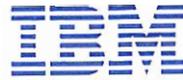


INVESTIGATION DATA REPORT
SUPPLEMENTAL VAPOR INTRUSION ASSESSMENT

*Former IBM Manassas Facility
Manassas, Virginia*

*Prepared for IBM Corporate Environmental Affairs
File No. 2732.05*



8976 Wellington Road
Manassas, VA 20109

December 13, 2012

Barbara Smith
US EPA Region III (3LC20)
1650 Arch Street
Philadelphia, PA 19103-2029

Re: Investigation Data Report - Final
Supplemental Vapor Intrusion Assessment
IBM Corporation, Manassas, VA

Dear Ms. Smith:

Enclosed please find two (2) copies of the final *Investigation Data Report*, dated December 13, 2012. The report includes data and observations from the drilling, installation, and initial sampling of subsurface gas and groundwater monitoring implants and wells at the former IBM Manassas facility which was conducted during June and July 2012. The enclosed report addresses EPA's comments on the draft report which were provided to IBM in a letter, dated December 3, 2012.

If you have any questions or need additional information, please contact me at (703) 257-2583.

Sincerely yours,

Dean W. Chartrand
Groundwater Project Coordinator

Enclosure

Cc:	Jutta Schneider	VDEQ	(w/ enclosure)
	Richard Doucette	VDEQ	(w/ enclosure)
	Lisa Jacob	Sanborn Head and Associates, Inc	(w/o enclosure)

Mr. Dean Chartrand
IBM Corporate Environmental Affairs
8976 Wellington Road
Manassas, VA 20109

December 13, 2012
File No. 2732.05

Re: Investigation Data Report
Supplemental Vapor Intrusion Assessment
Former IBM Manassas Facility
Manassas, Virginia

Dear Mr. Chartrand:

The attached document presents data and observations recorded during the drilling, installation, and initial sampling of subsurface gas and groundwater monitoring devices at the referenced site, conducted in June and July 2012. This work was completed as part of the Supplemental Vapor Intrusion Assessment associated with the former IBM Manassas facility.

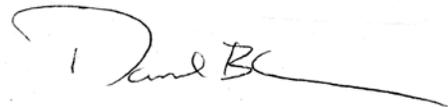
This report addresses comments provided by USEPA on the draft report dated October 30, 2012. We understand that this report will be placed in the public information repository, following receipt of a letter from USEPA granting approval.

Thank you for the opportunity to serve you on this project. Please contact us with any questions.

Very truly yours,
SANBORN, HEAD & ASSOCIATES, INC.



Lisa J. Jacob, P.G.
Senior Project Manager



Daniel B. Carr, P.E., P.G.
Principal and Vice President

EMB/LJJ/DBC: emb

Encl. Investigation Data Report

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1.0 INTRODUCTION

This report transmits data, observations, and findings from the installation and initial sampling of additional monitoring devices in June and July 2012. This work was conducted by Sanborn, Head & Associates, Inc. (Sanborn Head) as a part of the Supplemental Vapor Intrusion Assessment associated with the former IBM Manassas facility in Manassas, Virginia. The work was completed in accordance with the project Work Plan¹ and April 2012 addendum² with approval from the United States Environmental Protection Agency (USEPA). We understand that this report will be submitted to USEPA for review.

The supplemental vapor intrusion assessment is focused on an area of the Bristoe Station neighborhood across the northerly facility property boundary adjacent to the Building 101 (B101) area of the former IBM Manassas Facility. The objective of the work is to assess the presence or absence of volatile organic compounds (VOCs), principally tetrachloroethene (PCE) in the subsurface gas and groundwater, and to evaluate the potential for subsurface vapor migration that could lead to intrusion into occupied structures in the vicinity. The investigation area is shown on Figure 1. Sanborn Head's work and this report are subject to the limitations presented in Appendix A.

The findings of prior drilling and monitoring point installation work were reported in a July 29, 2011 Interim Report³ and in a progress data report prepared after 12 months of periodic monitoring of these installations⁴. The additional subsurface investigations, monitoring point installation and testing work conducted in June and July 2012 were intended to increase the spatial resolution of the monitoring network. The locations were selected to support development of a possible structure sampling program to be conducted during the 2012/2013 heating season, and for monitoring the performance of new groundwater and subsurface vapor extraction capacity. The work included coordination, observation, and logging of:

- Drilling and installation of four foundation depth implants (SG-114, -116, -119, and -122, shown on Figure 1) in soil, nominally 5 to 6 feet below ground surface (ft bgs);
- Drilling and installation of multi-depth vapor, groundwater, and vacuum monitoring devices at seven locations (SG-115, -117, -118, -120, -121, and -123 off-site, and SG-31/D-86 on the B101 property, shown on Figure 1);

¹ Sanborn, Head & Associates, Inc., October 15, 2010, "Updated Work Plan for Supplemental Vapor Intrusion Assessment, Former IBM Manassas Facility, Manassas, Virginia."

² Sanborn, Head & Associates, Inc. April 16, 2012, "Work Plan Addendum, Supplemental Vapor Intrusion Assessment, Former IBM Manassas Facility, Manassas, Virginia"

³ Sanborn, Head & Associates, Inc., July 29, 2011, "Interim Report of Findings, Supplemental Vapor Intrusion Assessment, Former IBM Manassas Facility, Manassas, Virginia."

⁴ Sanborn, Head & Associates, Inc. October 17, 2012, "12-Month Monitoring Data Report, Supplemental Vapor Intrusion Assessment, Former IBM Manassas Facility, Manassas, Virginia."

- An initial sampling of the newly-installed monitoring points;
- Water level and differential pressure monitoring of new and selected existing points; and
- Review of analytical laboratory data collected in accordance with the Work Plan by a third party to validate the data usability against data quality objectives.

This work was completed prior to beginning enhanced extraction of groundwater and subsurface vapor from four on-site wells near the property boundary on July 15, 2012. Continued monitoring of enhanced groundwater and vapor extraction effects, including expansion of vacuum conditions and enhanced hydraulic capture, will be assessed and reported separately.

An overview of the investigations and testing field program is provided in Appendix B. Work was conducted and locations installed and constructed in general accordance with the Work Plan Addendum and the July 2011 Interim Report. In addition to the proposed monitoring depths, two additional screened intervals were added (SG-117-23 and SG-118-22), to provide the capability to monitor fractured intervals observed during drilling and rock core logging. Further description is provided in Appendix B. Analytical laboratory data and the findings of data validation and usability review are compiled in Appendices C and D, respectively.

2.0 DATA AND OBSERVATIONS

This section summarizes data and observations recorded during drilling, installation, and sampling of monitoring points installed in June and July 2012. Water levels and differential pressure conditions recorded from the newly installed monitoring locations are also discussed. Figures 2A through 2E provide summaries of analytical laboratory data, inferred groundwater elevation contours and flow directions, and inferred vacuum contours for each of five depth zones.

2.1 Subsurface Conditions

The new explorations encountered soils and bedrock conditions generally similar to those described in previous reports. Bedrock was typically encountered underlying 5 to 6 feet of residual silty clay soil derived from in place weathering of the rock. The rock was primarily reddish siltstone interbedded with lesser amounts of sandstone and shale. The detailed logs of each boring and monitoring point installation detailing these observations are provided in Appendix B.

Histograms of fracture data are also provided in Appendix B. As with prior drilling work, in most cases, the majority of fractures were observed to be near-horizontal, bedding-plane-parallel features, and the density of fracturing generally decreased with depth. Extremely fractured zones (EFZs), which are defined as intervals where individual fractured cannot be distinguished, were observed generally above a depth of about 25 ft bgs, consistent with prior drilling. As a generality, boreholes at locations SG-115, -117, and -118 exhibited fewer fractures than prior drilling with mean fracture spacing (MFS) greater than 0.8 feet,

above the upper-end MFS found in prior work. Locations SG-120 and -121 exhibited a greater fracture density, greater proportion of steeply dipping joints, and the presence of EFZs at depths greater than 25 ft bgs. In borehole SG-121, the majority of fracturing was observed to be moderately dipping with a greater proportion of steeply dipping joints and EFZs in the depth intervals from 20 to 35 ft bgs.

Intervals of intact unfractured rock or rock exhibiting only sparse near horizontal fracturing were encountered in all of the boreholes, which are inferred to represent “aquitard” intervals limiting vertical transport of water and gas. Notably, only four horizontal fractures were encountered in the bottom ten feet of SG-117 in the courtyard area of McRae Court.

2.2 Groundwater Levels and Flow Directions

Table 1 provides a summary of groundwater elevations recorded during a comprehensive monitoring event after the new monitoring points were installed. Figures 2C through 2E depict inferred potentiometric surface elevation contours and groundwater flow directions based on water levels recorded on July 13, 2012. Groundwater extraction from wells D-39 and D-80 continued during this characterization sampling as did operation of the B101 vapor extraction (VES) system. Enhanced extraction of vapor and groundwater near the B101 property line had not yet started by the time data and observations discussed here were recorded.

In general, groundwater flow patterns are similar to those observed under similar seasonal dry conditions in August 2011 and reported in the 12-Month Monitoring Data Report but with greater spatial resolution. SG-120 and -121 were found to be dry to the bottom of the screened intervals at depths of 32.5 and 33 ft bgs, respectively.

2.3 Subsurface Vacuum Conditions

Differential pressure measurements (i.e., measurements of the gauge pressure difference between the open atmosphere and subsurface) recorded during the monitoring period are summarized in Table 1. Positive values indicate subsurface pressures greater than ambient atmospheric pressure, and negative values indicate subsurface pressures below atmospheric pressure (i.e., vacuum conditions). The differential pressure measurements reflect the superimposed influences of barometric pressures and VES operations. Contours of inferred vacuum conditions are shown in purple on Figures 2A through 2E.

Vacuum conditions continue to be observed at all monitoring depths, with a higher frequency and magnitude of vacuum generally recorded for monitoring intervals greater than 25 ft bgs and for shallower monitoring points close to the original extraction points near B101. As a generality, a greater magnitude and consistency of vacuum conditions are observed east-southeast of McRae Court where SG-120 and -121 have been found to be dry and a higher proportion of fracturing has been observed. The overall pattern of vacuum distribution continues to be consistent with downward airflow, and flow back towards the VES. In general, the areal extent of the vacuum field believed attributable to VES operations also generally increases with depth as shown on Figures 2B through 2E.

3.0 SAMPLING AND ANALYSIS OF GROUNDWATER AND SUBSURFACE GAS

During the July 2012 characterization sampling of newly installed monitoring points, gas and groundwater samples were collected using methods described in previous reports. Consistent with the Work Plan, vapor samples were collected in 1-liter Summa®-type evacuated canisters with 1-hour flow controllers, from locations with sufficient air-filled porosity. Where there was insufficient air-filled porosity to allow sampling via 1-liter canisters, grab samples of gas were collected via a disposable syringe and placed into evacuated glass vials. Grab water samples were also collected via peristaltic pump or syringe from water-filled implant locations. Results of subsurface gas and groundwater grab sampling are considered screening-level data.

Due to ongoing monitoring of differential pressure and water levels associated with the expanded VES network, use of passive diffusion bag sampling technology was not possible. As an alternative, bailer samples were collected from well points with sufficient water volume. PCE concentrations in gas and groundwater samples are presented in Table 2, along with data collected from existing monitoring points in June 2012. The analytical laboratory reports from July characterization sampling are included in Appendix C.

Groundwater samples were analyzed for 60 VOCs included on the USEPA Method #8021 analyte list. As shown in Table 3, 15 compounds including PCE were detected above laboratory reporting limits in one or more groundwater samples. Several of the compounds are indicative of chlorination of municipal drinking water and may represent the continued presence of potable water used during drilling in the vicinity of the monitoring points. These compounds were generally detected at low concentrations in the presence of higher concentrations of chlorinated ethenes. As such, the discussion in Section 3.2 focuses on PCE.

3.1 Data Quality and Validation

Data derived from Summa® canister samples and groundwater analytical data were subject to independent usability review and validation by New Environmental Horizons, Inc. All of the data were found to be usable for the project objectives, subject to certain qualifications. In total, less than 1% of the data recorded for all analyzed compounds were subject to qualifiers. PCE was detected in a single trip blank at 1.8 micrograms per liter ($\mu\text{g/L}$) which is comparable to concentrations in some of the groundwater samples, indicating the potential for a high bias. A vinyl chloride concentration detected in a single groundwater sample also was qualified due to high recovery in a laboratory control sample. There were no field duplicate pairs analyzed for this sampling round. Data validation and usability reports are included in Appendix D.

3.2 Summary of PCE Data and Observations

Representations of PCE data recorded for subsurface gas and groundwater samples are depicted in Figures 2A through 2E. The values and graphical bubble size posted on the figures reflect PCE concentrations recorded during June 2012 routine monitoring of existing locations and July 2012 characterization sampling of newly-installed monitoring points. Inferred subsurface vacuum conditions and groundwater elevation contours and

flow directions are included on the figures to provide context for the June and July 2012 sampling results.

The following notable observations are highlighted from this initial sampling:

- PCE and other associated chlorinated ethenes were not detected in sampling of the new foundation depth (5 to 6 foot depth) implants SG-116 and -114 located in and northwest of McRae Court. PCE and associated compounds either were not detected or only found at trace concentrations (e.g., less than 1 µg/L in groundwater) at greater depth at these locations. The trace detections are in the range of historically observed concentrations in trip blanks.
- Elsewhere, the data from new monitoring locations screening the first water bearing zone nominally from 25 to 30 feet bgs indicate conditions consistent with relatively low aqueous concentrations of PCE ranging from 1.7 to 20 µg/L.
- The data continue to support the presence of a diving plume and cleaner water lens above the historical monitoring depth.

Additional repeat sampling of these newly installed points was incorporated into the routine quarterly monitoring program starting in August 2012.

4.0 SUMMARY AND CLOSING

In accordance with the Work Plan, we have successfully installed and completed an initial sampling of monitoring points both on and off B101 property in a manner consistent with the goals of the Work Plan addendum. The locations are being used in part for performance monitoring of enhanced extraction of groundwater and gas, and the findings will be considered in the possible development of a program of confirmatory structure sampling during 2012/2013 heating season.

Other objectives of the work were to establish a wider spatial network for monitoring subsurface conditions, and to more fully define the area of interest with respect to the potential for vapor intrusion. We have met these objectives, and continue to conclude that the focus of vapor intrusion is outside the southeast corner of McRae Court.

TABLES

Table 1
Water Level and Differential Pressure Data
Investigation Data Report
Supplemental Vapor Intrusion Assessment
Former IBM Manassas
Manassas, Virginia

Monitoring Depth	Location	Ref. Point	Reference Elevation (ft AMSL)	DTW (ft)	WLE (ft AMSL)	Differential Pressure (in.H ₂ O)
5 to 8 ft Depth	SG-06-8	-	-	-	-	0
	SG-07	-	-	-	-	-0.03
	SG-08	-	-	-	-	0.34
	SG-09	-	-	-	-	-1.5
	SG-10	-	-	-	-	4.6
	SG-11	-	-	-	-	-0.21
	SG-12	-	-	-	-	0.43
	SG-13	-	-	-	-	0.2
	SG-14	-	-	-	-	-2.7
	SG-15	-	-	-	-	-0.04
	SG-16	-	-	-	-	-1.7
	SG-17	-	-	-	-	-0.01
	SG-18	-	-	-	-	-0.004
	SG-19	-	-	-	-	0
	SG-20	-	-	-	-	0
	SG-21	-	-	-	-	0
	SG-22	-	-	-	-	-0.03
	SG-23	-	-	-	-	0
	SG-24	-	-	-	-	0.54
	SG-25	-	-	-	-	-0.37
	SG-26	-	-	-	-	0.01
	SG-27	-	-	-	-	-0.03
	SG-28	-	-	-	-	0
	SG-29	-	-	-	-	0.01
	SG-30	-	-	-	-	-0.9
	SG-101	-	-	-	-	0
SG-103	-	-	-	-	0	
SG-104	-	-	-	-	0.04	
SG-105	-	-	-	-	0.02	
SG-107	-	-	-	-	-0.35	
SG-109	-	-	-	-	-0.01	
SG-110	-	-	-	-	-0.02	
SG-112	-	-	-	-	-0.01	
SG-114	-	-	-	-	0	
SG-116	-	-	-	-	-0.01	
SG-119	-	-	-	-	-4.7	
SG-122	-	-	-	-	0	
10 to 12 ft Depth	SG-04-10	-	-	-	-	-0.32
	SG-05-10	-	-	-	-	-23
	SG-102S	-	-	-	-	-4.8
	SG-106S	-	-	-	-	0.003
	SG-108S	-	-	-	-	0.01
	SG-111S	-	-	-	-	0
	SG-113S	-	-	-	-	4.7
	SG-115S	-	-	-	-	2.4
	SG-117S	-	-	-	-	0
	SG-118S	-	-	-	-	0.02
	SG-120S	-	-	-	-	-19
	SG-121S	-	-	-	-	-8.2
	SG-123S	-	-	-	-	-0.01
SG-31S	-	-	-	-	0	
25 to 30 ft Depth	D-74	WLMP	248.78	16.16	232.62	-50
	D-75	WLMP	248.91	14.25	234.66	0.01
	D-76	TOC	250.25	-	-	-
	D-77	TOC	250.54	-	-	-
	D-78	TOC	250.16	-	-	-
	SG-04-25	-	-	-	-	0.13
	SG-05-25	-	-	-	-	-22
	SG-06-25	-	-	-	-	0.38
	SG-102I	TOR	245.75	20.79	224.96	-1.8
	SG-106I	TOR	249.78	24.07	225.71	0.004
	SG-108I	TOR	251.38	26.59	224.79	-0.01
	SG-111I	TOR	252.31	29.89	222.42	-7.6
	SG-113I	TOR	247.00	14.88	232.12	8.4
	SG-115I	TOR	246.77	31.26	215.51	-5.2
	SG-117I	TOR	253.23	28.47	224.76	0.08
	SG-118I	TOR	248.73	20.64	228.09	0.06
	SG-120I	TOR	250.89	>31.56	<219.33	
	SG-121I	TOR	252.64	>32.56	<220.08	-11
	SG-123I	TOR	253.65	27.05	226.60	0
	SG-31I	TOR	245.76	22.64	223.12	0.2
SG-04-45	-	-	-	-	-0.41	
SG-05-45	-	-	-	-	-26	
SG-06-44	-	-	-	-	-16	

Table 1
Water Level and Differential Pressure Data
Investigation Data Report
Supplemental Vapor Intrusion Assessment
Former IBM Manassas
Manassas, Virginia

Monitoring Depth	Location	Ref. Point	Reference Elevation (ft AMSL)	DTW (ft)	WLE (ft AMSL)	Differential Pressure (in.H ₂ O)
45 to 50 ft Depth	SG-102D	-	-	-	-	-4.9
	SG-106D	TOR	249.81	42.89	206.92	-11
	SG-108D	TOR	251.40	45.44	205.96	-11
	SG-111D	TOR	252.31	41.20	211.11	0.01
	SG-113D	TOR	246.98	41.67	205.31	-6.8
	SG-31D	TOR	245.79	45.65	200.14	0.07
70 to 80 ft Depth	D-68	WLMP	249.58	77.68	171.90	-28
	D-69	WLMP	250.05	83.30	166.75	-18
	D-70	WLMP	248.23	71.56	176.67	-13
	D-71	WLMP	248.20	77.26	170.94	-0.16
	D-72	WLMP	247.61	71.13	176.48	-9
	D-73	WLMP	247.41	69.70	177.71	-14
	D-81	TOC	243.03	60.78	182.25	-0.05
	D-82	TOC	244.94	62.43	182.51	-0.64
	D-83	TOC	246.10	67.30	178.80	-0.48
	D-84	TOC	245.72	73.49	172.23	-4.4
	D-85	TOC	246.49	61.25	185.24	-0.11
	D-86	TOR	245.68	67.08	178.60	-1.1
	OF-54	TOR	252.18	72.49	179.69	-12
	OF-55	TOR	247.31	68.65	178.66	-0.6
Miscellaneous	SG-04	TOR	246.68	41.77	204.91	-
	SG-05	TOR	246.83	>45.3	<201.53	-
	SG-06	TOR	247.32	>45.5	<201.82	-
	S-38	TOC	250.48	13.80	236.68	-
	S-41	TOC	250.39	>47.2	<203.19	-
	S-42	TOC	250.04	>62.7	<187.34	-
	MW-08	TOC	248.98	71.61	177.37	-
	SG-118-22	TOR	248.73	13.70	235.03	0.08
	SG-117-23	TOR	253.22	18.09	235.13	-0.01

Notes:

1. This table is intended to summarize water levels and differential pressure measurements recorded during characterization sampling of newly installed monitoring points in the Building 101 area at the former IBM facility in Manassas, Virginia.
2. Measurements were recorded by Sanborn Head personnel on July 13, 2012. Water levels are recorded as feet below the reference point as marked on the monitoring well or multi-depth implant. Differential pressures were recorded using a Dwyer Serice 475 hand held digital micromanometer measuring ranges of 0-1 and 0-40 inches of water column (in.H₂O). The rated accuracy at near room temperature is +/- 0.5% of full scale or about 0.005 inches of water for the 0-1" micromanometer.
3. Refer to the report text for additional details.
4. WLMP = Water level measurement point
TOR = Top of riser

Table 2
Summary of PCE in Subsurface Gas and Groundwater Samples
Investigation Data Report
Supplemental Vapor Intrusion Assessment
Former IBM Manassas Facility
Manassas, Virginia

Subsurface Gas ($\mu\text{g}/\text{m}^3$)

Monitoring Depth	Location	June 2012		July 2012	
		Result	Method	Result	Method
5 to 6' Depth	SG-07	16	C		
	SG-10	10	C		
	SG-12	630,000	C		
	SG-18				
	SG-19	42	C		
	SG-20	32	C		
	SG-21	39	C		
	SG-24				
	SG-26	95	C		
	SG-27				
	SG-28	3,500	C		
	SG-29				
	SG-30	52	C		
	SG-101	<5.4 U / <5.6 U	C		
	SG-103	14	C		
	SG-104	160	S		
	SG-105	56	C		
	SG-107	1,700	C		
	SG-109	<5.8 U	C		
	SG-110	58 J	S		
SG-112	7.6	C			
SG-114			<5.7 U / 5.7 U	C	
SG-116			<6.3 U	C	
SG-119			<8.9 U	C	
SG-122			64	C	
10 to 12' Depth	SG-04-10	<5.7 U	C		
	SG-05-10	19	C		
	SG-06-8	35 / 35	C		
	SG-102S	260	S		
	SG-106S	3,100 J	C		
	SG-108S	95	C		
	SG-111S	200 / 190	C		
	SG-113S	33 J	S		
	SG-115S				
	SG-117S				
	SG-118S			9.8	C
	SG-120S			56	C
	SG-121S			<6.1 U	C
	SG-123S			130	C
SG-31S			1,400	C	
25 to 30' Depth	SG-05-25	25,000	C		
	SG-111I	9.3	C		
	SG-115I				
	SG-117I				
	SG-118I				
	SG-120I			30,000	C
	SG-121I			<5.7 U	C
	SG-123I				
SG-31I					
45 to 50' Depth	SG-05-45	1,500	C		
	SG-06-44	220,000	C		
	SG-102D	26,000	C		
	SG-106D	600,000	C		
	SG-108D	200,000	C		
	SG-113D	620	C		
SG-31D			46	C	

Groundwater ($\mu\text{g}/\text{L}$)

Monitoring Depth	Location	June 2012		July 2012	
		Result	Method	Result	Method
5 to 6' Depth	SG-103				
	SG-104				
	SG-107				
	SG-109				
	SG-112				
10 to 12' Depth	SG-102S				
	SG-113S				
	SG-115S			<0.5 U	S
25 to 30' Depth	SG-102I	0.1 J	D		
	SG-106I	240	D		
	SG-108I	100	D		
	SG-111I	5.4	D		
	SG-113I	<0.5 U	D		
	SG-115I			0.6	B
	SG-117I			0.2 J B	B
	SG-118I			20	B
	SG-123I			6.2	B
SG-31I			7.0	B	
45 to 50' Depth	SG-106D	1,900	D		
	SG-108D				
	SG-111D	0.2 J	D		
	SG-113D	0.7	D		
	SG-31D			0.8	B
70 to 80' Depth	OF-54	340	D		
	OF-55	180 / 1,500	D		
	D-68				
	D-69				
	D-70				
	D-71				
	D-72				
	D-73				
	D-74				
	D-75				
	D-81				
	D-82				
	D-83				
	D-84				
D-85					
D-86			450	B	
Other Depths	SG-117-23			<0.5 U	B
	SG-118-22			1.7	B
Equipment/Field Blank		0.1 J		<0.5 U	
Trip Blank		<0.5 U		1.8	

Notes:

1. Soil vapor and groundwater quality monitoring was performed in the months noted by Sanborn Head. Previously-existing monitoring points were sampled in June; newly-installed locations were sampled in July. All previously-existing monitoring points from which subsurface gas or groundwater samples have historically been collected are listed, as well as new monitoring points. Where no laboratory analytical results are shown, no sample could be collected. Refer to field documentation in Appendix B.4 and the report text for additional details.
2. Subsurface gas samples collected into Summa®-type canisters were sent to Air Toxics, Ltd. of Folsom, CA and analyzed for the project-specific list of volatile organic compounds (VOCs) including tetrachloroethene (PCE) by method TO-15. Subsurface gas samples collected into evacuated glass vials were sent to Microseeps, Inc. of Pittsburgh, PA and analyzed for the project-specific list of VOCs by proprietary method AM4.02. Groundwater samples were sent to Lancaster Laboratories, Inc. of Lancaster, PA and analyzed for VOCs including PCE by USEPA method 8260B, 25 ml purge. Laboratory detections are emboldened.
3. Please refer to the letter report text and figure for additional details.
4. < and U = Result is below the limit of quantitation.
J = Result is estimated.
B = Analyte was also detected in an associated blank.
5. Vapor Samples were collected using evacuated Summa®-type canisters (C). Where there was not sufficient air available to fill a one-liter canister, gas was collected in evacuated glass vials via syringe (S). Groundwater samples were collected into 40 ml VOA vials, using several either a bailer (B) or syringe (S).
6. Duplicates are shown after the sample and "/", i.e. 24 / 19.
7. Red text indicates data validation action.

Table 3
Summary of VOCs Detected in Groundwater Samples

Investigation Data Report
 Supplemental Vapor Intrusion Investigation
 Manassas, Virginia

Name	CAS No.	SG-115S	SG-115I	SG-117-23	SG-117I	SG-118-22	SG-118I	SG-123I	SG-31I	SG-31D	D-86	Field Blank
		7/10/2012	7/10/2012	7/12/2012	7/12/2012	7/10/2012	7/10/2012	7/10/2012	7/11/2012	7/11/2012	7/11/2012	7/11/2012
Benzene	71-43-2	0.2 J	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<0.5
Bromodichloromethane	75-27-4	0.1 J	0.2 J	1.2	1.8	<0.5	0.5 J	<0.5	0.3 J	3.0	0.4 J	<0.5
Chloroform (Trichloromethane)	67-66-3	1.9	2.9	7.5	11	4.4	5.4	0.5	5.2	17	2.4	<0.5
Dibromochloromethane	124-48-1	<0.5	<0.5	0.2 J	0.3 J	<0.5	<0.5	<0.5	<0.5	0.6	<1.0	<0.5
Dichloroethene (cis-1,2-)	156-59-2	<0.5	0.2 J	<0.5	<0.5	<0.5	0.6	0.1 J	65	8.8	1.6	<0.5
Ethylbenzene	100-41-4	0.2 J	<0.5	0.2 J	<0.5	<0.5	0.1 J	0.1 J	0.1 J	<0.5	<1.0	<0.5
Isopropyltoluene (4-)	99-87-6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.3 J	0.2 J	<1.0	<0.5
Methylene Chloride (Dichloromethane)	75-09-2	<0.5	<0.5	<0.5	6.9	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<0.5
Naphthalene	91-20-3	<0.5	<0.5	0.6	0.5	<0.5	<0.5	<0.5	0.5	0.5	<1.0	<0.5
Tetrachloroethene (PCE)	127-18-4	<0.5	0.6	<0.5	0.2 JB	1.7	20	6.2	7.0	0.8	450	<0.5
Toluene	108-88-3	1.4	0.5 J	1.0	0.5	0.4 J	0.7	0.8	0.5 J	2.4	0.3 J	<0.5
Trichloroethene (TCE)	79-01-6	<0.5	0.5 J	<0.5	<0.5	<0.5	0.5 J	0.3 J	9.4	0.8	5.6	<0.5
Trichlorofluoromethane	75-69-4	<0.5	0.1 J	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<0.5
Trimethylbenzene (1,2,4-)	95-63-6	0.2 J	<0.5	0.3 J	0.1 J	<0.5	<0.5	<0.5	0.1 J	<0.5	<1.0	<0.5
Vinyl chloride	75-01-4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6 J	<0.5	<1.0	<0.5
Xylenes	1330-20-7	1.2	0.2 J	1.4	0.4 J	0.4 J	0.7	0.6	0.6	0.3 J	<1.0	<0.5

Notes:

- Groundwater quality monitoring was performed on the dates noted by Sanborn Head. Samples were sent to Lancaster Laboratories, Inc. of Lancaster, PA and analyzed for VOCs including PCE by USEPA method 8260B, 25 ml purge. Laboratory detections are emboldened. Only those compounds with one or more detections are shown.
- Please refer to the progress data report text and figures for additional details.
- All values are in micrograms per liter (µg/L).
- < and U = Result is below the limit of quantitation.
 J = Result is estimated.
 B = Analyte was also detected in an associated blank.
- All samples were collected in 40 ml VOA vials, either by passive diffusion bag, bailer, or syringe methods.
- Red text indicates data validation action.

FIGURES

Figure 1

Exploration Location Plan

Investigation Data Report
Supplemental Vapor Intrusion
Assessment
Former IBM Manassas Facility

Manassas, Virginia

Drawn By: J. Pierce
Designed By: L. Jacob
Reviewed By: D. Carr
Project No: 2732.05
Date: December 2012

Notes

This figure shows locations of subsurface explorations, including foundation-depth vapor implants, multi-level monitoring installations, and monitoring wells. The baseplan image was acquired from Google Maps and is dated Aug. 28, 2010. Image is not orthorectified.

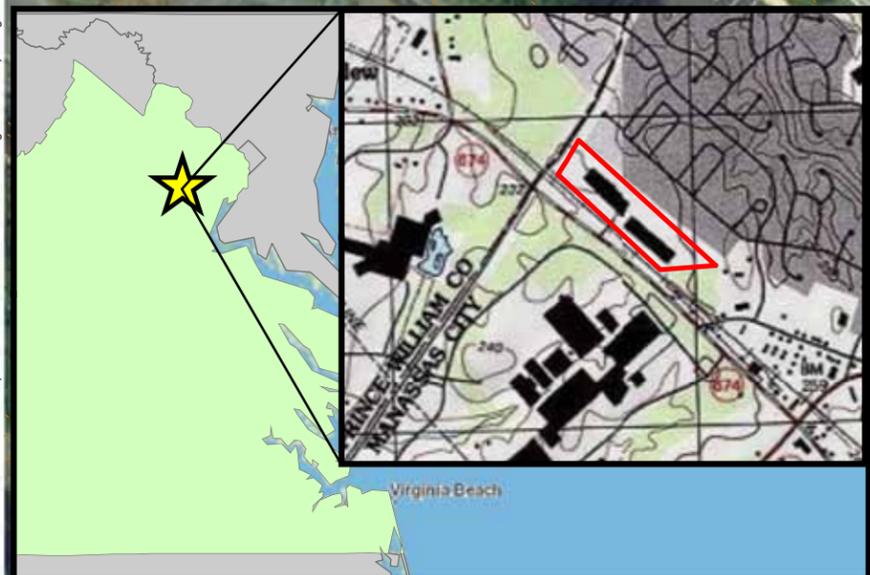
The locations for newly completed explorations are based on a survey by Ross, France, and Ratliff, Ltd. of Manassas, Virginia on July 18, 2012. Sanitary sewer manhole and line locations are based on mapping obtained through the City of Manassas Mapping Department in January 2010. The 2-foot topographic contours were produced as part of the 2006 and 2007 orthophotography update cycle of the Virginia Geographic Information Network's (VGIN) Virginia Base Mapping Program (VBMP).

Legend

- Sanitary Sewer Manhole
- Foundation Depth Vapor Implant
- Multi-Depth Vapor Implant
- ⊕ Monitoring Well
- ⊙ Groundwater Extraction Well
- ⊙ Vapor Extraction Well
- ⊙ Groundwater and Vapor Extraction Well
- Approximate Property/Fence Line
- Sanitary Sewer Line
- Vapor Extraction Well Area
- 2 ft Topographic Contour



MW-08 is located approximately 600 feet northeast of SG-113, adjacent to Ashton Avenue.



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Figure 2A
Observed Soil Vapor and Vacuum Conditions, 5 to 6' Monitoring Depth
 Investigation Data Report
 Supplemental Vapor Intrusion Assessment
 Former IBM Manassas Facility
 Manassas, Virginia

Drawn By: J. Pierce
 Designed By: L. Jacob
 Reviewed By: D. Carr
 Project No: 2732.05
 Date: December 2012

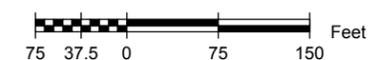
Figure Narrative

This figure is intended to show values of observed relative concentrations of PCE in gas and groundwater samples beneath the area of investigation, from the noted depth interval. Inferred equipotential groundwater contours and generalized groundwater flow directions inferred from July 2012 water level measurements are represented with blue contours and arrows. Inferred vacuum conditions observed during the July 2012 monitoring event are represented with purple contours. At the time measurements were taken, only the vapor extraction wells at B101 (see dashed yellow line) were in operation.

Actual groundwater and vacuum/vapor conditions include vertical components, and vary temporally. Conditions are likely more complex than shown. Other interpretations are possible.

Legend

- F Implant/Well Flooded with Water
- Differential Pressure Contour (in wc; dashed where inferred outside limits of available data)
- Vapor Extraction Well Area
- Potentiometric Contour (ft AMSL; dashed where inferred outside limits of available data; hatched to denote a depression)
- Generalized Groundwater Flow Direction
- Approximate Property/Fence Line
- Sanitary Sewer Line
- Paved Area
- Commercial Building
- Residential Building



PCE Concentrations	
Soil Vapor ($\mu\text{g}/\text{m}^3$)	Groundwater ($\mu\text{g}/\text{L}$)
PCE Not Detected	PCE Not Detected
0-50	0-5
50-100	5-10
100-1,000	10-100
1,000-10,000	100-1,000
>10,000	>1,000





Figure 2B
Observed Soil Vapor and Vacuum Conditions, 10 to 12' Monitoring Depth

Investigation Data Report
 Supplemental Vapor Intrusion Assessment
 Former IBM Manassas Facility
 Manassas, Virginia

Drawn By: J. Pierce
 Designed By: L. Jacob
 Reviewed By: D. Carr
 Project No: 2732.05
 Date: December 2012

Figure Narrative

This figure is intended to show values of observed relative concentrations of PCE in gas and groundwater samples beneath the area of investigation, from the noted depth interval. Inferred equipotential groundwater contours and generalized groundwater flow directions inferred from July 2012 water level measurements are represented with blue contours and arrows. Inferred vacuum conditions observed during the July 2012 monitoring event are represented with purple contours. At the time measurements were taken, only the vapor extraction wells at B101 (see dashed yellow line) were in operation.

Actual groundwater and vacuum/vapor conditions include vertical components, and vary temporally. Conditions are likely more complex than shown. Other interpretations are possible.

Legend

- F Implant/Well Flooded with Water
- Differential Pressure Contour (in wc; dashed where inferred outside limits of available data)
- Vapor Extraction Well Area
- Potentiometric Contour (ft AMSL; dashed where inferred outside limits of available data; hatched to denote a depression)
- Generalized Groundwater Flow Direction
- Approximate Property/Fence Line
- Sanitary Sewer Line
- Paved Area
- Commercial Building
- Residential Building

PCE Concentrations	
Soil Vapor ($\mu\text{g}/\text{m}^3$)	Groundwater ($\mu\text{g}/\text{L}$)
PCE Not Detected	PCE Not Detected
0-50	0-5
50-100	5-10
100-1,000	10-100
1,000-10,000	100-1,000
>10,000	>1,000

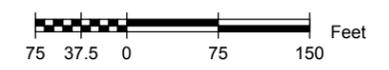




Figure 2C
Observed Soil Vapor and Vacuum Conditions, 25 to 30' Monitoring Depth

Investigation Data Report
Supplemental Vapor Intrusion Assessment
Former IBM Manassas Facility
Manassas, Virginia

Drawn By: J. Pierce
Designed By: L. Jacob
Reviewed By: D. Carr
Project No: 2732.05
Date: December 2012

Figure Narrative

This figure is intended to show values of observed relative concentrations of PCE in gas and groundwater samples beneath the area of investigation, from the noted depth interval. Inferred equipotential groundwater contours and generalized groundwater flow directions inferred from July 2012 water level measurements are represented with blue contours and arrows. Inferred vacuum conditions observed during the July 2012 monitoring event are represented with purple contours. At the time measurements were taken, only the vapor extraction wells at B101 (see dashed yellow line) were in operation.

Actual groundwater and vacuum/vapor conditions include vertical components, and vary temporally. Conditions are likely more complex than shown. Other interpretations are possible.

Legend

- F Implant/Well Flooded with Water
- Differential Pressure Contour (in wc; dashed where inferred outside limits of available data)
- Vapor Extraction Well Area
- Potentiometric Contour (ft AMSL; dashed where inferred outside limits of available data; hatched to denote a depression)
- Generalized Groundwater Flow Direction
- Approximate Property/Fence Line
- Sanitary Sewer Line
- Paved Area
- Commercial Building
- Residential Building

PCE Concentrations	
Soil Vapor ($\mu\text{g}/\text{m}^3$)	Groundwater ($\mu\text{g}/\text{L}$)
PCE Not Detected	PCE Not Detected
0-50	0-5
50-100	5-10
100-1,000	10-100
1,000-10,000	100-1,000
>10,000	>1,000





Figure 2D
Observed Soil Vapor and Vacuum Conditions, 45 to 50' Monitoring Depth

Investigation Data Report
Supplemental Vapor Intrusion Assessment
Former IBM Manassas Facility
Manassas, Virginia

Drawn By: J. Pierce
Designed By: L. Jacob
Reviewed By: D. Carr
Project No: 2732.05
Date: December 2012

Figure Narrative

This figure is intended to show values of observed relative concentrations of PCE in gas and groundwater samples beneath the area of investigation, from the noted depth interval. Inferred equipotential groundwater contours and generalized groundwater flow directions inferred from July 2012 water level measurements are represented with blue contours and arrows. Inferred vacuum conditions observed during the July 2012 monitoring event are represented with purple contours. At the time measurements were taken, only the vapor extraction wells at B101 (see dashed yellow line) were in operation.

Actual groundwater and vacuum/vapor conditions include vertical components, and vary temporally. Conditions are likely more complex than shown. Other interpretations are possible.

Legend

- F Implant/Well Flooded with Water
- Differential Pressure Contour (in wc; dashed where inferred outside limits of available data)
- Vapor Extraction Well Area
- Potentiometric Contour (ft AMSL; dashed where inferred outside limits of available data; hatched to denote a depression)
- Generalized Groundwater Flow Direction
- Approximate Property/Fence Line
- Sanitary Sewer Line
- Paved Area
- Commercial Building
- Residential Building



PCE Concentrations	
Soil Vapor ($\mu\text{g}/\text{m}^3$)	Groundwater ($\mu\text{g}/\text{L}$)
PCE Not Detected	PCE Not Detected
0-50	0-5
50-100	5-10
100-1,000	10-100
1,000-10,000	100-1,000
>10,000	>1,000





Figure 2E Observed Soil Vapor and Vacuum Conditions, 70 to 80' Monitoring Depth

Investigation Data Report
Supplemental Vapor Intrusion
Assessment
Former IBM Manassas Facility
Manassas, Virginia

Drawn By: J. Pierce
Designed By: L. Jacob
Reviewed By: D. Carr
Project No: 2732.05
Date: December 2012

Figure Narrative

This figure is intended to show values of observed relative concentrations of PCE in gas and groundwater samples beneath the area of investigation, from the noted depth interval. Inferred equipotential groundwater contours and generalized groundwater flow directions inferred from July 2012 water level measurements are represented with blue contours and arrows. Inferred vacuum conditions observed during the July 2012 monitoring event are represented with purple contours. At the time measurements were taken, only the vapor extraction wells at B101 (see dashed yellow line) were in operation.

Actual groundwater and vacuum/vapor conditions include vertical components, and vary temporally. Conditions are likely more complex than shown. Other interpretations are possible.

Legend

- F Implant/Well Flooded with Water
- Differential Pressure Contour (in wc; dashed where inferred outside limits of available data)
- Vapor Extraction Well Area
- Potentiometric Contour (ft AMSL; dashed where inferred outside limits of available data; hatched to denote a depression)
- Generalized Groundwater Flow Direction
- Approximate Property/Fence Line
- Sanitary Sewer Line
- Paved Area
- Commercial Building
- Residential Building

PCE Concentrations	
Soil Vapor ($\mu\text{g}/\text{m}^3$)	Groundwater ($\mu\text{g}/\text{L}$)
PCE Not Detected	PCE Not Detected
0-50	0-5
50-100	5-10
100-1,000	10-100
1,000-10,000	100-1,000
>10,000	>1,000



APPENDIX A
LIMITATIONS

APPENDIX A

LIMITATIONS

1. The conclusions described in this report are based in part on the data obtained from a finite number of soil gas and groundwater samples from widely spaced subsurface explorations. The figures are intended to depict inferred conditions during a given period of time, consistent with available information. The actual conditions will vary from that shown, both spatially and temporally. Other interpretations are possible. The nature and extent of variations between explorations may not become evident until further investigation is initiated. If variations or other latent conditions then appear evident, it may be necessary to re-evaluate the conclusions of this report.
2. Water levels were measured at times and under conditions stated in the report. Note that fluctuations in the level of the groundwater may occur due to variations in rainfall and other factors not evident at the time measurements were made.
3. The conclusions contained in this report are based in part upon various types of chemical data as well as historical and hydrogeologic information developed by previous investigators. While Sanborn Head has reviewed that data available to us at the time the report was prepared and information as stated in this report, any of Sanborn Head's interpretations and conclusions that have relied on that information will be contingent on its validity. Sanborn Head has not performed an independent assessment of the reliability of the data; should additional chemical data, historical information, or hydrogeologic information become available in the future, such information should be reviewed by Sanborn Head and the interpretations and conclusions presented herein may be modified accordingly.
4. Sampling and quantitative laboratory testing was performed by others as part of the investigation as noted within the report. Where such analyses have been conducted by an outside laboratory, unless otherwise stated in the report, Sanborn Head has relied upon the data provided, and has not conducted an independent evaluation of the reliability of these data. Moreover, it should be noted that variations in the types and concentrations of contaminants and variations in their distribution within groundwater and gas may occur due to the passage of time, seasonal water table fluctuations, recharge events, and other factors.
5. This report has been prepared for the exclusive use of the IBM Corporation for specific application to the former IBM Manassas facility in accordance with generally accepted hydrogeologic practices. No warranty, expressed or implied, is made. The contents of this report should not be relied on by any other party without the express written consent of Sanborn Head.
6. In preparing this report, Sanborn Head has endeavored to conform to generally accepted practices of other consultants undertaking similar studies at the same time and in the same geographical area. Sanborn Head has attempted to observe a degree of care and skill generally exercised by the technical community under similar circumstances and conditions.

7. The analyses and recommendations contained in this report are based on the data obtained from the referenced subsurface explorations. The explorations indicate subsurface conditions only at the specific locations and times, and only to the depths penetrated. They do not necessarily reflect strata variations that may exist between such locations. The validity of the recommendations is based in part on assumptions and inference Sanborn Head has made about conditions at the site. Such assumptions may be confirmed only during further investigation or remediation. If subsurface conditions different from those described become evident, the recommendations in this report must be re-evaluated.

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Appendix A\20121213 App A Limitations.docx

APPENDIX B

OVERVIEW OF FIELD PROGRAM

APPENDIX B.1
SUMMARY OF FIELD METHODS

APPENDIX B.1

OVERVIEW OF FIELD EXPLORATION AND TESTING PROGRAM

B.1.1 INTRODUCTION

This appendix describes the field exploration and testing program conducted by Sanborn, Head & Associates, Inc. (Sanborn Head). In accordance with the project Work Plan¹, the work included drilling and installation of foundation-depth vapor implants and multi-depth vapor/groundwater sampling installations. Work was initiated in mid June 2012 and completed in mid July 2012 as summarized in Exhibit B.1 below.

Exhibit B.1 – Summary of Field Investigation and Testing Activities

<i>Component</i>	<i>Dates</i>
Drilling, Logging, Construction/Installation of Monitoring Equipment	June 18 to July 12, 2012
Performance Testing	June 21 to July 13, 2012
Monitoring and Sampling of Subsurface Gas and Groundwater – Characterization Round	July 9 to July 13, 2012

The work was conducted in general accordance with the project goals and objectives as described in the project Work Plan, with few material deviations that are described in the sections to follow.

B.1.2 DRILLING PROGRAM

Sanborn Head contracted with Parratt Wolff, Inc. of East Syracuse, New York for drilling services at the site. Boreholes were advanced into subsurface soil and rock using the following techniques:

- Foundation-Depth Vapor Implants: Direct-push Geoprobe® drilling methods to 6 feet below ground surface (ft bgs);
- Multi-Depth Installations: Split-spoon soil sampling from the surface to refusal, followed by rock core drilling methods to depths ranging from 31 to 35.5 ft bgs; and
- Groundwater Monitoring Well: Split-spoon soil sampling from the surface to refusal, followed by rock core drilling methods to 80 ft bgs.

Rock core drilling was conducted using HQ triple-tube wireline coring methods, resulting in 5-foot sections of continuous, minimally-disturbed rock core. The drilling was coordinated, observed, and logged by Sanborn Head personnel to describe and characterize soil and rock types encountered during drilling. A representative of the United States

¹ Sanborn, Head & Associates, Inc., *Work Plan for Supplemental Vapor Intrusion Assessment, Former IBM Manassas Facility, Manassas, Virginia*, May 29, 2009 – updated October 15, 2010 and April 16, 2012.

Environmental Protection Agency (USEPA) was present during one day of the drilling program.

The soil and rock core samples were logged in accordance with the field logging forms presented in the Standard Operating Procedures (SOPs) in the Work Plan, to document lithology and fracture morphology, including location (depth), angle, and spacing of observed fractures and jointing. Fracture data were entered into spreadsheets in the field and used to create graphical fracture logs. Boring and monitoring point completion logs are presented in Appendix B.2. Graphical fracture logs and histograms are provided in Appendix B.3.

Soil and rock cuttings created during drilling were contained in 55-gallon drums and staged in the B101 area. Water associated with rock coring and development of monitoring wells was piped to and stored in a 21,000 gallon fractionalization tank on the B101 property. Drill cuttings, water, and solids suspended in drilling water were sampled prior to disposal by IBM. After receiving sample results, water was decanted from the fractionalization tank to the sanitary sewer with permission from the local sanitary district. Remaining solids in the bottom of the tank were disposed of and the tank cleaned by FCC Environmental of Alexandria, Virginia.

B.1.3 INSTALLATION OF MONITORING EQUIPMENT

Monitoring equipment was installed in the completed boreholes at depths consistent with the generalized depth targets outlined in the Work Plan, targeting specific fractured intervals at depth. Monitoring point construction is documented in the completion diagrams as part of the boring logs in Appendix B.2. Foundation-depth implants and monitoring wells were constructed in general accordance with the Work Plan, while construction of the multi-depth installations varied somewhat from the Work Plan as described in more detail below.

Foundation-depth implants, constructed with stainless steel screen and riser, and multi-depth installations were installed immediately after each borehole was drilled. As noted above, fracture depth and frequency were reviewed to inform the selection of monitoring intervals in the deeper boreholes. Graphical logs of fracturing are included on the borehole logs in Appendix B.2.

Similar to the installation of monitoring equipment at the site in February and March 2011, 3/4-inch PVC piezometers were constructed and installed to screen the intermediate depths, allowing the capability to sample both water and gas from those monitoring intervals.

The completed installations were surveyed to document the location and elevation by Ross, France & Ratliff, Ltd. of Manassas, Virginia. The survey data are attached to this appendix.

B.1.4 OPERATIONS & PERFORMANCE TESTING

After constructing the foundation-depth and shallow vapor implants, the functionality of the installations was confirmed prior to the drill rig demobilizing from the drill site.

Operations testing was conducted by withdrawing gas from the device into a Tedlar bag while recording in-line vacuum. The Tedlar bag samples were screened in the field for oxygen, carbon dioxide, and methane as a baseline measurement proximate to the installation time.

Foundation-depth and shallow vapor implants within the multi-depth installations were also subjected to a more rigorous program of performance testing that included the use of helium tracer gas. The performance testing was conducted at least 24 hours after installation and at least a week before the sampling event. Performance and operations testing records are provided in Appendix B.4.

B.1.5 MONITORING OF SUBSURFACE GAS AND WATER

One characterization sampling and monitoring round followed the completion of the monitoring point installation. A tabular summary documenting the monitoring program is presented in Table B.1. Field sampling records are provided in Appendix B.4.

As documented by Table B.1, in addition to sampling using Summa[®]-type evacuated canisters as per the Work Plan, where canisters could not be filled due to insufficient air-filled pore space presumably due to water saturation local to the device screen, subsurface gas samples were collected via single-use disposable syringes and injected into laboratory-cleaned 22 ml vials equipped with a septum seal. A syringe was used to collect a grab groundwater sample into VOA vials where the monitoring point was observed to produce water during purging or sampling.

The results for the evacuated vial samples and groundwater samples collected via syringe under partially saturated conditions are considered screening level data. In both cases, the samples are small volume samples collected under nearly saturated conditions and under vacuums that were substantially greater than when sampling with canisters. Vial sampling of subsurface gas was particularly useful at implants where a mixture of water and gas could be drawn through the implant. The evacuated vial samples required up to approximately 80 milliliters (ml) of gas per location, compared to 800 ml for a canister sample. Grab water samples were collected from both foundation depth implants screened well above the water table in soil and the implants installed at 10 to 12 feet below ground. The presence of water in these installations is believed to reflect conditions that may be local to the sampling device resulting from precipitation infiltration.

The validated data from canister sampling are to be used as the primary data for assessing vapor intrusion potential while data from the vial sampling is considered screening level data under conditions in which sampling might otherwise not have been possible.

The canister sampling procedures were modified slightly from Work Plan SOPs for the multi-depth monitoring installations constructed using 3/4-inch PVC:

- After a water level measurement was recorded to establish the position of the water level in the screened interval and the screen was found not to be fully submerged, the center point of the screen exposed to subsurface gas was calculated;

- A 6-inch $\frac{1}{4}$ -inch outer diameter (O.D) stainless steel mesh screen attached to an appropriate length of $\frac{1}{4}$ -inch O.D Teflon tubing was lowered to the mid-point of the exposed screen;
- The tubing was threaded through a rubber stopper fitted into the top of the PVC well point;
- The rubber stopper was sealed to the PVC riser with Teflon tape; and
- A gas volume equivalent to one volume of the riser and open screen interval was removed using a peristaltic pump at a low flow rate. The capped piezometer was allowed to sit for up to 24 hours prior to collection of a canister sample.
- Groundwater samples were collected via syringe as described above from vapor implants, and via bailers from monitoring wells and $\frac{3}{4}$ -inch PVC piezometers.

Canister samples were submitted to Air Toxics, Ltd. (ATL), of Folsom, California for analysis for the project-specific list of six VOCs². Vapor samples collected into vials via syringe were submitted to Microseeps[®] of Pittsburgh, Pennsylvania for VOC analysis by proprietary method AM4.02. Groundwater samples were submitted for USEPA Method 8260B VOC analysis to Lancaster Laboratories of Lancaster, Pennsylvania. Analytical laboratory reports are compiled in Appendix C. Groundwater data and canister data were submitted to New Environmental Horizons, Inc., for independent data validation and review of data usability. Data validation reports are compiled in Appendix D.

Quality assurance/quality control (QA/QC) measures such as field duplicates, field blanks, and analytical laboratory blanks were collected in accordance with the schedule outlined in the QA/QC project plan in the Supplemental Work Plan. QA/QC measures implemented during field sampling activities included:

- confirmation of sample container and flow metering valve integrity before and after sample collection;
- sample collection pursuant to the methods outlined in the Work Plan;
- collection of field duplicate samples; and
- collection of field/trip blanks for Summa[®]-type canister and groundwater samples.

Encl:

Survey Data
Table B.1 – Sampling Program Summary

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² PCE, Trichloroethene (TCE), cis-1,2-dichloroethene (cDCE), trans-1,2-dichloroethene (tDCE), vinyl chloride (VC), and 1,1,2-trichloroethane (112TCA).

Table B.1
Sampling Program Summary
Investigation Data Report
Former IBM Manassas Facility
Manassas, Virginia

Exploration I.D.	Depth Designation	Sample Type	June 2012 Routine	July 2012 Characterization
SG-04	10	Vapor	X	
SG-05	10	Vapor	X	
	25	Vapor	X	
	45	Vapor	X	
SG-06	8	Vapor	X	
	44	Vapor	X	
SG-07		Vapor	X	
SG-10		Vapor	X	
SG-12		Vapor	X	
SG-17		Vapor		
SG-18		Vapor		
SG-19		Vapor	X	
SG-20		Vapor	X	
SG-21		Vapor	X	
SG-24		Vapor		
SG-25		Vapor		
SG-26		Vapor	X	
SG-27		Vapor		
SG-28		Vapor	X	
SG-29		Vapor		
SG-30		Vapor	X	
SG-31	S	Vapor	Not Installed	X
	I	GW		X
	D	Vapor		X
D-86		GW		X
SG-101		Vapor	X	
SG-102	S	Vapor	X (VIAL)	
		GW		
	I	GW	X	
SG-103		Vapor	X	
SG-104		Vapor	X (VIAL)	
		GW		
SG-105		Vapor	X	
SG-106	S	Vapor	X	
	I	GW	X	
	D	Vapor	X	
SG-107		GW	X	
SG-108	S	Vapor	X	
	I	Vapor		
		GW	X	
SG-109		Vapor	X	
		GW		
SG-110		Vapor	X (VIAL)	
SG-111	S	Vapor	X	
	I	Vapor	X	
		GW	X	
SG-112		Vapor	X	
		GW		
SG-113	S	Vapor	X (VIAL)	
		GW		
	I	GW	X	
SG-114		Vapor		X
SG-115	S	Vapor		X (Y)
		GW		
	I	Vapor		
SG-116		GW		X
SG-117	S	Vapor		
		GW		
	I	GW		X
SG-118	23	GW		X
	S	Vapor	Not Installed	X
	I	GW		X
22	GW	X		
SG-119		Vapor		X
SG-120	S	Vapor		X
	I	Vapor		X
SG-121	S	Vapor		X
	I	Vapor		X
SG-122		Vapor		X
SG-123	S	Vapor		X
	I	GW		X
OF-54		GW	X	
OF-55		GW	X	

Exploration I.D.	Depth Designation	Sample Type	June 2012 Routine	July 2012 Characterization
SG-114		Vapor		X
SG-115	S	Vapor		X (Y)
		GW		
	I	Vapor		
SG-116		GW		X
SG-117	S	Vapor		
		GW		
	I	GW		X
SG-118	23	GW		X
	S	Vapor	Not Installed	X
	I	GW		X
22	GW	X		
SG-119		Vapor		X
SG-120	S	Vapor		X
	I	Vapor		X
SG-121	S	Vapor		X
	I	Vapor		X
SG-122		Vapor		X
SG-123	S	Vapor		X
	I	GW		X
OF-54		GW	X	
OF-55		GW	X	

Notes:

1. This table is intended to summarize sampling completed during routine and characterization sampling in June and July 2012 at the former IBM facility in Manassas, Virginia. The sampling was conducted by Sanborn Head & Associates, Inc. (Sanborn Head) personnel in the months noted. Unless otherwise noted, soil vapor and groundwater samples were collected using Summa® canisters or bailers, respectively.

2. Please refer to the report text for additional details.

3. Abbreviations:

- S - Shallow vapor implant installed as part of a multi-depth implant, nominally 10 to 12 feet below ground
- I - Intermediate depth piezometer installed as a part of a multi-depth implant, nominally 25 to 30 feet below ground
- D - Deep piezometer installed as part of a multi-depth implant, nominally 45 to 50 feet below ground
- GW - Groundwater

4. Collection Methods:

- Vial - Vapor sample collected into evacuated vial via syringe
- Y - Water sample collected via syringe

IBM Well Log

	Northing(NAD83)	Easting(NAD83)	Northing(NAD27)	Easting(NAD27)	Elevation	Comment
SG-31	6960920.82	11768228.45	399202.83	2285237.30	246.04	elev @ tag
SG-31i					245.76	top - pvc
SG-31D					245.79	top - pvc
D86					245.68	top - pvc
SG-114	6961030.01	11768487.93	399312.02	2285496.78	247.08	elev @ tag
SG-115	6961026.09	11768484.60	399308.11	2285493.45	247.11	elev @ tag
SG-115i					246.77	top - pvc
SG-116	6960862.50	11768553.03	399144.52	2285561.88	253.60	elev @ tag
SG-117	6960866.72	11768548.66	399148.73	2285557.51	253.57	elev @ tag
SG-117i					253.23	top - pvc
SG-117-23					253.39	top - pvc tee
						coupler
SG-118	6960763.48	11768503.38	399045.49	2285512.23	249.13	elev @ tag
SG-119	6960617.46	11768695.14	398899.48	2285703.99	251.14	elev @ tag
SG-120	6960614.95	11768698.59	398896.97	2285707.44	251.19	elev @ tag
SG-120i					250.89	top - pvc
SG-121	6960666.42	11768803.71	398948.43	2285812.56	252.91	elev @ tag
SG-121i					252.64	top - pvc
SG-122	6960832.10	11768784.00	399114.11	2285792.86	254.00	elev @ tag
SG-123	6960828.96	11768787.03	399110.97	2285795.89	253.95	elev @ tag

APPENDIX B.2

BORING AND MONITORING COMPLETION LOGS



Project: Former IBM Manassas
 Location: Manassas, VA
 Project No.: 2732.05

Log of Soil Vapor Implant SG-114

TOC Elevation: 247.08 feet
 Datum: NAD27

Sanborn, Head & Associates, Inc.

Drilling Method: 2" O.D. Split Spoon

Sampling Method: 2" O.D. Split Spoon

Drilling Company: Parratt Wolff Inc.

Foreman: B. Rice

Date Started: 06/27/12

Date Finished: 06/27/12

Logged By: EMB

Checked By: LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
------	------	----------------	----------	-----------------	---------------	------------

BORING LOG \\PORSERV1\DATA\SHARE\DATA\IORDA\TA\2700S\2732.05\WORK\GINT\LOGS\2732.05_BORING_CORING_LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 10/19/12

Depth (ft)	Sample Information					Stratum		Geologic Description	Well Diagram	Well Description
	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/Rec (in)	Field Testing Data	Log	Description			
0	S-1	0 - 2	2 5 7 13	24/15	PID: 4.8 ppmv		CLAY & SILT	S-1 (0 to 2'): Stiff, brown, tan, and red, CLAY & SILT, trace Roots, trace gravel-sized rock fragments, trace black mineralization. Color change from brown to tan at 0.7' and from tan to red at 1.0'. Moist.		9" Dia. Flushmounted Road Box set in Concrete (0 to 0.8') Fine Sand (0.5 to 1') Bentonite Chip Seal (1 to 4.5')
2	S-2	2 - 4	12 24 32 40	24/21	PID: 3.8 ppmv		CLAY & SILT	S-2 (2 to 3.9'): Hard, red, CLAY & SILT. Moist. Drier than above.		1/4" Stainless Steel Tubing Riser (0.5 to 5.5')
4	S-3	4 - 6	32 50 47 60	24/24	PID: 4.7 ppmv		WEATHERED SANDY SILTSTONE	S-3 (4 to 6'): Soft, very severely weathered, red, fine-grained SANDY SILTSTONE. Moist.		Fine Sand (4.5 to 6') 6" x 1/4" Stainless Steel Mesh Screen (5.5 to 6')
6	Boring terminated at 6', no refusal encountered.									
NOTES: 1. Boring terminated at 6', split-spoon refusal not encountered. 2. The borehole was completed as a soil vapor implant as shown in the well diagram immediately after the completion of drilling. 3. The Field Testing column represents headspace of bagged samples, which were screened for the presence of volatile organic compounds (VOCs) using a RAE System MiniRae Model 2000 Photoionization Detector (PID). The PID was equipped with a 10.6 eV lamp and programmed with a response factor of 1. Calibration of the PID was performed using a 100 parts per million by volume (ppmv) isobutylene standard. 4. No soil samples were submitted for analysis.										
10										



Project: Former IBM Manassas
 Location: Manassas, VA
 Project No.: 2732.05

Log of Monitoring Well SG-115

TOC Elevation: 247.11 feet
 PVC Elevation: 246.77 feet (I)
 Datum: NAD27

Sanborn, Head & Associates, Inc.

Drilling Method: 8.25" O.D. Hollow Stem Auger/HQ Wireline Rock Coring

Sampling Method: 2" O.D. Split Spoon

Drilling Company: Parratt Wolff Inc.

Foreman: B. Rice

Date Started: 06/26/12

Date Finished: 06/27/12

Logged By: EMB, JAP

Checked By: LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
06/27/12	11:25	9.7'	Ground Surface	10.5'	33.5'	0 min. (pre-purge)
06/27/12	12:00	31.91'	Ground Surface	10.5'	33.5'	35 mins.
06/27/12	13:00	24.05'	Ground Surface	10.5'	32.0'	Well mat. installed

BORING LOG \\PORSERV1\DATA\SHARE\DATA\I\PORDA\TA\2700S\2732.05\WORK\GINT\LOGS\2732.05_BORING_CORING_LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 10/19/12

Depth (ft)	Drill Rate (min/ft)	Sample Information				Stratum		Geologic Description	Well Diagram	Well Description
		Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/Rec (in)	Field Testing Data	Log			
0		S-1	0 - 2	4 7 7 10	24/21	PID: 0.7 ppmv	---	S-1A (0 to 1.1'): Stiff, reddish tan, CLAY & SILT, trace Gravel, trace Roots. Dry.		9" Dia. Flushmounted Road Box set in Concrete (0 to 0.8') 4" Steel Casing (0.5 to 10.5') Coarse Sand (0.5 to 1')
2		S-2	2 - 4	12 22 30 43	24/24	PID: 19.5 ppmv	CLAY & SILT	S-1B (1.2 to 2'): Very stiff, red, CLAY & SILT, little, gravel-sized Bedrock fragments, trace Roots. Dry. S-2 (2 to 4'): Hard, red, CLAY & SILT, becoming more weathered Rock with depth. Weathered Siltstone 3.8 - 4' with black staining along bedding planes. Moist to Dry.		
4		S-3	4 - 6	26 34 47 54	24/18	PID: 17.4 ppmv		S-3 (4 to 6'): Hard, red, CLAY & SILT, trace coarse Sand. Dry.		
6		S-4	6 - 6.5	83/0.5	6/6	PID: 24.5 ppmv	WEATHERED SILTSTONE	S-4A (6 to 6.2'): Hard, red, CLAY & SILT, trace coarse Sand, trace black mineralization. Moist. S-4B (6.2 to 6.5'): Very soft, completely weathered, red, fine-grained SANDY SILTSTONE. Dry.		1/4" Stainless Steel Riser (0.5 to 12') Bentonite Chip Seal (1 to 11.5')
8							No Recovery			
10										



Project: Former IBM Manassas
 Location: Manassas, VA
 Project No.: 2732.05

Log of Monitoring Well SG-115

TOC Elevation: 247.11 feet
 PVC Elevation: 246.77 feet (I)
 Datum: NAD27

Sanborn, Head & Associates, Inc.

Drilling Method: 8.25" O.D. Hollow Stem Auger/HQ Wireline Rock Coring

Sampling Method: 2" O.D. Split Spoon

Drilling Company: Parratt Wolff Inc.

Foreman: B. Rice

Date Started: 06/26/12

Date Finished: 06/27/12

Logged By: EMB, JAP

Checked By: LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
06/27/12	11:25	9.7'	Ground Surface	10.5'	33.5'	0 min. (pre-purge)
06/27/12	12:00	31.91'	Ground Surface	10.5'	33.5'	35 mins.
06/27/12	13:00	24.05'	Ground Surface	10.5'	32.0'	Well mat. installed

BORING LOG \\PORSERV1\DATA\SHARE\DATA\2700S\2732.05\WORK\GINT\LOGS\2732.05_BORING_CORING LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 10/19/12

Depth (ft)	Drill Rate (min/ft)	Sample Information					Stratum		Geologic Description	Well Diagram	Well Description
		Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/Rec (in)	Field Testing Data	Log	Description			
10								No Recovery			
12											
14											
16											
18											
20											

Split-spoon refusal encountered at 6.5'. Drillers advanced 8.25" OD hollow-stem augers to 10.5' without sampling, no refusal encountered. A permanent 4" steel casing was installed to 10.5' and grouted into place. The log continues on page 3.

Sanborn, Head & Associates, Inc.

TOC Elevation: 247.11 feet
 PVC Elevation: 246.77 feet (I)
 Datum: NAD27

Drilling Method: 8.25" O.D. Hollow Stem Auger/HQ Wireline Rock Coring

Sampling Method: 2" O.D. Split Spoon

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
06/27/12	11:25	9.7'	Ground Surface	10.5'	33.5'	0 min. (pre-purge)
06/27/12	12:00	31.91'	Ground Surface	10.5'	33.5'	35 mins.
06/27/12	13:00	24.05'	Ground Surface	10.5'	32.0'	Well mat. installed

Drilling Company: Parratt Wolff Inc.

Foreman: B. Rice

Date Started: 06/26/12

Date Finished: 06/27/12

Logged By: EMB, JAP

Checked By: LJJ

CORING LOG \\PORSERV1\DATA\SHARE\DATA\2732.05\WORK\GINT\LOGS\2732.05_BORING_CORING LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 10/19/12

Depth (ft)	Sample No.	Drill Rate (min/ft)	Sample Information				Stratum			Geologic Description	Well Diagram	Well Description
			Depth (ft)	Pen/Rec (ft) (%)	RQD (%)	Field Testing Data	Log	Fractures	Description			
10.5 - 13.5	C-1	4	3.0/3.0 100%	48	PID: 1.4 ppmv			-----10.5'-----	C-1 (10.5 to 13.5'): Medium to moderately hard, slightly to moderately weathered, red, fine-grained, SANDY SILTSTONE. Very thin horizontal bedding, very close to close horizontal and vertical jointing. Hardness increases and weathering decreases with depth. Minor Calcite-filled vugs and veins throughout.			
12		4										
13.5 - 18.5	C-2	3	5.0/5.2 104%	83	PID: 0.8 ppmv				C-2 (13.5 to 18.5'): Moderately hard, slightly weathered, red, fine-grained, interbedded SANDSTONE & SILTSTONE and SANDY SILTSTONE. Very thin horizontal and crossbedding, very close to close horizontal to shallow dipping joints. Sandstone portions crossbedded. Calcite-filled veins and vugs at 14.4 - 15.9'.		6" x 1/4" Stainless Steel Mesh Screen (12 to 12.5')	
14		3									Fine Sand (11.5 to 15.5') 3/4" Dia. Sch. 40 PVC (0.5 to 27')	
15.2								-----15.2'-----	Int. SILTSTONE & SANDSTONE			
15.9								-----15.9'-----	SILTSTONE			
16.5								-----16.5'-----	Int. SILTSTONE & SANDSTONE			
17.9								-----17.9'-----	SANDY SILTSTONE			
18.2								-----18.2'-----				
18.4	C-3	3	5.0/4.9 98%	97	PID: 5.0 ppmv			-----18.4'-----	C-3 (18.5 to 23.5'): Moderately hard, fresh, red, fine-grained, interbedded SANDSTONE & SILTSTONE and SANDY SILTSTONE. Very thin horizontal and cross bedding, very close to moderately close horizontal to shallow dipping joints. Sandstone portions crossbedded. Calcite-filled veins at 21.2' and 22.6'.			
18		3							SANDSTONE			
19.8								-----19.8'-----	SANDY SILTSTONE			
20												

Fracture Symbols



Crack



Joint



Extremely Fractured Zone

Sanborn, Head & Associates, Inc.

TOC Elevation: 247.11 feet
 PVC Elevation: 246.77 feet (I)
 Datum: NAD27

Drilling Method: 8.25" O.D. Hollow Stem Auger/HQ Wireline Rock Coring

Sampling Method: 2" O.D. Split Spoon

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
06/27/12	11:25	9.7'	Ground Surface	10.5'	33.5'	0 min. (pre-purge)
06/27/12	12:00	31.91'	Ground Surface	10.5'	33.5'	35 mins.
06/27/12	13:00	24.05'	Ground Surface	10.5'	32.0'	Well mat. installed

Drilling Company: Parratt Wolff Inc.

Foreman: B. Rice

Date Started: 06/26/12

Date Finished: 06/27/12

Logged By: EMB, JAP

Checked By: LJJ

CORING LOG \\PORSERV1\DATA\SHARE\DATA\PO\ORDA\TA\2700S\2732.05\WORK\GINT\LOGS\2732.05_BORING_CORING_LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 10/19/12

Depth (ft)	Sample No.	Drill Rate (min/ft)	Sample Information				Stratum		Geologic Description	Well Diagram	Well Description
			Depth (ft)	Pen/Rec (ft) (%)	RQD (%)	Field Testing Data	Log	Fractures			
20.7								Int. SILTSTONE & SANDSTONE		Bentonite Chip Seal (15.5 to 26.5')	
21.1											
22.4								SANDY SILTSTONE			
23.5 - 28.5	C-4		23.5 - 28.5	5.0/5.0 100%	96	PID: ND		Int. SILTSTONE & SANDSTONE		C-4 (23.5 to 28.5): Moderately hard, fresh, red, fine-grained, interbedded SANDSTONE & SILTSTONE and SANDY SILTSTONE. Very thin horizontal and cross bedding, very close to moderately close horizontal to moderately dipping joints.	
24.1								Int. SILTSTONE & SANDSTONE			
24.7											
25.3								SANDY SILTSTONE		Portions of interbedded Siltstone & Sandstone are crossbedded. Sandstone component is coarse from 27 - 27.4'. Calcite-filled veins and vugs throughout.	
25.6								SANDSTONE			
26.5										Fine Sand (26.5 to 27')	
27.4											
28.5 - 33.5	C-5		28.5 - 33.5	5.0/5.0 100%	66	PID: 1.7 ppmv		Int. SILTSTONE & SANDSTONE		C-5 (28.5 to 33.5): Moderately hard, slightly weathered to fresh, red, fine to coarse-grained, interbedded SANDSTONE & SILTSTONE, SANDY SILTSTONE and SANDSTONE. Very thin horizontal and cross bedding, very close to close horizontal to vertical joints.	
29.5											
29.9								SANDSTONE		Portions of interbedded Siltstone & Sandstone are crossbedded. Sandstone is coarse from 29.9 - 31' and 31 - 31.4'. Coarse Sandstone lenses at 30.5' and 32.3'.	
30.5											
31.4											
32.3								Int. SILTSTONE & SANDSTONE			
32.3										Coarse Sand (27 to 32') 3/4" Dia. Sch. 40 PVC Well Screen (0.010" Slots) (27 to 32')	

Fracture Symbols



Crack



Joint



Extremely Fractured Zone



Project: Former IBM Manassas
 Location: Manassas, VA
 Project No.: 2732.05

Log of Monitoring Well SG-115

TOC Elevation: 247.11 feet
 PVC Elevation: 246.77 feet (I)
 Datum: NAD27

Sanborn, Head & Associates, Inc.

Drilling Method: 8.25" O.D. Hollow Stem Auger/HQ Wireline Rock Coring

Sampling Method: 2" O.D. Split Spoon

Drilling Company: Parratt Wolff Inc.

Foreman: B. Rice

Date Started: 06/26/12

Date Finished: 06/27/12

Logged By: EMB, JAP

Checked By: LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
06/27/12	11:25	9.7'	Ground Surface	10.5'	33.5'	0 min. (pre-purge)
06/27/12	12:00	31.91'	Ground Surface	10.5'	33.5'	35 mins.
06/27/12	13:00	24.05'	Ground Surface	10.5'	32.0'	Well mat. installed

CORING LOG \\PORSERV1\DATA\SHARE\IDA\IPORDA\TA\2700S\2732.05\WORK\GINT LOGS\2732.05_BORING_CORING LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 10/19/12

Depth (ft)	Sample No.	Drill Rate (min/ft)	Sample Information				Stratum		Geologic Description	Well Diagram	Well Description
			Depth (ft)	Pen/Rec (ft) (%)	RQD (%)	Field Testing Data	Log	Fractures			
32.0		2.5						Int. SILTSTONE & SANDSTONE ---31'---		Fine Sand (32 to 32.5') Bentonite Chip Seal (32.5 to 33.5')	
32.5		2.5					SANDSTONE ---31.4'---				
33.0		2.5					Int. SILTSTONE & SANDSTONE ---33.1'--- SANDY SILTSTONE ---33.5'---				
34.0								Boring terminated at 33.5'.			
<p>NOTES:</p> <ol style="list-style-type: none"> The borehole was completed as a multi-depth monitoring installation as shown in the well diagram. Exterior surfaces and natural and mechanical breaks in soil and rock samples and the headspace of bagged samples were screened for the presence of volatile organic compounds (VOCs) using a RAE Systems MiniRae Model 2000 Photoionization Detector (PID). The PID was equipped with a 10.6 eV lamp and programmed with a response factor of 1. Calibration of the PID was performed using a 100 parts per million by volume (ppmv) isobutylene standard. Values recorded in the Field Testing Data column represent headspace screening results. No soil samples were submitted for laboratory analysis. 											

Fracture Symbols



Crack



Joint



Extremely Fractured Zone



Project: Former IBM Manassas
 Location: Manassas, VA
 Project No.: 2732.05

Log of Soil Vapor Implant SG-116

Ground Elevation: 253.60 feet
 Datum: NAD27

Sanborn, Head & Associates, Inc.

Drilling Method: 2" O.D. Split Spoon

Sampling Method: 2" O.D. Split Spoon

Drilling Company: Parratt Wolff Inc.

Foreman: B. Rice

Date Started: 07/12/12

Date Finished: 07/12/12

Logged By: EMB, JAP

Checked By: LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

BORING LOG \\PORSERV1\DATA\SHARE\DATA\IORDA\TA\2700S\2732.05\WORK\GINT\LOGS\2732.05_BORING_CORING_LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 10/19/12

Depth (ft)	Sample Information					Stratum		Geologic Description	Well Diagram	Well Description
	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/Rec (in)	Field Testing Data	Log	Description			
0							---0'---			9" Dia. Flushmounted Road Box set in Concrete (0 to 0.8')
							ASPHALT			Fine Sand (0.5 to 1')
							---0.5'---			
	S-1	1 - 2	1	12/4	PID: 2.1 ppmv			S-1 (1 to 2'): Soft, red, CLAY & SILT, trace Gravel. Moist.		Bentonite Chip Seal (1 to 4.5')
2	S-2	2 - 4	2 2 2 3	24/5	PID: 2.5 ppmv			S-2 (2 to 4'): Soft, red, CLAY & SILT, little Gravel. Moist.		
							CLAY & SILT			1/4" Stainless Steel Tubing Riser (0.5 to 5.5')
4	S-3	4 - 6	1 1 2 1	24/11	PID: 1.5 ppmv			S-3 (4 to 6'): Soft, red, CLAY & SILT, trace Gravel, trace Roots. Moist.		Fine Sand (4.5 to 6')
6							---6'---	Boring terminated at 6', no refusal encountered.		6" x 1/4" Stainless Steel Mesh Screen (5.5 to 6')
								NOTES: 1. Boring terminated at 6', split-spoon refusal not encountered. 2. The borehole was completed as a soil vapor implant as shown in the well diagram immediately after the completion of drilling. 3. The Field Testing column represents headspace of bagged samples, which were screened for the presence of volatile organic compounds (VOCs) using a RAE System MiniRae Model 2000 Photoionization Detector (PID). The PID was equipped with a 10.6 eV lamp and programmed with a response factor of 1. Calibration of the PID was performed using a 100 parts per million by volume (ppmv) isobutylene standard. 4. No soil samples were submitted for analysis.		
8										
10										



Project: Former IBM Manassas
 Location: Manassas, VA
 Project No.: 2732.05

Log of Monitoring Well SG-117

Ground Elevation: 253.57 feet
 PVC Elevation: 253.23 feet (I) / 253.22 feet (23)
 Datum: NAD27

Sanborn, Head & Associates, Inc.

Drilling Method: 8.25" O.D. Hollow Stem Auger/HQ Wireline Rock Coring

Sampling Method: 2" O.D. Split Spoon

Drilling Company: Parratt Wolff Inc.

Foreman: B. Rice

Date Started: 07/11/12

Date Finished: 07/12/12

Logged By: EMB, JAP

Checked By: LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
07/11/12	15:45	1.61'	Ground Surface	14'	35.5'	5 min.
07/11/12	16:11	32.75'	Ground Surface	14'	35.5'	
07/11/12	16:17	30.35'	Ground Surface	14'	35.5'	37 min.

BORING LOG \\PORSERV1\DATA\SHARE\DATA\I\PORDA\TA\2700S\2732.05\WORK\GINT\LOGS\2732.05_BORING_CORING_LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 10/19/12

Depth (ft)	Drill Rate (min/ft)	Sample Information				Field Testing Data	Stratum		Geologic Description	Well Diagram	Well Description
		Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/Rec (in)		Log	Description			
0								---0'---			9" Dia. Flushmounted Road Box set in Concrete (0 to 0.8')
0.5		S-1	0.5 - 2	3 6 4	18/14	PID: 7.1 ppmv	ASPHALT	---0.5'---	S-1 (0.5 to 2'): Stiff, red, Silty CLAY, trace Gravel, trace Roots. Moist.		Coarse Sand (0.5 to 1')
2		S-2	2 - 4	3 4 4 4	24/12	PID: 3.2 ppmv	SILTY CLAY	---2'---	S-2 (2 to 4'): Medium stiff, red, CLAY & SILT, trace Sand. Moist.		
4		S-3	4 - 6	1 1 1 1	24/22	PID: 0.5 ppmv			S-3 (4 to 6'): Soft, red, CLAY & SILT, trace Sand. Wet.		
6		S-4	6 - 8	2 3 4 6	24/24	PID: 1.9 ppmv	CLAY & SILT		S-4 (6 to 8'): Medium stiff, red, CLAY & SILT, trace Wood, Root fragments. Moist.		
8		S-5	8 - 10	4 9 26 55	24/24	PID: 4.7 ppmv			S-5A (8 to 9.4'): Hard, red, CLAY & SILT. Tan and white Clay mineralization at 9.1'. Moist.		1/4" Stainless Steel Riser (0.5 to 14.5') Bentonite Chip Seal (1 to 14')
9.4						PID: 0.9 ppmv		---9.4'---	S-5B (9.4 to 10'): Soft, very severely weathered, red, fine-grained SILTSTONE, very thin horizontal bedding. Black staining on fracture surface. Moist.		3/4" Dia. Sch. 40 PVC Riser (0.5 to 19')
10							SANDY SILTSTONE				



Project: Former IBM Manassas
 Location: Manassas, VA
 Project No.: 2732.05

Log of Monitoring Well SG-117

Ground Elevation: 253.57 feet
 PVC Elevation: 253.23 feet (I) / 253.22 feet (23)
 Datum: NAD27

Sanborn, Head & Associates, Inc.

Drilling Method: 8.25" O.D. Hollow Stem Auger/HQ Wireline Rock Coring

Sampling Method: 2" O.D. Split Spoon

Drilling Company: Parratt Wolff Inc.

Foreman: B. Rice

Date Started: 07/11/12

Date Finished: 07/12/12

Logged By: EMB, JAP

Checked By: LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
07/11/12	15:45	1.61'	Ground Surface	14'	35.5'	5 min.
07/11/12	16:11	32.75'	Ground Surface	14'	35.5'	
07/11/12	16:17	30.35'	Ground Surface	14'	35.5'	37 min.

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Depth (ft)	Drill Rate (min/ft)	Sample Information				Stratum		Geologic Description	Well Diagram	Well Description
		Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/Rec (in)	Field Testing Data	Log Description			
10		S-6	10 - 11.9	23 51 55 75/0.4	23/23					
12							SANDY SILTSTONE			
14								Split-spoon refusal encountered at 11.9'. Drillers advanced 8.25" O.D. hollow-stem augers to 14' without sampling, no refusal encountered. A temporary 6" steel casing was installed to 14' and coring continued through the temporary casing. The log continues on page 2.		
16										
18										
20										

Sanborn, Head & Associates, Inc.

Drilling Method: 8.25" O.D. Hollow Stem Auger/HQ Wireline Rock Coring

Sampling Method: 2" O.D. Split Spoon

Drilling Company: Parratt Wolff Inc.

Foreman: B. Rice

Date Started: 07/11/12

Date Finished: 07/12/12

Logged By: EMB, JAP

Checked By: LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
07/11/12	15:45	1.61'	Ground Surface	14'	35.5'	5 min.
07/11/12	16:11	32.75'	Ground Surface	14'	35.5'	
07/11/12	16:17	30.35'	Ground Surface	14'	35.5'	37 min.

CORING LOG \\PORSERV1\DATA\SHARE\DATA\IPORDA\TA\2700S\2732.05\WORK\GINT\LOGS\2732.05_BORING_CORING_LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 10/19/12

Depth (ft)	Sample No.	Drill Rate (min/ft)	Sample Information				Stratum		Geologic Description	Well Diagram	Well Description	
			Depth (ft)	Pen/Rec (ft) (%)	RQD (%)	Field Testing Data	Log	Fractures				
14	C-1	3.8	14 - 18.5	4.5/4.0 89%	10	PID: 2.8 ppmv		-----14'-----	C-1 (14 to 18.5'): Soft to medium hard, severely to moderately weathered, red, fine-grained, interbedded SANDY SILTSTONE & SANDSTONE. Very thin horizontal and cross bedding, very close to close horizontal to vertical joints. Black staining on fracture surfaces..		Fine Sand (14 to 15.5') 6" x 1/4" Stainless Steel Mesh Screen (14.5 to 15')	
		3.8										3/4" Dia. Sch. 40 PVC Riser (0.5 to 33') Bentonite Chip Seal (15.5 to 18.5')
16		3.8					Int. SILTSTONE & SANDSTONE					
		3.8										
18	C-2	2	18.5 - 23.5	5.0/4.9 98%	46	PID: 25.7 ppmv		-----19'-----	C-2 (18.5 to 23.5'): Medium to moderately hard, severely to slightly weathered, red, fine to coarse-grained, interbedded SANDY SILTSTONE & SANDSTONE and SANDY SILTSTONE. Very thin horizontal and cross bedding, very close to close horizontal to steeply dipping joints. Severely weathered zones from 18.5 - 19.2' and 21.4 - 22.2'.		Fine Sand (18.5 to 19') 3/4" Dia. Sch. 40 PVC Well Screen (0.010" Slots) (19 to 23')	
		2.9					SANDSTONE					
20		2.9					-----19.9'----- Int. SILTSTONE & SANDSTONE					
		2.9					SANDSTONE					
		2.9					-----21.1'----- Int. SILTSTONE & SANDSTONE					
		2.9					SANDSTONE					
22		2.9					-----22.3'----- SANDSTONE					
		2.9					-----22.7'----- SANDSTONE					
24	C-3	2.1	23.5 - 28.5	5.0/5.0 100%	90	PID: 6.2 ppmv			C-3 (23.5 to 28.5'): Moderately hard to hard, fresh to slightly weathered, red, fine-grained, SANDY SILTSTONE. Very thin horizontal		Fine Sand (23 to 24.5')	

Fracture Symbols



Crack



Joint



Extremely Fractured Zone



Project: Former IBM Manassas
 Location: Manassas, VA
 Project No.: 2732.05

Log of Monitoring Well SG-117

Ground Elevation: 253.57 feet
 PVC Elevation: 253.23 feet (1) / 253.22 feet (23)
 Datum: NAD27

Sanborn, Head & Associates, Inc.

Drilling Method: 8.25" O.D. Hollow Stem Auger/HQ Wireline Rock Coring

Sampling Method: 2" O.D. Split Spoon

Drilling Company: Parratt Wolff Inc.

Foreman: B. Rice

Date Started: 07/11/12

Date Finished: 07/12/12

Logged By: EMB, JAP

Checked By: LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
07/11/12	15:45	1.61'	Ground Surface	14'	35.5'	5 min.
07/11/12	16:11	32.75'	Ground Surface	14'	35.5'	
07/11/12	16:17	30.35'	Ground Surface	14'	35.5'	37 min.

CORING LOG \\PORSERV1\DATA\SHARE\DATA\2700S\2732.05\WORK\GINT LOGS\2732.05_BORING_CORING LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 10/19/12

Depth (ft)	Sample No.	Drill Rate (min/ft)	Sample Information			Field Testing Data	Log	Fractures	Stratum Description	Geologic Description	Well Diagram	Well Description
			Depth (ft)	Pen/Rec (ft) (%)	RQD (%)							
24		2.1							bedding, very close to moderately close horizontal to steeply dipping joints. Large steeply dipping calcite-filled vein from 24.1 - 25.1'.			
26		2.1						SANDY SILTSTONE				
28	C-4	2.9	28.5 - 33.5	5.0/5.3 106%	100	PID: 2.3 ppmv		-----28.5'-----	C-4 (28.5 to 33.5'): Very hard, fresh, red, fine-grained, SILTY SANDSTONE, Very thin horizontal bedding, no joints. Green staining from 33.1 - 33.5'.		Bentonite Chip Seal (24.5 to 32.5')	
30		2.9						SANDSTONE				
32		2.9										
34	C-5	3.8	33.5 - 35.5	2.0/2.0 100%	71	PID: 2.6 ppmv		-----33.5'-----	C-5 (33.5 to 35.5'): Very hard, fresh, red, fine-grained, SANDY SILTSTONE. Very thin horizontal bedding, very close to close joints.		Fine Sand (32.5 to 33') 3/4" Dia. Sch. 40 PVC Well Screen (0.010" Slots) (33 to 35.5')	

Fracture Symbols



Crack



Joint



Extremely Fractured Zone



Project: Former IBM Manassas
 Location: Manassas, VA
 Project No.: 2732.05

Log of Monitoring Well SG-118

Ground Elevation: 249.13 feet
 PVC Elevation: 249.73 feet (1) / 248.73 feet (22)
 Datum: NAD27

Sanborn, Head & Associates, Inc.

Drilling Method: 8.25" O.D. Hollow Stem Auger/HQ Wireline Rock Coring

Sampling Method: 2" O.D. Split Spoon

Drilling Company: Parratt Wolff Inc.

Foreman: B. Rice

Date Started: 06/25/12

Date Finished: 06/26/12

Logged By: EMB, JAP

Checked By: LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
06/26/12	12:02	8.86'	Ground Surface	8.5'	31'	0 min. (pre-purge)
06/26/12	12:15	28.55'	Ground Surface	8.5'	31'	13 mins. (purged)
06/26/12	12:22	25.89'	Ground Surface	8.5'	31'	20 mins.
06/26/12	13:06	20.15'	Ground Surface	8.5'	31'	Well mat. installed (1)
06/26/12	13:07	13.77'	Ground Surface	8.5'	22.5'	Well mat. installed (22)

BORING LOG \\PORSERV1\DATA\SHARE\DATA\I\PORDA\TA\2700S\2732.05\WORK\GINT\LOGS\2732.05_BORING_CORING_LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 10/19/12

Depth (ft)	Drill Rate (min/ft)	Sample Information				Stratum		Geologic Description	Well Diagram	Well Description
		Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/Rec (in)	Field Testing Data	Log			
0		S-1	0 - 2	2 6 6 6	24/16	PID: ND	---	S-1 (0 to 2'): Stiff, red, CLAY & SILT, trace Gravel, trace Roots. Moist.		9" Dia. Flushmounted Road Box set in Concrete (0 to 0.8') 4" Steel Casing (0.5 to 8.5') Coarse Sand (0.5 to 1')
2		S-2	2 - 4	4 4 8 7	24/17	PID: ND	CLAY & SILT	S-2 (2 to 4'): Stiff, red, CLAY & SILT, trace Gravel. Moist.		
4		S-3	4 - 6	2 3 17 14	24/18	PID: ND		S-3 (4 to 6'): Very stiff, red, CLAY & SILT, trace Gravel. Moist.		
6		S-4	6 - 7	9 64	12/12	PID: ND	-----6.5'----- WEATHERED SILTSTONE -----7'-----	S-4A (6 to 6.5'): Hard, red, CLAY & SILT, trace Gravel. Moist. S-4B (6.5 to 7'): Very soft, very severely weathered, red, fine-grained SANDY SILTSTONE. Black staining on fracture surfaces. Moist.		1/4" Stainless Steel Riser (0.5 to 9.5') Bentonite Chip Seal (1 to 9')
8							No Recovery	Split-spoon refusal encountered at 7'. Drillers advanced 8.25" OD hollow-stem augers to refusal at 8.5' without sampling. A permanent 4" steel casing was installed to 8.5' and grouted into place. The log continues on page 2.		
10										



Project: Former IBM Manassas
 Location: Manassas, VA
 Project No.: 2732.05

Log of Monitoring Well SG-118

Ground Elevation: 249.13 feet
 PVC Elevation: 249.73 feet (1) / 248.73 feet (22)
 Datum: NAD27

Sanborn, Head & Associates, Inc.

Drilling Method: 8.25" O.D. Hollow Stem Auger/HQ Wireline Rock Coring

Sampling Method: 2" O.D. Split Spoon

Drilling Company: Parratt Wolff Inc.

Foreman: B. Rice

Date Started: 06/25/12

Date Finished: 06/26/12

Logged By: EMB, JAP

Checked By: LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
06/26/12	12:02	8.86'	Ground Surface	8.5'	31'	0 min. (pre-purge)
06/26/12	12:15	28.55'	Ground Surface	8.5'	31'	13 mins. (purged)
06/26/12	12:22	25.89'	Ground Surface	8.5'	31'	20 mins.
06/26/12	13:06	20.15'	Ground Surface	8.5'	31'	Well mat. installed (1)
06/26/12	13:07	13.77'	Ground Surface	8.5'	22.5'	Well mat. installed (22)

CORING LOG \\PORSERV1\DATA\SHARE\IDA\IPOR\DATA\2700S\2732.05\WORK\GINT\LOGS\2732.05_BORING_CORING LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 10/19/12

Depth (ft)	Sample No.	Drill Rate (min/ft)	Sample Information				Stratum		Geologic Description	Well Diagram	Well Description
			Depth (ft)	Pen/Rec (ft) (%)	RQD (%)	Field Testing Data	Log	Fractures			
8.5 - 9.5	C-1	4.5	1.0/0.9 90%	44	PID: 2.6 ppmv		-----8.5'-----	C-1 (8.5 to 9.5'): Moderately hard, fresh, red, fine-grained, SANDY SILTSTONE. Very thin horizontal bedding, very close to close horizontal to shallow dipping joints. Tan mineral-filled vugs throughout.			
9.5 - 14.5	C-2	4	5.0/5.0 100%	76	PID: 2.9 ppmv			C-2 (9.5 to 14.5'): Moderately hard, slightly weathered to fresh, red, fine-grained, SANDY SILTSTONE. Very thin horizontal bedding, very close to close horizontal to shallow dipping joints. Calcite-filled veins and vugs throughout, especially 9.5 - 11.4' and 12.9 - 13.2'.		3/4" Dia. Sch. 40 PVC (0.5 to 19') 6" x 1/4" Stainless Steel Mesh Screen (9.5 to 10')	
14.5 - 19.5	C-3	3	5.0/4.9 98%	60	PID: 3.0 ppmv			C-3 (14.5 to 19.5'): Moderately hard, slightly weathered, red, fine-grained, SANDY SILTSTONE. Very thin horizontal bedding, very close horizontal to shallow dipping joints. Calcite-filled veins and vugs from 14.5- 18.0'.		Fine Sand (9 to 13') 3/4" Dia. Sch. 40 PVC (0.5 to 26')	
13 to 18.5										Bentonite Chip Seal (13 to 18.5')	

Fracture Symbols



Crack



Joint



Extremely Fractured Zone



Project: Former IBM Manassas
 Location: Manassas, VA
 Project No.: 2732.05

Log of Monitoring Well SG-118

Ground Elevation: 249.13 feet
 PVC Elevation: 249.73 feet (1) / 248.73 feet (22)
 Datum: NAD27

Sanborn, Head & Associates, Inc.

Drilling Method: 8.25" O.D. Hollow Stem Auger/HQ Wireline Rock Coring

Sampling Method: 2" O.D. Split Spoon

Drilling Company: Parratt Wolff Inc.

