BROWNFIELD CLEANUP PROGRAM

SITE MANAGEMENT PLAN

295 Maryland Street Site
BCP Site No. C915242
Buffalo, New York

November 2015 0222-001-100

Prepared For:

295 Maryland, LLC

Prepared By:

BENCHMARK
ENVIRONMENTAL
ENGINEERING &
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295 MARYLAND STREET
NYSDEC SITE NUMBER: C915242
ERIE COUNTY
BUFFALO, NEW YORK

November 2015 0222-014-100

Prepared for:

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Revisions to Final Approved Site Management Plan:

Revision #	Submitted Date	Summary of Revision	NYSDEC Approval Date

NOVEMBER 2015

CERTIFICATION STATEMENT

I, Thomas H. Forbes, P.E., of Benchmark Environmental Engineering & Science, PLLC certify that I am currently a [NYS registered professional engineer and that this Site Management Plan for the 295 Maryland Street Site, C915242, was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

_____ [P.E., QEP]

_____DATE

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List of Acronyms

AS	Air Sparging
ASP	Analytical Services Protocol
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CAMP	Community Air Monitoring Plan
C/D	Construction and Demolition
CFR	Code of Federal Regulation
CLP	Contract Laboratory Program
COC	Certificate of Completion
CO2	Carbon Dioxide
CP	Commissioner Policy
DER	Division of Environmental Remediation
EC	Engineering Control
ECL	Environmental Conservation Law
ELAP	Environmental Laboratory Approval Program
ERP	Environmental Restoration Program
GHG	Green House Gas
GWE&T	Groundwater Extraction and Treatment
HASP	Health and Safety Plan
IC	Institutional Control
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYCRR	New York Codes, Rules and Regulations
O&M	Operations and Maintenance
OM&M	Operation, Maintenance and Monitoring
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
PID	Photoionization Detector
PRP	Potentially Responsible Party
PRR	Periodic Review Report
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RAO	Remedial Action Objective
RAWP	Remedial Action Work Plan
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RP	Remedial Party
RSO	Remedial System Optimization
SAC	State Assistance Contract
SCG	Standards, Criteria and Guidelines
SCO	Soil Cleanup Objective

SMP	Soil Management Plan
SOP	Standard Operating Procedures
SOW	Statement of Work
SPDES	State Pollutant Discharge Elimination System
SSD	Sub-slab Depressurization
SVE	Soil Vapor Extraction
SVI	Soil Vapor Intrusion
SVMS	Soil Vapor Mitigation System
TAL	Target Analyte List
TCL	Target Compound List
TCLP	Toxicity Characteristic Leachate Procedure
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VCA	Voluntary Cleanup Agreement
VCP	Voluntary Cleanup Program

ES EXECUTIVE SUMMARY

The following provides a brief summary of the controls implemented for the Site, as well as the inspections, monitoring, maintenance and reporting activities required by this Site Management Plan:

Institutional Controls:	1. The property may be used for restricted residential; commercial, or industrial use as described in 6NYCRR Part 375-1.8(g)(2)(ii-iv); 2. All Engineering Controls (ECs) must be operated and maintained as specified in this SMP; 3. All ECs must be inspected at a frequency and in a manner defined in the SMP. 4. The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the Erie County Department of Health to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the Department. 5. Data and information pertinent to site management must be reported at the frequency and in a manner as defined in this SMP. 6. All future activities that will disturb remaining contaminated material must be conducted in accordance with this SMP. 7. Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in this SMP; 8. Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical component of the

	remedy shall be performed as defined in this SMP; 9. Access to the site must be provided to agents, employees or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified. 10. All ECs must be inspected at a frequency and in a manner defined in the SMP.
Engineering Controls:	1. Composite Cover system, comprised of building, concrete and asphalt pavement, and 2 feet of soil above demarcation layer in vegetated areas.
Inspections:	Frequency
1. Cover Inspection	Annually
Reporting:	Frequency
1. Periodic Review Report	Annually

Further descriptions of the above requirements are provided in detail in the latter sections of this Site Management Plan.

1.0 INTRODUCTION AND DESCRIPTION OF REMEDIAL PROGRAM

1.1 Introduction

This Site Management Plan (SMP) is a required element of the remedial program for the 295 Maryland Street Site located in Buffalo, New York (hereinafter referred to as the "Site"; See Figures 1 and 2). The Site is currently in the New York State (NYS) Brownfield Cleanup Program (BCP), Site #C915242 which is administered by New York State Department of Environmental Conservation (NYSDEC).

1.1.1 General

295 Maryland, LLC entered into a Brownfield Cleanup Agreement (BCA) on July 14, 2011 with the NYSDEC to remediate the site. Figures showing the site location and boundaries of this site are provided as Figures 1 and 2, respectively. The boundaries of the site are more fully described in the metes and bounds site description that is part of the Environmental Easement provided in Appendix A.

After completion of the remedial work, some contamination was left at this site, which is hereafter referred to as "remaining contamination". Institutional and Engineering Controls (ICs and ECs) have been incorporated into the site remedy to control exposure to remaining contamination to ensure protection of public health and the environment. An Environmental Easement granted to the NYSDEC, and recorded with the Erie County Clerk, requires compliance with this SMP and all ECs and ICs placed on the site.

This SMP was prepared to manage remaining contamination at the site until the Environmental Easement is extinguished in accordance with ECL Article 71, Title 36. This plan has been approved by the NYSDEC, and compliance with this plan is required by the grantor of the Environmental Easement and the grantor's successors and assigns. This SMP may only be revised with the approval of the NYSDEC.

It is important to note that:

- This SMP details the site-specific implementation procedures that are required by the Environmental Easement. Failure to properly implement the SMP is a violation of the Environmental Easement, which is grounds for revocation of the Certificate of Completion (COC);

- Failure to comply with this SMP is also a violation of Environmental Conservation Law, 6NYCRR Part 375 and the BCA (Index #C915242-05-11; Site #C915242) for the site, and thereby subject to applicable penalties.

All reports associated with the site can be viewed by contacting the NYSDEC or its successor agency managing environmental issues in New York State. A list of contacts for persons involved with the site is provided in Appendix B of this SMP.

This SMP was prepared by Benchmark Environmental Engineering & Science, PLLC, on behalf of 295 Maryland, LLC, in accordance with the requirements of the NYSDEC's DER-10 ("Technical Guidance for Site Investigation and Remediation"), dated May 2010, and the guidelines provided by the NYSDEC. This SMP addresses the means for implementing the ICs and/or ECs that are required by the Environmental Easement for the site.

1.1.2 Revisions

Revisions to this plan will be proposed in writing to the NYSDEC's project manager. Revisions will be necessary upon, but not limited to, the following occurring: a change in media monitoring requirements, upgrades to or shut-down of a remedial system, post-remedial removal of contaminated sediment or soil, or other significant change to the site conditions. In accordance with the Environmental Easement for the site, the NYSDEC will provide a notice of any approved changes to the SMP, and append these notices to the SMP that is retained in its files.

1.1.3 Notifications

Notifications will be submitted by the property owner to the NYSDEC, as needed, in accordance with NYSDEC's DER – 10 for the following reasons:

- 60-day advance notice of any proposed changes in site use that are required under the terms of the BCA, 6NYCRR Part 375 and/or Environmental Conservation Law.

- 7-day advance notice of any field activity associated with the remedial program.

- 15-day advance notice of any proposed ground-intrusive activity pursuant to the Excavation Work Plan.

- Notice within 48-hours of any damage or defect to the foundation, structures or EC that reduces or has the potential to reduce the effectiveness of an EC, and likewise, any action to be taken to mitigate the damage or defect.

- Verbal notice by noon of the following day of any emergency, such as a fire; flood; or earthquake that reduces or has the potential to reduce the effectiveness of ECs in place at the site, with written confirmation within 7 days that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.

- Follow-up status reports on actions taken to respond to any emergency event requiring ongoing responsive action submitted to the NYSDEC within 45 days describing and documenting actions taken to restore the effectiveness of the ECs.

Any change in the ownership of the site or the responsibility for implementing this SMP will include the following notifications:

- At least 60 days prior to the change, the NYSDEC will be notified in writing of the proposed change. This will include a certification that the prospective purchaser/Remedial Party has been provided with a copy of the Brownfield Cleanup Agreement (BCA), and all approved work plans and reports, including this SMP.

- Within 15 days after the transfer of all or part of the site, the new owner's name, contact representative, and contact information will be confirmed in writing to the NYSDEC.

Table 1 includes contact information for the above notification. The information on this table will be updated as necessary to provide accurate contact information. A full listing of site-related contact information is provided in Appendix B.

2.0 SUMMARY OF PREVIOUS INVESTIGATIONS AND REMEDIAL ACTIONS

2.1 Site Location and Description

The site is located in the City of Buffalo, Erie County, New York and is identified as Section 111.21 Block 8 and Lots 3.111 and 1.1 on the Erie County Tax Map (see Figure [x]). The site is an approximately 1.5-acre area and is bounded by Maryland Street to the northwest and West Avenue to the southwest. (see Figure 2 – Site Layout Map). The boundaries of the site are more fully described in Appendix A –Environmental Easement. The owners of the site parcels at the time of issuance of this SMP are 295 Maryland, LLC and Anthony P. LoRusso.

2.2 Physical Setting

2.2.1 Land Use

The Site is generally flat and partially vegetated. The Site is zoned for commercial and residential use, but is currently vacant. Properties surrounding the site are primarily residential with, some mixed use commercial/residential properties.

2.2.2 Geology

Soil at the 295 Maryland Street Site generally consists of fill to a nominal depth between 3 and 4 feet below ground surface (fbgs), with deeper areas of fill identified in certain areas where former dwellings with basements were located. Fill thickness thins toward West Avenue consistent with Site topography. Groundwater was not encountered within the fill, excluding some instances of perched water over clayey soils. The fill material generally consists of fine-grained soil (silt and clay) with mixtures of brick, concrete, ash, slag, and varying types of metallic debris. Beneath the fill material is a thin native topsoil layer underlain by brown clayey soils containing some silt typically extending to approximately 15-20 fbgs, on average.

2.2.3 Hydrogeology

A sandy silt layer beneath the clay layer is present at depths of 15-20 fbgs and represents the uppermost water bearing unit at the Site. A groundwater contour map is shown in Figure 3. As indicated, overburden groundwater flows toward the southwest.

Groundwater elevation data collected during site characterization activities is provided in Table 2. Groundwater monitoring well construction logs are provided in Appendix C.

2.3 Summary of Remedial Investigation Findings and History

The following narrative provides a remedial history timeline and a brief summary of the available project records to document key investigative and remedial milestones for the Site. Full titles for each of the reports referenced below are provided in Section 8.0 - References.

The Site was historically used in a residential and commercial capacity, with the property at 295 Maryland Street most recently occupied by a firm specializing in the sale of billboard advertising space and erection of billboard signs. The advertising firm relocated to another location within the City in December 2000; the associated commercial buildings and facilities on 295 Maryland Street as well as former residences at 121 West Avenue have been demolished. Currently, the Site is vacant and undeveloped.

2.3.1 Phase I Site Assessments

A Phase I Environmental Site Assessment (ESA) was performed for the 295 Maryland Street property in January 2000, prior to commercial building demolition (Ref. 1). A separate Phase I ESA was prepared in 2001 for 121-129 West Avenue on behalf of the Buffalo Niagara Renaissance Corporation (BNRC) (Ref. 2). The ESA reports indicate that 121-129 West Avenue was historically used for residential purposes, with 295 Maryland Street historically improved with an office, commercial building, and two multiple bay garages. Potential recognized environmental conditions (RECs) at 295 Maryland Street included:

- Vehicle maintenance
- Use and storage of paints, adhesives, and other flammables

- Underground storage tanks (USTs): 550-gallon and 4,000-gallon gasoline USTs were reportedly removed from the Site in 1974 and 1997, respectively. In addition, a small UST containing benzene was reportedly discovered and removed during facility decommissioning.

2.3.2 Phase II Investigation

A Phase II Environmental Site Investigation was completed at 295 Maryland Street by Benchmark on behalf of the BNRC in November 2001 (Ref. 3). The Phase II identified surface and subsurface soil/fill materials exceeding NY State soil cleanup guidance values (i.e., as compared to TAGM 4046, the applicable NYSDEC guidance in place at that time) for certain parameters, including arsenic, lead, mercury, and several polyaromatic hydrocarbons (PAHs). These same parameters were elevated with respect to more recent Soil Cleanup Objectives (SCOs) for restricted-residential use as published in 6NYCRR Part 375.

In September 2001 Benchmark directed completion of an electromagnetic geophysical (EM-61) survey across 295 Maryland Street. The purpose of the EM-61 survey was to identify and define areas within the Site boundary that may be indicative of buried metal or other highly conductive material. Results of the geophysical survey indicated a number of suspect buried metallic anomalies across the property. Based on discussions with the former owner, several of the anomalies were suspected to be structural (reinforced) concrete. In addition, the former owner provided documentation substantiating removal of two USTs historically used for gasoline storage and a small UST historically containing benzene; these three USTs were identified in the January 2000 Phase I ESA Report. Nevertheless, Benchmark and the BNRC agreed that additional intrusive investigation would be required to positively identify the source of the anomalies. Accordingly, On October 22, 2001, a total of 10 test pits (EM-1 through EM-10) were excavated at suspect anomaly locations identified during the EM survey (see Figure 4). The test pits were excavated with a track-mounted excavator until the geophysical anomaly was positively identified, which occurred at depths ranging from 6 inches to 4 fbgs. All EM test pits positively identified each geophysical anomaly as metallic debris (e.g., steel channeling, plates, angles, etc.) and/or reinforced concrete; no vessels or containers were discovered. None of the test pits exhibited field evidence of impact with the exception of test pit EM-6, where a slight

petroleum odor and staining were noted in the excavated fill soils. Based on these observations, test pit EM-6 was extended approximately 6 feet in the northern direction to provide an indication of the extent of impact. As the test pit was continued to the north, visual and olfactory evidence of petroleum became less evident to the point where no impacts were observed. In addition, perched water was encountered at the apparent native soil interface (approximately 3 fbgs), with a slight sheen observed on the perched water surface at this location.

In order to characterize the impacted soil/fill, a composite sample was collected from the side wall of test pit EM-6 for laboratory analysis of: "full list" volatile organic compounds (i.e., NYSDEC STARS List and Target Compound List volatiles); Target Compound List (TCL) semi-volatile organic compounds (SVOCs); Target Analyte List (TAL) inorganic compounds; and polychlorinated biphenyls (PCBs).

2.3.3 Soil Characterization Test Pits

On October 23, 2001, Benchmark completed 10 soil characterization test pits (TP-1 through TP-10) across the 295 Maryland Street parcel (see Figure 4). Each test pit was completed to a depth of 8 fbgs or refusal, whichever occurred first. Separate composite samples of the surficial (0-6" below grade) and subsurface (1' below grade to completion) soils were collected from each test pit. All shallow (0-6") samples were analyzed for TCL SVOCs, PCBs, and TAL inorganic compounds. Deeper samples (6" to completion) were analyzed for these same parameters as well as TCL VOCs.

2.3.4 2010-2011 Supplemental Investigation

In September 2010, Benchmark performed a preliminary groundwater investigation in support of the BCP application. Four groundwater monitoring wells (MW-1 to MW-4) were installed to allow for collection of representative overburden groundwater samples across the Site and determine groundwater elevation and flow direction. The wells were initially sampled in September 2010 and resampled for select parameters in March 2011. In addition, the drill rig advanced one soil boring (deemed SB-5) on the 129 West Avenue parcel to establish soil lithology and allow for sample collection on that property, which was not assessed during the 2001 Phase II investigation.

Borings MW-1 through MW-4 were drilled to a nominal depth of 22 fbgs, and SB-5 to 6 fbgs. Two soil samples were collected during soil boring advancement. Sample MW-3 (4-6') was collected to discretely characterize the native soil layer, as the 2001 program involved collection of a composite of subsurface soil/fill sample that straddled both the fill and native soil intervals. Sample SB-5 (0-2') was collected to characterize fill materials on the 129 West Avenue Parcel. The soil samples were analyzed for TCL VOCs, TCL SVOCs, PCBs, pesticides, and TAL inorganic compounds.

Groundwater grab samples were collected from each monitoring well; the September 2010 samples were analyzed for TCL VOCs, TCL SVOCs, Pesticides/PCBs, and TAL inorganic compounds as well as total cyanide. Samples collected on March 1, 2011 were analyzed for a subset of parameters based on detections during the first event.

2.3.5 Soil BUD-Evaluation

A soil beneficial use determination (BUD) investigation was performed in September 2013 to better assist in defining the volume of soil/fill materials potentially requiring remediation and evaluate the possibility of reuse of some of the soil at another BCP Site. The work included the completion of 25 test pits designated as TP-1-13 through TP-25-13 (see Figure 4). Several of the test pits were directed toward areas of former dwellings on the property to characterize backfill of the basement areas. Soil/fill samples were generally characterized within each test pit in 2-foot intervals continuously from the ground surface through the test pit terminus. No evidence of gross impact was observed with the exception of elevated PID readings in two areas (deemed "areas of concern or "AOCs": AOC 1 as represented by test pit TP-6-13 (5.5 to 11 fbgs); and AOC 2 as represented by test pits TP-9-13 (4 to 14 fbgs) and TP-13-13 (0 to 7 fbgs). At these locations, PID readings greater than 100 ppm were reported along with moderate odor.

To further assess potential impacts across the Site and determine potential alternatives for beneficial reuse of excavated soil/fill, 10 composite soil/fill samples were selected for laboratory analysis from 10 test pits at varying depths.

2.3.6 Soil Sample Results

Table 3 summarizes the analytical results of soil samples collected during the 2001 Phase II investigation, 2010 soil boring program, and 2013 pre-remedial investigation. Figure 4 shows the soil sample locations.

As indicated on Table 3, surficial (0-0.5') and subsurface (>0.5') soil testing identified several PAHs and five inorganic compounds at levels in excess of the NYSDEC Soil Clenup Objectives (SCOs) for restricted-residential use (see Figure 7). The compounds detected above restricted-residential SCOs in at least one samples include: benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3)pyrene, dibenz(a,h)anthracene, arsenic, barium, cadmium, lead, and mercury.

Samples from AOC 1 (TP-6-13; 7-9') and AOC 2 (TP-9-13; 9-12') were tested using the toxic characteristic leaching procedure (TCLP) with the extract analyzed for VOCs via USEPA Method 1311. No VOCs were detected in the extract from either sample. The negligible total VOCs and absence of leachable VOCs in these AOCs suggested that the elevated PID readings and moderate odors are indicative of weathered petroleum from a historic release.

2.3.7 Groundwater Sample Analytical Results

Table 4 summarizes the analytical results of the groundwater sampling. As indicated, select VOCs and SVOCs were detected in the sample from well MW-2 at concentrations above NYSDEC groundwater quality standards and guidance values (GWQS/GVs). The VOCs and SVOCs detected above these standards included: benzene, ethylbenzene, toluene, and xylenes (BTEX); 1,2,4-trimethylbenzene; isopropylbenzene; benzo(a)anthracene; and naphthalene, all of which are constituents of petroleum products (e.g., gasoline or diesel). No other VOCs or SVOCs exceeded GWQS/GVs. Individual VOC and SVOC concentrations at well MW-2 were less than 100 micrograms per liter (ug/L). The total VOC concentrations from each of the two sampling rounds were 196 and 263 ug/L, well below the 1,000 ug/L threshold typically employed for inactivation of petroleum spill sites. Benzo(a)anthracene and naphthalene are relatively immobile in groundwater (i.e., high octanol-water partition coefficient and low water solubility). Results of groundwater testing are presented on Figure 5 for the sampling done on March 1, 2011.

Pesticides were also detected in the groundwater from all four wells. Pesticide exceedances of the GWQS/GVs were reported in wells MW-2, MW-3, and MW-4 for one or more of the following: alpha-BHC, beta-BHC, dieldrin, gamma-chlordane, and heptachlor. Concentrations were all less than 1 ug/L. Higher levels of pesticides were identified in wells MW-4 (upgradient) and MW-3, suggesting groundwater transport onto the Site from an upgradient source. Downgradient well MW-2 had one exceedance (beta-BHC) of the GWQS/GVs at a concentration of 0.06 ug/L during the September 23, 2010 sampling event. Well MW-1 did not contain any pesticide concentration above the GWQS/GVs.

Groundwater from all four wells contained levels of sodium greater than the GWQS. Groundwater from well MW-4 contained a slight exceedance of manganese (0.315 mg/L) as compared to the GWQS (0.3 mg/L). Sodium and manganese are naturally-occurring minerals. Their presence in the upgradient wells indicates ambient conditions.

2.3.8 Chemicals of Potential Concern

Based on the foregoing, chemicals of potential concern (COPCs) in groundwater and soil, as defined by exceedances of restricted-residential SCOs, included benzo(a)pyrene, benzo(b)fluoranthene, chrysene, indeno(1,2,3-cd)pyrene, arsenic, lead, mercury, chromium, naphthalene, beta-bhc, alpha-bhc, benzo(a)anthracene, arsenic, dieldrin, dibenz(a,h)anthracene, benzene, toluene, ethylbenzene, and xylenes (BTEX).

2.4 Remedial Action Objectives

The Remedial Action Objectives (RAOs) for the Site as listed in the Decision Document dated March 2015 are as follows:

2.4.1 Groundwater

RAOs for Public Health Protection

- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.

- Prevent contact with, or inhalation of, volatiles from contaminated groundwater.

RAOs for Environmental Protection

- Remove the source of ground or surface water contamination.

2.4.2 Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.

RAOs for Environmental Protection

- Prevent migration of contaminants that would result in groundwater or surface water contamination.

2.4.3 Soil Vapor

RAOs for Public Health Protection

- Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into buildings at a site.

2.5 Remaining Contamination

The selected remedy for the site was a Track 4: Restricted Residential use with site-specific soil cleanup objectives remedy. The elements of the selected remedy included:

- **Excavation:** Limited excavation and off-site disposal of approximately 3,584 tons (2,240 cubic yards) of soil/fill 0.5 – 8 feet below ground surface (fbgs) impacted by metals, polycyclic aromatic hydrocarbons (PAHs), or grossly contaminated material as per NYCRR Part 375 1.2(u) in six (6) discrete areas of concern (AOCs) exceeding commercial SCOs for metals and total PAH values above 100 mg/kg, as (see Figure 5). Following excavation the site was re-graded to accommodate installation of a cover system as described below. Where needed, clean backfill soil or aggregate meeting the requirements of 6 NYCRR Part 375-6.7(d) was brought in to provide support for pavement, building slabs/foundations, etc. and establish the design subgrade elevations at the site.

- **Cover System:** Because the excavation was focused on AOCs and did not include all areas of the property where constituents in excess of Restricted Residential SCOs

are present, a site cover was required to allow for restricted residential use of the site. The cover consists either of the structures such as buildings, pavement, sidewalks comprising the site development or a soil cover in vegetated areas. Where the soil cover was placed it was a minimum of two feet of soil, meeting the SCOs for cover material as set forth in 6 NYCRR Part 375-6.7(d) for restricted residential use. The soil cover was placed over a demarcation layer, with the upper six inches of the soil of sufficient quality to maintain a vegetation layer.

Soil and groundwater conditions before and after remedy implementation are discussed below.

2.5.1 Groundwater

Table 4 summarizes the results of all samples of groundwater that were collected prior to completion of the remedial action. Results of testing from the most recent groundwater sampling round (March 1, 2011) are also presented schematically on Figure 3. In both cases exceedances of GWQS/GVs, where present, are highlighted.

Groundwater constituents that were identified above GWQS/GVs but were not otherwise identified in upgradient wells include VOC and SVOC compounds commonly associated with petroleum products (e.g., gasoline or diesel). While groundwater samples from well MW-2 exceeded GWQS/GVs for certain petroleum VOCs and SVOCs, the concentrations present are not indicative of a large release; rather, these results are indicative of residual contamination in *de minimis* quantities. Further, the contaminants are subject to natural degradation due to sorption and biodegradation, and the likely source of VOCs has been removed (i.e., historic underground storage tanks and AOCs). Consequently, the levels of VOCs are expected to continue to naturally degrade over time.

2.5.2 Soil

Table 3 summarizes the results of all soil samples collected and analyzed as part of the site characterization process, and highlights exceedances of the SCOs that existed prior to implementation of the AOC excavation work. Exceedances of the Restricted Residential

SCOs (i.e., the comparative criteria deemed appropriate based upon the end use of the site) that existed prior to remedy implementation are also presented schematically on Figure 5.

As indicated above, the remedy selected for the Site was a Track 4 approach whereby the AOCs were removed to achieve site-specific cleanup levels and a cover system was then employed to mitigate exposure to remaining impacted soil/fill. Table 5 and Figure 6 summarize the results of all soil samples collected that exceed the Restricted Residential Use SCOs at the site after completion of the remedial action. Table 5 also includes exceedances of the Unrestricted Use SCOs. In all cases these exceedances are present beneath the 2 foot thick imported clean soil cover system or hard cover (building, pavement, etc.), and are generally limited to the fill materials present at thicknesses of 2-4 feet beneath the cover. Note that the imported clean soil cover material overlies an orange plastic netting material which serves as demarcation between the clean soils and the underlying fill materials.

3.0 ENGINEERING & INSTITUTIONAL CONTROL PLAN

3.1 Introduction

3.1.1 General

Since remaining contamination exists at the site, Institutional Controls (ICs) and Engineering Controls (ECs) are required to protect human health and the environment. This IC/EC Plan describes the procedures for the implementation and management of all IC/ECs at the site. The IC/EC Plan is one component of the SMP and is subject to revision by the NYSDEC.

3.1.2 Purpose

This plan provides:

- A description of all IC/ECs on the site;
- The basic implementation and intended role of each IC/EC;
- A description of the key components of the ICs set forth in the Environmental Easement;
- A description of the controls to be evaluated during each required inspection and periodic review;
- A description of plans and procedures to be followed for implementation of IC/ECs, such as the implementation of the Excavation Work Plan (EWP) (as provided in Appendix D for the proper handling of remaining contamination that may be disturbed during maintenance or redevelopment work on the site; and
- Any other provisions necessary to identify or establish methods for implementing the IC/ECs required by the site remedy, as determined by the NYSDEC.

3.2 Engineering Controls

3.2.1 Engineering Control Systems

3.2.1.1 Cover (or Cap)

Exposure to remaining contamination at the site is prevented by a cover system placed over the site. This cover system is comprised of a minimum of 24 inches, of clean soil, asphalt pavement, concrete-covered sidewalks, and concrete building slab,. Figure 7 presents the location of the cover system and applicable demarcation layers. The Excavation Work Plan (EWP) provided in Appendix D outlines the procedures required to be implemented in the event the cover system is breached, penetrated or temporarily removed, and any underlying remaining contamination is disturbed. Procedures for the inspection of this cover are provided in the Monitoring and Sampling Plan included in Section 4.0 of this SMP. Any work conducted pursuant to the EWP must also be conducted in accordance with the procedures defined in a Health and Safety Plan (HASP) and associated Community Air Monitoring Plan (CAMP) prepared for the site and provided in Appendix E.

3.2.1.2 Other ECs

The composite cover system is a permanent control and the quality and integrity of this system will be inspected at defined, regular intervals in accordance with this SMP in perpetuity.

3.3 Institutional Controls

A series of ICs is required by the Decision Document to: (1) implement, maintain and monitor Engineering Control systems; (2) prevent future exposure to remaining contamination; and, (3) limit the use and development of the site to restricted residential or more restrictive uses only. Adherence to these ICs on the site is required by the Environmental Easement and will be implemented under this SMP. ICs identified in the Environmental Easement may not be discontinued without an amendment to or extinguishment of the Environmental Easement. The IC boundaries extend to the limits of the site and are shown on the Environmental Easement (see Appendix A). These ICs are:

- The property may be used for : restricted residential; commercial, or industrial use;
- All ECs must be operated and maintained as specified in this SMP;
- All ECs must be inspected at a frequency and in a manner defined in the SMP.
- The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the Erie County Department of Health to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the Department.
- Data and information pertinent to site management must be reported at the frequency and in a manner as defined in this SMP;
- All future activities that will disturb remaining contaminated material must be conducted in accordance with this SMP;
- Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in this SMP;
- Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical component of the remedy shall be performed as defined in this SMP;
- Access to the site must be provided to agents, employees or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified by the Environmental Easement.
- The potential for vapor intrusion must be evaluated for any new buildings developed on the Site with a provision for implementing recommended actions to address exposures related to soil vapor intrusion, and any potential impacts that are identified must be monitored or mitigated; and
- Vegetable gardens and farming on the site are prohibited;

4.0 MONITORING AND SAMPLING PLAN

4.1 Introduction

4.1.1 General

The Monitoring Plan describes the measures for evaluating the performance and effectiveness of the remedy to reduce or mitigate contamination at the site, the soil cover system, and all affected site media identified below. Monitoring of other Engineering Controls is described in Chapter 4, Operation, Monitoring, and Maintenance Plan. This Monitoring Plan may only be revised with the approval of NYSDEC.

4.1.2 Purpose and Schedule

This Monitoring and Sampling Plan describes the methods to be used for:

- Sampling and analysis of all appropriate media (i.e., soil vapor.)
- Assessing compliance with applicable NYSDEC standards, criteria and guidance (SCGs), particularly NY State Department of Health Guidance for Evaluating Soil Vapor Intrusion; and
- Evaluating sampling information to confirm that the remedy continues to be effective in protecting public health and the environment;

To adequately address these issues, this Monitoring and Sampling Plan provides information on:

- Sampling locations, protocol and frequency;
- Analytical sampling program requirements; and
- Annual inspection and periodic certification.

Reporting requirements are provided in Section 7.0 of this SMP.

4.2 Site-Wide Inspection

Site-wide inspections will be performed at a minimum of once per year. Modification to the frequency or duration of the inspections will require approval from the NYSDEC. Site-wide inspections will also be performed after all severe weather conditions that may affect ECs or monitoring devices. During these inspections, an inspection form will be completed as provided in Appendix F – Site Management Forms. The form will compile sufficient information to assess the following:

- Compliance with all ICs, including site usage;
- An evaluation of the condition and continued effectiveness of ECs;
- General site conditions at the time of the inspection;
- The site management activities being conducted including, where appropriate, confirmation sampling and a health and safety inspection; and
- Confirm that site records are up to date.

Inspections of all remedial components installed at the site will be conducted. A comprehensive site-wide inspection will be conducted and documented according to the SMP schedule, regardless of the frequency of the Periodic Review Report. The inspections will determine and document the following:

- Whether ECs continue to perform as designed;
- If these controls continue to be protective of human health and the environment;
- Compliance with requirements of this SMP and the Environmental Easement;
- Achievement of remedial performance criteria; and
- If site records are complete and up to date

Reporting requirements are outlined in Section 7.0 of this plan.

Inspections will also be performed in the event of an emergency. If an emergency, such as a natural disaster or an unforeseen failure of any of the ECs occurs that reduces or has the potential to reduce the effectiveness of ECs in place at the site, verbal notice to the NYSDEC must be given by noon of the following day. In addition, an inspection of the site will be conducted within 5 days of the event to verify the effectiveness of the IC/ECs implemented at the site by a qualified environmental professional, as determined by the NYSDEC. Written confirmation must be provided to the NYSDEC within 7 days of the event that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.

4.3 Post-Remediation Media Monitoring and Sampling

Post-remedial Soil Vapor Intrusion (SVI) samples shall be collected from any newly constructed structures designed for human use. Sampling locations, required analytical parameters, and schedule are provided in Table 6 – SVI Sampling Requirements and Schedule. Modification to the frequency or sampling requirements will require approval from the NYSDEC and NYSDOH.

Detailed sample collection and analytical procedures and protocols are provided in Appendix G – Field Activities Plan and Appendix H – Quality Assurance Project Plan.

4.3.1 Soil Vapor Intrusion Sampling

Soil vapor intrusion (SVI) sampling will be performed, in accordance with the NYSDOH SVI Guidance document, for each newly constructed and operational building prior to occupancy and during the heating season, if those events do not coincide, to assess the performance of the remedy. Modification to the frequency or sampling requirements will require approval from the NYSDEC.

The network of soil vapor, sub-slab, indoor, and outdoor sample locations will be established and approved by the NYSDOH and NYSDEC based upon the building foundation design and intended use. Analyses shall be for Method TO-15 VOCs with low level detection limits by an ELAP-certified laboratory. The detection limit for indoor air samples of matrix 1 analytes will be 0.25 ug/m^3 and less than 1 ug/m^3 for all other samples.

The sampling frequency may only be modified with the approval of the NYSDEC. This SMP will be modified to reflect changes in sampling plans approved by the NYSDEC.

Deliverables for the soil vapor intrusion sampling program are specified in Section 7.0 – Reporting Requirements.

4.3.2 Monitoring and Sampling Protocol

All sampling activities will be recorded in a field book and associated sampling log as provided in Appendix F - Site Management Forms. Other observations (e.g., groundwater monitoring well integrity, etc.) will be noted on the sampling log. The sampling log will serve as the inspection form for the monitoring network. Additional detail regarding monitoring and sampling protocols are provided in the site-specific Field Activities Plan provided as Appendix G of this document.

5.0 OPERATION AND MAINTENANCE PLAN

5.1 General

The site remedy does not rely on any mechanical systems, such as groundwater treatment systems, sub-slab depressurization systems or air sparge/soil vapor extraction systems to protect public health and the environment. Therefore, the operation and maintenance of such components is not included in this SMP. However, this SMP will be modified to include an operation and maintenance plan if any such systems are installed on-Site after development.

6.0 PERIODIC ASSESSMENTS/EVALUATIONS

6.1 Climate Change Vulnerability Assessment

Increases in both the severity and frequency of storms/weather events, an increase in sea level elevations along with accompanying flooding impacts, shifting precipitation patterns and wide temperature fluctuation, resulting from global climactic change and instability, have the potential to significantly impact the performance, effectiveness and protectiveness of a given site and associated remedial systems. Vulnerability assessments provide information so that the site and associated remedial systems are prepared for the impacts of the increasing frequency and intensity of severe storms/weather events and associated flooding.

The subject site is considered to have low vulnerability related to climatic conditions. It is outside of any floodplains; will not employ any remedial systems reliant upon electrical power; will be serviced by a municipal storm drainage system; and will not incorporate any petroleum or chemical bulk storage in the redevelopment. In addition it will be substantially covered by hardscape (building, pavement, etc.), with only minimal green space cover comprised of 2 feet of clean, vegetated soil overlying a demarcation layer. Consequently, acute cap erosion resultant in potential exposure to remaining impacted soil/fill is unlikely.

6.2 Green Remediation Evaluation

NYSDEC's DER-31 Green Remediation requires that green remediation concepts and techniques be considered during all stages of the remedial program including site management, with the goal of improving the sustainability of the cleanup and summarizing the net environmental benefit of any implemented green technology. This section of the SMP provides a summary of any green remediation evaluations to be completed for the site during site management, and as reported in the Periodic Review Report (PRR).

6.2.1 Building Operations

Structures including buildings and sheds will be operated and maintained to provide for the most efficient operation of the remedy, while minimizing energy, waste generation and water consumption. The planned building will incorporate several energy conserving features, including high efficiency appliances, lighting, and HVAC equipment. In addition the building frame is intended to be constructed in modular fashion at an offsite facility, minimizing waste and prolonged use of onsite generators for conventional stick-built structures.

6.2.2 Frequency of System Checks, Sampling, and Other Periodic Activities

Transportation to and from the Site and use of consumables in relation to visiting the Site in order to conduct system checks and or collect samples and shipping samples to a laboratory for analyses have direct and/or inherent energy costs. The schedule and/or means of these periodic activities have been prepared so that these tasks can be accomplished in a manner that does not impact remedy protectiveness but reduces expenditure of energy or resources.

6.3 Remedial System Optimization

A Remedial Site Optimization (RSO) study will be conducted any time that the NYSDEC or the remedial party requests in writing that an in-depth evaluation of the remedy is needed. An RSO may be appropriate if any of the following occur:

- The remedial actions have not met or are not expected to meet RAOs in the time frame estimated in the Decision Document;
- The management and operation of the remedial system is exceeding the estimated costs;
- The remedial system is not performing as expected or as designed;
- Previously unidentified source material may be suspected;
- Plume shift has potentially occurred;

- Site conditions change due to development, change of use, change in groundwater use, etc.;
- There is an anticipated transfer of the site management to another remedial party or agency; and
- A new and applicable remedial technology becomes available.

An RSO will provide a critique of a site's conceptual model, give a summary of past performance, document current cleanup practices, summarize progress made toward the site's cleanup goals, gather additional performance or media specific data and information and provide recommendations for improvements to enhance the ability of the present system to reach RAOs or to provide a basis for changing the remedial strategy.

The RSO study will focus on overall site cleanup strategy, process optimization and management with the intent of identifying impediments to cleanup and improvements to site operations to increase efficiency, cost effectiveness and remedial time frames. Green remediation technology and principals are to be considered when performing the RSO.

7.0 REPORTING REQUIREMENTS

7.1 Site Management Reports

All site management inspection, maintenance and monitoring events will be recorded on the appropriate site management forms provided in Appendix F. These forms are subject to NYSDEC revision.

All applicable inspection forms and other records, including media sampling data and system maintenance reports, generated for the site during the reporting period will be provided in electronic format to the NYSDEC in accordance with the requirements of Table 7 and summarized in the Periodic Review Report.

All interim monitoring/inspections reports will include, at a minimum:

- Date of event or reporting period;
- Name, company, and position of person(s) conducting monitoring/inspection activities;
- Description of the activities performed;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet);
- Type of samples collected (e.g., sub-slab vapor, indoor air, outdoor air, etc);
- Copies of all field forms completed (e.g., well sampling logs, chain-of-custody documentation, etc.);
- Sampling results in comparison to appropriate standards/criteria;
- A figure illustrating sample type and sampling locations;
- Copies of all laboratory data sheets and the required laboratory data deliverables required for all points sampled (to be submitted electronically in the NYSDEC-identified format);
- Any observations, conclusions, or recommendations; and

- A determination as to whether contaminant conditions have changed since the last reporting event.

Routine maintenance event reporting forms will include, at a minimum:

- Date of event;
- Name, company, and position of person(s) conducting maintenance activities;
- Description of maintenance activities performed;
- Any modifications to the system;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet); and,
- Other documentation such as copies of invoices for maintenance work, receipts for replacement equipment, etc., (attached to the checklist/form).

Non-routine maintenance event reporting forms will include, at a minimum:

- Date of event;
- Name, company, and position of person(s) conducting non-routine maintenance/repair activities;
- Description of non-routine activities performed;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents (included either on the form or on an attached sheet); and
- Other documentation such as copies of invoices for repair work, receipts for replacement equipment, etc. (attached to the checklist/form).

Data will be reported in digital format as determined by the NYSDEC. Currently, data is to be supplied electronically and submitted to the NYSDEC EQuIS™ database in accordance with the requirements found at this link http://www.dec.ny.gov/chemical/62440.html.

7.2 Periodic Review Report

A Periodic Review Report (PRR) will be submitted to the Department beginning sixteen (16) months after the Certificate of Completion is issued. After submittal of the initial Periodic Review Report, the next PRR shall be submitted annually to the Department or at another frequency as may be required or agreed to by the Department. In the event that the site is subdivided into separate parcels with different ownership, a single Periodic Review Report will be prepared that addresses the site described in Appendix A - Environmental Easement. The report will be prepared in accordance with NYSDEC's DER-10 and submitted within 30 days of the end of each certification period. Media sampling results will also be incorporated into the Periodic Review Report. The report will include:

- Identification, assessment and certification of all ECs/ICs required by the remedy for the site.
- Results of the required annual site inspections and severe condition inspections, if applicable.
- All applicable site management forms and other records generated for the site during the reporting period in the NYSDEC-approved electronic format, if not previously submitted.
- A summary of any discharge monitoring data and/or information generated during the reporting period, with comments and conclusions.
- Data summary tables and graphical representations of contaminants of concern by media (groundwater, soil vapor, etc.), which include a listing of all compounds analyzed, along with the applicable standards, with all exceedances highlighted. These will include a presentation of past data as part of an evaluation of contaminant concentration trends.
- Results of all analyses, copies of all laboratory data sheets, and the required laboratory data deliverables for all samples collected during the reporting period will be submitted in digital format as determined by the NYSDEC. Currently, data is supplied electronically and submitted to the NYSDEC EQuIS™ database in accordance with the requirements found at this link: http://www.dec.ny.gov/chemical/62440.html.
- A site evaluation, which includes the following:
  - The compliance of the remedy with the requirements of the site-specific RAWP, ROD or Decision Document;

- The operation and the effectiveness of all treatment units, etc., including identification of any needed repairs or modifications;
- Any new conclusions or observations regarding site contamination based on inspections or data generated by the Monitoring and Sampling Plan for the media being monitored;
- Recommendations regarding any necessary changes to the remedy and/or Monitoring and Sampling Plan; and
- Trends in contaminant levels in the affected media will be evaluated to determine if the remedy continues to be effective in achieving remedial goals as specified by the Decision Document.
- The overall performance and effectiveness of the remedy.

