

REPORT ON
BUILDING 10 SVE/SSD PILOT TESTING REPORT AND
CONVERSION PLAN
BCP SITE # C932138
LOCKPORT, NEW YORK

by Haley & Aldrich of New York
Rochester, New York

for New York State Department of Environmental Conservation
Buffalo, New York

File No. 36795-027
January 2016





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27 January 2016
File No. 36795-027

New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 9
270 Michigan Avenue
Buffalo, New York 14203

Attention: Mr. Glenn May
Environmental Geologist II

Subject: Building 10 SVE/ SSD Pilot Testing Report and Conversion Plan
BCP Site # C932138
200 Upper Mountain Road
Lockport, New York

Dear Mr. May:

On behalf of GM Components Holdings, LLC, (GMCH) Haley & Aldrich of New York (Haley & Aldrich) and GZA Environmental (GZA) have prepared this report of Pilot Testing activities to support the conversion of the Building 10 combined Soil Vapor Extraction (SVE)/ Sub-Slab Depressurization (SSD) system to a dedicated SSD system.

The pilot testing was conducted pursuant to the recommendations in the Building 10 SVE/SSDS Operation and Monitoring Report (GZA March 2015) and the NYSDEC's request "to determine the sizing requirements of the blowers required to apply vacuum influence to the sub-slab component of the system" as stated in its 29 April 2015 approval letter. Pilot testing activities and data collection were conducted by GZA and Haley & Aldrich between 5 June 2015 and 20 August 2015. The target objectives for the pilot testing activities were as follows:

- Determine required blower system operating parameters to provide appropriate sub-slab vacuum influence in an SSD only operations mode;
- Determine the appropriate size blower unit to provide appropriate sub-slab vacuum influence in an SSD only operations mode;
- Estimate the short term and annual potential to emit (PTE) of hazardous air pollutants (HAPs) from the proposed SSD only system; and
- Assess potential for relocation of the vacuum blower system from the current location on the Plant floor to a roof-top mechanical room.

Data Collection

The summary of field data collection activities and calculations used to assess system performance and design considerations are presented in Table 1. Below is a discussion of the steps taken during the pilot testing to evaluate the current SVE/SSD system and develop the design parameters for the future SSD-only system.

5 JUNE 2015 [INITIAL OPERATING DATA COLLECTION]

Nine (9) temporary sub-slab vacuum monitoring points (VMPs) were installed by drilling 1/2-inch diameter holes through the concrete floor to a depth of approximately 1/2-inch below the bottom of the existing concrete slab. The VMPs were installed in the approximate areas where tetrachloroethene (PCE) was detected during previous investigations at concentrations above 300 ppm¹. Refer to Figure 1 for the locations of the installed VMPs. (Note: The temporary VMPs were resealed after the 5 June 2015 data collection activities.)

Following the installation of the temporary VMPs, step testing of the system was conducted to collect air flow and vacuum readings at various operating conditions and was completed by operating the existing SVE blower system as follows:

- At full capacity (100-percent) with the existing (20) extraction points consisting of (17) SVE extraction wells and (3) sub-slab legs (SSD-1, SSD-2, SSD-3) fully open;
- Closing the valves to the existing SVE wells and adjusting the valves on the sub-slab legs to operate at a vacuum of 15-inches water column (W.C.), to match their historical operating conditions;
- Adjusting the blower unit from 100-percent capacity to approximately 75-percent capacity by adjusting the existing variable frequency drive for the blower unit; and
- Measuring vacuum influence at the VMPs utilizing a handheld micro-manometer. The micro-manometer was connected to 1/4-inch high density polyethylene (HDPE) tubing extended through the floor surface and temporarily sealed with clay to provide an air-tight surface seal.

Based on review of the 5 June 2015 pilot testing data, it was determined that additional operational data (i.e. total air flow rates and vacuums at the SSD piping headers) would be needed to determine the optimal blower system operating conditions.

22 JULY - 20 AUGUST 2015 [ADDITIONAL OPERATING DATA COLLECTION]

The SVE system vacuum, discharge pressure, and air flow rates were collected with each of the SSD sub-slab leg valves in the partially closed position, to replicate the vacuum achieved at each leg during the 5 June 2015 testing, and with each of the SSD sub-slab leg valves in the open position. These valve adjustments allowed for the assessment of the potential maximum vacuum and air flow rates that could

¹ Refer to the "Remedial Investigation Report- Building 10 BCP Site #932140" prepared by Haley & Aldrich, submitted to the NYSDEC on 14 November 2011.

be achieved when operating the SVE system in SSD only mode. After the 20 August 2015 monthly operational and pilot testing sampling, the Building 10 SVE/SSDS system was operated in SSD only mode² to assess blower effluent concentration data trends.

Observations/ Findings

EXTENT AND DEGREE OF SUB-SURFACE DEPRESSURIZATION (VACUUM) INFLUENCE

Review of the pilot testing data indicates that approximately 15-inches W.C. vacuum at the inlet of each of the SSD laterals will be required to achieve a minimum of 0.002-inches W.C. vacuum at the VMPs. This is the criteria prescribed to demonstrate sub-slab depressurization in the NYSDOH guidance for the control of soil vapor intrusion³.

Based on the operational data and information collected during the pilot testing program as summarized in Table 1 (test condition no. 3), a blower system with a minimum capacity of 380 CFM will be required to achieve the target sub-slab vacuum at the VMPs using the existing SSD legs.

SSD BLOWER SYSTEM RELOCATION AND SIZING

Upon review with Plant personnel, an existing roof-top mechanical room was identified as a location for the SSD system equipment (see Figure 1 for proposed location). Installing the SSD vacuum blower system at this location would allow the SSD system piping within the building to be operated under vacuum, similar to the SSD systems currently operating in Buildings 7, 7A, and 8.

A blower unit designed to operate at 380 CFM, at 62-inches W.C. total pressure (combined vacuum and discharge pressure) would be required to provide the necessary vacuum for SSD only operations and achieve the targeted sub-slab vacuum levels at the VMPs.

Based on these operational requirements and manufacturer's performance ranges, a GAST Model R7P, 18 horsepower (Hp) blower, or equivalent, with an operating capacity (as placed within the new system configuration) of 475 CFM, at 81-inches W.C. would be sufficient to replace the existing 25 Hp unit. At the design conditions determined during the pilot testing, it is anticipated that the blower unit will operate at approximately 85-percent capacity (15 Hp). (Note: Additional operating capacity will also allow for operational adjustment and optimization of the system during start-up and adjustability for longer term operations, as needed.)

² NYSDEC's 7 October 2014 electronic mail correspondence.

³ New York State Department of Health, (2006). Guidance for Evaluating Soil Vapor Intrusion in the State of New York. Center for Environmental Health, Bureau of Environmental Exposure Investigation, October 2006. Radon Prevention in the Design and Construction of Schools and Other Large Buildings EPA [EPA 625-R-92-016, June 1994]

The lower Hp blower system will provide an annual projected cost savings in power usage of approximately \$1,000 per year which assumes a reduction in approximately 10 Hp usage (25 Hp to 15 Hp) over 8,760 hours per year and electricity costs of \$0.015 per Kilowatt Hour (KwH).

Several of the existing control panels, electrical, instrumentation, and mechanical devices can be re-used and will be relocated as part of the roof-top mechanical room build-out and new blower system installation. The proposed equipment re-use, along with the anticipated energy savings further supports the implementation of Green Remediation solutions as outlined in the NYSDEC's DER-31 guidance document.

VAPOR FLOW RATES AND POTENTIAL TO EMIT

An analysis was conducted for the projected short term and annual emissions, or Potential-to-Emit (PTE), from the discharge of the proposed SSD system, utilizing vapor phase laboratory analytical data from pilot test sampling⁴, collected at the blower effluent (pre-vapor carbon on the existing system), and operating conditions of the selected new blower unit. Results of this analysis are summarized in Table 2A, which indicate that the projected total hazardous air pollutant (HAP) PTE will be approximately 133 pounds per year (0.07 tons per year). (Note: The average constituent concentration value for the blower effluent samples collected between 20 August 2015 and 18 November 2015 was used for this analysis.) The above estimate of the maximum PTE for the converted SSD system along with the current SSD systems operating in Buildings 7,7A and 8⁵ is well below the USEPA regulatory threshold of 10 tons per year and should not affect the facility's current status as an Area (Minor) Source of HAP.

Using the above PTE data, an analysis was conducted using calculations provided in the NYSDEC *Guidelines for the Control of Toxic Ambient Air Contaminants* (DAR-1), published 12 November 1997, for the projected short term and annual impacts for the SSD only operations, and were compared to the Short-Term and Annual Guideline Concentration (SGC/AGC) values published by NYSDEC on 28 February 2014. The calculated SGC/AGC for each VOC detected from the vapor phase sampling was below the current NYSDEC guideline values indicating that the direct discharge of the proposed converted SSD system will not require VOC emission controls.

Results of the DAR-1 analysis are summarized in Table 2B. The laboratory reports for the referenced vapor phase sampling are included in Attachment A.

⁴ The samples were collected in Tedlar® sampling bags and submitted under a chain of custody to a NYSDOH certified environmental laboratory for the analysis of volatile organic compounds (VOC) via USEPA Method 8260B.

⁵ Estimated annual HAPs emissions of 0.72 tons per year (1,455 pounds per year) as outlined in the draft "Construction Completion Report – SSD System Installation" prepared by Haley & Aldrich, submitted to the NYSDEC on 29 July 2015.

Conversion Implementation

Implementation of the conversion to an SSD only operation is anticipated to be completed as follows:

- Dismantlement of the existing SVE/ SSDS mechanical, electrical, control equipment and devices, including the existing equipment enclosure and proper disposal of the existing vapor phase granulated activated carbon (GAC);
- Complete necessary trenching for installation of piping to tie-in the existing SSD laterals for connection to the conveyance piping system;
- Refurbish the Building 10 roof top mechanical room to house the SSD blower equipment and appurtenances;
- Install the necessary mechanical, electrical and control systems including new blower, conveyance piping, electrical panels and control devices;
- Start-up and debug of the system;
- Re-install the temporary VMPs and measure vacuum influence;
- Adjust system to optimize operations; and
- Convert the temporary VMPs to permanent VMPs.

All materials and equipment removed during the dismantlement that will not be re-used as part of the converted SSD system, will be managed for proper disposal per Plant requirements.

SCHEDULE

The proposed schedule is contingent upon manufacturing activities and access to the production area and subcontractor availability. The schedule for conversion of the existing SVE system to a roof-top SSD only configuration is anticipated to be as follows:

Contractor Pre-Mobilization, Ordering of new blower unit	2-3 weeks
Site Work	2-3 weeks
<ul style="list-style-type: none"> • mechanical room buildout • conveyance piping installation • shutdown and dismantle existing systems • reconfiguring sub-slab piping headers • completing new blower system mechanical and electrical work 	
System start-up, debug, and baseline system monitoring:	1 week

GMCH is prepared to move forward with the implementation upon the NYSDEC's review and concurrence with the proposed SSD system design basis.

SSD OPERATIONS, MONITORING, AND TESTING

Following startup of the SSD only system, operations monitoring will include the following:

- After one-week confirm the radius of sub-slab vacuum influence; and
- After one (1) month confirm vacuum influence and collect a blower effluent vapor sample measuring for the total volatile organic compounds (VOC) concentration.

Once the start-up process is completed, routine SSD only system monitoring will include:

- Monthly routine operational checks performed concurrently with existing systems in Buildings 7, 7A and 8; and
- Quarterly collection of sub-slab vacuum measurements and blower effluent vapor samples for off-site laboratory analysis.

During the system checks, operating data will be collected, and if during the initial or quarterly checks the vacuum influence at the VMPs is observed to be less than (<) 0.002 inches W.C., adjust the system operations, recheck valve settings at the SSD lateral headers and adjust the blower speed to increase flow and system vacuum.

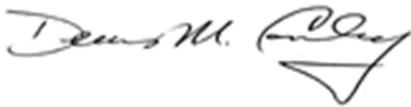
Upon receipt of the analytical results and compiling of the system operations data and vacuum measurements obtained during the initial operating period, GMCH will confer with the NYSDEC to determine if additional actions are needed.

Closing

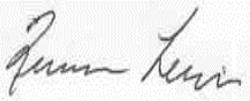
This report has provided a summary of the pilot testing activities and conversion plan for the Building 10 SVE/SSD system to a roof-top SSD only system. The new SSD only system will be implemented as the soil vapor remedy for Building 10 area as outlined in the GMCH Lockport BCP Site #932138 Final Remedial Work Plan (Haley & Aldrich, 2015).

If there are questions or any require additional information concerning the information provided in this report, please do not hesitate to contact us 585.321.4245.

Sincerely yours,
HALEY & ALDRICH OF NEW YORK



Denis Conley
Project Manager



E. Quinn Lewis, P.E.
Senior Engineer



David Hagen
Sr. Vice President

Enclosures:

Tables
Figure
Laboratory Reports

c: Matt Forcucci, NYSDOH
James Hartnett, GM. LLC
Roy Knapp, GMCH, LLC
James Richert PG, GZA GeoEnvironmental, LLC

TABLES

Table 1: SVE/SSD Pilot Testing – Step Tests

Table 2A: Vapor Phase Analytical Summary and Potential to Emit Calculations

Table 2B: Air Guide – 1 Review – Area Source Method

TABLE 1
SVE/SSD Pilot Testing - Step Tests
Building 10 SVE/SSD System

GMCH Lockport BCP Site #932138

Project No.: 36795-027

Date	Time	Test Condition No.	Vacuum Monitoring Point (VMP) Location	VMP Vacuum Reading (inches W.C.) - see note 2	Blower Unit Variable Frequency Drive Setting (Hertz) - see note 4	Blower Influent Velocity Pressure (Vacuum Side) (inches W.C.) - see note 5	Vacuum at Blower Filter Inlet (inches Hg)	Vacuum at Filter Outlet (Blower inlet) (inches Hg)	Blower Effluent Velocity Pressure (inches W.C.) - see note 5	Blower Discharge Silencer Temperature (degrees F)	SS-1 Piping Header Vacuum (inches W.C.)	SS-2 Piping Header Vacuum (inches W.C.)	SS-3 Piping Header Vacuum (inches W.C.)	Comments	Calculated Blower Influent Velocity based on Velocity Pressure Reading (FPM)	Calculated Blower Influent Flow Rate based on Velocity Pressure (CFM) - see note 7	Calculated Blower Effluent Velocity based on Velocity Pressure Reading (FPM)	Calculated Blower Effluent Flow Rate based on Velocity Pressure (CFM) - see note 7	Measured Velocity in Blower Effluent Piping - FPM (see note 8)	Calculated Blower Effluent Flow Rate based on measured velocity (CFM)
5 June 2015 (see note 1)	1432	1	VMP-1	0.000	60	>2 (see note 6)	4.5	6	2.4	129	1	1	1	All SVE Extraction Wells Open, All SSD Laterals Open	N/A		6205	525	N/A	
	1445		VMP-2	0.218																
	1451		VMP-3	0.978																
	1458		VMP-4	0.425																
	1503		VMP-5	0.066																
	1510		VMP-6	0.112																
	1517		VMP-7	0.116																
	1525		VMP-8	1.478																
	1528		VMP-9	0.076																
	NM	2	VMP-1	NM	60	1	14.5	15.5	0.75	228	3.5	6.5	8	All SVE Extraction Wells Closed, All SSD Laterals Open	4005	339	3468	294		
			VMP-2																	
			VMP-3																	
			VMP-4																	
			VMP-5																	
			VMP-6																	
			VMP-7																	
			VMP-8																	
			VMP-9																	
	1544	3	VMP-1	0.036	60	1.95	10.5	11.5	1.25	202	15	15	15	All SVE Extraction Wells Closed, SSD Laterals adjusted to 15" W.C. at individual piping headers	5593	473	4478	379		
	1545		VMP-2	0.077																
	1546		VMP-3	0.131																
	1547		VMP-4	0.163																
	1549		VMP-5	0.063																
	1550		VMP-6	0.031																
	1552		VMP-7	0.064																
	1553		VMP-8	0.413																
	1556		VMP-9	0.012																
	1615	4	VMP-1	0.000	55	1.2	9.5	10.5	0.75	175	14	14	14	All SVE Extraction Wells Closed, SSD Laterals not adjusted any further for step testing to 55Hz	4387	371	3468	294		
	1617		VMP-2	0.162																
	1619		VMP-3	0.251																
	1620		VMP-4	0.224																
	1621		VMP-5	0.076																
	1624		VMP-6	0.007																
	1625		VMP-7	0.098																
	1626		VMP-8	0.586																
	1629		VMP-9	0.004																
	1634	5	VMP-1	0.000	50	1.1	8.5	9.5	0.55	161	13	13	13	All SVE Extraction Wells Closed, SSD Laterals not adjusted any further for step testing to 50Hz	4200	355	2970	251		
	1635		VMP-2	0.075																
	1636		VMP-3	0.230																
	1638		VMP-4	0.202																
	1639		VMP-5	0.073																
	1644		VMP-6	0.000																
	1646		VMP-7	0.074																
	1647		VMP-8	0.503																
	1648		VMP-9	0.000																
	1652	6	VMP-1	0.000	45	1	7.7	8.5	0.3	147	11.5	11.5	11.5	All SVE Extraction Wells Closed, SSD Laterals not adjusted any further for step testing to 45Hz	4005	339	2194	186		
	1653		VMP-2	0.154																
1655	VMP-3		0.233																	
1656	VMP-4		0.219																	
1657	VMP-5		0.083																	
1659	VMP-6		0.010																	
1701	VMP-7		0.068																	
1703	VMP-8		0.463																	
1704	VMP-9		0.000																	