Foreman: B. Rice

Date Started: 06/25/12

Date Finished: 06/26/12

Logged By: EMB, JAP

Checked By: LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
06/26/12	12:02	8.86'	Ground Surface	8.5'	31'	0 min. (pre-purge)
06/26/12	12:15	28.55'	Ground Surface	8.5'	31'	13 mins. (purged)
06/26/12	12:22	25.89'	Ground Surface	8.5'	31'	20 mins.
06/26/12	13:06	20.15'	Ground Surface	8.5'	31'	Well mat. installed (1)
06/26/12	13:07	13.77'	Ground Surface	8.5'	22.5'	Well mat. installed (22)

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Depth (ft)	Sample No.	Drill Rate (min/ft)	Sample Information				Stratum			Geologic Description	Well Diagram	Well Description
			Depth (ft)	Pen/Rec (ft) (%)	RQD (%)	Field Testing Data	Log	Fractures	Description			
18.5 - 19.5	C-4	3									Fine Sand (18.5 to 19')	
19.5 - 24.5	C-4	4	19.5 - 24.5	5.0/5.0 100%	23	PID: 3.4 ppmv				C-4 (19.5 to 24.5): Moderately hard, slightly weathered, red, fine-grained, SANDY SILTSTONE and interbedded SANDSTONE & SILTSTONE. Very thin horizontal and cross bedding, very close to close horizontal to vertical joints. Portions of interbedded Siltstone & Sandstone are crossbedded. Odor noted. Open-air PID along core length = 400 ppmv at 21'.		
21.5 - 22.5		4						SANDY SILTSTONE			Coarse Sand (19 to 22.5') ¾" Dia. Sch. 40 PVC Well Screen (0.010" Slots) (19 to 22.5')	
22.5 - 23.5		4									Fine Sand (22.5 to 23')	
23.5 - 24.5		4										
24.5 - 29.5	C-5	3	24.5 - 29.5	5.0/5.0 100%	98	PID: 400 ppmv				C-5 (24.5 to 29.5): Moderately hard, slightly weathered, red, fine-grained, SANDY SILTSTONE and interbedded SANDSTONE & SILTSTONE. Very thin horizontal and cross bedding, very close to close horizontal to shallow dipping joints. Portions of interbedded Siltstone & Sandstone are crossbedded.		
23.8'								Int. SILTSTONE & SANDSTONE			Bentonite Chip Seal (23 to 25.5')	
24.5'												
25.5 - 26.5		3						SANDY SILTSTONE			Fine Sand (25.5 to 26')	
26.2'								Int. SILTSTONE & SANDSTONE				
26.8'								SANDY SILTSTONE				
27.6'								Int. SILTSTONE & SANDSTONE				
28.4'								SANDY SILTSTONE				

Fracture Symbols: Crack, Joint, Extremely Fractured Zone



Project: Former IBM Manassas
 Location: Manassas, VA
 Project No.: 2732.05

Log of Monitoring Well SG-118

Ground Elevation: 249.13 feet
 PVC Elevation: 249.73 feet (1) / 248.73 feet (22)
 Datum: NAD27

Sanborn, Head & Associates, Inc.

Drilling Method: 8.25" O.D. Hollow Stem Auger/HQ Wireline Rock Coring

Sampling Method: 2" O.D. Split Spoon

Drilling Company: Parratt Wolff Inc.

Foreman: B. Rice

Date Started: 06/25/12

Date Finished: 06/26/12

Logged By: EMB, JAP

Checked By: LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
06/26/12	12:02	8.86'	Ground Surface	8.5'	31'	0 min. (pre-purge)
06/26/12	12:15	28.55'	Ground Surface	8.5'	31'	13 mins. (purged)
06/26/12	12:22	25.89'	Ground Surface	8.5'	31'	20 mins.
06/26/12	13:06	20.15'	Ground Surface	8.5'	31'	Well mat. installed (1)
06/26/12	13:07	13.77'	Ground Surface	8.5'	22.5'	Well mat. installed (22)

CORING LOG \\PORSERV1\DATA\SHARE\DATA\POORDA\TA\2700S\2732.05\WORK\GINT\LOGS\2732.05_BORING_CORING LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 10/19/12

Depth (ft)	Sample No.	Drill Rate (min/ft)	Sample Information				Stratum		Geologic Description	Well Diagram	Well Description
			Depth (ft)	Pen/Rec (ft) (%)	RQD (%)	Field Testing Data	Log	Frac-tures			
		3									
	C-6	3	29.5 - 31	1.5/1.1 73%	50	PID: 27 ppmv		Int. SANDSTONE & SILTSTONE	C-6 (29.5 to 31'): Moderately hard, slightly weathered, red, fine-grained, interbedded SANDSTONE & SILTSTONE. Very thin horizontal and cross bedding, very close to close horizontal to vertical joints. Sandstone portions are crossbedded.		Coarse Sand (26 to 31') 3/4" Dia. Sch. 40 PVC Well Screen (0.010" Slots) (26 to 31')
		1									
30											
32											
34											
36											
38											

Boring terminated at 31'.

NOTES:

- The borehole was completed as a multi-depth monitoring installation as shown in the well diagram.
- Exterior surfaces and natural and mechanical breaks in soil and rock samples and the headspace of bagged samples were screened for the presence of volatile organic compounds (VOCs) using a RAE Systems MiniRae Model 2000 Photoionization Detector (PID). The PID was equipped with a 10.6 eV lamp and programmed with a response factor of 1. Calibration of the PID was performed using a 100 parts per million by volume (ppmv) isobutylene standard.
- Values recorded in the Field Testing Data column represent headspace screening results.
- No soil samples were submitted for laboratory analysis.

Fracture Symbols



Crack



Joint



Extremely Fractured Zone



Project: Former IBM Manassas
 Location: Manassas, VA
 Project No.: 2732.05

Log of Monitoring Well SG-119

Ground Elevation: 251.14 feet
 Datum: NAD27

Sanborn, Head & Associates, Inc.

Drilling Method: 2" O.D. Split Spoon

Sampling Method: 2" O.D. Split Spoon

Drilling Company: Parratt Wolff Inc.

Foreman: B. Rice

Date Started: 06/20/12

Date Finished: 06/20/12

Logged By: EMB

Checked By: LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
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BORING LOG \\PORSERV1\DATA\SHARE\DATA\IORDA\TA\2700S\2732.05\WORK\GINT\LOGS\2732.05_BORING_CORING_LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 10/19/12

Depth (ft)	Sample Information					Stratum		Geologic Description	Well Diagram	Well Description
	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/Rec (in)	Field Testing Data	Log	Description			
0	S-1	0 - 2	4 8 8 6	24/15	PID: ND		---0'---	S-1 (0 to 2'): Very stiff, red, CLAY & SILT, trace Gravel, trace Roots. Dry.		9" Dia. Flushmounted Road Box set in Concrete (0 to 0.8') Fine Sand (0.5 to 1')
2	S-2	2 - 4	4 5 8 9	24/14	PID: ND	CLAY & SILT		S-2 (2 to 3.9'): Stiff, red, CLAY & SILT, trace coarse Sand. Moist.		Bentonite Chip Seal (1 to 4.5') 1/4" Stainless Steel Tubing Riser (0.5 to 5')
4	S-3	4 - 6	10 12 20 45	24/22	PID: ND			S-3A (4 to 5.3'): Very stiff, red, CLAY & SILT, trace fine Sand. Moist.		Fine Sand (4.5 to 6')
6					PID: ND	WEATHERED SILTSTONE	---5.3'---	S-3B (5.3 to 6'): Very soft, completely weathered, red, fine-grained SANDY SILTSTONE. Very thin horizontal bedding. Moist.		6" x 1/4" Stainless Steel Mesh Screen (5 to 5.5')
6	Boring terminated at 6', no refusal encountered.									
<p>NOTES:</p> <ol style="list-style-type: none"> Boring terminated at 6', split-spoon refusal not encountered. The borehole was completed as a soil vapor implant as shown in the well diagram immediately after the completion of drilling. The Field Testing column represents headspace of bagged samples, which were screened for the presence of volatile organic compounds (VOCs) using a RAE System MiniRae Model 2000 Photoionization Detector (PID). The PID was equipped with a 10.6 eV lamp and programmed with a response factor of 1. Calibration of the PID was performed using a 100 parts per million by volume (ppmv) isobutylene standard. No soil samples were submitted for analysis. 										
10										



Project: Former IBM Manassas
 Location: Manassas, VA
 Project No.: 2732.05

Log of Monitoring Well SG-120

Ground Elevation: 251.19 feet
 PVC Elevation: 250.89 feet (I)
 Datum: NAD27

Sanborn, Head & Associates, Inc.

Drilling Method: 8.25" O.D. Hollow Stem Auger/HQ Wireline Rock Coring

Sampling Method: 2" O.D. Split Spoon

Drilling Company: Parratt Wolff Inc.

Foreman: B. Rice

Date Started: 06/19/12

Date Finished: 06/20/12

Logged By: EMB, JAP

Checked By: LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
06/20/12	13:50	15.68'	Ground Surface	11'	34'	45 min. (pre-purge)
06/20/12	13:58	32.25'	Ground Surface	11'	34'	53 min. (purged)
06/21/12	09:27	31.63'	Ground Surface	11'	34'	20 hrs.
06/22/12	11:30	31.97'	Ground Surface	11'	34'	2 days

BORING LOG \\PORSERV1\DATA\SHARE\DATA\I\PORDA\TA\2700S\2732.05\WORK\GINT\LOGS\2732.05_BORING_CORING_LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 10/19/12

Depth (ft)	Drill Rate (min/ft)	Sample Information				Stratum		Geologic Description	Well Diagram	Well Description	
		Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/Rec (in)	Field Testing Data	Log				Description
0		S-1	0 - 2	-	24/24	PID: 20.3 ppmv		---0'---		S-1 (0 to 2'): Red, CLAY & SILT, trace gravel-sized angular Rock fragments. Moist. Hand dug.	9" Dia. Flushmounted Road Box set in Concrete (0 to 0.8') Coarse Sand (0.5 to 1') 4" Steel Casing (0.8 to 11')
2		S-2	2 - 4	3 3 3 3	24/13	PID: 8.5 ppmv				S-2 (2 to 4'): Medium stiff, red, CLAY & SILT, trace gravel-sized angular Rock fragments. Moist.	
4		S-3	4 - 6	3 8 13 36	24/18	PID: 6.8 ppmv	CLAY & SILT			S-3 (4 to 6'): Very stiff, red, CLAY & SILT, tan mineralization in break at 5.6'. Moist.	
6		S-4	6 - 8	33 47 37 50	24/24	PID: 11.2 ppmv				S-4 (6 to 8'): Hard, red, CLAY & SILT, Rock fabric more evident with depth. Moist.	1/4" Stainless Steel Riser (0 to 12') Bentonite Chip Seal (1 to 11.5')
8		S-5	8 - 9	10 94	12/12	PID: 3.30 ppmv		---8'---		S-5 (8 to 9'): Very soft, very severely weathered red fine-grained SANDY SILTSTONE. Very thin bedding. Tan mineralization along bedding planes.	
10							SANDY SILTSTONE			Split-spoon refusal encountered at 9'. Drillers advanced 8.25" OD hollow-stem augers to 9.5' without sampling, at which point a temporary 6" casing was installed before coring to 11'. The temporary casig was removed and a permanent 4" steel casing was installed to 11' and grouted into place.	

The log continues on page 2.



Project: Former IBM Manassas
 Location: Manassas, VA
 Project No.: 2732.05

Log of Monitoring Well SG-120

Ground Elevation: 251.19 feet
 PVC Elevation: 250.89 feet (I)
 Datum: NAD27

Sanborn, Head & Associates, Inc.

Drilling Method: 8.25" O.D. Hollow Stem Auger/HQ Wireline Rock Coring

Sampling Method: 2" O.D. Split Spoon

Drilling Company: Parratt Wolff Inc.

Foreman: B. Rice

Date Started: 06/19/12

Date Finished: 06/20/12

Logged By: EMB, JAP

Checked By: LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
06/20/12	13:50	15.68'	Ground Surface	11'	34'	45 min. (pre-purge)
06/20/12	13:58	32.25'	Ground Surface	11'	34'	53 min. (purged)
06/21/12	09:27	31.63'	Ground Surface	11'	34'	20 hrs.
06/22/12	11:30	31.97'	Ground Surface	11'	34'	2 days

CORING LOG \\PORSERV1\DATA\SHARE\IDA\IPOR\DATA\2700S\2732.05\WORK\GINT LOGS\2732.05_BORING_CORING LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 10/19/12

Depth (ft)	Sample No.	Drill Rate (min/ft)	Sample Information				Stratum		Geologic Description	Well Diagram	Well Description
			Depth (ft)	Pen/Rec (ft) (%)	RQD (%)	Field Testing Data	Log	Frac-tures			
10	C-1	7	9.8 - 11	1.2/0.9 75%	0	PID: NM			C-1 (9.8 to 11'): Soft, moderately weathered, red, fine-grained, SANDY SILTSTONE. Very thin horizontal bedding, very close horizontal to steeply dipping jointing. Extremely fractured above 10.5'.		
11	C-2	5.5	11 - 14	3.0/2.7 90%	42	PID: ND			C-2 (11 to 14'): Very soft to soft, slightly weathered, red, aphanitic, SANDY SILTSTONE and SHALE. Very thin horizontal bedding, very close to close horizontal to steeply dipping joints. Shale zone from 13.2 - 13.6'. Green staining at diagonal fracture from 11.7 - 12' and within rock matrix from 13 - 13.5'.		
12		5.5						SANDY SILTSTONE			6" x 1/4" Stainless Steel Mesh Screen (12 to 12.5')
14	C-3	4.5	14 - 19	5.0/3.5 70%	83	PID: ND			C-3 (14 to 19'): Soft, slightly weathered, red, fine-grained, interbedded SILTSTONE & SHALE. Very thin horizontal bedding, very close to close horizontal to steeply dipping joints. Shalier zone 17.8 - 18.0'. White mineral filled vugs and veins with green mineralization halos throughout.		
16		4.5						Int. SILTSTONE & SHALE			3/4" Dia. Sch. 40 PVC (0 to 27') Coarse Sand (11.5 to 15.5')
18	C-4	5	19 - 24	5.0/4.8 96%	71	PID: ND			C-4 (19 to 24'): Medium to moderately hard, slightly weathered, red, fine-grained, SANDY SILTSTONE and interbedded SANDSTONE & SILTSTONE. Very thin horizontal and cross-bedding bedding, very close to close horizontal to shallow dipping joints.		
								SANDY SILTSTONE			

Fracture Symbols



Crack



Joint



Extremely Fractured Zone



Project: Former IBM Manassas
 Location: Manassas, VA
 Project No.: 2732.05

Log of Monitoring Well SG-120

Ground Elevation: 251.19 feet
 PVC Elevation: 250.89 feet (I)
 Datum: NAD27

Sanborn, Head & Associates, Inc.

Drilling Method: 8.25" O.D. Hollow Stem Auger/HQ Wireline Rock Coring

Sampling Method: 2" O.D. Split Spoon

Drilling Company: Parratt Wolff Inc.

Foreman: B. Rice

Date Started: 06/19/12

Date Finished: 06/20/12

Logged By: EMB, JAP

Checked By: LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
06/20/12	13:50	15.68'	Ground Surface	11'	34'	45 min. (pre-purge)
06/20/12	13:58	32.25'	Ground Surface	11'	34'	53 min. (purged)
06/21/12	09:27	31.63'	Ground Surface	11'	34'	20 hrs.
06/22/12	11:30	31.97'	Ground Surface	11'	34'	2 days

CORING LOG \\PORSERV1\DATA\SHARE\IDA\I\PORTDA\TA\2700S\2732.05\WORK\GINT\LOGS\2732.05_BORING_CORING_LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 10/19/12

Depth (ft)	Sample No.	Drill Rate (min/ft)	Sample Information			Field Testing Data	Stratum		Geologic Description	Well Diagram	Well Description
			Depth (ft)	Pen/Rec (ft) (%)	RQD (%)		Log	Fractures			
20		5						SANDY SILTSTONE -----20.3'-----	Portions of interbedded Siltstone & Sandstone are crossbedded.	Bentonite Chip Seal (15.5 to 26.5')	
		5						Int. SILTSTONE & SANDSTONE -----21.4'-----			
22		5						SANDY SILTSTONE	C-5 (24 to 29'): Medium to moderately hard, slightly weathered, red, fine-grained, interbedded SANDSTONE & SILTSTONE and SANDSTONE. Very thin horizontal and cross bedding, very close to close horizontal to vertical joints.		
		5						-----23.8'-----			
24	C-5	5	24 - 29	5.0/4.9 98%	58	PID: ND			Portions of interbedded Siltstone & Sandstone are crossbedded. Calcite filled vertical veins from 24.9 - 26.2' and 26.8 - 27.3'. Sandstone lenses at 27.0 and 27.2.		
		5						Int. SILTSTONE & SANDSTONE			
26		5						-----26.3'----- SANDSTONE -----26.6'-----	Fine Sand (26.5 to 27')		
		5						Int. SILTSTONE & SANDSTONE -----27.3'----- SANDSTONE -----27.5'-----			
28		5						Int. SILTSTONE & SANDSTONE -----28.3'----- SANDSTONE -----28.5'-----	C-6 (29 to 34'): Medium hard to hard, slightly weathered, red, fine-grained, interbedded SANDSTONE. Very thin horizontal and cross bedding, very close to close horizontal to vertical joints.	Coarse Sand (27 to 32')	
	C-6	5	29 - 34	5.0/4.7 94%	53			Int. SILTSTONE & SANDSTONE			

Fracture Symbols



Crack



Joint



Extremely Fractured Zone



Project: Former IBM Manassas
 Location: Manassas, VA
 Project No.: 2732.05

Log of Monitoring Well SG-121

Ground Elevation: 252.91 feet
 PVC Elevation: 256.64 feet (I)
 Datum: NAD27

Sanborn, Head & Associates, Inc.

Drilling Method: 8.25" O.D. Hollow Stem Auger/HQ Wireline Rock Coring

Sampling Method: 2" O.D. Split Spoon

Drilling Company: Parratt Wolff Inc.

Foreman: B. Rice

Date Started: 06/21/12

Date Finished: 06/22/12

Logged By: EMB, JAP, LJJ

Checked By: LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
06/22/12	15:20	8.55'	Ground Surface	10.5'	33.5'	0 min.
06/22/12	15:32	32.55'	Ground Surface	10.5'	33.5'	12 min.
06/22/12	15:43	32.65'	Ground Surface	10.5'	33.5'	23 min.
06/22/12	16:38	31.51'	Ground Surface	10.5'	33.5'	1 hr. 18 min.

BORING LOG \\PORSERV1\DATA\SHARE\DATA\I\PORTDA\TA\2700S\2732.05\WORK\GINT\LOGS\2732.05_BORING_CORING_LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 10/19/12

Depth (ft)	Drill Rate (min/ft)	Sample Information				Field Testing Data	Stratum		Geologic Description	Well Diagram	Well Description
		Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/Rec (in)		Log	Description			
0		S-1	0 - 2	2 6 7 6	24/12	PID: 0.5 ppmv		---0'---	S-1 (0 to 2'): Stiff, red, CLAY & SILT, trace Roots. Dry.	9" Dia. Flushmounted Road Box set in Concrete (0 to 0.8')	
2		S-2	2 - 4	5 5 11 11	24/15	PID: 49.1 ppmv	CLAY & SILT		S-2 (2 to 4'): Very stiff, red, CLAY & SILT, trace coarse Sand, trace Roots, color change to grayish red at 3.7'. Moist.	4" Steel Casing (1 to 10.5')	
4		S-3	4 - 6	4 7 12 25	24/24	PID: 4.8 ppmv			S-3A (4 to 5.7'): Very stiff, red, CLAY & SILT, trace coarse Sand. Moist.		
6		S-4	6 - 6.9	53 75/0.4	11/11	PID: 3.8 ppmv	SANDY SILTSTONE	---5.7'---	S-3B (5.7 to 6'): Soft, very severely weathered, red, fine-grained SANDY SILTSTONE. Very thin horizontal bedding. Dry. S-4 (6 to 6.9'): Hard, red, CLAY & SILT, Soft, very severely weathered, red, fine-grained SANDY SILTSTONE. Very thin horizontal bedding. Gray mineralization in fracture at 6.5'. Dry.	1/4" Stainless Steel Riser (0.5 to 11.5') Bentonite Chip Seal (1 to 11')	
8		S-5	8 - 9.4	26 29 75/0.4	17/17	PID: ND	SILTSTONE	---8'---	S-5A (8 to 9.2'): Very soft, very severely weathered, red, fine-grained SANDY SILTSTONE. Black staining on fracture surfaces at 8.1 and 9.2'. Softer and drier from 8.6 - 8.9'.		
10							SANDY SILTSTONE	---9.2'---	S-5B (9.2 to 9.4'): Soft, severely weathered, red, SANDY SILTSTONE. Very thin horizontal bedding, extremely fractured.		



Project: Former IBM Manassas
 Location: Manassas, VA
 Project No.: 2732.05

Log of Monitoring Well SG-121

Ground Elevation: 252.91 feet
 PVC Elevation: 256.64 feet (I)
 Datum: NAD27

Sanborn, Head & Associates, Inc.

Drilling Method: 8.25" O.D. Hollow Stem Auger/HQ Wireline Rock Coring

Sampling Method: 2" O.D. Split Spoon

Drilling Company: Parratt Wolff Inc.

Foreman: B. Rice

Date Started: 06/21/12

Date Finished: 06/22/12

Logged By: EMB, JAP, LJJ

Checked By: LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
06/22/12	15:20	8.55'	Ground Surface	10.5'	33.5'	0 min.
06/22/12	15:32	32.55'	Ground Surface	10.5'	33.5'	12 min.
06/22/12	15:43	32.65'	Ground Surface	10.5'	33.5'	23 min.
06/22/12	16:38	31.51'	Ground Surface	10.5'	33.5'	1 hr. 18 min.

BORING LOG \\PORSERV1\DATA\SHARE\DATA\I\PORDA\TA\2700S\2732.05\WORK\GINT\LOGS\2732.05_BORING_CORING_LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 10/19/12

Depth (ft)	Drill Rate (min/ft)	Sample Information				Stratum		Geologic Description	Well Diagram	Well Description
		Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/Rec (in)	Field Testing Data	Log Description			
10							 SANDY SILTSTONE		<p>Split-spoon refusal encountered at 9.4'. Drillers advanced 8.25" OD hollow-stem augers to 10.5' without sampling, no refusal encountered. A permanent 4" steel casing was installed to 10.5' and grouted into place.</p> <p>The log continues on page 3.</p>	
12										
14										
16										
18										
20										

Sanborn, Head & Associates, Inc.

Drilling Method: 8.25" O.D. Hollow Stem Auger/HQ Wireline Rock Coring

Sampling Method: 2" O.D. Split Spoon

Drilling Company: Parratt Wolff Inc.

Foreman: B. Rice

Date Started: 06/21/12

Date Finished: 06/22/12

Logged By: EMB, JAP, LJJ

Checked By: LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
06/22/12	15:20	8.55'	Ground Surface	10.5'	33.5'	0 min.
06/22/12	15:32	32.55'	Ground Surface	10.5'	33.5'	12 min.
06/22/12	15:43	32.65'	Ground Surface	10.5'	33.5'	23 min.
06/22/12	16:38	31.51'	Ground Surface	10.5'	33.5'	1 hr. 18 min.

CORING LOG \\PORSERV1\DATA\SHARE\DATA\2700S\2732.05\WORK\GINT\LOGS\2732.05_BORING_CORING_LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 10/19/12

Depth (ft)	Sample No.	Drill Rate (min/ft)	Sample Information			Field Testing Data	Stratum		Geologic Description	Well Diagram	Well Description
			Depth (ft)	Pen/Rec (ft) (%)	RQD (%)		Log	Fractures			
10.5 - 13.5	C-1	4.5	3.0/3.0 100%	10	PID: ND	Log	Fractures	<p>10.5' - 11.3': SILTSTONE</p> <p>11.3' - 11.7': SANDSTONE</p> <p>11.7' - 12.2': Int. SILTSTONE & SANDSTONE</p>		<p>C-1 (10.5 to 13.5'): Soft to medium hard, slightly to moderately weathered, red, fine to coarse-grained, interbedded SANDY SILTSTONE & SANDSTONE, SANDY SILTSTONE, and SANDSTONE. Very thin horizontal and cross bedding, very close to close horizontal to steeply dipping joints.</p> <p>Portions of interbedded Siltstone & Sandstone are crossbedded. Calcite-filled veins throughout. Soft, moderately weathered zone from 10.5 - 11.3'.</p>	<p>6" x 1/4" Stainless Steel Mesh Screen (11.5 to 12')</p> <p>Fine Sand (11 to 15')</p> <p>3/4" Dia. Sch. 40 PVC (0.5 to 28')</p>
13.5 - 17.3	C-2	5	3.8/3.5 92%	77	PID: 0.4 ppmv	Log	Fractures	<p>13.5' - 15.3': SANDY SILTSTONE</p> <p>15.3' - 17.3': SANDY SILTSTONE</p>		<p>C-2 (13.5 to 17.3'): Medium hard, slightly to moderately weathered, red, fine-grained, SANDY SILTSTONE. Very thin horizontal and cross bedding, very close to moderately close horizontal to vertical joints.</p> <p>Portions of interbedded Siltstone & Sandstone are crossbedded. Green staining parallel and perpendicular to bedding from 14.5 - 15.3' and at 17.1'. Calcite-filled veins and vugs especially from 15.4 - 15.9'.</p>	
17.3 - 18.5	C-3	5	1.2/1.2 100%	58	PID: 0.5 ppmv	Log	Fractures	<p>17.3' - 18.5': SANDY SILTSTONE</p>		<p>C-3 (17.3 to 18.5'): Medium hard, slightly weathered, red, fine-grained, SANDY SILTSTONE. Very thin horizontal to shallow dipping bedding, close shallow dipping joints.</p> <p>Calcite-filled veins with green halos parallel to bedding at 17.8 and 18.4'.</p>	
18.5 - 23.5	C-4	2	5.0/4.6 92%	28	PID: 39 ppmv	Log	Fractures	<p>18.5' - 21.7': SANDY SILTSTONE</p> <p>21.7' - 21.8': SANDSTONE</p> <p>21.8' - 23.5': SANDY SILTSTONE</p>		<p>C-4 (18.5 to 23.5'): Medium to moderately hard, slightly to moderately weathered, red, fine-grained, SANDY SILTSTONE. Very thin horizontal bedding, very close to moderately close horizontal to vertical joints.</p> <p>Sandstone lens from 21.7 - 21.8'. Green and black staining on fracture surfaces from 20.5 - 23.5'. Green staining at fractures at 21.2', 21.9', 22.15', and 23.3'.</p>	

Fracture Symbols



Crack



Joint



Extremely Fractured Zone



Project: Former IBM Manassas
 Location: Manassas, VA
 Project No.: 2732.05

Log of Monitoring Well SG-121

Ground Elevation: 252.91 feet
 PVC Elevation: 256.64 feet (I)
 Datum: NAD27

Sanborn, Head & Associates, Inc.

Drilling Method: 8.25" O.D. Hollow Stem Auger/HQ Wireline Rock Coring

Sampling Method: 2" O.D. Split Spoon

Drilling Company: Parratt Wolff Inc.

Foreman: B. Rice

Date Started: 06/21/12

Date Finished: 06/22/12

Logged By: EMB, JAP, LJJ

Checked By: LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
06/22/12	15:20	8.55'	Ground Surface	10.5'	33.5'	0 min.
06/22/12	15:32	32.55'	Ground Surface	10.5'	33.5'	12 min.
06/22/12	15:43	32.65'	Ground Surface	10.5'	33.5'	23 min.
06/22/12	16:38	31.51'	Ground Surface	10.5'	33.5'	1 hr. 18 min.

CORING LOG \\PORSERV1\DATA\SHARE\DATA\2700S\2732.05\WORK\GINT LOGS\2732.05_BORING_CORING LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 10/19/12

Depth (ft)	Sample No.	Drill Rate (min/ft)	Sample Information			Field Testing Data	Stratum		Geologic Description	Well Diagram	Well Description
			Depth (ft)	Pen/Rec (ft) (%)	RQD (%)		Log	Fractures			
22		4.5									
24	C-5	4.5	23.5 - 28.5	5.0/5.0 100%	42	PID: 7.6 ppmv		<p>---23.8'--- Int. SILTSTONE & SANDSTONE ---24.3'---</p> <p>SANDY SILTSTONE</p> <p>---25.7'--- Int. SILTSTONE & SANDSTONE ---26.1'---</p> <p>SANDY SILTSTONE</p> <p>---27.1'--- ---27.3'--- SILTSTONE ---27.5'---</p>	<p>C-5 (23.5 to 28.5'): Medium to moderately hard, slightly weathered, red, fine-grained, interbedded SANDY SILTSTONE & SANDSTONE, SANDY SILTSTONE, and SANDSTONE. Very thin horizontal, shallow dipping and cross bedding, very close to close horizontal to moderately dipping joints.</p> <p>Portions of interbedded Siltstone and Sandstone are crossbedded. Tan mineralization in vugs, especially from 26.1 - 27'. Black staining on fracture from 23.5 - 24.4'. Green mineralization in Sandstone from 27.3 - 27.5'.</p>		
28	C-6	4.5	28.5 - 33.5	5.0/5.0 100%	56	PID: 1.0 ppmv		<p>---28.8'---</p> <p>SANDY SILTSTONE</p> <p>Int. SILTSTONE & SANDSTONE</p>	<p>C-6 (28.5 to 33.5'): Moderately hard, slightly weathered, red, fine-grained, interbedded SANDY SILTSTONE & SANDSTONE and SANDY SILTSTONE. Very thin horizontal and cross bedding, very close to close horizontal to steeply dipping joints.</p> <p>Portions of interbedded Siltstone & Sandstone are crossbedded. Green staining at cracks from 28.5 - 30.2'.</p>		<p>Bentonite Chip Seal (15 to 27.5')</p> <p>Fine Sand (27.5 to 28')</p>
30		4									

Fracture Symbols



Crack



Joint



Extremely Fractured Zone



Project: Former IBM Manassas
 Location: Manassas, VA
 Project No.: 2732.05

Log of Monitoring Well SG-121

Ground Elevation: 252.91 feet
 PVC Elevation: 256.64 feet (I)
 Datum: NAD27

Sanborn, Head & Associates, Inc.

Drilling Method: 8.25" O.D. Hollow Stem Auger/HQ Wireline Rock Coring

Sampling Method: 2" O.D. Split Spoon

Drilling Company: Parratt Wolff Inc.

Foreman: B. Rice

Date Started: 06/21/12

Date Finished: 06/22/12

Logged By: EMB, JAP, LJJ

Checked By: LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
06/22/12	15:20	8.55'	Ground Surface	10.5'	33.5'	0 min.
06/22/12	15:32	32.55'	Ground Surface	10.5'	33.5'	12 min.
06/22/12	15:43	32.65'	Ground Surface	10.5'	33.5'	23 min.
06/22/12	16:38	31.51'	Ground Surface	10.5'	33.5'	1 hr. 18 min.

CORING LOG \\PORSERV1\DATA\SHARE\IDA\IPORDA\TA\2700S\2732.05\WORK\GINT\LOGS\2732.05_BORING_CORING LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 10/19/12

Depth (ft)	Sample No.	Drill Rate (min/ft)	Sample Information				Stratum		Geologic Description	Well Diagram	Well Description
			Depth (ft)	Pen/Rec (ft) (%)	RQD (%)	Field Testing Data	Log	Fractures			
	4									Coarse Sand (28 to 33') 3/4" Dia. Sch. 40 PVC Well Screen (0.010" Slots) (28 to 33')	
	4						SANDY SILTSTONE				
32	4						Int. SILTSTONE & SANDSTONE				
	4						SANDY SILTSTONE				
	4									Fine Sand (33 to 33.5') Boring terminated at 33.5'.	
34								NOTES: 1. The borehole was completed as a multi-depth monitoring installation as shown in the well diagram immediately after the completion of drilling. 2. Exterior surfaces and natural and mechanical breaks in soil and rock samples and the headspace of bagged samples were screened for the presence of volatile organic compounds (VOCs) using a RAE Systems MiniRae Model 2000 Photoionization Detector (PID). The PID was equipped with a 10.6 eV lamp and programmed with a response factor of 1. Calibration of the PID was performed using a 100 parts per million by volume (ppmv) isobutylene standard. 3. Values recorded in the Field Testing Data column represent headspace screening results.			
36											
38											
40											

Fracture Symbols



Crack



Joint



Extremely Fractured Zone



Project: Former IBM Manassas
 Location: Manassas, VA
 Project No.: 2732.05

Log of Monitoring Well SG-122

Ground Elevation: 254.00 feet
 Datum: NAD27

Sanborn, Head & Associates, Inc.

Drilling Method: 2" O.D. Split Spoon

Sampling Method: 2" O.D. Split Spoon

Drilling Company: Parratt Wolff Inc.

Foreman: B. Rice

Date Started: 06/27/12

Date Finished: 06/27/12

Logged By: EMB

Checked By: LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
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BORING LOG \\PORSERV1\DATA\SHARE\DATA\IORDA\TA\2700S\2732.05\WORK\GINT LOGS\2732.05_BORING_CORING LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 10/19/12

Depth (ft)	Sample Information					Stratum		Geologic Description	Well Diagram	Well Description
	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/Rec (in)	Field Testing Data	Log	Description			
0	S-1	0 - 2	3 12 15 15	24/23	PID: 3.5 ppmv		---0'---	S-1 (0 to 2'): Very stiff, red, CLAY & SILT, trace Roots, trace Gravel. Tannish red from 0-0.7'. Increasing moisture with depth.		9" Dia. Flushmounted Road Box set in Concrete (0 to 0.8') Fine Sand (0.5 to 1')
2	S-2	2 - 4	6 13 15 17	24/16	PID: 0.8 ppmv			S-2 (2 to 4'): Very stiff, red, CLAY & SILT, trace gravel-sized Rock fragments, trace coarse Sand. Dry Cobble fragments from 3.3 - 3.6'.		Bentonite Chip Seal (1 to 4.5')
4	S-3	4 - 6	15 19 11 9	24/24	PID: 1.6 ppmv	CLAY & SILT		S-3 (4 to 6'): Very stiff, red, CLAY & SILT, some gravel-sized Siltstone fragments. Dry from 4 - 5.2' and moist from 5.2 - 6'.		1/4" Stainless Steel Tubing Riser (0.5 to 5.5')
6							---6'---	Boring terminated at 6', no refusal encountered.		Fine Sand (4.5 to 6')
6								NOTES: 1. Boring terminated at 6', split-spoon refusal not encountered. 2. The borehole was completed as a soil vapor implant as shown in the well diagram immediately after the completion of drilling. 3. The Field Testing column represents headspace of bagged samples, which were screened for the presence of volatile organic compounds (VOCs) using a RAE System MiniRae Model 2000 Photoionization Detector (PID). The PID was equipped with a 10.6 eV lamp and programmed with a response factor of 1. Calibration of the PID was performed using a 100 parts per million by volume (ppmv) isobutylene standard. 4. No soil samples were submitted for analysis.		6" x 1/4" Stainless Steel Mesh Screen (5.5 to 6')
8										
10										



Project: Former IBM Manassas
 Location: Manassas, VA
 Project No.: 2732.05

Log of Monitoring Well SG-123

Ground Elevation: 253.95 feet
 PVC Elevation: 253.65 feet (I)
 Datum: NAD27

Sanborn, Head & Associates, Inc.

Drilling Method: 8.25" O.D. Hollow Stem Auger/HQ Wireline Rock Coring

Sampling Method: 2" O.D. Split Spoon

Drilling Company: Parratt Wolff Inc.

Foreman: B. Rice

Date Started: 06/21/12

Date Finished: 06/25/12

Logged By: EMB, JAP

Checked By: LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
06/25/12	12:43	18'	Ground Surface	10.5'	33.5'	0 min. (prepurge)
06/25/12	13:15	32.73'	Ground Surface	10.5'	33.5'	32 min. (purged)
06/25/12	13:30	29.65'	Ground Surface	10.5'	33.5'	47 min.
06/25/12	17:26	25.59'	Ground Surface	10.5'	33.5'	5 hrs.

BORING LOG \\PORSERV1\DATA\SHARE\DATA\I\PORDA\TA\2700S\2732.05\WORK\GINT\LOGS\2732.05_BORING_CORING_LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 10/19/12

Depth (ft)	Drill Rate (min/ft)	Sample Information				Field Testing Data	Stratum		Geologic Description	Well Diagram	Well Description
		Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/Rec (in)		Log	Description			
0		S-1	0 - 2	3 8 8 8	24/16	PID: ND		---0'---	S-1 (0 to 2'): Very stiff, red, CLAY & SILT, trace fine to medium Gravel, trace Sand, trace Roots. Dry.		9" Dia. Flushmounted Road Box set in Concrete (0 to 0.8') 4" Steel Casing (0.5 to 10.5') Coarse Sand (0.5 to 1')
2		S-2	2 - 4	6 7 9 10	24/20	PID: ND	CLAY & SILT		S-2 (2 to 4'): Very stiff, red, CLAY & SILT, trace fine to medium Gravel, trace Sand, trace Roots. Moist.		
4		S-3	4 - 6	9 7 7 3	24/6	PID: ND			S-3 (4 to 6'): Stiff, red, CLAY & SILT, some gravel-sized Bedrock fragments, trace Sand. Moist, wet at 5.8'.		
6		S-4	6 - 7	10 78	12/0		No recovery	---6'---	S-4 (6 to 6.9'): No recovery.		1/4" Stainless Steel Riser (0.5 to 11.5') Bentonite Chip Seal (1 to 11')
8		S-5	8 - 8.9	26 75/0.4	11/11	PID: ND	SANDY SILTSTONE	---8'---	S-5 (8 to 8.9'): Very soft, very severely weathered, red, fine-grained SANDY SILTSTONE. Very thin horizontal bedding, extremely fractured.		
10									Split-spoon refusal encountered at 8.9'. Drillers advanced 8.25" OD hollow-stem augers to 10.5' without sampling, no refusal encountered. A permanent 4" steel casing was installed to 10.5' and grouted into place.		
									The log continues on page 2.		



Project: Former IBM Manassas
 Location: Manassas, VA
 Project No.: 2732.05

Log of Monitoring Well SG-123

Ground Elevation: 253.95 feet
 PVC Elevation: 253.65 feet (I)
 Datum: NAD27

Sanborn, Head & Associates, Inc.

Drilling Method: 8.25" O.D. Hollow Stem Auger/HQ Wireline Rock Coring

Sampling Method: 2" O.D. Split Spoon

Drilling Company: Parratt Wolff Inc.

Foreman: B. Rice

Date Started: 06/21/12

Date Finished: 06/25/12

Logged By: EMB, JAP

Checked By: LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
06/25/12	12:43	18'	Ground Surface	10.5'	33.5'	0 min. (prepurge)
06/25/12	13:15	32.73'	Ground Surface	10.5'	33.5'	32 min. (purged)
06/25/12	13:30	29.65'	Ground Surface	10.5'	33.5'	47 min.
06/25/12	17:26	25.59'	Ground Surface	10.5'	33.5'	5 hrs.

CORING LOG \\PORSERV1\DATA\SHARE\IDA\IPORDA\TA\2700S\2732.05\WORK\GIN\LOGS\2732.05_BORING_CORING LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 10/19/12

Depth (ft)	Sample No.	Drill Rate (min/ft)	Sample Information				Stratum		Geologic Description	Well Diagram	Well Description
			Depth (ft)	Pen/Rec (ft) (%)	RQD (%)	Field Testing Data	Log	Fractures			
10.5 - 13.5	C-1	4	3.0/3.0 100%	29	PID: 1.0 ppmv			C-1 (10.5 to 13.5'): Medium hard, slightly weathered, red, fine-grained, SANDY SILTSTONE. Very thin horizontal bedding, very close to close horizontal to steeply dipping joints. Calcite-filled vugs throughout.			
13.5 - 18.5	C-2	4	5.0/5.0 100%	35	PID: 0.8 ppmv			C-2 (13.5 to 18.5'): Medium to moderately hard, severely weathered, red, fine-grained, SANDY SILTSTONE. Very thin horizontal bedding, very close to close horizontal to steeply dipping joints. Calcite-filled veins and vugs from 13.5 to 17'. Green staining parallel to bedding at 14.6', 15.9', and 16.1'.		6" x 1/4" Stainless Steel Mesh Screen (11.5 to 12')	
18.5 - 23.5	C-3	4	5.0/5.0 100%	70	PID: 1.1 ppmv			C-3 (18.5 to 23.5'): Moderately hard, slightly weathered to fresh, red, fine-grained, interbedded SANDY SILTSTONE & SANDSTONE and SANDY SILTSTONE. Very thin horizontal and cross bedding, very close to moderately close horizontal to steeply dipping joints. Portions of interbedded Siltstone & Sandstone are crossbedded. Sandier than C-2. Interbedded Siltstone & Sandstone lenses at 19.9 - 20.1', 20.9 - 21.2', 22.1 - 22.3' and 22.9 - 23.2'.		3/4" Dia. Sch. 40 PVC (0.5 to 28.5')	

Fracture Symbols



Crack



Joint



Extremely Fractured Zone



Project: Former IBM Manassas
 Location: Manassas, VA
 Project No.: 2732.05

Log of Monitoring Well SG-123

Ground Elevation: 253.95 feet
 PVC Elevation: 253.65 feet (I)
 Datum: NAD27

Sanborn, Head & Associates, Inc.

Drilling Method: 8.25" O.D. Hollow Stem Auger/HQ Wireline Rock Coring

Sampling Method: 2" O.D. Split Spoon

Drilling Company: Parratt Wolff Inc.

Foreman: B. Rice

Date Started: 06/21/12

Date Finished: 06/25/12

Logged By: EMB, JAP

Checked By: LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
06/25/12	12:43	18'	Ground Surface	10.5'	33.5'	0 min. (prepurge)
06/25/12	13:15	32.73'	Ground Surface	10.5'	33.5'	32 min. (purged)
06/25/12	13:30	29.65'	Ground Surface	10.5'	33.5'	47 min.
06/25/12	17:26	25.59'	Ground Surface	10.5'	33.5'	5 hrs.

CORING LOG \\PORSERV1\DATA\SHARE\DATA\PO\ORDA\TA\2700S\2732.05\WORK\GINT\LOGS\2732.05_BORING_CORING_LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 10/19/12

Depth (ft)	Sample No.	Drill Rate (min/ft)	Sample Information			Field Testing Data	Stratum		Geologic Description	Well Diagram	Well Description
			Depth (ft)	Pen/Rec (ft) (%)	RQD (%)		Log	Fractures			
20.9'	4							SANDY SILTSTONE	Green staining parallel to bedding at 21'.		
21.2'											
22.1'	4							SILTSTONE			
22.3'											
22.9'	4							SILTSTONE			
23.2'											
23.5'	C-4		23.5 - 28.5	5.0/5.0 100%	46	PID: ND		SILTSTONE	C-4 (23.5 to 28.5): Moderately hard, fresh to moderately weathered, red, fine to coarse-grained, interbedded SANDY SILTSTONE & SANDSTONE, SANDY SILTSTONE, and SANDSTONE. Very thin horizontal bedding, very close to moderately close horizontal to steeply dipping joints.		Bentonite Chip Seal (15 to 27.5')
25.2'	4							Int. SILTSTONE & SANDSTONE			
25.6'	4							SANDSTONE	Portions of interbedded Siltstone & Sandstone are crossbedded. Calcite-filled veins and vugs from 25.4 - 26.6'. Coarse-grained Sandstone lens at 25.9'.		
28.8'	4							SANDY SILTSTONE			
29'	4										
29.9'	C-5		28.5 - 33.5	5.0/5.0 100%	32	PID: ND		SANDY SILTSTONE	C-5 (28.5 to 33.5): Moderately hard, slightly weathered, red, fine-grained, interbedded SANDY SILTSTONE & SANDSTONE and SANDY SILTSTONE. Very thin horizontal and cross bedding, very close to close horizontal to vertical jointing.		Fine Sand (28 to 28.5')
29.9'	3.5							Int. SILTSTONE & SANDSTONE	Portions of interbedded Siltstone & Sandstone are crossbedded. Calcite-filled veins at from 29.2 - 29.4' and at 31.9' and 32.3'.		

Fracture Symbols



Crack



Joint



Extremely Fractured Zone



Project: Former IBM Manassas
 Location: Manassas, VA
 Project No.: 2732.05

Log of Monitoring Well SG-123

Ground Elevation: 253.95 feet
 PVC Elevation: 253.65 feet (I)
 Datum: NAD27

Sanborn, Head & Associates, Inc.

Drilling Method: 8.25" O.D. Hollow Stem Auger/HQ Wireline Rock Coring

Sampling Method: 2" O.D. Split Spoon

Drilling Company: Parratt Wolff Inc.

Foreman: B. Rice

Date Started: 06/21/12

Date Finished: 06/25/12

Logged By: EMB, JAP

Checked By: LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
06/25/12	12:43	18'	Ground Surface	10.5'	33.5'	0 min. (prepurge)
06/25/12	13:15	32.73'	Ground Surface	10.5'	33.5'	32 min. (purged)
06/25/12	13:30	29.65'	Ground Surface	10.5'	33.5'	47 min.
06/25/12	17:26	25.59'	Ground Surface	10.5'	33.5'	5 hrs.

CORING LOG \\PORSERV1\DATA\SHARE\IDA\IPORDA\TA\2700S\2732.05\WORK\GINT\LOGS\2732.05_BORING_CORING LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 10/19/12

Depth (ft)	Sample No.	Drill Rate (min/ft)	Sample Information				Stratum		Geologic Description	Well Diagram	Well Description
			Depth (ft)	Pen/Rec (ft) (%)	RQD (%)	Field Testing Data	Log	Fractures			
		3.5									
		3.5						Int. SILTSTONE & SANDSTONE ---31'---		Coarse Sand (28.5 to 33.5') ¾" Dia. Sch. 40 PVC Well Screen (0.010" Slots) (28.5 to 33.5')	
32								SANDY SILTSTONE			
		3.5						---32.7'--- Int. SILTSTONE & SANDSTONE ---33.1'--- SANDY SILTSTONE ---33.5'---			
34										Boring terminated at 33.5', split spoon refusal is covered on page 1 of this log. NOTES: 1. The borehole was completed as a multi-depth monitoring installation as shown in the well diagram immediately after the completion of drilling. 2. Exterior surfaces and natural and mechanical breaks in soil and rock samples and the headspace of bagged samples were screened for the presence of volatile organic compounds (VOCs) using a RAE Systems MiniRae Model 2000 Photoionization Detector (PID). The PID was equipped with a 10.6 eV lamp and programmed with a response factor of 1. Calibration of the PID was performed using a 100 parts per million by volume (ppmv) isobutylene standard. 3. Values recorded in the Field Testing Data column represent headspace screening results.	
36											
38											
40											

Fracture Symbols



Crack



Joint



Extremely Fractured Zone



Project: Former IBM Manassas
 Location: Manassas, VA
 Project No.: 2732.05

Log of Monitoring Well SG-31/D-86

Ground Elevation: 246.04 feet
 PVC Elevation: 245.76 feet (I) / 245.79 feet (D) / 245.68 feet (D-86)
 Datum: NAD27

Sanborn, Head & Associates, Inc.

Drilling Method: 8.25" O.D. Hollow Stem Auger/HQ Wireline Rock Coring

Sampling Method: 2" O.D. Split Spoon

Drilling Company: Parratt Wolff Inc.

Foreman: B. Rice

Date Started: 06/28/12

Date Finished: 06/28/12

Logged By: EMB, JAP

Checked By: LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
06/29/12	14:10	57.83'	Ground Surface	10.5'	68.5'	
07/09/12	11:30	61.03'	Ground Surface	10.5'	68.5'	
07/10/12	10:05	32.45'	Ground Surface	10.5'	80'	Prepurge
07/10/12	10:35	77.45'	Ground Surface	10.5'	80'	Purged
07/10/12	10:38	76.3'	Ground Surface	10.5'	80'	

BORING LOG \\PORSERV1\DATA\SHARE\DATA\I\PORTDA\TA\2700S\2732.05\WORK\GINT\LOGS\2732.05_BORING_CORING_LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 10/19/12

Depth (ft)	Drill Rate (min/ft)	Sample Information				Stratum		Geologic Description	Well Diagram	Well Description
		Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/Rec (in)	Field Testing Data	Log			
0								Asphalt.		9" Dia. Flushmounted Road Box set in Concrete (0 to 0.8') Coarse Sand (0.5 to 1')
0.5 - 2		S-1	0.5 - 2	9 5 3	18/14	PID: 3.5 ppmv	ASPHALT	S-1 (0.5 to 2'): Medium stiff, brown, fine to coarse SAND, trace Silt, trace Gravel. Dry. FILL.		
2		S-2	2 - 4	3 3 6 8	24/18	PID: 1.3 ppmv	FILL	S-2A (2 to 2.7'): Medium stiff, brown, fine to coarse SAND, trace Silt, trace Gravel. Dry. FILL. S-2B (2.7 to 4'): Stiff, brownish-red, Silty CLAY, trace Roots. Moist.		Bentonite Chip Seal (1 to 11.5')
4		S-3	4 - 6	3 8 22 37	24/24	PID: 5.7 ppmv	SILTY CLAY	S-3A (4 to 4.4'): Stiff, brownish-red, Silty CLAY, trace Roots. Moist. S-3B (4.4 to 6'): CLAY & SILT, trace gravel-sized Rock fragments. Drier and more weathered Rock-like with depth.		4" Dia. Protective Steel Casing (0.5 to 10.5')
6		S-4	6 - 6.4	75/0.4	5/5	PID: 4.2 ppmv	CLAY & SILT	S-4 (6 to 6.4'): Soft, very severely weathered red, fine-grained SANDY SILTSTONE. Moist. Split-spoon refusal encountered at 6.4'. Drillers advanced 8.25" OD hollow-stem augers to 8.0' without sampling.		1/4" Stainless Steel Tubing Riser (0.5 to 12')
8		S-5	8 - 8.9	23 100/0.4	11/11	PID: 5.5 ppmv	WEATHERED SILTSTONE	S-5 (8 to 8.9'): Soft, very severely weathered red, fine-grained SANDY SILTSTONE, more competent with depth. Black staining along fracture surfaces. Moist. Split-spoon refusal encountered at 8.9'. Drillers advanced 8.25" OD hollow-stem augers to 10.5' without sampling, no refusal encountered. A permanent 4" steel casing was installed to 10.5' and grouted into place.		
10								The log continues on page 2.		

Sanborn, Head & Associates, Inc.

Drilling Method: 8.25" O.D. Hollow Stem Auger/HQ Wireline Rock Coring

Sampling Method: 2" O.D. Split Spoon

Drilling Company: Parratt Wolff Inc.

Foreman: B. Rice

Date Started: 06/28/12

Date Finished: 06/28/12

Logged By: EMB, JAP

Checked By: LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
06/29/12	14:10	57.83'	Ground Surface	10.5'	68.5'	
07/09/12	11:30	61.03'	Ground Surface	10.5'	68.5'	
07/10/12	10:05	32.45'	Ground Surface	10.5'	80'	Prepurge
07/10/12	10:35	77.45'	Ground Surface	10.5'	80'	Purged
07/10/12	10:38	76.3'	Ground Surface	10.5'	80'	

CORING LOG \\PORSERV1\DATA\SHARE\DATA\2700S\2732.05\WORK\GINT\LOGS\2732.05_BORING_CORING_LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 10/19/12

Depth (ft)	Sample No.	Drill Rate (min/ft)	Sample Information			Field Testing Data	Stratum		Geologic Description	Well Diagram	Well Description
			Depth (ft)	Pen/Rec (ft) (%)	RQD (%)		Log	Fractures			
10.5 - 13.5	C-1	4	3.0/2.4 80%	0	PID: 1.1 ppmv			C-1 (10.5 to 13.5'): Soft to medium hard, moderately to severely weathered, red, very fine-grained to aphanitic, interbedded SANDY SILTSTONE & SHALE and SANDY SILTSTONE. Very thin horizontal bedding, very close to close horizontal to vertical jointing.			
12		4						Green mineralization on fracture surfaces from 10.5 - 12'. SANDY SILTSTONE		Fine Sand (11.5 to 15.5')	
12.4'		4						Int. SILTSTONE & SHALE		6" x 1/4" Stainless Steel Mesh Screen (12 to 12.5')	
13.5 - 18.5	C-2	4	5.0/4.9 98%	40	PID: 0.9 ppmv			C-2 (13.5 to 18.5'): Medium to moderately hard, severe to slightly weathered, red, fine-grained to aphanitic, interbedded SANDY SILTSTONE & SHALE, SANDY SILTSTONE, and interbedded SANDY SILTSTONE & SANDSTONE. Very thin horizontal and crossbeddings, very close to close horizontal to vertical jointing.			
14		4						SANDY SILTSTONE			
15.8'		3						Int. SILTSTONE & SANDSTONE			
16		3						SANDY SILTSTONE			
16.8'		3						Int. SILTSTONE & SANDSTONE			
18.5 - 23.5	C-3	2.2	5.0/5.2 104%	94	PID: 6.0 ppmv			C-3 (18.5 to 23.5'): Moderately hard, fresh, red, fine-grained, interbedded Siltstone. Very thin horizontal and crossbedding, very close to moderately close horizontal jointing.			
18		2.2						SANDY SILTSTONE		3/4" Dia. PVC Riser (0.5 to 32')	
20		2.2									

Fracture Symbols



Crack



Joint



Extremely Fractured Zone



Project: Former IBM Manassas
 Location: Manassas, VA
 Project No.: 2732.05

Log of Monitoring Well SG-31/D-86

Ground Elevation: 246.04 feet
 PVC Elevation: 245.76 feet (I) / 245.79 feet (D) / 245.68 feet (D-86)
 Datum: NAD27

Sanborn, Head & Associates, Inc.

Drilling Method: 8.25" O.D. Hollow Stem Auger/HQ Wireline Rock Coring

Sampling Method: 2" O.D. Split Spoon

Drilling Company: Parratt Wolff Inc.

Foreman: B. Rice

Date Started: 06/28/12

Date Finished: 06/28/12

Logged By: EMB, JAP

Checked By: LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
06/29/12	14:10	57.83'	Ground Surface	10.5'	68.5'	
07/09/12	11:30	61.03'	Ground Surface	10.5'	68.5'	
07/10/12	10:05	32.45'	Ground Surface	10.5'	80'	Prepurge
07/10/12	10:35	77.45'	Ground Surface	10.5'	80'	Purged
07/10/12	10:38	76.3'	Ground Surface	10.5'	80'	

CORING LOG \\PORSERV1\DATA\SHARE\DATA\2700S\2732.05\WORK\GINT LOGS\2732.05_BORING_CORING LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 10/19/12

Depth (ft)	Sample No.	Drill Rate (min/ft)	Sample Information				Stratum		Geologic Description	Well Diagram	Well Description
			Depth (ft)	Pen/Rec (ft) (%)	RQD (%)	Field Testing Data	Log	Fractures			
32		2.2						SANDY SILTSTONE			
		2.2						Int. SILTSTONE & SANDSTONE		Fine Sand (32 to 32.5')	
		2.2						SANDY SILTSTONE			
34	C-6	2.5	33.5 - 38.5	5.0/5.0 100%	72	PID: 1.7 ppmv		C-6 (33.5 to 38.5): Moderately hard to hard, fresh to slightly weathered, red, fine to coarse-grained, interbedded SANDY SILTSTONE & SANDSTONE, SANDY SILTSTONE and SANDSTONE. Very thin horizontal and cross bedding, very close to moderately close horizontal to shallow dipping joints.			
		2.5						Int. SILTSTONE & SANDSTONE		3/4" Dia. PVC Riser (0.5 to 70')	
		2.5						Coarse SANDSTONE			
36		2.5						SANDY SILTSTONE			
		2.5						Int. SILTSTONE & SANDSTONE		Bentonite Chip Seal (32.5 to 43')	
38	C-7	2.5	38.5 - 43.5	5.0/5.2 104%	100	PID: 6.0 ppmv		C-7 (38.5 to 43.5): Moderately hard to hard, fresh to slightly weathered, red, fine-grained, SANDY SILTSTONE. Very thin horizontal bedding, very close to thick horizontal joints. Fine to coarse Sandy lens from 39.25 - 39.3'.			
		2.5						SANDY SILTSTONE			
40		2.5									

Fracture Symbols



Crack



Joint



Extremely Fractured Zone



Project: Former IBM Manassas
 Location: Manassas, VA
 Project No.: 2732.05

Log of Monitoring Well SG-31/D-86

Ground Elevation: 246.04 feet
 PVC Elevation: 245.76 feet (I) / 245.79 feet (D) / 245.68 feet (D-86)
 Datum: NAD27

Sanborn, Head & Associates, Inc.

Drilling Method: 8.25" O.D. Hollow Stem Auger/HQ Wireline Rock Coring

Sampling Method: 2" O.D. Split Spoon

Drilling Company: Parratt Wolff Inc.

Foreman: B. Rice

Date Started: 06/28/12

Date Finished: 06/28/12

Logged By: EMB, JAP

Checked By: LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
06/29/12	14:10	57.83'	Ground Surface	10.5'	68.5'	
07/09/12	11:30	61.03'	Ground Surface	10.5'	68.5'	
07/10/12	10:05	32.45'	Ground Surface	10.5'	80'	Prepurge
07/10/12	10:35	77.45'	Ground Surface	10.5'	80'	Purged
07/10/12	10:38	76.3'	Ground Surface	10.5'	80'	

CORING LOG \\PORSERV1\DATA\SHARE\DATA\2700S\2732.05\WORK\GINT\LOGS\2732.05_BORING_CORING_LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 10/19/12

Depth (ft)	Sample No.	Drill Rate (min/ft)	Sample Information				Stratum		Geologic Description	Well Diagram	Well Description
			Depth (ft)	Pen/Rec (ft) (%)	RQD (%)	Field Testing Data	Log	Frac-tures			
42		2.5									
43.5	C-8	2.2	43.5 - 48.5	5.0/4.9 98%	96	PID: 2.3 ppmv		SANDY SILTSTONE	C-8 (43.5 to 48.5): Hard, fresh to slightly weathered, red, fine to coarse-grained, interbedded SANDY SILTSTONE & SANDSTONE and SANDY SILTSTONE. Very thin horizontal and cross bedding, very close to moderately close horizontal to shallow dipping joints. Portions of interbedded Siltstone & Sandstone are crossbedded.	Fine Sand (43 to 43.5')	
46		2.2									
48.5	C-9	2.5	48.5 - 53.5	5.0/5.0 100%	64	PID: ND		SILTSTONE & SANDSTONE 48.1' Int. 48.5'	C-9 (48.5 to 53.5): Hard, fresh to slightly weathered, red, fine to coarse-grained, interbedded SANDY SILTSTONE & SANDSTONE and SANDY SILTSTONE. Very thin horizontal and cross bedding, very close to moderately close horizontal to vertical joints. Portions of interbedded Siltstone & Sandstone are crossbedded.	Coarse Sand (43.5 to 48.5') 3/4" Dia. Sch. 40 PVC Well Screen (0.010" Slots) (43.5 to 48.5')	
50		2.5						SANDY SILTSTONE		Fine Sand (48.5 to 49')	

Fracture Symbols



Crack



Joint



Extremely Fractured Zone

Sanborn, Head & Associates, Inc.

Drilling Method: 8.25" O.D. Hollow Stem Auger/HQ Wireline Rock Coring

Sampling Method: 2" O.D. Split Spoon

Drilling Company: Parratt Wolff Inc.

Foreman: B. Rice

Date Started: 06/28/12

Date Finished: 06/28/12

Logged By: EMB, JAP

Checked By: LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
06/29/12	14:10	57.83'	Ground Surface	10.5'	68.5'	
07/09/12	11:30	61.03'	Ground Surface	10.5'	68.5'	
07/10/12	10:05	32.45'	Ground Surface	10.5'	80'	Prepurge
07/10/12	10:35	77.45'	Ground Surface	10.5'	80'	Purged
07/10/12	10:38	76.3'	Ground Surface	10.5'	80'	

CORING LOG \\PORSERV1\DATA\SHARE\DATA\2700S\2732.05\WORK\GINT LOGS\2732.05_BORING_CORING LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 10/19/12

Depth (ft)	Sample No.	Drill Rate (min/ft)	Sample Information				Stratum		Geologic Description	Well Diagram	Well Description
			Depth (ft)	Pen/Rec (ft) (%)	RQD (%)	Field Testing Data	Log	Fractures			
50.8		2.5						SANDY SILTSTONE			
51.1											
52.1		2.5						SANDY SILTSTONE			
52.5								Int. SILTSTONE & SANDSTONE			
53.5 - 58.5	C-10	2.5	53.5 - 58.5	5.0/5.0 100%	15	PID: 1.0 ppmv		SANDY SILTSTONE		C-10 (53.5 to 58.5'): Medium to moderately hard, slightly to moderately weathered, red, fine-grained, SANDY SILTSTONE. Very thin horizontal and cross bedding, very close to moderately close horizontal to vertical joints. Coarse portions of Sandy Siltstone are crossbedded. Calcite-filled veins and vugs at 54 - 54.3', 55.9', and 58.3 - 58.5'.	
55		2.5									
58.5 - 63.5	C-11	2.5	58.5 - 63.5	5.0/5.0 100%	100	PID: 0.5 ppmv		Int. SILTSTONE & SANDSTONE		C-11 (58.5 to 63.5'): Hard, fresh, red, fine-grained, interbedded SANDY SILTSTONE & SANDSTONE and SANDY SILTSTONE. Very thin horizontal and cross bedding, close to moderately close horizontal joints.	
58.7											
60.6		2.5						SANDY SILTSTONE		Portions of interbedded Siltstone & Sandstone are crossbedded. Sandy lens from 6.5 - 60.6.	
69.5										Bentonite Chip Seal (49 to 69.5')	

Fracture Symbols



Crack



Joint



Extremely Fractured Zone



Project: Former IBM Manassas
 Location: Manassas, VA
 Project No.: 2732.05

Log of Monitoring Well SG-31/D-86

Ground Elevation: 246.04 feet
 PVC Elevation: 245.76 feet (I) / 245.79 feet (D) / 245.68 feet (D-86)
 Datum: NAD27

Sanborn, Head & Associates, Inc.

Drilling Method: 8.25" O.D. Hollow Stem Auger/HQ Wireline Rock Coring

Sampling Method: 2" O.D. Split Spoon

Drilling Company: Parratt Wolff Inc.

Foreman: B. Rice

Date Started: 06/28/12

Date Finished: 06/28/12

Logged By: EMB, JAP

Checked By: LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
06/29/12	14:10	57.83'	Ground Surface	10.5'	68.5'	
07/09/12	11:30	61.03'	Ground Surface	10.5'	68.5'	
07/10/12	10:05	32.45'	Ground Surface	10.5'	80'	Prepurge
07/10/12	10:35	77.45'	Ground Surface	10.5'	80'	Purged
07/10/12	10:38	76.3'	Ground Surface	10.5'	80'	

CORING LOG \\PORSERV1\DATA\SHARE\DATA\PO\ORDA\TA\2700S\2732.05\WORK\GINT\LOGS\2732.05_BORING_CORING_LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 10/19/12

Depth (ft)	Sample No.	Drill Rate (min/ft)	Sample Information			Field Testing Data	Stratum		Geologic Description	Well Diagram	Well Description
			Depth (ft)	Pen/Rec (ft) (%)	RQD (%)		Log	Frac-tures			
62		2.5									
62		2.5									
62		2.5						SANDY SILTSTONE			
64	C-12	2.5	63.5 - 68.5	5.0/5.0 100%	60	PID: ND			C-12 (63.5 to 68.5'): Moderately hard to hard, slightly weathered, red, fine-grained to aphanitic, interbedded SANDY SILTSTONE & SANDSTONE, SANDY SILTSTONE, and interbedded SANDY SILTSTONE & SHALE. Very thin horizontal and cross bedding, very close to moderately close horizontal to vertical joints.		
64		2.5									
64		2.5						Int. SILTSTONE & SANDSTONE			
64		2.5							Portions of interbedded Siltstone & Sandstone are crossbedded. Green mineralization at 63.7'. Shale lenses at 65.5', 66', and 66.8'. Calcite-filled vugs from 65.7 - 66.2' and 63.8 - 64.2'.		
66		2.5						Int. SILTSTONE & SHALE			
66		2.5									
66		2.5									
68		2.5									
68	C-13	2.5	68.5 - 73.5	5.0/5.2 104%	90	PID: 2.5 ppmv		Int. SILTSTONE & SANDSTONE	C-13 (68.5 to 73.5'): Moderately hard to hard, fresh to slightly weathered, red, fine-grained, interbedded SANDY SILTSTONE & SANDSTONE. Very thin horizontal and cross bedding, very close to moderately close horizontal to shallow dipping joints.		
68		2.5									
68		2.5									
70		2.5							Coarser portions of interbedded Siltstone & Sandstone are crossbedded. Shale lens at 71.2', Calcite-filled veins especially from 70.6 - 72.4'.		
70		2.5								Fine Sand (69.5 to 70')	

Fracture Symbols



Crack



Joint



Extremely Fractured Zone



Project: Former IBM Manassas
 Location: Manassas, VA
 Project No.: 2732.05

Log of Monitoring Well SG-31/D-86

Ground Elevation: 246.04 feet
 PVC Elevation: 245.76 feet (I) / 245.79 feet (D) / 245.68 feet (D-86)
 Datum: NAD27

Sanborn, Head & Associates, Inc.

Drilling Method: 8.25" O.D. Hollow Stem Auger/HQ Wireline Rock Coring

Sampling Method: 2" O.D. Split Spoon

Drilling Company: Parratt Wolff Inc.

Foreman: B. Rice

Date Started: 06/28/12

Date Finished: 06/28/12

Logged By: EMB, JAP

Checked By: LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
06/29/12	14:10	57.83'	Ground Surface	10.5'	68.5'	
07/09/12	11:30	61.03'	Ground Surface	10.5'	68.5'	
07/10/12	10:05	32.45'	Ground Surface	10.5'	80'	Prepurge
07/10/12	10:35	77.45'	Ground Surface	10.5'	80'	Purged
07/10/12	10:38	76.3'	Ground Surface	10.5'	80'	

CORING LOG \\PORSERV1\DATA\SHARE\DATA\IPOR\DATA\2700S\2732.05\WORK\GINT LOGS\2732.05_BORING_CORING LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 10/19/12

Depth (ft)	Sample No.	Drill Rate (min/ft)	Sample Information				Stratum		Geologic Description	Well Diagram	Well Description
			Depth (ft)	Pen/Rec (ft) (%)	RQD (%)	Field Testing Data	Log	Fractures			
72		2.5									
74	C-14	2.5	73.5 - 75	1.5/1.3 87%	27	PID: 2.3 ppmv			C-14 (73.5 to 75'): Moderately hard, slightly weathered, red, fine-grained, interbedded SANDY SILTSTONE & SANDSTONE. Very thin horizontal and cross bedding, very close to close horizontal joints.		
		1					Int. SILTSTONE & SANDSTONE		Coarser portions of interbedded Siltstone & Sandstone are cross bedded.		
76	C-15	2.5	75 - 78.5	3.5/3.5 100%	57	PID: 2.8 ppmv			C-15 (75 to 78.5'): Moderately hard to hard, fresh to slightly weathered, red, fine to medium-grained, interbedded SANDY SILTSTONE & SANDSTONE, and SANDSTONE. Very thin horizontal and cross bedding, very close to close horizontal to vertical joints.	Coarse Sand (70 to 80') 3/4" Dia. Sch. 40 PVC Well Screen (0.010" Slots) (70 to 80')	
		2.5							Portions of interbedded Siltstone & Sandstone are cross bedded. Shale lens at 76'.		
78		1									
	C-16	2.5	78.5 - 80	1.5/1.7 113%	76	PID: 2.4 ppmv			C-16 (78.5 to 80'): Moderately hard to hard, fresh to slightly weathered, red, fine to medium-grained, interbedded SANDY SILTSTONE & SANDSTONE, and SANDSTONE. Very thin horizontal and cross bedding, very close to close horizontal to vertical joints.		
		1					Int. SILTSTONE & SANDSTONE		Portions of interbedded Siltstone & Sandstone are crossbedded.		
80		1							Boring terminated at 80'		

Fracture Symbols



Crack



Joint



Extremely Fractured Zone



Project: Former IBM Manassas
 Location: Manassas, VA
 Project No.: 2732.05

Log of Monitoring Well SG-31/D-86

Ground Elevation: 246.04 feet
 PVC Elevation: 245.76 feet (I) / 245.79 feet (D) / 245.68 feet (D-86)
 Datum: NAD27

Sanborn, Head & Associates, Inc.

Drilling Method: 8.25" O.D. Hollow Stem Auger/HQ Wireline Rock Coring

Sampling Method: 2" O.D. Split Spoon

Drilling Company: Parratt Wolff Inc.

Foreman: B. Rice

Date Started: 06/28/12

Date Finished: 06/28/12

Logged By: EMB, JAP

Checked By: LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
06/29/12	14:10	57.83'	Ground Surface	10.5'	68.5'	
07/09/12	11:30	61.03'	Ground Surface	10.5'	68.5'	
07/10/12	10:05	32.45'	Ground Surface	10.5'	80'	Prepurge
07/10/12	10:35	77.45'	Ground Surface	10.5'	80'	Purged
07/10/12	10:38	76.3'	Ground Surface	10.5'	80'	

CORING LOG \\PORSERV1\DATA\SHARE\IDA\IPOR\DATA\2700S\2732.05\WORK\GINT LOGS\2732.05_BORING_CORING LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 10/19/12

Depth (ft)	Sample No.	Drill Rate (min/ft)	Sample Information				Stratum		Geologic Description	Well Diagram	Well Description
			Depth (ft)	Pen/Rec (ft) (%)	RQD (%)	Field Testing Data	Log	Fractures			
82											
84											
86											
88											
90											

NOTES:

- The borehole was completed as a multi-depth monitoring installation as shown in the well diagram immediately after the completion of drilling.
- Exterior surfaces and natural and mechanical breaks in soil and rock samples and the headspace of bagged samples were screened for the presence of volatile organic compounds (VOCs) using a RAE Systems MiniRae Model 2000 Photoionization Detector (PID). The PID was equipped with a 10.6 eV lamp and programmed with a response factor of 1. Calibration of the PID was performed using a 100 parts per million by volume (ppmv) isobutylene standard.
- Values recorded in the Field Testing Data column represent headspace screening results.
- Well point D-86 is identified as the screened interval from 70 - 80 feet below ground surface.

Fracture Symbols



Crack



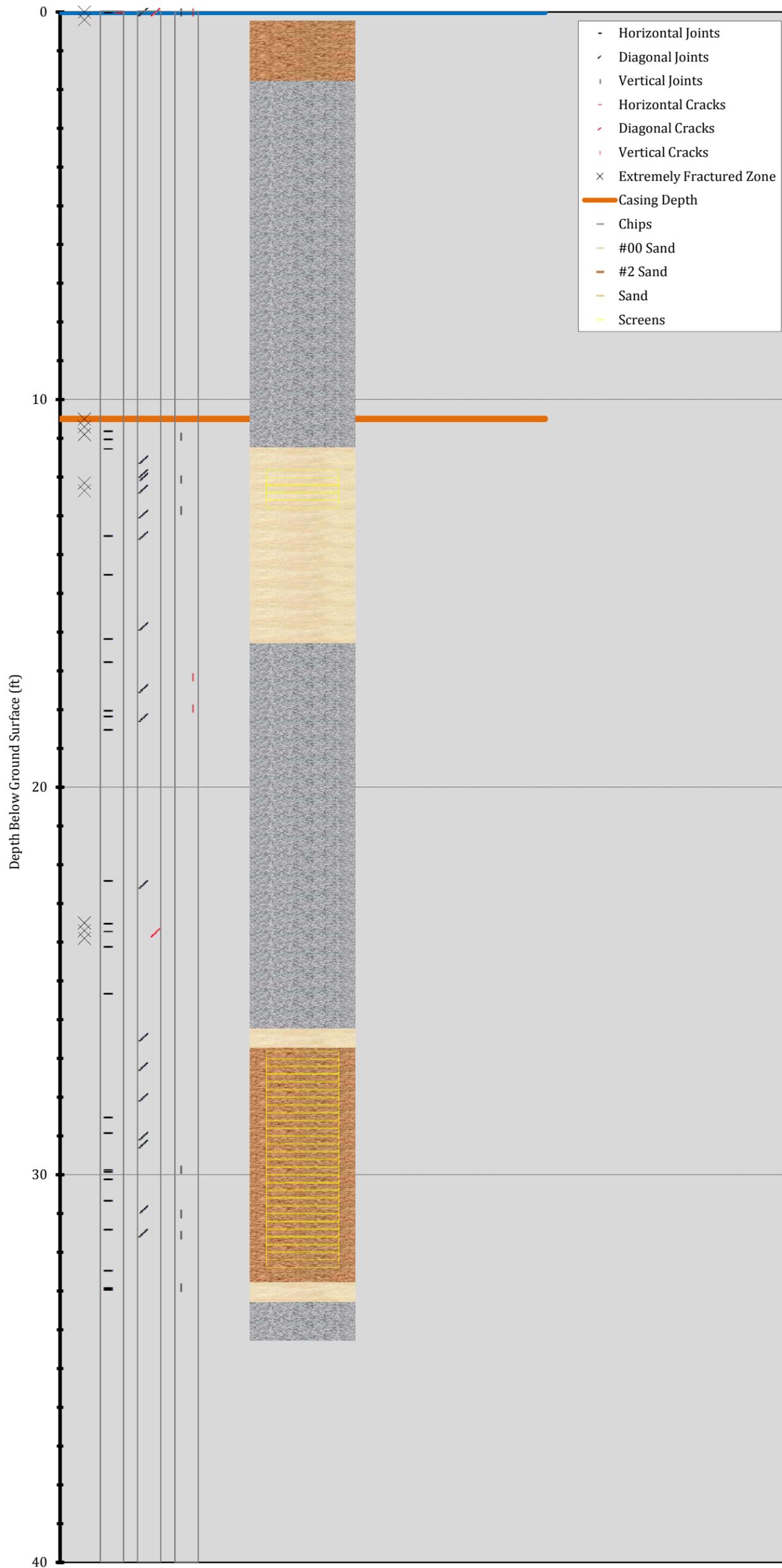
Joint



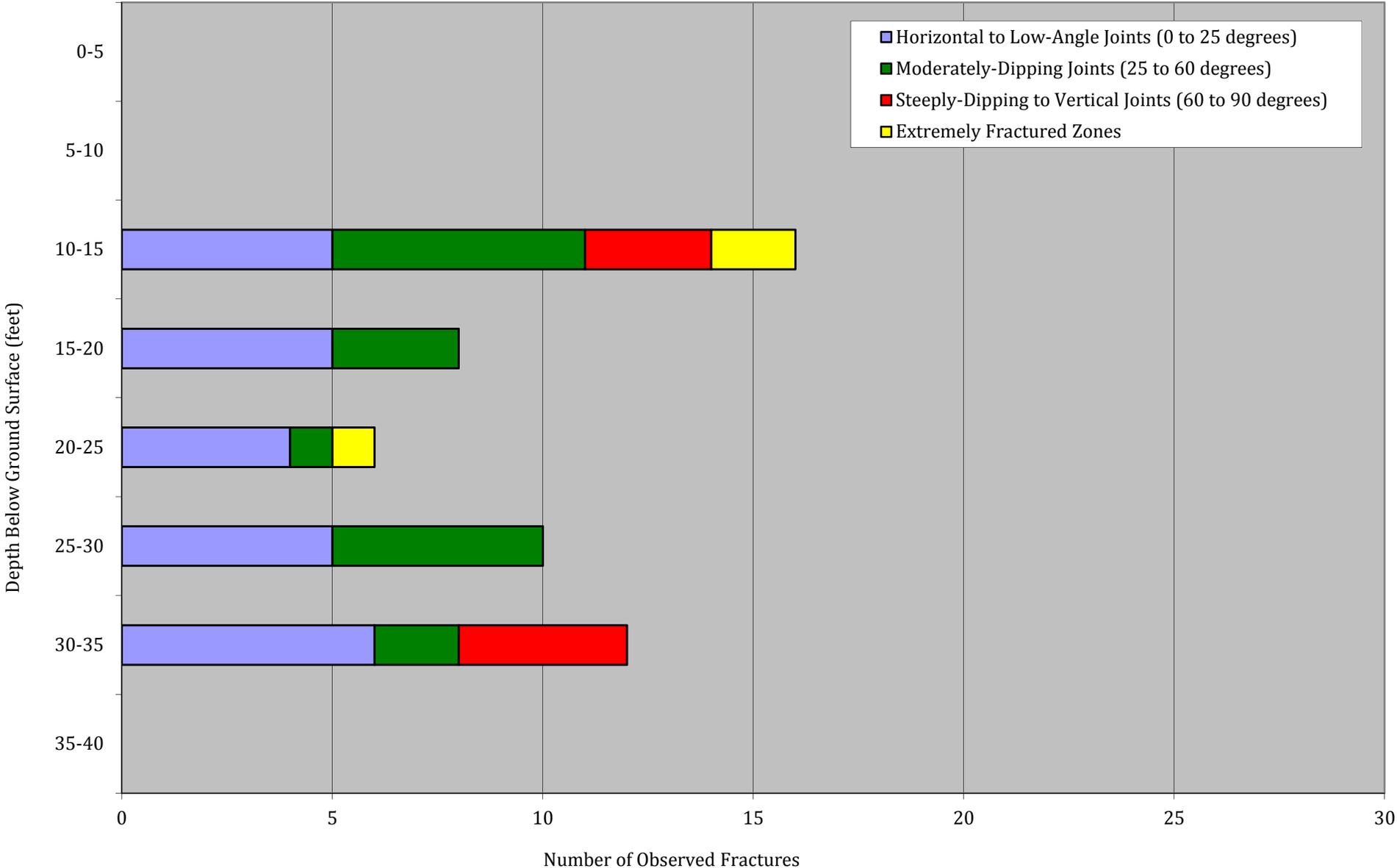
Extremely Fractured Zone

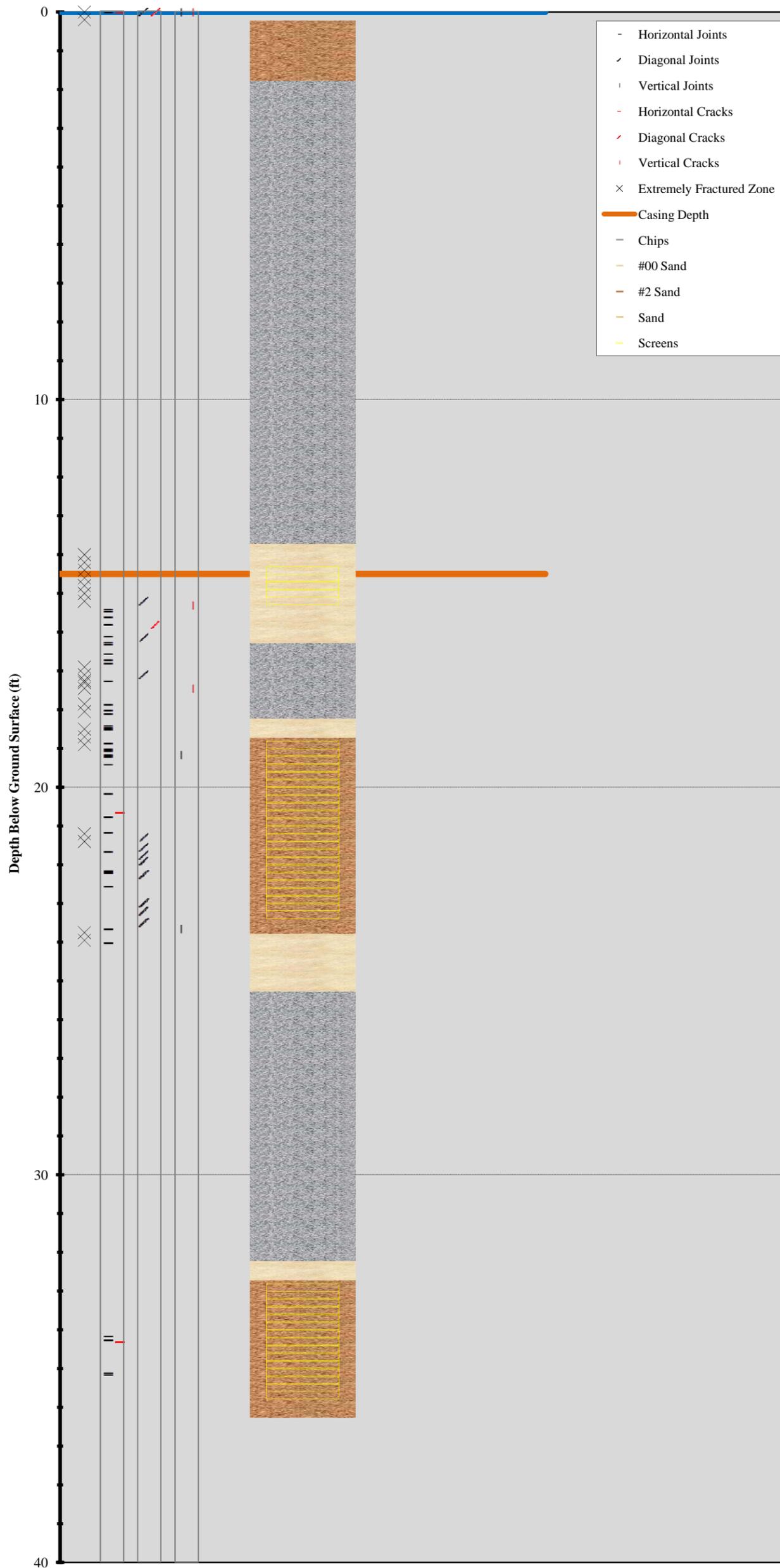
APPENDIX B.3
FRACTURE LOG PLOTS

SG-115

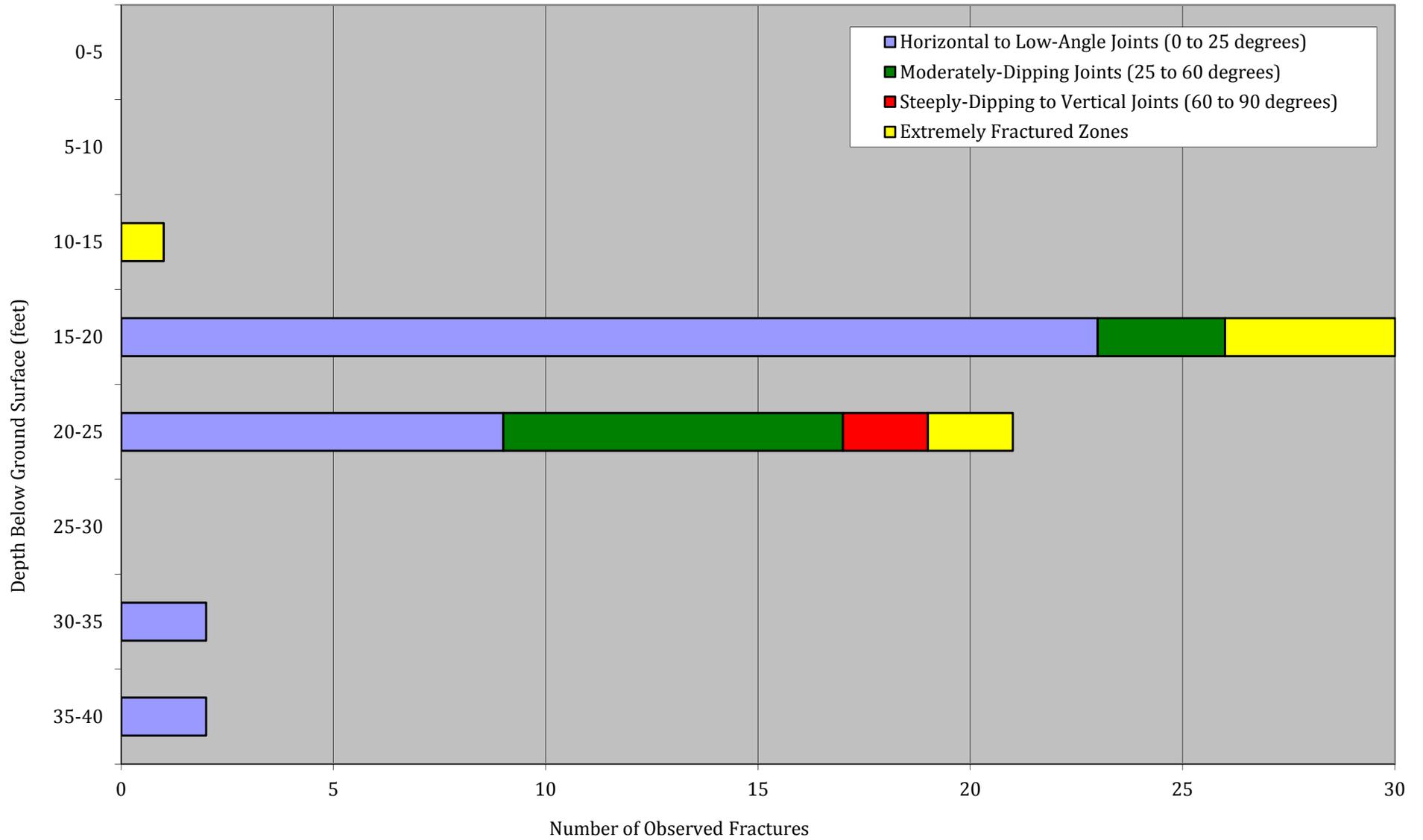


SG-115
Elevation Distribution of Observed Fractures, Combined

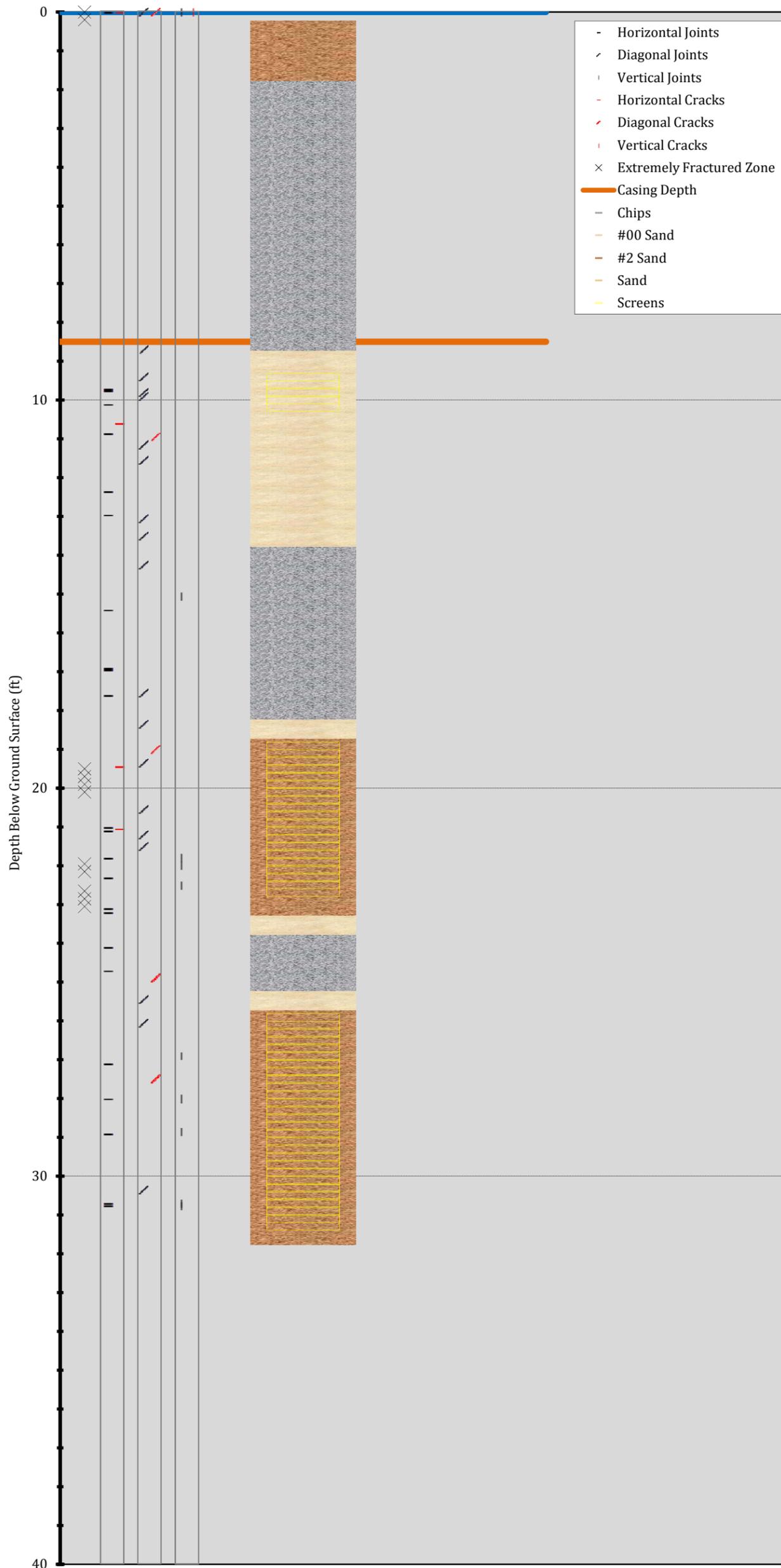




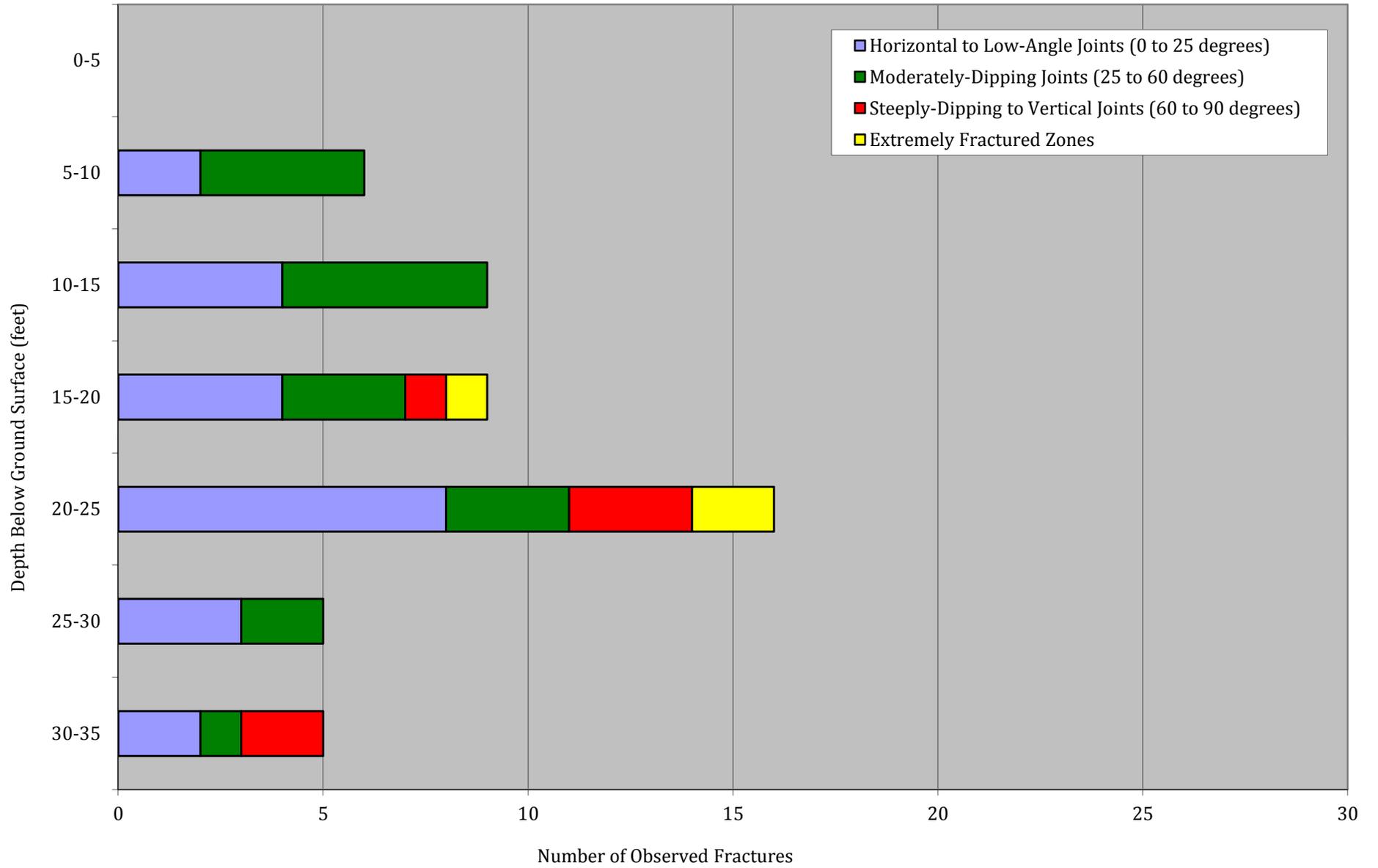
SG-117
Elevation Distribution of Observed Fractures, Combined