7.2.1 Certification of Institutional and Engineering Controls

Following the last inspection of the reporting period, a qualified environmental professional will prepare, and include in the Periodic Review Report, the following certification as per the requirements of NYSDEC DER-10:

"For each institutional or engineering control identified for the site, I certify that all of the following statements are true:

- *The inspection of the site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under my direction;*
- *The institutional control and/or engineering control employed at this site is unchanged from the date the control was put in place, or last approved by the Department;*
- *Nothing has occurred that would impair the ability of the control to protect the public health and environment;*
- *Nothing has occurred that would constitute a violation or failure to comply with any site management plan for this control;*
- *Access to the site will continue to be provided to the Department to evaluate the remedy, including access to evaluate the continued maintenance of this control;*
- *If a financial assurance mechanism is required under the oversight document for the site, the mechanism remains valid and sufficient for the intended purpose under the document;*

- *Use of the site is compliant with the environmental easement;*
- *The engineering control systems are performing as designed and are effective;*
- *No new information has come to my attention, including groundwater monitoring data from wells located at the site boundary, if any, to indicate that the assumptions made in the qualitative exposure assessment of off-site contamination are no longer valid; and*
- *To the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program; and*
- *The information presented in this report is accurate and complete.*

I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law. I, [name], of [business address], am certifying as [Owner/Remedial Party or Owner's/Remedial Party's Designated Site Representative]

At the end of each certifying period, as determined by the NYSDEC, the following certification will be provided to the Department:

"For each institutional identified for the site, I certify that all of the following statements are true:

- *The institutional control employed at this site is unchanged from the date the control was put in place, or last approved by the Department;*
- *Nothing has occurred that would impair the ability of the control to protect the public health and environment;*
- *Nothing has occurred that would constitute a violation or failure to comply with any site management plan for this control;*
- *Access to the site will continue to be provided to the Department to evaluate the remedy, including access to evaluate the continued maintenance of this control;*
- *If a financial assurance mechanism is required under the oversight document for the site, the mechanism remains valid and sufficient for the intended purpose under the document;*
- *Use of the site is compliant with the environmental easement.*

- *No new information has come to my attention, including groundwater monitoring data from wells located at the site boundary, if any, to indicate that the assumptions made in the qualitative exposure assessment of off-site contamination are no longer valid; and*
- *The information presented in this report is accurate and complete.*

I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law. I, [name], of [business address], am certifying as [Owner or Owner's Designated Site Representative]

In addition, very five years the following certification will be added:

- *The assumptions made in the qualitative exposure assessment remain valid.*

The signed certification will be included in the Periodic Review Report.

The Periodic Review Report will be submitted, in electronic format, to the NYSDEC Central Office, Regional Office in which the site is located and the NYSDOH Bureau of Environmental Exposure Investigation. The Periodic Review Report may need to be submitted in hard-copy format, as requested by the NYSDEC project manager.

7.3 Corrective Measures Work Plan

If any component of the remedy is found to have failed, or if the periodic certification cannot be provided due to the failure of an institutional or engineering control, a Corrective Measures Work Plan will be submitted to the NYSDEC for approval. This plan will explain the failure and provide the details and schedule for performing work necessary to correct the failure. Unless an emergency condition exists, no work will be performed pursuant to the Corrective Measures Work Plan until it has been approved by the NYSDEC and NYSDOH.

7.4 Remedial Site Optimization Report

In the event that an RSO is to be performed, the RSO report will document the research/ investigation and data gathering that was conducted, evaluate the results and facts obtained, present a revised conceptual site model and present recommendations. RSO recommendations are to be implemented upon approval from the NYSDEC. Additional work plans, design documents, HASPs etc., may still be required to implement the recommendations, based upon the actions that need to be taken. A final engineering report and update to the SMP may also be required.

The RSO report will be submitted, in electronic format, to the NYSDEC Central Office, Regional Office in which the site is located, Site Control and the NYSDOH Bureau of Environmental Exposure Investigation.

8.0 REFERENCES

1. Clayton Group Services, Inc. Excerpts of the January 2000 *Phase I Environmental Site Assessment and Trench Sampling Report of the Lamar Outdoor Advertising Facility, 295 Maryland Street, Buffalo, New York*.

2. Benchmark Environmental Engineering & Science, PLLC. *Phase I Environmental Site Assessment at 295 Maryland Street & 121-129 West Avenue*. 2001.

3. Benchmark Environmental Engineering & Science, PLLC. *Phase II Environmental Site Investigation Report, 295 Maryland Street, Buffalo, NY*. November 2001.

4. 6NYCRR Part 375, Environmental Remediation Programs. December 14, 2006.

5. NYSDEC DER-10 – "Technical Guidance for Site Investigation and Remediation".

6. NYSDEC, 1998. Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1. June 1998 (April 2000 addendum).

TABLES

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 1
NOTIFICATIONS*

Site Management Plan
295 Maryland Street Site

Name	Contact Information
Anthony Lopes, P.E., (NYSDEC Project Manager)	(716) 851-7220 anthony.lopes@dec.ny.gov
Chad Staniszewski, P.E.	(716) 851-7220 chad.staniszewski@dec.ny.gov
Kelly Lewandowski	(518) 402-9575 kelly.lewandowski@dec.ny.gov

* Note: Notifications are subject to change and will be updated as necessary.

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 2
SUMMARY OF SEPTEMBER 2010 GROUNDWATER ELEVATIONS

Site Management Plan
295 Maryland Street Site

			18-Sep-10		23-Sep-10	
Monitoring Location	**Grade**	**Top of PVC Riser Elev.**	**Water Level from Top of Riser**	**Groundwater Elevation**	**Water Level from Top of Riser**	**Groundwater Elevation**
MW-1	492.4	491.78	7.94	483.84	8.09	483.69
MW-2	493.4	495.85	14.78	481.07	15.00	480.85
MW-3	497.2	499.49	15.08	484.41	15.25	484.24
MW-4	497.5	499.83	14.07	485.76	14.46	485.37

Notes:

1. All wells were surveyed on 10/12/10 with site specific datum of 500 feet.

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 3
SUMMARY OF SOIL/FILL ANALYTICAL RESULTS

Site Management Plan
295 Maryland Street Site

Parameter	Part 375 SCOs					2001 Test Pit Investigation																				2010 Boring Program		2013 Pre-Remedial Investigation									
	USCO	RSCO	RRSCO	CSCO	ISCO	TP-1 0-0.5'	TP-1 0.5-8'	TP-2 0-0.5'	TP-2 0.5-8'	TP-3 0-0.5'	TP-3 0.5-8'	TP-4 0-0.5'	TP-4 0.5-8'	TP-5 0-0.5'	TP-5 0.5-8'	TP-6 0-0.5'	TP-6 0.5-8'	TP-7 0-0.5'	TP-7 0.5-5.5'	TP-8 0-0.5'	TP-8 0.5-8'	TP-9 0-0.5'	TP-9 0.5-8'	TP-10 0-0.5'	TP-10 0.5-8'	EM-6 Composite	MW-3 4-6'	SB-5 0-2'	TP-4-13 0-3'	TP-5-13 0-3'	TP-6-13 7-9'	TP-7-13 0-3'	TP-9-13 9-12'	TP-13-13 8-9'	TP-22-13 6-8'	TP-23-13 0.5-3'	TP-24-13 0.5-4'	TP-25-13 0.5-4'
Volatile Organic Compounds (ug/kg)																																			
Benzene	60	2900	4800	44,000	89,000	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	NA	0.8	NA	--	NA	--	3	--	--	--	--	--	NA	--	--	NA	NA	NA
Acetone	50	100,000	100,000	500,000	1,000,000	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	--	--	--	--	--	--	NA	--	32	--	NA	NA	NA
2-butanone	None	None	None	None	None	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	--	--	--	--	--	--	NA	--	3 J	--	NA	NA	NA
Ethylbenzene	1,000	30,000	41,000	390,000	780,000	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	--	--	--	--	--	--	NA	62	--	--	NA	NA	NA
Bromomethane	None	None	None	None	None	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	--	--	--	--	--	--	NA	97 J	--	--	NA	NA	NA
p/m-xylene	260	100,000	100,000	500,000	1,000,000	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	--	--	--	--	--	--	NA	92 J	--	--	NA	NA	NA
Isopropylbenzene	None	None	None	None	None	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	--	--	--	--	--	--	NA	46 J	1.3	--	NA	NA	NA
Methylene chloride	50	5,100	100,000	500,000	1,000,000	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	--	7.9	3.5	--	--	--	NA	--	--	--	NA	NA	NA
TCLP Volatile Organic Compounds (ug/L)																																			
No Compounds Detected	None	None	None	None	None	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	--	NA	--	NA	NA	NA	NA	NA
Semi-Volatile Organic Compounds (ug/kg)																																			
2-Methylnaphthalene	None	None	None	None	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	69	--	--	--	--	--	--	18,000	--	--	NA	NA	NA
Acenaphthene	20,000	100,000	100,000	500,000	1,000,000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	250	--	--	--	--	--	--	3,000	240	--	NA	NA	NA
Anthracene	100,000	100,000	100,000	500,000	1,000,000	--	--	--	--	220	--	2,100	--	330	--	280	98	200	--	440	200	2,500	280	4,700	930	--	--	20	80 J	58 J	--	62 J	960	--	--	--	--	4,000
Benzo(a)anthracene	1,000	1,000	1,000	5,600	11,000	150	--	85	--	840	--	4,900	110	1,200	--	1,800	290	1,700	290	2,000	900	8,700	760	17,000	2,000	2,700	--	73	320	240	--	220	100 J	--	64 J	52 J	--	4,800
Benzo(a)pyrene	1,000	1,000	1,000	1,000	1,100	110	--	--	--	750	--	3,600	--	1,200	--	2,100	250	3,000	370	2,000	900	7,100	670	13,000	1,600	--	--	59	300	260	--	200	--	--	53 J	57 J	--	3,400
Benzo(b)fluoranthene	1,000	1,000	1,000	5,600	11,000	--	--	--	--	1,100	--	5,100	--	1,800	--	3,000	360	3,900	350	3,000	1,300	9,900	1,000	19,000	2,600	--	--	84	350	270	--	250	54 J	--	65 J	77 J	--	4,300
Benzo(g,h,i)perylene	100,000	100,000	100,000	500,000	1,000,000	--	--	--	--	330	--	1,400	--	770	--	1,800	99	2,700	720	1,300	470	3,300	260	5,700	680	--	--	47	180	170	--	--	--	--	--	--	NA	NA
Benzo(k)fluoranthene	800	1,000	3,900	56,000	110,000	--	--	--	--	410	--	1,900	--	540	--	900	140	1,200	--	1,100	540	3,800	330	8,100	980	--	--	31	180	130	--	120	--	--	66 J	40 J	--	2,000
Biphenyl	None	None	None	None	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	120	--	--	--	--	2,600	--	--	NA	NA	NA
Bis-2-ethylhexyl phthalate	None	None	None	None	None	--	--	--	--	--	--	--	--	--	--	--	--	250	970	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	NA	NA	NA
Butyl benzyl phthalate	None	None	None	None	None	--	--	--	--	--	--	--	--	--	--	--	--	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	NA	NA	NA
Carbazole	None	None	None	None	None	--	--	--	--	--	--	--	--	150	--	--	--	--	--	--	--	--	160	--	400	--	--	--	43 J	--	--	--	120 J	--	--	NA	NA	NA
Chrysene	1,000	1,000	3,900	56,000	110,000	120	--	75	--	710	--	4,100	98	1,100	--	1,600	240	1,700	420	1,700	830	7,400	660	14,000	1,700	2,800	--	77	330	210	--	240	110	--	--	60 J	--	4,200
Dibenzo (a,h) anthracene	330	330	330	560	1,100	--	--	--	--	--	--	--	--	--	--	420	--	610	--	--	--	--	--	--	--	--	--	--	50 J	55 J	--	--	--	--	--	--	--	560
Dibenzofuran	7,000	14,000	59,000	None	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	230	--	--	--	--	--	--	--	1,400	--	--	NA	NA	NA
Di-n-octyl phthalate	None	None	None	None	None	--	--	--	73	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	130	--	--	--	--	--	--	--	--	--	--	NA	NA	NA
Fluoranthene	100,000	100,000	100,000	500,000	1,000,000	230	--	--	--	1,700	--	13,000	240	2,500	--	2,200	570	1,400	320	3,600	2,400	19,000	1,600	38,000	4,800	--	--	150	640	280	37 J	--	700	--	120	NA	NA	NA
Fluorene	30,000	100,000	100,000	500,000	1,000,000	--	--	--	--	--	--	610	--	72	--	61	--	--	--	--	61	--	86	1,200	250	--	--	--	--	--	--	--	2,400	130 J	--	NA	NA	NA
Indeno(1,2,3-cd)pyrene	500	500	500	5,600	11,000	--	--	--	--	390	--	1,700	--	830	--	1,800	--	3,000	410	1,300	550	4,300	290	7,000	740	--	--	43	190	180	--	130 J	--	--	--	42 J	--	1,900
Naphthalene	12,000	100,000	100,000	500,000	1,000,000	--	--	--	--	61	--	--	--	--	--	--	--	--	--	--	--	--	--	--	150	--	--	--	--	--	--	--	17,000	--	--	NA	NA	NA
Phenanthrene	100,000	100,000	100,000	500,000	1,000,000	190	--	79	--	980	63	10,000	160	1,500	--	1,200	510	740	250	2,200	1,300	13,000	1,200	25,000	4,000	--	--	100	310	220	--	--	4,800	--	78 J	NA	NA	NA
Pyrene	100,000	100,000	100,000	500,000	1,000,000	230	--	130	--	1,600	110	10,000	190	3,600	--	6,400	530	5,500	1,900	4,800	2,200	18,000	1,500	35,000	4,100	--	--	120	530	260	--	--	580	--	100 J	NA	NA	NA
				TOTAL PAHs		***800***	--	*369*	*0*	***7,330***	*173*	***45,410***	***558***	***12,942***	--	***21,361***	***2,517***	***24,250***	***4,710***	***19,840***	***9,251***	***78,000***	***7,036***	***149,700***	***19,830***	***5,500***	--	***654***	***2,820***	***2,053***	--	***1,222***	***12,004***	*370*	*426*	*328*	--	***25,160***
PCBs (ug/kg)																																			
Total PCBs	100	1,000	1,000	1,000	25,000	--	--	--	--	--	42	12	--	48	--	61	--	57	--	91	--	211	--	765	--	--	--	--	--	--	NA	--	NA	NA	--	--	--	--
PCB 1254	None	None	None	None	None	--	--	--	--	--	42	12	--	48	--	61	--	57	--	91	--	211	--	765	--	--	--	--	--	--	NA	--	NA	NA	--	--	--	--
Pesticides (ug/kg)																																			
4,4'-DDE	3.3	1800	8900	62,000	120,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	--	4.1	4.66	--	NA	NA	NA	NA	--	NA	NA	NA
4,4'-DDT	3.3	1700	7900	47,000	94,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	--	4	--	--	NA	NA	NA	NA	--	NA	NA	NA
Inorganic Compounds (mg/kg)																																			
Aluminum	None	None	None	None	None	6,820	9,980	7,760	8,260	7,980	11,000	8,930	7,710	8,450	8,870	5,690	11,100	4,470	4,410	4,490	5,710	6,720	8,240	10,800	7,270	NA	11,600	13,800	8,700	10,000	NA	NA	NA	NA	8,000	NA	NA	NA
Antimony	None	None	None	None	None	--	--	--	--	--	--	--	8.11	--	--	--	--	7.18	--	7.83	--	--	8.45	--	--	NA	--	--	--	--	NA	NA	NA	NA	--	NA	NA	NA
Arsenic	13	16	16	16	16	2.9	3.5	7.8	2.8	7.2	3.3	16	2.4	23	3.1	4.2	5.2	3.1	4.1	4.7	7.8	4.1	7.5	1.1	3.2	NA	4.5	6.4	7	3.9	5	NA	NA	NA	3.5	2.8	4.4	3.4
Barium	350	350	400	400	10,000	97	82.7	90.2	67.4	218	95.5	327	80	516	78.2	213	106	61.8	552	98.8	192	143	150	140	73.5	NA	136	133	140	100	110	NA	NA	NA	72	78	72	69
Beryllium	7	14	72	590	2,700	0.486	0.539	0.646	0.477	0.536	0.676	0.596	0.46	0.601	0.506	0.603	0.628	0.543	0.244	0.493	0.478	0.778	0.508	2.03	0.467	NA	0.562	0.649	0.44	0.5	NA	NA	NA	NA	0.36 J	NA	NA	NA
Cadmium	2.5	2.5	4	9	60	--	0.608	--	0.885	1.29	--	3.17	0.775	4.2	0.673	1.44	0.599	0.872	1.41	0.651	2.26	2.91	1.81	1.87	0.697	NA	--	0.621	0.96	0.9	0.83	NA	NA	NA	0.72 J	0.63	0.6	1.1
Calcium	None	None	None	None	None	43,100	55,300	35,900	66,900	40,700	70,800	59,900	69,100	45,900	67,100	105,000	45,900	161,000	53,500	179,000	83,000	84,900	48,000	94,200	65,400	NA	55,100	13,200	40,000	9,000	NA	NA	NA	NA	67,000	NA	NA	NA
Chromium	30	36	180	1,500	6,800	8.84	11.5	9.08	10.5	65.4	14.4	37.4	11.3	71.6	11.8	17.2	15.3	11	10.7	13.6	13.8	30	18.9	18	11	NA	14.3	19.2	20	15	NA	NA	NA	NA	13	NA	NA	NA
Cobalt	None	None	None	None	None	5.34	7.83	5.61	7.87	7.42	8.85	6.96	7.15	6.91	9.2	3.74	7.64	1.9	5.38	2.9	5.4	5.15	6.45	3.83	6.09	NA	13	11.8	6	6.7	NA	NA	NA	NA	6.3	NA	NA	NA
Copper	50	270	270	270	1,000	23.8	19.3	25.7	18.5	141	39.5	52.3	17.2	52.3	18	28.8	23.3	19.9	33.4	23.2	49.3	35	28	30.7	22.5	NA	19.4	22.7	32	45	20	NA	NA	NA	19	12	18	37
Iron	None	None	None	None	None	11,100	14,600	8,830	14,600	14,500	19,700	15,200	13,000	15,700	15,200	8,850	17,200	6,390	9,990	7,620	14,500	17,300	19,700	11,700	13,000	NA	18,000	23,600	16,000	17,000	NA	NA	NA	NA	16,000	NA	NA	NA
Lead	63	400	400	1,000	3,900	302	55.2	182	34.3	3,610	126	3,270	167	8,160	36.3	632	150	71.4	1,420	176	503	602	344	328	97.6	NA	14.7	85.3	920	130	270	NA	NA	NA	48	17	110	120
Magnesium	None	None	None	None	None	7,170	16,600	9,630	21,100	12,000	22,900	9,830	20,100	12,000	24,500	15,800	17,900	18,200	9,160	13,600	9,960	23,500	16,000	28,500	21,600	NA	20,600	9,340	13,000	4,800	NA	NA	NA	NA	21,000	NA	NA	NA
Manganese	1,600	2,000	2,000	10,000	10,000	274	510	231	451	540	463	413	388	394	498	655	455	376	291	375	365	533	474	1,120	386	NA	648	904	340	520	NA	NA	NA	NA	390	NA	NA	NA
Mercury	0.18	0.81	0.81	3	6	0.31	--	0.3	--	1	0.3	0.94	0.19	1	--	--	0.062	--	--	0.11	0.92	0.35	0.25	--	--	NA	0.0218	0.167	1.3	1.1	0.7	NA	NA	NA	0.08	--	3.7	4
Nickel	30	140	310	310	10,000	11.1	16.7	11.6	17.6	17.8	20.3	16.2	15.2	15.5	18.3	14.8	19	9.55	10.6	9.59	20	15	17.2	14.9	15.1	NA	22	21.6	12	14	NA	NA	NA	NA	14	NA	NA	NA
Potassium	None	None	None	None	None	1120	1570	1320	1250	1250	1770	1410	1360	1370	1690	881	1620	579	803	726	996	983	1350	1030	1310	NA	1820	1910	950	960	NA	NA	NA	NA	1100	NA	NA	NA
Selenium	3.9	36	180	1,500	6,800	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	NA	--	--	--	--	NA	NA	NA	NA	--	NA	NA	NA
Silver	2	36	180	1,500	6,800	--	--	--	--	--	--	--	--	1.19	--	31.8	1.41	9.39	--	6.91	1.26	1.4	--	3.85	--	NA	--	--	--	--	--	NA	NA	NA	--	--	--	--
Sodium	None	None	None	None	None	149	159	1080	258	299	172	255	155	224	218	379	210	233	339	315	306	208	170	446	228	NA	260	--	88 J	140 J	NA	NA	NA	NA	120 J	NA	NA	NA
Thallium	None	None	None	None	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	NA	--	--	--	--	NA	NA	NA	NA	--	NA	NA	NA
Vanadium	None	None	None	None	None	14.9	19.9	20.7	17.7	19.9	26.2	20.1	17.2	19.1	19.5	12.2	22.6	10.2	12.2	8.37	17.1	11.9	18.8	10.3	15.3	NA	21.6	28.5	19	21	NA	NA	NA	NA	18	NA	NA	NA
Zinc	109	2,200	10,000	10,000	10,000	112	78	60.9	63.9	342	102	683	75.8	784	66.7	141	103	80	546	131	885	850	265	661	170	NA	66.5	135	210	140	99	NA	NA	NA	94	71	84	87

Notes:

= Exceeds the Unrestricted SCO (USCO)
= Exceeds the Residential SCO (RSCO)
= Exceeds the Restricted Residential SCO (RRSCO)
= Exceeds the Commercial SCO (CSCO)
= Exceeds the Industrial SCO (ISCO)

Semi-volatile Organic Compounds highlighted in blue are also categorized as Polyaromatic Hydrocarbons (PAHs). A total PAH concentration of 500 ppm was used to delineate the Track 4 cleanup extents in lieu of individual Industrial Restricted SCOs as specified in the CP-51 policy.

Definitions:
TCLP = Toxic characteristic leaching procedure
NA = not analyzed
-- = Not Detected

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 4
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Site Management Plan
295 Maryland Street Site

Parameter[1]	Sample ID and Date									GWQS/GV[2]
	MW-1		MW-2		MW-3		MW-4		Blind Dup[3]	
	(9/23/10)	(3/1/11)	(9/23/10)	(3/1/11)[4]	(9/23/10)	(3/1/11)	(9/23/10)	(3/1/11)[4]	(3/1/11)	
Volatile Organic Compounds (µg/L)										
1,2,4-Trimethylbenzene	ND	ND	ND	**19**	ND	ND	ND	ND	ND	**5**
1,3,5-Trimethylbenzene	--	ND	--	1.2	--	ND	--	ND	ND	**5**
Acetone	5	ND	ND	ND	ND	ND	ND	ND	ND	**50**
Benzene	ND	ND	**38**	**20**	ND	ND	ND	ND	ND	**1**
Chloroform	2	ND	4.2	ND	5.4	ND	2.8	ND	ND	**7**
Ethylbenzene	ND	ND	**39**	**46**	ND	ND	ND	ND	ND	**5**
Isopropylbenzene	ND	ND	ND	4.6	ND	ND	ND	ND	ND	**5**
m/p-Xylenes	--	ND	ND	**43**	ND	ND	ND	ND	ND	**5**
Methyl-t-Butyl Ether (MTBE)	ND	ND	ND	2.3	ND	ND	ND	ND	ND	**10**
o-Xylenes	--	ND	--	**35**	ND	ND	ND	ND	ND	**5**
Toluene	ND	ND	**18**	**14**	ND	ND	ND	ND	ND	**5**
Xylenes(Total)	ND	ND	**97**	**78**	ND	ND	ND	ND	ND	**5**
Semi-Volatile Organic Compounds (ug/L)										
2-Methylphenol	ND	--	1.3	--	ND	--	ND	--	--	**5**
Acetophenone	ND	--	2.8	--	1.1	--	ND	--	--	--
Benzo(a)anthracene	ND	--	**0.35**	ND	ND	--	ND	--	--	**0.002**
Butyl benzyl phthalate	0.51	--	0.71	--	0.58	--	0.72	--	--	**50**
Di-n-butyl phthalate	0.51	--	0.65	--	0.55	--	1.1	--	--	**50**
Fluoranthene	ND	--	0.47	ND	ND	--	ND	--	--	**50**
Naphthalene	ND	--	**21**	**92**	ND	--	ND	--	--	**10**
Phenanthrene	ND	--	0.58	ND	0.46	--	ND	--	--	**50**
Pyrene	ND	--	0.42	ND	ND	--	ND	--	--	**50**
Pesticides (ug/L)										
4,4'-DDD	ND	--	ND	--	0.23	0.04 J	0.25	0.036 J	0.022 J	**0.3**
4,4'-DDT	0.082	--	ND	--	ND	0.017 J	0.2	ND	ND	**0.2**
alpha-BHC	ND	--	ND	--	**0.18**	ND	ND	ND	ND	**0.01**
beta-BHC	ND	--	**0.06**	--	**0.13**	ND	**0.21**	ND	ND	**0.04**
Dieldrin	ND	--	ND	--	ND	ND	**0.14**	**0.027 J**	**0.031 J**	**0.004**
Endosulfan I	ND	--	ND	--	ND	ND	0.07	ND	ND	--
Endosulfan II	0.069	--	0.11	--	0.14	ND	0.14	0.016 J	ND	--
Endosulfan sulfate	ND	--	ND	--	ND	ND	0.092	ND	ND	--
Endrin aldehyde	ND	--	ND	--	ND	ND	ND	0.022 J	ND	**5**
gamma-Chlordane	0.036	--	0.041	--	**0.13**	**0.03 J**	**0.15**	ND	ND	**0.05**
Heptachlor	ND	--	ND	--	**0.11**	ND	**0.14**	ND	ND	**0.04**
Heptachlor epoxide	0.018	--	ND	--	ND	ND	ND	ND	ND	**0.03**
Methoxychlor	0.059	--	0.098	--	0.2	ND	0.16	0.024 J	ND	**35**
Inorganic Compounds (mg/L)										
Barium	0.0542	--	0.332	--	0.0985	--	0.0687	--	--	**1**
Calcium	75.6	--	119	--	123	--	150	--	--	--
Magnesium	45.3	--	107	--	98.3	--	151	--	--	--
Manganese	0.0739	--	0.204	--	0.195	--	**0.315**	--	--	**0.3**
Nickel	ND	--	ND	--	0.0159	--	ND	--	--	**0.1**
Potassium	4.5	--	6.41	--	10	--	12.2	--	--	--
Sodium	**25.1**	--	**59.2**	--	**88.8**	--	**34.4**	--	--	**20**

Notes:

1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect.
2. NYSDEC Class "GA" Groundwater Quality Standards/Guidance Values (GWQS/GV), 6 NYCRR Part 703.
3. Blind Duplicate collected at monitoring well MW-3.
4. MS/MSD collected at monitoring wells MW-2 and MW-4.

Bold Exceeds the NYSDEC TOGS 1.1.1 Groundwater Quality Standard or Guidance Value

Definitions:

N/A = Not Available
ND = Not Detected
J = Result estimated below the quantitation limit.
"--" = Not analyzed or no GWQS/GV

TABLE 5
SUMMARY OF SOIL/FILL RRSCO EXCEEDANCES AFTER REMEDY COMPLETION

Site Management Plan
295 Maryland Street Site

Parameter	Part 375 SCOs	2001 Test Pit Investigation					2015 Pre-Remedial Investigation	2015 ConfirmatorySoil Samples															
	RRSCO	TP-6 0-0.5'	TP-8 0-0.5'	TP-8 0.5-8'	TP-9 0-0.5'	EM-6 Composite	TP-5-13 0-3'	SW-1 TP-24-4, 7-13	SW-2 TP-24-4, 7-13	SW-3 TP-24-4, 7-13	SW-4 TP-24-4, 7-13	SW-5 TP-24-4, 7-13	SW-6 TP-24-4, 7-13	SW-7 TP-24-4, 7-13	SW-8 TP-24-4, 7-13	SW-10 TP-24-4, 7-13	SW-11 TP-24-4, 7-13	SW-12 TP-24-4, 7-13	SW-13 TP-24-4, 7-13	SW-14 TP-24-4, 7-13	SW-7 (AOC-2)	NW-2 (TP-7)	EW-3 (TP-7)	SW-1 (TP-10)
Volatile Organic Compounds (ug/kg)																							
Benzene	4800	NA	NA	0.8	NA	3	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	100,000	NA	NA	--	NA	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-butanone	None	NA	NA	--	NA	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	41,000	NA	NA	--	NA	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane	None	NA	NA	--	NA	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
p/m-xylene	100,000	NA	NA	--	NA	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	None	NA	NA	--	NA	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	100,000	NA	NA	--	NA	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TCLP Volatile Organic Compounds (ug/L)																							
No Compounds Detected	None	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semi-Volatile Organic Compounds (ug/kg)																							
2-Methylnaphthalene	None	--	--	--	--	--	--	ND	ND	ND	17 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND
Acenaphthene	100,000	--	--	--	--	--	--	ND	ND	ND	18 J	ND	ND	ND	ND	ND	ND	ND	0.27 J	ND	ND	NA	NA	0.52 J
Anthracene	100,000	280	440	200	2,500	--	58 J	ND	ND	ND	31	ND	ND	ND	0.72 J	ND	ND	ND	0.75	ND	ND	NA	NA	1.7 J
Benzo(a)anthracene	1,000	1,800	2,000	900	8,700	2,700	240	0.26 J	0.5 J	ND	61	0.89 J	1.1 J	0.77 J	2.1	ND	ND	ND	2.8 J	ND	ND	NA	NA	6.1
Benzo(a)pyrene	1,000	2,100	2,000	900	7,100	--	260	0.37 J	0.8 J	ND	61	1.1 J	1.3 J	1 J	2.3	ND	ND	ND	2.4 J	ND	ND	NA	NA	5.9
Benzo(b)fluoranthene	1,000	3,000	3,000	1,300	9,900	--	270	0.41 J	0.89 J	ND	75	1.4 J	1.5 J	1.1 J	3.2	0.35 J	ND	ND	3.1 J	ND	ND	NA	NA	6.8
Benzo(g,h,i)perylene	100,000	1,800	1,300	470	3,300	--	170	ND	0.27 J	ND	39	0.45 J	0.74 J	0.43 J	1.3 J	ND	ND	ND	1.4 J	ND	ND	NA	NA	3.6
Benzo(k)fluoranthene	3,900	900	1,100	540	3,800	--	130	ND	ND	ND	23	ND	ND	ND	0.56 J	ND	ND	ND	1.5	ND	ND	NA	NA	3.9
Biphenyl	None	--	--	--	--	--	--	ND	ND	ND	4.7 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND
Bis-2-ethylhexyl phthalate	None	--	--	--	--	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND
Butyl benzyl phthalate	None	--	--	--	--	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND
Carbazole	None	--	--	--	--	--	--	ND	ND	ND	20	ND	ND	ND	ND	ND	ND	ND	0.58 J	ND	ND	NA	NA	0.93 J
Chrysene	3,900	1,600	1,700	830	7,400	2,800	210	ND	ND	ND	70	ND	0.81 J	ND	2.2	ND	ND	ND	2.60	ND	ND	NA	NA	6.0
Dibenzo (a,h) anthracene	330	420	--	--	--	--	55 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.38 J	ND	ND	NA	NA	ND
Dibenzofuran	59,000	--	--	--	--	--	--	ND	ND	ND	28	ND	ND	ND	ND	ND	ND	ND	0.16 J	ND	ND	NA	NA	0.25 J
Di-n-octyl phthalate	None	--	--	--	--	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND
Fluoranthene	100,000	2,200	3,600	2,400	19,000	--	280	0.32 J	0.99 J	0.27 J	190	1.4 J	2.7 J	1.2 J	6.1	0.61 J	ND	ND	6 J	ND	ND	NA	NA	13
Fluorene	100,000	61	--	61	--	--	--	ND	ND	ND	31	ND	ND	ND	ND	ND	ND	ND	0.28 J	ND	ND	NA	NA	0.51 J
Indeno(1,2,3-cd)pyrene	500	1,800	1,300	550	4,300	--	180	0.27 J	0.57 J	ND	34	0.7 J	0.94 J	0.68 J	1.3 J	ND	ND	ND	1.40	ND	ND	NA	NA	3.3
Naphthalene	100,000	--	--	--	--	--	--	ND	ND	ND	58	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND
Phenanthrene	100,000	1,200	2,200	1,300	13,000	--	220	ND	0.47 J	ND	250	ND	2.5 J	0.47 J	5.8	0.5 J	ND	ND	3.80	ND	ND	NA	NA	7.7
Perene	100,000	6,400	4,800	2,200	18,000	--	260	0.3 J	0.85 J	ND	160	1.3 J	2.4	1.3	4.8	0.5 J	ND	ND	5.00	ND	ND	NA	NA	12
TOTAL PAHs		***21,361***	***19,840***	***9,251***	***78,000***	***5,500***	***2,053***	*2*	*5*	*0*	*853*	*6*	*11*	*6*	*24*	*1*	*0*	*0*	*26*	*0*	*0*	*0*	*0*	*58*
PCBs (ug/kg)																							
Total PCBs	1,000	61	91	--	211	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB 1254	None	61	91	--	211	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pesticides (ug/kg)																							
4,4'-DDE	8900	NA	NA	NA	NA	NA	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	7900	NA	NA	NA	NA	NA	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganic Compounds (mg/kg)																							
Aluminum	None	5,690	4,490	5,710	6,720	NA	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	None	--	7.83	--	--	NA	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	16	4.2	4.7	7.8	4.1	NA	3.9	7.6	4.2	6	10.9	6.9	8.4	7.8	**34.9**	5.6	**18.8**	**19.8**	**18.7**	9.7	9.5	6.3	8.5	7.5
Barium	400	213	98.8	192	143	NA	100	210	77.2	173	158	145	274	227	**608**	102	NA	NA	400	NA	242	NA	NA	323
Beryllium	72	0.603	0.493	0.478	0.778	NA	0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	4	1.44	0.651	2.26	2.91	NA	0.9	0.45	NA	0.42	0.58	0.9	0.83	0.96	2.3	NA	NA	NA	2.9	NA	0.42	NA	NA	0.6
Calcium	None	105,000	179,000	83,000	84,900	NA	9,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	180	17.2	13.6	13.8	30	NA	15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	NA	NA	NA	NA	NA
Cobalt	None	3.74	2.9	5.4	5.15	NA	6.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	270	28.8	23.2	49.3	35	NA	45	34.3	33.9	34.2	96.6	26.9	34.3	34.8	**662**	23.4	NA	NA	89.3	NA	37	NA	NA	35.6
Iron	None	8,850	7,620	14,500	17,300	NA	17,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	400	632	176	503	602	NA	130	784	308	166	**1630**	705	**2450**	**2610**	**18400**	820	**2460**	**6860**	**6230**	853	472	486	503	634
Magnesium	None	15,800	13,600	9,960	23,500	NA	4,800	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	2,000	655	375	365	533	NA	520	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	0.81	--	0.11	0.92	0.35	NA	1.1	0.27	**3.3**	1	0.39	0.85	0.64	1.7	2.4	0.25	0.91	0.76	1.3	1.4	0.067	0.22	0.53	0.13
Nickel	310	14.8	9.59	20	15	NA	14	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	None	881	726	996	983	NA	960	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	180	--	--	--	--	NA	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	180	31.8	6.91	1.26	1.4	NA	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	None	379	315	306	208	NA	140 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	None	--	--	--	--	NA	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	None	12.2	8.37	17.1	11.9	NA	21	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	10,000	141	131	885	850	NA	140	219	102	156	328	322	270	338	2560	NA	NA	NA	1300	NA	140	NA	NA	347

Notes:

= Exceeds Restricted Residential SCO (RRSCO)

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 6
SVI SAMPLING REQUIREMENTS AND SCHEDULE

Site Management Plan
295 Maryland Street Site

Sampling Location[1]	Analytical Parameters	Schedule[2]
Subslab (basement or lowest level of building)	VOC (Method TO-15)	Minimum once during heating season.
Indoor (basement or lowest level of building)	VOC (Method TO-15)	Minimum once during heating season (concurrent with subslab sample)
Outdoor (ambient)	VOC (Method TO-15)	Minimum once during heating season (concurrent with subslab and indoor samples)

Notes:

1. Sample locations to be coordinated with NYSDEC and NYSDOH. Additional subslab and indoor locations may be required depending on building foundation design and use

2. Additional sampling may be required depending on results of initial round of sampling.

Table 7: Schedule of Interim Monitoring/Inspection Reports

Task/Report	Reporting Frequency*
Inspection Report	As needed
Initial Pre-Occupancy SVI Results	Prior to Building Occupancy
Heating Season SVI Results	Prior to Building Occupancy, if Pre-Occupancy Samples Coincide with Heating Season, Otherwise within 45 Days of Collection
Periodic Review Report	Annually, or as otherwise determined by the Department

* The frequency of events will be conducted as specified until otherwise approved by the NYSDEC.

FIGURES

F:\CAD\Benchmark\295 Maryland\2014 IRM\Figure 1 - Site Location Map.dwg

FIGURE 1

BENCHMARK
ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC
2558 HAMBURG TURNPIKE
SUITE 300
BUFFALO, NY 14218
(716) 856-0599

PROJECT NO.: 0222-014-100

DATE: JUNE 2015

DRAFTED BY: RFL

SITE LOCATION AND VICINITY MAP

SITE MANAGEMENT PLAN

295 MARYLAND STREET SITE
BUFFALO, NEW YORK

PREPARED FOR
295 MARYLAND, LLC

F:\CAD\Benchmark\295 Maryland\SMP\Figure 2 - Aerial Map.dwg

FIGURE 2

100 0' 100 200

SCALE: 1 INCH = 100 FEET
SCALE IN FEET
(approximate)

N

LEGEND

BCP PARCEL BOUNDARY

SITE BOUNDARY

BENCHMARK
ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

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SUITE 300
BUFFALO, NY 14218
(716) 856-0599

PROJECT NO.: 0222-014-100

DATE: JUNE 2015

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SITE PLAN (AERIAL)

SITE MANAGEMENT PLAN

295 MARYLAND STREET SITE
BUFFALO, NEW YORK

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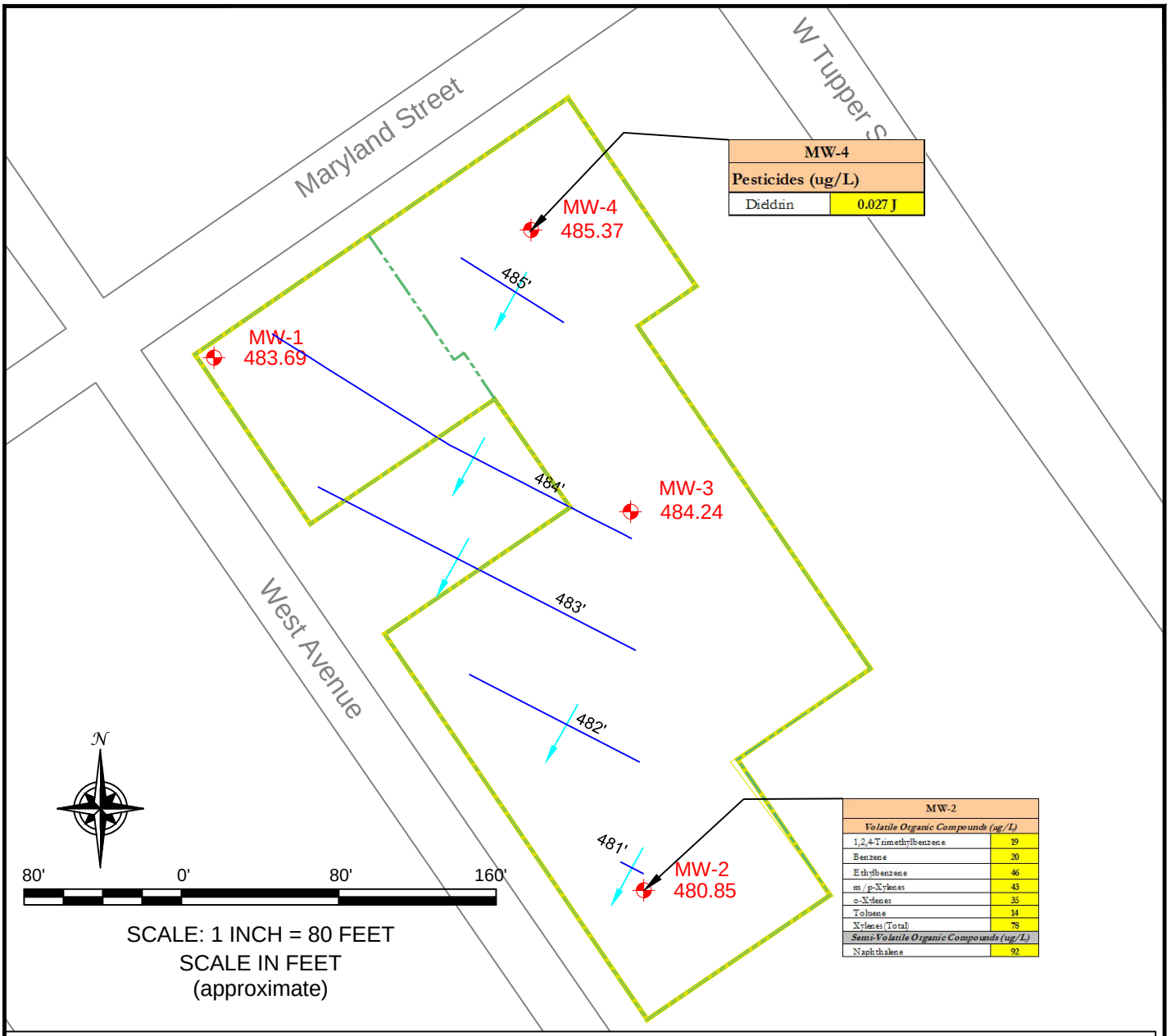
F:\CAD\Benchmark\295 Maryland\SMP\Figure 3 - Groundwater Elevation and Contamination.dwg

FIGURE 3



LEGEND

- PARCEL BOUNDARY
- SITE BOUNDARY
- MW-3 484.24 — MONITORING WELL (GROUNDWATER ELEVATION FROM 9/23/10)
- 482' — GROUNDWATER CONTOUR
- GROUNDWATER FLOW DIRECTION

MW-4
Pesticides (ug/L)
Dieldrin 0.027 J

GROUNDWATER TEST RESULTS FROM MARCH 1, 2011 SAMPLING EVENT

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SUITE 300
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(716) 856-0599

PROJECT NO.: 0222-014-100

DATE: JUNE 2015

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GROUNDWATER CONTOUR AND CONCENTRATION MAP

SITE MANAGEMENT PLAN

295 MARYLAND STREET SITE
BUFFALO, NEW YORK

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F:\CAD\Benchmark\295 Maryland\2014 IRM\Figure 4 Exploration Location Plan.dwg

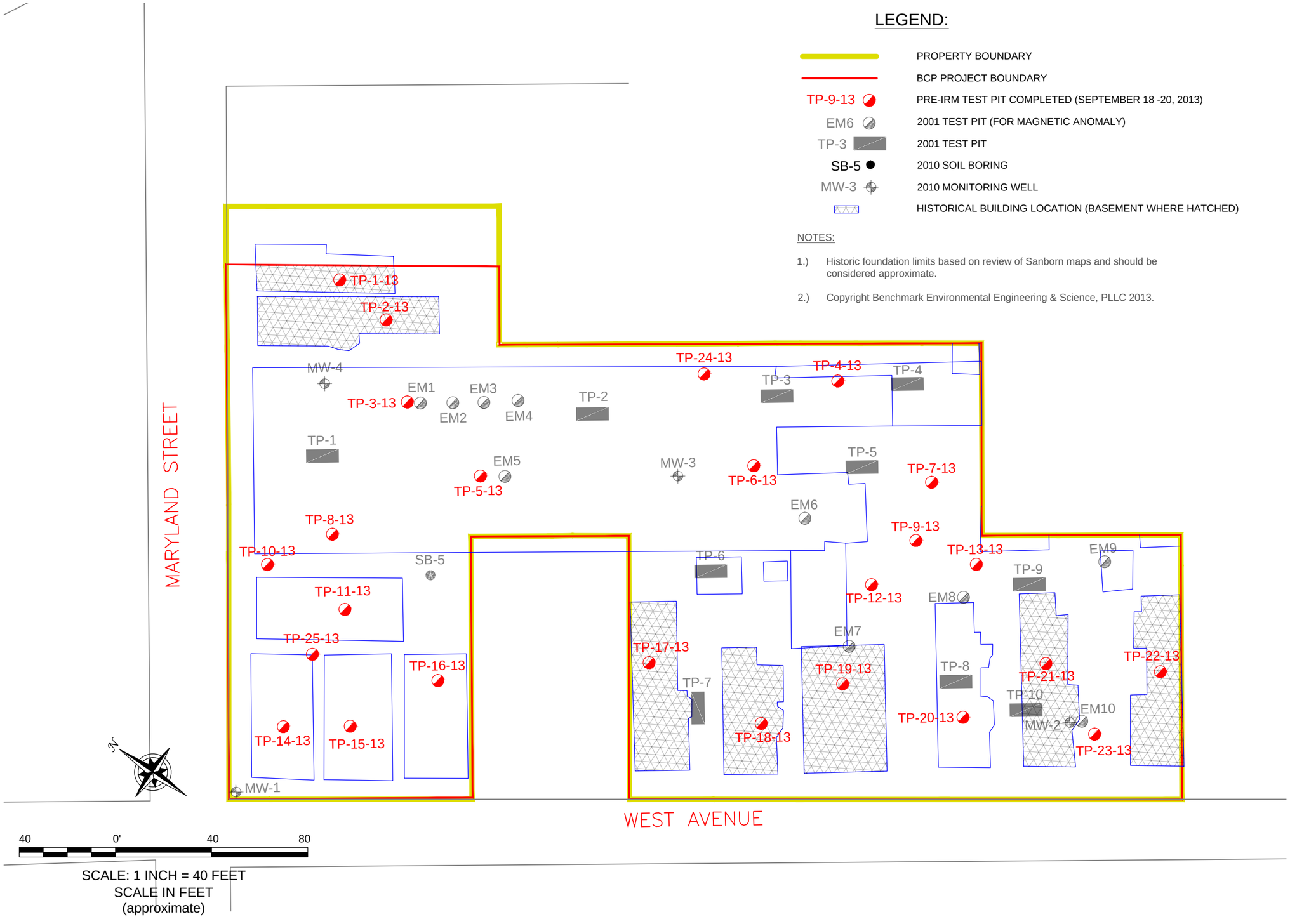
LEGEND:

- PROPERTY BOUNDARY
- BCP PROJECT BOUNDARY
- TP-9-13 — PRE-IRM TEST PIT COMPLETED (SEPTEMBER 18 -20, 2013)
- EM6 — 2001 TEST PIT (FOR MAGNETIC ANOMALY)
- TP-3 — 2001 TEST PIT
- SB-5 — 2010 SOIL BORING
- MW-3 — 2010 MONITORING WELL
- HISTORICAL BUILDING LOCATION (BASEMENT WHERE HATCHED)

NOTES:

1.) Historic foundation limits based on review of Sanborn maps and should be considered approximate.

