine grained; medium stiff, wet, gray.
19		0.3	0.1		
20					
21		2.0	42.0		Sand, fine to medium grained; wet, very stiff, gray.
22					
23	5	2.0	11.4		
24					Silty Sand, fine grained; very stiff, wet, gray.
25		0.9	15.5		Sand, fine to medium grained; very stiff, wet, gray.
26					
27		1.1	26.8		Silty Sand, fine grained; medium stiff, wet, gray.
28	0				
29		1.9	9.8		Sand, medium to coarse; and Gravel, small, angular; very stiff, wet, gray.
					Sand, fine to medium grained; wet, medium stiff, gray.
30					Gravel, angular; weathered bedrock; wet.

Well/Boring Construction



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Date Start/Finish: 10/15/2018
Drilling Company: Nothnagle Drilling Inc.
Driller's Name: T. Mangefrida; A. Farrell
Drilling Method: HSA
Rig Type: Split Spoon

Northing: 1384851.6 ft NAD83
Easting: 695623.9 ft NAD83
Casing Elevation: 27.40 ft NGVD29
Surface Elevation: 25.37 ft NGVD29

Borehole Depth: 30 ft bgs
Well Diameter: 4 inches

Descriptions By: K. Stilson

Well/Boring ID: **IW-B09**

Client: Ashland LLC

Location: 130 South Street
Rensselaer, New York.

DEPTH / ELEVATION	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
-2 / -1 / 0					J-Plug
25 / 1 / 2 / 3 / 4 / 5				HAND CLEARED; NOT LOGGED.	Sch. 40 PVC Riser
20 / 6 / 7 / 8				NO SPLIT SPOON.	Portland Grout

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Remarks: NAD83 = North American Datum of 1983; NGVD29 = National Geodetic Vertical Datum of 1929; bgs = below ground surface; dtw = depth to groundwater; ft = feet; HSA = hollow stem auger; HA = hand auger; NA = not available/not applicable.

Date Start/Finish: 10/15/2018
Drilling Company: Nothnagle Drilling Inc.
Driller's Name: T. Mangefrida; A. Farrell
Drilling Method: HSA
Rig Type: Split Spoon

Northing: 1384851.6 ft NAD83
Easting: 695623.9 ft NAD83
Casing Elevation: 27.40 ft NGVD29
Surface Elevation: 25.37 ft NGVD29

Borehole Depth: 30 ft bgs
Well Diameter: 4 inches

Descriptions By: K. Stilson

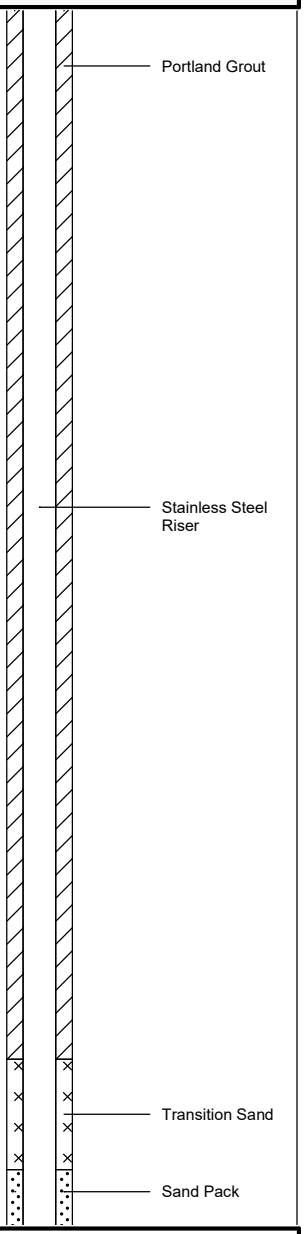
Well/Boring ID: **IW-B09**

Client: Ashland LLC

Location: 130 South Street
Rensselaer, New York.

DEPTH	ELEVATION	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
15	10				Silty Sand, fine to medium grained; some gravel, subrounded to rounded; brown.
16		1.5	0.0		Clay; some silt; little sand; little gravel, small; moist, gray; 15.5 ft bgs, some oxidation staining present.
17					Silty Clay; some gravel, small, subangular; moist, loose, brown to gray.
18		0.1	0.0		
19					Sand, fine to medium grained; trace gravel, small, subangular; wet, loose, gray.

Well/Boring Construction



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ARCADIS Design & Consultancy for natural and built assets

Date Start/Finish: 10/15/2018
Drilling Company: Nothnagle Drilling Inc.
Driller's Name: T. Mangefrida; A. Farrell
Drilling Method: HSA
Rig Type: Split Spoon

Northing: 1384851.6 ft NAD83
Easting: 695623.9 ft NAD83
Casing Elevation: 27.40 ft NGVD29
Surface Elevation: 25.37 ft NGVD29

Borehole Depth: 30 ft bgs
Well Diameter: 4 inches

Descriptions By: K. Stilson

Well/Boring ID: **IW-B09**

Client: Ashland LLC

Location: 130 South Street
Rensselaer, New York.

DEPTH	ELEVATION	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
20		1.3	0.0			
	5					
21					Silty Sand, fine grained; some gravel, small to medium, subangular; wet, soft, gray; some oxidation staining present.	
22		1.4	0.0		Silty Sand, fine grained; wet, soft, gray.	0.020-Inch Stainless Steel Screen
23					Silty Sand, fine grained; some gravel, small to medium, subangular; wet, loose, gray; some oxidation staining present.	
24		1.2	0.0		Silt and Clay; trace gravel, small, subangular; wet, soft to medium stiff, gray.	Sand Pack
25					Sand, fine grained; little silt; wet, loose, gray.	
	0				Silty Sand, fine grained; some gravel, small to medium, subangular; wet, soft, gray; some oxidation staining present.	
26		0.7	0.0			
27					Sand, fine to medium grained; wet, soft, gray.	
					Sand and Silt; some gravel, small to medium, subangular; wet, loose, gray; some oxidation staining present.	
28		1.0	0.0			
29					Sand, fine to medium grained; some gravel, small to large, subangular; wet, loose, gray; some oxidation staining present.	
		0.9	0.0		Gravel, small to large, angular to subangular; little silty sand, fine to coarse grained; trace clay; wet loose, gray; stone in shoe.	
30						

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Date Start/Finish: 10/11/2018
Drilling Company: Nothnagle Drilling Inc.
Driller's Name: S. Loranty; B. Swartz
Drilling Method: HSA
Rig Type: Split Spoon

Northing: 1384871.9 ft NAD83
Easting: 695644.2 ft NAD83
Casing Elevation: 26.84 ft NGVD29
Surface Elevation: 25.72 ft NGVD29

Borehole Depth: 29 ft bgs
Well Diameter: 4 inches

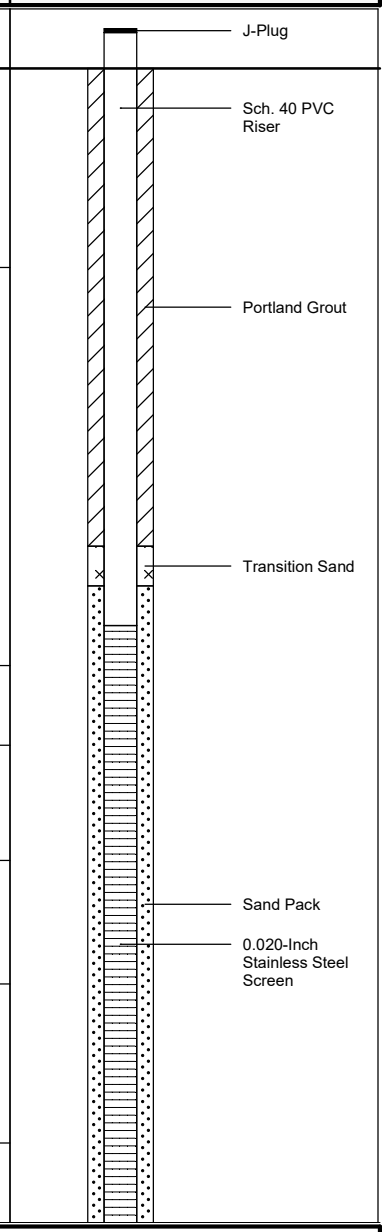
Descriptions By: J. Duquette

Well/Boring ID: **IW-B10**

Client: Ashland LLC

Location: 130 South Street
Rensselaer, New York.

DEPTH	ELEVATION	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
0	25				HAND CLEARED; NOT LOGGED.
5	20				NO SPLIT SPOON.
10	15	1.2	0.0		Sand, medium to coarse grained; some clay; moist, medium stiff, dark gray.
		0.75	0.0		Sand, fine to medium grained; little clay; wet, loose, dark gray.
		1.5	0.0		Sand and Silt, very fine grained sand; little clay; wet, soft, dark gray.
		1.1	0.0		
		1.4	0.8		Silty Sand, very fine grained; little clay; little gravel, small, angular; wet, medium stiff, dark gray.
15	10	0.5			
					Silty Sand; little clay; little gravel, large, angular; dark gray. REFUSAL at 29.0 ft bgs.



ARCADIS Design & Consultancy for natural and built assets

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Date Start/Finish: 10/10/2018
Drilling Company: Nothnagle Drilling Inc.
Driller's Name: S. Loranty; B. Swartz
Drilling Method: HSA
Rig Type: Split Spoon

Northing: 1384903.8 ft NAD83
Easting: 695651.5 ft NAD83
Casing Elevation: 25.79 ft NGVD29
Surface Elevation: 25.74 ft NGVD29

Borehole Depth: 30 ft bgs
Well Diameter: 4 inches

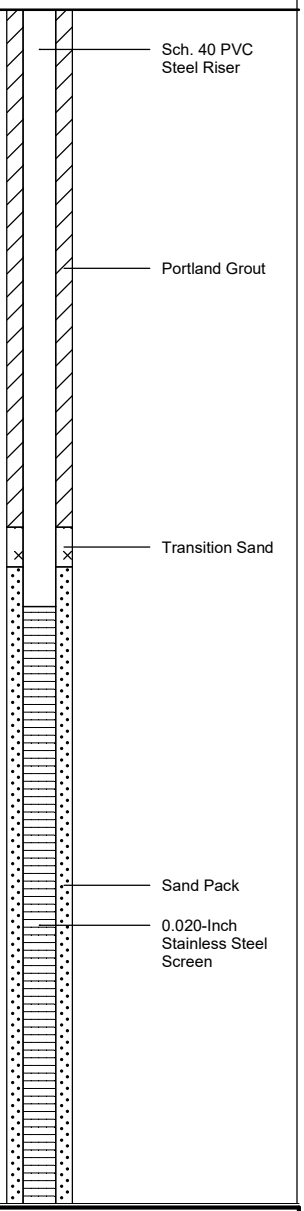
Descriptions By: J. Duquette

Well/Boring ID: **IW-B11**

Client: Ashland LLC

Location: 130 South Street
Rensselaer, New York.

DEPTH	ELEVATION	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
0					
1	25				HAND CLEARED; NOT LOGGED.
2					
3					
4					
5					
6	20				NO SPLIT SPOON.
7					
8					
9					
10					
11	15				
12					
13					
14					
15					
16	10	0.65	0.0		Sand and Clay; fine grained sand; some silt; some gravel, large, rounded; moist, medium stiff, dark gray.
17					
18		0.25	0.1		Sand, fine to medium grained; little clay; wet, loose, dark gray.
19					
20		1.45	0.4		Sand and Silt, very fine grained sand; little clay; wet, soft, dark gray.
21	5				
22		1.4	0.3		
23					
24		1.8	0.4		
25					
26	0	1.15	0.0		Sand and Clay, very fine grained sand; some silt; some gravel, small, angular; wet, hard, dark gray.
27					
28		1.4	0.0		Sand, medium to coarse grained; and Gravel, medium to large, angular; little clay; wet, very stiff, dark gray.
29					
30		0.7	0.0		



Well/Boring Construction

ARCADIS Design & Consultancy for natural and built assets

Remarks: NAD83 = North American Datum of 1983; NGVD29 = National Geodetic Vertical Datum of 1929; bgs = below ground surface; dtw = depth to groundwater; ft = feet; HSA = hollow stem auger; HA = hand auger; NA = not available/not applicable.

Date Start/Finish: 10/16/2018
Drilling Company: Nothnagle Drilling Inc.
Driller's Name: T. Mangefrida; A. Wall
Drilling Method: HSA
Rig Type: Split Spoon

Northing: 1384812.7 ft NAD83
Easting: 695685.4 ft NAD83
Casing Elevation: 27.68 ft NGVD29
Surface Elevation: 25.87 ft NGVD29

Borehole Depth: 30 ft bgs
Well Diameter: 4 inches

Descriptions By: E. Sousa

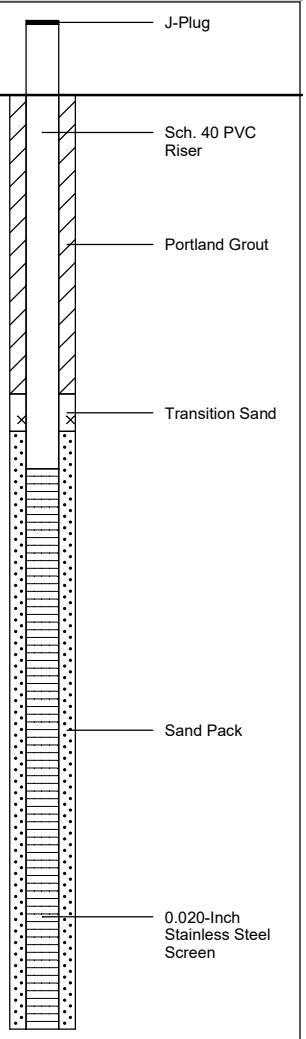
Well/Boring ID: **IW-B12**

Client: Ashland LLC

Location: 130 South Street
Rensselaer, New York.

DEPTH	ELEVATION	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
-2					
-1					
0					
1	25				HAND CLEARED; NOT LOGGED.
2					
3					
4					
5					
6	20				NO SPLIT SPOON.
7					
8					
9					
10					Silty Sand; some gravel, small, angular; dry, loose, brown; some brick fill present.
11	15	2.0	104.2		Silty Clay; wet, soft, brown.
12					
13		1.8	33.4		
14					
15		1.0	0.8		Silty Sand, medium to coarse grained; some gravel, small to medium, rounded; wet, soft, loose, gray.
16	10				
17		1.7	1.1		Sand, fine to medium grained; some silt; wet, soft, gray.
18					
19		1.1	0.6		
20					
21	5	0.2	1.0		
22					
23		2.0	0.4		
24					Sand, medium to coarse grained; some silt; some gravel, small to medium, angular; wet, medium stiff, gray.
25		0.8	0.5		
26	0				
27		0.3	0.8		Sand, fine to medium grained; some silt; wet, soft, loose, gray.
28					
29		1.0	1.1		Sand, medium to coarse grained; some silt; some gravel, small to medium, angular; wet, soft, gray.
30					

Well/Boring Construction



ARCADIS Design & Consultancy for natural and built assets

Remarks: NAD83 = North American Datum of 1983; NGVD29 = National Geodetic Vertical Datum of 1929; bgs = below ground surface; dtw = depth to groundwater; ft = feet; HSA = hollow stem auger; HA = hand auger; NA = not available/not applicable.