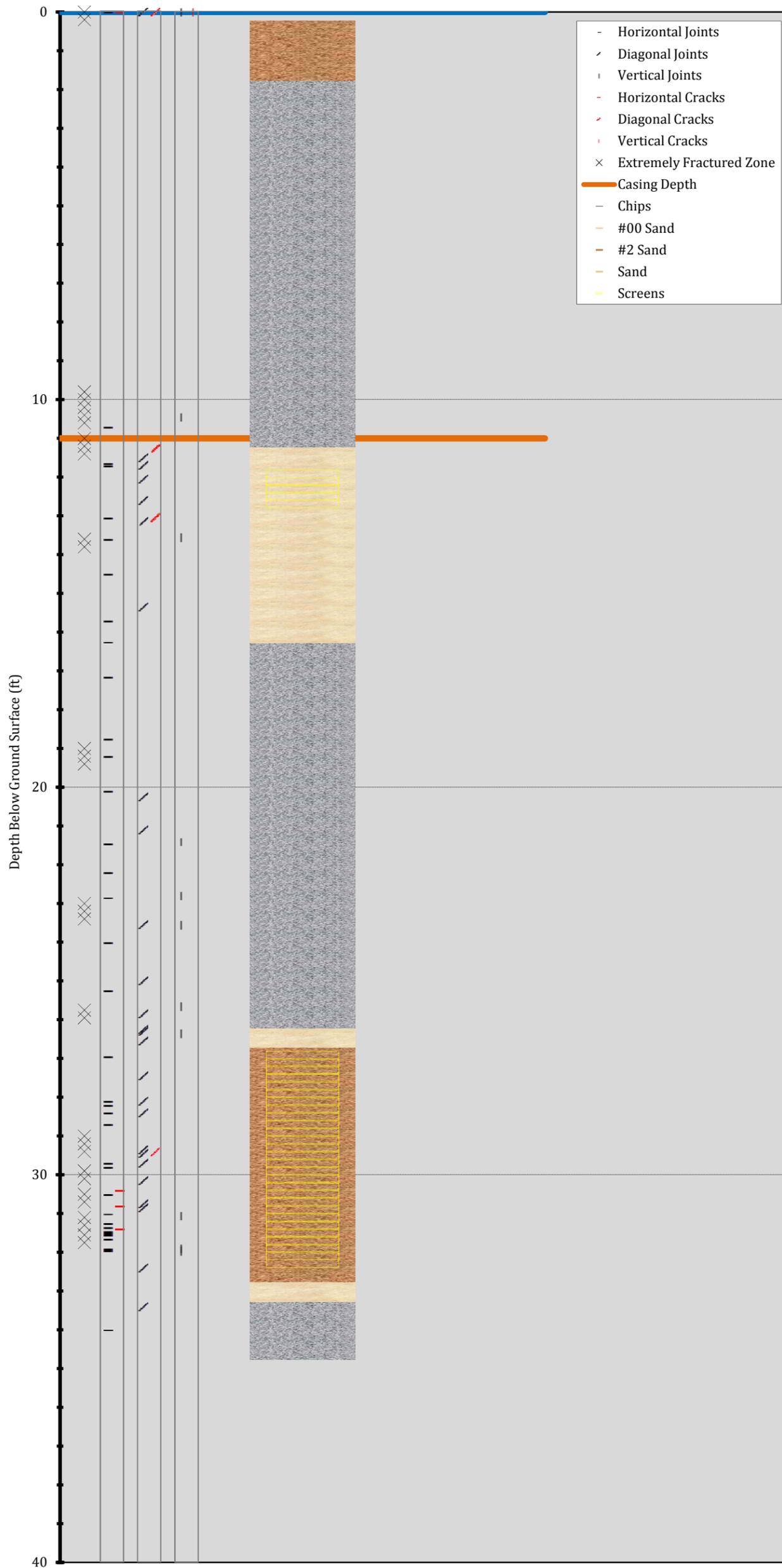
SG-118



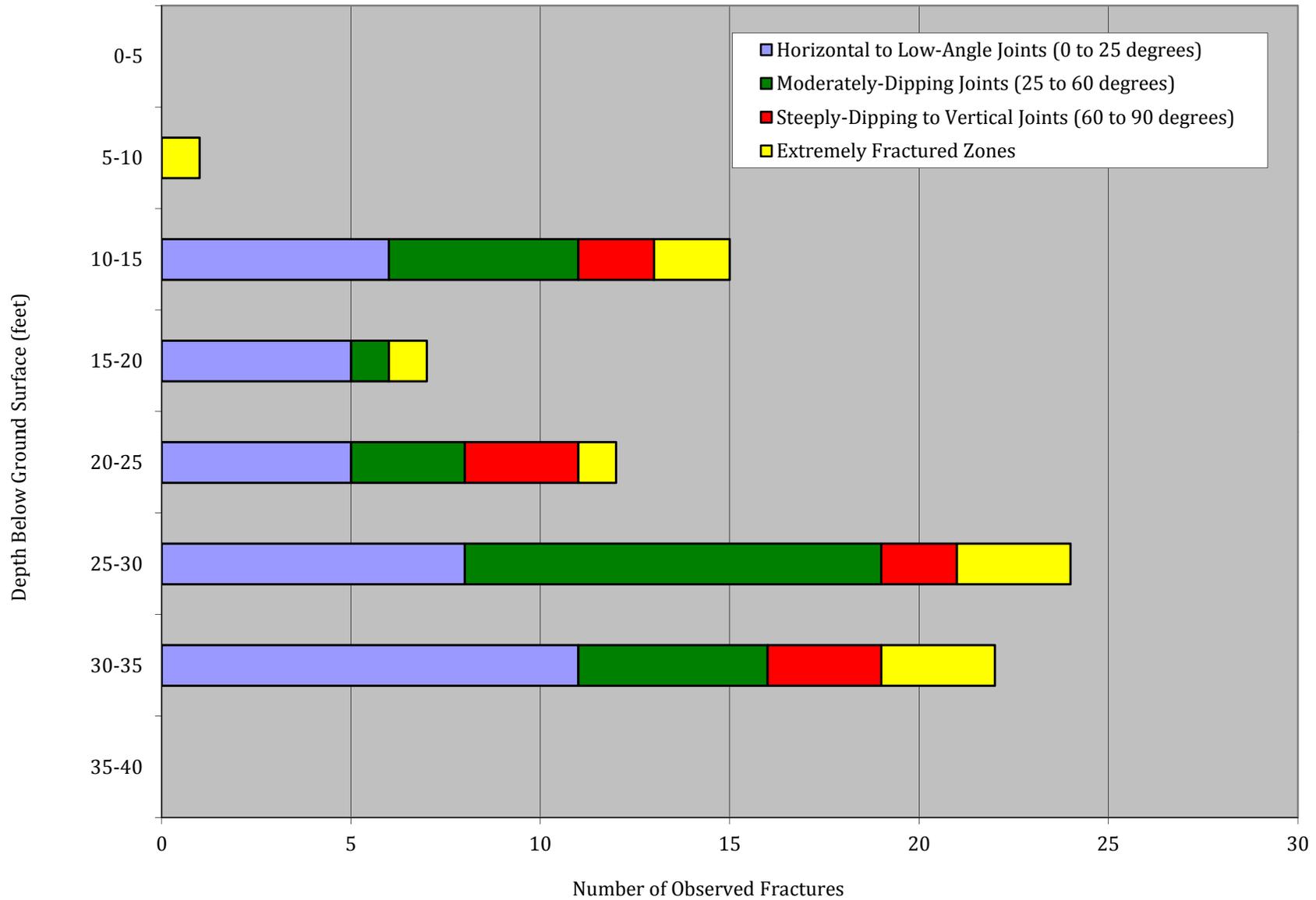
SG-118
Elevation Distribution of Observed Fractures, Combined



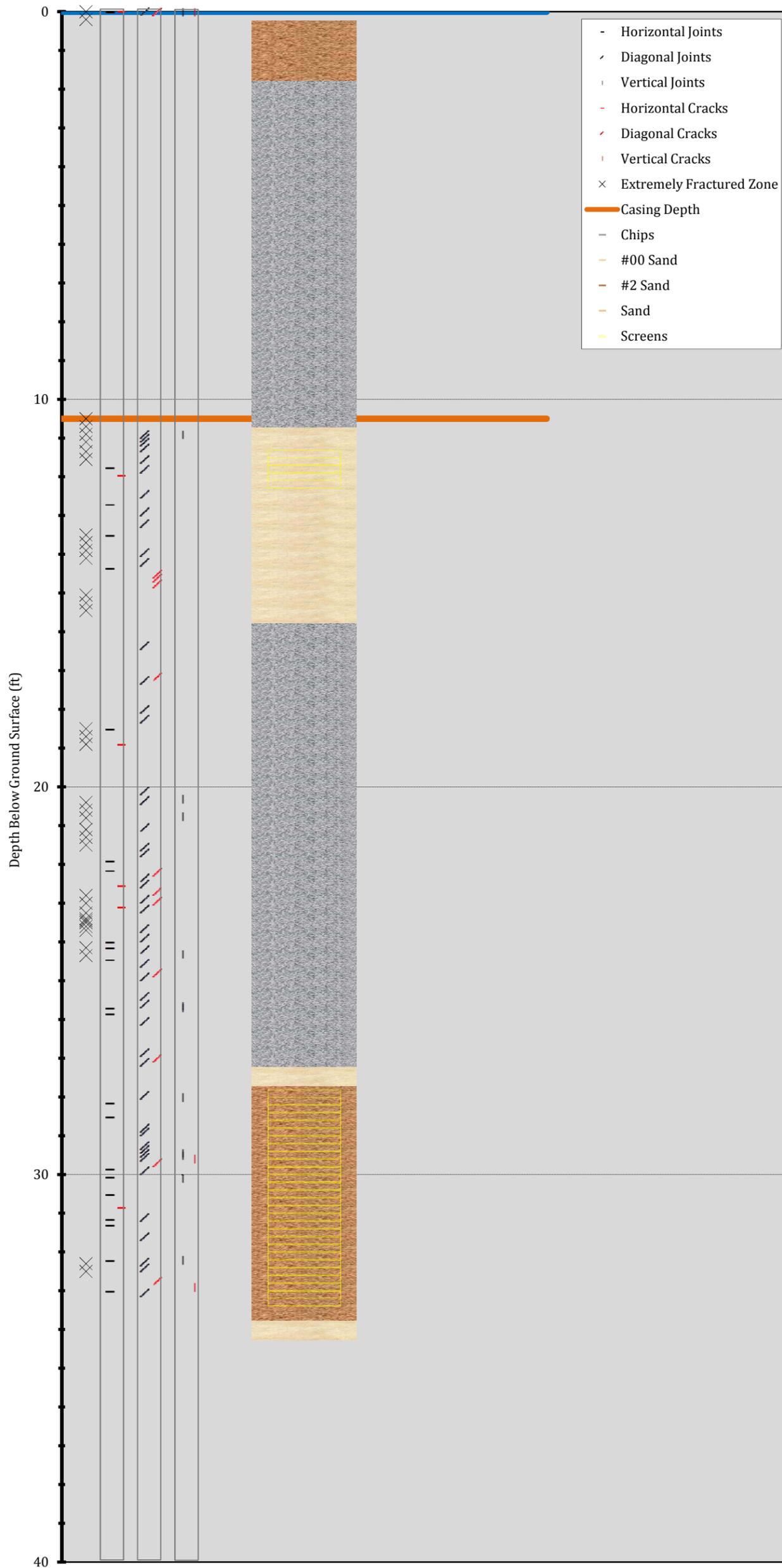
SG-120



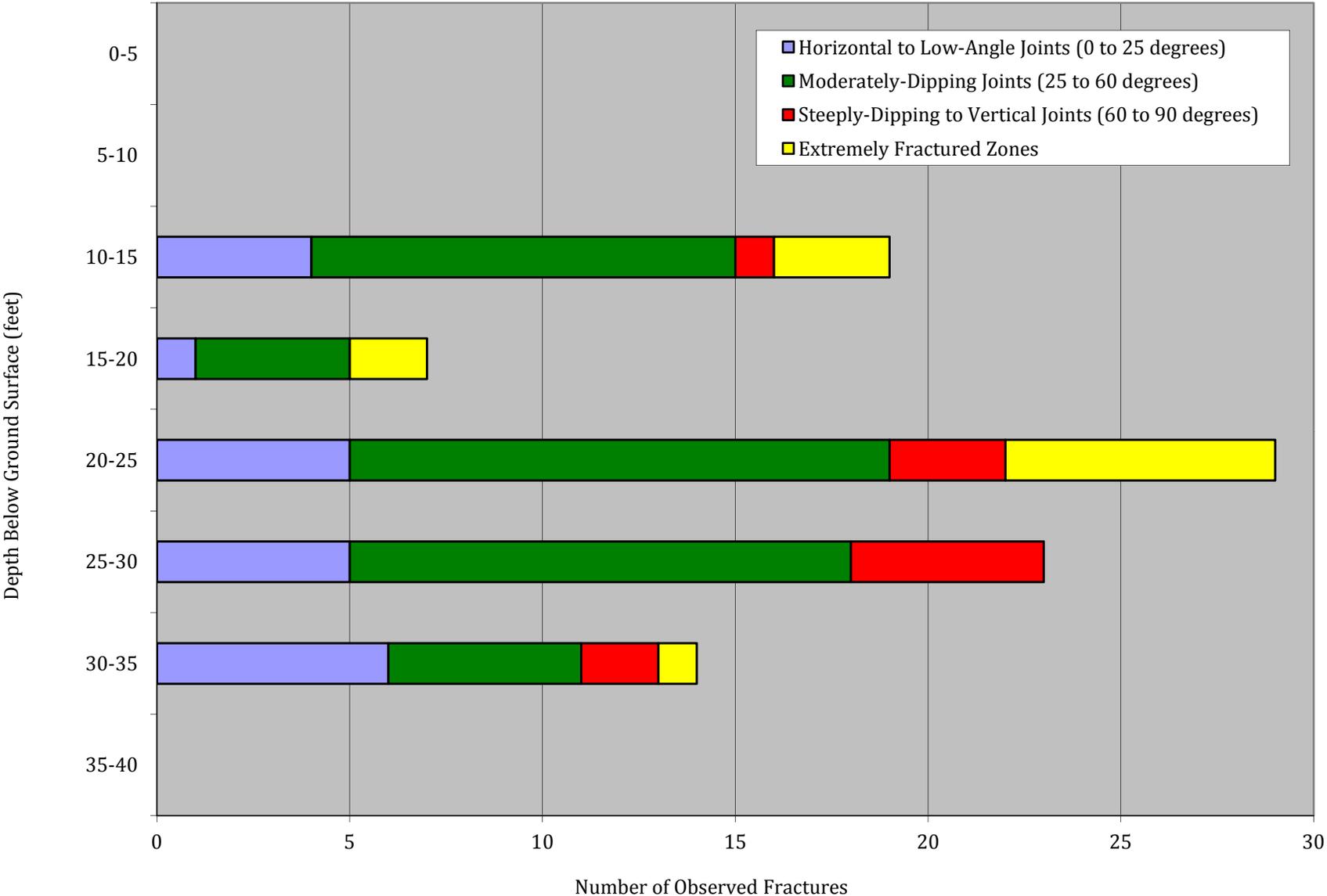
SG-120
Elevation Distribution of Observed Fractures, Combined



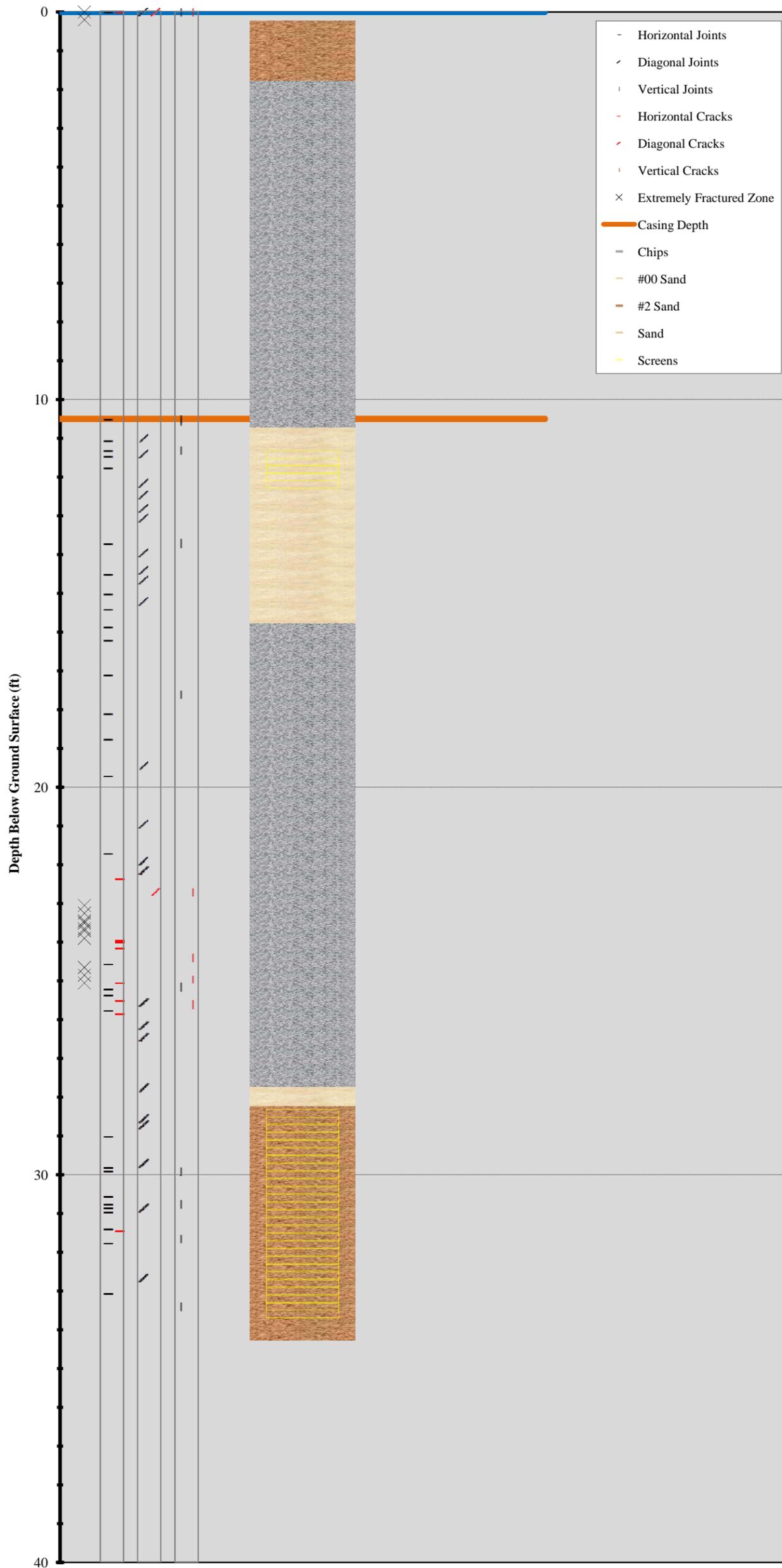
SG-121



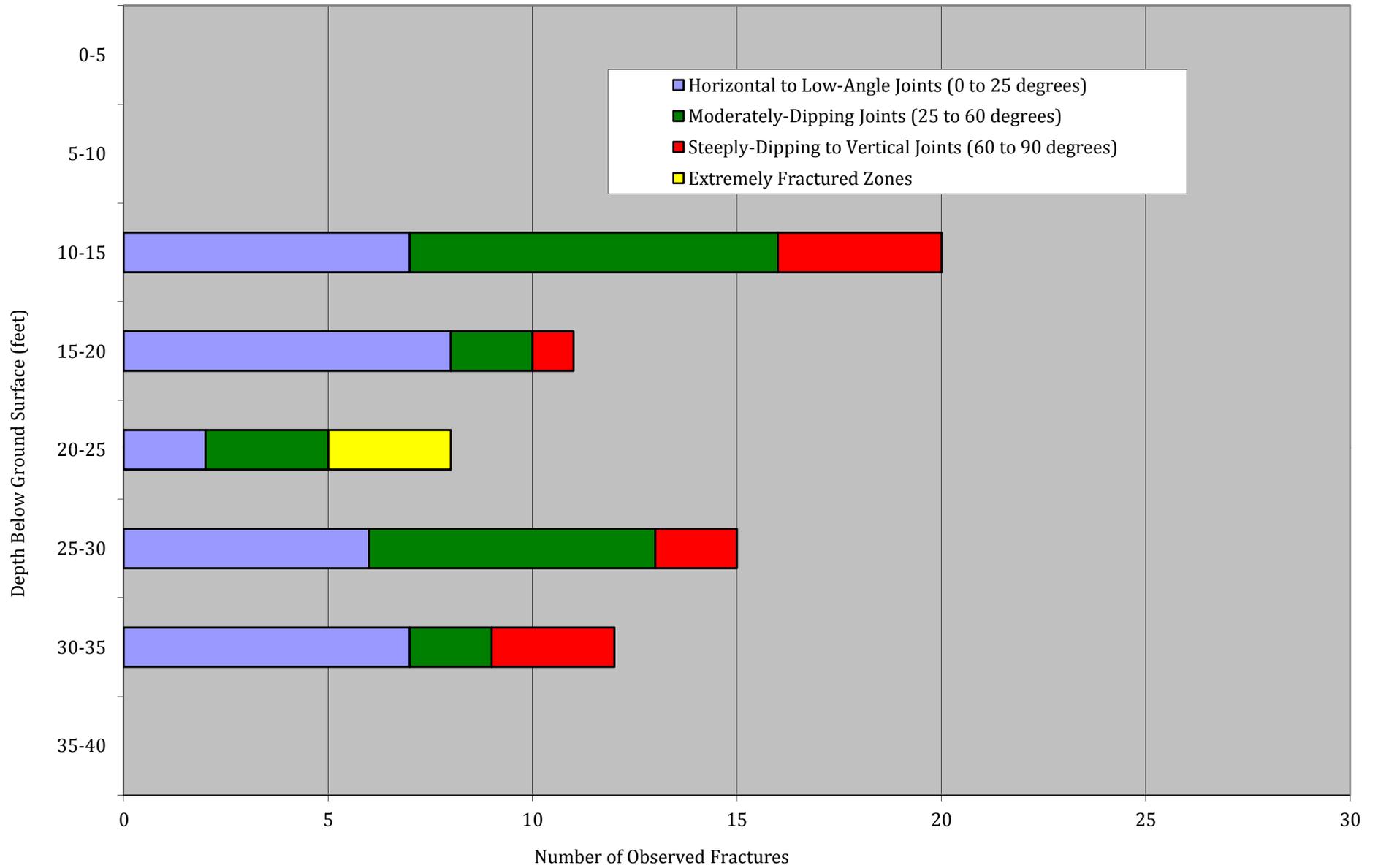
SG-121
 Elevation Distribution of Observed Fractures, Combined

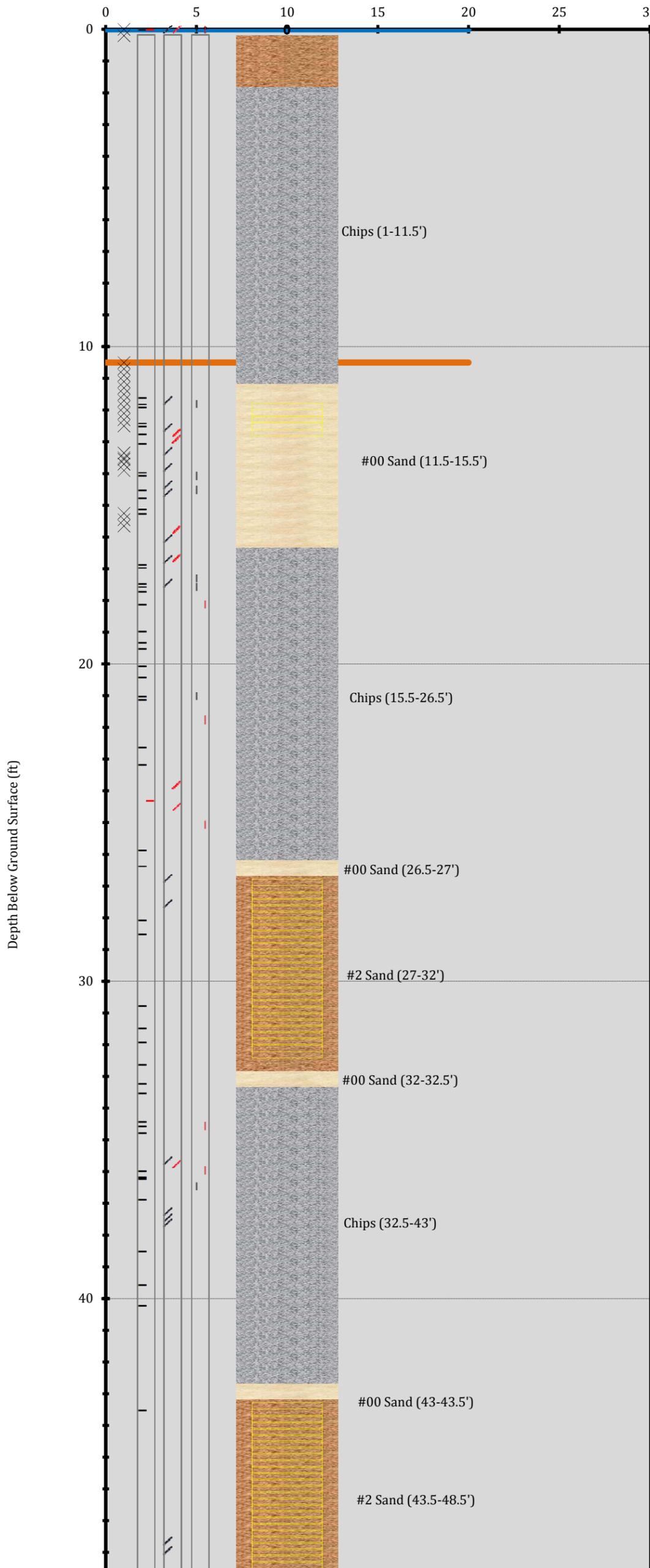


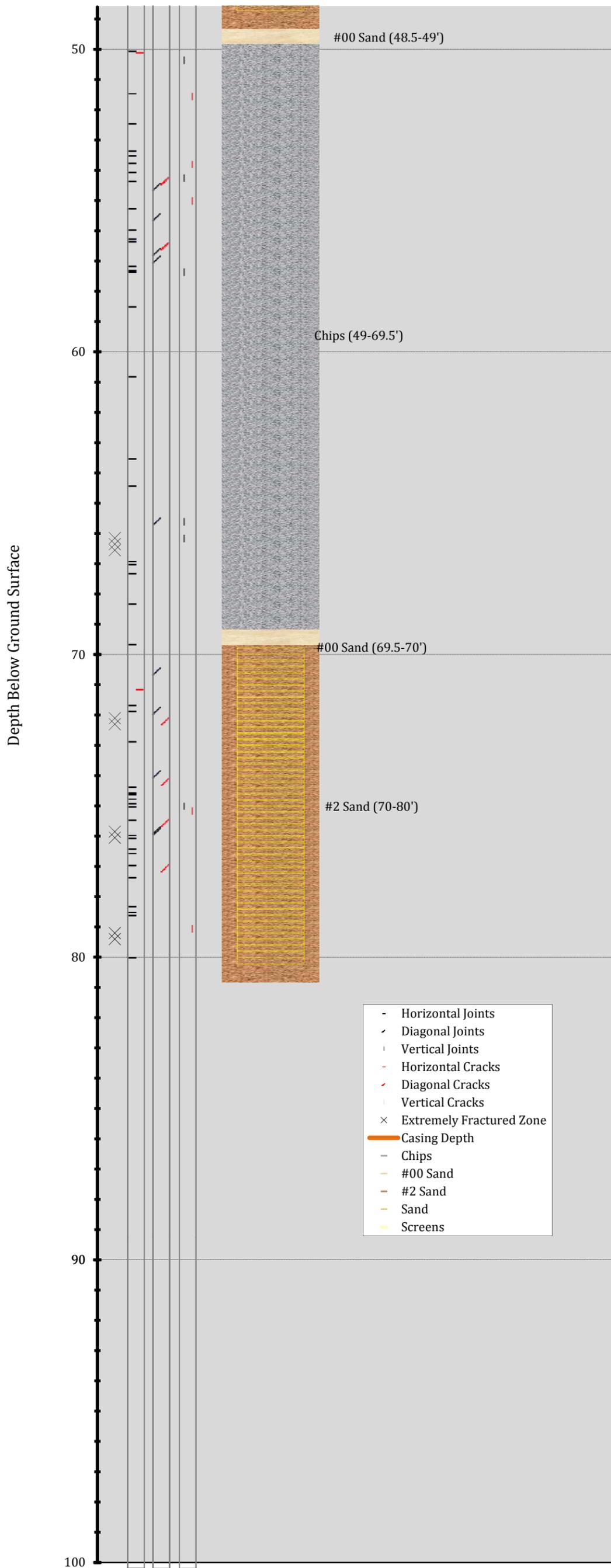
SG-123



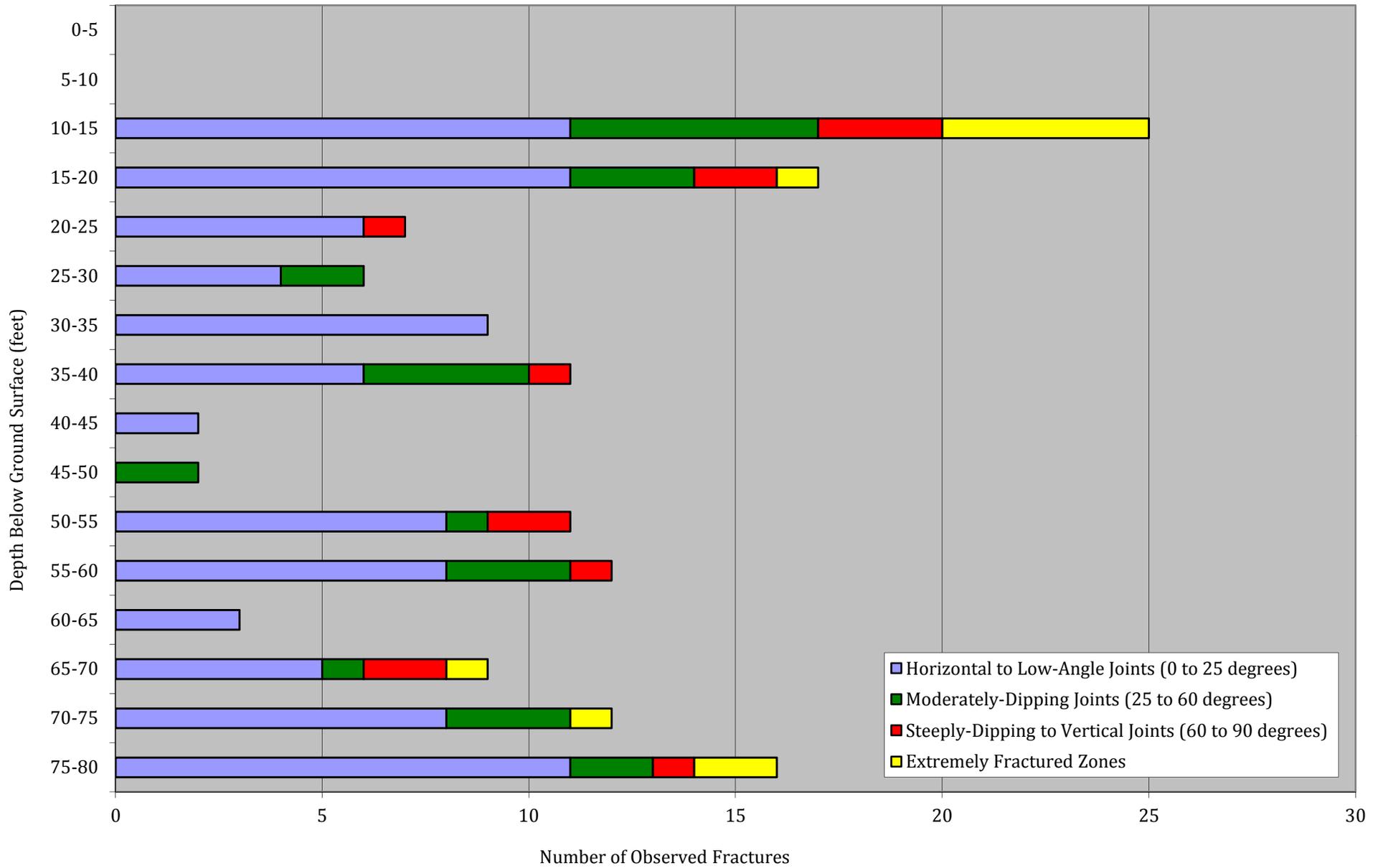
SG-123
Elevation Distribution of Observed Fractures, Combined







SG-31
Elevation Distribution of Observed Fractures, Combined



APPENDIX B.4
FIELD SAMPLING DOCUMENTATION

**JUNE 2012
ROUTINE SAMPLING**

Soil Vapor Field Sampling Summary

	Project No.: 2732.08			Date: June 25, 2012	
	Project Name: Supplemental VI Assessment				
	Location: Manassas, VA				
O ₂ / CH ₄ / CO ₂ Meter Used: Landtec GEM 2000			Project Manager: E. Bradstreet		
PID Meter Used: MiniRAE 2000 w/10.6eV bulb, RF=1			Collector(s): M. Stein		
Other: Dwyer Series 475 Mark III Digital Manometer (0-1, 0-40"); Dwyer Magnehelic (0-10, 0-80")			FID Meter Used: ----		
SUBSURFACE VAPOR SAMPLE RECORD					
Location No.	SG-07	SG-19	SG-06-8	SG-06-8	SG-06-44
Sample ID	SG07	SG19	SG068	DUP1	SG0644
Sample Date	06/25/12	06/25/12	06/25/12		06/25/12
Sample Collection Depth (ft bgs)	10	3.4	8		44
Pre-purge Diff. Press. (in. H ₂ O)	0.11	-0.11	-0.01		-10
Approx. Purge Volume (ml)	100	35	80		440
Purge Vacuum (in.H ₂ O)	2	2	2		>10
Canister Serial No.	3691	36395	9380	94933	3297
Start Time	1234	1252	1325	1325	1312
Start Pressure (inches Hg)	28	30	30	29.5	29.5
Stop Time	1334	1352	1525	1525	1418
Stop Pressure (inches Hg)	6	5.5	7	6.5	7
Ambient Air Temp (°F)	80-85	80-85	80-85		80-85
Weather Conditions	Cloudy	Rain-sprinkle	Sunny		P. Sunny
Screening Sample Collection Rate (ml/min)	200	83	250		222
Screening Sample Collection Vacuum (in.H ₂ O)	28	>80	0.4		25
O ₂ Reading (%)	2.6	18.5	18.2		20.3
CH ₄ Reading (%)	0.9	0.1	0.1		0.1
CO ₂ Reading (%)	10.6	1.8	1.7		0.1
PID reading (ppmv)	2.2	6.5	1.7		5.6
FID reading (ppmv)	-	-	-		-
Comment No.					
COMMENTS					

Soil Vapor Field Sampling Summary

	Project No.: 2732.08			Date: June 25, 2012	
	Project Name: Supplemental VI Assessment				
	Location: Manassas, VA				
O ₂ / CH ₄ / CO ₂ Meter Used: Landtec GEM 2000			Project Manager: E. Bradstreet		
PID Meter Used: MiniRAE 2000 w/10.6eV bulb, RF=1			Collector(s): M. Stein		
Other: Dwyer Series 475 Mark III Digital Manometer (0-1, 0-40"); Dwyer Magnehelic (0-10, 0-80")			FID Meter Used: ----		
SUBSURFACE VAPOR SAMPLE RECORD					
Location No.	SG-20	SG-21	SG-30	SG-05-10	SG-05-25
Sample ID	SG20	SG21	SG30	SG0510	SG0525
Sample Date	06/25/12	06/25/12	06/25/12	06/25/12	06/25/12
Sample Collection Depth (ft bgs)	4	4	5	10	25
Pre-purge Diff. Press. (in. H ₂ O)	-0.01	0	0.42	-8.9	-17
Approx. Purge Volume (ml)	40	40	50	100	250
Purge Vacuum (in.H ₂ O)	10	2	10	10	20
Canister Serial No.	3372	36537	20778	3327	36397
Start Time	1343	1442	1510	1434	1446
Start Pressure (inches Hg)	30	30	30	30	30
Stop Time	1450	1548	1628	1545	1608
Stop Pressure (inches Hg)	7	6.5	7	7	7
Ambient Air Temp (°F)	80-85	80-85	80-85	80-85	80-85
Weather Conditions	Sunny	Sunny	Sunny	Sunny	Sunny
Screening Sample Collection Rate (ml/min)	235	250	-	222	222
Screening Sample Collection Vacuum (in.H ₂ O)	16	0.6	-	32	24
O ₂ Reading (%)	19.6	20.1	-	19.9	20.4
CH ₄ Reading (%)	0.1	0.1	-	0.2	0.1
CO ₂ Reading (%)	1.2	0.3	-	0.4	0.6
PID reading (ppmv)	1.9	1.8	-	1.8	2.8
FID reading (ppmv)	-	-	-	-	-
Comment No.			1		
COMMENTS					
1. Water entered tedlar bag during screening. Soil Vapor quality parameters not collected.					

Soil Vapor Field Sampling Summary

	Project No.: 2732.08			Date: June 25, 2012		
	Project Name: Supplemental VI Assessment					
	Location: Manassas, VA					
O ₂ / CH ₄ / CO ₂ Meter Used: Landtec GEM 2000			Project Manager: E. Bradstreet			
PID Meter Used: MiniRAE 2000 w/10.6eV bulb, RF=1			Collector(s): M. Stein			
Other: Dwyer Series 475 Mark III Digital Manometer (0-1, 0-40"); Dwyer Magnehelic (0-10, 0-80")			FID Meter Used: ----			
SUBSURFACE VAPOR SAMPLE RECORD						
Location No.	SG-05-45	SG-04-10	SG-28	SG-26	SG-12	SG-10
Sample ID	SG0545	SG0410	SG28	SG26	SG12	SG10
Sample Date	06/25/12	06/25/12	06/25/12	06/25/12	06/25/12	06/25/12
Sample Collection Depth (ft bgs)	45	10	5	5	5	5
Pre-purge Vacuum (in. H ₂ O)	-11	-0.45	0	0	0.20	0.49
Pre-purge Diff. Press. (in. H ₂ O)	450	100	50	50	50	50
Purge Vacuum (in.H ₂ O)	22	2	2	2	10	2
Canister Serial No.	3356	35604	3325	34098	37730	1040
Start Time	1448	1505	1520	1533	1543	1606
Start Pressure (inches Hg)	29	30	30	28	28	30
Stop Time	1548	1622	1624	1648	1708	1848
Stop Pressure (inches Hg)	6.5	6	7	6.5	7	6.5
Ambient Air Temp (°F)	80-85	80-85	80-85	80-85	80-85	80-85
Weather Conditions	P. Cloudy	P. Cloudy	M. Sunny	M. Sunny	M. Sunny	M. Sunny
Screening Sample Collection Rate (ml/min)	200	222	250	222	-	211
Screening Sample Collection Vacuum (in.H ₂ O)	28	1	0.5	2.2	-	25
O ₂ Reading (%)	20.1	19.9	17.6	20.1	-	5.2
CH ₄ Reading (%)	0.2	0.2	0.2	0.1	-	0.2
CO ₂ Reading (%)	0.1	0.3	1.0	0.0	-	7.4
PID reading (ppmv)	2.0	2.0	2.8	2.3	-	2.9
FID reading (ppmv)	-	-	-	-	-	-
Comment No.					1	
COMMENTS						
1. Water entered tedlar bag during screening. Soil Vapor quality parameters not collected.						

Soil Vapor Field Sampling Summary

	Project No.: 2732.08		Date: June 26, 2012		
	Project Name: Supplemental VI Assessment				
	Location: Manassas, VA				
O ₂ / CH ₄ / CO ₂ Meter Used: Landtec GEM 2000			Project Manager: E. Bradstreet		
PID Meter Used: MiniRAE 2000 w/10.6eV bulb, RF=1			Collector(s): M. Stein		
Other: Dwyer Series 475 Mark III Digital Manometer (0-1, 0-40"); Dwyer Magnehelic (0-10, 0-80")			FID Meter Used: ----		
SUBSURFACE VAPOR SAMPLE RECORD					
Location No.	SG-101	SG-101	SG-102S	SG-102D	SG-103
Sample ID	SG101	DUP2	Microseeps SG102S	SG102D	SG103
Sample Date	06/26/12		06/26/12	06/26/12	06/26/12
Sample Collection Depth (ft bgs)	5.5		11.5	45	5.5
Pre-purge Vacuum (in. H ₂ O)	0		0.21	-3.4	0.05
Pre-purge Diff. Press. (in. H ₂ O)	48		100	3,700	48
Purge Vacuum (in.H ₂ O)	2		-	32	10
Canister Serial No.	34598	3397	-	3345	12392
Start Time	0930	0930	-	1016	1024
Start Pressure (inches Hg)	27.5	30	-	30	30
Stop Time	1156	1156	1201	1120	1207
Stop Pressure (inches Hg)	5	7.5	-	6	6.5
Ambient Air Temp (°F)	65-70	65-70	65-70	65-70	70-75
Weather Conditions	Sunny	Sunny	Sunny	Sunny	Sunny
Screening Sample Collection Rate (ml/min)	182		-	174	60
Screening Sample Collection Vacuum (in.H ₂ O)	0.4		-	24	>80
O ₂ Reading (%)	12.8		-	12.2	4.1
CH ₄ Reading (%)	0.1		-	0.1	0.2
CO ₂ Reading (%)	7.1		-	0.8	10.6
PID reading (ppmv)	9.7		-	12.0	8.8
FID reading (ppmv)	-		-	-	-
Comment No.			1		
COMMENTS					
<p>1. Water encountered during Summa canister sampling. Implant purged of standing water and then a Microseeps Vapor sample was collected.</p>					

Soil Vapor Field Sampling Summary

	Project No.: 2732.08		Date: June 26, 2012		
	Project Name: Supplemental VI Assessment				
	Location: Manassas, VA				
O ₂ / CH ₄ / CO ₂ Meter Used: Landtec GEM 2000		Project Manager: E. Bradstreet			
PID Meter Used: MiniRAE 2000 w/10.6eV bulb, RF=1		Collector(s): M. Stein			
Other: Dwyer Series 475 Mark III Digital Manometer (0-1, 0-40"); Dwyer Magnehelic (0-10, 0-80")		FID Meter Used: ----			
SUBSURFACE VAPOR SAMPLE RECORD					
Location No.	SG-111I	SG-111S	SG-111S	SG-110	SG-112
Sample ID	SG111I	SG111S	DUP3	Microseeps SG110	SG112
Sample Date	06/26/12	06/26/12		06/26/12	06/26/12
Sample Collection Depth (ft bgs)	28	13		6	5.5
Pre-purge Diff. Press. (in. H ₂ O)	-0.01	-0.01		-0.10	0
Approx. Purge Volume (ml)	2,500	120		48	48
Purge Vacuum (in.H ₂ O)	2	2		>10	2
Canister Serial No.	3824	2085	37746	-	37432
Start Time	1111	1112	1112	-	1231
Start Pressure (inches Hg)	30	30	30	-	29.5
Stop Time	1218	1346	1346	1438	1336
Stop Pressure (inches Hg)	7	6	7	-	6
Ambient Air Temp (°F)	75-80	75-80	75-80	75-80	75-80
Weather Conditions	Sunny	Sunny	Sunny	Sunny	Sunny
Screening Sample Collection Rate (ml/min)	182	200		-	65
Screening Sample Collection Vacuum (in.H ₂ O)	1.6	0.6		-	2.4
O ₂ Reading (%)	20.8	2.6		-	18.4
CH ₄ Reading (%)	0.1	0.2		-	0.0
CO ₂ Reading (%)	0.0	2.8		-	4.0
PID reading (ppmv)	12.8	16.4		-	21.9
FID reading (ppmv)	-	-		-	-
Comment No.				1	
COMMENTS					
<p>1. Water encountered during Summa canister sampling. Implant purged of standing water and then a Microseeps Vapor sample was collected.</p>					

Soil Vapor Field Sampling Summary

	Project No.: 2732.08			Date: June 26, 2012		
	Project Name: Supplemental VI Assessment					
	Location: Manassas, VA					
O ₂ / CH ₄ / CO ₂ Meter Used: Landtec GEM 2000			Project Manager: E. Bradstreet			
PID Meter Used: MiniRAE 2000 w/10.6eV bulb, RF=1			Collector(s): M. Stein			
Other: Dwyer Series 475 Mark III Digital Manometer (0-1, 0-40"); Dwyer Magnehelic (0-10, 0-80")			FID Meter Used: ----			
SUBSURFACE VAPOR SAMPLE RECORD						
Location No.	SG-113D	SG-113S	SG-109	SG-108D	SG-108S	SG-107
Sample ID	SG113D	Microseeps SG113S	SG109	SG108D	SG108S	SG107
Sample Date	06/26/12	06/26/12	06/26/12	06/26/12	06/26/12	06/26/12
Sample Collection Depth (ft bgs)	40	12	5.5	43	12	5.5
Pre-purge Diff. Press. (in. H ₂ O)	-3.3	0.01	0	-11	-0.06	-0.01
Approx. Purge Volume (ml)	3,400	110	48	3,700	110	48
Purge Vacuum (in.H ₂ O)	44	>10	>10	18	6	>10
Canister Serial No.	34097	-	3329	36411	3353	3392
Start Time	1306	-	1402	1536	1540	1542
Start Pressure (inches Hg)	30	-	30	30	30	29
Stop Time	1430	1435	1511	1647	1642	1814
Stop Pressure (inches Hg)	6.5	-	6.5	7	7	15
Ambient Air Temp (°F)	75-80	75-80	75-80	75-80	75-80	75-80
Weather Conditions	M. Sunny	M. Sunny	M. Sunny	M. Sunny	M. Sunny	Sunny
Screening Sample Collection Rate (ml/min)	300	-	175	190	192	-
Screening Sample Collection Vacuum (in.H ₂ O)	30	-	26	22	42	>80
O ₂ Reading (%)	9.0	-	18.5	20.0	4.4	-
CH ₄ Reading (%)	0.0	-	0.0	0.0	0.0	-
CO ₂ Reading (%)	0.2	-	4.1	0.3	4.7	-
PID reading (ppmv)	43.8	-	17.8	20.2	17.2	-
FID reading (ppmv)	-	-	-	-	-	-
Comment No.		1				2
COMMENTS						
<p>1. Water encountered during Summa canister sampling. Implant purged of standing water and then a Microseeps Vapor sample was collected. Only 1 Microseeps vial collected prior to water re-entering tubing.</p> <p>2. Water entered Tedlar bag during attempted collection of soil vapor quality parameters.</p>						

Soil Vapor Field Sampling Summary

	Project No.: 2732.08			Date: June 27, 2012	
	Project Name: Supplemental VI Assessment				
	Location: Manassas, VA				
O ₂ / CH ₄ / CO ₂ Meter Used: Landtec GEM 2000			Project Manager: E. Bradstreet		
PID Meter Used: MiniRAE 2000 w/10.6eV bulb, RF=1			Collector(s): M. Stein		
Other: Dwyer Series 475 Mark III Digital Manometer (0-1, 0-40"); Dwyer Magnehelic (0-10, 0-80")			FID Meter Used: ----		
SUBSURFACE VAPOR SAMPLE RECORD					
Location No.	SG-106S	SG-106D	SG-105	SG-104	Equipment Blank
Sample ID	SG106S	SG106D	SG105	Microseeps SG-104	EB1
Sample Date	06/27/12	06/27/12	06/27/12	06/27/12	06/27/12
Sample Collection Depth (ft bgs)	9	40.5	4.7	5.5	-
Pre-purge Diff. Press. (in. H ₂ O)	-0.01	-7.5	-0.01	0.03	-
Approx. Purge Volume (ml)	80	3,500	48	48	-
Purge Vacuum (in.H ₂ O)	2	44	6	>10	-
Canister Serial No.	3336	2191	3348	-	35607
Start Time	1025	1024	1028	-	1340
Start Pressure (inches Hg)	30	28	30	-	29.5
Stop Time	1128	1127	1128	1610	1411
Stop Pressure (inches Hg)	7.0	5	6	-	7
Ambient Air Temp (°F)	70-75	70-75	70-75	70-75	85-90
Weather Conditions	Sunny	Sunny	Sunny	Sunny	Sunny
Screening Sample Collection Rate (ml/min)	211	200	190	-	-
Screening Sample Collection Vacuum (in.H ₂ O)	1	36	20	-	-
O ₂ Reading (%)	5.2	10.8	13.5	-	-
CH ₄ Reading (%)	0.0	0.0	0.0	-	-
CO ₂ Reading (%)	3.5	1.4	7.3	-	-
PID reading (ppmv)	53.9	79.2	33.4	-	-
FID reading (ppmv)	-	-	-	-	-
Comment No.				1	
COMMENTS					
<p>1. Water encountered during Summa canister sampling. Implant purged of standing water. A Microseeps sample was collected for analysis.</p>					

Groundwater Quality Field Sampling Summary

	Project Number: 2732.05				Date: June 18, 2012		
	Project Name: Supplemental VI Assessment						
	Project Location: Manassas, VA						
pH, Conductivity, Temperature Meter: -				Project Manager: E. Bradstreet			
Water Level Meter: Solinst (Pine Rental)				Collector(s): J. Pierce			
Other:				Weather: Sunny			
Field Measurements							
Sampling Location	SG-111I	SG-111D	OF-54	SG-108I	SG-106I	SG-106D	
Sample Name	SG111I	SG111D	OF54	SG108I	SG106I	SG106D	
Reference Point	TOR	TOR	TOR	TOR	TOR	TOR	
Sample Depth (feet)	30.3	44.2	73.4	26.9	25.3	41.8	
Depth to Floating Product (feet)							
Depth to Water (feet)							
Water Table Elevation (feet)							
Depth to Bottom (feet bgs)							
pH (standard units)							
Specific Conductance (µS/cm)							
Temperature (°C)							
Dissolved Oxygen (mg/L)							
Oxidation Reduction Potential (mv)							
Date of Sample	6/18/2012	6/18/2012	6/18/2012	6/18/2012	6/18/2012	6/18/2012	
Sample Time	1615	1620	1630	1645	1705	1710	
Number of Sample VOAs Collected	1	3	3	3	3	1	
Purge/Sample Device	PDB	PDB	PDB	PDB	PDB	PDB	
Comment Reference Number							
Comments							

Groundwater Quality Field Sampling Summary

	Project Number: 2732.05				Date: June 18, 2012			
	Project Name: Supplemental VI Assessment							
	Project Location: Manassas, VA							
pH, Conductivity, Temperature Meter: -				Project Manager: E. Bradstreet				
Water Level Meter: Solinst (Pine Rental)				Collector(s): J. Pierce				
Other:				Weather: Sunny				
Field Measurements								
Sampling Location	Equipment Blank	Field Blank	SG-102I	SG-113I	SG-113D	OF-55	OF-55	
Sample Name	EB1	FB1	SG102I	SG113I	SG113D	OF55	DUP1	
Reference Point	-	-	TOR	TOR	TOR	TOR	TOR	
Sample Depth (feet)	-	-	21.8	24.4	42.2	80.0	80.0	
Depth to Floating Product (feet)								
Depth to Water (feet)								
Water Table Elevation (feet)								
Depth to Bottom (feet bgs)								
pH (standard units)								
Specific Conductance (µS/cm)								
Temperature (°C)								
Dissolved Oxygen (mg/L)								
Oxidation Reduction Potential (mv)								
Date of Sample	6/18/2012	6/18/2012	6/18/2012	6/18/2012	6/18/2012	6/18/2012	6/18/2012	
Sample Time	1730	1735	1430	1515	1540	1550	1550	
Number of Sample VOAs Collected	2	2	3	3	1	3	3	
Purge/Sample Device			PDB	PDB	PDB	PDB	PDB	
Comment Reference Number								
Comments								

B101 Passive Diffusion Bag Deployment/Retrieval

Groundwater Monitoring Well or Air Inlet Well	Passive Diffusion Bag (PDB) Deployment			PDB Retrieval				Notes
	Deployment Depth (ft)	DTW (ft)	Date/Time	DTW at Equilibrium (ft)	Date/Time	Sample ID	No. Samples Collected	
On-Site Monitoring Wells								
D-68	73	67.77	6/18/2012 15:31					Duplicate deployed
D-69	76.5	71.58	6/18/2012 15:50					
D-70								No PDB deployed
D-71								No PDB deployed
D-72								No PDB deployed
D-73								No PDB deployed
D-74	18	13.29	6/18/2012 16:42					New TOC = 0.67' above ground surface
D-75	18	12.71	6/18/2012 16:55					
D-81	63.5	58.52	6/18/2012 14:25					
D-82	69	64.16	6/18/2012 15:00					
D-83	70	64.63	6/18/2012 15:15					
D-84	71	66.23	6/18/2012 15:28					
D-85	63	57.62	6/18/2012 16:29					

Notes:

**JULY 2012
CHARACTERIZATION SAMPLING**



Project No.: 2732.05 Date: _____
 Project Name: Former IBM Manassas
 Location: Manassas, VA

Project Manager: L. Jacob Collector(s): M. Stein
 PID Meter Used: MiniRAE2000 (Pine Rental) FID Meter Used: None
 He Meter: Dielectric MGD-2002 O2 / CH4 / CO2 Meter Used: Gem2000 (Pine)
 Other: Magnehelic gauges (0-1 and 0-80 inwc)

	OPERATIONS TESTING	PERFORMANCE TESTING RECORD		
Location No.	SG-114	SG-114		
Vacuum (in H ₂ O)	0.0	0.6	1.2	2.4
Time to fill 1 liter Bag (min)	1.5	6.3	2.4	1.2
Approx. Flow Rate (ml/min)	670	160	420	820
Tracer Gas Applied	N	Y	Y	Y
Tracer Gas Concentration (ppmv or %)	-	ND	17.750 ppmv	4.9%
O ₂ (%)	18.5	18.2	19.2	19.0
CH ₄ (%)	0.1	0.1	0.1	0.1
CO ₂ (%)	0.9	4.1	2.7	1.9
PID (ppmv)	30	9.8	28	7.9
Testing Date and Time	6/27/12 - 1055	7/9/12 - 1210	7/9/12 - 1220	7/9/12 - 1225
Screen Interval Depth (ft bgs)	5.5 - 6	5.5 - 6		
Ambient Air Temp (°F)	80 - 85	80 - 85		
Weather Conditions	Sunny, Humid	Overcast, humid		
Comment No.**	8.4" H ₂ O	0.000" pre-performance testing ΔP		

COMMENTS

** For all performance tests, 1st reading is at lowest pump speed, 2nd is at medium pump speed, and 3rd is at the highest pump speed.

	Project No.: 2732.05		Date:		
	Project Name: Former IBM Manassas				
	Location: Manassas, VA				
Project Manager: L. Jacob			Collector(s): M. Stein		
PID Meter Used: MiniRAE2000 (Pine Rental)			FID Meter Used: None		
He Meter: Dielectric MGD-2002			O2 / CH4 / CO2 Meter Used: Gem2000 (Pine)		
	OPERATIONS TESTING	PERFORMANCE TESTING RECORD			
Location No.	SG-115S	SG-115S			
Vacuum (in H ₂ O)	0.0	>80			
Time to fill 1 liter Bag (min)	1.5	6.25			
Approx. Flow Rate (ml/min)	860	160			
Tracer Gas Applied	N	X			
Tracer Gas Concentration (ppmv or %)	-				
O ₂ (%)	19.2				
CH ₄ (%)	0.0				
CO ₂ (%)	0.4				
PID (ppmv)	19				
Testing Date and Time	6/28/12 - 1044	7/9/12 - 1141			
Screen Interval Depth (ft bgs)	12 - 12.5	12 - 12.5			
Ambient Air Temp (°F)	80 - 85	80 - 85			
Weather Conditions	Sunny, Humid	overcast - humid			
Comment No.**	2.4" H ₂ O	0.000 pre-performance testing ΔP; 1. (comment below)			
COMMENTS					
<p>** For all performance tests, 1st reading is at lowest pump speed, 2nd is at medium pump speed, and 3rd is at the highest pump speed.</p> <p>1. Water entered tedlar bag during attempted reformance testing. Implant appears to be flooded and groundwater recharge was noted.</p>					



Project No.: 2732.05

Date:

Location: Manassas, VA

Project Manager: L. Jacob

Collector(s): E. Bradstreet

PID Meter Used: MiniRAE2000 (Pine Rental)

FID Meter Used: None

He Meter: Dielectric MGD-2002

O2 / CH4 / CO2 Meter Used: Gem2000 (Pine)

Other: Magnehelic gauges (0-1 and 0-80 inwc)

	OPERATIONS TESTING	PERFORMANCE TESTING RECORD			
Location No.	SG-116	SG-116			
Vacuum (in H ₂ O)	>80	20	>80	>80	
Time to fill 1 liter Bag (min)	1.5	6.3	2.4	1.2	
Approx. Flow Rate (ml/min)	670	160	420	830	
Tracer Gas Applied	N	Y	Y	Y	
Tracer Gas Concentration (ppmv or %)	-	ND	250 ppm	1000 ppm	
O ₂ (%)	19.3	15.9	13.6	15.6	
CH ₄ (%)	0.0	0.0	0.0	0.0	
CO ₂ (%)	0.4	0.5	0.7	0.7	
PID (ppmv)	17	65	8.7	2.5	
Testing Date and Time	7/12/12 1355	7/13/12 1035	7/13/12 1045	7/13/12 1052	
Screen Interval Depth (ft bgs)	5.5 - 6	5.5 - 6			
Ambient Air Temp (°F)	85	85			
Weather Conditions	Sunny, breezy	Mostly cloudy, humid			
Comment No.**					

COMMENTS

** For all performance tests, 1st reading is at lowest pump speed, 2nd is at medium pump speed, and 3rd is at the highest pump speed.



Project No.: 2732.05 Date:
 Project Name: Former IBM Manassas
 Location: Manassas, VA

Project Manager: L. Jacob Collector(s): E. Bradstreet
 PID Meter Used: MiniRAE2000 (Pine Rental) FID Meter Used: None
 He Meter: Dielectric MGD-2002 O2 / CH4 / CO2 Meter Used: Gem2000 (Pine)
 Other: Magnehelic gauges (0-1 and 0-80 inwc)

	OPERATIONS TESTING	PERFORMANCE TESTING RECORD		
Location No.	SG-117S			
Vacuum (in H ₂ O)	>80			
Time to fill 1 liter Bag (min)	1.5			
Approx. Flow Rate (ml/min)	X			
Tracer Gas Applied				
Tracer Gas Concentration (ppmv or %)				
O ₂ (%)				
CH ₄ (%)				
CO ₂ (%)				
PID (ppmv)				
Testing Date and Time		7/12 - 1430		
Screen Interval Depth (ft bgs)	14.5 - 15			
Ambient Air Temp (°F)	85			
Weather Conditions	Sunny, breezy			
Comment No.**	1			

COMMENTS

** For all performance tests, 1st reading is at lowest pump speed, 2nd is at medium pump speed, and 3rd is at the highest pump speed.
 1. Continuous flow of water, confirmed 7/13/12.



Project No.: 2732.05

Date:

Location: Manassas, VA

Project Manager: L. Jacob

Collector(s): M. Stein

PID Meter Used: MiniRAE2000 (Pine Rental)

FID Meter Used: None

He Meter: Dielectric MGD-2002

O2 / CH4 / CO2 Meter Used: Gem2000 (Pine)

Other: Magnehelic gauges (0-1 and 0-80 inwc)

	OPERATIONS TESTING	PERFORMANCE TESTING RECORD			
Location No.	SG-118S	SG-118S			
Vacuum (in H ₂ O)	-1.1	18	24	62	
Time to fill 1 liter Bag (min)	1.5	6.25	2.4	1.2	
Approx. Flow Rate (ml/min)	670	160	390	800	
Tracer Gas Applied	N	Y	Y	Y	
Tracer Gas Concentration (ppmv or %)	-	ND	6.2%	9.3%	
O ₂ (%)	18.1	18.7	18.1	17.5	
CH ₄ (%)	0.0	0.1	0.0	0.1	
CO ₂ (%)	0.1	0.0	0.0	0.0	
PID (ppmv)	23	16	16	17	
Testing Date and Time	6/28/12 - 1030	6/29/12	6/29/12	6/29/12	
Screen Interval Depth (ft bgs)	9.5 - 10	9.5 - 10			
Ambient Air Temp (°F)	80 - 85	90 - 95			
Weather Conditions	Sunny, Humid	Sunny, Humid			
Comment No.**	58" H ₂ O	0.000 pre-performance test vac			

COMMENTS

** For all performance tests, 1st reading is at lowest pump speed, 2nd is at medium pump speed, and 3rd is at the highest pump speed.



Project No.: 2732.05 Date: 6/21, 25, 28/12
 Project Name: Former IBM Manassas
 Location: Manassas, VA

Project Manager: L. Jacob Collector(s) J. Pierce, M. Stein
 PID Meter Used: MiniRAE2000 (Pine Rental) FID Meter Used: None
 He Meter: Dielectric MGD-2002 O2 / CH4 / CO2 Meter Used: Gem2000 (Pine)
 Other: Magnehelic gauges (0-1 and 0-80 inwc)

	OPERATIONS TESTING #1	PERFORMANCE TESTING RECORD	OPERATIONS TESTING #2	OPERATIONS TESTING #3
Location No.	SG-119		SG-119	SG-119
Vacuum (in H ₂ O)	-0.03		+0.40	0.000
Time to fill 1 liter Bag (min)	2		-	-
Approx. Flow Rate (ml/min)	-		-	-
Tracer Gas Applied	N		N	-
Tracer Gas Concentration (ppmv or %)	-		-	-
O ₂ (%)	-		-	-
CH ₄ (%)	-		-	-
CO ₂ (%)	-		-	-
PID (ppmv)	-		-	-
Testing Date and Time	6/21/12 1430		6/25/12 1720	6/28/12 1150
Screen Interval Depth (ft bgs)	5 - 5.5		5 - 5.5	5 - 5.5
Ambient Air Temp (°F)	95° F		80s	85 - 90
Weather Conditions	Sunny, humid, breezy		Sunny, breezy	Sunny
Comment No.**	1		1	2

COMMENTS

** For all performance tests, 1st reading is at lowest pump speed, 2nd is at medium pump speed, and 3rd is at the highest pump speed.

1. Purged 60 mL. Tedlar bag didn't fill after 3 mins. Sounded like no air was being pulled into line. Max vacuum was >80" H₂O.
2. Water entered tubing during attempted operations testing #3.



Project No.: 2732.05 Date:
 Project Name: Former IBM Manassas
 Location: Manassas, VA

Project Manager: L. Jacob Collector(s): J. Pierce, M. Stein
 PID Meter Used: MiniRAE2000 (Pine Rental) FID Meter Used: None
 He Meter: Dielectric MGD-2002 O2 / CH4 / CO2 Meter Used: Gem2000 (Pine)
 Other: Magnehelic gauges (0-1 and 0-80 inwc)

	OPERATIONS TESTING	PERFORMANCE TESTING RECORD			
Location No.	SG-120S	SG-120S			
Vacuum (in H ₂ O)	-0.39	-28	-48	-68	
Time to fill 1 liter Bag (min)	1.5	6.25	2.4	1.2	
Approx. Flow Rate (ml/min)	550	160	400	630	
Tracer Gas Applied	N	Y	Y	Y	
Tracer Gas Concentration (ppmv or %)	-	ND	ND	ND	
O ₂ (%)	11.1	17.6	15.4	14.0	
CH ₄ (%)	0.0	0.1	0.1	0.2	
CO ₂ (%)	0.1	0.0	0.0	0.0	
PID (ppmv)	27	16	17.2	19.6	
Testing Date and Time	6/21/12 1420	6/28/12	6/28/12	6/28/12	
Screen Interval Depth (ft bgs)	12 - 12.5	12 - 12.5			
Ambient Air Temp (°F)	95° F	90 - 95s			
Weather Conditions	Sunny, breezy, humid				
Comment No.**	1	-2.578 - pre performance testing			

COMMENTS

** For all performance tests, 1st reading is at lowest pump speed, 2nd is at medium pump speed, and 3rd is at the highest pump speed.

1. Purged 60 mL. Max vacuum during bag collection was 18" H₂O.



Project No.: 2732.05

Date:

Project Name: Former IBM Manassas

Location: Manassas, VA

Project Manager: L. Jacob

Collector(s): J. Pierce, M. Stein

PID Meter Used: MiniRAE2000 (Pine Rental)

FID Meter Used: None

He Meter: Dielectric MGD-2002

O2 / CH4 / CO2 Meter Used: Gem2000 (Pine)

Other: Magnehelic gauges (0-1 and 0-80 inwc)

	OPERATIONS TESTING	PERFORMANCE TESTING RECORD			
Location No.	SG-121S	SG-121S			
Vacuum (in H ₂ O)	-1.9	-16	-26	-38	
Time to fill 1 liter Bag (min)	1.5	6.25	2.4	1.2	
Approx. Flow Rate (ml/min)	250	160	420	830	
Tracer Gas Applied	N	Y	Y	Y	
Tracer Gas Concentration (ppmv or %)	-	ND	ND	ND	
O ₂ (%)	18.0	19.5	16.6	16.6	
CH ₄ (%)	0.0	0.2	0.2	0.3	
CO ₂ (%)	0	0.0	0.0	0.0	
PID (ppmv)	1.2	15	21	22	
Testing Date and Time	6/25/12 1730	6/28/12	6/28/12	6/28/12	
Screen Interval Depth (ft bgs)	11.5 - 12	11.5 - 12			
Ambient Air Temp (°F)	80s	85 - 90s			
Weather Conditions	Sunny, breezy	Sunny, breezy			
Comment No.**		-1.371 pre performance test vac			

COMMENTS

** For all performance tests, 1st reading is at lowest pump speed, 2nd is at medium pump speed, and 3rd is at the highest pump speed.



Project No.: 2732.05 Date:
 Project Name: Former IBM Manassas
 Location: Manassas, VA

Project Manager: L. Jacob Collector(s): M. Stein
 PID Meter Used: MiniRAE2000 (Pine Rental) FID Meter Used: None
 He Meter: Dielectric MGD-2002 O2 / CH4 / CO2 Meter Used: Gem2000 (Pine)
 Other: Magnehelic gauges (0-1 and 0-80 inwc)

	OPERATIONS TESTING	PERFORMANCE TESTING RECORD			
Location No.	SG-122	SG-122			
Vacuum (in H ₂ O)	0.0	0.3	0.6	1.2	
Time to fill 1 liter Bag (min)	1.5	6.25	2.4	1.2	
Approx. Flow Rate (ml/min)	860	160	410	830	
Tracer Gas Applied	N	Y	Y	Y	
Tracer Gas Concentration (ppmv or %)	-	ND	ND	ND	
O ₂ (%)	16.3	11.2	13.0	13.3	
CH ₄ (%)	0.1	0.1	0.1	0.1	
CO ₂ (%)	4.8	8.9	8.1	8.1	
PID (ppmv)	27.9	1.0	7.1	3.3	
Testing Date and Time	6/28/12 - 1111	7/9/12 - 1024	7/9/12 - 1033	7/9/12 - 1038	
Screen Interval Depth (ft bgs)	5.5 - 6	5.5 - 6			
Ambient Air Temp (°F)	85 - 90	80 - 85			
Weather Conditions	Sunny, Humid	Overcast, humid			
Comment No.**	1.4" H ₂ O	-0.005 pre-performance testing ΔP			

COMMENTS

** For all performance tests, 1st reading is at lowest pump speed, 2nd is at medium pump speed, and 3rd is at the highest pump speed.



Project No.: 2732.05 Date:
 Project Name: Former IBM Manassas
 Location: Manassas, VA

Project Manager: L. Jacob Collector(s): M. Stein
 PID Meter Used: MiniRAE2000 (Pine Rental) FID Meter Used: None
 He Meter: Dielectric MGD-2002 O2 / CH4 / CO2 Meter Used: Gem2000 (Pine)
 Other: Magnehelic gauges (0-1 and 0-80 inwc)

	OPERATIONS TESTING	PERFORMANCE TESTING RECORD			
Location No.	SG-123S	SG-123S			
Vacuum (in H ₂ O)	-0.004	25	25	44	
Time to fill 1 liter Bag (min)	1.5	6.25	2.4	1.2	
Approx. Flow Rate (ml/min)	800	160	330	670	
Tracer Gas Applied	N	Y	Y	Y	
Tracer Gas Concentration (ppmv or %)	-	ND	ND	ND	
O ₂ (%)	8.9	8.1	12.8	13.0	
CH ₄ (%)	0.1	0.0	0.1	0.0	
CO ₂ (%)	0.1	1.5	4.0	4.8	
PID (ppmv)	34	2.3	1.2	ND	
Testing Date and Time	6/28/12 - 1119	7/9/12 - 1052	7/9/12 - 1102	7/9/12 - 1108	
Screen Interval Depth (ft bgs)	11.5 - 12	11.5 - 12			
Ambient Air Temp (°F)	85 - 90	80 - 85			
Weather Conditions	Sunny, Humid	Overcast, humid			
Comment No.**	3.6" H ₂ O	0.009 pre-performance testing ΔP			

COMMENTS

** For all performance tests, 1st reading is at lowest pump speed, 2nd is at medium pump speed, and 3rd is at the highest pump speed.



Project No.: 2732.05 Date:
 Project Name: Former IBM Manassas
 Location: Manassas, VA

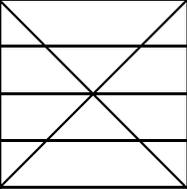
Project Manager: L. Jacob Collector(s): M. Stein
 PID Meter Used: MiniRAE2000 (Pine Rental) FID Meter Used: None
 He Meter: Dielectric MGD-2002 O2 / CH4 / CO2 Meter Used: Gem2000 (Pine)
 Other: Magnehelic gauges (0-1 and 0-80 inwc)

	OPERATIONS TESTING	PERFORMANCE TESTING RECORD			
Location No.	SG-31S	SG-31S			
Vacuum (in H ₂ O)	0.4	0.3	0.5	0.8	
Time to fill 1 liter Bag (min)	1.5	6.25	2.4	1.2	
Approx. Flow Rate (ml/min)	670	160	420	830	
Tracer Gas Applied	N	Y	Y	Y	
Tracer Gas Concentration (ppmv or %)	-	ND	ND	ND	
O ₂ (%)	18.1	16.4	17.3	16.9	
CH ₄ (%)	0.1	0.1	0.1	0.1	
CO ₂ (%)	1.6	3.0	1.4	1.1	
PID (ppmv)	3.2	6.3	4.9	3.3	
Testing Date and Time	7/10/12 - 1557	7/11/12 - 0826	7/11/12 - 0836	7/11/12 - 0843	
Screen Interval Depth (ft bgs)	12 - 12.5	12-12.5			
Ambient Air Temp (°F)	85	75			
Weather Conditions	Mostly cloudy	Mostly Sunny			
Comment No.**	ΔP - 0.000" H ₂ O	ΔP - 0.000" H ₂ O pre-performance test			

COMMENTS

** For all performance tests, 1st reading is at lowest pump speed, 2nd is at medium pump speed, and 3rd is at the highest pump speed.

Field Sampling Summary

	Project No.: 2732.05			Date:	
	Project Name: Supplemental VI Assessment				
	Location: Manassas, VA				
O ₂ / CH ₄ / CO ₂ Meter Used: Gem2000			Project Manager: E. Bradstreet		
PID Meter Used: MiniRAE			Collector(s): M. Stein, J. Pierce		
Other: Dwyer Digital Manometer Magnehilic Gauges			FID Meter Used: ----		
SUBSURFACE VAPOR SAMPLE RECORD					
Location No.	SG-121S	SG-121I	SG-119	SG-119	
Sample ID	SG121S	SG121I	SG119	SG119	
Sample Date	07/09/12	07/09/12	07/09/12	07/09/12	
Sample Collection Depth (ft bgs)	11.5	30	5	5	
Pre-purge Vacuum (in. H ₂ O)	-2.6	-9.8	+0.14	+0.14	
Approx. Purge Volume (ml)	100	2500	60	160	
Purge Vacuum (in.H ₂ O)	2	18	-	NR	
Canister Serial No.	3036	3322	-	3350	
Start Time	14:12	14:12	14:22	14:32	
Start Pressure (inches Hg)	29.5	30	-	30	
Stop Time	15:17	15:18	-	16:55	
Stop Pressure (inches Hg)	7	7	-	9.5	
Ambient Air Temp (°F)	80 - 85	80 - 85	80 - 85	80 - 85	
Weather Conditions	Overcast, humid	Overcast, Humid	Overcast, Humid	Overcast, Humid	
Screening Sample Collection Rate (ml/min)	240	200	-	Not recorded	
Screening Sample Collection Vacuum (in.H ₂ O)	22	16	-	>80	
O ₂ Reading (%)	12	19.7	-		
CH ₄ Reading (%)	0.1	0.0	-		
CO ₂ Reading (%)	0.0	0.1	-		
PID reading (ppmv)	1.7	ND	-		
FID reading (ppmv)	-	-	-	-	-
Comment No.			Microseeps; 1	2	
COMMENTS					
<p>1. Water entered tubing during post-sampling screening. No screening sample collected.</p> <p>2. Initial canister #8030 - initial vacuum -24.5 in Hg, replaced with new canister. Purge volume includes vapor used to fill exvauated vials prior to attempting canister sampling. Implant was able to be sampled via canister and vials were not submitted to the analytical laboratory.</p>					

Field Sampling Summary

	Project No.: 2732.05			Date:	
	Project Name: Supplemental VI Assessment				
	Location: Manassas, VA				
O ₂ / CH ₄ / CO ₂ Meter Used: Gem2000			Project Manager: E. Bradstreet		
PID Meter Used: MiniRAE			Collector(s): M. Stein, J. Pierce		
Other: Dwyer Digital Manometer Magnehilic Gauges			FID Meter Used: ----		
SUBSURFACE VAPOR SAMPLE RECORD					
Location No.	SG-120S	SG-120I	SG-118S	Equipment Blank	
Sample ID	SG120S	SG120I	SG118S	EB1	
Sample Date	07/09/12	07/09/12	07/09/12	07/12/12	
Sample Collection Depth (ft bgs)	12	30	9.5	-	
Pre-purge Vacuum (in. H ₂ O)	-8.2	-18	-0.01	-	
Approx. Purge Volume (ml)	100	2500	100	-	
Purge Vacuum (in.H ₂ O)	-7	-25	-7.5	-	
Canister Serial No.	1364	8010	3460	3321	
Start Time	1440	1440	1504	1140	
Start Pressure (inches Hg)	30	29.5	30	30	
Stop Time	15:57	15:58	16:07	12:15	
Stop Pressure (inches Hg)	7	7	7.00	7.0	
Ambient Air Temp (°F)	80 - 85	80 - 85	80 - 85	80	
Weather Conditions	Overcast, humid	Overcast, Humid	Overcast, Humid	Mostly Sunny	
Screening Sample Collection Rate (ml/min)	240	200	170	-	
Screening Sample Collection Vacuum (in.H ₂ O)	45	25	16	-	
O ₂ Reading (%)	10.3	18.0	18.4	-	
CH ₄ Reading (%)	0.1	0.1	0.1	-	
CO ₂ Reading (%)	0.0	1.5	0.0	-	
PID reading (ppmv)	0.9	1.5	1.6	-	
FID reading (ppmv)	-	-	-	-	
Comment No.					
COMMENTS					

Field Sampling Summary

	Project No.: 2732.05			Date:	
	Project Name: Supplemental VI Assessment				
	Location: Manassas, VA				
O ₂ / CH ₄ / CO ₂ Meter Used: Gem2000			Project Manager: E. Bradstreet		
PID Meter Used: MiniRAE			Collector(s): M. Stein		
Other: Dwyer Digital Manometer Magnehilic Gauges			FID Meter Used: ----		
SUBSURFACE VAPOR SAMPLE RECORD					
Location No.	SG-114	SG-114	SG-122	SG-123S	SG-31S
Sample ID	SG-114	DUP1	SG122	SG123S	SG31S
Sample Date	07/11/12	07/11/12	07/11/12	07/11/12	07/12/12
Sample Collection Depth (ft bgs)	5.5	-	5.5	11.5	12
Pre-purge Vacuum (in. H ₂ O)	0.0	-	NM	NM	0.0
Approx. Purge Volume (ml)	54	-	54	108	113
Purge Vacuum (in.H ₂ O)	2	-	2	4	2
Canister Serial No.	3338	3003	3463	3334	3825
Start Time	09:34	09:34	09:55	09:56	08:42
Start Pressure (inches Hg)	30	29.5	30	30	28.5
Stop Time	11:51	11:51	11:03	11:04	09:42
Stop Pressure (inches Hg)	7	7	6	6	6.5
Ambient Air Temp (°F)	75-80	75-80	75-80	75-80	75-80
Weather Conditions	M. Cloudy	M. Cloudy	M. Cloudy	M. Cloudy	M. Sunny
Screening Sample Collection Rate (ml/min)	240	200	180	Not recorded	110
Screening Sample Collection Vacuum (in.H ₂ O)	0.7	-	0.4	9.4	0.4
O ₂ Reading (%)	19.8	-	13.7	13.3	14.0
CH ₄ Reading (%)	0.0	-	0.0	0.0	0.0
CO ₂ Reading (%)	2.3	-	7.9	4.5	2.3
PID reading (ppmv)	ND	-	3.1	ND	6.0
FID reading (ppmv)	-	-	-	-	-
Comment No.					
COMMENTS					

Groundwater Quality Field Sampling Summary

	Project Number: 2732.05					Date: June 20, 22, 25, 26, 27 and July 10 to 12				
	Supplemental VI Assessment									
	Project Location: Manassas, VA									
pH, Conductivity, Temperature Meter:					Project Manager: E. Bradstreet					
Dissolved Oxygen Meter: Solinst (Pine)					Collector(s): EMB, JAP					
Water Level Meter:					Weather: June: Sunny, breezy, 90's; July: Sunny, 80's					
Field Measurements										
Sampling Location	SG-120	SG-121	SG-123	SG-118	SG-115	SG-31	SG-117	SG-117I	SG-117-23	Frac Tank
Sample Name	SG120	SG121	SG123	SG118	SG115	SG31	SG117	SG117I	SG11723	Frac01
Reference Point	Ground	Ground	Ground	Ground	Ground	Ground	Ground	Ground	Ground	
Sample Depth (feet)	32.10	32.65	29.65	28.55	31.91	75.50	30.35	28.81	18.09	
Depth to Floating Product (feet)	 									
Depth to Water (feet)	 									
Water Table Elevation (feet)	 									
Depth to Bottom (feet bgs)	 									
pH (standard units)	 									
Specific Conductance (µS/cm)	 									
Temperature (°C)	 									
Dissolved Oxygen (mg/L)	 									
Date of Sample	6/20/12	6/22/12	6/25/12	6/26/12	6/27/12	7/10/12	7/11/12	7/12/12	7/12/12	7/12/12
Sample Time	1410	1550	1330	1215	1205	1050	1620	1445	1540	1630
Number of Sample VOAs Collected	2	2	2	2	2	2	2	2	2	2
Purge/Sample Device	Bailer	Bailer	Bailer	Bailer	Bailer	Bailer	Bailer	Bailer	Bailer	Bailer
Comment Reference Number	1	1	2	2	2	3	3	4	4	
Comments										
<ol style="list-style-type: none"> 1. Shipped to Lancaster on 6/22/12. 2. Shipped to Lancaster on 6/27/12 (Week 2). 3. Shipped to Lancaster on 7/11/12 (Week 3). 4. Recorded water levels represent measurements recorded on July 13, 2012 										

Groundwater Quality Field Sampling Summary

	Project Number: 2732.05						Date: 7/10-11/12		
	Project Name: Supplemental VI Assessment								
	Project Location: Manassas, VA								
pH, Conductivity, Temperature Meter: -					Project Manager: Lisa Jacob				
Water Level Meter:					Collector(s): J. Pierce, M. Stein				
Other:					Weather:				
Field Measurements									
Sampling Location	SG-118-22	SG-123I	SG-118I	SG-115S	SG-115I	SG-31I	SG-31D	D-86	Field Blank
Sample Name	SG11822	SG123I	SG118I	SG115S	SG115I	SG31I	SG31D	D86	FB1
Reference Point	Ground	Ground	Ground	Ground	Ground	Ground	Ground	Ground	Ground
Sample Depth (feet)	NM	NM	NM	NM	NM	NM	NM	NM	NM
Depth to Floating Product (feet)	<div style="position: relative; width: 100%; height: 100%; border: 1px solid black;"> <div style="position: absolute; top: 0; left: 0; bottom: 0; right: 0; border: 1px solid black; transform: rotate(45deg); transform-origin: center;"></div> </div>								
Depth to Water (feet)									
Water Table Elevation (feet)									
Depth to Bottom (feet bgs)									
pH (standard units)									
Specific Conductance (µS/cm)									
Temperature (°C)									
Dissolved Oxygen (mg/L)									
Oxidation Reduction Potential (mv)									
Date of Sample									
Sample Time	1035	0954	1115	1141	1219	1333	1600	1453	1745
Number of Sample VOAs Collected	2	2	2	2	2	2	2	2	2
Purge/Sample Device	Bailer	Bailer	Bailer	Syringe	Bailer	Bailer	Bailer	Bailer	Submerge Analytical Container
Comment Reference Number									
Comments									

Water Level Elevation Data
Investigation Data Report
Supplemental Vapor Intrusion Assessment
Former IBM Manassas
Manassas, Virginia

Monitoring Depth	Location	Ref. Point	Reference Elevation (ft AMSL)	June 2011 Routine June 16, 2011		August 2011 Routine August 18, 2011		October 2011 Routine October 24, 2011		December 2011 Routine December 12, 2011		February 2012 Routine February 23, 2012		June 2012 Routine June 23, 2012		July 2012 Non-Routine July 13, 2012	
				DTW (ft)	WLE (ft AMSL)	DTW (ft)	WLE (ft AMSL)	DTW (ft)	WLE (ft AMSL)	DTW (ft)	WLE (ft AMSL)	DTW (ft)	WLE (ft AMSL)	DTW (ft)	WLE (ft AMSL)	DTW (ft)	WLE (ft AMSL)
25 to 30' Depth	D-74	WLMP	248.78	15.82	232.96	16.00	232.78	16.01	232.77	16.01	232.77	15.93	232.85	15.96	232.82	16.16	232.62
	D-75	WLMP	248.91	12.25	236.66	15.18	233.73	15.66	233.25	13.70	235.21	16.20	232.71	14.69	234.22	14.25	234.66
	D-76	TOC	250.25	-	-	-	-	12.75	237.50	12.70	237.55	12.93	237.32	-	-	-	-
	D-77	TOC	250.54	-	-	-	-	13.05	237.49	13.00	237.54	13.15	237.39	-	-	-	-
	D-78	TOC	250.16	-	-	-	-	24.55	225.61	25.76	224.40	27.22	222.94	-	-	-	-
	SG-102I	TOR	245.75	11.41	234.34	12.57	233.18	12.05	233.70	18.20	227.55	18.37	227.38	21.20	224.55	20.79	224.96
	SG-106I	TOR	249.78	23.57	226.21	23.43	226.35	21.10	228.68	21.70	228.08	22.60	227.18	24.23	225.55	24.07	225.71
	SG-108I	TOR	251.38	26.72	224.66	26.71	224.67	24.56	226.82	24.58	226.80	25.35	226.03	26.71	224.67	26.59	224.79
	SG-111I	TOR	252.31	29.39	222.92	30.29	222.02	28.68	223.63	29.18	223.13	29.27	223.04	29.84	222.47	29.89	222.42
	SG-113I	TOR	247.00	12.87	234.13	12.83	234.17	13.71	233.29	15.59	231.41	14.48	232.52	15.83	231.17	14.88	232.12
	SG-115I	TOR	246.77	-	-	-	-	-	-	-	-	-	-	-	-	31.26	215.51
	SG-117I	TOR	253.23	-	-	-	-	-	-	-	-	-	-	-	-	28.47	224.76
	SG-118I	TOR	248.73	-	-	-	-	-	-	-	-	-	-	-	-	20.64	228.09
	SG-120I	TOR	250.89	-	-	-	-	-	-	-	-	-	-	-	-	>31.56	<219.33
	SG-121I	TOR	252.64	-	-	-	-	-	-	-	-	-	-	-	-	>32.56	<220.08
SG-123I	TOR	253.65	-	-	-	-	-	-	-	-	-	-	-	-	27.05	226.60	
SG-31I	TOR	245.76	-	-	-	-	-	-	-	-	-	-	-	-	22.64	223.12	
45 to 50' Depth	SG-102D	TOR	245.78	>48.00	<197.78	>48.00	<197.78	>48.00	<197.78	>48.00	<197.78	>48.00	<197.78	>48.00	<197.78	>48.00	<197.78
	SG-106D	TOR	249.81	42.31	207.50	42.05	207.76	40.25	209.56	40.35	209.46	41.04	208.77	41.72	208.09	42.89	206.92
	SG-108D	TOR	251.40	45.94	205.46	45.58	205.82	45.22	206.18	46.11	205.29	46.17	205.23	46.34	205.06	45.44	205.96
	SG-111D	TOR	252.31	38.27	214.04	40.19	212.12	38.39	213.92	40.80	211.51	37.80	214.51	39.34	212.97	41.20	211.11
	SG-113D	TOR	246.98	41.61	205.37	41.94	205.04	42.21	204.77	42.16	204.82	41.63	205.35	41.59	205.39	41.67	205.31
SG-31D	TOR	245.79	-	-	-	-	-	-	-	-	-	-	-	-	45.65	200.14	
70 to 80' Depth	D-68	WLMP	249.58	84.54	165.04	87.08	162.50	79.69	169.89	79.29	170.29	74.52	175.06	78.85	170.73	77.68	171.90
	D-69	WLMP	250.05	88.09	161.96	90.18	159.87	83.40	166.65	82.72	167.33	76.10	173.95	77.74	172.31	83.30	166.75
	D-70	WLMP	248.23	75.56	172.67	79.17	169.06	72.75	175.48	71.92	176.31	68.47	179.76	69.46	178.77	71.56	176.67
	D-71	WLMP	248.20	74.17	174.03	76.42	171.78	72.63	175.57	71.42	176.78	68.98	179.22	70.34	177.86	77.26	170.94
	D-72	WLMP	247.61	81.92	165.69	84.27	163.34	77.51	170.10	76.28	171.33	73.14	174.47	74.45	173.16	71.13	176.48
	D-73	WLMP	247.41	71.80	175.61	75.55	171.86	70.85	176.56	69.56	177.85	65.90	181.51	66.86	180.55	69.70	177.71
	D-81	WLMP	243.03	60.32	182.71	63.82	179.21	61.12	181.91	60.08	182.95	57.38	185.65	58.76	184.27	60.78	182.25
	D-82	WLMP	244.94	67.29	177.65	70.66	174.28	66.50	178.44	65.42	179.52	63.15	181.79	64.55	180.39	62.43	182.51

Water Level Elevation Data
Investigation Data Report
Supplemental Vapor Intrusion Assessment
Former IBM Manassas
Manassas, Virginia

Monitoring Depth	Location	Ref. Point	Reference Elevation (ft AMSL)	June 2011 Routine June 16, 2011		August 2011 Routine August 18, 2011		October 2011 Routine October 24, 2011		December 2011 Routine December 12, 2011		February 2012 Routine February 23, 2012		June 2012 Routine June 23, 2012		July 2012 Non-Routine July 13, 2012		
				DTW (ft)	WLE (ft AMSL)	DTW (ft)	WLE (ft AMSL)	DTW (ft)	WLE (ft AMSL)	DTW (ft)	WLE (ft AMSL)	DTW (ft)	WLE (ft AMSL)	DTW (ft)	WLE (ft AMSL)	DTW (ft)	WLE (ft AMSL)	
70 to 80' Depth	D-83	WLMP	246.10	68.31	177.79	71.61	174.49	67.20	178.90	66.03	180.07	63.70	182.40	65.30	180.80	67.30	178.80	
	D-84	WLMP	245.72	79.31	166.41	82.31	163.41	75.70	170.02	74.67	171.05	70.67	175.05	74.01	171.71	73.49	172.23	
	D-85	WLMP	246.49	57.46	189.03	66.04	180.45	62.49	184.00	59.96	186.53	56.29	190.20	58.04	188.45	61.25	185.24	
	D-86	TOR	245.68	-	-	-	-	-	-	-	-	-	-	-	-	-	67.08	178.60
	OF-54	TOR	252.18	73.26	178.92	76.24	175.94	72.21	179.97	70.80	181.38	68.72	183.46	70.84	181.34	72.49	179.69	
	OF-55	TOR	247.31	69.48	177.83	72.81	174.50	68.45	178.86	67.37	179.94	65.16	182.15	66.69	180.62	68.65	178.66	
Miscellaneous	SG-04	TOR	246.68	-	-	43.72	202.96	34.93	211.75	34.84	211.84	35.00	211.68	40.02	206.66	41.77	204.91	
	SG-05	TOR	246.83	-	-	>45.3	<201.53	>45.35	<201.53	>45.3	<201.53	>45.3	<201.53	>45.3	<201.53	>45.3	<201.53	
	SG-06	TOR	247.32	-	-	>45.5	<201.82	>45.5	<201.82	>45.5	<201.82	>45.5	<201.82	>45.5	<201.82	>45.5	<201.82	
	S-38	TOC	250.48	-	-	13.43	237.05	13.25	237.23	13.15	237.33	13.28	237.20	13.56	236.92	13.80	236.68	
	S-41	TOC	250.39	-	-	>47.2	<203.19	>47.2	<203.19	>47.2	<203.19	>47.2	<203.19	>47.2	<203.19	>47.2	<203.19	
	S-42	TOC	250.04	-	-	>62.7	<187.34	>62.7	<187.34	>62.7	<187.34	>62.7	<187.34	>62.7	<187.34	>62.7	<187.34	
	MW-08	TOC	248.98	73.25	175.73	76.26	172.72	71.42	177.56	70.41	178.57	68.04	180.94	69.50	179.48	71.61	177.37	
	SG-118-22	TOR	248.73	-	-	-	-	-	-	-	-	-	-	-	-	-	13.70	235.03
	SG-117-23	TOR	253.22	-	-	-	-	-	-	-	-	-	-	-	-	-	18.09	235.13

Notes:

1. This table is intended to summarize water levels recorded during characterization and routine sampling rounds in the Building 101 area at the former IBM facility in Manassas, Virginia. Depth to water measurements were collected by Sanborn Head personnel on the dates noted, and are recorded as feet below the reference point as marked on the monitoring well or multi-depth implant.
2. Refer to the report text for additional details.