2.) Copyright Benchmark Environmental Engineering & Science, PLLC 2013.



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JOB NO.: 0222-014-100

EXPLORATION LOCATION PLAN

SITE MANAGEMENT PLAN
295 MARYLAND STREET SITE
BUFFALO, NEW YORK

PREPARED FOR
295 MARYLAND LLC

FIGURE 4

F:\CAD\Benchmark\295 Maryland\SMP\Figure 5; AOCS.dwg

LEGEND:

- PROPERTY BOUNDARY
- BCP PROJECT BOUNDARY
- TP-9-13 — PRE-IRM TEST PIT COMPLETED (SEPTEMBER 18 -20, 2013)
- EM6 — 2001 TEST PIT (FOR MAGNETIC ANOMALY)
- TP-3 — 2001 TEST PIT
- SB-5 — 2010 SOIL BORING
- MW-3 — 2010 MONITORING WELL
- AOC FOR GROSSLY CONTAMINATED SOILS
- AOC FOR METALS, AND/OR PAHS

NOTES:

1.) AOC MEANS AREA OF CONCERN; AND PAHS MEANS POLYNUCLEAR AROMATIC HYDROCARBONS.

2.) Copyright Benchmark Environmental Engineering & Science, PLLC 2015.

TP-24-13		
COMMERCIAL SCO EXCEEDANCES		
Mercury	3.7 mg/kg	0.5 - 4'

TP-4		
INDUSTRIAL SCO EXCEEDANCES		
Benzo(a)pyrene	3,600 ug/kg	0 - 0.5'
COMMERCIAL SCO EXCEEDANCES		
Arsenic	16 mg/kg	0 - 0.5'
Lead	3270 mg/kg	0 - 0.5'
RESTRICTED RESIDENTIAL SCO EXCEEDANCES		
Benzo(a)anthracene	4,900 ug/kg	0 - 0.5'
Benzo(b)fluoranthene	5,100 ug/kg	0 - 0.5'
Chrysene	4,100 ug/kg	0 - 0.5'
Indeno(1,2,3-cd)pyrene	1,700 ug/kg	0 - 0.5'
Mercury	0.94 mg/kg	0 - 0.5'

TP-6-13			
PID READINGS			
0 - 5.5'	5.5 - 7'	7 - 9'	9 - 11'
0	400	1,000	1,300

TP-4-13		
RESTRICTED RESIDENTIAL SCO EXCEEDANCES		
Lead	920 mg/kg	0 - 3'
Mercury	1.3 mg/kg	0 - 3'

TP-3		
COMMERCIAL SCO EXCEEDANCES		
Lead	3,610 mg/kg	0 - 0.5'
RESTRICTED RESIDENTIAL SCO EXCEEDANCES		
Benzo(b)fluoranthene	1,100 ug/kg	0 - 0.5'
Mercury	1.0 mg/kg	0 - 0.5'

TP-5-13		
RESTRICTED RESIDENTIAL SCO EXCEEDANCES		
Mercury	1.1 mg/kg	0 - 3'

TP-5		
INDUSTRIAL SCO EXCEEDANCES		
Arsenic	23 mg/kg	0 - 0.5'
Lead	8,160 mg/kg	0 - 0.5'
Benzo(a)pyrene	1,200 ug/kg	0-0.5'
COMMERCIAL SCO EXCEEDANCES		
Arsenic	23 mg/kg	0 - 0.5'
Barium	516 mg/kg	0 - 0.5'
Lead	8,160 mg/kg	0 - 0.5'
RESTRICTED RESIDENTIAL SCO EXCEEDANCES		
Benzo(a)anthracene	1,200 ug/kg	0 - 0.5'
Indeno(1,2,3-cd)pyrene	830 ug/kg	0 - 0.5'
Cadmium	4.2 mg/kg	0 - 0.5'
Mercury	1.0 mg/kg	0 - 0.5'

TP-9-13			
PID READINGS			
0 - 4'	4 - 6'	6 - 11'	11 - 14'
0	300	400	500

TP-13-13		
PID READINGS		
0 - 3'	3 - 7'	7 - 9'
300	500	25

TP-9		
INDUSTRIAL SCO EXCEEDANCES		
Benzo(a)pyrene	7,100 ug/kg	0 - 0.5'
COMMERCIAL SCO EXCEEDANCES		
Benzo(a)anthracene	8,700 ug/kg	0 - 0.5'
Benzo(b)fluoranthene	9,900 ug/kg	0 - 0.5'
RESTRICTED RESIDENTIAL SCO EXCEEDANCES		
Chrysene	7,400 ug/kg	0 - 0.5'
Fluorene	4,300 ug/kg	0 - 0.5'
Lead	602 mg/kg	0 - 0.5'

TP-23-13		
PID READINGS		
0 - 1'	1 - 5'	5 - 8'
0	1.7	0

TP-25-13		
COMMERCIAL SCO EXCEEDANCES		
Mercury	4 mg/kg	0.5 - 4'

TP-6		
INDUSTRIAL SCO EXCEEDANCES		
Benzo(a)pyrene	2,100 ug/kg	0-0.5'
RESTRICTED RESIDENTIAL SCO EXCEEDANCES		
Benzo(a)anthracene	1,800 ug/kg	0 - 0.5'
Benzo(b)fluoranthene	3,000 ug/kg	0 - 0.5'
Dibenzo(a,h)anthracene	420 ug/kg	0 - 0.5'
Indeno(1,2,3-cd)pyrene	1,800 ug/kg	0 - 0.5'
Lead	632 mg/kg	0 - 0.5'

TP-7		
INDUSTRIAL SCO EXCEEDANCES		
Benzo(a)pyrene	3,000 ug/kg	0-0.5'
COMMERCIAL SCO EXCEEDANCES		
Barium	552 mg/kg	0.5 - 5.5'
Lead	1,420 mg/kg	0.5 - 5.5'
RESTRICTED RESIDENTIAL SCO EXCEEDANCES		
Benzo(a)anthracene	1,700 ug/kg	0 - 0.5'
Benzo(b)fluoranthene	3,900 ug/kg	0 - 0.5'
Dibenzo(a,h)anthracene	610 ug/kg	0 - 0.5'
Indeno(1,2,3-cd)pyrene	3,000 ug/kg	0 - 0.5'

TP-8		
INDUSTRIAL SCO EXCEEDANCES		
Benzo(a)pyrene	2,000 ug/kg	0 - 0.5'
RESTRICTED RESIDENTIAL SCO EXCEEDANCES		
Benzo(a)anthracene	2,000 ug/kg	0 - 0.5'
Benzo(b)fluoranthene	3,000 ug/kg	0 - 0.5'
Benzo(b)fluoranthene	1,300 ug/kg	0.5 - 8'
Indeno(1,2,3-cd)pyrene	1,300 ug/kg	0 - 0.5'
Indeno(1,2,3-cd)pyrene	550 ug/kg	0.5 - 8'
Lead	503 mg/kg	0.5 - 8'
Mercury	0.92 mg/kg	0.5 - 8'

TP-10		
INDUSTRIAL SCO EXCEEDANCES		
Benzo(a)anthracene	17,000 ug/kg	0 - 0.5'
Benzo(a)pyrene	13,000 ug/kg	0 - 0.5'
Benzo(a)pyrene	1,600 ug/kg	0.5 - 8'
Benzo(b)fluoranthene	19,000 ug/kg	0 - 0.5'
COMMERCIAL SCO EXCEEDANCES		
Indeno(1,2,3-cd)pyrene	7,000 ug/kg	0 - 0.5'
RESTRICTED RESIDENTIAL SCO EXCEEDANCES		
Benzo(k)fluoranthene	8,100 ug/kg	0 - 0.5'
Chrysene	14,000 ug/kg	0 - 0.5'
Benzo(a)anthracene	2,000 ug/kg	0.5 - 8'
Benzo(b)fluoranthene	2,600 ug/kg	0.5 - 8'
Indeno(1,2,3-cd)pyrene	740 ug/kg	0.5 - 8'

EM-6		
RESTRICTED RESIDENTIAL SCO EXCEEDANCES		
Benzo(a)anthracene	2,700 ug/kg	0 - 6'

60' 0' 60' 120'

SCALE: 1 INCH = 60 FEET
SCALE IN FEET
(approximate)

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JOB NO.: 0222-014-001

AREAS OF CONCERN

SITE MANAGEMENT PLAN
295 MARYLAND STREET SITE
BUFFALO, NEW YORK

PREPARED FOR
295 MARYLAND LLC

FIGURE 5

F:\CAD\Benchmark\295 Maryland\SMP\Figure 6: Remaining Contamination Under RRSCOs.dwg

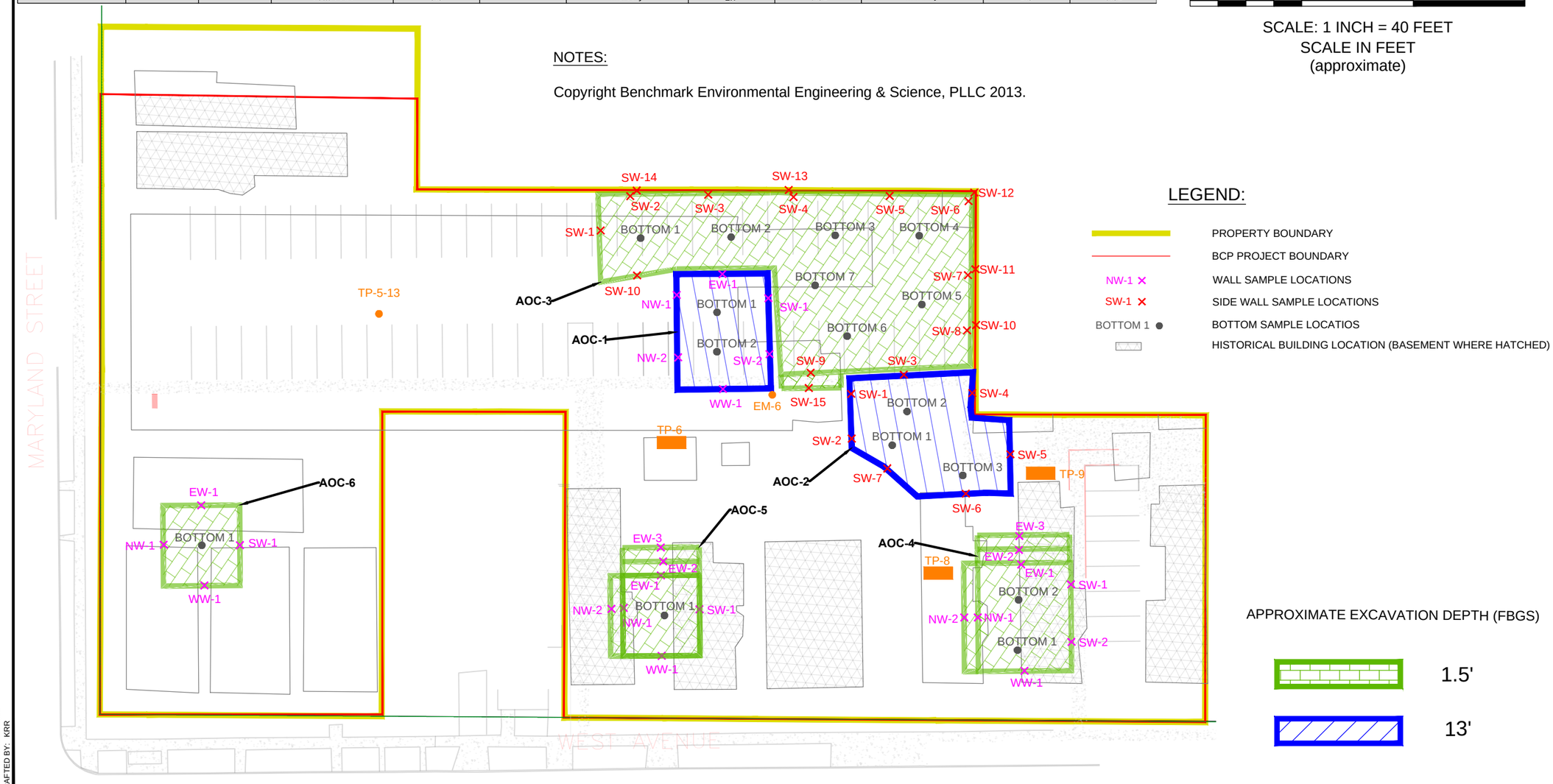
TP-6 (0-0.5)	mg/Kg	RRSCO
Benzo(a)anthracene	1.8	1
Benzo(a)pyrene	2.1	1
Benzo(b)fluoranthene	3.0	1
Dibenzo(a,h)anthracene	0.42	0.33
Indeno(1,2,3-cd)pyrene	1.8	0.5
Total PAH	21.36	--
Lead	632	400
TP-8 (0-0.5)	**mg/Kg**	**RRSCO**
Benzo(a)anthracene	2.0	1
Benzo(a)pyrene	2.0	1
Benzo(b)fluoranthene	3.0	1
Benzo(k)fluoranthene	1.1	3.9
Chrysene	1.7	3.9
Indeno(1,2,3-cd)pyrene	1.3	0.5
Total PAH	19.840	--

TP-8 (0.5-8)	mg/Kg	RRSCO
Benzo(b)fluoranthene	1.3	1
Indeno(1,2,3-cd)pyrene	.55	0.5
Total PAH	9.25	--
Lead	503	400
Mercury	0.92	0.81
TP-9 (0-0.5)	**mg/Kg**	**RRSCO**
Benzo(a)anthracene	8.7	1
Benzo(a)pyrene	7.1	1
Benzo(b)fluoranthene	9.9	1
Benzo(k)fluoranthene	3.8	3.9
Chrysene	7.4	3.9
Indeno(1,2,3-cd)pyrene	4.3	0.5
Total PAH	78.0	--
Cadmium	2.91	4
Lead	602	400
EM-6 Composite	**mg/Kg**	**RRSCO**
Benzo(b)fluoranthene	1.3	1
Chrysene	2.8	3.9
Total PAH	5.5	--

TP-5-13 (0-3)	mg/Kg	RRSCO
Total PAH	2.05	--
Mercury	1.1	0.81
SW-1 (TP-24-4, 7-13)	**mg/Kg**	**RRSCO**
Lead	784	400
SW-2 (TP-24-4, 7-13)	**mg/Kg**	**RRSCO**
Mercury	3.3	0.81
SW-3 (TP-24-4, 7-13)	**mg/Kg**	**RRSCO**
Mercury	1	0.81
SW-4 (TP-24-4,7-13)	**mg/Kg**	**RRSCO**
Total PAH	.853	--
Lead	1630	400
SW-5 (TP-24-4,7-13)	**mg/Kg**	**RRSCO**
Lead	705	400
Mercury	.85	0.81
SW-6 (TP-24-4,7-13)	**mg/Kg**	**RRSCO**
Lead	2450	400
SW-7 (TP-24-4,7-13)	**mg/Kg**	**RRSCO**
Lead	2610	400
Mercury	1.7	0.81

SW-8 (TP-24-4,7-13)	mg/Kg	RRSCO
Arsenic	34.9	16
Barium	608	400
Copper	662	270
Lead	18400	400
Mercury	2.4	0.81
SW-10 (TP-24-4,7-13)	**mg/Kg**	**RRSCO**
Lead	820	400
SW-11 (TP-24-4,7-13)	**mg/Kg**	**RRSCO**
Arsenic	18.8	16
Lead	705	400
Mercury	0.85	0.81
SW-12 (TP-24-4,7-13)	**mg/Kg**	**RRSCO**
Arsenic	19.8	16
Lead	6860	400
SW-13 (TP-24-4,7-13)	**mg/Kg**	**RRSCO**
Arsenic	18.7	16
Lead	6230	400
Mercury	1.3	0.81

SW-14 (TP-24-4,7-13)	mg/Kg	RRSCO
Lead	853	400
Mercury	1.4	0.81
SW-7 (AOC-2)	**mg/Kg**	**RRSCO**
Lead	472	400
NW-2 (TP-7)	**mg/Kg**	**RRSCO**
Lead	486	400
EW-3 (TP-7)	**mg/Kg**	**RRSCO**
Lead	503	400
SW-1 (TP-10)	**mg/Kg**	**RRSCO**
Lead	634	400



NOTES:

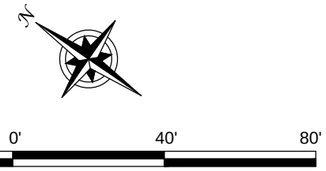
Copyright Benchmark Environmental Engineering & Science, PLLC 2013.

LEGEND:

- PROPERTY BOUNDARY
- BCP PROJECT BOUNDARY
- NW-1 × WALL SAMPLE LOCATIONS
- SW-1 × SIDE WALL SAMPLE LOCATIONS
- BOTTOM 1 ● BOTTOM SAMPLE LOCATIOS
- HISTORICAL BUILDING LOCATION (BASEMENT WHERE HATCHED)

APPROXIMATE EXCAVATION DEPTH (FBGS)

- 1.5'
- 13'



SCALE: 1 INCH = 40 FEET
SCALE IN FEET
(approximate)

DATE: OCTOBER 2015
DRAFTED BY: KRR

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC
2558 HAMBURG TURNPIKE
SUITE 300
BUFFALO, NY 14218
(716) 856-0599

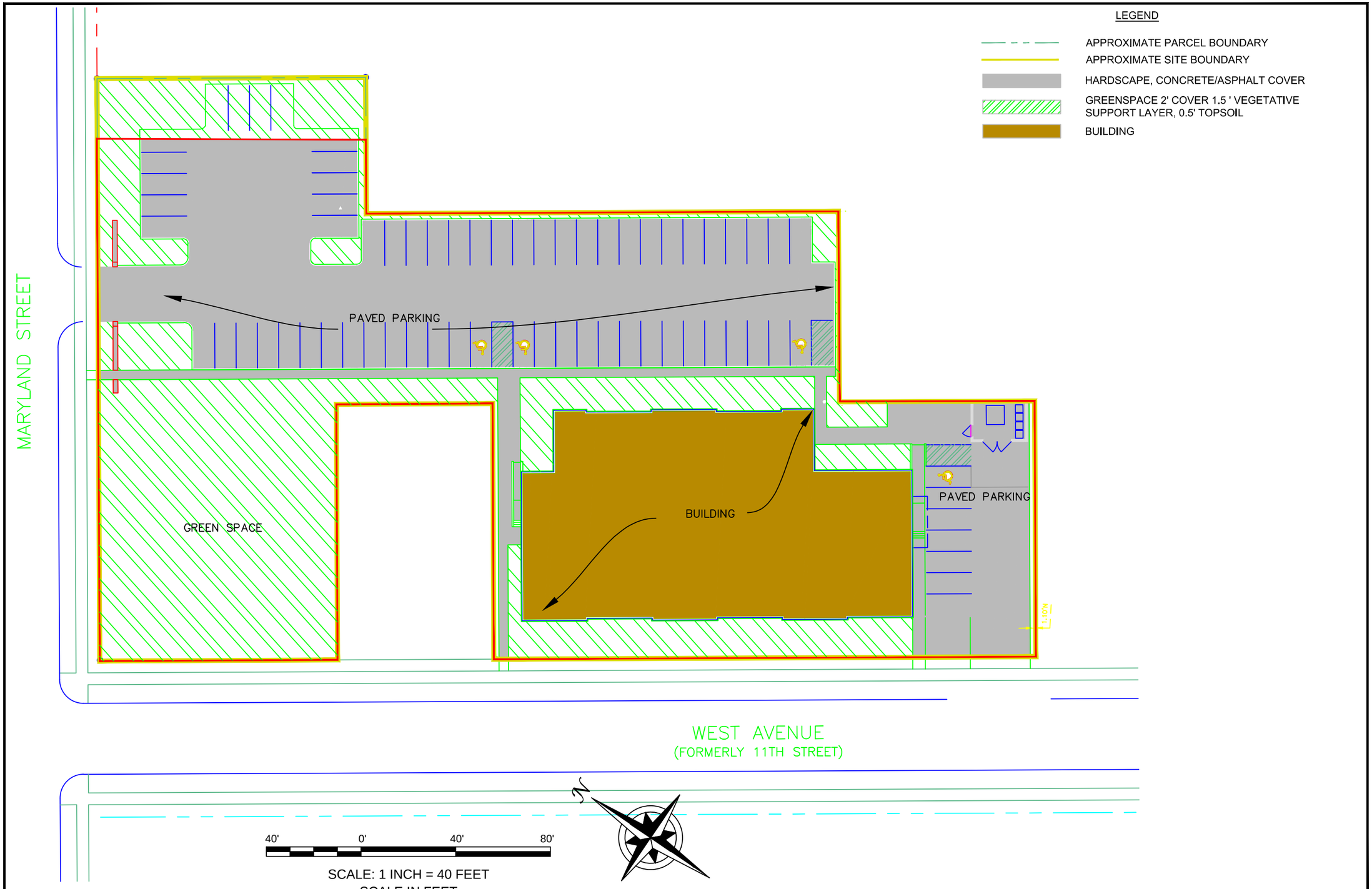
JOB NO.: 0222-012-001

REMAINING CONTAMINATION UNDER RRSCOs

SITE MANAGEMENT PLAN
295 MARYLAND STREET SITE
BUFFALO, NEW YORK
PREPARED FOR
295 MARYLAND LLC

FIGURE 6

F:\CAD\Benchmark\295 Maryland\SMP\Figure 7 - Cover Planrev.DWG



2558 HAMBURG TURNPIKE
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BUFFALO, NY 14218
(716) 856-0599

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

JOB NO.: 0222-014-100

COVER PLAN
SITE MANAGEMENT PLAN
295 MARYLAND STREET SITE
BUFFALO, NEW YORK

PREPARED FOR
295 MARYLAND, LLC

FIGURE 7

DATE: JUNE 2015
DRAFTED BY: RFL

APPENDIX A

ENVIRONMENTAL EASEMENT

CHRISTOPHER L. JACOBS, ERIE COUNTY CLERK
REF:

DATE:12/11/2015
TIME:9:16:28 AM
RECEIPT: 15201896

PARALEGAL SERVICES OF BUFFALO
ACCOUNT #: 9273

ITEM - 01 785
RECD: 12/11/2015 9:17:41 AM
FILE: 2015254443 BK/PG D 11289/2985
Deed Sequence: TT2015010060
295 MARYLAND LLC
PEOPLE OF THE STATE OF NEW YORK (THE)
Recording Fees 90.00
TP584 10.00

Subtotal 100.00

TOTAL DUE $100.00
PAID TOTAL $100.00
PAID ESCROW $100.00

REC BY: Loretta
COUNTY RECORDER

D 11269 W485
Brk 140
SLATER

County: Erie Site No: C915242 Brownfield Cleanup Agreement Index : C915242-05-11

FILED

DEC 11 2015

ERIE COUNTY
CLERK'S OFFICE

ENVIRONMENTAL EASEMENT GRANTED PURSUANT TO ARTICLE 71, TITLE 36 OF THE NEW YORK STATE ENVIRONMENTAL CONSERVATION LAW

THIS INDENTURE made this 3RD day of DECEMBER, 2015, between Owner(s) 295 Maryland, LLC, having an office at 366 Elmwood Avenue, Buffalo, New York 14222, County of Erie, State of New York (the "Grantor"), and The People of the State of New York (the "Grantee."), acting through their Commissioner of the Department of Environmental Conservation (the "Commissioner", or "NYSDEC" or "Department" as the context requires) with its headquarters located at 625 Broadway, Albany, New York 12233,

WHEREAS, the Legislature of the State of New York has declared that it is in the public interest to encourage the remediation of abandoned and likely contaminated properties ("sites") that threaten the health and vitality of the communities they burden while at the same time ensuring the protection of public health and the environment; and

WHEREAS, the Legislature of the State of New York has declared that it is in the public interest to establish within the Department a statutory environmental remediation program that includes the use of Environmental Easements as an enforceable means of ensuring the performance of operation, maintenance, and/or monitoring requirements and the restriction of future uses of the land, when an environmental remediation project leaves residual contamination at levels that have been determined to be safe for a specific use, but not all uses, or which includes engineered structures that must be maintained or protected against damage to perform properly and be effective, or which requires groundwater use or soil management restrictions; and

WHEREAS, the Legislature of the State of New York has declared that Environmental Easement shall mean an interest in real property, created under and subject to the provisions of Article 71, Title 36 of the New York State Environmental Conservation Law ("ECL") which contains a use restriction and/or a prohibition on the use of land in a manner inconsistent with engineering controls which are intended to ensure the long term effectiveness of a site remedial program or eliminate potential exposure pathways to hazardous waste or petroleum; and

WHEREAS, Grantor, is the owner of real property located at the addresses of 295 Maryland Street and 129 West Avenue in the City of Buffalo, County of Erie and State of New York, known and designated on the tax map of the County Clerk of Erie as tax map parcel numbers: Section 111.21 Block 8 Lots 3.111 and 1.1, being the same as that property conveyed to Grantor by deeds dated January 4, 2011 and September 16, 2015 and recorded in the Erie County Clerk's Office in Liber and Page 11195/4613 and 11285/3388, respectively. The property subject to this Environmental Easement (the "Controlled Property") comprises approximately 1.48 +/- acres, and is hereinafter more fully described in the Land Title Survey dated February 10, 2015 and last revised September 25, 2015 prepared by Lawrence J. Zygaj, P.L.S., which will be attached to the Site Management Plan. The Controlled Property description is set forth in and attached hereto as Schedule A; and

WHEREAS, the Department accepts this Environmental Easement in order to ensure the protection of public health and the environment and to achieve the requirements for remediation

established for the Controlled Property until such time as this Environmental Easement is extinguished pursuant to ECL Article 71, Title 36; and

NOW THEREFORE, in consideration of the mutual covenants contained herein and the terms and conditions of Brownfield Cleanup Agreement Index Number: C915242-05-11, Grantor conveys to Grantee a permanent Environmental Easement pursuant to ECL Article 71, Title 36 in, on, over, under, and upon the Controlled Property as more fully described herein ("Environmental Easement").

1. Purposes. Grantor and Grantee acknowledge that the Purposes of this Environmental Easement are: to convey to Grantee real property rights and interests that will run with the land in perpetuity in order to provide an effective and enforceable means of encouraging the reuse and redevelopment of this Controlled Property at a level that has been determined to be safe for a specific use while ensuring the performance of operation, maintenance, and/or monitoring requirements; and to ensure the restriction of future uses of the land that are inconsistent with the above-stated purpose.

2. Institutional and Engineering Controls. The controls and requirements listed in the Department approved Site Management Plan ("SMP") including any and all Department approved amendments to the SMP are incorporated into and made part of this Environmental Easement. These controls and requirements apply to the use of the Controlled Property, run with the land, are binding on the Grantor and the Grantor's successors and assigns, and are enforceable in law or equity against any owner of the Controlled Property, any lessees and any person using the Controlled Property.

A. (1) The Controlled Property may be used for:

Restricted Residential as described in 6 NYCRR Part 375-1.8(g)(2)(ii), Commercial as described in 6 NYCRR Part 375-1.8(g)(2)(iii) and Industrial as described in 6 NYCRR Part 375-1.8(g)(2)(iv)

(2) All Engineering Controls must be operated and maintained as specified in the Site Management Plan (SMP);

(3) All Engineering Controls must be inspected at a frequency and in a manner defined in the SMP;

(4) The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the Erie County Department of Health to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the Department;

(5) Groundwater and other environmental or public health monitoring must be performed as defined in the SMP;

(6) Data and information pertinent to Site Management of the Controlled Property must be reported at the frequency and in a manner defined in the SMP;

(7) All future activities on the property that will disturb remaining contaminated material must be conducted in accordance with the SMP;

(8) Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in the SMP;

(9) Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical components of the remedy shall be performed as defined in the SMP;

(10) Access to the site must be provided to agents, employees or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified by this Environmental Easement.

B. The Controlled Property shall not be used for Residential purposes as defined in 6NYCRR 375-1.8(g)(2)(i), and the above-stated engineering controls may not be discontinued without an amendment or extinguishment of this Environmental Easement.

C. The SMP describes obligations that the Grantor assumes on behalf of Grantor, its successors and assigns. The Grantor's assumption of the obligations contained in the SMP which may include sampling, monitoring, and/or operating a treatment system, and providing certified reports to the NYSDEC, is and remains a fundamental element of the Department's determination that the Controlled Property is safe for a specific use, but not all uses. The SMP may be modified in accordance with the Department's statutory and regulatory authority. The Grantor and all successors and assigns, assume the burden of complying with the SMP and obtaining an up-to-date version of the SMP from:

Site Control Section
Division of Environmental Remediation
NYSDEC
625 Broadway
Albany, New York 12233
Phone: (518) 402-9553

D. Grantor must provide all persons who acquire any interest in the Controlled Property a true and complete copy of the SMP that the Department approves for the Controlled Property and all Department-approved amendments to that SMP.

E. Grantor covenants and agrees that until such time as the Environmental Easement is extinguished in accordance with the requirements of ECL Article 71, Title 36 of the ECL, the property deed and all subsequent instruments of conveyance relating to the Controlled Property shall state in at least fifteen-point bold-faced type:

This property is subject to an Environmental Easement held by the New York State Department of Environmental Conservation

pursuant to Title 36 of Article 71 of the Environmental Conservation Law.

F. Grantor covenants and agrees that this Environmental Easement shall be incorporated in full or by reference in any leases, licenses, or other instruments granting a right to use the Controlled Property.

G. Grantor covenants and agrees that it shall, at such time as NYSDEC may require, submit to NYSDEC a written statement by an expert the NYSDEC may find acceptable certifying under penalty of perjury, in such form and manner as the Department may require, that:

(1) the inspection of the site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under the direction of the individual set forth at 6 NYCRR Part 375-1.8(h)(3).

(2) the institutional controls and/or engineering controls employed at such site:

(i) are in-place;

(ii) are unchanged from the previous certification, or that any identified changes to the controls employed were approved by the NYSDEC and that all controls are in the Department-approved format; and

(iii) that nothing has occurred that would impair the ability of such control to protect the public health and environment;

(3) the owner will continue to allow access to such real property to evaluate the continued maintenance of such controls;

(4) nothing has occurred that would constitute a violation or failure to comply with any site management plan for such controls;

(5) the report and all attachments were prepared under the direction of, and reviewed by, the party making the certification;

(6) to the best of his/her knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program, and generally accepted engineering practices; and

(7) the information presented is accurate and complete.

3. Right to Enter and Inspect. Grantee, its agents, employees, or other representatives of the State may enter and inspect the Controlled Property in a reasonable manner and at reasonable times to assure compliance with the above-stated restrictions.

4. Reserved Grantor's Rights. Grantor reserves for itself, its assigns, representatives, and successors in interest with respect to the Property, all rights as fee owner of the Property, including:

A. Use of the Controlled Property for all purposes not inconsistent with, or limited by the terms of this Environmental Easement;

B. The right to give, sell, assign, or otherwise transfer part or all of the underlying fee interest to the Controlled Property, subject and subordinate to this Environmental Easement;

5. Enforcement

A. This Environmental Easement is enforceable in law or equity in perpetuity by Grantor, Grantee, or any affected local government, as defined in ECL Section 71-3603, against the owner of the Property, any lessees, and any person using the land. Enforcement shall not be defeated because of any subsequent adverse possession, laches, estoppel, or waiver. It is not a defense in any action to enforce this Environmental Easement that: it is not appurtenant to an interest in real property; it is not of a character that has been recognized traditionally at common law; it imposes a negative burden; it imposes affirmative obligations upon the owner of any interest in the burdened property; the benefit does not touch or concern real property; there is no privity of estate or of contract; or it imposes an unreasonable restraint on alienation.

B. If any person violates this Environmental Easement, the Grantee may revoke the Certificate of Completion with respect to the Controlled Property.

C. Grantee shall notify Grantor of a breach or suspected breach of any of the terms of this Environmental Easement. Such notice shall set forth how Grantor can cure such breach or suspected breach and give Grantor a reasonable amount of time from the date of receipt of notice in which to cure. At the expiration of such period of time to cure, or any extensions granted by Grantee, the Grantee shall notify Grantor of any failure to adequately cure the breach or suspected breach, and Grantee may take any other appropriate action reasonably necessary to remedy any breach of this Environmental Easement, including the commencement of any proceedings in accordance with applicable law.

D. The failure of Grantee to enforce any of the terms contained herein shall not be deemed a waiver of any such term nor bar any enforcement rights.

6. Notice. Whenever notice to the Grantee (other than the annual certification) or approval from the Grantee is required, the Party providing such notice or seeking such approval shall identify the Controlled Property by referencing the following information:

County, NYSDEC Site Number, NYSDEC Brownfield Cleanup Agreement, State Assistance Contract or Order Number, and the County tax map number or the Liber and Page or computerized system identification number.

Parties shall address correspondence to:

Site Number: C915242
Office of General Counsel
NYSDEC
625 Broadway
Albany New York 12233-5500

With a copy to:

Site Control Section
Division of Environmental Remediation
NYSDEC
625 Broadway
Albany, NY 12233

All notices and correspondence shall be delivered by hand, by registered mail or by Certified mail and return receipt requested. The Parties may provide for other means of receiving and

communicating notices and responses to requests for approval.

7. Recordation. Grantor shall record this instrument, within thirty (30) days of execution of this instrument by the Commissioner or her/his authorized representative in the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

8. Amendment. Any amendment to this Environmental Easement may only be executed by the Commissioner of the New York State Department of Environmental Conservation or the Commissioner's Designee, and filed with the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

9. Extinguishment. This Environmental Easement may be extinguished only by a release by the Commissioner of the New York State Department of Environmental Conservation, or the Commissioner's Designee, and filed with the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

10. Joint Obligation. If there are two or more parties identified as Grantor herein, the obligations imposed by this instrument upon them shall be joint and several.

Remainder of Page Intentionally Left Blank

IN WITNESS WHEREOF, Grantor has caused this instrument to be signed in its name.

295 Maryland, LLC:

By: Anthony P. LoRusso

Print Name: ANTHONY P. LoRUSSO

Title: Owner Date: 11-18-15

Grantor's Acknowledgment

STATE OF NEW YORK)
) ss:
COUNTY OF Erie)

On the 18th day of Nov., in the year 20 15, before me, the undersigned, personally appeared Anthony P. LoRusso, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

Maria T Reeves
Notary Public - State of New York

MARIA T. REEVES
NOTARY PUBLIC, STATE OF NEW YORK
QUALIFIED IN ERIE COUNTY
MY COMMISSION EXPIRES AUGUST 7, 20 18

THIS ENVIRONMENTAL EASEMENT IS HEREBY ACCEPTED BY THE PEOPLE OF THE STATE OF NEW YORK, Acting By and Through the Department of Environmental Conservation as Designee of the Commissioner,

By: _____
Robert W. Schick, Director
Division of Environmental Remediation

Grantee's Acknowledgment

STATE OF NEW YORK)
) ss:
COUNTY OF ALBANY)

On the 3rd day of December, in the year 2015, before me, the undersigned, personally appeared Robert W. Schick, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/ executed the same in his/her/ capacity as Designee of the Commissioner of the State of New York Department of Environmental Conservation, and that by his/her/ signature on the instrument, the individual, or the person upon behalf of which the individual acted, executed the instrument.

_____
Notary Public - State of New York

David J. Chiusano
Notary Public, State of New York
No. 01CH5032146
Qualified in Schenectady County
Commission Expires August 22, 2016

SCHEDULE "A" PROPERTY DESCRIPTION

Environmental Easement Description
For 295 Maryland Street Site
BCP Site No. C915242

ALL THAT TRACT OR PARCEL OF LAND situate in the City of Buffalo, County of Erie, State of New York, being part of Block No. 45, and being more particularly described as follows:

BEGINNING at the intersection of the south line of Maryland Street as a 66 foot wide right of way with the east line of West Avenue as a 66 foot wide right of way; thence easterly along the south line of Maryland Street, a distance of 221.03 feet to the northeast corner of lands of Penn Advertising Inc. as described in a deed recorded in the Erie County Clerk's Office in Liber 10528 of Deeds at Page 637; thence southerly along the easterly line of said lands of Penn Advertising, Inc., being at right angles to the south line of Maryland Street, a distance of 113.50 feet to the southeast corner of said lands of Penn Advertising, Inc.; thence westerly along the southerly line of said lands of Penn Advertising, Inc., being parallel with the south line of Maryland Street, a distance of 32.53 feet to a point in the easterly line of Parcel IV of lands of Wittmer & Ferris Co., Inc., as described in a deed recorded in the Erie County Clerk's Office in Liber 9650 of Deeds at Page 165; thence southerly along the easterly line of Parcel IV of said lands of Wittmer & Ferris Co., Inc., being parallel with the east line of West Avenue, a distance of 199.50 feet to the southeast corner of Parcel IV of said lands of Wittmer & Ferris Co., Inc.; thence westerly along the southerly line of Parcel IV of said lands of Wittmer & Ferris Co., Inc., being parallel with the south line of Maryland Avenue, a distance of 80.50 feet to a point in a line being 108.00 feet east of the east line of West Avenue, as measured at right angles therefrom; thence southerly along a line parallel with the east line of West Avenue, a distance of 82.50 feet to the southeast corner of Parcel I of said lands of Wittmer & Ferris Co., Inc.; thence westerly along the southerly line of Parcel I of said lands of Wittmer & Ferris Co., Inc., being at right angles to the east line of West Avenue, a distance of 108.00 feet to a point in the east line of West Avenue, at the southwest corner of Parcel I of said lands of Wittmer & Ferris Co., Inc.; thence northerly along the east line of West Avenue, a distance of 229.00 feet to the southwest corner of lands of Norman Glenister & David Blesnuk, as described in a deed recorded in the Erie County Clerk's Office in Liber 11150 of Deeds at Page 1520; thence easterly along the south line of said lands of Norman Glenister & David Blesnuk, a distance of 108.00 feet to the southeast corner of said lands of Norman Glenister & David Blesnuk; thence northerly along the easterly line of said lands of Norman Glenister & David Blesnuk, and along the easterly line of lands of the City of Buffalo as described in a deed recorded in the Erie County Clerk's Office in Liber 11179 at Page 2833, a distance of 66.00 feet to the northeast corner of said lands of the City of Buffalo; thence westerly along the northerly line of said lands of the City of Buffalo, a distance of 108.00 feet to a point in the east line of West Avenue; thence northerly along the east line of West Avenue, a distance of 100.50 feet to the point or place of beginning containing 1.48 Acres more or less.

