98-102 STEUBEN STREET

BROOKLYN, NEW YORK

Remedial Investigation Report

NYC VCP Site Number: 15EH-N053K

Prepared for:

Clinton Hill Development II LLC
152 West 57th Street, 60th Floor
New York, NY 11205
(212) 649-9700

Prepared by:

Carlin-Simpson & Associates
61 Main Street
Sayreville, NJ 08872
732-432-5757

February 2015

REMEDIAL INVESTIGATION REPORT

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

LIST OF ACRONYMS

Acronym	Definition
AOC	Area of Concern
CAMP	Community Air Monitoring Plan
COC	Contaminant of Concern
CPP	Citizen Participation Plan
CSM	Conceptual Site Model
DER-10	New York State Department of Environmental Conservation Technical Guide 10
FID	Flame Ionization Detector
GPS	Global Positioning System
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
IRM	Interim Remedial Measure
NAPL	Non-aqueous Phase Liquid
NYC VCP	New York City Voluntary Cleanup Program
NYC DOHMH	New York City Department of Health and Mental Hygiene
NYC OER	New York City Office of Environmental Remediation
NYS DOH ELAP	New York State Department of Health Environmental Laboratory Accreditation Program
OSHA	Occupational Safety and Health Administration
PID	Photoionization Detector
QEP	Qualified Environmental Professional
RI	Remedial Investigation
RIR	Remedial Investigation Report
SCO	Soil Cleanup Objective
SPEED	Searchable Property Environmental Electronic Database

CERTIFICATION

I, Meredith R. Anke, P.E., am a Qualified Environmental Professional, as defined in RCNY § 43-1402(ar). I have primary direct responsibility for implementation of the Remedial Investigation for the 98-102 Steuben Street Site, (NYC VCP Site No. 15EH-N053K). I am responsible for the content of this Remedial Investigation Report (RIR), have reviewed its contents and certify that this RIR is accurate to the best of my knowledge and contains all available environmental information and data regarding the property.

Meredith R. Anke, P.E.	2/2/15	M. Anke
Qualified Environmental Professional	Date	Signature

EXECUTIVE SUMMARY

The Remedial Investigation Report (RIR) provides sufficient information for establishment of remedial action objectives, evaluation of remedial action alternatives, and selection of a remedy pursuant to RCNY§ 43-1407(f). The remedial investigation (RI) described in this document is consistent with applicable guidance.

Site Location and Current Usage

The Site is located at 98-102 Steuben Street in the Clinton Hill section in Brooklyn, New York and is identified as Block 1893 and Lot 47 on the New York City Tax Map. Figure 1 shows the Site location. The Site is 7,500-square feet and is bounded by Steuben Street to the east, residential properties to the south, and multi-family residential properties to the north and west. A map of the site boundary is shown in Figure 3. Currently, the Site is vacant but was recently used for residential use. The site contains two residential two-story buildings with basements. There is also a yard to the west of the buildings, undeveloped space in the northern portion of the property, and a small dilapidated structure in the northwest corner of the Site.

Summary of Proposed Redevelopment Plan

The proposed future use of the Site will consist of a new 8-story multi-family residential building with a cellar. The existing Site buildings will be demolished in order to re-develop the property. The proposed building will have 39 residential units and will be approximately 4,500 square feet in area. The structure will be situated in the eastern portion (front) of the property. An excavation depth of approximately 10 feet in anticipated in the proposed building area. There will also be an open space area at the rear yard, approximately 3,000 square feet in area, which will not be covered with concrete or asphalt. Layout of the proposed site development is presented in Figure 2. The current zoning designation is R7A. The proposed use is consistent with existing zoning for the property.

Summary of Past Uses of Site and Areas of Concern

At the time of a Phase I Environmental Site Assessment (ESA) in February 2014, the northern Site building and the first floor of the southern Site building were being used for storage. The second floor of the southern building was occupied by residential tenants. The exterior of the site was also being used for storage.

According to the Phase I ESA Report, the southern portion of the Site has been occupied with the present day two-story structure since 1887. The two-story structure has been primarily occupied by residential tenants from 1887 to 2007 with the exception of a brief period from 1969 to 1977 when it was occupied by an office. From 2007 to the present day, the two-story structure has been occupied by both residential and commercial tenants. A varying level lumber shed was located to the west of the structure from 1915 to 1938 and a single-story shed was located to the west from 1938 to 1969.

The Phase I ESA Report also indicates that the northern portion of the Site has been occupied with the present day two-story structure since 1887. The two-story structure has been occupied by both residential and commercial tenants from 1887 to the present day. Commercial tenants including offices, a storage company, a coal company, and a setting controls company have occupied the northern portion of the site from 1934 to the present day. A stable was located to the north and west of this structure from 1887 to 1904 and a lumber storage building was located to the north from 1904 to 1938. Additionally, a lumber shed was located to the west of the structure from 1915 to 1938. In the period from 1938 to 1969, a contractor's storage facility was located to the north of the structure. From 1977 to 2007, a single-story auto repair facility was located in the northwest portion of the Site.

Based on the Phase I Environmental Site Assessment (ESA) that was performed by Environmental Business Consultants (EBC) in February 2014, the areas of concern (AOCs) identified for this site are as follows:

1. There is a 275-gallon heating oil aboveground storage tank (AST) (installation date unknown) in the basement of 102 Steuben Street located on the southern portion of the Site. The heating oil fill pipe and vent pipe for the AST in the basement were observed on the east side of the Site. The AST is connected to a boiler. The oil supply line from the AST to the boiler was buried and was most likely repaired at some point as holes in the concrete indicated. Surficial staining was noted on top of the AST and on the concrete floor in the area of the boiler. The presence of the staining represents a recognized environmental concern as it is indicative of a release of heating oil from the oil supply line which may have impacted the subsurface at the Site.

2. Based on a review of historical records, a single-story commercial building used for auto repair operations was located on the northwest portion of the Site from approximately 1977

to circa 2007. Auto repair facilities typically store and utilize solvents and petroleum products on-site including oil, waste oil, antifreeze, battery acid, grease, antifreeze, and solvent parts washers. The former occupancy of the auto repair facility on the northwest side of the Site represents a recognized environmental condition.

The scope of work for this RI was developed in response to the proposed development project and took into consideration the AOCs listed above. An investigation of soil, soil vapor, and groundwater was performed to characterize the entire Site for potential environmental contamination from historic on-site uses, operations, etc.

Summary of the Work Performed under the Remedial Investigation

As part of this investigation, Carlin-Simpson & Associates performed the following scope of work:

1. Installed 7 soil borings across the entire project Site, and collected 12 soil samples for chemical analysis from the soil borings to evaluate soil quality;
2. Installed 3 groundwater monitoring wells throughout the Site to establish groundwater flow and collected 3 groundwater samples for chemical analysis to evaluate groundwater quality;

In addition, Environmental Maintenance Contractors, Inc. (EMC) performed the following scope of work:

1. Installed 4 soil vapor probes across the project Site and collected 4 samples for chemical analysis.

Summary of Environmental Findings

1. Elevation of the property ranges from approximately 42 to 44 feet.
2. Depth to groundwater ranges from 37.5 to 38.4 feet at the Site.
3. Groundwater flow is generally from south to north beneath the Site.
4. Depth to bedrock is greater than 102 feet at the Site.
5. The stratigraphy of the site, from the surface down, consists of 2 to 5 feet of existing fill material (Class 7) that is underlain by medium dense to dense Sand, Silty Sand, or Sandy Silt, with trace to little Gravel (Class 3a or 3b).

6. Twelve soil/fill samples collected during the investigations were compared to New York State Department of Environmental Conservation (NYSDEC) Part 375, Table 375-6.8 Unrestricted Use (Track 1) and Restricted Residential Use (Track 2) Soil Cleanup Objectives (SCOs). The samples results showed that VOCs, pesticides, and PCBs were not detected in any of soil samples. Several SVOCs including benzo(a)anthracene (max. of 6.8 mg/kg), benzo(a)pyrene (max. of 5.4 mg/kg), benzo(b)fluoranthene (max 6.8 mg/kg), benzo(k)fluoranthene (max 2.6 mg/kg), chrysene (max 7.3 mg/kg), dibenz(a,h)anthracene (max 1.4 mg/kg), and indeno(1,2,3-c,d)pyrene (max 5.1 mg/kg), were detected above Restricted Residential Use SCOs in four shallow (0 to 2') samples. The detected SVOCs are all in a class of compounds known as polycyclic aromatic hydrocarbons (PAHs). Metals including arsenic (max of 32.9 mg.kg), barium (max of 646 mg/kg), cadmium (max 3.7 mg/kg), copper (max 550 mg/kg), lead (max of 1580 mg/kg), and mercury (max 1.5 mg/kg) exceeded Restricted Residential Use SCOs in one or more shallow soil samples. Nickel, silver, and zinc also exceeded Unrestricted Use SCOs. Only iron exceeded Restricted Residential Use SCOs in deeper soil samples. The data indicates that the PAHs and metals, which are typical constituents of historic fill material, are widespread in the upper 2 to 5 feet across the site at varying concentrations.

7. Three groundwater samples collected during the investigations were compared to the NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards (GQS) for Class GA (drinking water). Groundwater samples collected during the RI showed that SVOCs, pesticides, and PCBs were not detected in groundwater. Three VOCs including chloroform, tetrachloroethene (PCE), and trichloroethene were detected in groundwater samples. Only PCE at 28 ug/L exceeded its GQS in one of three groundwater samples. Several metals were identified in groundwater, but only sodium exceeded its GQS.. The RI data indicates that there is no widespread impact to the groundwater below the Site as a result of the historic fill material or the identified AOCs. Based on the Groundwater Flow Map, the PCE appears to be from an unknown upgradient source to the south of the Site.

8. Four soil vapor samples collected during the 2014 RI were compared Table 3.1 Air Guideline Values derived by the NYSDOH located in the New York State Department of Health (NYSDOH) Final Guidance for Evaluating Soil Vapor Intrusion. Soil vapor samples showed moderate levels of petroleum related and chlorinated VOCs in all soil

vapor samples. Most contaminant concentrations were below 20 ug/m^3 except for 2,2,4-trimethylpentane (max of 8100 ug/m^3), acetone (max of 210 ug/m^3), cyclohexane (max of 950 ug/m^3), and hexane (max of 2800 ug/m^3). Petroleum related compounds (BTEX) were detected at a maximum concentration of 169 ug/m^3. Chlorinated VOC, tetrachloroethylene (PCE) was detected in all four samples at a maximum concentration of 26 μg/m^3. Trichlorethylene (TCE) was detected in three samples at a maximum concentration of 1.3 μg/m^3. Carbon tetrachloride was not detected in any samples. The TCE and PCE concentrations are below the monitoring level ranges established within the State NYS DOH soil vapor guidance matrix.

REMEDIAL INVESTIGATION REPORT

1.0 SITE BACKGROUND

Clinton Hill Development II LLC has enrolled in the New York City Voluntary Cleanup Program (NYC VCP) to investigate and remediate a 0.172-acre site located at 98-102 Steuben Street in Clinton Hill section of Brooklyn, New York. Residential use is proposed for the property. The RI work was performed between 22 December 2014 and 5 January 2015. This RIR summarizes the nature and extent of contamination and provides sufficient information for establishment of remedial action objectives, evaluation of remedial action alternatives, and selection of a remedy that is protective of human health and the environment consistent with the use of the property pursuant to RCNY§ 43-1407(f).

1.1 Site Location and Current Usage

The Site is located at 98-102 Steuben Street in the Clinton Hill section in Brooklyn, New York and is identified as Block 1893 and Lot 47 on the New York City Tax Map. Figure 1 shows the Site location. The Site is 7,500-square feet and is bounded by Steuben Street to the east, residential properties to the south, and multi-family residential properties to the north and west. A map of the site boundary is shown in Figure 3. Currently, the Site is vacant but was recently used for residential use and storage. The site contains two residential two-story buildings with basements. There is also a yard to the west of the buildings, undeveloped space in the northern portion of the property, and a small dilapidated structure in the northwest corner of the Site.

1.2 Proposed Redevelopment Plan

The proposed future use of the Site will consist of a new 8-story multi-family residential building with a cellar. The existing Site buildings will be demolished in order to re-develop the property. The proposed building will have 39 residential units and will be approximately 4,500 square feet in area. The structure will be situated in the eastern portion (front) of the property. An excavation depth of approximately 10 feet in anticipated in the proposed building area. There will also be an open space area at the rear yard, approximately 3,000 square feet in area, which will not be covered with concrete or asphalt. Layout of the proposed site development is presented in Figure 2. The current zoning designation is R7A. The proposed use is consistent with existing zoning for the property.

1.3 Description of Surrounding Property

The area surrounding the Site consists of residential and commercial properties. To the immediate north of the Site is a 7-story multi-family residential building that was recently completed in 2014. To the west is another 7-story multi-family residential building on Grand Avenue. To the east is Steuben Street followed by commercial buildings. To the south of the Site are three (3) 4-story residential buildings followed by commercial properties along Myrtle Avenue. Figure 1 shows the surrounding land usage.

2.0 SITE HISTORY

2.1 Past Uses and Ownership

The Site is currently owned by Clinton Hill development II LLC. It was purchased from 100 Steuben LLC in September 2014. Previous owners of the Site back to the 1970s are listed as Scott Witter, Legladys McDuffie, Gwendolyn Ferguson, Donato & Mary Ruggiero, Ande Holding Corp, and Mormile & Co. Inc.

At the time of a Phase I Environmental Site Assessment (ESA) in February 2014, the northern Site building and the first floor of the southern Site building were being used for storage. The second floor of the southern building was occupied by residential tenants. The exterior of the site was also being used for storage.

According to the Phase I ESA Report, the southern portion of the Site has been occupied with the present day two-story structure since 1887. The two-story structure has been primarily occupied by residential tenants from 1887 to 2007 with the exception of a brief period from 1969 to 1977 when it was occupied by an office. From 2007 to the present day, the two-story structure has been occupied by both residential and commercial tenants. A varying level lumber shed was located to the west of the structure from 1915 to 1938 and a single-story shed was located to the west from 1938 to 1969.

The Phase I ESA Report also indicates that the northern portion of the Site has been occupied with the present day two-story structure since 1887. The two-story structure has been occupied by both residential and commercial tenants from 1887 to the present day. Commercial tenants including offices, a storage company, a coal company, and a setting controls company have occupied the northern portion of the site from 1934 to the present day. A stable was located to the north and west of this structure from 1887 to 1904 and a lumber storage building was located to the north from 1904 to 1938. Additionally, a lumber shed was located to the west of the structure from 1915 to 1938. In the period from 1938 to 1969, a contractor's storage facility was located to the north of the structure. From 1977 to 2007, a single-story auto repair facility was located in the northwest portion of the Site.

2.2 Previous Investigations

A Limited Phase II Environmental Site Investigation (ESI) was performed at the subject site in August 2014 by Partner Engineering and Science (Partner) to preliminarily evaluate soil and groundwater conditions relating to the recognized environmental conditions (RECs) that were identified in the Phase I Environmental Site Assessment report prepared by Environmental Business Consultants (EBC), dated 17 February 2014.

During the study, two (2) geoprobe borings were performed in the northern portion of the site to a depth of 21 feet below the existing ground surface. Soil samples were collected from 20.5 feet to 21 feet below grade at both locations. Groundwater was not encountered at either location. A third soil sample was also collected at the surface (0 to 1 foot deep) from the southern portion of the site. The soil samples were analyzed for volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs). Based on the laboratory analytical results, surficial SVOC impacts were identified in the southern portion of the property, behind the existing buildings. No VOCs or SVOCs were detected in the deeper soil samples.

2.3 Site Inspection

A site inspection was not performed as part of the RI at the site.

2.4 Areas of Concern

Based on the Phase I Environmental Site Assessment (ESA) that was performed by EBC in February 2014, the AOCs identified for this site are as follows:

3. There is a 275-gallon heating oil aboveground storage tank (AST) (installation date unknown) in the basement of 102 Steuben Street located on the southern portion of the Site. The heating oil fill pipe and vent pipe for the AST in the basement were observed on the east side of the Site. The AST is connected to a boiler. The oil supply line from the AST to the boiler was buried and was most likely repaired at some point as holes in the concrete indicated. Surficial staining was noted on top of the AST and on the concrete floor in the area of the boiler. The presence of the staining represents a recognized environmental concern as it is indicative of a release of heating oil from the oil supply line which may have impacted the subsurface at the Site.

4. Based on a review of historical records, a single-story commercial building used for auto repair operations was located on the northwest portion of the Site from approximately 1977 to circa 2007. Auto repair facilities typically store and utilize solvents and petroleum products on-site including oil, waste oil, antifreeze, battery acid, grease, antifreeze, and solvent parts washers. The former occupancy of the auto repair facility on the northwest side of the Site represents a recognized environmental condition.

A map showing areas of concern is presented in Figure 3.

The scope of work for this RI was developed in response to the proposed development project and took into consideration the AOCs listed above. An investigation of soil, soil vapor, and groundwater was performed to characterize the entire Site for potential environmental contamination from historic on-site uses, operations, etc.

3.0 PROJECT MANAGEMENT

3.1 Project Organization

The Qualified Environmental Profession (QEP) responsible for preparation of this RIR is Meredith R. Anke, P.E. of Carlin-Simpson & Associates.

3.2 Health and Safety

All work described in this RIR was performed in full compliance with applicable laws and regulations, including Site and OSHA worker safety requirements and HAZWOPER requirements.

3.3 Materials Management

All material encountered during the RI was managed in accordance with applicable laws and regulations.

4.0 REMEDIAL INVESTIGATION ACTIVITIES

As part of this investigation, Carlin-Simpson & Associates performed the following scope of work:

3. Installed 7 soil borings across the entire project Site, and collected 12 soil samples plus 1 duplicate sample for chemical analysis from the soil borings to evaluate soil quality;

4. Installed 3 groundwater monitoring wells throughout the Site to establish groundwater flow and collected 3 groundwater samples plus 1 duplicate sample for chemical analysis to evaluate groundwater quality;

In addition, Environmental Maintenance Contractors, Inc. (EMC) performed the following scope of work:

2. Installed 4 soil vapor probes across the project Site and collected 4 samples for chemical analysis.

4.1 Geophysical Investigation

A geophysical investigation was not performed as part of the Remedial Investigation at the project Site.

4.2 Borings and Monitoring Wells

Drilling and Soil Logging

On 22, 23, and 29 December 2014, General Borings Inc. installed 7 soil borings at the site under the full-time supervision of the Qualified Environmental Profession (QEP) from Carlin-Simpson & Associates. These borings are identified as B-1 through B-7. The boring observations are summarized in Table 1.

The test borings were performed approximately at the locations outlined in the approved Work Plan. Some boring locations had to be adjusted due to surface debris and obstructions. The borings were advanced using 3.25-inch I.D. hollow stem augers (HSA). Soil sampling with two (2) foot long split spoon samplers was performed to collect semi-continuous soil samples for the upper 15 feet of each borehole. Sampling beyond this depth was performed at 5 foot intervals. At each boring location, Carlin-Simpson & Associates visually identified the soil layers encountered, screened for volatile and semi-volatile organic vapors using a calibrated photoionization detector

(PID), and inspected for any visual and/or olfactory evidence of contamination. No odors, stained soils, sheens, or free/residual product was noted at any of the boring locations. Results of soil screening are recorded on the soil boring logs. PID readings were not detected in any of the test borings during this investigation.

Boring logs that were prepared by a geotechnical engineer are attached in Appendix C. A map showing the location of soil borings and monitoring wells is shown on Figure 3.

Groundwater Monitoring Well Construction

During this investigation, 3 groundwater monitoring wells were installed at the subject site. The wells were installed on 22 and 23 December 2014 by General Borings Inc. Monitoring well locations are shown in Figure 3 and the monitoring well data is summarized in Table 2. Monitoring well construction logs have also been prepared and are included in Appendix D of this report.

While advancing the well borings, soil samples were obtained using a split spoon sampler so that the soil samples could be inspected for evidence of contamination (i.e. staining, odors, etc.). The soil samples were also screened with a photoionization detector (PID), which is capable of detecting volatile and semi-volatile organic compounds (VOCs and SVOCs). No petroleum odors or PID readings were encountered in the borings. When the boring was completed, a one (1) inch groundwater monitoring well was constructed in the borehole. The monitoring well was constructed as follows:

- The borings were advanced to a depth of 47 feet beneath the ground surface.
- Ten (10) feet of 20 slot PVC well screen and approximately 36 feet of PVC casing was placed down the center of the hollow stem augers.
- The hollow stem augers were them slowly removed while sand pack was installed to approximately two (2) feet above the top of the well screen.
- The borehole was then filled with approximately two (2) feet of bentonite chips.
- The remainder of the borehole was then filled with soil from the borehole to the ground surface where a concrete pad was constructed. A stick-up steel casing was also installed for well protection.

After the wells were constructed, they was developed using a bailer. The development water was placed into a 55-gallon steel drum for storage until laboratory testing of the groundwater

was conducted. During well development, the groundwater appeared to be turbid but no odors or sheens were observed. Approximately two (2) gallons of water was removed from each well during well development.

Survey

Each of the boring, monitoring well, and soil vapor probe locations was accurately measured to fixed benchmarks, which included the property lines, existing on-site structures, and adjacent structures, by Carlin-Simpson & Associates. The locations are shown on Figure 3.

Water Level Measurement

Groundwater depth was recorded at each of the monitoring well locations using a Solinst 101 Water Level Meter, which is capable of recording the water depth to the nearest hundredth of a foot. The water level data is included in Table 3.

4.3 Sample Collection and Chemical Analysis

Sampling performed as part of the field investigation was conducted for all Areas of Concern and also considered other means for bias of sampling based on professional judgment, area history, discolored soil, stressed vegetation, drainage patterns, field instrument measurements, odor, or other field indicators. All media including soil, groundwater, and soil vapor have been sampled and evaluated in the RIR. Discrete (grab) samples have been used for final delineation of the nature and extent of contamination and to determine the impact of contaminants on public health and the environment. The sampling performed and presented in this RIR provides sufficient basis for evaluation of remedial action alternatives, establishment of a qualitative human health exposure assessment, and selection of a final remedy.

Soil Sampling

As discussed in Section 4.2 above, soil sampling with two (2) foot long split spoon samplers was performed to collect semi-continuous soil samples from each of the boreholes. The split spoon sampler was decontaminated after each sample using alconox cleaner and fresh water. A field/equipment blank was collected to verify the decontamination procedures. Soil samples to be analyzed were collected from the split spoon samplers using disposable equipment for each sample. The soil samples were placed into laboratory prepared unpreserved glass jars and placed

on ice in a cooler maintained at four (4) degrees Celsius. The samples were then transported under proper chain of custody procedures to the testing laboratory for analysis.

Soil samples collected inside the existing structures, and within the proposed building footprint, were collected from approximately 4 to 5.5 feet below the floor slab elevation, which corresponds to approximately 11 to 12.5 feet below the outside grade. Soil samples collected on the exterior of the site and within the proposed building footprint were collected at depth intervals of 0 to 2 feet below grade and 11 to 13 feet below grade. Soil samples collected on the exterior of the site and within the proposed rear yard area were collected at depth intervals of 0 to 2 feet below grade and 2 to 4 feet below grade.

Quality assurance/quality control (QA/QC) samples are typically performed at a rate of 5% (i.e. one for every 20 collected samples). During this investigation, the QA/QC samples for soil included the following: one (1) field/equipment blank, one (1) field duplicate, and one (1) trip blank. In addition, the laboratory prepared matrix spike (MS) and matrix spike duplicate (MSD) samples as part of their in-house QA/QC plan.

Twelve (12) soil samples and 1 duplicate sample were collected for chemical analysis during this RI. Data on soil sample collection for chemical analyses, including dates of collection and sample depths, is reported in Table 5. Figure 3 shows the location of samples collected in this investigation. Laboratories and analytical methods are shown below.

Groundwater Sampling

The newly-installed and developed monitoring wells were allowed to stabilize for one (1) week prior to sampling. On 29 December 2014, Carlin-Simpson & Associates returned to the site to collect samples from each of the wells. Prior to sampling, the static groundwater level at each well was measured and the well casing was scanned for volatile and semi-volatile organic vapors using a calibrated PID. No PID readings were detected in any of the wells. The groundwater measurements are presented in Table 3.

Groundwater samples were collected from each of the monitoring wells using the United States Environmental Protection Agency (USEPA) Region II Low Stress (Low Flow) Purging and Sampling Procedures (March 1998). Dedicated tubing was used at each well location.

Field measurements for pH, specific conductivity, dissolved oxygen (DO), temperature, turbidity, flow rate and water level, as well as visual and olfactory field observations, were

monitored and recorded during well purging. A well was considered stabilized and ready for sample collection when the recorded field parameters had stabilized for three consecutive readings as follows: ±0.1 for pH, ±3% for specific conductivity and temperature, and ±10% for DO and turbidity. The recorded water quality measurements are included on the Groundwater Sampling Logs in Appendix E.

The groundwater samples were placed into laboratory prepared glass or plastic bottles and placed on ice in a cooler maintained at four (4) degrees Celsius. The samples were then transported under proper chain of custody procedures to the testing laboratory for analysis.

During this investigation, the QA/QC samples for groundwater included the following: one (1) field duplicate and one (1) trip blank. In addition, the laboratory prepared matrix spike (MS) and matrix spike duplicate (MSD) samples as part of their in-house QA/QC plan.

Three (3) groundwater samples and 1 duplicate sample were collected for chemical analysis during this RI. Groundwater sample collection data is reported in Table 6. Sampling logs with information on purging and sampling of groundwater monitor wells is included in Appendix E. Figure 3 shows the location of groundwater sampling. Laboratories and analytical methods are shown below.

Soil Vapor Sampling

The soil vapor sampling was performed by Environmental Maintenance Contractors, Inc. (EMC). The soil vapor sampling methods and results are discussed in the Soil Vapor Investigation Report, which is attached in Appendix A.

Four (4) soil vapor probes were installed and four (4) soil vapor samples were collected for chemical analysis during this RI. Soil vapor sampling locations are shown in Figure 3. Soil vapor sample collection data is reported in the Soil Vapor Investigation Report, which is attached in Appendix A. Methodologies used for soil vapor assessment conform to the *NYS DOH Final Guidance on Soil Vapor Intrusion, October 2006.*

Chemical Analysis

Chemical analytical work presented in this RIR has been performed in the following manner:

Factor	Description
Quality Assurance Officer	The chemical analytical quality assurance is directed by Test America Inc.
Chemical Analytical Laboratory	Chemical analytical laboratory(s) used in the RI is NYS ELAP certified and was Test America Inc.
Chemical Analytical Methods	Soil analytical methods: • TAL Metals by EPA Method 6010C (rev. 2007); • VOCs by EPA Method 8260C (rev. 2006); • SVOCs by EPA Method 8270D (rev. 2007); • Pesticides by EPA Method 8081B (rev. 2000); • PCBs by EPA Method 8082A (rev. 2000); Groundwater analytical methods: • TAL Metals by EPA Method 6010C (rev. 2007); • VOCs by EPA Method 8260C (rev. 2006); • SVOCs by EPA Method 8270D (rev. 2007); • Pesticides by EPA Method 8081B (rev. 2000); • PCBs by EPA Method 8082A (rev. 2000); Soil vapor analytical methods: • VOCs by TO-15 VOC parameters..

Results of Chemical Analyses

Laboratory data for soil and groundwater are summarized in Table 7 and Table 8, respectively. Laboratory data for soil vapor are summarized in Table 2 of the Soil Vapor Investigation Report, which is attached in Appendix A.

Laboratory data deliverables for all soil and groundwater samples evaluated in this RIR are provided in digital form in Appendix F. The laboratory data deliverables for the soil vapor samples are included in Appendix A of the Soil Vapor Investigation Report.

5.0 ENVIRONMENTAL EVALUATION

5.1 Geological and Hydrogeological Conditions

The geological and hydrogeological conditions encountered at the site during this investigation are summarized below.

Stratigraphy

The boring data indicates that the site consists of existing fill (Class 7) that extends to depths ranging from 2 feet to 5 feet below the ground surface at the boring locations. In general, the fill material consists of Sand with Silt and Gravel and varying amounts of debris such as brick, concrete, coal, asphalt, cinders, and organics. Below the fill are layers of Sand, Silty Sand, or Sandy Silt, with trace to little Gravel (Class 3a or 3b). Bedrock was not encountered in any of the borings during this investigation, the deepest of which extended 102 feet below the ground surface.

Hydrogeology

Groundwater was recorded in the on-site monitoring wells at depths ranging from 37.5 to 38.4 feet below the ground surface. A table of water level data for all monitoring wells is included in Table 3. A map of groundwater level elevations with groundwater contours and inferred flow lines is shown in Figure 4. Groundwater flow is generally from south to north.

5.2 Soil Chemistry

The analytical results for soil indicate that the historic fill material throughout the site contains semi-volatile organic compounds (SVOCs) and metals at concentrations that exceed both the NYSDEC Unrestricted Use and Residential Use Soil Cleanup Objectives (SCO). The SVOCs that exceed the standards are as follows: benzo(a)anthracene (1.3 to 6.8 ppm in 5 samples), benzo(a)pyrene (1.2 to 5.4 ppm in 5 samples), benzo(b)fluoranthene (1.8 to 6.8 ppm in 5 samples), benzo(k)fluoranthene (0.83 to 2.6 ppm in 4 samples), chrysene (1.4 to 7.3 ppm in 5 samples), dibenz(a,h)anthracene (0.49 to 1.4 ppm in 4 samples), and indeno(1,2,3-cd)pyrene (0.66 to 5.1 ppm in 5 samples). These SVOCs are all in a class of compounds known as polycyclic aromatic hydrocarbons (PAHs). The metals that exceed the standards are as follows: arsenic (15.5 to 32.9 in 2 samples), barium (392 to 646 ppm in 2 samples), cadmium (3.7 ppm in 1 sample), chromium (52.8 ppm in 1 sample), copper (67 to 550 ppm in 5 samples), iron (18,500 to 59,100 ppm in 13 samples), lead (84.9 to 1,580 ppm in 7 samples), mercury (0.30 to 1.5 ppm in 7 samples), nickel (43.8 ppm in 1 sample), silver (17 ppm in 1 sample), and zinc (349 to 762 ppm in 5 samples).