Differential Pressure Data
Investigation Data Report
Supplemental Vapor Intrusion Assessment
Former IBM Manassas
Manassas, Virginia

Monitoring Depth	Location	June 2011 Routine June 15, 2011	August 2011 Routine August 17, 2011	October 2011 Routine October 24, 2011	December 2011 Routine December 15, 2011	February 2012 Routine February 22, 2012	June 2012 Routine June 23, 2012	July Non-Routine July 13, 2012	# Rounds Vacuum Observed
5 to 8' Depth	SG-06-8	0.0	0.0	-0.02	-0.01	-0.07	-0.01	0	6
	SG-07	0.01	-0.03	0.05	2.8	0.95	0.13	-0.03	2
	SG-08	0.38	0.10	0.16	0.35	0.77	-0.19	0.34	1
	SG-09	-0.05	0.0	0.51	0.28	0.06	0.01	-1.5	2
	SG-10	0.45	-1.5	-9.3	-1.4	-0.23	2.8	4.6	5
	SG-11	-1.1	-0.27	3.0	-1.3	-0.38	-0.44	-0.21	7
	SG-12	0.59	-0.14	-0.15	0.51	0.20	-0.13	0.43	3
	SG-13	-0.09	0.13	2.1	0.24	-0.33	0.26	0.2	4
	SG-14	-2.1	-1.6	3.2	2.1	-0.63	-1.8	-2.7	5
	SG-15	0.68	-0.57	0.50	0.19	0.28	-0.06	-0.04	3
	SG-16	-2.1	0.15	4.3	0.77	-1.4	1.1	-1.7	4
	SG-17	0.0	0.0	0.02	0.09	-0.01	0.0	-0.01	3
	SG-18	0.01	0.0	0.11	0.19	0.04	-0.01	-0.004	2
	SG-19	-2.9	0.0	1.5	-0.15	-3.5	-1.9	0	7
	SG-20	-4.2	0.0	-0.05	-1.7	-3.4	1.2	0	7
	SG-21	0.0	0.0	-0.02	-0.01	-0.01	0.0	0	4
	SG-22	-3.6	0.0	-1.2	0.78	-0.14	1.3	-0.03	4
	SG-23	-19	0.0	-4.3	0.0	0.55	-0.32	0	6
	SG-24	0.81	0.0	0.74	1.1	0.85	0.9	0.54	0
	SG-25	-0.49	0.43	0.11	0.14	-1.3	0.53	-0.37	6
	SG-26	-0.01	0.0	0.0	0.0	-0.02	-0.01	0.01	5
	SG-27	-0.01	-0.05	-0.01	-0.02	-0.03	-0.02	-0.03	10
	SG-28	0.0	0.0	-0.01	-0.01	-0.02	-0.01	0	7
	SG-29	-0.08	0.0	-0.01	-0.03	-0.02	-0.02	0.01	7
SG-30	-0.41	0.0	-0.38	0.17	-1.8	-0.35	-0.9	8	
SG-101	0.0	0.0	-0.01	-0.02	0.04	0.0	0	3	
SG-103	0.06	0.0	0.00	2.5	0.35	-0.015	0	2	
SG-104	0.74	0.04	-0.01	-0.04	0.05	-0.004	0.04	5	
SG-105	-0.75	0.0	-0.02	-0.3	0.01	0.0	0.02	5	
SG-107	0.08	0.0	0.82	0.72	0.07	0.0	-0.35	2	
SG-109	0.01	0.0	0.35	1.2	0.11	-0.008	-0.01	4	
SG-110	-0.19	0.36	-0.03	-0.73	-0.04	-0.010	-0.02	6	
SG-112	0.30	0.0	0.0	2.1	0	-0.005	-0.01	2	
SG-114	-	-	-	-	-	-	0	0	
SG-116	-	-	-	-	-	-	-0.01	1	
SG-119	-	-	-	-	-	-	-4.7	1	
SG-122	-	-	-	-	-	-	0	0	
10 to 12' Depth	SG-04-10	-1.3	-0.31	-0.41	-0.85	-0.66	-0.52	-0.32	10
	SG-05-10	-25	-23	-31	-33	-21	-22	-23	10
	SG-102S	-1.6	-4.5	-0.03	-1.3	-0.79	-1.1	-4.8	9
	SG-106S	0.003	0.0	-0.02	-0.01	0.02	-0.015	0.003	4
	SG-108S	0.01	0.10	-0.01	0.17	0.07	-0.72	0.01	2
	SG-111S	0.0	0.0	0.02	0.0	0.05	-0.005	0	1
	SG-113S	0.02	9.3	0.29	0.15	0.67	0.0	4.7	0
	SG-115S	-	-	-	-	-	-	2.4	0
	SG-117S	-	-	-	-	-	-	0	0
	SG-118S	-	-	-	-	-	-	0.02	0
	SG-120S	-	-	-	-	-	-	-19	1
	SG-121S	-	-	-	-	-	-	-8.2	1
	SG-123S	-	-	-	-	-	-	-0.01	1
SG-31S	-	-	-	-	-	-	0	0	
25 to 30' Depth	D-74	-3.4	-42	-50	-50	-58	-52	-50	8
	D-75	-0.01	0.10	0.003	-0.01	-0.02	0.01	0.01	4
	D-76	-	-	-0.01	-0.01	-0.02	-	-	3
	D-77	-	-	-0.10	0.0	0	-	-	1
	D-78	-	-	0.09	-0.01	-0.01	-	-	2
	SG-04-25	-0.14	-0.34	-0.66	0.23	0.31	0.13	0.13	6
	SG-05-25	-26	-24	-31	-34	-27	-23	-22	10
	SG-06-25	0.0	0.02	-0.01	-0.52	-0.38	-0.04	0.38	6
	SG-102I	0.18	0.11	-0.33	-0.14	0.06	0.88	-1.8	5
	SG-106I	-0.35	-0.35	0.95	0.5	0.18	-0.010	0.004	3
	SG-108I	-0.67	-0.79	0.03	0.87	0.12	0.0	-0.01	3
	SG-111I	-0.10	-5.1	-2.8	-3.9	-0.28	-0.40	-7.6	10
	SG-113I	0.25	0.09	0.02	0.2	0.62	0.44	8.4	0
	SG-115I	-	-	-	-	-	-	-5.2	1
	SG-117I	-	-	-	-	-	-	0.08	0
SG-118I	-	-	-	-	-	-	0.06	0	
SG-121I	-	-	-	-	-	-	-11	1	
SG-123I	-	-	-	-	-	-	0	0	
SG-31I	-	-	-	-	-	-	0.2	0	
45 to 50' Depth	SG-04-45	-0.13	-14	0.22	0.19	0.8	0.06	-0.41	4
	SG-05-45	-25	-25	-31	-33	-12	-23	-26	10
	SG-06-44	-17	-14	0.04	-2.7	-8.3	-19	-16	9
	SG-102D	-0.05	-3.6	-0.88	0.08	-5.2	-1.1	-4.9	9
	SG-106D	-12	-8.5	-0.17	0.77	0.26	-2.5	-11	8
	SG-108D	-7.6	-7.6	-0.32	-3.3	-8.2	-13	-11	10
	SG-111D	0.01	0.08	0.04	0.0	0.14	-0.01	0.01	2
	SG-113D	-2.7	-4.8	-0.03	0.5	0.24	-1.3	-6.8	8
SG-31D	-	-	-	-	-	-	0.07	0	
70 to 80' Depth	D-68	-11	-26	-30	-32	-27	-0.39	-28	9
	D-69	-20	-16	-15	-9.2	-14	-18	-18	9
	D-70	-18	-14	-17	-23	-20	-17	-13	9
	D-71	-0.14	-0.16	-0.11	-0.09	-0.09	-0.31	-0.16	9
	D-72	-16	-11	-10	-17	-16	-15	-9	9
	D-73	-19	-14	-16	-21	-19	-18	-14	9
	D-81	-4.8	-1.7	0.0	1.8	2.6	-1.4	-0.05	6
	D-82	0.0	-0.94	-0.20	0.0	0	-2.2	-0.64	5
	D-83	-8.5	-7.7	-5.5	-2.4	0	-7.1	-0.48	7
	D-84	-5.6	-7.2	-0.28	-4.7	-0.2	-1.3	-4.4	9
	D-85	-0.23	-0.03	-0.36	-0.03	-1.2	-0.13	-0.11	9
	D-86	-	-	-	-	-	-	-1.1	1
OF-54	-11	-10	-0.05	-0.69	-0.21	-1.3	-12	10	
OF-55	0.0	0.02	0.0	-0.01	0.04	-0.025	-0.6	4	
Miscellaneous	SG-118-22	-	-	-	-	-	0.08	0	
	SG-117-23	-	-	-	-	-	-0.01	1	

1. This table is intended to summarize differential pressure between the ambient atmosphere and below ground conditions. Differential pressure was recorded in the Building 101 area at the former IBM facility in Manassas, Virginia by Sanborn Head on the dates noted. Measurements were recorded using 0-1 inches water column (in.H₂O) or 0-40 in.H₂O digital micromanometers.

2. Refer to the report text for additional details.

APPENDIX C

ANALYTICAL LABORATORY REPORTS

APPENDIX C.1

JUNE 2012

ROUTINE SAMPLING

7/13/2012

Ms. Lisa Jacob
Sanborn, Head & Associates
1 Technology Park Drive

Westford MA 01886

Project Name: Supplemental VI Assessment

Project #: 2732.08

Workorder #: 1206667

Dear Ms. Lisa Jacob

The following report includes the data for the above referenced project for sample(s) received on 6/29/2012 at Air Toxics Ltd.

The data and associated QC analyzed by Modified TO-15 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Air Toxics Ltd. for your air analysis needs. Air Toxics Ltd. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Ausha Scott at 916-985-1000 if you have any questions regarding the data in this report.

Regards,



Ausha Scott
Project Manager

WORK ORDER #: 1206667

Work Order Summary

CLIENT: Ms. Lisa Jacob
 Sanborn, Head & Associates
 1 Technology Park Drive
 Westford, MA 01886

BILL TO: Accounts Payable
 Sanborn, Head & Associates
 20 Foundry Street
 Concord, NH 03301

PHONE: 978-392-0900

P.O. # 2732.00

FAX:

PROJECT # 2732.08 Supplemental VI Assessment

DATE RECEIVED: 06/29/2012

CONTACT: Ausha Scott

DATE COMPLETED: 07/13/2012

<u>FRACTION #</u>	<u>NAME</u>	<u>TEST</u>	<u>RECEIPT VAC./PRES.</u>	<u>FINAL PRESSURE</u>
01A	DUP1	Modified TO-15	6.8 "Hg	5 psi
02A	SG-04-10	Modified TO-15	6.0 "Hg	5 psi
03A	SG-05-10	Modified TO-15	7.4 "Hg	5 psi
04A	SG-05-25	Modified TO-15	6.2 "Hg	5 psi
05A	SG-05-45	Modified TO-15	6.8 "Hg	5 psi
05AA	SG-05-45 Lab Duplicate	Modified TO-15	6.8 "Hg	5 psi
06A	SG-06-44	Modified TO-15	8.0 "Hg	5 psi
07A	SG-06-8	Modified TO-15	7.0 "Hg	5 psi
08A	SG-07	Modified TO-15	6.2 "Hg	5 psi
09A	SG-10	Modified TO-15	6.4 "Hg	5 psi
10A	SG102D	Modified TO-15	5.0 "Hg	5 psi
11A	SG106D	Modified TO-15	4.8 "Hg	5 psi
12A	SG107	Modified TO-15	14.8 "Hg	5 psi
13A	SG112	Modified TO-15	5.2 "Hg	5 psi
14A	SG-12	Modified TO-15	6.4 "Hg	5 psi
15A	SG-19	Modified TO-15	6.4 "Hg	5 psi
16A	SG-20	Modified TO-15	6.4 "Hg	5 psi
17A	SG-21	Modified TO-15	7.0 "Hg	5 psi
18A	SG-26	Modified TO-15	6.4 "Hg	5 psi
19A	SG-28	Modified TO-15	6.8 "Hg	5 psi
20A	SG-30	Modified TO-15	7.4 "Hg	5 psi
20AA	SG-30 Lab Duplicate	Modified TO-15	7.4 "Hg	5 psi
21A	Lab Blank	Modified TO-15	NA	NA

Continued on next page

WORK ORDER #: 1206667

Work Order Summary

CLIENT: Ms. Lisa Jacob
 Sanborn, Head & Associates
 1 Technology Park Drive
 Westford, MA 01886

BILL TO: Accounts Payable
 Sanborn, Head & Associates
 20 Foundry Street
 Concord, NH 03301

PHONE: 978-392-0900

P.O. # 2732.00

FAX:

PROJECT # 2732.08 Supplemental VI Assessment

DATE RECEIVED: 06/29/2012

CONTACT: Ausha Scott

DATE COMPLETED: 07/13/2012

<u>FRACTION #</u>	<u>NAME</u>	<u>TEST</u>	<u>RECEIPT VAC./PRES.</u>	<u>FINAL PRESSURE</u>
21B	Lab Blank	Modified TO-15	NA	NA
22A	CCV	Modified TO-15	NA	NA
22B	CCV	Modified TO-15	NA	NA
23A	LCS	Modified TO-15	NA	NA
23AA	LCSD	Modified TO-15	NA	NA
23B	LCS	Modified TO-15	NA	NA
23BB	LCSD	Modified TO-15	NA	NA

CERTIFIED BY:



Technical Director

DATE: 07/13/12

Certification numbers: AZ Licensure AZ0719, CA NELAP - 02110CA, LA NELAP - 02089,
 NY NELAP - 11291, TX NELAP - T104704434-11-3, UT NELAP -CA009332011-1, WA NELAP - C935
 Name of Accrediting Agency: NELAP/Florida Department of Health, Scope of Application: Clean Air Act,
 Accreditation number: E87680, Effective date: 07/01/11 , Expiration date: 06/30/12.

Air Toxics Ltd. certifies that the test results contained in this report meet all requirements of the NELAC standards

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180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
 (916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
EPA Method TO-15
Sanborn, Head & Associates
Workorder# 1206667

Twenty 1 Liter Summa Canister (100% Certified) samples were received on June 29, 2012. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan mode.

This workorder was independently validated prior to submittal using 'USEPA National Functional Guidelines' as generally applied to the analysis of volatile organic compounds in air. A rules-based, logic driven, independent validation engine was employed to assess completeness, evaluate pass/fail of relevant project quality control requirements and verification of all quantified amounts.

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

Dilution was performed on samples SG-05-25, SG-06-44, SG102D, SG106D, SG-12 and SG-28 due to the presence of high level target species.

Definition of Data Qualifying Flags

Eight qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit.

UJ- Non-detected compound associated with low bias in the CCV and/or LCS.

N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

Summary of Detected Compounds EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: DUP1

Lab ID#: 1206667-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	0.86	5.2	5.9	35

Client Sample ID: SG-04-10

Lab ID#: 1206667-02A

No Detections Were Found.

Client Sample ID: SG-05-10

Lab ID#: 1206667-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	0.89	2.8	6.0	19

Client Sample ID: SG-05-25

Lab ID#: 1206667-04A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	11	21	60	110
Tetrachloroethene	11	3700	76	25000

Client Sample ID: SG-05-45

Lab ID#: 1206667-05A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	0.86	1.1	4.6	5.9
Tetrachloroethene	0.86	220	5.9	1500

Client Sample ID: SG-05-45 Lab Duplicate

Lab ID#: 1206667-05AA

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	1.2	1.2	6.3	6.7
Tetrachloroethene	1.2	230	7.9	1500

Summary of Detected Compounds EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: SG-06-44

Lab ID#: 1206667-06A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	180	32000	1200	220000

Client Sample ID: SG-06-8

Lab ID#: 1206667-07A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	0.88	5.1	5.9	35

Client Sample ID: SG-07

Lab ID#: 1206667-08A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	0.84	2.3	5.7	16

Client Sample ID: SG-10

Lab ID#: 1206667-09A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	0.85	1.5	5.8	10

Client Sample ID: SG102D

Lab ID#: 1206667-10A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
cis-1,2-Dichloroethene	11	11	43	44
Trichloroethene	11	190	58	1000
Tetrachloroethene	11	3800	73	26000

Client Sample ID: SG106D

Lab ID#: 1206667-11A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
-----------------	--------------------------	----------------------	---------------------------	-----------------------

Summary of Detected Compounds EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: SG106D

Lab ID#: 1206667-11A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	320	89000	2200	600000

Client Sample ID: SG107

Lab ID#: 1206667-12A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	1.3	250	9.0	1700

Client Sample ID: SG112

Lab ID#: 1206667-13A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	0.81	1.1	5.5	7.6

Client Sample ID: SG-12

Lab ID#: 1206667-14A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
trans-1,2-Dichloroethene	340	470	1300	1800
cis-1,2-Dichloroethene	340	12000	1300	48000
Trichloroethene	340	28000	1800	150000
Tetrachloroethene	340	94000	2300	630000

Client Sample ID: SG-19

Lab ID#: 1206667-15A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	0.85	6.2	5.8	42

Client Sample ID: SG-20

Lab ID#: 1206667-16A

Summary of Detected Compounds EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: SG-20

Lab ID#: 1206667-16A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	0.85	4.7	5.8	32

Client Sample ID: SG-21

Lab ID#: 1206667-17A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	0.88	5.7	5.9	39

Client Sample ID: SG-26

Lab ID#: 1206667-18A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
cis-1,2-Dichloroethene	0.85	0.85	3.4	3.4
Trichloroethene	0.85	0.92	4.6	5.0
Tetrachloroethene	0.85	14	5.8	95

Client Sample ID: SG-28

Lab ID#: 1206667-19A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	1.7	9.0	9.3	48
Tetrachloroethene	1.7	520	12	3500

Client Sample ID: SG-30

Lab ID#: 1206667-20A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
trans-1,2-Dichloroethene	0.89	0.94	3.5	3.7
Tetrachloroethene	0.89	7.6	6.0	52

Client Sample ID: SG-30 Lab Duplicate

Lab ID#: 1206667-20AA

Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: SG-30 Lab Duplicate

Lab ID#: 1206667-20AA

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	1.2	7.9	8.0	54



Air Toxics

Client Sample ID: DUP1

Lab ID#: 1206667-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	p070313	Date of Collection:	6/25/12 3:25:00 PM
Dil. Factor:	1.73	Date of Analysis:	7/3/12 04:59 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.86	Not Detected	2.2	Not Detected
trans-1,2-Dichloroethene	0.86	Not Detected	3.4	Not Detected
cis-1,2-Dichloroethene	0.86	Not Detected	3.4	Not Detected
Trichloroethene	0.86	Not Detected	4.6	Not Detected
1,1,2-Trichloroethane	0.86	Not Detected	4.7	Not Detected
Tetrachloroethene	0.86	5.2	5.9	35

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	94	70-130
1,2-Dichloroethane-d4	110	70-130
4-Bromofluorobenzene	94	70-130



Client Sample ID: SG-04-10

Lab ID#: 1206667-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	p070314	Date of Collection: 6/25/12 4:22:00 PM
Dil. Factor:	1.68	Date of Analysis: 7/3/12 05:27 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.84	Not Detected	2.1	Not Detected
trans-1,2-Dichloroethene	0.84	Not Detected	3.3	Not Detected
cis-1,2-Dichloroethene	0.84	Not Detected	3.3	Not Detected
Trichloroethene	0.84	Not Detected	4.5	Not Detected
1,1,2-Trichloroethane	0.84	Not Detected	4.6	Not Detected
Tetrachloroethene	0.84	Not Detected	5.7	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	89	70-130
1,2-Dichloroethane-d4	105	70-130
4-Bromofluorobenzene	95	70-130



Air Toxics

Client Sample ID: SG-05-10

Lab ID#: 1206667-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	p070315	Date of Collection:	6/25/12 3:45:00 PM
Dil. Factor:	1.78	Date of Analysis:	7/3/12 05:53 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.89	Not Detected	2.3	Not Detected
trans-1,2-Dichloroethene	0.89	Not Detected	3.5	Not Detected
cis-1,2-Dichloroethene	0.89	Not Detected	3.5	Not Detected
Trichloroethene	0.89	Not Detected	4.8	Not Detected
1,1,2-Trichloroethane	0.89	Not Detected	4.8	Not Detected
Tetrachloroethene	0.89	2.8	6.0	19

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	89	70-130
1,2-Dichloroethane-d4	102	70-130
4-Bromofluorobenzene	97	70-130



Air Toxics

Client Sample ID: SG-05-25

Lab ID#: 1206667-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	p070513	Date of Collection:	6/25/12 4:08:00 PM
Dil. Factor:	22.5	Date of Analysis:	7/5/12 02:27 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	11	Not Detected	29	Not Detected
trans-1,2-Dichloroethene	11	Not Detected	45	Not Detected
cis-1,2-Dichloroethene	11	Not Detected	45	Not Detected
Trichloroethene	11	21	60	110
1,1,2-Trichloroethane	11	Not Detected	61	Not Detected
Tetrachloroethene	11	3700	76	25000

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	92	70-130
1,2-Dichloroethane-d4	105	70-130
4-Bromofluorobenzene	103	70-130



Air Toxics

Client Sample ID: SG-05-45

Lab ID#: 1206667-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	p070316	Date of Collection:	6/25/12 3:48:00 PM	
Dil. Factor:	1.73	Date of Analysis:	7/3/12 06:19 PM	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.86	Not Detected	2.2	Not Detected
trans-1,2-Dichloroethene	0.86	Not Detected	3.4	Not Detected
cis-1,2-Dichloroethene	0.86	Not Detected	3.4	Not Detected
Trichloroethene	0.86	1.1	4.6	5.9
1,1,2-Trichloroethane	0.86	Not Detected	4.7	Not Detected
Tetrachloroethene	0.86	220	5.9	1500

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	111	70-130
4-Bromofluorobenzene	94	70-130



Air Toxics

Client Sample ID: SG-05-45 Lab Duplicate

Lab ID#: 1206667-05AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	p070326	Date of Collection:	6/25/12 3:48:00 PM
Dil. Factor:	2.33	Date of Analysis:	7/3/12 11:28 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.0	Not Detected
trans-1,2-Dichloroethene	1.2	Not Detected	4.6	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.6	Not Detected
Trichloroethene	1.2	1.2	6.3	6.7
1,1,2-Trichloroethane	1.2	Not Detected	6.4	Not Detected
Tetrachloroethene	1.2	230	7.9	1500

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	111	70-130
4-Bromofluorobenzene	94	70-130

Client Sample ID: SG-06-44

Lab ID#: 1206667-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	p070510	Date of Collection:	6/25/12 2:18:00 PM
Dil. Factor:	366	Date of Analysis:	7/5/12 12:54 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	180	Not Detected	470	Not Detected
trans-1,2-Dichloroethene	180	Not Detected	720	Not Detected
cis-1,2-Dichloroethene	180	Not Detected	720	Not Detected
Trichloroethene	180	Not Detected	980	Not Detected
1,1,2-Trichloroethane	180	Not Detected	1000	Not Detected
Tetrachloroethene	180	32000	1200	220000

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	94	70-130
1,2-Dichloroethane-d4	108	70-130
4-Bromofluorobenzene	118	70-130



Client Sample ID: SG-06-8

Lab ID#: 1206667-07A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	p070317	Date of Collection:	6/25/12 3:25:00 PM	
Dil. Factor:	1.75	Date of Analysis:	7/3/12 06:56 PM	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.88	Not Detected	2.2	Not Detected
trans-1,2-Dichloroethene	0.88	Not Detected	3.5	Not Detected
cis-1,2-Dichloroethene	0.88	Not Detected	3.5	Not Detected
Trichloroethene	0.88	Not Detected	4.7	Not Detected
1,1,2-Trichloroethane	0.88	Not Detected	4.8	Not Detected
Tetrachloroethene	0.88	5.1	5.9	35

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	94	70-130
1,2-Dichloroethane-d4	108	70-130
4-Bromofluorobenzene	97	70-130



Air Toxics

Client Sample ID: SG-07

Lab ID#: 1206667-08A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	p070318	Date of Collection:	6/25/12 1:34:00 PM
Dil. Factor:	1.69	Date of Analysis:	7/3/12 07:26 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.84	Not Detected	2.2	Not Detected
trans-1,2-Dichloroethene	0.84	Not Detected	3.4	Not Detected
cis-1,2-Dichloroethene	0.84	Not Detected	3.4	Not Detected
Trichloroethene	0.84	Not Detected	4.5	Not Detected
1,1,2-Trichloroethane	0.84	Not Detected	4.6	Not Detected
Tetrachloroethene	0.84	2.3	5.7	16

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	97	70-130
1,2-Dichloroethane-d4	111	70-130
4-Bromofluorobenzene	100	70-130



Air Toxics

Client Sample ID: SG-10

Lab ID#: 1206667-09A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	p070319	Date of Collection:	6/25/12 6:48:00 PM
Dil. Factor:	1.70	Date of Analysis:	7/3/12 07:51 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.85	Not Detected	2.2	Not Detected
trans-1,2-Dichloroethene	0.85	Not Detected	3.4	Not Detected
cis-1,2-Dichloroethene	0.85	Not Detected	3.4	Not Detected
Trichloroethene	0.85	Not Detected	4.6	Not Detected
1,1,2-Trichloroethane	0.85	Not Detected	4.6	Not Detected
Tetrachloroethene	0.85	1.5	5.8	10

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	92	70-130
1,2-Dichloroethane-d4	105	70-130
4-Bromofluorobenzene	97	70-130



Air Toxics

Client Sample ID: SG102D

Lab ID#: 1206667-10A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	p070514	Date of Collection:	6/26/12 11:20:00 AM
Dil. Factor:	21.5	Date of Analysis:	7/5/12 02:54 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	11	Not Detected	27	Not Detected
trans-1,2-Dichloroethene	11	Not Detected	43	Not Detected
cis-1,2-Dichloroethene	11	11	43	44
Trichloroethene	11	190	58	1000
1,1,2-Trichloroethane	11	Not Detected	59	Not Detected
Tetrachloroethene	11	3800	73	26000

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	96	70-130
1,2-Dichloroethane-d4	105	70-130
4-Bromofluorobenzene	95	70-130



Client Sample ID: SG106D

Lab ID#: 1206667-11A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	p070511	Date of Collection:	6/27/12 11:27:00 AM
Dil. Factor:	640	Date of Analysis:	7/5/12 01:13 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	320	Not Detected	820	Not Detected
trans-1,2-Dichloroethene	320	Not Detected	1300	Not Detected
cis-1,2-Dichloroethene	320	Not Detected	1300	Not Detected
Trichloroethene	320	Not Detected	1700	Not Detected
1,1,2-Trichloroethane	320	Not Detected	1700	Not Detected
Tetrachloroethene	320	89000	2200	600000

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	92	70-130
1,2-Dichloroethane-d4	103	70-130
4-Bromofluorobenzene	123	70-130



Air Toxics

Client Sample ID: SG107

Lab ID#: 1206667-12A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	p070320	Date of Collection:	6/26/12 6:14:00 PM
Dil. Factor:	2.64	Date of Analysis:	7/3/12 08:37 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.3	Not Detected	3.4	Not Detected
trans-1,2-Dichloroethene	1.3	Not Detected	5.2	Not Detected
cis-1,2-Dichloroethene	1.3	Not Detected	5.2	Not Detected
Trichloroethene	1.3	Not Detected	7.1	Not Detected
1,1,2-Trichloroethane	1.3	Not Detected	7.2	Not Detected
Tetrachloroethene	1.3	250	9.0	1700

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	93	70-130
1,2-Dichloroethane-d4	107	70-130
4-Bromofluorobenzene	106	70-130



Client Sample ID: SG112

Lab ID#: 1206667-13A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	p070321	Date of Collection: 6/26/12 1:36:00 PM
Dil. Factor:	1.62	Date of Analysis: 7/3/12 09:07 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.81	Not Detected	2.1	Not Detected
trans-1,2-Dichloroethene	0.81	Not Detected	3.2	Not Detected
cis-1,2-Dichloroethene	0.81	Not Detected	3.2	Not Detected
Trichloroethene	0.81	Not Detected	4.4	Not Detected
1,1,2-Trichloroethane	0.81	Not Detected	4.4	Not Detected
Tetrachloroethene	0.81	1.1	5.5	7.6

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	94	70-130
1,2-Dichloroethane-d4	106	70-130
4-Bromofluorobenzene	96	70-130

Client Sample ID: SG-12

Lab ID#: 1206667-14A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	p070512	Date of Collection:	6/25/12 5:08:00 PM
Dil. Factor:	680	Date of Analysis:	7/5/12 01:52 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	340	Not Detected	870	Not Detected
trans-1,2-Dichloroethene	340	470	1300	1800
cis-1,2-Dichloroethene	340	12000	1300	48000
Trichloroethene	340	28000	1800	150000
1,1,2-Trichloroethane	340	Not Detected	1800	Not Detected
Tetrachloroethene	340	94000	2300	630000

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	96	70-130
1,2-Dichloroethane-d4	107	70-130
4-Bromofluorobenzene	120	70-130



Air Toxics

Client Sample ID: SG-19

Lab ID#: 1206667-15A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	p070322	Date of Collection:	6/25/12 1:52:00 PM
Dil. Factor:	1.70	Date of Analysis:	7/3/12 09:32 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.85	Not Detected	2.2	Not Detected
trans-1,2-Dichloroethene	0.85	Not Detected	3.4	Not Detected
cis-1,2-Dichloroethene	0.85	Not Detected	3.4	Not Detected
Trichloroethene	0.85	Not Detected	4.6	Not Detected
1,1,2-Trichloroethane	0.85	Not Detected	4.6	Not Detected
Tetrachloroethene	0.85	6.2	5.8	42

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	88	70-130
1,2-Dichloroethane-d4	109	70-130
4-Bromofluorobenzene	96	70-130



Air Toxics

Client Sample ID: SG-20

Lab ID#: 1206667-16A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	p070323	Date of Collection:	6/25/12 2:50:00 PM
Dil. Factor:	1.70	Date of Analysis:	7/3/12 10:04 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.85	Not Detected	2.2	Not Detected
trans-1,2-Dichloroethene	0.85	Not Detected	3.4	Not Detected
cis-1,2-Dichloroethene	0.85	Not Detected	3.4	Not Detected
Trichloroethene	0.85	Not Detected	4.6	Not Detected
1,1,2-Trichloroethane	0.85	Not Detected	4.6	Not Detected
Tetrachloroethene	0.85	4.7	5.8	32

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	93	0-130
1,2-Dichloroethane-d4	108	0-130
4-Bromofluorobenzene	96	0-130



Client Sample ID: SG-21

Lab ID#: 1206667-17A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	p070324	Date of Collection: 6/25/12 3:48:00 PM
Dil. Factor:	1.75	Date of Analysis: 7/3/12 10:34 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.88	Not Detected	2.2	Not Detected
trans-1,2-Dichloroethene	0.88	Not Detected	3.5	Not Detected
cis-1,2-Dichloroethene	0.88	Not Detected	3.5	Not Detected
Trichloroethene	0.88	Not Detected	4.7	Not Detected
1,1,2-Trichloroethane	0.88	Not Detected	4.8	Not Detected
Tetrachloroethene	0.88	5.7	5.9	39

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	96	70-130
1,2-Dichloroethane-d4	112	70-130
4-Bromofluorobenzene	95	70-130



Air Toxics

Client Sample ID: SG-26

Lab ID#: 1206667-18A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	p070325	Date of Collection:	6/25/12 4:48:00 PM
Dil. Factor:	1.70	Date of Analysis:	7/3/12 11:03 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.85	Not Detected	2.2	Not Detected
trans-1,2-Dichloroethene	0.85	Not Detected	3.4	Not Detected
cis-1,2-Dichloroethene	0.85	0.85	3.4	3.4
Trichloroethene	0.85	0.92	4.6	5.0
1,1,2-Trichloroethane	0.85	Not Detected	4.6	Not Detected
Tetrachloroethene	0.85	14	5.8	95

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	91	70-130
1,2-Dichloroethane-d4	108	70-130
4-Bromofluorobenzene	94	70-130



Air Toxics

Client Sample ID: SG-28

Lab ID#: 1206667-19A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	p070509	Date of Collection:	6/25/12 4:24:00 PM
Dil. Factor:	3.46	Date of Analysis:	7/5/12 12:17 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.7	Not Detected	4.4	Not Detected
trans-1,2-Dichloroethene	1.7	Not Detected	6.8	Not Detected
cis-1,2-Dichloroethene	1.7	Not Detected	6.8	Not Detected
Trichloroethene	1.7	9.0	9.3	48
1,1,2-Trichloroethane	1.7	Not Detected	9.4	Not Detected
Tetrachloroethene	1.7	520	12	3500

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	92	70-130
1,2-Dichloroethane-d4	109	70-130
4-Bromofluorobenzene	95	70-130



Air Toxics

Client Sample ID: SG-30

Lab ID#: 1206667-20A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	p070507	Date of Collection:	6/25/12 4:28:00 PM
Dil. Factor:	1.78	Date of Analysis:	7/5/12 11:10 AM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.89	Not Detected	2.3	Not Detected
trans-1,2-Dichloroethene	0.89	0.94	3.5	3.7
cis-1,2-Dichloroethene	0.89	Not Detected	3.5	Not Detected
Trichloroethene	0.89	Not Detected	4.8	Not Detected
1,1,2-Trichloroethane	0.89	Not Detected	4.8	Not Detected
Tetrachloroethene	0.89	7.6	6.0	52

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	88	70-130
1,2-Dichloroethane-d4	104	70-130
4-Bromofluorobenzene	91	70-130



Air Toxics

Client Sample ID: SG-30 Lab Duplicate

Lab ID#: 1206667-20AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	p070508	Date of Collection:	6/25/12 4:28:00 PM
Dil. Factor:	2.35	Date of Analysis:	7/5/12 11:39 AM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.0	Not Detected
trans-1,2-Dichloroethene	1.2	Not Detected	4.6	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.6	Not Detected
Trichloroethene	1.2	Not Detected	6.3	Not Detected
1,1,2-Trichloroethane	1.2	Not Detected	6.4	Not Detected
Tetrachloroethene	1.2	7.9	8.0	54

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	90	70-130
1,2-Dichloroethane-d4	109	70-130
4-Bromofluorobenzene	97	70-130



Air Toxics

Client Sample ID: Lab Blank

Lab ID#: 1206667-21A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	p070307	Date of Collection:	NA
Dil. Factor:	1.00	Date of Analysis:	7/3/12 11:21 AM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
trans-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
1,1,2-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	94	70-130
1,2-Dichloroethane-d4	96	70-130
4-Bromofluorobenzene	94	70-130



Client Sample ID: Lab Blank

Lab ID#: 1206667-21B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	p070506	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 7/5/12 10:17 AM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
trans-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
1,1,2-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	96	70-130
1,2-Dichloroethane-d4	105	70-130
4-Bromofluorobenzene	94	70-130

Client Sample ID: CCV

Lab ID#: 1206667-22A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	p070302	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 7/3/12 08:26 AM

Compound	%Recovery
Vinyl Chloride	100
trans-1,2-Dichloroethene	105
cis-1,2-Dichloroethene	92
Trichloroethene	98
1,1,2-Trichloroethane	103
Tetrachloroethene	106

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130
1,2-Dichloroethane-d4	104	70-130
4-Bromofluorobenzene	105	70-130

Client Sample ID: CCV

Lab ID#: 1206667-22B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	p070502	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 7/5/12 08:21 AM

Compound	%Recovery
Vinyl Chloride	101
trans-1,2-Dichloroethene	111
cis-1,2-Dichloroethene	96
Trichloroethene	102
1,1,2-Trichloroethane	107
Tetrachloroethene	107

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130
1,2-Dichloroethane-d4	112	70-130
4-Bromofluorobenzene	102	70-130

Client Sample ID: LCS

Lab ID#: 1206667-23A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	p070303	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 7/3/12 09:00 AM

Compound	%Recovery
Vinyl Chloride	105
trans-1,2-Dichloroethene	120
cis-1,2-Dichloroethene	94
Trichloroethene	99
1,1,2-Trichloroethane	105
Tetrachloroethene	102

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	99	70-130
4-Bromofluorobenzene	103	70-130

Client Sample ID: LCSD

Lab ID#: 1206667-23AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	p070304	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 7/3/12 09:19 AM

Compound	%Recovery
Vinyl Chloride	101
trans-1,2-Dichloroethene	116
cis-1,2-Dichloroethene	90
Trichloroethene	95
1,1,2-Trichloroethane	103
Tetrachloroethene	99

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	99	70-130
1,2-Dichloroethane-d4	98	70-130
4-Bromofluorobenzene	100	70-130

Client Sample ID: LCS

Lab ID#: 1206667-23B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	p070503	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 7/5/12 09:00 AM

Compound	%Recovery
Vinyl Chloride	104
trans-1,2-Dichloroethene	122
cis-1,2-Dichloroethene	92
Trichloroethene	97
1,1,2-Trichloroethane	109
Tetrachloroethene	107

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	104	70-130
4-Bromofluorobenzene	105	70-130

Client Sample ID: LCSD

Lab ID#: 1206667-23BB

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	p070504	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 7/5/12 09:19 AM

Compound	%Recovery
Vinyl Chloride	105
trans-1,2-Dichloroethene	117
cis-1,2-Dichloroethene	96
Trichloroethene	99
1,1,2-Trichloroethane	104
Tetrachloroethene	103

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130
1,2-Dichloroethane-d4	101	70-130
4-Bromofluorobenzene	100	70-130

7/15/2012

Ms. Lisa Jacob
Sanborn, Head & Associates
1 Technology Park Drive

Westford MA 01886

Project Name: Supplemental VI Assessment

Project #: 2732.08

Workorder #: 1206668

Dear Ms. Lisa Jacob

The following report includes the data for the above referenced project for sample(s) received on 6/29/2012 at Air Toxics Ltd.

The data and associated QC analyzed by Modified TO-15 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Air Toxics Ltd. for your air analysis needs. Air Toxics Ltd. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Ausha Scott at 916-985-1000 if you have any questions regarding the data in this report.

Regards,



Ausha Scott
Project Manager

WORK ORDER #: 1206668

Work Order Summary

CLIENT: Ms. Lisa Jacob
 Sanborn, Head & Associates
 1 Technology Park Drive
 Westford, MA 01886

BILL TO: Accounts Payable
 Sanborn, Head & Associates
 20 Foundry Street
 Concord, NH 03301

PHONE: 978-392-0900

P.O. # 2732.00

FAX:

PROJECT # 2732.08 Supplemental VI Assessment

DATE RECEIVED: 06/29/2012

CONTACT: Ausha Scott

DATE COMPLETED: 07/15/2012

<u>FRACTION #</u>	<u>NAME</u>	<u>TEST</u>	<u>RECEIPT VAC./PRES.</u>	<u>FINAL PRESSURE</u>
01A	DUP2	Modified TO-15	5.5 "Hg	5 psi
02A	DUP3	Modified TO-15	6.5 "Hg	5 psi
03A	EB1	Modified TO-15	7.0 "Hg	5 psi
04A	SG101	Modified TO-15	4.5 "Hg	5 psi
05A	SG103	Modified TO-15	6.5 "Hg	5 psi
06A	SG105	Modified TO-15	7.0 "Hg	5 psi
07A	SG106S	Modified TO-15	0.5 "Hg	5 psi
08A	SG108D	Modified TO-15	6.5 "Hg	5 psi
08AA	SG108D Lab Duplicate	Modified TO-15	6.5 "Hg	5 psi
09A	SG108S	Modified TO-15	7.5 "Hg	5 psi
10A	SG109	Modified TO-15	6.5 "Hg	5 psi
11A	SG111I	Modified TO-15	6.0 "Hg	5 psi
12A	SG111S	Modified TO-15	6.5 "Hg	5 psi
13A	SG113D	Modified TO-15	5.5 "Hg	5 psi
14A	Lab Blank	Modified TO-15	NA	NA
15A	CCV	Modified TO-15	NA	NA
16A	LCS	Modified TO-15	NA	NA
16AA	LCSD	Modified TO-15	NA	NA

CERTIFIED BY: 

DATE: 07/15/12

Technical Director

Certification numbers: AZ Licensure AZ0719, CA NELAP - 02110CA, LA NELAP - 02089,
 NY NELAP - 11291, TX NELAP - T104704434-11-3, UT NELAP -CA009332011-1, WA NELAP - C935
 Name of Accrediting Agency: NELAP/Florida Department of Health, Scope of Application: Clean Air Act,
 Accreditation number: E87680, Effective date: 07/01/11 , Expiration date: 06/30/12.

Air Toxics Ltd. certifies that the test results contained in this report meet all requirements of the NELAC standards

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180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
 (916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
EPA Method TO-15
Sanborn, Head & Associates
Workorder# 1206668

Thirteen 1 Liter Summa Canister (100% Certified) samples were received on June 29, 2012. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan mode.

This workorder was independently validated prior to submittal using 'USEPA National Functional Guidelines' as generally applied to the analysis of volatile organic compounds in air. A rules-based, logic driven, independent validation engine was employed to assess completeness, evaluate pass/fail of relevant project quality control requirements and verification of all quantified amounts.

Receiving Notes

The canister valve on sample SG106S was received open and a brass plug was used to seal the canister. The reported analyte concentrations are considered to be estimated.

Analytical Notes

Dilution was performed on samples SG106S and SG108D due to the presence of high level target species.

Definition of Data Qualifying Flags

Eight qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit.

UJ- Non-detected compound associated with low bias in the CCV and/or LCS.

N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

Summary of Detected Compounds

EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: DUP2

Lab ID#: 1206668-01A

No Detections Were Found.

Client Sample ID: DUP3

Lab ID#: 1206668-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	0.86	3.2	4.6	17
Tetrachloroethene	0.86	27	5.8	190

Client Sample ID: EB1

Lab ID#: 1206668-03A

No Detections Were Found.

Client Sample ID: SG101

Lab ID#: 1206668-04A

No Detections Were Found.

Client Sample ID: SG103

Lab ID#: 1206668-05A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	0.86	2.1	5.8	14

Client Sample ID: SG105

Lab ID#: 1206668-06A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	0.88	1.2	4.7	6.4
Tetrachloroethene	0.88	8.2	5.9	56

Client Sample ID: SG106S

Lab ID#: 1206668-07A

Summary of Detected Compounds EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: SG106S

Lab ID#: 1206668-07A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	1.5	450	10	3100

Client Sample ID: SG108D

Lab ID#: 1206668-08A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	170	30000	1200	200000

Client Sample ID: SG108D Lab Duplicate

Lab ID#: 1206668-08AA

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	170	31000	1200	210000

Client Sample ID: SG108S

Lab ID#: 1206668-09A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	0.90	14	6.1	95

Client Sample ID: SG109

Lab ID#: 1206668-10A

No Detections Were Found.

Client Sample ID: SG111I

Lab ID#: 1206668-11A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	0.84	1.4	5.7	9.3

Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: SG111S

Lab ID#: 1206668-12A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	0.86	3.3	4.6	18
Tetrachloroethene	0.86	30	5.8	200

Client Sample ID: SG113D

Lab ID#: 1206668-13A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	0.82	91	5.6	620



Air Toxics

Client Sample ID: DUP2

Lab ID#: 1206668-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	o070609	Date of Collection:	6/26/12 11:56:00 AM
Dil. Factor:	1.64	Date of Analysis:	7/6/12 02:21 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.82	Not Detected	2.1	Not Detected
trans-1,2-Dichloroethene	0.82	Not Detected	3.2	Not Detected
cis-1,2-Dichloroethene	0.82	Not Detected	3.2	Not Detected
Trichloroethene	0.82	Not Detected	4.4	Not Detected
1,1,2-Trichloroethane	0.82	Not Detected	4.5	Not Detected
Tetrachloroethene	0.82	Not Detected	5.6	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	96	70-130
1,2-Dichloroethane-d4	90	70-130
4-Bromofluorobenzene	83	70-130



Air Toxics

Client Sample ID: DUP3

Lab ID#: 1206668-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	o070610	Date of Collection:	6/26/12 1:46:00 PM
Dil. Factor:	1.71	Date of Analysis:	7/6/12 02:58 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.86	Not Detected	2.2	Not Detected
trans-1,2-Dichloroethene	0.86	Not Detected	3.4	Not Detected
cis-1,2-Dichloroethene	0.86	Not Detected	3.4	Not Detected
Trichloroethene	0.86	3.2	4.6	17
1,1,2-Trichloroethane	0.86	Not Detected	4.7	Not Detected
Tetrachloroethene	0.86	27	5.8	190

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	87	70-130
1,2-Dichloroethane-d4	94	70-130
4-Bromofluorobenzene	100	70-130



Air Toxics

Client Sample ID: EB1

Lab ID#: 1206668-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	o070611	Date of Collection:	6/25/12 2:11:00 PM
Dil. Factor:	1.75	Date of Analysis:	7/6/12 03:36 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.88	Not Detected	2.2	Not Detected
trans-1,2-Dichloroethene	0.88	Not Detected	3.5	Not Detected
cis-1,2-Dichloroethene	0.88	Not Detected	3.5	Not Detected
Trichloroethene	0.88	Not Detected	4.7	Not Detected
1,1,2-Trichloroethane	0.88	Not Detected	4.8	Not Detected
Tetrachloroethene	0.88	Not Detected	5.9	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	87	70-130
1,2-Dichloroethane-d4	93	70-130
4-Bromofluorobenzene	102	70-130



Air Toxics

Client Sample ID: SG101

Lab ID#: 1206668-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	o070612	Date of Collection:	6/26/12 11:56:00 AM
Dil. Factor:	1.58	Date of Analysis:	7/6/12 04:12 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.79	Not Detected	2.0	Not Detected
trans-1,2-Dichloroethene	0.79	Not Detected	3.1	Not Detected
cis-1,2-Dichloroethene	0.79	Not Detected	3.1	Not Detected
Trichloroethene	0.79	Not Detected	4.2	Not Detected
1,1,2-Trichloroethane	0.79	Not Detected	4.3	Not Detected
Tetrachloroethene	0.79	Not Detected	5.4	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	86	70-130
1,2-Dichloroethane-d4	93	70-130
4-Bromofluorobenzene	101	70-130



Air Toxics

Client Sample ID: SG103

Lab ID#: 1206668-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	o070613	Date of Collection:	6/26/12 12:07:00 PM
Dil. Factor:	1.71	Date of Analysis:	7/6/12 04:49 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.86	Not Detected	2.2	Not Detected
trans-1,2-Dichloroethene	0.86	Not Detected	3.4	Not Detected
cis-1,2-Dichloroethene	0.86	Not Detected	3.4	Not Detected
Trichloroethene	0.86	Not Detected	4.6	Not Detected
1,1,2-Trichloroethane	0.86	Not Detected	4.7	Not Detected
Tetrachloroethene	0.86	2.1	5.8	14

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	92	70-130
1,2-Dichloroethane-d4	99	70-130
4-Bromofluorobenzene	101	70-130



Air Toxics

Client Sample ID: SG105

Lab ID#: 1206668-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	o070614	Date of Collection:	6/27/12 11:28:00 AM
Dil. Factor:	1.75	Date of Analysis:	7/6/12 05:26 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.88	Not Detected	2.2	Not Detected
trans-1,2-Dichloroethene	0.88	Not Detected	3.5	Not Detected
cis-1,2-Dichloroethene	0.88	Not Detected	3.5	Not Detected
Trichloroethene	0.88	1.2	4.7	6.4
1,1,2-Trichloroethane	0.88	Not Detected	4.8	Not Detected
Tetrachloroethene	0.88	8.2	5.9	56

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	90	70-130
1,2-Dichloroethane-d4	93	70-130
4-Bromofluorobenzene	99	70-130



Client Sample ID: SG106S

Lab ID#: 1206668-07A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	o070617	Date of Collection:	6/27/12 11:28:00 AM
Dil. Factor:	2.96	Date of Analysis:	7/6/12 07:17 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.5	Not Detected	3.8	Not Detected
trans-1,2-Dichloroethene	1.5	Not Detected	5.9	Not Detected
cis-1,2-Dichloroethene	1.5	Not Detected	5.9	Not Detected
Trichloroethene	1.5	Not Detected	8.0	Not Detected
1,1,2-Trichloroethane	1.5	Not Detected	8.1	Not Detected
Tetrachloroethene	1.5	450	10	3100

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	92	70-130
1,2-Dichloroethane-d4	96	70-130
4-Bromofluorobenzene	100	70-130



Air Toxics

Client Sample ID: SG108D

Lab ID#: 1206668-08A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	o070618	Date of Collection:	6/26/12 4:47:00 PM
Dil. Factor:	342	Date of Analysis:	7/6/12 07:54 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	170	Not Detected	440	Not Detected
trans-1,2-Dichloroethene	170	Not Detected	680	Not Detected
cis-1,2-Dichloroethene	170	Not Detected	680	Not Detected
Trichloroethene	170	Not Detected	920	Not Detected
1,1,2-Trichloroethane	170	Not Detected	930	Not Detected
Tetrachloroethene	170	30000	1200	200000

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	90	70-130
1,2-Dichloroethane-d4	98	70-130
4-Bromofluorobenzene	100	70-130



Air Toxics

Client Sample ID: SG108D Lab Duplicate
Lab ID#: 1206668-08AA
EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	o070619	Date of Collection:	6/26/12 4:47:00 PM
Dil. Factor:	342	Date of Analysis:	7/6/12 08:31 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	170	Not Detected	440	Not Detected
trans-1,2-Dichloroethene	170	Not Detected	680	Not Detected
cis-1,2-Dichloroethene	170	Not Detected	680	Not Detected
Trichloroethene	170	Not Detected	920	Not Detected
1,1,2-Trichloroethane	170	Not Detected	930	Not Detected
Tetrachloroethene	170	31000	1200	210000

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	91	70-130
1,2-Dichloroethane-d4	95	70-130
4-Bromofluorobenzene	99	70-130



Air Toxics

Client Sample ID: SG108S

Lab ID#: 1206668-09A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	o070615	Date of Collection:	6/26/12 4:42:00 PM	
Dil. Factor:	1.79	Date of Analysis:	7/6/12 06:03 PM	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.90	Not Detected	2.3	Not Detected
trans-1,2-Dichloroethene	0.90	Not Detected	3.5	Not Detected
cis-1,2-Dichloroethene	0.90	Not Detected	3.5	Not Detected
Trichloroethene	0.90	Not Detected	4.8	Not Detected
1,1,2-Trichloroethane	0.90	Not Detected	4.9	Not Detected
Tetrachloroethene	0.90	14	6.1	95

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	91	70-130
1,2-Dichloroethane-d4	97	70-130
4-Bromofluorobenzene	101	70-130



Air Toxics

Client Sample ID: SG109

Lab ID#: 1206668-10A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	o070616	Date of Collection: 6/26/12 3:11:00 PM
Dil. Factor:	1.71	Date of Analysis: 7/6/12 06:40 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.86	Not Detected	2.2	Not Detected
trans-1,2-Dichloroethene	0.86	Not Detected	3.4	Not Detected
cis-1,2-Dichloroethene	0.86	Not Detected	3.4	Not Detected
Trichloroethene	0.86	Not Detected	4.6	Not Detected
1,1,2-Trichloroethane	0.86	Not Detected	4.7	Not Detected
Tetrachloroethene	0.86	Not Detected	5.8	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	87	70-130
1,2-Dichloroethane-d4	93	70-130
4-Bromofluorobenzene	102	70-130



Client Sample ID: SG111I

Lab ID#: 1206668-11A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	o070620	Date of Collection:	6/26/12 12:18:00 PM	
Dil. Factor:	1.68	Date of Analysis:	7/6/12 09:07 PM	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.84	Not Detected	2.1	Not Detected
trans-1,2-Dichloroethene	0.84	Not Detected	3.3	Not Detected
cis-1,2-Dichloroethene	0.84	Not Detected	3.3	Not Detected
Trichloroethene	0.84	Not Detected	4.5	Not Detected
1,1,2-Trichloroethane	0.84	Not Detected	4.6	Not Detected
Tetrachloroethene	0.84	1.4	5.7	9.3

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	87	70-130
1,2-Dichloroethane-d4	94	70-130
4-Bromofluorobenzene	99	70-130



Air Toxics

Client Sample ID: SG111S

Lab ID#: 1206668-12A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	o070621	Date of Collection:	6/26/12 1:46:00 PM
Dil. Factor:	1.71	Date of Analysis:	7/6/12 09:45 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.86	Not Detected	2.2	Not Detected
trans-1,2-Dichloroethene	0.86	Not Detected	3.4	Not Detected
cis-1,2-Dichloroethene	0.86	Not Detected	3.4	Not Detected
Trichloroethene	0.86	3.3	4.6	18
1,1,2-Trichloroethane	0.86	Not Detected	4.7	Not Detected
Tetrachloroethene	0.86	30	5.8	200

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	91	70-130
1,2-Dichloroethane-d4	98	70-130
4-Bromofluorobenzene	96	70-130



Air Toxics

Client Sample ID: SG113D

Lab ID#: 1206668-13A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	o070622	Date of Collection:	6/26/12 2:30:00 PM
Dil. Factor:	1.64	Date of Analysis:	7/6/12 10:21 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.82	Not Detected	2.1	Not Detected
trans-1,2-Dichloroethene	0.82	Not Detected	3.2	Not Detected
cis-1,2-Dichloroethene	0.82	Not Detected	3.2	Not Detected
Trichloroethene	0.82	Not Detected	4.4	Not Detected
1,1,2-Trichloroethane	0.82	Not Detected	4.5	Not Detected
Tetrachloroethene	0.82	91	5.6	620

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	88	70-130
1,2-Dichloroethane-d4	92	70-130
4-Bromofluorobenzene	98	70-130

Client Sample ID: Lab Blank

Lab ID#: 1206668-14A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	o070606	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 7/6/12 12:13 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
trans-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
1,1,2-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130
1,2-Dichloroethane-d4	97	70-130
4-Bromofluorobenzene	97	70-130

Client Sample ID: CCV

Lab ID#: 1206668-15A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	o070602	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 7/6/12 09:20 AM

Compound	%Recovery
Vinyl Chloride	98
trans-1,2-Dichloroethene	98
cis-1,2-Dichloroethene	100
Trichloroethene	92
1,1,2-Trichloroethane	102
Tetrachloroethene	103

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	87	70-130
1,2-Dichloroethane-d4	81	70-130
4-Bromofluorobenzene	95	70-130

Client Sample ID: LCS

Lab ID#: 1206668-16A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	o070603	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 7/6/12 10:23 AM

Compound	%Recovery
Vinyl Chloride	103
trans-1,2-Dichloroethene	111
cis-1,2-Dichloroethene	102
Trichloroethene	95
1,1,2-Trichloroethane	101
Tetrachloroethene	101

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	88	70-130
1,2-Dichloroethane-d4	78	70-130
4-Bromofluorobenzene	99	70-130

Client Sample ID: LCSD

Lab ID#: 1206668-16AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	o070604	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 7/6/12 11:00 AM

Compound	%Recovery
Vinyl Chloride	94
trans-1,2-Dichloroethene	108
cis-1,2-Dichloroethene	102
Trichloroethene	97
1,1,2-Trichloroethane	106
Tetrachloroethene	104

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	89	70-130
1,2-Dichloroethane-d4	80	70-130
4-Bromofluorobenzene	100	70-130

ANALYTICAL RESULTS

Prepared by:

Lancaster Laboratories
2425 New Holland Pike
Lancaster, PA 17605-2425

Prepared for:

IBM c/o Sanborn Head and Assoc
1715 W. 13th Street
Houston TX 77008

July 03, 2012

Project: Supplemental VI Assessment

Submittal Date: 06/20/2012

Group Number: 1317054

SDG: MAN25

PO Number: 2732.05

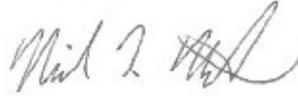
State of Sample Origin: VA

<u>Client Sample Description</u>	<u>Lancaster Labs (LLI) #</u>
DUP1 Ground Water	6694166
EB1 Water	6694167
FB1 Water	6694168
OF54 Ground Water	6694169
OF55 Ground Water	6694170
SG102I Ground Water	6694171
SG106D Ground Water	6694172
SG106I Ground Water	6694173
SG108I Ground Water	6694174
SG111D Ground Water	6694175
SG111I Ground Water	6694176
SG113D Ground Water	6694177
SG113I Ground Water	6694178
TB1 Water	6694179

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

ELECTRONIC COPY TO	Sanborn Head and Assoc	Attn: Erica Bradstreet
1 COPY TO	Data Package Group	
ELECTRONIC COPY TO	IBM c/o Sanborn Head & Assoc.	Attn: Lisa Jacob

Respectfully Submitted,



Nicole L. Maljovec
Senior Specialist Group Leader

(717) 556-7259

Sample Description: DUP1 Ground Water
2732.05

LLI Sample # WW 6694166
LLI Group # 1317054
Account # 09671

Project Name: Supplemental VI Assessment

Collected: 06/18/2012 15:50

IBM c/o Sanborn Head and Assoc

Submitted: 06/20/2012 09:20

1715 W. 13th Street

Reported: 07/03/2012 19:12

Houston TX 77008

2732D SDG#: MAN25-01FD

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
		purge				
02898	Benzene	71-43-2	25 U	25	5.0	50
02898	Bromobenzene	108-86-1	25 U	25	5.0	50
02898	Bromochloromethane	74-97-5	25 U	25	5.0	50
02898	Bromodichloromethane	75-27-4	25 U	25	5.0	50
02898	Bromoform	75-25-2	25 U	25	5.0	50
02898	Bromomethane	74-83-9	25 U	25	5.0	50
02898	n-Butylbenzene	104-51-8	25 U	25	5.0	50
02898	sec-Butylbenzene	135-98-8	25 U	25	5.0	50
02898	tert-Butylbenzene	98-06-6	25 U	25	5.0	50
02898	Carbon Tetrachloride	56-23-5	25 U	25	5.0	50
02898	Chlorobenzene	108-90-7	25 U	25	5.0	50
02898	Chloroethane	75-00-3	25 U	25	5.0	50
02898	Chloroform	67-66-3	25 U	25	5.0	50
02898	Chloromethane	74-87-3	25 U	25	10	50
02898	2-Chlorotoluene	95-49-8	25 U	25	5.0	50
02898	4-Chlorotoluene	106-43-4	25 U	25	5.0	50
02898	1,2-Dibromo-3-chloropropane	96-12-8	25 U	25	10	50
02898	Dibromochloromethane	124-48-1	25 U	25	5.0	50
02898	1,2-Dibromoethane	106-93-4	25 U	25	5.0	50
02898	Dibromomethane	74-95-3	25 U	25	5.0	50
02898	1,2-Dichlorobenzene	95-50-1	25 U	25	5.0	50
02898	1,3-Dichlorobenzene	541-73-1	25 U	25	5.0	50
02898	1,4-Dichlorobenzene	106-46-7	25 U	25	5.0	50
02898	Dichlorodifluoromethane	75-71-8	25 U	25	5.0	50
02898	1,1-Dichloroethane	75-34-3	25 U	25	5.0	50
02898	1,2-Dichloroethane	107-06-2	25 U	25	5.0	50
02898	1,1-Dichloroethene	75-35-4	25 U	25	5.0	50
02898	cis-1,2-Dichloroethene	156-59-2	19 J	25	5.0	50
02898	trans-1,2-Dichloroethene	156-60-5	25 U	25	5.0	50
02898	1,2-Dichloropropane	78-87-5	25 U	25	5.0	50
02898	1,3-Dichloropropane	142-28-9	25 U	25	5.0	50
02898	2,2-Dichloropropane	594-20-7	25 U	25	5.0	50
02898	1,1-Dichloropropene	563-58-6	25 U	25	5.0	50
02898	cis-1,3-Dichloropropene	10061-01-5	25 U	25	5.0	50
02898	trans-1,3-Dichloropropene	10061-02-6	25 U	25	5.0	50
02898	Ethylbenzene	100-41-4	25 U	25	5.0	50
02898	Freon 113	76-13-1	25 U	25	10	50
02898	Hexachlorobutadiene	87-68-3	25 U	25	5.0	50
02898	Isopropylbenzene	98-82-8	25 U	25	5.0	50
02898	p-Isopropyltoluene	99-87-6	25 U	25	5.0	50
02898	Methylene Chloride	75-09-2	25 U	25	10	50
02898	Naphthalene	91-20-3	25 U	25	5.0	50
02898	n-Propylbenzene	103-65-1	25 U	25	5.0	50
02898	Styrene	100-42-5	25 U	25	5.0	50
02898	1,1,1,2-Tetrachloroethane	630-20-6	25 U	25	5.0	50
02898	1,1,2,2-Tetrachloroethane	79-34-5	25 U	25	5.0	50
02898	Tetrachloroethene	127-18-4	1,500	100	20	200
02898	Tetrahydrofuran	109-99-9	250 U	250	100	50
02898	Toluene	108-88-3	25 U	25	5.0	50
02898	1,2,3-Trichlorobenzene	87-61-6	25 U	25	5.0	50

*=This limit was used in the evaluation of the final result

Sample Description: DUP1 Ground Water
2732.05

LLI Sample # WW 6694166
LLI Group # 1317054
Account # 09671

Project Name: Supplemental VI Assessment

Collected: 06/18/2012 15:50
Submitted: 06/20/2012 09:20
Reported: 07/03/2012 19:12

IBM c/o Sanborn Head and Assoc
1715 W. 13th Street
Houston TX 77008

2732D SDG#: MAN25-01FD

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
		purge				
02898	1,2,4-Trichlorobenzene	120-82-1	25 U	25	5.0	50
02898	1,1,1-Trichloroethane	71-55-6	25 U	25	5.0	50
02898	1,1,2-Trichloroethane	79-00-5	25 U	25	5.0	50
02898	Trichloroethene	79-01-6	6.3 J	25	5.0	50
02898	Trichlorofluoromethane	75-69-4	25 U	25	5.0	50
02898	1,2,3-Trichloropropane	96-18-4	50 U	50	15	50
02898	1,2,4-Trimethylbenzene	95-63-6	25 U	25	5.0	50
02898	1,3,5-Trimethylbenzene	108-67-8	25 U	25	5.0	50
02898	Vinyl Chloride	75-01-4	25 U	25	5.0	50
02898	Xylene (Total)	1330-20-7	25 U	25	5.0	50

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary.

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02898	Former 8021 Manassas, VA VOCs	SW-846 8260B 25mL purge	1	C121781AA	06/26/2012 18:05	Kerri E Legerlotz	50
02898	Former 8021 Manassas, VA VOCs	SW-846 8260B 25mL purge	1	C121812AA	06/29/2012 23:13	Kevin A Sposito	200
01163	GC/MS VOA Water Prep	SW-846 5030B	1	C121781AA	06/26/2012 18:05	Kerri E Legerlotz	50
01163	GC/MS VOA Water Prep	SW-846 5030B	2	C121812AA	06/29/2012 23:13	Kevin A Sposito	200

Sample Description: **EB1 Water**
2732.05

LLI Sample # **WW 6694167**
LLI Group # **1317054**
Account # **09671**

Project Name: **Supplemental VI Assessment**

Collected: 06/18/2012 17:30
Submitted: 06/20/2012 09:20
Reported: 07/03/2012 19:12

IBM c/o Sanborn Head and Assoc
1715 W. 13th Street
Houston TX 77008

2732E SDG#: MAN25-02EB

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
		purge				
02898	Benzene	71-43-2	0.5 U	0.5	0.1	1
02898	Bromobenzene	108-86-1	0.5 U	0.5	0.1	1
02898	Bromochloromethane	74-97-5	0.5 U	0.5	0.1	1
02898	Bromodichloromethane	75-27-4	0.5 U	0.5	0.1	1
02898	Bromoform	75-25-2	0.5 U	0.5	0.1	1
02898	Bromomethane	74-83-9	0.5 U	0.5	0.1	1
02898	n-Butylbenzene	104-51-8	0.5 U	0.5	0.1	1
02898	sec-Butylbenzene	135-98-8	0.5 U	0.5	0.1	1
02898	tert-Butylbenzene	98-06-6	0.5 U	0.5	0.1	1
02898	Carbon Tetrachloride	56-23-5	0.5 U	0.5	0.1	1
02898	Chlorobenzene	108-90-7	0.5 U	0.5	0.1	1
02898	Chloroethane	75-00-3	0.5 U	0.5	0.1	1
02898	Chloroform	67-66-3	0.5 U	0.5	0.1	1
02898	Chloromethane	74-87-3	0.5 U	0.5	0.2	1
02898	2-Chlorotoluene	95-49-8	0.5 U	0.5	0.1	1
02898	4-Chlorotoluene	106-43-4	0.5 U	0.5	0.1	1
02898	1,2-Dibromo-3-chloropropane	96-12-8	0.5 U	0.5	0.2	1
02898	Dibromochloromethane	124-48-1	0.5 U	0.5	0.1	1
02898	1,2-Dibromoethane	106-93-4	0.5 U	0.5	0.1	1
02898	Dibromomethane	74-95-3	0.5 U	0.5	0.1	1
02898	1,2-Dichlorobenzene	95-50-1	0.5 U	0.5	0.1	1
02898	1,3-Dichlorobenzene	541-73-1	0.5 U	0.5	0.1	1
02898	1,4-Dichlorobenzene	106-46-7	0.5 U	0.5	0.1	1
02898	Dichlorodifluoromethane	75-71-8	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethane	75-34-3	0.5 U	0.5	0.1	1
02898	1,2-Dichloroethane	107-06-2	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethene	75-35-4	0.5 U	0.5	0.1	1
02898	cis-1,2-Dichloroethene	156-59-2	0.5 U	0.5	0.1	1
02898	trans-1,2-Dichloroethene	156-60-5	0.5 U	0.5	0.1	1
02898	1,2-Dichloropropane	78-87-5	0.5 U	0.5	0.1	1
02898	1,3-Dichloropropane	142-28-9	0.5 U	0.5	0.1	1
02898	2,2-Dichloropropane	594-20-7	0.5 U	0.5	0.1	1
02898	1,1-Dichloropropene	563-58-6	0.5 U	0.5	0.1	1
02898	cis-1,3-Dichloropropene	10061-01-5	0.5 U	0.5	0.1	1
02898	trans-1,3-Dichloropropene	10061-02-6	0.5 U	0.5	0.1	1
02898	Ethylbenzene	100-41-4	0.5 U	0.5	0.1	1
02898	Freon 113	76-13-1	0.5 U	0.5	0.2	1
02898	Hexachlorobutadiene	87-68-3	0.5 U	0.5	0.1	1
02898	Isopropylbenzene	98-82-8	0.5 U	0.5	0.1	1
02898	p-Isopropyltoluene	99-87-6	0.5 U	0.5	0.1	1
02898	Methylene Chloride	75-09-2	0.2 J	0.5	0.2	1
02898	Naphthalene	91-20-3	0.5 J	0.5	0.1	1
02898	n-Propylbenzene	103-65-1	0.5 U	0.5	0.1	1
02898	Styrene	100-42-5	0.5 U	0.5	0.1	1
02898	1,1,1,2-Tetrachloroethane	630-20-6	0.5 U	0.5	0.1	1
02898	1,1,2,2-Tetrachloroethane	79-34-5	0.5 U	0.5	0.1	1
02898	Tetrachloroethene	127-18-4	0.1 J	0.5	0.1	1
02898	Tetrahydrofuran	109-99-9	5.0 U	5.0	2.0	1
02898	Toluene	108-88-3	0.5 U	0.5	0.1	1
02898	1,2,3-Trichlorobenzene	87-61-6	0.5 U	0.5	0.1	1

*=This limit was used in the evaluation of the final result

Sample Description: **EB1 Water**
2732.05

LLI Sample # **WW 6694167**
LLI Group # **1317054**
Account # **09671**

Project Name: **Supplemental VI Assessment**

Collected: 06/18/2012 17:30

IBM c/o Sanborn Head and Assoc

Submitted: 06/20/2012 09:20

1715 W. 13th Street

Reported: 07/03/2012 19:12

Houston TX 77008

2732E SDG#: MAN25-02EB

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
		purge				
02898	1,2,4-Trichlorobenzene	120-82-1	0.5 U	0.5	0.1	1
02898	1,1,1-Trichloroethane	71-55-6	0.5 U	0.5	0.1	1
02898	1,1,2-Trichloroethane	79-00-5	0.5 U	0.5	0.1	1
02898	Trichloroethene	79-01-6	0.5 U	0.5	0.1	1
02898	Trichlorofluoromethane	75-69-4	0.5 U	0.5	0.1	1
02898	1,2,3-Trichloropropane	96-18-4	1.0 U	1.0	0.3	1
02898	1,2,4-Trimethylbenzene	95-63-6	0.5 U	0.5	0.1	1
02898	1,3,5-Trimethylbenzene	108-67-8	0.5 U	0.5	0.1	1
02898	Vinyl Chloride	75-01-4	0.5 U	0.5	0.1	1
02898	Xylene (Total)	1330-20-7	0.5 U	0.5	0.1	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02898	Former 8021 Manassas, VA VOCs	SW-846 8260B 25mL	1	C121812AA	06/29/2012 23:35	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	C121812AA	06/29/2012 23:35	Kevin A Sposito	1

Sample Description: **FB1 Water**
2732.05

LLI Sample # **WW 6694168**
LLI Group # **1317054**
Account # **09671**

Project Name: **Supplemental VI Assessment**

Collected: 06/18/2012 17:35

IBM c/o Sanborn Head and Assoc

Submitted: 06/20/2012 09:20

1715 W. 13th Street

Reported: 07/03/2012 19:12

Houston TX 77008

2732F SDG#: MAN25-03FB

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
		purge				
02898	Benzene	71-43-2	0.5 U	0.5	0.1	1
02898	Bromobenzene	108-86-1	0.5 U	0.5	0.1	1
02898	Bromochloromethane	74-97-5	0.5 U	0.5	0.1	1
02898	Bromodichloromethane	75-27-4	0.5 U	0.5	0.1	1
02898	Bromoform	75-25-2	0.5 U	0.5	0.1	1
02898	Bromomethane	74-83-9	0.5 U	0.5	0.1	1
02898	n-Butylbenzene	104-51-8	0.5 U	0.5	0.1	1
02898	sec-Butylbenzene	135-98-8	0.5 U	0.5	0.1	1
02898	tert-Butylbenzene	98-06-6	0.5 U	0.5	0.1	1
02898	Carbon Tetrachloride	56-23-5	0.5 U	0.5	0.1	1
02898	Chlorobenzene	108-90-7	0.5 U	0.5	0.1	1
02898	Chloroethane	75-00-3	0.5 U	0.5	0.1	1
02898	Chloroform	67-66-3	0.5 U	0.5	0.1	1
02898	Chloromethane	74-87-3	0.5 U	0.5	0.2	1
02898	2-Chlorotoluene	95-49-8	0.5 U	0.5	0.1	1
02898	4-Chlorotoluene	106-43-4	0.5 U	0.5	0.1	1
02898	1,2-Dibromo-3-chloropropane	96-12-8	0.5 U	0.5	0.2	1
02898	Dibromochloromethane	124-48-1	0.5 U	0.5	0.1	1
02898	1,2-Dibromoethane	106-93-4	0.5 U	0.5	0.1	1
02898	Dibromomethane	74-95-3	0.5 U	0.5	0.1	1
02898	1,2-Dichlorobenzene	95-50-1	0.5 U	0.5	0.1	1
02898	1,3-Dichlorobenzene	541-73-1	0.5 U	0.5	0.1	1
02898	1,4-Dichlorobenzene	106-46-7	0.5 U	0.5	0.1	1
02898	Dichlorodifluoromethane	75-71-8	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethane	75-34-3	0.5 U	0.5	0.1	1
02898	1,2-Dichloroethane	107-06-2	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethene	75-35-4	0.5 U	0.5	0.1	1
02898	cis-1,2-Dichloroethene	156-59-2	0.5 U	0.5	0.1	1
02898	trans-1,2-Dichloroethene	156-60-5	0.5 U	0.5	0.1	1
02898	1,2-Dichloropropane	78-87-5	0.5 U	0.5	0.1	1
02898	1,3-Dichloropropane	142-28-9	0.5 U	0.5	0.1	1
02898	2,2-Dichloropropane	594-20-7	0.5 U	0.5	0.1	1
02898	1,1-Dichloropropene	563-58-6	0.5 U	0.5	0.1	1
02898	cis-1,3-Dichloropropene	10061-01-5	0.5 U	0.5	0.1	1
02898	trans-1,3-Dichloropropene	10061-02-6	0.5 U	0.5	0.1	1
02898	Ethylbenzene	100-41-4	0.5 U	0.5	0.1	1
02898	Freon 113	76-13-1	0.5 U	0.5	0.2	1
02898	Hexachlorobutadiene	87-68-3	0.5 U	0.5	0.1	1
02898	Isopropylbenzene	98-82-8	0.5 U	0.5	0.1	1
02898	p-Isopropyltoluene	99-87-6	0.5 U	0.5	0.1	1
02898	Methylene Chloride	75-09-2	0.5 U	0.5	0.2	1
02898	Naphthalene	91-20-3	0.5 U	0.5	0.1	1
02898	n-Propylbenzene	103-65-1	0.5 U	0.5	0.1	1
02898	Styrene	100-42-5	0.5 U	0.5	0.1	1
02898	1,1,1,2-Tetrachloroethane	630-20-6	0.5 U	0.5	0.1	1
02898	1,1,2,2-Tetrachloroethane	79-34-5	0.5 U	0.5	0.1	1
02898	Tetrachloroethene	127-18-4	0.5 U	0.5	0.1	1
02898	Tetrahydrofuran	109-99-9	5.0 U	5.0	2.0	1
02898	Toluene	108-88-3	0.5 U	0.5	0.1	1
02898	1,2,3-Trichlorobenzene	87-61-6	0.5 U	0.5	0.1	1

*=This limit was used in the evaluation of the final result

Sample Description: **FB1 Water**
2732.05

LLI Sample # **WW 6694168**
LLI Group # **1317054**
Account # **09671**

Project Name: **Supplemental VI Assessment**

Collected: 06/18/2012 17:35
Submitted: 06/20/2012 09:20
Reported: 07/03/2012 19:12

IBM c/o Sanborn Head and Assoc
1715 W. 13th Street
Houston TX 77008

2732F SDG#: MAN25-03FB

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
	purge					
02898	1,2,4-Trichlorobenzene	120-82-1	0.5 U	0.5	0.1	1
02898	1,1,1-Trichloroethane	71-55-6	0.5 U	0.5	0.1	1
02898	1,1,2-Trichloroethane	79-00-5	0.5 U	0.5	0.1	1
02898	Trichloroethene	79-01-6	0.5 U	0.5	0.1	1
02898	Trichlorofluoromethane	75-69-4	0.5 U	0.5	0.1	1
02898	1,2,3-Trichloropropane	96-18-4	1.0 U	1.0	0.3	1
02898	1,2,4-Trimethylbenzene	95-63-6	0.5 U	0.5	0.1	1
02898	1,3,5-Trimethylbenzene	108-67-8	0.5 U	0.5	0.1	1
02898	Vinyl Chloride	75-01-4	0.5 U	0.5	0.1	1
02898	Xylene (Total)	1330-20-7	0.5 U	0.5	0.1	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary.

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02898	Former 8021 Manassas, VA VOCs	SW-846 8260B 25mL	1	C121781AA	06/26/2012 19:11	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	C121781AA	06/26/2012 19:11	Kerri E Legerlotz	1

Sample Description: **OF54 Ground Water**
2732.05

LLI Sample # **WW 6694169**
LLI Group # **1317054**
Account # **09671**

Project Name: **Supplemental VI Assessment**

Collected: 06/18/2012 16:30
Submitted: 06/20/2012 09:20
Reported: 07/03/2012 19:12

IBM c/o Sanborn Head and Assoc
1715 W. 13th Street
Houston TX 77008

-OF54 SDG#: MAN25-04

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
		purge				
02898	Benzene	71-43-2	2.0 U	2.0	0.4	4
02898	Bromobenzene	108-86-1	2.0 U	2.0	0.4	4
02898	Bromochloromethane	74-97-5	2.0 U	2.0	0.4	4
02898	Bromodichloromethane	75-27-4	2.0 U	2.0	0.4	4
02898	Bromoform	75-25-2	2.0 U	2.0	0.4	4
02898	Bromomethane	74-83-9	2.0 U	2.0	0.4	4
02898	n-Butylbenzene	104-51-8	2.0 U	2.0	0.4	4
02898	sec-Butylbenzene	135-98-8	2.0 U	2.0	0.4	4
02898	tert-Butylbenzene	98-06-6	2.0 U	2.0	0.4	4
02898	Carbon Tetrachloride	56-23-5	2.0 U	2.0	0.4	4
02898	Chlorobenzene	108-90-7	2.0 U	2.0	0.4	4
02898	Chloroethane	75-00-3	2.0 U	2.0	0.4	4
02898	Chloroform	67-66-3	2.0 U	2.0	0.4	4
02898	Chloromethane	74-87-3	2.0 U	2.0	0.8	4
02898	2-Chlorotoluene	95-49-8	2.0 U	2.0	0.4	4
02898	4-Chlorotoluene	106-43-4	2.0 U	2.0	0.4	4
02898	1,2-Dibromo-3-chloropropane	96-12-8	2.0 U	2.0	0.8	4
02898	Dibromochloromethane	124-48-1	2.0 U	2.0	0.4	4
02898	1,2-Dibromoethane	106-93-4	2.0 U	2.0	0.4	4
02898	Dibromomethane	74-95-3	2.0 U	2.0	0.4	4
02898	1,2-Dichlorobenzene	95-50-1	2.0 U	2.0	0.4	4
02898	1,3-Dichlorobenzene	541-73-1	2.0 U	2.0	0.4	4
02898	1,4-Dichlorobenzene	106-46-7	2.0 U	2.0	0.4	4
02898	Dichlorodifluoromethane	75-71-8	2.0 U	2.0	0.4	4
02898	1,1-Dichloroethane	75-34-3	2.0 U	2.0	0.4	4
02898	1,2-Dichloroethane	107-06-2	2.0 U	2.0	0.4	4
02898	1,1-Dichloroethene	75-35-4	2.0 U	2.0	0.4	4
02898	cis-1,2-Dichloroethene	156-59-2	7.3	2.0	0.4	4
02898	trans-1,2-Dichloroethene	156-60-5	2.0 U	2.0	0.4	4
02898	1,2-Dichloropropane	78-87-5	2.0 U	2.0	0.4	4
02898	1,3-Dichloropropane	142-28-9	2.0 U	2.0	0.4	4
02898	2,2-Dichloropropane	594-20-7	2.0 U	2.0	0.4	4
02898	1,1-Dichloropropene	563-58-6	2.0 U	2.0	0.4	4
02898	cis-1,3-Dichloropropene	10061-01-5	2.0 U	2.0	0.4	4
02898	trans-1,3-Dichloropropene	10061-02-6	2.0 U	2.0	0.4	4
02898	Ethylbenzene	100-41-4	2.0 U	2.0	0.4	4
02898	Freon 113	76-13-1	2.0 U	2.0	0.8	4
02898	Hexachlorobutadiene	87-68-3	2.0 U	2.0	0.4	4
02898	Isopropylbenzene	98-82-8	2.0 U	2.0	0.4	4
02898	p-Isopropyltoluene	99-87-6	2.0 U	2.0	0.4	4
02898	Methylene Chloride	75-09-2	2.0 U	2.0	0.8	4
02898	Naphthalene	91-20-3	2.0 U	2.0	0.4	4
02898	n-Propylbenzene	103-65-1	2.0 U	2.0	0.4	4
02898	Styrene	100-42-5	2.0 U	2.0	0.4	4
02898	1,1,1,2-Tetrachloroethane	630-20-6	2.0 U	2.0	0.4	4
02898	1,1,2,2-Tetrachloroethane	79-34-5	2.0 U	2.0	0.4	4
02898	Tetrachloroethene	127-18-4	340	10	2.0	20
02898	Tetrahydrofuran	109-99-9	20 U	20	8.0	4
02898	Toluene	108-88-3	2.0 U	2.0	0.4	4
02898	1,2,3-Trichlorobenzene	87-61-6	2.0 U	2.0	0.4	4

*=This limit was used in the evaluation of the final result

Sample Description: OF54 Ground Water
2732.05

LLI Sample # WW 6694169
LLI Group # 1317054
Account # 09671

Project Name: Supplemental VI Assessment

Collected: 06/18/2012 16:30

IBM c/o Sanborn Head and Assoc

Submitted: 06/20/2012 09:20

1715 W. 13th Street

Reported: 07/03/2012 19:12

Houston TX 77008

-OF54 SDG#: MAN25-04

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
		purge				
02898	1,2,4-Trichlorobenzene	120-82-1	2.0 U	2.0	0.4	4
02898	1,1,1-Trichloroethane	71-55-6	2.0 U	2.0	0.4	4
02898	1,1,2-Trichloroethane	79-00-5	2.0 U	2.0	0.4	4
02898	Trichloroethene	79-01-6	8.2	2.0	0.4	4
02898	Trichlorofluoromethane	75-69-4	2.0 U	2.0	0.4	4
02898	1,2,3-Trichloropropane	96-18-4	4.0 U	4.0	1.2	4
02898	1,2,4-Trimethylbenzene	95-63-6	2.0 U	2.0	0.4	4
02898	1,3,5-Trimethylbenzene	108-67-8	2.0 U	2.0	0.4	4
02898	Vinyl Chloride	75-01-4	2.0 U	2.0	0.4	4
02898	Xylene (Total)	1330-20-7	2.0 U	2.0	0.4	4

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary.

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02898	Former 8021 Manassas, VA VOCs	SW-846 8260B 25mL purge	1	C121781AA	06/26/2012 19:33	Kerri E Legerlotz	4
02898	Former 8021 Manassas, VA VOCs	SW-846 8260B 25mL purge	1	C121781AA	06/26/2012 19:55	Kerri E Legerlotz	20
01163	GC/MS VOA Water Prep	SW-846 5030B	1	C121781AA	06/26/2012 19:33	Kerri E Legerlotz	4
01163	GC/MS VOA Water Prep	SW-846 5030B	2	C121781AA	06/26/2012 19:55	Kerri E Legerlotz	20

Sample Description: OF55 Ground Water
2732.05

LLI Sample # WW 6694170
LLI Group # 1317054
Account # 09671

Project Name: Supplemental VI Assessment

Collected: 06/18/2012 15:50
Submitted: 06/20/2012 09:20
Reported: 07/03/2012 19:12

IBM c/o Sanborn Head and Assoc
1715 W. 13th Street
Houston TX 77008

-OF55 SDG#: MAN25-05

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
		purge				
02898	Benzene	71-43-2	0.5 J	0.5	0.1	1
02898	Bromobenzene	108-86-1	0.5 U	0.5	0.1	1
02898	Bromochloromethane	74-97-5	0.5 U	0.5	0.1	1
02898	Bromodichloromethane	75-27-4	0.5 U	0.5	0.1	1
02898	Bromoform	75-25-2	0.5 U	0.5	0.1	1
02898	Bromomethane	74-83-9	0.5 U	0.5	0.1	1
02898	n-Butylbenzene	104-51-8	0.5 U	0.5	0.1	1
02898	sec-Butylbenzene	135-98-8	0.5 U	0.5	0.1	1
02898	tert-Butylbenzene	98-06-6	0.5 U	0.5	0.1	1
02898	Carbon Tetrachloride	56-23-5	0.5 U	0.5	0.1	1
02898	Chlorobenzene	108-90-7	0.5 U	0.5	0.1	1
02898	Chloroethane	75-00-3	0.5 U	0.5	0.1	1
02898	Chloroform	67-66-3	0.5 U	0.5	0.1	1
02898	Chloromethane	74-87-3	0.3 J	0.5	0.2	1
02898	2-Chlorotoluene	95-49-8	0.5 U	0.5	0.1	1
02898	4-Chlorotoluene	106-43-4	0.5 U	0.5	0.1	1
02898	1,2-Dibromo-3-chloropropane	96-12-8	0.5 U	0.5	0.2	1
02898	Dibromochloromethane	124-48-1	0.5 U	0.5	0.1	1
02898	1,2-Dibromoethane	106-93-4	0.5 U	0.5	0.1	1
02898	Dibromomethane	74-95-3	0.5 U	0.5	0.1	1
02898	1,2-Dichlorobenzene	95-50-1	0.5 U	0.5	0.1	1
02898	1,3-Dichlorobenzene	541-73-1	0.5 U	0.5	0.1	1
02898	1,4-Dichlorobenzene	106-46-7	0.5 U	0.5	0.1	1
02898	Dichlorodifluoromethane	75-71-8	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethane	75-34-3	0.5 U	0.5	0.1	1
02898	1,2-Dichloroethane	107-06-2	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethene	75-35-4	0.8	0.5	0.1	1
02898	cis-1,2-Dichloroethene	156-59-2	190	5.0	1.0	10
02898	trans-1,2-Dichloroethene	156-60-5	0.1 J	0.5	0.1	1
02898	1,2-Dichloropropane	78-87-5	0.5 U	0.5	0.1	1
02898	1,3-Dichloropropane	142-28-9	0.5 U	0.5	0.1	1
02898	2,2-Dichloropropane	594-20-7	0.5 U	0.5	0.1	1
02898	1,1-Dichloropropene	563-58-6	0.5 U	0.5	0.1	1
02898	cis-1,3-Dichloropropene	10061-01-5	0.5 U	0.5	0.1	1
02898	trans-1,3-Dichloropropene	10061-02-6	0.5 U	0.5	0.1	1
02898	Ethylbenzene	100-41-4	0.5 U	0.5	0.1	1
02898	Freon 113	76-13-1	0.5 U	0.5	0.2	1
02898	Hexachlorobutadiene	87-68-3	0.5 U	0.5	0.1	1
02898	Isopropylbenzene	98-82-8	0.5 U	0.5	0.1	1
02898	p-Isopropyltoluene	99-87-6	0.5 U	0.5	0.1	1
02898	Methylene Chloride	75-09-2	0.5 U	0.5	0.2	1
02898	Naphthalene	91-20-3	0.5 U	0.5	0.1	1
02898	n-Propylbenzene	103-65-1	0.5 U	0.5	0.1	1
02898	Styrene	100-42-5	0.5 U	0.5	0.1	1
02898	1,1,1,2-Tetrachloroethane	630-20-6	0.5 U	0.5	0.1	1
02898	1,1,2,2-Tetrachloroethane	79-34-5	0.5 U	0.5	0.1	1
02898	Tetrachloroethene	127-18-4	180	5.0	1.0	10
02898	Tetrahydrofuran	109-99-9	5.0 U	5.0	2.0	1
02898	Toluene	108-88-3	0.5 U	0.5	0.1	1
02898	1,2,3-Trichlorobenzene	87-61-6	0.5 U	0.5	0.1	1

*=This limit was used in the evaluation of the final result

Sample Description: OF55 Ground Water
2732.05

LLI Sample # WW 6694170
LLI Group # 1317054
Account # 09671

Project Name: Supplemental VI Assessment

Collected: 06/18/2012 15:50
Submitted: 06/20/2012 09:20
Reported: 07/03/2012 19:12

IBM c/o Sanborn Head and Assoc
1715 W. 13th Street
Houston TX 77008

-OF55 SDG#: MAN25-05

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
		purge				
02898	1,2,4-Trichlorobenzene	120-82-1	0.5 U	0.5	0.1	1
02898	1,1,1-Trichloroethane	71-55-6	0.5 U	0.5	0.1	1
02898	1,1,2-Trichloroethane	79-00-5	0.5 U	0.5	0.1	1
02898	Trichloroethene	79-01-6	23	5.0	1.0	10
02898	Trichlorofluoromethane	75-69-4	0.5 U	0.5	0.1	1
02898	1,2,3-Trichloropropane	96-18-4	1.0 U	1.0	0.3	1
02898	1,2,4-Trimethylbenzene	95-63-6	0.5 U	0.5	0.1	1
02898	1,3,5-Trimethylbenzene	108-67-8	0.5 U	0.5	0.1	1
02898	Vinyl Chloride	75-01-4	0.2 J	0.5	0.1	1
02898	Xylene (Total)	1330-20-7	0.5 U	0.5	0.1	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary.

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02898	Former 8021 Manassas, VA VOCs	SW-846 8260B 25mL purge	1	C121781AA	06/26/2012 20:18	Kerri E Legerlotz	1
02898	Former 8021 Manassas, VA VOCs	SW-846 8260B 25mL purge	1	C121781AA	06/26/2012 20:40	Kerri E Legerlotz	10
01163	GC/MS VOA Water Prep	SW-846 5030B	1	C121781AA	06/26/2012 20:18	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030B	2	C121781AA	06/26/2012 20:40	Kerri E Legerlotz	10

Sample Description: SG102I Ground Water
2732.05

LLI Sample # WW 6694171
LLI Group # 1317054
Account # 09671

Project Name: Supplemental VI Assessment

Collected: 06/18/2012 14:30

IBM c/o Sanborn Head and Assoc

Submitted: 06/20/2012 09:20

1715 W. 13th Street

Reported: 07/03/2012 19:12

Houston TX 77008

G102I SDG#: MAN25-06

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
		purge				
02898	Benzene	71-43-2	0.5 U	0.5	0.1	1
02898	Bromobenzene	108-86-1	0.5 U	0.5	0.1	1
02898	Bromochloromethane	74-97-5	0.5 U	0.5	0.1	1
02898	Bromodichloromethane	75-27-4	0.5 U	0.5	0.1	1
02898	Bromoform	75-25-2	0.5 U	0.5	0.1	1
02898	Bromomethane	74-83-9	0.5 U	0.5	0.1	1
02898	n-Butylbenzene	104-51-8	0.5 U	0.5	0.1	1
02898	sec-Butylbenzene	135-98-8	0.5 U	0.5	0.1	1
02898	tert-Butylbenzene	98-06-6	0.5 U	0.5	0.1	1
02898	Carbon Tetrachloride	56-23-5	0.5 U	0.5	0.1	1
02898	Chlorobenzene	108-90-7	0.5 U	0.5	0.1	1
02898	Chloroethane	75-00-3	0.5 U	0.5	0.1	1
02898	Chloroform	67-66-3	1.0	0.5	0.1	1
02898	Chloromethane	74-87-3	0.5 U	0.5	0.2	1
02898	2-Chlorotoluene	95-49-8	0.5 U	0.5	0.1	1
02898	4-Chlorotoluene	106-43-4	0.5 U	0.5	0.1	1
02898	1,2-Dibromo-3-chloropropane	96-12-8	0.5 U	0.5	0.2	1
02898	Dibromochloromethane	124-48-1	0.5 U	0.5	0.1	1
02898	1,2-Dibromoethane	106-93-4	0.5 U	0.5	0.1	1
02898	Dibromomethane	74-95-3	0.5 U	0.5	0.1	1
02898	1,2-Dichlorobenzene	95-50-1	0.5 U	0.5	0.1	1
02898	1,3-Dichlorobenzene	541-73-1	0.5 U	0.5	0.1	1
02898	1,4-Dichlorobenzene	106-46-7	0.5 U	0.5	0.1	1
02898	Dichlorodifluoromethane	75-71-8	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethane	75-34-3	0.5 U	0.5	0.1	1
02898	1,2-Dichloroethane	107-06-2	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethene	75-35-4	0.5 U	0.5	0.1	1
02898	cis-1,2-Dichloroethene	156-59-2	0.3 J	0.5	0.1	1
02898	trans-1,2-Dichloroethene	156-60-5	0.5 U	0.5	0.1	1
02898	1,2-Dichloropropane	78-87-5	0.5 U	0.5	0.1	1
02898	1,3-Dichloropropane	142-28-9	0.5 U	0.5	0.1	1
02898	2,2-Dichloropropane	594-20-7	0.5 U	0.5	0.1	1
02898	1,1-Dichloropropene	563-58-6	0.5 U	0.5	0.1	1
02898	cis-1,3-Dichloropropene	10061-01-5	0.5 U	0.5	0.1	1
02898	trans-1,3-Dichloropropene	10061-02-6	0.5 U	0.5	0.1	1
02898	Ethylbenzene	100-41-4	0.5 U	0.5	0.1	1
02898	Freon 113	76-13-1	0.5 U	0.5	0.2	1
02898	Hexachlorobutadiene	87-68-3	0.5 U	0.5	0.1	1
02898	Isopropylbenzene	98-82-8	0.5 U	0.5	0.1	1
02898	p-Isopropyltoluene	99-87-6	0.5 U	0.5	0.1	1
02898	Methylene Chloride	75-09-2	0.5 U	0.5	0.2	1
02898	Naphthalene	91-20-3	0.5 U	0.5	0.1	1
02898	n-Propylbenzene	103-65-1	0.5 U	0.5	0.1	1
02898	Styrene	100-42-5	0.5 U	0.5	0.1	1
02898	1,1,1,2-Tetrachloroethane	630-20-6	0.5 U	0.5	0.1	1
02898	1,1,2,2-Tetrachloroethane	79-34-5	0.5 U	0.5	0.1	1
02898	Tetrachloroethene	127-18-4	0.1 J	0.5	0.1	1
02898	Tetrahydrofuran	109-99-9	5.0 U	5.0	2.0	1
02898	Toluene	108-88-3	0.5 U	0.5	0.1	1
02898	1,2,3-Trichlorobenzene	87-61-6	0.5 U	0.5	0.1	1

*=This limit was used in the evaluation of the final result

Sample Description: SG102I Ground Water
2732.05

LLI Sample # WW 6694171
LLI Group # 1317054
Account # 09671

Project Name: Supplemental VI Assessment

Collected: 06/18/2012 14:30

IBM c/o Sanborn Head and Assoc

Submitted: 06/20/2012 09:20

1715 W. 13th Street

Reported: 07/03/2012 19:12

Houston TX 77008

G102I SDG#: MAN25-06

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
	purge					
02898	1,2,4-Trichlorobenzene	120-82-1	0.5 U	0.5	0.1	1
02898	1,1,1-Trichloroethane	71-55-6	0.5 U	0.5	0.1	1
02898	1,1,2-Trichloroethane	79-00-5	0.5 U	0.5	0.1	1
02898	Trichloroethene	79-01-6	0.5 U	0.5	0.1	1
02898	Trichlorofluoromethane	75-69-4	0.5 U	0.5	0.1	1
02898	1,2,3-Trichloropropane	96-18-4	1.0 U	1.0	0.3	1
02898	1,2,4-Trimethylbenzene	95-63-6	0.5 U	0.5	0.1	1
02898	1,3,5-Trimethylbenzene	108-67-8	0.5 U	0.5	0.1	1
02898	Vinyl Chloride	75-01-4	0.5 U	0.5	0.1	1
02898	Xylene (Total)	1330-20-7	0.5 U	0.5	0.1	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary.