APPENDIX B

FULL LIST OF CONTACT INFORMATION

APPENDIX B – LIST OF SITE CONTACTS

Name	Phone/Email Address
Site Owner: Anthony P. LoRusso	716-884-3800 aplpropertygrp@gmail.com
Remedial Party: Anthony P. LoRusso	716-884-3800 aplpropertygrp@gmail.com
Qualified Environmental Professional: Thomas H. Forbes, P.E.	716-856-0599 tforbes@benchmarkturnkey.com
NYSDEC DER Project Manager: Anthony Lopes, P.E.	716-851-7220 anthony.lopes@dec.ny.gov
NYSDEC Regional Haz Waste Engineer: Chad Staniszewski, P.E.	716-851-7220 chad.staniszewski@dec.ny.gov
NYSDEC Site Control: Kelly Lewandowski, P.E.	518-402-9575 kelly.lewandowski@dec.ny.gov
Remedial Party Attorney: Craig A. Slater	716-845-6760 cslater@cslaterlaw.com
NYSDOH Project Manager: Scarlett McLaughlin	518-402-7860 BEEI@health.ny.gov

APPENDIX C

GROUNDWATER WELL CONSTRUCTION LOGS

Project No: 0222-001-100

Borehole Number: MW-1

Project: Phase II Investigation

A.K.A.:

Client: 295 Maryland LLC.

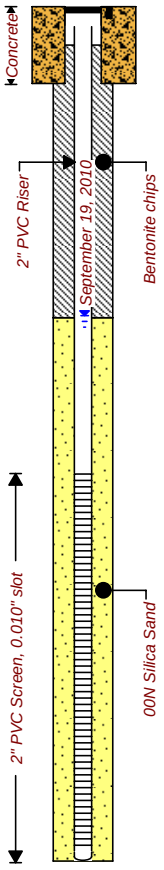
Logged By: TAB

Site Location: 295 Maryland, Buffalo, NY

Checked By: BCH

Benchmark Environmental Engineering & Science, PLLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0599

SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs ppm (0 – 12.5 – 25)	Lab Sample	Well Completion Details or Remarks
0.0	0.0	Ground Surface							
	0.0	***Top soil*** Brown, moist, mostly nonplastic fines, trace subrounded coarse sand, trace fine gravel medium dense rootlets.	S1	52	2.0		0.0		
	-2.0 2.0	***Silt*** Reddish brown, moist, non plastic fines, trace fine sand, very dense, medium to high dry strength.	S2	27	!.5		0.0		
	-4.0 4.0	As above, medium dense.	S3	55	2.0		0.0		
5.0	-6.0 6.0	***Lean Clay*** Reddish Brown, moist, low plasticty fines, hard, high toughness.	S4	37	2.0		0.0		
	-8.0 8.0	As above, trace coarse sand. As above, mostly low to medium plastic fines, little coarse sand, slight laminations.	S5	41	2.0		0.0		
10.0									
	-13.0 13.0	Reddish brown, moist, medium to high plasticity fines, stiff.	S6	13			0.0		
	-14.5 14.5	***Silt with Sand*** Reddish brown, wet, mostly non plastic fines with some fine sand, medium dense.							
15.0	-18.0 18.0	As above.	S7	57	1.9		0.0		
	-19.5 19.5 -20.5 20.5	***Lean Clay*** Reddish brown, wet, high plasticity fines, with few fine sand, hard, high toughness	S8	54	1.4		0.0		
20.0	-22.0 22.0	As Above ***Silt with Sand*** Reddish brown, wet, mostly non plastic fines with some fine sand, medium dense.							
25.0		End of Borehole							
30.0									



Drilled By: Earth Dimensions, Inc.
Drill Rig Type: CME 550
Drill Method: 4.25-inch Continous SS w/HSA
Comments:
Drill Date(s): 9 13 10

Hole Size: 8 1/2 - inch
Stick-up: Flush Mount
Datum: NA

Sheet: 1 of 1

Project No: 0222-001-100

Borehole Number: MW-2

Project: Phase II Investigation

A.K.A.:

Client: 295 Maryland LLC.

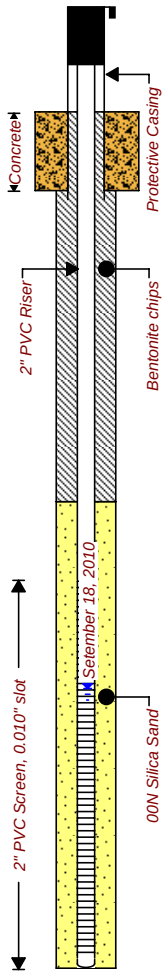
Logged By: TAB

Site Location: 295 Maryland, Buffalo, NY

Checked By: BCH

Benchmark Environmental Engineering & Science, PLLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0599

SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs ppm (0 – 12.5 – 25)	Lab Sample	Well Completion Details or Remarks
-3.0									
	0.0	Ground Surface							
	0.0	***Lean Clay w/Fill*** Reddish brown with black, moist, non to low plastic fines, few fine sand, trace fine gravel, very stiff, with concrete and cinders, wood fragments, medium toughness.	S1	16	2.0		0.0		
2.0	-2.0 2.0		S2	12	1.4		0.0		
	-4.0 4.0	As above no black, no wood fragments, cinders or concrete, moist, orange brick fragments, rootlets, trace coarse sand and fine gravel.	S3	29	2.0		0.0		
	-6.0 6.0	***Lean Clay*** Reddish Brown, moist, low plasticty fines, very stiff, medium toughness.	S4	37	2.0		0.0		
7.0		As above, trace coarse sand.					0.0		
	-10.0 10.0	As above, mostly medium plastic fines, trace fine sand, trace fine gravel, orange fine sand areas, medium toughness	S5	20	2.0				
12.0									
	-15.0 15.0	***Silt with Sand*** Brown, wet, mostly non plastic fines with some fine sand, dense, rapid dilatancy.	S6	37	1.4		0.0		
17.0									
	-20.0 20.0	As above, slight odor..	S7	24	1.3		1.6		
22.0	-22.0 22.0	End of Borehole							
27.0									



Drilled By: Earth Dimensions, Inc.
Drill Rig Type: CME 550
Drill Method: 4 1/4-inch HSA w/Continous SS
Comments:
Drill Date(s): 9 13 10

Hole Size: 8 1/2-inch
Stick-up: 2.5-foot
Datum: NA

Sheet: 1 of 1

Project No: 0222-001-100

Borehole Number: MW-3

Project: Phase II Investigation

A.K.A.:

Client: 295 Maryland LLC.

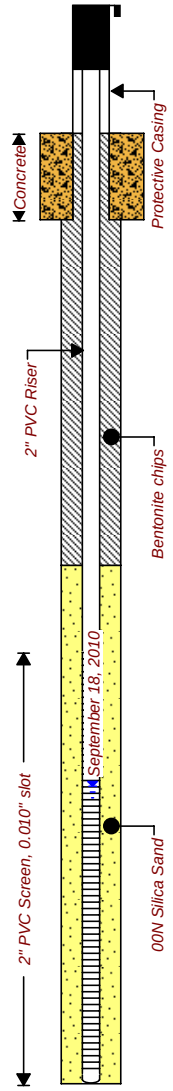
Logged By: TAB

Site Location: 295 Maryland, Buffalo NY

Checked By: BCH

Benchmark Environmental Engineering & Science, PLLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0599

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs ppm	Lab Sample	Well Completion Details or Remarks
	0.0	Ground Surface							
	0.0	***Top Soil*** Brown, moist, mostly low plastic fines, trace subrounded coarse sand, trace fine gravel medium dense rootlets.	S1	28	1.5		0.0		
2.0	-2.0 2.0	***Lean Clay w/ Fill*** Reddish brown, moist, dense mostly low plasticity fines , trace fine sand, trace fine to coarse gravel, orange brick.	S2	15	1.5		0.0		
	-4.0 4.0	As above, ash layer .5-inch thick at (3.0) fbgs.	S3	17	1.4		0.0	See analytical table	
7.0		***Lean Clay*** Reddish brown, moist, low to medium plastic fines, trace fine sand, stiff, rootlets, high toughness.	S4	36	1.9		0.0		
	-8.0 8.0	As above, trace coarse sand.	S5	34	2.0		0.0		
	-10.0 10.0	As above, grey fine sand filled fractures. As above, trace, fine and coarse gravel.	S6	37	2.0		0.0		
12.0	-12.0 12.0	As above, iron stained fine sand lenses.	S7	22	2.0		0.0		
	-14.0 14.0	As above.	S8	14	1.8		0.0		
	-15.0 15.0	***Sandy Silt*** Brown, wet, mostly, non-plastic fines, with some fine sand, medium dense.	S9	18	1.5		0.0		
17.0	-18.0 18.0	As above	S10	46	1.4		0.0		
	-20.0 20.0	As above.	S11	29	1.3		0.0		
22.0	-22.0 22.0	End of Borehole							



Drilled By: Earth Dimensions, Inc
Drill Rig Type: CME 550
Drill Method: 4 1/4-inch HSA w/Continous SS
Comments:
Drill Date(s): 9 14 10

Hole Size: 8 1/2-inch
Stick-up: 2.5-fbgs
Datum: NA

Sheet: 1 of 1

Project No: 0222-001-100

Borehole Number: MW-4

Project: Phase II Investigation

A.K.A.:

Client: 295 Maryland LLC.

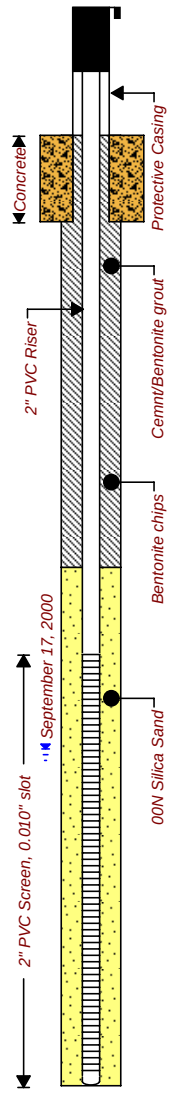
Logged By: TAB

Site Location: 295 Maryland, Buffalo, NY

Checked By: BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs ppm (0 – 12.5 – 25)	Lab Sample	Well Completion Details or Remarks
-3.0									
	0.0	Ground Surface							
	0.0	***Lean Clay W/Fill*** Brown, moist, mostly non to low platicty fines with some fine sand, few coarse sand and fine gravel asphalt and brick.	S1	18	1.3				
2.0									
	-5.0								
	5.0	***Lean Clay*** Reddish brown, moist, mostly medium plastic fines with trace fine sand, very stiff, trace coarse sand, grey fine sand partings, medium toughness.	S2	23	2.0				
7.0									
	-10.0								
	10.0	As above, with brown fine sand lenses 0.05 to 0.1-inch thick.	S3	36	2.0				
12.0									
	-15.0								
	15.0	As above, no brown fine sand lenses.	S4	12	2.0				
17.0									
	-20.0								
	20.0	***Sandy Silt*** Brown, wet, mostly non plastic fines with some fine sand, very dense, trace fine gravel.	S5	61	1.6				
22.0	-22.0								
	22.0	End of Borehole							



Drilled By: Earth Dimensions, Inc.
Drill Rig Type: CME 550
Drill Method: 41/4-inch HSA w/Continous SS
Comments:
Drill Date(s): 9 14 10

Hole Size: 8 1/2-inch
Stick-up: 2.5-feet
Datum: NA

Sheet: 1 of 1

Project No: 0222-001-100

Borehole Number: SB-5

Project: Phase II investigation

A.K.A.:

Client: 295 Maryland LLC.

Logged By: TAB

Site Location: 295 Maryland, Buffalo, NY

Checked By: BCH

Benchmark Environmental Engineering & Science, PLLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0599

SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs ppm (0 / 12.5 / 25)	Lab Sample	Well Completion Details or Remarks
0.0	0.0	Ground Surface							
	0.0	***Lean Clay w/Fill*** Reddish brown, moist, low to non plastic fines, trace fine sand, very stiff, asphalt and glass piecies, cinders.	S1	20	2.0		0.0		
	-2.0 / 2.0	As above.	S2	20	1.4		0.0		
	-4.0 / 4.0	***Lean Clay*** Reddish brown, moist, low plasticity fines, trace fine sand, very stiff, medium toughness.	S3	27	2.0		0.0	See analytical tables	
5.0	-6.0 / 6.0	End of Borehole							

Drilled By: Earth Dimensions, Inc.
Drill Rig Type: CME 550
Drill Method: 4 1/4-inch HSA w/ Continous SS
Comments:
Drill Date(s): 9 13 10

Hole Size: 8 1/2-inch
Stick-up: NA
Datum: Mean Sea Level

Sheet: 1 of 1

APPENDIX D

EXCAVATION WORK PLAN

APPENDIX D – EXCAVATION WORK PLAN (EWP)

D-1 NOTIFICATION

At least 15 days prior to the start of any activity that is anticipated to encounter remaining contamination, the site owner or their representative will notify the NYSDEC. Table 1, below, includes contact information for the above notification. The information on this table will be updated as necessary to provide accurate contact information. A full listing of site-related contact information is provided in Appendix B.

Table 1: Notifications*

Name	Contact Information
Anthony Lopes, P.E, (NYSDEC Project Manager)	716-851-7220 anthony.lopes@dec.ny.gov
Chad Staniszewski, P.E.	716-851-7220 chad.staniszewski@dec.ny.gov
Kelly Lewandowski	518) 402-9575 kelly.lewandowski@dec.ny.gov

* Note: Notifications are subject to change and will be updated as necessary.

This notification will include:

- A detailed description of the work to be performed, including the location and areal extent of excavation, plans/drawings for site re-grading, intrusive elements or utilities to be installed below the soil cover, estimated volumes of contaminated soil to be excavated and any work that may impact an engineering control;
- A summary of environmental conditions anticipated to be encountered in the work areas, including the nature and concentration levels of contaminants of concern, potential presence of grossly contaminated media, and plans for any pre-construction sampling;
- A schedule for the work, detailing the start and completion of all intrusive work;

- A summary of the applicable components of this EWP;
- A statement that the work will be performed in compliance with this EWP and 29 CFR 1910.120;
- A copy of the contractor's health and safety plan (HASP), in electronic format, if it differs from the HASP provided in Appendix E of this SMP;
- Identification of disposal facilities for potential waste streams; and
- Identification of sources of any anticipated backfill, along with all required chemical testing results.

D-2 SOIL SCREENING METHODS

Visual, olfactory and instrument-based (e.g. photoionization detector) soil screening will be performed by a qualified environmental professional during all excavations into known or potentially contaminated material (remaining contamination). Soil screening will be performed when invasive work is done and will include all excavation and invasive work performed during development, such as excavations for foundations and utility work, after issuance of the COC.

Soils will be segregated based on previous environmental data and screening results into material that requires off-site disposal and material that requires testing to determine if the material can be reused on-site as soil beneath a cover or if the material can be used as cover soil. Further discussion of off-site disposal of materials and on-site reuse is provided below.

D-3 SOIL STAGING METHODS

Soil stockpiles will be continuously encircled with a berm and/or silt fence. Hay bales will be used as needed near catch basins, surface waters and other discharge points.

Stockpiles will be kept covered at all times with appropriately anchored tarps. Stockpiles will be routinely inspected and damaged tarp covers will be promptly replaced.

Stockpiles will be inspected at a minimum once each week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the site and available for inspection by the NYSDEC.

D-4 MATERIALS EXCAVATION AND LOAD-OUT

A qualified environmental professional or person under their supervision will oversee all invasive work and the excavation and load-out of all excavated material.

The owner of the property and remedial party (if applicable) and its contractors are responsible for safe execution of all invasive and other work performed under this Plan.

The presence of utilities and easements on the site will be investigated by the qualified environmental professional. It will be determined whether a risk or impediment to the planned work under this SMP is posed by utilities or easements on the site.

Loaded vehicles leaving the site will be appropriately lined, tarped, securely covered, manifested, and placarded in accordance with appropriate Federal, State, local, and NYSDOT requirements (and all other applicable transportation requirements).

A truck wash will be operated on-site, as appropriate. The qualified environmental professional will be responsible for ensuring that all outbound trucks will be washed at the truck wash before leaving the site until the activities performed under this section are complete Truck wash waters will be collected and disposed of off-site in an appropriate manner.

Locations where vehicles enter or exit the site shall be inspected daily for evidence of off-site soil tracking.

The qualified environmental professional will be responsible for ensuring that all egress points for truck and equipment transport from the site are clean of dirt and other materials derived from the site during intrusive excavation activities. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to site-derived materials.

D-5 MATERIALS TRANSPORT OFF-SITE

All transport of materials will be performed by licensed haulers in accordance with appropriate local, State, and Federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded.

Material transported by trucks exiting the site will be secured with tight-fitting covers. Loose-fitting canvas-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used.

Truck transport routes shall be selected to involve the shortest commute through residential neighborhoods as feasible. For the subject site, this will generally involve proceeding west on Maryland Street to Niagara Street, the latter of which serves as a major thoroughfare and has direct ramp access to the NY State thruway system. All trucks loaded with site materials will exit the vicinity of the site using only these approved truck routes. This is the most appropriate route and takes into account: (a) limiting transport through residential areas and past sensitive sites; (b) use of city mapped truck routes; (c) prohibiting off-site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport.

Trucks will be prohibited from stopping and idling in the neighborhood outside the project site.

Egress points for truck and equipment transport from the site will be kept clean of dirt and other materials during site remediation and development.

Queuing of trucks will be performed on-site in order to minimize off-site disturbance. Off-site queuing will be prohibited.

D-6 MATERIALS DISPOSAL OFF-SITE

All material excavated and removed from the site will be treated as contaminated and regulated material and will be transported and disposed in accordance with all local, State (including 6NYCRR Part 360) and Federal regulations. If disposal of material from this site is proposed for unregulated off-site disposal (i.e. clean soil removed for development purposes), a formal request with an associated plan will be made to the NYSDEC. Unregulated off-site management of materials from this site will not occur without formal NYSDEC approval.

Off-site disposal locations for excavated soils will be identified in the pre-excavation notification. This will include estimated quantities and a breakdown by class of disposal facility if appropriate, i.e. hazardous waste disposal facility, solid waste landfill, petroleum treatment facility, C/D recycling facility, etc. Actual disposal quantities and associated documentation will be reported to the NYSDEC in the Periodic Review Report. This documentation will include: waste profiles, test results, facility acceptance letters, manifests, bills of lading and facility receipts.

Non-hazardous historic fill and contaminated soils taken off-site will be handled, at minimum, as a Municipal Solid Waste per 6NYCRR Part 360-1.2. Material that does not meet Unrestricted SCOs is prohibited from being taken to a New York State recycling facility (6NYCRR Part 360-16 Registration Facility).

D-7 MATERIALS REUSE ON-SITE

The qualified environmental professional will ensure that procedures defined for materials reuse in this SMP are followed and that unacceptable material does not remain on-site. Contaminated on-site material, including historic fill and contaminated soil, that is acceptable for reuse on-site will be placed below the demarcation layer or impervious surface, and will not be reused within a cover soil layer, within landscaping berms, or as backfill for subsurface utility lines. No grossly-impacted materials shall be reused onsite; such materials must be disposed offsite in accordance with applicable local, state and federal regulations.

Any demolition material proposed for reuse on-site will be sampled for asbestos and the results will be reported to the NYSDEC for acceptance. Concrete crushing or processing on-site will not be performed without prior NYSDEC approval. Organic matter (wood, roots, stumps, etc.) or other solid waste derived from clearing and grubbing of the site will not be reused on-site.

D-8 FLUIDS MANAGEMENT

All liquids to be removed from the site, including but not limited to, excavation dewatering, decontamination waters and groundwater monitoring well purge and development waters, will be handled, transported and disposed in accordance with applicable local, State, and Federal regulations. Dewatering, purge and development fluids will not be recharged back to the land surface or subsurface of the site, and will be managed off-site, unless prior approval is obtained from NYSDEC.

Discharge of water generated during large-scale construction activities to surface waters (i.e. a local pond, stream or river) will be performed under a SPDES permit.

D-9 COVER SYSTEM RESTORATION

After the completion of soil removal and any other invasive activities the cover system will be restored in a manner that complies with the RAWP. The existing cover system is comprised of a minimum of 24 inches of clean soil, asphalt pavement, concrete covered sidewalks and concrete building, etc. The demarcation layer, consisting of orange netting, will be replaced beneath the soil cover to provide a visual reference to the top of the remaining contamination zone, the zone that requires adherence to special conditions for disturbance of remaining contaminated soils defined in this SMP. If the type of cover system changes from that which exists prior to the excavation (i.e., a soil cover is replaced by asphalt), this will constitute a modification of the cover element of the remedy and the upper surface of the remaining contamination. A figure showing the modified surface will be included in the subsequent Periodic Review Report and in an updated SMP.

D-10 BACKFILL FROM OFF-SITE SOURCES

All materials proposed for import onto the site will be approved by the qualified environmental professional and will be in compliance with provisions in this SMP prior to receipt at the site. A Request to Import/Reuse Fill or Soil form, which can be found at http://www.dec.ny.gov/regulations/67386.html, will be prepared and submitted to the NYSDEC project manager allowing a minimum of 5 business days for review.

Material from industrial sites, spill sites, or other environmental remediation sites or potentially contaminated sites will not be imported to the site.

All imported soils will be tested and demonstrated to meet the backfill and cover soil quality standards established in 6NYCRR 375-6.7(d). The specific criteria under which off-site material may be used as cover or backfill are presented below.

- **Off-Site Soil:** Off-Site soil may be used as backfill provided that it originates from: 1) an NYSDEC-approved borrow site; or 2) a known source having no evidence of

disposal or releases of hazardous substances, hazardous, toxic, radioactive wastes, or petroleum. In both instances the imported soil must be tested as discussed herein and demonstrated to meet restricted-residential SCOs and protection of groundwater quality SCOs or lesser as published in 6NYCRR Part 375-6.8(b) In addition, no off-site materials meeting the definition of a solid waste as defined in 6NYCRR, Part 360-1.2 (a) shall be used as backfill.

- **Other Off-Site Material:** Certain material may be imported as backfill or cover, without chemical testing, provided it contains less than 10% (by weight) material that would pass through a size 80 sieve: 1) Rock or stone, consisting of virgin material from a permitted mine or quarry; 2) steel slag under BUD#555-9-152; 3) Recycled concrete, brick, or asphalt from a NYSDEC-registered or permitted construction and demolition (C&D) debris processing facility (as specified in Section 360-16.1 of 6NYCRR Part 360) that conforms to Section 304 of the New York State Department of Transportation Standard Specifications Construction and Materials Volume 1 (2002). As stated in Section 360-16.4(b)(2), the facility may only accept recognizable, uncontaminated, non-pulverized C&D debris or C&D debris from other authorized C&D processing facilities. According to Section 360-16.2(c), "uncontaminated" means C&D debris that is not mixed or commingled with other solid waste at the point of generation, processing, or disposal, and that is not contaminated with spills of a petroleum product, hazardous waste, or industrial waste.

D-10.1 Quality Assurance Requirements

All imported soil sources, including general backfill soil and topsoil, will be subject to third-party testing to verify that they meet the QA requirements specified below. The contractor will be required to collect the specified number of samples and submit the samples to an independent, NYSDOH ELAP-certified laboratory for analysis. The NYSDEC will be notified of the sampling and provided an opportunity to observe the sample collection work.

All analyses will be in accordance with USEPA SW-846 methodology. The laboratory data package will be a Category A deliverable; however, the NYSDEC may

request, at any time, to upgrade the deliverable to Category B. Each import soil source shall be analyzed for the following parameters as more specifically listed in 6NYCRR Part 375-6:

- VOCs – Method 8260
- SVOCs – Method 8270
- Organochlorine Pesticides and PCBs – Method 8081/8082
- Metals, excluding mercury – Method 6010
- Mercury – Method 7471
- Cyanide – Method 9013

Each import soil source shall be subject to testing in accordance with the following schedule per NYSDEC DER-10 Table 5.4(e)10:

<table>
<tr><th>Contaminant:</th><th>VOCs</th><th colspan="2">SVOCs, Inorganics & PCBs/Pesticides</th></tr>
<tr><th>Soil Quantity (cubic yards)</th><th>Discrete Samples</th><th>Composite</th><th>Discrete Samples/Composite</th></tr>
<tr><td>0-50</td><td>1</td><td>1</td><td rowspan="8">3-5 discrete samples from different locations in the fill being provided will comprise a composite sample for analysis</td></tr>
<tr><td>50-100</td><td>2</td><td>1</td></tr>
<tr><td>100-200</td><td>3</td><td>1</td></tr>
<tr><td>200-300</td><td>4</td><td>1</td></tr>
<tr><td>300-400</td><td>4</td><td>2</td></tr>
<tr><td>400-500</td><td>5</td><td>2</td></tr>
<tr><td>500-800</td><td>6</td><td>2</td></tr>
<tr><td>800-1,000</td><td>7</td><td>2</td></tr>
<tr><td>1,000</td><td colspan="3">Add an additional 2 VOC and 1 composite for each additional 1,000 cubic yards or consult with DER</td></tr>
</table>

Grab samples collected via En-Core® sampling technique will be required for VOC analysis. For all other required analyses, a minimum of four grab samples will be collected to form a single composite sample. Approximately equal aliquots of the grab samples will be composited in the field using a stainless steel trowel and bowl. The trowel and bowl shall be decontaminated with a non-phosphate detergent (e.g., Alconox®) and potable water wash solution followed by a distilled water rinse between sampling locations).

Import criteria are restricted-residential SCOs and protection of groundwater quality SCOs or lesser as published in 6NYCRR Part 375-6.8(b).

.Soils that meet 'exempt' fill requirements under 6 NYCRR Part 360, but do not meet backfill or cover soil objectives for this site, will not be imported onto the site without prior approval by NYSDEC. Solid waste will not be imported onto the site.

Trucks entering the site with imported soils will be securely covered with tight fitting covers. Imported soils will be stockpiled separately from excavated materials and covered to prevent dust releases.

D-11 STORMWATER POLLUTION PREVENTION

Small excavations disturbing less than 1-acre shall follow the minimum erosion controls presented below. For construction projects exceeding 1 acre, coverage must be obtained under the NYSDEC SPDES General Permit for Construction Activity, and shall include preparation and approval of a Storm Water Pollution Prevention Plan (SWPPP) that conforms to the requirements of the NYSDEC Division of Water guidelines and NYS regulations.

Minimum Storm Water Controls for Small Excavations:

Silt fencing or hay bales will be installed around the entire perimeter of the construction area and inspected once a week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the site and available for inspection by the NYSDEC. All necessary repairs shall be made immediately.

Accumulated sediments will be removed as required to keep the barrier and hay bale check functional.

All undercutting or erosion of the silt fence toe anchor shall be repaired immediately with appropriate backfill materials.

Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

Erosion and sediment control measures identified in the SMP shall be observed to ensure that they are operating correctly. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters.

D-12 EXCAVATION CONTINGENCY PLAN

If underground tanks or other previously unidentified contaminant sources are found during post-remedial subsurface excavations or development related construction, excavation activities will be suspended until sufficient equipment is mobilized to address the condition.

Sampling will be performed on product, sediment and surrounding soils, etc. as necessary to determine the nature of the material and proper disposal method. Chemical analysis will be performed for a full list of analytes (TAL metals; TCL volatiles and semi-volatiles, TCL pesticides and PCBs), unless the site history and previous sampling results provide a sufficient justification to limit the list of analytes. In this case, a reduced list of analytes will be proposed to the NYSDEC for approval prior to sampling.

Identification of unknown or unexpected contaminated media identified by screening during invasive site work will be promptly communicated by phone to NYSDEC's Project Manager. Reportable quantities of petroleum product will also be reported to the NYSDEC spills hotline. These findings will be also included in the Periodic Review Report.

D-13 COMMUNITY AIR MONITORING PLAN

The New York State Department of Health (NYSDOH) Generic Community Air Monitoring Plan (CAMP) found in Appendix 1A of NYSDEC's DER-10 *Technical Guidance for Site Investigation and Remediation* will be implemented for all intrusive activities performed at the site. A copy of the CAMP and additional details concerning CAMP requirements are included in Appendix E of this SMP.

D-14 OTHER NUISANCES

A plan for rodent control will be developed and utilized by the contractor prior to and during site clearing and site grubbing, and during all remedial work.

A plan will be developed and utilized by the contractor for all remedial work to ensure compliance with local noise control ordinances.

APPENDIX E

HEALTH & SAFETY PLAN (HASP)
&
COMMUNITY AIR MONITORING PLAN (CAMP)

SITE MANAGEMENT PLAN– APPENDIX E

SITE HEALTH & SAFETY PLAN
FOR
POST REMEDIAL ACTIVITIES UNDER THE SITE MANAGEMENT PLAN

295 Maryland Street Site
Buffalo, New York

June 2015 0222-014-100
Revised October 2015

Prepared for:

295 MARYLAND, LLC

Prepared By:

Benchmark Environmental Engineering & Science, PLLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0599

SITE HEALTH & SAFETY PLAN FOR POST REMEDIAL ACTIVITIES UNDER THE SITE MANAGEMENT PLAN
295 MARYLAND STREET SITE

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ACKNOWLEDGEMENT

Plan Reviewed by (initial):

Corporate Health and Safety Director: _____

Project Manager: _____

Designated Site Safety and Health Officer: _____

Acknowledgement:
I acknowledge that I have reviewed the information contained in this site-specific Health and Safety Plan, and understand the hazards associated with performance of the field activities described herein. I agree to comply with the requirements of this plan.

NAME (PRINT)	SIGNATURE	DATE

SITE HEALTH & SAFETY PLAN FOR POST REMEDIAL ACTIVITIES UNDER THE SITE MANAGEMENT PLAN

295 MARYLAND STREET SITE

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SITE HEALTH & SAFETY PLAN FOR POST REMEDIAL ACTIVITIES UNDER THE SITE MANAGEMENT PLAN
295 MARYLAND STREET SITE

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APPENDICES

1.0 INTRODUCTION

1.1 General

In accordance with OSHA requirements contained in 29 CFR 1910.120, this Health and Safety Plan (HASP) for post remedial activities under the Site Management Plan describes the specific health and safety practices and procedures to be employed by Benchmark Environmental Engineering & Science, PLLC (Benchmark) employees during post remedial activities on the 295 Maryland Street Site (Site) located in the City of Buffalo, New York. This HASP presents procedures for Benchmark employees who will be involved with remedial field activities; it does not cover the activities of other contractors, subcontractors, or other individuals on the Site. Non-Benchmark site personnel will be required to develop and enforce their own HASPs as discussed in Section 2.0. Benchmark accepts no responsibility for the health and safety of contractor, subcontractor, or other personnel.

This HASP presents information on known Site health and safety hazards using available historical information, and identifies the equipment, materials and procedures that will be used to eliminate or control these hazards. Environmental monitoring will be performed during the course of field activities to provide real-time data for on-going assessment of potential hazards.

1.2 Background

The Site was historically used in a residential and commercial capacity, with the property at 295 Maryland Street most recently occupied by Lamar Advertising, Inc., a firm specializing in the sale of billboard advertising space and erection of billboard signs. Lamar relocated within the City of Buffalo in December 2000; the associated commercial buildings and facilities on 295 Maryland Street as well as the residences at 121-129 West Avenue have been demolished. Currently, the Site is vacant and undeveloped.

A Phase I Environmental Site Assessment (ESA) was performed for the former Lamar Advertising property in January 2000 prior to facility demolition. A separate Phase I ESA was prepared in 2001 for 121-129 West Avenue on behalf of the Buffalo Niagara Renaissance Corporation. The ESA reports indicated that 121-129 West Avenue was

historically used for residential purposes, with 295 Maryland Street historically improved with an office, commercial building, two multiple bay garages, and a parking area. Several identified prior use activities on 295 Maryland, including vehicle maintenance and the use and storage of paints, adhesives, and other flammables, were cited in the Phase I ESA's as indicators of potential environmental conditions on the property. The Phase I also identified a 550-gallon underground gasoline storage tank (UST) and a 4,000-gallon gasoline UST that were reportedly removed from the Site in 1974 and 1997, respectively. A small UST containing benzene was also reportedly discovered and removed during facility decommissioning.

A Phase II Site Investigation was completed at 295 Maryland Street by Benchmark in November 2001 based on Phase I ESA findings. The Phase II identified surface and subsurface soil/fill materials exceeding NY State soil cleanup guidance values (i.e., as compared to TAGM 4046, the applicable NYSDEC guidance in place at that time) for certain parameters, including arsenic, lead, mercury and several polyaromatic hydrocarbons (PAHs). These same parameters are elevated with respect to more recent Soil Cleanup Objectives (SCOs) for restricted residential use as published in 6NYCRR Part 375.

Additional Phase II activities were completed in 2010, 2011 and 2013 in support of entrance of the Site into the NY State Brownfield Cleanup Program (BCP) and development of a remedial plan. This work confirmed earlier findings and assisted in establishing the known and suspected environmental conditions at the Site as identified below.

1.3 Known Environmental Conditions Prior to Cleanup

Portions of the 295 Maryland Street Site were formerly used to house automotive repair facilities containing USTs and hydraulic lifts. Surficial and subsurface soil testing identified seven polyaromatic hydrocarbons (PAHs) at levels in excess of the NYSDEC soil cleanup objectives (SCOs) for restricted residential use. The compounds detected in at least one of the samples include: benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k) fluoranthene, benzo(a)pyrene, indeno(1,2,3)pyrene, and dibenz(a,h)anthracene. In addition, the inorganic compounds detected in excess of the restricted residential SCOs include: arsenic, barium, cadmium, lead and mercury. While not exceeding restricted residential SCOs, low levels of volatile organic compounds (VOCs) and polychlorinated biphenyls (PCBs) were detected. In addition, groundwater results show that VOCs were detected in

the sample from well MW-2 at concentrations exceeding NYSDEC groundwater quality standards (GWQSs). The VOCs detected include benzene, ethylbenzene, toluene, and xylenes (BTEX), which are characteristic of gasoline contamination.

BCP remedial activities were conducted in 2015. The work involved removal/offsite disposal of soils from several Areas of Concern (AOCs) to meet site-specific action levels (SSALs), and placement of a cover system across the site to preclude exposure to remaining soil/fill materials. SSALs were established as: total polyaromatic hydrocarbons (PAHs) <100 mg/kg; inorganics less than commercial soil cleanup objectives (SCOs) per 6 NYCRR Part 375.

1.4 Remedial Activities

BCP remedial activities were conducted in 2015. The work involved removal/offsite disposal of soils from several Areas of Concern (AOCs) to meet site-specific action levels (SSALs), and placement of a cover system across the site to preclude exposure to remaining soil/fill materials. SSALs were established as:

- Total PAHs at or below 100 mg/kg;
- Inorganics at or below commercial Soil Cleanup Objectives
- Complete removal of soil/fill exhibiting gross impacts (strong visual, olfactory or PID evidence of impact).

1.5 Parameters of Interest

Potential parameters of interest at the Site include:

- **Volatile Organic Compounds (VOCs)** – VOCs remaining in groundwater at low levels (typically within one order of magnitude of Class GA groundwater quality standards and guidance values) may include benzene, toluene, ethylbenzene, and xylene (i.e., BTEX). These VOCs are typically associated with storage and handling of petroleum products such as gasoline.

- **Polyaromatic Hydrocarbons (PAHs)** – PAHs present at the Site include derivatives from oils, greases, and fuels associated with the operation of historic automotive repair operations; specifically, PAHs that are byproducts of incomplete combustion and impurities in petroleum products. Although PAHs

are commonly found in urban soil environments, they may be present at the Site at concentrations that are elevated compared to typical "background" levels. As indicated above SSALs were established to remove areas of known PAH impact above 100 mg/kg (total).

- **Inorganic Compounds** – Inorganic compounds potentially present at elevated concentrations in soil/fill due to accidental spillage or misguided disposal may include arsenic, cadmium, chromium, lead, and mercury. As indicated above SSALs were established to remove areas of known inorganic impact above commercial SCOs.

1.6 Overview of Post Remedial Activities

Benchmark personnel will be on-site to observe post-remedial activities involving soil/fill disturbance. Activities of this nature that are reasonably expected to occur during the post-remedial period are described below.

- **Subgrade Utility Installation or Repair** – Installation or repair of new subgrade utilities (gas, electric, telecom, etc.) may be required to service existing or new buildings.

- **Subgrade Foundation Construction** – It may be necessary or desirable to construct a new structure (e.g., shed or other support building) on the property, in which case subgrade soil/fill would be encountered for foundation work.

- **Cover System Repair** – It may be necessary to remove or repair a portion of the cover system (asphalt pavement, soil cover, etc.). Subgrade soil/fill may be exposed as part of that effort.

2.0 ORGANIZATIONAL STRUCTURE

This chapter of the HASP describes the lines of authority, responsibility, and communication as they pertain to health and safety functions at the Site. The purpose of this chapter is to identify the personnel who impact the development and implementation of the HASP and to describe their roles and responsibilities. This chapter also identifies other contractors and subcontractors involved in work operations, and establishes the lines of communications among them for health and safety matters. The organizational structure described in this chapter is consistent with the requirements of 29 CFR 1910.120(b)(2). This section will be reviewed by the Project Manager and updated as necessary to reflect the current organizational structure at the Site.

2.1 Roles and Responsibilities

All Benchmark personnel on the Site must comply with the minimum requirements of this HASP. The specific responsibilities and authority of management, safety and health, and other personnel on this Site are detailed in the following paragraphs.

2.1.1 Corporate Health and Safety Director

The Benchmark Corporate Health and Safety Director is ***Mr. Thomas H. Forbes, P.E.*** The Corporate Health and Safety Director responsible for developing and implementing the Health and Safety program and policies for Benchmark Environmental Engineering & Science, PLLC and consulting with corporate management to ensure adequate resources are available to properly implement these programs and policies. The Corporate Health and Safety Director coordinates Benchmark's Health and Safety training and medical monitoring programs and assists project management and field staff in developing site-specific health and safety plans.

2.1.2 Project Manager

The Project Manager for this site is ***Pay Laport, P.E.*** The Project Manager has the responsibility and authority to direct all Benchmark work operations at the Site. The Project Manager coordinates safety and health functions with the Site Safety and Health Officer, and bears ultimate responsibility for proper implementation of this HASP. He may delegate

authority to expedite and facilitate any application of the program, including modifications to the overall project approach as necessary to circumvent unsafe work conditions. Specific duties of the Project Manager include:

- Preparing and coordinating the site work plan.
- Providing Benchmark workers with work assignments and overseeing their performance.
- Coordinating health and safety efforts with the Site Safety and Health Officer (SSHO).
- Reviewing the emergency response coordination plan to assure its effectiveness.
- Serving as the primary liaison with site contractors and the property owner.

2.1.3 Site Safety and Health Officer

The Site Safety and Health Officer (SSHO) for this site is ***Mr. Richard L. Dubisz***. The qualified alternate SSHO is ***Mr. Thomas Behrendt.*** The SSHO reports to the Project Manager. The SSHO is on-site or readily accessible to the site during all work operations and has the authority to halt site work if unsafe conditions are detected. The specific responsibilities of the SSHO are:

- Managing the safety and health functions for Benchmark personnel on the Site.
- Serving as the point of contact for safety and health matters.
- Ensuring that Benchmark field personnel working on the Site have received proper training (per 29 CFR Part 1910.120(e)), that they have obtained medical clearance to wear respiratory protection (per 29 CFR Part 1910.134), and that they are properly trained in the selection, use and maintenance of personal protective equipment, including qualitative respirator fit testing.
- Performing or overseeing site monitoring as required by the HASP.
- Assisting in the preparation and review of the HASP
- Maintaining site-specific safety and health records as described in this HASP
- Coordinating with the Project Manager, Site Workers and Contractor's SSHO as necessary for safety and health efforts.

2.1.4 Site Workers

Site workers are responsible for: complying with this HASP or a more stringent

HASP, if appropriate (i.e., Contractor and Subcontractor's HASP); using proper PPE; reporting unsafe acts and conditions to the SSHO; and following the safety and health instructions of the Project Manager and SSHO.

2.1.5 Other Site Personnel

Other site personnel who will have health and safety responsibilities will include the Remedial Contractor, who will be responsible for developing, implementing, and enforcing a Health and Safety Plan equally stringent or more stringent than Benchmark's HASP. Benchmark assumes no responsibility for the health and safety of anyone outside its direct employ. Each Contractor's HASP shall cover all non-Benchmark site personnel. Each Contractor shall assign a SSHO who will coordinate with Benchmark's SSHO as necessary to ensure effective lines of communication and consistency between contingency plans.

In addition to Benchmark and Contractor personnel, other individuals who may have responsibilities in the work zone include subcontractors and governmental agencies performing site inspection work (i.e., the New York State Department of Environmental Conservation). The Contractor shall be responsible for ensuring that these individuals have received OSHA-required training (29 CFR 1910.120(e)), including initial, refresher, and site-specific training, and shall be responsible for the safety and health of these individuals while they are on-site.