TABLE 1
SVE/SSD Pilot Testing - Step Tests
Building 10 SVE/SSD System

GMCH Lockport BCP Site #932138

Project No.: 36795-027

Date	Time	Test Condition No.	Vacuum Monitoring Point (VMP) Location	VMP Vacuum Reading (inches W.C.) - see note 2	Blower Unit Variable Frequency Drive Setting (Hertz) - see note 4	Blower Influent Velocity Pressure (Vacuum Side) (inches W.C.) - see note 5	Vacuum at Blower Filter Inlet (inches Hg)	Vacuum at Filter Outlet (Blower inlet) (inches Hg)	Blower Effluent Velocity Pressure (inches W.C.) - see note 5	Blower Discharge Silencer Temperature (degrees F)	SS-1 Piping Header Vacuum (inches W.C.)	SS-2 Piping Header Vacuum (inches W.C.)	SS-3 Piping Header Vacuum (inches W.C.)	Comments	Calculated Blower Influent Velocity based on Velocity Pressure Reading (FPM)	Calculated Blower Influent Flow Rate based on Velocity Pressure (CFM) - see note 7	Calculated Blower Effluent Velocity based on Velocity Pressure Reading (FPM)	Calculated Blower Effluent Flow Rate based on Velocity Pressure (CFM) - see note 7	Measured Velocity in Blower Effluent Piping - FPM (see note 8)	Calculated Blower Effluent Flow Rate based on measured velocity (CFM)																							
22 July 2015 (see note 3)	1200	7	N/A	60	1	14.5	15.5	2.2	228	15	15	15	All SVE Extraction Wells Open, SSD Laterals Open - adjusted to 15" W.C. at headers	4005	339	5940	503	5760	487																								
	1201	8		55	NM	NM (see note 8)	NM	NM	NM	NM	26	26	26	All SVE Extraction Wells Open, SSD Laterals Full Open	6581	557	5940	503	5380	455																							
	1202	9		50															4965	420																							
	1203	10		45															4530	383																							
20 August 2015 (see note 2)	1500	11	N/A	60	2.7	NM	5	2.2	NM	26	26	26	All SVE Extraction Wells Open, SSD Laterals Full Open	6581	557	5940	503	N/A	N/A																								
	1502	12		60	1.7															5	0.9	NM	15	15	15	All SVE Extraction Wells Closed, SSD Laterals adjusted to 15" W.C. at individual piping headers	5222	442	3799	322													
	1505	13		55	1.7																										5.8	6.8	1.7	141	25	25	25	All SVE Extraction Wells Closed, SSD Laterals Full Open	5222	442	3799	322	
	1510	14		55	2.2	10.1	11.1	0.9	152	14	14	14	All SVE Extraction Wells Closed, SSD Laterals adjusted to 14" W.C. at individual piping headers	5222	442	3799	322																										
	1511	15		55	1.7															9.4	10.1	0.9	161	13	13	13	All SVE Extraction Wells Closed, SSD Laterals not adjusted any further for step testing to 50Hz	4739	401	3799													322
	1512	16		50	1.4																																						
	1513	17		50	2.1	4.5	5.1	1.6	139	23	28	22.5	All SVE Extraction Wells Closed, SSD Laterals Full Open	5804	491	5066	429																										

Notes:

- 1 Data collected by GZA
- 2 VMP measurements collected using TPI micromanometer model 621. VMPs were resealed after the 6/5/15 testing activities
- 3 Data collected by GZA & Haley & Aldrich
- 4 VFD settings of 60 Hz is equivalent to ~100% operating capacity, 55 Hz ~90%, 50 Hz ~85%, 45 Hz ~75% capacity respectively
- 5 Velocity pressure as read from magnehelic gauge connected to an in-line flow sensor (pitot tube)
- 6 Reading exceeded operating range of device (unit range 0-2 " W.C.) - unit replaced on 8/20/15
- 7 System blower influent and effluent piping is 4" Sch. 80 PVC
- 8 TSI unit - model 9565-P hot wire anemometer (in-line flow sensor temporarily disconnected)
- 9 Dwyer Series 475-3-FM unit (in-line flow sensor temporarily disconnected for measurement)

- Target minimum operating parameters
- Target design flow rate for blower unit to achieve the minimum (or greater) target vacuum at the sub-slab header.

Nomenclature:

- W.C - inches water column
- Hg - inches mercury
- degree F - fahrenheit
- FPM - feet per minute
- CFM - cubic feet per minute
- NM - not measured
- N/A - not applicable

TABLE 2A

Vapor Phase Analytical Summary and Potential to Emit Calculations

GMCH - Lockport Facility

Bldg No: 10 - SSD Only Pilot Testing
 Project No. 36795-027
 Date: 12/15/2015

Bldg 10	Analyte	Vapor Phase Analytical Results (mg/m3)								Avg Vapor Phase Concentration (Pilot Test Data) (mg/m3) A	Design Vapor Flow Rate (CFM) B	HAPs Potential to Emit (lb/yr) C	HAPs Potential to Emit (tons/yr) D	HAPs Potential to Emit (lbs/Hr)
		8/20/2015	8/20/2015 - duplicate	9/15/2015	9/15/2015 - duplicate	10/20/2015	10/20/2015 - duplicate	11/18/2015	11/18/2015 - duplicate					
	Tetrachloroethene*	9.74	4.77	4.61	9.31	4.02	4.25	1.41 J	1.68 J	4.97	475	77.5	0.039	0.0089
	Trichloroethene*	14.3	2.2	<2	<2	<2	<2	<2	<2	3.56		55.5	0.028	0.0063
Totals:										8.53		133.0	0.07	0.02

Notes:

- * - hazardous air pollutant (HAP)
- Vapor phase sampling of existing blower effluent, system operating with sub-slab laterals only. Sample point is located at the pre-carbon point within the existing system.
- "J" - result estimated between the quantitation limit and the method detection limit
- <2 - analyzed for but not detected at or above indicated quantitation limit
- Avg. concentration is average of the eight analytical results. A value of 2.0 was used for the <2 analytical results for conservative avg concentration estimates
- Conversion equation from mg/m3 to lbs/yr:

$$A \frac{mg}{m^3} \times \frac{1 lb}{453,592.37 mg} \times B \frac{ft^3}{min} \times \frac{m^3}{35.31 ft^3} \times \frac{525,600 min}{1 yr} = C \frac{lb}{yr}$$

TABLE 2B

Air Guide -1 Review - Area Source Method

GMCH - Lockport BCP Site #932138

Bldg No: 10 - SSD Only Pilot Testing

Project No.: 36795-027

Date: 12/15/2015

s - Bldg side length (ft) 1200 (Bldg is ~350' x ~1200')

Parameter	Q (lb/hr)	Q _a (lb/yr)	C _a (µg/m ³)	C _p (µg/m ³)	AGC (µg/m ³)	C _{st} (µg/m ³)	SGC (µg/m ³)
Tetrachloroethene*	0.0089	77.53	0.0170	0.0170	4	0.43	300
Trichloroethene*	0.0063	55.5	0.0122	0.0122	0.2	0.30	14000

Assumptions

Method used to determine the maximum overall actual annual, potential annual, and short term impacts from an area source.

Calculations

Maximum Actual Annual Impact (C_a): $C_a \text{ (mg/m}^3\text{)} = (76.6 * Q_a) / (s^{1.8})$

Maximum Potential Annual Impact (C_p): $C_p \text{ (mg/m}^3\text{)} = (670600 * Q) / (s^{1.8})$

Maximum Short Term Impact (C_{st}): $C_{st} \text{ (mg/m}^3\text{)} = C_p * 25$

Q: Hourly Emissions (lbs/hr)

Q_a: Annual Emissions Rate (lbs/yr)

s: Building Side Dimension (feet)

SGC: Short-Term Guidance Concentrations - Guidance Values

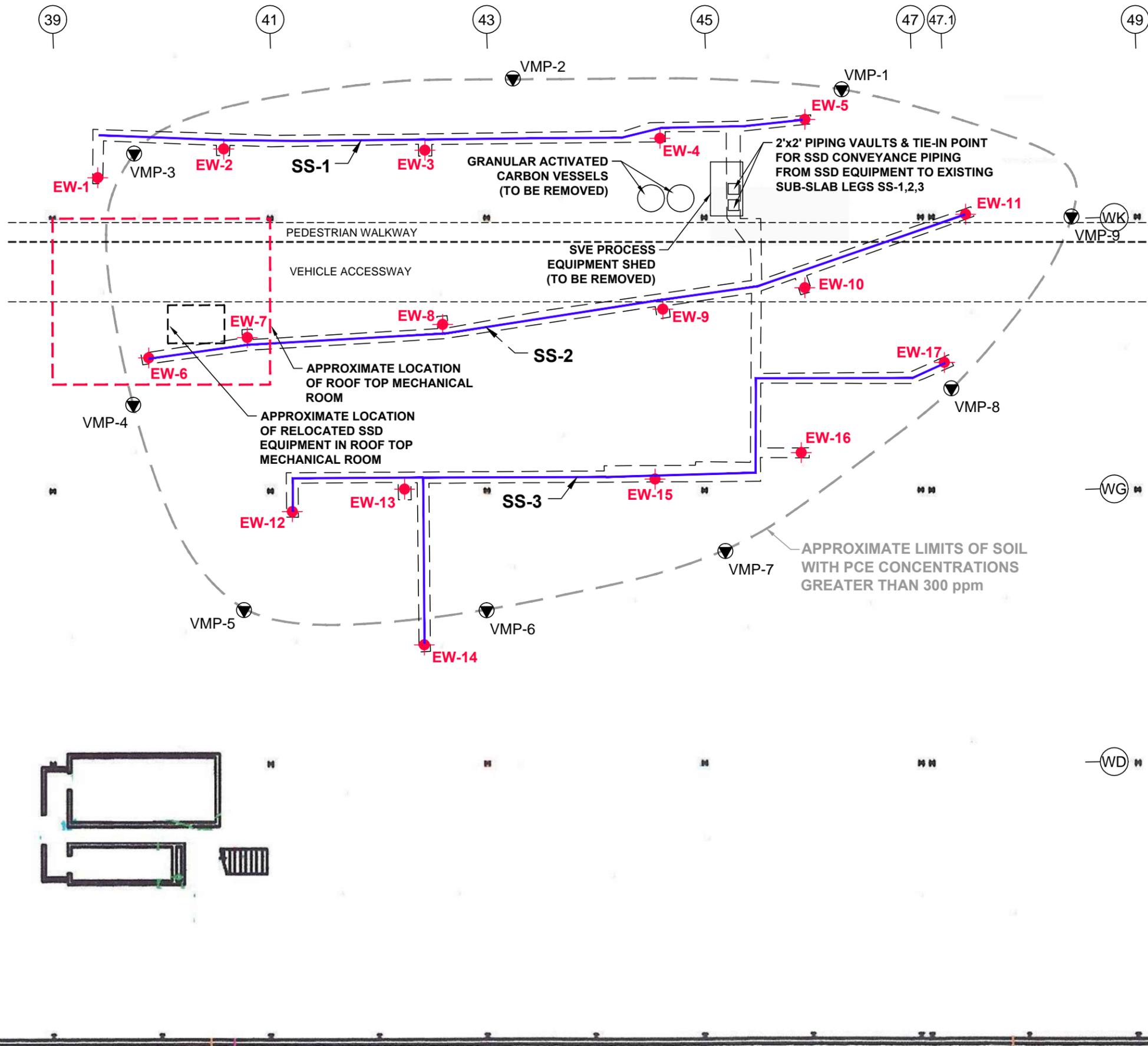
AGC: Annual Guidance Concentrations - Guidance Values

NGV: No Guidance Value

mg/m³ micro-grams per cubic meter

FIGURE

Figure 1: SVE/SSD System Layout/Vacuum Monitoring Points



LEGEND:

- APPROXIMATE LOCATION OF TRENCHES INSTALLED BENEATH CONCRETE SLAB FOR SVE AND SSD PIPING
- SUB-SLAB LEG 1
- APPROXIMATE LOCATION AND DESIGNATION OF 4-INCH DIAMETER SOIL VAPOR EXTRACTION WELL
- APPROXIMATE LOCATION AND DESIGNATION OF TEMPORARY VACUUM MONITORING POINT

NOTES:

1. BASE MAP ADAPTED FROM A SITE PLAN PROVIDED BY THE CLIENT.
2. THE SIZE AND LOCATION OF EXISTING SITE FEATURES SHOULD BE CONSIDERED APPROXIMATE.

DRAWN BY: DEW DATE: DECEMBER 2015	
APPROXIMATE SCALE IN FEET 	
GM COMPONENTS HOLDINGS, LLC GMCH LOCKPORT FACILITY 200 UPPER MOUNTAIN ROAD, LOCKPORT, NEW YORK BUILDING 10 SVE / SSD SYSTEM CONVERSION PILOT STUDY SVE / SSD SYSTEM LAYOUT/ VACUUM MONITORING POINTS	
PROJECT No. 21.0056546.00	
FIGURE No. 1	

LABORATORY REPORTS



PARADIGM
ENVIRONMENTAL SERVICES, INC.

Analytical Report For
GZA Geo Environmental of New York

For Lab Project ID

153567

Referencing

21.0056546.00 Task 33

Prepared

Monday, August 31, 2015

Any noncompliant QC parameters or other notes impacting data interpretation are flagged or documented on the final report or are noted below.

Certifies that this report has been approved by the Technical Director or Designee

179 Lake Avenue • Rochester, NY 14608 • (585) 647-2530 • Fax (585) 647-3311 • ELAP ID# 10958

This report is part of a multipage document and should only be evaluated in its entirety. The Chain of Custody provides additional sample information, including compliance with the sample condition requirements upon receipt.

Page 1 of 9

Report Prepared Monday, August 31, 2015



Lab Project ID: 153567

Client: GZA Geo Environmental of New York

Project Reference: 21.0056546.00 Task 33

Sample Identifier: Pre-Carbon

Lab Sample ID: 153567-01

Date Sampled: 8/20/2015

Matrix: Air

Date Received: 8/25/2015

Volatile Organics

Analyte	Result	Units	Qualifier	Date Analyzed
1,1,1-Trichloroethane	< 2.00	mg/m3		8/28/2015 18:48
1,1-Dichloroethane	< 2.00	mg/m3		8/28/2015 18:48
1,1-Dichloroethene	< 2.00	mg/m3		8/28/2015 18:48
1,2-Dichloropropane	< 2.00	mg/m3		8/28/2015 18:48
2-Butanone (MEK)	< 10.0	mg/m3		8/28/2015 18:48
Benzene	< 2.00	mg/m3		8/28/2015 18:48
Chlorobenzene	< 2.00	mg/m3		8/28/2015 18:48
Chloroform	< 2.00	mg/m3		8/28/2015 18:48
cis-1,2-Dichloroethene	< 2.00	mg/m3		8/28/2015 18:48
Ethylbenzene	< 2.00	mg/m3		8/28/2015 18:48
m,p-Xylene	< 2.00	mg/m3		8/28/2015 18:48
Methyl tert-butyl Ether	< 2.00	mg/m3		8/28/2015 18:48
Methylene chloride	< 5.00	mg/m3		8/28/2015 18:48
o-Xylene	< 2.00	mg/m3		8/28/2015 18:48
Tetrachloroethene	12.4	mg/m3		8/28/2015 18:48
Toluene	< 2.00	mg/m3		8/28/2015 18:48
trans-1,2-Dichloroethene	< 2.00	mg/m3		8/28/2015 18:48
Trichloroethene	< 2.00	mg/m3		8/28/2015 18:48
Vinyl chloride	< 2.00	mg/m3		8/28/2015 18:48

Surrogate	Percent Recovery	Limits	Outliers	Date Analyzed
1,2-Dichloroethane-d4	98.2	80.6 - 125		8/28/2015 18:48
4-Bromofluorobenzene	101	86.6 - 111		8/28/2015 18:48
Pentafluorobenzene	103	90.9 - 107		8/28/2015 18:48
Toluene-D8	101	90.8 - 109		8/28/2015 18:48

Method Reference(s): EPA 8260C Modified
EPA 5030

Data File: x25778.D

This test represents parameters for which Paradigm does not carry ELAP certification. The results of this test should only be used where ELAP certification is not required, such as personal exposure assessment.



Client: GZA Geo Environmental of New York

Project Reference: 21.0056546.00 Task 33

Sample Identifier: Mid-Carbon

Lab Sample ID: 153567-02

Date Sampled: 8/20/2015

Matrix: Air

Date Received: 8/25/2015

Volatile Organics

Analyte	Result	Units	Qualifier	Date Analyzed
1,1,1-Trichloroethane	< 2.00	mg/m3		8/28/2015 19:12
1,1-Dichloroethane	< 2.00	mg/m3		8/28/2015 19:12
1,1-Dichloroethene	< 2.00	mg/m3		8/28/2015 19:12
1,2-Dichloropropane	< 2.00	mg/m3		8/28/2015 19:12
2-Butanone (MEK)	< 10.0	mg/m3		8/28/2015 19:12
Benzene	< 2.00	mg/m3		8/28/2015 19:12
Chlorobenzene	< 2.00	mg/m3		8/28/2015 19:12
Chloroform	< 2.00	mg/m3		8/28/2015 19:12
cis-1,2-Dichloroethene	< 2.00	mg/m3		8/28/2015 19:12
Ethylbenzene	< 2.00	mg/m3		8/28/2015 19:12
m,p-Xylene	< 2.00	mg/m3		8/28/2015 19:12
Methyl tert-butyl Ether	< 2.00	mg/m3		8/28/2015 19:12
Methylene chloride	< 5.00	mg/m3		8/28/2015 19:12
o-Xylene	< 2.00	mg/m3		8/28/2015 19:12
Tetrachloroethene	7.18	mg/m3		8/28/2015 19:12
Toluene	< 2.00	mg/m3		8/28/2015 19:12
trans-1,2-Dichloroethene	< 2.00	mg/m3		8/28/2015 19:12
Trichloroethene	< 2.00	mg/m3		8/28/2015 19:12
Vinyl chloride	< 2.00	mg/m3		8/28/2015 19:12

Surrogate	Percent Recovery	Limits	Outliers	Date Analyzed
1,2-Dichloroethane-d4	99.3	80.6 - 125		8/28/2015 19:12
4-Bromofluorobenzene	100	86.6 - 111		8/28/2015 19:12
Pentafluorobenzene	102	90.9 - 107		8/28/2015 19:12
Toluene-D8	101	90.8 - 109		8/28/2015 19:12

Method Reference(s): EPA 8260C Modified
EPA 5030

Data File: x25779.D

This test represents parameters for which Paradigm does not carry ELAP certification. The results of this test should only be used where ELAP certification is not required, such as personal exposure assessment.