Date Start/Finish: 10/09/2018
Drilling Company: Nothnagle Drilling Inc.
Driller's Name: S. Loranty; B. Swartz
Drilling Method: HSA
Rig Type: Split Spoon

Northing: 1384835.6 ft NAD83
Easting: 695690.9 ft NAD83
Casing Elevation: 29.01 ft NGVD29
Surface Elevation: 25.94 ft NGVD29

Borehole Depth: 22 ft bgs
Well Diameter: 4 inches

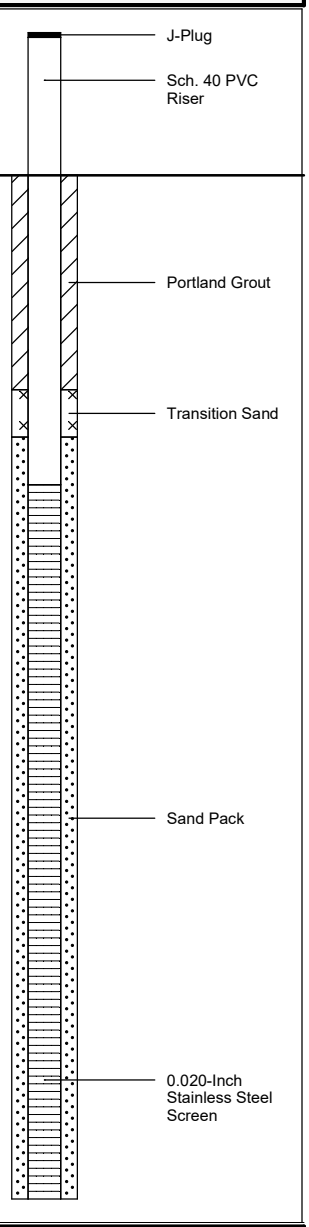
Descriptions By: J. Duquette

Well/Boring ID: **IW-B13**

Client: Ashland LLC

Location: 130 South Street
Rensselaer, New York.

DEPTH	ELEVATION	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
-3 to 0					
0 to 5	25 to 20				HAND CLEARED; NOT LOGGED.
5 to 10	20 to 15				NO SPLIT SPOON.
10 to 11	15	0.2	0.0		Silty Sand; some clay; some gravel, angular; moist, loose, brownish gray.
11 to 14	15 to 10	0.55	240.1		Clay; some sand, medium to coarse grained; some gravel, angular; wet, very stiff, brownish gray.
14 to 16	10	1.0	7.9		Clay; little sand, coarse grained; little gravel, small, subangular to rounded; wet, stiff, dark gray.
16 to 19	10 to 5	1.2	4.6		Silt and Sand, fine grained sand; wet, soft, dark gray.
		1.15	4.8		
19 to 21	5	0.0	1.0		BEDROCK; NO RECOVERY.



ARCADIS Design & Consultancy for natural and built assets

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Date Start/Finish: 10/09/2018
Drilling Company: Nothnagle Drilling Inc.
Driller's Name: T. Mangefrida; A. Farrell
Drilling Method: HSA
Rig Type: Split Spoon

Northing: 1384874.4 ft NAD83
Easting: 695705.8 ft NAD83
Casing Elevation: 31.65 ft NGVD29
Surface Elevation: 29.85 ft NGVD29

Borehole Depth: 32 ft bgs
Well Diameter: 4 inches

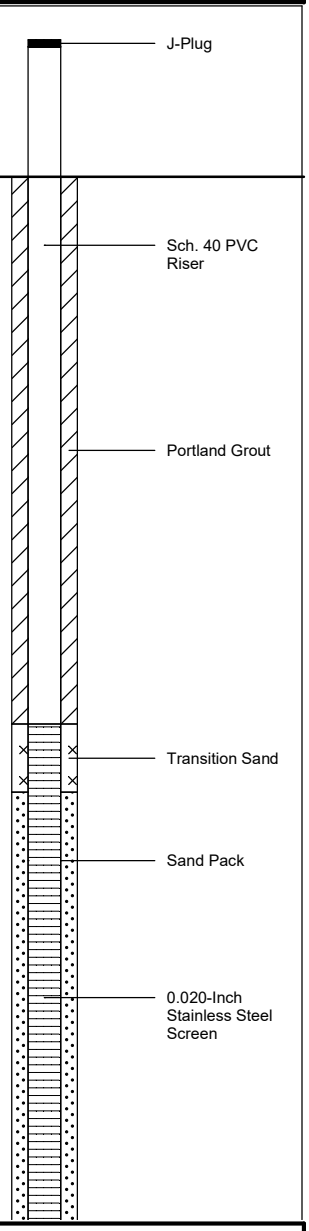
Descriptions By: E. Sousa

Well/Boring ID: **IW-B14**

Client: Ashland LLC

Location: 130 South Street
Rensselaer, New York.

DEPTH	ELEVATION	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
-2					
-1					
0					HAND CLEARED; NOT LOGGED.
1	25				
2					
3					
4					
5					
6	20	0.2	0.0		Sand, fine to medium grained; some silt; some gravel, small to medium, subrounded; wet, loose, brown.
7					Sand, medium grained; some silt; some clay; some gravel, small to medium, angular; wet, soft, gray; at 7.0 ft bgs, wood debris layer.
8		1.25	0.0		Silty Sand, fine grained; some clay; trace gravel, subangular; moist, soft, dark gray; at 8.25 ft bgs, trace brick fill.
9					
10		1.7	0.0		Silty Clay; dry, medium stiff, light gray to tan; at 10.2 ft bgs, gravel layer.
11	15				Silty Clay; dry, medium stiff, tan to brown; at 12.0 ft bgs, angular gravel present.
12		1.0	0.0		
13					
14		1.3	0.0		Sand, medium to coarse grained; some gravel, small to medium, rounded; wet, loose, dark brown.
15					



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Date Start/Finish: 10/09/2018
Drilling Company: Nothnagle Drilling Inc.
Driller's Name: T. Mangefrida; A. Farrell
Drilling Method: HSA
Rig Type: Split Spoon

Northing: 1384874.4 ft NAD83
Easting: 695705.8 ft NAD83
Casing Elevation: 31.65 ft NGVD29
Surface Elevation: 29.85 ft NGVD29

Borehole Depth: 32 ft bgs
Well Diameter: 4 inches

Descriptions By: E. Sousa

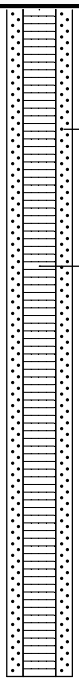
Well/Boring ID: **IW-B14**

Client: Ashland LLC

Location: 130 South Street
Rensselaer, New York.

DEPTH	ELEVATION	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
16	10	1.4	31.0		Sand, fine to medium grained; wet, loose, brown.
17					
18		1.2	226.0		Sand, fine to medium grained; some silt; some gravel, small to medium, rounded; wet, stiff, gray; slight odor.
19					Sand, fine grained; wet, stiff, dark gray.
20		1.1	23.7		Sand, fine grained; some silt; wet, stiff, dark gray.
21	5				
22		1.8	12.3		
23					NO RECOVERY.
24		0.0			
25					Sand, fine grained; some silt; some gravel, small, angular; wet, loose, gray.
26	0	0.2	3.8		
27					
28		2.0	0.0		Silty Sand; wet, loose, gray.
29					Sand, fine to medium grained; some silt; some gravel, small to medium, angular; wet, loose, gray.
30		1.0	0.0		
31	-5				
32		0.9	0.0		

Well/Boring Construction



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Date Start/Finish: 10/09/2018
Drilling Company: Nothnagle Drilling Inc.
Driller's Name: T. Mangefrida; A. Farrell
Drilling Method: HSA
Rig Type: Split Spoon

Northing: 1384897.3 ft NAD83
Easting: 695707.9 ft NAD83
Casing Elevation: 31.89 ft NGVD29
Surface Elevation: 29.87 ft NGVD29

Borehole Depth: 25 ft bgs
Well Diameter: 4 inches

Descriptions By: E. Sousa

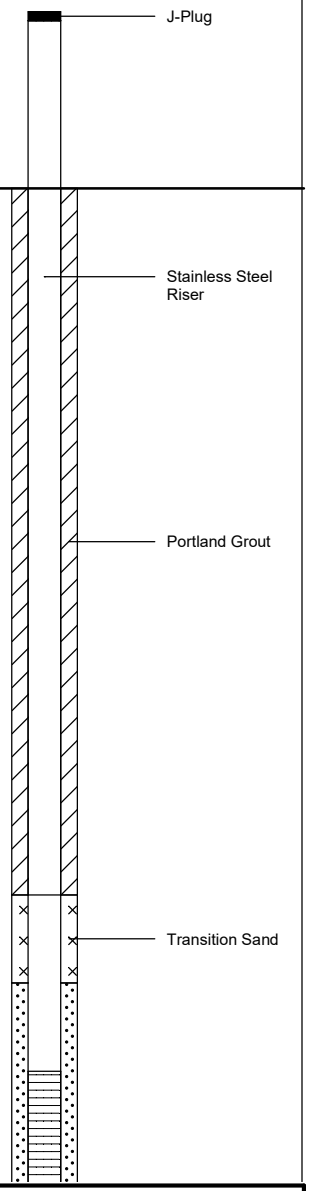
Well/Boring ID: **IW-B15**

Client: Ashland LLC

Location: 130 South Street
Rensselaer, New York.

DEPTH	ELEVATION	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
0	30				HAND CLEARED; NOT LOGGED.
5	25	1.7	0.0		Sand, medium grained; some gravel, small, rounded; dry, loose, tan to brown; at 7.3 ft bgs, trace cobbles.
8		1.2	0.4		Sand, fine to medium grained; some silt; some gravel, small, rounded; moist, medium stiff, gray.
10	20	1.1	0.0		Silty Clay; dry, very stiff, gray to tan.

Well/Boring Construction



Remarks: NAD83 = North American Datum of 1983; NGVD29 = National Geodetic Vertical Datum of 1929; bgs = below ground surface; dtw = depth to groundwater; ft = feet; HSA = hollow stem auger; HA = hand auger; NA = not available/not applicable.

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Date Start/Finish: 10/09/2018
Drilling Company: Nothnagle Drilling Inc.
Driller's Name: T. Mangefrida; A. Farrell
Drilling Method: HSA
Rig Type: Split Spoon

Northing: 1384897.3 ft NAD83
Easting: 695707.9 ft NAD83
Casing Elevation: 31.89 ft NGVD29
Surface Elevation: 29.87 ft NGVD29

Borehole Depth: 25 ft bgs
Well Diameter: 4 inches

Descriptions By: E. Sousa

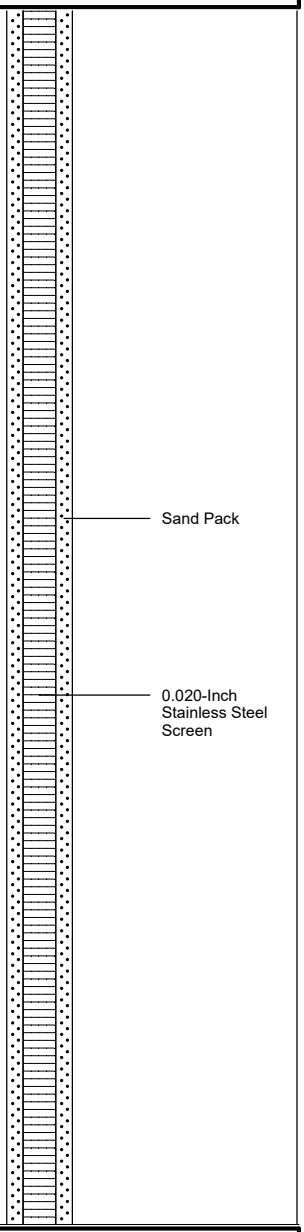
Well/Boring ID: **IW-B15**

Client: Ashland LLC

Location: 130 South Street
Rensselaer, New York.

DEPTH	ELEVATION	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
12		1.8	0.0		
13					Sand, medium to coarse grained; some gravel, small, subangular; wet, loose, brown to gray.
14		0.7	6.2		
15	15				Sand, coarse grained; some gravel, small, rounded; wet, loose, gray.
					Sand, fine to medium grained; wet, loose, brown to gray.
16		1.1	22.2		Silty Sand, fine grained; some gravel, small to medium, angular; moist, medium stiff, brown.
17					
					Silty Sand, fine grained; wet, medium stiff, gray.
18		1.1	45.0		Sand, fne grained; wet, loose, gray.
19					
20	10	1.2	223.2		
21					
22		2.0	110.1		
23					Silty Sand, fine grained; wet, medium stiff, gray.
24		0.9	9.2		
25	5				

Well/Boring Construction



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Date Start/Finish: 10/01/2018
Drilling Company: Nothnagle Drilling Inc.
Driller's Name: S. Loranty; B. Swartz
Drilling Method: HSA
Rig Type: Split Spoon

Northing: 1384345.7 ft NAD83
Easting: 695650.4 ft NAD83
Casing Elevation: 28.13 ft NGVD29
Surface Elevation: 28.50 ft NGVD29

Borehole Depth: 23 ft bgs
Well Diameter: 2 inches

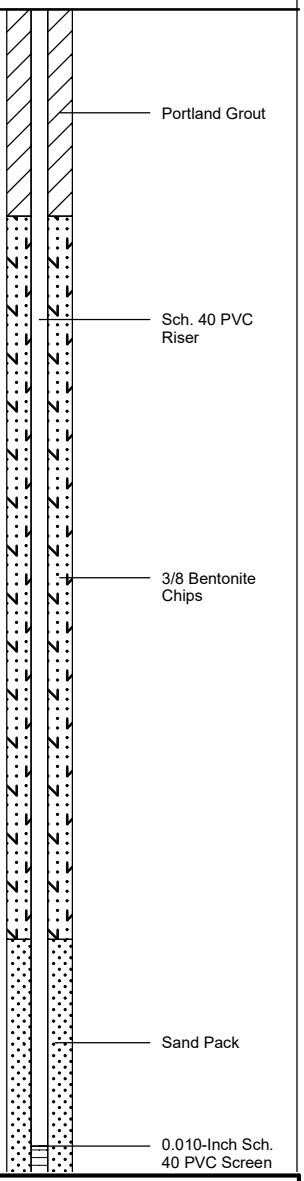
Descriptions By: J. Duquette

Well/Boring ID: **MW-25**

Client: Ashland LLC

Location: 130 South Street
Rensselaer, New York.