3.0 HAZARD EVALUATION

Due to the presence of certain contaminants at the Site, the possibility exists that workers will be exposed to hazardous substances during field activities. The principal points of exposure would be through direct contact with and incidental ingestion of soil/fill, and through the inhalation of contaminated particles or vapors, during soil/fill excavation activities and monitoring well installation. In addition, the use of heavy construction equipment (e.g., excavator) will also present conditions for potential physical injury to workers. Further, since work will be performed outdoors, the potential exists for heat/cold stress to impact workers, especially those wearing protective equipment and clothing. Adherence to the medical evaluations, worker training relative to chemical hazards, safe work practices, proper personal protection, environmental monitoring, establishment work zones and site control, appropriate decontamination procedures and contingency planning outlined herein will reduce the potential for chemical exposures and physical injuries.

3.1 Chemical Hazards

As discussed in Section 1.3, historic activities related to the former steel-manufacturing operations and facilities have resulted in elevated concentrations of VOCs, SVOCs, PCBs, and inorganic compounds in Site soils and groundwater. Table 1 identifies maximum concentrations of COPCs detected throughout the Site. Table 2 lists exposure limits for airborne concentrations of the COPCs identified in Section 1.4 of this HASP. Brief descriptions of the toxicology of the prevalent constituents of potential concern and related health and safety guidance and criteria are provided below.

- **Arsenic (CAS #7440-38-2)** is a naturally occurring element and is usually found combined with one or more elements, such as oxygen or sulfur. Inhalation is a more important exposure route than ingestion. First phase exposure symptoms include nausea, vomiting, diarrhea and pain in the stomach. Prolonged contact is corrosive to the skin and mucus membranes. Arsenic is considered a Group A human carcinogen by the USEPA. Exposure via inhalation is associated with an increased risk of lung cancer. Exposure via the oral route is associated with an increased risk of skin cancer.
- **Barium (CAS # 7440-39-3)** is a silver white metal, produced by the reduction of barium oxide. Local effects and symptoms of exposure to barium compounds, such as the hydroxide or carbonate, may include irritation of the eyes, throat, nose and skin. Systemic effects from ingestion include increased muscle contractility,

reduction of heart rate/potential arrest, intestinal peristalsis, vascular constriction, and bladder contraction.

- **Benzene (CAS #71-43-2)** poisoning occurs most commonly through inhalation of the vapor; however, benzene can also penetrate the skin and poison in that way. Locally, benzene has a comparatively strong irritating effect, producing erythema and burning and, in more severe cases, edema and blistering. Exposure to high concentrations of the vapor (i.e., 3,000 ppm or higher) may result in acute poisoning characterized by the narcotic action of benzene on the central nervous system. In acute poisoning, symptoms include confusion, dizziness, tightening of the leg muscles, and pressure over the forehead. Chronic exposure to benzene (i.e., long-term exposure to concentrations of 100 ppm or less) may lead to damage of the blood-forming system. Benzene is very flammable when exposed to heat or flame and can react vigorously with oxidizing materials.
- **Cadmium** is a natural element and is usually combined with one or more elements, such as oxygen, chloride or sulfur. Breathing high levels of cadmium severely damages the lungs and can cause death. Ingestion of high levels of cadmium severely irritates the stomach, leading to vomiting and diarrhea. Long term exposure to lower levels of cadmium leads to a buildup of this substance in the kidneys and possible kidney disease. Other potential long term effects are lung damage and fragile bones. Cadmium is suspected to be a human carcinogen.
- **Ethylbenzene (CAS #100-41-4)** is a component of automobile gasoline. Over-exposure may cause kidney, skin liver and/or respiratory disease. Signs of exposure may include dermatitis, irritation of the eyes and mucus membranes, headache. Narcosis and coma may result in more severe cases.
- **Lead (CAS #7439-92-1)** can affect almost every organ and system in our bodies. The most sensitive is the central nervous system, particularly in children. Lead also damages kidneys and the immune system. The effects are the same whether it is breathed or swallowed. Lead may decrease reaction time, cause weakness in fingers, wrists or ankles and possibly affect memory. Lead may cause anemia.
- **Mercury (CAS #7439-97-6)** is used in industrial applications for the production of caustic and chlorine, and in electrical control equipment and apparatus. Over-exposure to mercury may cause coughing, chest pains, bronchitis, pneumonia, indecision, headaches, fatigue and salivation. Mercury is a skin and eye irritant.
- **Polycyclic Aromatic Hydrocarbons (PAHs)** are formed as a result of the pyrolysis and incomplete combustion of organic matter such as fossil fuel. PAH aerosols formed during the combustion process disperse throughout the atmosphere, resulting in the deposition of PAH condensate in soil, water and on vegetation. In addition, several products formed from petroleum processing operations (e.g., roofing materials and asphalt) also contain elevated levels of

PAHs. Hence, these compounds are widely dispersed in the environment. PAHs are characterized by a molecular structure containing three or more fused, unsaturated carbon rings. Seven of the PAHs are classified by USEPA as probable human carcinogens (USEPA Class B2). These are: benzo(a)pyrene; benzo(a)anthracene; benzo(b)fluoranthene; benzo(k)fluoranthene; chrysene; dibenz(a,h)anthracene; and indeno(1,2,3-cd)pyrene. The primary route of exposure to PAHs is through incidental ingestion and inhalation of contaminated particulates. PAHs are characterized by an organic odor, and exist as oily liquids in pure form. Acute exposure symptoms may include acne-type blemishes in areas of the skin exposed to sunlight.

- **Toluene (CAS #108-88-3)** is a common component of paint thinners and automobile fuel. Acute exposure predominantly results in central nervous system depression. Symptoms include headache, dizziness, fatigue, muscular weakness, drowsiness, and coordination loss. Repeated exposures may cause removal of lipids from the skin, resulting in dry, fissured dermatitis.
- **Xylenes (o, m, and p) (CAS #95-47-6, 108-38-3, and 106-42-3)** are colorless, flammable liquids present in paint thinners and fuels. Acute exposure may cause central nervous system depression, resulting in headache, dizziness, fatigue, muscular weakness, drowsiness, and coordination loss. Repeated exposures may also cause removal of lipids from the skin, producing dry, fissured dermatitis. Exposure of high concentrations of vapor may cause eye irritation and damage, as well as irritation of the mucus membranes.

With respect to the anticipated Post Remedial activities discussed in Section 1.6, possible routes of exposure to the above-mentioned contaminants are presented in Table 3. The use of proper respiratory equipment, as outlined in Section 7.0 of this HASP, will minimize the potential for exposure to airborne contamination. Exposure to contaminants through dermal and other routes will also be minimized through the use of protective clothing (Section 7.0), safe work practices (Section 6.0), and proper decontamination procedures (Section 12.0).

3.2 Physical Hazards

Post Remedial activities at the Site may present the following physical hazards:

- The potential for physical injury during heavy construction equipment use, such as grading equipment, excavators, and tandem trucks.
- The potential for heat/cold stress to employees during the summer/winter months (see Section 10.0).

- The potential for slip and fall injuries due to rough, uneven terrain and/or open excavations.

These hazards represent only some of the possible means of injury that may be present during remedial activities at the Site. Since it is impossible to list all potential sources of injury, it shall be the responsibility of each individual to exercise proper care and caution during all phases of the work.

4.0 TRAINING

4.1 Site Workers

All personnel performing remedial activities at the Site (such as, but not limited to, equipment operators, general laborers, and supervisors) and who may be exposed to hazardous substances, health hazards, or safety hazards and their supervisors/ managers responsible for the Site shall receive training in accordance with 29 CFR 1910.120(e) before they are permitted to engage in operations in the exclusion zone or contaminant reduction zone. This training includes an initial 40-hour Hazardous Waste Site Worker Protection Course, an 8-hour Annual Refresher Course subsequent to the initial 40-hour training, and 3 days of actual field experience under the direct supervision of a trained, experienced supervisor. Additional site-specific training shall also be provided by the SSHO prior to the start of field activities. A description of topics to be covered by this training is provided below.

4.1.1 Initial and Refresher Training

Initial and refresher training is conducted by a qualified instructor as specified under OSHA 29 CFR 1910.120(e)(5), and is specifically designed to meet the requirements of OSHA 29 CFR 1910.120(e)(3) and 1910.120(e)(8). The training covers, as a minimum, the following topics:

- OSHA HAZWOPER regulations.
- Site safety and hazard recognition, including chemical and physical hazards.
- Medical monitoring requirements.
- Air monitoring, permissible exposure limits, and respiratory protection level classifications.
- Appropriate use of personal protective equipment (PPE), including chemical compatibility and respiratory equipment selection and use.
- Work practices to minimize risk.
- Work zones and site control.
- Safe use of engineering controls and equipment.
- Decontamination procedures.

- Emergency response and escape.
- Confined space entry procedures.
- Heat and cold stress monitoring.
- Elements of a Health and Safety Plan.
- Spill containment.

Initial training also incorporates workshops for PPE and respiratory equipment use (Levels A, B and C), and respirator fit testing. Records and certification received from the course instructor documenting each employee's successful completion of the training identified above are maintained on file at Benchmark's Buffalo, NY office. Contractors and Subcontractors are required to provide similar documentation of training for all their personnel who will be involved in on-site work activities.

Any employee who has not been certified as having received health and safety training in conformance with 29 CFR 1910.120(e) is prohibited from working in the exclusion and contamination reduction zones, or to engage in any on-site work activities that may involve exposure to hazardous substances or wastes.

4.1.2 Site Training

Site workers are given a copy of the HASP and provided a site-specific briefing prior to the commencement of work to ensure that employees are familiar with the HASP and the information and requirements it contains. The site briefing shall be provided by the SSHO prior to initiating field activities and shall include:

- Names of personnel and alternates responsible for site safety and health.
- Safety, health and other hazards present on the Site.
- The Site lay-out including work zones and places of refuge.
- The emergency communications system and emergency evacuation procedures.
- Use of PPE.
- Work practices by which the employee can minimize risks from hazards.
- Safe use of engineering controls and equipment on the site.
- Medical surveillance, including recognition of symptoms and signs of over-exposure as described in Chapter 5 of this HASP.

- Decontamination procedures as detailed in Chapter 12 of this HASP.
- The emergency response plan as detailed in Chapter 15 of this HASP.
- Confined space entry procedures, if required, as detailed in Chapter 13 of this HASP.
- The spill containment program as detailed in Chapter 9 of this HASP.
- Site control as detailed in Chapter 11 of this HASP.

Supplemental health and safety briefings will also be conducted by the SSHO on an as-needed basis during the course of the work. Supplemental briefings are provided as necessary to notify employees of any changes to this HASP as a result of information gathered during ongoing site characterization and analysis. Conditions for which the SSHO may schedule additional briefings include, but are not limited to: a change in Site conditions (i.e., based on monitoring results); changes in the work schedule/plan; newly discovered hazards; and safety incidents occurring during Site work.

4.2 Supervisor Training

On-site safety and health personnel who are directly responsible for or who supervise the safety and health of workers engaged in hazardous waste operations (i.e., SSHO) shall receive, in addition to the appropriate level of worker training described in Section 4.1, above, 8 additional hours of specialized supervisory training, in compliance with 29 CFR 1910.120(e)(4).

4.3 Emergency Response Training

Emergency response training is addressed in Appendix A of this HASP, Emergency Response Plan.

4.4 Site Visitors

Each Contractor's SSHO will provide a site-specific briefing to all site visitors and other non-Benchmark personnel who enter the Site beyond the site entry point. The site-specific briefing will provide information about site hazards, the site layout including work

zones and places of refuge, the emergency communications system and emergency evacuation procedures, and other pertinent safety and health requirements as appropriate.

Site visitors will not be permitted to enter the exclusion zone or contaminant reduction zones unless they have received the level of training required for site workers as described in Section 4.1.

5.0 MEDICAL MONITORING

Medical monitoring examinations are provided to Benchmark employees as stipulated under 29 CFR Part 1910.120(f). These exams include initial employment, annual, and employment termination physicals for all Benchmark employees involved in hazardous waste site field operations. Post-exposure examinations are also provided for employees who may have been injured, received a health impairment, or developed signs or symptoms of over-exposure to hazardous substances or were accidentally exposed to substances at concentrations above the permissible exposure limits without necessary personal protective equipment. Such exams are performed as soon as possible following development of symptoms or the known exposure event.

Medical evaluations are performed by HealthWorks WNY, an occupational health care provider under contract with Benchmark. HealthWork's local facility is located at Seneca Square Plaza, 1900 Ridge Road, West Seneca, New York 14224. The facility can be reached at (716) 823-5050 to schedule routine appointments or post-exposure examinations.

Medical evaluations are conducted according to the Benchmark Medical Monitoring Program and include an evaluation of the workers' ability to use respiratory protective equipment. The purpose of the medical evaluation is to determine an employee's fitness for duty on hazardous waste sites; and to establish baseline medical data. The examinations include:

- Occupational/medical history review.
- Physical exam, including vital sign measurement.
- Spirometry testing.
- Eyesight testing.
- Audio testing (minimum baseline and exit, annual for employees routinely exposed to greater than 85db).
- EKG (for employees >40 yrs age or as medical conditions dictate).
- Chest X-ray (baseline and exit, and every 5 years).
- Blood biochemistry (including blood count, white cell differential count, serum multiplastic screening).
- Medical certification of physical requirements (i.e., sight, musculoskeletal, cardiovascular) for safe job performance and to wear respiratory protection equipment.

In conformance with OSHA regulations, Benchmark will maintain and preserve medical records for a period of 30 years following termination of employment. Employees are provided a copy of the physician's post-exam report, and have access to their medical records and analyses.

6.0 SAFE WORK PRACTICES

All Benchmark employees shall conform to the following safe work practices during all on-site work activities conducted within the exclusion and contamination reduction zones:

- Eating, drinking, chewing gum or tobacco, smoking, or any practice that increases the probability of hand-to-mouth contact is strictly prohibited.
- The hands and face must be thoroughly washed upon leaving the work area and prior to engaging in any activity indicated above.
- Respiratory protective equipment and clothing must be worn by all personnel entering the site as required by the HASP or as modified by the site safety officer. Excessive facial hair (i.e., beards, long mustaches or sideburns) that interferes with the satisfactory respirator-to-face seal is prohibited.
- Contact with surfaces/materials either suspected or known to be contaminated will be avoided to minimize the potential for transfer to personnel, cross contamination and need for decontamination.
- Medicine and alcohol can synergize the effects of exposure to toxic chemicals. Due to possible contraindications, use of prescribed drugs should be reviewed with the Benchmark occupational physician. Alcoholic beverage and illegal drug intake are strictly forbidden during the workday.
- All personnel shall be familiar with standard operating safety procedures and additional instructions contained in this Health and Safety Plan.
- On-site personnel shall use the "buddy" system. No one may work alone (i.e., out of earshot or visual contact with other workers) in the exclusion zone.
- Personnel and equipment in the contaminated area shall be minimized, consistent with effective site operations.
- All employees have the obligation to immediately report and if possible, correct unsafe work conditions.
- Use of contact lenses on-site will not be permitted. Spectacle kits for insertion into full-face respirators will be provided for Benchmark employees, as requested and required.

The recommended specific safety practices for working around the contractor's equipment (e.g., backhoes, bulldozers, excavators, etc.) are as follows:

- Although the Contractor and subcontractors are responsible for their equipment and safe operation of the site, Benchmark personnel are also responsible for their

own safety.

- Subsurface work will not be initiated without first clearing underground utility services.
- Heavy equipment should not be operated within 20 feet of overhead wires. This distance may be increased if windy conditions are anticipated or if lines carry high voltage. The site should also be sufficiently clear to ensure the project staff can move around the heavy machinery safely.
- Care should be taken to avoid overhead wires when moving heavy-equipment from location to location.
- Hard hats, safety boots and safety glasses should be worn at all times in the vicinity of heavy equipment. Hearing protection is also recommended.
- The work site should be kept neat. This will prevent personnel from tripping and will allow for fast emergency exit from the site.
- Proper lighting must be provided when working at night.
- Construction activities should be discontinued during an electrical storm or severe weather conditions.
- The presence of combustible gases should be checked before igniting any open flame.
- Personnel shall stand upwind of any construction operation when not immediately involved in sampling/logging/observing activities.
- Personnel will not approach the edge of an unsecured trench/excavation closer than 2 feet.

7.0 PERSONAL PROTECTIVE EQUIPMENT

7.1 Equipment Selection

Personal protective equipment (PPE) will be donned when work activities may result in exposure to physical or chemical hazards beyond acceptable limits, and when such exposure can be mitigated through appropriate PPE. The selection of PPE will be based on an evaluation of the performance characteristics of the PPE relative to the requirements and limitations of the Site, the task-specific conditions and duration, and the hazards and potential hazards identified at the site.

Equipment designed to protect the body against contact with known or suspect chemical hazards are grouped into four categories according to the degree of protection afforded. These categories designated A through D consistent with USEPA Level of Protection designation, are:

- **Level A:** Should be selected when the highest level of respiratory, skin and eye protection is needed.
- **Level B:** Should be selected when the highest level of respiratory protection is needed, but a lesser level of skin protection is required. Level B protection is the minimum level recommended on initial site entries until the hazards have been further defined by on-site studies. Level B (or Level A) is also necessary for oxygen-deficient atmospheres.
- **Level C:** Should be selected when the types of airborne substances are known, the concentrations have been measured and the criteria for using air-purifying respirators are met. In atmospheres where no airborne contaminants are present, Level C provides dermal protection only.
- **Level D:** Should not be worn on any site with elevated respiratory or skin hazards. This is generally a work uniform providing minimal protection.

OSHA requires the use of certain PPE under conditions where an immediate danger to life and health (IDLH) may be present. Specifically, OSHA 29 CFR 1910.120(g)(3)(iii) requires use of a positive pressure self-contained breathing apparatus, or positive pressure air-line respirator equipped with an escape air supply when chemical exposure levels present a substantial possibility of immediate serious injury, illness or death, or impair the ability to escape. Similarly, OSHA 29 CFR 1910.120(g)(3)(iv) requires donning totally encapsulating chemical protective suits (with a protection level equivalent to Level A protection) in

conditions where skin absorption of a hazardous substance may result in a substantial possibility of immediate serious illness, injury or death, or impair the ability to escape.

In situations where the types of chemicals, concentrations, and possibilities of contact are unknown, the appropriate level of protection must be selected based on professional experience and judgment until the hazards can be further characterized. The individual components of clothing and equipment must be assembled into a full protective ensemble to protect the worker from site-specific hazards, while at the same time minimizing hazards and drawbacks of the personal protective gear itself. Ensemble components are detailed below for levels A/B, C, and D protection.

7.2 Protection Ensembles

7.2.1 Level A/B Protection Ensemble

Level A/B ensembles include similar respiratory protection, however Level A provides a higher degree of dermal protection than Level B. Use of Level A over Level B is determined by: comparing the concentrations of identified substances in the air with skin toxicity data, and assessing the effect of the substance (by its measured air concentrations or splash potential) on the small area of the head and neck unprotected by Level B clothing. The recommended PPE for level A/B is:

- Pressure-demand, full-face piece self-contained breathing apparatus (MSHA/-NIOSH approved) or pressure-demand supplied-air respirator with escape self-contained breathing apparatus (SCBA).
- Chemical-resistant clothing. For Level A, clothing consists of totally-encapsulating chemical resistant suit. Level B incorporates hooded one-or two-piece chemical splash suit.
- Inner and outer chemical resistant gloves.
- Chemical-resistant safety boots/shoes.
- Hardhat.

7.2.2 Level C Protection Ensemble

Level C protection is distinguished from Level B by the equipment used to protect the respiratory system, assuming the same type of chemical-resistant clothing is used. The

main selection criterion for Level C is that conditions permit wearing an air-purifying device. The device (when required) must be an air-purifying respirator (MSHA/NIOSH approved) equipped with filter cartridges. Cartridges must be able to remove the substances encountered. Respiratory protection will be used only with proper fitting, training and the approval of a qualified individual. In addition, an air-purifying respirator can be used only if: oxygen content of the atmosphere is at least 19.5% in volume; substances are identified and concentrations measured; substances have adequate warning properties; the individual passes a qualitative fit-test for the mask; and an appropriate cartridge/canister is used, and its service limit concentration is not exceeded. Recommended PPE for Level C conditions includes:

- Full-face piece, air-purifying respirator equipped with MSHA and NIOSH approved organic vapor/acid gas/dust/mist combination cartridges or as designated by the SSHO.
- Chemical-resistant clothing (hooded, one or two-piece chemical splash suit or disposable chemical-resistant one-piece suit).
- Inner and outer chemical-resistant gloves.
- Chemical-resistant safety boots/shoes.
- Hardhat.

An air-monitoring program is part of all response operations when atmospheric contamination is known or suspected. It is particularly important that the air be monitored thoroughly when personnel are wearing air-purifying respirators. Continual surveillance using direct-reading instruments is needed to detect any changes in air quality necessitating a higher level of respiratory protection.

7.2.3 Level D Protection Ensemble

As indicated above, Level D protection is primarily a work uniform. It can be worn in areas where only boots can be contaminated, where there are no inhalable toxic substances and where the atmospheric contains at least 19.5% oxygen. Recommended PPE for Level D includes:

- Coveralls.
- Safety boots/shoes.

- Safety glasses or chemical splash goggles.
- Hardhat.
- Optional gloves; escape mask; face shield.

7.2.4 Recommended Level of Protection for Site Tasks

Based on current information regarding both the contaminants suspected to be present at the Site and the various tasks that are included in the remedial activities, the minimum required Levels of Protection for these tasks shall be as identified in Table 4.

8.0 EXPOSURE MONITORING

8.1 General

Based on the results of historic sample analysis and the nature of the proposed work activities at the Site, the possibility exists that organic vapors and/or particulates may be released to the air during intrusive construction activities. Ambient breathing zone concentrations may at times, exceed the permissible exposure limits (PELs) established by OSHA for the individual compounds (see Table 2), in which case respiratory protection will be required. Respiratory and dermal protection may be modified (upgraded or downgraded) by the SSHO based upon real-time field monitoring data.

8.1.1 On-Site Work Zone Monitoring

Benchmark personnel will conduct routine, real-time air monitoring during all intrusive construction phases such as excavation, backfilling, drilling, etc. The work area will be monitored at regular intervals using a photo-ionization detector (PID), combustible gas meter and a particulate meter. Observed values will be recorded and maintained as part of the permanent field record.

Additional air monitoring measurements may be made by Benchmark personnel to verify field conditions during subcontractor oversight activities. Monitoring instruments will be protected from surface contamination during use. Additional monitoring instruments may be added if the situations or conditions change. Monitoring instruments will be calibrated in accordance with manufacturer's instructions before use.

8.1.2 Off-Site Community Air Monitoring

In addition to on-site monitoring within the work zone(s), community air monitoring at the upwind and downwind portion of the Site perimeter will be conducted per the NYSDOH Generic Community Air Monitoring Plan (Ref. 1, Appendix 1A of DER-10) and attached hereto as Appendix C. This will provide a real-time method for determination of substantial vapor and/or particulate releases to the surrounding community as a result of ground intrusive work.

Ground intrusive activities are defined by the NYSDOH Generic Community Air Monitoring Plan. Ground intrusive activities include soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells. Non-intrusive activities include the collection of soil and sediment samples or the collection of groundwater samples from existing wells. Continuous monitoring is required for ground intrusive activities and periodic monitoring is required for non-intrusive activities. Periodic monitoring consists of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring while bailing a well, and taking a reading prior to leaving a sampling location. This may be upgraded to continuous if the sampling location is in close proximity to individuals not involved in the site activity (i.e., on a curb of a busy street). The action levels below will be used during periodic monitoring. This will provide a real-time method for determination of substantial vapor and/or particulate releases to the surrounding community because of intrusive activities.

8.2 Monitoring Action Levels

8.2.1 On-Site Work Zone Action Levels

The PID, explosimeter, or other appropriate instrument(s), will be used by Benchmark personnel to monitor organic vapor concentrations as specified in this HASP. In addition, fugitive dust/particulate concentrations will be monitored during major soil intrusion using a real-time particulate monitor as specified in this plan. In the absence of such monitoring, appropriate respiratory protection for particulates shall be donned. Sustained readings obtained in the breathing zone may be interpreted (with regard to other site conditions) as follows for Benchmark personnel:

- Total atmospheric concentrations of unidentified vapors or gases ranging from 0 to 1 ppm above background on the PID) - Continue operations under Level D (see Appendix A).
- Total atmospheric concentrations of unidentified vapors or gases yielding sustained readings from >1 ppm to 5 ppm above background on the PID (vapors not suspected of containing high levels of chemicals toxic to the skin) - Continue operations under Level C (see Appendix A).
- Total atmospheric concentrations of unidentified vapors or gases yielding sustained readings of >5 ppm to 50 ppm above background on the PID -

Continue operations under Level B (see Attachment 1), re-evaluate and alter (if possible) construction methods to achieve lower vapor concentrations.

- Total atmospheric concentrations of unidentified vapors or gases above 50 ppm on the PID - Discontinue operations and exit the work zone immediately.

The explosimeter will be used to monitor levels of both combustible gases and oxygen during RD activities involving deep excavation, if required. Action levels based on the instrument readings shall be as follows:

- Less than 10% LEL - Continue engineering operations with caution.
- 10-25% LEL - Continuous monitoring with extreme caution, determine source/cause of elevated reading.
- Greater than 25% LEL - Explosion hazard, evaluate source and leave the Work Zone.
- 19.5-21% oxygen - Proceed with extreme caution; attempt to determine potential source of oxygen displacement.
- Less than 19.5% oxygen - Leave work zone immediately.
- 21-25% oxygen - Continue engineering operations with caution.
- Greater than 25% oxygen - Fire hazard potential, leave Work Zone immediately.

The particulate monitor will be used to monitor respirable dust concentrations during all intrusive activities and during handling of site soil/fill. Action levels based on the instrument readings shall be as follows:

- Less than 50 $\mu g/m^3$ - Continue field operations.
- 50-150 $\mu g/m^3$ - Don dust/particulate mask or equivalent
- Greater than 150 $\mu g/m^3$ - Don dust/particulate mask or equivalent. Initiate engineering controls to reduce respirable dust concentration (i.e., wetting of excavated soils or tools at discretion of SSHO).

Readings with the organic vapor analyzer, combustible gas meter, and particulate monitor will be recorded and documented on the appropriate Project Field Forms. All instruments will be calibrated before use on a daily basis and the procedure will be documented on the appropriate Project Field Forms.

8.2.2 Community Air Monitoring Action Levels

In addition to the action levels prescribed in Section 8.2.1 for Benchmark personnel on-site, the following criteria shall also be adhered to for the protection of downwind receptors consistent with NYSDOH requirements (Appendix C):

- **ORGANIC VAPOR PERIMETER MONITORING:**
  - If the sustained ambient air concentration of organic vapors at the downwind perimeter of the exclusion zone exceeds 5 ppm above background, work activities will be halted and monitoring continued. If the sustained organic vapor decreases below 5 ppm over background, work activities can resume but more frequent intervals of monitoring, as directed by the SSHO, must be conducted.
  - If the sustained ambient air concentration of organic vapors at the downwind perimeter of the exclusion zone are greater than 5 ppm over background but less than 25 ppm, activities can resume provided that: the organic vapor level 200 feet downwind of the working site or half the distance to the nearest off-site residential or commercial structure, whichever is less, is below 5 ppm over background; and more frequent intervals of monitoring, as directed by the SSHO, are conducted.
  - If the sustained organic vapor level is above 25 ppm at the perimeter of the exclusion zone, the SSHO must be notified and work activities shut down. The SSHO will determine when re-entry of the exclusion zone is possible and will implement downwind air monitoring to ensure vapor emissions do not impact the nearest off-site residential or commercial structure at levels exceeding those specified in the ***Organic Vapor Contingency Monitoring Plan*** below. All readings will be recorded and will be available for New York State Department of Environmental Conservation (NYSDEC) and Department of Health (NYSDOH) personnel to review.
- **ORGANIC VAPOR CONTINGENCY MONITORING PLAN:**
  - If the sustained organic vapor level is greater than 5 ppm over background 200 feet downwind from the work area or half the distance to the nearest off-site residential or commercial property, whichever is less, all work activities must be halted.
  - If, following the cessation of the work activities or as the result of an emergency, sustained organic levels persist above 5 ppm above background 200 feet downwind or half the distance to the nearest off-site residential or commercial property from the work area, then the air quality must be

monitored within 20 feet of the perimeter of the nearest off-site residential or commercial structure (20-foot zone).

- If efforts to abate the emission source are unsuccessful and if sustained organic vapor levels approach or exceed 5 ppm above background within the 20-foot zone for more than 30 minutes, or are sustained at levels greater than 10 ppm above background for longer than one minute, then the ***Major Vapor Emission Response Plan*** (see below) will automatically be placed into effect.

o **Major Vapor Emission Response Plan:**

Upon activation, the following activities will be undertaken:

1. All Emergency Response Contacts as listed in this Health and Safety Plan and the Emergency Response Plan (Appendix A) will be advised.
2. The local police authorities will immediately be contacted by the SSHO and advised of the situation.
3. Frequent air monitoring will be conducted at 30-minute intervals within the 20-foot zone. If two sustained successive readings below action levels are measured, air monitoring may be halted or modified by the SSHO.

The following personnel are to be notified in the listed sequence in the event that a Major Vapor Emission Plan is activated:

Responsible Person	Contact	Phone Number
SSHO	Police	911
SSHO	State Emergency Response Hotline	(800) 457-7362

Additional emergency numbers are listed in the Emergency Response Plan included as Appendix A.

o **Special Requirements for Work Within 20 Feet of Potentially Exposed Individuals or Structures**

- When work areas are within 20 feet of potentially exposed populations or occupied structures, the continuous monitoring locations for VOCs and particulates must reflect the nearest potentially exposed individuals and the location of ventilation system intakes for nearby structures. The use of engineering controls such as vapor/dust barriers, temporary negative-pressure

enclosures, or special ventilation devices should be considered to prevent exposures related to the work activities and to control dust and odors. Consideration should be given to implementing the planned activities when potentially exposed populations are at a minimum, such as during weekends or evening hours in non-residential settings.

- If total VOC concentrations opposite the walls of occupied structures or next to intake vents exceed 1 ppm, monitoring should occur within the occupied structure(s). Background readings in the occupied spaces must be taken prior to commencement of the planned work. Any unusual background readings should be discussed with NYSDOH prior to commencement of the work.
- If total particulate concentrations opposite the walls of occupied structures or next to intake vents exceed 150 mcg/m3, work activities should be suspended until controls are implemented and are successful in reducing the total particulate concentration to 150 mcg/m3 or less at the monitoring point.
- Depending upon the nature of contamination and remedial activities, other parameters (e.g., explosivity, oxygen, hydrogen sulfide, carbon monoxide) may also need to be monitored. Response levels and actions should be pre-determined, as necessary, for each site.

o **EXPLOSIVE VAPORS:**

- Sustained atmospheric concentrations of greater than 10% LEL in the work area - Initiate combustible gas monitoring at the downwind portion of the Site perimeter.
- Sustained atmospheric concentrations of greater than 10% LEL at the downwind Site perimeter – Halt work and contact local Fire Department.

o **Airborne Particulate Community Air Monitoring**

Respirable (PM-10) particulate monitoring will be performed on a continuous basis at the upwind and downwind perimeter of the exclusion zone. The monitoring will be performed using real-time monitoring equipment capable of measuring PM-10 and integrating over a period of 15-minutes for comparison to the airborne particulate action levels. The equipment will be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration will be visually assessed during all work activities. All readings will be recorded and will be

available for NYSDEC and NYSDOH review. Readings will be interpreted as follows:

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter ($\mu g/m^3$) greater than the background (upwind perimeter) reading for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression provided that the downwind PM-10 particulate levels do not exceed 150 $\mu g/m^3$ above the upwind level and that visible dust is not migrating from the work area.
- If, after implementation of dust suppression techniques downwind PM-10 levels are greater than 150 $\mu g/m^3$ above the upwind level, work activities must be stopped and dust suppression controls re-evaluated. Work can resume provided that supplemental dust suppression measures and/or other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 $\mu g/m^3$ of the upwind level and in preventing visible dust migration.

Pertinent emergency response information including the telephone number of the Fire Department is included in the Emergency Response Plan (Appendix A).

9.0 SPILL RELEASE/RESPONSE

This chapter of the HASP describes the potential for and procedures related to spills or releases of known or suspected petroleum and/or hazardous substances on the Site. The purpose of this Section of the HASP is to plan appropriate response, control, counter-measures and reporting, consistent with OSHA requirements in 29 CFR 1910.120(b)(4)(ii)(J) and (j)(1)(viii). The spill containment program addresses the following elements:

- Potential hazardous material spills and available controls.
- Initial notification and evaluation.
- Spill response.
- Post-spill evaluation.

9.1 Potential Spills and Available Controls

An evaluation was conducted to determine the potential for hazardous material and oil/petroleum spills at this site. For the purpose of this evaluation, hazardous materials posing a significant spill potential are considered to be:

- CERCLA Hazardous Substances as identified in 40 CFR Part 302, where such materials pose the potential for release in excess of their corresponding Reportable Quantity (RQ).
- Extremely Hazardous Substances as identified in 40 CFR Part 355, Appendix A, where such materials pose the potential for release in excess of their corresponding RQ.
- Hazardous Chemicals as defined under Section 311(e) of the Emergency Planning and Community Right-To-Know Act of 1986, where such chemicals are present or will be stored in excess of 10,000 lbs.
- Toxic Chemicals as defined in 40 CFR Part 372, where such chemicals are present or will be stored in excess of 10,000 lbs.
- Chemicals regulated under 6NYCRR Part 597, where such materials pose the potential for release in excess of their corresponding RQ.

Oil/petroleum products are considered to pose a significant spill potential whenever the following situations occur:

- The potential for a "harmful quantity" of oil (including petroleum and non-petroleum-based fuels and lubricants) to reach navigable waters of the U.S. exists (40 CFR Part 112.4). Harmful quantities are considered by USEPA to be

volumes that could form a visible sheen on the water or violate applicable water quality standards.

- The potential for any amount of petroleum to reach any waters of NY State, including groundwater, exists. Petroleum, as defined by NY State in 6NYCRR Part 612, is a petroleum-based heat source, energy source, or engine lubricant/maintenance fluid.
- The potential for any release, to soil or water, of petroleum from a bulk storage facility regulated under 6NYCRR Part 612. A regulated petroleum storage facility is defined by NY State as a site having stationary tank(s) and intra-facility piping, fixtures and related equipment with an aggregate storage volume of 1,100 gallons or greater.

The evaluation indicates that, based on site history and decommissioning records, a hazardous material spill and/or a petroleum product spill is not likely to occur during Remedial efforts.

9.2 Initial Spill Notification and Evaluation

Any worker who discovers a hazardous substance or oil/petroleum spill will immediately notify the Project Manager and SSHO. The worker will, to the best of his/her ability, report the material involved, the location of the spill, the estimated quantity of material spilled, the direction/flow of the spill material, related fire/explosion incidents, if any, and any associated injuries. The Emergency Response Plan presented as Appendix A of this HASP will immediately be implemented if an emergency release has occurred.

Following initial report of a spill, the Project Manager will make an evaluation as to whether the release exceeds RQ levels. If an RQ level is exceeded, the Project Manager will notify the site owner and NYSDEC at 1-800-457-7362 within 2 hours of spill discovery. The Project Manager will also determine what additional agencies (e.g., USEPA) are to be contacted regarding the release, and will follow-up with written reports as required by the applicable regulations.

9.3 Spill Response

For all spill situations, the following general response guidelines will apply:

- Only those personnel involved in overseeing or performing containment operations will be allowed within the spill area. If necessary, the area will be

roped, ribboned, or otherwise blocked off to prevent unauthorized access.

- Appropriate PPE, as specified by the SSHO, will be donned before entering the spill area.
- Ignition points will be extinguished/removed if fire or explosion hazards exist.
- Surrounding reactive materials will be removed.
- Drains or drainage in the spill area will be blocked to prevent inflow of spilled materials or applied materials.

For minor spills, the Contractor will maintain a Spill Control and Containment Kit in the Field Office or other readily accessible storage location. The kit will consist of, at a minimum, a 50 lb. bag of "speedy dry" granular absorbent material, absorbent pads, shovels, empty 5-gallon pails and an empty open-top 55-gallon drum. Spilled materials will be absorbed, and shoveled into a 55-gallon drum for proper disposal (NYSDEC approval will be secured for on-site treatment of the impacted soils/absorbent materials, if applicable). Impacted soils will be hand-excavated to the point that no visible signs of contamination remains, and will be drummed with the absorbent.

In the event of a major release or a release that threatens surface water, a spill response contractor will be called to the site. The response contractor may use heavy equipment (i.e., excavator, backhoe, etc.) to berm the soils surrounding the spill site or create diversion trenching to mitigate overland migration or release to navigable waters. Where feasible, pumps will be used to transfer free liquid to storage containers. Spill control/ cleanup contractors in the Western New York area that may be contacted for assistance include:

- The Environmental Service Group of NY, Inc: (716) 695-6720
- Op-Tech: (716) 525-1962

9.4 Post-Spill Evaluation

If a reportable quantity of hazardous material or oil/petroleum is spilled as determined by the Project Manager, a written report will be prepared as indicated in Section 9.2. The report will identify the root cause of the spill, type and amount of material released, date/time of release, response actions, agencies notified and/or involved in cleanup, and procedures to be implemented to avoid repeat incidents. In addition, all re-useable spill

cleanup and containment materials will be decontaminated, and spill kit supplies/disposable items will be replenished.

10.0 HEAT/COLD STRESS MONITORING

Since some of the work activities at the Site may be scheduled for both summer and winter months, measures will be taken to minimize heat/cold stress to Benchmark employees. The SSHO and/or his or her designee will be responsible for monitoring Benchmark field personnel for symptoms of heat/cold stress.

10.1 Heat Stress Monitoring

Personal protective equipment may place an employee at risk of developing heat stress, a common and potentially serious illnesses often encountered at construction, landfill, waste disposal, industrial or other unsheltered sites. The potential for heat stress is dependent on a number of factors, including environmental conditions, clothing, workload, physical conditioning and age. Personal protective equipment may severely reduce the body's normal ability to maintain temperature equilibrium (via evaporation and convection), and require increased energy expenditure due to its bulk and weight.

Proper training and preventive measures will mitigate the potential for serious illness. Heat stress prevention is particularly important because once a person suffers from heat stroke or heat exhaustion, that person may be predisposed to additional heat related illness. To avoid heat stress, the following steps should be taken:

- Adjust work schedules.
- Modify work/rest schedules according to monitoring requirements.
- Mandate work slowdowns as needed.
- Perform work during cooler hours of the day if possible or at night if adequate lighting can be provided.
- Provide shelter (air-conditioned, if possible) or shaded areas to protect personnel during rest periods.
- Maintain worker's body fluids at normal levels. This is necessary to ensure that the cardiovascular system functions adequately. Daily fluid intake must approximately equal the amount of water lost in sweat (i.e., eight fluid ounces must be ingested for approximately every 1 lb of weight lost). The normal thirst mechanism is not sensitive enough to ensure that enough water will be consumed to replace lost perspiration. When heavy sweating occurs, workers should be encouraged to drink more.
- Train workers to recognize the symptoms of heat related illness.

Heat-Related Illness - Symptoms:

- Heat rash may result from continuous exposure to heat or humid air.
- Heat cramps are caused by heavy sweating with inadequate electrolyte replacement. Signs and symptoms include: muscle spasms; pain in the hands, feet and abdomen.
- Heat exhaustion occurs from increased stress on various body organs including inadequate blood circulation due to cardiovascular insufficiency or dehydration. Signs and symptoms include: pale, cool, moist skin; heavy sweating; dizziness; nausea; fainting.
- Heat stroke is the most serious form of heat stress. Temperature regulation fails and the body temperature rises to critical levels. Immediate action must be taken to cool the body before serious injury and death occur. Competent medical help must be obtained. Signs and symptoms are: red, hot, usually dry skin; lack of or reduced perspiration; nausea; dizziness and confusion; strong, rapid pulse; coma.

The monitoring of personnel wearing protective clothing should commence when the ambient temperature is 70 degrees Fahrenheit or above. For monitoring the body's recuperative ability to excess heat, one or more of the following techniques should be used as a screening mechanism.

- Heart rate may be measured by the radial pulse for 30 seconds as early as possible in the resting period. The rate at the beginning of the rest period should not exceed 100 beats per minute. If the rate is higher, the next work period should be shortened by 10 minutes (or 33%), while the length of the rest periods stay the same. If the pulse rate is 100 beats per minute at the beginning of the next rest period, the following work cycle should be further shortened by 33%.
- Body temperature may be measured orally with a clinical thermometer as early as possible in the resting period. Oral temperature at the beginning of the rest period should not exceed 99.6 degrees Fahrenheit. If it does, the next work period should be shortened by 10 minutes (or 33%), while the length of the rest period remains the same. However, if the oral temperature exceeds 99.6 degrees Fahrenheit at the beginning of the next period, the work cycle may be further shortened by 33%. Oral temperature should be measured at the end of the rest period to make sure that it has dropped below 99.6 degrees Fahrenheit. No Benchmark employee will be permitted to continue wearing semi-permeable or impermeable garments when his/her oral temperature exceeds 100.6 degrees Fahrenheit.

10.2 Cold Stress Monitoring

Exposure to cold conditions may result in frostbite or hypothermia, each of which progresses in stages as shown below.

- **Frostbite** occurs when body tissue (usually on the extremities) begins to freeze. The three states of frostbite are:

  1) **Frost nip** - This is the first stage of the freezing process. It is characterized by a whitened area of skin, along with a slight burning or painful sensation. Treatment consists of removing the victim from the cold conditions, removal of boots and gloves, soaking the injured part in warm water (102 to 108 degrees Fahrenheit) and drinking a warm beverage. Do not rub skin to generate friction/ heat.