Lab Project ID: 153567

Client: GZA Geo Environmental of New York

Project Reference: 21.0056546.00 Task 33

Sample Identifier: Post-Carbon

Lab Sample ID: 153567-03

Date Sampled: 8/20/2015

Matrix: Air

Date Received: 8/25/2015

Volatile Organics

Analyte	Result	Units	Qualifier	Date Analyzed
1,1,1-Trichloroethane	< 2.00	mg/m3		8/28/2015 19:36
1,1-Dichloroethane	< 2.00	mg/m3		8/28/2015 19:36
1,1-Dichloroethene	< 2.00	mg/m3		8/28/2015 19:36
1,2-Dichloropropane	< 2.00	mg/m3		8/28/2015 19:36
2-Butanone (MEK)	< 10.0	mg/m3		8/28/2015 19:36
Benzene	< 2.00	mg/m3		8/28/2015 19:36
Chlorobenzene	< 2.00	mg/m3		8/28/2015 19:36
Chloroform	< 2.00	mg/m3		8/28/2015 19:36
cis-1,2-Dichloroethene	< 2.00	mg/m3		8/28/2015 19:36
Ethylbenzene	< 2.00	mg/m3		8/28/2015 19:36
m,p-Xylene	< 2.00	mg/m3		8/28/2015 19:36
Methyl tert-butyl Ether	< 2.00	mg/m3		8/28/2015 19:36
Methylene chloride	< 5.00	mg/m3		8/28/2015 19:36
o-Xylene	< 2.00	mg/m3		8/28/2015 19:36
Tetrachloroethene	< 2.00	mg/m3		8/28/2015 19:36
Toluene	< 2.00	mg/m3		8/28/2015 19:36
trans-1,2-Dichloroethene	< 2.00	mg/m3		8/28/2015 19:36
Trichloroethene	2.66	mg/m3		8/28/2015 19:36
Vinyl chloride	< 2.00	mg/m3		8/28/2015 19:36

Surrogate	Percent Recovery	Limits	Outliers	Date Analyzed
1,2-Dichloroethane-d4	99.1	80.6 - 125		8/28/2015 19:36
4-Bromofluorobenzene	99.2	86.6 - 111		8/28/2015 19:36
Pentafluorobenzene	100	90.9 - 107		8/28/2015 19:36
Toluene-D8	101	90.8 - 109		8/28/2015 19:36

Method Reference(s): EPA 8260C Modified
EPA 5030

Data File: x25780.D

This test represents parameters for which Paradigm does not carry ELAP certification. The results of this test should only be used where ELAP certification is not required, such as personal exposure assessment.



Lab Project ID: 153567

Client: **GZA Geo Environmental of New York**

Project Reference: 21.0056546.00 Task 33

Sample Identifier: Duplicate

Lab Sample ID: 153567-04

Date Sampled: 8/20/2015

Matrix: Air

Date Received: 8/25/2015

Volatile Organics

Analyte	Result	Units	Qualifier	Date Analyzed
1,1,1-Trichloroethane	< 2.00	mg/m3		8/28/2015 20:00
1,1-Dichloroethane	< 2.00	mg/m3		8/28/2015 20:00
1,1-Dichloroethene	< 2.00	mg/m3		8/28/2015 20:00
1,2-Dichloropropane	< 2.00	mg/m3		8/28/2015 20:00
2-Butanone (MEK)	< 10.0	mg/m3		8/28/2015 20:00
Benzene	< 2.00	mg/m3		8/28/2015 20:00
Chlorobenzene	< 2.00	mg/m3		8/28/2015 20:00
Chloroform	< 2.00	mg/m3		8/28/2015 20:00
cis-1,2-Dichloroethene	< 2.00	mg/m3		8/28/2015 20:00
Ethylbenzene	< 2.00	mg/m3		8/28/2015 20:00
m,p-Xylene	< 2.00	mg/m3		8/28/2015 20:00
Methyl tert-butyl Ether	< 2.00	mg/m3		8/28/2015 20:00
Methylene chloride	< 5.00	mg/m3		8/28/2015 20:00
o-Xylene	< 2.00	mg/m3		8/28/2015 20:00
Tetrachloroethene	2.21	mg/m3		8/28/2015 20:00
Toluene	< 2.00	mg/m3		8/28/2015 20:00
trans-1,2-Dichloroethene	< 2.00	mg/m3		8/28/2015 20:00
Trichloroethene	2.32	mg/m3		8/28/2015 20:00
Vinyl chloride	< 2.00	mg/m3		8/28/2015 20:00

Surrogate	Percent Recovery	Limits	Outliers	Date Analyzed
1,2-Dichloroethane-d4	100	80.6 - 125		8/28/2015 20:00
4-Bromofluorobenzene	99.4	86.6 - 111		8/28/2015 20:00
Pentafluorobenzene	101	90.9 - 107		8/28/2015 20:00
Toluene-D8	101	90.8 - 109		8/28/2015 20:00

Method Reference(s): EPA 8260C Modified
EPA 5030

Data File: x25781.D

This test represents parameters for which Paradigm does not carry ELAP certification. The results of this test should only be used where ELAP certification is not required, such as personal exposure assessment.



Analytical Report Appendix

The reported results relate only to the samples as they have been received by the laboratory.

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All soil/sludge samples have been reported on a dry weight basis, unless qualified "reported as received". Other solids are reported as received.

Low level Volatiles blank reports for soil/solid matrix are based on a nominal 5 gram weight. Sample results and reporting limits are based on actual weight, which may be more or less than 5 grams.

The Chain of Custody provides additional information, including compliance with sample condition requirements upon receipt. Sample condition requirements are defined under the 2003 NELAC Standard, sections 5.5.8.3.1 and 5.5.8.3.2.

NYSDOH ELAP does not certify for all parameters. Paradigm Environmental Services or the indicated subcontracted laboratory does hold certification for all analytes where certification is offered by ELAP unless otherwise specified. Aliquots separated for certain tests, such as TCLP, are indicated on the Chain of Custody and final reports with an "A" suffix.

Data qualifiers are used, when necessary, to provide additional information about the data. This information may be communicated as a flag or as text at the bottom of the report. Please refer to the following list of analyte-specific, frequently used data flags and their meaning:

"<" = Analyzed for but not detected at or above the quantitation limit.

"E" = Result has been estimated, calibration limit exceeded.

"Z" = See case narrative.

"D" = Sample, Laboratory Control Sample, or Matrix Spike Duplicate results above Relative Percent Difference limit.

"M" = Matrix spike recoveries outside QC limits. Matrix bias indicated.

"B" = Method blank contained trace levels of analyte. Refer to included method blank report.

"J" = Result estimated between the quantitation limit and half the quantitation limit.

"L" = Laboratory Control Sample recovery outside accepted QC limits.

"P" = Concentration differs by more than 40% between the primary and secondary analytical columns.
"NC" = Not calculable. Applicable to RPD if sample or duplicate result is non-detect or estimated (see primary report for data flags). Applicable to MS if sample is greater or equal to ten times the spike added. Applicable to sample surrogates or MS if sample dilution is 10x or higher.

"" = Indicates any recoveries outside associated acceptance windows. Surrogate outliers in samples are presumed matrix effects. LCS demonstrates method compliance unless otherwise noted.*

"(1)" = Indicates data from primary column used for QC calculation.

GENERAL TERMS AND CONDITIONS

LABORATORY SERVICES

These Terms and Conditions embody the whole agreement of the parties in the absence of a signed and executed contract between the Laboratory (LAB) and Client. They shall supersede all previous communications, representations, or agreements, either verbal or written, between the parties. The LAB specifically rejects all additional, inconsistent, or conflicting terms, whether printed or otherwise set forth in any purchase order or other communication from the Client to the LAB. The invalidity or unenforceability in whole or in part of any provision, term or condition hereof shall not affect in any way the validity or enforceability of the remainder of the Terms and Conditions. No waiver by LAB of any provision, term, or condition hereof or of any breach by or obligation of the Client hereunder shall constitute a waiver of such provision, term, or condition on any other occasion or a waiver of any other breach by or obligation of the Client. This agreement shall be administered and interpreted under the laws of the state which services are procured.

Warranty.

Recognizing that the nature of many samples is unknown and that some may contain potentially hazardous components, LAB warrants only that it will perform testing services, obtain findings, and prepare reports in accordance with generally accepted analytical laboratory principles and practices at the time of performance of services. LAB makes no other warranty, express or implied.

Scope and Compensation.

LAB agrees to perform the services described in the chain of custody to which these terms and conditions are attached. Unless the parties agree in writing to the contrary, the duties of LAB shall not be construed to exceed the services specifically described. LAB will use LAB default method for all tests unless specified otherwise on the Work Order.

Payment terms are net 30 days from the date of invoice. All overdue payments are subject to an interest charge of one and one-half percent (1-1/2%) per month or a portion thereof. Client shall also be responsible for costs of collection, including payment of reasonable attorney fees if such expense is incurred. The prices, unless stated, do not include any sale, use or other taxes. Such taxes will be added to invoice prices when required.

Prices.

Compensation for services performed will be based on the current Lab Analytical Fee Schedule or on quotations agreed to in writing by the parties. Turnaround time based charges are determined from the time of resolution of all work order questions. Testimony, court appearances or data compilation for legal action will be charged separately. Evaluation and reporting of initial screening runs may incur additional fees.

Limitations of Liability.

In the event of any error, omission, or other professional negligence, the sole and exclusive responsibility of LAB shall be to re-perform the deficient work at its own expense and LAB shall have no other liability whatsoever. All claims shall be deemed waived unless made in writing and received by LAB within ninety (90) days following completion of services.

LAB shall have no liability, obligation, or responsibility of any kind for losses, costs, expenses, or other damages (including but not limited to any special, direct, incidental or consequential damages) with respect to LAB's services or results.

All results provided by LAB are strictly for the use of its clients and LAB is in no way responsible for the use of such results by clients or third parties. All reports should be considered in their entirety, and LAB is not responsible for the separation, detachment, or other use of any portion of these reports. Client may not assign the lab report without the written consent of the LAB.

Client covenants and agrees, at its/his/her sole expense, to indemnify, protect, defend, and save harmless the LAB from and against any and all damages, losses, liabilities, obligations, penalties, claims, litigation, demands, defenses, judgments, suits, actions, proceedings, costs, disbursements and/or expenses (including, without limitation attorneys' and experts' fees and disbursements) of any kind whatsoever which may at any time be imposed upon, incurred by or asserted or awarded against client relating to, resulting from or arising out of (a) the breach of this agreement by this client, (b) the negligence of the client in handling, delivering or disclosing any hazardous substance, (c) the violation of the Client of any applicable law, (d) non-compliance by the Client with any environmental permit or (e) a material misrepresentation in disclosing the materials to be tested.

Hazard Disclosure.

Client represents and warrants that any sample delivered to LAB will be preceded or accompanied by complete written disclosure of the presence of any hazardous substances known or suspected by Client. Client further warrants that any sample containing any hazardous substance that is to be delivered to LAB will be packaged, labeled, transported, and delivered properly and in accordance with applicable laws.

Sample Handling.

Prior to LAB's acceptance of any sample (or after any revocation of acceptance), the entire risk of loss or of damage to such sample remains with Client. Samples are accepted when receipt is acknowledged on chain of custody documentation. In no event will LAB have any responsibility for the action or inaction of any carrier shipping or delivering any sample to or from LAB premises. Client authorizes LAB to proceed with the analysis of samples as received by the laboratory, recognizing that any samples not in compliance with all current DOH-ELAP-NELAP requirements for containers, preservation or holding time will be noted as such on the final report.

Disposal of hazardous waste samples is the responsibility of the Client. If the Client does not wish such samples returned, LAB may add storage and disposal fees to the final invoice. Maximum storage time for samples is 30 days after completion of analysis unless modified by applicable state or federal laws. Client will be required to give the LAB written instructions concerning disposal of these samples.

LAB reserves the absolute right, exercisable at any time, to refuse to receive delivery of, refuse to accept, or revoke acceptance of any sample, which, in the sole judgment of LAB (a) is of unsuitable volume, (b) may be or become unsuitable for or may pose a risk in handling, transport, or processing for any health, safety, environmental or other reason whether or not due to the presence in the sample of any hazardous substance, and whether or not such presence has been disclosed to LAB by Client or (c) if the condition or sample date make the sample unsuitable for analysis.

Legal Responsibility.

LAB is solely responsible for performance of this contract, and no affiliated company, director, officer, employee, or agent shall have any legal responsibility hereunder, whether in contract or tort including negligence.

Assignment.

LAB may assign its performance obligations under this contract to other parties, as it deems necessary. LAB shall disclose to Client any assignee (subcontractor) by ELAP ID # on the submitted final report.

Force Majeure.

LAB shall have no responsibility or liability to the Client for any failure or delay in performance by LAB, which results in whole or in part from any cause or circumstance beyond the reasonable control of LAB. Such causes and circumstances shall include, but not limited to, acts of God, acts or orders of any government authority, strikes or other labor disputes, natural disasters, accidents, wars, civil disturbances, difficulties or delays in transportation, mail or delivery services, inability to obtain sufficient services or supplies from LAB's usual suppliers, or any other cause beyond LAB's reasonable control.

Law.

This contract shall be continued under the laws of the State of New York without regard to its conflicts of laws provision.



CHAIN OF CUSTODY

REPORT TO:		INVOICE TO:		LAB PROJECT ID
CLIENT: <i>GZA Geo Environmental</i>	CLIENT:	ADDRESS:		<i>153567</i>
ADDRESS: <i>535 Washington St.</i>	ADDRESS:	CITY: <i>Buffalo NY</i>	STATE: <i>NY</i>	ZIP: <i>14203</i>
PHONE: <i>716 685-2300</i>	PHONE:	ATTN: <i>T. Bohlen</i>		Quotation #:
Email: <i>thomas.bohlen@gza.com</i>				

PROJECT REFERENCE
21-0056546.00
Task 33

Matrix Codes:

AQ - Aqueous Liquid	WA - Water	DW - Drinking Water	SO - Soil	SD - Solid	WP - Wipe	OL - Oil
NQ - Non-Aqueous Liquid	WG - Groundwater	WW - Wastewater	SL - Sludge	PT - Paint	CK - Caulk	AR - Air

REQUESTED ANALYSIS									
DATE COLLECTED	TIME COLLECTED	COMPOSITE	GRAB	SAMPLE IDENTIFIER	MATRIX	COUNTAINERS	REMARKS	PARADIGM LAB SAMPLE NUMBER	
<i>8/20/15</i>	<i>1200</i>		<i>X</i>	<i>Pre-Carbon</i>	<i>AR</i>	<i>1</i>	<i>* Please return Ted bags to T. Bohlen - GZA office *</i>	<i>01</i>	
<i>↓</i>	<i>1205</i>		<i>X</i>	<i>Mid-Carbon</i>	<i>↓</i>	<i>↓</i>		<i>02</i>	
<i>↓</i>	<i>1207</i>		<i>X</i>	<i>Post-Carbon</i>	<i>↓</i>	<i>↓</i>		<i>03</i>	
<i>↓</i>	<i>-</i>		<i>X</i>	<i>Duplicate</i>	<i>↓</i>	<i>↓</i>		<i>04</i>	
5									
6									
7									
8									
9									
10									

Turnaround Time	Report Supplements		
Availability contingent upon lab approval; additional fees may apply.			
Standard 5 day <input checked="" type="checkbox"/>	Batch QC <input type="checkbox"/>	Basic EDD <input type="checkbox"/>	
Rush 3 day <input type="checkbox"/>	Category A <input type="checkbox"/>	NYSDEC EDD <input type="checkbox"/>	
Rush 2 day <input type="checkbox"/>	Category B <input type="checkbox"/>		
Rush 1 day <input type="checkbox"/>			
Other <input type="checkbox"/>	Other <input type="checkbox"/>	Other EDD <input type="checkbox"/>	
please indicate: _____	please indicate: _____	please indicate: _____	

T. Bohlen *8/20/15*
 Sampled By *Thomas Bohlen* *8/21/15*
 Relinquished By *[Signature]* *8/21/15 1126*
 Received By *Molly Vail* *8/25/15 1234*
 Received @ Lab By _____

Total Cost:

P.I.F.

2082



Chain of Custody Supplement

Client: 62A Geo
Lab Project ID: 153567

Completed by: Moly Vail
Date: 8/25/15

Sample Condition Requirements Per NELAC/ELAP 210/241/242/243/244

Condition	NELAC compliance with the sample condition requirements upon receipt		
	Yes	No	N/A
Container Type	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments	_____		
Transferred to method-compliant container	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Headspace (<1 mL)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Comments	_____		
Preservation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Comments	_____		
Chlorine Absent (<0.10 ppm per test strip)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Comments	_____		
Holding Time	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments	_____		
Temperature	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Comments	_____		
Sufficient Sample Quantity	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments	_____		



PARADIGM
ENVIRONMENTAL SERVICES, INC.

Analytical Report For
GZA Geo Environmental of New York

For Lab Project ID

153913

Referencing

21.0056546.00 Task 33

Prepared

Thursday, September 24, 2015

Any noncompliant QC parameters or other notes impacting data interpretation are flagged or documented on the final report or are noted below.

Certifies that this report has been approved by the Technical Director or Designee

179 Lake Avenue • Rochester, NY 14608 • (585) 647-2530 • Fax (585) 647-3311 • ELAP ID# 10958

This report is part of a multipage document and should only be evaluated in its entirety. The Chain of Custody provides additional sample information, including compliance with the sample condition requirements upon receipt.