DEPTH	ELEVATION	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
0	30				HAND CLEARED; NOT LOGGED.
5	25	1.2	0.0		Clay; some gravel; moist, grayish brown.
7					NOT LOGGED.
10	20				



Remarks: NAD83 = North American Datum of 1983; NGVD29 = National Geodetic Vertical Datum of 1929; bgs = below ground surface; dtw = depth to groundwater; ft = feet; HSA = hollow stem auger; HA = hand auger; NA = not available/not applicable.

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Date Start/Finish: 10/01/2018
Drilling Company: Nothnagle Drilling Inc.
Driller's Name: S. Loranty; B. Swartz
Drilling Method: HSA
Rig Type: Split Spoon

Northing: 1384345.7 ft NAD83
Easting: 695650.4 ft NAD83
Casing Elevation: 28.13 ft NGVD29
Surface Elevation: 28.50 ft NGVD29

Borehole Depth: 23 ft bgs
Well Diameter: 2 inches

Descriptions By: J. Duquette

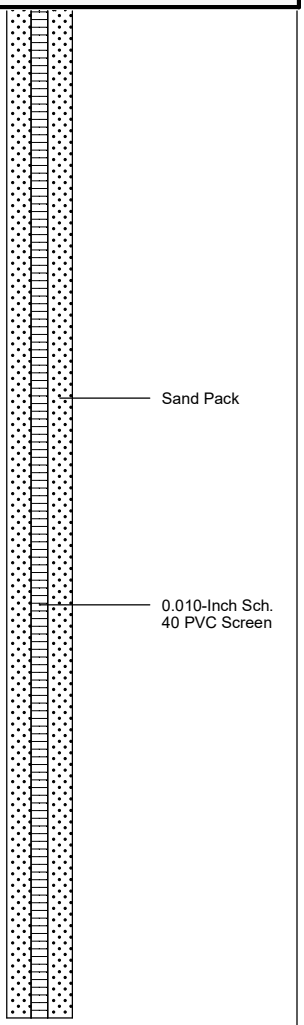
Well/Boring ID: **MW-25**

Client: Ashland LLC

Location: 130 South Street
Rensselaer, New York.

DEPTH	ELEVATION	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
12					
13		1.5	4132		Clay; some gravel; moist, light brown.
14					
15	15	1.5	9791		Clay; some gravel; moist, light brown.
		0.15	800.1		Silty Sand; trace gravel; wet, dark gray.
16					
17		0.5	84.6		Silty Sand; some clay; wet, dark gray.
18		0.5	12.4		
19		0.5	0.0		Sand, coarse grained; some silt; wet, dark gray.
		1.0	0.0		
20	10				
		0.65	0.0		Sand, fine grained; some gravel; wet, dark gray.
21					
22			0.0		Clay; some silt; some gravel; wet, dark gray.
23					

Well/Boring Construction



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APPENDIX B

Field Notes: Well Development

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Monitoring Well Development Log

Page 1 of 1

Project/No. Ashland LLC Well IW-B06 Date 10/17/2018

Total Depth	32.00	Casing Diameter (inches)	4	Purge Method Centrifugal	
Water Level	5.94	Well Volume (gal)	16.96	Submersible	X
Water Column	26.10	Total Volume Purged	169.6 gal	Other	
Pump On		Pump Off		Developed By	KS

Well Casing Volumes

gallon/foot				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

Time	~~Minutes~~ Elapsed Well Vol.	Rate (gpm) (mL/min)	DTW (ft)	Gallons Purged	pH	Specific Conductance (mS/cm)	Temp. (C) (F)	Turbidity (NTU)	REMARKS (PID readings, color, odor, etc.)	
1300	1			16.96	mud					
	2			33.92	mud					Surge 10min Purge mud
	3			50.88	mud					
	4			67.84	mud					
	5			84.80	mud					Surge 10min Purge mud
1500	6			101.76	mud				dry	
10/18 0800	7			118.72	7.20	1.13	8.30	782		
0820	8			135.68	7.40	1.16	7.57	598	gray, cloudy	Surge 10min
0910	9			152.64	7.38	1.27	10.16	71000	gray, cloudy	
0930	10			169.6				659		

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Monitoring Well Development Log

Page 1 of 1

Project/No. Ashland LLC Well IW-307 Date 10/17/2018

Total Depth 32.04 Casing Diameter (inches) 4 Purge Method

Water Level 7.67 Well Volume (gal) 15.84 Centrifugal ____

Water Column 24.37 Total Volume Purged 158.4 gal Submersible X

Pump On ____ Pump Off ____ Other ____

Developed By KS

Well Casing Volumes

gallon/foot				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

Time	~~Minutes~~ Elapsed well vol	Rate (gpm) (mL/min)	DTW (ft)	Gallons Purged	pH	Specific Conductance (mS/cm)	Temp. (C) (F)	Turbidity (NTU)	REMARKS (PID readings, color, odor, etc.)
~~1140~~	1			15.84				>1000	
1140	2			31.68	6.07	2.07	14.31	782	> Surge for 10 min purge mod
1145	3			47.52	6.21	1.98	14.17	>1000	
1200	4			63.36	6.43	1.69	14.38	>1000	
1215	5			79.20	6.91	1.66	14.000	759	> Surge 10 min purge mod
1300	6			95.04	6.91	1.66	13.91	>1000	
~~1330~~ 1400	7			110.88	6.92	1.68	12.34	458	
1400	8			126.72	6.95	1.75	11.56	281	
1500	9			142.56	6.92	1.82	11.65	201	
1545	10			158.4	6.92	1.86	11.28	70.5	

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Monitoring Well Development Log

Project/No. Ashland LLC Well MW-1308 Date 10/18/2018

Total Depth 32.32 Casing Diameter (inches) 4 Purge Method Centrifugal ____

Water Level 9.18 Well Volume (gal) 15.04 Submersible X

Water Column 23.14 Total Volume Purged 150.40 Other ____

Pump On ____ Pump Off ____ Developed By KS

Well Casing Volumes

gallon/foot			
1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

Time	Minutes Elapsed well vol	Rate (gpm) (mL/min)	DTW (ft)	Gallons Purged	pH	Specific Conductance (mS/cm)	Temp. (C) (F)	Turbidity (NTU)	REMARKS (PID readings, color, odor, etc.)
1000	1			15.04	7.22	2.42	14.01	>1000	cloudy
1030	2			30.08	7.07	2.13	13.82	520	cloudy 20'-25'
1100	3			45.12	7.01	2.11	13.80	>1000	surge for 10 min purge immed.
1130	4			60.16	7.17	2.00	13.97	>1000	very cloudy (25'-30')
1200	5			75.20	7.22	1.60	13.558	750	slightly cloudy
1230	6			90.24	7.20	1.59	13.73	73.9	
1400	7			105.28	7.19	1.76	13.92	70.6	
~1515	8			120.32	7.20	1.69			
1545	9			135.36	7.21	1.64	14.11	40.2	
1630	10			150.40	7.16	1.71	12.78	41.6	clear

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Monitoring Well Development Log

Project/No. Ashland LLC Well IWB09 Date 10/18/18

Total Depth 31.28 Casing Diameter (inches) 4" Purge Method

Water Level 0.13 Well Volume (gal) 23.15 Centrifugal ____

Water Column 23.15 Total Volume Purged 231.5 Submersible ____

Pump On ____ Pump Off ____ Other ____

Developed By KS

Well Casing Volumes

gallon/foot			
1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

Time	Minutes Elapsed / well vol	Rate (gpm) (mL/min)	DTW (ft)	Gallons Purged	pH	Specific Conductance (mS/cm)	Temp. (C) (F)	Turbidity (NTU)	REMARKS (PID readings, color, odor, etc.)
200	1			23.15	7.62	0.414	13.77	953	Cloudy gray
220	2			46.3	7.21	1.04	13.82	>1000	cloudy gray
240	3			69.45	mud				very cloudy surge 10min
300	4			92.6	MuD				very cloudy purge 1 hour
320	5			115.75	MuD				very cloudy
340	6			138.9	7.58	1.00	13.21	700	cloudy purge 10min
400	7			162.05	7.36	1.50	14.01	333	cloudy
420	8			185.2	7.07	1.59	14.32	562	cloudy
440	9			208.35	6.99	1.81	14.07	414	slightly cloudy gray
500	10			231.5	6.97	1.88	13.75	223	slightly cloudy

10/18/18

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Monitoring Well Development Log

Page 1 of 1

Project/No. Ashland LLC Well MWB-10 Date

Total Depth 29.40 Casing Diameter (inches)

Water Level 9.54 Well Volume (gal) 13.23

Water Column 20.36 Total Volume Purged 132.3

Pump On Pump Off

Purge Method: Centrifugal ____ Submersible ____ Other ____

Developed By KS

Well Casing Volumes

gallon/foot				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

Time	Minutes Elapsed	Rate (gpm) (mL/min)	DTW (ft)	Gallons Purged	pH	Specific Conductance (mS/cm)	Temp. (C) (F)	Turbidity (NTU)	REMARKS (PID readings, color, odor, etc.)
~~1200~~	815			13.23	MUD				
~~1210~~	845			26.46	Mud				20-25
~~1240~~	915			39.69	7.11	1.27	12.88	11.2	clear sponge lower
~~1300~~	945			52.92	mud				
~~1320~~	1015			66.15	7.29	1.25	14.83	>1000	~~slightly~~ cloudy gray
~~1340~~	1030			79.38	7.27	1.25	14.93	893	
~~1400~~	1045			92.61	7.21	1.26	15.01	29.3	
	1100			105.84	7.18	1.29	15.36	818	25-30 clear slightly cloudy
	1115			119.07	7.16	1.27	15.68	602	clear
	1130			132.3	7.16	1.32	15.45	29.4	clear

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Monitoring Well Development Log

Project/No. Ashland LLC Well MWB11 Date 10/12/18

Total Depth 28.60 Casing Diameter (inches) 4" Purge Method -15 Centrifugal ____

Water Level 8.03 Well Volume (gal) 13.37 Submersible ____

Water Column 20.57 Total Volume Purged 133.7 Other ____

Pump On ____ Pump Off ____ Developed By KStilson

Well Casing Volumes

gallon/foot			
1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

	Time	Minutes Elapsed	Rate (gpm) (mL/min)	DTW (ft)	Gallons Purged	pH	Specific Conductance (mS/cm)	Temp. (C) (F) ORP	Turbidity (NTU)	REMARKS (PID readings, color, odor, etc.)
1					13.37	7.43	1.94	53	MUD	
2					26.74	7.31	1.98	41	872	
3					40.11	7.29	1.92	37	MUD	swge
4					53.48	7.27	1.63	29	MUD	
5		1.52			66.85	7.20	1.62	24	212	slightly cloudy
6					80.22	7.20	1.63	16	237	
7					93.54	7.20	1.62	3	MUD	Purge
8					160.9	7.18	1.62	-11	399	
9		1.12			120.33	7.18	1.64	-17	239	slightly cloudy gray
					133.7					

ARCADIS

Monitoring Well Development Log

Project/No. Ashland LLC Well IW B11 Date 10/16/18

Total Depth 28.68 Casing Diameter (inches) 4" Purge Method

Water Level 7.16 Well Volume (gal) 13.95 Centrifugal ____

Water Column 21.47 Total Volume Purged 139.5 gal Submersible ____

Pump On ____ Pump Off ____ Other ____

Developed By ____

Well Casing Volumes

gallon/foot				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

Time	~~Minutes Elapsed~~ Time	Rate (gpm) (mL/min)	DTW (ft)	Gallons Purged	pH	Specific Conductance (mS/cm)	~~Temp.~~ ORP (C) (F)	Turbidity (NTU)	REMARKS DO mg/L (PID readings, color, odor, etc.)
1				13.91				>1000	
2	"			27.82	7.39	1.44	3	~~0.0~~	2.40
3				41.73	7.40	1.44	19	534	2.22
4				55.64	7.36	1.49	23	>1000	3.27
5				69.55	7.32	1.52	29	~~0.0~~ >1000	4.15
6				83.46	7.26	1.56	40	>1000	2.42
7				97.37	7.24	1.61	51	730	1.36
8				111.28	7.29	1.61	46	>1000	1.49
9				125.19	7.31	1.65	37	>1000	2.46
10				139.1	7.31	1.63	1	>1000	3.52
11	800			153.01	7.42	1.82	48	>1000	Cloudy surge
12	845			166.92	7.41	1.58	43	732	cloudy
13	930			180.83	7.41	1.59	42	559	slightly cloud
14	1030			194.74	7.42	1.58	43	432	" "
15	1130			208.65	7.41	1.59	43	253	" "

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Monitoring Well Development Log

Project/No. Ashland LLC Well B-12 Date 10/16/2018

Total Depth 27.25 Casing Diameter (inches) 4 Purge Method Centrifugal ____

Water Level 8.80 Well Volume (gal) 11.99 Submersible X

Water Column 18.45 Total Volume Purged ~~119.9 gal~~ 142.8 gal Other ____

Pump On ____ Pump Off ____ Developed By KS

Well Casing Volumes

gallon/foot				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

Time	Minutes Elapsed Well 0	Rate (gpm) (mL/min)	DTW (ft)	Gallons Purged	pH	Specific Conductance (mS/cm)	Temp. (C) (F)	Turbidity (NTU)	REMARKS (PID readings, color, odor, etc.)
	1			11.9	mud				
	2			23.8	mud				
	3			35.7	mud				dry
	4			47.6	7.25	1.219		355	ORP=42; dry; DO=13.37
	5			59.5	7.29	1.43		870	ORP=6; DO=4.61
	6			71.4	mud				
	7			83.3	mud				
	8			95.2	7.21	1.52		>1000	DO=5.66 ORP=~~47~~51
	9			107.1	7.21	1.52		>1000	ORP=~~50~~47 DO=~~4.99~~5.14
	10			119	7.31	1.52		>1000	ORP=50 DO=4.99
	11			130.9	7.00				
	12			142.8	7.49	1.79		422	ORP=-22 DO=2.75

ARCADIS

Monitoring Well Development Log

Project/No. Ashland LLC Well IW-B13 Date 10/15/2018

Total Depth	23.64	Casing Diameter (inches)	4	Purge Method Centrifugal	
Water Level	8.47	Well Volume (gal)	9.86	Submersible	X
Water Column	15.17	Total Volume Purged	98.6	Other	
Pump On		Pump Off		Developed By	KS

Well Casing Volumes

gallon/foot				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

Time	~~Minutes~~ Elapsed well vol	Rate (gpm) (mL/min)	DTW (ft)	Gallons Purged	pH	Specific Conductance (mS/cm)	Temp. (C) (F)	Turbidity (NTU)	REMARKS (PID readings, color, odor, etc.)
	1			9.86	mud				
	2			19.72	mud				
	3			29.58	mud				
	4			39.44	mud				
	5			49.3					
	6			59.16	6.64	0.984		>1000	ORP = 121 DO = 1.82
	7			69.02	mud				
	8			78.88	mud				
	9			88.74	mud				
	10			98.6	6.45	2.91		459	ORP = 198 DO = 3.13