  2) **Superficial Frostbite** - This is the second stage of the freezing process. It is characterized by a whitish gray area of tissue, which will be firm to the touch but will yield little pain. The treatment is identical for Frost nip.

  3) **Deep Frostbite** - In this final stage of the freezing process the affected tissue will be cold, numb and hard and will yield little to no pain. Treatment is identical to that for Frost nip.

- **Hypothermia** is a serious cold stress condition occurring when the body loses heat at a rate faster than it is produced. If untreated, hypothermia may be fatal. The stages of hypothermia may not be clearly defined or visible at first, but generally include:

  1) Shivering

  2) Apathy (i.e., a change to an indifferent or uncaring mood)

  3) Unconsciousness

  4) Bodily freezing

  Employees exhibiting signs of hypothermia should be treated by medical professionals. Steps that can be taken while awaiting help include:

  1) Remove the victim from the cold environment and remove wet or frozen clothing. (Do this carefully as frostbite may have started.)

  2) Perform active re-warming with hot liquids for drinking (Note: do not give the victim any liquid containing alcohol or caffeine) and a warm water bath (102 to 108 degrees Fahrenheit).

  3) Perform passive re-warming with a blanket or jacket wrapped around the victim.

In any potential cold stress situation, it is the responsibility of the Site Health and Safety Officer to encourage the following:

- Education of workers to recognize the symptoms of frostbite and hypothermia.
- Workers should dress warmly, with more layers of thin clothing as opposed to one thick layer.
- Personnel should remain active and keep moving.
- Personnel should be allowed to take shelter in a heated areas, as necessary.
- Personnel should drink warm liquids (no caffeine or alcohol if hypothermia has set in).
- For monitoring the body's recuperation from excess cold, oral temperature recordings should occur:
    - At the Site Safety Technicians discretion when suspicion is based on changes in a worker's performance or mental status.
    - At a workers request.
    - As a screening measure, two times per shift, under unusually hazardous conditions (e.g., wind chill less than 20 degrees Fahrenheit or wind chill less than 30 degrees Fahrenheit with precipitation).
    - As a screening measure whenever anyone worker on site develops hypothermia.

Any person developing moderate hypothermia (a core body temperature of 92 degrees Fahrenheit) will not be allowed to return to work for 48 hours without the recommendation of a qualified medical doctor.

11.0 WORK ZONES & SITE CONTROL

Work zones around the areas designated for construction activities will be established on a daily basis and communicated to all employees and other site users by the SSHO. It shall be each Contractor's SSHO's responsibility to ensure that all site workers are aware of the work zone boundaries and to enforce proper procedures in each area. The zones will include:

- Exclusion Zone ("Hot Zone"): The area where contaminated materials may be exposed, excavated or handled and all areas where contaminated equipment or personnel may travel. The zone will be delineated by flagging tape. All personnel entering the Exclusion Zone must wear the prescribed level of personal protective equipment identified in Section 7.
- Contamination Reduction Zone: The zone where decontamination of personnel and equipment takes place. Any potentially contaminated clothing, equipment and samples must remain in the Contamination Reduction Zone until decontaminated.
- Support Zone: The part of the site that is considered non-contaminated or "clean." Support equipment will be located in this zone, and personnel may wear normal work clothes within this zone.

In the absence of other task-specific work zone boundaries established by the SSHO, the following boundaries will apply to all construction activities involving disruption or handling of site soils or groundwater:

- Exclusion Zone: 50 foot radius from the outer limit of the sampling/construction activity.
- Contaminant Reduction Zone: 100 foot radius from the outer limit of the sampling/construction activity.
- Support Zone: Areas outside the Contaminant Reduction Zone.

Access of non-essential personnel to the Exclusion and Contamination Reduction Zones will be strictly controlled by the SSHO. Only personnel who are essential to the completion of the task will be allowed access to these areas and only if they are wearing the prescribed level of protection. Entrance of all personnel must be approved by the SSHO.

The SSHO will maintain a Health and Safety Logbook containing the names of Benchmark workers and their level of protection. The zone boundaries may be changed by

the SSHO as environmental conditions warrant, and to respond to the necessary changes in work locations on-site.

12.0 DECONTAMINATION

12.1 Decontamination for Benchmark Employees

The degree of decontamination required is a function of a particular task and the environment within which it occurs. The following decontamination procedure will remain flexible, thereby allowing the decontamination crew to respond appropriately to the changing environmental conditions that may arise at the site. All Benchmark personnel on-site shall follow the procedure below, or the Contractor's procedure (if applicable), whichever is more stringent.

Station 1 - Equipment Drop: Deposit visibly contaminated (if any) re-useable equipment used in the contamination reduction and exclusion zones (tools, containers, monitoring instruments, radios, clipboards, etc.) on plastic sheeting.

Station 2 - Boots and Gloves Wash and Rinse: Scrub outer boots and outer gloves.

Station 3 - Tape, Outer Boot and Glove Removal: Remove tape, outer boots and gloves. Deposit tape and gloves in waste disposal container.

Station 4 - Canister or Mask Change: If worker leaves exclusive zone to change canister (or mask), this is the last step in the decontamination procedure. Worker's canister is exchanged, new outer gloves and boot cover donned, and worker returns to duty.

Station 5 - Outer Garment/Face Piece Removal: Protective suit removed and deposited in separate container provided by Contractor. Face piece or goggles are removed if used. Avoid touching face with fingers. Face piece and/or goggles deposited on plastic sheet. Hard hat removed and placed on plastic sheet.

Station 6 - Inner Glove Removal: Inner gloves are the last PPE to be removed. Avoid touching the outside of the gloves with bare fingers. Dispose of these gloves in waste disposal container.

Following PPE removal, personnel shall wash hands, face and forearms with absorbent wipes. If field activities proceed for a duration of 6 consecutive months or longer, shower facilities will be provided for worker use in accordance with OSHA 29 CFR 1910.120(n).

12.2 Decontamination for Medical Emergencies

In the event of a minor, non-life threatening injury, personnel should follow the decontamination procedures as defined, and then administer first-aid.

In the event of a major injury or other serious medical concern (e.g., heat stroke), immediate first-aid is to be administered and the victim transported to the hospital in lieu of further decontamination efforts unless exposure to a site contaminant would be considered "Immediately Dangerous to Life or Health."

12.3 Decontamination of Field Equipment

Decontamination of heavy equipment will be conducted by the Contractor in accordance with his approved Health and Safety Plan in the Contamination Reduction Zone. As a minimum, this will include manually removing heavy soil contamination, followed by steam cleaning on an impermeable pad.

Decontamination of all tools used for sample collection purposes will be conducted by Benchmark personnel. It is expected that all tools will be constructed of nonporous, nonabsorbent materials (i.e., metal), which will aid in the decontamination effort. Any tool or part of a tool made of porous, absorbent material (i.e., wood) will be placed into suitable containers and prepared for disposal.

Decontamination of bailers, split-spoons, spatula knives, and other tools used for environmental sampling and examination shall be as follows:

- Disassemble the equipment.
- Water wash to remove all visible foreign matter.
- Wash with detergent.
- Rinse all parts with distilled-deionized water.
- Allow to air dry.
- Wrap all parts in aluminum foil or polyethylene.

13.0 CONFINED SPACE ENTRY

OSHA 29 CFR 1910.146 identifies a confined space as a space that is large enough and so configured that an employee can physically enter and do assigned work, has limited or restricted means for entry and exit, and is not intended for continuous employee occupancy. Confined spaces include, but are not limited to, trenches, storage tanks, process vessels, pits, sewers, tunnels, underground utility vaults, pipelines, sumps, wells, and excavations.

Confined space entry by Benchmark employees is not anticipated to be necessary to complete the remedial activities identified in Section 2.0. In the event that the scope of work changes or confined space entry appears necessary, the Project Manager will be consulted to determine if feasible engineering alternatives to confined space entry can be implemented. If confined space entry by Benchmark employees cannot be avoided through reasonable engineering measures, task-specific confined space entry procedures will be developed and a confined-space entry permit will be issued through Benchmark's corporate Health and Safety Director. Benchmark employees shall not enter a confined space without these procedures and permits in place.

14.0 FIRE PREVENTION & PROTECTION

14.1 General Approach

Recommended practices and standards of the National Fire Protection Association (NFPA) and other applicable regulations will be followed in the development and application of Project Fire Protection Programs. When required by regulatory authorities, the project management will prepare and submit a Fire Protection Plan for the approval of the contracting officers, authorized representative or other designated official. Essential considerations for the Fire Protection Plan will include:

- Proper site preparation and safe storage of combustible and flammable materials.
- Availability of coordination with private and public fire authorities.
- Adequate job-site fire protection and inspections for fire prevention.
- Adequate indoctrination and training of employees.

14.2 Equipment and Requirements

Fire extinguishers will be provided by each Contractor and are required on all heavy equipment and in each field trailer. Fire extinguishers will be inspected, serviced, and maintained in accordance with the manufacturer's instructions. As a minimum, all extinguishers shall be checked monthly and weighed semi-annually, and recharged if necessary. Recharge or replacement shall be mandatory immediately after each use.

14.3 Flammable and Combustible Substances

All storage, handling or use of flammable and combustible substances will be under the supervision of qualified persons. All tanks, containers and pumping equipment, whether portable or stationary, used for the storage and handling of flammable and combustible liquids, will meet the recommendations of the NFPA.

14.4 Hot Work

If the scope of work necessitates welding or blowtorch operation, the hot work permit presented in Appendix B will be completed by the SSHO and reviewed/issued by the Project Manager.

15.0 EMERGENCY INFORMATION

In accordance with OSHA 29 CFR Part 1910, an Emergency Response Plan is attached to this HASP as Appendix A. Figure A-1 is the hospital route map.

16.0 REFERENCES

1. New York State Department of Health. 2010. *Generic Community Air Monitoring Plan, Appendix 1A, DER-10 Technical Guidance for Site Investigation and Remediation.* May.

TABLES

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 1

PARAMETERS OF INTEREST

Site Health & Safety Plan
295 Maryland Street Site
Buffalo, New York

Parameter[1]	CAS No.	Maximum Detected Concentration [2]	
		Groundwater (µg/L)	Subsurface Soil/Fill (mg/kg)
Volatile Organic Compounds (VOCs):			
Benzene	71-43-2	38	0.8
Ethylbenzene	100-41-4	39	< 0.00034
Toluene	108-88-3	18	< 0.00048
Xylene, Total	1330-20-7	97	ND
Polycyclic Aromatic Hydrocarbons (PAHs):			
Benz(a)anthracene	56-55-3	0.35	2
Benzo(a)pyrene	50-32-8	< 0.44	1.6
Benzo(b)fluoranthene	205-99-2	< 0.32	2.6
Benzo(k)fluoranthene	207-08-9	< 0.69	0.98
Chrysene	218-01-9	< 0.31	1.7
Dibenz(ah)anthracene	53-70-3	< 0.4	< 0.0022
Indeno(1,2,3-cd)pyrene	193-39-5	< 0.44	0.74
Total PAHs	-	ND	100
Inorganic Compounds:			
Arsenic	7440-38-2	10	16
Barium	7440-39-3	0.332	400
Cadmium	7440-43-9	ND	9.3
Lead	7439-92-1	ND	1,000
Mercury	7439-97-6	ND	2.8

Notes:

1. Constituents were identified as parameters of interest during the Phase II and RAWP investigation.
2. Maximum detected concentrations represent post-remedial estimated values

Acronyms:

NA = Not analyzed.
ND = Parameter not detected above method detection limits.

BENCHMARK Environmental Engineering & Science, PLLC

TABLE 2

TOXICITY DATA FOR PARAMETERS OF INTEREST

Site Health & Safety Plan
295 Maryland Street Site
Buffalo, New York

Parameter	Synonyms	CAS No.	Code	Concentration Limits [1]		
				PEL	TLV	IDLH
Volatile Organic Compounds (VOCs): ppm						
Benzene	Benzol, Phenyl hydride	71-43-2	Ca	1	0.5	500
Ethylbenzene	Ethylbenzol, Phenylethane	100-41-4	*none*	100	100	800
Toluene	Methyl benzene, Methyl benzol	108-88-3	C-300	200	50	500
Xylene, Total	o-, m-, p-isomers	1330-20-7	*none*	100	100	900
Polycyclic Aromatic Hydrocarbons (PAHs) [2] : ppm						
Benz(a)anthracene	*none*	56-55-3	*none*	--	--	--
Benzo(a)pyrene	*none*	50-32-8	*none*	--	--	--
Benzo(b)fluoranthene	*none*	205-99-2	*none*	--	--	--
Benzo(k)fluoranthene	*none*	207-08-9	*none*	--	--	--
Chrysene	*none*	218-01-9	*none*	--	--	--
Dibenz(ah)anthracene	*none*	53-70-3	*none*	--	--	--
Indeno(1,2,3-cd)pyrene	*none*	193-39-5	*none*	--	--	--
Inorganic Compounds: mg/m [3]						
Arsenic	*none*	7440-38-2	Ca	0.01	0.01	5
Barium	*none*	7440-39-3	*none*	0.5	0.5	50
Cadmium	*none*	7440-43-9	Ca	0.005	0.01	9
Lead	*none*	7439-92-1	*none*	0.05	0.15	100
Mercury	*none*	7439-97-6	C-0.1	0.1	0.05	10

Notes:

1. Concentration limits as reported by NIOSH Pocket Guide to Chemical Hazards, February 2004 (NIOSH Publication No. 97-140, fourth printing with changes and updates).
2. Individual parameters listed are those most commonly detected at steel/coke manufacturing sites.
3. " -- " = concentration limit not available; exposure should be minimized to the extent feasible through appropriate engineering controls & PPE.

Explanation:

Ca = NIOSH considers constituent to be a potential occupational carcinogen.
C-## = Ceiling Level equals the maximum exposure concentration allowable during the work day.
IDLH = Immediately Dangerous to Life or Health.
ND indicates that an IDLH has not as yet been determined.
TLV = Threshold Limit Value, established by American Conference of Industrial Hygienists (ACGIH), equals the maximum exposure concentration allowable for 8 hours/day @ 40 hours/week.
TLVs are the amounts of chemicals in the air that almost all healthy adult workers are predicted to be able to tolerate without adverse effects. There are three types.
TLV-TWA (TLV-Time-Weighted Average) which is averaged over the normal eight-hour day/forty-hour work week. (Most TLVs.)
TLV-STEL or Short Term Exposure Limits are 15 minute exposures that should not be exceeded for even an instant. It is not a stand alone value but is accompanied by the TLV-TWA.
It indicates a higher exposure that can be tolerated for a short time without adverse effect as long as the total time weighted average is not exceded.
TLV-C or Ceiling limits are the concentration that should not be exceeded during any part of the working exposure.
Unless the initials "STEL" or "C" appear in the Code column, the TLV value should be considered to be the eight-hour TLV-TWA.
PEL = Permissible Exposure Limit, established by OSHA, equals the maximium exposure conconcentration allowable for 8 hours per day @ 40 hours per week

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TABLE 3

POTENTIAL ROUTES OF EXPOSURE TO PARAMETERS OF INTEREST

Site Health and Safety Plan
295 Maryland Street Site
Buffalo, New York

Activity [1]	Direct Contact with Soil/Fill	Inhalation of Vapors or Dust
1. Soil/Fill Excavation: Utility Work	x	x
2. Soil/Fill Excavation: New Foundation	x	x
3. Cover System Replacement/Major Repair	x	x
4. Other Subgrade Work	x	x

Notes:

1. Activity as described in Section 1.6 of the Health and Safety Plan.

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TABLE 4

REQUIRED LEVELS OF PROTECTION FOR POST-REMEDAL ACTIVITIES

Site Health and Safety Plan
295 Maryland Street Site
Buffalo, New York

Activity	Respiratory Protection [1]	Clothing	Gloves [2]	Boots [2, 3]	Other Required PPE/Modifications [2, 4]
1. Soil/Fill Excavation: Utility Work	Level D (upgrade to Level C if necessary)	Work Uniform or Tyvek	L	outer: L inner: STSS	HH SGSS
2. Soil/Fill Excavation: New Foundation	Level D (upgrade to Level C if necessary)	Work Uniform or Tyvek	L	outer: L inner: STSS	HH SGSS
3. Cover System Replacement/Major Repair	Level D (upgrade to Level C if necessary)	Work Uniform or Tyvek	L/N	outer: L inner: STSS	HH SGSS
4. Other Subgrade Work	Level D (upgrade to Level C if necessary)	Work Uniform or Tyvek	L	outer: L inner: STSS	HH SGSS

Notes:

1. Respiratory equipment shall conform to guidelines presented in Section 7.0 of this HASP. The Level C requirement is an air-purifying respirator equiped with organic compound/acid gas/dust
2. HH = hardhat; L= Latex; L/N = latex inner glove, nitrile outer glove; N = Nitrile; S = Saranex; SG = safety glasses; SGSS = safety glasses with sideshields; STSS = steel toe safety shoes.
3. Latex outer boot (or approved overboot) required whenever contact with contaminated materials may occur. SSHO may downgrade to STSS (steel-toed safety shoes) if contact will be limited to cover/replacement soils.
4. Dust masks shall be donned as directed by the SSHO (site safety and health officer) or site safety technician whenever potentially contaminated airborne particulates (i.e., dust) are present in significant amounts in the breathing zone. Goggles may be substituted with safety glasses w/side-shields whenever contact with contaminated liquids is not anticipated.

APPENDIX A

EMERGENCY RESPONSE PLAN

SITE HASP – APPENDIX A

EMERGENCY RESPONSE PLAN
FOR
POST-REMEDIAL ACTIVITIES

295 MARYLAND STREET SITE
BUFFALO, NEW YORK

June 2015 0222-014-100

Prepared for:

295 MARYLAND, LLC

Prepared By:

Benchmark Environmental Engineering & Science, PLLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716)856-0599

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LIST OF FIGURES

1.0 GENERAL

This report presents the site-specific Emergency Response Plan (ERP) referenced in the Site Health and Safety Plan (HASP) prepared for post-remedial activities conducted at the 295 Maryland Street Site in Buffalo, New York. This appendix of the HASP describes potential emergencies that may occur at the Site; procedures for responding to those emergencies; roles and responsibilities during emergency response; and training all workers must receive in order to follow emergency procedures. This ERP also describes the provisions this Site has made to coordinate its emergency response planning with other contractors on-site and with off-site emergency response organizations. This ERP is consistent with the requirements of 29 CFR 1910.120(l) and provides the following site-specific information:

- Pre-emergency planning.
- Personnel roles, lines of authority, and communication.
- Emergency recognition and prevention.
- Safe distances and places of refuge.
- Evacuation routes and procedures.
- Decontamination procedures.
- Emergency medical treatment and first aid.
- Emergency alerting and response procedures.
- Critique of response and follow-up.
- Emergency personal protective equipment (PPE) and equipment.

2.0 PRE-EMERGENCY PLANNING

This Site has been evaluated for potential emergency occurrences, based on site hazards, the required work tasks, the site topography, and prevailing weather conditions. The results of that evaluation indicate the potential for the following site emergencies to occur at the locations indicated.

Type of Emergency:

1. Medical, due to physical injury
2. Fire

Source of Emergency:

1. Slip/trip/fall
2. Fire

Location of Source:

Non-specific

3.0 ON-SITE EMERGENCY RESPONSE EQUIPMENT

Emergency procedures may require specialized equipment to facilitate worker rescue, contamination control and reduction, or post-emergency clean up. Emergency response equipment available on the Site is listed below. The equipment inventory and storage locations are based on the potential emergencies described above. This equipment inventory is designed to meet on-site emergency response needs and any specialized equipment needs that off-site responders might require because of the hazards at this Site but not ordinarily stocked.

Any additional personal protective equipment (PPE) required and stocked for emergency response is also listed in below. During an emergency, the Emergency Response Coordinator (ERC) is responsible for specifying the level of PPE required for emergency response. At a minimum, PPE used by emergency responders will comply with Section 7.0, Personal Protective Equipment, of this HASP. Emergency response equipment is inspected at regular intervals and maintained in good working order. The equipment inventory is replenished as necessary to maintain response capabilities.

Emergency Equipment	Quantity	Location
Spill Response Kit	1	Site Vehicle
First Aid Kit	1	Site Vehicle
Chemical Fire Extinguisher	2 (minimum)	All heavy equipment and Site Vehicle

Emergency PPE	Quantity	Location
Full-face respirator	1 for each worker	Site Vehicle
Chemical-resistant suits	4 (minimum)	Site Vehicle

4.0 EMERGENCY PLANNING MAPS

An area-specific map of the Site will be developed on a daily basis during performance of field activities. The map will be marked to identify critical on-site emergency planning information, including: emergency evacuation routes, a place of refuge, an assembly point, and the locations of key site emergency equipment. Site zone boundaries will be shown to alert responders to known areas of contamination. There are no major topographical features; however, the direction of prevailing winds/weather conditions that could affect emergency response planning are also marked on the map. The map will be posted at site-designated place of refuge and inside the Benchmark personnel field vehicle.

5.0 EMERGENCY CONTACTS

The following identifies the emergency contacts for this ERP.

Emergency Telephone Numbers:

Project Manager: ***Ray Laport***
Work: (716) 856-0599
Mobile: (716) 860-3971

Corporate Health and Safety Director: ***Thomas H. Forbes***
Work: (716) 856-0599
Mobile: (716) 864-1730

Site Safety and Health Officer (SSHO): ***Richard L. Dubisz***
Work: (716) 856-0599
Mobile: (716) 998-4334

Alternate SSHO: ***Thomas Behrendt***
Work: (716) 856-0599
Mobile: (716) 818-8358

BUFFALO GENERAL HOSPITAL:	(716)859-5600
FIRE	911
AMBULANCE:	911
BUFFALO POLICE:	911
STATE EMERGENCY RESPONSE HOTLINE:	(800) 457-7362
NATIONAL RESPONSE HOTLINE:	(800) 424-8802
NYSDOH:	(716) 847-4385
NYSDEC:	(716) 851-7220
NYSDEC 24-HOUR SPILL HOTLINE:	(800) 457-7252

The Site location is:
295 Maryland Street
Buffalo, New York 14201
Site Phone Number: (Insert Cell Phone or Field Trailer): _____

6.0 EMERGENCY ALERTING & EVACUATION

Internal emergency communication systems are used to alert workers to danger, convey safety information, and maintain site control. Any effective system can be employed. Two-way radio headsets or field telephones are often used when work teams are far from the command post. Hand signals and air-horn blasts are also commonly used. Every system must have a backup. It shall be the responsibility of each contractor's SSHO to ensure an adequate method of internal communication is understood by all personnel entering the site. Unless all personnel are otherwise informed, the following signals shall be used.

1) Emergency signals by portable air horn, siren, or whistle: two short blasts, personal injury; continuous blast, emergency requiring site evacuation.

2) Visual signals: hand gripping throat, out of air/cannot breathe; hands on top of head, need assistance; thumbs up, affirmative/ everything is OK; thumbs down, no/negative; grip partner's wrist or waist, leave area immediately.

If evacuation notice is given, site workers leave the worksite with their respective buddies, if possible, by way of the nearest exit. Emergency decontamination procedures detailed in Section 12.0 of the HASP are followed to the extent practical without compromising the safety and health of site personnel. The evacuation routes and assembly area will be determined by conditions at the time of the evacuation based on wind direction, the location of the hazard source, and other factors as determined by rehearsals and inputs from emergency response organizations. Wind direction indicators are located so that workers can determine a safe up wind or cross wind evacuation route and assembly area if not informed by the emergency response coordinator at the time the evacuation alarm sounds. Since work conditions and work zones within the site may be changing on daily basis, it shall be the responsibility of the construction Site Health and Safety Officer to review evacuation routes and procedures as necessary and to inform all Benchmark workers of any changes.

Personnel exiting the site will gather at a designated assembly point. To determine that everyone has successfully exited the site, personnel will be accounted for at the assembly site. If any worker cannot be accounted for, notification is given to the SSHO (***Thomas Behrendt*** or ***Richard Dubisz***) so that appropriate action can be initiated. Contractors and subcontractors on this site have coordinated their emergency response plans to ensure that

these plans are compatible and that source(s) of potential emergencies are recognized, alarm systems are clearly understood, and evacuation routes are accessible to all personnel relying upon them.

7.0 EXTREME WEATHER CONDITIONS

In the event of adverse weather conditions, the SSHO in conjunction with the Contractor's SSHO will determine if engineering operations can continue without sacrificing the health and safety of site personnel. Items to be considered prior to determining if work should continue include but are not limited to:

- Potential for heat/cold stress.
- Weather-related construction hazards (i.e., flooding or wet conditions producing undermining of structures or sheeting, high wind threats, etc).
- Limited visibility.
- Potential for electrical storms.
- Limited site access/egress (e.g., due to heavy snow)

8.0 EMERGENCY MEDICAL TREATMENT & FIRST AID

Personnel Exposure:

The following general guidelines will be employed in instances where health impacts threaten to occur acute exposure is realized:

- Skin Contact: Use copious amounts of soap and water. Wash/rinse affected area for at least 15 minutes. Decontaminate and provide medical attention. Eyewash stations will be provided on site. If necessary, transport to Mercy Hospital.
- Inhalation: Move to fresh air and, if necessary, transport to Mercy Hospital.
- Ingestion: Decontaminate and transport to Mercy Hospital.

Personal Injury:

Minor first-aid will be applied on-site as deemed necessary. In the event of a life threatening injury, the individual should be transported to Mercy Hospital via ambulance. The SSHO will supply available chemical specific information to appropriate medical personnel as requested.

First aid kits will conform to Red Cross and other applicable good health standards, and shall consist of a weatherproof container with individually sealed packages for each type of item. First aid kits will be fully equipped before being sent out on each job and will be checked weekly by the SSHO to ensure that the expended items are replaced.

Directions to Buffalo General Hospital (see Figure A-1):

The following directions describe the best route to Buffalo General Hospital:

- From the intersection of Maryland Street and West Avenue, proceed northeast (toward West Tupper Street).
- Turn right onto Cottage Street (street name changes to Virginia Street).
- Turn left onto Main Street.
- Turn right on Goodrich Street. Buffalo General Hospital will be on right hand side. Follow signs to emergency room (ER).

9.0 EMERGENCY RESPONSE CRITIQUE & RECORD KEEPING

Following an emergency, the SSHO and Project Manager shall review the effectiveness of this Emergency Response Plan (ERP) in addressing notification, control and evacuation requirements. Updates and modifications to this ERP shall be made accordingly. It shall be the responsibility of each contractor to establish and assure adequate records of the following:

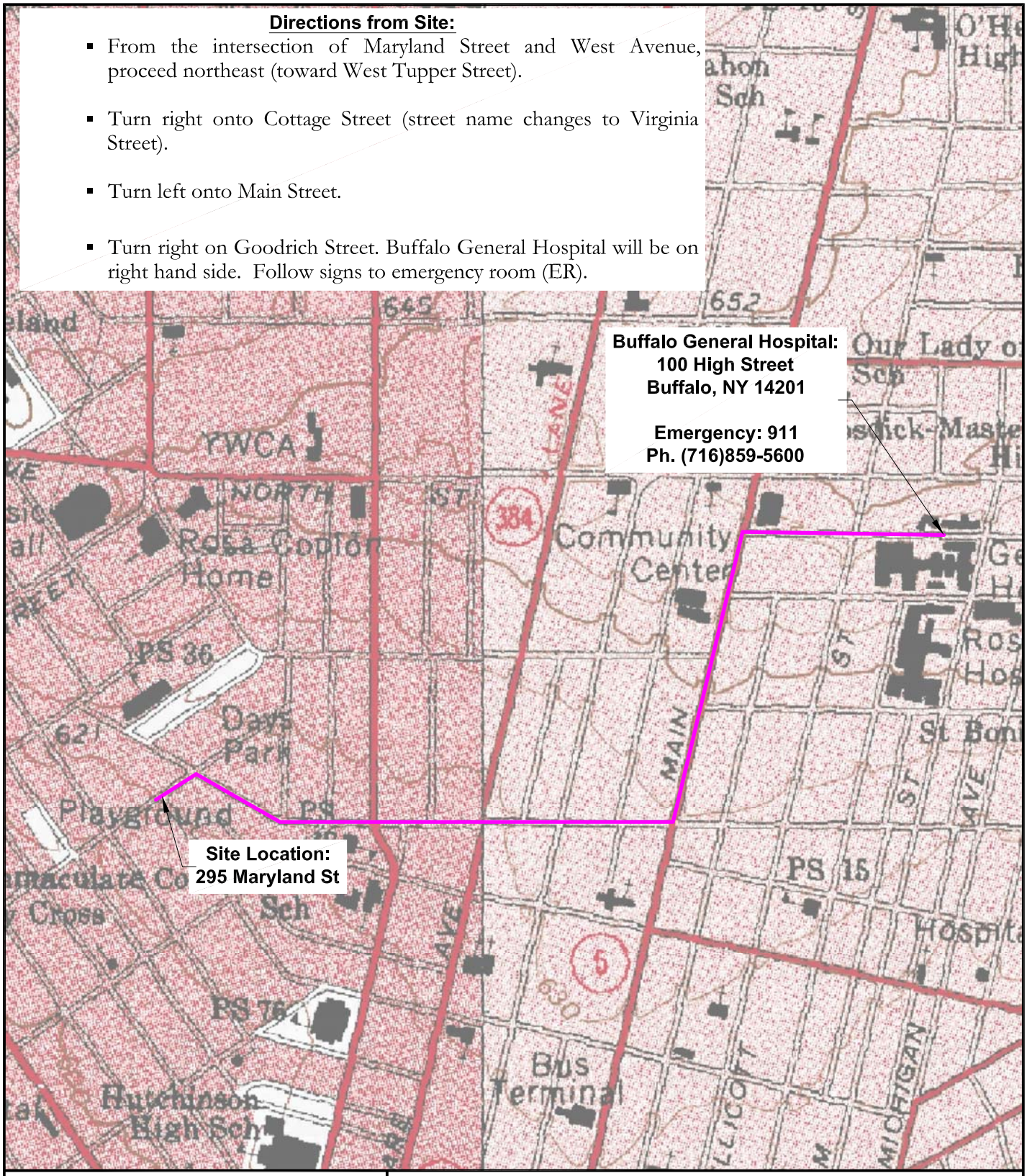
- Occupational injuries and illnesses.
- Accident investigations.
- Reports to insurance carrier or State compensation agencies.
- Reports required by the client.
- Records and reports required by local, state, federal and/or international agencies.
- Property or equipment damage.
- Third party injury or damage claims.
- Environmental testing logs.
- Explosive and hazardous substances inventories and records.
- Records of inspections and citations.
- Safety training.

10.0 EMERGENCY RESPONSE TRAINING

All persons who enter the worksite, including visitors, shall receive a site-specific briefing about anticipated emergency situations and the emergency procedures by the SSHO. Where this site relies on off-site organizations for emergency response, the training of personnel in those off-site organizations has been evaluated and is deemed adequate for response to this site.

FIGURES

FIGURE A-1



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(716) 856-0599

PROJECT NO.: 0222-001-100

DATE: JUNE 2011

DRAFTED BY: JCT

HOSPITAL ROUTE MAP

REMEDIAL ACTION WORK PLAN

295 MARYLAND STREET SITE
295 MARYLAND STREET
BUFFALO, NEW YORK

PREPARED FOR

295 MARYLAND, LLC

APPENDIX B

HOT WORK PERMIT FORM

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

HOT WORK PERMIT

PART 1 - INFORMATION

Issue Date:

Date Work to be Performed: Start: Finish (permit terminated):

Performed By:

Work Area:

Object to be Worked On:

PART 2 - APPROVAL

(for 1, 2 or 3: mark Yes, No or NA)*

Will working be on or in:	Finish (permit terminated):	
1. Metal partition, wall, ceiling covered by combustible material?	yes	no
2. Pipes, in contact with combustible material?	yes	no
3. Explosive area?	yes	no

* = If any of these conditions exist (marked "yes"), a permit will not be issued without being reviewed and approved by Thomas H. Forbes (Corporate Health and Safety Director). Required Signature below.

PART 3 - REQUIRED CONDITIONS**

(Check all conditions that must be met)

	PROTECTIVE ACTION		PROTECTIVE EQUIPMENT
	Specific Risk Assessment Required		Goggles/visor/welding screen
	Fire or spark barrier		Apron/fireproof clothing
	Cover hot surfaces		Welding gloves/gauntlets/other:
	Move movable fire hazards, specifically		Wellintons/Knee pads
	Erect screen on barrier		Ear protection: Ear muffs/Ear plugs
	Restrict Access		B.A.: SCBA/Long Breather
	Wet the ground		Respirator: Type:
	Ensure adequate ventilation		Cartridge:
	Provide adequate supports		Local Exhaust Ventilation
	Cover exposed drain/floor or wall cracks		Extinguisher/Fire blanket
	Fire watch (must remain on duty during duration of permit)		Personal flammable gas monitor
	Issue additional permit(s):		

Other precautions:

** Permit will not be issued until these conditions are met.

SIGNATURES

Orginating Employee:	Date:
Project Manager:	Date:
Part 2 Approval:	Date:

Prepared By: _____

APPENDIX C

NYSDOH GENERIC COMMUNITY AIR MONITORING PLAN

Appendix 1A
New York State Department of Health
Generic Community Air Monitoring Plan

Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. “Periodic” monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or

overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

December 2009

APPENDIX F

SMP FORMS

Summary of Green Remediation Metrics for Site Management

Site Name: _____ Site Code: _____
Address: _____ City: _____
State: _____ Zip Code: _____ County: _____

Initial Report Period (Start Date of period covered by the Initial Report submittal)
Start Date: _____

Current Reporting Period
Reporting Period From: _____ To: _____

Contact Information
Preparer's Name: _____ Phone No.: _____
Preparer's Affiliation: _____

I. Energy Usage: Quantify the amount of energy used directly on-site and the portion of that derived from renewable energy sources.

	Current Reporting Period	**Total to Date**
Fuel Type 1 (e.g. natural gas (cf))		
Fuel Type 2 (e.g. fuel oil, propane (gals))		
Electricity (kWh)		
Of that Electric usage, provide quantity:		
Derived from renewable sources (e.g. solar, wind)		
Other energy sources (e.g. geothermal, solar thermal (Btu))		

Provide a description of all energy usage reduction programs for the site in the space provided on Page 3.

II. Solid Waste Generation: Quantify the management of solid waste generated on-site.

	Current Reporting Period (tons)	**Total to Date (tons)**
Total waste generated on-site		
OM&M generated waste		
Of that total amount, provide quantity:		
Transported off-site to landfills		
Transported off-site to other disposal facilities		
Transported off-site for recycling/reuse		
Reused on-site		

Provide a description of any implemented waste reduction programs for the site in the space provided on Page 3.

III. Transportation/Shipping: Quantify the distances travelled for delivery of supplies, shipping of laboratory samples, and the removal of waste.

	Current Reporting Period (miles)	**Total to Date (miles)**
Standby Engineer/Contractor		
Laboratory Courier/Delivery Service		
Waste Removal/Hauling		

Provide a description of all mileage reduction programs for the site in the space provided on Page 3. Include specifically any local vendor/services utilized that are within 50 miles of the site.

IV. Water Usage: Quantify the volume of water used on-site from various sources.

	Current Reporting Period (gallons)	**Total to Date (gallons)**
Total quantity of water used on-site		
Of that total amount, provide quantity:		
Public potable water supply usage		
Surface water usage		
On-site groundwater usage		
Collected or diverted storm water usage		

Provide a description of any implemented water consumption reduction programs for the site in the space provided on Page 3.

V. Land Use and Ecosystems: Quantify the amount of land and/or ecosystems disturbed and the area of land and/or ecosystems restored to a pre-development condition (i.e. Green Infrastructure).

	Current Reporting Period (acres)	**Total to Date (acres)**
Land disturbed		
Land restored		

Provide a description of any implemented land restoration/green infrastructure programs for the site in the space provided on Page 3.

Description of green remediation programs reported above (Attach additional sheets if needed)
Energy Usage:
Waste Generation:
Transportation/Shipping:
Water usage:
Land Use and Ecosystems:
Other:

CERTIFICATION BY CONTRACTOR

I, _____ (**Name**) do hereby certify that I am _____ (**Title**) of the Company/Corporation herein referenced and contractor for the work described in the foregoing application for payment. According to my knowledge and belief, all items and amounts shown on the face of this application for payment are correct, all work has been performed and/or materials supplied, the foregoing is a true and correct statement of the contract account up to and including that last day of the period covered by this application.

_____

Date **Contractor**

APPENDIX G

FIELD OPERATING PROCEDURES

BENCHMARK
ENVIRONMENTAL
ENGINEERING &
SCIENCE, PLLC

FIELD OPERATING PROCEDURES

Soil Vapor Sample Collection Procedures

FOP 004.4

SUBSLAB SOIL VAPOR SAMPLE COLLECTION PROCEDURE

BACKGROUND

In October 2006, the New York State Department of Health (NYSDOH) finalized their vapor intrusion guidance document entitled "Guidance for Evaluating Soil Vapor Intrusion in the State of New York." (www.health.state.ny.us/nysdoh/gas/svi_guidance/), which has been guiding NYSDOH and New York State Department of Environmental Conservation (NYSDEC) decisions concerning the need for subslab vapor mitigation at sites undergoing investigation, cleanup and monitoring under formal NY Sate remedial programs (e.g., Brownfield Cleanup Program sites, Inactive Hazardous Waste Site Remediation Program sites, etc.). The guidance presents two soil vapor/indoor air matrices to assist in interpreting subslab, indoor and ambient air data (i.e., "Matrix 1" and "Matrix 2"). As of June 2007, six compounds have been assigned to these two matrices as follows:

Volatile Chemical	Soil Vapor / Indoor Air Matrix
Carbon tetrachloride	Matrix 1
1,1-Dichloroethene	Matrix 2
cis-1,2-Dichloroethene	Matrix 2
Tetrachloroethene	Matrix 2
1,1,1-Trichloroethane	Matrix 2
Trichloroethene	Matrix 1
Vinyl chloride	Matrix 1

Additional matrices will be developed when a chemical's toxicological properties, background concentrations, or analytical capabilities suggest that major revisions are needed. Both matrices are attached as Figures 1 and 2.

PURPOSE

The procedures presented herein delineate the scope of additional investigation at a building on the project site to determine if volatile organic compounds (VOCs) detected in groundwater and/or soil near the building are intruding into the building airspace or have the potential, in sufficient concentrations, to adversely impact indoor air quality. The soil vapor, subslab vapor, and ambient air monitoring procedures follow the NYSDOH Final Soil Vapor Intrusion Guidance (October 2006) as well as USEPA Methods TO-14 and TO-15, for volatile organic compounds (VOCs) using Summa passive canisters.

SURVEYS AND PRE-SAMPLING BUILDING PREPARATION (IF REQUIRED)

If required, a pre-sampling inspection should be performed prior to each sampling event to identify and minimize conditions that may interfere with the proposed testing. The inspection should evaluate the type of structure, floor layout, airflows, and physical conditions of the building(s) being studied. This information, along with information on sources of potential indoor air contamination, should be identified on a building inventory form. An example of the building inventory form is attached. Items to be included in the building inventory include the following:

- Construction characteristics, including foundation cracks and utility penetrations or other openings that may serve as preferential pathways for vapor intrusion;
- Presence of an attached garage;
- Recent renovations or maintenance to the building (e.g., fresh paint, new carpet or furniture);
- Mechanical equipment that can affect pressure gradients (e.g., heating systems, clothes dryers or exhaust fans);

- Use or storage of petroleum products (e.g., fuel containers, gasoline operated equipment and unvented kerosene heaters); and
- Recent use of petroleum-based finishes or products containing volatile chemicals.

Each room on the floor of the building being tested and on lower floors, if possible, should be inspected. This is important because even products stored in another area of a building can affect the air of the room being tested.

The presence and description of odors (e.g., solvent, moldy) and portable vapor monitoring equipment readings (e.g., PIDs, ppb RAE, Jerome Mercury Vapor Analyzer, etc.) should be noted and used to help evaluate potential sources. This includes taking readings near products stored or used in the building.

Potential interference from products or activities releasing volatile chemicals may need to be controlled. Removing the source from the indoor environment prior to testing is the most effective means of reducing interference. Ensuring that containers are tightly sealed may be acceptable. When testing for volatile organic compounds, containers should be tested with portable vapor monitoring equipment to determine whether compounds are leaking. The inability to eliminate potential interference may be justification for not testing, especially when testing for similar compounds at low levels. The investigator should consider the possibility that chemicals may adsorb onto porous materials and may take time to dissipate.

In some cases, the goal of the testing is to evaluate the impact from products used or stored in the building (e.g., pesticide misapplications, school renovation projects). If the goal of the testing is to determine whether products are an indoor volatile chemical contaminant source, the removing these sources does not apply.

Once interfering conditions are corrected (if applicable), ventilation may be needed prior to sampling to eliminate residual contamination in the indoor air. If ventilation is appropriate, it should be completed 24 hours or more prior to the scheduled sampling time. Where applicable, ventilation can be accomplished by operating the building's HVAC system to maximize outside air intake. Opening windows and doors, and operating exhaust fans may also help or may be needed if the building has no HVAC system.

Air samples are sometimes designed to represent typical exposure in a mechanically ventilated building and the operation of HVAC systems during sampling should be noted on the building inventory form (see attached sample). In general, the building's HVAC system should be operating under normal conditions. Unnecessary building ventilation should be avoided within 24 hours prior to and during sampling. During colder months, heating systems should be operating to maintain normal indoor air temperatures (i.e., 65 – 75 °F) for at least 24 hours prior to and during the scheduled sampling time.

Depending upon the goal of the indoor air sampling, some situations may warrant deviation from the above protocol regarding building ventilation. In such cases, building conditions and sampling efforts should be understood and noted within the framework and scope of the investigation.