The RI data indicates that the PAHs and metals, which are typical constituents of historic fill material, are widespread across the site at varying concentrations. Each of the soil/fill samples collected from 0 to 2 feet below grade contains at least one SVOC or metal compound that exceeds the Unrestricted Use and Residential Use SCOs.

Soil samples collected during the RI showed no detectable concentrations of VOCs, PCBs, or pesticides.

Data collected during the RI is sufficient to delineate the vertical and horizontal distribution of contaminants in soil/fill at the Site. A summary table of data for chemical analyses performed on soil samples is included in Table 7. Figure 5 shows the location and posts the values for soil/fill that exceed the 6NYCRR Part 375-6.8 Track 2 Soil Cleanup Objectives.

5.3 Groundwater Chemistry

The analytical results for groundwater indicate that the groundwater contains metals and one VOC at concentrations exceeding the New York State 6 NYCRR Part 703.5 Class GA groundwater standards. The metals that exceed the standards are as follows: total cobalt (9.7 to 16.5 ppb in 2 samples), total iron (360 to 8,220 ppb in 3 samples), total lead (27.8 ppb in 1 sample), total magnesium (35,500 to 35,700 ppb in 2 samples), total manganese (765 to 1,570 ppb in 2 samples), total sodium (24,900 to 67,500 ppb in 2 samples plus the duplicate), and dissolved sodium (23,100 to 61,800 ppb in 2 samples plus the duplicate). The one VOC that exceeds the standards is as follows: tetrachloroethene (24 to 28 ppb in 1 sample plus the duplicate). Based on the Groundwater Flow Map, the PCE appears to be from an unknown upgradient source to the south of the Site.

Groundwater samples collected during the RI showed no detectable concentrations of SVOCs, other than some tentatively identified compounds (TICs). Groundwater samples collected during the RI showed no detectable concentrations of PCBs or pesticides.

Data collected during the RI is sufficient to delineate the distribution of contaminants in groundwater at the Site. A summary table of data for chemical analyses performed on groundwater samples is included in Table 8. Exceedance of applicable groundwater standards are shown. Figure 6 shows the location and posts the values for groundwater that exceed the New York State 6NYCRR Part 703.5 Class GA groundwater standards.

5.4 Soil Vapor Chemistry

The results of chemical testing of soil vapor are discussed in the Soil Vapor Investigation Report that was prepared by Environmental Maintenance Contractors, Inc. (EMC). A copy of the report is attached in Appendix A.

5.5 Prior Activity

Based on an evaluation of the data and information from the RIR, disposal of significant amounts of hazardous waste is not suspected at this site.

5.6 Impediments to Remedial Action

There are no known impediments to remedial action at this property.

Site-Specific Standards, Criteria and Guidance

- New York State 6 NYCRR Subpart 375-6 - Remedial Program Soil Cleanup Objectives (Section 375-6.8(a) Unrestricted Use Soil Cleanup Objectives and Section 375-6.8(b) Restricted Soil Cleanup Objectives).
- New York State 6 NYCRR Parts 700-706 - Water Quality Standards (June 1998)
- TOGS 1.1.1 - Ambient Water Quality Standards & Guidance Values and Groundwater Effluent Limitations
- NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York (draft October 2004 or subsequent final draft)

FIGURES

ROBERT B. SIMPSON, P.E.
PROFESSIONAL ENGINEER

LICENSE NO. | SIGNATURE | DATE

SITE LOCATION MAP

98-102 STEUBEN STREET
BROOKLYN, NEW YORK

DRAWN: MRA	SCALE: NONE
CHECKED: RBS	DATE: 01.21.15
PROJECT NO.: 14-131A	DWG NO.: FIG -1
APPROVED:	

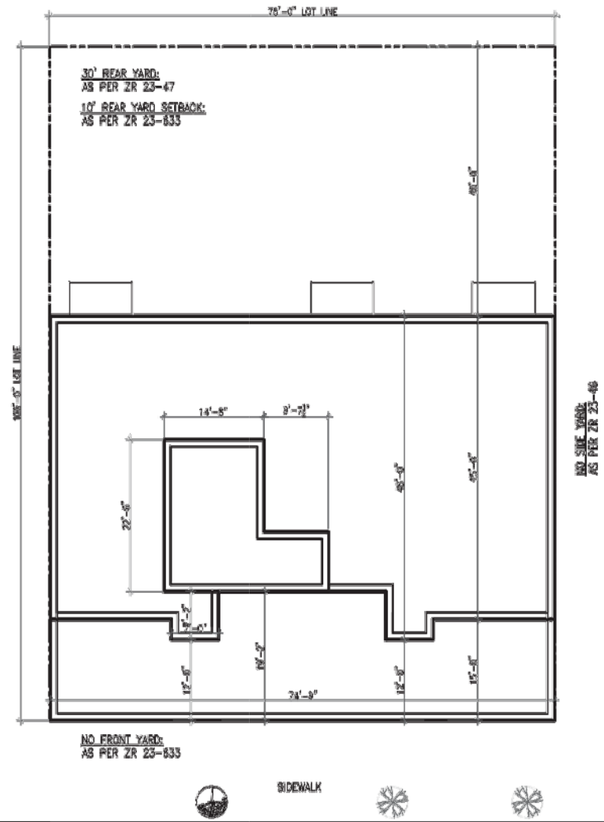
CARLIN-SIMPSON AND ASSOCIATES
61 Main Street
Sayreville, NJ 08872

Consulting Geotechnical and Environmental Engineers

SITE PLAN DIAGRAM
N.T.S.

LOT AREA: 7,500 SF

LOT COVERAGE: 61.8%
AS PER ZR 23-145



LEGEND
R7A ZONING DISTRICT

- EXISTING TREE
- PROPOSED TREE
- PROPERTY LINE
- MAXIMUM BUILDING ENVELOPE
- PROPOSED BUILDING
- PERMITTED OBSTRUCTION

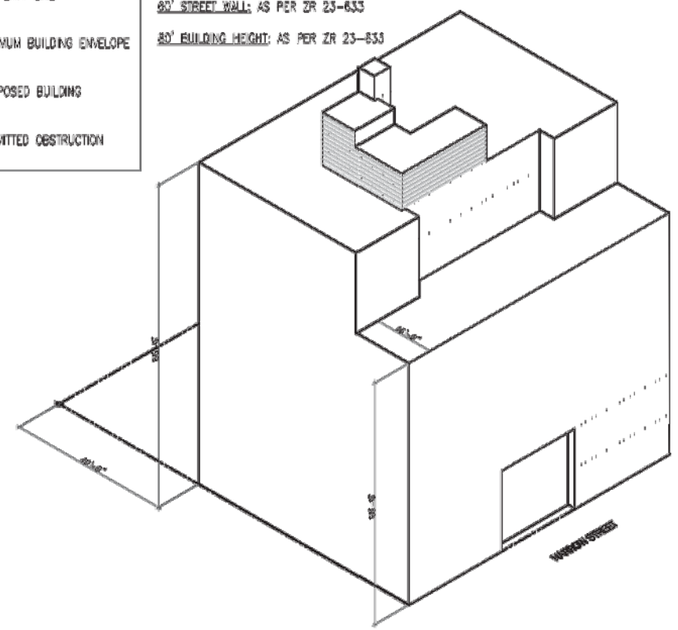
AXONOMETRIC DIAGRAM
N.T.S.

REQUIRED SETBACKS:
15' FRONT: AS PER ZR 23-633
10' REAR: AS PER ZR 23-633
0' SIDE: AS PER ZR 23-46

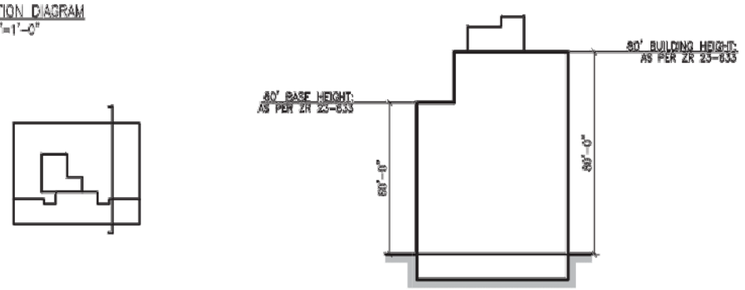
PERMITTED OBSTRUCTIONS:
ELEVTATOR AND STAIR BULKHEAD AS PER ZR 23-62

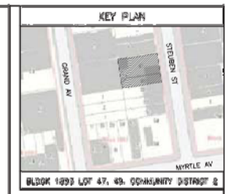
60' STREET WALL: AS PER ZR 23-633

80' BUILDING HEIGHT: AS PER ZR 23-633



SECTION DIAGRAM
1/18"=1'-0"





BLOCK 1893 LOT 47, 49. COMMUNITY DISTRICT 2

1		2014/08/11	RELED TO B.S.B.
zone	mm	date	description

ISSUED/REVISIONS

KAR FISCHER ARCHITECT

project title
NEW RESIDENTIAL DEVELOPMENT
BLOCK 1893 LOT 47, 49
98-102 STEUBEN STREET, BROOKLYN 11205

drawing title
PROPOSED LAYOUT

scale: AS INDICATED	project no. 14-11
date: 2014-07-31	sheet no. OF
drawn	drawing no. FIG-1
checked	

ROBERT B. SIMPSON, P.E.
PROFESSIONAL ENGINEER

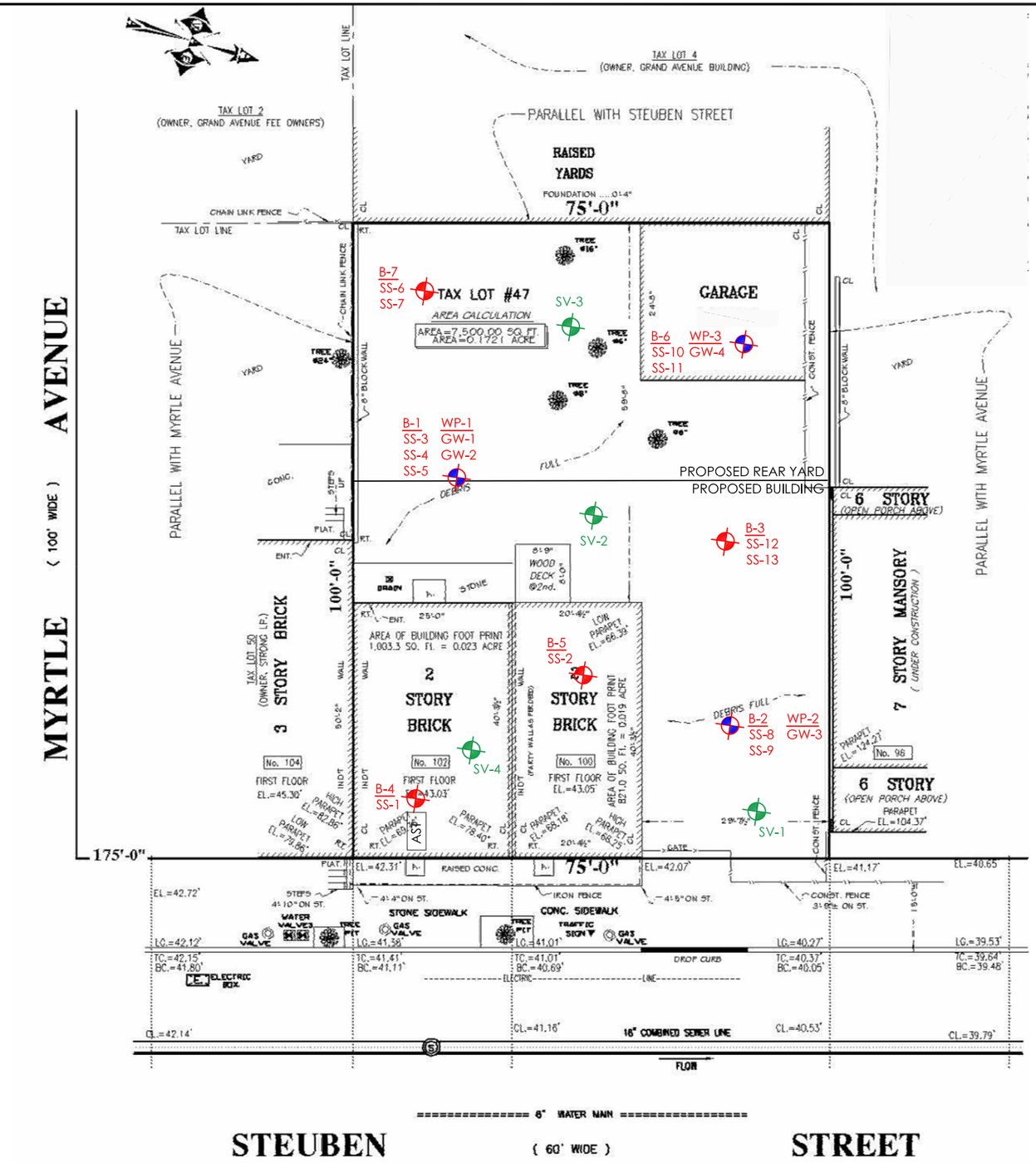
LICENSE NO. _____ SIGNATURE _____ DATE _____

REDEVELOPMENT PLAN

98-102 STEUBEN STREET
BROOKLYN, NEW YORK

DRAWN: MRA	SCALE: NONE
CHECKED: RBS	DATE: 01.21.15
PROJECT NO.: 14-131A	DWG NO.: FIG -2
APPROVED	

CARLIN-SIMPSON AND ASSOCIATES
61 Main Street
Sayreville, NJ 08872
Consulting Geotechnical and Environmental Engineers



GENERAL NOTES:

1. GENERAL LAYOUT WAS OBTAINED FROM A DRAWING THAT WAS PREPARED BY AAA GROUP LAND SURVEYING SERVICES, ENTITLED "ALTA/ACSM LAND TITLE SURVEY - 100/102 STEUBEN STREET, BROOKLYN, NEW YORK 11205", DATED 18 SEPTEMBER 2014.
2. BORING, WELL, AND SOIL VAPOR PROBE LOCATIONS WERE ALL LAID OUT IN THE FIELD BY CARLIN-SIMPSON & ASSOCIATES (CSA).
3. THE BORINGS AND WELLS WERE PERFORMED BY GENERAL BORINGS INC. IN DECEMBER 2014 UNDER THE FULL TIME INSPECTION OF CSA.
4. SOIL VAPOR PROBES WERE PERFORMED BY ENVIRONMENTAL MAINTENANCE CONTRACTORS, INC. (EMC) IN JANUARY 2015.
5. ALL LOCATIONS WERE ACCURATELY MEASURED TO FIXED BENCHMARKS (I.E. PROPERTY LINES, ON-SITE STRUCTURES, AND ADJACENT STRUCTURES).

LEGEND:

- - BORING LOCATION
- B-1 / SS-4 / SS-5 - SOIL SAMPLE (SS) NUMBERS
- - BORING & WELL LOCATION
- WP-1 / GW-1 / GW-2 - WELL NUMBER / GROUNDWATER (GW) SAMPLE NUMBERS
- - SOIL VAPOR PROBE LOCATION

ROBERT B. SIMPSON, P.E.
PROFESSIONAL ENGINEER

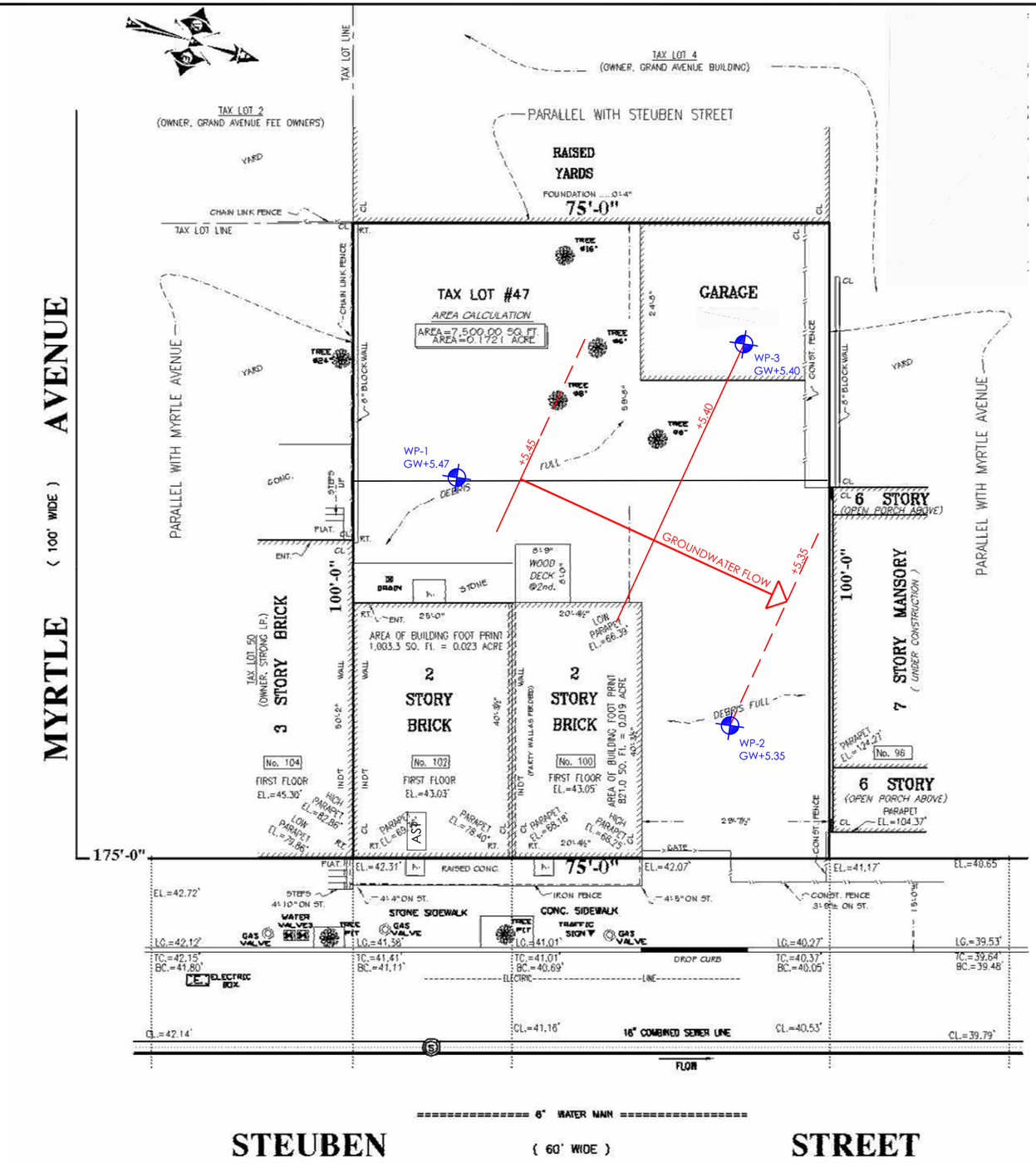
LICENSE NO. | SIGNATURE | DATE

LOCATION OF SOIL BORINGS, WELLS, AND SOIL VAPOR SAMPLES

98-102 STEUBEN STREET
BROOKLYN, NEW YORK

DRAWN: MRA	SCALE: 1" = 20'
CHECKED: RBS	DATE: 01.21.15
PROJECT NO.: 14-131A	DWG NO.: FIG -3
APPROVED:	

CARLIN-SIMPSON AND ASSOCIATES
61 Main Street
Sayreville, NJ 08872
Consulting Geotechnical and Environmental Engineers



GENERAL NOTES:

1. GENERAL LAYOUT WAS OBTAINED FROM A DRAWING THAT WAS PREPARED BY AAA GROUP LAND SURVEYING SERVICES, ENTITLED "ALTA/ACSM LAND TITLE SURVEY - 100/102 STEUBEN STREET, BROOKLYN, NEW YORK 11205", DATED 18 SEPTEMBER 2014.

LEGEND:

- WELL LOCATION

- GROUNDWATER CONTOURS

ROBERT B. SIMPSON, P.E.
PROFESSIONAL ENGINEER

LICENSE NO. | SIGNATURE | DATE

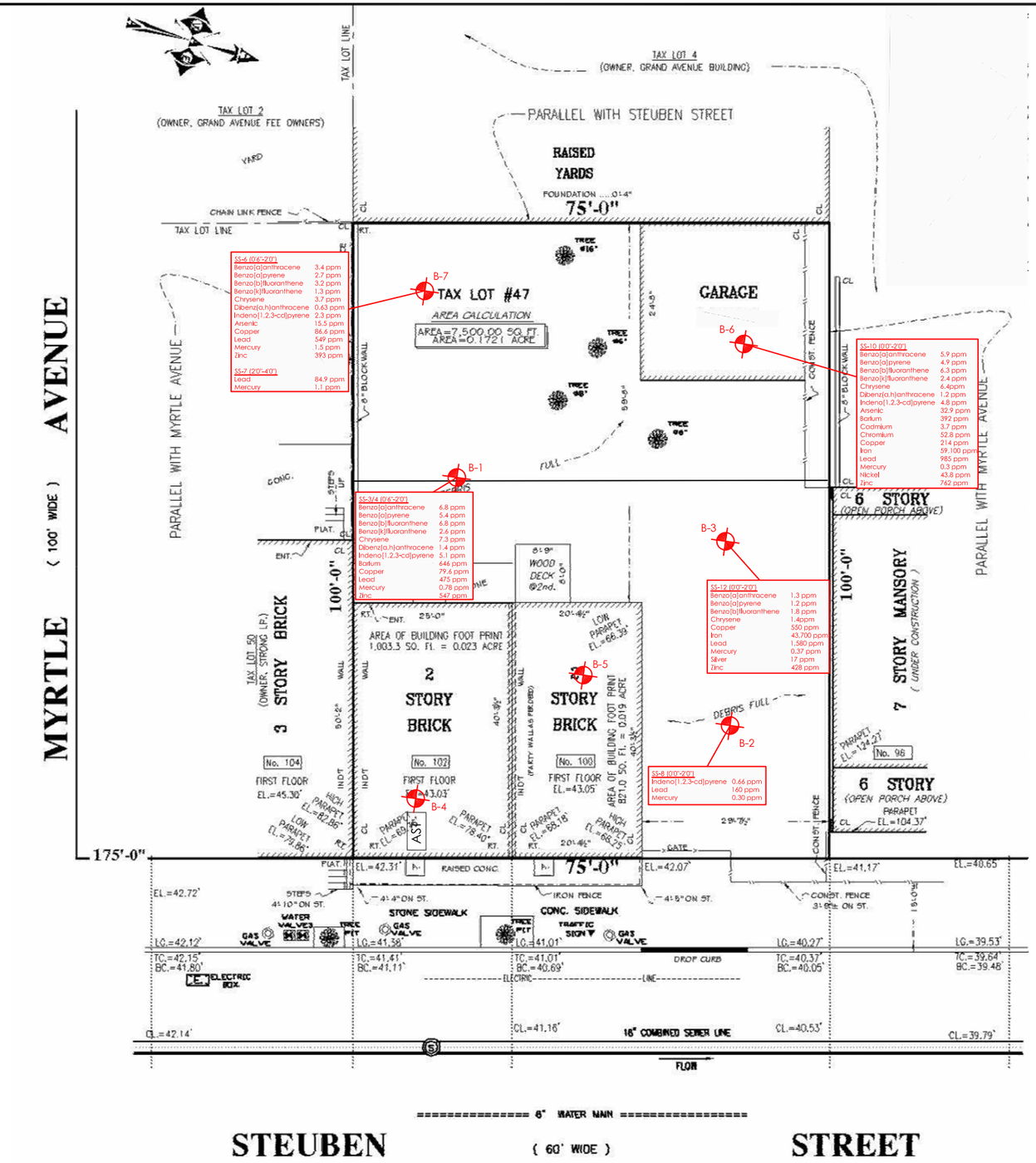
GROUNDWATER FLOW MAP

98-102 STEUBEN STREET
BROOKLYN, NEW YORK

DRAWN: MRA	SCALE: 1" = 20'
CHECKED: RBS	DATE: 01.21.15
PROJECT NO.: 14-131A	DWG NO.: FIG -4
APPROVED:	

CARLIN-SIMPSON AND ASSOCIATES
61 Main Street
Sayreville, NJ 08872

Consulting Geotechnical and Environmental Engineers



GENERAL NOTES:

1. GENERAL LAYOUT WAS OBTAINED FROM A DRAWING THAT WAS PREPARED BY AAA GROUP LAND SURVEYING SERVICES, ENTITLED "ALTA/ACSM LAND TITLE SURVEY - 100/102 STEUBEN STREET, BROOKLYN, NEW YORK 11205", DATED 18 SEPTEMBER 2014.

LEGEND:

- BORING LOCATION

ROBERT B. SIMPSON, P.E.
PROFESSIONAL ENGINEER

LICENSE NO. _____ SIGNATURE _____ DATE _____

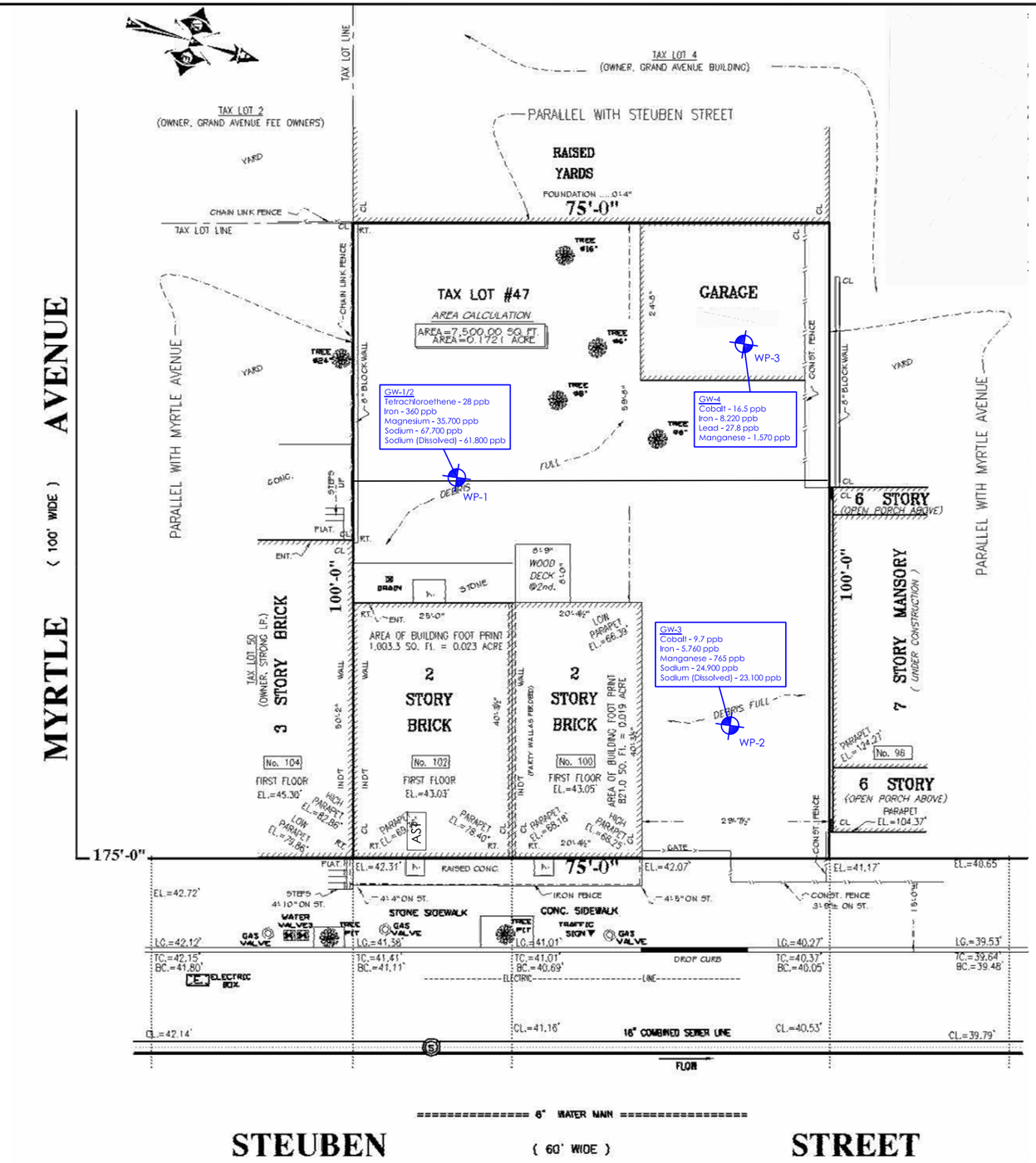
MAP OF SOIL CHEMISTRY RESULTS

98-102 STEUBEN STREET
BROOKLYN, NEW YORK

DRAWN: MRA	SCALE: 1" = 20'
CHECKED: RBS	DATE: 01.21.15
PROJECT NO.: 14-131A	DWG NO.: FIG -5
APPROVED	

CARLIN-SIMPSON AND ASSOCIATES
61 Main Street
Sayreville, NJ 08872

Consulting Geotechnical and Environmental Engineers



GENERAL NOTES:

1. GENERAL LAYOUT WAS OBTAINED FROM A DRAWING THAT WAS PREPARED BY AAA GROUP LAND SURVEYING SERVICES, ENTITLED "ALTA/ACSM LAND TITLE SURVEY - 100/102 STEUBEN STREET, BROOKLYN, NEW YORK 11205", DATED 18 SEPTEMBER 2014.