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Monitoring Well Development Log

Project/No. Ashland LLC Well IW-B14 Date 10/19/18

Total Depth 26.70 Casing Diameter (inches) 4" Purge Method

Water Level 11.16 Well Volume (gal) 10.10 Centrifugal ____ Submersible ____

Water Column 15.54 Total Volume Purged 101.0 Other ____

Pump On ____ Pump Off ____ Developed By KS

Well Casing Volumes

gallon/foot				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

Time	Minutes Elapsed	Rate (gpm) (mL/min)	DTW (ft)	Gallons Purged	pH	Specific Conductance (mS/cm)	Temp. (C) (F)	Turbidity (NTU)	REMARKS (PID readings, color, odor, etc.)
1200				10.10	7.32	0.759	17.91	189	clear (15-20 min surge)
1220				20.20	7.11	0.832	18.23	>1000 162	cloudy
1240				30.30	7.00	0.852	18.[illegible]	[illegible]	Clear (slightly cloudy)
100				40.40	6.96	0.851	18.79	>1000	cloudy (surge 20-25 min)
120				50.50	6.89	0.907	18.32	437	clear
140				60.60	6.89	0.881	18.93	185	clear
200				70.70	6.93	0.854	18.99	43.0	clear
220				80.80	6.93	0.871	19.75	0.0	clear
				90.90					
				101.0					

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Monitoring Well Development Log

Page 1 of 1

Project/No. Ashland LLC Well IW-B15 Date 10/19/18

Total Depth	26.08	Casing Diameter (inches)	4"	Purge Method	
				Centrifugal	
Water Level	11.36	Well Volume (gal)	9.56	Submersible	
Water Column	14.72	Total Volume Purged	95.6	Other	
Pump On		Pump Off		Developed By	KS

Well Casing Volumes

gallon/foot	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

Time	Minutes Elapsed	Rate (gpm) (mL/min)	DTW (ft)	Gallons Purged	pH	Specific Conductance (mS/cm)	Temp. (C) (F)	Turbidity (NTU)	REMARKS (PID readings, color, odor, etc.)
1200				9.56	7.29	1.007	17.70	0.0	Clear
1220				19.12	7.11	0.998	17.93	352	slightly cloudy
1240				28.68	7.05	0.992	17.79	2.9	Clear
100				38.24	6.94	0.996	18.02	323	clear slight particle
120				47.8	6.88	0.989	18.17	49.3	Clear
140				57.36	6.86	0.942	18.81	155	clear
200				66.92	6.99	0.982	18.44	0.0	clear
				76.48	~~[illegible]~~				
				86.04					
				95.6					

Screen interval 15-20'
~~[illegible]~~
surge
20-26'
~~[illegible]~~30
surge well
lower
purge

Field Forms-Environmental.xls
MW Development

ARCADIS

Monitoring Well Development Log

Page 1 of 1

Project/No. Ashland LLC Well IW-AOE Date 10/8/2018

Total Depth 26.43 Casing Diameter (inches) 4 Purge Method

Water Level 7.97 Well Volume (gal) ~~12.00~~ Centrifugal

Water Column 18.46 Total Volume Purged ~~120.0~~ 205 Submersible X

Pump On Pump Off Other

Developed By JD

Well Casing Volumes

gallon/foot				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

Time	Minutes Elapsed	Rate (gpm) (mL/min)	DTW (ft)	Gallons Purged	pH	Specific Conductance (mS/cm)	Temp. (C) (F)	Turbidity (NTU)	REMARKS (PID readings, color, odor, etc.)
				0	6.30	1.65		>1000	ORP = 108 DO = 9.08
				55	8.19	0.335		>1000	ORP = 148 DO = 8.82
				150	8.62	0.248		>1000	ORP = 76 DO = 5.55
				160	7.99	0.886		>1000	ORP = 138 DO = 7.70
				180	7.73	0.761		>1000	ORP = 188 DO = 6.91
				185	7.79	0.989		>1000	ORP = 176 DO = 6.99
				190	7.78	1.44		>1000	ORP = 162 DO = 7.11
				200	7.80	1.65		698	ORP = -17 DO = 6.86
				205	7.73	1.62		90.8	ORP = -7 DO = 7.87

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Monitoring Well Development Log

Project/No. Ashland LLC Well IW-A09 Date 10/10/2018

Total Depth 23.79 Casing Diameter (inches) 4 Purge Method: Centrifugal ____

Water Level 3.71 Well Volume (gal) 13.31 Submersible ____

Water Column 20.8 Total Volume Purged ~~133.1~~ 39.9 Other ____

Pump On ____ Pump Off ____ Developed By ____

Well Casing Volumes

gallon/foot				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

Time	Minutes Elapsed Well Vol	Rate (gpm) (mL/min)	DTW (ft)	Gallons Purged	pH	Specific Conductance (mS/cm)	Temp. (C) (F)	Turbidity (NTU)	REMARKS (PID readings, color, odor, etc.)
	1			13.3				7/1000	
	2			26.6	8.57	1.26		142	ORP = 87 DO = 3.60
	3			39.9	8.08	1.37		33.7	ORP = 44 DO = 3.16
	4			~~53.2~~					
	5			~~66.5~~					
	6			79.8					
	7			93.1					
	8			106.4					
	9			119.7					
	10			133.1					

ARCADIS

Monitoring Well Development Log

Project/No. Ashland LLC Well IW-A10 Date 10/10/2018

Total Depth 26.30 Casing Diameter (inches) 4 Purge Method

Water Level 5.06 Well Volume (gal) 13.6 Centrifugal ____ Submersible X

Water Column 21.24 Total Volume Purged 136 Other ____

Pump On ____ Pump Off ____ Developed By SD

Well Casing Volumes

gallon/foot				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

Time	~~Minutes~~ Elapsed well vol	Rate (gpm) (mL/min)	DTW (ft)	Gallons Purged	pH	Specific Conductance (mS/cm)	Temp. (C) (F)	Turbidity (NTU)	REMARKS (PID readings, color, odor, etc.)
10/9	1			13.6	7.08	1.37		>1000	ORP=105 DO=4.53
	2			27.2	6.64	1.29		962	ORP=31 DO=1.53
	3			40.8	6.67	1.24		>1000	ORP=30 DO=1.71
	4			54.4	6.72	1.18		>1000	ORP=27 DO=2.11
	5			68.0	6.78	1.52		>1000	ORP=94 DO=2.73
10/10	6			81.6	6.78	1.41		>1000	ORP=56 DO=2.43
	7			895.2	6.76	1.36		>1000	ORP=49 DO=1.94
	8			108.8	6.74	1.25		>1000	ORP=34 DO=1.81
	9			122.4	6.98	1.19		>1000	ORP=57 DO=3.89
	10			136.0	6.78	1.49		>1000	ORP=13 DO=2.03

ARCADIS

Monitoring Well Development Log

Project/No. Ashland LLC Well IW-A11 Date 10/10/2018.

Total Depth 30.14 Casing Diameter (inches) 4 Purge Method

Water Level 7.62 Well Volume (gal) 14.41 Centrifugal ____ Submersible X

Water Column 22.52 Total Volume Purged ~~144.1~~ 109.2 Other ____

Pump On ____ Pump Off ____ Developed By JD

Well Casing Volumes

gallon/foot				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

Time	Minutes Elapsed	Rate (gpm) (mL/min)	DTW (ft)	Gallons Purged	pH	Specific Conductance (mS/cm)	Temp. (C) (F)	Turbidity (NTU)	REMARKS (PID readings, color, odor, etc.)
1				14.41	7.14	0.824		>1000	ORP = -48 DO = 2.69
2				28.82				mud	
3				43.2				mud	
4				57.6				mud	
5				72.0	7.08	1.14		>1000	ORP = 14 DO = 4.25
6				86.4				mud	
7				97.8	7.01	1.28		242	ORP = -64 DO = 2.41
8				109.2	6.93	1.31		49.1	ORP = -71 DO = 1.17
9									
10									

ARCADIS

Monitoring Well Development Log

Project/No. Ashland LLC Well IW-A12 Date 10/10/2018

Total Depth	24.98	Casing Diameter (inches)	4	Purge Method Centrifugal	
Water Level	7.12	Well Volume (gal)	11.43	Submersible	X
Water Column	17.86	Total Volume Purged	~~44.3~~ 57.1	Other	
Pump On		Pump Off		Developed By	JD

Well Casing Volumes

gallon/foot				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

Time	Minutes Elapsed well vol	Rate (gpm) (mL/min)	DTW (ft)	Gallons Purged	pH	Specific Conductance (mS/cm)	Temp. (C) (F)	Turbidity (NTU)	REMARKS (PID readings, color, odor, etc.)
	1			11.4					
	2			22.9	7.38	1.32		333	ORP = -82 DO = 0.87
	3			34.3	7.88	0.78		>1000	ORP = -86 DO = 2.52
	4			45.7				mud	
	5			57.1	6.68	1.27		815	ORP = 194 DO = 1.70 - DRY
	6								
	7								
	8								
	9								
	10								

ARCADIS

Monitoring Well Development Log

Project/No. Ashland LLC Well IW-A13 Date 10/9/2018

Total Depth 17.14 Casing Diameter (inches) 4 ~~7.92~~

Water Level 4.77 Well Volume (gal) 7.92

Water Column 12.37 Total Volume Purged 39.6

Pump On _____ Pump Off _____

Purge Method: Centrifugal _____ Submersible X Other _____

Developed By JD

Well Casing Volumes

gallon/foot				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

Time	Minutes Elapsed ~~Well Vol~~	Rate (gpm) (mL/min)	DTW (ft)	Gallons Purged	pH	Specific Conductance (mS/cm)	Temp. (C) (F)	Turbidity (NTU)	REMARKS (PID readings, color, odor, etc.)
10/10	1			7.91	7.09	1.46		433	ORP = 58 DO = 6.16
	2			15.8	7.26	1.52		>1000	ORP = 108 DO = 7.73
	3			23.8	6.84	1.61		776	ORP = 226 DO = 5.71 - DRY
11/11 0800	4			31.7	6.44	1.71		342	ORP = 234 DO = 4.11
	5			39.6	6.51	1.77		31.4	ORP = 214 DO = 4.76

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Monitoring Well Development Log

Project/No. Ashland LLC Well IW-A14 Date 10/9/2018

Total Depth	19.94	Casing Diameter (inches)	4	Purge Method Centrifugal	
Water Level	4.86	Well Volume (gal)	9.780	Submersible	X
Water Column	15.04	Total Volume Purged	97.80	Other	
Pump On		Pump Off		Developed By	SD

Well Casing Volumes

gallon/foot				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

Time	Minutes Elapsed Well Vol	Rate (gpm) (mL/min)	DTW (ft)	Gallons Purged	pH	Specific Conductance (mS/cm)	Temp. (C) (F)	Turbidity (NTU)	REMARKS (PID readings, color, odor, etc.)
	1			9.78	6.85	2.48		>1000	ORP = 10 DO = 4.45
	2			19.56				mud	
	3			29.34				mud	
	4			39.12				mud	
	5			48.9	6.81	2.65		946.1	ORP = -8 DO = 4.36
	6			58.7	6.75	2.57		206.0	ORP = -5 DO = 2.99
10/10 ES 1120	7			68.5	6.41	2.49		385	ORP = -56 DO = 7.01
	8			78.2	6.86	2.45		>1000	ORP = -50 DO = 6.57
	9			88.0	6.80	2.55		>1000	ORP = -48 DO = 7.60
	10			97.8	6.	2.66		372	ORP = 6 DO = 6.23

-went dry
went dry
went dry

APPENDIX C

Lab Reports and Chain-of-Custody Forms

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Tel: (716)691-2600

TestAmerica Job ID: 480-142989-2
Client Project/Site: Ashland Rensselaer

For:
Ashland LLC
PO BOX 2219
Columbus, Ohio 43216

Attn: Shannon Lloyd

Authorized for release by:
10/17/2018 11:47:29 AM

Eddie Barnett, Project Manager I
(912)250-0280
eddie.barnett@testamericainc.com

Table of Contents

Cover Page 1
Table of Contents 2
Definitions/Glossary 3
Case Narrative 4
Detection Summary 6
Client Sample Results 7
Surrogate Summary 11
QC Sample Results 12
QC Association Summary 21
Lab Chronicle 22
Certification Summary 23
Method Summary 25
Sample Summary 26
Chain of Custody 27
Receipt Checklists 28

Definitions/Glossary

Client: Ashland LLC
Project/Site: Ashland Rensselaer

TestAmerica Job ID: 480-142989-2

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
*	LCS or LCSD is outside acceptance limits.
E	Result exceeded calibration range.

GC VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

General Chemistry

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 480-142989-2

Laboratory: TestAmerica Buffalo

Narrative

CASE NARRATIVE
Client: Ashland LLC
Project: Ashland Rensselaer

Report Number: 480-142989-2

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

RECEIPT

The samples were received on 10/05/2018; the samples arrived in good condition, properly preserved and on ice. The temperature of the cooler at receipt was 2.0º C.

VOLATILE ORGANIC COMPOUNDS

Samples MW-25-100418 (480-142989-9) and Trip Blank (480-142989-10) were analyzed for Volatile Organic Compounds in accordance with EPA SW846 Method 8260C. The samples were analyzed on 10/12/2018, 10/13/2018 and 10/16/2018.

Carbon disulfide was detected in method blank MB 480-438996/7 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Carbon disulfide was detected in method blank MB 480-439286/8 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Carbon disulfide was detected in method blank MB 480-439557/7 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

The continuing calibration verification (CCV) associated with batch 480-438996 recovered above the upper control limit for 2-Butanone (MEK). The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The following sample is impacted: Trip Blank (480-142989-10).

The continuing calibration verification (CCV) associated with batch 480-438996 recovered outside acceptance criteria, low biased, for 1,1,2-Trichloro-1,2,2-trifluoroethane, 1,1-Dichloroethene, Carbon disulfide and trans-1,2-Dichloroethene. A reporting limit (RL) standard was analyzed, and the target analyte was detected. Since the associated samples were non-detect for these analytes, the data have been reported. The following samples is impacted: Trip Blank (480-142989-10).

The continuing calibration verification (CCV) associated with batch 480-439557 recovered above the upper control limit for 2-Butanone (MEK) and Isopropylbenzene. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The following sample is impacted: MW-25-100418 (480-142989-9).

Due to the coelution of Ethyl Acetate with 2-Butanone in the full spike solution, 2-Butanone exceeded control limits in the laboratory control sample (LCS) associated with batch 480-439286. The following sample was affected: MW-25-100418 (480-142989-9). Refer to the QC report for details.

Samples MW-25-100418 (480-142989-9)[20X] and MW-25-100418 (480-142989-9)[200X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

DISSOLVED GASES

Sample MW-25-100418 (480-142989-9) was analyzed for dissolved gases in accordance with RSK-175. The sample was analyzed on

Job ID: 480-142989-2 (Continued)

Laboratory: TestAmerica Buffalo (Continued)

10/10/2018.