To avoid potential interferences and dilution effects, every effort should be made to avoid the following during the collection period and for 24 hours prior to sampling:

- Opening any windows, fireplace dampers, openings or vents;
- Operating ventilation fans unless special arrangements are made;
- Smoking in the building;
- Painting;
- Using a wood stove, fireplace or other auxiliary heating equipment (e.g., kerosene heater);
- Operating or storing automobile in an attached garage;

- Allowing containers of gasoline or oil to remain within the house or garage area, except for fuel oil tanks;
- Cleaning, waxing or polishing furniture, floors or other woodwork with petroleum- or oil-based products;
- Using air fresheners, scented candles or odor eliminators;
- Engaging in any hobbies that use materials containing volatile chemicals;
- Using cosmetics including hairspray, nail polish, nail polish removers, perfume/cologne, etc.;
- Lawn mowing, paving with asphalt, or snow blowing;
- Applying pesticides; and
- Using building repair or maintenance products, such as caulk or roofing tar.

PRODUCT INVENTORY (IF REQUIRED)

If required, the primary objective of the product inventory is to identify potential air sampling interference by characterizing the occurrence and use of chemicals and products throughout the building, keeping in mind the goal of the investigation and site-specific contaminants of concern. For example, it is not necessary to provide detailed information for each individual container of like items. However, it is necessary to indicate that "20 bottles of perfume" or
"12 cans of latex paint" were present with containers in good condition. This information is used to help formulate an indoor environment profile.

An inventory should be provided for each room on the floor of the building being tested and on lower floors, if possible. This is important because even products stored in another area of a building can affect the air of the room being tested.

The presence and description of odors (e.g., solvent, moldy) and portable vapor monitoring equipment readings (e.g., PIDs, ppb RAE, Jerome Mercury Vapor Analyzer, etc.) should be noted and used to help evaluate potential sources. This includes taking readings near

products stored or used in the building. Products in buildings should be inventoried every time air is tested to provide an accurate assessment of the potential contribution of volatile chemicals. If available, chemical ingredients of interest (e.g., analyte list) should be recorded for each product. If the ingredients are not listed on the label, record the product's exact and full name, and the manufacturer's name, address and telephone number, if available. In some cases, Material Safety Data Sheets (MSDS) may be useful for identifying confounding sources of volatile chemicals in air. Adequately documented photographs of the products and their labeled ingredients can supplement the inventory and facilitate recording the information.

SAMPLE LOCATIONS

The following are types of samples that are collected to investigate the soil vapor intrusion pathway:

- Subsurface vapor samples:
  - *Soil vapor* samples (i.e., soil vapor samples not beneath the foundation or slab of a building) and
  - *Sub-slab vapor* samples (i.e., soil vapor samples immediately beneath the foundation or slab of a building);
- Indoor air samples; and
- Outdoor air samples.

The types of samples that should be collected depend upon the specific objective(s) of the sampling, as described below.

- Soil vapor
  Soil vapor samples are collected to determine whether this environmental medium is contaminated, characterize the nature and extent of contamination, and identify possible sources of the contamination. Soil vapor sampling results are used when evaluating the following:
  - The potential for *current* human exposures;

- The potential for *future* human exposures (e.g., should a building be constructed); and
- The effectiveness of measures implemented to remediate contaminated subsurface vapors.

- Sub-slab vapor

  Sub-slab vapor samples are collected to characterize the nature and extent of soil vapor contamination immediately beneath a building with a basement foundation and/or a slab-on-grade. Sub-slab vapor sampling results are used when evaluating the following:
  - *Current* human exposures;
  - The potential for *future* human exposures (e.g., if the structural integrity of the building changes or the use of the building changes); and
  - Site-specific attenuation factors (i.e., the ratio of indoor air to sub-slab vapor concentrations).

  Sub-slab vapor samples are collected after soil vapor characterization and/or other environmental sampling (e.g., soil and groundwater characterization) indicate a need. Subslab samples are typically collected concurrently with indoor and outdoor air samples. However, outside of the heating season, sub-slab vapor samples may be collected independently depending on the sampling objective (e.g., characterize the extent of subsurface vapor contamination outside of the heating season to develop a more comprehensive, focused investigation plan for the heating season).

- Indoor air

  Indoor air samples are collected to characterize exposures to air within a building, including those with earthen floors and crawlspaces. Indoor air sampling results are used when evaluating the following:
  - *Current* human exposures;
  - The potential for *future* exposures (e.g., if a currently vacant building should become occupied); and
  - Site-specific attenuation factors (e.g., the ratio of indoor air to sub-slab vapor concentrations).

Indoor air samples are collected when environmental sampling (e.g., soil and groundwater characterization) indicate a need. When indoor air samples are collected, concurrent sub-slab vapor and outdoor air samples are collected to evaluate the indoor air results appropriately. However, indoor air and outdoor air samples, without sub-slab vapor samples, may be collected when confirming the effectiveness of a mitigation system.

In addition, site-specific situations may warrant collecting indoor air samples prior to characterizing subsurface vapors and/or without concurrent sub-slab sampling due to a need to examine immediate inhalation hazards. Examples of such situations may include, but are not limited to, the following:

- In response to a spill event when there is a need to qualitatively and/or quantitatively characterize the contamination;
- If high readings are obtained in a building when screening with field equipment (e.g., a photoionization detector (PID), an organic vapor analyzer, or an explosimeter) and the source is unknown;
- If significant odors are present and the source needs to be characterized; or
- If groundwater beneath the building is contaminated, the building is prone to groundwater intrusion or flooding (e.g., sump pit overflows), and subsurface vapor sampling is not feasible.

- Outdoor air

  Outdoor air samples are collected to characterize site-specific background outdoor air conditions. These samples must be collected simultaneously with indoor air samples. They may also be collected concurrently with soil vapor samples. Outdoor air sampling results are primarily used when evaluating the extent to which outdoor sources may be influencing indoor air quality. They may also be used in the evaluation of soil vapor results (i.e., to identify potential outdoor air interferences associated with the infiltration of outdoor air into the sampling apparatus while the soil vapor sample was collected).

SOIL VAPOR SAMPLE COLLECTION PROCEDURES

Soil vapor probe installations (see Figure 3 attached) may be permanent, semi-permanent, or temporary. In general, permanent installations are preferred for data consistency reasons. Soil implants or probes should be constructed in the same manner at all sampling locations to minimize possible discrepancies. The following procedures should be included in any construction protocol:

- Soil vapor probes should be installed using direct push technology or, if necessary to attain the desired depth, using an auger;
- Porous backfill material (e.g., glass beads or coarse sand) should be used to create a sampling zone 1 to 2 feet in length;
- Soil vapor probes should be fitted with inert tubing (e.g., polyethylene, stainless steel, or Teflon®) of the appropriate size (typically 1/8 inch to 1/4 inch diameter) and of laboratory or food grade quality to the surface;
- Soil vapor probes should be sealed above the sampling zone with a bentonite slurry for a minimum distance of 3 feet to prevent outdoor air infiltration and the remainder of the borehole backfilled with clean material;
- For multiple probe depths, the borehole should be grouted with bentonite between probes to create discrete sampling zones; and
- For permanent installations, a protective casing should be set around the top of the probe tubing and grouted in place to the top of bentonite to minimize infiltration of water or outdoor air, as well as to prevent accidental damage.

Soil vapor samples should be collected in the same manner at all locations to minimize possible discrepancies. The following procedures should be included in any sampling protocol:

- At least 24 hours after the installation of permanent probes and shortly after the installation of temporary probes, one to three implant volumes (i.e., the volume of

the sample probe and tube) must be purged prior to collecting the samples to ensure samples collected are representative;

- Flow rates for both purging and collecting must not exceed 0.2 liters per minute to minimize outdoor air infiltration during sampling;

- Samples must be collected, using conventional sampling methods, in an appropriate container — one which meets the objectives of the sampling (e.g., investigation of areas where low or high concentrations of volatile chemicals are expected; to minimize losses of volatile chemicals that are susceptible to photodegradation), meets the requirements of the sampling and analytical methods (e.g., low flow rate; Summa® canisters if analyzing by using EPA Method TO-15), and is certified clean by the laboratory;

- Sample size depends upon the volume of sample required to achieve minimum reporting limit requirements; and

- A tracer gas (e.g., helium, butane, or sulfur hexafluoride) must be used when collecting soil vapor samples to verify that adequate sampling techniques are being implemented (i.e., to verify infiltration of outdoor air is not occurring) (discussed later in this procedure). Once verified, continued use of the tracer gas may be reconsidered.

When soil vapor samples are collected, the following actions should be taken to document local conditions during sampling that may influence interpretation of the results:

- If sampling near a commercial or industrial building, uses of volatile chemicals during normal operations of the facility should be identified;

- Outdoor plot sketches should be drawn that include the site, area streets, neighboring commercial or industrial facilities (with estimated distance to the site), outdoor ambient air sample locations (if applicable), and compass orientation (north);

- Weather conditions (e.g., precipitation, outdoor temperature, barometric pressure, wind speed and direction) should be noted for the past 24 to 48 hours; and

- Any pertinent observations should be recorded, such as odors and readings from field instrumentation.

The field sampling team must maintain a sample log sheet summarizing the following:

- Sample identification,
- Date and time of sample collection,
- Sampling depth,
- Identity of samplers,
- Sampling methods and devices,
- Purge volumes,
- Volume of soil vapor extracted,
- If canisters used, the vacuum before and after samples collected,
- Apparent moisture content (dry, moist, saturated, etc.) of the sampling zone, and
- Chain of custody protocols and records used to track samples from sampling point to analysis.

SUB-SLAB VAPOR SAMPLE COLLECTION PROCEDURES

During colder months, heating systems should be operating to maintain normal indoor air temperatures (i.e., 65 – 75 °F) for at least 24 hours prior to and during the scheduled sampling time. Prior to installation of the sub-slab vapor probe, the building floor should be inspected and any penetrations (cracks, floor drains, utility perforations, sumps, etc.) should be noted and recorded. Probes should be installed at locations where the potential for ambient air infiltration via floor penetrations is minimal.

Sub-slab vapor probe installations (see Figure 4 attached) may be permanent, semi-permanent, or temporary. Sub-slab implants or probes should be constructed in the same manner at all sampling locations to minimize possible discrepancies. The following procedures should be included in any construction protocol:

- Permanent recessed probes must be constructed with brass or stainless steel tubing and fittings;
- Temporary probes must be constructed with polyethylene or Teflon® tubing of laboratory or food grade quality;
- Tubing should not extend further than 2 inches into the sub-slab material;
- Coarse sand or glass beads should be added to cover about 1 inch of the probe tip for permanent installations; and
- The soil vapor probe should be sealed to the surface with permagum grout, melted beeswax, putty or other non-VOC-containing and non-shrinking products for temporary installations or cement for permanent installations.

Sub-slab vapor samples should be collected in the following manner:

- After installation of the probes and after seal testing with tracer gas (see below), one to three volumes (i.e., the volume of the sample probe and tube) must be purged prior to collecting the samples to ensure samples collected are representative;
- Flow rates for both purging and collecting must not exceed 0.2 liters per minute to minimize outdoor air infiltration during sampling; and
- Samples must be collected, using conventional sampling methods, in an appropriate container — one which meets the objectives of the sampling (e.g., investigation of areas where low or high concentrations of volatile chemicals are expected; to minimize losses of volatile chemicals that are susceptible to photodegradation), meets the requirements of the sampling and analytical methods (e.g., low flow rate; Summa® canisters if analyzing by using EPA Method TO-15), and is certified clean by the laboratory;
- Sample size depends upon the volume of sample required to achieve minimum reporting limit requirements [Section 2.9 of the Guidance], the flow rate, and the sampling duration; and
- Ideally, samples should be collected over the same period of time as concurrent indoor and outdoor air samples.

When sub-slab vapor samples are collected, the following actions should be taken to document conditions during sampling and ultimately to aid in the interpretation of the sampling results:

- Storage and uses of volatile chemicals for cleaning, maintenance, process or other reasons in the building, regardless of building use or occupancy, should be identified;
- The use of heating or air conditioning systems during sampling should be noted;
- Floor plan sketches should be drawn that include the floor layout with sample locations, chemical storage areas, garages, doorways, stairways, location of basement sumps or subsurface drains and utility perforations through building foundations, HVAC system air supply and return registers, compass orientation (north), and any other pertinent information should be completed;
- If possible, photographs should accompany floor plan sketches;
- Outdoor plot sketches should be drawn that include the building site, area streets, outdoor air sample locations (if applicable), compass orientation (north), footings that create separate foundation sections, and paved areas;
- Weather conditions (e.g., precipitation, indoor and outdoor temperature, and barometric pressure) and ventilation conditions (e.g., heating system active and windows closed) should be reported;
- Smoke tubes or other devices should be used to confirm pressure relationships and air flow patterns, especially between floor levels and between suspected contaminant sources and other areas; and
- Any pertinent observations, such as spills, floor stains, smoke tube results, odors and readings from field instrumentation (e.g., vapors via PID, ppb RAE, Jerome Mercury Vapor Analyzer, etc.), should be recorded.

The field sampling team must maintain a sample log sheet summarizing the following:

- Sample identification,
- Date and time of sample collection,
- Sampling depth,
- Identity of samplers,
- Sampling methods and devices,
- Soil vapor purge volumes,
- Volume of soil vapor extracted,
- If canisters used, the vacuum before and after samples collected,
- Apparent moisture content (dry, moist, saturated, etc.) of the sampling zone, and

- Chain of custody protocols and records used to track samples from sampling point to analysis.

The following describes the subslab air sampling procedure:

1. Canisters will be supplied by the laboratory that will be conducting the analysis.

2. Sampling will take place in accordance with the project work plan sufficiently spaced to allow locations to be modified, if necessary.

3. The number of Summa canisters required as well as the flow rate of the constant differential low volume flow controllers will be supplied by the laboratory in accordance with the project work plan.

4. The sampling program will consist of concurrently collecting and analyzing one sub-slab vapor sample and one indoor ambient air sample (discussed in the next section). Sample locations should be selected based on the likelihood for potential continuous human occupancy during the workday (i.e., due to the size of the areas and available infrastructure), and to account for the possibility of varying foundation depths in different areas of the building. The lowest space (e.g., basement) should be sampled if feasible. In addition, sample locations typically are based upon the results of a subsurface investigation (i.e., soil gas survey or boring advancement) conducted prior to air sample collection activities. Canisters are typically placed in areas where the highest concentrations of soil gas were observed. Indoor air sample locations preferably should be selected near the middle of the sampled room away from cracks/penetrations and well away from the edges where dilution is more likely to occur. The NYSDOH representative should be consulted for guidance concerning the number of samples and sample locations prior to collection.

5. Collect at least one outdoor ambient air sample from a location at a designated background area of the site positioned away from building ventilation system equipment at an elevation similar to the breathing zone (typically 3-5 feet above grade). See the Outdoor Ambient Air Sampling Procedure section in this procedure.

6. Field personnel should assure conservative sampling conditions prior to and throughout the sampling event. The building should be closed (windows and doors shut) 24 hours before the air sampling is scheduled to begin as well as during sample collection. Any air-handling units that may induce positive pressure gradients within the structure should also be turned off for 24 hours prior to sample collection and during the collection event.

7. Any activity being conducted by current building tenants involving volatile organic compounds, such as the use of lacquer thinner and cleaning solvents, prior to and/or during air sampling activities should be noted in the Project Field Book. These activities have the potential to bias the analytical results.

8. At each location, drill an approximately ¾-inch diameter hole through the concrete slab (typically 6-8 inches thick) using a hand-held hammer drill.

9. Measure and record the concrete thickness in the Project Field Book. Measure the vapor with a photoionization detector (PID) upon breakthrough and record the results.

10. Insert polyethylene or Teflon® tubing of laboratory or food grade quality into the drilled hole and no further than 2 inches into the subslab material.

11. Seal the tubing with an appropriately sized volatile organic compound-free stopper (i.e., permagum grout, melted beeswax, putty, or other non-VOC-containing and non-shrinking product) into the concrete core hole and secure in-place making sure the fit is very snug. Supplement any visible gaps between the stopper and concrete slab with a VOC-free sealant, such as beeswax or bentonite slurry.

12. Run the tubing assembly through a shroud (plastic pail, cardboard box, or garbage bag) creating a tight seal with the surface making sure not to disturb the seal around the tubing penetration.

13. Enrich the atmosphere of the shroud with helium. Measure and record the helium concentration within the shroud.

14. Purge approximately 1 to 3 tubing volumes (i.e., the volume of the sample probe and tube) using a hand pump (or similar approved device) to ensure the collection of a representative sample.

15. Flow rates for both purging and sample collection must not exceed 0.2 liters per minute to minimize outdoor air infiltration during sampling.

16. Use a portable monitoring device to analyze a sample of soil vapor for the tracer **prior to and after** sampling for the compounds of concern. Note that the tracer gas samples can be collected via syringe, Tedlar bag etc. They need not be collected in Summa® canisters or minicans.

17. If tracer gas is detected either prior to and/or after sampling, the probe seal should be enhanced to reduce the infiltration of outdoor air. Following enhancement of the seal, repeat steps 14 through 17 above until purged concentrations exhibit no tracer gas.

18. Following tubing purge and adequate seal integrity testing via helium tracer gas, immediately attach a 6-liter Summa Canister fitted with a 24-hour regulator (or approved other duration) to the opposite end of the tubing. Concurrent with each subslab sample location, prepare an indoor ambient air sample by staging a second Summa Canister on a ladder (approximately 3 to 5-feet above the floor) adjacent to the sub-slab sample location.

19. All Summa Canister valves should remain closed until all subslab borings are complete and all of the canisters in their respective positions.

20. Open the valves to all of the canisters for the required collection period (i.e., 24-hours).

21. Following sample collection, close and cap each canister valve. Verify that some remaining vacuum is present, otherwise sample should be considered unusable and recollection will be required.

22. Collect all Summa Canisters and ship, under chain-of-custody command to an approved analytical laboratory for VOC analysis in accordance with USEPA Method TO-14 or TO-15.

23. Repair all concrete openings with a cement patch.

24. Analytical results submitted by the laboratory should be reported as concentrations of each VOC at each location, typically in parts per billion by volume (ppbv).

INDOOR AIR SAMPLE COLLECTION PROCEDURES

During colder months, heating systems should be operating to maintain normal indoor air temperatures (i.e., 65 – 75 °F) for at least 24 hours prior to and during the scheduled sampling time. If possible, prior to collecting indoor samples, a pre-sampling inspection, discussed earlier in this procedure, should be performed to evaluate the physical layout and conditions of the building being investigated, to identify conditions that may affect or interfere with the proposed sampling, and to prepare the building for sampling.

In general, indoor air samples should be collected in the following manner:

- Sampling duration should reflect the exposure scenario being evaluated without compromising the detection limit or sample collection flow rate (e.g., an 8 hour sample from a workplace with a single shift versus a 24 hour sample from a workplace with multiple shifts). To ensure that air is representative of the locations sampled and to avoid undue influence from sampling personnel, samples should be collected for at least 1 hour. If the goal of the sampling is to represent average concentrations over longer periods, then longer duration sampling periods may be appropriate. Typically, 24 hour samples are collected from residential settings;

- Personnel should avoid lingering in the immediate area of the sampling device while samples are being collected;

- Sample flow rates must conform to the specifications in the sample collection method and, if possible, should be consistent with the flow rates for concurrent outdoor air and sub-slab samples; and

- Samples must be collected, using conventional sampling methods, in an appropriate container — one which meets the objectives of the sampling (e.g., investigation of areas where low or high concentrations of volatile chemicals are expected; to minimize losses of volatile chemicals that are susceptible to photodegradation), meets the requirements of the sampling and analytical methods (e.g., low flow rate; Summa® canisters if analyzing by using EPA Method TO-15), and is certified clean by the laboratory.

At sites with tetrachloroethene contamination, passive air monitors that are specifically analyzed for tetrachloroethene (i.e., "perc badges") are commonly used to collect indoor and outdoor air samples. If site characterization activities indicate that degradation products of tetrachloroethene also represent a vapor intrusion concern, perc badges may be used to indicate the likelihood of vapor intrusion (i.e., by using tetrachloroethene as a surrogate) followed, as needed, by more comprehensive sampling and laboratory analyses to quantify both tetrachloroethene and its degradation products. Perc badge samples ideally should be collected over a twenty-four hour period, but for no less than eight hours.

The following actions should be taken to document conditions during indoor air sampling and ultimately to aid in the interpretation of the sampling results:

- A product inventory survey must be completed (discussed earlier);

- The use of heating or air conditioning systems during sampling should be noted;

- Floor plan sketches should be drawn that include the floor layout with sample locations, chemical storage areas, garages, doorways, stairways, location of basement sumps or subsurface drains and utility perforations through building foundations, HVAC system supply and return registers, compass orientation (north), and any other pertinent information should be completed;

- If possible, photographs should accompany floor plan sketches;

- Outdoor plot sketches should be drawn that include the building site, area streets, outdoor air sample locations (if applicable), compass orientation (north), footings that create separate foundation sections, and paved areas;

- Weather conditions (e.g., precipitation, indoor and outdoor temperature, and barometric pressure) and ventilation conditions (e.g., heating system active and windows closed) should be reported;

- Smoke tubes or other devices should be used to confirm pressure relationships and air flow patterns, especially between floor levels and between suspected contaminant sources and other areas; and

- Any pertinent observations, such as spills, floor stains, smoke tube results, odors and readings from field instrumentation (e.g., vapors via PID, ppb RAE, Jerome Mercury Vapor Analyzer, etc.), should be recorded.

The field sampling team must maintain a sample log sheet summarizing the following:

- Sample identification,
- Date and time of sample collection,
- Sampling height,
- Identity of samplers,
- Sampling methods and devices,
- Tracer gas measurements,
- Depending upon the method, volume of air sampled,
- If canisters used, the vacuum before and after samples collected,
- Chain of custody protocols and records used to track samples from sampling point to analysis.

The following describes the indoor air sampling procedure:

1. Canisters will be supplied by the laboratory that will be conducting the analysis.

2. Sampling will take place in accordance with the project work plan sufficiently spaced to allow locations to be modified, if necessary.

3. The number of Summa canisters required as well as the flow rate of the constant differential low volume flow controllers will be supplied by the laboratory in accordance with the project work plan. Indoor air sampling typically requires the continuous collection of samples over a 24-hour period.

4. The sampling program will consist of concurrently collecting and analyzing one sub-slab vapor sample and one indoor ambient air sample. Sample locations should be selected based on the likelihood for potential continuous human occupancy during the workday (i.e., due to the size of the areas and available infrastructure), and to account for the possibility of varying foundation depths in different areas of the building. In addition, sample locations typically are based upon the results of a subsurface investigation (i.e., soil gas survey or boring advancement) conducted prior to air sample collection activities. Canisters are typically placed in areas where the highest concentrations of soil gas were observed. Indoor air sample locations preferably should be selected near the middle of the sampled room, well away from the edges where dilution is more likely to occur.

5. Collect at least one outdoor ambient air sample from a location on the building roof or designated background area of the site positioned away from building ventilation system equipment on the highest portion of the building roof or site. See the Outdoor Ambient Air Sampling Procedure presented in this procedure.

6. Field personnel should assure conservative sampling conditions prior to and throughout the sampling event. The building should be closed (windows and doors shut) for 24 hours before the air sampling is scheduled to begin as well as during sample collection. Any air-handling units that may induce positive pressure gradients should also be turned off 24 hours prior to sampling and during the sample collection event.

7. Any activity being conducted by current building tenants involving volatile organic compounds, such as the use of lacquer thinner and cleaning solvents, prior to and/or during air sampling activities should be noted in the Project Field Book. These activities have the potential to bias the analytical results.

8. Concurrent with each subslab sample location, prepare an indoor ambient air sample by staging a second Summa Canister on a ladder (approximately 2 to 5-feet above the floor) adjacent to the sub-slab sample location.

9. All Summa Canister valves should remain closed until all subslab borings are complete and all of the canisters in their respective positions.

10. Open the valves to all of the canisters for the required collection period (i.e., 24-hours).

11. Following sample collection, close and cap each canister valve.

12. Collect all Summa Canisters and ship, under chain-of-custody command to an approved analytical laboratory for VOC analysis in accordance with USEPA Method TO-14 or TO-15.

13. Analytical results submitted by the laboratory should be reported as concentrations of each VOC at each location in units of micrograms per cubic meter (ug/m^3).

OUTDOOR AIR SAMPLE COLLECTION PROCEDURES

Outdoor air samples must be collected simultaneously with indoor air samples and may be collected concurrently with subsurface vapor samples. Outdoor air samples must be collected in the same manner as indoor samples.

The following actions should be taken to document conditions during outdoor air sampling and ultimately to aid in the interpretation of the sampling results:

- Outdoor plot sketches should be drawn that include the building site, area streets, outdoor air sample locations (if applicable), the location of potential interferences (e.g., gasoline stations, factories, lawn movers, etc.), compass orientation (north), footings that create separate foundation sections, and paved areas;

- Weather conditions (e.g., precipitation, indoor and outdoor temperature, and barometric pressure) and ventilation conditions (e.g., heating system active and windows closed) should be reported; and

- Any pertinent observations, such as odors, readings from field instrumentation, and significant activities in the vicinity (e.g., operation of heavy equipment or dry cleaners) should be recorded.

The following describes the outdoor air sampling procedure:

1. Canisters will be supplied by the laboratory that will be conducting the analysis.

2. Sampling will take place in accordance with the project work plan sufficiently spaced to allow locations to be modified, if necessary.

3. The number of Summa canisters required as well as the flow rate of the constant differential low volume flow controllers will be supplied by the laboratory in accordance with the project work plan.

4. Sample locations typically are collected upwind of the facility.

5. Place canisters on the ground, with a clear plastic sheet beneath to prevent contamination. Locate the sampling inlet approximately 18-inches above the ground surface.

6. Sample collection should take place on warm, dry days. If rain or high humidity conditions develop during sampling, the sampling event should be suspended. Temperature, barometric pressure, and wind speed should be monitored during the sampling event, for use in analysis of the results.

7. The combination of sampling location, height, and meteorological conditions will assure that sampling will measure VOCs at their highest concentrations.

8. Air samples will be analyzed by Gas Chromatography/Mass Spectroscopy (GC/MS) in accordance with EPA Method TO-14 or TO-15.

9. Analytical results will be reported as concentrations of each VOC at each location during each sampling event in units of micrograms per cubic meter (ug/m^3).

TRACER GAS

When collecting soil vapor and/or subslab vapor samples as part of a vapor intrusion evaluation, a tracer gas serves as a quality assurance/quality control device to verify the integrity of the soil vapor probe seal. Without the use of a tracer, there is no way to verify that a soil vapor sample has not been diluted by surface air.

Depending on the nature of the contaminants of concern, a number of different compounds can be used as a tracer. Typically, sulfur hexafluoride (SF6) or helium are used as tracers because they are readily available, have low toxicity, and can be monitored with portable measurement devices. Butane and propane (or other gases) could also be used as a tracer in some situations. The protocol for using a tracer gas is straightforward: simply enrich the atmosphere in the immediate vicinity of the area where the probe intersects the ground surface with the tracer gas, and measure a vapor sample from the probe for the presence of high concentrations (> 10%) of the tracer. A cardboard box, a plastic pail, or even a garbage bag can serve to keep the tracer gas in contact with the probe during the testing.

There are two basic approaches to testing for the tracer gas:

- Include the tracer gas in the list of target analytes reported by the laboratory; or

- Use a portable monitoring device to analyze a sample of soil vapor for the tracer prior to and after sampling for the compounds of concern. (Note that the tracer gas samples can be collected via syringe, Tedlar bag etc. They need not be collected in Summa® canisters or minicans.)

The advantage of the second approach is that the real time tracer sampling results can be used to confirm the integrity of the probe seals prior to formal sample collection. Figure 5 (attached) depicts common methods for using tracer gas. In each of the examples, a, b and c, the tracer gas is released in the enclosure prior to initially purging the sample point. Care should be taken to avoid excessive purging prior to sample collection. Care should also be taken to prevent pressure build-up in the enclosure during introduction of the tracer gas. Inspection of the installed sample probe, specifically noting the integrity of the surface seal and the porosity of the soil in which the probe is installed, will help to determine the tracer gas setup. Figure 5(a) may be most effective at preventing tracer gas infiltration; however, it may not be required in some situations depending on site-specific conditions. Figures 5(b) and 5(c) may be sufficient for probes installed in tight soils with well-constructed surface seals. In all cases, the same tracer gas application should be used for all probes at any given site.

Portable field monitoring devices with detection limits in the low ppm range are typically adequate for screening samples for the tracer. If concentrations of tracer gas are observed in a sample, the probe seal should be enhanced to reduce the infiltration of ambient air and the tracer test repeated.
Tracer gas samples should be collected at each of the sampling probes.

QUALITY ASSURANCE / QUALITY CONTROL (QA/QC)

Extreme care should be taken during all aspects of sample collection to ensure that sampling error is minimized and high quality data are obtained. The sampling team members should

avoid actions (e.g., fueling vehicles, using permanent marking pens, and wearing freshly dry-cleaned clothing or personal fragrances), which can cause sample interference in the field. Appropriate QA/QC protocols must be followed for sample collection and laboratory analysis, such as use of certified clean sample devices, meeting sample holding times and temperatures, sample accession, chain of custody, etc. Samples should be delivered to the analytical laboratory as soon as possible after collection. In addition, laboratory accession procedures must be followed including field documentation (sample collection information and locations), chain of custody, field blanks, field sample duplicates, and laboratory duplicates, as appropriate.

Some methods require collecting samples in duplicate (e.g., indoor air sampling using passive sampling devices for tetrachloroethene) to assess errors. Duplicate and/or split samples should be collected in accordance with the requirements of the sampling and analytical methods being implemented.

For certain regulatory programs, a Data Usability Summary Report (DUSR) may be required to determine whether or not the data, as presented, meets the site or project specific criteria for data quality and data use. This requirement may dictate the level of QC and the category of data deliverable to request from the laboratory. Guidance on preparing a DUSR is available by contacting the NYSDEC's Division of Environmental Remediation.

New York State Public Health Law requires laboratories analyzing environmental samples collected from within New York State to have current Environmental Laboratory Approval Program (ELAP) certification for the appropriate analyte and environmental matrix combinations. If ELAP certification is not currently required for an analyte (e.g., trichloroethene), the analysis should be performed by a laboratory that has ELAP certification for similar compounds in air and uses analytical methods with detection limits similar to background (e.g., tetrachloroethene via EPA Method TO-15).

The work plan must state that all samples that will be used to make decisions on appropriate actions to address exposures and environmental contamination will be analyzed by an ELAP-certified laboratory. If known, the name of the laboratory should also be provided. Similarly, the name of the laboratory that was used must be included in the report of the sampling results. For samples collected and tested in the field for screening purposes by using field testing technology, the qualifications of the field technician must be documented in the work plan.

DECISION MATRICES (FIGURES 1 AND 2)

Determination of actions to take based upon findings should be based upon the most up to date version of the NYSDOH Guidance for Evaluating Soil Vapor Intrusion or any issued replacement guidance/regulation.

TIME OF YEAR

Sub-slab vapor samples and, unless there is an immediate need for sampling, indoor air samples are typically collected during the heating season because soil vapor intrusion is more likely to occur when a building's heating system is in operation and air is being drawn into the building. In general, heating systems are expected to be operating routinely from November 15th to March 31st throughout the state. However, this timeframe may vary depending on factors, such as the location of the site (e.g., upstate versus downstate) and the weather conditions for a particular year.

A vapor intrusion investigation may also be conducted outside of the heating season. However, the results may not be used to rule out exposures. For example, results indicating

"no further action" or "monitoring required" must be verified during the heating season to ensure these actions are protective during the heating season as well.

SAMPLING ROUNDS

Investigating a soil vapor intrusion pathway usually requires more than one round of subsurface vapor, indoor air, and/or outdoor air sampling, for reasons such as the following:

- To characterize the nature and extent of subsurface vapor contamination (similar to the delineation of groundwater contamination) and to address corresponding exposure concerns;

- To evaluate fluctuations in concentrations due to
  - Different weather conditions (e.g., seasonal effects),
  - Changes in building conditions (e.g., various operating conditions of a building's HVAC system),
  - Changes in source strength, or
  - Vapor migration or contaminant biodegradation processes (particularly when degradation products may be more toxic than the parent compounds); or
- To confirm sampling results or the effectiveness of mitigation or remedial systems.

Overall, successive rounds of sampling are conducted until the following questions can be answered:

- Are subsurface vapors contaminated? If so, what are the nature and extent of contamination? What is/are the source(s) of the contamination?
- What are the current and potential exposures to contaminated subsurface vapors?
- What actions, if any, are needed to prevent or mitigate exposures and to remediate subsurface vapor contamination?

Toward this end, multiple rounds of sampling may be required to characterize the nature and extent of subsurface vapor contamination such that

- Both potential and current exposures are adequately addressed;

- Measures can be designed to remediate subsurface vapor contamination, either directly (e.g., SVE system) or indirectly (e.g., soil excavation or groundwater remediation), given that monitoring and mitigation are considered temporary measures implemented to address exposures related to vapor intrusion until contaminated environmental media are remediated; and
- The effectiveness of remedial measures can be monitored and confirmed (e.g., endpoint sampling).

ATTACHMENTS

Figure 1 *Schematics of a permanent soil vapor probe and permanent nested soil vapor probes*
Figure 2 *Schematic of a sub-slab vapor probe*
Figure 3 *Schematics of tracer gas applications*

Indoor Air Quality Questionnaire and Building Inventory

REFERENCES

New York State Department of Health, *Guidance for Evaluating Soil Vapor Intrusion in the State of New York*, February 2005.

New York State Department of Health, *Indoor Air Sampling & Analysis Guidance.* (February 1, 2005).

Office of Solid Waste and Emergency Response (OSWER). *Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance)*. November 2002.

United States Environmental Protection Agency. *EPA Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air*. 1988

- Method TO-15, Determination of Volatile Organic Compounds (VOCs) in Air Collected in Specially Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS). Pp. 15-1 through 15-62.

- Method TO-17, Determination of Volatile Organic Compounds in Ambient Air using Active Sampling on Sorbent Tubes. Pp. 17-1 through 17-49.

- Compendium of Methods for the Determination of Air Pollutants in Indoor Air, EPA/600/4-90-010.

To Be Deleted To be Deleted**FIGURE 1**

Schematics of a permanent soil vapor probe and permanent nested soil vapor probes

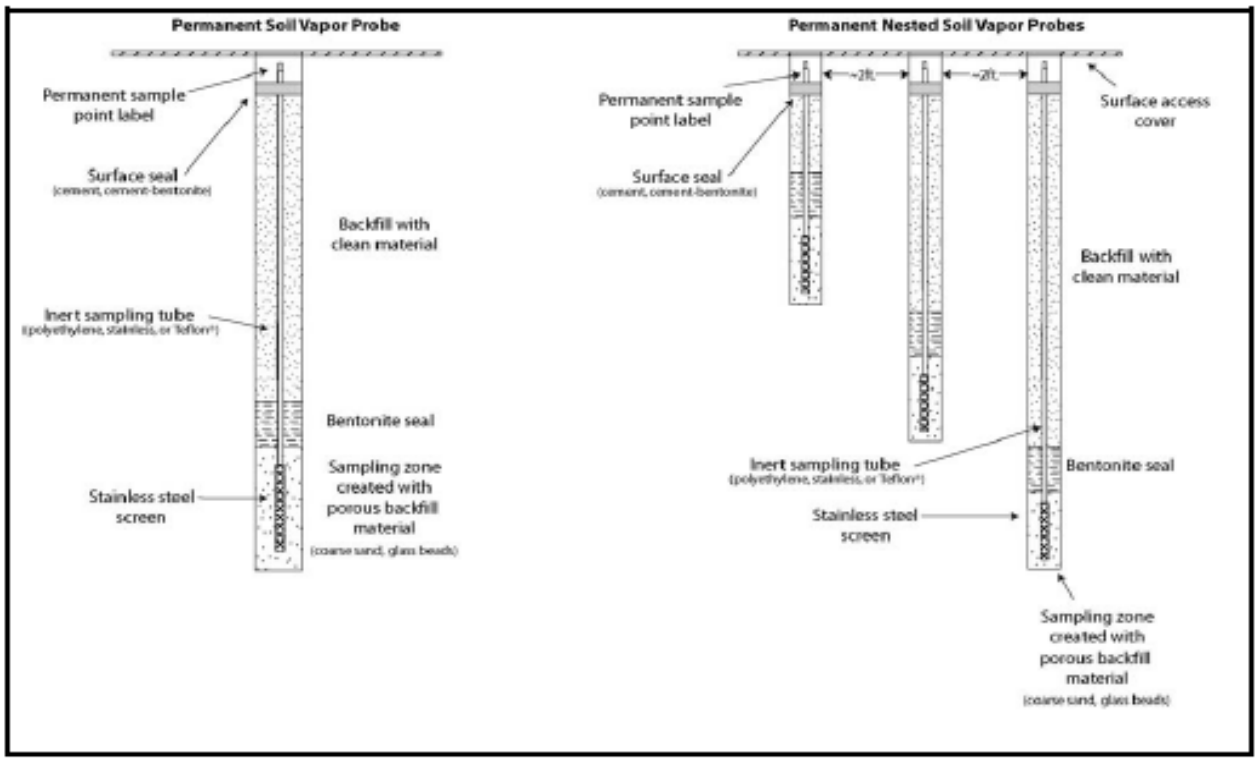
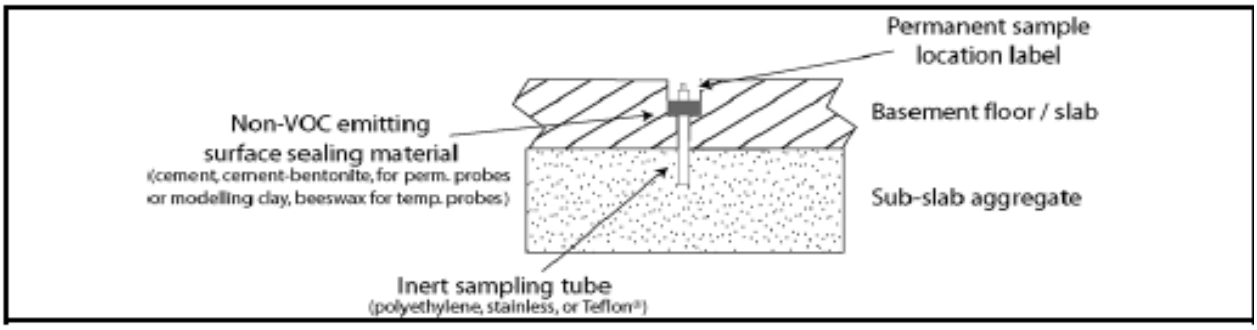


FIGURE 2

Schematic of a sub-slab vapor probe



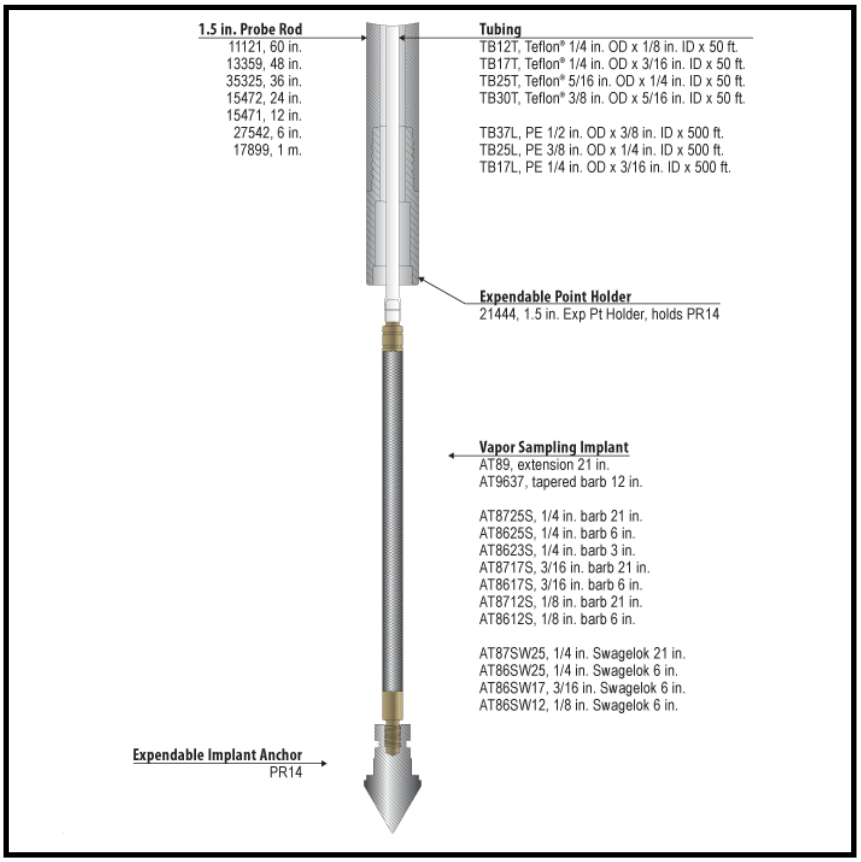
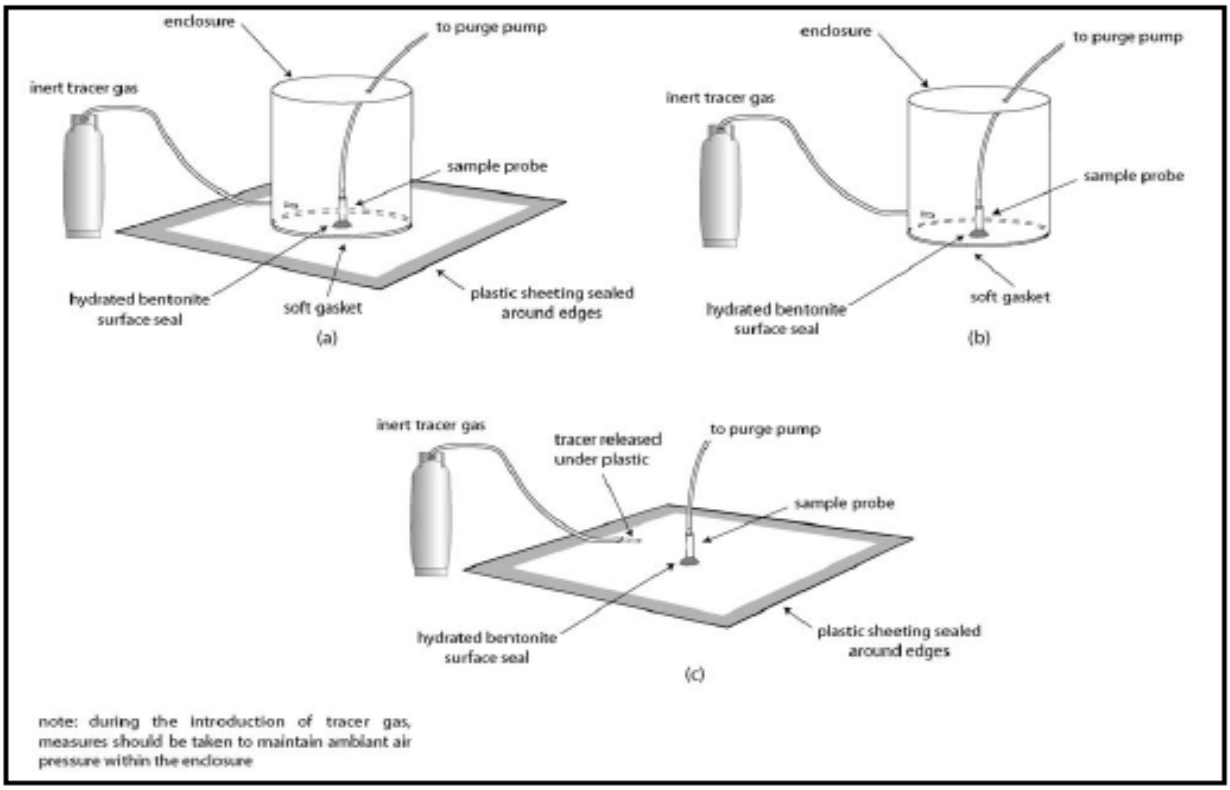