LEGEND:

- WELL LOCATION

ROBERT B. SIMPSON, P.E.
PROFESSIONAL ENGINEER

LICENSE NO. | SIGNATURE | DATE

MAP OF GROUNDWATER CHEMISTRY RESULTS

98-102 STEUBEN STREET
BROOKLYN, NEW YORK

DRAWN: MRA	SCALE: 1" = 20'
CHECKED: RBS	DATE: 01.21.15
PROJECT NO.: 14-131A	DWG NO.: FIG -6
APPROVED:	

CARLIN-SIMPSON AND ASSOCIATES
61 Main Street
Sayreville, NJ 08872
Consulting Geotechnical and Environmental Engineers

TABLES

Table 1: Soil Boring Observations

Boring No. (Well No.)	Boring Date	Ground Surface Elevation	Total Boring Depth (Elevation)	Depth to Groundwater (Elevation)	Depth to Bottom of Existing Fill (Elevation)	Maximum PID Reading in ppm (Depth Interval)
B-1 (WP-1)	12/22/14	+43.9	47'0" (-3.1)	38'5" (+5.5)	2'0" (+41.9)	0.0
B-2 (WP-2)	12/23/14	+42.9	47'0" (-4.1)	37'6" (+5.4)	5'0" (+37.9)	0.0
B-3	12/29/14	+42.9	102'0" (-59.1)	NR	5'0" (+37.9)	0.0
B-4	12/22/14	+36.0	5'2" (+30.8)	NE	3'0" (+33.0)	0.0
B-5	12/22/14	+36.0	5'5" (+30.6)	NE	NE	0.0
B-6 (WP-3)	12/23/14	+42.9	47'0" (-4.1)	37'9" (+5.2)	2'6" (+40.4)	0.0
B-7	12/23/14	+43.9	9'0" (+34.9)	NE	3'0" (+40.9)	0.0

Notes:
NE – Not Encountered
NR – Not Recorded

Table 2: Monitoring Well Observations

Monitoring Well No.	Installation Date	Ground Surface Elevation	Well Stickup Casing Height (Elevation)	Well Construction	Overall Well Depth	Well Screened Interval Elevation
WP-1	12/22/14	+43.91	1.61 (+45.52)	1” PVC	45’0”	(-1.1) – (+8.9)
WP-2	12/23/14	+42.89	1.69 (+44.58)	1” PVC	45’0”	(-2.1) – (+7.9)
WP-3	12/23/14	+42.94	1.73 (+44.67)	1” PVC	45’0”	(-2.1) – (+7.9)

Table 3: Groundwater Level Data

Monitoring Well No. (Boring No)	Date	Groundwater Depth Below Ground Surface (Elevation)
WP-1 (B-1)	12/22/14 14:45 (1) 12/29/14 08:45 (2)	38'4" (+5.6) 38.44' (+5.47)
WP-2 (B-2)	12/23/14 10:30 (1) 12/29/14 08:48 (2)	37'6" (+5.4) 37.54' (+5.35)
WP-3 (B-6)	12/23/14 14:25 (1) 12/29/14 08:51 (2)	37'9" (+5.2) 37.54' (+5.40)

(1) – Measurement recorded at the time of the boring and well installation
(2) – Measurement recorded in the well prior to purging and sampling

Table 4: Analytical Methods Summary for Soil and Groundwater

Matrix	Number of Samples	Analytical Methods	Number of Duplicate Samples	QA/QC Samples
Soil	12	-Volatile Organic Compounds by Method 8260 -Semi-Volatile Organic Compounds by Method 8270 -Pesticides/PCBs by Method 8081/8082 -Target Analyte List metals by Method 6010 and 7471	1	1 Trip Blank 1 Field Blank MS/MSD by lab
Groundwater	3	-Volatile Organic Compounds by Method 8260 -Semi-Volatile Organic Compounds by Method 8270 -Pesticides/PCBs by Method 8081/8082 -Total TAL Metals by Method 6010 and 7471 -Dissolved TAL Metals by Method 6010 and 7471	1	1 Trip Blank MS/MSD by lab

Table 5: Soil Sampling Summary

Boring No.	Sample No.	Sample Depth	Sample Date	PID Reading (ppm)
B-1	SS-3 SS-4 SS-5	0’6”-2’0” 0’6”-2’0” (Dup) 11’0”-12’6”	12/22/14 12/22/14 12/22/14	0.0 0.0 0.0
B-2	SS-8 SS-9	0’0”-2’0” 11’0”- 12’6”	12/23/14 12/23/14	0.0 0.0
B-3	SS-12 SS-13	0’0”-2’0” 11’0”-13’0”	12/29/14 12/29/14	0.0 0.0
B-4	SS-1	4’0”-5’2” (below slab) 11’0”-12’2” (below grade)	12/22/14	0.0
B-5	SS-2	4’0”-5’5” (below slab) 11’0”-12’5” (below grade)	12/22/14	0.0
B-6	SS-10 SS-11	0’0”-2’0” 2’0”-4’0”	12/23/14	0.0 0.0
B-7	SS-6 SS-7	0’6”-2’0” 2’0”-4’0”	12/23/14 12/23/14	0.0 0.0

Table 6: Groundwater Sampling Summary

Boring No.	Wellpoint No.	Sample No.	Sample Date	PID Reading (ppm)
B-1	WP-1	GW-1 GW-2 (Dup)	12/29/14	0.0
B-2	WP-2	GW-3	12/29/14	0.0
B-6	WP-3	GW-4	12/29/14	0.0

Table 7: Soil Analytical Data Summary

Sample Number	**NYSDEC**	**NYSDEC**	SS-1	SS-2	SS-3	SS-4	SS-5	SS-6	SS-7
Boring Number	**Unrestricted**	**Residential**	B-4	B-5	B-1	B-1	B-1	B-7	B-7
Sample Depth	**Use SCO**	**Use SCO**	11'0"-12'2"	11'0"-12'5"	0'6"-2'0"	0'6"-2'0" (Dup)	11'0"-12'6"	0'6"-2'0"	2'0"-4'0"
TCL Volatile Organic Compounds (VOCs, mg/kg)									
Total VOCs	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Estimated Conc. (TICs)	NS	NS	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TCL Semi-Volatile Organic Compounds (SVOCs, mg/kg)									
2-Methylnaphthalene	NS	NS	ND	ND	0.050 (J)	0.36 (J)	ND	0.16 (J)	ND
4-Methylphenol	NS	NS	ND	ND	ND	ND	ND	0.016 (J)	ND
Acenaphthene	20	100	ND	ND	0.13 (J)	1.0 (J)	ND	0.42	ND
Acenaphthylene	100	100	ND	ND	0.047 (J)	0.18 (J)	ND	0.086 (J)	ND
Anthracene	100	100	ND	ND	0.37 (J)	2.7	ND	1.0	ND
Benzo[a]anthracene	1	1	ND	ND	**2.0**	**6.8**	ND	**3.4**	0.15
Benzo[a]pyrene	1	1	ND	ND	**1.7**	**5.4**	0.027 (J)	**2.7**	0.12
Benzo[b]fluoranthene	1	1	ND	ND	**2.2**	**6.8**	ND	**3.2**	0.15
Benzo[g,h,i]perylene	100	100	ND	ND	1.7	4.2	ND	2.2	0.057 (J)
Benzo[k]fluoranthene	0.8	1	ND	ND	**0.83**	**2.6**	ND	**1.3**	0.071
Bis(2-ethylhexyl) phthalate	NS	NS	ND	ND	ND	ND	ND	ND	ND
Butyl benzyl phthalate	NS	NS	ND	ND	ND	ND	ND	ND	ND
Carbazole	NS	NS	ND	ND	0.21 (J)	1.7 (J)	ND	0.43	ND
Chrysene	1	1	ND	ND	**2.6**	**7.3**	ND	**3.7**	0.14 (J)
Dibenz(a,h)anthracene	0.33	0.33	ND	ND	**0.49**	**1.4**	ND	**0.63**	ND
Dibenzofuran	NS	NS	ND	ND	0.091 (J)	0.92 (J)	ND	0.27 (J)	ND
Di-n-butyl phthalate	NS	NS	ND	ND	0.047 (J)	ND	ND	0.075 (J)	ND
Fluoranthene	100	100	0.016 (J)	ND	3.3	16	ND	5.7	0.23 (J)
Fluorene	30	100	ND	ND	0.13 (J)	1.0 (J)	ND	0.43	ND
Indeno[1,2,3-cd]pyrene	0.5	0.5	ND	ND	**1.7**	**5.1**	ND	**2.3**	0.098
Isophorone	NS	NS	ND	0.011 (J)	0.012 (J)	ND	0.015 (J)	0.021 (J)	ND
Naphthalene	12	100	ND	ND	0.13 (J)	0.73 (J)	ND	0.23 (J)	0.011 (J)
Phenanthrene	100	100	0.020 (J)	ND	2.6	14	ND	5.5	0.083 (J)
Pyrene	100	100	ND	ND	4.0	11	ND	5.7	0.21 (J)
Total SVOCs	NS	NS	0.036	0.011	24.337	89.19	0.042	39.468	1.32
Total Estimated Conc. (TICs)	NS	NS	0.32	0.52	5.89	10.3	0.6	17.41	0.86
TCL Pesticides (mg/kg)									
Total Pesticides	-	-	ND	ND	ND	ND	ND	ND	ND
Polychlorinated Biphenyls (PCBs, mg/kg)									
Total PCBs	0.1	1.0	ND	ND	ND	ND	ND	ND	ND

Table 7: Soil Analytical Data Summary

Sample Number	**NYSDEC**	**NYSDEC**	SS-1	SS-2	SS-3	SS-4	SS-5	SS-6	SS-7
Boring Number	**Unrestricted**	**Residential**	B-4	B-5	B-1	B-1	B-1	B-7	B-7
Sample Depth	**Use SCO**	**Use SCO**	11'0"-12'2"	11'0"-12'5"	0'6"-2'0"	0'6"-2'0" (Dup)	11'0"-12'6"	0'6"-2'0"	2'0"-4'0"
TAL Metals (mg/kg)									
Aluminum	NS	NS	6,740	4,220	8,190	7,630	3,870	7,560	7,930
Antimony	NS	NS	ND	ND	ND	ND	ND	ND	ND
Arsenic	13	16	ND	ND	12.4	11.0	1.0 (J)	**15.5**	1.7 (J)
Barium	350	350	60.6	32.4 (J)	251	**646**	29.8 (J)	260	50.0
Beryllium	7.2	14	ND	ND	0.34 (J)	0.32 (J)	ND	0.35 (J)	0.38 (J)
Cadmium	2.5	2.5	ND	ND	ND	0.70 (J)	ND	ND	ND
Calcium	NS	NS	1,280	1,200	3,650	19,200	561 (J)	2,700	763 (J)
Chromium	30	36	19.9	14.5	23.1	24.5	12.3	25.3	18.0
Cobalt	NS	30	7.5 (J)	6.6 (J)	6.6 (J)	6.8 (J)	4.1 (J)	5.7 (J)	9.0 (J)
Copper	50	270	19.2	15.5	**67.0**	**79.6**	10.1	**86.6**	18.6
Iron	NS	2,000	**20,200**	**19,900**	**21,500**	**18,500**	**20,300**	**21,800**	**20,900**
Lead	63	400	6.1	3.6	**366**	**475**	2.7	**549**	**84.9**
Magnesium	NS	NS	2,620	1,720	2,300	3,720	1,480	1,740	1,980
Manganese	1,600	2,000	301	395	359	354	328	258	536
Mercury	0.18	0.81	0.019	ND	**0.78**	**0.75**	ND	**1.5**	**1.1**
Nickel	30	140	15.0	13.9	24.1	26.9	9.4	17.1	14.3
Potassium	NS	NS	1,860	800 (J)	753 (J)	717 (J)	837 (J)	762 (J)	919 (J)
Selenium	3.9	36	ND	ND	ND	ND	ND	1.5 (J)	ND
Silver	2	36	ND	ND	ND	ND	ND	0.44 (J)	ND
Sodium	NS	NS	87.9 (J)	ND	ND	ND	ND	143 (J)	ND
Thallium	NS	NS	ND	ND	ND	ND	ND	ND	ND
Tin	NS	NS	ND	ND	11.3	20.6	ND	22.4	3.5 (J)
Vanadium	NS	100	26.4	20.3	32.4	43.1	17.1	40.1	27.7
Zinc	109	2,200	53.8	35.5	**349**	**547**	27.8	**393**	80.4
Cyanide, Total	27	27	ND	ND	0.27	0.15	ND	0.33	0.072 (J)

Notes:

Highlighted Concentrations shown in bold type face exceed limits

B : Compound was found in the laboratory blank and sample

J : Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value

NS: No soil cleanup objective for this contaminant

ND : Indicates the analyte was analyzed for but not detected

Table 7: Soil Analytical Data Summary

Sample Number	**NYSDEC**	**NYSDEC**	SS-8	SS-9	SS-10	SS-11	SS-12	SS-13
Boring Number	**Unrestricted**	**Residential**	B-2	B-2	B-6	B-6	B-3	B-3
Sample Depth	**Use SCO**	**Use SCO**	0'0"-2'0"	11'0"-12'6"	0'0"-2'0"	2'0"-4'0"	0'0"-2'0"	11'0"-13'0"
TCL Volatile Organic Compounds (VOCs, mg/kg)								
Total VOCs	-	-	0.0	0.0	0.0	0.0	0.0	0.0
Total Estimated Conc. (TICs)	NS	NS	0.0	0.0	0.0	0.0	0.0335	2.583
TCL Semi-Volatile Organic Compounds (SVOCs, mg/kg)								
2-Methylnaphthalene	NS	NS	0.036 (J)	ND	0.62 (J)	ND	0.057 (J)	0.033 (J)
4-Methylphenol	NS	NS	ND	ND	0.11 (J)	ND	ND	ND
Acenaphthene	20	100	0.14 (J)	ND	1.5 (J)	ND	0.17 (J)	ND
Acenaphthylene	100	100	0.019 (J)	ND	0.27 (J)	ND	0.060 (J)	ND
Anthracene	100	100	0.29 (J)	ND	2.6	ND	0.52 (J)	ND
Benzo[a]anthracene	1	1	0.80	0.058	**5.9**	0.039	**1.3**	0.049
Benzo[a]pyrene	1	1	0.70	0.060	**4.9**	0.039	**1.2**	0.042
Benzo[b]fluoranthene	1	1	0.90	0.071	**6.3**	0.033 (J)	**1.8**	0.051
Benzo[g,h,i]perylene	100	100	0.56	0.036 (J)	3.9	ND	0.31 (J)	0.026 (J)
Benzo[k]fluoranthene	0.8	1	0.31	0.029 (J)	**2.4**	0.017 (J)	0.76	ND
Bis(2-ethylhexyl) phthalate	NS	NS	ND	0.015 (J)	ND	ND	0.33 (J)	0.022 (J)
Butyl benzyl phthalate	NS	NS	ND	ND	ND	ND	0.068 (J)	ND
Carbazole	NS	NS	0.12 (J)	ND	1.4 (J)	ND	0.24 (J)	ND
Chrysene	1	1	0.82	0.056 (J)	**6.4**	0.030 (J)	**1.4**	0.045 (J)
Dibenz(a,h)anthracene	0.33	0.33	0.18	ND	**1.2**	ND	0.096	ND
Dibenzofuran	NS	NS	0.075 (J)	ND	1.4 (J)	ND	0.16 (J)	ND
Di-n-butyl phthalate	NS	NS	ND	ND	ND	ND	0.066 (J)	ND
Fluoranthene	100	100	1.7	0.12 (J)	15	0.046 (J)	4.3	0.11 (J)
Fluorene	30	100	0.11 (J)	ND	1.4 (J)	ND	0.21 (J)	ND
Indeno[1,2,3-cd]pyrene	0.5	0.5	**0.66**	0.064	**4.8**	0.038	0.34	ND
Isophorone	NS	NS	0.017 (J)	ND	0.19 (J)	ND	ND	ND
Naphthalene	12	100	0.064 (J)	ND	1.4 (J)	ND	0.092 (J)	ND
Phenanthrene	100	100	1.6	0.081 (J)	15	0.017 (J)	2.8	0.073 (J)
Pyrene	100	100	1.7	0.12 (J)	9.7	0.041 (J)	2.0	0.075 (J)
Total SVOCs	NS	NS	10.801	0.71	86.39	0.3	18.279	0.526
Total Estimated Conc. (TICs)	NS	NS	1.76	0.31	9.8	4.2	1.0	6.34
TCL Pesticides (mg/kg)								
Total Pesticides	-	-	ND	ND	ND	ND	ND	ND
Polychlorinated Biphenyls (PCBs, mg/kg)								
Total PCBs	0.1	1.0	ND	ND	ND	ND	ND	ND

Table 7: Soil Analytical Data Summary

Sample Number	**NYSDEC**	**NYSDEC**	SS-8	SS-9	SS-10	SS-11	SS-12	SS-13
Boring Number	**Unrestricted**	**Residential**	B-2	B-2	B-6	B-6	B-3	B-3
Sample Depth	**Use SCO**	**Use SCO**	0'0"-2'0"	11'0"-12'6"	0'0"-2'0"	2'0"-4'0"	0'0"-2'0"	11'0"-13'0"
TAL Metals (mg/kg)								
Aluminum	NS	NS	7,230	3,320	5,480	10,000	14,600	6,220
Antimony	NS	NS	ND	ND	ND	ND	2.7 (J)	ND
Arsenic	13	16	4.8	1.2 (J)	**32.9**	2.4 (J)	8.7	1.6 (J)
Barium	350	350	117	32.7 (J)	**392**	51.6	314	49.1
Beryllium	7.2	14	0.30 (J)	ND	ND	ND	ND	ND
Cadmium	2.5	2.5	ND	ND	**3.7**	ND	ND	ND
Calcium	NS	NS	1,100	7,900	4,700	1,490	39,100	1,270
Chromium	30	36	18.9	9.6	**52.8**	24.8	29.6	23.6
Cobalt	NS	30	6.9 (J)	5.3 (J)	12.8 (J)	4.9 (J)	10.6 (J)	6.2 (J)
Copper	50	270	31.8	11.4	**214**	21.7	**550**	16.3
Iron	NS	2,000	**19,600**	**20,300**	**59,100**	**18,700**	**43,700**	**23,200**
Lead	63	400	**160**	4.4	**985**	19.1	**1,580**	25.2
Magnesium	NS	NS	1,560	4,480	772 (J)	3,310	9,970	2,140
Manganese	1,600	2,000	347	341	501	155	520	364
Mercury	0.18	0.81	**0.30**	ND	**0.30**	0.038	**0.37**	0.11
Nickel	30	140	17.2	10.6	**43.8**	19.5	20.4	14.4
Potassium	NS	NS	824 (J)	839 (J)	261 (J)	1,130	2,810	1,570
Selenium	3.9	36	ND	ND	ND	ND	ND	ND
Silver	2	36	ND	ND	ND	ND	**17.0**	ND
Sodium	NS	NS	ND	75.9 (J)	ND	ND	8,410	85.9 (J)
Thallium	NS	NS	ND	ND	ND	ND	ND	ND
Tin	NS	NS	7.7 (J)	ND	22.5 (J)	ND	217	ND
Vanadium	NS	100	23.9	16.8	43.3	36.8	39.2	26.3
Zinc	109	2,200	96.9	27.3	**762**	41.3	**428**	44.9
Cyanide, Total	27	27	0.099 (J)	0.059 (J)	0.36	0.064 (J)	0.12	ND

Notes:

Highlighted Concentrations shown in bold type face exceed limits

B : Compound was found in the laboratory blank and sample

J : Result is less than the RL but greater than or equal to the MDL and the

NS: No soil cleanup objective for this contaminant

ND : Indicates the analyte was analyzed for but not detected

Table 8: Groundwater Analytical Data Summary

Sample No.	NYSDEC Groundwater Criteria	GW-1	GW-2	GW-3	GW-4
Well Number		WP-1	WP-1 (Dup)	WP-2	WP-3
Boring Number		B-1	B-1	B-2	B-3
Sample Date		12/29/2014	12/29/2014	12/29/2014	12/29/2014
Volatile Organic Compounds (VOCs, ppb)					
Chloroform	7	3.2	3.1	ND	0.41 (J)
Tetrachloroethene	5	**28**	**24**	0.30 (J)	0.37 (J)
Trichloroethene	5	1.7	1.5	0.13 (J)	ND
Tentatively Identified VOCs (TICs)	-	0.0	0.0	0.0	0.0
Semi-Volatile Organic Compounds (SVOCs, ppb)					
Total SVOCS	-	ND	ND	ND	ND
Tentatively Identified SVOCs (TICs)	-	13	0.0	31.9	11
Pesticides (ppb)					
Total Pesticides	-	ND	ND	ND	ND
Polychlorinated Biphenyls (PCBs, ppb)					
Total PCBs	0.09	ND	ND	ND	ND
TAL Metals (ppb)					
Aluminum	-	227	65.2	2,460	3,490
Aluminum, Dissolved	-	ND	ND	ND	ND
Antimony	3	ND	ND	ND	ND
Antimony, Dissolved	-	ND	ND	ND	ND
Arsenic	25	ND	ND	1.2 (J)	1.5 (J)
Arsenic, Dissolved	-	ND	ND	ND	ND
Barium	1,000	86.6	86.0	71.8	173
Barium, Dissolved	-	82.7	84.1	24.7	65.7
Beryllium	3	ND	ND	ND	0.38 (J)
Beryllium, Dissolved	-	ND	ND	ND	ND
Cadmium	5	ND	ND	2.6	ND
Cadmium, Dissolved	-	ND	ND	0.95 (J)	ND
Calcium	-	99,700	99,700	72,200	110,000
Calcium, Dissolved	-	94,200	93,300	67,600	103,000
Chromium	50	4.5	3.8 (J)	12.3	19.1
Chromium, Dissolved	-	2.0 (J)	2.0 (J)	4.6	3.9 (J)
Cobalt	5	ND	ND	**9.7**	**16.5**
Cobalt, Dissolved	-	ND	ND	ND	ND
Copper	200	2.0 (J)	ND	11.8	25.2
Copper, Dissolved	-	ND	ND	ND	ND
Iron	300	**360**	178	**5,760**	**8,220**
Iron, Dissolved	-	ND	ND	ND	ND
Lead	25	ND	ND	8.2	**27.8**
Lead, Dissolved	-	ND	ND	ND	ND
Magnesium	35,000	**35,500**	**35,700**	20,100	19,400
Magnesium, Dissolved	-	33,100	32,900	17,400	16,100
Manganese	300	43.5	38.1	**765**	**1,570**
Manganese, Dissolved	-	19.2	17.6	16.6	138
Mercury	0.7	ND	ND	ND	ND
Mercury, Dissolved	-	ND	ND	ND	ND
Nickel	100	2.6 (J)	2.1 (J)	24.3	49.6
Nickel, Dissolved	-	ND	ND	3.1 (J)	4.1
Potassium	-	3,360	3,340	13,500	20,300
Potassium, Dissolved	-	3,180	3,170	12,700	18,900
Selenium	10	2.2 (J)	2.2 (J)	2.7 (J)	5.9 (J)
Selenium, Dissolved	-	2.6 (J)	2.4 (J)	3.1 (J)	6.6 (J)
Sodium	20,000	**67,500**	**67,700**	**24,900**	19,200
Sodium, Dissolved	-	**61,800**	**61,700**	**23,100**	17,700
Vanadium	-	2.4 (J)	2.0 (J)	10.2	9.0
Vanadium, Dissolved	-	ND	ND	ND	ND
Zinc	2,000	ND	ND	29.9	47.1
Zinc, Dissolved	-	ND		ND	ND
Cyanide	200	0.0049 (J)	ND	0.0078 (J)	0.0053 (J)

Notes:

Highlighted Concentrations shown in bold type face exceed limits

J : Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

ND : Indicates the analyte was analyzed for but not detected

APPENDIX A

SOIL VAPOR INVESTIGATION REPORT

98 - 102 STEUBEN STREET

BROOKLYN, NEW YORK

Soil Vapor Investigation Report

OER Project Number 15EH-N053K

Prepared for:

Mr. Thomas Ryan

Clinton Hill Development II LLC

152 West 57th Street – 11th Floor

New York, NY 10019

(212) 649-9738

Prepared by:

Environmental Maintenance Contractors, Inc.

5 Anderson Lane,

Goldens Bridge NY 10526

(914) 232-7355

January 22, 2015

SOIL VAPOR INVESTIGATION REPORT

TABLE OF CONTENTS

FIGURE

TABLES

APPENDICES

LIST OF ACRONYMS

Acronym	Definition
AOC	Area of Concern
CAMP	Community Air Monitoring Plan
COC	Contaminant of Concern
CPP	Citizen Participation Plan
CSM	Conceptual Site Model
DER-10	New York State Department of Environmental Conservation Technical Guide 10
FID	Flame Ionization Detector
GPS	Global Positioning System
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
IRM	Interim Remedial Measure
NAPL	Non-aqueous Phase Liquid
NYC VCP	New York City Voluntary Cleanup Program
NYC DOHMH	New York City Department of Health and Mental Hygiene
NYC OER	New York City Office of Environmental Remediation
NYS DOH ELAP	New York State Department of Health Environmental Laboratory Accreditation Program
OSHA	Occupational Safety and Health Administration
PID	Photo-Ionization Detector
QEP	Qualified Environmental Professional
RI	Remedial Investigation
RIR	Remedial Investigation Report
SCO	Soil Cleanup Objective
SPEED	Searchable Property Environmental Electronic Database
SVI	Soil Vapor Investigation

EXECUTIVE SUMMARY

The Remedial Investigation Report (RIR) provides sufficient information for establishment of remedial action objectives, evaluation of remedial action alternatives, and selection of a remedy pursuant to RCNY§ 43-1407(f). The remedial investigation (RI) described in this document is consistent with the applicable guidance.

The Soil Vapor Investigation (SVI) was performed in accordance with the Phase II Environmental Site Investigation (ESI) Work Plan prepared & submitted by Carlin-Simpson & Associated in December 9, 2014, and approved by the New York City Office of Environmental Remediation (NYC OER) on December 9, 2014.

Site Location and Current Usage

The Subject Site is located at 98 – 102 Steuben Street in the Clinton Hill section of Brooklyn, New York and is identified as Block 1893 and Lot 47 on the New York City Tax Map. Currently, the Subject Site includes two (2) - two-story vacant residential buildings with basements. There is also an open yard to the west of the buildings, undeveloped space in the northern portion of the property, and a small dilapidated structure in the North West corner of the Subject Site.

Summary of Proposed Redevelopment Plan

The proposed development project will consists of an 8-story multi-family residential building with a cellar that will encompass a majority of the Subject Site. There will also be an open space area at the rear yard that shall not be covered with concrete or asphalt. An excavation depth of approximately ten (10) feet is anticipated for the proposed building area.

Summary of the Work Performed under the Remedial Investigation

The Scope of Work for the SVI conducted to date at the Subject Site included the following.

Environmental Maintenance Contractors, Inc. (EMC) completed the installation of four (4) soil vapor probes at the Subject Site. Soil vapor probe locations were provided by Carlin-Simpson Associates. Four (4) samples were collected for chemical analysis from sampling locations SV1 – SV4, as detailed in Figure 1.

Summary of Environmental Findings

Soil vapor samples collected during the RI indicate on-site vapor concentrations (Total concentrations of VOCs) range from 259.41 microgram per cubic meter (mcg/m^3) to 12,125.13 mcg/m^3.

- Carbon Tetrachloride was Non Detect (ND) for all soil vapor probe locations.
- 1,1,1–Trichloroethane (TCA), concentrations were found to be ND to 7.6 mcg/m^3.
- Tetrachloroethelne (PCE) concentrations were found to be 17 mcg/m3 to 26 mcg/m^3.
- and Trichloroethene (TCE) concentrations were found to be ND to 1.3 mcg/m^3.

Table 1 summarizes the soil vapor analytical methods utilized and Table 2 summarizes the soil vapor analytical data obtained.

1.0 REMEDIAL INVESTIGATION ACTIVITIES

EMC performed the following scope of work:

Soil Vapor Probes Install

EMC mobilized the equipment necessary to install four (4) soil vapor probes at the Subject Site. Three (3) soil vapor probes (SV1 – SV3) were installed outside the yard and one (1) soil vapor probe was installed inside the basement of the Subject Site. SV1 & SV2 were installed approximately ten (10) feet below grade. SV3 was installed approximately six (6) feet below grade. SV4 were installed three (3) feet below the basement slab. Soil vapor probes located outside the yard were installed utilizing a Geoprobe® (i.e MT52 Mini Track and Probing unit) fitted with GP29 Geoprobe® tooling equipment. The soil vapor probe inside the basement was installed utilizing a Hand Auger.

The soil vapor probes were installed under the guidance of the New York City Office of Environmental Remediation (NYC OER). The location, depth and analytical methods were approved and reviewed by the NYC OER. Methodologies used for soil vapor assessment conform with the *NYS DOH Final Guidance on Soil Vapor Intrusion, October 2006.*

Sample Collection

EMC's Environmental Technician (ET) was dispatched to collect soil vapor samples from each of the installed soil vapor probes utilizing one (1) liter pre-cleaned, passivated, evacuated whole air Summa Canisters.

Prior to soil vapor sampling: *(1)* soil vapor probes were purged of a minimum of three tube volumes of soil vapor utilizing a 60 cc syringe; *(2)* organic vapors accumulated in the tubing of each soil vapor probe were screened utilizing a Photo Ionization Detector (PID) pursuant to section 2.3(b) of DER-10; *(3)* testing for helium (He) tracer gas was performed in accordance with NYSDOH protocols to verify the integrity of the soil vapor probe seal. A stainless steal dome served to keep the tracer gas (He) in contact with the probe, and a portable monitoring device was used to test for the tracer gas.

ET collected soil vapor samples utilizing a one (1) liter Summa Canisters for a minimum of two (2) hours. All samples were collected in accordance with the *NYS DOH Final Guidance on Soil Vapor Intrusion, October 2006*. A sample log sheet was maintained summarizing the sample identification, date and time of sample collection, sampling depth, identity of samplers, sampling methods and devices, soil vapor purge volumes, volume of the soil vapor extracted, vacuum of canisters before and after the samples are collected, apparent moisture content of

the sampling zone, and chain of custody protocols. ET prepared and submitted samples collected with a certified chain of custody to a NYS DOH accredited laboratory for analysis.

Decontamination Procedures

The Summa Canisters were calibrated for two (2) hours and the soil vapor sampling was performed utilizing each canister for a time period of two (2) hours. The initial vacuum (inches of mercury) and start time was recorded immediately after opening each Summa Canister. After the sampling was complete, the final vacuum and top time was recorded.

Chemical Analysis

After the soil vapor sampling was completed, each Summa Canister was labeled and transported to a NYS certified laboratory for analysis for Volatile Organic Compounds (VOC's) via USEPA Method TO-15. Chemical analyses were performed by Centek Laboratories, LLC.

Quality Assurance and Quality Control

A Quality Assurance (QA) and Quality Control (QC) program for all data reported was established to confirm that all objectives were met and all methodologies was consistent with the NYSDEC DER-10 Guidance. All QC sample collections were monitored by a laboratory QA officer to ensure that the process was performed as required.