Sample MW-25-100418 (480-142989-9)[22X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL ORGANIC CARBON

Sample MW-25-100418 (480-142989-9) was analyzed for total organic carbon in accordance with EPA SW-846 Method 9060A. The sample was analyzed on 10/12/2018.

TOC Result 1 was detected in method blank MB 480-439311/27 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. TOC Result 1 was detected in method blank MB 480-439311/51 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Ashland LLC
Project/Site: Ashland Rensselaer

TestAmerica Job ID: 480-142989-2

Client Sample ID: MW-25-100418 — Lab Sample ID: 480-142989-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	850		20	16	ug/L	20		8260C	Total/NA
1,1-Dichloroethane	17	J	20	7.6	ug/L	20		8260C	Total/NA
Methylene Chloride	16	J	20	8.8	ug/L	20		8260C	Total/NA
Tetrachloroethene	8800	E	20	7.2	ug/L	20		8260C	Total/NA
Trichloroethene	220		20	9.2	ug/L	20		8260C	Total/NA
Vinyl chloride	690		20	18	ug/L	20		8260C	Total/NA
cis-1,2-Dichloroethene - DL	850		200	160	ug/L	200		8260C	Total/NA
Tetrachloroethene - DL	9300		200	72	ug/L	200		8260C	Total/NA
Trichloroethene - DL	210		200	92	ug/L	200		8260C	Total/NA
Vinyl chloride - DL	660		200	180	ug/L	200		8260C	Total/NA
Ethane	290		7.5	1.5	ug/L	1		RSK-175	Total/NA
Ethene	190		7.0	1.5	ug/L	1		RSK-175	Total/NA
Methane - DL	2200		88	22	ug/L	22		RSK-175	Total/NA
TOC Result 1	5.5	B	1.0	0.43	mg/L	1		9060A	Total/NA
TOC Result 2	5.2		1.0	0.43	mg/L	1		9060A	Total/NA
Total Organic Carbon	5.3		1.0	0.43	mg/L	1		9060A	Total/NA

Client Sample ID: Trip Blank — Lab Sample ID: 480-142989-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acetone	3.0	J	10	3.0	ug/L	1		8260C	Total/NA
Bromodichloromethane	0.44	J	1.0	0.39	ug/L	1		8260C	Total/NA
Chloroform	4.0		1.0	0.34	ug/L	1		8260C	Total/NA
Methylene Chloride	0.49	J	1.0	0.44	ug/L	1		8260C	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-25-100418
Date Collected: 10/04/18 11:28
Date Received: 10/05/18 01:15

Lab Sample ID: 480-142989-9
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	200	U	200	60	ug/L			10/13/18 21:08	20
Benzene	20	U	20	8.2	ug/L			10/13/18 21:08	20
Bromodichloromethane	20	U	20	7.8	ug/L			10/13/18 21:08	20
Bromoform	20	U	20	5.2	ug/L			10/13/18 21:08	20
Bromomethane	20	U	20	14	ug/L			10/13/18 21:08	20
2-Butanone (MEK)	200	U *	200	26	ug/L			10/13/18 21:08	20
Carbon disulfide	20	U	20	3.8	ug/L			10/13/18 21:08	20
Carbon tetrachloride	20	U	20	5.4	ug/L			10/13/18 21:08	20
Chlorobenzene	20	U	20	15	ug/L			10/13/18 21:08	20
Chloroethane	20	U	20	6.4	ug/L			10/13/18 21:08	20
Chloroform	20	U	20	6.8	ug/L			10/13/18 21:08	20
Chloromethane	20	U	20	7.0	ug/L			10/13/18 21:08	20
cis-1,2-Dichloroethene	**850**		20	16	ug/L			10/13/18 21:08	20
cis-1,3-Dichloropropene	20	U	20	7.2	ug/L			10/13/18 21:08	20
Cyclohexane	20	U	20	3.6	ug/L			10/13/18 21:08	20
Dibromochloromethane	20	U	20	6.4	ug/L			10/13/18 21:08	20
1,2-Dibromo-3-Chloropropane	20	U	20	7.8	ug/L			10/13/18 21:08	20
1,2-Dibromoethane	20	U	20	15	ug/L			10/13/18 21:08	20
1,2-Dichlorobenzene	20	U	20	16	ug/L			10/13/18 21:08	20
1,3-Dichlorobenzene	20	U	20	16	ug/L			10/13/18 21:08	20
1,4-Dichlorobenzene	20	U	20	17	ug/L			10/13/18 21:08	20
Dichlorodifluoromethane	20	U	20	14	ug/L			10/13/18 21:08	20
1,1-Dichloroethane	**17**	**J**	20	7.6	ug/L			10/13/18 21:08	20
1,2-Dichloroethane	20	U	20	4.2	ug/L			10/13/18 21:08	20
1,1-Dichloroethene	20	U	20	5.8	ug/L			10/13/18 21:08	20
1,2-Dichloropropane	20	U	20	14	ug/L			10/13/18 21:08	20
Ethylbenzene	20	U	20	15	ug/L			10/13/18 21:08	20
2-Hexanone	100	U	100	25	ug/L			10/13/18 21:08	20
Isopropylbenzene	20	U	20	16	ug/L			10/13/18 21:08	20
Methyl acetate	50	U	50	26	ug/L			10/13/18 21:08	20
Methylcyclohexane	20	U	20	3.2	ug/L			10/13/18 21:08	20
Methylene Chloride	**16**	**J**	20	8.8	ug/L			10/13/18 21:08	20
4-Methyl-2-pentanone (MIBK)	100	U	100	42	ug/L			10/13/18 21:08	20
Methyl tert-butyl ether	20	U	20	3.2	ug/L			10/13/18 21:08	20
Styrene	20	U	20	15	ug/L			10/13/18 21:08	20
1,1,2,2-Tetrachloroethane	20	U	20	4.2	ug/L			10/13/18 21:08	20
Tetrachloroethene	**8800**	**E**	20	7.2	ug/L			10/13/18 21:08	20
Toluene	20	U	20	10	ug/L			10/13/18 21:08	20
trans-1,2-Dichloroethene	20	U	20	18	ug/L			10/13/18 21:08	20
trans-1,3-Dichloropropene	20	U	20	7.4	ug/L			10/13/18 21:08	20
1,2,4-Trichlorobenzene	20	U	20	8.2	ug/L			10/13/18 21:08	20
1,1,1-Trichloroethane	20	U	20	16	ug/L			10/13/18 21:08	20
1,1,2-Trichloroethane	20	U	20	4.6	ug/L			10/13/18 21:08	20
Trichloroethene	**220**		20	9.2	ug/L			10/13/18 21:08	20
Trichlorofluoromethane	20	U	20	18	ug/L			10/13/18 21:08	20
1,1,2-Trichloro-1,2,2-trifluoroethane	20	U	20	6.2	ug/L			10/13/18 21:08	20
Vinyl chloride	**690**		20	18	ug/L			10/13/18 21:08	20
Xylenes, Total	40	U	40	13	ug/L			10/13/18 21:08	20

Client Sample ID: MW-25-100418

Date Collected: 10/04/18 11:28
Date Received: 10/05/18 01:15

Lab Sample ID: 480-142989-9

Matrix: Water

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*98*		*73 - 120*		*10/13/18 21:08*	*20*
Dibromofluoromethane (Surr)	*100*		*75 - 123*		*10/13/18 21:08*	*20*
1,2-Dichloroethane-d4 (Surr)	*103*		*77 - 120*		*10/13/18 21:08*	*20*
Toluene-d8 (Surr)	*103*		*80 - 120*		*10/13/18 21:08*	*20*

Method: 8260C - Volatile Organic Compounds by GC/MS - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	2000	U	2000	600	ug/L			10/16/18 07:38	200
Benzene	200	U	200	82	ug/L			10/16/18 07:38	200
Bromodichloromethane	200	U	200	78	ug/L			10/16/18 07:38	200
Bromoform	200	U	200	52	ug/L			10/16/18 07:38	200
Bromomethane	200	U	200	140	ug/L			10/16/18 07:38	200
2-Butanone (MEK)	2000	U	2000	260	ug/L			10/16/18 07:38	200
Carbon disulfide	200	U	200	38	ug/L			10/16/18 07:38	200
Carbon tetrachloride	200	U	200	54	ug/L			10/16/18 07:38	200
Chlorobenzene	200	U	200	150	ug/L			10/16/18 07:38	200
Chloroethane	200	U	200	64	ug/L			10/16/18 07:38	200
Chloroform	200	U	200	68	ug/L			10/16/18 07:38	200
Chloromethane	200	U	200	70	ug/L			10/16/18 07:38	200
cis-1,2-Dichloroethene	**850**		200	160	ug/L			10/16/18 07:38	200
cis-1,3-Dichloropropene	200	U	200	72	ug/L			10/16/18 07:38	200
Cyclohexane	200	U	200	36	ug/L			10/16/18 07:38	200
Dibromochloromethane	200	U	200	64	ug/L			10/16/18 07:38	200
1,2-Dibromo-3-Chloropropane	200	U	200	78	ug/L			10/16/18 07:38	200
1,2-Dibromoethane	200	U	200	150	ug/L			10/16/18 07:38	200
1,2-Dichlorobenzene	200	U	200	160	ug/L			10/16/18 07:38	200
1,3-Dichlorobenzene	200	U	200	160	ug/L			10/16/18 07:38	200
1,4-Dichlorobenzene	200	U	200	170	ug/L			10/16/18 07:38	200
Dichlorodifluoromethane	200	U	200	140	ug/L			10/16/18 07:38	200
1,1-Dichloroethane	200	U	200	76	ug/L			10/16/18 07:38	200
1,2-Dichloroethane	200	U	200	42	ug/L			10/16/18 07:38	200
1,1-Dichloroethene	200	U	200	58	ug/L			10/16/18 07:38	200
1,2-Dichloropropane	200	U	200	140	ug/L			10/16/18 07:38	200
Ethylbenzene	200	U	200	150	ug/L			10/16/18 07:38	200
2-Hexanone	1000	U	1000	250	ug/L			10/16/18 07:38	200
Isopropylbenzene	200	U	200	160	ug/L			10/16/18 07:38	200
Methyl acetate	500	U	500	260	ug/L			10/16/18 07:38	200
Methylcyclohexane	200	U	200	32	ug/L			10/16/18 07:38	200
Methylene Chloride	200	U	200	88	ug/L			10/16/18 07:38	200
4-Methyl-2-pentanone (MIBK)	1000	U	1000	420	ug/L			10/16/18 07:38	200
Methyl tert-butyl ether	200	U	200	32	ug/L			10/16/18 07:38	200
Styrene	200	U	200	150	ug/L			10/16/18 07:38	200
1,1,2,2-Tetrachloroethane	200	U	200	42	ug/L			10/16/18 07:38	200
Tetrachloroethene	**9300**		200	72	ug/L			10/16/18 07:38	200
Toluene	200	U	200	100	ug/L			10/16/18 07:38	200
trans-1,2-Dichloroethene	200	U	200	180	ug/L			10/16/18 07:38	200
trans-1,3-Dichloropropene	200	U	200	74	ug/L			10/16/18 07:38	200
1,2,4-Trichlorobenzene	200	U	200	82	ug/L			10/16/18 07:38	200
1,1,1-Trichloroethane	200	U	200	160	ug/L			10/16/18 07:38	200
1,1,2-Trichloroethane	200	U	200	46	ug/L			10/16/18 07:38	200

Client Sample ID: MW-25-100418

Lab Sample ID: 480-142989-9
Matrix: Water
Date Collected: 10/04/18 11:28
Date Received: 10/05/18 01:15

Method: 8260C - Volatile Organic Compounds by GC/MS - DL (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Trichloroethene	**210**		200	92	ug/L			10/16/18 07:38	200
Trichlorofluoromethane	200	U	200	180	ug/L			10/16/18 07:38	200
1,1,2-Trichloro-1,2,2-trifluoroethane	200	U	200	62	ug/L			10/16/18 07:38	200
Vinyl chloride	**660**		200	180	ug/L			10/16/18 07:38	200
Xylenes, Total	400	U	400	130	ug/L			10/16/18 07:38	200

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*97*		*73 - 120*		*10/16/18 07:38*	*200*
Dibromofluoromethane (Surr)	*97*		*75 - 123*		*10/16/18 07:38*	*200*
1,2-Dichloroethane-d4 (Surr)	*98*		*77 - 120*		*10/16/18 07:38*	*200*
Toluene-d8 (Surr)	*99*		*80 - 120*		*10/16/18 07:38*	*200*

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	**290**		7.5	1.5	ug/L			10/10/18 13:16	1
Ethene	**190**		7.0	1.5	ug/L			10/10/18 13:16	1

Method: RSK-175 - Dissolved Gases (GC) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane	**2200**		88	22	ug/L			10/10/18 15:51	22

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
TOC Result 1	**5.5**	**B**	1.0	0.43	mg/L			10/12/18 23:17	1
TOC Result 2	**5.2**		1.0	0.43	mg/L			10/12/18 23:17	1
Total Organic Carbon	**5.3**		1.0	0.43	mg/L			10/12/18 23:17	1

Client Sample ID: Trip Blank

Lab Sample ID: 480-142989-10
Matrix: Water
Date Collected: 10/04/18 00:00
Date Received: 10/05/18 01:15

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**3.0**	**J**	10	3.0	ug/L			10/12/18 07:11	1
Benzene	1.0	U	1.0	0.41	ug/L			10/12/18 07:11	1
Bromodichloromethane	**0.44**	**J**	1.0	0.39	ug/L			10/12/18 07:11	1
Bromoform	1.0	U	1.0	0.26	ug/L			10/12/18 07:11	1
Bromomethane	1.0	U	1.0	0.69	ug/L			10/12/18 07:11	1
2-Butanone (MEK)	10	U	10	1.3	ug/L			10/12/18 07:11	1
Carbon disulfide	1.0	U	1.0	0.19	ug/L			10/12/18 07:11	1
Carbon tetrachloride	1.0	U	1.0	0.27	ug/L			10/12/18 07:11	1
Chlorobenzene	1.0	U	1.0	0.75	ug/L			10/12/18 07:11	1
Chloroethane	1.0	U	1.0	0.32	ug/L			10/12/18 07:11	1
Chloroform	**4.0**		1.0	0.34	ug/L			10/12/18 07:11	1
Chloromethane	1.0	U	1.0	0.35	ug/L			10/12/18 07:11	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.81	ug/L			10/12/18 07:11	1
cis-1,3-Dichloropropene	1.0	U	1.0	0.36	ug/L			10/12/18 07:11	1
Cyclohexane	1.0	U	1.0	0.18	ug/L			10/12/18 07:11	1
Dibromochloromethane	1.0	U	1.0	0.32	ug/L			10/12/18 07:11	1
1,2-Dibromo-3-Chloropropane	1.0	U	1.0	0.39	ug/L			10/12/18 07:11	1
1,2-Dibromoethane	1.0	U	1.0	0.73	ug/L			10/12/18 07:11	1