Client: GZA Geo Environmental of New York

Project Reference: 21.0056546.00 Task 33

Sample Identifier: Pre-Carbon

Lab Sample ID: 153913-01

Date Sampled: 9/15/2015

Matrix: Air

Date Received: 9/17/2015

Volatile Organics

Analyte	Result	Units	Qualifier	Date Analyzed
1,1,1-Trichloroethane	< 2.00	mg/m3		9/23/2015 23:26
1,1-Dichloroethane	< 2.00	mg/m3		9/23/2015 23:26
1,1-Dichloroethene	< 2.00	mg/m3		9/23/2015 23:26
1,2-Dichloropropane	< 2.00	mg/m3		9/23/2015 23:26
2-Butanone (MEK)	< 10.0	mg/m3		9/23/2015 23:26
Benzene	< 2.00	mg/m3		9/23/2015 23:26
Chlorobenzene	< 2.00	mg/m3		9/23/2015 23:26
Chloroform	< 2.00	mg/m3		9/23/2015 23:26
cis-1,2-Dichloroethene	< 2.00	mg/m3		9/23/2015 23:26
Ethylbenzene	< 2.00	mg/m3		9/23/2015 23:26
m,p-Xylene	< 2.00	mg/m3		9/23/2015 23:26
Methyl tert-butyl Ether	< 2.00	mg/m3		9/23/2015 23:26
Methylene chloride	< 5.00	mg/m3		9/23/2015 23:26
o-Xylene	< 2.00	mg/m3		9/23/2015 23:26
Tetrachloroethene	4.61	mg/m3		9/23/2015 23:26
Toluene	< 2.00	mg/m3		9/23/2015 23:26
trans-1,2-Dichloroethene	< 2.00	mg/m3		9/23/2015 23:26
Trichloroethene	< 2.00	mg/m3		9/23/2015 23:26
Vinyl chloride	< 2.00	mg/m3		9/23/2015 23:26

Surrogate	Percent Recovery	Limits	Outliers	Date Analyzed
1,2-Dichloroethane-d4	109	80.6 - 125		9/23/2015 23:26
4-Bromofluorobenzene	95.7	86.6 - 111		9/23/2015 23:26
Pentafluorobenzene	97.1	90.9 - 107		9/23/2015 23:26
Toluene-D8	100	90.8 - 109		9/23/2015 23:26

 Method Reference(s): EPA 8260C Modified
 EPA 5030

Data File: x26350.D

This test represents parameters for which Paradigm does not carry ELAP certification. The results of this test should only be used where ELAP certification is not required, such as personal exposure assessment.



Client: GZA Geo Environmental of New York

Project Reference: 21.0056546.00 Task 33

Sample Identifier: Mid-Carbon

Lab Sample ID: 153913-02

Date Sampled: 9/15/2015

Matrix: Air

Date Received: 9/17/2015

Volatile Organics

Analyte	Result	Units	Qualifier	Date Analyzed
1,1,1-Trichloroethane	< 2.00	mg/m3		9/23/2015 23:50
1,1-Dichloroethane	< 2.00	mg/m3		9/23/2015 23:50
1,1-Dichloroethene	< 2.00	mg/m3		9/23/2015 23:50
1,2-Dichloropropane	< 2.00	mg/m3		9/23/2015 23:50
2-Butanone (MEK)	< 10.0	mg/m3		9/23/2015 23:50
Benzene	< 2.00	mg/m3		9/23/2015 23:50
Chlorobenzene	< 2.00	mg/m3		9/23/2015 23:50
Chloroform	< 2.00	mg/m3		9/23/2015 23:50
cis-1,2-Dichloroethene	< 2.00	mg/m3		9/23/2015 23:50
Ethylbenzene	< 2.00	mg/m3		9/23/2015 23:50
m,p-Xylene	< 2.00	mg/m3		9/23/2015 23:50
Methyl tert-butyl Ether	< 2.00	mg/m3		9/23/2015 23:50
Methylene chloride	< 5.00	mg/m3		9/23/2015 23:50
o-Xylene	< 2.00	mg/m3		9/23/2015 23:50
Tetrachloroethene	3.10	mg/m3		9/23/2015 23:50
Toluene	< 2.00	mg/m3		9/23/2015 23:50
trans-1,2-Dichloroethene	< 2.00	mg/m3		9/23/2015 23:50
Trichloroethene	< 2.00	mg/m3		9/23/2015 23:50
Vinyl chloride	< 2.00	mg/m3		9/23/2015 23:50

Surrogate	Percent Recovery	Limits	Outliers	Date Analyzed
1,2-Dichloroethane-d4	111	80.6 - 125		9/23/2015 23:50
4-Bromofluorobenzene	94.0	86.6 - 111		9/23/2015 23:50
Pentafluorobenzene	98.6	90.9 - 107		9/23/2015 23:50
Toluene-D8	100	90.8 - 109		9/23/2015 23:50

Method Reference(s): EPA 8260C Modified
EPA 5030

Data File: x26351.D

This test represents parameters for which Paradigm does not carry ELAP certification. The results of this test should only be used where ELAP certification is not required, such as personal exposure assessment.



Client: GZA Geo Environmental of New York

Project Reference: 21.0056546.00 Task 33

Sample Identifier: Post-Carbon

Lab Sample ID: 153913-03

Date Sampled: 9/15/2015

Matrix: Air

Date Received: 9/17/2015

Volatile Organics

Analyte	Result	Units	Qualifier	Date Analyzed
1,1,1-Trichloroethane	< 2.00	mg/m3		9/23/2015 10:17
1,1-Dichloroethane	< 2.00	mg/m3		9/23/2015 10:17
1,1-Dichloroethene	< 2.00	mg/m3		9/23/2015 10:17
1,2-Dichloropropane	< 2.00	mg/m3		9/23/2015 10:17
2-Butanone (MEK)	< 10.0	mg/m3		9/23/2015 10:17
Benzene	< 2.00	mg/m3		9/23/2015 10:17
Chlorobenzene	< 2.00	mg/m3		9/23/2015 10:17
Chloroform	< 2.00	mg/m3		9/23/2015 10:17
cis-1,2-Dichloroethene	< 2.00	mg/m3		9/23/2015 10:17
Ethylbenzene	< 2.00	mg/m3		9/23/2015 10:17
m,p-Xylene	< 2.00	mg/m3		9/23/2015 10:17
Methyl tert-butyl Ether	< 2.00	mg/m3		9/23/2015 10:17
Methylene chloride	< 5.00	mg/m3		9/23/2015 10:17
o-Xylene	< 2.00	mg/m3		9/23/2015 10:17
Tetrachloroethene	< 2.00	mg/m3		9/23/2015 10:17
Toluene	< 2.00	mg/m3		9/23/2015 10:17
trans-1,2-Dichloroethene	< 2.00	mg/m3		9/23/2015 10:17
Trichloroethene	< 2.00	mg/m3		9/23/2015 10:17
Vinyl chloride	< 2.00	mg/m3		9/23/2015 10:17

Surrogate	Percent Recovery	Limits	Outliers	Date Analyzed
1,2-Dichloroethane-d4	108	80.6 - 125		9/23/2015 10:17
4-Bromofluorobenzene	99.0	86.6 - 111		9/23/2015 10:17
Pentafluorobenzene	100	90.9 - 107		9/23/2015 10:17
Toluene-D8	99.1	90.8 - 109		9/23/2015 10:17

Method Reference(s): EPA 8260C Modified
EPA 5030

Data File: x26317.D

This test represents parameters for which Paradigm does not carry ELAP certification. The results of this test should only be used where ELAP certification is not required, such as personal exposure assessment.

Client: **GZA Geo Environmental of New York**

Project Reference: 21.0056546.00 Task 33

Sample Identifier: Duplicate

Lab Sample ID: 153913-04

Date Sampled: 9/15/2015

Matrix: Air

Date Received: 9/17/2015

Volatile Organics

Analyte	Result	Units	Qualifier	Date Analyzed
1,1,1-Trichloroethane	< 2.00	mg/m3		9/24/2015 00:14
1,1-Dichloroethane	< 2.00	mg/m3		9/24/2015 00:14
1,1-Dichloroethene	< 2.00	mg/m3		9/24/2015 00:14
1,2-Dichloropropane	< 2.00	mg/m3		9/24/2015 00:14
2-Butanone (MEK)	< 10.0	mg/m3		9/24/2015 00:14
Benzene	< 2.00	mg/m3		9/24/2015 00:14
Chlorobenzene	< 2.00	mg/m3		9/24/2015 00:14
Chloroform	< 2.00	mg/m3		9/24/2015 00:14
cis-1,2-Dichloroethene	< 2.00	mg/m3		9/24/2015 00:14
Ethylbenzene	< 2.00	mg/m3		9/24/2015 00:14
m,p-Xylene	< 2.00	mg/m3		9/24/2015 00:14
Methyl tert-butyl Ether	< 2.00	mg/m3		9/24/2015 00:14
Methylene chloride	< 5.00	mg/m3		9/24/2015 00:14
o-Xylene	< 2.00	mg/m3		9/24/2015 00:14
Tetrachloroethene	9.31	mg/m3		9/24/2015 00:14
Toluene	< 2.00	mg/m3		9/24/2015 00:14
trans-1,2-Dichloroethene	< 2.00	mg/m3		9/24/2015 00:14
Trichloroethene	< 2.00	mg/m3		9/24/2015 00:14
Vinyl chloride	< 2.00	mg/m3		9/24/2015 00:14

Surrogate	Percent Recovery	Limits	Outliers	Date Analyzed
1,2-Dichloroethane-d4	110	80.6 - 125		9/24/2015 00:14
4-Bromofluorobenzene	93.0	86.6 - 111		9/24/2015 00:14
Pentafluorobenzene	96.8	90.9 - 107		9/24/2015 00:14
Toluene-D8	98.3	90.8 - 109		9/24/2015 00:14

 Method Reference(s): EPA 8260C Modified
 EPA 5030

Data File: x26352.D

This test represents parameters for which Paradigm does not carry ELAP certification. The results of this test should only be used where ELAP certification is not required, such as personal exposure assessment.



Analytical Report Appendix

The reported results relate only to the samples as they have been received by the laboratory.

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All soil/sludge samples have been reported on a dry weight basis, unless qualified "reported as received". Other solids are reported as received.

Low level Volatiles blank reports for soil/solid matrix are based on a nominal 5 gram weight. Sample results and reporting limits are based on actual weight, which may be more or less than 5 grams.

The Chain of Custody provides additional information, including compliance with sample condition requirements upon receipt. Sample condition requirements are defined under the 2003 NELAC Standard, sections 5.5.8.3.1 and 5.5.8.3.2.

NYSDOH ELAP does not certify for all parameters. Paradigm Environmental Services or the indicated subcontracted laboratory does hold certification for all analytes where certification is offered by ELAP unless otherwise specified. Aliquots separated for certain tests, such as TCLP, are indicated on the Chain of Custody and final reports with an "A" suffix.

Data qualifiers are used, when necessary, to provide additional information about the data. This information may be communicated as a flag or as text at the bottom of the report. Please refer to the following list of analyte-specific, frequently used data flags and their meaning:

"<" = Analyzed for but not detected at or above the quantitation limit.

"E" = Result has been estimated, calibration limit exceeded.

"Z" = See case narrative.

"D" = Sample, Laboratory Control Sample, or Matrix Spike Duplicate results above Relative Percent Difference limit.

"M" = Matrix spike recoveries outside QC limits. Matrix bias indicated.

"B" = Method blank contained trace levels of analyte. Refer to included method blank report.

"J" = Result estimated between the quantitation limit and half the quantitation limit.

"L" = Laboratory Control Sample recovery outside accepted QC limits.

"P" = Concentration differs by more than 40% between the primary and secondary analytical columns.

"NC" = Not calculable. Applicable to RPD if sample or duplicate result is non-detect or estimated (see primary report for data flags). Applicable to MS if sample is greater or equal to ten times the spike added. Applicable to sample surrogates or MS if sample dilution is 10x or higher.

"" = Indicates any recoveries outside associated acceptance windows. Surrogate outliers in samples are presumed matrix effects. LCS demonstrates method compliance unless otherwise noted.*

"(1)" = Indicates data from primary column used for QC calculation.

"A" = denotes a parameter for which ELAP does not offer approval as part of their laboratory certification program.

"F" = denotes a parameter for which Paradigm does not carry certification, the results for which should therefore only be used where ELAP certification is not required, such as personal exposure assessment.

This report is part of a multipage document and should only be evaluated in its entirety. The Chain of Custody provides additional sample information, including compliance with the sample condition requirements upon receipt.

GENERAL TERMS AND CONDITIONS

LABORATORY SERVICES

These Terms and Conditions embody the whole agreement of the parties in the absence of a signed and executed contract between the Laboratory (LAB) and Client. They shall supersede all previous communications, representations, or agreements, either verbal or written, between the parties. The LAB specifically rejects all additional, inconsistent, or conflicting terms, whether printed or otherwise set forth in any purchase order or other communication from the Client to the LAB. The invalidity or unenforceability in whole or in part of any provision, term or condition hereof shall not affect in any way the validity or enforceability of the remainder of the Terms and Conditions. No waiver by LAB of any provision, term, or condition hereof or of any breach by or obligation of the Client hereunder shall constitute a waiver of such provision, term, or condition on any other occasion or a waiver of any other breach by or obligation of the Client. This agreement shall be administered and interpreted under the laws of the state which services are procured.

Warranty.

Recognizing that the nature of many samples is unknown and that some may contain potentially hazardous components, LAB warrants only that it will perform testing services, obtain findings, and prepare reports in accordance with generally accepted analytical laboratory principles and practices at the time of performance of services. LAB makes no other warranty, express or implied.

Scope and Compensation.

LAB agrees to perform the services described in the chain of custody to which these terms and conditions are attached. Unless the parties agree in writing to the contrary, the duties of LAB shall not be construed to exceed the services specifically described. LAB will use LAB default method for all tests unless specified otherwise on the Work Order.

Payment terms are net 30 days from the date of invoice. All overdue payments are subject to an interest charge of one and one-half percent (1-1/2%) per month or a portion thereof. Client shall also be responsible for costs of collection, including payment of reasonable attorney fees if such expense is incurred. The prices, unless stated, do not include any sale, use or other taxes. Such taxes will be added to invoice prices when required.

Prices.

Compensation for services performed will be based on the current Lab Analytical Fee Schedule or on quotations agreed to in writing by the parties. Turnaround time based charges are determined from the time of resolution of all work order questions. Testimony, court appearances or data compilation for legal action will be charged separately. Evaluation and reporting of initial screening runs may incur additional fees.

Limitations of Liability.

In the event of any error, omission, or other professional negligence, the sole and exclusive responsibility of LAB shall be to re-perform the deficient work at its own expense and LAB shall have no other liability whatsoever. All claims shall be deemed waived unless made in writing and received by LAB within ninety (90) days following completion of services.

LAB shall have no liability, obligation, or responsibility of any kind for losses, costs, expenses, or other damages (including but not limited to any special, direct, incidental or consequential damages) with respect to LAB's services or results.

All results provided by LAB are strictly for the use of its clients and LAB is in no way responsible for the use of such results by clients or third parties. All reports should be considered in their entirety, and LAB is not responsible for the separation, detachment, or other use of any portion of these reports. Client may not assign the lab report without the written consent of the LAB.

Client covenants and agrees, at its/his/her sole expense, to indemnify, protect, defend, and save harmless the LAB from and against any and all damages, losses, liabilities, obligations, penalties, claims, litigation, demands, defenses, judgments, suits, actions, proceedings, costs, disbursements and/or expenses (including, without limitation attorneys' and experts' fees and disbursements) of any kind whatsoever which may at any time be imposed upon, incurred by or asserted or awarded against client relating to, resulting from or arising out of (a) the breach of this agreement by this client, (b) the negligence of the client in handling, delivering or disclosing any hazardous substance, (c) the violation of the Client of any applicable law, (d) non-compliance by the Client with any environmental permit or (e) a material misrepresentation in disclosing the materials to be tested.

Hazard Disclosure.

Client represents and warrants that any sample delivered to LAB will be preceded or accompanied by complete written disclosure of the presence of any hazardous substances known or suspected by Client. Client further warrants that any sample containing any hazardous substance that is to be delivered to LAB will be packaged, labeled, transported, and delivered properly and in accordance with applicable laws.

Sample Handling.

Prior to LAB's acceptance of any sample (or after any revocation of acceptance), the entire risk of loss or of damage to such sample remains with Client. Samples are accepted when receipt is acknowledged on chain of custody documentation. In no event will LAB have any responsibility for the action or inaction of any carrier shipping or delivering any sample to or from LAB premises.

Client authorizes LAB to proceed with the analysis of samples as received by the laboratory, recognizing that any samples not in compliance with all current DOH-ELAP-NELAP requirements for containers, preservation or holding time will be noted as such on the final report.

Disposal of hazardous waste samples is the responsibility of the Client. If the Client does not wish such samples returned, LAB may add storage and disposal fees to the final invoice. Maximum storage time for samples is 30 days after completion of analysis unless modified by applicable state or federal laws. Client will be required to give the LAB written instructions concerning disposal of these samples.

LAB reserves the absolute right, exercisable at any time, to refuse to receive delivery of, refuse to accept, or revoke acceptance of any sample, which, in the sole judgment of LAB (a) is of unsuitable volume, (b) may be or become unsuitable for or may pose a risk in handling, transport, or processing for any health, safety, environmental or other reason whether or not due to the presence in the sample of any hazardous substance, and whether or not such presence has been disclosed to LAB by Client or (c) if the condition or sample date make the sample unsuitable for analysis.

Legal Responsibility.

LAB is solely responsible for performance of this contract, and no affiliated company, director, officer, employee, or agent shall have any legal responsibility hereunder, whether in contract or tort including negligence.

Assignment.

LAB may assign its performance obligations under this contract to other parties, as it deems necessary. LAB shall disclose to Client any assignee (subcontractor) by ELAP ID # on the submitted final report.

Force Majeure.