All samples were properly handled and appropriately labeled. All samples were transmitted under proper chain of custody procedures to a State-certified (ELAP) laboratory for confirmatory laboratory analyses. All holding times were met. The laboratory did not report any irregularities with respect to their internal Quality Assurance/Quality Control program.

Results of Chemical Analyses

Laboratory data for soil vapor samples are summarized in Table 2. Laboratory data for all samples evaluated in this report are provided in Appendix A.

2.0 ENVIRONMENTAL EVALUATION

Soil Vapor Chemistry

Soil vapor sample were obtained from soil vapor probes SV1 – SV4. Based on the review of the analytical laboratory data reported for the soil vapor samples collected, the analytical results indicate that the on-site vapor concentrations (Total concentrations of VOCs) range from 259.41 mcg/m^3 to 12,125.13 mcg/m^3.

- Carbon Tetrachloride was Non Detect (ND) for all soil vapor probe locations.
- 1,1,1–Trichloroethane (TCA), concentrations were found to be ND to 7.6 mcg/m^3.
- Tetrachloroethelne (PCE) concentrations were found to be 17 mcg/m^3 to 26 mcg/m^3.
- and Trichloroethene (TCE) concentrations were found to be ND to 1.3 mcg/m^3.

Table 1 summarizes the soil vapor analytical methods utilized and Table 2 summarizes the soil vapor analytical data obtained.

Prepared and Reviewed by:
Environmental Maintenance Contractors, Inc.

Mr. Richard Stumbo
President

FIGURE

Figure 1

Soil Vapor Location Plan

FIGURE 1

98-102 Steuben Street,
Brooklyn NY

LEGEND:

- SOIL VAPOR SAMPLE LOCATION

TABLES

Table 1

Analytical Methods Summary

Table 1

Soil Vapor Analytical Methods Summary Table

Matrix	Number of Samples	Analytical parameters measured	Analytical methods
Air (Soil Vapor)	4	VOC's	EPA Method TO 15

Table 2

Soil Vapor Analytical Data Summary

Table 2

Project ID: 98 - 102 Steuben Street, Brooklyn NY							
Sample ID:			**SV1**	**SV2**	**SV3**	**SV4**	NYS DOH Matrix 1/2
Sample Date:			1/7/2015	1/7/2015	1/7/2015	1/7/2015	
Matrix			AIR	AIR	AIR	AIR	
Lab ID:			C1501024-001A	C1501024-002A	C1501024-003A	C1501024-004A	
Volitile Organic Compound by Method TO-15							
CAS	**Analyte**	**Units**	**Result**	**Result**	**Result**	**Result**	
71-55-6	1,1,1-Trichloroethane (TCA)	ug/m3	**3.9**	**2.9**	ND	**7.6**	<100
79-34-5	1,1,2,2-Tetrachloroethane	ug/m3	ND	ND	ND	ND	-
79-00-5	1,1,2-Trichloroethane	ug/m3	ND	ND	ND	ND	-
75-34-3	1,1-Dichloroethane	ug/m3	ND	ND	ND	ND	-
75-35-4	1,1-Dichloroethene	ug/m3	ND	ND	ND	ND	-
120-82-1	1,2,4-Trichlorobenzene	ug/m3	ND	ND	ND	ND	-
95-63-6	1,2,4-Trimethylbenzene	ug/m3	**6.7**	**6.7**	**6.4**	**9.8**	-
106-93-4	1,2-Dibromoethane	ug/m3	ND	ND	ND	ND	-
95-50-1	1,2-Dichlorobenzene	ug/m3	ND	ND	ND	ND	-
107-06-2	1,2-Dichloroethane	ug/m3	ND	ND	ND	ND	-
78-87-5	1,2-Dichloropropane	ug/m3	ND	ND	ND	ND	-
108-67-8	1,3,5-Trimethylbenzene	ug/m3	**2.1**	**1.9**	**1.7**	**3.4**	-
106-99-0	1,3-butadiene	ug/m3	ND	ND	ND	ND	-
541-73-1	1,3-Dichlorobenzene	ug/m3	ND	ND	ND	ND	-
106-46-7	1,4-Dichlorobenzene	ug/m3	ND	ND	ND	ND	-
123-91-1	1,4-Dioxane	ug/m3	ND	ND	ND	ND	-
540-84-1	2,2,4-trimethylpentane	ug/m3	**8100**	**14**	**4.8**	**1.9**	-
622-96-8	4-ethyltoluene	ug/m3	**3.4**	**3.2**	**3.4**	**6.5**	-
67-64-1	Acetone	ug/m3	ND	**210**	**190**	**15**	-
107-05-1	Allyl chloride	ug/m3	ND	ND	ND	ND	-
71-43-2	Benzene	ug/m3	ND	**13**	**11**	**3.9**	-
100-44-7	Benzyl chloride	ug/m3	ND	ND	ND	ND	-
75-27-4	Bromodichloromethane	ug/m3	ND	ND	ND	ND	-
460-00-4	Bromofluorobenzene	ug/m3	0	0	0	0	-
75-25-2	Bromoform	ug/m3	ND	ND	ND	ND	-
74-83-9	Bromomethane	ug/m3	ND	ND	ND	ND	-
75-15-0	Carbon disulfide	ug/m3	**1.2**	**0.93**	**20**	ND	-
56-23-5	Carbon tetrachloride	ug/m3	ND	ND	ND	ND	<5
108-90-7	Chlorobenzene	ug/m3	ND	ND	ND	ND	-
75-00-3	Chloroethane	ug/m3	ND	ND	ND	ND	-
67-66-3	Chloroform	ug/m3	ND	ND	ND	**2.2**	-
74-87-3	Chloromethane	ug/m3	ND	ND	**0.41**	ND	-
156-59-2	cis-1,2-Dichloroethene	ug/m3	ND	ND	ND	ND	-
10061-01-5	cis-1,3-Dichloropropene	ug/m3	ND	ND	ND	ND	-
110-82-7	Cyclohexane	ug/m3	**950**	**4.7**	**3.9**	**1.1**	-
124-48-1	Dibromochloromethane	ug/m3	ND	ND	ND	ND	-
141-78-6	Ethyl acetate	ug/m3	ND	ND	ND	ND	-
100-41-4	Ethylbenzene	ug/m3	**13**	**13**	**11**	**16**	-
75-69-4	Freon 11	ug/m3	**3.7**	**2.2**	**1.5**	**2.5**	-
76-13-1	Freon 113	ug/m3	ND	ND	ND	**0.77**	-
76-14-2	Freon 114	ug/m3	ND	ND	ND	ND	-
75-71-8	Freon 12	ug/m3	**6.3**	**4.5**	**4**	**3.9**	-
142-82-5	Heptane	ug/m3	**73**	**28**	**27**	**11**	-
87-68-3	Hexachloro-1,3-butadiene	ug/m3	ND	ND	ND	ND	-
110-54-3	Hexane	ug/m3	**2800**	**26**	**23**	**5.6**	-
67-63-0	Isopropyl alcohol	ug/m3	ND	ND	ND	ND	-
79601-23-1	m&p-Xylene	ug/m3	**46**	**40**	**38**	**58**	-
591-78-6	Methyl Butyl Ketone	ug/m3	ND	**14**	ND	ND	-
78-93-3	Methyl Ethyl Ketone	ug/m3	ND	**24**	**17**	**6.2**	-
108-10-1	Methyl Isobutyl Ketone	ug/m3	ND	ND	**2.5**	**2.4**	-
1634-04-4	Methyl tert-butyl ether	ug/m3	**0.83**	ND	ND	ND	-
75-09-2	Methylene chloride	ug/m3	ND	**1.1**	**0.97**	ND	-
95-47-6	o-Xylene	ug/m3	**11**	**10**	**9.1**	**14**	-
115-07-1	Propylene	ug/m3	ND	ND	ND	ND	-
100-42-5	Styrene	ug/m3	ND	ND	ND	ND	-
127-18-4	Tetrachloroethylene (Tetrachloroethene) (PCE)	ug/m3	**22**	**18**	**17**	**26**	<100
109-99-9	Tetrahydrofuran	ug/m3	ND	ND	ND	ND	-
108-88-3	Toluene	ug/m3	**82**	**87**	**69**	**61**	-
156-60-5	trans-1,2-Dichloroethene	ug/m3	ND	ND	ND	ND	-
10061-02-6	trans-1,3-Dichloropropene	ug/m3	ND	ND	ND	ND	-
79-01-6	Trichloroethene (TCE)	ug/m3	ND	**1.2**	**1.3**	**0.64**	<5
108-05-4	Vinyl acetate	ug/m3	ND	ND	ND	ND	-
593-60-2	Vinyl Bromide	ug/m3	ND	ND	ND	ND	-
75-01-4	Vinyl chloride	ug/m3	ND	ND	ND	ND	-
Total VOC's		**ug/m3**	**12125.13**	**526.33**	**462.98**	**259.41**	-

ND - Non Detect

APPENDICES

Appendix 1

Soil Vapor Analytical
Laboratory Data

Centek Laboratories, LLC

Date: *20-Jan-15*

CLIENT:	Environmental Maintenance Contractors, In	**Client Sample ID:**	SV 1
Lab Order:	C1501024	**Tag Number:**	133,1126
Project:	100-102 Steuben St	**Collection Date:**	1/7/2015
Lab ID:	C1501024-001A	**Matrix:**	AIR

Analyses	Result	**Limit	Qual	Units	DF	Date Analyzed
FIELD PARAMETERS		**FLD**				Analyst:
Lab Vacuum In	-2			"Hg		1/12/2015
Lab Vacuum Out	-30			"Hg		1/12/2015
1UG/M3 BY METHOD TO15		**TO-15**				Analyst: **RJP**
1,1,1-Trichloroethane	0.72	0.15		ppbV	1	1/16/2015 4:03:00 AM
1,1,2,2-Tetrachloroethane	< 0.15	0.15		ppbV	1	1/16/2015 4:03:00 AM
1,1,2-Trichloroethane	< 0.15	0.15		ppbV	1	1/16/2015 4:03:00 AM
1,1-Dichloroethane	< 0.15	0.15		ppbV	1	1/16/2015 4:03:00 AM
1,1-Dichloroethene	< 0.15	0.15		ppbV	1	1/16/2015 4:03:00 AM
1,2,4-Trichlorobenzene	< 0.15	0.15		ppbV	1	1/16/2015 4:03:00 AM
1,2,4-Trimethylbenzene	1.4	0.15		ppbV	1	1/16/2015 4:03:00 AM
1,2-Dibromoethane	< 0.15	0.15		ppbV	1	1/16/2015 4:03:00 AM
1,2-Dichlorobenzene	< 0.15	0.15		ppbV	1	1/16/2015 4:03:00 AM
1,2-Dichloroethane	< 0.15	0.15		ppbV	1	1/16/2015 4:03:00 AM
1,2-Dichloropropane	< 0.15	0.15		ppbV	1	1/16/2015 4:03:00 AM
1,3,5-Trimethylbenzene	0.43	0.15		ppbV	1	1/16/2015 4:03:00 AM
1,3-butadiene	< 0.15	0.15		ppbV	1	1/16/2015 4:03:00 AM
1,3-Dichlorobenzene	< 0.15	0.15		ppbV	1	1/16/2015 4:03:00 AM
1,4-Dichlorobenzene	< 0.15	0.15		ppbV	1	1/16/2015 4:03:00 AM
1,4-Dioxane	< 0.30	0.30		ppbV	1	1/16/2015 4:03:00 AM
2,2,4-trimethylpentane	1700	120		ppbV	810	1/16/2015 9:03:00 AM
4-ethyltoluene	0.69	0.15		ppbV	1	1/16/2015 4:03:00 AM
Acetone	< 0.30	0.30		ppbV	1	1/16/2015 4:03:00 AM
Allyl chloride	< 0.15	0.15		ppbV	1	1/16/2015 4:03:00 AM
Benzene	< 0.15	0.15		ppbV	1	1/16/2015 4:03:00 AM
Benzyl chloride	< 0.15	0.15		ppbV	1	1/16/2015 4:03:00 AM
Bromodichloromethane	< 0.15	0.15		ppbV	1	1/16/2015 4:03:00 AM
Bromoform	< 0.15	0.15		ppbV	1	1/16/2015 4:03:00 AM
Bromomethane	< 0.15	0.15		ppbV	1	1/16/2015 4:03:00 AM
Carbon disulfide	0.38	0.15		ppbV	1	1/16/2015 4:03:00 AM
Carbon tetrachloride	< 0.15	0.15		ppbV	1	1/16/2015 4:03:00 AM
Chlorobenzene	< 0.15	0.15		ppbV	1	1/16/2015 4:03:00 AM
Chloroethane	< 0.15	0.15		ppbV	1	1/16/2015 4:03:00 AM
Chloroform	< 0.15	0.15		ppbV	1	1/16/2015 4:03:00 AM
Chloromethane	< 0.15	0.15		ppbV	1	1/16/2015 4:03:00 AM
cis-1,2-Dichloroethene	< 0.15	0.15		ppbV	1	1/16/2015 4:03:00 AM
cis-1,3-Dichloropropene	< 0.15	0.15		ppbV	1	1/16/2015 4:03:00 AM
Cyclohexane	280	120		ppbV	810	1/16/2015 9:03:00 AM
Dibromochloromethane	< 0.15	0.15		ppbV	1	1/16/2015 4:03:00 AM
Ethyl acetate	< 0.25	0.25		ppbV	1	1/16/2015 4:03:00 AM

Qualifiers:

**	Reporting Limit	.	Results reported are not blank corrected
B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected at or below quantitation limits
JN	Non-routine analyte. Quantitation estimated.	ND	Not Detected at the Reporting Limit
S	Spike Recovery outside accepted recovery limits		

Centek Laboratories, LLC

Date: *20-Jan-15*

CLIENT:	Environmental Maintenance Contractors, In	**Client Sample ID:**	SV 1
Lab Order:	C1501024	**Tag Number:**	133,1126
Project:	100-102 Steuben St	**Collection Date:**	1/7/2015
Lab ID:	C1501024-001A	**Matrix:**	AIR

Analyses	Result	**Limit	Qual	Units	DF	Date Analyzed
1UG/M3 BY METHOD TO15		**TO-15**				Analyst: **RJP**
Ethylbenzene	3.1	1.5		ppbV	10	1/15/2015 6:46:00 PM
Freon 11	0.65	0.15		ppbV	1	1/16/2015 4:03:00 AM
Freon 113	< 0.15	0.15		ppbV	1	1/16/2015 4:03:00 AM
Freon 114	< 0.15	0.15		ppbV	1	1/16/2015 4:03:00 AM
Freon 12	1.3	0.15		ppbV	1	1/16/2015 4:03:00 AM
Heptane	18	1.5		ppbV	10	1/15/2015 6:46:00 PM
Hexachloro-1,3-butadiene	< 0.15	0.15		ppbV	1	1/16/2015 4:03:00 AM
Hexane	790	120		ppbV	810	1/16/2015 9:03:00 AM
Isopropyl alcohol	< 0.15	0.15		ppbV	1	1/16/2015 4:03:00 AM
m&p-Xylene	10	3.0		ppbV	10	1/15/2015 6:46:00 PM
Methyl Butyl Ketone	< 0.30	0.30		ppbV	1	1/16/2015 4:03:00 AM
Methyl Ethyl Ketone	< 0.30	0.30		ppbV	1	1/16/2015 4:03:00 AM
Methyl Isobutyl Ketone	< 0.30	0.30		ppbV	1	1/16/2015 4:03:00 AM
Methyl tert-butyl ether	0.23	0.15		ppbV	1	1/16/2015 4:03:00 AM
Methylene chloride	< 0.15	0.15		ppbV	1	1/16/2015 4:03:00 AM
o-Xylene	2.6	1.5		ppbV	10	1/15/2015 6:46:00 PM
Propylene	< 0.15	0.15		ppbV	1	1/16/2015 4:03:00 AM
Styrene	< 0.15	0.15		ppbV	1	1/16/2015 4:03:00 AM
Tetrachloroethylene	3.2	1.5		ppbV	10	1/15/2015 6:46:00 PM
Tetrahydrofuran	< 0.15	0.15		ppbV	1	1/16/2015 4:03:00 AM
Toluene	22	1.5		ppbV	10	1/15/2015 6:46:00 PM
trans-1,2-Dichloroethene	< 0.15	0.15		ppbV	1	1/16/2015 4:03:00 AM
trans-1,3-Dichloropropene	< 0.15	0.15		ppbV	1	1/16/2015 4:03:00 AM
Trichloroethene	< 0.15	0.15		ppbV	1	1/16/2015 4:03:00 AM
Vinyl acetate	< 0.15	0.15		ppbV	1	1/16/2015 4:03:00 AM
Vinyl Bromide	< 0.15	0.15		ppbV	1	1/16/2015 4:03:00 AM
Vinyl chloride	< 0.15	0.15		ppbV	1	1/16/2015 4:03:00 AM
Surr: Bromofluorobenzene	85.0	70-130		%REC	1	1/16/2015 4:03:00 AM

Qualifiers:

**	Reporting Limit	.	Results reported are not blank corrected
B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected at or below quantitation limits
JN	Non-routine analyte. Quantitation estimated.	ND	Not Detected at the Reporting Limit
S	Spike Recovery outside accepted recovery limits		

Centek Laboratories, LLC

Date: *20-Jan-15*

CLIENT:	Environmental Maintenance Contractors, In	**Client Sample ID:**	SV 2
Lab Order:	C1501024	**Tag Number:**	1186,1114
Project:	100-102 Steuben St	**Collection Date:**	1/7/2015
Lab ID:	C1501024-002A	**Matrix:**	AIR

Analyses	Result	**Limit	Qual	Units	DF	Date Analyzed
FIELD PARAMETERS		**FLD**				Analyst:
Lab Vacuum In	-2			"Hg		1/12/2015
Lab Vacuum Out	-30			"Hg		1/12/2015
1UG/M3 BY METHOD TO15		**TO-15**				Analyst: **RJP**
1,1,1-Trichloroethane	0.54	0.15		ppbV	1	1/16/2015 5:18:00 AM
1,1,2,2-Tetrachloroethane	< 0.15	0.15		ppbV	1	1/16/2015 5:18:00 AM
1,1,2-Trichloroethane	< 0.15	0.15		ppbV	1	1/16/2015 5:18:00 AM
1,1-Dichloroethane	< 0.15	0.15		ppbV	1	1/16/2015 5:18:00 AM
1,1-Dichloroethene	< 0.15	0.15		ppbV	1	1/16/2015 5:18:00 AM
1,2,4-Trichlorobenzene	< 0.15	0.15		ppbV	1	1/16/2015 5:18:00 AM
1,2,4-Trimethylbenzene	1.4	0.15		ppbV	1	1/16/2015 5:18:00 AM
1,2-Dibromoethane	< 0.15	0.15		ppbV	1	1/16/2015 5:18:00 AM
1,2-Dichlorobenzene	< 0.15	0.15		ppbV	1	1/16/2015 5:18:00 AM
1,2-Dichloroethane	< 0.15	0.15		ppbV	1	1/16/2015 5:18:00 AM
1,2-Dichloropropane	< 0.15	0.15		ppbV	1	1/16/2015 5:18:00 AM
1,3,5-Trimethylbenzene	0.38	0.15		ppbV	1	1/16/2015 5:18:00 AM
1,3-butadiene	< 0.15	0.15		ppbV	1	1/16/2015 5:18:00 AM
1,3-Dichlorobenzene	< 0.15	0.15		ppbV	1	1/16/2015 5:18:00 AM
1,4-Dichlorobenzene	< 0.15	0.15		ppbV	1	1/16/2015 5:18:00 AM
1,4-Dioxane	< 0.30	0.30		ppbV	1	1/16/2015 5:18:00 AM
2,2,4-trimethylpentane	3.1	1.5		ppbV	10	1/15/2015 7:21:00 PM
4-ethyltoluene	0.66	0.15		ppbV	1	1/16/2015 5:18:00 AM
Acetone	88	12		ppbV	40	1/16/2015 5:53:00 AM
Allyl chloride	< 0.15	0.15		ppbV	1	1/16/2015 5:18:00 AM
Benzene	4.0	1.5		ppbV	10	1/15/2015 7:21:00 PM
Benzyl chloride	< 0.15	0.15		ppbV	1	1/16/2015 5:18:00 AM
Bromodichloromethane	< 0.15	0.15		ppbV	1	1/16/2015 5:18:00 AM
Bromoform	< 0.15	0.15		ppbV	1	1/16/2015 5:18:00 AM
Bromomethane	< 0.15	0.15		ppbV	1	1/16/2015 5:18:00 AM
Carbon disulfide	0.30	0.15		ppbV	1	1/16/2015 5:18:00 AM
Carbon tetrachloride	< 0.15	0.15		ppbV	1	1/16/2015 5:18:00 AM
Chlorobenzene	< 0.15	0.15		ppbV	1	1/16/2015 5:18:00 AM
Chloroethane	< 0.15	0.15		ppbV	1	1/16/2015 5:18:00 AM
Chloroform	< 0.15	0.15		ppbV	1	1/16/2015 5:18:00 AM
Chloromethane	< 0.15	0.15		ppbV	1	1/16/2015 5:18:00 AM
cis-1,2-Dichloroethene	< 0.15	0.15		ppbV	1	1/16/2015 5:18:00 AM
cis-1,3-Dichloropropene	< 0.15	0.15		ppbV	1	1/16/2015 5:18:00 AM
Cyclohexane	1.4	0.15		ppbV	1	1/16/2015 5:18:00 AM
Dibromochloromethane	< 0.15	0.15		ppbV	1	1/16/2015 5:18:00 AM
Ethyl acetate	< 0.25	0.25		ppbV	1	1/16/2015 5:18:00 AM

Qualifiers:

**	Reporting Limit	.	Results reported are not blank corrected
B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected at or below quantitation limits
JN	Non-routine analyte. Quantitation estimated.	ND	Not Detected at the Reporting Limit
S	Spike Recovery outside accepted recovery limits		

Centek Laboratories, LLC

Date: *20-Jan-15*

CLIENT:	Environmental Maintenance Contractors, In	**Client Sample ID:**	SV 2
Lab Order:	C1501024	**Tag Number:**	1186,1114
Project:	100-102 Steuben St	**Collection Date:**	1/7/2015
Lab ID:	C1501024-002A	**Matrix:**	AIR

Analyses	Result	**Limit	Qual	Units	DF	Date Analyzed
1UG/M3 BY METHOD TO15		**TO-15**				Analyst: **RJP**
Ethylbenzene	2.9	1.5		ppbV	10	1/15/2015 7:21:00 PM
Freon 11	0.40	0.15		ppbV	1	1/16/2015 5:18:00 AM
Freon 113	< 0.15	0.15		ppbV	1	1/16/2015 5:18:00 AM
Freon 114	< 0.15	0.15		ppbV	1	1/16/2015 5:18:00 AM
Freon 12	0.91	0.15		ppbV	1	1/16/2015 5:18:00 AM
Heptane	6.9	1.5		ppbV	10	1/15/2015 7:21:00 PM
Hexachloro-1,3-butadiene	< 0.15	0.15		ppbV	1	1/16/2015 5:18:00 AM
Hexane	7.3	1.5		ppbV	10	1/15/2015 7:21:00 PM
Isopropyl alcohol	< 0.15	0.15		ppbV	1	1/16/2015 5:18:00 AM
m&p-Xylene	9.3	3.0		ppbV	10	1/15/2015 7:21:00 PM
Methyl Butyl Ketone	3.3	3.0		ppbV	10	1/15/2015 7:21:00 PM
Methyl Ethyl Ketone	8.2	3.0		ppbV	10	1/15/2015 7:21:00 PM
Methyl Isobutyl Ketone	< 0.30	0.30		ppbV	1	1/16/2015 5:18:00 AM
Methyl tert-butyl ether	< 0.15	0.15		ppbV	1	1/16/2015 5:18:00 AM
Methylene chloride	0.31	0.15		ppbV	1	1/16/2015 5:18:00 AM
o-Xylene	2.4	1.5		ppbV	10	1/15/2015 7:21:00 PM
Propylene	< 0.15	0.15		ppbV	1	1/16/2015 5:18:00 AM
Styrene	< 0.15	0.15		ppbV	1	1/16/2015 5:18:00 AM
Tetrachloroethylene	2.6	1.5		ppbV	10	1/15/2015 7:21:00 PM
Tetrahydrofuran	< 0.15	0.15		ppbV	1	1/16/2015 5:18:00 AM
Toluene	23	1.5		ppbV	10	1/15/2015 7:21:00 PM
trans-1,2-Dichloroethene	< 0.15	0.15		ppbV	1	1/16/2015 5:18:00 AM
trans-1,3-Dichloropropene	< 0.15	0.15		ppbV	1	1/16/2015 5:18:00 AM
Trichloroethene	0.23	0.15		ppbV	1	1/16/2015 5:18:00 AM
Vinyl acetate	< 0.15	0.15		ppbV	1	1/16/2015 5:18:00 AM
Vinyl Bromide	< 0.15	0.15		ppbV	1	1/16/2015 5:18:00 AM
Vinyl chloride	< 0.15	0.15		ppbV	1	1/16/2015 5:18:00 AM
Surr: Bromofluorobenzene	83.0	70-130		%REC	1	1/16/2015 5:18:00 AM

Qualifiers:

**	Reporting Limit	.	Results reported are not blank corrected
B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected at or below quantitation limits
JN	Non-routine analyte. Quantitation estimated.	ND	Not Detected at the Reporting Limit
S	Spike Recovery outside accepted recovery limits		

Centek Laboratories, LLC

Date: *20-Jan-15*

CLIENT:	Environmental Maintenance Contractors, In	**Client Sample ID:**	SV 3
Lab Order:	C1501024	**Tag Number:**	189,1145
Project:	100-102 Steuben St	**Collection Date:**	1/7/2015
Lab ID:	C1501024-003A	**Matrix:**	AIR

Analyses	Result	**Limit	Qual	Units	DF	Date Analyzed
FIELD PARAMETERS		**FLD**				Analyst:
Lab Vacuum In	-3			"Hg		1/12/2015
Lab Vacuum Out	-30			"Hg		1/12/2015
1UG/M3 BY METHOD TO15		**TO-15**				Analyst: **RJP**
1,1,1-Trichloroethane	< 0.15	0.15		ppbV	1	1/16/2015 6:32:00 AM
1,1,2,2-Tetrachloroethane	< 0.15	0.15		ppbV	1	1/16/2015 6:32:00 AM
1,1,2-Trichloroethane	< 0.15	0.15		ppbV	1	1/16/2015 6:32:00 AM
1,1-Dichloroethane	< 0.15	0.15		ppbV	1	1/16/2015 6:32:00 AM
1,1-Dichloroethene	< 0.15	0.15		ppbV	1	1/16/2015 6:32:00 AM
1,2,4-Trichlorobenzene	< 0.15	0.15		ppbV	1	1/16/2015 6:32:00 AM
1,2,4-Trimethylbenzene	1.3	0.15		ppbV	1	1/16/2015 6:32:00 AM
1,2-Dibromoethane	< 0.15	0.15		ppbV	1	1/16/2015 6:32:00 AM
1,2-Dichlorobenzene	< 0.15	0.15		ppbV	1	1/16/2015 6:32:00 AM
1,2-Dichloroethane	< 0.15	0.15		ppbV	1	1/16/2015 6:32:00 AM
1,2-Dichloropropane	< 0.15	0.15		ppbV	1	1/16/2015 6:32:00 AM
1,3,5-Trimethylbenzene	0.35	0.15		ppbV	1	1/16/2015 6:32:00 AM
1,3-butadiene	< 0.15	0.15		ppbV	1	1/16/2015 6:32:00 AM
1,3-Dichlorobenzene	< 0.15	0.15		ppbV	1	1/16/2015 6:32:00 AM
1,4-Dichlorobenzene	< 0.15	0.15		ppbV	1	1/16/2015 6:32:00 AM
1,4-Dioxane	< 0.30	0.30		ppbV	1	1/16/2015 6:32:00 AM
2,2,4-trimethylpentane	1.0	0.15		ppbV	1	1/16/2015 6:32:00 AM
4-ethyltoluene	0.70	0.15		ppbV	1	1/16/2015 6:32:00 AM
Acetone	79	12		ppbV	40	1/16/2015 7:07:00 AM
Allyl chloride	< 0.15	0.15		ppbV	1	1/16/2015 6:32:00 AM
Benzene	3.6	1.5		ppbV	10	1/15/2015 7:55:00 PM
Benzyl chloride	< 0.15	0.15		ppbV	1	1/16/2015 6:32:00 AM
Bromodichloromethane	< 0.15	0.15		ppbV	1	1/16/2015 6:32:00 AM
Bromoform	< 0.15	0.15		ppbV	1	1/16/2015 6:32:00 AM
Bromomethane	< 0.15	0.15		ppbV	1	1/16/2015 6:32:00 AM
Carbon disulfide	6.4	1.5		ppbV	10	1/15/2015 7:55:00 PM
Carbon tetrachloride	< 0.15	0.15		ppbV	1	1/16/2015 6:32:00 AM
Chlorobenzene	< 0.15	0.15		ppbV	1	1/16/2015 6:32:00 AM
Chloroethane	< 0.15	0.15		ppbV	1	1/16/2015 6:32:00 AM
Chloroform	< 0.15	0.15		ppbV	1	1/16/2015 6:32:00 AM
Chloromethane	0.20	0.15		ppbV	1	1/16/2015 6:32:00 AM
cis-1,2-Dichloroethene	< 0.15	0.15		ppbV	1	1/16/2015 6:32:00 AM
cis-1,3-Dichloropropene	< 0.15	0.15		ppbV	1	1/16/2015 6:32:00 AM
Cyclohexane	1.1	0.15		ppbV	1	1/16/2015 6:32:00 AM
Dibromochloromethane	< 0.15	0.15		ppbV	1	1/16/2015 6:32:00 AM
Ethyl acetate	< 0.25	0.25		ppbV	1	1/16/2015 6:32:00 AM

Qualifiers:

**	Reporting Limit	.	Results reported are not blank corrected
B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected at or below quantitation limits
JN	Non-routine analyte. Quantitation estimated.	ND	Not Detected at the Reporting Limit
S	Spike Recovery outside accepted recovery limits		

Centek Laboratories, LLC

Date: *20-Jan-15*

CLIENT:	Environmental Maintenance Contractors, In	**Client Sample ID:**	SV 3
Lab Order:	C1501024	**Tag Number:**	189,1145
Project:	100-102 Steuben St	**Collection Date:**	1/7/2015
Lab ID:	C1501024-003A	**Matrix:**	AIR