Client Sample ID: Trip Blank
Date Collected: 10/04/18 00:00
Date Received: 10/05/18 01:15

Lab Sample ID: 480-142989-10
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichlorobenzene	1.0	U	1.0	0.79	ug/L			10/12/18 07:11	1
1,3-Dichlorobenzene	1.0	U	1.0	0.78	ug/L			10/12/18 07:11	1
1,4-Dichlorobenzene	1.0	U	1.0	0.84	ug/L			10/12/18 07:11	1
Dichlorodifluoromethane	1.0	U	1.0	0.68	ug/L			10/12/18 07:11	1
1,1-Dichloroethane	1.0	U	1.0	0.38	ug/L			10/12/18 07:11	1
1,2-Dichloroethane	1.0	U	1.0	0.21	ug/L			10/12/18 07:11	1
1,1-Dichloroethene	1.0	U	1.0	0.29	ug/L			10/12/18 07:11	1
1,2-Dichloropropane	1.0	U	1.0	0.72	ug/L			10/12/18 07:11	1
Ethylbenzene	1.0	U	1.0	0.74	ug/L			10/12/18 07:11	1
2-Hexanone	5.0	U	5.0	1.2	ug/L			10/12/18 07:11	1
Isopropylbenzene	1.0	U	1.0	0.79	ug/L			10/12/18 07:11	1
Methyl acetate	2.5	U	2.5	1.3	ug/L			10/12/18 07:11	1
Methylcyclohexane	1.0	U	1.0	0.16	ug/L			10/12/18 07:11	1
Methylene Chloride	**0.49**	**J**	1.0	0.44	ug/L			10/12/18 07:11	1
4-Methyl-2-pentanone (MIBK)	5.0	U	5.0	2.1	ug/L			10/12/18 07:11	1
Methyl tert-butyl ether	1.0	U	1.0	0.16	ug/L			10/12/18 07:11	1
Styrene	1.0	U	1.0	0.73	ug/L			10/12/18 07:11	1
1,1,2,2-Tetrachloroethane	1.0	U	1.0	0.21	ug/L			10/12/18 07:11	1
Tetrachloroethene	1.0	U	1.0	0.36	ug/L			10/12/18 07:11	1
Toluene	1.0	U	1.0	0.51	ug/L			10/12/18 07:11	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.90	ug/L			10/12/18 07:11	1
trans-1,3-Dichloropropene	1.0	U	1.0	0.37	ug/L			10/12/18 07:11	1
1,2,4-Trichlorobenzene	1.0	U	1.0	0.41	ug/L			10/12/18 07:11	1
1,1,1-Trichloroethane	1.0	U	1.0	0.82	ug/L			10/12/18 07:11	1
1,1,2-Trichloroethane	1.0	U	1.0	0.23	ug/L			10/12/18 07:11	1
Trichloroethene	1.0	U	1.0	0.46	ug/L			10/12/18 07:11	1
Trichlorofluoromethane	1.0	U	1.0	0.88	ug/L			10/12/18 07:11	1
1,1,2-Trichloro-1,2,2-trifluoroethane	1.0	U	1.0	0.31	ug/L			10/12/18 07:11	1
Vinyl chloride	1.0	U	1.0	0.90	ug/L			10/12/18 07:11	1
Xylenes, Total	2.0	U	2.0	0.66	ug/L			10/12/18 07:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*105*		*73 - 120*		*10/12/18 07:11*	*1*
Dibromofluoromethane (Surr)	*109*		*75 - 123*		*10/12/18 07:11*	*1*
1,2-Dichloroethane-d4 (Surr)	*103*		*77 - 120*		*10/12/18 07:11*	*1*
Toluene-d8 (Surr)	*102*		*80 - 120*		*10/12/18 07:11*	*1*

Surrogate Summary

Client: Ashland LLC
Project/Site: Ashland Rensselaer

TestAmerica Job ID: 480-142989-2

Method: 8260C - Volatile Organic Compounds by GC/MS

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		BFB	DBFM	DCA	TOL
Lab Sample ID	Client Sample ID	(73-120)	(75-123)	(77-120)	(80-120)
480-142989-9	MW-25-100418	98	100	103	103
480-142989-9 - DL	MW-25-100418	97	97	98	99
480-142989-10	Trip Blank	105	109	103	102
LCS 480-438996/5	Lab Control Sample	100	95	97	101
LCS 480-439286/5	Lab Control Sample	96	100	102	96
LCS 480-439557/5	Lab Control Sample	99	99	99	99
MB 480-438996/7	Method Blank	99	101	106	100
MB 480-439286/8	Method Blank	99	100	99	98
MB 480-439557/7	Method Blank	102	103	104	102

Surrogate Legend

BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
DCA = 1,2-Dichloroethane-d4 (Surr)
TOL = Toluene-d8 (Surr)

Method: 8260C - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 480-438996/7
Matrix: Water
Analysis Batch: 438996

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	10	U	10	3.0	ug/L			10/11/18 23:23	1
Benzene	1.0	U	1.0	0.41	ug/L			10/11/18 23:23	1
Bromodichloromethane	1.0	U	1.0	0.39	ug/L			10/11/18 23:23	1
Bromoform	1.0	U	1.0	0.26	ug/L			10/11/18 23:23	1
Bromomethane	1.0	U	1.0	0.69	ug/L			10/11/18 23:23	1
2-Butanone (MEK)	10	U	10	1.3	ug/L			10/11/18 23:23	1
Carbon disulfide	0.193	J	1.0	0.19	ug/L			10/11/18 23:23	1
Carbon tetrachloride	1.0	U	1.0	0.27	ug/L			10/11/18 23:23	1
Chlorobenzene	1.0	U	1.0	0.75	ug/L			10/11/18 23:23	1
Chloroethane	1.0	U	1.0	0.32	ug/L			10/11/18 23:23	1
Chloroform	1.0	U	1.0	0.34	ug/L			10/11/18 23:23	1
Chloromethane	1.0	U	1.0	0.35	ug/L			10/11/18 23:23	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.81	ug/L			10/11/18 23:23	1
cis-1,3-Dichloropropene	1.0	U	1.0	0.36	ug/L			10/11/18 23:23	1
Cyclohexane	1.0	U	1.0	0.18	ug/L			10/11/18 23:23	1
Dibromochloromethane	1.0	U	1.0	0.32	ug/L			10/11/18 23:23	1
1,2-Dibromo-3-Chloropropane	1.0	U	1.0	0.39	ug/L			10/11/18 23:23	1
1,2-Dibromoethane	1.0	U	1.0	0.73	ug/L			10/11/18 23:23	1
1,2-Dichlorobenzene	1.0	U	1.0	0.79	ug/L			10/11/18 23:23	1
1,3-Dichlorobenzene	1.0	U	1.0	0.78	ug/L			10/11/18 23:23	1
1,4-Dichlorobenzene	1.0	U	1.0	0.84	ug/L			10/11/18 23:23	1
Dichlorodifluoromethane	1.0	U	1.0	0.68	ug/L			10/11/18 23:23	1
1,1-Dichloroethane	1.0	U	1.0	0.38	ug/L			10/11/18 23:23	1
1,2-Dichloroethane	1.0	U	1.0	0.21	ug/L			10/11/18 23:23	1
1,1-Dichloroethene	1.0	U	1.0	0.29	ug/L			10/11/18 23:23	1
1,2-Dichloropropane	1.0	U	1.0	0.72	ug/L			10/11/18 23:23	1
Ethylbenzene	1.0	U	1.0	0.74	ug/L			10/11/18 23:23	1
2-Hexanone	5.0	U	5.0	1.2	ug/L			10/11/18 23:23	1
Isopropylbenzene	1.0	U	1.0	0.79	ug/L			10/11/18 23:23	1
Methyl acetate	2.5	U	2.5	1.3	ug/L			10/11/18 23:23	1
Methylcyclohexane	1.0	U	1.0	0.16	ug/L			10/11/18 23:23	1
Methylene Chloride	1.0	U	1.0	0.44	ug/L			10/11/18 23:23	1
4-Methyl-2-pentanone (MIBK)	5.0	U	5.0	2.1	ug/L			10/11/18 23:23	1
Methyl tert-butyl ether	1.0	U	1.0	0.16	ug/L			10/11/18 23:23	1
Styrene	1.0	U	1.0	0.73	ug/L			10/11/18 23:23	1
1,1,2,2-Tetrachloroethane	1.0	U	1.0	0.21	ug/L			10/11/18 23:23	1
Tetrachloroethene	1.0	U	1.0	0.36	ug/L			10/11/18 23:23	1
Toluene	1.0	U	1.0	0.51	ug/L			10/11/18 23:23	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.90	ug/L			10/11/18 23:23	1
trans-1,3-Dichloropropene	1.0	U	1.0	0.37	ug/L			10/11/18 23:23	1
1,2,4-Trichlorobenzene	1.0	U	1.0	0.41	ug/L			10/11/18 23:23	1
1,1,1-Trichloroethane	1.0	U	1.0	0.82	ug/L			10/11/18 23:23	1
1,1,2-Trichloroethane	1.0	U	1.0	0.23	ug/L			10/11/18 23:23	1
Trichloroethene	1.0	U	1.0	0.46	ug/L			10/11/18 23:23	1
Trichlorofluoromethane	1.0	U	1.0	0.88	ug/L			10/11/18 23:23	1
1,1,2-Trichloro-1,2,2-trifluoroethane	1.0	U	1.0	0.31	ug/L			10/11/18 23:23	1
Vinyl chloride	1.0	U	1.0	0.90	ug/L			10/11/18 23:23	1
Xylenes, Total	2.0	U	2.0	0.66	ug/L			10/11/18 23:23	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	*99*		*73 - 120*		*10/11/18 23:23*	*1*
Dibromofluoromethane (Surr)	*101*		*75 - 123*		*10/11/18 23:23*	*1*
1,2-Dichloroethane-d4 (Surr)	*106*		*77 - 120*		*10/11/18 23:23*	*1*
Toluene-d8 (Surr)	*100*		*80 - 120*		*10/11/18 23:23*	*1*

Lab Sample ID: LCS 480-438996/5
Matrix: Water
Analysis Batch: 438996

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	125	159		ug/L		127	56 - 142
Benzene	25.0	25.1		ug/L		100	71 - 124
Bromodichloromethane	25.0	26.3		ug/L		105	80 - 122
Bromoform	25.0	21.8		ug/L		87	61 - 132
Bromomethane	25.0	21.6		ug/L		87	55 - 144
2-Butanone (MEK)	125	154		ug/L		123	57 - 140
Carbon disulfide	25.0	19.9		ug/L		80	59 - 134
Carbon tetrachloride	25.0	21.9		ug/L		88	72 - 134
Chlorobenzene	25.0	24.9		ug/L		100	80 - 120
Chloroethane	25.0	21.1		ug/L		85	69 - 136
Chloroform	25.0	22.9		ug/L		92	73 - 127
Chloromethane	25.0	21.4		ug/L		86	68 - 124
cis-1,2-Dichloroethene	25.0	23.9		ug/L		96	74 - 124
cis-1,3-Dichloropropene	25.0	28.3		ug/L		113	74 - 124
Cyclohexane	25.0	20.9		ug/L		84	59 - 135
Dibromochloromethane	25.0	25.1		ug/L		100	75 - 125
1,2-Dibromo-3-Chloropropane	25.0	23.4		ug/L		94	56 - 134
1,2-Dibromoethane	25.0	26.7		ug/L		107	77 - 120
1,2-Dichlorobenzene	25.0	25.8		ug/L		103	80 - 124
1,3-Dichlorobenzene	25.0	26.3		ug/L		105	77 - 120
1,4-Dichlorobenzene	25.0	26.7		ug/L		107	80 - 120
Dichlorodifluoromethane	25.0	20.7		ug/L		83	59 - 135
1,1-Dichloroethane	25.0	23.7		ug/L		95	77 - 120
1,2-Dichloroethane	25.0	24.0		ug/L		96	75 - 120
1,1-Dichloroethene	25.0	21.2		ug/L		85	66 - 127
1,2-Dichloropropane	25.0	25.7		ug/L		103	76 - 120
Ethylbenzene	25.0	24.9		ug/L		100	77 - 123
2-Hexanone	125	152		ug/L		122	65 - 127
Isopropylbenzene	25.0	27.9		ug/L		112	77 - 122
Methyl acetate	50.0	46.1		ug/L		92	74 - 133
Methylcyclohexane	25.0	22.2		ug/L		89	68 - 134
Methylene Chloride	25.0	22.8		ug/L		91	75 - 124
4-Methyl-2-pentanone (MIBK)	125	138		ug/L		110	71 - 125
Methyl tert-butyl ether	25.0	26.0		ug/L		104	77 - 120
Styrene	25.0	26.2		ug/L		105	80 - 120
1,1,2,2-Tetrachloroethane	25.0	27.1		ug/L		109	76 - 120
Tetrachloroethene	25.0	23.5		ug/L		94	74 - 122
Toluene	25.0	24.3		ug/L		97	80 - 122
trans-1,2-Dichloroethene	25.0	21.5		ug/L		86	73 - 127
trans-1,3-Dichloropropene	25.0	27.0		ug/L		108	80 - 120
1,2,4-Trichlorobenzene	25.0	26.3		ug/L		105	79 - 122
1,1,1-Trichloroethane	25.0	22.3		ug/L		89	73 - 126
1,1,2-Trichloroethane	25.0	26.2		ug/L		105	76 - 122
Trichloroethene	25.0	24.0		ug/L		96	74 - 123

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

Lab Sample ID: LCS 480-438996/5
Matrix: Water
Analysis Batch: 438996

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Trichlorofluoromethane	25.0	20.4		ug/L		82	62 - 150
1,1,2-Trichloro-1,2,2-trifluoroethane	25.0	19.0		ug/L		76	61 - 148
Vinyl chloride	25.0	22.1		ug/L		89	65 - 133

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*100*		*73 - 120*
Dibromofluoromethane (Surr)	*95*		*75 - 123*
1,2-Dichloroethane-d4 (Surr)	*97*		*77 - 120*
Toluene-d8 (Surr)	*101*		*80 - 120*