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02898	Former 8021 Manassas, VA VOCs	SW-846 8260B 25mL	1	C121781AA	06/26/2012 22:30	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	C121781AA	06/26/2012 22:30	Kerri E Legerlotz	1

Sample Description: SG106D Ground Water
2732.05

LLI Sample # WW 6694172
LLI Group # 1317054
Account # 09671

Project Name: Supplemental VI Assessment

Collected: 06/18/2012 17:10
Submitted: 06/20/2012 09:20
Reported: 07/03/2012 19:12

IBM c/o Sanborn Head and Assoc
1715 W. 13th Street
Houston TX 77008

G106D SDG#: MAN25-07

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
		purge				
02898	Benzene	71-43-2	5.0 U	5.0	1.0	10
02898	Bromobenzene	108-86-1	5.0 U	5.0	1.0	10
02898	Bromochloromethane	74-97-5	5.0 U	5.0	1.0	10
02898	Bromodichloromethane	75-27-4	5.0 U	5.0	1.0	10
02898	Bromoform	75-25-2	5.0 U	5.0	1.0	10
02898	Bromomethane	74-83-9	5.0 U	5.0	1.0	10
02898	n-Butylbenzene	104-51-8	5.0 U	5.0	1.0	10
02898	sec-Butylbenzene	135-98-8	5.0 U	5.0	1.0	10
02898	tert-Butylbenzene	98-06-6	5.0 U	5.0	1.0	10
02898	Carbon Tetrachloride	56-23-5	5.0 U	5.0	1.0	10
02898	Chlorobenzene	108-90-7	5.0 U	5.0	1.0	10
02898	Chloroethane	75-00-3	5.0 U	5.0	1.0	10
02898	Chloroform	67-66-3	5.0 U	5.0	1.0	10
02898	Chloromethane	74-87-3	5.0 U	5.0	2.0	10
02898	2-Chlorotoluene	95-49-8	5.0 U	5.0	1.0	10
02898	4-Chlorotoluene	106-43-4	5.0 U	5.0	1.0	10
02898	1,2-Dibromo-3-chloropropane	96-12-8	5.0 U	5.0	2.0	10
02898	Dibromochloromethane	124-48-1	5.0 U	5.0	1.0	10
02898	1,2-Dibromoethane	106-93-4	5.0 U	5.0	1.0	10
02898	Dibromomethane	74-95-3	5.0 U	5.0	1.0	10
02898	1,2-Dichlorobenzene	95-50-1	5.0 U	5.0	1.0	10
02898	1,3-Dichlorobenzene	541-73-1	5.0 U	5.0	1.0	10
02898	1,4-Dichlorobenzene	106-46-7	5.0 U	5.0	1.0	10
02898	Dichlorodifluoromethane	75-71-8	5.0 U	5.0	1.0	10
02898	1,1-Dichloroethane	75-34-3	5.0 U	5.0	1.0	10
02898	1,2-Dichloroethane	107-06-2	5.0 U	5.0	1.0	10
02898	1,1-Dichloroethene	75-35-4	5.0 U	5.0	1.0	10
02898	cis-1,2-Dichloroethene	156-59-2	1.8 J	5.0	1.0	10
02898	trans-1,2-Dichloroethene	156-60-5	5.0 U	5.0	1.0	10
02898	1,2-Dichloropropane	78-87-5	5.0 U	5.0	1.0	10
02898	1,3-Dichloropropane	142-28-9	5.0 U	5.0	1.0	10
02898	2,2-Dichloropropane	594-20-7	5.0 U	5.0	1.0	10
02898	1,1-Dichloropropene	563-58-6	5.0 U	5.0	1.0	10
02898	cis-1,3-Dichloropropene	10061-01-5	5.0 U	5.0	1.0	10
02898	trans-1,3-Dichloropropene	10061-02-6	5.0 U	5.0	1.0	10
02898	Ethylbenzene	100-41-4	5.0 U	5.0	1.0	10
02898	Freon 113	76-13-1	5.0 U	5.0	2.0	10
02898	Hexachlorobutadiene	87-68-3	5.0 U	5.0	1.0	10
02898	Isopropylbenzene	98-82-8	5.0 U	5.0	1.0	10
02898	p-Isopropyltoluene	99-87-6	5.0 U	5.0	1.0	10
02898	Methylene Chloride	75-09-2	5.0 U	5.0	2.0	10
02898	Naphthalene	91-20-3	5.0 U	5.0	1.0	10
02898	n-Propylbenzene	103-65-1	5.0 U	5.0	1.0	10
02898	Styrene	100-42-5	5.0 U	5.0	1.0	10
02898	1,1,1,2-Tetrachloroethane	630-20-6	5.0 U	5.0	1.0	10
02898	1,1,2,2-Tetrachloroethane	79-34-5	5.0 U	5.0	1.0	10
02898	Tetrachloroethene	127-18-4	1,900	50	10	100
02898	Tetrahydrofuran	109-99-9	50 U	50	20	10
02898	Toluene	108-88-3	5.0 U	5.0	1.0	10
02898	1,2,3-Trichlorobenzene	87-61-6	5.0 U	5.0	1.0	10

*=This limit was used in the evaluation of the final result

Sample Description: SG106D Ground Water
2732.05

LLI Sample # WW 6694172
LLI Group # 1317054
Account # 09671

Project Name: Supplemental VI Assessment

Collected: 06/18/2012 17:10
Submitted: 06/20/2012 09:20
Reported: 07/03/2012 19:12

IBM c/o Sanborn Head and Assoc
1715 W. 13th Street
Houston TX 77008

G106D SDG#: MAN25-07

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
		purge				
02898	1,2,4-Trichlorobenzene	120-82-1	5.0 U	5.0	1.0	10
02898	1,1,1-Trichloroethane	71-55-6	5.0 U	5.0	1.0	10
02898	1,1,2-Trichloroethane	79-00-5	5.0 U	5.0	1.0	10
02898	Trichloroethene	79-01-6	1.3 J	5.0	1.0	10
02898	Trichlorofluoromethane	75-69-4	5.0 U	5.0	1.0	10
02898	1,2,3-Trichloropropane	96-18-4	10 U	10	3.0	10
02898	1,2,4-Trimethylbenzene	95-63-6	5.0 U	5.0	1.0	10
02898	1,3,5-Trimethylbenzene	108-67-8	5.0 U	5.0	1.0	10
02898	Vinyl Chloride	75-01-4	5.0 U	5.0	1.0	10
02898	Xylene (Total)	1330-20-7	5.0 U	5.0	1.0	10

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary.

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02898	Former 8021 Manassas, VA VOCs	SW-846 8260B 25mL	1	C121781AA	06/26/2012 22:52	Kerri E Legerlotz	10
02898	Former 8021 Manassas, VA VOCs	SW-846 8260B 25mL	1	C121781AA	06/26/2012 23:14	Kerri E Legerlotz	100
01163	GC/MS VOA Water Prep	SW-846 5030B	1	C121781AA	06/26/2012 22:52	Kerri E Legerlotz	10
01163	GC/MS VOA Water Prep	SW-846 5030B	2	C121781AA	06/26/2012 23:14	Kerri E Legerlotz	100

Sample Description: SG106I Ground Water
2732.05

LLI Sample # WW 6694173
LLI Group # 1317054
Account # 09671

Project Name: Supplemental VI Assessment

Collected: 06/18/2012 17:05

IBM c/o Sanborn Head and Assoc

Submitted: 06/20/2012 09:20

1715 W. 13th Street

Reported: 07/03/2012 19:12

Houston TX 77008

G106I SDG#: MAN25-08

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
		purge				
02898	Benzene	71-43-2	2.5 U	2.5	0.5	5
02898	Bromobenzene	108-86-1	2.5 U	2.5	0.5	5
02898	Bromochloromethane	74-97-5	2.5 U	2.5	0.5	5
02898	Bromodichloromethane	75-27-4	2.5 U	2.5	0.5	5
02898	Bromoform	75-25-2	2.5 U	2.5	0.5	5
02898	Bromomethane	74-83-9	2.5 U	2.5	0.5	5
02898	n-Butylbenzene	104-51-8	2.5 U	2.5	0.5	5
02898	sec-Butylbenzene	135-98-8	2.5 U	2.5	0.5	5
02898	tert-Butylbenzene	98-06-6	2.5 U	2.5	0.5	5
02898	Carbon Tetrachloride	56-23-5	2.5 U	2.5	0.5	5
02898	Chlorobenzene	108-90-7	2.5 U	2.5	0.5	5
02898	Chloroethane	75-00-3	2.5 U	2.5	0.5	5
02898	Chloroform	67-66-3	2.5 U	2.5	0.5	5
02898	Chloromethane	74-87-3	2.5 U	2.5	1.0	5
02898	2-Chlorotoluene	95-49-8	2.5 U	2.5	0.5	5
02898	4-Chlorotoluene	106-43-4	2.5 U	2.5	0.5	5
02898	1,2-Dibromo-3-chloropropane	96-12-8	2.5 U	2.5	1.0	5
02898	Dibromochloromethane	124-48-1	2.5 U	2.5	0.5	5
02898	1,2-Dibromoethane	106-93-4	2.5 U	2.5	0.5	5
02898	Dibromomethane	74-95-3	2.5 U	2.5	0.5	5
02898	1,2-Dichlorobenzene	95-50-1	2.5 U	2.5	0.5	5
02898	1,3-Dichlorobenzene	541-73-1	2.5 U	2.5	0.5	5
02898	1,4-Dichlorobenzene	106-46-7	2.5 U	2.5	0.5	5
02898	Dichlorodifluoromethane	75-71-8	2.5 U	2.5	0.5	5
02898	1,1-Dichloroethane	75-34-3	2.5 U	2.5	0.5	5
02898	1,2-Dichloroethane	107-06-2	2.5 U	2.5	0.5	5
02898	1,1-Dichloroethene	75-35-4	2.5 U	2.5	0.5	5
02898	cis-1,2-Dichloroethene	156-59-2	2.5 U	2.5	0.5	5
02898	trans-1,2-Dichloroethene	156-60-5	2.5 U	2.5	0.5	5
02898	1,2-Dichloropropane	78-87-5	2.5 U	2.5	0.5	5
02898	1,3-Dichloropropane	142-28-9	2.5 U	2.5	0.5	5
02898	2,2-Dichloropropane	594-20-7	2.5 U	2.5	0.5	5
02898	1,1-Dichloropropene	563-58-6	2.5 U	2.5	0.5	5
02898	cis-1,3-Dichloropropene	10061-01-5	2.5 U	2.5	0.5	5
02898	trans-1,3-Dichloropropene	10061-02-6	2.5 U	2.5	0.5	5
02898	Ethylbenzene	100-41-4	2.5 U	2.5	0.5	5
02898	Freon 113	76-13-1	2.5 U	2.5	1.0	5
02898	Hexachlorobutadiene	87-68-3	2.5 U	2.5	0.5	5
02898	Isopropylbenzene	98-82-8	2.5 U	2.5	0.5	5
02898	p-Isopropyltoluene	99-87-6	2.5 U	2.5	0.5	5
02898	Methylene Chloride	75-09-2	2.5 U	2.5	1.0	5
02898	Naphthalene	91-20-3	2.5 U	2.5	0.5	5
02898	n-Propylbenzene	103-65-1	2.5 U	2.5	0.5	5
02898	Styrene	100-42-5	2.5 U	2.5	0.5	5
02898	1,1,1,2-Tetrachloroethane	630-20-6	2.5 U	2.5	0.5	5
02898	1,1,2,2-Tetrachloroethane	79-34-5	2.5 U	2.5	0.5	5
02898	Tetrachloroethene	127-18-4	240	25	5.0	50
02898	Tetrahydrofuran	109-99-9	25 U	25	10	5
02898	Toluene	108-88-3	2.5 U	2.5	0.5	5
02898	1,2,3-Trichlorobenzene	87-61-6	2.5 U	2.5	0.5	5

*=This limit was used in the evaluation of the final result

Sample Description: SG106I Ground Water
2732.05

LLI Sample # WW 6694173
LLI Group # 1317054
Account # 09671

Project Name: Supplemental VI Assessment

Collected: 06/18/2012 17:05

IBM c/o Sanborn Head and Assoc

Submitted: 06/20/2012 09:20

1715 W. 13th Street

Reported: 07/03/2012 19:12

Houston TX 77008

G106I SDG#: MAN25-08

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
	purge					
02898	1,2,4-Trichlorobenzene	120-82-1	2.5 U	2.5	0.5	5
02898	1,1,1-Trichloroethane	71-55-6	2.5 U	2.5	0.5	5
02898	1,1,2-Trichloroethane	79-00-5	2.5 U	2.5	0.5	5
02898	Trichloroethene	79-01-6	2.5 U	2.5	0.5	5
02898	Trichlorofluoromethane	75-69-4	2.5 U	2.5	0.5	5
02898	1,2,3-Trichloropropane	96-18-4	5.0 U	5.0	1.5	5
02898	1,2,4-Trimethylbenzene	95-63-6	2.5 U	2.5	0.5	5
02898	1,3,5-Trimethylbenzene	108-67-8	2.5 U	2.5	0.5	5
02898	Vinyl Chloride	75-01-4	2.5 U	2.5	0.5	5
02898	Xylene (Total)	1330-20-7	2.5 U	2.5	0.5	5

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02898	Former 8021 Manassas, VA VOCs	SW-846 8260B 25mL	1	C121811AA	06/29/2012 18:49	Kerri E Legerlotz	5
02898	Former 8021 Manassas, VA VOCs	SW-846 8260B 25mL	1	C121811AA	06/29/2012 19:11	Kerri E Legerlotz	50
01163	GC/MS VOA Water Prep	SW-846 5030B	1	C121811AA	06/29/2012 18:49	Kerri E Legerlotz	5
01163	GC/MS VOA Water Prep	SW-846 5030B	2	C121811AA	06/29/2012 19:11	Kerri E Legerlotz	50

*=This limit was used in the evaluation of the final result

Sample Description: SG108I Ground Water
2732.05

LLI Sample # WW 6694174
LLI Group # 1317054
Account # 09671

Project Name: Supplemental VI Assessment

Collected: 06/18/2012 16:45

IBM c/o Sanborn Head and Assoc

Submitted: 06/20/2012 09:20

1715 W. 13th Street

Reported: 07/03/2012 19:12

Houston TX 77008

G108I SDG#: MAN25-09

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
		purge				
02898	Benzene	71-43-2	0.5 U	0.5	0.1	1
02898	Bromobenzene	108-86-1	0.5 U	0.5	0.1	1
02898	Bromochloromethane	74-97-5	0.5 U	0.5	0.1	1
02898	Bromodichloromethane	75-27-4	0.5 U	0.5	0.1	1
02898	Bromoform	75-25-2	0.5 U	0.5	0.1	1
02898	Bromomethane	74-83-9	0.5 U	0.5	0.1	1
02898	n-Butylbenzene	104-51-8	0.5 U	0.5	0.1	1
02898	sec-Butylbenzene	135-98-8	0.5 U	0.5	0.1	1
02898	tert-Butylbenzene	98-06-6	0.5 U	0.5	0.1	1
02898	Carbon Tetrachloride	56-23-5	0.5 U	0.5	0.1	1
02898	Chlorobenzene	108-90-7	0.5 U	0.5	0.1	1
02898	Chloroethane	75-00-3	0.5 U	0.5	0.1	1
02898	Chloroform	67-66-3	0.2 J	0.5	0.1	1
02898	Chloromethane	74-87-3	0.5 U	0.5	0.2	1
02898	2-Chlorotoluene	95-49-8	0.5 U	0.5	0.1	1
02898	4-Chlorotoluene	106-43-4	0.5 U	0.5	0.1	1
02898	1,2-Dibromo-3-chloropropane	96-12-8	0.5 U	0.5	0.2	1
02898	Dibromochloromethane	124-48-1	0.5 U	0.5	0.1	1
02898	1,2-Dibromoethane	106-93-4	0.5 U	0.5	0.1	1
02898	Dibromomethane	74-95-3	0.5 U	0.5	0.1	1
02898	1,2-Dichlorobenzene	95-50-1	0.5 U	0.5	0.1	1
02898	1,3-Dichlorobenzene	541-73-1	0.5 U	0.5	0.1	1
02898	1,4-Dichlorobenzene	106-46-7	0.5 U	0.5	0.1	1
02898	Dichlorodifluoromethane	75-71-8	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethane	75-34-3	0.5 U	0.5	0.1	1
02898	1,2-Dichloroethane	107-06-2	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethene	75-35-4	0.5 U	0.5	0.1	1
02898	cis-1,2-Dichloroethene	156-59-2	1.8	0.5	0.1	1
02898	trans-1,2-Dichloroethene	156-60-5	0.5 U	0.5	0.1	1
02898	1,2-Dichloropropane	78-87-5	0.5 U	0.5	0.1	1
02898	1,3-Dichloropropane	142-28-9	0.5 U	0.5	0.1	1
02898	2,2-Dichloropropane	594-20-7	0.5 U	0.5	0.1	1
02898	1,1-Dichloropropene	563-58-6	0.5 U	0.5	0.1	1
02898	cis-1,3-Dichloropropene	10061-01-5	0.5 U	0.5	0.1	1
02898	trans-1,3-Dichloropropene	10061-02-6	0.5 U	0.5	0.1	1
02898	Ethylbenzene	100-41-4	0.5 U	0.5	0.1	1
02898	Freon 113	76-13-1	0.5 U	0.5	0.2	1
02898	Hexachlorobutadiene	87-68-3	0.5 U	0.5	0.1	1
02898	Isopropylbenzene	98-82-8	0.5 U	0.5	0.1	1
02898	p-Isopropyltoluene	99-87-6	0.5 U	0.5	0.1	1
02898	Methylene Chloride	75-09-2	0.5 U	0.5	0.2	1
02898	Naphthalene	91-20-3	0.5 U	0.5	0.1	1
02898	n-Propylbenzene	103-65-1	0.5 U	0.5	0.1	1
02898	Styrene	100-42-5	0.5 U	0.5	0.1	1
02898	1,1,1,2-Tetrachloroethane	630-20-6	0.5 U	0.5	0.1	1
02898	1,1,2,2-Tetrachloroethane	79-34-5	0.5 U	0.5	0.1	1
02898	Tetrachloroethene	127-18-4	100	5.0	1.0	10
02898	Tetrahydrofuran	109-99-9	5.0 U	5.0	2.0	1
02898	Toluene	108-88-3	0.5 U	0.5	0.1	1
02898	1,2,3-Trichlorobenzene	87-61-6	0.5 U	0.5	0.1	1

*=This limit was used in the evaluation of the final result

Sample Description: SG108I Ground Water
2732.05

LLI Sample # WW 6694174
LLI Group # 1317054
Account # 09671

Project Name: Supplemental VI Assessment

Collected: 06/18/2012 16:45

IBM c/o Sanborn Head and Assoc

Submitted: 06/20/2012 09:20

1715 W. 13th Street

Reported: 07/03/2012 19:12

Houston TX 77008

G108I SDG#: MAN25-09

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
		purge				
02898	1,2,4-Trichlorobenzene	120-82-1	0.5 U	0.5	0.1	1
02898	1,1,1-Trichloroethane	71-55-6	0.5 U	0.5	0.1	1
02898	1,1,2-Trichloroethane	79-00-5	0.5 U	0.5	0.1	1
02898	Trichloroethene	79-01-6	2.4	0.5	0.1	1
02898	Trichlorofluoromethane	75-69-4	0.5 U	0.5	0.1	1
02898	1,2,3-Trichloropropane	96-18-4	1.0 U	1.0	0.3	1
02898	1,2,4-Trimethylbenzene	95-63-6	0.5 U	0.5	0.1	1
02898	1,3,5-Trimethylbenzene	108-67-8	0.5 U	0.5	0.1	1
02898	Vinyl Chloride	75-01-4	0.5 U	0.5	0.1	1
02898	Xylene (Total)	1330-20-7	0.5 U	0.5	0.1	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02898	Former 8021 Manassas, VA VOCs	SW-846 8260B 25mL	1	C121811AA	06/29/2012 19:33	Kerri E Legerlotz	1
02898	Former 8021 Manassas, VA VOCs	SW-846 8260B 25mL	1	C121811AA	06/29/2012 19:56	Kerri E Legerlotz	10
01163	GC/MS VOA Water Prep	SW-846 5030B	1	C121811AA	06/29/2012 19:33	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030B	2	C121811AA	06/29/2012 19:56	Kerri E Legerlotz	10

Sample Description: SG111D Ground Water
2732.05

LLI Sample # WW 6694175
LLI Group # 1317054
Account # 09671

Project Name: Supplemental VI Assessment

Collected: 06/18/2012 16:20

IBM c/o Sanborn Head and Assoc

Submitted: 06/20/2012 09:20

1715 W. 13th Street

Reported: 07/03/2012 19:12

Houston TX 77008

G111D SDG#: MAN25-10

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
		purge				
02898	Benzene	71-43-2	0.5 U	0.5	0.1	1
02898	Bromobenzene	108-86-1	0.5 U	0.5	0.1	1
02898	Bromochloromethane	74-97-5	0.5 U	0.5	0.1	1
02898	Bromodichloromethane	75-27-4	0.5 U	0.5	0.1	1
02898	Bromoform	75-25-2	0.5 U	0.5	0.1	1
02898	Bromomethane	74-83-9	0.5 U	0.5	0.1	1
02898	n-Butylbenzene	104-51-8	0.5 U	0.5	0.1	1
02898	sec-Butylbenzene	135-98-8	0.5 U	0.5	0.1	1
02898	tert-Butylbenzene	98-06-6	0.5 U	0.5	0.1	1
02898	Carbon Tetrachloride	56-23-5	0.5 U	0.5	0.1	1
02898	Chlorobenzene	108-90-7	0.5 U	0.5	0.1	1
02898	Chloroethane	75-00-3	0.5 U	0.5	0.1	1
02898	Chloroform	67-66-3	0.5 U	0.5	0.1	1
02898	Chloromethane	74-87-3	0.5 U	0.5	0.2	1
02898	2-Chlorotoluene	95-49-8	0.5 U	0.5	0.1	1
02898	4-Chlorotoluene	106-43-4	0.5 U	0.5	0.1	1
02898	1,2-Dibromo-3-chloropropane	96-12-8	0.5 U	0.5	0.2	1
02898	Dibromochloromethane	124-48-1	0.5 U	0.5	0.1	1
02898	1,2-Dibromoethane	106-93-4	0.5 U	0.5	0.1	1
02898	Dibromomethane	74-95-3	0.5 U	0.5	0.1	1
02898	1,2-Dichlorobenzene	95-50-1	0.5 U	0.5	0.1	1
02898	1,3-Dichlorobenzene	541-73-1	0.5 U	0.5	0.1	1
02898	1,4-Dichlorobenzene	106-46-7	0.5 U	0.5	0.1	1
02898	Dichlorodifluoromethane	75-71-8	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethane	75-34-3	0.5 U	0.5	0.1	1
02898	1,2-Dichloroethane	107-06-2	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethene	75-35-4	0.5 U	0.5	0.1	1
02898	cis-1,2-Dichloroethene	156-59-2	0.5 U	0.5	0.1	1
02898	trans-1,2-Dichloroethene	156-60-5	0.5 U	0.5	0.1	1
02898	1,2-Dichloropropane	78-87-5	0.5 U	0.5	0.1	1
02898	1,3-Dichloropropane	142-28-9	0.5 U	0.5	0.1	1
02898	2,2-Dichloropropane	594-20-7	0.5 U	0.5	0.1	1
02898	1,1-Dichloropropene	563-58-6	0.5 U	0.5	0.1	1
02898	cis-1,3-Dichloropropene	10061-01-5	0.5 U	0.5	0.1	1
02898	trans-1,3-Dichloropropene	10061-02-6	0.5 U	0.5	0.1	1
02898	Ethylbenzene	100-41-4	0.5 U	0.5	0.1	1
02898	Freon 113	76-13-1	0.5 U	0.5	0.2	1
02898	Hexachlorobutadiene	87-68-3	0.5 U	0.5	0.1	1
02898	Isopropylbenzene	98-82-8	0.5 U	0.5	0.1	1
02898	p-Isopropyltoluene	99-87-6	0.5 U	0.5	0.1	1
02898	Methylene Chloride	75-09-2	0.5 U	0.5	0.2	1
02898	Naphthalene	91-20-3	0.5 U	0.5	0.1	1
02898	n-Propylbenzene	103-65-1	0.5 U	0.5	0.1	1
02898	Styrene	100-42-5	0.5 U	0.5	0.1	1
02898	1,1,1,2-Tetrachloroethane	630-20-6	0.5 U	0.5	0.1	1
02898	1,1,2,2-Tetrachloroethane	79-34-5	0.5 U	0.5	0.1	1
02898	Tetrachloroethene	127-18-4	0.2 J	0.5	0.1	1
02898	Tetrahydrofuran	109-99-9	5.0 U	5.0	2.0	1
02898	Toluene	108-88-3	0.5 U	0.5	0.1	1
02898	1,2,3-Trichlorobenzene	87-61-6	0.5 U	0.5	0.1	1

*=This limit was used in the evaluation of the final result

Sample Description: SG111D Ground Water
2732.05

LLI Sample # WW 6694175
LLI Group # 1317054
Account # 09671

Project Name: Supplemental VI Assessment

Collected: 06/18/2012 16:20

IBM c/o Sanborn Head and Assoc

Submitted: 06/20/2012 09:20

1715 W. 13th Street

Reported: 07/03/2012 19:12

Houston TX 77008

G111D SDG#: MAN25-10

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
	purge					
02898	1,2,4-Trichlorobenzene	120-82-1	0.5 U	0.5	0.1	1
02898	1,1,1-Trichloroethane	71-55-6	0.5 U	0.5	0.1	1
02898	1,1,2-Trichloroethane	79-00-5	0.5 U	0.5	0.1	1
02898	Trichloroethene	79-01-6	0.5 U	0.5	0.1	1
02898	Trichlorofluoromethane	75-69-4	0.5 U	0.5	0.1	1
02898	1,2,3-Trichloropropane	96-18-4	1.0 U	1.0	0.3	1
02898	1,2,4-Trimethylbenzene	95-63-6	0.5 U	0.5	0.1	1
02898	1,3,5-Trimethylbenzene	108-67-8	0.5 U	0.5	0.1	1
02898	Vinyl Chloride	75-01-4	0.5 U	0.5	0.1	1
02898	Xylene (Total)	1330-20-7	0.5 U	0.5	0.1	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02898	Former 8021 Manassas, VA VOCs	SW-846 8260B 25mL	1	C121811AA	06/29/2012 20:18	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	C121811AA	06/29/2012 20:18	Kerri E Legerlotz	1

Sample Description: SG111I Ground Water
2732.05

LLI Sample # WW 6694176
LLI Group # 1317054
Account # 09671

Project Name: Supplemental VI Assessment

Collected: 06/18/2012 16:15

IBM c/o Sanborn Head and Assoc

Submitted: 06/20/2012 09:20

1715 W. 13th Street

Reported: 07/03/2012 19:12

Houston TX 77008

G111I SDG#: MAN25-11

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
		purge				
02898	Benzene	71-43-2	0.5 U	0.5	0.1	1
02898	Bromobenzene	108-86-1	0.5 U	0.5	0.1	1
02898	Bromochloromethane	74-97-5	0.5 U	0.5	0.1	1
02898	Bromodichloromethane	75-27-4	0.5 U	0.5	0.1	1
02898	Bromoform	75-25-2	0.5 U	0.5	0.1	1
02898	Bromomethane	74-83-9	0.5 U	0.5	0.1	1
02898	n-Butylbenzene	104-51-8	0.5 U	0.5	0.1	1
02898	sec-Butylbenzene	135-98-8	0.5 U	0.5	0.1	1
02898	tert-Butylbenzene	98-06-6	0.5 U	0.5	0.1	1
02898	Carbon Tetrachloride	56-23-5	0.5 U	0.5	0.1	1
02898	Chlorobenzene	108-90-7	0.5 U	0.5	0.1	1
02898	Chloroethane	75-00-3	0.5 U	0.5	0.1	1
02898	Chloroform	67-66-3	0.1 J	0.5	0.1	1
02898	Chloromethane	74-87-3	0.5 U	0.5	0.2	1
02898	2-Chlorotoluene	95-49-8	0.5 U	0.5	0.1	1
02898	4-Chlorotoluene	106-43-4	0.5 U	0.5	0.1	1
02898	1,2-Dibromo-3-chloropropane	96-12-8	0.5 U	0.5	0.2	1
02898	Dibromochloromethane	124-48-1	0.5 U	0.5	0.1	1
02898	1,2-Dibromoethane	106-93-4	0.5 U	0.5	0.1	1
02898	Dibromomethane	74-95-3	0.5 U	0.5	0.1	1
02898	1,2-Dichlorobenzene	95-50-1	0.5 U	0.5	0.1	1
02898	1,3-Dichlorobenzene	541-73-1	0.5 U	0.5	0.1	1
02898	1,4-Dichlorobenzene	106-46-7	0.5 U	0.5	0.1	1
02898	Dichlorodifluoromethane	75-71-8	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethane	75-34-3	0.5 U	0.5	0.1	1
02898	1,2-Dichloroethane	107-06-2	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethene	75-35-4	0.5 U	0.5	0.1	1
02898	cis-1,2-Dichloroethene	156-59-2	0.1 J	0.5	0.1	1
02898	trans-1,2-Dichloroethene	156-60-5	0.5 U	0.5	0.1	1
02898	1,2-Dichloropropane	78-87-5	0.5 U	0.5	0.1	1
02898	1,3-Dichloropropane	142-28-9	0.5 U	0.5	0.1	1
02898	2,2-Dichloropropane	594-20-7	0.5 U	0.5	0.1	1
02898	1,1-Dichloropropene	563-58-6	0.5 U	0.5	0.1	1
02898	cis-1,3-Dichloropropene	10061-01-5	0.5 U	0.5	0.1	1
02898	trans-1,3-Dichloropropene	10061-02-6	0.5 U	0.5	0.1	1
02898	Ethylbenzene	100-41-4	0.5 U	0.5	0.1	1
02898	Freon 113	76-13-1	0.5 U	0.5	0.2	1
02898	Hexachlorobutadiene	87-68-3	0.5 U	0.5	0.1	1
02898	Isopropylbenzene	98-82-8	0.5 U	0.5	0.1	1
02898	p-Isopropyltoluene	99-87-6	0.5 U	0.5	0.1	1
02898	Methylene Chloride	75-09-2	0.5 U	0.5	0.2	1
02898	Naphthalene	91-20-3	0.5 U	0.5	0.1	1
02898	n-Propylbenzene	103-65-1	0.5 U	0.5	0.1	1
02898	Styrene	100-42-5	0.5 U	0.5	0.1	1
02898	1,1,1,2-Tetrachloroethane	630-20-6	0.5 U	0.5	0.1	1
02898	1,1,2,2-Tetrachloroethane	79-34-5	0.5 U	0.5	0.1	1
02898	Tetrachloroethene	127-18-4	5.4	0.5	0.1	1
02898	Tetrahydrofuran	109-99-9	5.0 U	5.0	2.0	1
02898	Toluene	108-88-3	0.5 U	0.5	0.1	1
02898	1,2,3-Trichlorobenzene	87-61-6	0.5 U	0.5	0.1	1

*=This limit was used in the evaluation of the final result

Sample Description: SG111I Ground Water
2732.05

LLI Sample # WW 6694176
LLI Group # 1317054
Account # 09671

Project Name: Supplemental VI Assessment

Collected: 06/18/2012 16:15

IBM c/o Sanborn Head and Assoc

Submitted: 06/20/2012 09:20

1715 W. 13th Street

Reported: 07/03/2012 19:12

Houston TX 77008

G111I SDG#: MAN25-11

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
		purge				
02898	1,2,4-Trichlorobenzene	120-82-1	0.5 U	0.5	0.1	1
02898	1,1,1-Trichloroethane	71-55-6	0.5 U	0.5	0.1	1
02898	1,1,2-Trichloroethane	79-00-5	0.5 U	0.5	0.1	1
02898	Trichloroethene	79-01-6	0.2 J	0.5	0.1	1
02898	Trichlorofluoromethane	75-69-4	0.5 U	0.5	0.1	1
02898	1,2,3-Trichloropropane	96-18-4	1.0 U	1.0	0.3	1
02898	1,2,4-Trimethylbenzene	95-63-6	0.5 U	0.5	0.1	1
02898	1,3,5-Trimethylbenzene	108-67-8	0.5 U	0.5	0.1	1
02898	Vinyl Chloride	75-01-4	0.5 U	0.5	0.1	1
02898	Xylene (Total)	1330-20-7	0.5 U	0.5	0.1	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02898	Former 8021 Manassas, VA VOCs	SW-846 8260B 25mL	1	C121812AA	06/29/2012 23:57	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	C121812AA	06/29/2012 23:57	Kevin A Sposito	1

Sample Description: SG113D Ground Water
2732.05

LLI Sample # WW 6694177
LLI Group # 1317054
Account # 09671

Project Name: Supplemental VI Assessment

Collected: 06/18/2012 15:40

IBM c/o Sanborn Head and Assoc

Submitted: 06/20/2012 09:20

1715 W. 13th Street

Reported: 07/03/2012 19:12

Houston TX 77008

G113D SDG#: MAN25-12

CAT No.	Analysis Name	CAS Number	As Received Result		As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l		ug/l	ug/l	
		purge					
02898	Benzene	71-43-2	0.1	J	0.5	0.1	1
02898	Bromobenzene	108-86-1	0.5	U	0.5	0.1	1
02898	Bromochloromethane	74-97-5	0.5	U	0.5	0.1	1
02898	Bromodichloromethane	75-27-4	0.5	U	0.5	0.1	1
02898	Bromoform	75-25-2	0.5	U	0.5	0.1	1
02898	Bromomethane	74-83-9	0.5	U	0.5	0.1	1
02898	n-Butylbenzene	104-51-8	0.5	U	0.5	0.1	1
02898	sec-Butylbenzene	135-98-8	0.5	U	0.5	0.1	1
02898	tert-Butylbenzene	98-06-6	0.5	U	0.5	0.1	1
02898	Carbon Tetrachloride	56-23-5	0.5	U	0.5	0.1	1
02898	Chlorobenzene	108-90-7	0.5	U	0.5	0.1	1
02898	Chloroethane	75-00-3	0.5	U	0.5	0.1	1
02898	Chloroform	67-66-3	0.8		0.5	0.1	1
02898	Chloromethane	74-87-3	0.5	U	0.5	0.2	1
02898	2-Chlorotoluene	95-49-8	0.5	U	0.5	0.1	1
02898	4-Chlorotoluene	106-43-4	0.5	U	0.5	0.1	1
02898	1,2-Dibromo-3-chloropropane	96-12-8	0.5	U	0.5	0.2	1
02898	Dibromochloromethane	124-48-1	0.5	U	0.5	0.1	1
02898	1,2-Dibromoethane	106-93-4	0.5	U	0.5	0.1	1
02898	Dibromomethane	74-95-3	0.5	U	0.5	0.1	1
02898	1,2-Dichlorobenzene	95-50-1	0.5	U	0.5	0.1	1
02898	1,3-Dichlorobenzene	541-73-1	0.5	U	0.5	0.1	1
02898	1,4-Dichlorobenzene	106-46-7	0.5	U	0.5	0.1	1
02898	Dichlorodifluoromethane	75-71-8	0.5	U	0.5	0.1	1
02898	1,1-Dichloroethane	75-34-3	0.5	U	0.5	0.1	1
02898	1,2-Dichloroethane	107-06-2	0.5	U	0.5	0.1	1
02898	1,1-Dichloroethene	75-35-4	0.5	U	0.5	0.1	1
02898	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	0.1	1
02898	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	0.1	1
02898	1,2-Dichloropropane	78-87-5	0.5	U	0.5	0.1	1
02898	1,3-Dichloropropane	142-28-9	0.5	U	0.5	0.1	1
02898	2,2-Dichloropropane	594-20-7	0.5	U	0.5	0.1	1
02898	1,1-Dichloropropene	563-58-6	0.5	U	0.5	0.1	1
02898	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	0.1	1
02898	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	0.1	1
02898	Ethylbenzene	100-41-4	0.5	U	0.5	0.1	1
02898	Freon 113	76-13-1	0.5	U	0.5	0.2	1
02898	Hexachlorobutadiene	87-68-3	0.5	U	0.5	0.1	1
02898	Isopropylbenzene	98-82-8	0.5	U	0.5	0.1	1
02898	p-Isopropyltoluene	99-87-6	0.5	U	0.5	0.1	1
02898	Methylene Chloride	75-09-2	0.5	U	0.5	0.2	1
02898	Naphthalene	91-20-3	0.5	U	0.5	0.1	1
02898	n-Propylbenzene	103-65-1	0.5	U	0.5	0.1	1
02898	Styrene	100-42-5	0.5	U	0.5	0.1	1
02898	1,1,1,2-Tetrachloroethane	630-20-6	0.5	U	0.5	0.1	1
02898	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	0.1	1
02898	Tetrachloroethene	127-18-4	0.7		0.5	0.1	1
02898	Tetrahydrofuran	109-99-9	5.0	U	5.0	2.0	1
02898	Toluene	108-88-3	0.5	U	0.5	0.1	1
02898	1,2,3-Trichlorobenzene	87-61-6	0.5	U	0.5	0.1	1

*=This limit was used in the evaluation of the final result

Sample Description: SG113D Ground Water
2732.05

LLI Sample # WW 6694177
LLI Group # 1317054
Account # 09671

Project Name: Supplemental VI Assessment

Collected: 06/18/2012 15:40

IBM c/o Sanborn Head and Assoc

Submitted: 06/20/2012 09:20

1715 W. 13th Street

Reported: 07/03/2012 19:12

Houston TX 77008

G113D SDG#: MAN25-12

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
		purge				
02898	1,2,4-Trichlorobenzene	120-82-1	0.5 U	0.5	0.1	1
02898	1,1,1-Trichloroethane	71-55-6	0.5 U	0.5	0.1	1
02898	1,1,2-Trichloroethane	79-00-5	0.5 U	0.5	0.1	1
02898	Trichloroethene	79-01-6	0.5 U	0.5	0.1	1
02898	Trichlorofluoromethane	75-69-4	0.5 U	0.5	0.1	1
02898	1,2,3-Trichloropropane	96-18-4	1.0 U	1.0	0.3	1
02898	1,2,4-Trimethylbenzene	95-63-6	0.5 U	0.5	0.1	1
02898	1,3,5-Trimethylbenzene	108-67-8	0.5 U	0.5	0.1	1
02898	Vinyl Chloride	75-01-4	0.5 U	0.5	0.1	1
02898	Xylene (Total)	1330-20-7	0.5 U	0.5	0.1	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02898	Former 8021 Manassas, VA VOCs	SW-846 8260B 25mL	1	C121812AA	06/30/2012 00:20	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	C121812AA	06/30/2012 00:20	Kevin A Sposito	1

*=This limit was used in the evaluation of the final result

Sample Description: SG113I Ground Water
2732.05

LLI Sample # WW 6694178
LLI Group # 1317054
Account # 09671

Project Name: Supplemental VI Assessment

Collected: 06/18/2012 15:15

IBM c/o Sanborn Head and Assoc

Submitted: 06/20/2012 09:20

1715 W. 13th Street

Reported: 07/03/2012 19:12

Houston TX 77008

G113I SDG#: MAN25-13

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
		purge				
02898	Benzene	71-43-2	0.5 U	0.5	0.1	1
02898	Bromobenzene	108-86-1	0.5 U	0.5	0.1	1
02898	Bromochloromethane	74-97-5	0.5 U	0.5	0.1	1
02898	Bromodichloromethane	75-27-4	0.5 U	0.5	0.1	1
02898	Bromoform	75-25-2	0.5 U	0.5	0.1	1
02898	Bromomethane	74-83-9	0.5 U	0.5	0.1	1
02898	n-Butylbenzene	104-51-8	0.5 U	0.5	0.1	1
02898	sec-Butylbenzene	135-98-8	0.5 U	0.5	0.1	1
02898	tert-Butylbenzene	98-06-6	0.5 U	0.5	0.1	1
02898	Carbon Tetrachloride	56-23-5	0.5 U	0.5	0.1	1
02898	Chlorobenzene	108-90-7	0.5 U	0.5	0.1	1
02898	Chloroethane	75-00-3	0.5 U	0.5	0.1	1
02898	Chloroform	67-66-3	0.3 J	0.5	0.1	1
02898	Chloromethane	74-87-3	0.5 U	0.5	0.2	1
02898	2-Chlorotoluene	95-49-8	0.5 U	0.5	0.1	1
02898	4-Chlorotoluene	106-43-4	0.5 U	0.5	0.1	1
02898	1,2-Dibromo-3-chloropropane	96-12-8	0.5 U	0.5	0.2	1
02898	Dibromochloromethane	124-48-1	0.5 U	0.5	0.1	1
02898	1,2-Dibromoethane	106-93-4	0.5 U	0.5	0.1	1
02898	Dibromomethane	74-95-3	0.5 U	0.5	0.1	1
02898	1,2-Dichlorobenzene	95-50-1	0.5 U	0.5	0.1	1
02898	1,3-Dichlorobenzene	541-73-1	0.5 U	0.5	0.1	1
02898	1,4-Dichlorobenzene	106-46-7	0.5 U	0.5	0.1	1
02898	Dichlorodifluoromethane	75-71-8	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethane	75-34-3	0.5 U	0.5	0.1	1
02898	1,2-Dichloroethane	107-06-2	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethene	75-35-4	0.5 U	0.5	0.1	1
02898	cis-1,2-Dichloroethene	156-59-2	0.5 U	0.5	0.1	1
02898	trans-1,2-Dichloroethene	156-60-5	0.5 U	0.5	0.1	1
02898	1,2-Dichloropropane	78-87-5	0.5 U	0.5	0.1	1
02898	1,3-Dichloropropane	142-28-9	0.5 U	0.5	0.1	1
02898	2,2-Dichloropropane	594-20-7	0.5 U	0.5	0.1	1
02898	1,1-Dichloropropene	563-58-6	0.5 U	0.5	0.1	1
02898	cis-1,3-Dichloropropene	10061-01-5	0.5 U	0.5	0.1	1
02898	trans-1,3-Dichloropropene	10061-02-6	0.5 U	0.5	0.1	1
02898	Ethylbenzene	100-41-4	0.5 U	0.5	0.1	1
02898	Freon 113	76-13-1	0.5 U	0.5	0.2	1
02898	Hexachlorobutadiene	87-68-3	0.5 U	0.5	0.1	1
02898	Isopropylbenzene	98-82-8	0.5 U	0.5	0.1	1
02898	p-Isopropyltoluene	99-87-6	0.5 U	0.5	0.1	1
02898	Methylene Chloride	75-09-2	0.5 U	0.5	0.2	1
02898	Naphthalene	91-20-3	0.5 U	0.5	0.1	1
02898	n-Propylbenzene	103-65-1	0.5 U	0.5	0.1	1
02898	Styrene	100-42-5	0.5 U	0.5	0.1	1
02898	1,1,1,2-Tetrachloroethane	630-20-6	0.5 U	0.5	0.1	1
02898	1,1,2,2-Tetrachloroethane	79-34-5	0.5 U	0.5	0.1	1
02898	Tetrachloroethene	127-18-4	0.5 U	0.5	0.1	1
02898	Tetrahydrofuran	109-99-9	5.0 U	5.0	2.0	1
02898	Toluene	108-88-3	0.5 U	0.5	0.1	1
02898	1,2,3-Trichlorobenzene	87-61-6	0.5 U	0.5	0.1	1

*=This limit was used in the evaluation of the final result

Sample Description: SG113I Ground Water
2732.05

LLI Sample # WW 6694178
LLI Group # 1317054
Account # 09671

Project Name: Supplemental VI Assessment

Collected: 06/18/2012 15:15

IBM c/o Sanborn Head and Assoc

Submitted: 06/20/2012 09:20

1715 W. 13th Street

Reported: 07/03/2012 19:12

Houston TX 77008

G113I SDG#: MAN25-13

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
	purge					
02898	1,2,4-Trichlorobenzene	120-82-1	0.5 U	0.5	0.1	1
02898	1,1,1-Trichloroethane	71-55-6	0.5 U	0.5	0.1	1
02898	1,1,2-Trichloroethane	79-00-5	0.5 U	0.5	0.1	1
02898	Trichloroethene	79-01-6	0.5 U	0.5	0.1	1
02898	Trichlorofluoromethane	75-69-4	0.5 U	0.5	0.1	1
02898	1,2,3-Trichloropropane	96-18-4	1.0 U	1.0	0.3	1
02898	1,2,4-Trimethylbenzene	95-63-6	0.5 U	0.5	0.1	1
02898	1,3,5-Trimethylbenzene	108-67-8	0.5 U	0.5	0.1	1
02898	Vinyl Chloride	75-01-4	0.5 U	0.5	0.1	1
02898	Xylene (Total)	1330-20-7	0.5 U	0.5	0.1	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02898	Former 8021 Manassas, VA VOCs	SW-846 8260B 25mL	1	G121841AA	07/02/2012 14:55	Angela D Sneeringer	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	G121841AA	07/02/2012 14:55	Angela D Sneeringer	1

Sample Description: TB1 Water
2732.05

LLI Sample # WW 6694179
LLI Group # 1317054
Account # 09671

Project Name: Supplemental VI Assessment

Collected: 06/12/2012

IBM c/o Sanborn Head and Assoc

Submitted: 06/20/2012 09:20

1715 W. 13th Street

Reported: 07/03/2012 19:12

Houston TX 77008

2732T SDG#: MAN25-14TB*

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
		purge				
02898	Benzene	71-43-2	0.5 U	0.5	0.1	1
02898	Bromobenzene	108-86-1	0.5 U	0.5	0.1	1
02898	Bromochloromethane	74-97-5	0.5 U	0.5	0.1	1
02898	Bromodichloromethane	75-27-4	0.5 U	0.5	0.1	1
02898	Bromoform	75-25-2	0.5 U	0.5	0.1	1
02898	Bromomethane	74-83-9	0.5 U	0.5	0.1	1
02898	n-Butylbenzene	104-51-8	0.5 U	0.5	0.1	1
02898	sec-Butylbenzene	135-98-8	0.5 U	0.5	0.1	1
02898	tert-Butylbenzene	98-06-6	0.5 U	0.5	0.1	1
02898	Carbon Tetrachloride	56-23-5	0.5 U	0.5	0.1	1
02898	Chlorobenzene	108-90-7	0.5 U	0.5	0.1	1
02898	Chloroethane	75-00-3	0.5 U	0.5	0.1	1
02898	Chloroform	67-66-3	0.5 U	0.5	0.1	1
02898	Chloromethane	74-87-3	0.5 U	0.5	0.2	1
02898	2-Chlorotoluene	95-49-8	0.5 U	0.5	0.1	1
02898	4-Chlorotoluene	106-43-4	0.5 U	0.5	0.1	1
02898	1,2-Dibromo-3-chloropropane	96-12-8	0.5 U	0.5	0.2	1
02898	Dibromochloromethane	124-48-1	0.5 U	0.5	0.1	1
02898	1,2-Dibromoethane	106-93-4	0.5 U	0.5	0.1	1
02898	Dibromomethane	74-95-3	0.5 U	0.5	0.1	1
02898	1,2-Dichlorobenzene	95-50-1	0.5 U	0.5	0.1	1
02898	1,3-Dichlorobenzene	541-73-1	0.5 U	0.5	0.1	1
02898	1,4-Dichlorobenzene	106-46-7	0.5 U	0.5	0.1	1
02898	Dichlorodifluoromethane	75-71-8	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethane	75-34-3	0.5 U	0.5	0.1	1
02898	1,2-Dichloroethane	107-06-2	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethene	75-35-4	0.5 U	0.5	0.1	1
02898	cis-1,2-Dichloroethene	156-59-2	0.5 U	0.5	0.1	1
02898	trans-1,2-Dichloroethene	156-60-5	0.5 U	0.5	0.1	1
02898	1,2-Dichloropropane	78-87-5	0.5 U	0.5	0.1	1
02898	1,3-Dichloropropane	142-28-9	0.5 U	0.5	0.1	1
02898	2,2-Dichloropropane	594-20-7	0.5 U	0.5	0.1	1
02898	1,1-Dichloropropene	563-58-6	0.5 U	0.5	0.1	1
02898	cis-1,3-Dichloropropene	10061-01-5	0.5 U	0.5	0.1	1
02898	trans-1,3-Dichloropropene	10061-02-6	0.5 U	0.5	0.1	1
02898	Ethylbenzene	100-41-4	0.5 U	0.5	0.1	1
02898	Freon 113	76-13-1	0.5 U	0.5	0.2	1
02898	Hexachlorobutadiene	87-68-3	0.5 U	0.5	0.1	1
02898	Isopropylbenzene	98-82-8	0.5 U	0.5	0.1	1
02898	p-Isopropyltoluene	99-87-6	0.5 U	0.5	0.1	1
02898	Methylene Chloride	75-09-2	0.5 U	0.5	0.2	1
02898	Naphthalene	91-20-3	0.5 U	0.5	0.1	1
02898	n-Propylbenzene	103-65-1	0.5 U	0.5	0.1	1
02898	Styrene	100-42-5	0.5 U	0.5	0.1	1
02898	1,1,1,2-Tetrachloroethane	630-20-6	0.5 U	0.5	0.1	1
02898	1,1,2,2-Tetrachloroethane	79-34-5	0.5 U	0.5	0.1	1
02898	Tetrachloroethene	127-18-4	0.5 U	0.5	0.1	1
02898	Tetrahydrofuran	109-99-9	5.0 U	5.0	2.0	1
02898	Toluene	108-88-3	0.5 U	0.5	0.1	1
02898	1,2,3-Trichlorobenzene	87-61-6	0.5 U	0.5	0.1	1

*=This limit was used in the evaluation of the final result

Sample Description: TB1 Water
2732.05

LLI Sample # WW 6694179
LLI Group # 1317054
Account # 09671

Project Name: Supplemental VI Assessment

Collected: 06/12/2012

IBM c/o Sanborn Head and Assoc
1715 W. 13th Street
Houston TX 77008

Submitted: 06/20/2012 09:20

Reported: 07/03/2012 19:12

2732T SDG#: MAN25-14TB*

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
		purge				
02898	1,2,4-Trichlorobenzene	120-82-1	0.5 U	0.5	0.1	1
02898	1,1,1-Trichloroethane	71-55-6	0.5 U	0.5	0.1	1
02898	1,1,2-Trichloroethane	79-00-5	0.5 U	0.5	0.1	1
02898	Trichloroethene	79-01-6	0.5 U	0.5	0.1	1
02898	Trichlorofluoromethane	75-69-4	0.5 U	0.5	0.1	1
02898	1,2,3-Trichloropropane	96-18-4	1.0 U	1.0	0.3	1
02898	1,2,4-Trimethylbenzene	95-63-6	0.5 U	0.5	0.1	1
02898	1,3,5-Trimethylbenzene	108-67-8	0.5 U	0.5	0.1	1
02898	Vinyl Chloride	75-01-4	0.5 U	0.5	0.1	1
02898	Xylene (Total)	1330-20-7	0.5 U	0.5	0.1	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02898	Former 8021 Manassas, VA VOCs	SW-846 8260B 25mL	1	C121841AA	07/02/2012 20:08	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	C121841AA	07/02/2012 20:08	Kerri E Legerlotz	1

Quality Control Summary

Client Name: IBM c/o Sanborn Head and Assoc
Reported: 07/03/12 at 07:12 PM

Group Number: 1317054

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Laboratory Compliance Quality Control

<u>Analysis Name</u>	<u>Blank Result</u>	<u>Blank LOQ**</u>	<u>Blank MDL</u>	<u>Report Units</u>	<u>LCS %REC</u>	<u>LCSD %REC</u>	<u>LCS/LCSD Limits</u>	<u>RPD</u>	<u>RPD Max</u>
Batch number: C121781AA									
Sample number(s): 6694166,6694168-6694172									
Benzene	0.5 U	0.5	0.1	ug/l	105	105	80-120	0	30
Bromobenzene	0.5 U	0.5	0.1	ug/l	113	114	80-120	1	30
Bromochloromethane	0.5 U	0.5	0.1	ug/l	104	104	80-125	1	30
Bromodichloromethane	0.5 U	0.5	0.1	ug/l	92	92	80-120	0	30
Bromoform	0.5 U	0.5	0.1	ug/l	98	98	70-128	1	30
Bromomethane	0.5 U	0.5	0.1	ug/l	110	109	66-124	2	30
n-Butylbenzene	0.5 U	0.5	0.1	ug/l	108	108	80-120	0	30
sec-Butylbenzene	0.5 U	0.5	0.1	ug/l	114	114	80-120	0	30
tert-Butylbenzene	0.5 U	0.5	0.1	ug/l	126*	127*	80-120	0	30
Carbon Tetrachloride	0.5 U	0.5	0.1	ug/l	86	85	74-133	1	30
Chlorobenzene	0.5 U	0.5	0.1	ug/l	111	112	80-120	1	30
Chloroethane	0.5 U	0.5	0.1	ug/l	101	99	67-124	2	30
Chloroform	0.5 U	0.5	0.1	ug/l	88	88	80-120	0	30
Chloromethane	0.5 U	0.5	0.2	ug/l	98	96	55-135	2	30
2-Chlorotoluene	0.5 U	0.5	0.1	ug/l	117	117	80-120	0	30
4-Chlorotoluene	0.5 U	0.5	0.1	ug/l	117	116	80-120	1	30
1,2-Dibromo-3-chloropropane	0.5 U	0.5	0.2	ug/l	115	126*	59-125	9	30
Dibromochloromethane	0.5 U	0.5	0.1	ug/l	104	106	80-120	2	30
1,2-Dibromoethane	0.5 U	0.5	0.1	ug/l	108	110	80-120	2	30
Dibromomethane	0.5 U	0.5	0.1	ug/l	99	102	80-120	2	30
1,2-Dichlorobenzene	0.5 U	0.5	0.1	ug/l	110	110	80-120	0	30
1,3-Dichlorobenzene	0.5 U	0.5	0.1	ug/l	112	113	80-120	1	30
1,4-Dichlorobenzene	0.5 U	0.5	0.1	ug/l	111	112	80-120	0	30
Dichlorodifluoromethane	0.5 U	0.5	0.1	ug/l	83	82	39-120	2	30
1,1-Dichloroethane	0.5 U	0.5	0.1	ug/l	92	92	89-122	0	30
1,2-Dichloroethane	0.5 U	0.5	0.1	ug/l	75*	75*	80-127	0	30
1,1-Dichloroethene	0.5 U	0.5	0.1	ug/l	113	112	80-123	1	30
cis-1,2-Dichloroethene	0.5 U	0.5	0.1	ug/l	110	111	80-120	1	30
trans-1,2-Dichloroethene	0.5 U	0.5	0.1	ug/l	110	109	80-121	1	30
1,2-Dichloropropane	0.5 U	0.5	0.1	ug/l	101	101	80-120	0	30
1,3-Dichloropropane	0.5 U	0.5	0.1	ug/l	102	103	80-120	2	30
2,2-Dichloropropane	0.5 U	0.5	0.1	ug/l	80	82	75-122	2	30
1,1-Dichloropropene	0.5 U	0.5	0.1	ug/l	98	97	80-121	0	30
cis-1,3-Dichloropropene	0.5 U	0.5	0.1	ug/l	106	107	74-120	1	30
trans-1,3-Dichloropropene	0.5 U	0.5	0.1	ug/l	100	101	80-120	1	30
Ethylbenzene	0.5 U	0.5	0.1	ug/l	106	106	80-120	1	30
Freon 113	0.5 U	0.5	0.2	ug/l	105	104	78-132	1	30
Hexachlorobutadiene	0.5 U	0.5	0.1	ug/l	83	83	79-120	1	30
Isopropylbenzene	0.5 U	0.5	0.1	ug/l	109	110	80-120	0	30
p-Isopropyltoluene	0.5 U	0.5	0.1	ug/l	114	113	80-120	1	30
Methylene Chloride	0.5 U	0.5	0.2	ug/l	102	103	80-120	1	30
Naphthalene	0.5 U	0.5	0.1	ug/l	91	94	77-120	4	30
n-Propylbenzene	0.5 U	0.5	0.1	ug/l	111	111	80-120	0	30
Styrene	0.5 U	0.5	0.1	ug/l	116	118	80-122	1	30
1,1,1,2-Tetrachloroethane	0.5 U	0.5	0.1	ug/l	100	101	80-120	1	30

*- Outside of specification

** - This limit was used in the evaluation of the final result for the blank

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: IBM c/o Sanborn Head and Assoc
Reported: 07/03/12 at 07:12 PM

Group Number: 1317054

Analysis Name	Blank Result	Blank U	Blank LOQ**	Blank MDL	Report Units	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
1,1,2,2-Tetrachloroethane	0.5	U	0.5	0.1	ug/l	113	114	80-125	1	30
Tetrachloroethene	0.5	U	0.5	0.1	ug/l	108	108	80-120	0	30
Tetrahydrofuran	5.0	U	5.0	2.0	ug/l	128	142*	65-131	10	30
Toluene	0.5	U	0.5	0.1	ug/l	109	109	80-120	0	30
1,2,3-Trichlorobenzene	0.5	U	0.5	0.1	ug/l	89	91	77-120	3	30
1,2,4-Trichlorobenzene	0.5	U	0.5	0.1	ug/l	95	99	79-120	3	30
1,1,1-Trichloroethane	0.5	U	0.5	0.1	ug/l	85	84	79-127	1	30
1,1,2-Trichloroethane	0.5	U	0.5	0.1	ug/l	109	111	80-120	2	30
Trichloroethene	0.5	U	0.5	0.1	ug/l	104	105	80-120	0	30
Trichlorofluoromethane	0.5	U	0.5	0.1	ug/l	95	93	66-134	2	30
1,2,3-Trichloropropane	1.0	U	1.0	0.3	ug/l	99	100	80-120	1	30
1,2,4-Trimethylbenzene	0.5	U	0.5	0.1	ug/l	110	110	80-120	0	30
1,3,5-Trimethylbenzene	0.5	U	0.5	0.1	ug/l	111	112	80-120	1	30
Vinyl Chloride	0.5	U	0.5	0.1	ug/l	102	101	65-127	2	30
Xylene (Total)	0.5	U	0.5	0.1	ug/l	114	115	80-120	1	30

Batch number: C121811AA

Sample number(s): 6694173-6694175

Benzene	0.5	U	0.5	0.1	ug/l	109	108	80-120	1	30
Bromobenzene	0.5	U	0.5	0.1	ug/l	105	105	80-120	0	30
Bromochloromethane	0.5	U	0.5	0.1	ug/l	102	101	80-125	1	30
Bromodichloromethane	0.5	U	0.5	0.1	ug/l	107	105	80-120	2	30
Bromoform	0.5	U	0.5	0.1	ug/l	106	105	70-128	1	30
Bromomethane	0.5	U	0.5	0.1	ug/l	100	97	66-124	3	30
n-Butylbenzene	0.5	U	0.5	0.1	ug/l	109	108	80-120	1	30
sec-Butylbenzene	0.5	U	0.5	0.1	ug/l	111	110	80-120	1	30
tert-Butylbenzene	0.5	U	0.5	0.1	ug/l	113	112	80-120	0	30
Carbon Tetrachloride	0.5	U	0.5	0.1	ug/l	99	97	74-133	2	30
Chlorobenzene	0.5	U	0.5	0.1	ug/l	104	103	80-120	1	30
Chloroethane	0.5	U	0.5	0.1	ug/l	100	96	67-124	4	30
Chloroform	0.5	U	0.5	0.1	ug/l	102	99	80-120	2	30
Chloromethane	0.5	U	0.5	0.2	ug/l	91	88	55-135	3	30
2-Chlorotoluene	0.5	U	0.5	0.1	ug/l	105	104	80-120	0	30
4-Chlorotoluene	0.5	U	0.5	0.1	ug/l	104	103	80-120	1	30
1,2-Dibromo-3-chloropropane	0.5	U	0.5	0.2	ug/l	110	123	59-125	11	30
Dibromochloromethane	0.5	U	0.5	0.1	ug/l	108	107	80-120	1	30
1,2-Dibromoethane	0.5	U	0.5	0.1	ug/l	106	107	80-120	1	30
Dibromomethane	0.5	U	0.5	0.1	ug/l	103	101	80-120	1	30
1,2-Dichlorobenzene	0.5	U	0.5	0.1	ug/l	105	104	80-120	0	30
1,3-Dichlorobenzene	0.5	U	0.5	0.1	ug/l	105	104	80-120	0	30
1,4-Dichlorobenzene	0.5	U	0.5	0.1	ug/l	104	104	80-120	1	30
Dichlorodifluoromethane	0.5	U	0.5	0.1	ug/l	79	76	39-120	4	30
1,1-Dichloroethane	0.5	U	0.5	0.1	ug/l	108	105	89-122	3	30
1,2-Dichloroethane	0.5	U	0.5	0.1	ug/l	102	101	80-127	1	30
1,1-Dichloroethene	0.5	U	0.5	0.1	ug/l	114	110	80-123	4	30
cis-1,2-Dichloroethene	0.5	U	0.5	0.1	ug/l	109	107	80-120	2	30
trans-1,2-Dichloroethene	0.5	U	0.5	0.1	ug/l	109	104	80-121	5	30
1,2-Dichloropropane	0.5	U	0.5	0.1	ug/l	109	107	80-120	2	30
1,3-Dichloropropane	0.5	U	0.5	0.1	ug/l	108	106	80-120	2	30
2,2-Dichloropropane	0.5	U	0.5	0.1	ug/l	102	98	75-122	4	30
1,1-Dichloropropene	0.5	U	0.5	0.1	ug/l	107	104	80-121	3	30
cis-1,3-Dichloropropene	0.5	U	0.5	0.1	ug/l	108	105	74-120	2	30
trans-1,3-Dichloropropene	0.5	U	0.5	0.1	ug/l	118	114	80-120	3	30
Ethylbenzene	0.5	U	0.5	0.1	ug/l	111	109	80-120	1	30
Freon 113	0.5	U	0.5	0.2	ug/l	110	105	78-132	4	30
Hexachlorobutadiene	0.5	U	0.5	0.1	ug/l	98	98	79-120	0	30
Isopropylbenzene	0.5	U	0.5	0.1	ug/l	112	110	80-120	2	30
p-Isopropyltoluene	0.5	U	0.5	0.1	ug/l	109	109	80-120	0	30
Methylene Chloride	0.5	U	0.5	0.2	ug/l	108	106	80-120	3	30

*- Outside of specification

** - This limit was used in the evaluation of the final result for the blank

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: IBM c/o Sanborn Head and Assoc
Reported: 07/03/12 at 07:12 PM

Group Number: 1317054

<u>Analysis Name</u>	<u>Blank Result</u>		<u>Blank LOQ**</u>	<u>Blank MDL</u>	<u>Report Units</u>	<u>LCS %REC</u>	<u>LCSD %REC</u>	<u>LCS/LCSD Limits</u>	<u>RPD</u>	<u>RPD Max</u>
Naphthalene	0.5	U	0.5	0.1	ug/l	103	103	77-120	0	30
n-Propylbenzene	0.5	U	0.5	0.1	ug/l	112	110	80-120	1	30
Styrene	0.5	U	0.5	0.1	ug/l	114	113	80-122	1	30
1,1,1,2-Tetrachloroethane	0.5	U	0.5	0.1	ug/l	101	101	80-120	1	30
1,1,2,2-Tetrachloroethane	0.5	U	0.5	0.1	ug/l	117	118	80-125	1	30
Tetrachloroethene	0.5	U	0.5	0.1	ug/l	101	99	80-120	2	30
Tetrahydrofuran	5.0	U	5.0	2.0	ug/l	114	121	65-131	6	30
Toluene	0.5	U	0.5	0.1	ug/l	109	106	80-120	2	30
1,2,3-Trichlorobenzene	0.5	U	0.5	0.1	ug/l	105	105	77-120	0	30
1,2,4-Trichlorobenzene	0.5	U	0.5	0.1	ug/l	108	108	79-120	0	30
1,1,1-Trichloroethane	0.5	U	0.5	0.1	ug/l	101	99	79-127	2	30
1,1,2-Trichloroethane	0.5	U	0.5	0.1	ug/l	108	109	80-120	1	30
Trichloroethene	0.5	U	0.5	0.1	ug/l	106	104	80-120	2	30
Trichlorofluoromethane	0.5	U	0.5	0.1	ug/l	101	97	66-134	4	30
1,2,3-Trichloropropane	1.0	U	1.0	0.3	ug/l	105	111	80-120	5	30
1,2,4-Trimethylbenzene	0.5	U	0.5	0.1	ug/l	109	108	80-120	1	30
1,3,5-Trimethylbenzene	0.5	U	0.5	0.1	ug/l	110	108	80-120	2	30
Vinyl Chloride	0.5	U	0.5	0.1	ug/l	100	97	65-127	3	30
Xylene (Total)	0.5	U	0.5	0.1	ug/l	111	109	80-120	2	30

Batch number: C121812AA

Sample number (s): 6694166-6694167, 6694176-6694177

Benzene	0.5	U	0.5	0.1	ug/l	106		80-120		
Bromobenzene	0.5	U	0.5	0.1	ug/l	103		80-120		
Bromochloromethane	0.5	U	0.5	0.1	ug/l	100		80-125		
Bromodichloromethane	0.5	U	0.5	0.1	ug/l	101		80-120		
Bromoform	0.5	U	0.5	0.1	ug/l	96		70-128		
Bromomethane	0.5	U	0.5	0.1	ug/l	95		66-124		
n-Butylbenzene	0.5	U	0.5	0.1	ug/l	106		80-120		
sec-Butylbenzene	0.5	U	0.5	0.1	ug/l	106		80-120		
tert-Butylbenzene	0.5	U	0.5	0.1	ug/l	115		80-120		
Carbon Tetrachloride	0.5	U	0.5	0.1	ug/l	95		74-133		
Chlorobenzene	0.5	U	0.5	0.1	ug/l	102		80-120		
Chloroethane	0.5	U	0.5	0.1	ug/l	93		67-124		
Chloroform	0.5	U	0.5	0.1	ug/l	101		80-120		
Chloromethane	0.5	U	0.5	0.2	ug/l	84		55-135		
2-Chlorotoluene	0.5	U	0.5	0.1	ug/l	102		80-120		
4-Chlorotoluene	0.5	U	0.5	0.1	ug/l	102		80-120		
1,2-Dibromo-3-chloropropane	0.5	U	0.5	0.2	ug/l	80		59-125		
Dibromochloromethane	0.5	U	0.5	0.1	ug/l	103		80-120		
1,2-Dibromoethane	0.5	U	0.5	0.1	ug/l	105		80-120		
Dibromomethane	0.5	U	0.5	0.1	ug/l	103		80-120		
1,2-Dichlorobenzene	0.5	U	0.5	0.1	ug/l	103		80-120		
1,3-Dichlorobenzene	0.5	U	0.5	0.1	ug/l	103		80-120		
1,4-Dichlorobenzene	0.5	U	0.5	0.1	ug/l	101		80-120		
Dichlorodifluoromethane	0.5	U	0.5	0.1	ug/l	68		39-120		
1,1-Dichloroethane	0.5	U	0.5	0.1	ug/l	104		89-122		
1,2-Dichloroethane	0.5	U	0.5	0.1	ug/l	103		80-127		
1,1-Dichloroethene	0.5	U	0.5	0.1	ug/l	109		80-123		
cis-1,2-Dichloroethene	0.5	U	0.5	0.1	ug/l	106		80-120		
trans-1,2-Dichloroethene	0.5	U	0.5	0.1	ug/l	105		80-121		
1,2-Dichloropropane	0.5	U	0.5	0.1	ug/l	107		80-120		
1,3-Dichloropropane	0.5	U	0.5	0.1	ug/l	106		80-120		
2,2-Dichloropropane	0.5	U	0.5	0.1	ug/l	94		75-122		
1,1-Dichloropropene	0.5	U	0.5	0.1	ug/l	100		80-121		
cis-1,3-Dichloropropene	0.5	U	0.5	0.1	ug/l	98		74-120		
trans-1,3-Dichloropropene	0.5	U	0.5	0.1	ug/l	106		80-120		
Ethylbenzene	0.5	U	0.5	0.1	ug/l	109		80-120		
Freon 113	0.5	U	0.5	0.2	ug/l	105		78-132		

*- Outside of specification

** - This limit was used in the evaluation of the final result for the blank

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: IBM c/o Sanborn Head and Assoc
Reported: 07/03/12 at 07:12 PM

Group Number: 1317054

<u>Analysis Name</u>	<u>Blank Result</u>		<u>Blank LOQ**</u>	<u>Blank MDL</u>	<u>Report Units</u>	<u>LCS %REC</u>	<u>LCS %REC</u>	<u>LCS/LCSD Limits</u>	<u>RPD</u>	<u>RPD Max</u>
Hexachlorobutadiene	0.5	U	0.5	0.1	ug/l	97		79-120		
Isopropylbenzene	0.5	U	0.5	0.1	ug/l	108		80-120		
p-Isopropyltoluene	0.5	U	0.5	0.1	ug/l	106		80-120		
Methylene Chloride	0.3	J	0.5	0.2	ug/l	111		80-120		
Naphthalene	0.5	U	0.5	0.1	ug/l	99		77-120		
n-Propylbenzene	0.5	U	0.5	0.1	ug/l	108		80-120		
Styrene	0.5	U	0.5	0.1	ug/l	113		80-122		
1,1,1,2-Tetrachloroethane	0.5	U	0.5	0.1	ug/l	100		80-120		
1,1,2,2-Tetrachloroethane	0.5	U	0.5	0.1	ug/l	112		80-125		
Tetrachloroethene	0.5	U	0.5	0.1	ug/l	97		80-120		
Tetrahydrofuran	5.0	U	5.0	2.0	ug/l	87		65-131		
Toluene	0.5	U	0.5	0.1	ug/l	106		80-120		
1,2,3-Trichlorobenzene	0.5	U	0.5	0.1	ug/l	104		77-120		
1,2,4-Trichlorobenzene	0.5	U	0.5	0.1	ug/l	106		79-120		
1,1,1-Trichloroethane	0.5	U	0.5	0.1	ug/l	97		79-127		
1,1,2-Trichloroethane	0.5	U	0.5	0.1	ug/l	107		80-120		
Trichloroethene	0.5	U	0.5	0.1	ug/l	102		80-120		
Trichlorofluoromethane	0.5	U	0.5	0.1	ug/l	95		66-134		
1,2,3-Trichloropropane	1.0	U	1.0	0.3	ug/l	108		80-120		
1,2,4-Trimethylbenzene	0.5	U	0.5	0.1	ug/l	106		80-120		
1,3,5-Trimethylbenzene	0.5	U	0.5	0.1	ug/l	107		80-120		
Vinyl Chloride	0.5	U	0.5	0.1	ug/l	93		65-127		
Xylene (Total)	0.5	U	0.5	0.1	ug/l	109		80-120		

Batch number: C121841AA

Sample number(s): 6694179

Benzene	0.5	U	0.5	0.1	ug/l	111	110	80-120	1	30
Bromobenzene	0.5	U	0.5	0.1	ug/l	106	105	80-120	1	30
Bromochloromethane	0.5	U	0.5	0.1	ug/l	99	101	80-125	2	30
Bromodichloromethane	0.5	U	0.5	0.1	ug/l	111	112	80-120	1	30
Bromoform	0.5	U	0.5	0.1	ug/l	113	113	70-128	0	30
Bromomethane	0.5	U	0.5	0.1	ug/l	120	118	66-124	1	30
n-Butylbenzene	0.5	U	0.5	0.1	ug/l	112	110	80-120	2	30
sec-Butylbenzene	0.5	U	0.5	0.1	ug/l	114	113	80-120	1	30
tert-Butylbenzene	0.5	U	0.5	0.1	ug/l	115	113	80-120	2	30
Carbon Tetrachloride	0.5	U	0.5	0.1	ug/l	100	97	74-133	3	30
Chlorobenzene	0.5	U	0.5	0.1	ug/l	104	102	80-120	2	30
Chloroethane	0.5	U	0.5	0.1	ug/l	118	116	67-124	2	30
Chloroform	0.5	U	0.5	0.1	ug/l	104	102	80-120	1	30
Chloromethane	0.5	U	0.5	0.2	ug/l	119	116	55-135	2	30
2-Chlorotoluene	0.5	U	0.5	0.1	ug/l	107	106	80-120	1	30
4-Chlorotoluene	0.5	U	0.5	0.1	ug/l	105	104	80-120	0	30
1,2-Dibromo-3-chloropropane	0.5	U	0.5	0.2	ug/l	103	103	59-125	0	30
Dibromochloromethane	0.5	U	0.5	0.1	ug/l	113	114	80-120	0	30
1,2-Dibromoethane	0.5	U	0.5	0.1	ug/l	109	110	80-120	0	30
Dibromomethane	0.5	U	0.5	0.1	ug/l	105	104	80-120	1	30
1,2-Dichlorobenzene	0.5	U	0.5	0.1	ug/l	105	104	80-120	0	30
1,3-Dichlorobenzene	0.5	U	0.5	0.1	ug/l	105	105	80-120	1	30
1,4-Dichlorobenzene	0.5	U	0.5	0.1	ug/l	103	104	80-120	1	30
Dichlorodifluoromethane	0.5	U	0.5	0.1	ug/l	115	114	39-120	2	30
1,1-Dichloroethane	0.5	U	0.5	0.1	ug/l	110	110	89-122	0	30
1,2-Dichloroethane	0.5	U	0.5	0.1	ug/l	104	105	80-127	1	30
1,1-Dichloroethene	0.5	U	0.5	0.1	ug/l	113	111	80-123	2	30
cis-1,2-Dichloroethene	0.5	U	0.5	0.1	ug/l	110	110	80-120	0	30
trans-1,2-Dichloroethene	0.5	U	0.5	0.1	ug/l	108	106	80-121	2	30
1,2-Dichloropropane	0.5	U	0.5	0.1	ug/l	112	111	80-120	1	30
1,3-Dichloropropane	0.5	U	0.5	0.1	ug/l	110	111	80-120	1	30
2,2-Dichloropropane	0.5	U	0.5	0.1	ug/l	100	101	75-122	0	30
1,1-Dichloropropene	0.5	U	0.5	0.1	ug/l	108	106	80-121	1	30

*- Outside of specification

** - This limit was used in the evaluation of the final result for the blank

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: IBM c/o Sanborn Head and Assoc
Reported: 07/03/12 at 07:12 PM

Group Number: 1317054

Analysis Name	Blank Result	Blank LOQ**	Blank MDL	Report Units	LCS %REC	LCS %REC	LCS/LCSD Limits	RPD	RPD Max
cis-1,3-Dichloropropene	0.5 U	0.5	0.1	ug/l	116	116	74-120	1	30
trans-1,3-Dichloropropene	0.5 U	0.5	0.1	ug/l	124*	126*	80-120	2	30
Ethylbenzene	0.5 U	0.5	0.1	ug/l	113	112	80-120	1	30
Freon 113	0.5 U	0.5	0.2	ug/l	108	108	78-132	0	30
Hexachlorobutadiene	0.5 U	0.5	0.1	ug/l	102	102	79-120	0	30
Isopropylbenzene	0.5 U	0.5	0.1	ug/l	114	113	80-120	1	30
p-Isopropyltoluene	0.5 U	0.5	0.1	ug/l	113	110	80-120	2	30
Methylene Chloride	0.5 U	0.5	0.2	ug/l	110	109	80-120	0	30
Naphthalene	0.5 U	0.5	0.1	ug/l	106	109	77-120	2	30
n-Propylbenzene	0.5 U	0.5	0.1	ug/l	115	113	80-120	1	30
Styrene	0.5 U	0.5	0.1	ug/l	116	116	80-122	0	30
1,1,1,2-Tetrachloroethane	0.5 U	0.5	0.1	ug/l	103	102	80-120	1	30
1,1,2,2-Tetrachloroethane	0.5 U	0.5	0.1	ug/l	120	120	80-125	0	30
Tetrachloroethene	0.5 U	0.5	0.1	ug/l	102	98	80-120	3	30
Tetrahydrofuran	5.0 U	5.0	2.0	ug/l	107	100	65-131	6	30
Toluene	0.5 U	0.5	0.1	ug/l	110	108	80-120	3	30
1,2,3-Trichlorobenzene	0.5 U	0.5	0.1	ug/l	106	109	77-120	2	30
1,2,4-Trichlorobenzene	0.5 U	0.5	0.1	ug/l	111	113	79-120	2	30
1,1,1-Trichloroethane	0.5 U	0.5	0.1	ug/l	102	100	79-127	2	30
1,1,2-Trichloroethane	0.5 U	0.5	0.1	ug/l	111	112	80-120	0	30
Trichloroethene	0.5 U	0.5	0.1	ug/l	106	104	80-120	2	30
Trichlorofluoromethane	0.5 U	0.5	0.1	ug/l	113	111	66-134	1	30
1,2,3-Trichloropropane	1.0 U	1.0	0.3	ug/l	108	107	80-120	1	30
1,2,4-Trimethylbenzene	0.5 U	0.5	0.1	ug/l	110	110	80-120	0	30
1,3,5-Trimethylbenzene	0.5 U	0.5	0.1	ug/l	111	110	80-120	1	30
Vinyl Chloride	0.5 U	0.5	0.1	ug/l	126	124	65-127	1	30
Xylene (Total)	0.5 U	0.5	0.1	ug/l	112	112	80-120	0	30

Batch number: G121841AA

Sample number(s): 6694178

Benzene	0.5 U	0.5	0.1	ug/l	97	96	80-120	1	30
Bromobenzene	0.5 U	0.5	0.1	ug/l	100	99	80-120	0	30
Bromochloromethane	0.5 U	0.5	0.1	ug/l	102	102	80-125	0	30
Bromodichloromethane	0.5 U	0.5	0.1	ug/l	89	88	80-120	1	30
Bromoform	0.5 U	0.5	0.1	ug/l	78	79	70-128	1	30
Bromomethane	0.5 U	0.5	0.1	ug/l	88	85	66-124	3	30
n-Butylbenzene	0.5 U	0.5	0.1	ug/l	92	91	80-120	1	30
sec-Butylbenzene	0.5 U	0.5	0.1	ug/l	93	92	80-120	2	30
tert-Butylbenzene	0.5 U	0.5	0.1	ug/l	103	104	80-120	1	30
Carbon Tetrachloride	0.5 U	0.5	0.1	ug/l	85	83	74-133	1	30
Chlorobenzene	0.5 U	0.5	0.1	ug/l	98	96	80-120	2	30
Chloroethane	0.5 U	0.5	0.1	ug/l	80	77	67-124	4	30
Chloroform	0.5 U	0.5	0.1	ug/l	93	93	80-120	1	30
Chloromethane	0.5 U	0.5	0.2	ug/l	66	64	55-135	3	30
2-Chlorotoluene	0.5 U	0.5	0.1	ug/l	97	96	80-120	2	30
4-Chlorotoluene	0.5 U	0.5	0.1	ug/l	97	96	80-120	1	30
1,2-Dibromo-3-chloropropane	0.5 U	0.5	0.2	ug/l	129*	126*	59-125	3	30
Dibromochloromethane	0.5 U	0.5	0.1	ug/l	89	88	80-120	1	30
1,2-Dibromoethane	0.5 U	0.5	0.1	ug/l	97	97	80-120	0	30
Dibromomethane	0.5 U	0.5	0.1	ug/l	97	95	80-120	2	30
1,2-Dichlorobenzene	0.5 U	0.5	0.1	ug/l	99	99	80-120	0	30
1,3-Dichlorobenzene	0.5 U	0.5	0.1	ug/l	100	99	80-120	1	30
1,4-Dichlorobenzene	0.5 U	0.5	0.1	ug/l	100	99	80-120	1	30
Dichlorodifluoromethane	0.5 U	0.5	0.1	ug/l	51	49	39-120	5	30
1,1-Dichloroethane	0.5 U	0.5	0.1	ug/l	91	90	89-122	1	30
1,2-Dichloroethane	0.5 U	0.5	0.1	ug/l	91	90	80-127	1	30
1,1-Dichloroethene	0.5 U	0.5	0.1	ug/l	104	103	80-123	1	30
cis-1,2-Dichloroethene	0.5 U	0.5	0.1	ug/l	102	102	80-120	1	30
trans-1,2-Dichloroethene	0.5 U	0.5	0.1	ug/l	104	101	80-121	3	30

*- Outside of specification

** - This limit was used in the evaluation of the final result for the blank

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: IBM c/o Sanborn Head and Assoc
Reported: 07/03/12 at 07:12 PM

Group Number: 1317054

<u>Analysis Name</u>	<u>Blank Result</u>		<u>Blank LOQ**</u>	<u>Blank MDL</u>	<u>Report Units</u>	<u>LCS %REC</u>	<u>LCS %REC</u>	<u>LCS/LCSD Limits</u>	<u>RPD</u>	<u>RPD Max</u>
1,2-Dichloropropane	0.5	U	0.5	0.1	ug/l	88	88	80-120	1	30
1,3-Dichloropropane	0.5	U	0.5	0.1	ug/l	89	88	80-120	1	30
2,2-Dichloropropane	0.5	U	0.5	0.1	ug/l	84	83	75-122	1	30
1,1-Dichloropropene	0.5	U	0.5	0.1	ug/l	90	89	80-121	2	30
cis-1,3-Dichloropropene	0.5	U	0.5	0.1	ug/l	93	92	74-120	1	30
trans-1,3-Dichloropropene	0.5	U	0.5	0.1	ug/l	81	80	80-120	1	30
Ethylbenzene	0.5	U	0.5	0.1	ug/l	95	93	80-120	2	30
Freon 113	0.5	U	0.5	0.2	ug/l	101	101	78-132	0	30
Hexachlorobutadiene	0.5	U	0.5	0.1	ug/l	94	93	79-120	1	30
Isopropylbenzene	0.5	U	0.5	0.1	ug/l	96	94	80-120	2	30
p-Isopropyltoluene	0.5	U	0.5	0.1	ug/l	97	95	80-120	1	30
Methylene Chloride	0.5	U	0.5	0.2	ug/l	102	101	80-120	1	30
Naphthalene	0.5	U	0.5	0.1	ug/l	96	95	77-120	1	30
n-Propylbenzene	0.5	U	0.5	0.1	ug/l	92	91	80-120	1	30
Styrene	0.5	U	0.5	0.1	ug/l	99	97	80-122	2	30
1,1,1,2-Tetrachloroethane	0.5	U	0.5	0.1	ug/l	89	89	80-120	0	30
1,1,2,2-Tetrachloroethane	0.5	U	0.5	0.1	ug/l	92	90	80-125	2	30
Tetrachloroethene	0.5	U	0.5	0.1	ug/l	103	99	80-120	4	30
Tetrahydrofuran	5.0	U	5.0	2.0	ug/l	118	117	65-131	1	30
Toluene	0.5	U	0.5	0.1	ug/l	96	94	80-120	2	30
1,2,3-Trichlorobenzene	0.5	U	0.5	0.1	ug/l	99	98	77-120	0	30
1,2,4-Trichlorobenzene	0.5	U	0.5	0.1	ug/l	100	100	79-120	1	30
1,1,1-Trichloroethane	0.5	U	0.5	0.1	ug/l	91	90	79-127	2	30
1,1,2-Trichloroethane	0.5	U	0.5	0.1	ug/l	98	96	80-120	2	30
Trichloroethene	0.5	U	0.5	0.1	ug/l	100	99	80-120	1	30
Trichlorofluoromethane	0.5	U	0.5	0.1	ug/l	82	78	66-134	6	30
1,2,3-Trichloropropane	1.0	U	1.0	0.3	ug/l	92	95	80-120	3	30
1,2,4-Trimethylbenzene	0.5	U	0.5	0.1	ug/l	95	94	80-120	1	30
1,3,5-Trimethylbenzene	0.5	U	0.5	0.1	ug/l	95	94	80-120	1	30
Vinyl Chloride	0.5	U	0.5	0.1	ug/l	73	72	65-127	2	30
Xylene (Total)	0.5	U	0.5	0.1	ug/l	98	98	80-120	1	30

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

<u>Analysis Name</u>	<u>MS %REC</u>	<u>MSD %REC</u>	<u>MS/MSD Limits</u>	<u>RPD</u>	<u>RPD MAX</u>	<u>BKG Conc</u>	<u>DUP Conc</u>	<u>DUP RPD</u>	<u>Dup RPD Max</u>
Batch number: C121812AA	Sample number(s): 6694166-6694167,6694176-6694177 UNSPK: P704933								
Benzene	104	103	87-126	0	30				
Bromobenzene	103	104	80-123	0	30				
Bromochloromethane	103	103	82-125	0	30				
Bromodichloromethane	106	108	82-133	2	30				
Bromoform	92	89	60-138	3	30				
Bromomethane	86	86	69-135	0	30				
n-Butylbenzene	97	95	83-131	1	30				
sec-Butylbenzene	98	97	84-128	1	30				
tert-Butylbenzene	105	103	84-135	2	30				
Carbon Tetrachloride	83	84	81-148	1	30				
Chlorobenzene	101	100	78-133	1	30				
Chloroethane	80	80	70-139	0	30				
Chloroform	100	101	86-136	1	30				
Chloromethane	76	76	55-152	0	30				

*- Outside of specification

** - This limit was used in the evaluation of the final result for the blank

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: IBM c/o Sanborn Head and Assoc
Reported: 07/03/12 at 07:12 PM

Group Number: 1317054

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

<u>Analysis Name</u>	<u>MS</u> <u>%REC</u>	<u>MSD</u> <u>%REC</u>	<u>MS/MSD</u> <u>Limits</u>	<u>RPD</u> <u>RPD</u>	<u>RPD</u> <u>MAX</u>	<u>BKG</u> <u>Conc</u>	<u>DUP</u> <u>Conc</u>	<u>DUP</u> <u>RPD</u>	<u>Dup RPD</u> <u>Max</u>
2-Chlorotoluene	102	101	81-120	0	30				
4-Chlorotoluene	100	101	82-119	0	30				
1,2-Dibromo-3-chloropropane	144	108	55-156	28	30				
Dibromochloromethane	104	101	79-125	3	30				
1,2-Dibromoethane	109	109	84-127	0	30				
Dibromomethane	105	104	83-126	1	30				
1,2-Dichlorobenzene	103	102	83-117	1	30				
1,3-Dichlorobenzene	103	103	81-118	0	30				
1,4-Dichlorobenzene	104	103	79-120	1	30				
Dichlorodifluoromethane	49	50	39-155	1	30				
1,1-Dichloroethane	66 (2)	77 (2)	88-136	1	30				
1,2-Dichloroethane	102	102	82-135	0	30				
1,1-Dichloroethene	94	97	83-150	3	30				
cis-1,2-Dichloroethene	76 (2)	72 (2)	82-129	0	30				
trans-1,2-Dichloroethene	-145 (2)	-80 (2)	88-127	1	30				
1,2-Dichloropropane	109	110	91-126	1	30				
1,3-Dichloropropane	109	107	80-127	2	30				
2,2-Dichloropropane	91	92	80-134	1	30				
1,1-Dichloropropene	91	92	86-139	1	30				
cis-1,3-Dichloropropene	102	100	74-132	2	30				
trans-1,3-Dichloropropene	105	102	71-128	3	30				
Ethylbenzene	95	98	80-140	1	30				
Freon 113	81*	83*	87-158	2	30				
Hexachlorobutadiene	89	90	84-128	1	30				
Isopropylbenzene	103	103	81-133	0	30				
p-Isopropyltoluene	102	100	84-124	2	30				
Methylene Chloride	109	108	84-122	0	30				
Naphthalene	95	97	70-131	0	30				
n-Propylbenzene	98	99	79-131	1	30				
Styrene	124	123	63-151	1	30				
1,1,1,2-Tetrachloroethane	98	97	87-126	1	30				
1,1,2,2-Tetrachloroethane	117	117	75-131	1	30				
Tetrachloroethene	89	91	63-156	2	30				
Tetrahydrofuran	134	99	56-154	30	30				
Toluene	95 (2)	98 (2)	83-127	1	30				
1,2,3-Trichlorobenzene	110	111	73-125	1	30				
1,2,4-Trichlorobenzene	118	118	77-120	0	30				
1,1,1-Trichloroethane	82*	87	85-140	2	30				
1,1,2-Trichloroethane	189*	189*	85-129	0	30				
Trichloroethene	99	110	85-131	6	30				
Trichlorofluoromethane	74	74	67-161	0	30				
1,2,3-Trichloropropane	116	110	76-120	5	30				
1,2,4-Trimethylbenzene	81 (2)	84 (2)	87-126	0	30				
1,3,5-Trimethylbenzene	99	101	89-129	1	30				
Vinyl Chloride	-2 (2)	6 (2)	65-151	1	30				
Xylene (Total)	100	102	81-137	0	30				

Surrogate Quality Control

*- Outside of specification

** - This limit was used in the evaluation of the final result for the blank

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: IBM c/o Sanborn Head and Assoc
Reported: 07/03/12 at 07:12 PM

Group Number: 1317054

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: EPA SW846/8260 (water-25ml) #1
Batch number: C121781AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
6694166	93	100	94	85
6694168	93	101	95	85
6694169	93	102	93	84
6694170	94	103	92	85
6694171	94	102	95	86
6694172	94	103	91	84
Blank	92	101	96	86
LCS	90	99	98	89
LCSD	89	97	98	90
<hr/>				
Limits:	77-114	74-113	77-110	78-110

Analysis Name: EPA SW846/8260 (water-25ml) #1
Batch number: C121811AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
6694173	98	102	97	92
6694174	99	104	97	93
6694175	100	104	99	93
Blank	97	104	99	94
LCS	96	100	101	99
LCSD	96	101	102	98
<hr/>				
Limits:	77-114	74-113	77-110	78-110

Analysis Name: EPA SW846/8260 (water-25ml) #1
Batch number: C121812AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
6694167	100	107	99	95
6694176	100	107	98	93
6694177	99	104	99	93
Blank	99	105	99	93
LCS	97	103	102	98
MS	98	102	103	99
MSD	97	101	102	99
<hr/>				
Limits:	77-114	74-113	77-110	78-110

Analysis Name: EPA SW846/8260 (water-25ml) #1
Batch number: C121841AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
6694179	98	105	100	95
Blank	96	103	100	97
LCS	95	100	101	98
LCSD	96	103	102	100
<hr/>				
Limits:	77-114	74-113	77-110	78-110

*- Outside of specification

** - This limit was used in the evaluation of the final result for the blank

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: IBM c/o Sanborn Head and Assoc
Reported: 07/03/12 at 07:12 PM

Group Number: 1317054

Surrogate Quality Control

Analysis Name: EPA SW846/8260 (water-25ml) #1
Batch number: G121841AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
6694178	100	99	96	97
Blank	100	103	96	97
LCS	101	102	97	97
LCSD	100	104	96	97
Limits:	77-114	74-113	77-110	78-110

*- Outside of specification

** - This limit was used in the evaluation of the final result for the blank

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

9671/1317054/6694166-79

Shipping Group:1 SANBORN HEAD 95 High St Portland, ME 04101 P (207) 761-9300 F (207) 761-9339	Chain-of-Custody To: Lancaster Laboratories, Inc. 2425 New Holland Pike PO Box 12425 Lancaster, PA 17605-2425 P (717) 656-2300 F (717) 656-2681	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:30%;">Relinquished By:</th> <th style="width:30%;">Date / Time</th> <th style="width:30%;">Received By:</th> <th style="width:30%;">Date / Time</th> </tr> <tr> <td style="text-align: center;">Jessica Purice</td> <td style="text-align: center;">6/19/12 1830</td> <td style="text-align: center;">[Signature]</td> <td style="text-align: center;">6/20/12 920</td> </tr> <tr> <td style="text-align: center;">[Signature]</td> <td></td> <td style="text-align: center;">[Signature]</td> <td></td> </tr> <tr> <td></td> <td></td> <td style="text-align: center;">[Signature]</td> <td></td> </tr> </table>	Relinquished By:	Date / Time	Received By:	Date / Time	Jessica Purice	6/19/12 1830	[Signature]	6/20/12 920	[Signature]		[Signature]				[Signature]	
Relinquished By:	Date / Time	Received By:	Date / Time															
Jessica Purice	6/19/12 1830	[Signature]	6/20/12 920															
[Signature]		[Signature]																
		[Signature]																

Project Information	Deliverable Information	Other Information
Name: Supplemental VI Assessment	TAT: Standard	SGD Complete? Yes
Number: 2732.05	Delivery Method: Email	Internal COC Required? No
Location: Manassas, Virginia	Email To: ebradstreet@sanbornhead.com	Site Specific QA/QC? DUPS
Manager: Erica Bradstreet	Data Package Option:	
Account #:	EDD Type: SHDMS	
Quote #:		IBM Manassas VOCs list 6396

Lab ID (Lab Use Only)	Sample Name	Collection		Matrix	Top Depth	Bottom Depth	Filtered? (Field / Lab)	S260B/HCl						Remarks:
		Date	Time											
	DUP1	6/18/2012	1550	GW	80	80		3						
	EB1	6/18/2012	1730	AQ				2						
	FB1	6/18/2012	1735	AQ				2						
	OF54	6/18/2012	1630	GW	73.4	73.4		3						
	OF55	6/18/2012	1550	GW	80	80		3						
	SG102I	6/18/2012	1430	GW	21.8	21.8		3						
	SG106D	6/18/2012	1710	GW	41.8	41.8		1						
	SG106I	6/18/2012	1705	GW	25.3	25.3		3						
	SG108I	6/18/2012	1645	GW	26.9	26.9		3						
	SG111D	6/18/2012	1620	GW	44.2	44.2		3						

9671 / 1317054 / 0694166-79

Shipping Group:1 SANBORN HEAD 95 High St Portland, ME 04101 P (207) 761-9300 F (207) 761-9339	Chain-of-Custody To: Lancaster Laboratories, Inc. 2425 New Holland Pike PO Box 12425 Lancaster, PA 17605-2425 P (717) 656-2300 F (717) 656-2681	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:30%;">Relinquished By:</th> <th style="width:30%;">Date / Time</th> <th style="width:30%;">Received By:</th> <th style="width:30%;">Date / Time</th> </tr> <tr> <td>Justin Pura</td> <td>6/19/12 1830</td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td>ZZ</td> <td>6/20/12 920</td> </tr> </table>	Relinquished By:	Date / Time	Received By:	Date / Time	Justin Pura	6/19/12 1830													ZZ	6/20/12 920
Relinquished By:	Date / Time	Received By:	Date / Time																			
Justin Pura	6/19/12 1830																					
		ZZ	6/20/12 920																			

Project Information	Deliverable Information	Other Information
Name: Supplemental VI Assessment	TAT: Standard	SGD Complete? Yes
Number: 2732.05	Delivery Method: Email	Internal COC Required? No
Location: Manassas, Virginia	Email To: ebradstreet@sanbornhead.com	Site Specific QA/QC? DUPS
Manager: Erica Bradstreet	Data Package Option:	
Account #:	EDD Type: SHDMS	
Quote #:		IBM Manassas VOCs list 6396

Lab ID (Lab Use Only)	Sample Name	Collection		Matrix	Top Depth	Bottom Depth	Filtered? (Field / Lab)	8260B/HCl						Remarks:
		Date	Time											
	SG111I	6/18/2012	1615	GW	30.3	30.3		1						
	SG113D	6/18/2012	1540	GW	42.2	42.2		1						
	SG113I	6/18/2012	1515	GW	24.4	24.4		3						
	TB1	6/12/2012		AQ				2						

Environmental Sample Administration
Receipt Documentation Log

Client/Project: Sanborn Head
 Date of Receipt: 6/20/12
 Time of Receipt: 920
 Source Code: 50-1

Shipping Container Sealed: YES NO
 Custody Seal Present * : YES NO
 * Custody seal was intact unless otherwise noted in the discrepancy section
 Package: Chilled Not Chilled

Temperature of Shipping Containers							
Cooler #	Thermometer ID	Temperature (°C)	Temp Bottle (TB) or Surface Temp (ST)	Wet Ice (WI) or Dry Ice (DI) or Ice Packs (IP)	Ice Present? Y/N	Loose (L) Bagged Ice (B) or NA	Comments
1	0129951	1.8"	TB	WI	Y	B	
2	↓	1.9"	↓	↓	↓	↓	
3	↓	0.7"	↓	↓	↓	↓	
4	↓	2.4"	↓	↓	↓	↓	
5	↓	1.3"	↓	↓	↓	↓	
6			↓				

Number of Trip Blanks received NOT listed on chain of custody: 0

Paperwork Discrepancy/Unpacking Problems:

B57-601/3A 6/19/12 930 = B57-601 3B 6/19/12 930
 B57-601/3B 6/19/12 937 = B57-601 3C 6/19/12 937
 608/1 and 608/3 dates = 6/18/12, 609/1B, 609/2B, 609/3A dates = 6/18/12 (mistake cups only)
 624/3A time = 1545, trip blank vials have no labels

Unpacker Signature/Emp#: [Signature] 2308 Date/Time: 6/20/12 1324

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	BMQL	Below Minimum Quantitation Level
N.D.	none detected	MPN	Most Probable Number
TNTC	Too Numerous To Count	CP Units	cobalt-chloroplatinate units
IU	International Units	NTU	nephelometric turbidity units
umhos/cm	micromhos/cm	ng	nanogram(s)
C	degrees Celsius	F	degrees Fahrenheit
meq	milliequivalents	lb.	pound(s)
g	gram(s)	kg	kilogram(s)
µg	microgram(s)	mg	milligram(s)
mL	milliliter(s)	L	liter(s)
m³	cubic meter(s)	µL	microliter(s)
		pg/L	picogram/liter
<	less than - The number following the sign is the <u>limit of quantitation</u> , the smallest amount of analyte which can be reliably determined using this specific test.		
>	greater than		
ppm	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg), or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter of gas per liter of gas.		
ppb	parts per billion		
Dry weight basis	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.		