Analyses	Result	**Limit	Qual	Units	DF	Date Analyzed
1UG/M3 BY METHOD TO15		**TO-15**				Analyst: **RJP**
Ethylbenzene	2.6	1.5		ppbV	10	1/15/2015 7:55:00 PM
Freon 11	0.26	0.15		ppbV	1	1/16/2015 6:32:00 AM
Freon 113	< 0.15	0.15		ppbV	1	1/16/2015 6:32:00 AM
Freon 114	< 0.15	0.15		ppbV	1	1/16/2015 6:32:00 AM
Freon 12	0.80	0.15		ppbV	1	1/16/2015 6:32:00 AM
Heptane	6.6	1.5		ppbV	10	1/15/2015 7:55:00 PM
Hexachloro-1,3-butadiene	< 0.15	0.15		ppbV	1	1/16/2015 6:32:00 AM
Hexane	6.6	1.5		ppbV	10	1/15/2015 7:55:00 PM
Isopropyl alcohol	< 0.15	0.15		ppbV	1	1/16/2015 6:32:00 AM
m&p-Xylene	8.7	3.0		ppbV	10	1/15/2015 7:55:00 PM
Methyl Butyl Ketone	< 0.30	0.30		ppbV	1	1/16/2015 6:32:00 AM
Methyl Ethyl Ketone	5.9	3.0		ppbV	10	1/15/2015 7:55:00 PM
Methyl Isobutyl Ketone	0.60	0.30		ppbV	1	1/16/2015 6:32:00 AM
Methyl tert-butyl ether	< 0.15	0.15		ppbV	1	1/16/2015 6:32:00 AM
Methylene chloride	0.28	0.15		ppbV	1	1/16/2015 6:32:00 AM
o-Xylene	2.1	0.15		ppbV	1	1/16/2015 6:32:00 AM
Propylene	< 0.15	0.15		ppbV	1	1/16/2015 6:32:00 AM
Styrene	< 0.15	0.15		ppbV	1	1/16/2015 6:32:00 AM
Tetrachloroethylene	2.5	1.5		ppbV	10	1/15/2015 7:55:00 PM
Tetrahydrofuran	< 0.15	0.15		ppbV	1	1/16/2015 6:32:00 AM
Toluene	18	6.0		ppbV	40	1/16/2015 7:07:00 AM
trans-1,2-Dichloroethene	< 0.15	0.15		ppbV	1	1/16/2015 6:32:00 AM
trans-1,3-Dichloropropene	< 0.15	0.15		ppbV	1	1/16/2015 6:32:00 AM
Trichloroethene	0.24	0.15		ppbV	1	1/16/2015 6:32:00 AM
Vinyl acetate	< 0.15	0.15		ppbV	1	1/16/2015 6:32:00 AM
Vinyl Bromide	< 0.15	0.15		ppbV	1	1/16/2015 6:32:00 AM
Vinyl chloride	< 0.15	0.15		ppbV	1	1/16/2015 6:32:00 AM
Surr: Bromofluorobenzene	84.0	70-130		%REC	1	1/16/2015 6:32:00 AM

Qualifiers:

**	Reporting Limit	.	Results reported are not blank corrected
B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected at or below quantitation limits
JN	Non-routine analyte. Quantitation estimated.	ND	Not Detected at the Reporting Limit
S	Spike Recovery outside accepted recovery limits		

Centek Laboratories, LLC

Date: *20-Jan-15*

CLIENT:	Environmental Maintenance Contractors, In	**Client Sample ID:**	SV 4
Lab Order:	C1501024	**Tag Number:**	1173,1132
Project:	100-102 Steuben St	**Collection Date:**	1/7/2015
Lab ID:	C1501024-004A	**Matrix:**	AIR

Analyses	Result	**Limit	Qual	Units	DF	Date Analyzed
FIELD PARAMETERS		**FLD**				Analyst:
Lab Vacuum In	-2			"Hg		1/12/2015
Lab Vacuum Out	-30			"Hg		1/12/2015
1UG/M3 BY METHOD TO15		**TO-15**				Analyst: **RJP**
1,1,1-Trichloroethane	1.4	0.15		ppbV	1	1/16/2015 7:45:00 AM
1,1,2,2-Tetrachloroethane	< 0.15	0.15		ppbV	1	1/16/2015 7:45:00 AM
1,1,2-Trichloroethane	< 0.15	0.15		ppbV	1	1/16/2015 7:45:00 AM
1,1-Dichloroethane	< 0.15	0.15		ppbV	1	1/16/2015 7:45:00 AM
1,1-Dichloroethene	< 0.15	0.15		ppbV	1	1/16/2015 7:45:00 AM
1,2,4-Trichlorobenzene	< 0.15	0.15		ppbV	1	1/16/2015 7:45:00 AM
1,2,4-Trimethylbenzene	2.0	1.5		ppbV	10	1/15/2015 8:30:00 PM
1,2-Dibromoethane	< 0.15	0.15		ppbV	1	1/16/2015 7:45:00 AM
1,2-Dichlorobenzene	< 0.15	0.15		ppbV	1	1/16/2015 7:45:00 AM
1,2-Dichloroethane	< 0.15	0.15		ppbV	1	1/16/2015 7:45:00 AM
1,2-Dichloropropane	< 0.15	0.15		ppbV	1	1/16/2015 7:45:00 AM
1,3,5-Trimethylbenzene	0.69	0.15		ppbV	1	1/16/2015 7:45:00 AM
1,3-butadiene	< 0.15	0.15		ppbV	1	1/16/2015 7:45:00 AM
1,3-Dichlorobenzene	< 0.15	0.15		ppbV	1	1/16/2015 7:45:00 AM
1,4-Dichlorobenzene	< 0.15	0.15		ppbV	1	1/16/2015 7:45:00 AM
1,4-Dioxane	< 0.30	0.30		ppbV	1	1/16/2015 7:45:00 AM
2,2,4-trimethylpentane	0.41	0.15		ppbV	1	1/16/2015 7:45:00 AM
4-ethyltoluene	1.3	0.15		ppbV	1	1/16/2015 7:45:00 AM
Acetone	6.5	3.0		ppbV	10	1/15/2015 8:30:00 PM
Allyl chloride	< 0.15	0.15		ppbV	1	1/16/2015 7:45:00 AM
Benzene	1.2	0.15		ppbV	1	1/16/2015 7:45:00 AM
Benzyl chloride	< 0.15	0.15		ppbV	1	1/16/2015 7:45:00 AM
Bromodichloromethane	< 0.15	0.15		ppbV	1	1/16/2015 7:45:00 AM
Bromoform	< 0.15	0.15		ppbV	1	1/16/2015 7:45:00 AM
Bromomethane	< 0.15	0.15		ppbV	1	1/16/2015 7:45:00 AM
Carbon disulfide	< 0.15	0.15		ppbV	1	1/16/2015 7:45:00 AM
Carbon tetrachloride	< 0.15	0.15		ppbV	1	1/16/2015 7:45:00 AM
Chlorobenzene	< 0.15	0.15		ppbV	1	1/16/2015 7:45:00 AM
Chloroethane	< 0.15	0.15		ppbV	1	1/16/2015 7:45:00 AM
Chloroform	0.45	0.15		ppbV	1	1/16/2015 7:45:00 AM
Chloromethane	< 0.15	0.15		ppbV	1	1/16/2015 7:45:00 AM
cis-1,2-Dichloroethene	< 0.15	0.15		ppbV	1	1/16/2015 7:45:00 AM
cis-1,3-Dichloropropene	< 0.15	0.15		ppbV	1	1/16/2015 7:45:00 AM
Cyclohexane	0.32	0.15		ppbV	1	1/16/2015 7:45:00 AM
Dibromochloromethane	< 0.15	0.15		ppbV	1	1/16/2015 7:45:00 AM
Ethyl acetate	< 0.25	0.25		ppbV	1	1/16/2015 7:45:00 AM

Qualifiers:

**	Reporting Limit	.	Results reported are not blank corrected
B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected at or below quantitation limits
JN	Non-routine analyte. Quantitation estimated.	ND	Not Detected at the Reporting Limit
S	Spike Recovery outside accepted recovery limits		

Centek Laboratories, LLC

Date: *20-Jan-15*

CLIENT:	Environmental Maintenance Contractors, In	**Client Sample ID:**	SV 4
Lab Order:	C1501024	**Tag Number:**	1173,1132
Project:	100-102 Steuben St	**Collection Date:**	1/7/2015
Lab ID:	C1501024-004A	**Matrix:**	AIR

Analyses	Result	**Limit	Qual	Units	DF	Date Analyzed
1UG/M3 BY METHOD TO15		**TO-15**				Analyst: **RJP**
Ethylbenzene	3.6	1.5		ppbV	10	1/15/2015 8:30:00 PM
Freon 11	0.44	0.15		ppbV	1	1/16/2015 7:45:00 AM
Freon 113	0.10	0.15	J	ppbV	1	1/16/2015 7:45:00 AM
Freon 114	< 0.15	0.15		ppbV	1	1/16/2015 7:45:00 AM
Freon 12	0.78	0.15		ppbV	1	1/16/2015 7:45:00 AM
Heptane	2.6	1.5		ppbV	10	1/15/2015 8:30:00 PM
Hexachloro-1,3-butadiene	< 0.15	0.15		ppbV	1	1/16/2015 7:45:00 AM
Hexane	1.6	0.15		ppbV	1	1/16/2015 7:45:00 AM
Isopropyl alcohol	< 0.15	0.15		ppbV	1	1/16/2015 7:45:00 AM
m&p-Xylene	13	3.0		ppbV	10	1/15/2015 8:30:00 PM
Methyl Butyl Ketone	< 0.30	0.30		ppbV	1	1/16/2015 7:45:00 AM
Methyl Ethyl Ketone	2.1	0.30		ppbV	1	1/16/2015 7:45:00 AM
Methyl Isobutyl Ketone	0.58	0.30		ppbV	1	1/16/2015 7:45:00 AM
Methyl tert-butyl ether	< 0.15	0.15		ppbV	1	1/16/2015 7:45:00 AM
Methylene chloride	< 0.15	0.15		ppbV	1	1/16/2015 7:45:00 AM
o-Xylene	3.2	1.5		ppbV	10	1/15/2015 8:30:00 PM
Propylene	< 0.15	0.15		ppbV	1	1/16/2015 7:45:00 AM
Styrene	< 0.15	0.15		ppbV	1	1/16/2015 7:45:00 AM
Tetrachloroethylene	3.8	1.5		ppbV	10	1/15/2015 8:30:00 PM
Tetrahydrofuran	< 0.15	0.15		ppbV	1	1/16/2015 7:45:00 AM
Toluene	16	1.5		ppbV	10	1/15/2015 8:30:00 PM
trans-1,2-Dichloroethene	< 0.15	0.15		ppbV	1	1/16/2015 7:45:00 AM
trans-1,3-Dichloropropene	< 0.15	0.15		ppbV	1	1/16/2015 7:45:00 AM
Trichloroethene	0.12	0.15	J	ppbV	1	1/16/2015 7:45:00 AM
Vinyl acetate	< 0.15	0.15		ppbV	1	1/16/2015 7:45:00 AM
Vinyl Bromide	< 0.15	0.15		ppbV	1	1/16/2015 7:45:00 AM
Vinyl chloride	< 0.15	0.15		ppbV	1	1/16/2015 7:45:00 AM
Surr: Bromofluorobenzene	96.0	70-130		%REC	1	1/16/2015 7:45:00 AM

Qualifiers:

**	Reporting Limit	.	Results reported are not blank corrected
B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected at or below quantitation limits
JN	Non-routine analyte. Quantitation estimated.	ND	Not Detected at the Reporting Limit
S	Spike Recovery outside accepted recovery limits		

Centek Chain of Custody

Centek Laboratories
Air Quality Testing - It's a Gas
www.CentekLabs.com

143 Midler Park Drive
Syracuse, NY 13206
315-431-9730
www.CentekLabs.com

Vapor Intrusion & IAQ

Site Name: 100-102 STEUBEN ST.
Project: BROOKLYN, NY
PO#:
Quote # Q- 1898/130 4780
Other:

Detection Limit	Report Level
☐ 5ppbv	☐ Level I
☑ 1ug/M3	☐ Level II
☐ 1ug/M3 +TCE .25	☐ Cat "B" Like

Turnaround Time:	Check One	Rush TAT Surcharge %	Due Date:
5 Business Days	☑	0%	
4 Business Days	☐	25%	
3 Business Days	☐	50%	
2 Business Days	☐	75%	
Next Day by 5pm	☐	100%	
Next Day by Noon	☐	150%	
Same Day	☐	200%	

Company: EMC
Report to: RICHARD STUMBO
Address: 5 ANDERSON LANE
City, State, Zip GOLDENS BRIDGE, NY 10526
Email: admin@enviromain.com
Phone: 914-232-7355

Company:
Check Here If Same: ☑
Invoice to:
Address:
City, State, Zip
Email:
Phone:

Sample ID	Date Sampled	Canister Number	Regulator Number	Analysis Request	Comments	Vacuum Start/Stop
SV1	1/7/2015	133	1126	TO-15	TIME START: 1220/STOP: 1429	-30/-2
SV2	↓	1186	1114	↓	↓ START: 1237/STOP: 1438	-29/0
SV3	↓	189	1145	↓	↓ START: 1250/STOP: 1450	-30/-3
SV4	1/7/2015	1173	1132	TO-15	TIME START 1316/STOP: 1516	-29/0

Chain of Custody	Print Name	Signature	Date/Time	Courier: CIRCLE ONE
Sampled by:	FRANCIS CIRIACO		1/7/15: 3:30	FedEx UPS Pickup/Dropoff
Relinquished by:				For LAB USE ONLY
Received at Lab by:	Jan Scala		1715	Work Order # C1501024

*** By signing Centek Labs Chain of Custody, you are accepting Centek Labs Terms and Conditions listed on the reverse side.

Appendix 2

EMC Health and Safety Plan

HEALTH AND SAFETY PLAN

98-102 Steuben Street
Brooklyn NY
Block 1893, Lot 47

January 22, 2015

Prepared by:
Environmental Maintenance Contractors, Inc.
5 Anderson Lane, Goldens Bridge,
New York 10526

TABLE OF CONTENTS

Attachment:

- Directions and Map to the nearest Medical Facility –
  The Brooklyn Hospital Center 121 DeKalb Avenue, Brooklyn NY 11201

1.0 INTRODUCTION

This project involves the installation of four (4) soil vapor probes and collection of four (4) soil vapor samples at 98-102 Steuben Street, Brooklyn NY, hereafter referred to as the "Subject Site".

1.1 Scope and Applicability of the Site Health and Safety Plan

This health and safety plan (HASP) sets forth the basic requirements that will be observed at the site. This plan provides for the control of contaminants that may have health and environmental implications for the surrounding community and for the personal safety of all personnel concerned with this project.

The implementation of the HASP will be dictated by the assigned Health and Safety Officer (HSO) who will continually assess potential hazards and their risks at the Subject Site. These observations will be supplemented by performing on site screening/testing and as appropriate laboratory data/analytical results from sampling events to determine what necessary health and safety measures should be taken to insure the health and safety of all personnel on and off the Subject Site.

The basis for this HASP is provided in the following regulations and guidelines: The Occupational Safety and Health Administration (OSHA) Standards and Regulations contained in Title 29, Code of Federal Regulations, Parts 1910 and 1926 (29 CFR 1910 and 1926);

Subsequent additions and/or modifications, the New York State Labor Law Section 876 (Right-To-Know-Law);

The Interim Standard Operating Safety Guidelines by the United States Environmental Protection Agency and the Office of Emergency and Remedial Response; Additional OSHA regulations; National Institute for Occupational Safety and Health (NIOSH) pocket guide; and The American Conference of Governmental Industrial Hygienists (ACGIH) handbook.

The health and safety of the public and project personnel and the protection of the environment will take precedence over cost and schedule considerations for all work at the Subject Site. Any additional costs will only be considered after the cause for suspension of operations is addressed and work is resumed. The owner/client will be kept appraised by the site Health and Safety Officer (HSO) of the conditions that may adversely affect the health and safety of project personnel and the community. The final authority for stopping or starting work for health and safety reasons rests with the HSO.

The overall objectives of the HASP are:

- To maintain safe working conditions at all times;
- To protect the public (i.e. passersby);
- To protect the environment.

To meet these objectives, all site-personnel should adhere to and fully comply with the health and safety policies set forth by this plan during activities that may result in coming in direct contact with potentially contaminated materials. The requirements included within this HASP include **the minimum** requirements necessary to minimize the potential health hazards, which may occur upon exposure to contaminated materials. **This HASP will be revised as necessary to meet any changes in site conditions.**

The HSO will insure that these objectives are attained.

1.2 Definitions

The following definitions will apply to this HASP:

"Site" - Site means that area utilized by workers and equipment to perform the duties as specified in the contract.

"Project" - The project will be defined as the site and all work areas.

"Contractor" - The contractor includes all persons including the Contractor's and Subcontractor's personnel employed on-site.

"HSO" - The competent person (as defined by OSHA) or person(s) responsible for health and safety considerations and who will oversee the compliance of all persons on the site with this HASP.

"Visitor" - Visitors are all personnel other than those defined On-Site Personnel. The HSO has primary responsibility on determining who is qualified and may enter the site.

"Work" - Work includes all labor, materials, and other items that are shown, described, implied and/or required in the performance of the Contract and include all extra and additional work that may be ordered.

"Hazardous Work Zone (Dirty Area)" - Any portion of the project in which hazardous substances are present, or may be reasonably suspected to be present in the air, concrete, or any other surfaces within the boundaries of the Work Area.

"Contamination Reduction Zone (CRZ)" - This is a transition area between the Hazardous Work Area and Clean Zone which provides a transition between contamination and clean areas.

"Clean Zone" - Any portion of the site not contaminated. Support equipment is located in this area.

"Monitoring" - The use of instrumentation to provide information indicating possible levels of contamination present at the site. Monitoring will be conducted to evaluate employee exposures to toxic materials and hazardous conditions.

"HASP" - The approved Health and Safety Plan.

"Work Plan" - The overall means by which the objective of the project will be accomplished. This item will identify milestone objectives.

1.3 Statement of Policy

Safety is a job requirement for work conducted at the Subject Site. This HASP applies to any and all operations performed by companies participating on the site, including:

a. Those engaged in activities involving contaminated soil or fill materials (i.e. excavation, shoring, etc.);

b. All operations in support of project activities (maintenance, management, clerical, etc.).

It is understood that activities at the site will not be permitted if they are considered unsafe or in non-compliance with established safety procedures (i.e. OSHA, NYS Department of Labor, etc.).

The purpose of this HASP is to insure that the proper protective measures are taken throughout the duration of the site project. **This is a "living" document that will be revised and amended / revised as conditions at the Subject Site dictate.** All persons reading this document should be aware of any attachments and or amendments and will be required to read and understand this document and any attachment and or amendments / revisions. The requirements within this HASP include the minimum requirements necessary to maintain safe working conditions.

2.0 IDENTIFICATION OF KEY HEALTH AND SAFETY PERSONNEL

The elements of management commitment and employee involvement are complementary and form the core of any HASP. Management's commitment provides the motivating force and the resources for organizing and controlling activities. Employee involvement provides the means by which workers develop a commitment to safety for themselves and for their fellow workers.

In order to ensure success, this HASP shall be carried out as designed. Responsibilities by job function (management, superintendents, and workers) are assigned as described below:

2.1 Executive Responsibilities

As a part of the cooperative effort to reduce personal injury, executives shall supervise and assist in the continuing development of a practical and effective HASP. Overall site safety supervision will be the responsibility of the Health and Safety Officer (HSO). On site safety supervision will be performed by the assigned Project Manager / Competent Person.

Executives shall:

Be ultimately responsible for the safety of employees engaged in any and all operations.

Insist that all supervisory personnel assume responsibility for enforcing all the provisions of the HASP.

Verify that any changes in operation are reviewed to consider the impact on employee safety prior to commencement. If a procedure is added or amended which is unique to proposed project operations or if it presents/anticipates exposures not normally encountered within the scope of normal operations then specific safety guidelines will be promulgated in writing, addressing each safety issue. These site-specific items will be incorporated into and become a part of this HASP.

Actively analyze work on hand, and any change in operation so as to try to anticipate, identify and prevent hazardous conditions.

Make available and strictly enforce the use of personal protective equipment (PPE). This includes, but is not necessarily limited to, hard hats, safety vests, hearing protection, safety glasses, face shields, and respirators.

Keep required records on site including but not necessarily limited to:

OSHA Standards, State Safety Codes and other safety materials
Job site Safety Bulletin Board displaying safety posters, pamphlets, letters, etc.

OSHA poster #2203 *Job Safety and Health Protection*

Emergency phone numbers including 911, local hospitals and fire departments

A basic map of the site

Master OSHA Form No. 300 *Log and Summary of Occupational Injuries and Illnesses*

Master OSHA Form No. 101 *Supplementary Record of Occupational Injuries and Illnesses*

A copy of the written hazardous communication program and all Material Safety Data Sheets, including a list of all hazardous chemicals projected to be on site

Appropriate warning signs (Hard Hat Area, No Trespassing, Danger, Caution, etc.)

Maintain a written record of safety inspections and reports with note of corrective actions, if necessary.

Provide each job with approved first aid kits.

Provide safety training for Project Managers and or Competent Persons.

Ensure that union employees, as applicable, have been properly trained by their individual union's safety training expert.

2.2 Project Manager and Competent Person Responsibilities

The Project Manager(s) and or Competent Person is an integral part of work safety. The amount of effort they put into accident prevention on their daily assignments helps determine whether or not a good accident record is established. It shall be the immediate on site responsibility of the Project Manager(s) to see that planned safety is observed by complying with all provisions of this HASP.

Project Managers shall:

Ensure that the entire scope of the HASP is actively and aggressively carried out.

Investigate all accidents/injuries as thoroughly as possible. Promptly fill out, in its entirety, an accident Investigation Report and OSHA No. 300 and forward them to executives within 48 hours after any incident. For every illness or injury entered on the log, it is necessary to record additional information on the supplementary record, OSHA No. 101, within 6 workdays after the incident.

Encourage workers to report unsafe acts/conditions as soon as they are detected.

Ensure availability and use of all necessary PPE and first aid materials.

Review equipment for safe use (i.e. extension cord condition, ladder stability, etc.).

Make it a standard practice to continually look for unsafe acts and document what was found and how the problem was addressed and corrected.

Continually acquaint workers with all applicable safety standards inherent with their job.

Post proper informational notification on site (i.e. hard hat signs, etc.).

Accompany any and all outside agencies making an inspection of the site and make immediate responses to their recommendations.

Ensure that only employees qualified by training or experience are allowed to operate equipment and machinery.

Contact the local fire department and/or other emergency response organizations (police, HazMat Teams, etc.) to notify them of the company emergency response plan, including the circumstances or conditions under which outside responders will provide emergency response to the facility.

2.3 Employee Responsibilities

The effectiveness of the HASP depends upon the active participation and sincere cooperation of all employees, and the coordination of their efforts in carrying out the following basic responsibilities:

Employees shall:

Review and adhere to all aspects of this HASP. **Employees will sign a form attesting that they have received and understand the HASP, and will submit this form to management to be placed in a personnel file.**

Refrain from committing any unsafe acts or permitting any unsafe conditions, which places oneself or any other worker in jeopardy. Report any unsafe situation to one's immediate supervisor.

Use all personal protection devices that are provided.

Work fully dressed. At minimum, long pants, shirts that cover the shoulder, and sturdy, steel-toed work boots or shoes ("Level D" protection) are required. Hard hats are required for all field operations. During removal operations, "Level C" protection is required.

Safety goggles, glasses, face shields or a combination of them are required for tasks such as grinding, chipping, burning, drilling or welding.

Report all accidents/injuries to his immediate supervisor, no matter how minor or inconsequential it may be. Be aware of the location of all emergency telephone numbers, including a telephone, in the event of an emergency.

Be responsible for knowing the safe operating limitations for tools/equipment. Never operate any tool or piece of equipment for which he is not certified (if certification is applicable) nor trained for in its safe and proper use.

Be responsible for inspecting all equipment (i.e., hand tools) prior to use. Defective tools/equipment should be tagged for repair (using red tags), or disposed of.

Under no circumstance bring alcohol or any controlled substance to the job site. Workers will not be permitted at a job site if anyone arrives in an

intoxicated state or under the influence of a controlled substance. This restriction also includes any medication, whether over-the-counter or given under the direction of a doctor, which alters or otherwise inhibits the ability to perform a job safely (both to oneself and one's coworkers).

Be responsible for keeping the work area clean and free of unnecessary debris that may create a hazard.

2.4 Health and Safety Officer

The HSO at a minimum will:

Be responsible for the implementation, enforcement, monitoring and revision to the HASP; and

Be responsible for the health and safety briefing for all on-site personnel with regard to the HASP and other safety requirements to be observed during work, including potential hazards, personal hygiene principles, personnel protective equipment (PPE), respiratory protection equipment usage and emergency procedures dealing with fire and medical situations; and

Be responsible for the maintenance of the separation between the "Hazardous Work Zone" and the "Clean Zone" areas described; and

Be responsible for designating assistants for the implementation of the HASP.

2.5 Visitors / Vendors

All visitors / vendors shall comply with all rules and regulations set forth in the Health and Safety Plan and shall be escorted at all times while on the project site.

Before project work is scheduled to commence, a conference will be held at the project Site for the purpose of reviewing contract documents, discussing requirements for the work, and reviewing work procedures.

3.0 GENERAL HEALTH AND SAFETY RULES

The construction industry varies from plant to plant in size, type of work performed, and processes used, but operations are similar and occupational safety problems are also similar. The leading safety hazards at work sites are:

Accidents
An accident is an unplanned event that has undesirable consequences. The fact that accidents are caused and can be prevented is the key to operating a safe work site. Accidents have multiple causes, but all of them can be controlled.

Site personnel should constantly look out for potential safety hazards and should immediately inform their supervisors of any new hazards so that preventive action can be taken.

Slips, Trips and Falls
16% of construction fatalities are the result of falls. These are often not falls from great height. Causes of slips, trips and falls include:

Holes, ditches or uneven terrain and mud

Walking on precariously positioned objects

Slippery or unstable surfaces

Unstable surfaces

Scaffolds and ladders

Heavy Equipment and Excavation
35% of construction fatalities are caused by motor vehicles and heavy equipment.

Material Handling
OSHA requires that "storage of materials shall not create a hazard".

Machine Guarding
Guarding is important in protecting persons from the hazards associated with operating machinery.

Electrical
Downed power lines or improper use of electrical equipment pose electrical hazards on job sites. Shock is the primary hazard from electrical tools. Electrical shock may cause death, burns, or falls that lead to serious injury.

It is essential to establish the "safety first" principle when performing any job or task. This section is a handy guide, in alphabetical order, for worker protection requirements during construction work at the Demolition Project. Bracketed items represent the OSHA construction and general industry standard, if applicable. These standards are not to be considered as "all inclusive", but rather as general guidelines.

Asbestos [29 CFR 1910.12]
The employer shall ensure that no employee is exposed to an airborne concentration of asbestos in excess of 1.0 fiber per cubic centimeter of air (1 f/cc) as averaged over a sampling period of (30) thirty minutes.

On multi-employer work sites, the employer shall inform the other employers of the nature of the work with asbestos, the requirements pertaining to regulated areas and the measures to be taken to ensure that employees are not exposed to asbestos.

All persons entering a regulated area where employees are required to wear respirators shall be supplied with a respirator providing the appropriate level of protection. See Section 5 for Personnel Protection Equipment and Levels of Protection.

Employees shall not eat, drink, smoke, chew tobacco or gum, or apply cosmetics in the regulated area.

Exposure monitoring is required to determine airborne concentrations of asbestos to which employees may be exposed.

Cables, Slings, and Hooks
Use only cables, chains, ropes, blocks and similar tackle of sufficient size and strength to safely raise, lower, or sustain the loads for which they are intended.

Do not use hooks that are deformed from over loading. Report them immediately to a supervisor for replacement.

Inspect sheaves and blocks frequently and keep them well lubricated.

Never weld on a hook. Proper latching of the hook must be down so that it in no way damages the hook.

Report to a supervisor for repair or replacement any sheaves that are worn, chipped, or otherwise defective.

Do not use wire cables with sheaves and blocks that are designed for use with manila rope.

Cables and blocks used to change the direction of cables, located near any floor or in close proximity to any working area, should be enclosed or effectively guarded against accidental contact by workers.

Bring to the attention of your supervisor any cable that is kinked, badly rusted or damaged.

Be sure that three full turns of cable are left on drums at all times.

Chutes [29 CFR 1926.850]
No material shall be dropped to any point lying outside the exterior walls of the structure unless the area is effectively protected.

When not in operation, the end of a chute shall be securely closed off.

Where material is dumped from mechanical equipment or wheelbarrows, a securely attached toeboard or bumper shall be provided at each chute opening.

Chutes shall be designed and constructed so as to prevent failure due to impact of materials or debris.

Compressed Gas Cylinders [29 CFR 1926.302; 29 CFR 1910.169]
Valve protection caps must be secured in place when compressed gas cylinders are transported, moved, or stored.

Cylinder valves must be closed when work is finished and when cylinders are empty or are moved.

Compressed gas cylinders shall be secured in an upright position at all times, and shall not be dropped or struck.

When cylinders are hoisted, they shall be secured on a cradle or pallet.

Cylinders shall be kept as far away as possible from actual welding or cutting operations.

Cylinders must be placed where they cannot become part of an electrical circuit.

Cylinders must be properly labeled.

Concrete and Masonry Construction [29 CFR 1926.701-706]
All exposed reinforcing steel must be bent or covered to prevent impalement or injury to workers.

Employees are prohibited from riding concrete buckets or working under the buckets while the buckets are being elevated or lowered into position. Whenever practical, elevated buckets must be routed so that the fewest possible employees are exposed to the danger of falling buckets.

Forms and shores (except those used for slabs on grade and slip forms) must not be removed until a competent person determines that the concrete has gained sufficient strength to support its weight and superimposed loads.

Rebar must be neatly stockpiled to prevent tripping and falling due to poor housekeeping.

Gloves must be worn while tying and placing rebar.