Lab Sample ID: MB 480-439286/8
Matrix: Water
Analysis Batch: 439286

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	10	U	10	3.0	ug/L			10/13/18 14:42	1
Benzene	1.0	U	1.0	0.41	ug/L			10/13/18 14:42	1
Bromodichloromethane	1.0	U	1.0	0.39	ug/L			10/13/18 14:42	1
Bromoform	1.0	U	1.0	0.26	ug/L			10/13/18 14:42	1
Bromomethane	1.0	U	1.0	0.69	ug/L			10/13/18 14:42	1
2-Butanone (MEK)	10	U	10	1.3	ug/L			10/13/18 14:42	1
Carbon disulfide	0.229	J	1.0	0.19	ug/L			10/13/18 14:42	1
Carbon tetrachloride	1.0	U	1.0	0.27	ug/L			10/13/18 14:42	1
Chlorobenzene	1.0	U	1.0	0.75	ug/L			10/13/18 14:42	1
Chloroethane	1.0	U	1.0	0.32	ug/L			10/13/18 14:42	1
Chloroform	1.0	U	1.0	0.34	ug/L			10/13/18 14:42	1
Chloromethane	1.0	U	1.0	0.35	ug/L			10/13/18 14:42	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.81	ug/L			10/13/18 14:42	1
cis-1,3-Dichloropropene	1.0	U	1.0	0.36	ug/L			10/13/18 14:42	1
Cyclohexane	1.0	U	1.0	0.18	ug/L			10/13/18 14:42	1
Dibromochloromethane	1.0	U	1.0	0.32	ug/L			10/13/18 14:42	1
1,2-Dibromo-3-Chloropropane	1.0	U	1.0	0.39	ug/L			10/13/18 14:42	1
1,2-Dibromoethane	1.0	U	1.0	0.73	ug/L			10/13/18 14:42	1
1,2-Dichlorobenzene	1.0	U	1.0	0.79	ug/L			10/13/18 14:42	1
1,3-Dichlorobenzene	1.0	U	1.0	0.78	ug/L			10/13/18 14:42	1
1,4-Dichlorobenzene	1.0	U	1.0	0.84	ug/L			10/13/18 14:42	1
Dichlorodifluoromethane	1.0	U	1.0	0.68	ug/L			10/13/18 14:42	1
1,1-Dichloroethane	1.0	U	1.0	0.38	ug/L			10/13/18 14:42	1
1,2-Dichloroethane	1.0	U	1.0	0.21	ug/L			10/13/18 14:42	1
1,1-Dichloroethene	1.0	U	1.0	0.29	ug/L			10/13/18 14:42	1
1,2-Dichloropropane	1.0	U	1.0	0.72	ug/L			10/13/18 14:42	1
Ethylbenzene	1.0	U	1.0	0.74	ug/L			10/13/18 14:42	1
2-Hexanone	5.0	U	5.0	1.2	ug/L			10/13/18 14:42	1
Isopropylbenzene	1.0	U	1.0	0.79	ug/L			10/13/18 14:42	1
Methyl acetate	2.5	U	2.5	1.3	ug/L			10/13/18 14:42	1
Methylcyclohexane	1.0	U	1.0	0.16	ug/L			10/13/18 14:42	1
Methylene Chloride	1.0	U	1.0	0.44	ug/L			10/13/18 14:42	1

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

Lab Sample ID: MB 480-439286/8
Matrix: Water
Analysis Batch: 439286

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4-Methyl-2-pentanone (MIBK)	5.0	U	5.0	2.1	ug/L			10/13/18 14:42	1
Methyl tert-butyl ether	1.0	U	1.0	0.16	ug/L			10/13/18 14:42	1
Styrene	1.0	U	1.0	0.73	ug/L			10/13/18 14:42	1
1,1,2,2-Tetrachloroethane	1.0	U	1.0	0.21	ug/L			10/13/18 14:42	1
Tetrachloroethene	1.0	U	1.0	0.36	ug/L			10/13/18 14:42	1
Toluene	1.0	U	1.0	0.51	ug/L			10/13/18 14:42	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.90	ug/L			10/13/18 14:42	1
trans-1,3-Dichloropropene	1.0	U	1.0	0.37	ug/L			10/13/18 14:42	1
1,2,4-Trichlorobenzene	1.0	U	1.0	0.41	ug/L			10/13/18 14:42	1
1,1,1-Trichloroethane	1.0	U	1.0	0.82	ug/L			10/13/18 14:42	1
1,1,2-Trichloroethane	1.0	U	1.0	0.23	ug/L			10/13/18 14:42	1
Trichloroethene	1.0	U	1.0	0.46	ug/L			10/13/18 14:42	1
Trichlorofluoromethane	1.0	U	1.0	0.88	ug/L			10/13/18 14:42	1
1,1,2-Trichloro-1,2,2-trifluoroethane	1.0	U	1.0	0.31	ug/L			10/13/18 14:42	1
Vinyl chloride	1.0	U	1.0	0.90	ug/L			10/13/18 14:42	1
Xylenes, Total	2.0	U	2.0	0.66	ug/L			10/13/18 14:42	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*99*		*73 - 120*		*10/13/18 14:42*	*1*
Dibromofluoromethane (Surr)	*100*		*75 - 123*		*10/13/18 14:42*	*1*
1,2-Dichloroethane-d4 (Surr)	*99*		*77 - 120*		*10/13/18 14:42*	*1*
Toluene-d8 (Surr)	*98*		*80 - 120*		*10/13/18 14:42*	*1*

Lab Sample ID: LCS 480-439286/5
Matrix: Water
Analysis Batch: 439286

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	125	144		ug/L		115	56 - 142
Benzene	25.0	25.1		ug/L		100	71 - 124
Bromodichloromethane	25.0	25.5		ug/L		102	80 - 122
Bromoform	25.0	22.2		ug/L		89	61 - 132
Bromomethane	25.0	22.2		ug/L		89	55 - 144
2-Butanone (MEK)	125	245	*	ug/L		196	57 - 140
Carbon disulfide	25.0	23.9		ug/L		95	59 - 134
Carbon tetrachloride	25.0	25.3		ug/L		101	72 - 134
Chlorobenzene	25.0	23.2		ug/L		93	80 - 120
Chloroethane	25.0	23.4		ug/L		94	69 - 136
Chloroform	25.0	23.6		ug/L		94	73 - 127
Chloromethane	25.0	23.4		ug/L		94	68 - 124
cis-1,2-Dichloroethene	25.0	23.4		ug/L		94	74 - 124
cis-1,3-Dichloropropene	25.0	28.4		ug/L		113	74 - 124
Cyclohexane	25.0	25.8		ug/L		103	59 - 135
Dibromochloromethane	25.0	24.0		ug/L		96	75 - 125
1,2-Dibromo-3-Chloropropane	25.0	21.7		ug/L		87	56 - 134
1,2-Dibromoethane	25.0	23.4		ug/L		94	77 - 120
1,2-Dichlorobenzene	25.0	24.6		ug/L		98	80 - 124
1,3-Dichlorobenzene	25.0	24.9		ug/L		100	77 - 120

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

Lab Sample ID: LCS 480-439286/5
Matrix: Water
Analysis Batch: 439286

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dichlorobenzene	25.0	24.7		ug/L		99	80 - 120
Dichlorodifluoromethane	25.0	24.5		ug/L		98	59 - 135
1,1-Dichloroethane	25.0	25.6		ug/L		102	77 - 120
1,2-Dichloroethane	25.0	23.5		ug/L		94	75 - 120
1,1-Dichloroethene	25.0	25.0		ug/L		100	66 - 127
1,2-Dichloropropane	25.0	25.0		ug/L		100	76 - 120
Ethylbenzene	25.0	23.9		ug/L		96	77 - 123
2-Hexanone	125	127		ug/L		101	65 - 127
Isopropylbenzene	25.0	28.5		ug/L		114	77 - 122
Methyl acetate	50.0	47.9		ug/L		96	74 - 133
Methylcyclohexane	25.0	27.1		ug/L		109	68 - 134
Methylene Chloride	25.0	21.8		ug/L		87	75 - 124
4-Methyl-2-pentanone (MIBK)	125	121		ug/L		97	71 - 125
Methyl tert-butyl ether	25.0	24.2		ug/L		97	77 - 120
Styrene	25.0	24.2		ug/L		97	80 - 120
1,1,2,2-Tetrachloroethane	25.0	24.4		ug/L		98	76 - 120
Tetrachloroethene	25.0	27.6		ug/L		110	74 - 122
Toluene	25.0	23.0		ug/L		92	80 - 122
trans-1,2-Dichloroethene	25.0	22.8		ug/L		91	73 - 127
trans-1,3-Dichloropropene	25.0	25.3		ug/L		101	80 - 120
1,2,4-Trichlorobenzene	25.0	24.3		ug/L		97	79 - 122
1,1,1-Trichloroethane	25.0	24.9		ug/L		100	73 - 126
1,1,2-Trichloroethane	25.0	22.9		ug/L		92	76 - 122
Trichloroethene	25.0	24.8		ug/L		99	74 - 123
Trichlorofluoromethane	25.0	26.3		ug/L		105	62 - 150
1,1,2-Trichloro-1,2,2-trifluoroethane	25.0	24.7		ug/L		99	61 - 148
Vinyl chloride	25.0	25.2		ug/L		101	65 - 133

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*96*		*73 - 120*
Dibromofluoromethane (Surr)	*100*		*75 - 123*
1,2-Dichloroethane-d4 (Surr)	*102*		*77 - 120*
Toluene-d8 (Surr)	*96*		*80 - 120*

Lab Sample ID: MB 480-439557/7
Matrix: Water
Analysis Batch: 439557

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	10	U	10	3.0	ug/L			10/15/18 23:47	1
Benzene	1.0	U	1.0	0.41	ug/L			10/15/18 23:47	1
Bromodichloromethane	1.0	U	1.0	0.39	ug/L			10/15/18 23:47	1
Bromoform	1.0	U	1.0	0.26	ug/L			10/15/18 23:47	1
Bromomethane	1.0	U	1.0	0.69	ug/L			10/15/18 23:47	1
2-Butanone (MEK)	10	U	10	1.3	ug/L			10/15/18 23:47	1
Carbon disulfide	0.242	J	1.0	0.19	ug/L			10/15/18 23:47	1
Carbon tetrachloride	1.0	U	1.0	0.27	ug/L			10/15/18 23:47	1

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

Lab Sample ID: MB 480-439557/7
Matrix: Water
Analysis Batch: 439557

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorobenzene	1.0	U	1.0	0.75	ug/L			10/15/18 23:47	1
Chloroethane	1.0	U	1.0	0.32	ug/L			10/15/18 23:47	1
Chloroform	1.0	U	1.0	0.34	ug/L			10/15/18 23:47	1
Chloromethane	1.0	U	1.0	0.35	ug/L			10/15/18 23:47	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.81	ug/L			10/15/18 23:47	1
cis-1,3-Dichloropropene	1.0	U	1.0	0.36	ug/L			10/15/18 23:47	1
Cyclohexane	1.0	U	1.0	0.18	ug/L			10/15/18 23:47	1
Dibromochloromethane	1.0	U	1.0	0.32	ug/L			10/15/18 23:47	1
1,2-Dibromo-3-Chloropropane	1.0	U	1.0	0.39	ug/L			10/15/18 23:47	1
1,2-Dibromoethane	1.0	U	1.0	0.73	ug/L			10/15/18 23:47	1
1,2-Dichlorobenzene	1.0	U	1.0	0.79	ug/L			10/15/18 23:47	1
1,3-Dichlorobenzene	1.0	U	1.0	0.78	ug/L			10/15/18 23:47	1
1,4-Dichlorobenzene	1.0	U	1.0	0.84	ug/L			10/15/18 23:47	1
Dichlorodifluoromethane	1.0	U	1.0	0.68	ug/L			10/15/18 23:47	1
1,1-Dichloroethane	1.0	U	1.0	0.38	ug/L			10/15/18 23:47	1
1,2-Dichloroethane	1.0	U	1.0	0.21	ug/L			10/15/18 23:47	1
1,1-Dichloroethene	1.0	U	1.0	0.29	ug/L			10/15/18 23:47	1
1,2-Dichloropropane	1.0	U	1.0	0.72	ug/L			10/15/18 23:47	1
Ethylbenzene	1.0	U	1.0	0.74	ug/L			10/15/18 23:47	1
2-Hexanone	5.0	U	5.0	1.2	ug/L			10/15/18 23:47	1
Isopropylbenzene	1.0	U	1.0	0.79	ug/L			10/15/18 23:47	1
Methyl acetate	2.5	U	2.5	1.3	ug/L			10/15/18 23:47	1
Methylcyclohexane	1.0	U	1.0	0.16	ug/L			10/15/18 23:47	1
Methylene Chloride	1.0	U	1.0	0.44	ug/L			10/15/18 23:47	1
4-Methyl-2-pentanone (MIBK)	5.0	U	5.0	2.1	ug/L			10/15/18 23:47	1
Methyl tert-butyl ether	1.0	U	1.0	0.16	ug/L			10/15/18 23:47	1
Styrene	1.0	U	1.0	0.73	ug/L			10/15/18 23:47	1
1,1,2,2-Tetrachloroethane	1.0	U	1.0	0.21	ug/L			10/15/18 23:47	1
Tetrachloroethene	1.0	U	1.0	0.36	ug/L			10/15/18 23:47	1
Toluene	1.0	U	1.0	0.51	ug/L			10/15/18 23:47	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.90	ug/L			10/15/18 23:47	1
trans-1,3-Dichloropropene	1.0	U	1.0	0.37	ug/L			10/15/18 23:47	1
1,2,4-Trichlorobenzene	1.0	U	1.0	0.41	ug/L			10/15/18 23:47	1
1,1,1-Trichloroethane	1.0	U	1.0	0.82	ug/L			10/15/18 23:47	1
1,1,2-Trichloroethane	1.0	U	1.0	0.23	ug/L			10/15/18 23:47	1
Trichloroethene	1.0	U	1.0	0.46	ug/L			10/15/18 23:47	1
Trichlorofluoromethane	1.0	U	1.0	0.88	ug/L			10/15/18 23:47	1
1,1,2-Trichloro-1,2,2-trifluoroethane	1.0	U	1.0	0.31	ug/L			10/15/18 23:47	1
Vinyl chloride	1.0	U	1.0	0.90	ug/L			10/15/18 23:47	1
Xylenes, Total	2.0	U	2.0	0.66	ug/L			10/15/18 23:47	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*102*		*73 - 120*		*10/15/18 23:47*	*1*
Dibromofluoromethane (Surr)	*103*		*75 - 123*		*10/15/18 23:47*	*1*
1,2-Dichloroethane-d4 (Surr)	*104*		*77 - 120*		*10/15/18 23:47*	*1*
Toluene-d8 (Surr)	*102*		*80 - 120*		*10/15/18 23:47*	*1*