Data Qualifiers:

C – result confirmed by reanalysis.

J - estimated value – The result is \geq the Method Detection Limit (MDL) and $<$ the Limit of Quantitation (LOQ).

U.S. EPA CLP Data Qualifiers:

Organic Qualifiers		Inorganic Qualifiers	
A	TIC is a possible aldol-condensation product	B	Value is $<$ CRDL, but \geq IDL
B	Analyte was also detected in the blank	E	Estimated due to interference
C	Pesticide result confirmed by GC/MS	M	Duplicate injection precision not met
D	Compound quantitated on a diluted sample	N	Spike sample not within control limits
E	Concentration exceeds the calibration range of the instrument	S	Method of standard additions (MSA) used for calculation
N	Presumptive evidence of a compound (TICs only)	U	Compound was not detected
P	Concentration difference between primary and confirmation columns $>25\%$	W	Post digestion spike out of control limits
U	Compound was not detected	*	Duplicate analysis not within control limits
X,Y,Z	Defined in case narrative	+	Correlation coefficient for MSA <0.995

Analytical test results meet all requirements of NELAC unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR part 136 Table II as “analyze immediately” are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL LANCASTER LABORATORIES BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF LANCASTER LABORATORIES AND (B) WHETHER LANCASTER LABORATORIES HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Lancaster Laboratories which includes any conditions that vary from the Standard Terms and Conditions, and Lancaster hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

APPENDIX C.2

JULY 2012

CHARACTERIZATION SAMPLING

7/26/2012

Ms. Lisa Jacob
Sanborn, Head & Associates
1 Technology Park Drive

Westford MA 01886

Project Name: Supplemental VI Assessment

Project #: 2732.05

Workorder #: 1207235

Dear Ms. Lisa Jacob

The following report includes the data for the above referenced project for sample(s) received on 7/13/2012 at Air Toxics Ltd.

The data and associated QC analyzed by Modified TO-15 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Air Toxics Ltd. for your air analysis needs. Air Toxics Ltd. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Ausha Scott at 916-985-1000 if you have any questions regarding the data in this report.

Regards,



Ausha Scott

Project Manager

WORK ORDER #: 1207235

Work Order Summary

CLIENT: Ms. Lisa Jacob
 Sanborn, Head & Associates
 1 Technology Park Drive
 Westford, MA 01886

BILL TO: Accounts Payable
 Sanborn, Head & Associates
 20 Foundry Street
 Concord, NH 03301

PHONE: 978-392-0900

P.O. # 2732.00

FAX:

PROJECT # 2732.05 Supplemental VI Assessment

DATE RECEIVED: 07/13/2012

CONTACT: Ausha Scott

DATE COMPLETED: 07/26/2012

<u>FRACTION #</u>	<u>NAME</u>	<u>TEST</u>	<u>RECEIPT VAC./PRES.</u>	<u>FINAL PRESSURE</u>
01A	DUP1	Modified TO-15	6.0 "Hg	5 psi
02A	EB1	Modified TO-15	4.6 "Hg	5 psi
03A	SG114	Modified TO-15	6.0 "Hg	5 psi
04A	SG118S	Modified TO-15	7.2 "Hg	5 psi
05A	SG119	Modified TO-15	8.4 "Hg	5 psi
06A	SG120I	Modified TO-15	5.6 "Hg	5 psi
06AA	SG120I Lab Duplicate	Modified TO-15	5.6 "Hg	5 psi
07A	SG120S	Modified TO-15	6.6 "Hg	5 psi
08A	SG121I	Modified TO-15	6.2 "Hg	5 psi
09A	SG121S	Modified TO-15	7.6 "Hg	5 psi
10A	SG122	Modified TO-15	5.6 "Hg	5 psi
11A	SG123S	Modified TO-15	6.0 "Hg	5 psi
12A	SG31S	Modified TO-15	6.6 "Hg	5 psi
12AA	SG31S Lab Duplicate	Modified TO-15	6.6 "Hg	5 psi
13A	Lab Blank	Modified TO-15	NA	NA
13B	Lab Blank	Modified TO-15	NA	NA
14A	CCV	Modified TO-15	NA	NA
14B	CCV	Modified TO-15	NA	NA
15A	LCS	Modified TO-15	NA	NA
15AA	LCSD	Modified TO-15	NA	NA
15B	LCS	Modified TO-15	NA	NA
15BB	LCSD	Modified TO-15	NA	NA

CERTIFIED BY: 

DATE: 07/26/12

Technical Director

Certification numbers: AZ Licensure AZ0719, CA NELAP - 02110CA, LA NELAP - 02089,
 NY NELAP - 11291, TX NELAP - T104704434-11-3, UT NELAP -CA009332011-1, WA NELAP - C935
 Name of Accrediting Agency: NELAP/Florida Department of Health, Scope of Application: Clean Air Act,
 Accreditation number: E87680, Effective date: 07/01/11 , Expiration date: 06/30/12.

Air Toxics Ltd. certifies that the test results contained in this report meet all requirements of the NELAC standards

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180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
 (916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
EPA Method TO-15
Sanborn, Head & Associates
Workorder# 1207235

Twelve 1 Liter Summa Canister (100% Certified) samples were received on July 13, 2012. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan mode.

This workorder was independently validated prior to submittal using 'USEPA National Functional Guidelines' as generally applied to the analysis of volatile organic compounds in air. A rules-based, logic driven, independent validation engine was employed to assess completeness, evaluate pass/fail of relevant project quality control requirements and verification of all quantified amounts.

Receiving Notes

The Chain of Custody (COC) information for sample SG119 did not match the information on the canister with regard to canister identification. The client was notified of the discrepancy and the information on the canister was used to process and report the sample.

Analytical Notes

Dilution was performed on samples SG120I, SG120I Lab Duplicate, SG31S and SG31S Lab Duplicate due to the presence of high level target species.

Definition of Data Qualifying Flags

Eight qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit.

UJ- Non-detected compound associated with low bias in the CCV and/or LCS.

N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

Summary of Detected Compounds EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: DUP1

Lab ID#: 1207235-01A

No Detections Were Found.

Client Sample ID: EB1

Lab ID#: 1207235-02A

No Detections Were Found.

Client Sample ID: SG114

Lab ID#: 1207235-03A

No Detections Were Found.

Client Sample ID: SG118S

Lab ID#: 1207235-04A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.88	12	2.2	30
Tetrachloroethene	0.88	1.4	6.0	9.8

Client Sample ID: SG119

Lab ID#: 1207235-05A

No Detections Were Found.

Client Sample ID: SG120I

Lab ID#: 1207235-06A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	16	78	89	420
Tetrachloroethene	16	4400	110	30000

Client Sample ID: SG120I Lab Duplicate

Lab ID#: 1207235-06AA

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	16	84	89	450

Summary of Detected Compounds EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: SG120I Lab Duplicate

Lab ID#: 1207235-06AA

Tetrachloroethene	16	4100	110	28000
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Client Sample ID: SG120S

Lab ID#: 1207235-07A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	0.86	8.2	5.8	56

Client Sample ID: SG121I

Lab ID#: 1207235-08A

No Detections Were Found.

Client Sample ID: SG121S

Lab ID#: 1207235-09A

No Detections Were Found.

Client Sample ID: SG122

Lab ID#: 1207235-10A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	0.82	9.4	5.6	64

Client Sample ID: SG123S

Lab ID#: 1207235-11A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	0.84	19	5.7	130

Client Sample ID: SG31S

Lab ID#: 1207235-12A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	17	450	44	1200

**Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN**

Client Sample ID: SG31S

Lab ID#: 1207235-12A

trans-1,2-Dichloroethene	17	340	68	1300
cis-1,2-Dichloroethene	17	3800	68	15000
Trichloroethene	17	690	92	3700
Tetrachloroethene	17	210	120	1400

Client Sample ID: SG31S Lab Duplicate

Lab ID#: 1207235-12AA

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	17	410	44	1000
trans-1,2-Dichloroethene	17	310	68	1200
cis-1,2-Dichloroethene	17	3600	68	14000
Trichloroethene	17	690	92	3700
Tetrachloroethene	17	230	120	1600



Air Toxics

Client Sample ID: DUP1

Lab ID#: 1207235-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	o071813	Date of Collection:	7/11/12 11:51:00 AM
Dil. Factor:	1.68	Date of Analysis:	7/18/12 05:44 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.84	Not Detected	2.1	Not Detected
trans-1,2-Dichloroethene	0.84	Not Detected	3.3	Not Detected
cis-1,2-Dichloroethene	0.84	Not Detected	3.3	Not Detected
Trichloroethene	0.84	Not Detected	4.5	Not Detected
1,1,2-Trichloroethane	0.84	Not Detected	4.6	Not Detected
Tetrachloroethene	0.84	Not Detected	5.7	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	90	70-130
1,2-Dichloroethane-d4	86	70-130
4-Bromofluorobenzene	103	70-130



Air Toxics

Client Sample ID: EB1

Lab ID#: 1207235-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	o071909	Date of Collection:	7/12/12 12:15:00 PM
Dil. Factor:	2.50	Date of Analysis:	7/19/12 04:57 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.2	Not Detected
trans-1,2-Dichloroethene	1.2	Not Detected	5.0	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	5.0	Not Detected
Trichloroethene	1.2	Not Detected	6.7	Not Detected
1,1,2-Trichloroethane	1.2	Not Detected	6.8	Not Detected
Tetrachloroethene	1.2	Not Detected	8.5	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	89	70-130
1,2-Dichloroethane-d4	90	70-130
4-Bromofluorobenzene	108	70-130



Client Sample ID: SG114

Lab ID#: 1207235-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	o071814	Date of Collection: 7/11/12 11:51:00 AM
Dil. Factor:	1.68	Date of Analysis: 7/18/12 06:21 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.84	Not Detected	2.1	Not Detected
trans-1,2-Dichloroethene	0.84	Not Detected	3.3	Not Detected
cis-1,2-Dichloroethene	0.84	Not Detected	3.3	Not Detected
Trichloroethene	0.84	Not Detected	4.5	Not Detected
1,1,2-Trichloroethane	0.84	Not Detected	4.6	Not Detected
Tetrachloroethene	0.84	Not Detected	5.7	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	90	70-130
1,2-Dichloroethane-d4	79	70-130
4-Bromofluorobenzene	106	70-130

Client Sample ID: SG118S

Lab ID#: 1207235-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	o071815	Date of Collection:	7/9/12 4:07:00 PM
Dil. Factor:	1.76	Date of Analysis:	7/18/12 06:57 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.88	12	2.2	30
trans-1,2-Dichloroethene	0.88	Not Detected	3.5	Not Detected
cis-1,2-Dichloroethene	0.88	Not Detected	3.5	Not Detected
Trichloroethene	0.88	Not Detected	4.7	Not Detected
1,1,2-Trichloroethane	0.88	Not Detected	4.8	Not Detected
Tetrachloroethene	0.88	1.4	6.0	9.8

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	90	70-130
1,2-Dichloroethane-d4	86	70-130
4-Bromofluorobenzene	104	70-130



Air Toxics

Client Sample ID: SG119

Lab ID#: 1207235-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	o071910	Date of Collection:	7/9/12 4:55:00 PM
Dil. Factor:	2.62	Date of Analysis:	7/19/12 05:34 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.3	Not Detected	3.3	Not Detected
trans-1,2-Dichloroethene	1.3	Not Detected	5.2	Not Detected
cis-1,2-Dichloroethene	1.3	Not Detected	5.2	Not Detected
Trichloroethene	1.3	Not Detected	7.0	Not Detected
1,1,2-Trichloroethane	1.3	Not Detected	7.1	Not Detected
Tetrachloroethene	1.3	Not Detected	8.9	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	92	70-130
1,2-Dichloroethane-d4	89	70-130
4-Bromofluorobenzene	94	70-130



Air Toxics

Client Sample ID: SG120I

Lab ID#: 1207235-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	o071816	Date of Collection:	7/9/12 3:58:00 PM
Dil. Factor:	33.0	Date of Analysis:	7/18/12 07:34 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	16	Not Detected	42	Not Detected
trans-1,2-Dichloroethene	16	Not Detected	65	Not Detected
cis-1,2-Dichloroethene	16	Not Detected	65	Not Detected
Trichloroethene	16	78	89	420
1,1,2-Trichloroethane	16	Not Detected	90	Not Detected
Tetrachloroethene	16	4400	110	30000

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	88	70-130
1,2-Dichloroethane-d4	85	70-130
4-Bromofluorobenzene	102	70-130



Air Toxics

Client Sample ID: SG120I Lab Duplicate

Lab ID#: 1207235-06AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	o071831	Date of Collection:	7/9/12 3:58:00 PM
Dil. Factor:	33.0	Date of Analysis:	7/19/12 04:48 AM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	16	Not Detected	42	Not Detected
trans-1,2-Dichloroethene	16	Not Detected	65	Not Detected
cis-1,2-Dichloroethene	16	Not Detected	65	Not Detected
Trichloroethene	16	84	89	450
1,1,2-Trichloroethane	16	Not Detected	90	Not Detected
Tetrachloroethene	16	4100	110	28000

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	89	70-130
1,2-Dichloroethane-d4	89	70-130
4-Bromofluorobenzene	95	70-130



Air Toxics

Client Sample ID: SG120S

Lab ID#: 1207235-07A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	o071818	Date of Collection:	7/9/12 3:57:00 PM
Dil. Factor:	1.72	Date of Analysis:	7/18/12 08:48 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.86	Not Detected	2.2	Not Detected
trans-1,2-Dichloroethene	0.86	Not Detected	3.4	Not Detected
cis-1,2-Dichloroethene	0.86	Not Detected	3.4	Not Detected
Trichloroethene	0.86	Not Detected	4.6	Not Detected
1,1,2-Trichloroethane	0.86	Not Detected	4.7	Not Detected
Tetrachloroethene	0.86	8.2	5.8	56

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	89	70-130
1,2-Dichloroethane-d4	90	70-130
4-Bromofluorobenzene	103	70-130



Client Sample ID: SG121I

Lab ID#: 1207235-08A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	o071819	Date of Collection: 7/9/12 3:18:00 PM
Dil. Factor:	1.69	Date of Analysis: 7/18/12 09:25 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.84	Not Detected	2.2	Not Detected
trans-1,2-Dichloroethene	0.84	Not Detected	3.4	Not Detected
cis-1,2-Dichloroethene	0.84	Not Detected	3.4	Not Detected
Trichloroethene	0.84	Not Detected	4.5	Not Detected
1,1,2-Trichloroethane	0.84	Not Detected	4.6	Not Detected
Tetrachloroethene	0.84	Not Detected	5.7	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	87	70-130
1,2-Dichloroethane-d4	93	70-130
4-Bromofluorobenzene	99	70-130



Air Toxics

Client Sample ID: SG121S

Lab ID#: 1207235-09A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	o071821	Date of Collection:	7/9/12 3:17:00 PM
Dil. Factor:	1.79	Date of Analysis:	7/18/12 10:39 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.90	Not Detected	2.3	Not Detected
trans-1,2-Dichloroethene	0.90	Not Detected	3.5	Not Detected
cis-1,2-Dichloroethene	0.90	Not Detected	3.5	Not Detected
Trichloroethene	0.90	Not Detected	4.8	Not Detected
1,1,2-Trichloroethane	0.90	Not Detected	4.9	Not Detected
Tetrachloroethene	0.90	Not Detected	6.1	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	83	70-130
1,2-Dichloroethane-d4	86	70-130
4-Bromofluorobenzene	98	70-130



Air Toxics

Client Sample ID: SG122

Lab ID#: 1207235-10A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	o071822	Date of Collection:	7/11/12 11:03:00 AM
Dil. Factor:	1.65	Date of Analysis:	7/18/12 11:16 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.82	Not Detected	2.1	Not Detected
trans-1,2-Dichloroethene	0.82	Not Detected	3.3	Not Detected
cis-1,2-Dichloroethene	0.82	Not Detected	3.3	Not Detected
Trichloroethene	0.82	Not Detected	4.4	Not Detected
1,1,2-Trichloroethane	0.82	Not Detected	4.5	Not Detected
Tetrachloroethene	0.82	9.4	5.6	64

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	82	70-130
1,2-Dichloroethane-d4	82	70-130
4-Bromofluorobenzene	92	70-130



Air Toxics

Client Sample ID: SG123S

Lab ID#: 1207235-11A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	o071823	Date of Collection:	7/11/12 11:04:00 AM
Dil. Factor:	1.68	Date of Analysis:	7/18/12 11:52 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.84	Not Detected	2.1	Not Detected
trans-1,2-Dichloroethene	0.84	Not Detected	3.3	Not Detected
cis-1,2-Dichloroethene	0.84	Not Detected	3.3	Not Detected
Trichloroethene	0.84	Not Detected	4.5	Not Detected
1,1,2-Trichloroethane	0.84	Not Detected	4.6	Not Detected
Tetrachloroethene	0.84	19	5.7	130

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	90	70-130
1,2-Dichloroethane-d4	80	70-130
4-Bromofluorobenzene	95	70-130



Air Toxics

Client Sample ID: SG31S

Lab ID#: 1207235-12A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	o071911	Date of Collection:	7/12/12 9:42:00 AM
Dil. Factor:	34.4	Date of Analysis:	7/19/12 06:11 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	17	450	44	1200
trans-1,2-Dichloroethene	17	340	68	1300
cis-1,2-Dichloroethene	17	3800	68	15000
Trichloroethene	17	690	92	3700
1,1,2-Trichloroethane	17	Not Detected	94	Not Detected
Tetrachloroethene	17	210	120	1400

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	92	70-130
1,2-Dichloroethane-d4	91	70-130
4-Bromofluorobenzene	99	70-130



Air Toxics

Client Sample ID: SG31S Lab Duplicate

Lab ID#: 1207235-12AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	o071912	Date of Collection:	7/12/12 9:42:00 AM
Dil. Factor:	34.4	Date of Analysis:	7/19/12 06:48 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	17	410	44	1000
trans-1,2-Dichloroethene	17	310	68	1200
cis-1,2-Dichloroethene	17	3600	68	14000
Trichloroethene	17	690	92	3700
1,1,2-Trichloroethane	17	Not Detected	94	Not Detected
Tetrachloroethene	17	230	120	1600

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	92	70-130
1,2-Dichloroethane-d4	86	70-130
4-Bromofluorobenzene	98	70-130



Air Toxics

Client Sample ID: Lab Blank

Lab ID#: 1207235-13A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	o071807	Date of Collection:	NA
Dil. Factor:	1.00	Date of Analysis:	7/18/12 01:07 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
trans-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
1,1,2-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	96	70-130
1,2-Dichloroethane-d4	83	70-130
4-Bromofluorobenzene	99	70-130



Client Sample ID: Lab Blank

Lab ID#: 1207235-13B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	o071907	Date of Collection:	NA
Dil. Factor:	1.00	Date of Analysis:	7/19/12 02:57 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
trans-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
1,1,2-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	86	70-130
1,2-Dichloroethane-d4	88	70-130
4-Bromofluorobenzene	98	70-130

Client Sample ID: CCV

Lab ID#: 1207235-14A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	o071802	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 7/18/12 09:38 AM

Compound	%Recovery
Vinyl Chloride	103
trans-1,2-Dichloroethene	108
cis-1,2-Dichloroethene	113
Trichloroethene	101
1,1,2-Trichloroethane	113
Tetrachloroethene	112

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	90	70-130
1,2-Dichloroethane-d4	81	70-130
4-Bromofluorobenzene	94	70-130

Client Sample ID: CCV

Lab ID#: 1207235-14B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	o071902	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 7/19/12 11:54 AM

Compound	%Recovery
Vinyl Chloride	104
trans-1,2-Dichloroethene	106
cis-1,2-Dichloroethene	110
Trichloroethene	102
1,1,2-Trichloroethane	113
Tetrachloroethene	109

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130
1,2-Dichloroethane-d4	91	70-130
4-Bromofluorobenzene	98	70-130

Client Sample ID: LCS

Lab ID#: 1207235-15A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	o071803	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 7/18/12 10:36 AM

Compound	%Recovery
Vinyl Chloride	103
trans-1,2-Dichloroethene	121
cis-1,2-Dichloroethene	109
Trichloroethene	103
1,1,2-Trichloroethane	115
Tetrachloroethene	114

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	88	70-130
1,2-Dichloroethane-d4	81	70-130
4-Bromofluorobenzene	97	70-130

Client Sample ID: LCSD

Lab ID#: 1207235-15AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	o071804	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 7/18/12 11:13 AM

Compound	%Recovery
Vinyl Chloride	96
trans-1,2-Dichloroethene	115
cis-1,2-Dichloroethene	106
Trichloroethene	100
1,1,2-Trichloroethane	108
Tetrachloroethene	107

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	90	70-130
1,2-Dichloroethane-d4	79	70-130
4-Bromofluorobenzene	97	70-130

Client Sample ID: LCS

Lab ID#: 1207235-15B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	o071903	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 7/19/12 12:30 PM

Compound	%Recovery
Vinyl Chloride	114
trans-1,2-Dichloroethene	124
cis-1,2-Dichloroethene	109
Trichloroethene	107
1,1,2-Trichloroethane	108
Tetrachloroethene	112

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	89	70-130
1,2-Dichloroethane-d4	86	70-130
4-Bromofluorobenzene	94	70-130

Client Sample ID: LCSD

Lab ID#: 1207235-15BB

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	o071904	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 7/19/12 01:07 PM

Compound	%Recovery
Vinyl Chloride	109
trans-1,2-Dichloroethene	121
cis-1,2-Dichloroethene	108
Trichloroethene	98
1,1,2-Trichloroethane	112
Tetrachloroethene	106

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	92	70-130
1,2-Dichloroethane-d4	87	70-130
4-Bromofluorobenzene	98	70-130

7/30/2012

Ms. Lisa Jacob
Sanborn, Head & Associates
1 Technology Park Drive

Westford MA 01886

Project Name: Supplemental VI Assessment

Project #: 2732.05

Workorder #: 1207320

Dear Ms. Lisa Jacob

The following report includes the data for the above referenced project for sample(s) received on 7/18/2012 at Air Toxics Ltd.

The data and associated QC analyzed by Modified TO-15 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Air Toxics Ltd. for your air analysis needs. Air Toxics Ltd. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Ausha Scott at 916-985-1000 if you have any questions regarding the data in this report.

Regards,



Ausha Scott

Project Manager

WORK ORDER #: 1207320

Work Order Summary

CLIENT:	Ms. Lisa Jacob Sanborn, Head & Associates 1 Technology Park Drive Westford, MA 01886	BILL TO:	Accounts Payable Sanborn, Head & Associates 20 Foundry Street Concord, NH 03301
PHONE:	978-392-0900	P.O. #	2732.00
FAX:		PROJECT #	2732.05 Supplemental VI Assessment
DATE RECEIVED:	07/18/2012	CONTACT:	Ausha Scott
DATE COMPLETED:	07/30/2012		

<u>FRACTION #</u>	<u>NAME</u>	<u>TEST</u>	<u>RECEIPT VAC./PRES.</u>	<u>FINAL PRESSURE</u>
01A	SG116	Modified TO-15	8.5 "Hg	5 psi
02A	SG31D	Modified TO-15	9.0 "Hg	5 psi
02AA	SG31D Lab Duplicate	Modified TO-15	9.0 "Hg	5 psi
03A	Lab Blank	Modified TO-15	NA	NA
04A	CCV	Modified TO-15	NA	NA
05A	LCS	Modified TO-15	NA	NA
05AA	LCSD	Modified TO-15	NA	NA

CERTIFIED BY: 

 Technical Director

DATE: 07/30/12

Certification numbers: AZ Licensure AZ0775, CA NELAP - 12282CA, NY NELAP - 11291,
 TX NELAP - T104704434-12-5, UT NELAP CA009332012-3, WA NELAP - C935

Name of Accrediting Agency: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)

Accreditation number: CA300005, Effective date: 10/18/2011, Expiration date: 10/17/2012.

Eurofins Air Toxics Ltd. certifies that the test results contained in this report meet all requirements of the NELAC standards

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180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630

(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
EPA Method TO-15
Sanborn, Head & Associates
Workorder# 1207320

Two 1 Liter Summa Canister (100% Certified) samples were received on July 18, 2012. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan mode.

This workorder was independently validated prior to submittal using 'USEPA National Functional Guidelines' as generally applied to the analysis of volatile organic compounds in air. A rules-based, logic driven, independent validation engine was employed to assess completeness, evaluate pass/fail of relevant project quality control requirements and verification of all quantified amounts.

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

Dilution was performed on sample SG31D due to the presence of high level target species.

Definition of Data Qualifying Flags

Eight qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit.

UJ- Non-detected compound associated with low bias in the CCV and/or LCS.

N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

**Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN**

Client Sample ID: SG116

Lab ID#: 1207320-01A

No Detections Were Found.

Client Sample ID: SG31D

Lab ID#: 1207320-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.3	390	3.2	1000
trans-1,2-Dichloroethene	1.3	38	5.0	150
cis-1,2-Dichloroethene	1.3	470	5.0	1900
Trichloroethene	1.3	50	6.8	270
Tetrachloroethene	1.3	6.7	8.6	46

Client Sample ID: SG31D Lab Duplicate

Lab ID#: 1207320-02AA

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.3	410	3.3	1000
trans-1,2-Dichloroethene	1.3	39	5.1	150
cis-1,2-Dichloroethene	1.3	500	5.1	2000
Trichloroethene	1.3	54	6.9	290
Tetrachloroethene	1.3	7.7	8.7	52



Air Toxics

Client Sample ID: SG116

Lab ID#: 1207320-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	3071913	Date of Collection:	7/16/12 11:45:00 AM
Dil. Factor:	1.87	Date of Analysis:	7/19/12 03:49 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.94	Not Detected	2.4	Not Detected
trans-1,2-Dichloroethene	0.94	Not Detected	3.7	Not Detected
cis-1,2-Dichloroethene	0.94	Not Detected	3.7	Not Detected
Trichloroethene	0.94	Not Detected	5.0	Not Detected
1,1,2-Trichloroethane	0.94	Not Detected	5.1	Not Detected
Tetrachloroethene	0.94	Not Detected	6.3	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	95	0-130
1,2-Dichloroethane-d4	101	0-130
4-Bromofluorobenzene	82	0-130

Client Sample ID: SG31D

Lab ID#: 1207320-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	3071914	Date of Collection:	7/16/12 2:46:00 PM
Dil. Factor:	2.55	Date of Analysis:	7/19/12 04:24 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.3	390	3.2	1000
trans-1,2-Dichloroethene	1.3	38	5.0	150
cis-1,2-Dichloroethene	1.3	470	5.0	1900
Trichloroethene	1.3	50	6.8	270
1,1,2-Trichloroethane	1.3	Not Detected	7.0	Not Detected
Tetrachloroethene	1.3	6.7	8.6	46

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	91	0-130
1,2-Dichloroethane-d4	104	0-130
4-Bromofluorobenzene	81	0-130



Air Toxics

Client Sample ID: SG31D Lab Duplicate

Lab ID#: 1207320-02AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	3071915	Date of Collection:	7/16/12 2:46:00 PM
Dil. Factor:	2.56	Date of Analysis:	7/19/12 05:40 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.3	410	3.3	1000
trans-1,2-Dichloroethene	1.3	39	5.1	150
cis-1,2-Dichloroethene	1.3	500	5.1	2000
Trichloroethene	1.3	54	6.9	290
1,1,2-Trichloroethane	1.3	Not Detected	7.0	Not Detected
Tetrachloroethene	1.3	7.7	8.7	52

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	91	0-130
1,2-Dichloroethane-d4	103	0-130
4-Bromofluorobenzene	83	0-130

Client Sample ID: Lab Blank

Lab ID#: 1207320-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	3071912	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 7/19/12 03:00 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
trans-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
1,1,2-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	94	70-130
1,2-Dichloroethane-d4	100	70-130
4-Bromofluorobenzene	80	70-130

Client Sample ID: CCV

Lab ID#: 1207320-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	3071903	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 7/19/12 10:05 AM

Compound	%Recovery
Vinyl Chloride	112
trans-1,2-Dichloroethene	108
cis-1,2-Dichloroethene	99
Trichloroethene	101
1,1,2-Trichloroethane	102
Tetrachloroethene	94

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	91	70-130
1,2-Dichloroethane-d4	105	70-130
4-Bromofluorobenzene	83	70-130

Client Sample ID: LCS

Lab ID#: 1207320-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	3071904	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 7/19/12 10:42 AM

Compound	%Recovery
Vinyl Chloride	117
trans-1,2-Dichloroethene	125
cis-1,2-Dichloroethene	103
Trichloroethene	104
1,1,2-Trichloroethane	106
Tetrachloroethene	97

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	90	70-130
1,2-Dichloroethane-d4	102	70-130
4-Bromofluorobenzene	84	70-130

Client Sample ID: LCSD

Lab ID#: 1207320-05AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	3071907	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 7/19/12 12:10 PM

Compound	%Recovery
Vinyl Chloride	116
trans-1,2-Dichloroethene	126
cis-1,2-Dichloroethene	103
Trichloroethene	104
1,1,2-Trichloroethane	104
Tetrachloroethene	96

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	91	70-130
1,2-Dichloroethane-d4	107	70-130
4-Bromofluorobenzene	84	70-130

ANALYTICAL RESULTS

Prepared by:

Lancaster Laboratories
2425 New Holland Pike
Lancaster, PA 17605-2425

Prepared for:

Sanborn Head and Assoc
1715 W. 13th Street
Houston TX 77008

July 23, 2012

Project: Supplemental VI Assessment

Submittal Date: 07/12/2012

Group Number: 1321595

SDG: MAN27

PO Number: 2732.05

State of Sample Origin: VA

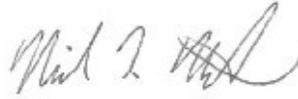
Client Sample DescriptionD86 Water
FB1 Water
SG115I Water
SG115S Water
SG11822 Water
SG118I Water
SG123I Water
SG31D Water
SG31I Water
SG117 Water
SG31 Water
TB4 WaterLancaster Labs (LLI) #6717575
6717576
6717577
6717578
6717579
6717580
6717581
6717582
6717583
6717584
6717585
6717586

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

ELECTRONIC
COPY TO
1 COPY TOSanborn Head and Assoc
Data Package Group

Attn: Erica Bradstreet

Respectfully Submitted,



Nicole L. Maljovec
Senior Specialist Group Leader

(717) 556-7259

Sample Description: D86 Water

LLI Sample # WW 6717575

Project Name: Supplemental VI Assessment

LLI Group # 1321595

Account # 09671

Collected: 07/11/2012 14:53

Sanborn Head and Assoc

Submitted: 07/12/2012 09:20

1715 W. 13th Street

Reported: 07/23/2012 20:10

Houston TX 77008

--D86 SDG#: MAN27-01

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
		purge				
02898	Benzene	71-43-2	1.0 U	1.0	0.2	2
02898	Bromobenzene	108-86-1	1.0 U	1.0	0.2	2
02898	Bromochloromethane	74-97-5	1.0 U	1.0	0.2	2
02898	Bromodichloromethane	75-27-4	0.4 J	1.0	0.2	2
02898	Bromoform	75-25-2	1.0 U	1.0	0.2	2
02898	Bromomethane	74-83-9	1.0 U	1.0	0.2	2
02898	n-Butylbenzene	104-51-8	1.0 U	1.0	0.2	2
02898	sec-Butylbenzene	135-98-8	1.0 U	1.0	0.2	2
02898	tert-Butylbenzene	98-06-6	1.0 U	1.0	0.2	2
02898	Carbon Tetrachloride	56-23-5	1.0 U	1.0	0.2	2
02898	Chlorobenzene	108-90-7	1.0 U	1.0	0.2	2
02898	Chloroethane	75-00-3	1.0 U	1.0	0.2	2
02898	Chloroform	67-66-3	2.4	1.0	0.2	2
02898	Chloromethane	74-87-3	1.0 U	1.0	0.4	2
02898	2-Chlorotoluene	95-49-8	1.0 U	1.0	0.2	2
02898	4-Chlorotoluene	106-43-4	1.0 U	1.0	0.2	2
02898	1,2-Dibromo-3-chloropropane	96-12-8	1.0 U	1.0	0.4	2
02898	Dibromochloromethane	124-48-1	1.0 U	1.0	0.2	2
02898	1,2-Dibromoethane	106-93-4	1.0 U	1.0	0.2	2
02898	Dibromomethane	74-95-3	1.0 U	1.0	0.2	2
02898	1,2-Dichlorobenzene	95-50-1	1.0 U	1.0	0.2	2
02898	1,3-Dichlorobenzene	541-73-1	1.0 U	1.0	0.2	2
02898	1,4-Dichlorobenzene	106-46-7	1.0 U	1.0	0.2	2
02898	Dichlorodifluoromethane	75-71-8	1.0 U	1.0	0.2	2
02898	1,1-Dichloroethane	75-34-3	1.0 U	1.0	0.2	2
02898	1,2-Dichloroethane	107-06-2	1.0 U	1.0	0.2	2
02898	1,1-Dichloroethene	75-35-4	1.0 U	1.0	0.2	2
02898	cis-1,2-Dichloroethene	156-59-2	1.6	1.0	0.2	2
02898	trans-1,2-Dichloroethene	156-60-5	1.0 U	1.0	0.2	2
02898	1,2-Dichloropropane	78-87-5	1.0 U	1.0	0.2	2
02898	1,3-Dichloropropane	142-28-9	1.0 U	1.0	0.2	2
02898	2,2-Dichloropropane	594-20-7	1.0 U	1.0	0.2	2
02898	1,1-Dichloropropene	563-58-6	1.0 U	1.0	0.2	2
02898	cis-1,3-Dichloropropene	10061-01-5	1.0 U	1.0	0.2	2
02898	trans-1,3-Dichloropropene	10061-02-6	1.0 U	1.0	0.2	2
02898	Ethylbenzene	100-41-4	1.0 U	1.0	0.2	2
02898	Freon 113	76-13-1	1.0 U	1.0	0.4	2
02898	Hexachlorobutadiene	87-68-3	1.0 U	1.0	0.2	2
02898	Isopropylbenzene	98-82-8	1.0 U	1.0	0.2	2
02898	p-Isopropyltoluene	99-87-6	1.0 U	1.0	0.2	2
02898	Methylene Chloride	75-09-2	1.0 U	1.0	0.4	2
02898	Naphthalene	91-20-3	1.0 U	1.0	0.2	2
02898	n-Propylbenzene	103-65-1	1.0 U	1.0	0.2	2
02898	Styrene	100-42-5	1.0 U	1.0	0.2	2
02898	1,1,1,2-Tetrachloroethane	630-20-6	1.0 U	1.0	0.2	2
02898	1,1,2,2-Tetrachloroethane	79-34-5	1.0 U	1.0	0.2	2
02898	Tetrachloroethene	127-18-4	450	10	2.0	20
02898	Tetrahydrofuran	109-99-9	10 U	10	4.0	2
02898	Toluene	108-88-3	0.3 J	1.0	0.2	2
02898	1,2,3-Trichlorobenzene	87-61-6	1.0 U	1.0	0.2	2
02898	1,2,4-Trichlorobenzene	120-82-1	1.0 U	1.0	0.2	2

*=This limit was used in the evaluation of the final result

Sample Description: D86 Water

LLI Sample # WW 6717575

Project Name: Supplemental VI Assessment

LLI Group # 1321595

Account # 09671

Collected: 07/11/2012 14:53

Sanborn Head and Assoc

Submitted: 07/12/2012 09:20

1715 W. 13th Street

Reported: 07/23/2012 20:10

Houston TX 77008

--D86 SDG#: MAN27-01

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
	purge					
02898	1,1,1-Trichloroethane	71-55-6	1.0 U	1.0	0.2	2
02898	1,1,2-Trichloroethane	79-00-5	1.0 U	1.0	0.2	2
02898	Trichloroethene	79-01-6	5.6	1.0	0.2	2
02898	Trichlorofluoromethane	75-69-4	1.0 U	1.0	0.2	2
02898	1,2,3-Trichloropropane	96-18-4	2.0 U	2.0	0.6	2
02898	1,2,4-Trimethylbenzene	95-63-6	1.0 U	1.0	0.2	2
02898	1,3,5-Trimethylbenzene	108-67-8	1.0 U	1.0	0.2	2
02898	Vinyl Chloride	75-01-4	1.0 U	1.0	0.2	2
02898	Xylene (Total)	1330-20-7	1.0 U	1.0	0.2	2

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02898	Former 8021 Manassas, VA VOCs	SW-846 8260B 25mL purge	1	C122011AA	07/19/2012 13:39	Kerri E Legerlotz	2
02898	Former 8021 Manassas, VA VOCs	SW-846 8260B 25mL purge	1	C122011AA	07/19/2012 14:01	Kerri E Legerlotz	20
01163	GC/MS VOA Water Prep	SW-846 5030B	1	C122011AA	07/19/2012 13:39	Kerri E Legerlotz	2
01163	GC/MS VOA Water Prep	SW-846 5030B	2	C122011AA	07/19/2012 14:01	Kerri E Legerlotz	20

Sample Description: **FB1 Water**

LLI Sample # **WW 6717576**

Project Name: **Supplemental VI Assessment**

LLI Group # **1321595**

Account # **09671**

Collected: 07/11/2012 17:45

Sanborn Head and Assoc

Submitted: 07/12/2012 09:20

1715 W. 13th Street

Reported: 07/23/2012 20:10

Houston TX 77008

MNNF1 SDG#: MAN27-02FB

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
	purge					
02898	Benzene	71-43-2	0.5 U	0.5	0.1	1
02898	Bromobenzene	108-86-1	0.5 U	0.5	0.1	1
02898	Bromochloromethane	74-97-5	0.5 U	0.5	0.1	1
02898	Bromodichloromethane	75-27-4	0.5 U	0.5	0.1	1
02898	Bromoform	75-25-2	0.5 U	0.5	0.1	1
02898	Bromomethane	74-83-9	0.5 U	0.5	0.1	1
02898	n-Butylbenzene	104-51-8	0.5 U	0.5	0.1	1
02898	sec-Butylbenzene	135-98-8	0.5 U	0.5	0.1	1
02898	tert-Butylbenzene	98-06-6	0.5 U	0.5	0.1	1
02898	Carbon Tetrachloride	56-23-5	0.5 U	0.5	0.1	1
02898	Chlorobenzene	108-90-7	0.5 U	0.5	0.1	1
02898	Chloroethane	75-00-3	0.5 U	0.5	0.1	1
02898	Chloroform	67-66-3	0.5 U	0.5	0.1	1
02898	Chloromethane	74-87-3	0.5 U	0.5	0.2	1
02898	2-Chlorotoluene	95-49-8	0.5 U	0.5	0.1	1
02898	4-Chlorotoluene	106-43-4	0.5 U	0.5	0.1	1
02898	1,2-Dibromo-3-chloropropane	96-12-8	0.5 U	0.5	0.2	1
02898	Dibromochloromethane	124-48-1	0.5 U	0.5	0.1	1
02898	1,2-Dibromoethane	106-93-4	0.5 U	0.5	0.1	1
02898	Dibromomethane	74-95-3	0.5 U	0.5	0.1	1
02898	1,2-Dichlorobenzene	95-50-1	0.5 U	0.5	0.1	1
02898	1,3-Dichlorobenzene	541-73-1	0.5 U	0.5	0.1	1
02898	1,4-Dichlorobenzene	106-46-7	0.5 U	0.5	0.1	1
02898	Dichlorodifluoromethane	75-71-8	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethane	75-34-3	0.5 U	0.5	0.1	1
02898	1,2-Dichloroethane	107-06-2	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethene	75-35-4	0.5 U	0.5	0.1	1
02898	cis-1,2-Dichloroethene	156-59-2	0.5 U	0.5	0.1	1
02898	trans-1,2-Dichloroethene	156-60-5	0.5 U	0.5	0.1	1
02898	1,2-Dichloropropane	78-87-5	0.5 U	0.5	0.1	1
02898	1,3-Dichloropropane	142-28-9	0.5 U	0.5	0.1	1
02898	2,2-Dichloropropane	594-20-7	0.5 U	0.5	0.1	1
02898	1,1-Dichloropropene	563-58-6	0.5 U	0.5	0.1	1
02898	cis-1,3-Dichloropropene	10061-01-5	0.5 U	0.5	0.1	1
02898	trans-1,3-Dichloropropene	10061-02-6	0.5 U	0.5	0.1	1
02898	Ethylbenzene	100-41-4	0.5 U	0.5	0.1	1
02898	Freon 113	76-13-1	0.5 U	0.5	0.2	1
02898	Hexachlorobutadiene	87-68-3	0.5 U	0.5	0.1	1
02898	Isopropylbenzene	98-82-8	0.5 U	0.5	0.1	1
02898	p-Isopropyltoluene	99-87-6	0.5 U	0.5	0.1	1
02898	Methylene Chloride	75-09-2	0.5 U	0.5	0.2	1
02898	Naphthalene	91-20-3	0.5 U	0.5	0.1	1
02898	n-Propylbenzene	103-65-1	0.5 U	0.5	0.1	1
02898	Styrene	100-42-5	0.5 U	0.5	0.1	1
02898	1,1,1,2-Tetrachloroethane	630-20-6	0.5 U	0.5	0.1	1
02898	1,1,2,2-Tetrachloroethane	79-34-5	0.5 U	0.5	0.1	1
02898	Tetrachloroethene	127-18-4	0.5 U	0.5	0.1	1
02898	Tetrahydrofuran	109-99-9	5.0 U	5.0	2.0	1
02898	Toluene	108-88-3	0.5 U	0.5	0.1	1
02898	1,2,3-Trichlorobenzene	87-61-6	0.5 U	0.5	0.1	1
02898	1,2,4-Trichlorobenzene	120-82-1	0.5 U	0.5	0.1	1

*=This limit was used in the evaluation of the final result

Sample Description: FB1 Water

LLI Sample # WW 6717576

Project Name: Supplemental VI Assessment

LLI Group # 1321595

Account # 09671

Collected: 07/11/2012 17:45

Sanborn Head and Assoc

Submitted: 07/12/2012 09:20

1715 W. 13th Street

Reported: 07/23/2012 20:10

Houston TX 77008

MNNF1 SDG#: MAN27-02FB

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
	purge					
02898	1,1,1-Trichloroethane	71-55-6	0.5 U	0.5	0.1	1
02898	1,1,2-Trichloroethane	79-00-5	0.5 U	0.5	0.1	1
02898	Trichloroethene	79-01-6	0.5 U	0.5	0.1	1
02898	Trichlorofluoromethane	75-69-4	0.5 U	0.5	0.1	1
02898	1,2,3-Trichloropropane	96-18-4	1.0 U	1.0	0.3	1
02898	1,2,4-Trimethylbenzene	95-63-6	0.5 U	0.5	0.1	1
02898	1,3,5-Trimethylbenzene	108-67-8	0.5 U	0.5	0.1	1
02898	Vinyl Chloride	75-01-4	0.5 U	0.5	0.1	1
02898	Xylene (Total)	1330-20-7	0.5 U	0.5	0.1	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02898	Former 8021 Manassas, VA VOCs	SW-846 8260B 25mL purge	1	C122011AA	07/19/2012 12:55	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	C122011AA	07/19/2012 12:55	Kerri E Legerlotz	1

Sample Description: SG115I Water

LLI Sample # WW 6717577

Project Name: Supplemental VI Assessment

LLI Group # 1321595

Account # 09671

Collected: 07/10/2012 12:19

Sanborn Head and Assoc

Submitted: 07/12/2012 09:20

1715 W. 13th Street

Reported: 07/23/2012 20:10

Houston TX 77008

SG15I SDG#: MAN27-03

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
		purge				
02898	Benzene	71-43-2	0.5 U	0.5	0.1	1
02898	Bromobenzene	108-86-1	0.5 U	0.5	0.1	1
02898	Bromochloromethane	74-97-5	0.5 U	0.5	0.1	1
02898	Bromodichloromethane	75-27-4	0.2 J	0.5	0.1	1
02898	Bromoform	75-25-2	0.5 U	0.5	0.1	1
02898	Bromomethane	74-83-9	0.5 U	0.5	0.1	1
02898	n-Butylbenzene	104-51-8	0.5 U	0.5	0.1	1
02898	sec-Butylbenzene	135-98-8	0.5 U	0.5	0.1	1
02898	tert-Butylbenzene	98-06-6	0.5 U	0.5	0.1	1
02898	Carbon Tetrachloride	56-23-5	0.5 U	0.5	0.1	1
02898	Chlorobenzene	108-90-7	0.5 U	0.5	0.1	1
02898	Chloroethane	75-00-3	0.5 U	0.5	0.1	1
02898	Chloroform	67-66-3	2.9	0.5	0.1	1
02898	Chloromethane	74-87-3	0.5 U	0.5	0.2	1
02898	2-Chlorotoluene	95-49-8	0.5 U	0.5	0.1	1
02898	4-Chlorotoluene	106-43-4	0.5 U	0.5	0.1	1
02898	1,2-Dibromo-3-chloropropane	96-12-8	0.5 U	0.5	0.2	1
02898	Dibromochloromethane	124-48-1	0.5 U	0.5	0.1	1
02898	1,2-Dibromoethane	106-93-4	0.5 U	0.5	0.1	1
02898	Dibromomethane	74-95-3	0.5 U	0.5	0.1	1
02898	1,2-Dichlorobenzene	95-50-1	0.5 U	0.5	0.1	1
02898	1,3-Dichlorobenzene	541-73-1	0.5 U	0.5	0.1	1
02898	1,4-Dichlorobenzene	106-46-7	0.5 U	0.5	0.1	1
02898	Dichlorodifluoromethane	75-71-8	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethane	75-34-3	0.5 U	0.5	0.1	1
02898	1,2-Dichloroethane	107-06-2	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethene	75-35-4	0.5 U	0.5	0.1	1
02898	cis-1,2-Dichloroethene	156-59-2	0.2 J	0.5	0.1	1
02898	trans-1,2-Dichloroethene	156-60-5	0.5 U	0.5	0.1	1
02898	1,2-Dichloropropane	78-87-5	0.5 U	0.5	0.1	1
02898	1,3-Dichloropropane	142-28-9	0.5 U	0.5	0.1	1
02898	2,2-Dichloropropane	594-20-7	0.5 U	0.5	0.1	1
02898	1,1-Dichloropropene	563-58-6	0.5 U	0.5	0.1	1
02898	cis-1,3-Dichloropropene	10061-01-5	0.5 U	0.5	0.1	1
02898	trans-1,3-Dichloropropene	10061-02-6	0.5 U	0.5	0.1	1
02898	Ethylbenzene	100-41-4	0.5 U	0.5	0.1	1
02898	Freon 113	76-13-1	0.5 U	0.5	0.2	1
02898	Hexachlorobutadiene	87-68-3	0.5 U	0.5	0.1	1
02898	Isopropylbenzene	98-82-8	0.5 U	0.5	0.1	1
02898	p-Isopropyltoluene	99-87-6	0.5 U	0.5	0.1	1
02898	Methylene Chloride	75-09-2	0.5 U	0.5	0.2	1
02898	Naphthalene	91-20-3	0.5 U	0.5	0.1	1
02898	n-Propylbenzene	103-65-1	0.5 U	0.5	0.1	1
02898	Styrene	100-42-5	0.5 U	0.5	0.1	1
02898	1,1,1,2-Tetrachloroethane	630-20-6	0.5 U	0.5	0.1	1
02898	1,1,2,2-Tetrachloroethane	79-34-5	0.5 U	0.5	0.1	1
02898	Tetrachloroethene	127-18-4	0.6	0.5	0.1	1
02898	Tetrahydrofuran	109-99-9	5.0 U	5.0	2.0	1
02898	Toluene	108-88-3	0.5 J	0.5	0.1	1
02898	1,2,3-Trichlorobenzene	87-61-6	0.5 U	0.5	0.1	1
02898	1,2,4-Trichlorobenzene	120-82-1	0.5 U	0.5	0.1	1

*=This limit was used in the evaluation of the final result

Sample Description: SG115I Water

LLI Sample # WW 6717577

Project Name: Supplemental VI Assessment

LLI Group # 1321595

Account # 09671

Collected: 07/10/2012 12:19

Sanborn Head and Assoc

Submitted: 07/12/2012 09:20

1715 W. 13th Street

Reported: 07/23/2012 20:10

Houston TX 77008

SG15I SDG#: MAN27-03

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS Volatiles		SW-846 8260B 25mL	ug/l	ug/l	ug/l	
purge						
02898	1,1,1-Trichloroethane	71-55-6	0.5 U	0.5	0.1	1
02898	1,1,2-Trichloroethane	79-00-5	0.5 U	0.5	0.1	1
02898	Trichloroethene	79-01-6	0.5 J	0.5	0.1	1
02898	Trichlorofluoromethane	75-69-4	0.1 J	0.5	0.1	1
02898	1,2,3-Trichloropropane	96-18-4	1.0 U	1.0	0.3	1
02898	1,2,4-Trimethylbenzene	95-63-6	0.5 U	0.5	0.1	1
02898	1,3,5-Trimethylbenzene	108-67-8	0.5 U	0.5	0.1	1
02898	Vinyl Chloride	75-01-4	0.5 U	0.5	0.1	1
02898	Xylene (Total)	1330-20-7	0.2 J	0.5	0.1	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02898	Former 8021 Manassas, VA VOCs	SW-846 8260B 25mL purge	1	C122011AA	07/19/2012 14:23	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	C122011AA	07/19/2012 14:23	Kerri E Legerlotz	1

Sample Description: SG115S Water

LLI Sample # WW 6717578

Project Name: Supplemental VI Assessment

LLI Group # 1321595

Account # 09671

Collected: 07/10/2012 11:41

Sanborn Head and Assoc

Submitted: 07/12/2012 09:20

1715 W. 13th Street

Reported: 07/23/2012 20:10

Houston TX 77008

SG15S SDG#: MAN27-04

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
		purge				
02898	Benzene	71-43-2	0.2 J	0.5	0.1	1
02898	Bromobenzene	108-86-1	0.5 U	0.5	0.1	1
02898	Bromochloromethane	74-97-5	0.5 U	0.5	0.1	1
02898	Bromodichloromethane	75-27-4	0.1 J	0.5	0.1	1
02898	Bromoform	75-25-2	0.5 U	0.5	0.1	1
02898	Bromomethane	74-83-9	0.5 U	0.5	0.1	1
02898	n-Butylbenzene	104-51-8	0.5 U	0.5	0.1	1
02898	sec-Butylbenzene	135-98-8	0.5 U	0.5	0.1	1
02898	tert-Butylbenzene	98-06-6	0.5 U	0.5	0.1	1
02898	Carbon Tetrachloride	56-23-5	0.5 U	0.5	0.1	1
02898	Chlorobenzene	108-90-7	0.5 U	0.5	0.1	1
02898	Chloroethane	75-00-3	0.5 U	0.5	0.1	1
02898	Chloroform	67-66-3	1.9	0.5	0.1	1
02898	Chloromethane	74-87-3	0.5 U	0.5	0.2	1
02898	2-Chlorotoluene	95-49-8	0.5 U	0.5	0.1	1
02898	4-Chlorotoluene	106-43-4	0.5 U	0.5	0.1	1
02898	1,2-Dibromo-3-chloropropane	96-12-8	0.5 U	0.5	0.2	1
02898	Dibromochloromethane	124-48-1	0.5 U	0.5	0.1	1
02898	1,2-Dibromoethane	106-93-4	0.5 U	0.5	0.1	1
02898	Dibromomethane	74-95-3	0.5 U	0.5	0.1	1
02898	1,2-Dichlorobenzene	95-50-1	0.5 U	0.5	0.1	1
02898	1,3-Dichlorobenzene	541-73-1	0.5 U	0.5	0.1	1
02898	1,4-Dichlorobenzene	106-46-7	0.5 U	0.5	0.1	1
02898	Dichlorodifluoromethane	75-71-8	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethane	75-34-3	0.5 U	0.5	0.1	1
02898	1,2-Dichloroethane	107-06-2	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethene	75-35-4	0.5 U	0.5	0.1	1
02898	cis-1,2-Dichloroethene	156-59-2	0.5 U	0.5	0.1	1
02898	trans-1,2-Dichloroethene	156-60-5	0.5 U	0.5	0.1	1
02898	1,2-Dichloropropane	78-87-5	0.5 U	0.5	0.1	1
02898	1,3-Dichloropropane	142-28-9	0.5 U	0.5	0.1	1
02898	2,2-Dichloropropane	594-20-7	0.5 U	0.5	0.1	1
02898	1,1-Dichloropropene	563-58-6	0.5 U	0.5	0.1	1
02898	cis-1,3-Dichloropropene	10061-01-5	0.5 U	0.5	0.1	1
02898	trans-1,3-Dichloropropene	10061-02-6	0.5 U	0.5	0.1	1
02898	Ethylbenzene	100-41-4	0.2 J	0.5	0.1	1
02898	Freon 113	76-13-1	0.5 U	0.5	0.2	1
02898	Hexachlorobutadiene	87-68-3	0.5 U	0.5	0.1	1
02898	Isopropylbenzene	98-82-8	0.5 U	0.5	0.1	1
02898	p-Isopropyltoluene	99-87-6	0.5 U	0.5	0.1	1
02898	Methylene Chloride	75-09-2	0.5 U	0.5	0.2	1
02898	Naphthalene	91-20-3	0.5 U	0.5	0.1	1
02898	n-Propylbenzene	103-65-1	0.5 U	0.5	0.1	1
02898	Styrene	100-42-5	0.5 U	0.5	0.1	1
02898	1,1,1,2-Tetrachloroethane	630-20-6	0.5 U	0.5	0.1	1
02898	1,1,2,2-Tetrachloroethane	79-34-5	0.5 U	0.5	0.1	1
02898	Tetrachloroethene	127-18-4	0.5 U	0.5	0.1	1
02898	Tetrahydrofuran	109-99-9	5.0 U	5.0	2.0	1
02898	Toluene	108-88-3	1.4	0.5	0.1	1
02898	1,2,3-Trichlorobenzene	87-61-6	0.5 U	0.5	0.1	1
02898	1,2,4-Trichlorobenzene	120-82-1	0.5 U	0.5	0.1	1

*=This limit was used in the evaluation of the final result

Sample Description: SG115S Water

LLI Sample # WW 6717578

Project Name: Supplemental VI Assessment

LLI Group # 1321595

Account # 09671

Collected: 07/10/2012 11:41

Sanborn Head and Assoc

Submitted: 07/12/2012 09:20

1715 W. 13th Street

Reported: 07/23/2012 20:10

Houston TX 77008

SG15S SDG#: MAN27-04

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS Volatiles		SW-846 8260B 25mL	ug/l	ug/l	ug/l	
purge						
02898	1,1,1-Trichloroethane	71-55-6	0.5 U	0.5	0.1	1
02898	1,1,2-Trichloroethane	79-00-5	0.5 U	0.5	0.1	1
02898	Trichloroethene	79-01-6	0.5 U	0.5	0.1	1
02898	Trichlorofluoromethane	75-69-4	0.5 U	0.5	0.1	1
02898	1,2,3-Trichloropropane	96-18-4	1.0 U	1.0	0.3	1
02898	1,2,4-Trimethylbenzene	95-63-6	0.2 J	0.5	0.1	1
02898	1,3,5-Trimethylbenzene	108-67-8	0.5 U	0.5	0.1	1
02898	Vinyl Chloride	75-01-4	0.5 U	0.5	0.1	1
02898	Xylene (Total)	1330-20-7	1.2	0.5	0.1	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02898	Former 8021 Manassas, VA VOCs	SW-846 8260B 25mL purge	1	C122011AA	07/19/2012 14:45	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	C122011AA	07/19/2012 14:45	Kerri E Legerlotz	1

Sample Description: SG11822 Water

LLI Sample # WW 6717579

Project Name: Supplemental VI Assessment

LLI Group # 1321595

Account # 09671

Collected: 07/10/2012 10:35

Sanborn Head and Assoc

Submitted: 07/12/2012 09:20

1715 W. 13th Street

Reported: 07/23/2012 20:10

Houston TX 77008

SG182 SDG#: MAN27-05

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
		purge				
02898	Benzene	71-43-2	0.5 U	0.5	0.1	1
02898	Bromobenzene	108-86-1	0.5 U	0.5	0.1	1
02898	Bromochloromethane	74-97-5	0.5 U	0.5	0.1	1
02898	Bromodichloromethane	75-27-4	0.5 U	0.5	0.1	1
02898	Bromoform	75-25-2	0.5 U	0.5	0.1	1
02898	Bromomethane	74-83-9	0.5 U	0.5	0.1	1
02898	n-Butylbenzene	104-51-8	0.5 U	0.5	0.1	1
02898	sec-Butylbenzene	135-98-8	0.5 U	0.5	0.1	1
02898	tert-Butylbenzene	98-06-6	0.5 U	0.5	0.1	1
02898	Carbon Tetrachloride	56-23-5	0.5 U	0.5	0.1	1
02898	Chlorobenzene	108-90-7	0.5 U	0.5	0.1	1
02898	Chloroethane	75-00-3	0.5 U	0.5	0.1	1
02898	Chloroform	67-66-3	4.4	0.5	0.1	1
02898	Chloromethane	74-87-3	0.5 U	0.5	0.2	1
02898	2-Chlorotoluene	95-49-8	0.5 U	0.5	0.1	1
02898	4-Chlorotoluene	106-43-4	0.5 U	0.5	0.1	1
02898	1,2-Dibromo-3-chloropropane	96-12-8	0.5 U	0.5	0.2	1
02898	Dibromochloromethane	124-48-1	0.5 U	0.5	0.1	1
02898	1,2-Dibromoethane	106-93-4	0.5 U	0.5	0.1	1
02898	Dibromomethane	74-95-3	0.5 U	0.5	0.1	1
02898	1,2-Dichlorobenzene	95-50-1	0.5 U	0.5	0.1	1
02898	1,3-Dichlorobenzene	541-73-1	0.5 U	0.5	0.1	1
02898	1,4-Dichlorobenzene	106-46-7	0.5 U	0.5	0.1	1
02898	Dichlorodifluoromethane	75-71-8	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethane	75-34-3	0.5 U	0.5	0.1	1
02898	1,2-Dichloroethane	107-06-2	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethene	75-35-4	0.5 U	0.5	0.1	1
02898	cis-1,2-Dichloroethene	156-59-2	0.5 U	0.5	0.1	1
02898	trans-1,2-Dichloroethene	156-60-5	0.5 U	0.5	0.1	1
02898	1,2-Dichloropropane	78-87-5	0.5 U	0.5	0.1	1
02898	1,3-Dichloropropane	142-28-9	0.5 U	0.5	0.1	1
02898	2,2-Dichloropropane	594-20-7	0.5 U	0.5	0.1	1
02898	1,1-Dichloropropene	563-58-6	0.5 U	0.5	0.1	1
02898	cis-1,3-Dichloropropene	10061-01-5	0.5 U	0.5	0.1	1
02898	trans-1,3-Dichloropropene	10061-02-6	0.5 U	0.5	0.1	1
02898	Ethylbenzene	100-41-4	0.5 U	0.5	0.1	1
02898	Freon 113	76-13-1	0.5 U	0.5	0.2	1
02898	Hexachlorobutadiene	87-68-3	0.5 U	0.5	0.1	1
02898	Isopropylbenzene	98-82-8	0.5 U	0.5	0.1	1
02898	p-Isopropyltoluene	99-87-6	0.5 U	0.5	0.1	1
02898	Methylene Chloride	75-09-2	0.5 U	0.5	0.2	1
02898	Naphthalene	91-20-3	0.5 U	0.5	0.1	1
02898	n-Propylbenzene	103-65-1	0.5 U	0.5	0.1	1
02898	Styrene	100-42-5	0.5 U	0.5	0.1	1
02898	1,1,1,2-Tetrachloroethane	630-20-6	0.5 U	0.5	0.1	1
02898	1,1,2,2-Tetrachloroethane	79-34-5	0.5 U	0.5	0.1	1
02898	Tetrachloroethene	127-18-4	1.7	0.5	0.1	1
02898	Tetrahydrofuran	109-99-9	5.0 U	5.0	2.0	1
02898	Toluene	108-88-3	0.4 J	0.5	0.1	1
02898	1,2,3-Trichlorobenzene	87-61-6	0.5 U	0.5	0.1	1
02898	1,2,4-Trichlorobenzene	120-82-1	0.5 U	0.5	0.1	1

*=This limit was used in the evaluation of the final result

Sample Description: SG11822 Water

LLI Sample # WW 6717579

Project Name: Supplemental VI Assessment

LLI Group # 1321595

Account # 09671

Collected: 07/10/2012 10:35

Sanborn Head and Assoc

Submitted: 07/12/2012 09:20

1715 W. 13th Street

Reported: 07/23/2012 20:10

Houston TX 77008

SG182 SDG#: MAN27-05

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS Volatiles		SW-846 8260B 25mL	ug/l	ug/l	ug/l	
purge						
02898	1,1,1-Trichloroethane	71-55-6	0.5 U	0.5	0.1	1
02898	1,1,2-Trichloroethane	79-00-5	0.5 U	0.5	0.1	1
02898	Trichloroethene	79-01-6	0.5 U	0.5	0.1	1
02898	Trichlorofluoromethane	75-69-4	0.5 U	0.5	0.1	1
02898	1,2,3-Trichloropropane	96-18-4	1.0 U	1.0	0.3	1
02898	1,2,4-Trimethylbenzene	95-63-6	0.5 U	0.5	0.1	1
02898	1,3,5-Trimethylbenzene	108-67-8	0.5 U	0.5	0.1	1
02898	Vinyl Chloride	75-01-4	0.5 U	0.5	0.1	1
02898	Xylene (Total)	1330-20-7	0.4 J	0.5	0.1	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02898	Former 8021 Manassas, VA VOCs	SW-846 8260B 25mL purge	1	C122011AA	07/19/2012 15:08	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	C122011AA	07/19/2012 15:08	Kerri E Legerlotz	1

Sample Description: SG118I Water

LLI Sample # WW 6717580

Project Name: Supplemental VI Assessment

LLI Group # 1321595

Account # 09671

Collected: 07/10/2012 11:15

Sanborn Head and Assoc

Submitted: 07/12/2012 09:20

1715 W. 13th Street

Reported: 07/23/2012 20:10

Houston TX 77008

SG18I SDG#: MAN27-06

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
		purge				
02898	Benzene	71-43-2	0.5 U	0.5	0.1	1
02898	Bromobenzene	108-86-1	0.5 U	0.5	0.1	1
02898	Bromochloromethane	74-97-5	0.5 U	0.5	0.1	1
02898	Bromodichloromethane	75-27-4	0.5 J	0.5	0.1	1
02898	Bromoform	75-25-2	0.5 U	0.5	0.1	1
02898	Bromomethane	74-83-9	0.5 U	0.5	0.1	1
02898	n-Butylbenzene	104-51-8	0.5 U	0.5	0.1	1
02898	sec-Butylbenzene	135-98-8	0.5 U	0.5	0.1	1
02898	tert-Butylbenzene	98-06-6	0.5 U	0.5	0.1	1
02898	Carbon Tetrachloride	56-23-5	0.5 U	0.5	0.1	1
02898	Chlorobenzene	108-90-7	0.5 U	0.5	0.1	1
02898	Chloroethane	75-00-3	0.5 U	0.5	0.1	1
02898	Chloroform	67-66-3	5.4	0.5	0.1	1
02898	Chloromethane	74-87-3	0.5 U	0.5	0.2	1
02898	2-Chlorotoluene	95-49-8	0.5 U	0.5	0.1	1
02898	4-Chlorotoluene	106-43-4	0.5 U	0.5	0.1	1
02898	1,2-Dibromo-3-chloropropane	96-12-8	0.5 U	0.5	0.2	1
02898	Dibromochloromethane	124-48-1	0.5 U	0.5	0.1	1
02898	1,2-Dibromoethane	106-93-4	0.5 U	0.5	0.1	1
02898	Dibromomethane	74-95-3	0.5 U	0.5	0.1	1
02898	1,2-Dichlorobenzene	95-50-1	0.5 U	0.5	0.1	1
02898	1,3-Dichlorobenzene	541-73-1	0.5 U	0.5	0.1	1
02898	1,4-Dichlorobenzene	106-46-7	0.5 U	0.5	0.1	1
02898	Dichlorodifluoromethane	75-71-8	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethane	75-34-3	0.5 U	0.5	0.1	1
02898	1,2-Dichloroethane	107-06-2	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethene	75-35-4	0.5 U	0.5	0.1	1
02898	cis-1,2-Dichloroethene	156-59-2	0.6	0.5	0.1	1
02898	trans-1,2-Dichloroethene	156-60-5	0.5 U	0.5	0.1	1
02898	1,2-Dichloropropane	78-87-5	0.5 U	0.5	0.1	1
02898	1,3-Dichloropropane	142-28-9	0.5 U	0.5	0.1	1
02898	2,2-Dichloropropane	594-20-7	0.5 U	0.5	0.1	1
02898	1,1-Dichloropropene	563-58-6	0.5 U	0.5	0.1	1
02898	cis-1,3-Dichloropropene	10061-01-5	0.5 U	0.5	0.1	1
02898	trans-1,3-Dichloropropene	10061-02-6	0.5 U	0.5	0.1	1
02898	Ethylbenzene	100-41-4	0.1 J	0.5	0.1	1
02898	Freon 113	76-13-1	0.5 U	0.5	0.2	1
02898	Hexachlorobutadiene	87-68-3	0.5 U	0.5	0.1	1
02898	Isopropylbenzene	98-82-8	0.5 U	0.5	0.1	1
02898	p-Isopropyltoluene	99-87-6	0.5 U	0.5	0.1	1
02898	Methylene Chloride	75-09-2	0.5 U	0.5	0.2	1
02898	Naphthalene	91-20-3	0.5 U	0.5	0.1	1
02898	n-Propylbenzene	103-65-1	0.5 U	0.5	0.1	1
02898	Styrene	100-42-5	0.5 U	0.5	0.1	1
02898	1,1,1,2-Tetrachloroethane	630-20-6	0.5 U	0.5	0.1	1
02898	1,1,2,2-Tetrachloroethane	79-34-5	0.5 U	0.5	0.1	1
02898	Tetrachloroethene	127-18-4	20	5.0	1.0	10
02898	Tetrahydrofuran	109-99-9	5.0 U	5.0	2.0	1
02898	Toluene	108-88-3	0.7	0.5	0.1	1
02898	1,2,3-Trichlorobenzene	87-61-6	0.5 U	0.5	0.1	1
02898	1,2,4-Trichlorobenzene	120-82-1	0.5 U	0.5	0.1	1

*=This limit was used in the evaluation of the final result

Sample Description: SG118I Water

LLI Sample # WW 6717580

Project Name: Supplemental VI Assessment

LLI Group # 1321595

Account # 09671

Collected: 07/10/2012 11:15

Sanborn Head and Assoc

Submitted: 07/12/2012 09:20

1715 W. 13th Street

Reported: 07/23/2012 20:10

Houston TX 77008

SG18I SDG#: MAN27-06

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
	purge					
02898	1,1,1-Trichloroethane	71-55-6	0.5 U	0.5	0.1	1
02898	1,1,2-Trichloroethane	79-00-5	0.5 U	0.5	0.1	1
02898	Trichloroethene	79-01-6	0.5 J	0.5	0.1	1
02898	Trichlorofluoromethane	75-69-4	0.5 U	0.5	0.1	1
02898	1,2,3-Trichloropropane	96-18-4	1.0 U	1.0	0.3	1
02898	1,2,4-Trimethylbenzene	95-63-6	0.5 U	0.5	0.1	1
02898	1,3,5-Trimethylbenzene	108-67-8	0.5 U	0.5	0.1	1
02898	Vinyl Chloride	75-01-4	0.5 U	0.5	0.1	1
02898	Xylene (Total)	1330-20-7	0.7	0.5	0.1	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02898	Former 8021 Manassas, VA VOCs	SW-846 8260B 25mL purge	1	C122011AA	07/19/2012 15:30	Kerri E Legerlotz	1
02898	Former 8021 Manassas, VA VOCs	SW-846 8260B 25mL purge	1	C122022AA	07/20/2012 17:28	Kerri E Legerlotz	10
01163	GC/MS VOA Water Prep	SW-846 5030B	1	C122011AA	07/19/2012 15:30	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030B	2	C122022AA	07/20/2012 17:28	Kerri E Legerlotz	10

Sample Description: SG123I Water

LLI Sample # WW 6717581

Project Name: Supplemental VI Assessment

LLI Group # 1321595

Account # 09671

Collected: 07/10/2012 09:54

Sanborn Head and Assoc

Submitted: 07/12/2012 09:20

1715 W. 13th Street

Reported: 07/23/2012 20:10

Houston TX 77008

SG23I SDG#: MAN27-07

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
		purge				
02898	Benzene	71-43-2	0.5 U	0.5	0.1	1
02898	Bromobenzene	108-86-1	0.5 U	0.5	0.1	1
02898	Bromochloromethane	74-97-5	0.5 U	0.5	0.1	1
02898	Bromodichloromethane	75-27-4	0.5 U	0.5	0.1	1
02898	Bromoform	75-25-2	0.5 U	0.5	0.1	1
02898	Bromomethane	74-83-9	0.5 U	0.5	0.1	1
02898	n-Butylbenzene	104-51-8	0.5 U	0.5	0.1	1
02898	sec-Butylbenzene	135-98-8	0.5 U	0.5	0.1	1
02898	tert-Butylbenzene	98-06-6	0.5 U	0.5	0.1	1
02898	Carbon Tetrachloride	56-23-5	0.5 U	0.5	0.1	1
02898	Chlorobenzene	108-90-7	0.5 U	0.5	0.1	1
02898	Chloroethane	75-00-3	0.5 U	0.5	0.1	1
02898	Chloroform	67-66-3	0.5	0.5	0.1	1
02898	Chloromethane	74-87-3	0.5 U	0.5	0.2	1
02898	2-Chlorotoluene	95-49-8	0.5 U	0.5	0.1	1
02898	4-Chlorotoluene	106-43-4	0.5 U	0.5	0.1	1
02898	1,2-Dibromo-3-chloropropane	96-12-8	0.5 U	0.5	0.2	1
02898	Dibromochloromethane	124-48-1	0.5 U	0.5	0.1	1
02898	1,2-Dibromoethane	106-93-4	0.5 U	0.5	0.1	1
02898	Dibromomethane	74-95-3	0.5 U	0.5	0.1	1
02898	1,2-Dichlorobenzene	95-50-1	0.5 U	0.5	0.1	1
02898	1,3-Dichlorobenzene	541-73-1	0.5 U	0.5	0.1	1
02898	1,4-Dichlorobenzene	106-46-7	0.5 U	0.5	0.1	1
02898	Dichlorodifluoromethane	75-71-8	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethane	75-34-3	0.5 U	0.5	0.1	1
02898	1,2-Dichloroethane	107-06-2	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethene	75-35-4	0.5 U	0.5	0.1	1
02898	cis-1,2-Dichloroethene	156-59-2	0.1 J	0.5	0.1	1
02898	trans-1,2-Dichloroethene	156-60-5	0.5 U	0.5	0.1	1
02898	1,2-Dichloropropane	78-87-5	0.5 U	0.5	0.1	1
02898	1,3-Dichloropropane	142-28-9	0.5 U	0.5	0.1	1
02898	2,2-Dichloropropane	594-20-7	0.5 U	0.5	0.1	1
02898	1,1-Dichloropropene	563-58-6	0.5 U	0.5	0.1	1
02898	cis-1,3-Dichloropropene	10061-01-5	0.5 U	0.5	0.1	1
02898	trans-1,3-Dichloropropene	10061-02-6	0.5 U	0.5	0.1	1
02898	Ethylbenzene	100-41-4	0.1 J	0.5	0.1	1
02898	Freon 113	76-13-1	0.5 U	0.5	0.2	1
02898	Hexachlorobutadiene	87-68-3	0.5 U	0.5	0.1	1
02898	Isopropylbenzene	98-82-8	0.5 U	0.5	0.1	1
02898	p-Isopropyltoluene	99-87-6	0.5 U	0.5	0.1	1
02898	Methylene Chloride	75-09-2	0.5 U	0.5	0.2	1
02898	Naphthalene	91-20-3	0.5 U	0.5	0.1	1
02898	n-Propylbenzene	103-65-1	0.5 U	0.5	0.1	1
02898	Styrene	100-42-5	0.5 U	0.5	0.1	1
02898	1,1,1,2-Tetrachloroethane	630-20-6	0.5 U	0.5	0.1	1
02898	1,1,2,2-Tetrachloroethane	79-34-5	0.5 U	0.5	0.1	1
02898	Tetrachloroethene	127-18-4	6.2	0.5	0.1	1
02898	Tetrahydrofuran	109-99-9	5.0 U	5.0	2.0	1
02898	Toluene	108-88-3	0.8	0.5	0.1	1
02898	1,2,3-Trichlorobenzene	87-61-6	0.5 U	0.5	0.1	1
02898	1,2,4-Trichlorobenzene	120-82-1	0.5 U	0.5	0.1	1

*=This limit was used in the evaluation of the final result

Sample Description: SG123I Water

LLI Sample # WW 6717581

Project Name: Supplemental VI Assessment

LLI Group # 1321595

Account # 09671

Collected: 07/10/2012 09:54

Sanborn Head and Assoc

Submitted: 07/12/2012 09:20

1715 W. 13th Street

Reported: 07/23/2012 20:10

Houston TX 77008

SG23I SDG#: MAN27-07

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS Volatiles		SW-846 8260B 25mL	ug/l	ug/l	ug/l	
purge						
02898	1,1,1-Trichloroethane	71-55-6	0.5 U	0.5	0.1	1
02898	1,1,2-Trichloroethane	79-00-5	0.5 U	0.5	0.1	1
02898	Trichloroethene	79-01-6	0.3 J	0.5	0.1	1
02898	Trichlorofluoromethane	75-69-4	0.5 U	0.5	0.1	1
02898	1,2,3-Trichloropropane	96-18-4	1.0 U	1.0	0.3	1
02898	1,2,4-Trimethylbenzene	95-63-6	0.5 U	0.5	0.1	1
02898	1,3,5-Trimethylbenzene	108-67-8	0.5 U	0.5	0.1	1
02898	Vinyl Chloride	75-01-4	0.5 U	0.5	0.1	1
02898	Xylene (Total)	1330-20-7	0.6	0.5	0.1	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02898	Former 8021 Manassas, VA VOCs	SW-846 8260B 25mL purge	1	C122011AA	07/19/2012 15:52	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	C122011AA	07/19/2012 15:52	Kerri E Legerlotz	1

*=This limit was used in the evaluation of the final result

Sample Description: SG31D Water

LLI Sample # WW 6717582

Project Name: Supplemental VI Assessment

LLI Group # 1321595

Account # 09671

Collected: 07/11/2012 16:00

Sanborn Head and Assoc

Submitted: 07/12/2012 09:20

1715 W. 13th Street

Reported: 07/23/2012 20:10

Houston TX 77008

SG31D SDG#: MAN27-08

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
		purge				
02898	Benzene	71-43-2	0.5 U	0.5	0.1	1
02898	Bromobenzene	108-86-1	0.5 U	0.5	0.1	1
02898	Bromochloromethane	74-97-5	0.5 U	0.5	0.1	1
02898	Bromodichloromethane	75-27-4	3.0	0.5	0.1	1
02898	Bromoform	75-25-2	0.5 U	0.5	0.1	1
02898	Bromomethane	74-83-9	0.5 U	0.5	0.1	1
02898	n-Butylbenzene	104-51-8	0.5 U	0.5	0.1	1
02898	sec-Butylbenzene	135-98-8	0.5 U	0.5	0.1	1
02898	tert-Butylbenzene	98-06-6	0.5 U	0.5	0.1	1
02898	Carbon Tetrachloride	56-23-5	0.5 U	0.5	0.1	1
02898	Chlorobenzene	108-90-7	0.5 U	0.5	0.1	1
02898	Chloroethane	75-00-3	0.5 U	0.5	0.1	1
02898	Chloroform	67-66-3	17	0.5	0.1	1
02898	Chloromethane	74-87-3	0.5 U	0.5	0.2	1
02898	2-Chlorotoluene	95-49-8	0.5 U	0.5	0.1	1
02898	4-Chlorotoluene	106-43-4	0.5 U	0.5	0.1	1
02898	1,2-Dibromo-3-chloropropane	96-12-8	0.5 U	0.5	0.2	1
02898	Dibromochloromethane	124-48-1	0.6	0.5	0.1	1
02898	1,2-Dibromoethane	106-93-4	0.5 U	0.5	0.1	1
02898	Dibromomethane	74-95-3	0.5 U	0.5	0.1	1
02898	1,2-Dichlorobenzene	95-50-1	0.5 U	0.5	0.1	1
02898	1,3-Dichlorobenzene	541-73-1	0.5 U	0.5	0.1	1
02898	1,4-Dichlorobenzene	106-46-7	0.5 U	0.5	0.1	1
02898	Dichlorodifluoromethane	75-71-8	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethane	75-34-3	0.5 U	0.5	0.1	1
02898	1,2-Dichloroethane	107-06-2	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethene	75-35-4	0.5 U	0.5	0.1	1
02898	cis-1,2-Dichloroethene	156-59-2	8.8	0.5	0.1	1
02898	trans-1,2-Dichloroethene	156-60-5	0.1 J	0.5	0.1	1
02898	1,2-Dichloropropane	78-87-5	0.5 U	0.5	0.1	1
02898	1,3-Dichloropropane	142-28-9	0.5 U	0.5	0.1	1
02898	2,2-Dichloropropane	594-20-7	0.5 U	0.5	0.1	1
02898	1,1-Dichloropropene	563-58-6	0.5 U	0.5	0.1	1
02898	cis-1,3-Dichloropropene	10061-01-5	0.5 U	0.5	0.1	1
02898	trans-1,3-Dichloropropene	10061-02-6	0.5 U	0.5	0.1	1
02898	Ethylbenzene	100-41-4	0.5 U	0.5	0.1	1
02898	Freon 113	76-13-1	0.5 U	0.5	0.2	1
02898	Hexachlorobutadiene	87-68-3	0.5 U	0.5	0.1	1
02898	Isopropylbenzene	98-82-8	0.5 U	0.5	0.1	1
02898	p-Isopropyltoluene	99-87-6	0.2 J	0.5	0.1	1
02898	Methylene Chloride	75-09-2	0.5 U	0.5	0.2	1
02898	Naphthalene	91-20-3	0.5	0.5	0.1	1
02898	n-Propylbenzene	103-65-1	0.5 U	0.5	0.1	1
02898	Styrene	100-42-5	0.5 U	0.5	0.1	1
02898	1,1,1,2-Tetrachloroethane	630-20-6	0.5 U	0.5	0.1	1
02898	1,1,2,2-Tetrachloroethane	79-34-5	0.5 U	0.5	0.1	1
02898	Tetrachloroethene	127-18-4	0.8	0.5	0.1	1
02898	Tetrahydrofuran	109-99-9	5.0 U	5.0	2.0	1
02898	Toluene	108-88-3	2.4	0.5	0.1	1
02898	1,2,3-Trichlorobenzene	87-61-6	0.5 U	0.5	0.1	1
02898	1,2,4-Trichlorobenzene	120-82-1	0.5 U	0.5	0.1	1

*=This limit was used in the evaluation of the final result

Sample Description: SG31D Water

LLI Sample # WW 6717582

Project Name: Supplemental VI Assessment

LLI Group # 1321595

Account # 09671

Collected: 07/11/2012 16:00

Sanborn Head and Assoc

Submitted: 07/12/2012 09:20

1715 W. 13th Street

Reported: 07/23/2012 20:10

Houston TX 77008

SG31D SDG#: MAN27-08

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS Volatiles		SW-846 8260B 25mL	ug/l	ug/l	ug/l	
purge						
02898	1,1,1-Trichloroethane	71-55-6	0.5 U	0.5	0.1	1
02898	1,1,2-Trichloroethane	79-00-5	0.5 U	0.5	0.1	1
02898	Trichloroethene	79-01-6	0.8	0.5	0.1	1
02898	Trichlorofluoromethane	75-69-4	0.5 U	0.5	0.1	1
02898	1,2,3-Trichloropropane	96-18-4	1.0 U	1.0	0.3	1
02898	1,2,4-Trimethylbenzene	95-63-6	0.5 U	0.5	0.1	1
02898	1,3,5-Trimethylbenzene	108-67-8	0.5 U	0.5	0.1	1
02898	Vinyl Chloride	75-01-4	0.5 U	0.5	0.1	1
02898	Xylene (Total)	1330-20-7	0.3 J	0.5	0.1	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02898	Former 8021 Manassas, VA VOCs	SW-846 8260B 25mL purge	1	C122011AA	07/19/2012 16:14	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	C122011AA	07/19/2012 16:14	Kerri E Legerlotz	1

Sample Description: SG31I Water

LLI Sample # WW 6717583

Project Name: Supplemental VI Assessment

LLI Group # 1321595

Account # 09671

Collected: 07/11/2012 13:33

Sanborn Head and Assoc

Submitted: 07/12/2012 09:20

1715 W. 13th Street

Reported: 07/23/2012 20:10

Houston TX 77008

SG31I SDG#: MAN27-09

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
		purge				
02898	Benzene	71-43-2	0.5 U	0.5	0.1	1
02898	Bromobenzene	108-86-1	0.5 U	0.5	0.1	1
02898	Bromochloromethane	74-97-5	0.5 U	0.5	0.1	1
02898	Bromodichloromethane	75-27-4	0.3 J	0.5	0.1	1
02898	Bromoform	75-25-2	0.5 U	0.5	0.1	1
02898	Bromomethane	74-83-9	0.5 U	0.5	0.1	1
02898	n-Butylbenzene	104-51-8	0.5 U	0.5	0.1	1
02898	sec-Butylbenzene	135-98-8	0.5 U	0.5	0.1	1
02898	tert-Butylbenzene	98-06-6	0.5 U	0.5	0.1	1
02898	Carbon Tetrachloride	56-23-5	0.5 U	0.5	0.1	1
02898	Chlorobenzene	108-90-7	0.5 U	0.5	0.1	1
02898	Chloroethane	75-00-3	0.5 U	0.5	0.1	1
02898	Chloroform	67-66-3	5.2	0.5	0.1	1
02898	Chloromethane	74-87-3	0.5 U	0.5	0.2	1
02898	2-Chlorotoluene	95-49-8	0.5 U	0.5	0.1	1
02898	4-Chlorotoluene	106-43-4	0.5 U	0.5	0.1	1
02898	1,2-Dibromo-3-chloropropane	96-12-8	0.5 U	0.5	0.2	1
02898	Dibromochloromethane	124-48-1	0.5 U	0.5	0.1	1
02898	1,2-Dibromoethane	106-93-4	0.5 U	0.5	0.1	1
02898	Dibromomethane	74-95-3	0.5 U	0.5	0.1	1
02898	1,2-Dichlorobenzene	95-50-1	0.5 U	0.5	0.1	1
02898	1,3-Dichlorobenzene	541-73-1	0.5 U	0.5	0.1	1
02898	1,4-Dichlorobenzene	106-46-7	0.5 U	0.5	0.1	1
02898	Dichlorodifluoromethane	75-71-8	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethane	75-34-3	0.5 U	0.5	0.1	1
02898	1,2-Dichloroethane	107-06-2	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethene	75-35-4	0.5 U	0.5	0.1	1
02898	cis-1,2-Dichloroethene	156-59-2	65	5.0	1.0	10
02898	trans-1,2-Dichloroethene	156-60-5	1.6	0.5	0.1	1
02898	1,2-Dichloropropane	78-87-5	0.5 U	0.5	0.1	1
02898	1,3-Dichloropropane	142-28-9	0.5 U	0.5	0.1	1
02898	2,2-Dichloropropane	594-20-7	0.5 U	0.5	0.1	1
02898	1,1-Dichloropropene	563-58-6	0.5 U	0.5	0.1	1
02898	cis-1,3-Dichloropropene	10061-01-5	0.5 U	0.5	0.1	1
02898	trans-1,3-Dichloropropene	10061-02-6	0.5 U	0.5	0.1	1
02898	Ethylbenzene	100-41-4	0.1 J	0.5	0.1	1
02898	Freon 113	76-13-1	0.5 U	0.5	0.2	1
02898	Hexachlorobutadiene	87-68-3	0.5 U	0.5	0.1	1
02898	Isopropylbenzene	98-82-8	0.5 U	0.5	0.1	1
02898	p-Isopropyltoluene	99-87-6	0.3 J	0.5	0.1	1
02898	Methylene Chloride	75-09-2	0.5 U	0.5	0.2	1
02898	Naphthalene	91-20-3	0.5	0.5	0.1	1
02898	n-Propylbenzene	103-65-1	0.5 U	0.5	0.1	1
02898	Styrene	100-42-5	0.5 U	0.5	0.1	1
02898	1,1,1,2-Tetrachloroethane	630-20-6	0.5 U	0.5	0.1	1
02898	1,1,2,2-Tetrachloroethane	79-34-5	0.5 U	0.5	0.1	1
02898	Tetrachloroethene	127-18-4	7.0	0.5	0.1	1
02898	Tetrahydrofuran	109-99-9	5.0 U	5.0	2.0	1
02898	Toluene	108-88-3	0.5 J	0.5	0.1	1
02898	1,2,3-Trichlorobenzene	87-61-6	0.5 U	0.5	0.1	1
02898	1,2,4-Trichlorobenzene	120-82-1	0.5 U	0.5	0.1	1

*=This limit was used in the evaluation of the final result

Sample Description: SG31I Water

LLI Sample # WW 6717583

Project Name: Supplemental VI Assessment

LLI Group # 1321595

Account # 09671

Collected: 07/11/2012 13:33

Sanborn Head and Assoc

Submitted: 07/12/2012 09:20

1715 W. 13th Street

Reported: 07/23/2012 20:10

Houston TX 77008

SG31I SDG#: MAN27-09

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS Volatiles		SW-846 8260B 25mL	ug/l	ug/l	ug/l	
purge						
02898	1,1,1-Trichloroethane	71-55-6	0.5 U	0.5	0.1	1
02898	1,1,2-Trichloroethane	79-00-5	0.5 U	0.5	0.1	1
02898	Trichloroethene	79-01-6	9.4	0.5	0.1	1
02898	Trichlorofluoromethane	75-69-4	0.5 U	0.5	0.1	1
02898	1,2,3-Trichloropropane	96-18-4	1.0 U	1.0	0.3	1
02898	1,2,4-Trimethylbenzene	95-63-6	0.1 J	0.5	0.1	1
02898	1,3,5-Trimethylbenzene	108-67-8	0.5 U	0.5	0.1	1
02898	Vinyl Chloride	75-01-4	0.6	0.5	0.1	1
02898	Xylene (Total)	1330-20-7	0.6	0.5	0.1	1

The LCS and/or LCSD recoveries are outside the stated QC window but within the marginal exceedance allowance of +/- 4 standard deviations as defined in the NELAC Standards. The following analytes are accepted based on this allowance: vinyl chloride.