LAB shall have no responsibility or liability to the Client for any failure or delay in performance by LAB, which results in whole or in part from any cause or circumstance beyond the reasonable control of LAB. Such causes and circumstances shall include, but not limited to, acts of God, acts or orders of any government authority, strikes or other labor disputes, natural disasters, accidents, wars, civil disturbances, difficulties or delays in transportation, mail or delivery services, inability to obtain sufficient services or supplies from LAB's usual suppliers, or any other cause beyond LAB's reasonable control.

Law.

This contract shall be continued under the laws of the State of New York without regard to its conflicts of laws provision.

This report is part of a multipage document and should only be evaluated in its entirety. The Chain of Custody provides additional sample information, including compliance with the sample condition requirements upon receipt.



CHAIN OF CUSTODY

REPORT TO:			INVOICE TO:		
CLIENT: <i>GZA GeoEnvironmental</i>	CLIENT:		LAB PROJECT ID: <i>153913</i>		
ADDRESS: <i>535 Washington St.</i>	ADDRESS:		Quotation #:		
CITY: <i>Buffalo, NY</i> STATE: <i>NY</i> ZIP: <i>14203</i>	CITY: <i>→</i> STATE: ZIP:		Email: <i>thomas.bohlen@gza.com</i>		
PHONE: <i>716-685-2300</i>	PHONE:		ATTN: <i>T. Bohlen</i>		

PROJECT REFERENCE
21.0056546.00
Task 33

Matrix Codes:

AQ - Aqueous Liquid	WA - Water	DW - Drinking Water	SO - Soil	SD - Solid	WP - Wipe	OL - Oil
NQ - Non-Aqueous Liquid	WG - Groundwater	WW - Wastewater	SL - Sludge	PT - Paint	CK - Caulk	AR - Air

REQUESTED ANALYSIS									
DATE COLLECTED	TIME COLLECTED	COMPOSITE	GRAB	SAMPLE IDENTIFIER	MATRIX	CONTAINER OF	REMARKS	PARADIGM LAB SAMPLE NUMBER	
1	9/15/15		X	Pre-Carbon	AR	X	* Please return Tedlars to T. Bohlen - GZA office *	01	
2	↓		X	Mid-Carbon	↓	↓		02	
3	↓		X	Post-Carbon	↓	↓		03	
4	↓		X	Duplicate	↓	↓		04	
5									
6									
7									
8									
9									
10									

Turnaround Time	Report Supplements		
Availability contingent upon lab approval; additional fees may apply.			
Standard 5 day <input checked="" type="checkbox"/>	Batch QC <input type="checkbox"/>	Basic EDD <input type="checkbox"/>	
Rush 3 day <input type="checkbox"/>	Category A <input type="checkbox"/>	NYSDEC EDD <input type="checkbox"/>	
Rush 2 day <input type="checkbox"/>	Category B <input type="checkbox"/>		
Rush 1 day <input type="checkbox"/>			
Other please indicate: <input type="checkbox"/>	Other please indicate: <input type="checkbox"/>	Other EDD please indicate: <input type="checkbox"/>	

T. Bohlen 9/15/15 / 1510
 Sampled By _____ Date/Time _____ Total Cost:

Thomas Bohlen 9/16/15 / 1250
 Relinquished By _____ Date/Time _____ P.I.F.

Molly Vail 9/17/15 1448
 Received By _____ Date/Time _____

2082



Chain of Custody Supplement

Client: GZA
Lab Project ID: 153913

Completed by: Molly Vail
Date: 9/17/15

Sample Condition Requirements Per NELAC/ELAP 210/241/242/243/244

Condition	NELAC compliance with the sample condition requirements upon receipt		
	Yes	No	N/A
Container Type	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments	_____		
Transferred to method-compliant container	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Headspace (<1 mL)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Comments	_____		
Preservation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Comments	_____		
Chlorine Absent (<0.10 ppm per test strip)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Comments	_____		
Holding Time	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments	_____		
Temperature	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Comments	_____		
Sufficient Sample Quantity	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments	<u>bag 03 in not full</u>		



PARADIGM
ENVIRONMENTAL SERVICES, INC.

Analytical Report For

GZA Geo Environmental of New York

For Lab Project ID

154484

Referencing

21.0056546.00 Task 33

Prepared

Wednesday, October 28, 2015

Any noncompliant QC parameters or other notes impacting data interpretation are flagged or documented on the final report or are noted below.

A handwritten signature in black ink, consisting of several overlapping, slanted strokes, positioned above a horizontal line.

Certifies that this report has been approved by the Technical Director or Designee

179 Lake Avenue • Rochester, NY 14608 • (585) 647-2530 • Fax (585) 647-3311 • ELAP ID# 10958

This report is part of a multipage document and should only be evaluated in its entirety. The Chain of Custody provides additional sample information, including compliance with the sample condition requirements upon receipt.

Page 1 of 9

Report Prepared Wednesday, October 28, 2015



Lab Project ID: 154484

Client: GZA Geo Environmental of New York

Project Reference: 21.0056546.00 Task 33

Sample Identifier: Pre-Carbon

Lab Sample ID: 154484-01

Date Sampled: 10/20/2015

Matrix: Air

Date Received: 10/23/2015

Volatile Organics

Analyte	Result	Units	Qualifier	Date Analyzed
1,1,1-Trichloroethane	< 2.00	mg/m3		10/27/2015 14:43
1,1-Dichloroethane	< 2.00	mg/m3		10/27/2015 14:43
1,1-Dichloroethene	< 2.00	mg/m3		10/27/2015 14:43
1,2-Dichloropropane	< 2.00	mg/m3		10/27/2015 14:43
2-Butanone (MEK)	< 10.0	mg/m3		10/27/2015 14:43
Benzene	< 2.00	mg/m3		10/27/2015 14:43
Chlorobenzene	< 2.00	mg/m3		10/27/2015 14:43
Chloroform	< 2.00	mg/m3		10/27/2015 14:43
cis-1,2-Dichloroethene	< 2.00	mg/m3		10/27/2015 14:43
Ethylbenzene	< 2.00	mg/m3		10/27/2015 14:43
m,p-Xylene	< 2.00	mg/m3		10/27/2015 14:43
Methyl tert-butyl Ether	< 2.00	mg/m3		10/27/2015 14:43
Methylene chloride	< 5.00	mg/m3		10/27/2015 14:43
o-Xylene	< 2.00	mg/m3		10/27/2015 14:43
Tetrachloroethene	4.02	mg/m3		10/27/2015 14:43
Toluene	< 2.00	mg/m3		10/27/2015 14:43
trans-1,2-Dichloroethene	< 2.00	mg/m3		10/27/2015 14:43
Trichloroethene	< 2.00	mg/m3		10/27/2015 14:43
Vinyl chloride	< 2.00	mg/m3		10/27/2015 14:43

Surrogate	Percent Recovery	Limits	Outliers	Date Analyzed
1,2-Dichloroethane-d4	105	80.6 - 125		10/27/2015 14:43
4-Bromofluorobenzene	90.6	86.6 - 111		10/27/2015 14:43
Pentafluorobenzene	96.3	90.9 - 107		10/27/2015 14:43
Toluene-D8	96.5	90.8 - 109		10/27/2015 14:43

Method Reference(s): EPA 8260C Modified
EPA 5030

Data File: x27148.D

This test represents parameters for which Paradigm does not carry ELAP certification. The results of this test should only be used where ELAP certification is not required, such as personal exposure assessment.



Client: GZA Geo Environmental of New York

Project Reference: 21.0056546.00 Task 33

Sample Identifier: Mid-Carbon

Lab Sample ID: 154484-02

Date Sampled: 10/20/2015

Matrix: Air

Date Received: 10/23/2015

Volatile Organics

Analyte	Result	Units	Qualifier	Date Analyzed
1,1,1-Trichloroethane	< 2.00	mg/m3		10/27/2015 14:19
1,1-Dichloroethane	< 2.00	mg/m3		10/27/2015 14:19
1,1-Dichloroethene	< 2.00	mg/m3		10/27/2015 14:19
1,2-Dichloropropane	< 2.00	mg/m3		10/27/2015 14:19
2-Butanone (MEK)	< 10.0	mg/m3		10/27/2015 14:19
Benzene	< 2.00	mg/m3		10/27/2015 14:19
Chlorobenzene	< 2.00	mg/m3		10/27/2015 14:19
Chloroform	< 2.00	mg/m3		10/27/2015 14:19
cis-1,2-Dichloroethene	< 2.00	mg/m3		10/27/2015 14:19
Ethylbenzene	< 2.00	mg/m3		10/27/2015 14:19
m,p-Xylene	< 2.00	mg/m3		10/27/2015 14:19
Methyl tert-butyl Ether	< 2.00	mg/m3		10/27/2015 14:19
Methylene chloride	< 5.00	mg/m3		10/27/2015 14:19
o-Xylene	< 2.00	mg/m3		10/27/2015 14:19
Tetrachloroethene	2.22	mg/m3		10/27/2015 14:19
Toluene	< 2.00	mg/m3		10/27/2015 14:19
trans-1,2-Dichloroethene	< 2.00	mg/m3		10/27/2015 14:19
Trichloroethene	< 2.00	mg/m3		10/27/2015 14:19
Vinyl chloride	< 2.00	mg/m3		10/27/2015 14:19

Surrogate	Percent Recovery	Limits	Outliers	Date Analyzed
1,2-Dichloroethane-d4	107	80.6 - 125		10/27/2015 14:19
4-Bromofluorobenzene	90.9	86.6 - 111		10/27/2015 14:19
Pentafluorobenzene	99.4	90.9 - 107		10/27/2015 14:19
Toluene-D8	98.5	90.8 - 109		10/27/2015 14:19

Method Reference(s): EPA 8260C Modified
EPA 5030

Data File: x27147.D

This test represents parameters for which Paradigm does not carry ELAP certification. The results of this test should only be used where ELAP certification is not required, such as personal exposure assessment.



Lab Project ID: 154484

Client: GZA Geo Environmental of New York

Project Reference: 21.0056546.00 Task 33

Sample Identifier: Post-Carbon

Lab Sample ID: 154484-03

Date Sampled: 10/20/2015

Matrix: Air

Date Received: 10/23/2015

Volatile Organics

Analyte	Result	Units	Qualifier	Date Analyzed
1,1,1-Trichloroethane	< 2.00	mg/m3		10/27/2015 13:55
1,1-Dichloroethane	< 2.00	mg/m3		10/27/2015 13:55
1,1-Dichloroethene	< 2.00	mg/m3		10/27/2015 13:55
1,2-Dichloropropane	< 2.00	mg/m3		10/27/2015 13:55
2-Butanone (MEK)	< 10.0	mg/m3		10/27/2015 13:55
Benzene	< 2.00	mg/m3		10/27/2015 13:55
Chlorobenzene	< 2.00	mg/m3		10/27/2015 13:55
Chloroform	< 2.00	mg/m3		10/27/2015 13:55
cis-1,2-Dichloroethene	< 2.00	mg/m3		10/27/2015 13:55
Ethylbenzene	< 2.00	mg/m3		10/27/2015 13:55
m,p-Xylene	< 2.00	mg/m3		10/27/2015 13:55
Methyl tert-butyl Ether	< 2.00	mg/m3		10/27/2015 13:55
Methylene chloride	< 5.00	mg/m3		10/27/2015 13:55
o-Xylene	< 2.00	mg/m3		10/27/2015 13:55
Tetrachloroethene	2.70	mg/m3		10/27/2015 13:55
Toluene	< 2.00	mg/m3		10/27/2015 13:55
trans-1,2-Dichloroethene	< 2.00	mg/m3		10/27/2015 13:55
Trichloroethene	< 2.00	mg/m3		10/27/2015 13:55
Vinyl chloride	< 2.00	mg/m3		10/27/2015 13:55

Surrogate	Percent Recovery	Limits	Outliers	Date Analyzed
1,2-Dichloroethane-d4	104	80.6 - 125		10/27/2015 13:55
4-Bromofluorobenzene	91.6	86.6 - 111		10/27/2015 13:55
Pentafluorobenzene	97.8	90.9 - 107		10/27/2015 13:55
Toluene-D8	95.2	90.8 - 109		10/27/2015 13:55

Method Reference(s): EPA 8260C Modified
EPA 5030

Data File: x27146.D

This test represents parameters for which Paradigm does not carry ELAP certification. The results of this test should only be used where ELAP certification is not required, such as personal exposure assessment.



Lab Project ID: 154484

Client: GZA Geo Environmental of New York

Project Reference: 21.0056546.00 Task 33

Sample Identifier: Duplicate

Lab Sample ID: 154484-04

Date Sampled: 10/20/2015

Matrix: Air

Date Received: 10/23/2015

Volatile Organics

Analyte	Result	Units	Qualifier	Date Analyzed
1,1,1-Trichloroethane	< 2.00	mg/m3		10/27/2015 13:31
1,1-Dichloroethane	< 2.00	mg/m3		10/27/2015 13:31
1,1-Dichloroethene	< 2.00	mg/m3		10/27/2015 13:31
1,2-Dichloropropane	< 2.00	mg/m3		10/27/2015 13:31
2-Butanone (MEK)	< 10.0	mg/m3		10/27/2015 13:31
Benzene	< 2.00	mg/m3		10/27/2015 13:31
Chlorobenzene	< 2.00	mg/m3		10/27/2015 13:31
Chloroform	< 2.00	mg/m3		10/27/2015 13:31
cis-1,2-Dichloroethene	< 2.00	mg/m3		10/27/2015 13:31
Ethylbenzene	< 2.00	mg/m3		10/27/2015 13:31
m,p-Xylene	< 2.00	mg/m3		10/27/2015 13:31
Methyl tert-butyl Ether	< 2.00	mg/m3		10/27/2015 13:31
Methylene chloride	< 5.00	mg/m3		10/27/2015 13:31
o-Xylene	< 2.00	mg/m3		10/27/2015 13:31
Tetrachloroethene	4.25	mg/m3		10/27/2015 13:31
Toluene	< 2.00	mg/m3		10/27/2015 13:31
trans-1,2-Dichloroethene	< 2.00	mg/m3		10/27/2015 13:31
Trichloroethene	< 2.00	mg/m3		10/27/2015 13:31
Vinyl chloride	< 2.00	mg/m3		10/27/2015 13:31

Surrogate	Percent Recovery	Limits	Outliers	Date Analyzed
1,2-Dichloroethane-d4	103	80.6 - 125		10/27/2015 13:31
4-Bromofluorobenzene	94.2	86.6 - 111		10/27/2015 13:31
Pentafluorobenzene	98.2	90.9 - 107		10/27/2015 13:31
Toluene-D8	96.8	90.8 - 109		10/27/2015 13:31

Method Reference(s): EPA 8260C Modified
EPA 5030

Data File: x27145.D

This test represents parameters for which Paradigm does not carry ELAP certification. The results of this test should only be used where ELAP certification is not required, such as personal exposure assessment.



Analytical Report Appendix

The reported results relate only to the samples as they have been received by the laboratory.

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All soil/sludge samples have been reported on a dry weight basis, unless qualified "reported as received". Other solids are reported as received.

Low level Volatiles blank reports for soil/solid matrix are based on a nominal 5 gram weight. Sample results and reporting limits are based on actual weight, which may be more or less than 5 grams.

The Chain of Custody provides additional information, including compliance with sample condition requirements upon receipt. Sample condition requirements are defined under the 2003 NELAC Standard, sections 5.5.8.3.1 and 5.5.8.3.2.

NYSDOH ELAP does not certify for all parameters. Paradigm Environmental Services or the indicated subcontracted laboratory does hold certification for all analytes where certification is offered by ELAP unless otherwise specified. Aliquots separated for certain tests, such as TCLP, are indicated on the Chain of Custody and final reports with an "A" suffix.

Data qualifiers are used, when necessary, to provide additional information about the data. This information may be communicated as a flag or as text at the bottom of the report. Please refer to the following list of analyte-specific, frequently used data flags and their meaning:

"<" = Analyzed for but not detected at or above the quantitation limit.

"E" = Result has been estimated, calibration limit exceeded.

"Z" = See case narrative.

"D" = Sample, Laboratory Control Sample, or Matrix Spike Duplicate results above Relative Percent Difference limit.

"M" = Matrix spike recoveries outside QC limits. Matrix bias indicated.

"B" = Method blank contained trace levels of analyte. Refer to included method blank report.

"J" = Result estimated between the quantitation limit and half the quantitation limit.

"L" = Laboratory Control Sample recovery outside accepted QC limits.

"P" = Concentration differs by more than 40% between the primary and secondary analytical columns.

"NC" = Not calculable. Applicable to RPD if sample or duplicate result is non-detect or estimated (see primary report for data flags). Applicable to MS if sample is greater or equal to ten times the spike added. Applicable to sample surrogates or MS if sample dilution is 10x or higher.

"" = Indicates any recoveries outside associated acceptance windows. Surrogate outliers in samples are presumed matrix effects. LCS demonstrates method compliance unless otherwise noted.*

"(1)" = Indicates data from primary column used for QC calculation.

"A" = denotes a parameter for which ELAP does not offer approval as part of their laboratory certification program.

"F" = denotes a parameter for which Paradigm does not carry certification, the results for which should therefore only be used where ELAP certification is not required, such as personal exposure assessment.

GENERAL TERMS AND CONDITIONS

LABORATORY SERVICES

These Terms and Conditions embody the whole agreement of the parties in the absence of a signed and executed contract between the Laboratory (LAB) and Client. They shall supersede all previous communications, representations, or agreements, either verbal or written, between the parties. The LAB specifically rejects all additional, inconsistent, or conflicting terms, whether printed or otherwise set forth in any purchase order or other communication from the Client to the LAB. The invalidity or unenforceability in whole or in part of any provision, term or condition hereof shall not affect in any way the validity or enforceability of the remainder of the Terms and Conditions. No waiver by LAB of any provision, term, or condition hereof or of any breach by or obligation of the Client hereunder shall constitute a waiver of such provision, term, or condition on any other occasion or a waiver of any other breach by or obligation of the Client. This agreement shall be administered and interpreted under the laws of the state which services are procured.