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

Lab Sample ID: LCS 480-439557/5
Matrix: Water
Analysis Batch: 439557

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	125	153		ug/L		122	56 - 142
Benzene	25.0	25.0		ug/L		100	71 - 124
Bromodichloromethane	25.0	26.2		ug/L		105	80 - 122
Bromoform	25.0	24.5		ug/L		98	61 - 132
Bromomethane	25.0	21.1		ug/L		84	55 - 144
2-Butanone (MEK)	125	152		ug/L		122	57 - 140
Carbon disulfide	25.0	21.4		ug/L		86	59 - 134
Carbon tetrachloride	25.0	21.6		ug/L		86	72 - 134
Chlorobenzene	25.0	23.7		ug/L		95	80 - 120
Chloroethane	25.0	22.0		ug/L		88	69 - 136
Chloroform	25.0	23.4		ug/L		94	73 - 127
Chloromethane	25.0	21.0		ug/L		84	68 - 124
cis-1,2-Dichloroethene	25.0	23.6		ug/L		94	74 - 124
cis-1,3-Dichloropropene	25.0	29.2		ug/L		117	74 - 124
Cyclohexane	25.0	21.9		ug/L		88	59 - 135
Dibromochloromethane	25.0	25.1		ug/L		101	75 - 125
1,2-Dibromo-3-Chloropropane	25.0	22.5		ug/L		90	56 - 134
1,2-Dibromoethane	25.0	26.3		ug/L		105	77 - 120
1,2-Dichlorobenzene	25.0	24.4		ug/L		97	80 - 124
1,3-Dichlorobenzene	25.0	24.8		ug/L		99	77 - 120
1,4-Dichlorobenzene	25.0	24.9		ug/L		99	80 - 120
Dichlorodifluoromethane	25.0	20.2		ug/L		81	59 - 135
1,1-Dichloroethane	25.0	23.7		ug/L		95	77 - 120
1,2-Dichloroethane	25.0	23.8		ug/L		95	75 - 120
1,1-Dichloroethene	25.0	22.3		ug/L		89	66 - 127
1,2-Dichloropropane	25.0	25.5		ug/L		102	76 - 120
Ethylbenzene	25.0	23.6		ug/L		95	77 - 123
2-Hexanone	125	141		ug/L		113	65 - 127
Isopropylbenzene	25.0	26.7		ug/L		107	77 - 122
Methyl acetate	50.0	47.6		ug/L		95	74 - 133
Methylcyclohexane	25.0	23.7		ug/L		95	68 - 134
Methylene Chloride	25.0	21.7		ug/L		87	75 - 124
4-Methyl-2-pentanone (MIBK)	125	131		ug/L		105	71 - 125
Methyl tert-butyl ether	25.0	25.8		ug/L		103	77 - 120
Styrene	25.0	25.1		ug/L		101	80 - 120
1,1,2,2-Tetrachloroethane	25.0	25.1		ug/L		100	76 - 120
Tetrachloroethene	25.0	23.8		ug/L		95	74 - 122
Toluene	25.0	23.1		ug/L		92	80 - 122
trans-1,2-Dichloroethene	25.0	21.4		ug/L		86	73 - 127
trans-1,3-Dichloropropene	25.0	27.2		ug/L		109	80 - 120
1,2,4-Trichlorobenzene	25.0	25.1		ug/L		100	79 - 122
1,1,1-Trichloroethane	25.0	22.1		ug/L		88	73 - 126
1,1,2-Trichloroethane	25.0	25.2		ug/L		101	76 - 122
Trichloroethene	25.0	23.8		ug/L		95	74 - 123
Trichlorofluoromethane	25.0	20.4		ug/L		82	62 - 150
1,1,2-Trichloro-1,2,2-trifluoroethane	25.0	21.0		ug/L		84	61 - 148
Vinyl chloride	25.0	22.2		ug/L		89	65 - 133

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

Lab Sample ID: LCS 480-439557/5
Matrix: Water
Analysis Batch: 439557

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*99*		*73 - 120*
Dibromofluoromethane (Surr)	*99*		*75 - 123*
1,2-Dichloroethane-d4 (Surr)	*99*		*77 - 120*
Toluene-d8 (Surr)	*99*		*80 - 120*

Method: RSK-175 - Dissolved Gases (GC)

Lab Sample ID: MB 480-438622/4
Matrix: Water
Analysis Batch: 438622

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	7.5	U	7.5	1.5	ug/L			10/10/18 10:37	1
Ethene	7.0	U	7.0	1.5	ug/L			10/10/18 10:37	1
Methane	4.0	U	4.0	1.0	ug/L			10/10/18 10:37	1

Lab Sample ID: LCS 480-438622/5
Matrix: Water
Analysis Batch: 438622

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ethane	14.6	15.2		ug/L		104	79 - 120
Ethene	13.6	14.6		ug/L		107	85 - 120
Methane	7.77	7.65		ug/L		98	85 - 120

Lab Sample ID: LCSD 480-438622/6
Matrix: Water
Analysis Batch: 438622

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Ethane	14.6	15.7		ug/L		108	79 - 120	3	50
Ethene	13.6	14.4		ug/L		106	85 - 120	1	50
Methane	7.77	8.17		ug/L		105	85 - 120	7	50

Method: 9060A - Organic Carbon, Total (TOC)

Lab Sample ID: MB 480-439311/27
Matrix: Water
Analysis Batch: 439311

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
TOC Result 1	0.482	J	1.0	0.43	mg/L			10/12/18 08:17	1
TOC Result 2	1.0	U	1.0	0.43	mg/L			10/12/18 08:17	1
Total Organic Carbon	1.0	U	1.0	0.43	mg/L			10/12/18 08:17	1

Method: 9060A - Organic Carbon, Total (TOC) (Continued)

Lab Sample ID: MB 480-439311/51
Matrix: Water
Analysis Batch: 439311

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
TOC Result 1	0.489	J	1.0	0.43	mg/L			10/12/18 20:18	1
TOC Result 2	1.0	U	1.0	0.43	mg/L			10/12/18 20:18	1
Total Organic Carbon	1.0	U	1.0	0.43	mg/L			10/12/18 20:18	1

Lab Sample ID: LCS 480-439311/28
Matrix: Water
Analysis Batch: 439311

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
TOC Result 1	60.0	59.4		mg/L		99	90 - 110
TOC Result 2	60.0	59.7		mg/L		99	90 - 110
Total Organic Carbon	60.0	60.1		mg/L		100	90 - 110

Lab Sample ID: LCS 480-439311/52
Matrix: Water
Analysis Batch: 439311

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
TOC Result 1	60.0	59.0		mg/L		98	90 - 110
TOC Result 2	60.0	60.5		mg/L		101	90 - 110
Total Organic Carbon	60.0	60.1		mg/L		100	90 - 110

QC Association Summary

Client: Ashland LLC
Project/Site: Ashland Rensselaer

TestAmerica Job ID: 480-142989-2

GC/MS VOA

Analysis Batch: 438996

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-142989-10	Trip Blank	Total/NA	Water	8260C	
MB 480-438996/7	Method Blank	Total/NA	Water	8260C	
LCS 480-438996/5	Lab Control Sample	Total/NA	Water	8260C	

Analysis Batch: 439286

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-142989-9	MW-25-100418	Total/NA	Water	8260C	
MB 480-439286/8	Method Blank	Total/NA	Water	8260C	
LCS 480-439286/5	Lab Control Sample	Total/NA	Water	8260C	

Analysis Batch: 439557

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-142989-9 - DL	MW-25-100418	Total/NA	Water	8260C	
MB 480-439557/7	Method Blank	Total/NA	Water	8260C	
LCS 480-439557/5	Lab Control Sample	Total/NA	Water	8260C	

GC VOA

Analysis Batch: 438622

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-142989-9	MW-25-100418	Total/NA	Water	RSK-175	
480-142989-9 - DL	MW-25-100418	Total/NA	Water	RSK-175	
MB 480-438622/4	Method Blank	Total/NA	Water	RSK-175	
LCS 480-438622/5	Lab Control Sample	Total/NA	Water	RSK-175	
LCSD 480-438622/6	Lab Control Sample Dup	Total/NA	Water	RSK-175	

General Chemistry

Analysis Batch: 439311

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-142989-9	MW-25-100418	Total/NA	Water	9060A	
MB 480-439311/27	Method Blank	Total/NA	Water	9060A	
MB 480-439311/51	Method Blank	Total/NA	Water	9060A	
LCS 480-439311/28	Lab Control Sample	Total/NA	Water	9060A	
LCS 480-439311/52	Lab Control Sample	Total/NA	Water	9060A	

Lab Chronicle

Client: Ashland LLC
Project/Site: Ashland Rensselaer

TestAmerica Job ID: 480-142989-2

Client Sample ID: MW-25-100418

Lab Sample ID: 480-142989-9

Date Collected: 10/04/18 11:28

Matrix: Water

Date Received: 10/05/18 01:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		20	439286	10/13/18 21:08	AEM	TAL BUF
Total/NA	Analysis	8260C	DL	200	439557	10/16/18 07:38	KMN	TAL BUF
Total/NA	Analysis	RSK-175		1	438622	10/10/18 13:16	DSC	TAL BUF
Total/NA	Analysis	RSK-175	DL	22	438622	10/10/18 15:51	DSC	TAL BUF
Total/NA	Analysis	9060A		1	439311	10/12/18 23:17	SMH	TAL BUF

Client Sample ID: Trip Blank

Lab Sample ID: 480-142989-10

Date Collected: 10/04/18 00:00

Matrix: Water

Date Received: 10/05/18 01:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	438996	10/12/18 07:11	KMN	TAL BUF

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

Accreditation/Certification Summary

Client: Ashland LLC
Project/Site: Ashland Rensselaer

TestAmerica Job ID: 480-142989-2

Laboratory: TestAmerica Buffalo

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
New York	NELAP	2	10026	03-31-19

Laboratory: TestAmerica Savannah

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
	AFCEE		SAVLAB	
Alabama	State Program	4	41450	06-30-19
Alaska	State Program	10		06-30-19
Alaska (UST)	State Program	10	UST-104	09-22-19
ANAB	DoD ELAP		L2463	09-22-19
ANAB	ISO/IEC 17025		L2463.01	09-22-19
Arizona	State Program	9	AZ0808	12-14-18
Arkansas DEQ	State Program	6	88-0692	02-01-19
California	State Program	9	2939	06-30-19
Colorado	State Program	8	N/A	12-31-18
Connecticut	State Program	1	PH-0161	03-31-19
Florida	NELAP	4	E87052	06-30-19
GA Dept. of Agriculture	State Program	4	N/A	06-12-19
Georgia	State Program	4	N/A	06-30-19
Guam	State Program	9	15-005r	04-17-19
Hawaii	State Program	9	N/A	06-30-19
Illinois	NELAP	5	200022	11-30-18
Indiana	State Program	5	N/A	06-30-19
Iowa	State Program	7	353	06-30-19
Kentucky (DW)	State Program	4	90084	12-31-18
Kentucky (UST)	State Program	4	18	06-30-19
Kentucky (WW)	State Program	4	90084	12-31-18 *
Louisiana	NELAP	6	30690	06-30-19
Louisiana (DW)	NELAP	6	LA160019	12-31-18
Maine	State Program	1	GA00006	09-25-20
Maryland	State Program	3	250	12-31-18
Massachusetts	State Program	1	M-GA006	06-30-19
Michigan	State Program	5	9925	03-05-19
Mississippi	State Program	4	N/A	06-30-19
Nebraska	State Program	7	TestAmerica-Savannah	06-30-19
New Jersey	NELAP	2	GA769	06-30-19
New Mexico	State Program	6	N/A	06-30-19
New York	NELAP	2	10842	03-31-19
North Carolina (DW)	State Program	4	13701	07-31-19
North Carolina (WW/SW)	State Program	4	269	12-31-18
Oklahoma	State Program	6	9984	08-31-19
Pennsylvania	NELAP	3	68-00474	06-30-19
Puerto Rico	State Program	2	GA00006	12-31-18
South Carolina	State Program	4	98001	06-30-18 *
Tennessee	State Program	4	TN02961	06-30-19
Texas	NELAP	6	T104704185-16-9	11-30-18
Texas (DW)	State Program	1	T104704185	06-30-19
US Fish & Wildlife	Federal		LE058448-0	07-31-19
Virginia	NELAP	3	460161	06-14-19

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Accreditation/Certification Summary

Client: Ashland LLC
Project/Site: Ashland Rensselaer

TestAmerica Job ID: 480-142989-2

Laboratory: TestAmerica Savannah (Continued)

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Washington	State Program	10	C805	06-10-19
West Virginia (DW)	State Program	3	9950C	12-31-18
West Virginia DEP	State Program	3	094	06-30-19
Wisconsin	State Program	5	999819810	08-31-19
Wyoming	State Program	8	8TMS-L	06-30-16 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: Ashland LLC
Project/Site: Ashland Rensselaer

TestAmerica Job ID: 480-142989-2

Method	Method Description	Protocol	Laboratory
8260C	Volatile Organic Compounds by GC/MS	SW846	TAL BUF
RSK-175	Dissolved Gases (GC)	RSK	TAL BUF
9060A	Organic Carbon, Total (TOC)	SW846	TAL BUF
5030C	Purge and Trap	SW846	TAL BUF

Protocol References:

RSK = Sample Prep And Calculations For Dissolved Gas Analysis In Water Samples Using A GC Headspace Equilibration Technique, RSKSOP-175, Rev. 0, 8/11/94, USEPA Research Lab
SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

Sample Summary

Client: Ashland LLC
Project/Site: Ashland Rensselaer

TestAmerica Job ID: 480-142989-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
480-142989-9	MW-25-100418	Water	10/04/18 11:28	10/05/18 01:15
480-142989-10	Trip Blank	Water	10/04/18 00:00	10/05/18 01:15

TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228
Phone: 716.691.2600 Fax: 716.691.7991

Chain of Custody Record

243214

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.
TAL-8210 (0713)

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

Client Contact	Project Manager: Joe Zasso	Site Contact: K. Bidwell	Date: 10/4/18	COC No:
Company Name: ARCADIS	Tel/Fax:	Lab Contact:	Carrier:	1 of 1 COCs
Address: 855 RTE 146 STE 210	Analysis Turnaround Time			Sampler: JS
City/State/Zip: Clifton Park, NY 12065	☑ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
Phone: (518) 250-7300	TAT if different from Below Standard			Walk-in Client:
Fax:	☐ 2 weeks			Lab Sampling:
Project Name: Ashland Ren.	☐ 1 week			
Site:	☐ 2 days			Job / SDG No.:
P O #	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	VOCs	TOCs	RSK	Sample Specific Notes:
MW-25-100418	10/4/18	1128	G	W	8			✓	✓	✓	
Trip Blank	↓	—	—	↓	1			✓			

10-4-18

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☐ Disposal by Lab ☑ Archive for Standard Months

Special Instructions/QC Requirements & Comments:

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.:	Cooler Temp. (°C): Obs'd: 3.0 Corr'd:	Therm ID No.: 3

	Relinquished by:	Company	Date/Time:	Received by:	Company:	Date/Time:
1	Jessica Steigerwald Emanuel Sarsa	ARCADIS	10/4/18	Tim Kneller	TA	10-4-18 1357
2	Tim Kneller	TA	10-4-18 1800		TAB	10/5/18 0115
3				Received in Laboratory by:		

Login Sample Receipt Checklist

Client: Ashland LLC

Job Number: 480-142989-2

Login Number: 142989
List Number: 2
Creator: Kinecki, Kenneth P

List Source: TestAmerica Buffalo

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	