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02898	Former 8021 Manassas, VA VOCs	SW-846 8260B 25mL purge	1	C122011AA	07/19/2012 16:36	Kerri E Legerlotz	1
02898	Former 8021 Manassas, VA VOCs	SW-846 8260B 25mL purge	1	C122022AB	07/23/2012 14:23	Kerri E Legerlotz	10
01163	GC/MS VOA Water Prep	SW-846 5030B	1	C122011AA	07/19/2012 16:36	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030B	2	C122022AB	07/23/2012 14:23	Kerri E Legerlotz	10

Sample Description: SG117 Water

LLI Sample # WW 6717584

Project Name: Supplemental VI Assessment

LLI Group # 1321595

Account # 09671

Collected: 07/11/2012 16:20

Sanborn Head and Assoc

Submitted: 07/12/2012 09:20

1715 W. 13th Street

Reported: 07/23/2012 20:10

Houston TX 77008

SG117 SDG#: MAN27-10

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
		purge				
02898	Benzene	71-43-2	0.5 U	0.5	0.1	1
02898	Bromobenzene	108-86-1	0.5 U	0.5	0.1	1
02898	Bromochloromethane	74-97-5	0.5 U	0.5	0.1	1
02898	Bromodichloromethane	75-27-4	2.5	0.5	0.1	1
02898	Bromoform	75-25-2	0.5 U	0.5	0.1	1
02898	Bromomethane	74-83-9	0.5 U	0.5	0.1	1
02898	n-Butylbenzene	104-51-8	0.5 U	0.5	0.1	1
02898	sec-Butylbenzene	135-98-8	0.5 U	0.5	0.1	1
02898	tert-Butylbenzene	98-06-6	0.5 U	0.5	0.1	1
02898	Carbon Tetrachloride	56-23-5	0.5 U	0.5	0.1	1
02898	Chlorobenzene	108-90-7	0.5 U	0.5	0.1	1
02898	Chloroethane	75-00-3	0.5 U	0.5	0.1	1
02898	Chloroform	67-66-3	15	0.5	0.1	1
02898	Chloromethane	74-87-3	0.5 U	0.5	0.2	1
02898	2-Chlorotoluene	95-49-8	0.5 U	0.5	0.1	1
02898	4-Chlorotoluene	106-43-4	0.5 U	0.5	0.1	1
02898	1,2-Dibromo-3-chloropropane	96-12-8	0.5 U	0.5	0.2	1
02898	Dibromochloromethane	124-48-1	0.5 J	0.5	0.1	1
02898	1,2-Dibromoethane	106-93-4	0.5 U	0.5	0.1	1
02898	Dibromomethane	74-95-3	0.5 U	0.5	0.1	1
02898	1,2-Dichlorobenzene	95-50-1	0.5 U	0.5	0.1	1
02898	1,3-Dichlorobenzene	541-73-1	0.5 U	0.5	0.1	1
02898	1,4-Dichlorobenzene	106-46-7	0.5 U	0.5	0.1	1
02898	Dichlorodifluoromethane	75-71-8	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethane	75-34-3	0.5 U	0.5	0.1	1
02898	1,2-Dichloroethane	107-06-2	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethene	75-35-4	0.5 U	0.5	0.1	1
02898	cis-1,2-Dichloroethene	156-59-2	0.5 U	0.5	0.1	1
02898	trans-1,2-Dichloroethene	156-60-5	0.5 U	0.5	0.1	1
02898	1,2-Dichloropropane	78-87-5	0.5 U	0.5	0.1	1
02898	1,3-Dichloropropane	142-28-9	0.5 U	0.5	0.1	1
02898	2,2-Dichloropropane	594-20-7	0.5 U	0.5	0.1	1
02898	1,1-Dichloropropene	563-58-6	0.5 U	0.5	0.1	1
02898	cis-1,3-Dichloropropene	10061-01-5	0.5 U	0.5	0.1	1
02898	trans-1,3-Dichloropropene	10061-02-6	0.5 U	0.5	0.1	1
02898	Ethylbenzene	100-41-4	0.5 U	0.5	0.1	1
02898	Freon 113	76-13-1	0.5 U	0.5	0.2	1
02898	Hexachlorobutadiene	87-68-3	0.5 U	0.5	0.1	1
02898	Isopropylbenzene	98-82-8	0.5 U	0.5	0.1	1
02898	p-Isopropyltoluene	99-87-6	0.5 U	0.5	0.1	1
02898	Methylene Chloride	75-09-2	0.5 U	0.5	0.2	1
02898	Naphthalene	91-20-3	0.5 U	0.5	0.1	1
02898	n-Propylbenzene	103-65-1	0.5 U	0.5	0.1	1
02898	Styrene	100-42-5	0.5 U	0.5	0.1	1
02898	1,1,1,2-Tetrachloroethane	630-20-6	0.5 U	0.5	0.1	1
02898	1,1,2,2-Tetrachloroethane	79-34-5	0.5 U	0.5	0.1	1
02898	Tetrachloroethene	127-18-4	0.5 U	0.5	0.1	1
02898	Tetrahydrofuran	109-99-9	5.0 U	5.0	2.0	1
02898	Toluene	108-88-3	0.5 U	0.5	0.1	1
02898	1,2,3-Trichlorobenzene	87-61-6	0.5 U	0.5	0.1	1
02898	1,2,4-Trichlorobenzene	120-82-1	0.5 U	0.5	0.1	1

*=This limit was used in the evaluation of the final result

Sample Description: SG117 Water

LLI Sample # WW 6717584

Project Name: Supplemental VI Assessment

LLI Group # 1321595

Account # 09671

Collected: 07/11/2012 16:20

Sanborn Head and Assoc

Submitted: 07/12/2012 09:20

1715 W. 13th Street

Reported: 07/23/2012 20:10

Houston TX 77008

SG117 SDG#: MAN27-10

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS Volatiles		SW-846 8260B 25mL	ug/l	ug/l	ug/l	
purge						
02898	1,1,1-Trichloroethane	71-55-6	0.5 U	0.5	0.1	1
02898	1,1,2-Trichloroethane	79-00-5	0.5 U	0.5	0.1	1
02898	Trichloroethene	79-01-6	0.5 U	0.5	0.1	1
02898	Trichlorofluoromethane	75-69-4	0.5 U	0.5	0.1	1
02898	1,2,3-Trichloropropane	96-18-4	1.0 U	1.0	0.3	1
02898	1,2,4-Trimethylbenzene	95-63-6	0.5 U	0.5	0.1	1
02898	1,3,5-Trimethylbenzene	108-67-8	0.5 U	0.5	0.1	1
02898	Vinyl Chloride	75-01-4	0.5 U	0.5	0.1	1
02898	Xylene (Total)	1330-20-7	0.5 U	0.5	0.1	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02898	Former 8021 Manassas, VA VOCs	SW-846 8260B 25mL purge	1	C122011AA	07/19/2012 16:58	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	C122011AA	07/19/2012 16:58	Kerri E Legerlotz	1

Sample Description: SG31 Water

LLI Sample # WW 6717585

Project Name: Supplemental VI Assessment

LLI Group # 1321595

Account # 09671

Collected: 07/10/2012 10:50

Sanborn Head and Assoc

Submitted: 07/12/2012 09:20

1715 W. 13th Street

Reported: 07/23/2012 20:10

Houston TX 77008

31SG- SDG#: MAN27-11

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
		purge				
02898	Benzene	71-43-2	0.1 J	0.5	0.1	1
02898	Bromobenzene	108-86-1	0.5 U	0.5	0.1	1
02898	Bromochloromethane	74-97-5	0.5 U	0.5	0.1	1
02898	Bromodichloromethane	75-27-4	5.0	0.5	0.1	1
02898	Bromoform	75-25-2	0.5 U	0.5	0.1	1
02898	Bromomethane	74-83-9	0.5 U	0.5	0.1	1
02898	n-Butylbenzene	104-51-8	0.5 U	0.5	0.1	1
02898	sec-Butylbenzene	135-98-8	0.5 U	0.5	0.1	1
02898	tert-Butylbenzene	98-06-6	0.5 U	0.5	0.1	1
02898	Carbon Tetrachloride	56-23-5	0.5 U	0.5	0.1	1
02898	Chlorobenzene	108-90-7	0.5 U	0.5	0.1	1
02898	Chloroethane	75-00-3	0.5 U	0.5	0.1	1
02898	Chloroform	67-66-3	26	5.0	1.0	10
02898	Chloromethane	74-87-3	0.5 U	0.5	0.2	1
02898	2-Chlorotoluene	95-49-8	0.5 U	0.5	0.1	1
02898	4-Chlorotoluene	106-43-4	0.5 U	0.5	0.1	1
02898	1,2-Dibromo-3-chloropropane	96-12-8	0.5 U	0.5	0.2	1
02898	Dibromochloromethane	124-48-1	0.9	0.5	0.1	1
02898	1,2-Dibromoethane	106-93-4	0.5 U	0.5	0.1	1
02898	Dibromomethane	74-95-3	0.5 U	0.5	0.1	1
02898	1,2-Dichlorobenzene	95-50-1	0.5 U	0.5	0.1	1
02898	1,3-Dichlorobenzene	541-73-1	0.5 U	0.5	0.1	1
02898	1,4-Dichlorobenzene	106-46-7	0.5 U	0.5	0.1	1
02898	Dichlorodifluoromethane	75-71-8	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethane	75-34-3	0.5 U	0.5	0.1	1
02898	1,2-Dichloroethane	107-06-2	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethene	75-35-4	0.5 U	0.5	0.1	1
02898	cis-1,2-Dichloroethene	156-59-2	4.1	0.5	0.1	1
02898	trans-1,2-Dichloroethene	156-60-5	0.5 J	0.5	0.1	1
02898	1,2-Dichloropropane	78-87-5	0.5 U	0.5	0.1	1
02898	1,3-Dichloropropane	142-28-9	0.5 U	0.5	0.1	1
02898	2,2-Dichloropropane	594-20-7	0.5 U	0.5	0.1	1
02898	1,1-Dichloropropene	563-58-6	0.5 U	0.5	0.1	1
02898	cis-1,3-Dichloropropene	10061-01-5	0.5 U	0.5	0.1	1
02898	trans-1,3-Dichloropropene	10061-02-6	0.5 U	0.5	0.1	1
02898	Ethylbenzene	100-41-4	0.5 U	0.5	0.1	1
02898	Freon 113	76-13-1	0.5 U	0.5	0.2	1
02898	Hexachlorobutadiene	87-68-3	0.5 U	0.5	0.1	1
02898	Isopropylbenzene	98-82-8	0.5 U	0.5	0.1	1
02898	p-Isopropyltoluene	99-87-6	0.5 U	0.5	0.1	1
02898	Methylene Chloride	75-09-2	0.5 U	0.5	0.2	1
02898	Naphthalene	91-20-3	0.5 U	0.5	0.1	1
02898	n-Propylbenzene	103-65-1	0.5 U	0.5	0.1	1
02898	Styrene	100-42-5	0.5 U	0.5	0.1	1
02898	1,1,1,2-Tetrachloroethane	630-20-6	0.5 U	0.5	0.1	1
02898	1,1,2,2-Tetrachloroethane	79-34-5	0.5 U	0.5	0.1	1
02898	Tetrachloroethene	127-18-4	2.6	0.5	0.1	1
02898	Tetrahydrofuran	109-99-9	5.0 U	5.0	2.0	1
02898	Toluene	108-88-3	0.6	0.5	0.1	1
02898	1,2,3-Trichlorobenzene	87-61-6	0.5 U	0.5	0.1	1
02898	1,2,4-Trichlorobenzene	120-82-1	0.5 U	0.5	0.1	1

*=This limit was used in the evaluation of the final result

Sample Description: SG31 Water

LLI Sample # WW 6717585

Project Name: Supplemental VI Assessment

LLI Group # 1321595

Account # 09671

Collected: 07/10/2012 10:50

Sanborn Head and Assoc

Submitted: 07/12/2012 09:20

1715 W. 13th Street

Reported: 07/23/2012 20:10

Houston TX 77008

31SG- SDG#: MAN27-11

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
	purge					
02898	1,1,1-Trichloroethane	71-55-6	0.5 U	0.5	0.1	1
02898	1,1,2-Trichloroethane	79-00-5	0.5 U	0.5	0.1	1
02898	Trichloroethene	79-01-6	0.9	0.5	0.1	1
02898	Trichlorofluoromethane	75-69-4	0.5 U	0.5	0.1	1
02898	1,2,3-Trichloropropane	96-18-4	1.0 U	1.0	0.3	1
02898	1,2,4-Trimethylbenzene	95-63-6	0.5 U	0.5	0.1	1
02898	1,3,5-Trimethylbenzene	108-67-8	0.5 U	0.5	0.1	1
02898	Vinyl Chloride	75-01-4	0.5 U	0.5	0.1	1
02898	Xylene (Total)	1330-20-7	0.5 U	0.5	0.1	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02898	Former 8021 Manassas, VA VOCs	SW-846 8260B 25mL purge	1	C122011AA	07/19/2012 17:21	Kerri E Legerlotz	1
02898	Former 8021 Manassas, VA VOCs	SW-846 8260B 25mL purge	1	C122022AA	07/20/2012 18:13	Kerri E Legerlotz	10
01163	GC/MS VOA Water Prep	SW-846 5030B	1	C122011AA	07/19/2012 17:21	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030B	2	C122022AA	07/20/2012 18:13	Kerri E Legerlotz	10

Sample Description: TB4 Water

LLI Sample # WW 6717586

Project Name: Supplemental VI Assessment

LLI Group # 1321595

Account # 09671

Collected: 06/12/2012

Sanborn Head and Assoc

Submitted: 07/12/2012 09:20

1715 W. 13th Street

Reported: 07/23/2012 20:10

Houston TX 77008

MNNT1 SDG#: MAN27-12TB*

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
		purge				
02898	Benzene	71-43-2	0.5 U	0.5	0.1	1
02898	Bromobenzene	108-86-1	0.5 U	0.5	0.1	1
02898	Bromochloromethane	74-97-5	0.5 U	0.5	0.1	1
02898	Bromodichloromethane	75-27-4	0.5 U	0.5	0.1	1
02898	Bromoform	75-25-2	0.5 U	0.5	0.1	1
02898	Bromomethane	74-83-9	0.5 U	0.5	0.1	1
02898	n-Butylbenzene	104-51-8	0.5 U	0.5	0.1	1
02898	sec-Butylbenzene	135-98-8	0.5 U	0.5	0.1	1
02898	tert-Butylbenzene	98-06-6	0.5 U	0.5	0.1	1
02898	Carbon Tetrachloride	56-23-5	0.5 U	0.5	0.1	1
02898	Chlorobenzene	108-90-7	0.5 U	0.5	0.1	1
02898	Chloroethane	75-00-3	0.5 U	0.5	0.1	1
02898	Chloroform	67-66-3	0.5 U	0.5	0.1	1
02898	Chloromethane	74-87-3	0.5 U	0.5	0.2	1
02898	2-Chlorotoluene	95-49-8	0.5 U	0.5	0.1	1
02898	4-Chlorotoluene	106-43-4	0.5 U	0.5	0.1	1
02898	1,2-Dibromo-3-chloropropane	96-12-8	0.5 U	0.5	0.2	1
02898	Dibromochloromethane	124-48-1	0.5 U	0.5	0.1	1
02898	1,2-Dibromoethane	106-93-4	0.5 U	0.5	0.1	1
02898	Dibromomethane	74-95-3	0.5 U	0.5	0.1	1
02898	1,2-Dichlorobenzene	95-50-1	0.5 U	0.5	0.1	1
02898	1,3-Dichlorobenzene	541-73-1	0.5 U	0.5	0.1	1
02898	1,4-Dichlorobenzene	106-46-7	0.5 U	0.5	0.1	1
02898	Dichlorodifluoromethane	75-71-8	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethane	75-34-3	0.5 U	0.5	0.1	1
02898	1,2-Dichloroethane	107-06-2	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethene	75-35-4	0.5 U	0.5	0.1	1
02898	cis-1,2-Dichloroethene	156-59-2	0.5 U	0.5	0.1	1
02898	trans-1,2-Dichloroethene	156-60-5	0.5 U	0.5	0.1	1
02898	1,2-Dichloropropane	78-87-5	0.5 U	0.5	0.1	1
02898	1,3-Dichloropropane	142-28-9	0.5 U	0.5	0.1	1
02898	2,2-Dichloropropane	594-20-7	0.5 U	0.5	0.1	1
02898	1,1-Dichloropropene	563-58-6	0.5 U	0.5	0.1	1
02898	cis-1,3-Dichloropropene	10061-01-5	0.5 U	0.5	0.1	1
02898	trans-1,3-Dichloropropene	10061-02-6	0.5 U	0.5	0.1	1
02898	Ethylbenzene	100-41-4	0.5 U	0.5	0.1	1
02898	Freon 113	76-13-1	0.5 U	0.5	0.2	1
02898	Hexachlorobutadiene	87-68-3	0.5 U	0.5	0.1	1
02898	Isopropylbenzene	98-82-8	0.5 U	0.5	0.1	1
02898	p-Isopropyltoluene	99-87-6	0.5 U	0.5	0.1	1
02898	Methylene Chloride	75-09-2	0.5 U	0.5	0.2	1
02898	Naphthalene	91-20-3	0.5 U	0.5	0.1	1
02898	n-Propylbenzene	103-65-1	0.5 U	0.5	0.1	1
02898	Styrene	100-42-5	0.5 U	0.5	0.1	1
02898	1,1,1,2-Tetrachloroethane	630-20-6	0.5 U	0.5	0.1	1
02898	1,1,2,2-Tetrachloroethane	79-34-5	0.5 U	0.5	0.1	1
02898	Tetrachloroethene	127-18-4	0.5 U	0.5	0.1	1
02898	Tetrahydrofuran	109-99-9	5.0 U	5.0	2.0	1
02898	Toluene	108-88-3	0.5 U	0.5	0.1	1
02898	1,2,3-Trichlorobenzene	87-61-6	0.5 U	0.5	0.1	1
02898	1,2,4-Trichlorobenzene	120-82-1	0.5 U	0.5	0.1	1

*=This limit was used in the evaluation of the final result

Sample Description: TB4 Water

LLI Sample # WW 6717586

Project Name: Supplemental VI Assessment

LLI Group # 1321595

Account # 09671

Collected: 06/12/2012

Sanborn Head and Assoc

Submitted: 07/12/2012 09:20

1715 W. 13th Street

Reported: 07/23/2012 20:10

Houston TX 77008

MNNT1 SDG#: MAN27-12TB*

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
	purge					
02898	1,1,1-Trichloroethane	71-55-6	0.5 U	0.5	0.1	1
02898	1,1,2-Trichloroethane	79-00-5	0.5 U	0.5	0.1	1
02898	Trichloroethene	79-01-6	0.5 U	0.5	0.1	1
02898	Trichlorofluoromethane	75-69-4	0.5 U	0.5	0.1	1
02898	1,2,3-Trichloropropane	96-18-4	1.0 U	1.0	0.3	1
02898	1,2,4-Trimethylbenzene	95-63-6	0.5 U	0.5	0.1	1
02898	1,3,5-Trimethylbenzene	108-67-8	0.5 U	0.5	0.1	1
02898	Vinyl Chloride	75-01-4	0.5 U	0.5	0.1	1
02898	Xylene (Total)	1330-20-7	0.5 U	0.5	0.1	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02898	Former 8021 Manassas, VA VOCs	SW-846 8260B 25mL purge	1	C122011AA	07/19/2012 13:17	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	C122011AA	07/19/2012 13:17	Kerri E Legerlotz	1

Quality Control Summary

Client Name: Sanborn Head and Assoc
Reported: 07/23/12 at 08:10 PM

Group Number: 1321595

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Laboratory Compliance Quality Control

<u>Analysis Name</u>	<u>Blank Result</u>	<u>Blank LOQ**</u>	<u>Blank MDL</u>	<u>Report Units</u>	<u>LCS %REC</u>	<u>LCSD %REC</u>	<u>LCS/LCSD Limits</u>	<u>RPD</u>	<u>RPD Max</u>
Batch number: C122011AA									
Sample number(s): 6717575-6717586									
Benzene	0.5	U	0.5	0.1	ug/l	106	80-120		
Bromobenzene	0.5	U	0.5	0.1	ug/l	104	80-120		
Bromochloromethane	0.5	U	0.5	0.1	ug/l	105	80-125		
Bromodichloromethane	0.5	U	0.5	0.1	ug/l	112	80-120		
Bromoform	0.5	U	0.5	0.1	ug/l	120	70-128		
Bromomethane	0.5	U	0.5	0.1	ug/l	112	66-124		
n-Butylbenzene	0.5	U	0.5	0.1	ug/l	98	80-120		
sec-Butylbenzene	0.5	U	0.5	0.1	ug/l	102	80-120		
tert-Butylbenzene	0.5	U	0.5	0.1	ug/l	108	80-120		
Carbon Tetrachloride	0.5	U	0.5	0.1	ug/l	112	74-133		
Chlorobenzene	0.5	U	0.5	0.1	ug/l	102	80-120		
Chloroethane	0.5	U	0.5	0.1	ug/l	106	67-124		
Chloroform	0.5	U	0.5	0.1	ug/l	104	80-120		
Chloromethane	0.5	U	0.5	0.2	ug/l	111	55-135		
2-Chlorotoluene	0.5	U	0.5	0.1	ug/l	103	80-120		
4-Chlorotoluene	0.5	U	0.5	0.1	ug/l	102	80-120		
1,2-Dibromo-3-chloropropane	0.5	U	0.5	0.2	ug/l	102	59-125		
Dibromochloromethane	0.5	U	0.5	0.1	ug/l	117	80-120		
1,2-Dibromoethane	0.5	U	0.5	0.1	ug/l	105	80-120		
Dibromomethane	0.5	U	0.5	0.1	ug/l	109	80-120		
1,2-Dichlorobenzene	0.5	U	0.5	0.1	ug/l	103	80-120		
1,3-Dichlorobenzene	0.5	U	0.5	0.1	ug/l	104	80-120		
1,4-Dichlorobenzene	0.5	U	0.5	0.1	ug/l	102	80-120		
Dichlorodifluoromethane	0.5	U	0.5	0.1	ug/l	92	39-120		
1,1-Dichloroethane	0.5	U	0.5	0.1	ug/l	105	80-122		
1,2-Dichloroethane	0.5	U	0.5	0.1	ug/l	112	80-127		
1,1-Dichloroethene	0.5	U	0.5	0.1	ug/l	109	80-123		
cis-1,2-Dichloroethene	0.5	U	0.5	0.1	ug/l	107	80-120		
trans-1,2-Dichloroethene	0.5	U	0.5	0.1	ug/l	106	80-121		
1,2-Dichloropropane	0.5	U	0.5	0.1	ug/l	105	80-120		
1,3-Dichloropropane	0.5	U	0.5	0.1	ug/l	104	80-120		
2,2-Dichloropropane	0.5	U	0.5	0.1	ug/l	112	75-122		
1,1-Dichloropropene	0.5	U	0.5	0.1	ug/l	104	80-121		
cis-1,3-Dichloropropene	0.5	U	0.5	0.1	ug/l	108	74-120		
trans-1,3-Dichloropropene	0.5	U	0.5	0.1	ug/l	119	80-120		
Ethylbenzene	0.5	U	0.5	0.1	ug/l	107	80-120		
Freon 113	0.5	U	0.5	0.2	ug/l	112	78-132		
Hexachlorobutadiene	0.5	U	0.5	0.1	ug/l	95	79-120		
Isopropylbenzene	0.5	U	0.5	0.1	ug/l	109	80-120		
p-Isopropyltoluene	0.5	U	0.5	0.1	ug/l	104	80-120		
Methylene Chloride	0.5	U	0.5	0.2	ug/l	107	80-120		
Naphthalene	0.5	U	0.5	0.1	ug/l	90	77-120		
n-Propylbenzene	0.5	U	0.5	0.1	ug/l	102	80-120		
Styrene	0.5	U	0.5	0.1	ug/l	111	80-122		
1,1,1,2-Tetrachloroethane	0.5	U	0.5	0.1	ug/l	108	80-120		

*- Outside of specification

** - This limit was used in the evaluation of the final result for the blank

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: Sanborn Head and Assoc
Reported: 07/23/12 at 08:10 PM

Group Number: 1321595

<u>Analysis Name</u>	<u>Blank Result</u>	<u>Blank LOQ**</u>	<u>Blank MDL</u>	<u>Report Units</u>	<u>LCS %REC</u>	<u>LCS %REC</u>	<u>LCS/LCSD Limits</u>	<u>RPD</u>	<u>RPD Max</u>
1,1,2,2-Tetrachloroethane	0.5 U	0.5	0.1	ug/l	105		80-125		
Tetrachloroethene	0.5 U	0.5	0.1	ug/l	104		80-120		
Tetrahydrofuran	5.0 U	5.0	2.0	ug/l	94		65-131		
Toluene	0.5 U	0.5	0.1	ug/l	104		80-120		
1,2,3-Trichlorobenzene	0.5 U	0.5	0.1	ug/l	95		77-120		
1,2,4-Trichlorobenzene	0.5 U	0.5	0.1	ug/l	101		79-120		
1,1,1-Trichloroethane	0.5 U	0.5	0.1	ug/l	111		79-127		
1,1,2-Trichloroethane	0.5 U	0.5	0.1	ug/l	108		80-120		
Trichloroethene	0.5 U	0.5	0.1	ug/l	105		80-120		
Trichlorofluoromethane	0.5 U	0.5	0.1	ug/l	124		66-134		
1,2,3-Trichloropropane	1.0 U	1.0	0.3	ug/l	107		80-120		
1,2,4-Trimethylbenzene	0.5 U	0.5	0.1	ug/l	103		80-120		
1,3,5-Trimethylbenzene	0.5 U	0.5	0.1	ug/l	103		80-120		
Vinyl Chloride	0.5 U	0.5	0.1	ug/l	130*		65-127		
Xylene (Total)	0.5 U	0.5	0.1	ug/l	108		80-120		

Batch number: C122022AA	Sample number(s): 6717580,6717585
Chloroform	0.5 U 0.5 0.1 ug/l 104 80-120
Tetrachloroethene	0.5 U 0.5 0.1 ug/l 109 80-120
Batch number: C122022AB	Sample number(s): 6717583
cis-1,2-Dichloroethene	0.5 U 0.5 0.1 ug/l 107 80-120

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

<u>Analysis Name</u>	<u>MS %REC</u>	<u>MSD %REC</u>	<u>MS/MSD Limits</u>	<u>RPD</u>	<u>RPD MAX</u>	<u>BKG Conc</u>	<u>DUP Conc</u>	<u>DUP RPD</u>	<u>Dup RPD Max</u>
Batch number: C122011AA	Sample number(s): 6717575-6717586 UNSPK: P717504								
Benzene	103	103	87-126	0	30				
Bromobenzene	106	108	80-123	2	30				
Bromochloromethane	106	106	82-125	0	30				
Bromodichloromethane	112	111	82-133	1	30				
Bromoform	120	119	60-138	1	30				
Bromomethane	105	105	69-135	0	30				
n-Butylbenzene	103	108	83-131	5	30				
sec-Butylbenzene	107	112	84-128	4	30				
tert-Butylbenzene	109	118	84-135	7	30				
Carbon Tetrachloride	110	112	81-148	1	30				
Chlorobenzene	106	107	78-133	1	30				
Chloroethane	101	103	70-139	1	30				
Chloroform	103	104	86-136	0	30				
Chloromethane	107	108	55-152	1	30				
2-Chlorotoluene	104	108	81-120	4	30				
4-Chlorotoluene	103	108	82-119	4	30				
1,2-Dibromo-3-chloropropane	104	99	55-156	4	30				
Dibromochloromethane	119	121	79-125	2	30				
1,2-Dibromoethane	107	108	84-127	1	30				
Dibromomethane	107	104	83-126	2	30				
1,2-Dichlorobenzene	104	108	83-117	3	30				
1,3-Dichlorobenzene	105	108	81-118	3	30				
1,4-Dichlorobenzene	103	108	79-120	5	30				

*- Outside of specification

** - This limit was used in the evaluation of the final result for the blank

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: Sanborn Head and Assoc
Reported: 07/23/12 at 08:10 PM

Group Number: 1321595

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

<u>Analysis Name</u>	<u>MS</u> <u>%REC</u>	<u>MSD</u> <u>%REC</u>	<u>MS/MSD</u> <u>Limits</u>	<u>RPD</u> <u>RPD</u>	<u>RPD</u> <u>MAX</u>	<u>BKG</u> <u>Conc</u>	<u>DUP</u> <u>Conc</u>	<u>DUP</u> <u>RPD</u>	<u>Dup RPD</u> <u>Max</u>
Dichlorodifluoromethane	91	90	39-155	1	30				
1,1-Dichloroethane	102	102	88-136	1	30				
1,2-Dichloroethane	107	105	82-135	2	30				
1,1-Dichloroethene	107	107	83-150	0	30				
cis-1,2-Dichloroethene	106	105	82-129	0	30				
trans-1,2-Dichloroethene	102	103	88-127	2	30				
1,2-Dichloropropane	104	104	91-126	1	30				
1,3-Dichloropropane	106	106	80-127	1	30				
2,2-Dichloropropane	111	111	80-134	0	30				
1,1-Dichloropropene	105	105	86-139	0	30				
cis-1,3-Dichloropropene	109	108	74-132	0	30				
trans-1,3-Dichloropropene	122	121	71-128	1	30				
Ethylbenzene	109	111	80-140	1	30				
Freon 113	110	110	87-158	0	30				
Hexachlorobutadiene	103	108	84-128	5	30				
Isopropylbenzene	114	117	81-133	3	30				
p-Isopropyltoluene	109	113	84-124	4	30				
Methylene Chloride	101	101	84-122	1	30				
Naphthalene	89	92	70-131	3	30				
n-Propylbenzene	106	109	79-131	3	30				
Styrene	114	115	63-151	1	30				
1,1,1,2-Tetrachloroethane	112	113	87-126	1	30				
1,1,2,2-Tetrachloroethane	105	107	75-131	2	30				
Tetrachloroethene	113	120	63-156	4	30				
Tetrahydrofuran	97	90	56-154	7	30				
Toluene	104	105	83-127	1	30				
1,2,3-Trichlorobenzene	96	100	73-125	4	30				
1,2,4-Trichlorobenzene	102	107	77-120	5	30				
1,1,1-Trichloroethane	109	110	85-140	1	30				
1,1,2-Trichloroethane	107	109	85-129	1	30				
Trichloroethene	105	105	85-131	0	30				
Trichlorofluoromethane	119	121	67-161	2	30				
1,2,3-Trichloropropane	107	109	76-120	2	30				
1,2,4-Trimethylbenzene	106	110	87-126	3	30				
1,3,5-Trimethylbenzene	106	110	89-129	3	30				
Vinyl Chloride	118	124	65-151	5	30				
Xylene (Total)	111	113	81-137	2	30				

Batch number: C122022AA Sample number(s): 6717580, 6717585 UNSPK: P726582
Chloroform 100 102 86-136 3 30
Tetrachloroethene 112 115 63-156 3 30

Batch number: C122022AB Sample number(s): 6717583 UNSPK: P726582
cis-1,2-Dichloroethene 104 107 82-129 4 30

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

*- Outside of specification

** - This limit was used in the evaluation of the final result for the blank

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: Sanborn Head and Assoc
Reported: 07/23/12 at 08:10 PM

Group Number: 1321595

Surrogate Quality Control

Analysis Name: EPA SW846/8260 (water-25ml) #1
Batch number: C122011AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
6717575	107	107	92	93
6717576	106	107	98	94
6717577	108	103	96	94
6717578	107	106	97	98
6717579	108	107	96	95
6717580	108	109	95	93
6717581	107	107	96	95
6717582	103	101	95	96
6717583	108	107	95	96
6717584	106	108	96	94
6717585	104	105	95	95
6717586	107	111	97	93
Blank	105	106	96	94
LCS	102	105	99	100
MS	103	104	100	99
MSD	102	103	100	99
<hr/>				
Limits:	77-114	74-113	77-110	78-110

Analysis Name: EPA SW846/8260 (water-25ml) #1
Batch number: C122022AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
Blank	106	105	97	91
LCS	103	103	101	96
MS	103	108	101	97
MSD	103	103	101	97
<hr/>				
Limits:	77-114	74-113	77-110	78-110

Analysis Name: EPA SW846/8260 (water-25ml) #1
Batch number: C122022AB

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
Blank	106	105	96	90
LCS	103	104	100	96
MS	103	108	101	97
MSD	103	103	101	97
<hr/>				
Limits:	77-114	74-113	77-110	78-110

*- Outside of specification

** - This limit was used in the evaluation of the final result for the blank

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

9671 | 1321595 / 6717575 -86

Shipping Group:1 SANBORN HEAD 95 High St Portland, ME 04101 P (207) 761-9300 F (207) 761-9339	Chain-of-Custody To: Lancaster Laboratories, Inc. 2425 New Holland Pike PO Box 12425 Lancaster, PA 17605-2425 P (717) 656-2300 F (717) 656-2681	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:30%;">Relinquished By:</th> <th style="width:30%;">Date / Time</th> <th style="width:30%;">Received By:</th> <th style="width:30%;">Date / Time</th> </tr> <tr> <td>Jessica Peria</td> <td>7/11/12 1200</td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td>Bunny Bunny</td> <td>7.12.12 920</td> </tr> </table>	Relinquished By:	Date / Time	Received By:	Date / Time	Jessica Peria	7/11/12 1200									Bunny Bunny	7.12.12 920
Relinquished By:	Date / Time	Received By:	Date / Time															
Jessica Peria	7/11/12 1200																	
		Bunny Bunny	7.12.12 920															

Project Information	Deliverable Information	Other Information
Name: Supplemental VI Assessment	TAT: Standard	SGD Complete? Yes
Number: 2732.05	Delivery Method: Email	Internal COC Required? No
Location: Manassas, Virginia	Email To: ebradstreet@sanbornhead.com	Site Specific QA/QC?
Manager: Erica Bradstreet	Data Package Option:	
Account #:	EDD Type: SHDMS	IBM Manassas VOCs list 6396
Quote #:		

Lab ID (Lab Use Only)	Sample Name	Collection		Matrix	Top Depth	Bottom Depth	Filtered? (Field / Lab)	8260B/HCI					Remarks:
		Date	Time										
	D86	7/11/2012	1453	GW				2					
	FB1	7/11/2012	1745	AQ				2					
	SG115I	7/10/2012	1219	GW				2					
	SG115S	7/10/2012	1141	GW				2					
	SG11822	7/10/2012	1035	GW				2					
	SG118I	7/10/2012	1115	GW				2					
	SG123I	7/10/2012	0954	GW				2					
	SG31D	7/11/2012	1600	GW				2					
	SG31I	7/11/2012	1333	GW				2					

Environmental Sample Administration Receipt Documentation Log

Client/Project: Sanborn Head
 Date of Receipt: 7-12-12
 Time of Receipt: 9:20
 Source Code: 50-1

Shipping Container Sealed: YES NO
 Custody Seal Present * : YES NO
* Custody seal was intact unless otherwise noted in the discrepancy section
 Package: Chilled Not Chilled

Temperature of Shipping Containers

Cooler #	Thermometer ID	Temperature (°C)	Temp Bottle (TB) or Surface Temp (ST)	Wet Ice (WI) or Dry Ice (DI) or Ice Packs (IP)	Ice Present? Y/N	Loose (L) Bagged Ice (B) or NA	Comments
1	2939	3.9	TB	WI	X	B	
2							
3							
4							
5							
6							

Number of Trip Blanks received NOT listed on chain of custody: 0

Paperwork Discrepancy/Unpacking Problems:

TB4 = TB

Unpacker Signature/Emp#: Bernard Bentley 2299 Date/Time: 7-12-12 12:39

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	BMQL	Below Minimum Quantitation Level
N.D.	none detected	MPN	Most Probable Number
TNTC	Too Numerous To Count	CP Units	cobalt-chloroplatinate units
IU	International Units	NTU	nephelometric turbidity units
umhos/cm	micromhos/cm	ng	nanogram(s)
C	degrees Celsius	F	degrees Fahrenheit
meq	milliequivalents	lb.	pound(s)
g	gram(s)	kg	kilogram(s)
µg	microgram(s)	mg	milligram(s)
mL	milliliter(s)	L	liter(s)
m³	cubic meter(s)	µL	microliter(s)
		pg/L	picogram/liter
<	less than - The number following the sign is the <u>limit of quantitation</u> , the smallest amount of analyte which can be reliably determined using this specific test.		
>	greater than		
ppm	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg), or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter of gas per liter of gas.		
ppb	parts per billion		
Dry weight basis	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.		

Data Qualifiers:

C – result confirmed by reanalysis.

J - estimated value – The result is \geq the Method Detection Limit (MDL) and $<$ the Limit of Quantitation (LOQ).

U.S. EPA CLP Data Qualifiers:

Organic Qualifiers		Inorganic Qualifiers	
A	TIC is a possible aldol-condensation product	B	Value is $<$ CRDL, but \geq IDL
B	Analyte was also detected in the blank	E	Estimated due to interference
C	Pesticide result confirmed by GC/MS	M	Duplicate injection precision not met
D	Compound quantitated on a diluted sample	N	Spike sample not within control limits
E	Concentration exceeds the calibration range of the instrument	S	Method of standard additions (MSA) used for calculation
N	Presumptive evidence of a compound (TICs only)	U	Compound was not detected
P	Concentration difference between primary and confirmation columns $>25\%$	W	Post digestion spike out of control limits
U	Compound was not detected	*	Duplicate analysis not within control limits
X,Y,Z	Defined in case narrative	+	Correlation coefficient for MSA <0.995

Analytical test results meet all requirements of NELAC unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR part 136 Table II as “analyze immediately” are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL LANCASTER LABORATORIES BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF LANCASTER LABORATORIES AND (B) WHETHER LANCASTER LABORATORIES HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Lancaster Laboratories which includes any conditions that vary from the Standard Terms and Conditions, and Lancaster hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

ANALYTICAL RESULTS

Prepared by:

Lancaster Laboratories
2425 New Holland Pike
Lancaster, PA 17605-2425

Prepared for:

Sanborn Head and Assoc
1 Technology Park Drive
Westford MA 01886

July 23, 2012

Project: Supplemental VI Assessment

Submittal Date: 07/13/2012

Group Number: 1321868

SDG: MAN28

PO Number: 2732.05.030

State of Sample Origin: VA

Client Sample Description

Frac01 Grab Water

SG11723 Grab Water

SG1171 Grab Water

TB1 Water

Lancaster Labs (LLI) #

6719353

6719354

6719355

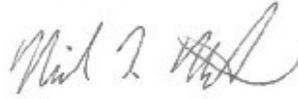
6719356

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

ELECTRONIC Sanborn Head and Assoc
COPY TO
1 COPY TO Data Package Group

Attn: Erica Bradstreet

Respectfully Submitted,



Nicole L. Maljovec
Senior Specialist Group Leader

(717) 556-7259

Sample Description: **Frac01 Grab Water**
Supplemental VI Assessment

LLI Sample # **WW 6719353**
LLI Group # **1321868**
Account # **09671**

Project Name: **Supplemental VI Assessment**

Collected: 07/12/2012 16:30

Sanborn Head and Assoc

Submitted: 07/13/2012 09:30

1 Technology Park Drive

Reported: 07/23/2012 19:59

Westford MA 01886

FRAC1 SDG#: MAN28-01

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
		purge				
02898	Benzene	71-43-2	1.1	0.5	0.1	1
02898	Bromobenzene	108-86-1	0.5 U	0.5	0.1	1
02898	Bromochloromethane	74-97-5	0.5 U	0.5	0.1	1
02898	Bromodichloromethane	75-27-4	1.9	0.5	0.1	1
02898	Bromoform	75-25-2	0.5 U	0.5	0.1	1
02898	Bromomethane	74-83-9	0.5 U	0.5	0.1	1
02898	n-Butylbenzene	104-51-8	0.5 U	0.5	0.1	1
02898	sec-Butylbenzene	135-98-8	0.5 U	0.5	0.1	1
02898	tert-Butylbenzene	98-06-6	0.5 U	0.5	0.1	1
02898	Carbon Tetrachloride	56-23-5	0.5 U	0.5	0.1	1
02898	Chlorobenzene	108-90-7	0.5 U	0.5	0.1	1
02898	Chloroethane	75-00-3	0.5 U	0.5	0.1	1
02898	Chloroform	67-66-3	17	0.5	0.1	1
02898	Chloromethane	74-87-3	0.5 U	0.5	0.2	1
02898	2-Chlorotoluene	95-49-8	0.5 U	0.5	0.1	1
02898	4-Chlorotoluene	106-43-4	0.5 U	0.5	0.1	1
02898	1,2-Dibromo-3-chloropropane	96-12-8	0.5 U	0.5	0.2	1
02898	Dibromochloromethane	124-48-1	0.4 J	0.5	0.1	1
02898	1,2-Dibromoethane	106-93-4	0.5 U	0.5	0.1	1
02898	Dibromomethane	74-95-3	0.5 U	0.5	0.1	1
02898	1,2-Dichlorobenzene	95-50-1	0.5 U	0.5	0.1	1
02898	1,3-Dichlorobenzene	541-73-1	0.5 U	0.5	0.1	1
02898	1,4-Dichlorobenzene	106-46-7	0.5 U	0.5	0.1	1
02898	Dichlorodifluoromethane	75-71-8	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethane	75-34-3	0.5 U	0.5	0.1	1
02898	1,2-Dichloroethane	107-06-2	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethene	75-35-4	0.5 U	0.5	0.1	1
02898	cis-1,2-Dichloroethene	156-59-2	0.5 U	0.5	0.1	1
02898	trans-1,2-Dichloroethene	156-60-5	0.5 U	0.5	0.1	1
02898	1,2-Dichloropropane	78-87-5	0.5 U	0.5	0.1	1
02898	1,3-Dichloropropane	142-28-9	0.5 U	0.5	0.1	1
02898	2,2-Dichloropropane	594-20-7	0.5 U	0.5	0.1	1
02898	1,1-Dichloropropene	563-58-6	0.5 U	0.5	0.1	1
02898	cis-1,3-Dichloropropene	10061-01-5	0.5 U	0.5	0.1	1
02898	trans-1,3-Dichloropropene	10061-02-6	0.5 U	0.5	0.1	1
02898	Ethylbenzene	100-41-4	1.1	0.5	0.1	1
02898	Freon 113	76-13-1	0.5 U	0.5	0.2	1
02898	Hexachlorobutadiene	87-68-3	0.5 U	0.5	0.1	1
02898	Isopropylbenzene	98-82-8	0.5 U	0.5	0.1	1
02898	p-Isopropyltoluene	99-87-6	0.5 U	0.5	0.1	1
02898	Methylene Chloride	75-09-2	0.5 U	0.5	0.2	1
02898	Naphthalene	91-20-3	0.7	0.5	0.1	1
02898	n-Propylbenzene	103-65-1	0.1 J	0.5	0.1	1
02898	Styrene	100-42-5	0.5 U	0.5	0.1	1
02898	1,1,1,2-Tetrachloroethane	630-20-6	0.5 U	0.5	0.1	1
02898	1,1,2,2-Tetrachloroethane	79-34-5	0.5 U	0.5	0.1	1
02898	Tetrachloroethene	127-18-4	0.5 U	0.5	0.1	1
02898	Tetrahydrofuran	109-99-9	5.0 U	5.0	2.0	1
02898	Toluene	108-88-3	8.7	0.5	0.1	1
02898	1,2,3-Trichlorobenzene	87-61-6	0.5 U	0.5	0.1	1

*=This limit was used in the evaluation of the final result

Sample Description: **Frac01 Grab Water**
Supplemental VI Assessment

LLI Sample # **WW 6719353**
LLI Group # **1321868**
Account # **09671**

Project Name: **Supplemental VI Assessment**

Collected: 07/12/2012 16:30
Submitted: 07/13/2012 09:30
Reported: 07/23/2012 19:59

Sanborn Head and Assoc
1 Technology Park Drive
Westford MA 01886

FRAC1 SDG#: MAN28-01

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
		purge				
02898	1,2,4-Trichlorobenzene	120-82-1	0.5 U	0.5	0.1	1
02898	1,1,1-Trichloroethane	71-55-6	0.5 U	0.5	0.1	1
02898	1,1,2-Trichloroethane	79-00-5	0.5 U	0.5	0.1	1
02898	Trichloroethene	79-01-6	0.5 U	0.5	0.1	1
02898	Trichlorofluoromethane	75-69-4	0.5 U	0.5	0.1	1
02898	1,2,3-Trichloropropane	96-18-4	1.0 U	1.0	0.3	1
02898	1,2,4-Trimethylbenzene	95-63-6	0.3 J	0.5	0.1	1
02898	1,3,5-Trimethylbenzene	108-67-8	0.5 U	0.5	0.1	1
02898	Vinyl Chloride	75-01-4	0.5 U	0.5	0.1	1
02898	Xylene (Total)	1330-20-7	5.3	0.5	0.1	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02898	Former 8021 Manassas, VA VOCs	SW-846 8260B 25mL	1	C121981AA	07/16/2012 11:39	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	C121981AA	07/16/2012 11:39	Kerri E Legerlotz	1

*=This limit was used in the evaluation of the final result

Sample Description: SG11723 Grab Water
Supplemental VI Assessment

LLI Sample # WW 6719354
LLI Group # 1321868
Account # 09671

Project Name: Supplemental VI Assessment

Collected: 07/12/2012 15:40

Sanborn Head and Assoc

Submitted: 07/13/2012 09:30

1 Technology Park Drive

Reported: 07/23/2012 19:59

Westford MA 01886

11723 SDG#: MAN28-02

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
		purge				
02898	Benzene	71-43-2	0.5 U	0.5	0.1	1
02898	Bromobenzene	108-86-1	0.5 U	0.5	0.1	1
02898	Bromochloromethane	74-97-5	0.5 U	0.5	0.1	1
02898	Bromodichloromethane	75-27-4	1.2	0.5	0.1	1
02898	Bromoform	75-25-2	0.5 U	0.5	0.1	1
02898	Bromomethane	74-83-9	0.5 U	0.5	0.1	1
02898	n-Butylbenzene	104-51-8	0.5 U	0.5	0.1	1
02898	sec-Butylbenzene	135-98-8	0.5 U	0.5	0.1	1
02898	tert-Butylbenzene	98-06-6	0.5 U	0.5	0.1	1
02898	Carbon Tetrachloride	56-23-5	0.5 U	0.5	0.1	1
02898	Chlorobenzene	108-90-7	0.5 U	0.5	0.1	1
02898	Chloroethane	75-00-3	0.5 U	0.5	0.1	1
02898	Chloroform	67-66-3	7.5	0.5	0.1	1
02898	Chloromethane	74-87-3	0.5 U	0.5	0.2	1
02898	2-Chlorotoluene	95-49-8	0.5 U	0.5	0.1	1
02898	4-Chlorotoluene	106-43-4	0.5 U	0.5	0.1	1
02898	1,2-Dibromo-3-chloropropane	96-12-8	0.5 U	0.5	0.2	1
02898	Dibromochloromethane	124-48-1	0.2 J	0.5	0.1	1
02898	1,2-Dibromoethane	106-93-4	0.5 U	0.5	0.1	1
02898	Dibromomethane	74-95-3	0.5 U	0.5	0.1	1
02898	1,2-Dichlorobenzene	95-50-1	0.5 U	0.5	0.1	1
02898	1,3-Dichlorobenzene	541-73-1	0.5 U	0.5	0.1	1
02898	1,4-Dichlorobenzene	106-46-7	0.5 U	0.5	0.1	1
02898	Dichlorodifluoromethane	75-71-8	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethane	75-34-3	0.5 U	0.5	0.1	1
02898	1,2-Dichloroethane	107-06-2	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethene	75-35-4	0.5 U	0.5	0.1	1
02898	cis-1,2-Dichloroethene	156-59-2	0.5 U	0.5	0.1	1
02898	trans-1,2-Dichloroethene	156-60-5	0.5 U	0.5	0.1	1
02898	1,2-Dichloropropane	78-87-5	0.5 U	0.5	0.1	1
02898	1,3-Dichloropropane	142-28-9	0.5 U	0.5	0.1	1
02898	2,2-Dichloropropane	594-20-7	0.5 U	0.5	0.1	1
02898	1,1-Dichloropropene	563-58-6	0.5 U	0.5	0.1	1
02898	cis-1,3-Dichloropropene	10061-01-5	0.5 U	0.5	0.1	1
02898	trans-1,3-Dichloropropene	10061-02-6	0.5 U	0.5	0.1	1
02898	Ethylbenzene	100-41-4	0.2 J	0.5	0.1	1
02898	Freon 113	76-13-1	0.5 U	0.5	0.2	1
02898	Hexachlorobutadiene	87-68-3	0.5 U	0.5	0.1	1
02898	Isopropylbenzene	98-82-8	0.5 U	0.5	0.1	1
02898	p-Isopropyltoluene	99-87-6	0.5 U	0.5	0.1	1
02898	Methylene Chloride	75-09-2	0.5 U	0.5	0.2	1
02898	Naphthalene	91-20-3	0.6	0.5	0.1	1
02898	n-Propylbenzene	103-65-1	0.5 U	0.5	0.1	1
02898	Styrene	100-42-5	0.5 U	0.5	0.1	1
02898	1,1,1,2-Tetrachloroethane	630-20-6	0.5 U	0.5	0.1	1
02898	1,1,2,2-Tetrachloroethane	79-34-5	0.5 U	0.5	0.1	1
02898	Tetrachloroethene	127-18-4	0.5 U	0.5	0.1	1
02898	Tetrahydrofuran	109-99-9	5.0 U	5.0	2.0	1
02898	Toluene	108-88-3	1.0	0.5	0.1	1
02898	1,2,3-Trichlorobenzene	87-61-6	0.5 U	0.5	0.1	1

*=This limit was used in the evaluation of the final result

Sample Description: SG11723 Grab Water
Supplemental VI Assessment

LLI Sample # WW 6719354
LLI Group # 1321868
Account # 09671

Project Name: Supplemental VI Assessment

Collected: 07/12/2012 15:40
Submitted: 07/13/2012 09:30
Reported: 07/23/2012 19:59

Sanborn Head and Assoc
1 Technology Park Drive
Westford MA 01886

11723 SDG#: MAN28-02

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
	purge					
02898	1,2,4-Trichlorobenzene	120-82-1	0.5 U	0.5	0.1	1
02898	1,1,1-Trichloroethane	71-55-6	0.5 U	0.5	0.1	1
02898	1,1,2-Trichloroethane	79-00-5	0.5 U	0.5	0.1	1
02898	Trichloroethene	79-01-6	0.5 U	0.5	0.1	1
02898	Trichlorofluoromethane	75-69-4	0.5 U	0.5	0.1	1
02898	1,2,3-Trichloropropane	96-18-4	1.0 U	1.0	0.3	1
02898	1,2,4-Trimethylbenzene	95-63-6	0.3 J	0.5	0.1	1
02898	1,3,5-Trimethylbenzene	108-67-8	0.5 U	0.5	0.1	1
02898	Vinyl Chloride	75-01-4	0.5 U	0.5	0.1	1
02898	Xylene (Total)	1330-20-7	1.4	0.5	0.1	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02898	Former 8021 Manassas, VA VOCs	SW-846 8260B 25mL	1	C122011AA	07/19/2012 17:43	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	C122011AA	07/19/2012 17:43	Kerri E Legerlotz	1

*=This limit was used in the evaluation of the final result

Sample Description: SG117I Grab Water
Supplemental VI Assessment

LLI Sample # WW 6719355
LLI Group # 1321868
Account # 09671

Project Name: Supplemental VI Assessment

Collected: 07/12/2012 14:45

Sanborn Head and Assoc

Submitted: 07/13/2012 09:30

1 Technology Park Drive

Reported: 07/23/2012 19:59

Westford MA 01886

S1171 SDG#: MAN28-03

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
		purge				
02898	Benzene	71-43-2	0.5 U	0.5	0.1	1
02898	Bromobenzene	108-86-1	0.5 U	0.5	0.1	1
02898	Bromochloromethane	74-97-5	0.5 U	0.5	0.1	1
02898	Bromodichloromethane	75-27-4	1.8	0.5	0.1	1
02898	Bromoform	75-25-2	0.5 U	0.5	0.1	1
02898	Bromomethane	74-83-9	0.5 U	0.5	0.1	1
02898	n-Butylbenzene	104-51-8	0.5 U	0.5	0.1	1
02898	sec-Butylbenzene	135-98-8	0.5 U	0.5	0.1	1
02898	tert-Butylbenzene	98-06-6	0.5 U	0.5	0.1	1
02898	Carbon Tetrachloride	56-23-5	0.5 U	0.5	0.1	1
02898	Chlorobenzene	108-90-7	0.5 U	0.5	0.1	1
02898	Chloroethane	75-00-3	0.5 U	0.5	0.1	1
02898	Chloroform	67-66-3	11	0.5	0.1	1
02898	Chloromethane	74-87-3	0.5 U	0.5	0.2	1
02898	2-Chlorotoluene	95-49-8	0.5 U	0.5	0.1	1
02898	4-Chlorotoluene	106-43-4	0.5 U	0.5	0.1	1
02898	1,2-Dibromo-3-chloropropane	96-12-8	0.5 U	0.5	0.2	1
02898	Dibromochloromethane	124-48-1	0.3 J	0.5	0.1	1
02898	1,2-Dibromoethane	106-93-4	0.5 U	0.5	0.1	1
02898	Dibromomethane	74-95-3	0.5 U	0.5	0.1	1
02898	1,2-Dichlorobenzene	95-50-1	0.5 U	0.5	0.1	1
02898	1,3-Dichlorobenzene	541-73-1	0.5 U	0.5	0.1	1
02898	1,4-Dichlorobenzene	106-46-7	0.5 U	0.5	0.1	1
02898	Dichlorodifluoromethane	75-71-8	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethane	75-34-3	0.5 U	0.5	0.1	1
02898	1,2-Dichloroethane	107-06-2	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethene	75-35-4	0.5 U	0.5	0.1	1
02898	cis-1,2-Dichloroethene	156-59-2	0.5 U	0.5	0.1	1
02898	trans-1,2-Dichloroethene	156-60-5	0.5 U	0.5	0.1	1
02898	1,2-Dichloropropane	78-87-5	0.5 U	0.5	0.1	1
02898	1,3-Dichloropropane	142-28-9	0.5 U	0.5	0.1	1
02898	2,2-Dichloropropane	594-20-7	0.5 U	0.5	0.1	1
02898	1,1-Dichloropropene	563-58-6	0.5 U	0.5	0.1	1
02898	cis-1,3-Dichloropropene	10061-01-5	0.5 U	0.5	0.1	1
02898	trans-1,3-Dichloropropene	10061-02-6	0.5 U	0.5	0.1	1
02898	Ethylbenzene	100-41-4	0.5 U	0.5	0.1	1
02898	Freon 113	76-13-1	0.5 U	0.5	0.2	1
02898	Hexachlorobutadiene	87-68-3	0.5 U	0.5	0.1	1
02898	Isopropylbenzene	98-82-8	0.5 U	0.5	0.1	1
02898	p-Isopropyltoluene	99-87-6	0.5 U	0.5	0.1	1
02898	Methylene Chloride	75-09-2	6.9	0.5	0.2	1
02898	Naphthalene	91-20-3	0.5	0.5	0.1	1
02898	n-Propylbenzene	103-65-1	0.5 U	0.5	0.1	1
02898	Styrene	100-42-5	0.5 U	0.5	0.1	1
02898	1,1,1,2-Tetrachloroethane	630-20-6	0.5 U	0.5	0.1	1
02898	1,1,2,2-Tetrachloroethane	79-34-5	0.5 U	0.5	0.1	1
02898	Tetrachloroethene	127-18-4	0.2 J	0.5	0.1	1
02898	Tetrahydrofuran	109-99-9	5.0 U	5.0	2.0	1
02898	Toluene	108-88-3	0.5	0.5	0.1	1
02898	1,2,3-Trichlorobenzene	87-61-6	0.5 U	0.5	0.1	1

*=This limit was used in the evaluation of the final result

Sample Description: SG117I Grab Water
Supplemental VI Assessment

LLI Sample # WW 6719355
LLI Group # 1321868
Account # 09671

Project Name: Supplemental VI Assessment

Collected: 07/12/2012 14:45
Submitted: 07/13/2012 09:30
Reported: 07/23/2012 19:59

Sanborn Head and Assoc
1 Technology Park Drive
Westford MA 01886

S1171 SDG#: MAN28-03

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
	purge					
02898	1,2,4-Trichlorobenzene	120-82-1	0.5 U	0.5	0.1	1
02898	1,1,1-Trichloroethane	71-55-6	0.5 U	0.5	0.1	1
02898	1,1,2-Trichloroethane	79-00-5	0.5 U	0.5	0.1	1
02898	Trichloroethene	79-01-6	0.5 U	0.5	0.1	1
02898	Trichlorofluoromethane	75-69-4	0.5 U	0.5	0.1	1
02898	1,2,3-Trichloropropane	96-18-4	1.0 U	1.0	0.3	1
02898	1,2,4-Trimethylbenzene	95-63-6	0.1 J	0.5	0.1	1
02898	1,3,5-Trimethylbenzene	108-67-8	0.5 U	0.5	0.1	1
02898	Vinyl Chloride	75-01-4	0.5 U	0.5	0.1	1
02898	Xylene (Total)	1330-20-7	0.4 J	0.5	0.1	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02898	Former 8021 Manassas, VA VOCs	SW-846 8260B 25mL	1	C122022AA	07/20/2012 17:06	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	C122022AA	07/20/2012 17:06	Kerri E Legerlotz	1

*=This limit was used in the evaluation of the final result

Sample Description: TB1 Water
Supplemental VI Assessment

LLI Sample # WW 6719356
LLI Group # 1321868
Account # 09671

Project Name: Supplemental VI Assessment

Collected: 07/05/2012

Sanborn Head and Assoc
1 Technology Park Drive
Westford MA 01886

Submitted: 07/13/2012 09:30

Reported: 07/23/2012 19:59

SVATB SDG#: MAN28-04TB*

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
		purge				
02898	Benzene	71-43-2	0.5 U	0.5	0.1	1
02898	Bromobenzene	108-86-1	0.5 U	0.5	0.1	1
02898	Bromochloromethane	74-97-5	0.5 U	0.5	0.1	1
02898	Bromodichloromethane	75-27-4	0.5 U	0.5	0.1	1
02898	Bromoform	75-25-2	0.5 U	0.5	0.1	1
02898	Bromomethane	74-83-9	0.5 U	0.5	0.1	1
02898	n-Butylbenzene	104-51-8	0.5 U	0.5	0.1	1
02898	sec-Butylbenzene	135-98-8	0.5 U	0.5	0.1	1
02898	tert-Butylbenzene	98-06-6	0.5 U	0.5	0.1	1
02898	Carbon Tetrachloride	56-23-5	0.5 U	0.5	0.1	1
02898	Chlorobenzene	108-90-7	0.5 U	0.5	0.1	1
02898	Chloroethane	75-00-3	0.5 U	0.5	0.1	1
02898	Chloroform	67-66-3	0.4 J	0.5	0.1	1
02898	Chloromethane	74-87-3	0.5 U	0.5	0.2	1
02898	2-Chlorotoluene	95-49-8	0.5 U	0.5	0.1	1
02898	4-Chlorotoluene	106-43-4	0.5 U	0.5	0.1	1
02898	1,2-Dibromo-3-chloropropane	96-12-8	0.5 U	0.5	0.2	1
02898	Dibromochloromethane	124-48-1	0.5 U	0.5	0.1	1
02898	1,2-Dibromoethane	106-93-4	0.5 U	0.5	0.1	1
02898	Dibromomethane	74-95-3	0.5 U	0.5	0.1	1
02898	1,2-Dichlorobenzene	95-50-1	0.5 U	0.5	0.1	1
02898	1,3-Dichlorobenzene	541-73-1	0.5 U	0.5	0.1	1
02898	1,4-Dichlorobenzene	106-46-7	0.5 U	0.5	0.1	1
02898	Dichlorodifluoromethane	75-71-8	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethane	75-34-3	0.5 U	0.5	0.1	1
02898	1,2-Dichloroethane	107-06-2	0.5 U	0.5	0.1	1
02898	1,1-Dichloroethene	75-35-4	0.5 U	0.5	0.1	1
02898	cis-1,2-Dichloroethene	156-59-2	0.5 U	0.5	0.1	1
02898	trans-1,2-Dichloroethene	156-60-5	0.5 U	0.5	0.1	1
02898	1,2-Dichloropropane	78-87-5	0.5 U	0.5	0.1	1
02898	1,3-Dichloropropane	142-28-9	0.5 U	0.5	0.1	1
02898	2,2-Dichloropropane	594-20-7	0.5 U	0.5	0.1	1
02898	1,1-Dichloropropene	563-58-6	0.5 U	0.5	0.1	1
02898	cis-1,3-Dichloropropene	10061-01-5	0.5 U	0.5	0.1	1
02898	trans-1,3-Dichloropropene	10061-02-6	0.5 U	0.5	0.1	1
02898	Ethylbenzene	100-41-4	0.5 U	0.5	0.1	1
02898	Freon 113	76-13-1	0.5 U	0.5	0.2	1
02898	Hexachlorobutadiene	87-68-3	0.5 U	0.5	0.1	1
02898	Isopropylbenzene	98-82-8	0.5 U	0.5	0.1	1
02898	p-Isopropyltoluene	99-87-6	0.5 U	0.5	0.1	1
02898	Methylene Chloride	75-09-2	0.5 U	0.5	0.2	1
02898	Naphthalene	91-20-3	0.5 U	0.5	0.1	1
02898	n-Propylbenzene	103-65-1	0.5 U	0.5	0.1	1
02898	Styrene	100-42-5	0.5 U	0.5	0.1	1
02898	1,1,1,2-Tetrachloroethane	630-20-6	0.5 U	0.5	0.1	1
02898	1,1,1,2,2-Tetrachloroethane	79-34-5	0.5 U	0.5	0.1	1
02898	Tetrachloroethene	127-18-4	1.8	0.5	0.1	1
02898	Tetrahydrofuran	109-99-9	5.0 U	5.0	2.0	1
02898	Toluene	108-88-3	0.5 U	0.5	0.1	1
02898	1,2,3-Trichlorobenzene	87-61-6	0.5 U	0.5	0.1	1

*=This limit was used in the evaluation of the final result

Sample Description: TB1 Water
Supplemental VI Assessment

LLI Sample # WW 6719356
LLI Group # 1321868
Account # 09671

Project Name: Supplemental VI Assessment

Collected: 07/05/2012

Sanborn Head and Assoc
1 Technology Park Drive
Westford MA 01886

Submitted: 07/13/2012 09:30

Reported: 07/23/2012 19:59

SVATB SDG#: MAN28-04TB*

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	ug/l	
	purge					
02898	1,2,4-Trichlorobenzene	120-82-1	0.5 U	0.5	0.1	1
02898	1,1,1-Trichloroethane	71-55-6	0.5 U	0.5	0.1	1
02898	1,1,2-Trichloroethane	79-00-5	0.5 U	0.5	0.1	1
02898	Trichloroethene	79-01-6	0.5 U	0.5	0.1	1
02898	Trichlorofluoromethane	75-69-4	0.5 U	0.5	0.1	1
02898	1,2,3-Trichloropropane	96-18-4	1.0 U	1.0	0.3	1
02898	1,2,4-Trimethylbenzene	95-63-6	0.5 U	0.5	0.1	1
02898	1,3,5-Trimethylbenzene	108-67-8	0.5 U	0.5	0.1	1
02898	Vinyl Chloride	75-01-4	0.5 U	0.5	0.1	1
02898	Xylene (Total)	1330-20-7	0.5 U	0.5	0.1	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02898	Former 8021 Manassas, VA VOCs	SW-846 8260B 25mL	1	C122011AA	07/19/2012 18:31	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	C122011AA	07/19/2012 18:31	Kerri E Legerlotz	1

Quality Control Summary

Client Name: Sanborn Head and Assoc
Reported: 07/23/12 at 07:59 PM

Group Number: 1321868

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Laboratory Compliance Quality Control

<u>Analysis Name</u>	<u>Blank Result</u>	<u>Blank LOQ**</u>	<u>Blank MDL</u>	<u>Report Units</u>	<u>LCS %REC</u>	<u>LCSD %REC</u>	<u>LCS/LCSD Limits</u>	<u>RPD</u>	<u>RPD Max</u>
Batch number: C121981AA		Sample number(s): 6719353							
Benzene	0.5 U	0.5	0.1	ug/l	104		80-120		
Bromobenzene	0.5 U	0.5	0.1	ug/l	106		80-120		
Bromochloromethane	0.5 U	0.5	0.1	ug/l	105		80-125		
Bromodichloromethane	0.5 U	0.5	0.1	ug/l	111		80-120		
Bromoform	0.5 U	0.5	0.1	ug/l	120		70-128		
Bromomethane	0.5 U	0.5	0.1	ug/l	129*		66-124		
n-Butylbenzene	0.5 U	0.5	0.1	ug/l	94		80-120		
sec-Butylbenzene	0.5 U	0.5	0.1	ug/l	100		80-120		
tert-Butylbenzene	0.5 U	0.5	0.1	ug/l	108		80-120		
Carbon Tetrachloride	0.5 U	0.5	0.1	ug/l	112		74-133		
Chlorobenzene	0.5 U	0.5	0.1	ug/l	103		80-120		
Chloroethane	0.5 U	0.5	0.1	ug/l	115		67-124		
Chloroform	0.5 U	0.5	0.1	ug/l	103		80-120		
Chloromethane	0.5 U	0.5	0.2	ug/l	100		55-135		
2-Chlorotoluene	0.5 U	0.5	0.1	ug/l	103		80-120		
4-Chlorotoluene	0.5 U	0.5	0.1	ug/l	103		80-120		
1,2-Dibromo-3-chloropropane	0.5 U	0.5	0.2	ug/l	102		59-125		
Dibromochloromethane	0.5 U	0.5	0.1	ug/l	117		80-120		
1,2-Dibromoethane	0.5 U	0.5	0.1	ug/l	106		80-120		
Dibromomethane	0.5 U	0.5	0.1	ug/l	105		80-120		
1,2-Dichlorobenzene	0.5 U	0.5	0.1	ug/l	102		80-120		
1,3-Dichlorobenzene	0.5 U	0.5	0.1	ug/l	102		80-120		
1,4-Dichlorobenzene	0.5 U	0.5	0.1	ug/l	103		80-120		
Dichlorodifluoromethane	0.5 U	0.5	0.1	ug/l	98		39-120		
1,1-Dichloroethane	0.5 U	0.5	0.1	ug/l	102		80-122		
1,2-Dichloroethane	0.5 U	0.5	0.1	ug/l	107		80-127		
1,1-Dichloroethene	0.5 U	0.5	0.1	ug/l	110		80-123		
cis-1,2-Dichloroethene	0.5 U	0.5	0.1	ug/l	107		80-120		
trans-1,2-Dichloroethene	0.5 U	0.5	0.1	ug/l	105		80-121		
1,2-Dichloropropane	0.5 U	0.5	0.1	ug/l	104		80-120		
1,3-Dichloropropane	0.5 U	0.5	0.1	ug/l	102		80-120		
2,2-Dichloropropane	0.5 U	0.5	0.1	ug/l	110		75-122		
1,1-Dichloropropene	0.5 U	0.5	0.1	ug/l	106		80-121		
cis-1,3-Dichloropropene	0.5 U	0.5	0.1	ug/l	110		74-120		
trans-1,3-Dichloropropene	0.5 U	0.5	0.1	ug/l	119		80-120		
Ethylbenzene	0.5 U	0.5	0.1	ug/l	106		80-120		
Freon 113	0.5 U	0.5	0.2	ug/l	111		78-132		
Hexachlorobutadiene	0.5 U	0.5	0.1	ug/l	97		79-120		
Isopropylbenzene	0.5 U	0.5	0.1	ug/l	107		80-120		
p-Isopropyltoluene	0.5 U	0.5	0.1	ug/l	102		80-120		
Methylene Chloride	0.5 U	0.5	0.2	ug/l	104		80-120		
Naphthalene	0.5 U	0.5	0.1	ug/l	91		77-120		
n-Propylbenzene	0.5 U	0.5	0.1	ug/l	101		80-120		
Styrene	0.5 U	0.5	0.1	ug/l	110		80-122		
1,1,1,2-Tetrachloroethane	0.5 U	0.5	0.1	ug/l	106		80-120		

*- Outside of specification

** - This limit was used in the evaluation of the final result for the blank

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: Sanborn Head and Assoc
Reported: 07/23/12 at 07:59 PM

Group Number: 1321868

<u>Analysis Name</u>	<u>Blank Result</u>		<u>Blank LOQ**</u>	<u>Blank MDL</u>	<u>Report Units</u>	<u>LCS %REC</u>	<u>LCS %REC</u>	<u>LCS/LCSD Limits</u>	<u>RPD</u>	<u>RPD Max</u>
1,1,2,2-Tetrachloroethane	0.5	U	0.5	0.1	ug/l	104		80-125		
Tetrachloroethene	0.5	U	0.5	0.1	ug/l	105		80-120		
Tetrahydrofuran	5.0	U	5.0	2.0	ug/l	89		65-131		
Toluene	0.5	U	0.5	0.1	ug/l	102		80-120		
1,2,3-Trichlorobenzene	0.5	U	0.5	0.1	ug/l	93		77-120		
1,2,4-Trichlorobenzene	0.5	U	0.5	0.1	ug/l	99		79-120		
1,1,1-Trichloroethane	0.5	U	0.5	0.1	ug/l	110		79-127		
1,1,2-Trichloroethane	0.5	U	0.5	0.1	ug/l	104		80-120		
Trichloroethene	0.5	U	0.5	0.1	ug/l	105		80-120		
Trichlorofluoromethane	0.5	U	0.5	0.1	ug/l	120		66-134		
1,2,3-Trichloropropane	1.0	U	1.0	0.3	ug/l	108		80-120		
1,2,4-Trimethylbenzene	0.5	U	0.5	0.1	ug/l	102		80-120		
1,3,5-Trimethylbenzene	0.5	U	0.5	0.1	ug/l	102		80-120		
Vinyl Chloride	0.5	U	0.5	0.1	ug/l	121		65-127		
Xylene (Total)	0.5	U	0.5	0.1	ug/l	106		80-120		

Batch number: C122011AA

Sample number(s): 6719354,6719356

Benzene	0.5	U	0.5	0.1	ug/l	106		80-120		
Bromobenzene	0.5	U	0.5	0.1	ug/l	104		80-120		
Bromochloromethane	0.5	U	0.5	0.1	ug/l	105		80-125		
Bromodichloromethane	0.5	U	0.5	0.1	ug/l	112		80-120		
Bromoform	0.5	U	0.5	0.1	ug/l	120		70-128		
Bromomethane	0.5	U	0.5	0.1	ug/l	112		66-124		
n-Butylbenzene	0.5	U	0.5	0.1	ug/l	98		80-120		
sec-Butylbenzene	0.5	U	0.5	0.1	ug/l	102		80-120		
tert-Butylbenzene	0.5	U	0.5	0.1	ug/l	108		80-120		
Carbon Tetrachloride	0.5	U	0.5	0.1	ug/l	112		74-133		
Chlorobenzene	0.5	U	0.5	0.1	ug/l	102		80-120		
Chloroethane	0.5	U	0.5	0.1	ug/l	106		67-124		
Chloroform	0.5	U	0.5	0.1	ug/l	104		80-120		
Chloromethane	0.5	U	0.5	0.2	ug/l	111		55-135		
2-Chlorotoluene	0.5	U	0.5	0.1	ug/l	103		80-120		
4-Chlorotoluene	0.5	U	0.5	0.1	ug/l	102		80-120		
1,2-Dibromo-3-chloropropane	0.5	U	0.5	0.2	ug/l	102		59-125		
Dibromochloromethane	0.5	U	0.5	0.1	ug/l	117		80-120		
1,2-Dibromoethane	0.5	U	0.5	0.1	ug/l	105		80-120		
Dibromomethane	0.5	U	0.5	0.1	ug/l	109		80-120		
1,2-Dichlorobenzene	0.5	U	0.5	0.1	ug/l	103		80-120		
1,3-Dichlorobenzene	0.5	U	0.5	0.1	ug/l	104		80-120		
1,4-Dichlorobenzene	0.5	U	0.5	0.1	ug/l	102		80-120		
Dichlorodifluoromethane	0.5	U	0.5	0.1	ug/l	92		39-120		
1,1-Dichloroethane	0.5	U	0.5	0.1	ug/l	105		80-122		
1,2-Dichloroethane	0.5	U	0.5	0.1	ug/l	112		80-127		
1,1-Dichloroethene	0.5	U	0.5	0.1	ug/l	109		80-123		
cis-1,2-Dichloroethene	0.5	U	0.5	0.1	ug/l	107		80-120		
trans-1,2-Dichloroethene	0.5	U	0.5	0.1	ug/l	106		80-121		
1,2-Dichloropropane	0.5	U	0.5	0.1	ug/l	105		80-120		
1,3-Dichloropropane	0.5	U	0.5	0.1	ug/l	104		80-120		
2,2-Dichloropropane	0.5	U	0.5	0.1	ug/l	112		75-122		
1,1-Dichloropropene	0.5	U	0.5	0.1	ug/l	104		80-121		
cis-1,3-Dichloropropene	0.5	U	0.5	0.1	ug/l	108		74-120		
trans-1,3-Dichloropropene	0.5	U	0.5	0.1	ug/l	119		80-120		
Ethylbenzene	0.5	U	0.5	0.1	ug/l	107		80-120		
Freon 113	0.5	U	0.5	0.2	ug/l	112		78-132		
Hexachlorobutadiene	0.5	U	0.5	0.1	ug/l	95		79-120		
Isopropylbenzene	0.5	U	0.5	0.1	ug/l	109		80-120		
p-Isopropyltoluene	0.5	U	0.5	0.1	ug/l	104		80-120		
Methylene Chloride	0.5	U	0.5	0.2	ug/l	107		80-120		

*- Outside of specification

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- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: Sanborn Head and Assoc
Reported: 07/23/12 at 07:59 PM

Group Number: 1321868

<u>Analysis Name</u>	<u>Blank Result</u>	<u>Blank LOQ**</u>	<u>Blank MDL</u>	<u>Report Units</u>	<u>LCS %REC</u>	<u>LCSD %REC</u>	<u>LCS/LCSD Limits</u>	<u>RPD</u>	<u>RPD Max</u>
Naphthalene	0.5 U	0.5	0.1	ug/l	90		77-120		
n-Propylbenzene	0.5 U	0.5	0.1	ug/l	102		80-120		
Styrene	0.5 U	0.5	0.1	ug/l	111		80-122		
1,1,1,2-Tetrachloroethane	0.5 U	0.5	0.1	ug/l	108		80-120		
1,1,2,2-Tetrachloroethane	0.5 U	0.5	0.1	ug/l	105		80-125		
Tetrachloroethene	0.5 U	0.5	0.1	ug/l	104		80-120		
Tetrahydrofuran	5.0 U	5.0	2.0	ug/l	94		65-131		
Toluene	0.5 U	0.5	0.1	ug/l	104		80-120		
1,2,3-Trichlorobenzene	0.5 U	0.5	0.1	ug/l	95		77-120		
1,2,4-Trichlorobenzene	0.5 U	0.5	0.1	ug/l	101		79-120		
1,1,1-Trichloroethane	0.5 U	0.5	0.1	ug/l	111		79-127		
1,1,2-Trichloroethane	0.5 U	0.5	0.1	ug/l	108		80-120		
Trichloroethene	0.5 U	0.5	0.1	ug/l	105		80-120		
Trichlorofluoromethane	0.5 U	0.5	0.1	ug/l	124		66-134		
1,2,3-Trichloropropane	1.0 U	1.0	0.3	ug/l	107		80-120		
1,2,4-Trimethylbenzene	0.5 U	0.5	0.1	ug/l	103		80-120		
1,3,5-Trimethylbenzene	0.5 U	0.5	0.1	ug/l	103		80-120		
Vinyl Chloride	0.5 U	0.5	0.1	ug/l	130*		65-127		
Xylene (Total)	0.5 U	0.5	0.1	ug/l	108		80-120		

Batch number: C122022AA

Sample number(s): 6719355

Benzene	0.5 U	0.5	0.1	ug/l	107		80-120		
Bromobenzene	0.5 U	0.5	0.1	ug/l	104		80-120		
Bromochloromethane	0.5 U	0.5	0.1	ug/l	111		80-125		
Bromodichloromethane	0.5 U	0.5	0.1	ug/l	109		80-120		
Bromoform	0.5 U	0.5	0.1	ug/l	117		70-128		
Bromomethane	0.5 U	0.5	0.1	ug/l	114		66-124		
n-Butylbenzene	0.5 U	0.5	0.1	ug/l	99		80-120		
sec-Butylbenzene	0.5 U	0.5	0.1	ug/l	104		80-120		
tert-Butylbenzene	0.5 U	0.5	0.1	ug/l	109		80-120		
Carbon Tetrachloride	0.5 U	0.5	0.1	ug/l	110		74-133		
Chlorobenzene	0.5 U	0.5	0.1	ug/l	104		80-120		
Chloroethane	0.5 U	0.5	0.1	ug/l	111		67-124		
Chloroform	0.5 U	0.5	0.1	ug/l	104		80-120		
Chloromethane	0.5 U	0.5	0.2	ug/l	105		55-135		
2-Chlorotoluene	0.5 U	0.5	0.1	ug/l	103		80-120		
4-Chlorotoluene	0.5 U	0.5	0.1	ug/l	102		80-120		
1,2-Dibromo-3-chloropropane	0.5 U	0.5	0.2	ug/l	107		59-125		
Dibromochloromethane	0.5 U	0.5	0.1	ug/l	118		80-120		
1,2-Dibromoethane	0.5 U	0.5	0.1	ug/l	108		80-120		
Dibromomethane	0.5 U	0.5	0.1	ug/l	107		80-120		
1,2-Dichlorobenzene	0.5 U	0.5	0.1	ug/l	103		80-120		
1,3-Dichlorobenzene	0.5 U	0.5	0.1	ug/l	104		80-120		
1,4-Dichlorobenzene	0.5 U	0.5	0.1	ug/l	104		80-120		
Dichlorodifluoromethane	0.5 U	0.5	0.1	ug/l	89		39-120		
1,1-Dichloroethane	0.5 U	0.5	0.1	ug/l	104		80-122		
1,2-Dichloroethane	0.5 U	0.5	0.1	ug/l	102		80-127		
1,1-Dichloroethene	0.5 U	0.5	0.1	ug/l	110		80-123		
cis-1,2-Dichloroethene	0.5 U	0.5	0.1	ug/l	109		80-120		
trans-1,2-Dichloroethene	0.5 U	0.5	0.1	ug/l	106		80-121		
1,2-Dichloropropane	0.5 U	0.5	0.1	ug/l	107		80-120		
1,3-Dichloropropane	0.5 U	0.5	0.1	ug/l	105		80-120		
2,2-Dichloropropane	0.5 U	0.5	0.1	ug/l	102		75-122		
1,1-Dichloropropene	0.5 U	0.5	0.1	ug/l	105		80-121		
cis-1,3-Dichloropropene	0.5 U	0.5	0.1	ug/l	105		74-120		
trans-1,3-Dichloropropene	0.5 U	0.5	0.1	ug/l	113		80-120		
Ethylbenzene	0.5 U	0.5	0.1	ug/l	110		80-120		
Freon 113	0.5 U	0.5	0.2	ug/l	110		78-132		

*- Outside of specification

** - This limit was used in the evaluation of the final result for the blank

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: Sanborn Head and Assoc
Reported: 07/23/12 at 07:59 PM

Group Number: 1321868

<u>Analysis Name</u>	<u>Blank Result</u>	<u>Blank LOQ**</u>	<u>Blank MDL</u>	<u>Report Units</u>	<u>LCS %REC</u>	<u>LCS %REC</u>	<u>LCS/LCSD Limits</u>	<u>RPD</u>	<u>RPD Max</u>
Hexachlorobutadiene	0.5 U	0.5	0.1	ug/l	100		79-120		
Isopropylbenzene	0.5 U	0.5	0.1	ug/l	113		80-120		
p-Isopropyltoluene	0.5 U	0.5	0.1	ug/l	105		80-120		
Methylene Chloride	0.5 U	0.5	0.2	ug/l	106		80-120		
Naphthalene	0.5 U	0.5	0.1	ug/l	86		77-120		
n-Propylbenzene	0.5 U	0.5	0.1	ug/l	105		80-120		
Styrene	0.5 U	0.5	0.1	ug/l	115		80-122		
1,1,1,2-Tetrachloroethane	0.5 U	0.5	0.1	ug/l	108		80-120		
1,1,2,2-Tetrachloroethane	0.5 U	0.5	0.1	ug/l	105		80-125		
Tetrachloroethene	0.5 U	0.5	0.1	ug/l	109		80-120		
Tetrahydrofuran	5.0 U	5.0	2.0	ug/l	97		65-131		
Toluene	0.5 U	0.5	0.1	ug/l	107		80-120		
1,2,3-Trichlorobenzene	0.5 U	0.5	0.1	ug/l	90		77-120		
1,2,4-Trichlorobenzene	0.5 U	0.5	0.1	ug/l	96		79-120		
1,1,1-Trichloroethane	0.5 U	0.5	0.1	ug/l	107		79-127		
1,1,2-Trichloroethane	0.5 U	0.5	0.1	ug/l	106		80-120		
Trichloroethene	0.5 U	0.5	0.1	ug/l	106		80-120		
Trichlorofluoromethane	0.5 U	0.5	0.1	ug/l	118		66-134		
1,2,3-Trichloropropane	1.0 U	1.0	0.3	ug/l	102		80-120		
1,2,4-Trimethylbenzene	0.5 U	0.5	0.1	ug/l	102		80-120		
1,3,5-Trimethylbenzene	0.5 U	0.5	0.1	ug/l	103		80-120		
Vinyl Chloride	0.5 U	0.5	0.1	ug/l	118		65-127		
Xylene (Total)	0.5 U	0.5	0.1	ug/l	112		80-120		

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

<u>Analysis Name</u>	<u>MS %REC</u>	<u>MSD %REC</u>	<u>MS/MSD Limits</u>	<u>RPD</u>	<u>RPD MAX</u>	<u>BKG Conc</u>	<u>DUP Conc</u>	<u>DUP RPD</u>	<u>Dup RPD Max</u>
Batch number: C121981AA	Sample number(s): 6719353 UNSPK: P719370								
Benzene	95	105	87-126	11	30				
Bromobenzene	100	111	80-123	11	30				
Bromochloromethane	106	105	82-125	1	30				
Bromodichloromethane	102	114	82-133	11	30				
Bromoform	114	125	60-138	9	30				
Bromomethane	127	134	69-135	5	30				
n-Butylbenzene	92	106	83-131	14	30				
sec-Butylbenzene	95	111	84-128	15	30				
tert-Butylbenzene	100	115	84-135	14	30				
Carbon Tetrachloride	101	113	81-148	11	30				
Chlorobenzene	98	109	78-133	11	30				
Chloroethane	102	126	70-139	21	30				
Chloroform	96	105	86-136	9	30				
Chloromethane	105	112	55-152	6	30				
2-Chlorotoluene	96	110	81-120	14	30				
4-Chlorotoluene	96	107	82-119	11	30				
1,2-Dibromo-3-chloropropane	98	103	55-156	5	30				
Dibromochloromethane	110	122	79-125	10	30				
1,2-Dibromoethane	101	111	84-127	9	30				
Dibromomethane	99	106	83-126	7	30				
1,2-Dichlorobenzene	96	110	83-117	13	30				
1,3-Dichlorobenzene	97	111	81-118	13	30				

*- Outside of specification

** - This limit was used in the evaluation of the final result for the blank

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: Sanborn Head and Assoc
Reported: 07/23/12 at 07:59 PM

Group Number: 1321868

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

<u>Analysis Name</u>	<u>MS</u> <u>%REC</u>	<u>MSD</u> <u>%REC</u>	<u>MS/MSD</u> <u>Limits</u>	<u>RPD</u> <u>RPD</u>	<u>RPD</u> <u>MAX</u>	<u>BKG</u> <u>Conc</u>	<u>DUP</u> <u>Conc</u>	<u>DUP</u> <u>RPD</u>	<u>Dup RPD</u> <u>Max</u>
1,4-Dichlorobenzene	95	108	79-120	12	30				
Dichlorodifluoromethane	97	103	39-155	5	30				
1,1-Dichloroethane	93	104	88-136	11	30				
1,2-Dichloroethane	99	109	82-135	9	30				
1,1-Dichloroethene	101	111	83-150	9	30				
cis-1,2-Dichloroethene	97	109	82-129	12	30				
trans-1,2-Dichloroethene	94	105	88-127	11	30				
1,2-Dichloropropane	96	106	91-126	10	30				
1,3-Dichloropropane	99	108	80-127	9	30				
2,2-Dichloropropane	98	112	80-134	13	30				
1,1-Dichloropropene	94	108	86-139	13	30				
cis-1,3-Dichloropropene	100	113	74-132	12	30				
trans-1,3-Dichloropropene	111	123	71-128	10	30				
Ethylbenzene	101	113	80-140	12	30				
Freon 113	102	116	87-158	12	30				
Hexachlorobutadiene	94	109	84-128	15	30				
Isopropylbenzene	103	117	81-133	13	30				
p-Isopropyltoluene	97	112	84-124	14	30				
Methylene Chloride	95	104	84-122	9	30				
Naphthalene	86	100	70-131	15	30				
n-Propylbenzene	97	110	79-131	13	30				
Styrene	66	68	63-151	3	30				
1,1,1,2-Tetrachloroethane	103	116	87-126	12	30				
1,1,2,2-Tetrachloroethane	100	112	75-131	11	30				
Tetrachloroethene	99	111	63-156	11	30				
Tetrahydrofuran	103	98	56-154	5	30				
Toluene	96	106	83-127	9	30				
1,2,3-Trichlorobenzene	88	103	73-125	16	30				
1,2,4-Trichlorobenzene	94	110	77-120	16	30				
1,1,1-Trichloroethane	99	111	85-140	12	30				
1,1,2-Trichloroethane	102	112	85-129	9	30				
Trichloroethene	95	108	85-131	12	30				
Trichlorofluoromethane	117	125	67-161	7	30				
1,2,3-Trichloropropane	100	114	76-120	13	30				
1,2,4-Trimethylbenzene	97	110	87-126	12	30				
1,3,5-Trimethylbenzene	97	110	89-129	13	30				
Vinyl Chloride	118	132	65-151	12	30				
Xylene (Total)	102	114	81-137	12	30				

Batch number: C122011AA	Sample number(s): 6719354,6719356 UNSPK: P717504				
Benzene	103	103	87-126	0	30
Bromobenzene	106	108	80-123	2	30
Bromochloromethane	106	106	82-125	0	30
Bromodichloromethane	112	111	82-133	1	30
Bromoform	120	119	60-138	1	30
Bromomethane	105	105	69-135	0	30
n-Butylbenzene	103	108	83-131	5	30
sec-Butylbenzene	107	112	84-128	4	30
tert-Butylbenzene	109	118	84-135	7	30
Carbon Tetrachloride	110	112	81-148	1	30
Chlorobenzene	106	107	78-133	1	30
Chloroethane	101	103	70-139	1	30
Chloroform	103	104	86-136	0	30

*- Outside of specification

** - This limit was used in the evaluation of the final result for the blank

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: Sanborn Head and Assoc
Reported: 07/23/12 at 07:59 PM

Group Number: 1321868

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

<u>Analysis Name</u>	<u>MS</u> <u>%REC</u>	<u>MSD</u> <u>%REC</u>	<u>MS/MSD</u> <u>Limits</u>	<u>RPD</u> <u>RPD</u>	<u>RPD</u> <u>MAX</u>	<u>BKG</u> <u>Conc</u>	<u>DUP</u> <u>Conc</u>	<u>DUP</u> <u>RPD</u>	<u>Dup RPD</u> <u>Max</u>
Chloromethane	107	108	55-152	1	30				
2-Chlorotoluene	104	108	81-120	4	30				
4-Chlorotoluene	103	108	82-119	4	30				
1,2-Dibromo-3-chloropropane	104	99	55-156	4	30				
Dibromochloromethane	119	121	79-125	2	30				
1,2-Dibromoethane	107	108	84-127	1	30				
Dibromomethane	107	104	83-126	2	30				
1,2-Dichlorobenzene	104	108	83-117	3	30				
1,3-Dichlorobenzene	105	108	81-118	3	30				
1,4-Dichlorobenzene	103	108	79-120	5	30				
Dichlorodifluoromethane	91	90	39-155	1	30				
1,1-Dichloroethane	102	102	88-136	1	30				
1,2-Dichloroethane	107	105	82-135	2	30				
1,1-Dichloroethene	107	107	83-150	0	30				
cis-1,2-Dichloroethene	106	105	82-129	0	30				
trans-1,2-Dichloroethene	102	103	88-127	2	30				
1,2-Dichloropropane	104	104	91-126	1	30				
1,3-Dichloropropane	106	106	80-127	1	30				
2,2-Dichloropropane	111	111	80-134	0	30				
1,1-Dichloropropene	105	105	86-139	0	30				
cis-1,3-Dichloropropene	109	108	74-132	0	30				
trans-1,3-Dichloropropene	122	121	71-128	1	30				
Ethylbenzene	109	111	80-140	1	30				
Freon 113	110	110	87-158	0	30				
Hexachlorobutadiene	103	108	84-128	5	30				
Isopropylbenzene	114	117	81-133	3	30				
p-Isopropyltoluene	109	113	84-124	4	30				
Methylene Chloride	101	101	84-122	1	30				
Naphthalene	89	92	70-131	3	30				
n-Propylbenzene	106	109	79-131	3	30				
Styrene	114	115	63-151	1	30				
1,1,1,2-Tetrachloroethane	112	113	87-126	1	30				
1,1,2,2-Tetrachloroethane	105	107	75-131	2	30				
Tetrachloroethene	113	120	63-156	4	30				
Tetrahydrofuran	97	90	56-154	7	30				
Toluene	104	105	83-127	1	30				
1,2,3-Trichlorobenzene	96	100	73-125	4	30				
1,2,4-Trichlorobenzene	102	107	77-120	5	30				
1,1,1-Trichloroethane	109	110	85-140	1	30				
1,1,2-Trichloroethane	107	109	85-129	1	30				
Trichloroethene	105	105	85-131	0	30				
Trichlorofluoromethane	119	121	67-161	2	30				
1,2,3-Trichloropropane	107	109	76-120	2	30				
1,2,4-Trimethylbenzene	106	110	87-126	3	30				
1,3,5-Trimethylbenzene	106	110	89-129	3	30				
Vinyl Chloride	118	124	65-151	5	30				
Xylene (Total)	111	113	81-137	2	30				

Batch number: C122022AA	Sample number(s): 6719355	UNSPK: P726582
Benzene	103	106
Bromobenzene	104	107
Bromochloromethane	113	109
Bromodichloromethane	106	112

*- Outside of specification

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- (1) The result for one or both determinations was less than five times the LOQ.
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Quality Control Summary

Client Name: Sanborn Head and Assoc
Reported: 07/23/12 at 07:59 PM

Group Number: 1321868

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

<u>Analysis Name</u>	<u>MS</u> <u>%REC</u>	<u>MSD</u> <u>%REC</u>	<u>MS/MSD</u> <u>Limits</u>	<u>RPD</u> <u>RPD</u>	<u>RPD</u> <u>MAX</u>	<u>BKG</u> <u>Conc</u>	<u>DUP</u> <u>Conc</u>	<u>DUP</u> <u>RPD</u>	<u>Dup RPD</u> <u>Max</u>
Bromoform	117	122	60-138	4	30				
Bromomethane	102	101	69-135	1	30				
n-Butylbenzene	94	102	83-131	8	30				
sec-Butylbenzene	99	106	84-128	6	30				
tert-Butylbenzene	102	108	84-135	5	30				
Carbon Tetrachloride	106	109	81-148	3	30				
Chlorobenzene	102	106	78-133	4	30				
Chloroethane	103	101	70-139	3	30				
Chloroform	100	102	86-136	3	30				
Chloromethane	101	102	55-152	1	30				
2-Chlorotoluene	100	102	81-120	2	30				
4-Chlorotoluene	98	102	82-119	4	30				
1,2-Dibromo-3-chloropropane	117	114	55-156	3	30				
Dibromochloromethane	117	122	79-125	4	30				
1,2-Dibromoethane	106	111	84-127	4	30				
Dibromomethane	102	107	83-126	4	30				
1,2-Dichlorobenzene	102	105	83-117	3	30				
1,3-Dichlorobenzene	101	105	81-118	3	30				
1,4-Dichlorobenzene	101	105	79-120	4	30				
Dichlorodifluoromethane	76	76	39-155	1	30				
1,1-Dichloroethane	101	104	88-136	3	30				
1,2-Dichloroethane	99	101	82-135	3	30				
1,1-Dichloroethene	108	110	83-150	2	30				
cis-1,2-Dichloroethene	104	107	82-129	4	30				
trans-1,2-Dichloroethene	103	105	88-127	2	30				
1,2-Dichloropropane	104	109	91-126	4	30				
1,3-Dichloropropane	104	108	80-127	4	30				
2,2-Dichloropropane	103	105	80-134	2	30				
1,1-Dichloropropene	103	106	86-139	3	30				
cis-1,3-Dichloropropene	114	118	74-132	4	30				
trans-1,3-Dichloropropene	118	123	71-128	4	30				
Ethylbenzene	105	108	80-140	3	30				
Freon 113	109	110	87-158	1	30				
Hexachlorobutadiene	91	96	84-128	6	30				
Isopropylbenzene	107	112	81-133	5	30				
p-Isopropyltoluene	99	106	84-124	7	30				
Methylene Chloride	103	104	84-122	1	30				
Naphthalene	96	102	70-131	6	30				
n-Propylbenzene	100	104	79-131	4	30				
Styrene	111	114	63-151	3	30				
1,1,1,2-Tetrachloroethane	106	108	87-126	2	30				
1,1,2,2-Tetrachloroethane	107	110	75-131	3	30				
Tetrachloroethene	112	115	63-156	3	30				
Tetrahydrofuran	102	99	56-154	2	30				
Toluene	103	105	83-127	2	30				
1,2,3-Trichlorobenzene	95	105	73-125	10	30				
1,2,4-Trichlorobenzene	95	104	77-120	9	30				
1,1,1-Trichloroethane	105	107	85-140	1	30				
1,1,2-Trichloroethane	108	111	85-129	3	30				
Trichloroethene	102	106	85-131	3	30				
Trichlorofluoromethane	109	109	67-161	0	30				
1,2,3-Trichloropropane	108	111	76-120	3	30				
1,2,4-Trimethylbenzene	97	102	87-126	5	30				

*- Outside of specification

** - This limit was used in the evaluation of the final result for the blank

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: Sanborn Head and Assoc
Reported: 07/23/12 at 07:59 PM

Group Number: 1321868

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

<u>Analysis Name</u>	<u>MS</u> <u>%REC</u>	<u>MSD</u> <u>%REC</u>	<u>MS/MSD</u> <u>Limits</u>	<u>RPD</u> <u>RPD</u>	<u>RPD</u> <u>MAX</u>	<u>BKG</u> <u>Conc</u>	<u>DUP</u> <u>Conc</u>	<u>DUP</u> <u>RPD</u>	<u>Dup RPD</u> <u>Max</u>
1,3,5-Trimethylbenzene	98	103	89-129	5	30				
Vinyl Chloride	107	108	65-151	1	30				
Xylene (Total)	107	110	81-137	3	30				

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: EPA SW846/8260 (water-25ml) #1
Batch number: C121981AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
6719353	105	104	97	98
Blank	105	108	96	94
LCS	103	103	98	98
MS	101	102	100	98
MSD	100	102	100	99
Limits:	77-114	74-113	77-110	78-110

Analysis Name: EPA SW846/8260 (water-25ml) #1
Batch number: C122011AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
6719354	107	106	96	97
6719356	106	106	97	93
Blank	105	106	96	94
LCS	102	105	99	100
MS	103	104	100	99
MSD	102	103	100	99
Limits:	77-114	74-113	77-110	78-110

Analysis Name: EPA SW846/8260 (water-25ml) #1
Batch number: C122022AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
6719355	107	107	97	93
Blank	106	105	97	91
LCS	103	103	101	96
MS	103	108	101	97
MSD	103	103	101	97
Limits:	77-114	74-113	77-110	78-110

*- Outside of specification

** - This limit was used in the evaluation of the final result for the blank

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

9671 1321868 6719353-56

Shipping Group:1 SANBORN HEAD 95 High St Portland, ME 04101 P (207) 761-9300 F (207) 761-9339	Chain-of-Custody To: Lancaster Laboratories, Inc. 2425 New Holland Pike PO Box 12425 Lancaster, PA 17605-2425 P (717) 656-2300 F (717) 656-2681	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:30%;">Relinquished By:</th> <th style="width:30%;">Date / Time</th> <th style="width:30%;">Received By:</th> <th style="width:30%;">Date / Time</th> </tr> <tr> <td style="text-align: center;">Jessica Paris</td> <td style="text-align: center;">7/12/12 1730</td> <td style="text-align: center;">/</td> <td style="text-align: center;">/</td> </tr> <tr> <td style="text-align: center;">/</td> <td style="text-align: center;">/</td> <td style="text-align: center;">/</td> <td style="text-align: center;">/</td> </tr> <tr> <td style="text-align: center;">/</td> <td style="text-align: center;">/</td> <td style="text-align: center;">Kristin Nigh</td> <td style="text-align: center;">7-13-12 0930</td> </tr> </table>	Relinquished By:	Date / Time	Received By:	Date / Time	Jessica Paris	7/12/12 1730	/	/	/	/	/	/	/	/	Kristin Nigh	7-13-12 0930
Relinquished By:	Date / Time	Received By:	Date / Time															
Jessica Paris	7/12/12 1730	/	/															
/	/	/	/															
/	/	Kristin Nigh	7-13-12 0930															

Project Information	Deliverable Information	Other Information
Name: Supplemental VI Assessment	TAT: Standard	SGD Complete? Yes
Number: 2732.05	Delivery Method: Email	Internal COC Required? No
Location: Manassas, Virginia	Email To: ebradstreet@sanbornhead.com	Site Specific QA/QC?
Manager: Erica Bradstreet	Data Package Option:	
Account #:	EDD Type: SHDMS	
Quote #:		IBM Manassas VOCs list 6396

Lab ID (Lab Use Only)	Sample Name	Collection		Matrix	Top Depth	Bottom Depth	Filtered? (Field / Lab)	8260B/HCI					Remarks:
		Date	Time										
	Frac01	7/12/2012	1630	GW				2					Rush TAT on
	SG11723	7/12/2012	1540	GW				2					Frac01 per EB.
	SG1171	7/12/2012	1445	GW				2					NOT 7/13/12
	TB1	7/5/2012		AQ				2					

Environmental Sample Administration
Receipt Documentation Log

Client/Project: Sanborn Head

Date of Receipt: 7-13-12

Time of Receipt: 0930

Source Code: 50-1

Shipping Container Sealed: YES NO

Custody Seal Present * : YES NO

* Custody seal was intact unless otherwise noted in the discrepancy section

Package: Chilled Not Chilled

Temperature of Shipping Containers							
Cooler #	Thermometer ID	Temperature (°C)	Temp Bottle (TB) or Surface Temp (ST)	Wet Ice (WI) or Dry Ice (DI) or Ice Packs (IP)	Ice Present? Y/N	Loose (L) Bagged Ice (B) or NA	Comments
1	2783	1.40	TB	WI	Y	B	
2							
3							
4							
5							
6							

Number of Trip Blanks received NOT listed on chain of custody: 0

Paperwork Discrepancy/Unpacking Problems:

Unpacker Signature/Emp#: Kristin Leigh 2123 Date/Time: 7-13-12 0930

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	BMQL	Below Minimum Quantitation Level
N.D.	none detected	MPN	Most Probable Number
TNTC	Too Numerous To Count	CP Units	cobalt-chloroplatinate units
IU	International Units	NTU	nephelometric turbidity units
umhos/cm	micromhos/cm	ng	nanogram(s)
C	degrees Celsius	F	degrees Fahrenheit
meq	milliequivalents	lb.	pound(s)
g	gram(s)	kg	kilogram(s)
µg	microgram(s)	mg	milligram(s)
mL	milliliter(s)	L	liter(s)
m³	cubic meter(s)	µL	microliter(s)
		pg/L	picogram/liter
<	less than - The number following the sign is the <u>limit of quantitation</u> , the smallest amount of analyte which can be reliably determined using this specific test.		
>	greater than		
ppm	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg), or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter of gas per liter of gas.		
ppb	parts per billion		
Dry weight basis	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.		