Warranty.

Recognizing that the nature of many samples is unknown and that some may contain potentially hazardous components, LAB warrants only that it will perform testing services, obtain findings, and prepare reports in accordance with generally accepted analytical laboratory principles and practices at the time of performance of services. LAB makes no other warranty, express or implied.

Scope and Compensation.

LAB agrees to perform the services described in the chain of custody to which these terms and conditions are attached. Unless the parties agree in writing to the contrary, the duties of LAB shall not be construed to exceed the services specifically described. LAB will use LAB default method for all tests unless specified otherwise on the Work Order.

Payment terms are net 30 days from the date of invoice. All overdue payments are subject to an interest charge of one and one-half percent (1-1/2%) per month or a portion thereof. Client shall also be responsible for costs of collection, including payment of reasonable attorney fees if such expense is incurred. The prices, unless stated, do not include any sale, use or other taxes. Such taxes will be added to invoice prices when required.

Prices.

Compensation for services performed will be based on the current Lab Analytical Fee Schedule or on quotations agreed to in writing by the parties. Turnaround time based charges are determined from the time of resolution of all work order questions. Testimony, court appearances or data compilation for legal action will be charged separately. Evaluation and reporting of initial screening runs may incur additional fees.

Limitations of Liability.

In the event of any error, omission, or other professional negligence, the sole and exclusive responsibility of LAB shall be to re-perform the deficient work at its own expense and LAB shall have no other liability whatsoever. All claims shall be deemed waived unless made in writing and received by LAB within ninety (90) days following completion of services.

LAB shall have no liability, obligation, or responsibility of any kind for losses, costs, expenses, or other damages (including but not limited to any special, direct, incidental or consequential damages) with respect to LAB's services or results.

All results provided by LAB are strictly for the use of its clients and LAB is in no way responsible for the use of such results by clients or third parties. All reports should be considered in their entirety, and LAB is not responsible for the separation, detachment, or other use of any portion of these reports. Client may not assign the lab report without the written consent of the LAB.

Client covenants and agrees, at its/his/her sole expense, to indemnify, protect, defend, and save harmless the LAB from and against any and all damages, losses, liabilities, obligations, penalties, claims, litigation, demands, defenses, judgments, suits, actions, proceedings, costs, disbursements and/or expenses (including, without limitation attorneys' and experts' fees and disbursements) of any kind whatsoever which may at any time be imposed upon, incurred by or asserted or awarded against client relating to, resulting from or arising out of (a) the breach of this agreement by this client, (b) the negligence of the client in handling, delivering or disclosing any hazardous substance, (c) the violation of the Client of any applicable law, (d) non-compliance by the Client with any environmental permit or (e) a material misrepresentation in disclosing the materials to be tested.

Hazard Disclosure.

Client represents and warrants that any sample delivered to LAB will be preceded or accompanied by complete written disclosure of the presence of any hazardous substances known or suspected by Client. Client further warrants that any sample containing any hazardous substance that is to be delivered to LAB will be packaged, labeled, transported, and delivered properly and in accordance with applicable laws.

Sample Handling.

Prior to LAB's acceptance of any sample (or after any revocation of acceptance), the entire risk of loss or of damage to such sample remains with Client. Samples are accepted when receipt is acknowledged on chain of custody documentation. In no event will LAB have any responsibility for the action or inaction of any carrier shipping or delivering any sample to or from LAB premises.

Client authorizes LAB to proceed with the analysis of samples as received by the laboratory, recognizing that any samples not in compliance with all current DOH-ELAP-NELAP requirements for containers, preservation or holding time will be noted as such on the final report.

Disposal of hazardous waste samples is the responsibility of the Client. If the Client does not wish such samples returned, LAB may add storage and disposal fees to the final invoice. Maximum storage time for samples is 30 days after completion of analysis unless modified by applicable state or federal laws. Client will be required to give the LAB written instructions concerning disposal of these samples.

LAB reserves the absolute right, exercisable at any time, to refuse to receive delivery of, refuse to accept, or revoke acceptance of any sample, which, in the sole judgment of LAB (a) is of unsuitable volume, (b) may be or become unsuitable for or may pose a risk in handling, transport, or processing for any health, safety, environmental or other reason whether or not due to the presence in the sample of any hazardous substance, and whether or not such presence has been disclosed to LAB by Client or (c) if the condition or sample date make the sample unsuitable for analysis.

Legal Responsibility.

LAB is solely responsible for performance of this contract, and no affiliated company, director, officer, employee, or agent shall have any legal responsibility hereunder, whether in contract or tort including negligence.

Assignment.

LAB may assign its performance obligations under this contract to other parties, as it deems necessary. LAB shall disclose to Client any assignee (subcontractor) by ELAP ID # on the submitted final report.

Force Majeure.

LAB shall have no responsibility or liability to the Client for any failure or delay in performance by LAB, which results in whole or in part from any cause or circumstance beyond the reasonable control of LAB. Such causes and circumstances shall include, but not limited to, acts of God, acts or orders of any government authority, strikes or other labor disputes, natural disasters, accidents, wars, civil disturbances, difficulties or delays in transportation, mail or delivery services, inability to obtain sufficient services or supplies from LAB's usual suppliers, or any other cause beyond LAB's reasonable control.

Law.

This contract shall be continued under the laws of the State of New York without regard to its conflicts of laws provision.

This report is part of a multipage document and should only be evaluated in its entirety. The Chain of Custody provides additional sample information, including compliance with the sample condition requirements upon receipt.



CHAIN OF CUSTODY

REPORT TO:			INVOICE TO:			LAB PROJECT ID		
CLIENT:	GZA Geo Environmental			CLIENT:				154484
ADDRESS:	535 Washington St.			ADDRESS:				
CITY:	STATE:	ZIP:		CITY:	STATE:	ZIP:		Quotation #:
Buffalo, NY		14203						
PHONE:	716-685-2300			PHONE:				Email: thomas.bohlen@gza.com
ATTN:	T. Bohlen			ATTN:				

PROJECT REFERENCE
21.0056546.00
Task 33

Matrix Codes:

AQ - Aqueous Liquid	WA - Water	DW - Drinking Water	SO - Soil	SD - Solid	WP - Wipe	OL - Oil
NQ - Non-Aqueous Liquid	WG - Groundwater	WW - Wastewater	SL - Sludge	PT - Paint	CK - Caulk	AR - Air

REQUESTED ANALYSIS									
DATE COLLECTED	TIME COLLECTED	COMPOSITE	GRAB	SAMPLE IDENTIFIER	MATRIX	CONTAINER NO.	ANALYSIS	REMARKS	PARADIGM LAB SAMPLE NUMBER
10/20/15	1600		X	Pre-Carbon	AR	1	X	* Please Return Tertars to T. Bohlen - GZA Office *	01
	1605		X	Mid-Carbon					02
	1610		X	Post-Carbon					03
	-		X	Duplicate					04
2									
3									
4									
5									
6									
7									
8									
9									
10									

Turnaround Time	Report Supplements		
Availability contingent upon lab approval; additional fees may apply.			
Standard 5 day <input checked="" type="checkbox"/>	Batch QC <input type="checkbox"/>	Basic EDD <input type="checkbox"/>	
Rush 3 day <input type="checkbox"/>	Category A <input type="checkbox"/>	NYSDEC EDD <input type="checkbox"/>	
Rush 2 day <input type="checkbox"/>	Category B <input type="checkbox"/>		
Rush 1 day <input type="checkbox"/>			
Other please indicate: <input type="checkbox"/>	Other please indicate: <input type="checkbox"/>	Other EDD please indicate: <input type="checkbox"/>	

T. Bohlen 10/20/15 1610
 Sampled By Date/Time
 T. Bohlen
 Relinquished By Date/Time
 [Signature] 10/21/15 12:55
 Received By Date/Time
 [Signature] 10/23/15 12:50
 Received @ Lab By Date/Time

Total Cost:

P.I.F.



Chain of Custody Supplement

Client: GZA Geo Environmental Completed by: Glenn Pezzulo
 Lab Project ID: 154484 Date: 10/23/15

Sample Condition Requirements
 Per NELAC/ELAP 210/241/242/243/244

Condition	NELAC compliance with the sample condition requirements upon receipt		
	Yes	No	N/A
Container Type	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments	_____		
Transferred to method-compliant container	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Headspace (<1 mL)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Comments	_____		
Preservation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Comments	_____		
Chlorine Absent (<0.10 ppm per test strip)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Comments	_____		
Holding Time	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments	_____		
Temperature	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Comments	_____		
Sufficient Sample Quantity	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments	_____		



PARADIGM
ENVIRONMENTAL SERVICES, INC.

Analytical Report For
GZA Geo Environmental of New York

For Lab Project ID

154981

Referencing

21.0056546.00 Task 33

Prepared

Monday, November 30, 2015

Any noncompliant QC parameters or other notes impacting data interpretation are flagged or documented on the final report or are noted below.

Certifies that this report has been approved by the Technical Director or Designee

179 Lake Avenue • Rochester, NY 14608 • (585) 647-2530 • Fax (585) 647-3311 • ELAP ID# 10958

This report is part of a multipage document and should only be evaluated in its entirety. The Chain of Custody provides additional sample information, including compliance with the sample condition requirements upon receipt. Page 1 of 9

Report Prepared Monday, November 30, 2015



Lab Project ID: 154981

Client: GZA Geo Environmental of New York

Project Reference: 21.0056546.00 Task 33

Sample Identifier: Pre-Carbon

Lab Sample ID: 154981-01

Date Sampled: 11/18/2015

Matrix: Air

Date Received: 11/20/2015

Volatile Organics

Analyte	Result	Units	Qualifier	Date Analyzed
1,1,1-Trichloroethane	< 2.00	mg/m3		11/25/2015 14:23
1,1-Dichloroethane	< 2.00	mg/m3		11/25/2015 14:23
1,1-Dichloroethene	< 2.00	mg/m3		11/25/2015 14:23
1,2-Dichloropropane	< 2.00	mg/m3		11/25/2015 14:23
2-Butanone (MEK)	< 10.0	mg/m3		11/25/2015 14:23
Benzene	< 2.00	mg/m3		11/25/2015 14:23
Chlorobenzene	< 2.00	mg/m3		11/25/2015 14:23
Chloroform	< 2.00	mg/m3		11/25/2015 14:23
cis-1,2-Dichloroethene	< 2.00	mg/m3		11/25/2015 14:23
Ethylbenzene	< 2.00	mg/m3		11/25/2015 14:23
m,p-Xylene	< 2.00	mg/m3		11/25/2015 14:23
Methyl tert-butyl Ether	< 2.00	mg/m3		11/25/2015 14:23
Methylene chloride	< 5.00	mg/m3		11/25/2015 14:23
o-Xylene	< 2.00	mg/m3		11/25/2015 14:23
Tetrachloroethene	< 2.00	mg/m3		11/25/2015 14:23
Toluene	< 2.00	mg/m3		11/25/2015 14:23
trans-1,2-Dichloroethene	< 2.00	mg/m3		11/25/2015 14:23
Trichloroethene	< 2.00	mg/m3		11/25/2015 14:23
Vinyl chloride	< 2.00	mg/m3		11/25/2015 14:23

Surrogate	Percent Recovery	Limits	Outliers	Date Analyzed
1,2-Dichloroethane-d4	98.6	80.6 - 125		11/25/2015 14:23
4-Bromofluorobenzene	96.9	86.6 - 111		11/25/2015 14:23
Pentafluorobenzene	100	90.9 - 107		11/25/2015 14:23
Toluene-D8	93.7	90.8 - 109		11/25/2015 14:23

Method Reference(s): EPA 8260C Modified
x27810.D

Data File:

This test represents parameters for which Paradigm does not carry ELAP certification. The results of this test should only be used where ELAP certification is not required, such as personal exposure assessment.



Lab Project ID: 154981

Client: GZA Geo Environmental of New York

Project Reference: 21.0056546.00 Task 33

Sample Identifier: Mid-Carbon

Lab Sample ID: 154981-02

Date Sampled: 11/18/2015

Matrix: Air

Date Received: 11/20/2015

Volatile Organics

Analyte	Result	Units	Qualifier	Date Analyzed
1,1,1-Trichloroethane	< 2.00	mg/m3		11/25/2015 14:47
1,1-Dichloroethane	< 2.00	mg/m3		11/25/2015 14:47
1,1-Dichloroethene	< 2.00	mg/m3		11/25/2015 14:47
1,2-Dichloropropane	< 2.00	mg/m3		11/25/2015 14:47
2-Butanone (MEK)	< 10.0	mg/m3		11/25/2015 14:47
Benzene	< 2.00	mg/m3		11/25/2015 14:47
Chlorobenzene	< 2.00	mg/m3		11/25/2015 14:47
Chloroform	< 2.00	mg/m3		11/25/2015 14:47
cis-1,2-Dichloroethene	< 2.00	mg/m3		11/25/2015 14:47
Ethylbenzene	< 2.00	mg/m3		11/25/2015 14:47
m,p-Xylene	< 2.00	mg/m3		11/25/2015 14:47
Methyl tert-butyl Ether	< 2.00	mg/m3		11/25/2015 14:47
Methylene chloride	< 5.00	mg/m3		11/25/2015 14:47
o-Xylene	< 2.00	mg/m3		11/25/2015 14:47
Tetrachloroethene	< 2.00	mg/m3		11/25/2015 14:47
Toluene	< 2.00	mg/m3		11/25/2015 14:47
trans-1,2-Dichloroethene	< 2.00	mg/m3		11/25/2015 14:47
Trichloroethene	< 2.00	mg/m3		11/25/2015 14:47
Vinyl chloride	< 2.00	mg/m3		11/25/2015 14:47

Surrogate	Percent Recovery	Limits	Outliers	Date Analyzed
1,2-Dichloroethane-d4	103	80.6 - 125		11/25/2015 14:47
4-Bromofluorobenzene	92.8	86.6 - 111		11/25/2015 14:47
Pentafluorobenzene	99.0	90.9 - 107		11/25/2015 14:47
Toluene-D8	96.3	90.8 - 109		11/25/2015 14:47

Method Reference(s): EPA 8260C Modified
x27811.D

Data File:

This test represents parameters for which Paradigm does not carry ELAP certification. The results of this test should only be used where ELAP certification is not required, such as personal exposure assessment.



Client: GZA Geo Environmental of New York

Project Reference: 21.0056546.00 Task 33

Sample Identifier: Post-Carbon

Lab Sample ID: 154981-03

Date Sampled: 11/18/2015

Matrix: Air

Date Received: 11/20/2015

Volatile Organics

Analyte	Result	Units	Qualifier	Date Analyzed
1,1,1-Trichloroethane	< 2.00	mg/m3		11/25/2015 15:11
1,1-Dichloroethane	< 2.00	mg/m3		11/25/2015 15:11
1,1-Dichloroethene	< 2.00	mg/m3		11/25/2015 15:11
1,2-Dichloropropane	< 2.00	mg/m3		11/25/2015 15:11
2-Butanone (MEK)	< 10.0	mg/m3		11/25/2015 15:11
Benzene	< 2.00	mg/m3		11/25/2015 15:11
Chlorobenzene	< 2.00	mg/m3		11/25/2015 15:11
Chloroform	< 2.00	mg/m3		11/25/2015 15:11
cis-1,2-Dichloroethene	< 2.00	mg/m3		11/25/2015 15:11
Ethylbenzene	< 2.00	mg/m3		11/25/2015 15:11
m,p-Xylene	< 2.00	mg/m3		11/25/2015 15:11
Methyl tert-butyl Ether	< 2.00	mg/m3		11/25/2015 15:11
Methylene chloride	< 5.00	mg/m3		11/25/2015 15:11
o-Xylene	< 2.00	mg/m3		11/25/2015 15:11
Tetrachloroethene	< 2.00	mg/m3		11/25/2015 15:11
Toluene	< 2.00	mg/m3		11/25/2015 15:11
trans-1,2-Dichloroethene	< 2.00	mg/m3		11/25/2015 15:11
Trichloroethene	< 2.00	mg/m3		11/25/2015 15:11
Vinyl chloride	< 2.00	mg/m3		11/25/2015 15:11

Surrogate	Percent Recovery	Limits	Outliers	Date Analyzed
1,2-Dichloroethane-d4	105	80.6 - 125		11/25/2015 15:11
4-Bromofluorobenzene	91.4	86.6 - 111		11/25/2015 15:11
Pentafluorobenzene	98.2	90.9 - 107		11/25/2015 15:11
Toluene-D8	93.4	90.8 - 109		11/25/2015 15:11

Method Reference(s): EPA 8260C Modified
x27812.D

Data File:

This test represents parameters for which Paradigm does not carry ELAP certification. The results of this test should only be used where ELAP certification is not required, such as personal exposure assessment.



Lab Project ID: 154981

Client: **GZA Geo Environmental of New York**

Project Reference: 21.0056546.00 Task 33

Sample Identifier: Duplicate

Lab Sample ID: 154981-04

Date Sampled: 11/18/2015

Matrix: Air

Date Received: 11/20/2015

Volatile Organics

Analyte	Result	Units	Qualifier	Date Analyzed
1,1,1-Trichloroethane	< 2.00	mg/m3		11/25/2015 15:35
1,1-Dichloroethane	< 2.00	mg/m3		11/25/2015 15:35
1,1-Dichloroethene	< 2.00	mg/m3		11/25/2015 15:35
1,2-Dichloropropane	< 2.00	mg/m3		11/25/2015 15:35
2-Butanone (MEK)	< 10.0	mg/m3		11/25/2015 15:35
Benzene	< 2.00	mg/m3		11/25/2015 15:35
Chlorobenzene	< 2.00	mg/m3		11/25/2015 15:35
Chloroform	< 2.00	mg/m3		11/25/2015 15:35
cis-1,2-Dichloroethene	< 2.00	mg/m3		11/25/2015 15:35
Ethylbenzene	< 2.00	mg/m3		11/25/2015 15:35
m,p-Xylene	< 2.00	mg/m3		11/25/2015 15:35
Methyl tert-butyl Ether	< 2.00	mg/m3		11/25/2015 15:35
Methylene chloride	< 5.00	mg/m3		11/25/2015 15:35
o-Xylene	< 2.00	mg/m3		11/25/2015 15:35
Tetrachloroethene	< 2.00	mg/m3		11/25/2015 15:35
Toluene	< 2.00	mg/m3		11/25/2015 15:35
trans-1,2-Dichloroethene	< 2.00	mg/m3		11/25/2015 15:35
Trichloroethene	< 2.00	mg/m3		11/25/2015 15:35
Vinyl chloride	< 2.00	mg/m3		11/25/2015 15:35

Surrogate	Percent Recovery	Limits	Outliers	Date Analyzed
1,2-Dichloroethane-d4	105	80.6 - 125		11/25/2015 15:35
4-Bromofluorobenzene	90.6	86.6 - 111		11/25/2015 15:35
Pentafluorobenzene	97.8	90.9 - 107		11/25/2015 15:35
Toluene-D8	94.2	90.8 - 109		11/25/2015 15:35

Method Reference(s): EPA 8260C Modified
x27813.D

Data File:

This test represents parameters for which Paradigm does not carry ELAP certification. The results of this test should only be used where ELAP certification is not required, such as personal exposure assessment.