FIGURE 3

Schematics of tracer gas applications



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INDOOR AIR QUALITY QUESTIONNAIRE & BUILDING INVENTORY

Project Name: Project No.
Project Location: Client:
Preparer's Name: Date/Time:
Preparer's Affiliation: Phone No:
Purpose of Investigation:

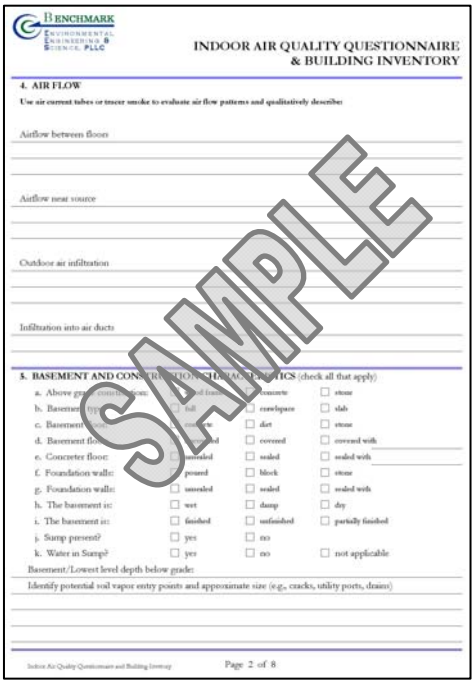
1. OCCUPANT:
Interviewed: yes no
Last Name: First Name:
Address:
County:
Home Phone: Office Phone:
Number of Occupants/persons at this location: Age of Occupants:

2. OWNER OR LANDLORD: (check if same as occupant)
Interviewed: yes no
Last Name:
Address:
County:
Home Phone:

3. BUILDING CHARACTERISTICS
Type of Building: (check appropriate box)
☐ Residential ☐ Industrial ☐ Commercial/Multi-use ☐ Other:
If the property is residential, type: (check appropriate response)
☐ Ranch ☐ Raised Ranch ☐ Cape Cod ☐ 2-Family ☐ Split Level ☐ Contemporary ☐ Duplex ☐ Apartment House ☐ Modular ☐ Log Home ☐ 3-Family ☐ Colonial ☐ Mobile Home ☐ Townhouse/Condo ☐ Other:
If multiple units, how many?
If the property is commercial, type?
Business Type(s):
Does it include residences (i.e., multi-use)? yes no If yes, how many?
Other Characteristics:
Number of floors Building age
Is the building insulated? yes no How air tight? tight average not tight

Indoor Air Quality Questionnaire and Building Inventory Page 1 of 8

SAMPLE



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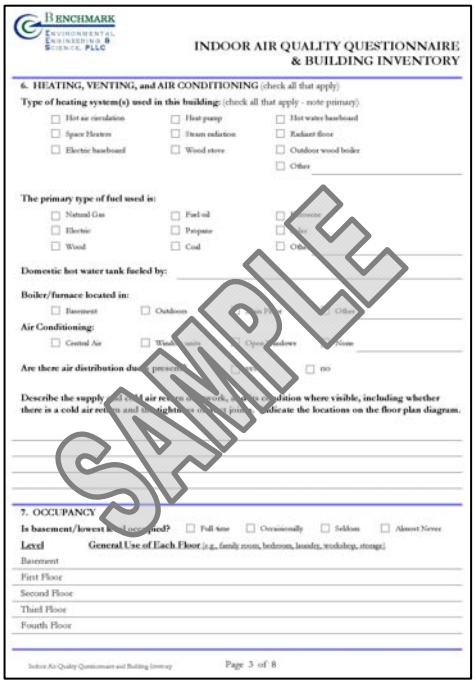
INDOOR AIR QUALITY QUESTIONNAIRE & BUILDING INVENTORY

4. AIR FLOW
Use air current tubes or tracer smoke to evaluate air flow patterns and qualitatively describe:
Airflow between floors
Airflow near source
Outdoor air infiltration
Infiltration into air ducts

5. BASEMENT AND CONSTRUCTION CHARACTERISTICS (check all that apply)
a. Above grade construction: ☐ wood ☐ concrete ☐ stone
b. Basement type: ☐ full ☐ crawlspace ☐ slab
c. Basement walls: ☐ concrete ☐ dirt ☐ stone
d. Basement floor: ☐ concrete ☐ covered ☐ covered with
e. Concrete floor: ☐ unsealed ☐ sealed ☐ sealed with
f. Foundation walls: ☐ poured ☐ block ☐ stone
g. Foundation walls: ☐ unsealed ☐ sealed ☐ sealed with
h. The basement is: ☐ wet ☐ damp ☐ dry
i. The basement is: ☐ finished ☐ unfinished ☐ partially finished
j. Sump present? ☐ yes ☐ no
k. Water in Sump? ☐ yes ☐ no ☐ not applicable
Basement/Lowest level depth below grade:
Identify potential soil vapor entry points and approximate size (e.g., cracks, utility ports, drains)

Indoor Air Quality Questionnaire and Building Inventory Page 2 of 8

SAMPLE



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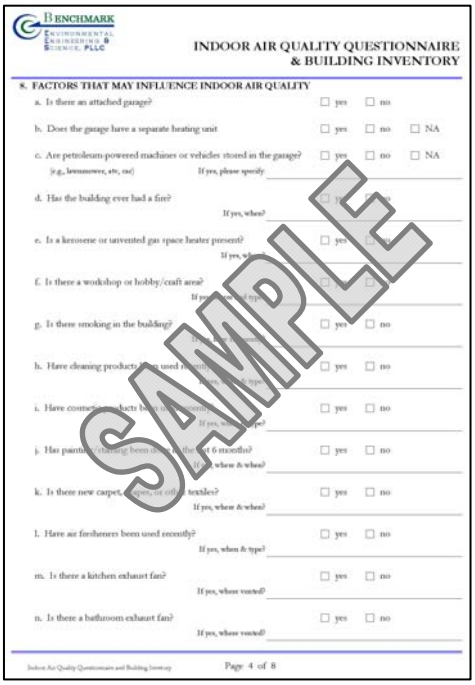
INDOOR AIR QUALITY QUESTIONNAIRE & BUILDING INVENTORY

6. HEATING, VENTING, and AIR CONDITIONING (check all that apply)
Type of heating system(s) used in this building: (check all that apply - note primary)
☐ Hot air circulation ☐ Heat pump ☐ Hot water baseboard
☐ Space Heaters ☐ Steam radiation ☐ Radiant floor
☐ Electric baseboard ☐ Wood stove ☐ Outdoor wood boiler
☐ Other
The primary type of fuel used is:
☐ Natural Gas ☐ Fuel oil ☐ Kerosene
☐ Electric ☐ Propane ☐ Other
☐ Wood ☐ Coal
Domestic hot water tank fueled by:
Boiler/furnace located in:
☐ Basement ☐ Outdoors
Air Conditioning:
☐ Central Air ☐ Window units ☐ Open Windows
Are there air distribution ducts present? ☐ yes ☐ no
Describe the supply and return air registers (e.g., floor or wall; condition where visible, including whether there is a cold air return and the tightness of duct joints. Indicate the locations on the floor plan diagram.

7. OCCUPANCY
Is basement/lowest level occupied? ☐ Full time ☐ Occasionally ☐ Seldom ☐ Almost Never
Level General Use of Each Floor (e.g., family room, bedroom, laundry, workshop, storage)
Basement
First Floor
Second Floor
Third Floor
Fourth Floor

Indoor Air Quality Questionnaire and Building Inventory Page 3 of 8

SAMPLE



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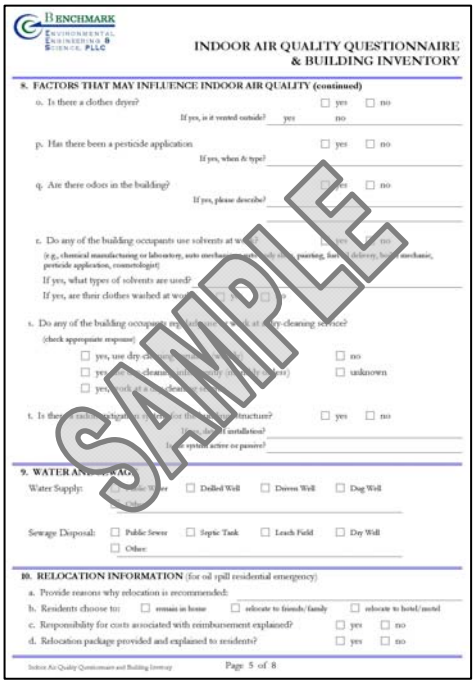
INDOOR AIR QUALITY QUESTIONNAIRE & BUILDING INVENTORY

8. FACTORS THAT MAY INFLUENCE INDOOR AIR QUALITY
a. Is there an attached garage? ☐ yes ☐ no
b. Does the garage have a separate heating unit ☐ yes ☐ no ☐ NA
c. Are petroleum-powered machines or vehicles stored in the garage? ☐ yes ☐ no ☐ NA
(e.g., lawnmower, atv, car) If yes, please specify:
d. Has the building ever had a fire? If yes, when?
e. Is a kerosene or unvented gas space heater present? ☐ yes ☐ no
If yes, where?
f. Is there a workshop or hobby/craft area? ☐ yes ☐ no
If yes, please describe type:
g. Is there smoking in the building? ☐ yes ☐ no
How frequently?
h. Have cleaning products been used recently? ☐ yes ☐ no
If yes, please list type:
i. Have cosmetic products been used recently? ☐ yes ☐ no
If yes, please list type:
j. Has painting/staining been done in the last 6 months? ☐ yes ☐ no
If yes, what & when?
k. Is there new carpet, drapes, or other textiles? ☐ yes ☐ no
If yes, when & where?
l. Have air fresheners been used recently? ☐ yes ☐ no
If yes, when & type?
m. Is there a kitchen exhaust fan? ☐ yes ☐ no
If yes, where vented?
n. Is there a bathroom exhaust fan? ☐ yes ☐ no
If yes, where vented?

Indoor Air Quality Questionnaire and Building Inventory Page 4 of 8

SAMPLE



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INDOOR AIR QUALITY QUESTIONNAIRE & BUILDING INVENTORY

8. FACTORS THAT MAY INFLUENCE INDOOR AIR QUALITY (continued)

o. Is there a clothes dryer? ☐ yes ☐ no

If yes, is it vented outside? ☐ yes ☐ no

p. Has there been a pesticide application ☐ yes ☐ no

If yes, when & type?

q. Are there odors in the building? ☐ yes ☐ no

If yes, please describe)

r. Do any of the building occupants use solvents at w ☐ yes ☐ no

(e.g., chemical manufacturing or laboratory, auto mechanic, paint, fuel delivery, boiler mechanic, pesticide application, cosmetologist)

If yes, what types of solvents are used?

If yes, are their clothes washed at wo ☐ yes ☐ no

s. Do any of the building occupants re ☐ yes ☐ no

(check appropriate response)

☐ yes, use dry ☐ no

☐ ye ☐ unknown

☐ ye

t. Is there ☐ yes ☐ no

If installation?

Is the system active or passive?

9. WATER AND SEWAGE

Water Supply: ☐ Public Water ☐ Drilled Well ☐ Driven Well ☐ Dug Well

Sewage Disposal: ☐ Public Sewer ☐ Septic Tank ☐ Leach Field ☐ Dry Well

☐ Other:

10. RELOCATION INFORMATION (for oil spill residential emergency)

a. Provide reasons why relocation is recommended:

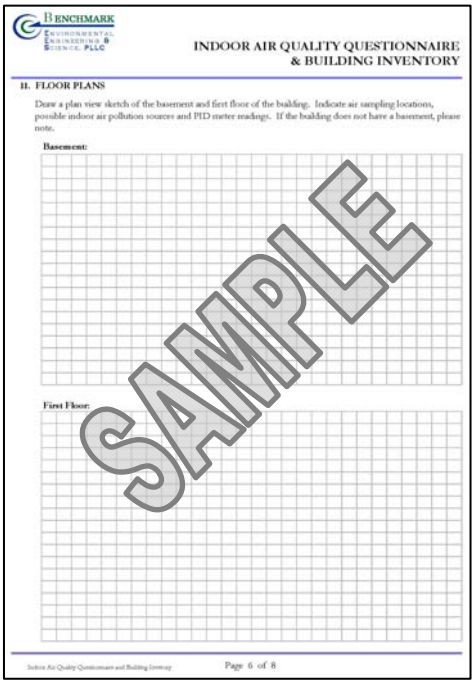
b. Residents choose to: ☐ remain in home ☐ relocate to friends/family ☐ relocate to hotel/motel

c. Responsibility for costs associated with reimbursement explained? ☐ yes ☐ no

d. Relocation package provided and explained to residents? ☐ yes ☐ no

Indoor Air Quality Questionnaire and Building Inventory Page 5 of 8

SAMPLE



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INDOOR AIR QUALITY QUESTIONNAIRE & BUILDING INVENTORY

11. FLOOR PLANS

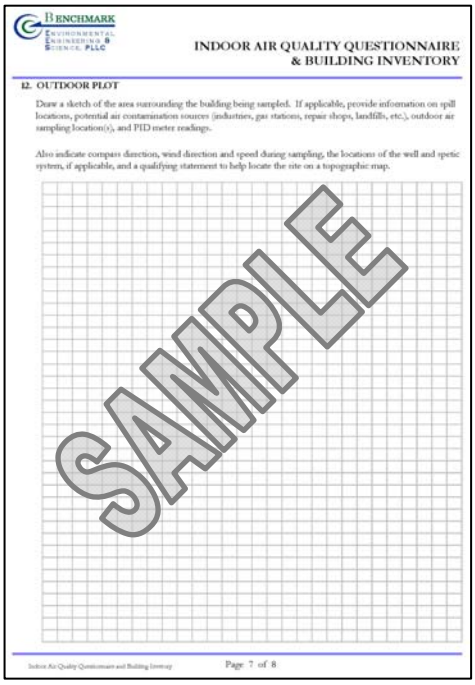
Draw a plan view sketch of the basement and first floor of the building. Indicate air sampling locations, possible indoor air pollution sources and PID meter readings. If the building does not have a basement, please note.

Basement:

First Floor:

Indoor Air Quality Questionnaire and Building Inventory Page 6 of 8

SAMPLE



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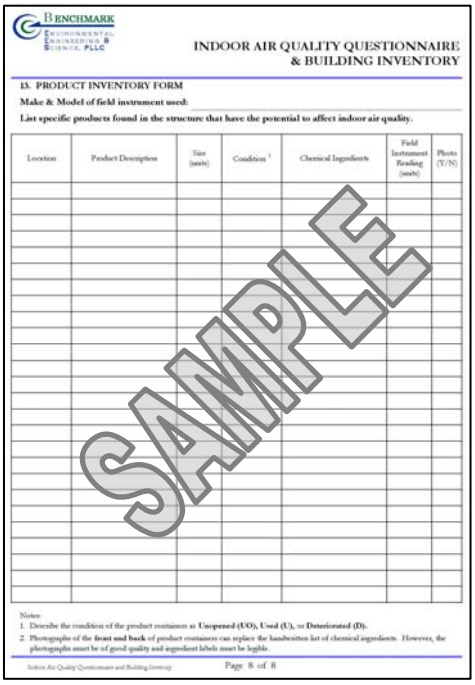
12. OUTDOOR PLOT

Draw a sketch of the area surrounding the building being sampled. If applicable, provide information on spill locations, potential air contamination sources (industries, gas stations, repair shops, landfills, etc.), outdoor air sampling location(s), and PID meter readings.

Also indicate compass direction, wind direction and speed during sampling, the locations of the well and septic system, if applicable, and a qualifying statement to help locate the site on a topographic map.

Indoor Air Quality Questionnaire and Building Inventory Page 7 of 8

SAMPLE



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INDOOR AIR QUALITY QUESTIONNAIRE & BUILDING INVENTORY

13. PRODUCT INVENTORY FORM

Make & Model of field instrument used:

List specific products found in the structure that have the potential to affect indoor air quality.

Location	Product Description	Size (units)	Condition [1]	Chemical Ingredients	Field Instrument Reading (units)	Photo (Y/N)

Notes:

1. Describe the condition of the product containers as **Unopened (UO), Used (U),** or **Deteriorated (D).**
2. Photographs of the **front and back** of product containers can replace the handwritten list of chemical ingredients. However, the photographs must be of good quality and ingredient labels must be legible.

Indoor Air Quality Questionnaire and Building Inventory Page 8 of 8

SAMPLE

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FIELD OPERATING PROCEDURES

Sample Labeling, Storage, and Shipment Procedures

FOP 046.0

SAMPLE LABELING, STORAGE & SHIPMENT PROCEDURES

PURPOSE

The collection and analysis of samples of environmental media, including soils, groundwater, surface water, and sediment, are the central activities of the field investigation. These samples must be properly labeled to preserve its identity, and properly stored and shipped in a manner that preserves its integrity and chain of custody. This procedure presents methods for these activities.

SAMPLE LABELING PROCEDURE

1. Assign each sample retained for analysis a unique 9-digit alphanumeric identification code or as indicated in the Project Work Plan. Typically, this code will be formatted as follows:

Sample I.D. Example: GW051402047	
GW	**Sample matrix** GW = groundwater; SW = surface water; SUB = subsurface soil; SS = surface soil; SED = sediment; L = leachate; A = air
05	Month of sample collection
14	Day of sample collection
02	Year of sample collection
047	Consecutive sample number

2. Consecutive sample numbers will indicate the individual sample's sequence in the total set of samples collected during the investigation/sampling event. The sample number above, for example, would indicate the 47th sample retained for analysis during the field investigation, collected on May 14, 2002.

3. Affix a non-removable (when wet) label to each sample container. The following information will be written on the label with black or blue ink that will not smudge when wet:

   - Project number
   - Sample ID (see Step 1 above)
   - Date of sample collection
   - Time of sample collection (military time only)
   - Specify "grab" or "composite" sample with an "X"
   - Sampler initials
   - Preservative(s) (if applicable)
   - Analytes for analysis (if practicable)

4. Record all sample label information in the Project Field Book and on a Sample Summary Collection Log (see attached samples), keyed to the sample identification number. In addition, add information regarding the matrix, sample location, depth, etc. to provide a complete description of the sample.

SAMPLE STORAGE PROCEDURE

1. Immediately after collection, placement in the proper container, and labeling, place samples to be retained for chemical analysis into resealable plastic bags.

2. Place bagged samples into an ice chest filled approximately half-full of double bagged ice. Blue ice is not an acceptable substitute for ice.

3. Maintain samples in an ice chest or in an alternative location (e.g. sample refrigerator) as approved by the Benchmark Field Team Leader until time of shipment. Periodically drain melt-water off coolers and replenish ice as necessary.

4. Ship samples on a daily basis, unless otherwise directed by the Benchmark Field Team Leader.

5. Maintain appropriate custody procedures on coolers and other sample storage containers at all times. These procedures are discussed in detail in the Project Quality Assurance Project Plan, Monitoring Plan or Work Plan.

6. Samples shall be kept in a secure location locked and controlled (i.e., locked building or fenced area) so that only the Project Field Team Leader has access to the location or under the constant visual surveillance of the same.

SAMPLE SHIPPING PROCEDURE

1. Fill out the chain-of-custody form completely (see attached sample) with all relevant information. The white original goes with the samples and should be placed in a resealable plastic bag and taped inside the sample cooler lid; the sampler should retain the copy.

2. Place a layer of inert cushioning material such as bubble pack in the bottom of cooler.

3. Place each bottle in a bubble wrap sleeve or other protective wrap. To the extent practicable, then place each bottle in a resealable plastic bag.

4. Open a garbage bag (or similar) into a cooler and place sample bottles into the garbage bag (or similar) with volatile organic analysis (VOA) vials near the center of the cooler.

5. Pack bottles with ice in plastic bags. At packing completion, cooler should be at least 50 percent ice, by volume. Coolers should be completely filled, so that samples do not move excessively during shipping.

6. Duct tape (or similar) cooler drain closed and wrap cooler completely in two or more locations to secure lid, specifically covering the hinges of the cooler.

7. Place laboratory label address identifying cooler number (i.e., 1 of 4, 2 of 4 etc.) and overnight delivery waybill sleeves on cooler lid or handle sleeve (Federal Express).

8. Sign the custody seal tape with an indelible soft-tip marker and place over the duct tape across the front and back seam between the lid and cooler body.

9. Cover the signed custody seal tape with an additional wrap of transparent strapping tape.

10. Place "Fragile" and "This Side Up" labels on all four sides of the cooler. "This Side Up" labels are yellow labels with a black arrow with the arrowhead pointing toward the cooler lid.

11. For coolers shipped by overnight delivery, retain a copy of the shipping waybill, and attach to the chain-of-custody documentation.

ATTACHMENTS

Soil/Sediment Sample Summary Collection Log (sample)
Groundwater/Surface Water Sample Summary Collection Log (sample)
Wipe Sample Summary Collection Log (sample)
Air Sample Summary Collection Log (sample)
Chain-Of-Custody Form (sample)

REFERENCES

None

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AIR SAMPLE COLLECTION SUMMARY LOG

Field ID	Location	QC Type	Analytical Parameters	Containers	Date	Time	Sampler Initials	Comments (e.g. problems encountered, ref. to variance, location changes, important observations or descriptions, etc.)

Notes:

1. See QAPP for sampling frequency and actual number of QC samples.
2. SC - Summa Canister.
3. TB - Tedlar Bag (quantity).
4. No Matrix Spike, Matrix Spike Duplicate, Matrix Spike Blanks, Field Duplicates, Field Blanks or Rinsates collected for air samples.

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CHAIN OF CUSTODY RECORD

Project No.	Project Name					Number of Containers	VOCs	SVOCs	Metals						REMARKS
Samplers (Signature)															
No.	Date	Time	comp	grab	Sample Identification										

Possible Hazard Identification:
☐ Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal:
☐ Return to Client ☐ Disposal by Lab ☐ Archive _____(mos.)

Turnaround Time Required:
Normal ☐ Rush ☐

QC Level:
I. ☐ II. ☐ III. ☐ Project Specific (specify):_____

Relinquished by: (Signature)	Date	Time	Relinquished by: (Signature)	Date	Time	REMARKS:
Relinquished by: (Signature)	Date	Time	Relinquished by: (Signature)	Date	Time	

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

WIPE SAMPLE COLLECTION SUMMARY LOG

Field ID	Location	QC Type	Analytical Parameters	Containers	Date	Time	Sampler Initials	Comments (e.g. problems encountered, ref. to variance, location changes, important observations or descriptions, etc.)

Notes:

1. See QAPP for sampling frequency and actual number of QC samples.
2. CWM - clear, wide-mouth glass jar with Teflon-lined cap.
3. FD - Field Duplicate.
4. FB - Field Blank.
5. RS - Rinsate.
6. No Matrix Spike, Matrix Spike Duplicate or Matrix Spike Blanks for wipe samples.
7. Rinsates should be taken at a rate of 1 per day during wipe sampling. Only take when reusable equipment is used.
8. Wipe sample FB collected by wiping unused glove and any other sampling equipment coming into contact with sampled surface) with prepared gauze pad and place in sample jar. Take at a rate of 1 FB per 20 samples.
9. Wipe sample FDs taken adjacent to original sample at a rate of 1 FD per 20 samples.
10. **EH :** Extract and Hold

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

AIR SAMPLE COLLECTION SUMMARY LOG

Field ID	Location	QC Type	Analytical Parameters	Containers	Date	Time	Sampler Initials	Comments (e.g. problems encountered, ref. to variance, location changes, important observations or descriptions, etc.)

Notes:

1. See QAPP for sampling frequency and actual number of QC samples.
2. SC - Summa Canister.
3. TB - Tedlar Bag (quantity).
4. No Matrix Spike, Matrix Spike Duplicate, Matrix Spike Blanks, Field Duplicates, Field Blanks or Rinsates collected for air samples.

SAMPLE LABELING, STORAGE & SHIPMENT PROCEDURES

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

CHAIN OF CUSTODY RECORD

Project No.	Project Name					Number of Containers	VOCs	SVOCs	Metals						REMARKS
Samplers (Signature)															
No.	Date	Time	comp	grab	Sample Identification										

Possible Hazard Identification:
☐ Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal:
☐ Return to Client ☐ Disposal by Lab ☐ Archive _____(mos.)

Turnaround Time Required:
Normal ☐ Rush ☐

QC Level:
I. ☐ II. ☐ III. ☐ Project Specific (specify):_____

Relinquished by: (Signature)	Date	Time	Relinquished by: (Signature)	Date	Time	REMARKS:
Relinquished by: (Signature)	Date	Time	Relinquished by: (Signature)	Date	Time	

APPENDIX H

QUALITY ASSURANCE PROJECT PLAN (QAPP)

APPENDIX H – QUALITY ASSURANCE PROJECT PLAN

All sampling and analyses will be performed in accordance with the requirements of a Quality Assurance Project Plan (QAPP) prepared for the site. A sample QAPP, prepared by Benchmark, is presented herein. This QAPP or an equivalent QAPP shall be followed for SMP-required sampling and analysis.

H QUALITY ASSURANCE PROJECT PLAN

A Quality Assurance Project Plan (QAPP) has been prepared in support of the SMP investigation activities. The QAPP dictates implementation of the investigation tasks delineated in this SMP. A Sampling and Analysis Plan (SAP) identifying methods for sample collection, decontamination, handling, and shipping, is provided as below.

The QAPP will assure the accuracy and precision of data collection during the Site characterization and data interpretation periods. The QAPP identifies procedures for sample collection to mitigate the potential for cross-contamination, as well as analytical requirements necessary to allow for independent data validation. The QAPP has been prepared in accordance with USEPA's Requirements for Quality Assurance Project Plans for Environmental Data Operations; the EPA Region II CERCLA Quality Assurance Manual, and NYSDEC's DER-10 Technical Guidance for Site Investigation and Remediation (May 2010).

H-1 Scope of the QAPP

This QAPP was prepared to provide quality assurance (QA) guidelines to be implemented during the RI activities. This document may be modified for subsequent phases of investigative work, as necessary. The QAPP provides:

- A means to communicate to the persons executing the various activities exactly what is to be done, by whom, and when.
- A culmination to the planning process that ensures that the program includes provisions for obtaining quality data (e.g., suitable methods of field operations).
- A historical record that documents the investigation in terms of the methods used, calibration standards and frequencies planned, and auditing planned.
- A document that can be used by the Project Manager's and QA Officer to assess if the activities planned are being implemented and their importance for accomplishing the goal of quality data.
- A plan to document and track project data and results.

- Detailed descriptions of the data documentation materials and procedures, project files, and tabular and graphical reports.

The QAPP is primarily concerned with the quality assurance and quality control aspects of the procedures involved in the collection, preservation, packaging, and transportation of samples; field testing; record keeping; data management; chain-of-custody procedures; laboratory analyses; and other necessary matters to assure that the investigation activities, once completed, will yield data whose integrity can be defended.

QA refers to the conduct of all planned and systematic actions necessary to perform satisfactorily all task-specific activities and to provide information and data confidence as a result of such activities. The QA for task-specific activities includes the development of procedures, auditing, monitoring and surveillance of the performance.

QC refers to the activity performed to determine if the work activities conform to the requirements. This includes activities such as inspections of the work activities in the field (e.g., verification that the items and materials installed conform to applicable codes and design specifications).

H-2 QAPP Organization and Responsibility

The principal organizations involved in verifying achievement of data collection goals for the 295 Maryland Street Site include: the NYSDEC; NYSDOH; 295 Maryland LLC (Volunteer Applicant); and Benchmark Environmental Engineering and Science, PLLC (Applicant's Engineering and Environmental Consultant); the independent environmental laboratory; and the independent third party data validator. Roles, responsibilities, and required qualifications of these organizations are discussed in the following subsections.

NYSDEC and NYSDOH

It is the responsibility of the New York State Department of Environmental Conservation (NYSDEC), in conjunction with the New York State Department of Health, to review the proposed sampling plan and supporting documents for completeness and conformance with

the site-specific cleanup objectives and to make a decision to accept or reject these documents based on this review. The NYSDEC also has the responsibility and authority to review and approve all QA documentation collected during brownfield cleanup construction and to confirm that the QA Plan was followed.

Applicant

295 Maryland, LLC ("Applicant") will be responsible for complying with the QA requirements as specified herein and for monitoring and controlling the quality of the SMP activities either directly or through their designated environmental consultant and/or legal counsel. The designated Project Manager is responsible for implementing the project, and has the authority to commit the resources necessary to meet project objectives and requirements.

Benchmark Environmental Engineering & Science, PLLC

Benchmark Environmental Engineering & Science, PLLC (Benchmark) is the prime environmental engineering consultant on this project and, unless other qualified consultant or personnel are employed by the Applicant, will be responsible for implementation of the SMP sampling activities, including, but not limited to, field operations, laboratory testing, data management, and reporting. Any one member of Benchmark's staff may fill more than one of the identified project positions (e.g., field team leader and site safety and health officer). The various quality assurances, field, laboratory, and management responsibilities of key project personnel are defined below.

Benchmark Project Manager (PM): *Thomas Forbes, P.E.*

The Benchmark PM has the responsibility for ensuring that the project meets the Work Plan objectives. The PM will report directly to the Applicant and the NYSDEC/NYSDOH Project Coordinators and is responsible for technical and project oversight. The PM will:

- Define project objectives and develop a detailed work plan schedule.

- Establish project policy and procedures to address the specific needs of the project as a whole, as well as the objectives of each task.
- Acquire and apply technical and corporate resources as needed to assure performance within budget and schedule constraints.
- Develop and meet ongoing project and/or task staffing requirements, including mechanisms to review and evaluate each task product.
- Review the work performed on each task to assure its quality, responsiveness, and timeliness.
- Review and analyze overall task performance with respect to planned requirements and authorizations.
- Review and approve all deliverables before their submission to NYSDEC.
- Develop and meet ongoing project and/or task staffing requirements, including mechanisms to review and evaluate each task product.
- Ultimately be responsible for the preparation and quality of interim and final reports.
- Represent the project team at meetings.

- *Benchmark FTL/SSHO:* *Richard Dubisz*

The Field Team Leader (FTL) has the responsibility for implementation of specific project tasks identified at the Site, and is responsible for the supervision of project field personnel, subconsultants, and subcontractors. The FTL reports directly to the Project Manager. The FTL will:

- Define daily work activities.
- Orient field staff concerning the project's special considerations.
- Monitor and direct subcontractor personnel.
- Review the work performed on each task to ensure its quality, responsiveness, and timeliness.
- Assure that field activities, including sample collection and handling, are carried out in accordance with this QAPP.

For this project the FTL will also serve as the Site Safety and Health Officer (SSHO). As such, he is responsible for implementing the procedures and required components of the Site Health and Safety Plan (HASP), determining

levels of protection needed during field tasks, controlling site entry/exit, briefing the field team and subcontractors on site-specific health and safety issues, and all other responsibilities as identified in the HASP.

H-3 Quality Assurance (QA) Responsibilities

The QA Officer will have direct access to corporate executive staff as necessary, to resolve any QA dispute, and is responsible for auditing the implementation of the QA program in conformance with the demands of specific investigations and Benchmark policies, and NYSDEC requirements.

The QA Officer has sufficient authority to stop work on the investigation as deemed necessary in the event of serious QA issues.

- *Project QA Officer:* *Raymond Laport, P.E.*

  Specific function and duties include:
  - Performing QA audits on various phases of the field operations
  - Reviewing and approving QA plans and procedures
  - Providing QA technical assistance to project staff
  - Reporting on the adequacy, status, and effectiveness of the QA program on a regular basis to the Project Manager for technical operations
  - Responsible for assuring third party data review of all sample results from the analytical laboratory

H-4 Field Responsibilities

Benchmark field staff for this project is drawn from a pool of qualified resources. The Project Manager will use staff to gather and analyze data, and to prepare various task reports and support materials. All of the designated technical team members are experienced professionals who possess the degree of specialization and technical competence required to effectively and efficiently perform the required work.

H-5 Quality Assurance Objectives for Measurement Data

The overall objectives and criteria for assuring quality for this effort are discussed below. This QAPP addresses how the acquisition and handling of samples and the review and reporting of data will be documented. The objectives of this QAPP are to address the following:

- The procedures to be used to collect, preserve, package, and transport groundwater samples.
- Field data collection.
- Record keeping.
- Data management.
- Chain-of-custody procedures.
- Precision, accuracy, completeness, representativeness, decision rules, comparability and level of quality control effort conformance for sample analysis and data management by a qualified ELAP-certified laboratory under EPA analytical methods.

H-6 Level of QC Effort for Sample Parameters

SVI sampling will not involve collection of Field QC samples. If SMP activities require collection of soil, water or sediment samples, field blank, method blank, trip blank, field duplicate, laboratory duplicate, laboratory control, standard reference materials (SRM) and matrix spike samples will be analyzed to assess the quality of the data resulting from the field sampling and analytical programs. QC samples are discussed below.

- Field and trip blanks consisting of distilled water will be submitted to the analytical laboratories to provide the means to assess the quality of the data resulting from the field-sampling program. Field (equipment) blank samples are analyzed to check for procedural chemical constituents at the facility that may cause sample contamination. Trip blanks are used to assess the potential for contamination of samples due to contaminant migration during sample shipment and storage.

- Method blank samples are generated within the laboratory and used to assess contamination resulting from laboratory procedures.

- Duplicate samples are analyzed to check for sampling and analytical reproducibility.

- MS/MSD and MS/Duplicate samples provide information about the effect of the sample matrix on the digestion and measurement methodology. Depending on site-specific circumstances, one MS/MSD or MS/Duplicate should be collected for every 20 or fewer investigative samples to be analyzed for organic and inorganic chemicals of a given matrix (see Table 1).

The general level of QC effort will be one field (blind) duplicate and one field blank (when non-dedicated equipment is used) for every 20 or fewer investigative samples of a given matrix. Additional sample volume will also be provided to the laboratory to allow one site-specific MS/MSD or MS/Duplicate for every 20 or fewer investigative samples of a given matrix. One trip blank consisting of distilled, deionized water will be included along with each sample delivery group of aqueous VOC samples.

H-7 Sampling and Analysis Plan

The selection and rationale for the RI sampling program is discussed in the SMP. Methods and protocol to be used to collect environmental samples for SMP are described in the Benchmark Field Operating Procedures (FOPs) presented in Appendix G.

The number and types of environmental samples to be collected is summarized on Table 6 of the SMP. Sample parameter lists, holding times and sample container requirements are listed below:

- **Parameters:** VOCs (Compendium TO-15) with low level detection limits. Detection limits should meet 0.25 ug/m^3 for matrix 1 analytes in indoor air, and less than 1 ug/m^3 for all other analytes.

- **Holding time:** 30 Days

- **Sample Container:** 6 L Summa Canister

To the extent allowed by existing physical conditions at the facility, sample collection efforts will adhere to the specific methods presented herein. If alternative sampling locations

or procedures are implemented in response to facility specific constraints, each will be selected on the basis of meeting data objectives. Such alternatives will be approved by NYSDEC before implementation and subsequently documented for inclusion in the project file.

Custody Procedures

Sample custody is controlled and maintained through the chain-of-custody procedures. Chain of custody is the means by which the possession and handling of samples will be tracked from the source (field) to their final disposition, the laboratory. A sample is considered to be in a person's custody if it is in the person's possession or it is in the person's view after being in his or her possession or it was in that person's possession and that person has locked it in a vehicle or room. Sample containers will be cleaned and preserved at the laboratory before shipment to the Site. FOPs for Sampling, Labeling, Storage, and Shipment, located in SMP Appendix G, describe procedures for maintaining sample custody from the time samples are collected to the time they are received by the analytical laboratory.

Sample Storage

Samples are stored in secure limited-access areas. Walk-in coolers or refrigerators are maintained at 4°C, ± 2°C, or as required by the applicable regulatory program. The temperatures of all refrigerated storage areas are monitored and recorded a minimum of once per day. Deviations of temperature from the applicable range require corrective action, including moving samples to another storage location if necessary.

Sample Custody

Sample custody is defined by this document as when any of the following occur:

- It is in someone's actual possession.
- It is in someone's view after being in his or her physical possession.
- It was in someone's possession and then locked, sealed, or secured in a manner that prevents unsuspected tampering.

- It is placed in a designated and secured area.

Samples are removed from storage areas by the sample custodian or analysts and transported to secure laboratory areas for analysis. Access to the laboratory and sample storage areas is restricted to laboratory personnel and escorted visitors only; all areas of the laboratory are therefore considered secure. If required by the applicable regulatory program, internal chain-of-custody is documented in a log by the person moving the samples between laboratory and storage areas.

Laboratory documentation used to establish COC and sample identification may include the following:

- Field COC forms or other paperwork that arrives with the sample.
- The laboratory COC.
- Sample labels or tags are attached to each sample container.
- Sample custody seals.
- Sample preparation logs (i.e., extraction and digestion information) recorded in hardbound laboratory books that are filled out in legible handwriting, and signed and dated by the chemist.
- Sample analysis logs (e.g., metals, GC/MS, etc.) information recorded in hardbound laboratory books that are filled out in legible handwriting, and signed and dated by the chemist.
- Sample storage log (same as the laboratory COC).
- Sample disposition log, which documents sample disposal by a contracted waste disposal company.

Sample Tracking

All samples are maintained in the appropriate coolers prior to and after analysis. The analysts remove and return their samples as needed. Samples that require internal COC are relinquished to the analysts by the sample custodians. The analyst and sample custodian

must sign the original COC relinquishing custody of the samples from the sample custodian to the analyst. When the samples are returned, the analyst will sign the original COC returning sample custody to the sample custodian. Sample extracts are relinquished to the instrumentation analysts by the preparatory analysts. Each preparation department tracks internal COC through their logbooks/spreadsheets.

Any change in the sample during the time of custody will be noted on the COC (e.g., sample breakage or depletion).

Split Sampling

The Department may collect additional (concurrent) air samples at the Department's expense (subject to oversight reimbursement), under the SMP. Benchmark personnel will cooperate with the Department to facilitate split sampling, as requested.

H-8 Calibration Procedures and Frequency

This section describes the calibration procedures and the frequency at which these procedures will be performed for both field and laboratory instruments.

Field Instrument Calibration

Quantitative field data to be obtained during air sampling include helium readings (i.e., to verify sub-slab air sample seal integrity). FOPs located in SMP Appendix G describe the field instruments used to monitor for this parameter and the calibration methods and frequency requirements. Calibration results will be recorded on the appropriate field forms and in the Project Field Book.

H-9 Data Usability Evaluation

Data usability evaluation procedures shall be performed for both field and laboratory operations as described below.

Procedures Used to Evaluate Field Data Usability

Procedures to validate field data for this project will be facilitated by adherence to the FOPs identified in Appendix F. The performance of all field activities, calibration checks on

all field instruments at the beginning of each day of use, manual checks of field calculations, checking for transcription errors and review of field log books is the responsibility of the Field Team Leader.

Procedures Used to Evaluate Laboratory Data Usability

Data evaluation will be performed by the third party data validator using the most current methods and quality control criteria from the USEPA's Contract Laboratory Program (CLP) *National Functional Guidelines for Organic Data Review*, and Contract Laboratory Program*, National Functional Guidelines for Inorganic Data Review*. The data review guidance will be used only to the extent that it is applicable to the methods; SW-846 methodologies will be followed primarily and given preference over CLP when differences occur. Also, results of blanks, surrogate spikes, MS/MSDs, and laboratory control samples will be reviewed/ evaluated by the data validator. All sample analytical data for each sample matrix shall be evaluated. The third party data validation expert will also evaluate the overall completeness of the data package. Completeness checks will be administered on all data to determine whether deliverables specified in this QAPP are present. The reviewer will determine whether all required items are present and request copies of missing deliverables.