Burning goggles must be worn while burning/cutting rebar.

Confined Spaces [29 CFR 1926.800]
Unauthorized entry into confined spaces (i.e. tanks, vessels, sump pits, etc.) poses unexpected risks due to the lack of ventilation and probability of aqueous contaminants in them.

A confined space shall never be entered alone. Entry into a confined space shall only be as prescribed in a "Confined Space Entry" program that meets with federal, state, and local codes.

Pre-Entry Briefing and Entry Permit
Prior to entry into a confined space, information required for the confined space entry must be discussed by means of a safety briefing with ALL personnel entering AND assisting in the confined space entry procedure. The safety briefing will involve the following topics:

- Purpose for entering the confined space and objectives (i.e. sampling to determine contents, decontamination of vessel, etc.).
- Chemical hazards present or believed to be present at the site.
- State of chemical hazard (liquid, impregnated concrete, etc.) and review Material Safety Data Sheets (MSDSs) for the chemicals.

- Chemicals to be used in the decontamination process (i.e. cleaning compounds, solutions) and review MSDSs for the chemicals.
- PPE Level required for chemical concentrations present.
- Asbestos Hazards present or believed to be present at the site.
- Type and nature of the asbestos containing material (i.e. electrical wire insulation, asbestos cement piping, etc.). and review specific methods required for handling the types of asbestos.
- Lead Hazards present or believed to be present at the site.
- Type and nature of the lead containing material (i.e. paints, contaminated soils or water, miscellaneous lead containing materials, etc.) and review specific methods required for handling the lead.
- Physical hazards present or believed to be present at the site.
- Other hazards specific to the site.
- Responsibilities of all persons who are part of the confined space entry team.
- Personnel safety equipment to be used for the procedure.
- Site specific safety equipment required for the procedure.

Ventilation of Confined Space

Forced ventilation of confined spaces is required when the following conditions exist:

- Combustible gas levels have been detected.
- Oxygen level is beyond the range of 19.5 to 22%.
- Toxic levels are found in excess of allowable concentrations.
- Organic solvents are to be used in the confined space.
- The manhole is located in a heavy vehicular usage area and/or is subject to gas seepage.

Prior to entering the confined space, the utility company must inspect the area to determine if any defective conditions exist. If defective conditions do exist, they must be corrected prior to entering the area.

All liquid shall be removed from the confined space prior to additional work or entry.

Persons in the entry team other than those persons entering the confined space will provide support services. Included in the responsibility of the support personnel are:

- Maintain communication with workers entering the confined space.
- Monitor the atmosphere in the confined space
- Initiate rescue operations as needed.
- Work in same PPE as those in confined space with the exception of respiratory protection.
- Respiratory protection will be the next highest level of those persons working within the confined space.

Cranes and Hoists [29 CFR 1926.550]

All personnel hoists used by employees shall be constructed of materials and components which meet the specifications for materials, construction, safety devices, assembly, and structural integrity as stated in the American National Standard A10.4-1963, Safety Requirements for Workmen's Hoists.

Rated load capacities, recommended operating speeds, and special hazard warnings or instructions must be posted on all equipment. Instructions or warnings must be visible from the operator's station.

Equipment must be inspected by a competent person before each use and during use, and all deficiencies corrected before further use. Annual documented inspections must be performed to "certify crane."

Serial numbers on the rating chart and equipment must match.

Accessible areas within the swing radius of the rear of the rotating superstructure must be properly barricaded to prevent employees from being struck or crushed by the crane.

The use of a crane or derrick to hoist employees on a personnel platform is prohibited, except when the erection, use, and dismantling of conventional means of reaching the worksite would be more hazardous.

Hoisting ropes should be installed in accordance with the wire rope manufacturer's recommendations. Wire rope should be removed from service when there is any detectable damage or excessive wear on the ropes.

Internal combustion engines shall not be permitted for direct drive.

Demolition [29 CFR 1926.850]

Prior to permitting employees to start demolition operations, an engineering survey shall be made, by a competent person, of the structure to determine the condition of the framing, floors, and walls, and possibility of unplanned collapse of any portion of the structure. Any adjacent structure where employees may be exposed shall also have in writing evidence that such a survey has been performed.

Utility companies shall be notified in advanced, and all utilities and service lines shall be shut off, capped, or otherwise controlled, outside the building line before demolition work is started. If it is necessary to maintain any power, water or other utilities during demolition, such lines shall be temporarily relocated, and protected.

Any type of hazardous chemicals, gas, explosives, flammable materials, or similarly dangerous substances used in any pipes, tanks, or other equipment on the property shall be eliminated before demolition is started.

All openings in floors not used as material drops or chutes shall be covered and protected so as not to be a fall hazard to employees.

Demolition of exterior walls and floor construction shall begin at the top of the structure and proceed downward.

Employee entrances to multistory structures shall be completely protected by sidewalk sheds or canopies, providing protection from the face of the building for a minimum of 8 feet.

Electrical - Installations/Grounding &Work Practices [29 CFR 1926.402 - 404, 416, 417]
Pre-work considerations should include identification of wiring faults in the building including locating open ground paths, reverse wiring polarity, and hot-neutral or hot-ground wires reversed. These common faults can be identified with plug-in type circuit testers and should be corrected prior to the start up of the project. This is particularly important if these circuits will be used to provide power inside the work area.

Electrical installations must be provided with ground-fault circuit interrupters (GFCI).

Regularly ensure that all electrical equipment is properly grounded. Check for the ground pins on plugs. These checks should be made while setting up and regularly during the job.

De-energize as much equipment as possible. Use portable floodlight systems for lighting and regularly check the systems and wiring for damage.

Determine operating voltages of equipment and lines before working on or near energized parts. Electrical equipment and lines should be considered energized unless tested and determined otherwise.

Energized parts must be insulated or guarded from employee contact and any other conductive object.

Utilize "hot-line" covers over energized cables and power lines when possible.

Equipment or circuits that are de-energized shall be rendered inoperative and must have tags attached at all points where the equipment or circuits could be energized.

Avoid stringing electrical wiring across floors. Elevate wiring if possible to keep it away from any contaminated or conductive material which may be on the floor and damage from foot traffic, ladders and rolling scaffolds.

Ensure that all electrical outlets are tightly sealed and taped to avoid water spray.

Supply workers with heavily insulated rubber boots and/or gloves when working around energized wiring or equipment.

Extension cords must be of the three-wire type (with ground plug).

Worn or frayed electrical cords (extension cords, power tool cords, etc.) must not be used. They must be removed from service and tagged "Out of Service" until repaired by a competent employee or discarded from use.

Extension cords must not be fastened with staples, hung from nails, or suspended by wire.

In work areas where the exact location of underground electrical power lines is unknown, employees using jack hammers, bars, or other hand tools that may contact the lines shall be protected by insulating gloves.

Barriers or other means of guarding shall be used to ensure that workspace for electrical equipment will not be used as a passageway during periods when energized parts of equipment are exposed.

When working near power lines, be sure to allow proper clearance for personnel and equipment.

Portable electric hand tools should be double insulated and equipped with a three-wire cord having a ground wire permanently fixed to the tool frame.

Use the guards provided for all power tools. Do not use any equipment if the guard is defective, broken or missing.

Non-metallic tools should be used for scraping to prevent a possible shock if wiring is cut or contact is made with energized equipment.

Utilize stable wooden or fiberglass ladders - not metal.

Exit [29 CFR 1910.35]
Every exit shall be clearly visible or the route to reach it shall be conspicuously indicated in such a manner that every occupant of every structure will readily know the direction of escape from any point.

Fall Protection [29 CFR 1926.500-503]
A training program shall be provided for each employee exposed to fall hazards.

Personal Fall Arrest systems (PFAs) will be issued and worn when work is being performed at a height above 6 feet. Employees shall be protected by the use of guardrails, safety net systems, or personal fall arrest systems.

A Competent Person shall monitor the safety of other employees including, but not limited to:

- recognizing fall hazards;
- warning employees of a fall hazards or making employees aware of unsafe actions; and
- maintaining oral communication communicate orally with employees.

The safety monitor shall not have other responsibilities which could take his / her attention from the monitoring function.

Toe boards may be used to protect employees from falling objects.

The work area should be kept clear of excess materials and debris.

If an employee falls, or a serious incident occurs, the employer shall investigate the circumstances of the incident to determine if the fall protection plan needs to be changed (e.g. new practices, procedures, or training) and shall implement those changes to prevent similar types of falls or incidents.

Fire Protection [29 CFR 1926.150]
Firefighting equipment shall be conspicuously located and readily available at all times, must be inspected monthly and must be maintained in operating condition.

A fire extinguisher shall be placed in each piece of heavy equipment / vehicle.

An alarm system at the worksite shall be established so that employees and the local fire department can be alerted for an emergency.

Gases and Fumes / Ventilation [29 CFR 1926.55, 57]
Exposure to toxic gases and fumes shall be monitored to ensure that levels are kept below OSHA Permissible Exposure Limits (PELs).

PPE must be used to keep the exposure of employees to air contaminants below OSHA PELs. A technically qualified person must first approve any equipment used for this purpose.

Exhaust systems (exhaust fans, jets, ducts, hoods, etc.) shall be designed, constructed, and operated to ensure a maintained volume and velocity of exhaust air sufficient to gather dusts and fumes, vapors or gases; preventing dispersion in harmful quantities into the atmosphere where employees work.

The exhaust system shall continually operate during all operations that produce fumes, vapors, or gases.

Hazard Communication [29 CFR 1926.59]
The purpose of this standard is to ensure that the hazards of all chemicals produced or imported are evaluated, and that information concerning their hazards is transmitted to employers and employees. This transmittal of information must be accomplished by means of Hazard Communication Programs, which include container labeling and other forms of warning, Material Data Safety Sheets (MSDS), and employee training.

Each container of hazardous chemicals in the workplace should be labeled, tagged, or marked with the identity of the hazardous chemicals contained therein; and must show hazard warning appropriate for employee protection.

An MSDS will be obtained from the chemical manufacturer for each hazardous chemical and made available to employees for review. MSDSs will be kept on file at Corporate Headquarters with appropriate copies on site.

Heat Disorder and Health Effects

Heat Stroke occurs when the body's system of temperature regulation fails and body temperature rises to critical levels. This condition is caused by a combination of highly variable factors, and its occurrence is difficult to predict. Heat stroke is a medical emergency. The primary signs and symptoms of heat stroke are confusion; irrational behavior; loss of consciousness; convulsions; a lack of sweating (usually); hot, dry skin; and an abnormally high body temperature, e.g., a rectal temperature of 41°C (105.8°F). If body temperature is too high, it causes death. The elevated metabolic temperatures caused by a combination of work load and environmental heat

load, both of which contribute to heat stroke, are also highly variable and difficult to predict.

If a worker shows signs of possible heat stroke, professional medical treatment should be obtained immediately. The worker should be placed in a shady area and the outer clothing should be removed. The worker's skin should be wetted and air movement around the worker should be increased to improve evaporative cooling until professional methods of cooling are initiated and the seriousness of the condition can be assessed. Fluids should be replaced as soon as possible. The medical outcome of an episode of heat stroke depends on the victim's physical fitness and the timing and effectiveness of first aid treatment.

Regardless of the worker's protests, no employee suspected of being ill from heat stroke should be sent home or left unattended unless a physician has specifically approved such an order.

Heat Exhaustion symptoms include headache, nausea, vertigo, weakness, thirst, and giddiness. Fortunately, this condition responds readily to prompt treatment. Heat exhaustion should not be dismissed lightly, however, for several reasons. One is that the fainting associated with heat exhaustion can be dangerous because the victim may be operating machinery or controlling an operation that should not be left unattended; moreover, the victim may be injured when he or she faints. Also, the signs and symptoms seen in heat exhaustion are similar to those of heat stroke, a medical emergency. Workers suffering from heat exhaustion should be removed from the hot environment and given fluid replacement. They should also be encouraged to get adequate rest.

Heat Cramps are usually caused by performing hard physical labor in a hot environment. These cramps have been attributed to an electrolyte imbalance caused by sweating. It is important to understand that cramps can be caused by both too much and too little salt. Cramps appear to be caused by the lack of water replenishment. Because sweat is a hypotonic solution (±0.3% NaCl), excess salt can build up in the body if the water lost through sweating is not replaced. Thirst cannot be relied on as a guide to the need for water; instead, water must be taken every 15 to 20 minutes in hot environments.

Under extreme conditions, such as working for 6 to 8 hours in heavy protective gear, a loss of sodium may occur. Recent studies have shown that drinking commercially available carbohydrate-electrolyte replacement liquids is effective in minimizing physiological disturbances during recovery.

Heat Collapse ("Fainting"). In heat collapse, the brain does not receive enough oxygen because blood pools in the extremities. As a result, the exposed individual may lose consciousness. This reaction is similar to that of heat exhaustion and does not affect the body's heat balance. However, the onset of heat collapse is rapid and unpredictable. To prevent heat collapse, the worker should gradually become acclimatized to the hot environment.

Heat Rashes are the most common problem in hot work environments. Prickly heat is manifested as red papules and usually appears in areas where the clothing is restrictive. As sweating increases, these papules give rise to a prickling sensation. Prickly heat occurs in skin that is persistently wetted by un-evaporated sweat, and heat rash papules may become infected if they are not treated. In most cases, heat rashes will disappear when the affected individual returns to a cool environment.

Heat Fatigue. A factor that predisposes an individual to heat fatigue is lack of acclimatization. The use of a program of acclimatization and training for work in hot environments is advisable. The signs and symptoms of heat fatigue include impaired performance of skilled sensorimotor, mental, or vigilance jobs. There is no treatment for heat fatigue except to remove the heat stress before a more serious heat-related condition develops.

Housekeeping [29 CFR 1926.25]
Lumber with protruding nails and all other debris must be cleared from all work areas.

Keep work areas as clean as possible. Aisles, walkways and work areas must remain clean and clear of debris at all times.

Combustible scrap and debris shall be removed at regular intervals.

Lockout - Tagout Clearance [29 CFR 1926.417]
Prior to starting any major operation that would involve locking and tagging procedures, a meeting must be set up to discuss specific procedures that must be adopted and reviewed by all concerned with the operation.

Circuits to be de-energized should be clearly identified and isolated from all energy sources.

Notification should be received from a designated employee that all switches and disconnectors that could supply energy have been de-energized, locked out, and plainly tagged so that they are visible to the workers.

Visual inspections and tests should be made to assure de-energizing of lines and equipment.

Protective grounds should be applied to disconnected lines and equipment.

Separate tags and lockouts should be attached for each crew requiring de-energizing of same line or equipment.

Tags should not be removed from completed work until designated employees report that all crew members are clear and protective grounds have been removed.

Material Handling and Storage [29 CFR 1926.857]
Manual handling of materials must be done carefully and properly.

When storing materials, adequate access shall be provided. Do not block aisles or exits.

Flammable or toxic materials shall be stored in properly designated, well-ventilated areas. Observe and abide by "No Smoking" and other warning signs.

Workers shall not attempt to lift heavy loads without assistance.

When pulling and prying objects, workers shall be properly positioned and balanced.

Materials and supplies shall be neatly and securely stacked, blocked, interlocked, and limited in height so as to be stable and in no danger of collapsing, sliding, or falling over, and secured from lifting and blowing in high winds. Incompatible materials must be segregated.

The storage of waste material and debris on any floor shall not exceed the allowable floor loads.

Storage space into which material is dumped shall be blocked off, except for openings necessary for the removal of material. Such openings shall be kept closed at all times when material is not being removed.

Motor Vehicles [29 CFR 1926.600, 601]
All vehicles in use shall be checked at the beginning of each shift to assure that all parts, equipment, and accessories that effect safe operation are in proper operating condition.

A motor vehicle having an obstructed rear view should not be used unless the vehicle has a reverse signal alarm, or the vehicle is backed up only when an observer signals that it is safe to do so.

All drivers will be properly trained in the use of the vehicles and will have valid Operator's Licenses. Employees will notify EMS in the event of a change in their license status.

Personal Protective Equipment (PPE) [29 CFR 1926.28, 104, 106; 1910.132, 136]
PPE (hard hats, hearing protection, face/eye protection, welders' goggles, safety lines, respirators, etc.) must be worn where the potential of exposure exists. Any employee who willfully refuses to use the prescribed PPE designed to protect him/her or willfully damages such equipment shall be subject to disciplinary action including immediate removal from the job site.

All employees will be trained in the proper use of PPE, and will receive any necessary approvals prior to usage (i.e. respirator - pulmonary test). See section 5.0 for PPE and levels of protection.

Scaffolds [29 CFR 1926.451; 1910.28, 29]
Employees working on scaffold must be trained by a person qualified on the use of such equipment.

When freestanding mobile scaffolding is used, the height shall not exceed four times the minimum base dimension.

When workers will be riding mobile scaffolding, the base dimension should be at least one half of the height.

Make sure that wheels on mobile scaffolds move freely and are in good repair.

Employees shall keep debris bagged and obstacles off the floor where mobile scaffolds will be used. If a wheel catches on debris on the floor when the unit is moved, additional force will be required to move it. This additional force may be all that is needed to turn the unit over.

Scaffolds must be capable of supporting, without failure, at least four times the maximum intended load.

Employees on a scaffold more than 10 feet above a lower level must be protected from falling. Guardrail systems must be installed along all open sides and ends of platforms.
In addition to wearing hard-hats, each employee on a scaffold shall be provided with additional protection from falling hand tools, debris, and other small objects through the installation of toe-boards, screens, or guardrail systems, or through the erection of debris nets, catch platforms, or canopy structures that contain or deflect falling objects.

Stairs, Passageways, and Ladders [29 CFR 1926.850]
Stairways, passageways, and ladders, specifically designated as entrance to and exit from the structure of a building, shall be used. Other access ways shall be entirely closed at times.

Stairways, passageways, and ladders shall be periodically inspected and maintained in a clean and safe condition.

Stairwells being used shall be properly illuminated and protected.

Employees will be instructed and required to ascend/descend ladders in the proper manner; that is facing the ladders and holding on the side rails with both hands. Material must be raised or lowered with a line or hoisting equipment and not carried in one hand while ascending or descending.

Wood ladders must not be painted.

Side rails and rungs must be kept clean and free of lines, hoses, cables, wires, oil, grease, and debris.

If a ladder is to provide the only means of access or exit from a working area for twenty-five (25) or more employees, or simultaneous two-way traffic is expected, a double cleat ladder must be installed.

Portable ladders must be placed so that the side rails have a secure footing. The top rest must be rigid and have ample strength to support the applied load. The top of the ladder must be clamped, tied off, or otherwise securely fastened, to prevent movement.

Faulty or defective ladders (i.e. with broken or missing rungs and steps, split side rails) must be removed from the site immediately.
Single portable ladders over thirty feet (30') in length and aluminum ladders must not be used.

Ladders must be of sufficient length to protect not less than 3 feet (3') above the top landing.

Tools [29 CFR 1926.301, 302, 304; 1910.212,244]
Inspect all tools prior to use. Damaged or defective units should be "Red Tagged" until repaired or replaced.

Wrenches shall not be used when jaws are sprung to the point that slippage occurs. The wooden handles of tools must be kept free of splinters or cracks and must be kept tight in the tool.

Electric power-operated tools shall either be approved double-insulated, be properly grounded, or used with GFIs.

Proper PPE (specified by manufacturer) shall be used with all power tools.

All tools (abrasive grinders, sanding machines, portable and stationary saws, etc.) shall be equipped with guards.

Welding and Cutting [29 CFR 1926.350-353]
Employees shall be trained in the safe use of welding equipment.
All equipment should be fully insulated against the maximum voltage encountered to ground.

Before starting to burn, look around to make sure that flame, sparks, or hot metal will not start a fire.

Always wear proper eye protection while burning. If helping, protect your eyes from flashes and sparks. Never wear contact lenses.

Proper precautions (isolating, welding, removing fire hazards, etc.) for fire prevention must be taken in areas where welding is being done. Fire extinguishing equipment should be readily available in the work area during all operations.

Hoses, cables, and other equipment shall be kept clear of all passageways, ladders, and stairs.

Keep compressed air bottles supported in the upright position at all times. Keep bottles properly capped or regulator turned-off except while in use.

Torches shall be inspected for leaking valves, hose couplings, and tip connections before and after each work shift.

The safest method of lighting a torch is with a friction lighter. Never use a cigarette or cigarette lighter.

Be sure that the torch hoses and connections are in proper order. Fuel gas hose and oxygen hoses shall be easily distinguishable from each other, and shall not be interchangeable.

Never use the torch as a hammer or pry bar.

Any equipment that is leaking, defective, or damaged shall not be used, and shall be removed from the work area.

Only manual electrode holders designed for arc welding and cutting shall be used.

Unattended equipment shall be removed from the work area.

As always, it is important that good judgment and common sense be used, and that individuals not place themselves or their coworkers in danger.

All unsafe acts and conditions shall be reported to the individual's immediate supervisor.

4.0 SITE-SPECIFIC HAZARDS

4.1 Introduction

As a result of the sub-grade contaminated soils and or fill materials being impacted by the proposed UST abatement work at the Subject Site employees may be exposed concentrations of Semi-Volatile and or Volatile Organic Compounds that exceed OSHA's Action Levels and or Permissible Exposure Levels (PEL). The applicable procedures outlined in this HASP will be implemented in order to reduce employee exposure.

4.2 Soil Contaminants and Operations for Impacting or Moving

The following work plan outlines the specific procedures to be followed for proper removal of subsurface soils and or fill materials impacted by the release of the fuel oil into the environment. The Work Area shall consist of the Hazardous Work Zone (HWZ) and the Contamination Reduction Zone (CRZ). Because of the small size of the site these two zones will be separated at all times while work is being performed. The HWZ is identified as the Hazardous Waste Storage Area (HWSA). The CRZ is identified as an area opposite the HWZ. The Support Zone (SZ) shall define the "clean" area located outside of the work area. Please see site map indicating locations of areas within the HWZ and CRZ.

The HSO will insure that these objectives will be attained.

Definitions - The following definitions will apply to this HASP

- "Contamination Control Line" – The boundary between the Contamination Reduction Zone and the Support Zone
- "Contamination Reduction Corridor (CRC)"- designated decontamination area within the CRZ
- "Contamination Reduction Zone (CRZ)" – The transition area between the contaminated area and the clean area.
- "Exclusion Zone (EZ)"- The area contamination does or could occur.
- "Health and Safety Officer (HSO) - The person or person(s) responsible for health and safety considerations and who will oversee the compliance of all persons on the site with this HASP.
- "Hotline" – The boundary between the EZ and CRZ.
- "Project" - The project will be defined as the site and all work areas.

- "Support Zone" – The clean area, the location of the administrative and other support functions needed to keep the operations in the EZ and CRZ running smoothly.

4.2.1 Exclusion Zone (EZ)

The EZ shall be cordoned off utilizing CAUTION tape at a distance of one foot beyond the north, west and south perimeters.
Personnel working within both the EZ and CRZ shall don appropriate PPE prior to entry and doff PPE within the Contamination Reduction Corridor only upon exiting the CRZ to enter the SZ.

All personnel working within the EZ shall be equipped with Level C PPE (see HASP Section 6.4-Level C PPE) consisting of:

1. Half-face air purifying respirator equipped with "piggy back" High Efficiency Particulate Air (HEPA) and Organic Vapor (OV) filter cartridges
2. Full body, hooded, one-piece chemical resistant coveralls (Tyvek)
3. Gloves (outer) chemical resistant neoprene
4. Gloves (inner) latex
5. Boots (outer) chemical-resistant, disposable
6. Boots (inner) work boot with steel toe and shank
7. Hard Hat (face shield optional)
8. All seams shall be taped with duct tape
9. Two-way communications devices

Excavation, stockpiling and disposal of impacted soils shall be completed utilizing an excavator and or bobcat or equivalents in tandem.

The excavator shall be located within the EZ and deposit excavated soils within the 20 yard container located in the CRZ with only the bucket freely passing between the HWZ and the CRZ.

The excavation shall continue until reaching a depth of approximately 12 feet below grade - see letter from Architect indicating limitations in excavating any deeper.

4.2.2 Contamination Reduction Zone (CRZ)

The CRZ shall compose the east-end of the work area and shall be cordoned off with CAUTION tape at a distance of one (1) foot beyond the north, east and south perimeters.

All personnel working within the EZ shall be equipped with Level C PPE (see HASP Section 6.4-Level C PPE) consisting of:

1. Half-face air purifying respirator equipped with "piggy back" High Efficiency Particulate Air (HEPA) and Organic Vapor (OV) filter cartridges
2. Full body, hooded, one-piece chemical resistant coveralls (Tyvek)
3. Gloves (outer) chemical resistant neoprene
4. Gloves (inner) latex
5. Boots (outer) chemical-resistant, disposable

6. Boots (inner) work boot with steel toe and shank
7. Hard Hat (face shield optional)
8. All seams shall be taped with duct tape
9. Two-way communications devices

The Hotline shall compose the west boundary of the CRZ and the east boundary shall comprise the Contamination Control Line.

The south side of the CRZ shall serve as the Contamination Reduction Corridor composed of one (1) personnel decontamination line.

Decontamination of personnel shall occur within the Contamination Reduction Corridor at the conclusion of each work shift or whenever an employee must exit the CRZ to enter the SZ.

Heavy equipment, deployed through the aforementioned decontamination line at the on-set of the project, will be removed through same tailored to the specific task of heavy equipment decommissioning at the conclusion of the project.

Access Control Points shall be located at both the Hotline and the Contamination Control Line to provide control of entry/exit between the EZ, CRZ and SZ.

Excavated soil shall be stockpiled within the CRZ on two (2) layers of reinforced 6-mil polyethylene sheeting and covered securely with same at the conclusion of each work shift.

4.2.3 Support Zone (SZ)

Any function that need not or cannot be performed within either the EZ or CRZ shall be performed within the SZ.

The SZ does not require the use of PPE, however Level D PPE is recommended (see HASP Section 6.5-Level D PPE).

All applicable support facilities shall be located within the SZ.

4.3 Employee Exposure Monitoring

Characterization of the subsurface soils and or fill materials have identified the presence of the following contaminants: SVOC's and VOC's

Personnel monitoring shall be performed to assess employee exposure to the aforementioned contaminants representing full shift exposure for each shift and for each job classification in each work area (see HASP Section 7.0-Medical Surveillance Requirements).

In the event that initial exposure monitoring reveals employee exposure to be below the action level and at or below the STEL, exposure monitoring may be discontinued for employees whose exposures are represented by the initial monitoring.

Additional monitoring shall be performed whenever there has been a change in the work processes that may present new or additional exposures

4.4 Soil Removal/Disposal

Upon completion of soil disposal characterization soil transport and disposal will commence.

Open top disposal containers lined with pre-engineered reinforced 6-mil polyethylene liners shall be placed in a designated staging area within the SZ.

Disposal corridors, consisting of two (2) layers of reinforced 6-mil polyethylene sheeting, shall be constructed and cordoned off with CAUTION tape providing bobcat access to said staging area.

Disposal corridors shall be considered extensions of the CRZ and therefore subject to all applicable contingencies.

Stockpiled soil shall be transported via bobcat and placed inside disposal containers.

Full disposal containers shall be covered securely with a tarp to await removal from site.

All disposal containers, full or otherwise shall be covered securely with a tarp at the conclusion of each work shift.

4.5 Decontamination Procedures

4.5.1 Personnel

Upon conclusion of each work-shift, personnel should proceed to the Contamination Reduction Corridor in an orderly fashion and doff PPE.

Doffed PPE shall be placed in 55-gallon waste containers and disposed of properly.

Personnel shall then proceed to the SZ.

The following level C decontamination procedures shall be adhered to:

1. Equipment drop – deposit equipment used in the work area on polyethylene sheeting
2. Outer boot removal – Remove outer boots and dispose of in 55-gallon waste drum
3. Outer garment and glove removal – remove outer PPE by rolling garment down on itself and dispose of in 55-gallon waste drum
4. Inner glove removal - Remove inner gloves and dispose of in 55-gallon waste container
5. Respirator Removal – Proceed toward access control point of contamination control line and remove respirator, dispose of respirator cartridges in 55-gallon waste container

4.5.2 Heavy Equipment

Upon completion of the project the Contamination Reduction Corridor shall be utilized to decommission the heavy equipment and be subject to the following procedures:

1. The equipment shall be driven onto two (2) layers of reinforced polyethylene sheeting
2. Lumber shall be placed under the edges of the polyethylene sheeting at least two (2) feet from the base of the equipment to form a containment burm around the entire perimeter
3. The equipment shall be rinsed with a solvent wash dispensed by Hudson sprayers
4. The equipment shall be scrubbed with brushes
5. The equipment shall undergo a second rinse
6. The equipment shall be wet-wiped
7. The equipment shall undergo a third and final rinse
8. All decontamination equipment shall be disposed of properly in 55-gallon waste drums
9. The equipment shall be driven out of the CRZ into the SZ
10. Upon completion of heavy equipment decontamination the polyethylene containment burm shall be rolled in upon itself and disposed of in a 55-gallon waste drum.

4.6 Waste Disposal

All contaminated soils and or fill materials shall be analytically characterized and disposed of in accordance with NYSDEC requirements.

5.0 PERSONNEL TRAINING REQUIREMENTS

Training is a key component of an effective HASP. Training helps identify the safety and health responsibilities of both management and employees at the work site(s). The ultimate purpose of training is to make each employee, from top management to workers in the field more aware of what is expected to ensure a safe working environment.

While many OSHA standards require employers to train employees in the safety and health aspects of their jobs, other OSHA standards require employers to limit certain job assignments to employees who are "certified," "competent," or "qualified," meaning that they have had specific previous training. This shall be an essential part of this program for protecting workers from accidents and illnesses. All personnel involved in responding to this project must be trained to perform their functions. The OSHA standards detail specific training requirements. Project Supervisor(s) will be considered by OSHA to be competent person as defined by 29 CFR 1926.32(f), 1926.62(b), and 1926.1101. Individuals working on Demolition Project will be experienced and informed of the hazards, through the applicable OSHA and / or EPA training curriculum, of working with debris containing lead, and asbestos (Class I and II).

Training will be provided in the use of all equipment including respiratory protective apparatus and protective clothing, safety practices and procedures, general safety

requirements, basic first aid, and hazard recognition and evaluation. Safety training must be a continuing part of a total response plan. Periodic retraining and practice sessions not only create a high degree of safety awareness, but also help maintain a profundity in the use of equipment and knowledge of safety requirements.