Analytical Report Appendix

The reported results relate only to the samples as they have been received by the laboratory.

Each page of this document is part of a multipage report. This document may not be reproduced except in its entirety, without the prior consent of Paradigm Environmental Services, Inc.

All soil/sludge samples have been reported on a dry weight basis, unless qualified "reported as received". Other solids are reported as received.

Low level Volatiles blank reports for soil/solid matrix are based on a nominal 5 gram weight. Sample results and reporting limits are based on actual weight, which may be more or less than 5 grams.

The Chain of Custody provides additional information, including compliance with sample condition requirements upon receipt. Sample condition requirements are defined under the 2003 NELAC Standard, sections 5.5.8.3.1 and 5.5.8.3.2.

NYSDOH ELAP does not certify for all parameters. Paradigm Environmental Services or the indicated subcontracted laboratory does hold certification for all analytes where certification is offered by ELAP unless otherwise specified. Aliquots separated for certain tests, such as TCLP, are indicated on the Chain of Custody and final reports with an "A" suffix.

Data qualifiers are used, when necessary, to provide additional information about the data. This information may be communicated as a flag or as text at the bottom of the report. Please refer to the following list of analyte-specific, frequently used data flags and their meaning:

"<" = Analyzed for but not detected at or above the quantitation limit.

"E" = Result has been estimated, calibration limit exceeded.

"Z" = See case narrative.

"D" = Sample, Laboratory Control Sample, or Matrix Spike Duplicate results above Relative Percent Difference limit.

"M" = Matrix spike recoveries outside QC limits. Matrix bias indicated.

"B" = Method blank contained trace levels of analyte. Refer to included method blank report.

"J" = Result estimated between the quantitation limit and half the quantitation limit.

"L" = Laboratory Control Sample recovery outside accepted QC limits.

"P" = Concentration differs by more than 40% between the primary and secondary analytical columns.

"NC" = Not calculable. Applicable to RPD if sample or duplicate result is non-detect or estimated (see primary report for data flags). Applicable to MS if sample is greater or equal to ten times the spike added. Applicable to sample surrogates or MS if sample dilution is 10x or higher.

"" = Indicates any recoveries outside associated acceptance windows. Surrogate outliers in samples are presumed matrix effects. LCS demonstrates method compliance unless otherwise noted.*

"(1)" = Indicates data from primary column used for QC calculation.

"A" = denotes a parameter for which ELAP does not offer approval as part of their laboratory certification program.

"F" = denotes a parameter for which Paradigm does not carry certification, the results for which should therefore only be used where ELAP certification is not required, such as personal exposure assessment.

This report is part of a multipage document and should only be evaluated in its entirety. The Chain of Custody provides additional sample information, including compliance with the sample condition requirements upon receipt.

GENERAL TERMS AND CONDITIONS

LABORATORY SERVICES

These Terms and Conditions embody the whole agreement of the parties in the absence of a signed and executed contract between the Laboratory (LAB) and Client. They shall supersede all previous communications, representations, or agreements, either verbal or written, between the parties. The LAB specifically rejects all additional, inconsistent, or conflicting terms, whether printed or otherwise set forth in any purchase order or other communication from the Client to the LAB. The invalidity or unenforceability in whole or in part of any provision, term or condition hereof shall not affect in any way the validity or enforceability of the remainder of the Terms and Conditions. No waiver by LAB of any provision, term, or condition hereof or of any breach by or obligation of the Client hereunder shall constitute a waiver of such provision, term, or condition on any other occasion or a waiver of any other breach by or obligation of the Client. This agreement shall be administered and interpreted under the laws of the state which services are procured.

Warranty.

Recognizing that the nature of many samples is unknown and that some may contain potentially hazardous components, LAB warrants only that it will perform testing services, obtain findings, and prepare reports in accordance with generally accepted analytical laboratory principles and practices at the time of performance of services. LAB makes no other warranty, express or implied.

Scope and Compensation.

LAB agrees to perform the services described in the chain of custody to which these terms and conditions are attached. Unless the parties agree in writing to the contrary, the duties of LAB shall not be construed to exceed the services specifically described. LAB will use LAB default method for all tests unless specified otherwise on the Work Order.

Payment terms are net 30 days from the date of invoice. All overdue payments are subject to an interest charge of one and one-half percent (1-1/2%) per month or a portion thereof. Client shall also be responsible for costs of collection, including payment of reasonable attorney fees if such expense is incurred. The prices, unless stated, do not include any sale, use or other taxes. Such taxes will be added to invoice prices when required.

Prices.

Compensation for services performed will be based on the current Lab Analytical Fee Schedule or on quotations agreed to in writing by the parties. Turnaround time based charges are determined from the time of resolution of all work order questions. Testimony, court appearances or data compilation for legal action will be charged separately. Evaluation and reporting of initial screening runs may incur additional fees.

Limitations of Liability.

In the event of any error, omission, or other professional negligence, the sole and exclusive responsibility of LAB shall be to re-perform the deficient work at its own expense and LAB shall have no other liability whatsoever. All claims shall be deemed waived unless made in writing and received by LAB within ninety (90) days following completion of services.

LAB shall have no liability, obligation, or responsibility of any kind for losses, costs, expenses, or other damages (including but not limited to any special, direct, incidental or consequential damages) with respect to LAB's services or results.

All results provided by LAB are strictly for the use of its clients and LAB is in no way responsible for the use of such results by clients or third parties. All reports should be considered in their entirety, and LAB is not responsible for the separation, detachment, or other use of any portion of these reports. Client may not assign the lab report without the written consent of the LAB.

Client covenants and agrees, at its/his/her sole expense, to indemnify, protect, defend, and save harmless the LAB from and against any and all damages, losses, liabilities, obligations, penalties, claims, litigation, demands, defenses, judgments, suits, actions, proceedings, costs, disbursements and/or expenses (including, without limitation attorneys' and experts' fees and disbursements) of any kind whatsoever which may at any time be imposed upon, incurred by or asserted or awarded against client relating to, resulting from or arising out of (a) the breach of this agreement by this client, (b) the negligence of the client in handling, delivering or disclosing any hazardous substance, (c) the violation of the Client of any applicable law, (d) non-compliance by the Client with any environmental permit or (e) a material misrepresentation in disclosing the materials to be tested.

Hazard Disclosure.

Client represents and warrants that any sample delivered to LAB will be preceded or accompanied by complete written disclosure of the presence of any hazardous substances known or suspected by Client. Client further warrants that any sample containing any hazardous substance that is to be delivered to LAB will be packaged, labeled, transported, and delivered properly and in accordance with applicable laws.

Sample Handling.

Prior to LAB's acceptance of any sample (or after any revocation of acceptance), the entire risk of loss or of damage to such sample remains with Client. Samples are accepted when receipt is acknowledged on chain of custody documentation. In no event will LAB have any responsibility for the action or inaction of any carrier shipping or delivering any sample to or from LAB premises.

Client authorizes LAB to proceed with the analysis of samples as received by the laboratory, recognizing that any samples not in compliance with all current DOH-ELAP-NELAP requirements for containers, preservation or holding time will be noted as such on the final report.

Disposal of hazardous waste samples is the responsibility of the Client. If the Client does not wish such samples returned, LAB may add storage and disposal fees to the final invoice. Maximum storage time for samples is 30 days after completion of analysis unless modified by applicable state or federal laws. Client will be required to give the LAB written instructions concerning disposal of these samples.

LAB reserves the absolute right, exercisable at any time, to refuse to receive delivery of, refuse to accept, or revoke acceptance of any sample, which, in the sole judgment of LAB (a) is of unsuitable volume, (b) may be or become unsuitable for or may pose a risk in handling, transport, or processing for any health, safety, environmental or other reason whether or not due to the presence in the sample of any hazardous substance, and whether or not such presence has been disclosed to LAB by Client or (c) if the condition or sample date make the sample unsuitable for analysis.

Legal Responsibility.

LAB is solely responsible for performance of this contract, and no affiliated company, director, officer, employee, or agent shall have any legal responsibility hereunder, whether in contract or tort including negligence.

Assignment.

LAB may assign its performance obligations under this contract to other parties, as it deems necessary. LAB shall disclose to Client any assignee (subcontractor) by ELAP ID # on the submitted final report.

Force Majeure.

LAB shall have no responsibility or liability to the Client for any failure or delay in performance by LAB, which results in whole or in part from any cause or circumstance beyond the reasonable control of LAB. Such causes and circumstances shall include, but not limited to, acts of God, acts or orders of any government authority, strikes or other labor disputes, natural disasters, accidents, wars, civil disturbances, difficulties or delays in transportation, mail or delivery services, inability to obtain sufficient services or supplies from LAB's usual suppliers, or any other cause beyond LAB's reasonable control.

Law.

This contract shall be continued under the laws of the State of New York without regard to its conflicts of laws provision.

This report is part of a multipage document and should only be evaluated in its entirety. The Chain of Custody provides additional sample information, including compliance with the sample condition requirements upon receipt.



CHAIN OF CUSTODY

REPORT TO:		INVOICE TO:		LAB PROJECT ID
CLIENT: <i>GZA Geo Environmental</i>	CLIENT:	ADDRESS:		<i>154981</i>
ADDRESS: <i>535 Washington St.</i>	ADDRESS:	CITY: <i>Buffalo, NY</i> STATE: <i>NY</i> ZIP: <i>14203</i>		Quotation #:
PHONE: <i>716-685-2300</i>	PHONE:	ATTN: <i>T. Bohlen</i>		Email: <i>thomas.bohlen@gza.com</i>

PROJECT REFERENCE
21.0056546.00
Task 33

Matrix Codes:

AQ - Aqueous Liquid	WA - Water	DW - Drinking Water	SO - Soil	SD - Solid	WP - Wipe	OL - Oil
NQ - Non-Aqueous Liquid	WG - Groundwater	WW - Wastewater	SL - Sludge	PT - Paint	CK - Caulk	AR - Air

REQUESTED ANALYSIS									
DATE COLLECTED	TIME COLLECTED	COMPOSITE	GRAB	SAMPLE IDENTIFIER	MATRIX	COUNTAINERS	REMARKS	PARADIGM LAB SAMPLE NUMBER	
<i>11/18/15</i>	<i>1430</i>		<i>X</i>	<i>Pre-Carbon</i>	<i>AR</i>	<i>1</i>	<i>* Please return lead bars to T. Bohlen - GZA Buffalo Office</i>	<i>01</i>	
<i>2</i>	<i>1435</i>		<i>↓</i>	<i>Mid-Carbon</i>	<i>↓</i>	<i>↓</i>		<i>02</i>	
<i>3</i>	<i>1440</i>		<i>↓</i>	<i>Post-Carbon</i>	<i>↓</i>	<i>↓</i>		<i>03</i>	
<i>4</i>	<i>-</i>		<i>X</i>	<i>Duplicate</i>	<i>↓</i>	<i>↓</i>		<i>04</i>	
5									
6									
7									
8									
9									
10									

Turnaround Time	Report Supplements		
Availability contingent upon lab approval; additional fees may apply.			
Standard 5 day <input checked="" type="checkbox"/>	Batch QC <input type="checkbox"/>	Basic EDD <input type="checkbox"/>	
Rush 3 day <input type="checkbox"/>	Category A <input type="checkbox"/>	NYSDEC EDD <input type="checkbox"/>	
Rush 2 day <input type="checkbox"/>	Category B <input type="checkbox"/>		
Rush 1 day <input type="checkbox"/>			
Other <input type="checkbox"/> please indicate: _____	Other <input type="checkbox"/> please indicate: _____	Other EDD <input type="checkbox"/> please indicate: _____	

T. Bohlen *11/18/15*
 Sampled By _____ Date/Time _____
Thomas Bohlen *11/19/15*
 Relinquished By _____ Date/Time _____
[Signature] *11/19/15 1233*
 Received By _____ Date/Time _____
[Signature] *11/20/15 1350*
 Received @ Lab By _____ Date/Time _____

Total Cost:

P.I.F.

2062



Chain of Custody Supplement

Client: GZA Completed by: Molykaid
 Lab Project ID: 154981 Date: 11/20/15

Sample Condition Requirements
 Per NELAC/ELAP 210/241/242/243/244

Condition	NELAC compliance with the sample condition requirements upon receipt		
	Yes	No	N/A
Container Type	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments	_____		
Transferred to method-compliant container	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Headspace (<1 mL)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Comments	_____		
Preservation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Comments	_____		
Chlorine Absent (<0.10 ppm per test strip)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Comments	_____		
Holding Time	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments	_____		
Temperature	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Comments	_____		
Sufficient Sample Quantity	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments	_____		



PARADIGM
ENVIRONMENTAL SERVICES, INC.

Analytical Report For

GZA Geo Environmental of New York

For Lab Project ID

155437

Referencing

21.0056546.00 Task 33

Prepared

Thursday, December 24, 2015

Any noncompliant QC parameters or other notes impacting data interpretation are flagged or documented on the final report or are noted below.

A handwritten signature in black ink, consisting of several overlapping, slanted strokes, positioned above a horizontal line.

Certifies that this report has been approved by the Technical Director or Designee

179 Lake Avenue • Rochester, NY 14608 • (585) 647-2530 • Fax (585) 647-3311 • ELAP ID# 10958

This report is part of a multipage document and should only be evaluated in its entirety. The Chain of Custody provides additional sample information, including compliance with the sample condition requirements upon receipt.

Page 1 of 9

Report Prepared Thursday, December 24, 2015



Lab Project ID: 155437

Client: GZA Geo Environmental of New York

Project Reference: 21.0056546.00 Task 33

Sample Identifier: Pre-Carbon

Lab Sample ID: 155437-01

Date Sampled: 12/18/2015

Matrix: Air

Date Received: 12/21/2015

Volatile Organics

Analyte	Result	Units	Qualifier	Date Analyzed
1,1,1-Trichloroethane	< 2.00	mg/m3		12/22/2015 03:58
1,1-Dichloroethane	< 2.00	mg/m3		12/22/2015 03:58
1,1-Dichloroethene	< 2.00	mg/m3		12/22/2015 03:58
1,2-Dichloropropane	< 2.00	mg/m3		12/22/2015 03:58
2-Butanone (MEK)	< 10.0	mg/m3		12/22/2015 03:58
Benzene	< 2.00	mg/m3		12/22/2015 03:58
Chlorobenzene	< 2.00	mg/m3		12/22/2015 03:58
Chloroform	< 2.00	mg/m3		12/22/2015 03:58
cis-1,2-Dichloroethene	< 2.00	mg/m3		12/22/2015 03:58
Ethylbenzene	< 2.00	mg/m3		12/22/2015 03:58
m,p-Xylene	< 2.00	mg/m3		12/22/2015 03:58
Methyl tert-butyl Ether	< 2.00	mg/m3		12/22/2015 03:58
Methylene chloride	< 5.00	mg/m3		12/22/2015 03:58
o-Xylene	< 2.00	mg/m3		12/22/2015 03:58
Tetrachloroethene	3.52	mg/m3		12/22/2015 03:58
Toluene	< 2.00	mg/m3		12/22/2015 03:58
trans-1,2-Dichloroethene	< 2.00	mg/m3		12/22/2015 03:58
Trichloroethene	< 2.00	mg/m3		12/22/2015 03:58
Vinyl chloride	< 2.00	mg/m3		12/22/2015 03:58

Surrogate	Percent Recovery	Limits	Outliers	Date Analyzed
1,2-Dichloroethane-d4	103	80.6 - 125		12/22/2015 03:58
4-Bromofluorobenzene	98.7	86.6 - 111		12/22/2015 03:58
Pentafluorobenzene	105	90.9 - 107		12/22/2015 03:58
Toluene-D8	97.9	90.8 - 109		12/22/2015 03:58

Method Reference(s): EPA 8260C Modified
EPA 5030C modified

Data File: x28524.D

This test represents parameters for which Paradigm does not carry ELAP certification. The results of this test should only be used where ELAP certification is not required, such as personal exposure assessment.