Data Qualifiers:

C – result confirmed by reanalysis.

J - estimated value – The result is \geq the Method Detection Limit (MDL) and $<$ the Limit of Quantitation (LOQ).

U.S. EPA CLP Data Qualifiers:

Organic Qualifiers		Inorganic Qualifiers	
A	TIC is a possible aldol-condensation product	B	Value is $<$ CRDL, but \geq IDL
B	Analyte was also detected in the blank	E	Estimated due to interference
C	Pesticide result confirmed by GC/MS	M	Duplicate injection precision not met
D	Compound quantitated on a diluted sample	N	Spike sample not within control limits
E	Concentration exceeds the calibration range of the instrument	S	Method of standard additions (MSA) used for calculation
N	Presumptive evidence of a compound (TICs only)	U	Compound was not detected
P	Concentration difference between primary and confirmation columns $>25\%$	W	Post digestion spike out of control limits
U	Compound was not detected	*	Duplicate analysis not within control limits
X,Y,Z	Defined in case narrative	+	Correlation coefficient for MSA <0.995

Analytical test results meet all requirements of NELAC unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR part 136 Table II as “analyze immediately” are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL LANCASTER LABORATORIES BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF LANCASTER LABORATORIES AND (B) WHETHER LANCASTER LABORATORIES HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Lancaster Laboratories which includes any conditions that vary from the Standard Terms and Conditions, and Lancaster hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

APPENDIX D

**QUALITY ASSURANCE/QUALITY CONTROL
& DATA VALIDATION**

(on disc)

APPENDIX D.1

JUNE 2012

ROUTINE SAMPLING



DATA VALIDATION REPORT **Method TO-15 Analysis**

Client: Sanborn, Head & Associates, Inc., Concord, New Hampshire (SHA)

Site: Former IBM Facility, Manassas, Virginia

Laboratory: eurofins/Air Toxics Limited (ATL), Folsom, California

Work Orders: 1206667

Date(s) of Collection: June 25, 2012 – June 27, 2012

**Number and type
Samples & analyses:** 20 Soil Vapor samples for six project-specific VOCs by Method TO-15

Senior Data Reviewers: Dr. Nancy C. Rothman, New Environmental Horizons, Inc.
Susan D. Chapnick, New Environmental Horizons, Inc.

Date Completed: August 28, 2012

A Data Validation Checklist Review was performed on the Work Order identified with the following intentions: 1) to determine if the data were generated and reported in accordance with the *Former IBM Manassas Facility, QAQC Plan, Manassas, Virginia*, prepared by Sanborn, Head & Associates, May 29, 2009 (QAQC Plan); *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review*; Publication USEPA540/R-07/003, July 2007; *USEPA Region III Modifications to the National Functional Guidelines for Organic Data Review*, September 1994; and *Method TO-15, Determination of Volatile Organic Compounds (VOCs) in Air Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS)*, Publication EPA/625/R-96/010b, January 1999; 2) to determine if the data met project data quality objectives for acceptable accuracy, precision, sensitivity; and technical usability; and 3) to update the project database with appropriate data quality qualifiers.

An In-Depth Data Usability Review was performed on Work Order 1103654R1. This review indicated that overall the laboratory met project DQOs; therefore, a checklist review of remaining air data associated with this QAQC plan was performed. Please see the Data Usability Report for Work Order 1103654R1 for complete details on the TO-15 review. The Air Data Review Checklist, attached, was completed during this assessment to document the review of this Work Order.

Table C.1 of the QAQC Plan identified four target compounds for analysis: vinyl chloride, cis-1,2-dichloroethene, trichloroethene, and tetrachloroethene. At the client's request, two additional compounds, trans-1,2-dichloroethene and 1,1,2-trichloroethane, were added as target compounds for this project prior to sample analysis.

Sensitivity requirements compared to the Reporting Limits (RLs) defined in Table C.1 of the QAQC Plan were achieved for all samples except SG-05-25, SG-06-44, SG102D, SG106D, SG-12, and SG-28, which were diluted to ensure all detected results were reported within the instrument calibration range. In addition, sample SG107 was received with a higher than expected receipt vacuum, which resulted in non-detects exceeding the expected RLs for this sample. The data user will need to evaluate the elevated non-detects in these samples for project objectives.

There was one field duplicate pair: SG-06-8 and DUP1. FD precision was acceptable for this FD pair indicating acceptable precision from field collection through analysis for the VOCs reported.

All other quality control information associated with accuracy, precision, and sensitivity for the project-specific list of VOCs reported met method criteria for the samples in this Work Order. The results reported by the laboratory were unchanged as a consequence of this data review and the results presented in the validated database are considered usable for project objectives.

Lab: euofins/ Air Toxics Ltd.
Date Sampled: 6/25/12 - 6/27/12
Method of Analysis: TO-15 Full Scan

No. Samples 19 + 1FD
Matrix/Sampling method Air/SUMMA® Canisters

Data Element Acceptable	Canister Receipt	HT	Surrogates & IS	LCS	Lab Dup (LCS or LD)	Tunes ICAL	CCAL	FD	RL & Quant.
Yes	√	√	√	√	√	√	√	√	√
No									

Other Issues: Yes All non-detects were > Expected RLs in 7 samples (see page 3)

Comments:
An In-Depth review of the TO-15 analysis for samples from the Former IBM Facility, Manassas, VA was performed on Work Order 1103654R1.

20 Soil Vapor samples were collected on 6/25/12 to 6/27/12 and were received at ATL on 6/29/12 in good condition. There were no COC issues noted.

These samples were analyzed for 6 project-specific VOCs, as requested on the COC, and as shown on page 5 of this checklist.

All Canister vacuums (field initial, field final, and lab receipt) were acceptable - Canister certification forms indicated all canisters were non-detect for 6 target VOCs prior to shipment to field; no Action required. Note surrogate %Rec on Certification form has the "1" cut off on all recoveries ≥ 100% - no action except to note.

Samples were all analyzed by 7/5/12; therefore, HT met - No Action required.

All 3 Surrogates and 3 IS's were recovered within criteria for samples & QC - No Action required.

LCS/LCSD = p070304/p070303 & p070504/p070503. All 6 VOCs reported were recovered within criteria in both LCS/LCSD. The RPDs between LCS/LCSD were also acceptable. No Action required.

Date: 8/28/12

Data Reviewer: Nancy C. Rothman, Ph.D.

Lab: euofins/ Air Toxics Ltd.

Associated Blanks: MB = p070307 & p070506

EB: EB1 (reported in W.O. #1206668)

Blank ID	Contaminant / Level ($\mu\text{g}/\text{m}^3$)	Action Level DF=	Sample and reported result ($\mu\text{g}/\text{m}^3$)	Corrected Database Result
p070307	None	---	No Blank Action Required	
p070506	None	---	No Blank Action Required	
EB1	None	---	No Blank Action Required	

Additional Notes:

LDs performed on SG-05-45 & SG-30. A comparison of detected results for these LDs shown below:

LD Evaluation_ Sample IDs: Sample = SG-05-45 LD = SG-05-45 Lab Duplicate

Analyte Name	CAS No.	DF=1.73	Sample $\mu\text{g}/\text{m}^3$	Sample Result Q Level	LD $\mu\text{g}/\text{m}^3$	LD Result Q Level	RPD	Action
		RL ($\mu\text{g}/\text{m}^3$)						
Trichloroethene	79-01-6	4.6	5.9	< 5xRL	6.7	< 5xRL	12.7	None
Tetrachloroethene	127-18-4	5.9	1500	> 5xRL	1500	> 5xRL	0.0	None

LD Evaluation_ Sample IDs: Sample = SG-30 LD = SG-30 Lab Duplicate

Analyte Name	CAS No.	DF=1.78	Sample $\mu\text{g}/\text{m}^3$	Sample Result Q Level	LD $\mu\text{g}/\text{m}^3$	LD Result Q Level	RPD	Action
		RL ($\mu\text{g}/\text{m}^3$)						
trans-1,2-Dichloroethene	156-60-5	3.5	3.7	< 5xRL	4.6	U < 5xRL	NA	None
Tetrachloroethene	127-18-4	6	52	> 5xRL	54	> 5xRL	3.8	None

LD precision acceptable for both Sample/LD pairs - No Action required.

Date: 8/28/12

Data Reviewer: Nancy C. Rothman, Ph.D.

Lab: eurofins/ Air Toxics Ltd.

Additional Notes:

FDs: SG-06-8/DUP1. A comparison of detected results shown below.

FD Evaluation_ Sample IDs: Sample = SG-06-8 FD = DUP1

Analyte Name	CAS No.	DF=1.75	Sample	Sample Result	FD	FD Result	RPD	Action
		RL ($\mu\text{g}/\text{m}^3$)						
Tetrachloroethene	127-18-4	5.9	35	> 5xRL	35	> 5xRL	0.0	None

FD precision was acceptable for SG-06-8 & DUP1 - No Action required.

Tunes: 4 BFB Tunes (Inst. P - 2 ICAL + 2 CCALs)- all 4 met criteria and samples was analyzed within 24 hours of tune - no action required.

ICAL: Instrument P performed 6/26-6/30/12. For ICAL, 6-level calibration from 0.5 to 200 ppbV for 6 target VOCs except trichloroethene and tetrachloroethene for which 7-level ICAL from 0.2 to 200 ppbV reported. ICALs supported RLs reported. %RSD \leq 30% and RRF > 0.05 for all 6 compounds. No Action required.

CCALs: p070302 & p070502 - All 6 VOCs were recovered within criteria - No Action required

All non-detects for the 6 project-specific VOCs were reported at or below the Expected RLs due to DF<2 except for sample SG107 due to higher than expected receipt vacuum (14.8 "Hg) and samples SG-05-25, SG-06-44, SG102D, SG106D, SG-12, and SG-28, which were diluted at the instrument level to ensure all detected results were reported within the instrument calibration range. The data user will need to evaluate non-detects at elevated levels for project use.

There were no "J" data reported.

The narrative did not raise any additional issues affecting data quality.

The data were unchanged as a consequence of this review

Date: 8/28/12

Data Reviewer: Nancy C. Rothman, Ph.D.

Lab: eurofins/ Air Toxics Ltd.

Analyte Name	CAS No.	Expected RL		LCS Criteria %	CCV Criteria %
		DF=1 RL (ppbv)	DF=2 RL ($\mu\text{g}/\text{m}^3$)		
Vinyl Chloride *	75-01-4	0.5	2.6	70-130	70-130
trans-1,2-Dichloroethene	156-60-5	0.5	4.0	60-140	60-140
cis-1,2-Dichloroethene *	156-59-2	0.5	4.0	70-130	70-130
Trichloroethene *	79-01-6	0.5	5.4	70-130	70-130
1,1,2-Trichloroethane	79-00-5	0.5	5.4	70-130	70-130
Tetrachloroethene *	127-18-4	0.5	6.8	70-130	70-130

* Expected RL from Table C.1 of QAQC Plan. trans-1,2-Dichloroethene and 1,1,2-Trichloroethane were added as target compounds at the client's request after the QAQC Plan was developed.

QA/QC Criteria for evaluation of TO-15 data:

<i>SUMMA Canister Pressure (P):</i>	Initial Field P < 25" Hg, J/UJ all results; Lab Receipt P > 15" Hg, J/UJ results; Lab Receipt P > ± 5" Hg of Final Field P, J/UJ results
<i>Hold Time (HT):</i>	30 days ≤ HT ≤ 60 days, J/UJ results; HT > 60 days, J detects/ R non-detects (or professional judgment)
<i>Surrogates:</i>	%Rec <10%, J detects, R non-detects; 10% ≤ %Rec <70%; J/UJ all associated data; %Rec >130%, J detects - no action for non-detects
<i>IS:</i>	Area <20% of CCAL, J detects, R non-detects; 20% ≤ Area <60%; J/UJ all associated data; Area >140%, J detects - no action for non-detects
<i>LCS & CCV:</i>	Percent Recovery (%Rec) <10%, J detects, reject (R) non-detects; 10% ≤ %Rec <LCL; J/UJ all associated data; %Rec >UCL, K detects - no action for non-detects
<i>LDs & FDs:</i>	LCS/LCSD, Sample/LD, or Sample/FD RPD > 25% for detects > 5x RL, J data; professional judgment for results < 5 x RL
<i>Blank Actions:</i>	Action Level = 5 x Level in Blank; Sample-specific Blank Action Level = Action Level x (Sample DF/Blank DF) Method Blank (MB) and Field Blank (Equipment Blank - EB): Result <Blank Action, B result at level reported
<i>Tune:</i>	SW-846 method 8260B tune criteria not met, professional judgment on R of all data; samples analyzed > 24-hours after tune; professional judgment on J/UJ or R of results
<i>ICAL:</i>	%RSD > 30%, J/UJ associated results
<i>RLs + Quant:</i>	Compound reported outside calibration range (< RL or at ppbV level > sample-specific highest ICAL standard for compound), J data. If RL > Expected RL, discuss possible issue with sensitivity of data
<i>DV Qualifiers:</i>	U = compound is non-detect; J = result is estimated ; UJ = non-detect is estimated; R = result is rejected and unusable. Final DV qualifier for a particular result may be influenced by multiple QC issues.
<i>References:</i>	Former IBM Manassas Facility, QAQC Plan, Manassas, Virginia , prepared by Sanborn, Head & Associates, May 29, 2009; USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review ; Publication USEPA540/R-07/003, July 2007; USEPA Region III Modifications to the National Functional Guidelines for Organic Data Review , September 1994; and Method TO-15, Determination of Volatile Organic Compounds (VOCs) in Air Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS) , Publication EPA/625/R-96/010b, January 1999

Date: 8/28/12

Data Reviewer: Nancy C. Rothman, Ph.D.



DATA VALIDATION REPORT **Method TO-15 Analysis**

Client: Sanborn, Head & Associates, Inc., Concord, New Hampshire (SHA)

Site: Former IBM Facility, Manassas, Virginia

Laboratory: eurofins/Air Toxics Limited (ATL), Folsom, California

Work Orders: 1206668

Date(s) of Collection: June 25, 2012 – June 27, 2012

**Number and type
Samples & analyses:** 12 Soil Vapor samples + 1 Equipment Blank for six project-specific VOCs by
Method TO-15

Senior Data Reviewers: Dr. Nancy C. Rothman, New Environmental Horizons, Inc.
Susan D. Chapnick, New Environmental Horizons, Inc.

Date Completed: August 28, 2012

A Data Validation Checklist Review was performed on the Work Order identified with the following intentions: 1) to determine if the data were generated and reported in accordance with the *Former IBM Manassas Facility, QAQC Plan, Manassas, Virginia*, prepared by Sanborn, Head & Associates, May 29, 2009 (QAQC Plan); *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review*; Publication USEPA540/R-07/003, July 2007; *USEPA Region III Modifications to the National Functional Guidelines for Organic Data Review*, September 1994; and *Method TO-15, Determination of Volatile Organic Compounds (VOCs) in Air Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS)*, Publication EPA/625/R-96/010b, January 1999; 2) to determine if the data met project data quality objectives for acceptable accuracy, precision, sensitivity; and technical usability; and 3) to update the project database with appropriate data quality qualifiers.

An In-Depth Data Usability Review was performed on Work Order 1103654R1. This review indicated that overall the laboratory met project DQOs; therefore, a checklist review of remaining air data associated with this QAQC plan was performed. Please see the Data Usability Report for Work Order 1103654R1 for complete details on the TO-15 review. The Air Data Review Checklist, attached, was completed during this assessment to document the review of this Work Order.

Table C.1 of the QAQC Plan identified four target compounds for analysis: vinyl chloride, cis-1,2-dichloroethene, trichloroethene, and tetrachloroethene. At the client's request, two additional compounds, trans-1,2-dichloroethene and 1,1,2-trichloroethane, were added as target compounds for this project prior to sample analysis.

The canister valve on sample SG106S was found to be open upon receipt at the laboratory. The field final and lab receipt vacuums for this sample differed by more than 5”Hg suggesting that the canister may have leaked during transit from the field to the laboratory. All results for this sample were estimated (J or UJ) with possible low bias as shown in Table 1.

Sensitivity requirements compared to the Reporting Limits (RLs) defined in Table C.1 of the QAQC Plan were achieved for all samples except SG106S and SG108D, which were diluted to ensure all detected results were reported within the instrument calibration range. The data user will need to evaluate the elevated non-detects in these samples for project objectives.

The equipment blank (EB1) included in this SDG was non-detect for all six project VOCs. Therefore, blank action was not required.

There were two field duplicate pairs: SG101 / DUP2 and SG111S / DUP3. FD precision was acceptable for both FD pairs indicating acceptable precision from field collection through analysis for the VOCs reported.

All other quality control information associated with accuracy, precision, and sensitivity for the VOCs reported met project criteria for these samples with the exceptions summarized in Table 1, below. The attached Data Validation Checklist includes all QA/QC reviewed during validation (including QC results that were acceptable) and details on the justification for actions taken.

Table 1. Summary of Data Validation Actions

Field Sample ID	Analyte	Qualifier	Bias	Validation Comments
SG106S	Vinyl Chloride trans-1,2-Dichloroethene cis-1,2-Dichloroethene Trichloroethene 1,1,2-Trichloroethane	UJ	L	Field final and Receipt vacuum disagree
SG106S	Tetrachloroethene	J	L	Field final and Receipt vacuum disagree

Qualifiers: U = Analyte is non-detect at the "DV Result" value; UJ = Non-detect is estimated; J = Result is estimated; EB = detected in field equipment blank; R = Result is rejected and is unusable for project decisions.

Bias: L = Low; H = High; I = Indeterminate

The qualified (U, UJ or J) and unqualified results presented in the validated data file, submitted electronically to SHA, are considered valid and usable for project objectives.

Lab: euofins/ Air Toxics Ltd.
Date Sampled: 6/25/12 - 6/27/12
Method of Analysis: TO-15 Full Scan

No. Samples 10 + 2FD + 1EB
Matrix/Sampling method Air/SUMMA® Canisters

Data Element Acceptable	Canister Receipt	HT	Surrogates & IS	LCS	Lab Dup (LCS or LD)	Tunes ICAL	CCAL	FD	RL & Quant.
Yes		√	√	√	√	√	√	√	√
No	Estimate (J or UJ) all results in SG106S								

Other Issues: Yes All non-detects were > Expected RLs in 2 samples (see page 3)

Comments:
An In-Depth review of the TO-15 analysis for samples from the Former IBM Facility, Manassas, VA was performed on Work Order 1103654R1.

12 Soil Vapor samples + 1 Equipment Blank were collected on 6/25/12 to 6/27/12 and were received at ATL on 6/29/12. The canister valve for sample SG106S was found to be open upon receipt at the lab and a brass plug was used to seal the canister.

These samples were analyzed for 6 project-specific VOCs, as requested on the COC, and as shown on page 5 of this checklist.

All Canister vacuums (field initial, field final, and lab receipt) were acceptable except for sample SG106S (field final vacuum was 7 " Hg and receipt vacuum was 0.5 " Hg) for which the canister valve was found to be open upon receipt at the lab. Canister certification forms indicated all canisters were non-detect for 6 target VOCs prior to shipment to field; no Action required. Note surrogate %Rec on Certification form has the "1" cut off on all recoveries ≥ 100% - no action except to note.

*ACTION: All results estimated (J or UJ) in SG106S with possible low bias due to a possible leak in the canister valve which caused the field final and lab receipt vacuums to differ by more than 5 " Hg.

Samples were all analyzed by 7/6/12; therefore, HT met - No Action required.

All 3 Surrogates and 3 IS's were recovered within criteria for samples & QC - No Action required.

LCS/LCSD = o070604/o070603. All 6 VOCs reported were recovered within criteria in LCS/LCSD. The RPDs between LCS/LCSD were also acceptable. No Action required.

Date: 8/28/12
Data Reviewer: Nancy C. Rothman, Ph.D.

Lab: euofins/ Air Toxics Ltd.

Associated Blanks: MB = o070606
EB: EB1

Blank ID	Contaminant / Level ($\mu\text{g}/\text{m}^3$)	Action Level DF=	Sample and reported result ($\mu\text{g}/\text{m}^3$)	Corrected Database Result
o070606	None	---	No Blank Action Required	
EB1	None	---	No Blank Action Required	

Additional Notes:

LD performed on SG108D. A comparison of detected results for these LDs shown below:

LD Evaluation_ Sample IDs: Sample = SG108D LD = SG108D Lab Duplicate

Analyte Name	CAS No.	DF=342 RL ($\mu\text{g}/\text{m}^3$)	Sample $\mu\text{g}/\text{m}^3$	Sample Result Q Level	LD $\mu\text{g}/\text{m}^3$	LD Result Q Level	RPD	Action
Tetrachloroethene	127-18-4	120	200000	> 5xRL	210000	> 5xRL	4.9	None

LD precision acceptable for Sample/LD pair - No Action required.

FDs: SG101/DUP2 & SG111S/DUP3. All results for SG101 and DUP2 were non-detect; therefore, while these results are consistent with one another, it is not possible to quantitatively evaluate FD precision through calculation of RPD. FD precision considered acceptable - No Action required. A comparison of detected results for SG111S/DUP3 shown below.

FD Evaluation_ Sample IDs: Sample = SG111S FD = DUP3

Analyte Name	CAS No.	DF=1.71 RL ($\mu\text{g}/\text{m}^3$)	Sample $\mu\text{g}/\text{m}^3$	Sample Result Q Level	FD $\mu\text{g}/\text{m}^3$	FD Result Q Level	RPD	Action
Trichloroethene	79-01-6	4.6	18	< 5xRL	17	< 5xRL	5.7	None
Tetrachloroethene	127-18-4	5.8	200	> 5xRL	190	> 5xRL	5.1	None

FD precision was acceptable for SG111S & DUP3 - No Action required.

Date: 8/28/12

Data Reviewer: Nancy C. Rothman, Ph.D.

Lab: euofins/ Air Toxics Ltd.

Additional Notes:

Tunes: 3 BFB Tunes (Inst. O - 2 ICAL + 1 CCALs)- all 3 met criteria and samples was analyzed within 24 hours of tune - no action required.

ICAL: Instrument O performed 5/16/12. For ICAL, 7-level calibration from 0.5 to 200 ppbV for 6 target VOCs except trichloroethene and tetrachloroethene for which 8-level ICAL from 0.2 to 200 ppbV reported. ICALs supported RLs reported. %RSD \leq 30% and RRF > 0.05 for all 6 compounds. No Action required.

CCAL: o070602 - All 6 VOCs were recovered within criteria - No Action required

All non-detects for the 6 project-specific VOCs were reported at or below the Expected RLs due to DF<2 except for samples SG106S and SG108D, which were diluted at the instrument level to ensure all detected results were reported within the instrument calibration range. The data user will need to evaluate non-detects at elevated levels for project use.

There were no "J" data reported.

The narrative did not raise any additional issues affecting data quality.

Date: 8/28/12

Data Reviewer: Nancy C. Rothman, Ph.D.

Lab: eurofins/ Air Toxics Ltd.

Analyte Name	CAS No.	Expected RL		LCS Criteria %	CCV Criteria %
		DF=1 RL (ppbv)	DF=2 RL ($\mu\text{g}/\text{m}^3$)		
Vinyl Chloride *	75-01-4	0.5	2.6	70-130	70-130
trans-1,2-Dichloroethene	156-60-5	0.5	4.0	60-140	60-140
cis-1,2-Dichloroethene *	156-59-2	0.5	4.0	70-130	70-130
Trichloroethene *	79-01-6	0.5	5.4	70-130	70-130
1,1,2-Trichloroethane	79-00-5	0.5	5.4	70-130	70-130
Tetrachloroethene *	127-18-4	0.5	6.8	70-130	70-130

* Expected RL from Table C.1 of QAQC Plan. trans-1,2-Dichloroethene and 1,1,2-Trichloroethane were added as target compounds at the client's request after the QAQC Plan was developed.

QA/QC Criteria for evaluation of TO-15 data:

<i>SUMMA Canister Pressure (P):</i>	Initial Field P < 25" Hg, J/UJ all results; Lab Receipt P > 15" Hg, J/UJ results; Lab Receipt P > \pm 5" Hg of Final Field P, J/UJ results
<i>Hold Time (HT):</i>	30 days \leq HT \leq 60 days, J/UJ results; HT > 60 days, J detects/ R non-detects (or professional judgment)
<i>Surrogates:</i>	%Rec <10%, J detects, R non-detects; 10% \leq %Rec <70%; J/UJ all associated data; %Rec >130%, J detects - no action for non-detects
<i>IS:</i>	Area <20% of CCAL, J detects, R non-detects; 20% \leq Area <60%; J/UJ all associated data; Area >140%, J detects - no action for non-detects
<i>LCS & CCV:</i>	Percent Recovery (%Rec) <10%, J detects, reject (R) non-detects; 10% \leq %Rec <LCL; J/UJ all associated data; %Rec >UCL, K detects - no action for non-detects
<i>LDs & FDs:</i>	LCS/LCSD, Sample/LD, or Sample/FD RPD > 25% for detects > 5x RL, J data; professional judgment for results < 5 x RL
<i>Blank Actions:</i>	Action Level = 5 x Level in Blank; Sample-specific Blank Action Level = Action Level x (Sample DF/Blank DF) Method Blank (MB) and Field Blank (Equipment Blank - EB): Result < Blank Action, B result at level reported
<i>Tune:</i>	SW-846 method 8260B tune criteria not met, professional judgment on R of all data; samples analyzed > 24-hours after tune; professional judgment on J/UJ or R of results
<i>ICAL:</i>	%RSD > 30%, J/UJ associated results
<i>RLs + Quant:</i>	Compound reported outside calibration range (< RL or at ppbV level > sample-specific highest ICAL standard for compound), J data. If RL > Expected RL, discuss possible issue with sensitivity of data
<i>DV Qualifiers:</i>	U = compound is non-detect; J = result is estimated ; UJ = non-detect is estimated; R = result is rejected and unusable. Final DV qualifier for a particular result may be influenced by multiple QC issues.
<i>References:</i>	Former IBM Manassas Facility, QAQC Plan, Manassas, Virginia , prepared by Sanborn, Head & Associates, May 29, 2009; USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review ; Publication USEPA540/R-07/003, July 2007; USEPA Region III Modifications to the National Functional Guidelines for Organic Data Review , September 1994; and Method TO-15, Determination of Volatile Organic Compounds (VOCs) in Air Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS) , Publication EPA/625/R-96/010b, January 1999

Date: 8/28/12

Data Reviewer: Nancy C. Rothman, Ph.D.



DATA VALIDATION REPORT
Method 8260B Analysis

Client: Sanborn, Head & Associates, Inc., Concord, New Hampshire (SHA)

Site: Former IBM Facility, Manassas, Virginia

Laboratory: euofins/Lancaster Laboratories, Inc., Lancaster, Pennsylvania (Lancaster)

SDG/Lab Project #: MAN25

Date(s) of Collection: June 18, 2012

**Number and type
Samples & analyses:** 11 Groundwater samples, 1 Equipment Blank, 1 Field Blank, and 1 Trip Blank
for 60 VOCs by Method 8260B

Senior Data Reviewers: Dr. Nancy C. Rothman, New Environmental Horizons, Inc.
Susan D. Chapnick, New Environmental Horizons, Inc.

Date Completed: September 12, 2012

A Data Validation Checklist Review was performed on the Work Order identified with the following intentions: 1) to determine if the data were generated and reported in accordance with the *Former IBM Manassas Facility, QAQC Plan, Manassas, Virginia*, prepared by Sanborn, Head & Associates, May 29, 2009 (QAQC Plan); *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review*; Publication USEPA540/R-07/003, July 2007; *USEPA Region III Modifications to the National Functional Guidelines for Organic Data Review*, September 1994; and EPA SW-846 Method 8260B; 2) to determine if the data met project data quality objectives for acceptable accuracy, precision, sensitivity; and technical usability; and 3) to update the project database with appropriate data quality qualifiers.

An In-Depth Data Usability Review was performed on SDG MAN01. This review indicated that overall the laboratory met project DQOs; therefore, a checklist review of remaining groundwater data associated with this QAQC plan was performed. Please see the Data Usability Report for SDG MAN01 for complete details on the 8260B review. The VOC Data Review Checklist, attached, was completed during this assessment to document the review of this SDG.

Table C.1 of the QAQC Plan identified four target compounds for analysis: vinyl chloride, cis-1,2-dichloroethene, trichloroethene, and tetrachloroethene. At the client's request, two additional compounds, trans-1,2-dichloroethene and 1,1,2-trichloroethane, were added as target compounds for this project prior to sample analysis. However, Lancaster reported 54 additional VOCs (60 total compounds reported) for the samples in this SDG. At the client's request, all 60 VOCs reported were evaluated.

The Trip Blank, TB1, date of collection is listed on the Chain-of-Custody (COC) as 6/12/12, which is probably the date when the TB was shipped from the laboratory to the field. Since there was no headspace in TB1, no action was taken for any holding time exceedance of this field QC sample.

Sensitivity requirements compared to the Reporting Limits (RLs) defined in Table C.1 of the QAQC Plan were achieved for the six target VOCs in all samples except cis-1,2-dichloroethene and trichloroethene in sample SG106I and vinyl chloride in samples DUP1, OF54, SG106D, and SG106I due to the dilutions made for sample analyses to ensure all detected results were reported within the instrument calibration range. The data user will need to evaluate the elevated non-detects in these samples for project objectives.

There were no MS/MSD analyses conducted on the samples in this SDG since insufficient sample was collected for this QC analysis. The laboratory narrated that they performed batch MS/MSD analysis on samples not related to this project (i.e., lab was method complaint); however, these results were not reported in this SDG since these MS/MSD data would not impact the samples reported herein.

There was one set of field duplicates (FD): OFF55 / DUP1. FD precision was unacceptable for cis-1,2-dichloroethene, trichloroethene, and tetrachloroethene. These three compounds were estimated (J) in the FD pair with indeterminate bias, as shown in Table 1. These results are an indication of variable precision and non-representativeness of the samples to the site location for these three VOCs in groundwater.

The Equipment Blank (EB1) reported detected results for several VOCs. A comparison of the compounds and levels detected in this blank with the sample results lead to qualification (B) of two tetrachloroethene results as shown in Table 1.

All other quality control information associated with accuracy, precision, and sensitivity for the VOCs reported met project criteria for these samples with the exceptions summarized in Table 1, below. The attached Data Validation Checklist includes all QA/QC reviewed during validation (including QC results that were acceptable) and details on the justification for actions taken.

Table 1. Summary of Data Validation Actions

Field Sample ID	Analyte	Qualifier	Bias	Validation Comments
SG102I SG111D	Tetrachloroethene	JB	I	Equipment Blank Action + Result uncertain below the calibration range
DUP1 OF55	Tetrachloroethene	J	I	FD imprecision
OF55	cis-1,2-Dichloroethene Trichloroethene	J	I	FD imprecision
DUP1	cis-1,2-Dichloroethene Trichloroethene	J	I	FD imprecision + Result uncertain below the calibration range
DUP1 FB1 OF54 SG102I SG106D	Benzene	UJ	L	Low LCS/LCSD recoveries

Table 1. Summary of Data Validation Actions - *continued*

Field Sample ID	Analyte	Qualifier	Bias	Validation Comments
OF55	Benzene	J	I	Low LCS/LCSD recoveries + Result uncertain below the calibration range
SG113D	Benzene	J	I	Result uncertain below the calibration range
EB1	Methylene Chloride Tetrachloroethene Naphthalene	J	I	Result uncertain below the calibration range
OF55	Chloromethane Vinyl Chloride trans-1,2-Dichloroethene	J	I	Result uncertain below the calibration range
SG102I	cis-1,2-Dichloroethene	J	I	Result uncertain below the calibration range
SG106D	cis-1,2-Dichloroethene Trichloroethene	J	I	Result uncertain below the calibration range
SG108I	Chloroform	J	I	Result uncertain below the calibration range
SG111I	cis-1,2-Dichloroethene Chloroform Trichloroethene	J	I	Result uncertain below the calibration range
SG113I	Chloroform	J	I	Result uncertain below the calibration range

Qualifiers: U = Analyte is non-detect at the "DV Result" value; UJ = Non-detect is estimated; J = Result is estimated; B = Analyte was also detected in an associated Blank [Region III DV requirement]; R = Result is rejected and is unusable for project decisions.

Bias: L = Low; H = High; I = Indeterminate

The qualified (U, J, UJ, or JB) and unqualified results presented in the validated data file, submitted electronically to SHA, are considered valid and usable for project objectives.

Volatile Data Review Checklist
Former IBM Facility, Manassas, Virginia

Lab Project #: MAN25

Lab: eurofins/Lancaster Laboratories
Date Sampled: 6/18/12
Method of Analysis: 8260B

No. Samples 10+1FD+1EB+1FB+1TB
Matrix: Groundwater

Data Element Acceptable	Preservation & HT	Surrogates	LCS / Blank Spike	MS/MSD	FD	Tunes ICALs CCALs	IS'	QL & Quant. Correct	Other Issues
Yes	√	√		NA		√	√		
No			Benzene estimated (J or UJ) in 6 samples		Estimate (J) 3 results in OF55 & DUP1			Accept 20 "J" values	Lab reported 60 VOCs - QAQC plan, modified by client, required 6 VOCs for analysis

Comments: % solids OK? NA

Samples were received at the lab on 6/20/12. Samples were received intact at 1.8, 1.9, 0.6, 2.4 & 1.3 °C and there were no Chain-of-Custody (COC) issues noted pertaining to these VOC samples other than the Trip Blank did not have labels. Additional samples other than these represented in this SDG were part of this shipment. No Action for samples received < 2 °C since samples were intact and HCl preserved. Only 1 VOC vial was collected for SG106D, SG111I, and SG113D, presumably since it was difficult to obtain a GW sample from these locations.

Samples were preserved with HCl to pH < 2 and all field samples were analyzed within 14 days of collection. Note Trip Blank (TB1) date of collection is listed as 6/12/12, which is probably the date when TB1 was shipped from the lab to the field. Since there was no headspace in TB1 and all VOCs were non-detect, no action was taken to qualify the TB results due to HT exceedance.

Surrogates : all surrogates were recovered within 70-130% QAQC Plan limits - No Action required.

LCS/LCSD : LCSC55/LCDC55, LCSC61/LCDC61, LCSC63, LCSC67/LCDC67, & LCSG67/LCDG67 - all target VOCs (60) reported recovery within Lab criteria for all LCS and RPD between LCS/LCSD all OK except: tetrahydrofuran and 1,2-dibromo-3-chloropropane LCSD high, benzene LCS & LCSD recoveries low, but 10%, and tert-butylbenzene LCS & LCSD recoveries high in LCSC55/LCDC55; trans-1,3-dichloropropene LCS & LCSD recoveries high in LCSC67/LCDC67; and 1,2-dibromo-3-chloropropane LCS&LCSD recoveries high in LCSG67/LCDG67. All samples were non-detect for tetrahydrofuran, 1,2-dibromo-3-chloropropane, tert-butylbenzene, and trans-1,3-dichloropropene; therefore, no action required for high LCS/LCSD recoveries.

**ACTION: Benzene estimated (UJ or J) in samples DUP1, FBI, OF54, OF55, SG102I, and SG106D with possible low bias, unless other issues affect the data, due to low LCS/LCSD recoveries.*

MS/MSD : there were no MS/MSD analyses performed on the GW samples in this SDG (insufficient sample collected to allow MS/MSD analysis). Narrative indicates batch MS/MSD on non-SDG related samples performed (lab was method compliant) but these were not reported since they would not affected the samples reported herein.

Date: 9/11/12

Data Reviewer: Nancy C. Rothman, Ph.D.

Volatile Data Review Checklist
Former IBM Facility, Manassas, Virginia

Lab Project #: MAN25

Lab: Lancaster

Method of Analysis: 8260B

Blank Action: _____ Blanks Reviewed: MB: VBLKC55, VBLKC61, VBLKC63, VBLKC67, & VBLKG67
TB: TB1 FB: FB1 EB: EB1

Blank ID	Contaminant / Level	Matrix Related?	Action Level / Action*	Sample and Reported Result	Corrected Result
VBLKC55	None	-	-	No Blank Action required	
VBLKC61	None	-	-	No Blank Action required	
VBLKC63	None	-	-	No Blank Action required	
VBLKC67	None	-	-	No Blank Action required	
VBLKG67	None	-	-	No Blank Action required	
TB1	None	-	-	No Blank Action required	
EB1	Methylene Chloride 0.2 J µg/L	Y	2 µg/L	All Samples were ND - no Blank Action required	
EB1	Tetrachloroethene 0.1 µg/L	Y	0.5 µg/L	SG102I 0.1 J	0.1 JB
				SG111D 0.2 J	0.2 JB
				All other Samples ND or >BAL - No Blank Action required	
EB1	Naphthalene 0.5 µg/L	Y	2.5 µg/L	All Samples were ND - no Blank Action required	
FB1	None	-	-	No Blank Action required	

Tunes: Instrument C 6/14/12 (ICAL), 6/26/12, 6/27/12 (ICAL), 6/29/12, 6/29/12 (2nd tune), and 7/2/12 and Instrument G 6/18/12 (ICAL) & 7/2/12. All abundances met BFB criteria and all samples were analyzed within 12 hours of BFB tune - No Action required.

ICALs: Instrument C (2 ICALs) & Instrument G - 6-level ICALs from 0.5 to 25 ug/L for 25-mL purge. ICALs contain more compounds than reported for samples in this SDG. Minimum RRF achieved for all compounds and %RSD < 30%. If %RSD > 15%, lab performed regression analysis and r2 > 0.99 - ICALs acceptable - No Action required.

CCAL: Inst. C 6/26/12, two on 6/29/12, & 7/2/12 and Inst. G on 7/2/12. RRF > 0.05 and %D ≤ ± 25% for all target VOCs. No Action required.

Date: 9/11/12

Data Reviewer: Nancy C. Rothman, Ph.D.

Lab: Lancaster

Method of Analysis: 8260B

Additional Notes:

IS: All IS areas and RTs were within criteria in all samples and QC - No Action required.

FD pair: OF55 & DUP1. A comparison of detected results shown below.

Field Duplicate Evaluation_ Sample IDs:

Analyte Name	DF= 1 & 10 *		Sample = OF55			FD = DUP1			RPD	Action
	RL (µg/L)		Sample µg/L	Q	Sample Result Level	FD µg/L	Q	FD Result Level		
Chloromethane	0.5		0.3	J	< RL	25	U	RL	NA	None
Vinyl Chloride	0.5		0.2	J	< RL	25	U	RL	NA	None
1,1-Dichloroethene	0.5		0.8		< 2 x RL	25	U	RL	NA	None
trans-1,2-Dichloroethene	0.5		0.1	J	< RL	25	U	RL	NA	None
cis-1,2-Dichloroethene	5		190		> 2 x RL	19	J	< RL	163.6	J Both
Benzene	0.5		0.5	J	< RL	25	U	RL	NA	None
Trichloroethene	5		23		> 2 x RL	6.3	J	< RL	114.0	J Both
Tetrachloroethene	5		180		> 2 x RL	1500		> 2 x RL	157.1	J Both

* FD DF = 50 & 200 rather than 1 & 10

FD precision was unacceptable for cis-1,2-dichloroethene, trichloroethene, and tetrachloroethene in FD pair (RPD > 30% for both or at least 1 result > 2 x RL).

**ACTION: cis-1,2-Dichloroethene, trichloroethene, and tetrachloroethene estimated (J) with indeterminate bias in samples OF55 and DUP1 due to FD imprecision*

All GW samples were initial analyzed (DF=1 or DF>1) and several samples were reanalyzed to report all results within the instrument calibration range (see table on page 4). All sets of data reviewed and Lancaster's choice of result for reporting was considered acceptable.

The RLs reported were supported by the ICALs. Table C.1 of QAQC Plan gives expected RLs for VOCs (4 targets in plan: Tetrachloroethene (PCE), Trichloroethene (TCE), cis-1,2-Dichloroethene (cDCE), & Vinyl chloride (VC)) in Groundwater of 1 µg/L. All non-detects for were < RLs expected except: cis-1,2-dichloroethene and trichloroethene in sample SG106I and vinyl chloride in samples DUP1, OF54, SG106D, and SG106I since samples were analyzed at dilutions to report all detects within the instrument calibration range (see page 4 for details on DF). The data user will need to evaluate non-detects for project uses.

20 results were reported at levels below the RL and were flagged "J" by the lab. These 20 "J" values were accepted with indeterminate bias due to uncertainty in quantitation at a level below the instrument calibration range.

The sample chromatograms, mass spectra of detects and quantitation reports were scanned and data appeared to have been reported correctly.

Narrative did not raise any issues affecting quality.

Date: 9/11/12

Data Reviewer: Nancy C. Rothman, Ph.D.

Volatile Data Review Checklist
Former IBM Facility, Manassas, Virginia

Lab Project #: MAN25

Lab: Lancaster

Method of Analysis: 8260B

Sample ID	Lab ID	Date Sampled	Field Blank	Trip Blank	Method Blank	LCS	Date Analyzed	Low or Med-Level	Instrument DF
DUP1	6694166	6/18/2012	FB1 & EB1	TB1	VBLKC55 & VBLKC63	C55 & C63	6/26/12 & 6/29/12	Low	50 & 200
EB1	6694167	6/18/2012	NA	TB1	VBLKC63	C63	6/29/2012	Low	1
FB1	6694168	6/18/2012	NA	TB1	VBLKC55	C55	6/26/2012	Low	1
OF54	6694169	6/18/2012	FB1 & EB1	TB1	VBLKC55	C55	6/26/2012	Low	4 & 20
OF55	6694170	6/18/2012	FB1 & EB1	TB1	VBLKC55	C55	6/26/2012	Low	1 & 10
SG102I	6694171	6/18/2012	FB1 & EB1	TB1	VBLKC55	C55	6/26/2012	Low	1
SG106D	6694172	6/18/2012	FB1 & EB1	TB1	VBLKC55	C55	6/26/2012	Low	10 & 100
SG106I	6694173	6/18/2012	FB1 & EB1	TB1	VBLKC61	C61	6/29/2012	Low	5 & 50
SG108I	6694174	6/18/2012	FB1 & EB1	TB1	VBLKC61	C61	6/29/2012	Low	1 & 10
SG111D	6694175	6/18/2012	FB1 & EB1	TB1	VBLKC61	C61	6/29/2012	Low	1
SG111I	6694176	6/18/2012	FB1 & EB1	TB1	VBLKC61	C61	6/29/2012	Low	1
SG113D	6694177	6/18/2012	FB1 & EB1	TB1	VBLKC63	C63	6/29/2012	Low	1
SG113I	6694178	6/18/2012	FB1 & EB1	TB1	VBLKG67	G67	7/2/2012	Low	1
TB1	6694179	6/12/2012	NA	NA	VBLKC67	C67	7/2/2012	Low	1

Date: 9/11/12

Data Reviewer: Nancy C. Rothman, Ph.D.

Lab: Lancaster
Method of Analysis: 8260B

SW-846 Method 8260B, QAQC Plan criteria, and National Functional Guidelines & Region III DV Guidance

HT: waters- pH >2 or no HCl: 7d<HT≤14 d, J Aromatic det/R Aromatic NDs; Accept all Non-aromatics;
pH < 2, 14d <HT< 28 d; J Aromatic det/R Aromatic NDs; J Non-aromatic det/J Non-aromatic ND
low- or medium-level solid - 14d <HT< 28 d, J det/J NDs; HT > 28 days, J det/R NDs
unfrozen solid - 48 hrs < HT < 96 hrs, J det/J NDs; HT > 96hrs, J det/R NDs

Surrogates: %Rec<10%, J det/ R NDs; 10% <%Rec<LCL, J det/ J NDs; %Rec >UCL, J det/Accept NDs.
LCS: %Rec<10%, J det/ R NDs; 10% <%Rec<LCL, J det/ J NDs; %Rec >UCL, J det/Accept NDs

Tunes: Samples analyzed within 12-hrs and criteria met per Table 7, NYSDEC ASP2005. If out, use professional judgment.

ICAL: 5-Level ; min. RRF < 0.05 J det/ R NDs; %RSD > 30% J det/J NDs

CCAL: %D > ± 25%, J det/J ND. If RRF < min.RRF J det/R ND

Blanks: Blank Action Level = 5 x Level reported except for Acetone, Methylene Chloride, and 2-Butanone with BAL = 10 x value reported in blank (Region III)
Non-Matrix related Blank contamination, TB or EB contaminant in all samples associated with Blank
If contamination in blank(s) exist, if Result < Blank Action, B result at level reported

MS/MSD: %Rec<10%, J det/ R NDs; 10% <%Rec<LCL, J det/ J NDs; %Rec >UCL, J det/Accept NDs- Unspiked Sample only. RPD > Control limit, J det / J ND; %RSD of non-spiked > 50%, J det

FD: Both Conc. > 2xQL, RPD >30% (water) 50% (soil), J det; One result ND, other >2 x QL, J det/J NDs; Both Conc. < 2xQL; RPD >criteria, LCS OK, Accept data

IS: 25% ≤ Area < 50% of IS in CCAL , J det/ J NDs; Area < 25% of CCAL, J det / R NDs; Area > 150% IS in CCAL, J det / Accept NDs
if result > upper calibration range, J result, if result < lowest calibration standard, J result. Verify all J data reported properly, if applicable. Verify

QLs: results met criteria (RL and component list) Table C.1 of QAQC Plan

APPENDIX D.2

JULY 2012

CHARACTERIZATION SAMPLING



DATA VALIDATION REPORT **Method TO-15 Analysis**

Client: Sanborn, Head & Associates, Inc., Concord, New Hampshire (SHA)

Site: Former IBM Facility, Manassas, Virginia

Laboratory: eurofins/Air Toxics Limited (ATL), Folsom, California

Work Orders: 1207235

Date(s) of Collection: July 9, 2012 – July 12, 2012

**Number and type
Samples & analyses:** 11 Soil Vapor samples + 1 Equipment Blank for six project-specific VOCs by
Method TO-15

Senior Data Reviewers: Dr. Nancy C. Rothman, New Environmental Horizons, Inc.
Susan D. Chapnick, New Environmental Horizons, Inc.

Date Completed: September 7, 2012

A Data Validation Checklist Review was performed on the Work Order identified with the following intentions: 1) to determine if the data were generated and reported in accordance with the *Former IBM Manassas Facility, QAQC Plan, Manassas, Virginia*, prepared by Sanborn, Head & Associates, May 29, 2009 (QAQC Plan); *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review*; Publication USEPA540/R-07/003, July 2007; *USEPA Region III Modifications to the National Functional Guidelines for Organic Data Review*, September 1994; and *Method TO-15, Determination of Volatile Organic Compounds (VOCs) in Air Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS)*, Publication EPA/625/R-96/010b, January 1999; 2) to determine if the data met project data quality objectives for acceptable accuracy, precision, sensitivity; and technical usability; and 3) to update the project database with appropriate data quality qualifiers.

An In-Depth Data Usability Review was performed on Work Order 1103654R1. This review indicated that overall the laboratory met project DQOs; therefore, a checklist review of remaining air data associated with this QAQC plan was performed. Please see the Data Usability Report for Work Order 1103654R1 for complete details on the TO-15 review. The Air Data Review Checklist, attached, was completed during this assessment to document the review of this Work Order.

Table C.1 of the QAQC Plan identified four target compounds for analysis: vinyl chloride, cis-1,2-dichloroethene, trichloroethene, and tetrachloroethene. At the client's request, two additional compounds, trans-1,2-dichloroethene and 1,1,2-trichloroethane, were added as target compounds for this project prior to sample analysis.

The Sample Device ID for sample SG119 on the Chain-of-Custody (COC) is incorrectly listed as Canister #3350. The Canister tag and Canister certification information indicate the Canister for sample SG119 was actually #3355. The laboratory used Canister #3355 to associate with sample SG119 throughout the data package.

Sensitivity requirements compared to the Reporting Limits (RLs) defined in Table C.1 of the QAQC Plan were achieved for all samples except SG120I and SG31S, which were diluted to ensure all detected results were reported within the instrument calibration range. In addition, sample SG119 required repressurization of the Canister, which resulted in non-detects exceeding the expected RLs for this sample. The data user will need to evaluate the elevated non-detects in these samples for project objectives.

The equipment blank (EB1) included in this SDG was non-detect for all six project VOCs. Therefore, blank action was not required.

There was one field duplicate pair: SG114 and DUP1. All results were non-detect for SG114 and DUP1; therefore, while these results are consistent with each other, it was not possible to assess precision through calculation of RPD. FD precision was considered acceptable for this FD pair indicating acceptable precision from field collection through analysis for the VOCs reported.

All other quality control information associated with accuracy, precision, and sensitivity for the project-specific list of VOCs reported met method criteria for the samples in this Work Order. The results reported by the laboratory were unchanged as a consequence of this data review and the results presented in the validated database are considered usable for project objectives.

Lab: euofins/ Air Toxics Ltd.
Date Sampled: 7/9/12 -7/12/12
Method of Analysis: TO-15 Full Scan

No. Samples 10 + 1FD + 1EB
Matrix/Sampling method Air/SUMMA® Canisters

Data Element Acceptable	Canister Receipt	HT	Surrogates & IS	LCS	Lab Dup (LCS or LD)	Tunes ICAL	CCAL	FD	RL & Quant.
Yes	√	√	√	√	√	√	√	√	√
No									

Other Issues: Yes All non-detects were > Expected RLs in 3 samples (see page 3)

Comments:
An In-Depth review of the TO-15 analysis for samples from the Former IBM Facility, Manassas, VA was performed on Work Order 1103654R1.

11 Soil Vapor samples + 1 Equipment Blank were received at ATL on 7/13/12 in good condition. The Sample Device ID for sample SG119 on the COC is incorrectly listed as Canister # 3350. The Canister tag and Canister certification information indicate the Canister for sample SG119 was actually #3355. The laboratory used Canister #3355 to associate with sample SG119 throughout the data package.

These samples were analyzed for 6 project-specific VOCs, as requested on the COC, and as shown on page 4 of this checklist.

All Canister vacuums (field initial, field final, and lab receipt) were acceptable - Canister certification forms indicated all canisters were non-detect for 6 target VOCs prior to shipment to field; no Action required. Note surrogate %Rec on Certification form has the "1" cut off on all recoveries ≥ 100% - no action except to note.

Samples were all analyzed by 7/19/12; therefore, HT met - No Action required.

All 3 Surrogates and 3 IS's were recovered within criteria for samples & QC - No Action required.

LCS/LCSD = o071804/o071803 & o071904/o071903. All 6 VOCs reported were recovered within criteria in both LCS/LCSD. The RPDs between LCS/LCSD were also acceptable. No Action required.

Lab: euofins/ Air Toxics Ltd.

Associated Blanks: MB = o071807 & o071907

EB: EB1

Blank ID	Contaminant / Level ($\mu\text{g}/\text{m}^3$)	Action Level DF=	Sample and reported result ($\mu\text{g}/\text{m}^3$)	Corrected Database Result
o071807	None	---	No Blank Action Required	
o071907	None	---	No Blank Action Required	
EB1	None	---	No Blank Action Required	

Additional Notes:

LDs performed on SG120I & SG31S. A comparison of detected results for these LDs shown below:

LD Evaluation_ Sample IDs: Sample = SG120I LD = SG120I Lab Duplicate

Analyte Name	CAS No.	DF=33	Sample $\mu\text{g}/\text{m}^3$	Sample Result Q Level	LD $\mu\text{g}/\text{m}^3$	LD Result	RPD	Action
		RL ($\mu\text{g}/\text{m}^3$)				Q Level		
Trichloroethene	79-01-6	89	420	> 5xRL	450	> 5xRL	6.9	None
Tetrachloroethene	127-18-4	110	30000	> 5xRL	28000	> 5xRL	6.9	None

LD Evaluation_ Sample IDs: Sample = SG31S LD = SG31S Lab Duplicate

Analyte Name	CAS No.	DF=34.4	Sample $\mu\text{g}/\text{m}^3$	Sample Result Q Level	LD $\mu\text{g}/\text{m}^3$	LD Result	RPD	Action
		RL ($\mu\text{g}/\text{m}^3$)				Q Level		
Vinyl Chloride	75-01-4	44	1200	> 5xRL	1000	> 5xRL	18.2	None
trans-1,2-Dichloroethene	156-60-5	68	1300	> 5xRL	1200	> 5xRL	8.0	None
cis-1,2-Dichloroethene	156-59-2	68	15000	> 5xRL	14000	> 5xRL	6.9	None
Trichloroethene	79-01-6	92	3700	> 5xRL	3700	> 5xRL	0.0	None
Tetrachloroethene	127-18-4	120	1400	> 5xRL	1600	> 5xRL	13.3	None

LD precision acceptable for both Sample/LD pairs - No Action required.

Date: 9/7/12

Data Reviewer: Nancy C. Rothman, Ph.D.

Lab: euofins/ Air Toxics Ltd.

Additional Notes:

FDs: SG114/DUP1. All 6 VOCs were non-detect in both samples; therefore, while these results are consistent with each other, it's not possible to evaluate precision quantitatively through calculation of RPD. FD precision considered acceptable - No Action required.

Tunes: 4 BFB Tunes (Inst. O - 2 ICAL + 2 CCALs)- all 4 met criteria and samples was analyzed within 24 hours of tune - no action required.

ICAL: Instrument O performed 5/16/12. For ICAL, 7-level calibration from 0.5 to 200 ppbV for 6 target VOCs except trichloroethene and tetrachloroethene for which 8-level ICAL from 0.2 to 200 ppbV reported. ICALs supported RLs reported. %RSD \leq 30% and RRF > 0.05 for all 6 compounds. No Action required.

CCALs: o071802 & o071902 - All 6 VOCs were recovered within criteria - No Action required

All non-detects for the 6 project-specific VOCs were reported at or below the Expected RLs due to DF<2 except for sample SG119 which required re-pressurization of the canister and samples SG120I and SG31S, which were diluted at the instrument level to ensure all detected results were reported within the instrument calibration range. The data user will need to evaluate non-detects at elevated levels for project use.

There were no "J" data reported.

The narrative did not raise any additional issues affecting data quality.

The data were unchanged as a consequence of this review

Date: 9/7/12

Data Reviewer: Nancy C. Rothman, Ph.D.

Lab: eurofins/ Air Toxics Ltd.

Analyte Name	CAS No.	Expected RL		LCS Criteria %	CCV Criteria %
		DF=1 RL (ppbv)	DF=2 RL ($\mu\text{g}/\text{m}^3$)		
Vinyl Chloride *	75-01-4	0.5	2.6	70-130	70-130
trans-1,2-Dichloroethene	156-60-5	0.5	4.0	60-140	60-140
cis-1,2-Dichloroethene *	156-59-2	0.5	4.0	70-130	70-130
Trichloroethene *	79-01-6	0.5	5.4	70-130	70-130
1,1,2-Trichloroethane	79-00-5	0.5	5.4	70-130	70-130
Tetrachloroethene *	127-18-4	0.5	6.8	70-130	70-130

* Expected RL from Table C.1 of QAQC Plan. trans-1,2-Dichloroethene and 1,1,2-Trichloroethane were added as target compounds at the client's request after the QAQC Plan was developed.

QA/QC Criteria for evaluation of TO-15 data:

<i>SUMMA Canister Pressure (P):</i>	Initial Field P < 25" Hg, J/UJ all results; Lab Receipt P > 15" Hg, J/UJ results; Lab Receipt P > \pm 5" Hg of Final Field P, J/UJ results
<i>Hold Time (HT):</i>	30 days \leq HT \leq 60 days, J/UJ results; HT > 60 days, J detects/ R non-detects (or professional judgment)
<i>Surrogates:</i>	%Rec <10%, J detects, R non-detects; 10% \leq %Rec <70%; J/UJ all associated data; %Rec >130%, J detects - no action for non-detects
<i>IS:</i>	Area <20% of CCAL, J detects, R non-detects; 20% \leq Area <60%; J/UJ all associated data; Area >140%, J detects - no action for non-detects
<i>LCS & CCV:</i>	Percent Recovery (%Rec) <10%, J detects, reject (R) non-detects; 10% \leq %Rec <LCL; J/UJ all associated data; %Rec >UCL, K detects - no action for non-detects
<i>LDs & FDs:</i>	LCS/LCSD, Sample/LD, or Sample/FD RPD > 25% for detects > 5x RL, J data; professional judgment for results < 5 x RL
<i>Blank Actions:</i>	Action Level = 5 x Level in Blank; Sample-specific Blank Action Level = Action Level x (Sample DF/Blank DF) Method Blank (MB) and Field Blank (Equipment Blank - EB): Result <Blank Action, B result at level reported
<i>Tune:</i>	SW-846 method 8260B tune criteria not met, professional judgment on R of all data; samples analyzed > 24-hours after tune; professional judgment on J/UJ or R of results
<i>ICAL:</i>	%RSD > 30%, J/UJ associated results
<i>RLs + Quant:</i>	Compound reported outside calibration range (< RL or at ppbV level > sample-specific highest ICAL standard for compound), J data. If RL > Expected RL, discuss possible issue with sensitivity of data
<i>DV Qualifiers:</i>	U = compound is non-detect; J = result is estimated ; UJ = non-detect is estimated; R = result is rejected and unusable. Final DV qualifier for a particular result may be influenced by multiple QC issues.
<i>References:</i>	Former IBM Manassas Facility, QAQC Plan, Manassas, Virginia , prepared by Sanborn, Head & Associates, May 29, 2009; USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review ; Publication USEPA540/R-07/003, July 2007; USEPA Region III Modifications to the National Functional Guidelines for Organic Data Review , September 1994; and Method TO-15, Determination of Volatile Organic Compounds (VOCs) in Air Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS) , Publication EPA/625/R-96/010b, January 1999

Date: 9/7/12

Data Reviewer: Nancy C. Rothman, Ph.D.



DATA VALIDATION REPORT **Method TO-15 Analysis**

Client: Sanborn, Head & Associates, Inc., Concord, New Hampshire (SHA)

Site: Former IBM Facility, Manassas, Virginia

Laboratory: eurofins/Air Toxics Limited (ATL), Folsom, California

Work Orders: 1207320

Date(s) of Collection: July 16, 2012

**Number and type
Samples & analyses:** 2 Soil Vapor samples for six project-specific VOCs by Method TO-15

Senior Data Reviewers: Dr. Nancy C. Rothman, New Environmental Horizons, Inc.
Susan D. Chapnick, New Environmental Horizons, Inc.

Date Completed: September 7, 2012

A Data Validation Checklist Review was performed on the Work Order identified with the following intentions: 1) to determine if the data were generated and reported in accordance with the *Former IBM Manassas Facility, QAQC Plan, Manassas, Virginia*, prepared by Sanborn, Head & Associates, May 29, 2009 (QAQC Plan); *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review*; Publication USEPA540/R-07/003, July 2007; *USEPA Region III Modifications to the National Functional Guidelines for Organic Data Review*, September 1994; and *Method TO-15, Determination of Volatile Organic Compounds (VOCs) in Air Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS)*, Publication EPA/625/R-96/010b, January 1999; 2) to determine if the data met project data quality objectives for acceptable accuracy, precision, sensitivity; and technical usability; and 3) to update the project database with appropriate data quality qualifiers.

An In-Depth Data Usability Review was performed on Work Order 1103654R1. This review indicated that overall the laboratory met project DQOs; therefore, a checklist review of remaining air data associated with this QAQC plan was performed. Please see the Data Usability Report for Work Order 1103654R1 for complete details on the TO-15 review. The Air Data Review Checklist, attached, was completed during this assessment to document the review of this Work Order.

Table C.1 of the QAQC Plan identified four target compounds for analysis: vinyl chloride, cis-1,2-dichloroethene, trichloroethene, and tetrachloroethene. At the client's request, two additional compounds, trans-1,2-dichloroethene and 1,1,2-trichloroethane, were added as target compounds for this project prior to sample analysis.

Sensitivity requirements compared to the Reporting Limits (RLs) defined in Table C.1 of the QAQC Plan were achieved for all samples except for sample SG31D, which was diluted to ensure all detected results were reported within the instrument calibration range. The data user will need to evaluate the elevated non-detects in these samples for project objectives.

There were no field duplicates associated with the samples in this Work Order; therefore, precision from field collection through analysis could not be evaluated.

All other quality control information associated with accuracy, precision, and sensitivity for the project-specific list of VOCs reported met method criteria for the samples in this Work Order. The results reported by the laboratory were unchanged as a consequence of this data review and the results presented in the validated database are considered usable for project objectives.

Lab: euofins/ Air Toxics Ltd.
Date Sampled: 7/16/12
Method of Analysis: TO-15 Full Scan

No. Samples 2
Matrix/Sampling method Air/SUMMA® Canisters

Data Element Acceptable	Canister Receipt	HT	Surrogates & IS	LCS	Lab Dup (LCS or LD)	Tunes ICAL	CCAL	FD	RL & Quant.
Yes	√	√	√	√	√	√	√	√	√
No									

Other Issues: Yes All non-detects were > Expected RLs in sample SG31D

Comments:
An In-Depth review of the TO-15 analysis for samples from the Former IBM Facility, Manassas, VA was performed on Work Order 1103654R1.

2 Soil Vapor samples were received at ATL on 7/18/12 in good condition. There were no COC issues noted.

These samples were analyzed for 6 project-specific VOCs, as requested on the COC, and as shown on page 4 of this checklist.

All Canister vacuums (field initial, field final, and lab receipt) were acceptable - Canister certification forms indicated all canisters were non-detect for 6 target VOCs prior to shipment to field; no Action required.

Samples were all analyzed by 7/19/12; therefore, HT met - No Action required.

All 3 Surrogates and 3 IS's were recovered within criteria for samples & QC - No Action required.

LCS/LCSD = 3071904/3071907. All 6 VOCs reported were recovered within criteria in LCS/LCSD. The RPDs between LCS/LCSD were also acceptable. No Action required.

Lab: euofins/ Air Toxics Ltd.

Associated Blanks: MB = 3071912

EB: EB1 (reported in W.O. 1207235)

Blank ID	Contaminant / Level ($\mu\text{g}/\text{m}^3$)	Action Level DF=	Sample and reported result ($\mu\text{g}/\text{m}^3$)	Corrected Database Result
3071912	None	---	No Blank Action Required	
EB1	None	---	No Blank Action Required	

Additional Notes:

LD performed on SG31D. A comparison of detected results for these LDs shown below:

LD Evaluation_ Sample IDs:

Sample = SG31D

LD = SG31D Lab Duplicate

Analyte Name	CAS No.	DF=2.55	Sample $\mu\text{g}/\text{m}^3$	Sample Result Q Level	LD $\mu\text{g}/\text{m}^3$	LD Result	RPD	Action
		RL ($\mu\text{g}/\text{m}^3$)				Q Level		
Vinyl Chloride	75-01-4	3.2	1000	> 5xRL	1000	> 5xRL	0.0	None
trans-1,2-Dichloroethene	156-60-5	5	150	> 5xRL	150	> 5xRL	0.0	None
cis-1,2-Dichloroethene	156-59-2	5	1900	> 5xRL	2000	> 5xRL	5.1	None
Trichloroethene	79-01-6	6.8	270	> 5xRL	290	> 5xRL	7.1	None
Tetrachloroethene	127-18-4	8.6	46	> 5xRL	52	> 5xRL	12.2	None

LD precision acceptable for both Sample/LD pairs - No Action required.

FDs: There were no FDs associated with the samples in this Work Order

Date: 9/7/12

Data Reviewer: Nancy C. Rothman, Ph.D.

Lab: euofins/ Air Toxics Ltd.

Additional Notes:

Tunes: 2 BFB Tunes (Inst. 3 - 1 ICAL + 1 CCALs)- both met criteria and samples was analyzed within 24 hours of tune - no action required.

ICAL: Instrument 3 performed 7/16/12. For ICAL, 6-level calibration from 0.5 to 200 ppbV for 6 target VOCs. ICALs supported RLs reported. %RSD \leq 30% and RRF $>$ 0.05 for all 6 compounds. No Action required.

CCALs: 3071903 - All 6 VOCs were recovered within criteria - No Action required

All non-detects for the 6 project-specific VOCs were reported at or below the Expected RLs due to DF $<$ 2 except for sample SG31D, which was diluted at the instrument level to ensure all detected results were reported within the instrument calibration range. The data user will need to evaluate non-detects at elevated levels for project use.

There were no "J" data reported.

The narrative did not raise any additional issues affecting data quality.

The data were unchanged as a consequence of this review

Date: 9/7/12

Data Reviewer: Nancy C. Rothman, Ph.D.

Lab: eurofins/ Air Toxics Ltd.

Analyte Name	CAS No.	Expected RL		LCS Criteria %	CCV Criteria %
		DF=1 RL (ppbv)	DF=2 RL ($\mu\text{g}/\text{m}^3$)		
Vinyl Chloride *	75-01-4	0.5	2.6	70-130	70-130
trans-1,2-Dichloroethene	156-60-5	0.5	4.0	60-140	60-140
cis-1,2-Dichloroethene *	156-59-2	0.5	4.0	70-130	70-130
Trichloroethene *	79-01-6	0.5	5.4	70-130	70-130
1,1,2-Trichloroethane	79-00-5	0.5	5.4	70-130	70-130
Tetrachloroethene *	127-18-4	0.5	6.8	70-130	70-130

* Expected RL from Table C.1 of QAQC Plan. trans-1,2-Dichloroethene and 1,1,2-Trichloroethane were added as target compounds at the client's request after the QAQC Plan was developed.

QA/QC Criteria for evaluation of TO-15 data:

<i>SUMMA Canister Pressure (P):</i>	Initial Field P < 25" Hg, J/UJ all results; Lab Receipt P > 15" Hg, J/UJ results; Lab Receipt P > ± 5" Hg of Final Field P, J/UJ results
<i>Hold Time (HT):</i>	30 days ≤ HT ≤ 60 days, J/UJ results; HT > 60 days, J detects/ R non-detects (or professional judgment)
<i>Surrogates:</i>	%Rec <10%, J detects, R non-detects; 10% ≤ %Rec <70%; J/UJ all associated data; %Rec >130%, J detects - no action for non-detects
<i>IS:</i>	Area <20% of CCAL, J detects, R non-detects; 20% ≤ Area <60%; J/UJ all associated data; Area >140%, J detects - no action for non-detects
<i>LCS & CCV:</i>	Percent Recovery (%Rec) <10%, J detects, reject (R) non-detects; 10% ≤ %Rec <LCL; J/UJ all associated data; %Rec >UCL, K detects - no action for non-detects
<i>LDs & FDs:</i>	LCS/LCSD, Sample/LD, or Sample/FD RPD > 25% for detects > 5x RL, J data; professional judgment for results < 5 x RL
<i>Blank Actions:</i>	Action Level = 5 x Level in Blank; Sample-specific Blank Action Level = Action Level x (Sample DF/Blank DF) Method Blank (MB) and Field Blank (Equipment Blank - EB): Result <Blank Action, B result at level reported
<i>Tune:</i>	SW-846 method 8260B tune criteria not met, professional judgment on R of all data; samples analyzed > 24-hours after tune; professional judgment on J/UJ or R of results
<i>ICAL:</i>	%RSD > 30%, J/UJ associated results
<i>RLs + Quant:</i>	Compound reported outside calibration range (< RL or at ppbV level > sample-specific highest ICAL standard for compound), J data. If RL > Expected RL, discuss possible issue with sensitivity of data
<i>DV Qualifiers:</i>	U = compound is non-detect; J = result is estimated ; UJ = non-detect is estimated; R = result is rejected and unusable. Final DV qualifier for a particular result may be influenced by multiple QC issues.
<i>References:</i>	Former IBM Manassas Facility, QAQC Plan, Manassas, Virginia , prepared by Sanborn, Head & Associates, May 29, 2009; USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review ; Publication USEPA540/R-07/003, July 2007; USEPA Region III Modifications to the National Functional Guidelines for Organic Data Review , September 1994; and Method TO-15, Determination of Volatile Organic Compounds (VOCs) in Air Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS) , Publication EPA/625/R-96/010b, January 1999

Date: 9/7/12

Data Reviewer: Nancy C. Rothman, Ph.D.



DATA VALIDATION REPORT
Method 8260B Analysis

Client: Sanborn, Head & Associates, Inc., Concord, New Hampshire (SHA)

Site: Former IBM Facility, Manassas, Virginia

Laboratory: eurofins/Lancaster Laboratories, Inc., Lancaster, Pennsylvania (Lancaster)

SDG/Lab Project #: MAN27

Date(s) of Collection: July 10, 2012 – July 11, 2012

**Number and type
Samples & analyses:** 8 Groundwater samples and 1 Field Blank for 60 VOCs by Method 8260B

Senior Data Reviewers: Dr. Nancy C. Rothman, New Environmental Horizons, Inc.
Susan D. Chapnick, New Environmental Horizons, Inc.

Date Completed: September 12, 2012

A Data Validation Checklist Review was performed on the Work Order identified with the following intentions: 1) to determine if the data were generated and reported in accordance with the *Former IBM Manassas Facility, QAQC Plan, Manassas, Virginia*, prepared by Sanborn, Head & Associates, May 29, 2009 (QAQC Plan); *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review*; Publication USEPA540/R-07/003, July 2007; *USEPA Region III Modifications to the National Functional Guidelines for Organic Data Review*, September 1994; and EPA SW-846 Method 8260B; 2) to determine if the data met project data quality objectives for acceptable accuracy, precision, sensitivity; and technical usability; and 3) to update the project database with appropriate data quality qualifiers.

An In-Depth Data Usability Review was performed on SDG MAN01. This review indicated that overall the laboratory met project DQOs; therefore, a checklist review of remaining groundwater data associated with this QAQC plan was performed. Please see the Data Usability Report for SDG MAN01 for complete details on the 8260B review. The VOC Data Review Checklist, attached, was completed during this assessment to document the review of this SDG.

Table C.1 of the QAQC Plan identified four target compounds for analysis: vinyl chloride, cis-1,2-dichloroethene, trichloroethene, and tetrachloroethene. At the client's request, two additional compounds, trans-1,2-dichloroethene and 1,1,2-trichloroethane, were added as target compounds for this project prior to sample analysis. However, Lancaster reported 54 additional VOCs (60 total compounds reported) for the samples in this SDG. At the client's request, all 60 VOCs reported were evaluated.

Ten groundwater samples, 1 field blank, and 1 trip blank were received at the laboratory on July 12, 2012. At SHA's request, the following samples were not validated: SG31, SG117, and TB4. These samples were not included in the EDD submitted to NEH from SHA. The trip blank (TB4) results were used to judge whether there was possible sample cross-contamination during transport from the field to the laboratory.

Sensitivity requirements compared to the Reporting Limits (RLs) defined in Table C.1 of the QAQC Plan were achieved for the six target VOCs in all samples.

There were no MS/MSD analyses conducted on the samples in this SDG since insufficient sample was collected for this QC analysis. The laboratory narrated that they performed batch MS/MSD analysis on samples not related to this project (i.e., lab was method complaint); however, these results were not reported in this SDG since these MS/MSD data would not impact the samples reported herein.

There were no field duplicates associated with the samples in this SDG; therefore, precision from field collection through analysis could not be evaluated for these groundwater samples.

There was no Equipment Blank (EB) associated with the samples in this SDG. The field blank, trip blank, and method blanks were all non-detect for VOCs; therefore, blank action was not required.

All other quality control information associated with accuracy, precision, and sensitivity for the VOCs reported met project criteria for these samples with the exceptions summarized in Table 1, below. The attached Data Validation Checklist includes all QA/QC reviewed during validation (including QC results that were acceptable) and details on the justification for actions taken.

Table 1. Summary of Data Validation Actions

Field Sample ID	Analyte	Qualifier	Bias	Validation Comments
SG31I	Vinyl Chloride	J	H	High LCS recovery
D86	Bromodichloromethane Toluene	J	I	Result uncertain below the calibration range
SG115I	Trichlorofluoromethane cis-1,2-Dichloroethene Trichloroethene Bromodichloromethane Toluene Xylene (Total)	J	I	Result uncertain below the calibration range
SG115S	Benzene Bromodichloromethane Ethylbenzene 1,2,4-Trimethylbenzene	J	I	Result uncertain below the calibration range
SG11822	Toluene Xylene (Total)	J	I	Result uncertain below the calibration range
SG118I	Trichloroethene Bromodichloromethane Ethylbenzene	J	I	Result uncertain below the calibration range
SG123I	cis-1,2-Dichloroethene Trichloroethene Ethylbenzene	J	I	Result uncertain below the calibration range

Table 1. Summary of Data Validation Actions - *continued*

Field Sample ID	Analyte	Qualifier	Bias	Validation Comments
SG31D	trans-1,2-Dichloroethene p-Isopropyltoluene Xylene (Total)	J	I	Result uncertain below the calibration range
SG31I	Bromodichloromethane Toluene Ethylbenzene 1,2,4-Trimethylbenzene p-Isopropyltoluene	J	I	Result uncertain below the calibration range

Qualifiers: U = Analyte is non-detect at the "DV Result" value; UJ = Non-detect is estimated; J = Result is estimated; B = Analyte was also detected in an associated Blank [Region III DV requirement]; R = Result is rejected and is unusable for project decisions.

Bias: L = Low; H = High; I = Indeterminate

The qualified (U or J) and unqualified results presented in the validated data file, submitted electronically to SHA, are considered valid and usable for project objectives.

Volatile Data Review Checklist
Former IBM Facility, Manassas, Virginia

Lab Project #: MAN27

Lab: eurofins/Lancaster Laboratories
Date Sampled: 7/10/12 - 7/11/12
Method of Analysis: 8260B

No. Samples: 8 + 1FB
Matrix: Groundwater

Data Element Acceptable	Preservation & HT	Surrogates	LCS / Blank Spike	MS/MSD	FD	Tunes ICALs CCALs	IS'	QL & Quant. Correct	Other Issues
Yes	√	√		NA	NA	√	√		
No			Vinyl chloride estimated (J) in SG31I					Accept 28 "J" values	Lab reported 60 VOCs - QAQC plan, modified by client, required 6 VOCs for analysis

Comments: % solids OK? NA

10 GW Samples, 1 FB, and 1 TB were received at the lab on 7/12/12. Samples were received intact at 3.9°C and there were no Chain-of-Custody (COC) issues noted except the Trip Blank, TB4, was labeled merely TB. At SHA's request, the following samples were not validated: SG31, SG117, and TB4. These samples were not included in the EDD submitted to NEH from SHA. TB4 results were used however, to judge whether there was possible sample cross-contamination during transport from the field to the laboratory.

Samples were preserved with HCl to pH < 2 and all field samples were analyzed within 14 days of collection.

Surrogates: all surrogates were recovered within 70-130% QAQC Plan limits - No Action required.

LCS/LCSD: LCSC97 (no LCSD), LCSC02, & LCSC03 - all target VOCs (60) reported recovery within Lab criteria for LCSC97 except vinyl chloride %Rec high compared to lab criteria. LCSC02 only had chloroform and tetrachloroethene summarized and LCSC03 only had cis-1,2-dichloroethene recovery summarized on Form III since these were associated with dilution analyses for these specific target compounds (OK). All vinyl chloride data were non-detect except for sample SG31I; - no action required for high LCS for non-detects.

**ACTION*: Vinyl chloride estimated (J) in sample SG31I with possible high bias due to high LCS recovery.

Date: 9/12/12

Data Reviewer: Nancy C. Rothman, Ph.D.

Volatile Data Review Checklist
Former IBM Facility, Manassas, Virginia

Lab Project #: MAN27

Lab: Lancaster

Method of Analysis: 8260B

Blank Action: _____ Blanks Reviewed: MB: VBLKC97, VBLKC02, & VBLKC03
TB: TB4 FB: FB1 EB: None

Blank ID	Contaminant / Level	Matrix Related?	Action Level / Action*	Sample and Reported Result	Corrected Result
VBLKC97	None	-	-	No Blank Action required	
VBLKC02	None	-	-	No Blank Action required	
VBLKC03	None	-	-	No Blank Action required	
TB4	None	-	-	No Blank Action required	
FB1	None	-	-	No Blank Action required	

Additional Notes:

MS/MSD: there were no MS/MSD analyses performed on the GW samples in this SDG (insufficient sample collected to allow MS/MSD analysis). Narrative indicates batch MS/MSD on non-SDG related samples performed (lab was method compliant) but these were not reported since they would not affected the samples reported herein.

Tunes: Instrument C 6/27/12 (ICAL), 7/19/12, 7/20/12, and 7/23/12. All abundances met BFB criteria and all samples were analyzed within 12 hours of BFB tune - No Action required.

ICALs: Instrument C - 6-level ICALs from 0.5 to 25 ug/L for 25-mL purge. ICALs contain more compounds than reported for samples in this SDG. Minimum RRF achieved for all compounds and %RSD < 30%. If %RSD > 15%, lab performed regression analysis and $r^2 > 0.99$ - ICALs acceptable - No Action required.

CCAL: Inst. C 7/19/12, 7/20/12, and 7/23/12, RRF > 0.05 and %D $\leq \pm 25\%$ for all 60 target VOCs. No action required.

IS: All IS areas and RTs were within criteria in all samples and QC - No Action required.

FD pair: There were no field duplicates associated with the samples in the SDG; therefore, unable to assess precision from field collection through analysis for these GW samples.

Date: 9/12/12

Data Reviewer: Nancy C. Rothman, Ph.D.

Lab: Lancaster

Method of Analysis: 8260B

Additional Notes:

All GW samples were initial analyzed (DF=1 or DF>1) and several samples were reanalyzed to report all results within the instrument calibration range (see table on page 4). All sets of data reviewed and Lancaster's choice of result for reporting was considered acceptable.

The RLs reported were supported by the ICALs. Table C.1 of QAQC Plan gives expected RLs for VOCs (4 targets in plan: Tetrachloroethene (PCE), Trichloroethene (TCE), cis-1,2-Dichloroethene (cDCE), & Vinyl chloride (VC)) in Groundwater of 1 µg/L. All non-detects were ≤ 1 µg/L; therefore, sensitivity requirements were met for these data.

28 results were reported at levels below the RL and were flagged "J" by the lab. These 28 "J" values were accepted with indeterminate bias due to uncertainty in quantitation at a level below the instrument calibration range.

The sample chromatograms, mass spectra of detects and quantitation reports were scanned and data appeared to have been reported correctly.

Narrative did not raise any issues affecting quality.

Lab: Lancaster
Method of Analysis: 8260B

SW-846 Method 8260B, QAQC Plan criteria, and National Functional Guidelines & Region III DV Guidance

HT: waters- pH >2 or no HCl: 7d<HT≤14 d, J Aromatic det/R Aromatic NDs; Accept all Non-aromatics;
pH < 2, 14d <HT< 28 d; J Aromatic det/R Aromatic NDs; J Non-aromatic det/J Non-aromatic ND
low- or medium-level solid - 14d <HT< 28 d, J det/J NDs; HT > 28 days, J det/R NDs
unfrozen solid - 48 hrs < HT < 96 hrs, J det/J NDs; HT > 96hrs, J det/R NDs

Surrogates: %Rec<10%, J det/ R NDs; 10% <%Rec<LCL, J det/ J NDs; %Rec >UCL, J det/Accept NDs.

LCS: %Rec<10%, J det/ R NDs; 10% <%Rec<LCL, J det/ J NDs; %Rec >UCL, J det/Accept NDs

Tunes: Samples analyzed within 12-hrs and criteria met per Table 7, NYSDEC ASP2005. If out, use professional judgment.

ICAL: 5-Level ; min. RRF < 0.05 J det/ R NDs; %RSD > 30% J det/J NDs

CCAL: %D > ± 25%, J det/J ND. If RRF < min.RRF J det/R ND

Blanks: Blank Action Level = 5 x Level reported except for Acetone, Methylene Chloride, and 2-Butanone with BAL = 10 x value reported in blank (Region III)
Non-Matrix related Blank contamination, TB or EB contaminant in all samples associated with Blank
If contamination in blank(s) exist, if Result < Blank Action, B result at level reported

MS/MSD: %Rec<10%, J det/ R NDs; 10% <%Rec<LCL, J det/ J NDs; %Rec >UCL, J det/Accept NDs- Unspiked Sample only. RPD > Control limit, J det / J ND; %RSD of non-spiked > 50%, J det

FD: Both Conc. > 2xQL, RPD >30% (water) 50% (soil), J det; One result ND, other >2 x QL, J det/J NDs; Both Conc. < 2xQL; RPD >criteria, LCS OK, Accept data

IS: 25% ≤ Area < 50% of IS in CCAL , J det/ J NDs; Area < 25% of CCAL, J det / R NDs; Area > 150% IS in CCAL, J det / Accept NDs

QLs: if result > upper calibration range, J result, if result < lowest calibration standard, J result. Verify all J data reported properly, if applicable. Verify results met criteria (RL and component list) Table C.1 of QAQC Plan



DATA VALIDATION REPORT
Method 8260B Analysis

Client: Sanborn, Head & Associates, Inc., Concord, New Hampshire (SHA)

Site: Former IBM Facility, Manassas, Virginia

Laboratory: eurofins/Lancaster Laboratories, Inc., Lancaster, Pennsylvania (Lancaster)

SDG/Lab Project #: MAN28

Date(s) of Collection: July 12, 2012

**Number and type
Samples & analyses:** 2 Groundwater samples for 60 VOCs by Method 8260B

Senior Data Reviewers: Dr. Nancy C. Rothman, New Environmental Horizons, Inc.
Susan D. Chapnick, New Environmental Horizons, Inc.

Date Completed: September 13, 2012

A Data Validation Checklist Review was performed on the Work Order identified with the following intentions: 1) to determine if the data were generated and reported in accordance with the *Former IBM Manassas Facility, QAQC Plan, Manassas, Virginia*, prepared by Sanborn, Head & Associates, May 29, 2009 (QAQC Plan); *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review*; Publication USEPA540/R-07/003, July 2007; *USEPA Region III Modifications to the National Functional Guidelines for Organic Data Review*, September 1994; and EPA SW-846 Method 8260B; 2) to determine if the data met project data quality objectives for acceptable accuracy, precision, sensitivity; and technical usability; and 3) to update the project database with appropriate data quality qualifiers.

An In-Depth Data Usability Review was performed on SDG MAN01. This review indicated that overall the laboratory met project DQOs; therefore, a checklist review of remaining groundwater data associated with this QAQC plan was performed. Please see the Data Usability Report for SDG MAN01 for complete details on the 8260B review. The VOC Data Review Checklist, attached, was completed during this assessment to document the review of this SDG.

Table C.1 of the QAQC Plan identified four target compounds for analysis: vinyl chloride, cis-1,2-dichloroethene, trichloroethene, and tetrachloroethene. At the client's request, two additional compounds, trans-1,2-dichloroethene and 1,1,2-trichloroethane, were added as target compounds for this project prior to sample analysis. However, Lancaster reported 54 additional VOCs (60 total compounds reported) for the samples in this SDG. At the client's request, all 60 VOCs reported were evaluated.

Three groundwater samples and 1 trip blank were received at the laboratory on July 13, 2012. At SHA's request, the following samples were not validated: Frac01 and TB1. These samples were not included in the EDD submitted to NEH from SHA. The trip blank (TB1) results were used to judge whether there was possible sample cross-contamination during transport from the field to the laboratory.

Sensitivity requirements compared to the Reporting Limits (RLs) defined in Table C.1 of the QAQC Plan were achieved for the six target VOCs in all samples.

There were no MS/MSD analyses conducted on the samples in this SDG since insufficient sample was collected for this QC analysis. The laboratory narrated that they performed batch MS/MSD analysis on samples not related to this project (i.e., lab was method complaint); however, these results were not reported in this SDG since these MS/MSD data would not impact the samples reported herein.

There were no field duplicates associated with the samples in this SDG; therefore, precision from field collection through analysis could not be evaluated for these groundwater samples.

There was no Equipment Blank (EB) or Field Blank (FB) associated with the samples in this SDG. The trip blank, TB1, reported detected results for two VOCs. A comparison of the compounds and levels detected in this blank with the sample results lead to qualification (B) of one tetrachloroethene result as shown in Table 1.

All other quality control information associated with accuracy, precision, and sensitivity for the VOCs reported met project criteria for these samples with the exceptions summarized in Table 1, below. The attached Data Validation Checklist includes all QA/QC reviewed during validation (including QC results that were acceptable) and details on the justification for actions taken.

Table 1. Summary of Data Validation Actions

Field Sample ID	Analyte	Qualifier	Bias	Validation Comments
SG117I	Tetrachloroethene	JB	I	Trip Blank Action + Result uncertain below the calibration range
SG11723	Dibromochloromethane Ethylbenzene 1,2,4-Trimethylbenzene	J	I	Result uncertain below the calibration range
SG117I	Dibromochloromethane 1,2,4-Trimethylbenzene Xylene (Total)	J	I	Result uncertain below the calibration range

Qualifiers: U = Analyte is non-detect at the "DV Result" value; UJ = Non-detect is estimated; J = Result is estimated; B = Analyte was also detected in an associated Blank [Region III DV requirement]; R = Result is rejected and is unusable for project decisions.

Bias: L = Low; H = High; I = Indeterminate

The qualified (U, J, or JB) and unqualified results presented in the validated data file, submitted electronically to SHA, are considered valid and usable for project objectives.

Volatile Data Review Checklist
Former IBM Facility, Manassas, Virginia

Lab Project #: MAN28

Lab: eurofins/Lancaster Laboratories
Date Sampled: 7/12/12
Method of Analysis: 8260B

No. Samples: 2
Matrix: Groundwater

Data Element Acceptable	Preservation & HT	Surrogates	LCS / Blank Spike	MS/MSD	FD	Tunes ICALs CCALs	IS'	QL & Quant. Correct	Other Issues
Yes	√	√	√	NA	NA	√	√		
No								Accept 7 "J" values	Lab reported 60 VOCs - QAQC plan, modified by client, required 6 VOCs for analysis

Comments: % solids OK? NA

3 GW Samples and 1 TB were received at the lab on 7/13/12. Samples were received intact at 1.4°C and there were no Chain-of-Custody (COC) issues noted. Since samples were intact, no action for Temperature upon receipt < 2°C. At SHA's request, the following samples were not validated: Frac01 and TB1. These samples were not included in the EDD submitted to NEH from SHA. TB1 results were used however, to judge whether there was possible sample cross-contamination during transport from the field to the laboratory.

Samples were preserved with HCl to pH < 2 and all field samples were analyzed within 14 days of collection.

Surrogates : all surrogates were recovered within 70-130% QAQC Plan limits - No Action required.

LCS/LCSD : LCSC97 (no LCSD) & LCSC02 - all target VOCs (60) reported recovery within Lab criteria for both LCS except LCSC97 vinyl chloride %Rec high compared to lab criteria. All vinyl chloride data were non-detect except for sample SG31I; - no actin required for high LCS for non-detects.

Date: 9/12/12

Data Reviewer: Nancy C. Rothman, Ph.D.

Lab: Lancaster

Method of Analysis: 8260B

Blank Action: _____ Blanks Reviewed: MB: VBLKC97 & VBLKC02
TB: TB1 FB: None EB: None

Blank ID	Contaminant / Level	Matrix Related?	Action Level / Action*	Sample and Reported Result	Corrected Result
VBLKC97	None	-	-	No Blank Action required	
VBLKC02	None	-	-	No Blank Action required	
TB1	Chloroform 0.4J µg/L	-	2 µg/L	Both samples >> Action Level - no Action required	
TB1	Tetrachloroethene 1.8 µg/L	-	9 µg/L	SG117I 0.2 J	0.2 JB
				other sample ND - No Blank Action required	

Additional Notes:

MS/MSD: there were no MS/MSD analyses performed on the GW samples in this SDG (insufficient sample collected to allow MS/MSD analysis). Narrative indicates batch MS/MSD on non-SDG related samples performed (lab was method compliant) but these were not reported since they would not affected the samples reported herein.

FD pair: There were no field duplicates associated with the samples in the SDG; therefore, unable to assess precision from field collection through analysis for these GW samples.

Tunes: Instrument C 6/27/12 (ICAL), 7/19/12 & 7/20/12. All abundances met BFB criteria and all samples were analyzed within 12 hours of BFB tune - No Action required.

ICALs: Instrument C - 6-level ICALs from 0.5 to 25 ug/L for 25-mL purge. ICALs contain more compounds than reported for samples in this SDG. Minimum RRF achieved for all compounds and %RSD < 30%. If %RSD > 15%, lab performed regression analysis and r2 > 0.99 - ICALs acceptable - No Action required.

CCAL: Inst. C 7/19/12 & 7/20/12, RRF > 0.05 and %D ≤ ± 25% for all 60 target VOCs. No action required.

IS: All IS areas and RTs were within criteria in all samples and QC - No Action required.

Date: 9/12/12

Data Reviewer: Nancy C. Rothman, Ph.D.

Lab: Lancaster

Method of Analysis: 8260B

Additional Notes:

Both GW samples were analyzed undiluted (DF=1). There were no secondary dilution analyses performed or required.

The RLs reported were supported by the ICALs. Table C.1 of QAQC Plan gives expected RLs for VOCs (4 targets in plan: Tetrachloroethene (PCE), Trichloroethene (TCE), cis-1,2-Dichloroethene (cDCE), & Vinyl chloride (VC)) in Groundwater of 1 µg/L. All non-detects were ≤ 1 µg/L; therefore, sensitivity requirements were met for these data.

7 results were reported at levels below the RL and were flagged "J" by the lab. These 7 "J" values were accepted with indeterminate bias due to uncertainty in quantitation at a level below the instrument calibration range.

The sample chromatograms, mass spectra of detects and quantitation reports were scanned and data appeared to have been reported correctly.

Narrative did not raise any issues affecting quality.

Lab: Lancaster
Method of Analysis: 8260B

SW-846 Method 8260B, QAQC Plan criteria, and National Functional Guidelines & Region III DV Guidance

HT: waters- pH >2 or no HCl: 7d<HT≤14 d, J Aromatic det/R Aromatic NDs; Accept all Non-aromatics;
pH < 2, 14d <HT< 28 d; J Aromatic det/R Aromatic NDs; J Non-aromatic det/J Non-aromatic ND
low- or medium-level solid - 14d <HT< 28 d, J det/J NDs; HT > 28 days, J det/R NDs
unfrozen solid - 48 hrs < HT < 96 hrs, J det/J NDs; HT > 96hrs, J det/R NDs

Surrogates: %Rec<10%, J det/ R NDs; 10% <%Rec<LCL, J det/ J NDs; %Rec >UCL, J det/Accept NDs.
LCS: %Rec<10%, J det/ R NDs; 10% <%Rec<LCL, J det/ J NDs; %Rec >UCL, J det/Accept NDs

Tunes: Samples analyzed within 12-hrs and criteria met per Table 7, NYSDEC ASP2005. If out, use professional judgment.

ICAL: 5-Level ; min. RRF < 0.05 J det/ R NDs; %RSD > 30% J det/J NDs

CCAL: %D > ± 25%, J det/J ND. If RRF < min.RRF J det/R ND

Blanks: Blank Action Level = 5 x Level reported except for Acetone, Methylene Chloride, and 2-Butanone with BAL = 10 x value reported in blank (Region III)
Non-Matrix related Blank contamination, TB or EB contaminant in all samples associated with Blank
If contamination in blank(s) exist, if Result < Blank Action, B result at level reported

MS/MSD: %Rec<10%, J det/ R NDs; 10% <%Rec<LCL, J det/ J NDs; %Rec >UCL, J det/Accept NDs- Unspiked Sample only. RPD > Control limit, J det / J ND; %RSD of non-spiked > 50%, J det

FD: Both Conc. > 2xQL, RPD >30% (water) 50% (soil), J det; One result ND, other >2 x QL, J det/J NDs; Both Conc. < 2xQL; RPD >criteria, LCS OK, Accept data

IS: 25% ≤ Area < 50% of IS in CCAL , J det/ J NDs; Area < 25% of CCAL, J det / R NDs; Area > 150% IS in CCAL, J det / Accept NDs
if result > upper calibration range, J result, if result < lowest calibration standard, J result. Verify all J data reported properly, if applicable. Verify

QLs: results met criteria (RL and component list) Table C.1 of QAQC Plan