The experience of the Construction Supervisor will be assigned to the project, including the supervisor's experience in materials / hazardous materials removal and certification that the individual is considered by OSHA to be a competent person as defined by 29 CFR 1926.32(f), 1926.62(b), and 1926.1101, will be included in an addendum of this HASP prior to the start of project work. Also, worker certifications, documenting the appropriate training relative to asbestos and lead handling, and other project hazards according to the applicable OSHA hazard communication regulations, will also be provided.

5.1 Pre-assignment Training

Prior to assignment at the site, employees and management will either through education, work experience, or a combination of the two have met the training requirements outlined in the OSHA standard. All personnel, including visitors entering the Hazardous Work Zone or Contamination Reduction Zone must have certifications of completion of training (40 Hour Hazardous Materials Training Certification, 10 Hour OSHA Construction Safety Training Certifications, etc.)

Managers shall be trained to understand the key role they play in job site safety and to enable them to carry out their safety and health responsibilities effectively. Select manager(s) shall receive first aid training as it becomes available.

5.2 Additional Personnel

Personnel regularly on site working in areas which have been monitored and fully characterized indicating that exposures are under the permissible exposure limits or published exposure limits, where respirators are not necessary and the characterization indicates that there are no health hazards or the possibility of an emergency developing, will require notification but not training.

Personnel on site only occasionally for a specific limited task and who area unlikely to be exposed over the permissible exposure limits or published exposure limits will also require notification.

5.3 Training/Briefing Topics

The HSO will be responsible for the indoctrination of all on-site personnel with regard to this HASP before any work is initiated. The initial pre-work safety meeting (indoctrination) will be conducted by the HSO for all employees including, but not be limited to, the following:

- Chemicals present at the site;
- Physical health and safety hazards identified at the site;
- Personal hygiene and personnel decontamination requirements and procedures;
- The selection, use and limitations of available safety equipment, and procedures required for personnel protection;
- Proper selection, use, maintenance, and fitting of respirators;
- Work zones established at the site;

- Prohibitions in contaminated areas;
- Explanation of the buddy system;
- Emergency preparedness procedures (emergency egress routes), emergency signals, personnel rescue methods, etc.);
- Site safety requirements and Health and Safety Plane review;
- Location of fire extinguisher;
- Decontamination procedures for equipment;
- Review of standard operating procedures;
- Review of team member responsibilities; and
- Evacuation procedures.

Employees who are required to handle or use poisons, flammable liquids (such as petroleum products), gases, and other harmful substances shall be trained regarding the safe handling and use and be made aware of the potential hazards and personal protective measures required.

A record of training should be kept for each member of personnel to confirm that adequate training has been provided for the work he/ she will perform.

5.4 Safety Meetings

The HSO, or designated representative under the direction of the HSO, will conduct daily safety meetings, which will be mandatory for all on-site personnel. Minutes of the meeting will be kept and will include persons in attendance and topics discussed. The meetings will provide as a refresher for existing equipment and protocols and will examine new site conditions as they are encountered. Opportunity will be provided for employees to voice safety and health related concerns.

Should any unforeseen or site peculiar safety related factor, hazard or condition become evident during the performance of the work at this site, the HSO will take prudent action to establish and maintain safe working conditions and to safeguard employees, the public and the environment.

6.0 PERSONNEL PROTECTIVE EQUIPMENT AND LEVELS OF PROTECTION

Respiratory protection measures, including respirator fit-testing for all employees and a personal protective equipment program, will be compliant with 29 CFR 1910.134.

6.1 Levels of Protection

Levels of protection are determined for each activity, based on best available data. As additional data becomes available or as site conditions or job functions change, the level of protection may be changed to more appropriately protect the workers.

The selection of levels of protection is an evolving process, guided by selection factors and actual conditions. The level of protection personnel protective equipment (PPE) selected should be based upon type and concentration of the chemical substance in the ambient atmosphere and its toxicity; and potential for exposure to substances in the air, splashes of liquids, or other direct contact with contaminants due to work being done.

6.1.1 Level A Protection

Level A protection is required when the chemical substance has been identified and requires the highest level of protection for skin, eyes and the respiratory system.

6.1.2 Level B Protection

Level B equipment provides a high level of protection to the respiratory tract, but a somewhat lower level of protection of skin as compared to Level A. The chemical resistant clothing required in Level B is available in a wide variety of styles, materials, construction details, permeability, etc. These factors all effect the degree of protection afforded. Therefore, the HSO should select the most effective chemical resistant clothing based upon the known or anticipated hazards and/or job function.

Criteria for Selection

Any one of the following warrants the use of Level B protection:

a) The type and atmospheric concentration of toxic substances have been identified and require a high level of respiratory protection;
b) The atmosphere contains less than 19.5% oxygen;
c) Site operations make it highly unlikely that the small, unprotected area of the head or neck will be contacted by splashes of extremely hazardous materials;
d) Work will be performed in confined spaces; and
e) Total atmospheric concentrations of unidentified vapors or gases range from 5 units above the background as measured on a photo ionizer or equal, and vapors are not suspected of containing high levels of chemicals toxic to skin.

Level B Personal Protective Equipment

The following Personal Protective Equipment is required for Level B:

- Pressure demand, self contained breathing apparatus (MSHA/NIOSH approved), or pressure-demand, airline respirator (with escape bottle for IDLH or potential IDLH, atmosphere, MSHA/NIOSH approved);
- Full body coveralls (Chemical-resistant Saranex or equivalent);
- Gloves (outer), chemical-resistant neoprene;
- Boots (inner), leather work boot with steel toe and shank;
- Hard hat (face shield optional);
- Taping between coveralls and gloves, and coveralls and boots is mandatory.

6.1.3 Level C Protection

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 criteria for Level C is what conditions permit wearing air purifying devices. The air-purifying device must be a full-face mask (MSHA/NIOSH approved) equipped with combination dual cartridge filters capable of filtering organic vapor and airborne particulates (combination OV/HEPA).

Criteria for Selection

Conditions meeting all of these criteria permits use of Level C protection:

a) Measured air concentrations or identified substances will be reduced by the respirator to levels at or below the Threshold Limit Value (TLV) for each substance present and the concentration is within the service limit of the canister;
b) Atmospheric contaminant concentrations do not exceed IDLH levels;
c) Atmospheric contaminants, liquid splashes, or other direct contact will not adversely affect the small area of the skin left unprotected by chemical resistant clothing;
d) Job functions have been determined not to require self-contained breathing apparatus;
e) Total atmospheric concentrations of unknown vapor/gas readings register between background and 5 units above background as measured by a photoionizer or equal;
f) Oxygen concentrations are not less than 19.5% by volume; and
g) Air will be monitored on a pre-established routine schedule.

Level C Personnel Protective Equipment

The following Personal Protective Equipment (PPE) is required for Level C:

- Half-face, air purifying, dual cartridge respirator (MSHA/NIOSH approved) equipped with combination organic vapor/HEPA filters;
- Full body coveralls (Chemical-resistant Saranex or equivalent);
- Gloves (outer), chemical resistant neoprene;
- Gloves (inner), surgical latex;
- Boots (outer), chemical-resistant, disposable; and
- Hard hat (face shield optional).
- Taping between coveralls and gloves, and coveralls and boots is mandatory.

6.1.4 Level D Protection

Level D protection is distinguished from other Levels of protection in that no equipment is used to protect against the respiratory system. This is the least restrictive level of protection available.

Criteria for Selection

Meeting any of these criteria allows the use of Level D protection:

a) Work tasks preclude splashes, immersion or potential for unexpected inhalation of any chemicals; or
b) No contaminants are present.

Level D Personnel Protective Equipment

The following Personnel Protective Equipment (PPE) is required for level D:

- Boots (inner), work boot with steel toe and shank;
- Hard hat (face shield optional).

At a minimum, steel-toed boots, outer boots and latex surgical gloves will be worn.

6.2 Respiratory Protection Program

This respiratory protection program has been written to comply with the applicable OSHA regulations and contract specifications, to provide the basis for administration of the respirator program, and to serve as a training tool for affected workers.

Since respiratory protection, in many instances, will be the primary method for protecting a worker's health, it is policy that all portions of this program be followed

and that any deficiencies in the administration and enforcement of this program will be immediately corrected.

OSHA standard 1910.134 and the contract specifications are explicit in prescribing the types of respirators that are permitted to be worn when contaminants are handled. Those requirements are based on the airborne concentration of various types of contaminants. Since monitoring is a requirement of the OSHA standard, sufficient data will be generated to determine the appropriate respiratory protection. The types of respirators to be used are outlined under the various levels of PPE.

It is important that a worker understands the proper use as well as the limitations of various respirators. Therefore, all personnel who are required to wear respirators will undergo a training program that consists of:

- Nature of the hazards
- Explanation of why other control methods are not feasible
- Explanation of the selection criteria for the respirators that are to be used
- Limitations
- Inspection
- Proper donning and wearing
- Positive and negative pressure fit tests
- Maintenance
- Emergency situations

All personnel who will be required to wear respirators must participate in the medical surveillance program outlined in the health and safety plan. A certificate stating that the employee is physically able to wear a respirator will be obtained.

6.3 Respirator Fit Testing

An employee wearing a respirator can be protected against airborne contaminants only if there is a successful sealing of the respirator on his/her face. All employees may not obtain a successful fit for a specific respirator, since facial dimensions vary considerably from person to person. The possibility of leakage with a half-face piece is greater than that with a full-face piece. Studies have shown that temples on glasses, absence of dentures, full beards, handlebar mustaches or wide sideburns can reduce respirator performance by as much as 25 percent.

The Competent Person will be responsible for fit testing of personnel if required. Personnel who have not been fit tested, are not allowed in the Hazardous Zone while Level C activities are ongoing.

The respirator face piece-to-face seal will be tested upon issuing a respirator to an employee. This fit test will consist of a qualitative test using irritant smoke. The test subject will don the respirator and recite the "Rainbow Passage" and simulate lifting, bending exercises while being subjected to irritant smoke outside the respirator. Should an employee fail this test, other makes of respirators will be tested to find a suitable fit. A record of this fit test will be maintained in the employee file.

The respirator face piece-to-face seal will be further tested each time the employee enters a contaminated atmosphere. Most respirator manufacturers provide instructions for wearing and leak testing and these instructions will be followed. The training program will cover these procedures. Face piece-to-face fit tests include the following:

- Positive Pressure Test- Close or "block off" the exhalation valve and exhale gently into the face piece. If a slight positive pressure is built up with no apparent outward leakage around the seal, then the face piece-to-face seal has been established. Note that this test only applies to those respirators which have an exhalation valve which can be blocked (the exhalation valve cover may have to be removed before the test).
- Negative Pressure Test- Close the inlet opening or hose of the respirator face piece with hand(s), tape or other means, inhale gently so that the face piece collapses slightly and hold the breath for ten seconds. If the face piece remains slightly collapsed and no inward leakage occurs, then a face piece-to-face seal has been established.
- According to the Qualitative Fit Test (QLFT) protocols such as those outlined in Appendix D of OSHA Standard 1910.1025, positive and negative pressure tests will be conducted by personnel before each use of the respirator.

6.4 Respiratory Maintenance and Inspection

All respirators will be cleaned and disinfected at the end of the work shift. The following procedure will be used:

1. Cartridges, filters, and canisters will be removed and discarded;
2. Wash respirators in warm water (approx. 120F) and cleaner/disinfectant solution;
3. Rinse in clean, warm water and wiped with an alcohol swab;
4. Air dry;
5. Inspect all parts of the respirator and replace any that are missing or defective;
6. Place face piece in plastic bag; and
7. Insert cartridges immediately before use.

It will be the responsibility of all site personnel to assure that all respirators have been properly inspected and maintained.

The inspection will include the following items:

1. Tightness of connections
2. Conditions of face piece, straps, connecting tubes, and canisters;
3. Condition of exhalation and inhalation valves;
4. Pliability and flexibility of rubber parts;
5. Condition of lenses of full face piece respirators;
6. Charge of compressed air cylinder of self contained breathing apparatus; and
7. Proper functioning of regulators and warning devices.

7.0 MEDICAL SURVEILLANCE REQUIREMENTS

7.1 Baseline Monitoring

Companies participating in the site project will use the services of an Occupational Physician who has specialized training in the occupational medicine to provide the minimum medical examinations and surveillance specified herein. The name of the physician and evidence of examination of each contract personnel be provided to the HSO prior to assigning theses baseline medical examinations. All project personnel involved in this project will have current medical examinations taken 15 days prior to the onset of work. At any time, if there is suspected excessive exposure to substances that would be medically detectable, all project personnel will be medically monitored.

Physical examinations are required for any Contractor, Subcontractor and any authorized visitor entering the Hazardous Work Zone at the Subject Site.

As part of the medical examination, the physician will determine the fitness of the worker to wear a respirator through the measurement of the FEV and FCV capacities of the subject.

Medical surveillance records will be maintained and will be available to any regulatory agencies upon official request.

The physical examination will also include but not limited to the following minimum requirements:

- medical history;
- general physical;
- pulmonary function;
- blood profile (heavy metals), ZPP;
- chest x-ray (the number of chest x-rays will be at the direction of the physician);

Additional tests may be included at the discretion of the attending industrial physician performing the physical examination.

7.2 Periodic Monitoring

Periodic surveillance examinations will be performed annually for all employees participating in medical surveillance program; and/or following an acute exposure to any toxic or hazardous material.

Periodic surveillance examinations will be specified for medicine surveillance protocol except that the requirement for a chest x-ray will be at the discretion of the attending physician performing the physical examination.

7.3 Exposure/Injury Incident Report

All incidents resulting in injury, exposure, illness or property damage must be reported to the HSO not later than the end of the workday or shift. An accident report will be filled out by the worker and submitted to the HSO. An OSHA 200 injury log will be maintained at the site and filled out by the HSO.

8.0 FREQUENCY AND TYPES OF MONITORING

To safeguard the health of Site personnel, an air-monitoring program will be implemented.

8.1 Personnel Monitoring

Full shift OSHA sampling will be conducted for a minimum of ten percent of the workers or a minimum of two workers per shift.

Samples will be collected using both High Volume and Low Volume vacuum pumps set a prescribed flow rates. If necessary, air monitoring for Lower Explosivity Levels (LEL) and oxygen levels will be conducted prior to and during any entry into confined spaces.

Laboratory sample turnaround time will be 24-hours. The analytical results will be posted in a visible location at the work site. Where sample analysis indicates that the applicable OSHA PEL has been exceeded, work methods will be altered to reduce airborne contamination.

8.2 Air Emission Control

Air sampling conducted outside the Hazardous Work Zone will be conducted to determine migration of contaminants off-site, if any. All precautions will be taken to prevent the emissions of contaminants into the air. Samples will be collected from points surrounding the immediate project area.

8.3 Sample Documentation and Analysis

Documentation of sample analysis will, at a minimum, include: sample identification and location, contaminant sampled, total sample duration, sample flow rate, and total air volume collected. Samples will be submitted to a laboratory qualified to analyze samples for lead, asbestos, and dust as inert / nuisance particulates.

9.0 SITE CONTROL MEASURES

9.1 Buddy System

All on-site involved in hazardous work will be required to work in teams of at least two. Each employee will be designated to observe the activities of at least one other employee in the Hazardous Work Zone. This is to provide assistance to those employees in the event of an emergency.

9.2 Site Communications

Communications using radios, hand signals, signs or other means will be maintained between personnel at all times. Emergency communications should be prearranged in case of radio failure, necessity for evacuation of site or other reasons.

Entrance and exit locations will be designated and emergency escape routes delineated. Warning signals for site evacuation will be established.

On-site personnel will act as safety backup to each other. Off-site personnel will provide emergency assistance.

Visual contact will be maintained between pairs on-site and safety personnel. Entry team members should remain close together to assist each other during emergencies.

9.3 Work Zone Definitions

Work zones will be established in the field and will limit equipment, operations, and personnel in the areas defined below:

a) Hazardous Work Zone: This area will be barricaded, fenced, or roped off and marked. The level of personnel protective equipment required in this area is to be determined by the HSO. In the event that work within this zone expands, the delineating boundary will be relocated as necessary to prevent the accidental contamination of nearby people and equipment. No on-site personnel will be allowed to be in this area unattended. Smoking and chewing gum in this area are prohibited.

b) Contamination Reduction Zone: This area will serve as a buffer between the hazardous work activities and the remainder of the site. Equipment decontamination stations will be located in this area. The overall length of this area will not be less than 25 feet. Smoking and chewing gum in this area are prohibited.

c) Clean Zone (support zone): This area is the remainder of the site. The site trailer, including equipment storage and emergency equipment, will be located in this area. Smoking and chewing gum are permitted in this area.

The function of the clean area includes:

- An entry area for personnel, material and equipment to the Hazardous Work Zone of site operations through the Contamination Reduction Zone;
- An exit area for decontaminated personnel, materials and equipment from the Contamination Reduction Zone of the site operations;
- The housing of site support services; and
- A storage area for clean, safety and work equipment.

9.4 Nearest Medical Facility

The nearest medical facility is **Montefiore Weiler Hospital located at 1825 Eastchester Road, Bronx, NY 10461, phone number (718) 904-3333** will be listed on the emergency numbers list that will be conspicuously posted at the project site. A map to the hospital and estimated travel time will be determined and attached to this HASP (please find the attached map).

A detailed plan for fire and medical emergencies describing procedures for evacuation, notification of local emergency personnel, and the care and decontamination of unconscious contaminated personnel will be provided prior to the start of project work. The plan will correspond with the NPS emergency personnel and procedures

9.5 Safe Work Practices

The following safe work practices will be adhered to:

All safety equipment and protective clothing is kept clean and well maintained;

All prescription eyeglasses in use on the project will be safety glasses equipped with side shields. Prescription glasses worn in conjunction with full-face respiratory protection must be compatible with the use of such respirators;

All disposable gloves worn on the site will be approved by the HSO. No disposable gloves will be reused;

During periods of prolonged respirator usage in contaminated areas, respirator filters will be changed when filters become clogged;

Footwear used on-site will be covered by rubber over-boots when entering or working in the Hazardous Work Zone;

All personal protective equipment used on-site will be decontaminated or disposed of at the end of each work shift or more frequently, as needed;

All respirators will be individually assigned and not interchanged between workers without cleaning and sanitizing;

All personnel unable to pass a fit test as a result of facial hair or facial configuration will not enter or work in an area that requires respiratory protection;

All project personnel will have vision or vision corrected to at least 20/40 in one eye;

On-site personnel found to be disregarding any provision of this plan will, at the request of the HSO, be barred from the project;

Used disposable coverings will be removed upon leaving the Hazardous Work Zone.

Used articles will be placed inside disposable containers provided for that purpose. These containers will be stored at the site at the designated staging area and will be properly disposed of at the completion of the shift.

Protective clothing that becomes torn or badly soiled will be replaced immediately;

Eating, drinking, chewing gum or tobacco, smoking, etc. will be prohibited in the Hazardous Work Zones and Contamination Reduction Zone;

All personnel will wash their hands, face and forearms before using toilet facilities or eating;

and no alcohol, firearms or drugs (without prescriptions) will be permitted on the site at any time.

9.6 Posted Warnings and Signs

The following signs should be posted:

a) No smoking, no eating, no drinking signs must be posted in the Hazardous Work Zone and Contamination Reduction Zone; and
b) Danger warning signs will be posted at the entrances to the work areas during the extent of asbestos removal operations; and
c) The Safety Regulations and Recommendations, attached and made part thereof, will be posted prominently about the project, so that on-site personnel will be reminded of necessary safety precautions.

10.0 DECONTAMINATION PLAN

10.1 Levels of Decontamination Protection Required for Personnel

10.1.1 Personnel Decontamination for Hazardous Materials Exposure

The decontamination layout plan for personnel exposed to hazardous chemicals is provided in Table 10-1 and 10-2. All personnel entering the Hazardous Work Zone will utilize a decontamination unit constructed at the entrance to each of the buildings. The levels of PPE required to enter specific areas will be determined by the HSO.

10.1.2 Level B Personal Protection Decontamination Procedure

All persons exiting a Hazardous Work Zone wearing Level B personal protective equipment (PPE) shall decontaminate themselves in the following manner (see Table):

Table 10-1

Step 1 Segregated Equipment Drop - Deposit equipment (tools, sampling devices, notes, monitoring instruments, radios, etc.) used on the site onto plastic drop cloths.
Step 2 Boot Cover and Glove Wash - Outer boot covers and outer gloves should be wet then scrubbed with a solution of detergent and water.
Step 3 Boot Cover and Glove Rinse - Decontamination solution should be rinsed off of boot covers and gloves using generous amounts of water. Repeat as many times as necessary.
Step 4 Tape Removal - Remove tape from around boots and gloves and place into container with plastic liner.
Step 5 Boot Cover Removal - Remove disposable boot covers and place into container with plastic liner.
Step 6 Outer Glove Removal - Remove outer gloves and deposit in container with plastic liner. Exit the Hazardous Work Area and enter the Contamination Reduction Zone (CRZ).
Step 7 Suit/Safety Boot Wash - Completely wash splash suit, SCBA, gloves, and safety boots.
Step 8 Suit/Safety Boot Rinse - Thoroughly rinse off all decontamination solutions from protective clothing.
Step 9 SCBA Tank Change - This is the last step in the decontamination process for those workers needing to change air tanks and return to the Hazardous Work Zone. The workers' tank is changed, new outer gloves and boot covers are donned, and joints are taped. Exit the Contamination Reduction Zone (CRZ) and re-enter the Hazardous Work Area.
Step 10 Safety Boot Removal - Remove safety boots and deposit in container with plastic liner.
Step 11 SCBA Backpack Removal - While still connected to the face piece,

remove the air tank and associated apparatus. Keep the tank and air supply fully operational during this exercise and through Step 15.

Step 12 Splash Suit Removal - With care, remove splash suit. Start at the top of the suit and fold down to the outside so that exposed surfaces of the suit do not come in contact with the skin. Ball suit up so that inside of suit is now on the outside.

Step 13 Inner Glove Wash - Wash inner gloves with a mild solution.

Step 14 Inner Glove Rinse - Rinse inner gloves with adequate amounts of water.

Step 15 Face Piece Removal - Remove face piece of SCBA. Wash thoroughly with mild soap solution and rinse with water.

Step 16 Inner Glove Removal - Remove inner glove and place in container with plastic liner.

Step 17 Inner Clothing Removal - If weather conditions call for the need of inner clothing, remove inner suit in same manner as splash suit, folding the suit down upon itself and into a ball. Exit Contamination Reduction Zone (CRZ) and enter the Support Zone.

Step 18 Field Wash - Thoroughly wash hands and face. Full body shower optional.

Step 19 Redress - Don street clothing.

10.1.3 Level C Personal Protection Decontamination Procedure

All persons exiting a Hazardous Work Zone wearing Level C personal protective equipment (PPE) shall decontaminate themselves in the following manner (see Table):

Table 10-2

Step 1 Segregated Equipment Drop - Deposit equipment (tools, sampling devices, notes, monitoring instruments, radios, etc.) used on the site onto plastic drop cloths.

Step 2 Boot Cover and Glove Wash - Outer boot covers and outer gloves should be wet wiped with a solution of TSP. detergent and water.

Step 3 Boot Cover and Glove Rinse - Decontamination solution should be rinsed off of boot covers and gloves using generous amounts of water. Repeat as many times as necessary.

Step 4 Tape Removal - Remove tape from around boots and gloves and place into container with plastic liner.

Step 5 Boot Cover Removal - Remove disposable boot covers and place into container with plastic liner.

Step 6 Outer Glove Removal - Remove outer gloves and deposit in container with plastic liner. Exit the Hazardous Work Area and enter the Contamination Reduction Zone (CRZ).

Step 7 Safety Boot Removal - Remove safety boots and deposit in container with plastic liner.

Step 8 Protective Suit Removal - With care, remove splash suit. Start at the top of the suit and fold down to the outside so that exposed surfaces of the suit do not come in contact with the skin. Ball suit up so that inside of suit is now on the outside.

Step 9 Inner Glove Wash - Wash inner gloves with a mild solution.

Step 10 Inner Glove Rinse - Rinse inner gloves with adequate amounts of water.

Step 11 Face Piece Removal - Remove face piece of respirator. Wash thoroughly with mild soap solution and rinse with water.

Step 12 Inner Glove Removal - Remove inner glove and place in container with plastic liner.

Step 13 Inner Clothing Removal - If weather conditions call for the need of inner clothing, remove inner suit in same manner as splash suit, folding the suit down upon itself and into a ball. Exit (CRZ) and enter the Support Zone.
Step 14 Field Wash - Thoroughly wash hands and face. Full body shower optional.
Step 15 Redress - Don street clothing.

10.2 Heavy Equipment Decontamination Requirements

Vehicles and equipment working in, being operated in, or otherwise coming in contact with known or suspected contaminants will be decontaminated in designated decontamination area(s). Decontamination is required prior to leaving the site, or when equipment is transferred to other work zones, or buildings. It will be documented that each piece of equipment has been decontaminated prior to leaving the site.

Decontamination will take place within the designated equipment and materials decontamination area. The existing decontamination area will be used for this purpose. The decontamination will consist of degreasing (if required) followed by a high pressure, hot water cleaning supplemented by detergents or solvents, as appropriate.
Personnel engaged in vehicle and equipment decontamination will wear level C PPE.

10.3 Disposal of Spent Clothing and Materials

Contaminated clothing, used respirator filters cartridges and other disposal items will be placed into lined drums/containers and disposed of in accordance with RCRA requirements.

Containers / 55-gallon drums will conform to the requirements of 40 CFR Part 178 for Transportation of Hazardous Materials.

The containers / drums containing hazardous material will be transported to the waste disposal staging area and will be transported to the appropriate landfill by a waste disposal contractor.

11.0 EMERGENCY RESPONSE PLAN

No facility or project is immune from disaster. Emergencies can arise at any time and from many causes, but the potential loss is the same - injury and damage to people and property. Advance planning for emergencies is the best way to minimize this potential loss.

Emergency plans involve organizing and training small groups of people to perform specialized services, such as evacuation, spill response, or first aid. These groups can serve as a nucleus that can be expanded to meet many kinds of emergencies. Even with outside help available, an emergency plan is the best assurance that losses will be kept to a minimum.

Simulated disaster drills will help employees respond to emergencies with greater confidence and effectiveness. In this situation, personnel operate under the direction of a drill coordinator

who feeds information to them on a real-time basis and monitors the response. Feedback is essential to improve emergency management plans.

Employees who are required to respond to emergencies at different levels in the command structure are required by OSHA to have specific training that is intended to ensure that emergency responders are properly trained and equipped to perform their assigned tasks.

In some instances (i.e., uncontrollable petroleum spill) an emergency response by an outside source will be required. The Project Manager shall be responsible for contacting the local fire department and/or other emergency response organizations (police, private HazMat Teams, etc.) to notify them of the company emergency response plan, including the circumstances or conditions under which outside responders will provide emergency response to the facility.

11.1 Spills / Releases

Depending on the level of training that management has acquired, emergency response to spills or releases will differ. There may also be incidences that require an emergency response regardless of the circumstances.

See Section 12.0 for more detailed information pertaining to spills and emergency response.

11.2 Fires

Many large fires originate as small blazes that, if caught early, could be controlled by trained personnel. Therefore, prompt action by a small, properly trained and equipped group can usually handle most situations. The main point is this: small fires must be extinguished as soon as they start. The first five minutes are considered the most important. Good housekeeping, prompt action by trained people, proper equipment, and common sense precautions will prevent a small fire from becoming a disastrous blaze.

11.3 First Aid

EMS will exercise supervision over first aid and the treatment of its personnel as covered under their Health and Safety Plan and the following:

- Fully stocked first aid kit will be kept inside the office trailer for the treatment of injured personnel.
- A person trained in First Aid will be assigned the duties of treating injured employees.

11.4 Emergency Medical Response

This section details the procedures to be followed by the Project Manager if a medical emergency arises on the job site.

- Summon an ambulance to the job site
- Respond and address any immediate hazard which may have caused the incident
- Report the emergency giving the following details:
  - Name of injured
  - Type of injury

- Location of accident
- Location of injured person
- All other information required on the Accident Investigation Report.

A copy of an Accident Investigation Report is included in the Appendix of this HASP. This should be filled out as soon as possible after an accident.

11.5 Evacuation

Employees should be aware of emergency escape procedures and escape routes. An alarm system that is recognizable and audible to all employees shall be used to alert them that the facility must be evacuated. During an evacuation, employees shall meet at a designated safe area, where they will be accounted for by the Project Manager, or his designee. A floor plan and/or site map should be posted that clearly shows the emergency escape routes and designated safe areas.

In the case of an evacuation, it is important for employees to remember the following:

- **Keep your head** - avoid panic and confusion.
- **Know the location of exits** - be sure all employees know the safest way out of the building / area no matter where they are.
- **Know the location of nearby fire extinguishers** - learn the proper way to use all types of extinguishers.
- **Know how to report a fire or other emergency** - send in the alarm without delay; notify the chief of exit drills.
- **Follow exit instructions** - be ready to leave rapidly.

12.0 SPILLS AND EMERGENCY RESPONSE

What is a spill? The function of this chapter is to present a thorough discussion of the distinction between incidental releases (spills) of hazardous substances, i.e., gasoline or fuel oil, and releases that require an emergency response, and hence, compliance with the provisions of OSHA 1910.120(q), Emergency Response to Hazardous Substance Releases.

An understanding of the distinction between an incidental release of a hazardous substance and releases that require an emergency response is fundamental to proper compliance with the provisions of 29 CRF 1910.120(q). This part of the standard was written to cover a wide array of facilities and situations.

Potential releases of hazardous substances in the workplace can be categorized into three (3) distinct groups in terms of the planning provisions of 1910.120(q). These groups are:

Releases that are clearly incidental regardless of the circumstances;

Releases that may be incidental or may require an emergency response depending on the circumstances; and

Releases that clearly require an emergency response regardless of the circumstances.

12.1 Releases that are Clearly Incidental

An incidental release is a release of hazardous substance which does not pose a significant safety or health hazard to employees in the immediate vicinity or to the employee cleaning it up. An incidental release does not have the potential to become an emergency within a short time frame. Incidental releases are limited in quantity, exposure potential, or toxicity and present minor safety or health hazards to employees in the immediate work area or those assigned to clean them up.