Client: GZA Geo Environmental of New York

Project Reference: 21.0056546.00 Task 33

Sample Identifier: Mid-Carbon

Lab Sample ID: 155437-02

Date Sampled: 12/18/2015

Matrix: Air

Date Received: 12/21/2015

Volatile Organics

Analyte	Result	Units	Qualifier	Date Analyzed
1,1,1-Trichloroethane	< 2.00	mg/m3		12/22/2015 04:23
1,1-Dichloroethane	< 2.00	mg/m3		12/22/2015 04:23
1,1-Dichloroethene	< 2.00	mg/m3		12/22/2015 04:23
1,2-Dichloropropane	< 2.00	mg/m3		12/22/2015 04:23
2-Butanone (MEK)	< 10.0	mg/m3		12/22/2015 04:23
Benzene	< 2.00	mg/m3		12/22/2015 04:23
Chlorobenzene	< 2.00	mg/m3		12/22/2015 04:23
Chloroform	< 2.00	mg/m3		12/22/2015 04:23
cis-1,2-Dichloroethene	< 2.00	mg/m3		12/22/2015 04:23
Ethylbenzene	< 2.00	mg/m3		12/22/2015 04:23
m,p-Xylene	< 2.00	mg/m3		12/22/2015 04:23
Methyl tert-butyl Ether	< 2.00	mg/m3		12/22/2015 04:23
Methylene chloride	< 5.00	mg/m3		12/22/2015 04:23
o-Xylene	< 2.00	mg/m3		12/22/2015 04:23
Tetrachloroethene	4.20	mg/m3		12/22/2015 04:23
Toluene	< 2.00	mg/m3		12/22/2015 04:23
trans-1,2-Dichloroethene	< 2.00	mg/m3		12/22/2015 04:23
Trichloroethene	< 2.00	mg/m3		12/22/2015 04:23
Vinyl chloride	< 2.00	mg/m3		12/22/2015 04:23

Surrogate	Percent Recovery	Limits	Outliers	Date Analyzed
1,2-Dichloroethane-d4	107	80.6 - 125		12/22/2015 04:23
4-Bromofluorobenzene	98.7	86.6 - 111		12/22/2015 04:23
Pentafluorobenzene	103	90.9 - 107		12/22/2015 04:23
Toluene-D8	95.4	90.8 - 109		12/22/2015 04:23

Method Reference(s): EPA 8260C Modified
EPA 5030C modified

Data File: x28525.D

This test represents parameters for which Paradigm does not carry ELAP certification. The results of this test should only be used where ELAP certification is not required, such as personal exposure assessment.



Lab Project ID: 155437

Client: GZA Geo Environmental of New York

Project Reference: 21.0056546.00 Task 33

Sample Identifier: Post-Carbon

Lab Sample ID: 155437-03

Date Sampled: 12/18/2015

Matrix: Air

Date Received: 12/21/2015

Volatile Organics

Analyte	Result	Units	Qualifier	Date Analyzed
1,1,1-Trichloroethane	< 2.00	mg/m3		12/22/2015 04:47
1,1-Dichloroethane	< 2.00	mg/m3		12/22/2015 04:47
1,1-Dichloroethene	< 2.00	mg/m3		12/22/2015 04:47
1,2-Dichloropropane	< 2.00	mg/m3		12/22/2015 04:47
2-Butanone (MEK)	< 10.0	mg/m3		12/22/2015 04:47
Benzene	< 2.00	mg/m3		12/22/2015 04:47
Chlorobenzene	< 2.00	mg/m3		12/22/2015 04:47
Chloroform	< 2.00	mg/m3		12/22/2015 04:47
cis-1,2-Dichloroethene	< 2.00	mg/m3		12/22/2015 04:47
Ethylbenzene	< 2.00	mg/m3		12/22/2015 04:47
m,p-Xylene	< 2.00	mg/m3		12/22/2015 04:47
Methyl tert-butyl Ether	< 2.00	mg/m3		12/22/2015 04:47
Methylene chloride	< 5.00	mg/m3		12/22/2015 04:47
o-Xylene	< 2.00	mg/m3		12/22/2015 04:47
Tetrachloroethene	3.28	mg/m3		12/22/2015 04:47
Toluene	< 2.00	mg/m3		12/22/2015 04:47
trans-1,2-Dichloroethene	< 2.00	mg/m3		12/22/2015 04:47
Trichloroethene	< 2.00	mg/m3		12/22/2015 04:47
Vinyl chloride	< 2.00	mg/m3		12/22/2015 04:47

Surrogate	Percent Recovery	Limits	Outliers	Date Analyzed
1,2-Dichloroethane-d4	110	80.6 - 125		12/22/2015 04:47
4-Bromofluorobenzene	98.0	86.6 - 111		12/22/2015 04:47
Pentafluorobenzene	103	90.9 - 107		12/22/2015 04:47
Toluene-D8	96.1	90.8 - 109		12/22/2015 04:47

Method Reference(s): EPA 8260C Modified
EPA 5030C modified

Data File: x28526.D

This test represents parameters for which Paradigm does not carry ELAP certification. The results of this test should only be used where ELAP certification is not required, such as personal exposure assessment.



Lab Project ID: 155437

Client: GZA Geo Environmental of New York

Project Reference: 21.0056546.00 Task 33

Sample Identifier: Duplicate

Lab Sample ID: 155437-04

Date Sampled: 12/18/2015

Matrix: Air

Date Received: 12/21/2015

Volatile Organics

Analyte	Result	Units	Qualifier	Date Analyzed
1,1,1-Trichloroethane	< 2.00	mg/m3		12/22/2015 05:11
1,1-Dichloroethane	< 2.00	mg/m3		12/22/2015 05:11
1,1-Dichloroethene	< 2.00	mg/m3		12/22/2015 05:11
1,2-Dichloropropane	< 2.00	mg/m3		12/22/2015 05:11
2-Butanone (MEK)	< 10.0	mg/m3		12/22/2015 05:11
Benzene	< 2.00	mg/m3		12/22/2015 05:11
Chlorobenzene	< 2.00	mg/m3		12/22/2015 05:11
Chloroform	< 2.00	mg/m3		12/22/2015 05:11
cis-1,2-Dichloroethene	< 2.00	mg/m3		12/22/2015 05:11
Ethylbenzene	< 2.00	mg/m3		12/22/2015 05:11
m,p-Xylene	< 2.00	mg/m3		12/22/2015 05:11
Methyl tert-butyl Ether	< 2.00	mg/m3		12/22/2015 05:11
Methylene chloride	< 5.00	mg/m3		12/22/2015 05:11
o-Xylene	< 2.00	mg/m3		12/22/2015 05:11
Tetrachloroethene	2.16	mg/m3		12/22/2015 05:11
Toluene	< 2.00	mg/m3		12/22/2015 05:11
trans-1,2-Dichloroethene	< 2.00	mg/m3		12/22/2015 05:11
Trichloroethene	< 2.00	mg/m3		12/22/2015 05:11
Vinyl chloride	< 2.00	mg/m3		12/22/2015 05:11

Surrogate	Percent Recovery	Limits	Outliers	Date Analyzed
1,2-Dichloroethane-d4	108	80.6 - 125		12/22/2015 05:11
4-Bromofluorobenzene	96.3	86.6 - 111		12/22/2015 05:11
Pentafluorobenzene	104	90.9 - 107		12/22/2015 05:11
Toluene-D8	98.5	90.8 - 109		12/22/2015 05:11

Method Reference(s): EPA 8260C Modified
EPA 5030C modified

Data File: x28527.D

This test represents parameters for which Paradigm does not carry ELAP certification. The results of this test should only be used where ELAP certification is not required, such as personal exposure assessment.



Analytical Report Appendix

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All soil/sludge samples have been reported on a dry weight basis, unless qualified "reported as received". Other solids are reported as received.

Low level Volatiles blank reports for soil/solid matrix are based on a nominal 5 gram weight. Sample results and reporting limits are based on actual weight, which may be more or less than 5 grams.

The Chain of Custody provides additional information, including compliance with sample condition requirements upon receipt. Sample condition requirements are defined under the 2003 NELAC Standard, sections 5.5.8.3.1 and 5.5.8.3.2.

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Data qualifiers are used, when necessary, to provide additional information about the data. This information may be communicated as a flag or as text at the bottom of the report. Please refer to the following list of analyte-specific, frequently used data flags and their meaning:

"<" = Analyzed for but not detected at or above the quantitation limit.

"E" = Result has been estimated, calibration limit exceeded.

"Z" = See case narrative.

"D" = Sample, Laboratory Control Sample, or Matrix Spike Duplicate results above Relative Percent Difference limit.

"M" = Matrix spike recoveries outside QC limits. Matrix bias indicated.

"B" = Method blank contained trace levels of analyte. Refer to included method blank report.

"J" = Result estimated between the quantitation limit and half the quantitation limit.

"L" = Laboratory Control Sample recovery outside accepted QC limits.

"P" = Concentration differs by more than 40% between the primary and secondary analytical columns.

"NC" = Not calculable. Applicable to RPD if sample or duplicate result is non-detect or estimated (see primary report for data flags). Applicable to MS if sample is greater or equal to ten times the spike added. Applicable to sample surrogates or MS if sample dilution is 10x or higher.

"" = Indicates any recoveries outside associated acceptance windows. Surrogate outliers in samples are presumed matrix effects. LCS demonstrates method compliance unless otherwise noted.*

"(1)" = Indicates data from primary column used for QC calculation.

"A" = denotes a parameter for which ELAP does not offer approval as part of their laboratory certification program.

"F" = denotes a parameter for which Paradigm does not carry certification, the results for which should therefore only be used where ELAP certification is not required, such as personal exposure assessment.

GENERAL TERMS AND CONDITIONS

LABORATORY SERVICES

These Terms and Conditions embody the whole agreement of the parties in the absence of a signed and executed contract between the Laboratory (LAB) and Client. They shall supersede all previous communications, representations, or agreements, either verbal or written, between the parties. The LAB specifically rejects all additional, inconsistent, or conflicting terms, whether printed or otherwise set forth in any purchase order or other communication from the Client to the LAB. The invalidity or unenforceability in whole or in part of any provision, term or condition hereof shall not affect in any way the validity or enforceability of the remainder of the Terms and Conditions. No waiver by LAB of any provision, term, or condition hereof or of any breach by or obligation of the Client hereunder shall constitute a waiver of such provision, term, or condition on any other occasion or a waiver of any other breach by or obligation of the Client. This agreement shall be administered and interpreted under the laws of the state which services are procured.

Warranty.

Recognizing that the nature of many samples is unknown and that some may contain potentially hazardous components, LAB warrants only that it will perform testing services, obtain findings, and prepare reports in accordance with generally accepted analytical laboratory principles and practices at the time of performance of services. LAB makes no other warranty, express or implied.

Scope and Compensation.

LAB agrees to perform the services described in the chain of custody to which these terms and conditions are attached. Unless the parties agree in writing to the contrary, the duties of LAB shall not be construed to exceed the services specifically described. LAB will use LAB default method for all tests unless specified otherwise on the Work Order.

Payment terms are net 30 days from the date of invoice. All overdue payments are subject to an interest charge of one and one-half percent (1-1/2%) per month or a portion thereof. Client shall also be responsible for costs of collection, including payment of reasonable attorney fees if such expense is incurred. The prices, unless stated, do not include any sale, use or other taxes. Such taxes will be added to invoice prices when required.

Prices.

Compensation for services performed will be based on the current Lab Analytical Fee Schedule or on quotations agreed to in writing by the parties. Turnaround time based charges are determined from the time of resolution of all work order questions. Testimony, court appearances or data compilation for legal action will be charged separately. Evaluation and reporting of initial screening runs may incur additional fees.

Limitations of Liability.

In the event of any error, omission, or other professional negligence, the sole and exclusive responsibility of LAB shall be to re-perform the deficient work at its own expense and LAB shall have no other liability whatsoever. All claims shall be deemed waived unless made in writing and received by LAB within ninety (90) days following completion of services.

LAB shall have no liability, obligation, or responsibility of any kind for losses, costs, expenses, or other damages (including but not limited to any special, direct, incidental or consequential damages) with respect to LAB's services or results.

All results provided by LAB are strictly for the use of its clients and LAB is in no way responsible for the use of such results by clients or third parties. All reports should be considered in their entirety, and LAB is not responsible for the separation, detachment, or other use of any portion of these reports. Client may not assign the lab report without the written consent of the LAB.

Client covenants and agrees, at its/his/her sole expense, to indemnify, protect, defend, and save harmless the LAB from and against any and all damages, losses, liabilities, obligations, penalties, claims, litigation, demands, defenses, judgments, suits, actions, proceedings, costs, disbursements and/or expenses (including, without limitation attorneys' and experts' fees and disbursements) of any kind whatsoever which may at any time be imposed upon, incurred by or asserted or awarded against client relating to, resulting from or arising out of (a) the breach of this agreement by this client, (b) the negligence of the client in handling, delivering or disclosing any hazardous substance, (c) the violation of the Client of any applicable law, (d) non-compliance by the Client with any environmental permit or (e) a material misrepresentation in disclosing the materials to be tested.

Hazard Disclosure.

Client represents and warrants that any sample delivered to LAB will be preceded or accompanied by complete written disclosure of the presence of any hazardous substances known or suspected by Client. Client further warrants that any sample containing any hazardous substance that is to be delivered to LAB will be packaged, labeled, transported, and delivered properly and in accordance with applicable laws.

Sample Handling.

Prior to LAB's acceptance of any sample (or after any revocation of acceptance), the entire risk of loss or of damage to such sample remains with Client. Samples are accepted when receipt is acknowledged on chain of custody documentation. In no event will LAB have any responsibility for the action or inaction of any carrier shipping or delivering any sample to or from LAB premises.

Client authorizes LAB to proceed with the analysis of samples as received by the laboratory, recognizing that any samples not in compliance with all current DOH-ELAP-NELAP requirements for containers, preservation or holding time will be noted as such on the final report.

Disposal of hazardous waste samples is the responsibility of the Client. If the Client does not wish such samples returned, LAB may add storage and disposal fees to the final invoice. Maximum storage time for samples is 30 days after completion of analysis unless modified by applicable state or federal laws. Client will be required to give the LAB written instructions concerning disposal of these samples.

LAB reserves the absolute right, exercisable at any time, to refuse to receive delivery of, refuse to accept, or revoke acceptance of any sample, which, in the sole judgment of LAB (a) is of unsuitable volume, (b) may be or become unsuitable for or may pose a risk in handling, transport, or processing for any health, safety, environmental or other reason whether or not due to the presence in the sample of any hazardous substance, and whether or not such presence has been disclosed to LAB by Client or (c) if the condition or sample date make the sample unsuitable for analysis.

Legal Responsibility.

LAB is solely responsible for performance of this contract, and no affiliated company, director, officer, employee, or agent shall have any legal responsibility hereunder, whether in contract or tort including negligence.

Assignment.

LAB may assign its performance obligations under this contract to other parties, as it deems necessary. LAB shall disclose to Client any assignee (subcontractor) by ELAP ID # on the submitted final report.

Force Majeure.

LAB shall have no responsibility or liability to the Client for any failure or delay in performance by LAB, which results in whole or in part from any cause or circumstance beyond the reasonable control of LAB. Such causes and circumstances shall include, but not limited to, acts of God, acts or orders of any government authority, strikes or other labor disputes, natural disasters, accidents, wars, civil disturbances, difficulties or delays in transportation, mail or delivery services, inability to obtain sufficient services or supplies from LAB's usual suppliers, or any other cause beyond LAB's reasonable control.

Law.

This contract shall be continued under the laws of the State of New York without regard to its conflicts of laws provision.

This report is part of a multipage document and should only be evaluated in its entirety. The Chain of Custody provides additional sample information, including compliance with the sample condition requirements upon receipt. Page 7 of 9

Report Prepared Thursday, December 24, 2015



CHAIN OF CUSTODY

REPORT TO:			INVOICE TO:			LAB PROJECT ID		
CLIENT: GZA	ADDRESS: 535 Washington St		CLIENT:	ADDRESS:		155437		
CITY: Buffalo	STATE: NY	ZIP: 14203	CITY:	STATE:	ZIP:	Quotation #:		
PHONE: 716-685-2300	ATTN: T. Bohlen		PHONE:	ATTN:		Email: thomas.bohlen@gza.com		

PROJECT REFERENCE
 J1.0056546.00
 Task 23

Matrix Codes: AQ - Aqueous Liquid NQ - Non-Aqueous Liquid	WA - Water WG - Groundwater	DW - Drinking Water WW - Wastewater	SO - Soil SL - Sludge	SD - Solid PT - Paint	WP - Wipe CK - Caulk	OL - Oil AR - Air
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REQUESTED ANALYSIS												
DATE COLLECTED	TIME COLLECTED	COMPOSITE	GRAB	SAMPLE IDENTIFIER	MATRIX	COUNTAINERS				REMARKS	PARADIGM LAB SAMPLE NUMBER	
1 12-18-15	1240		X	Pre-Carbon	AR	1	X	8260 vol				01
2 ↓	1245		↓	Mid-Carbon	↓	↓	↓			See prev. work order		02
3 ↓	1250		↓	Post-Carbon	↓	↓	↓					03
4 ↓	-		X	Duplicate								04
5												
6												
7												
8												
9												
10												

Turnaround Time	Report Supplements			
Availability contingent upon lab approval; additional fees may apply.				
Standard 5 day <input checked="" type="checkbox"/>	Batch QC <input type="checkbox"/>	Basic EDD <input type="checkbox"/>		
Rush 3 day <input type="checkbox"/>	Category A <input type="checkbox"/>	NYSDEC EDD <input type="checkbox"/>		
Rush 2 day <input type="checkbox"/>	Category B <input type="checkbox"/>			
Rush 1 day <input type="checkbox"/>				
Other <input type="checkbox"/> please indicate: _____	Other <input type="checkbox"/> please indicate: _____	Other EDD <input type="checkbox"/> please indicate: _____		

P. Nyzynk 12/18/15
 Sampled By Date/Time
 Relinquished By 12/21/15 0955
 Received By 12/21/15 955
 Received @ Lab By 12/21/15 1348
 Date/Time

Total Cost:

P.I.F.

2072



Chain of Custody Supplement

Client: GZA Completed by: Molly Vail
 Lab Project ID: 155437 Date: 12/21/15

Sample Condition Requirements
 Per NELAC/ELAP 210/241/242/243/244

Condition	NELAC compliance with the sample condition requirements upon receipt		
	Yes	No	N/A
Container Type	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments	_____		
Transferred to method-compliant container	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Headspace (<1 mL)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Comments	_____		
Preservation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Comments	_____		
Chlorine Absent (<0.10 ppm per test strip)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Comments	_____		
Holding Time	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments	_____		
Temperature	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Comments	_____		
Sufficient Sample Quantity	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments	_____		