If the hazardous substance that was spilled does not pose a significant safety and health threat at the released volume, and there is not a danger of more released materials, then the spill is clearly incidental. In this setting incidental releases will generally be the norm and employees will be trained to protect themselves in handling incidental releases per the training requirements of the Hazard Communication Standard (OSHA 29 CFR 1910.1200).

12.2 Releases That May be Incidental or Require an Emergency Response

The properties of hazardous substances (such as toxicity, volatility, flammability, explosiveness, corrosiveness etc.), as well as the particular circumstances of the release itself (such as quantity, confined space considerations, ventilation, etc.), will have an impact on what employees can handle safely and what procedures should be followed. Additionally, there are other factors that may mitigate the hazards associated with a release and its remediation, such as the knowledge of the employee in the immediate work area, the response and personal protective equipment (PPE) at hand, and the pre-established standard operating procedures for responding to releases of hazardous substances. There are some engineering control measures that will mitigate the release that employees can activate to assist them in controlling and stopping the release.

These considerations (properties of the hazardous substance, the circumstances of the release, and the mitigating factors in the work area) combine to define the distinction between incidental releases and releases that require an emergency response.

12.3 Releases that Require an Emergency Response Regardless of the Circumstances

There are releases of hazardous substances that pose a sufficient threat to health and safety that, by their very nature, require an emergency response regardless of the circumstances surrounding the release or the mitigating factors. An employer must determine the potential for an emergency in a reasonably predictable worst-case scenario (or "anticipated emergencies," 29 CFR 1910.120(q)(1)), and plan response procedures accordingly.

A spill emergency response includes the following situations:

1. The spill requires evacuation of employees in the area;
2. The spill poses conditions that are immediately dangerous to life and health (IDLH);
3. The spill poses a serious threat of fire or explosion;
4. The spill requires immediate attention because of imminent danger;

5. The spill may cause high levels of exposure to toxic substances;
6. There is uncertainty that the employee in the work area can handle the severity of the hazard with the PPE and equipment that has been provided and the exposure limit could easily be exceeded; and
7. The situation is unclear, or data are lacking on important factors.

12.4 Training

The appropriate training and necessary PPE must be provided in order to minimize the risks to employees when they are expected to handle incidental releases. If the employer expects employees to handle only incidental releases of hazardous substances and the release escalates beyond an incidental release, the employees are then expected to evacuate. The level of training required is based on the responsibilities and duties expected of a worker during an emergency response operation.

13.0 ACCIDENT INVESTIGATION / RECORDKEEPING

A good record-keeping system helps identify high accident rate units and problem areas so extra effort can be made in those areas. Accidents provide information that enables the participating companies to take appropriate corrective action to prevent a reoccurrence.
Two forms are used for OSHA record-keeping:

- OSHA Form No. 200, which serves as both the *Log of Occupational Injuries and Illnesses*, on which the occurrence and extent of cases are recorded during the year; and as the *Summary of Occupational Injuries and Illnesses*, which is used to summarize the log at the end of the year.
- OSHA Form No. 101 provides additional information on each of the cases that have been recorded on the log.

Any and all worker accidents/injuries are to be reported to one's supervisor immediately. Recordable cases will be posted on OSHA Form 200 *Log and Summary of Occupational Injuries and Illnesses*, as pursuant to 29 CFR 1904.2. Information received which updates the status of a lost workday injury or a case of restricted activity will be posted on the OSHA Form 200 within six (6) days.

13.1 First Aid Treatment

All accidents / incidents which result in on-site first aid treatment and subsequent observation of minor injuries shall be investigated by the Project Manager.

13.2 OSHA Recordable

Accidents / incidents resulting in medical treatment by a licensed physician shall be thoroughly investigated by the Project Manager.

13.3 Major Accidents / Incidents

All accidents / incidents resulting in a lost-time injury, fatality, or serious near miss shall be thoroughly investigated and a formal report will be made to the local OSHA office [(800) 321-6742] within 48 hours. The report should include, but not be limited to, the following:

- Accident Investigation Report (found in Appendix)
- Analysis of, and circumstances surrounding, the accident(s)
- Date and time of accident
- Photographs and/or sketches
- Extent of injuries, or number of fatalities

14.0 SITE SAFETY ANALYSIS

A practical analysis of the work environments involves a variety of work site examinations to identify existing conditions and operations in which changes might occur to create new hazards. This may be accomplished by taking the following measures:

- Conduct a comprehensive baseline work site survey for safety and health;
- Analyze planned and new processes, materials, and equipment;
- Perform routine job hazards analyses;
- Analyze injury and illness trends over time so patterns with common causes can be identified and prevented;
- Be familiar with emergency response procedures in the event of an emergency.

15.0 DRUG-FREE WORK PLACE POLICY

Drug use in the workplace puts the health and safety of the abuser and all other workers around him/her at increased risk. Employees who use illegal drugs or abuse other controlled substances on or off duty tend to be less productive, less reliable, and prone to greater absenteeism. For these reasons, tolerate drug use on the job will not be tolerated. In accordance with the Drug Free Workplace Act of 1986, all employees are hereby notified that possession or use of drugs in the workplace is prohibited and absolutely forbidden. Any employee caught possessing or using drugs (alcohol is a drug) or coming to work under the influence of drugs will result in disciplinary action, up to and including discharge, at the Company's sole discretion.

The Drug-Free Workplace Policy prohibits employees from engaging in any of the following activities:

- Use, possession, manufacture, distribution, dispensation or sale of illegal drugs or unauthorized controlled substances on company premises or company business, in company supplied vehicles, or during working hours.
- Storing in a locker, desk, automobile or other repository on company premises any unauthorized controlled substance.
- Being under the influence of a controlled substance on company premises or while on company business, or while in company supplied vehicles.
- Any possession, use, manufacture, distribution, or sale of illegal drugs off company premises that adversely affects the individual's work performance, his/her own or other's safety at work, or the company's regard or reputation in the community.
- Refusal to sign a statement to abide by the company's Drug-Free Workplace Policy.

Attachment

Direction and Map to the nearest Medical Facility –
The Brooklyn Hospital Center
121 DeKalb Avenue, Brooklyn NY 11201
(718) 250-8000

Google

Drive 1.5 miles, 6 min

Direction from 98-102 Steuben St to the Brooklyn Hospital Center

98-102 Steuben
Brooklyn, NY 11205

Head north on Steuben St toward Park Ave
0.1 mi / 19 s

Turn right onto Park Ave
272 ft / 21 s

Take the 1st right onto Emerson Pl
0.2 mi / 46 s

Drive along Dekalb Ave
1.1 mi / 4 min

4. Turn right onto Myrtle Ave
0.3 mi

5. Turn left onto Washington Ave
0.3 mi

6. Turn right at the 2nd cross street onto Dekalb Ave
0.6 mi

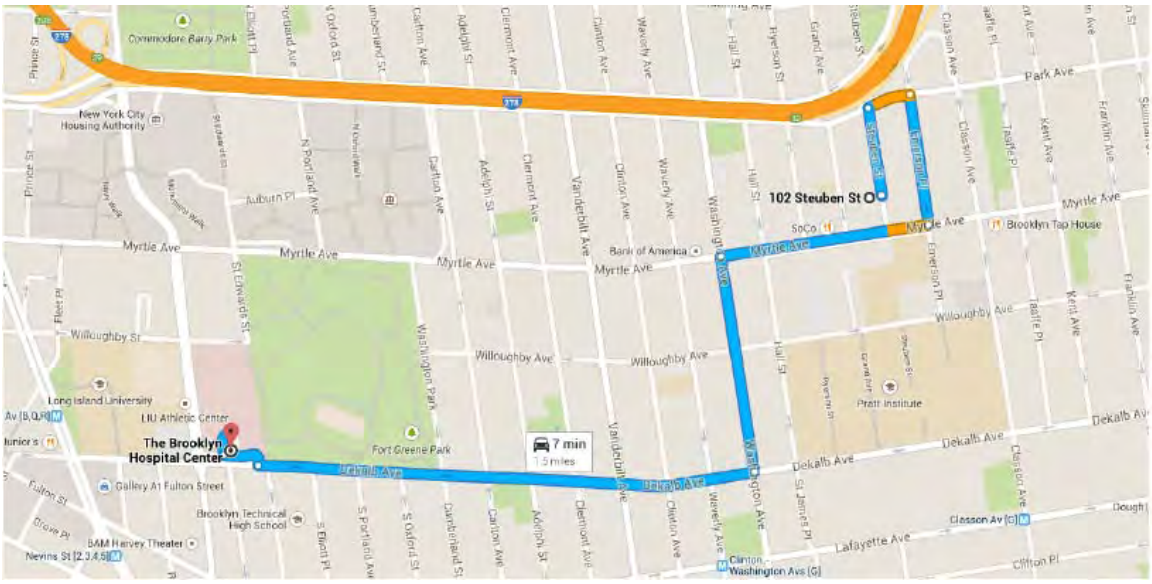
Drive to Brooklyn Hospital
423 ft / 27 s

7. Turn right toward Brooklyn Hospital
276 ft

8. Take the 2nd right onto Brooklyn Hospital
Destination will be on the right
148 ft

The Brooklyn Hospital Center
121 DeKalb Avenue, Brooklyn, NY 11201

Map Courtesy of Map data © Google



Map Courtesy of Map data © Google

APPENDIX B

HEALTH AND SAFETY PLAN

SITE-SPECIFIC HEALTH AND SAFETY PLAN

OER Project No. 15EH-N053K

Proposed Development
98-102 Steuben Street
Block 1893, Lot 47
Brooklyn, New York

Prepared By:
Carlin-Simpson & Associates
61 Main Street
Sayreville, New Jersey

December 2014

Carlin-Simpson & Associates
Site-Specific Health and Safety Plan

This Health and Safety Plan (HASP) presents information regarding known site-specific health and safety hazards using available information, and identifies the equipment, materials and procedures that will be used to eliminate or control these hazards during the Remedial Investigation at the subject site.

GENERAL INFORMATION

Client/Site Name:	Clinton Hill Development II, OER Project No. 15EH-N053K		
Site Address:	98-102 Steuben Street, Brooklyn, New York		
Job/Project #:	14-131A		
Estimated Start Date:	December 2014	Estimated Completion Date:	January 2015

EMERGENCY INFORMATION

Phone Numbers:	Hospital #:	718-250-8000	Ambulance #:	911
	Fire #:	911	Police #:	911

Hospital Name & Address: Brooklyn Hospital Center, 121 Dekalb Ave, Brooklyn, N

Directions and Street Map of Route to Nearest Hospital Attached: ☒ Yes ☐ No (if no, do not proceed)

Other Emergency Contact: Robert Simpson, PE Phone #: 732-432-5757

Location of Nearest Phone: Cell phone on-site at all times

Have Necessary Underground Utility Notifications for Subsurface Work Been Made? ☒ Yes ☐ Not Applicable

Specify Clearance Date & Time, Dig Safe Clearance I.D. #, And Other Relevant Information:

This will be performed prior to performing the field work.

SCOPE OF WORK

Site Description:	Vacant parcel with two rersidential buildings and a partial garage structure. There is varying amounts of surface debris and vegetation on the remainder of the property.
Specific Tasks Performed by CSA:	Environmental Site Investigation for Soil and Groundwater
Concurrent Tasks to be Performed by CSA Subcontractors (List Subcontractors by Name):	Drilling (hollow stem augers) - General Borings Inc.
Concurrent Tasks to be Performed by Others:	Soil Vapor Testing - Environmental Maintenance Contractors, Inc.
Does this project include confined space entry?	☐ yes ☒ no

ROLES AND RESPONSIBILITIES

CSA PERSONNEL

Name	Project Title/Assigned Role	Telephone Numbers
Meredith R. Anke, PE	Project Manager / Site Safety Officer	work: 732-432-5757 cell: 908-334-1080
Robert B. Simpson, P.E.	Associate/Principal-in-Charge	work: 732-432-5757 cell: 732-261-0974

Site Supervisors and Project Managers (SS/PM): Responsible for compliance with the HASP and applicable laws and regulations. This includes the need for effective oversight and supervision of project staff necessary to control the health and safety aspects of on-site activities. The Project Manager has the responsibility and authority to direct all CSA work operations at the site.

Site Safety Officers and Competent Persons (SSO/CP): The Site Safety Officer (SSO) or "Competent Person", as defined by the Occupational Safety and Health Administration (OSHA) 1926.20(b) - Accident Prevention Responsibilities, is the individual "who is capable of identifying existing and predictable hazards in surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them." The SSO is designated on a site-by-site basis based on the site conditions, scope-of-work, and the individual's ability to recognize site-specific hazards and take appropriate corrective actions.

Staff: Ultimate control of health and safety is in the hands of each individual employee. Therefore, each employee must become familiar with and comply with all health and safety requirements associated with their position and daily operations. Employees also have the responsibility to notify the appropriate management of unsafe conditions and accidents/injuries immediately. When employees are issued respirators or any other personal protective equipment (PPE), they are responsible for ensuring that said items are used properly, cleaned as required and maintained in good working order.

TRAINING

All personnel performing investigation and remedial activities at the site 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 before they are permitted to work at the site. 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 SSO prior to the start of field activities, when required.

SITE VISITORS

A site-specific briefing will be provided to all site visitors who enter the site beyond the site entry point. The site-specific briefing will provide information about the site hazards and other pertinent safety and health requirements as appropriate.

EQUIPMENT AND CONTROLS

Monitoring Equipment [1]	**Personal Protective Equipment**
☒ PID Type: 580S OVM Lamp Energy: 10.6 eV ☐ FID Type: ☐ Cal gas and equipment type: ☐ LEL/O_2 Meter ☐ Others: **Other Equipment & Gear** [2] ☐ 10# ABC Fire Extinguisher when gasoline powered equipment is present ☐ Caution Tape ☐ Traffic Cones or Stanchions ☐ Warning Signs or Placards ☒ Decon Buckets, Brushes, Detergent, Towels and Plastic Bags ☐ Others:	☐ Respirator Type: ☐ Resp-Cartridge Type: ☒ Hearing Protection ☒ Hardhat ☐ Outer Gloves Type: ☒ Inner Gloves Type: latex or nitrile ☒ Steel-toed boots/shoes ☐ Coveralls Type: ☐ Outer Boots Type: ☒ Eye Protection ☐ Traffic Vest ☐ Personal Flotation Device (PFD) Others:

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Equipment designed to protect individuals from contact with known or suspect chemical hazards are grouped into four categories according to the degree of protection afforded. These categories are designated A through D:

Level A: Should be selected when the highest level of respiratory, skin, and eye protection is required.

Level B: Should be selected when the highest level of respiratory protection is required, 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 against chemical hazards.

RECOMMENDED LEVEL OF PROTECTION FOR THE SUBJECT SITE

Based on the known site conditions, the contaminants expected to be present at the site, and the planned tasks for the investigation of the site, Level D PPE is recommended.

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. The recommended PPE for Level D includes safety boots/shoes, safety glasses, a hardhat, and optional gloves.

AIR MONITORING INSTRUMENTS AND ACTION LEVELS

Anticipated Chemical Hazards: NONE EXPECTED

Photoionization Detector - Breathing Zone Readings (will be completed by SSO):

0 to 35 units	Remain in Level D PPE.
35 to 250 units	Withdraw from work area and contact Project Management. Proceed to Level C protection for re-entry, or discontinue operation.
> 250 units	Secure operations, withdraw from work area, and discontinue work at that location until contaminants can be evaluated and a detailed site plan can be implemented.

Combustible Gas Indicator CGI/LEL Meter (if required) - Readings Near Vapor Source:

• < 10% LEL:	Continue to monitor with caution. Eliminate all ignition sources.
• 10% to 20% LEL:	Stop operations until appropriate vapor control measures (i e. foam, sand, polyethylene, film, portable blower etc.) and resample before resuming activity.
• > 20% LEL:	Stop operations and withdraw from area. Contact SSO before proceeding.

HAZARD ASSESSMENT

Due to the presence of certain contaminants at the subject site, the possibility exists that workers on the site could be exposed to hazardous substances during the Site Investigation. Exposure to contaminated soil could occur through direct contact, incidental ingestion, or inhalation of particulates. In addition, the use of a drill rig during the investigation will also present conditions for potential physical injury to workers and since the work will be performed outdoors, there is also a potential for other hazards such as heat/cold stress, insects, poisonous plants, etc. The potential hazards that could be encountered during the Site Investigation at the subject site are summarized below. 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 the investigation.

HAZARD ASSESSMENT: PHYSICAL HAZARDS AND RELATED CONCERNS

Construction Hazards, Drill Rigs, Backhoes, etc. The use of drill rigs, backhoes and other heavy equipment represent potentially serious construction hazards. Whenever such equipment is used, personnel in the vicinity should be limited to those who must be there to complete their assigned duties. All personnel must avoid standing within the turning radius of the equipment or below any suspended load. Job sites must be kept as clean, orderly and sanitary as possible. When water is used, care must be taken to avoid creating muddy or slippery conditions. If slippery conditions are unavoidable, barriers and warning signs must be used to warn of these dangers.

Never turn your back to operating machinery. Never wear loose clothing, jewelry, hair or other personal items around rotating equipment or other equipment that could may catch or ensnare loose clothing, jewelry, hair or other personal items. Always stand far enough away from operating machinery to prevent accident contact which may result from mechanical or human error.

Additionally, the following basic personal protective measures must be observed: Hardhats must be worn to protect against bumps or falling objects. Safety glasses must be worn by all workers in the vicinity of drill rigs or other sources of flying objects. Goggles, face shields or other forms of eye protection must be worn when necessary to protect against chemicals or other hazards. Steel-toed safety shoes or boots are also required. The shoes must be chemically resistant or protected with appropriately selected boots/coverings where necessary. Unless otherwise

specified, normal work clothes must be worn. Long sleeves and gloves are also required whenever necessary to protect against hazardous contact, cuts, abrasions or other possible skin hazards.

Heat and Cold Stress. Exposure to temperature extremes can pose significant risks to personnel if simple precautions are not taken. Typical control measures designed to prevent heat stress include dressing properly, drinking plenty of water, and establishing an appropriate work/break schedule. Typical control measures designed to prevent cold stress also include dressing properly and establishing an appropriate work/break schedule.

Noise. Noise exposure can be affected by many factors including the number and types of noise sources and the proximity to noise intensifying structures such as walls or buildings which cause noise to bounce back or echo. The single most important factor effecting noise exposure is distance from the source. The closer one is to the source, the louder the noise. The operation of a drill rig, backhoe or other mechanical equipment can be sources of significant noise exposure. In order to reduce the exposure to this noise, personnel working in areas of excessive noise must use hearing protection (ear plugs or ear muffs).

Rule-of-Thumb: Wherever actual data from sound level meters or noise dosimeters is unavailable and it is necessary to raise one's voice above a normal conversational level to communicate with others within 3 to 5 feet away, hearing protection should be worn.

Overhead Utilities and Hazards. Overhead hazards can include low hanging structures which can cause injury due to bumping into them. Other overhead hazards include falling objects, suspended loads, swinging loads and rotating equipment. Hardhats must be worn by personnel in areas were these types of physical hazards may be encountered. Barriers or other methods must also be used to exclude personnel from these areas were appropriate. Electrical wires are another significant overhead hazard. According to OSHA (29 CFR 1926.550), the minimum clearance which must be maintained from overhead electrical wires is 10 feet from an electrical source rated $\leq$ 50 kV.

Underground Utilities and Hazards. The identification of underground utilities and other underground hazards is critically important prior to all drilling, excavating, and other intrusive activities. In accordance with OSHA 29 CFR 1926.650, the estimated location of utility installations, such as sewer, telephone, electric, water lines and other underground installations that may reasonably be expected to be encountered during excavation work, must be determined prior to opening an excavation. The same requirements apply to drilling operations and the use of soil-gas probes. Where public utilities may exist, the utility agencies or operators must be contacted directly or through a utility-sponsored service such as Dig-Safe. Where other underground hazards may exist, reasonable attempts must be made to identify their locations as well. Failure to identify underground hazards can lead to fire, explosion, flooding, electrocution or other life threatening accidents.

Water Hazards and Boat Sampling. The collection of water or sediment samples on or immediately adjacent to a body of water can pose significant hazards. In addition to the slip, trip and fall hazards associated with wet surfaces, the potential for drowning accidents must be recognized. These hazards can be intensified by the use of some personnel protective equipment (PPE), particularly if respiratory protection is worn. OSHA 29 CFR 1926.106 requires that all employees working over or near water, where the danger of drowning exists, *must wear a U.S. Coast Guard-approved life jacket or buoyant work vest.* Ring buoys and emergency *standby personnel* must also be in place.

Pedestrian Traffic. The uncontrolled presence of pedestrians on a drilling or excavation site can be hazardous to both pedestrians and site workers. Prior to the initiation of site activities, the site should be surveyed to determine if, when and where pedestrian may gain access. This includes walkways, parking lots, gates and doorways. Barriers or caution tape should be used to exclude all pedestrian traffic. Exclusion of pedestrian traffic is intended to prevent injury to the pedestrians and eliminate distractions which could cause injury to site workers.

HAZARD ASSESSMENT: CHEMICAL HAZARDS AND RELATED CONCERNS

Chemicals Subject to OSHA Hazard Communication. All chemicals used in field activities such as solvents, reagents, decontamination solutions, or any other hazardous chemical must be listed and accompanied by the required labels, Material Safety Data Sheets (MSDS), and employee training documentation (OSHA 1910.1200).

BTEX Compounds. Exposure to the vapors of benzene, ethylbenzene, toluene and xylenes above their respective permissible exposure limits (PELs), as defined by OSHA, may produce irritation of the mucous membranes of the upper respiratory tract, nose and mouth. Acute exposure may also result in the depression of the central nervous system. Symptoms of such exposure include drowsiness, headache, fatigue, confusion, and loss of coordination. Benzene has been determined to be carcinogenic, targeting blood-forming system and bone marrow. The odor threshold for benzene is higher than the PEL and employees may be overexposed to benzene without sensing its presence, therefore, detector tubes must be utilized to evaluate airborne concentrations.

The vapor pressures of these compounds are high enough to generate significant quantities of airborne vapor. On sites where high concentrations of these compounds are present, a potential inhalation hazard to the field team during subsurface investigations can result. If the site is open and the anticipated quantities of BTEX contamination are small (i.e., part per million concentrations in the soil or groundwater), overexposure potential will also be small.

Volatile Organic Compounds (VOCs). See BTEX compounds.

Chromium Compounds. Hexavalent chromium compounds, upon contact with the skin can cause ulceration and possibly an allergic reaction. Inhalation of hexavalent chromium dusts is irritating and corrosive to the mucous membranes of the upper respiratory tract. Chrome ulcers and chrome dermatitis are common occupational health effects from prolonged and repeated exposure to hexavalent chromium compounds. Acute exposures to hexavalent chromium dusts may cause coughing or wheezing, pain on deep inspiration, tearing, inflammation of the conjunctiva, nasal itch and soreness or ulceration of the nasal septum. Certain forms of hexavalent chromium have been found to cause increased respiratory cancer among workers.

Trivalent chromium compounds (chromic oxide) are generally considered to be of lower toxicity, although dermatitis may occur as a result of direct handling.

Metal Compounds. Overexposure to metal compounds has been associated with a variety of local and systemic health hazards, both acute and chronic in nature, with chronic effects being most significant. Direct contact with the dusts of some metal compounds can result in contact or allergic dermatitis. Repeated contact with arsenic compounds may result in hyperpigmentation. Cases of skin cancer due to the trivalent inorganic arsenic compounds have been documented. The moist mucous membranes, particularly the conjunctivae, are most sensitive to the irritating effects of arsenic. Copper particles embedded in the eye result in a pronounced foreign body reaction with a characteristic discoloration of eye tissue.

Inhalation of copper and zinc dusts and fumes above their established PELs may result in flu-like symptoms known as "metal fume fever." Prolonged and repeated inhalation of the dusts of inorganic arsenic compounds above the established PEL may result in weakness, loss of appetite, a sense of heaviness in the stomach and vomiting. Respiratory problems such as cough, hoarseness and chest pain usually precede the gastrointestinal problems. Chronic overexposure to the dusts of inorganic arsenic may result in lung cancer.

The early symptoms of lead poisoning are usually nonspecific. Symptoms include sleep disturbances, decreased physical fitness, headache, decreased appetite and abdominal pains. Chronic overexposure may result in severe colic and severe abdominal cramping. The central nervous system (CNS) may also be adversely effected when lead is either inhaled or ingested in large quantities for extended periods of time. The peripheral nerve is usually affected. Lead has also been characterized as a male and female reproductive toxin as well as a fetotoxin. Exposure to lead (Pb) is regulated by a comprehensive OSHA standard (29 CFR 1910.1025).

Pesticides. Pesticides can be grouped into three major categories: organophosphates, carbamate and chlorinated hydrocarbons. The actual permissible exposure limits (PELs) as set by the Occupational Safety and Health Administration (OSHA), vary depending on the specific compound. Organophosphates, including Diazinon, Malathion and Parathion, are quickly absorbed into the body by inhalation, ingestion and direct skin contact. The symptoms of exposure include headache, fatigue, dizziness, blurred vision, sweating, cramps, nausea and vomiting. More severe symptoms can include tightness of the chest, muscle spasms, seizures and unconsciousness. It should also be noted that the Malathion and Parathion PELs both carry the *Skin* notation, indicating that these compounds adversely effect or penetrate the skin. OSHA specifies that skin exposure to substances carrying this designation be prevent or reduced through the use of the appropriate personal protective equipment (PPE).

Chlorinated Hydrocarbons such as Chlordane, DDT and Heptachlor can cause dizziness, nausea, abdominal pain and vomiting. The more severe symptoms include epileptic like seizures, rapid heart beat, coma and death. These compounds also carry the OSHA *Skin* notation. The symptoms of exposure to carbamate such Carbaryl (also known as Sevin) are similar to those described for the organophosphates. However, the OSHA exposure limit for Carbaryl *does not* carry the Skin notation.

Herbicides. Some of the commonly used herbicides present a low toxicity to man. However, other herbicides pose more serious problems. Organophosphorus and carbamate herbicides, if inhaled or ingested can interfere with the functioning of the central nervous system. Many herbicides can be readily absorbed through the skin to cause systemic effects. In addition to being absorbed through the skin, many herbicides, upon contact with the skin, may cause discoloring, skin irritation or dermatitis. Contaminants of commercial preparations of chlorinated phenoxy herbicides such as 2,4,5-T include 2,3,7,8-tetrachlorodibenzo-p-dioxin (dioxin). Dioxin is a known mutagen and a suspect carcinogen.

Petroleum Hydrocarbons (PHCs). Petroleum Hydrocarbons such as fuel oil are generally considered to be of low toxicity. Recommended airborne exposure limits have not been established for these vapors. However, inhalation of low concentrations of the vapor may cause mucous membrane irritation. Inhalation of high concentrations of the vapor may cause pulmonary edema. Repeated or prolonged direct skin contact with the oil may produce skin irritation as a result of defatting. Protective measures, such as the wearing of chemically resistant gloves, to minimize contact are addressed elsewhere in this plan. Because of the relatively low vapor pressures associated with PHCs, an inhalation hazard in the outdoor environment is not likely.

Polychlorinated Biphenyls (PCBs). Prolonged skin contact with PCBs may cause the formation of comedones, sebaceous cysts, and/or pustules (a condition known as chloracne). PCBs are considered to be suspect carcinogens and may also cause reproductive damage.

The OSHA permissible exposure limits (PELs) for PCBs are as follows:

Compound	*PEL (8-hour time-weighted average)*
Chlorodiphenyl (42% Chlorine)	1 mg/m^3-Skin
Chlorodiphenyl (54% Chlorine)	0.5 mg/m^3 -Skin

It should be noted that PCBs have extremely low vapor pressures (0.001 mm Hg @ 42% Chlorine and 0.00006 mm Hg @ 54% Chlorine). This makes it unlikely that any significant vapor concentration (i.e., exposures above the OSHA PEL) will be created in the ambient environment. This minimizes the potential for any health hazards to arise due to inhalation unless the source is heated or generates an airborne mist. If generated, vapor or mists above the PEL may cause irritation of the eyes, nose, and throat. The exposure limits noted above are considered low enough to prevent systemic effects but it is not known if these levels will prevent local effects. It should also be noted that both PELs carry the *Skin* notation, indicating that these compounds adversely effect or penetrate the skin. OSHA specifies that skin exposure to substances carrying this designation be prevented or reduced through the use of the appropriate personal protective equipment (PPE).

Polycyclic Aromatic Hydrocarbons (PAHs). Due to the relatively low vapor pressure of PAH compounds, vapor hazards at ambient temperatures are not expected to occur. However, if site conditions are dry, the generation of

contaminated dusts may pose a potential inhalation hazard. Therefore dust levels should be controlled with wetting if necessary. Repeated contact with certain PAH compounds has been associated with the development of skin cancer. Contact of PAH compounds with the skin may cause photosensitization of the skin, producing skin burns after subsequent exposure to ultraviolet radiation. Protective measures, such as the wearing of chemically resistant gloves, are appropriate when handling PAH contaminated materials.

HAZARD ASSESSMENT: BIOLOGICAL HAZARDS AND RELATED CONCERNS

Insects. Insects represent significant sources (vectors) of disease transmission. Therefore, precautions to avoid or minimize potential contact should be considered prior to all field activities. Disease or harmful effects can be transmitted through bites, stings, or through direct contact with insects or through ingestion of foods contaminated by certain insects. Examples of disease transmitted by insect bites include encephalitis and malaria from contaminated mosquitoes, Lyme disease and spotted fever from contaminated ticks. Stinging insects, such as bees and wasps, are prevalent throughout the country, particularly during the warmer months. The stings of these insects can be painful, and cause serious allergic reactions to some individuals.

Lyme Disease. Lyme disease is an infection caused by the bite of certain ticks, primarily deer, dog and wood ticks. The symptoms of Lyme disease usually start out as a skin rash then progress to more serious symptoms. The more serious symptoms can include lesions, headaches, arthritis and permanent damage to the neurological system. If detected early the disease can be treated successfully with antibiotics. If a tick is attached to the skin it should be removed with fine tipped tweezers. You should be alert for early symptoms over the next month or so. If you suspect that you have been bitten by a tick you should contact a physician for medical advice.

Poisonous Plants. The possible presence of poisonous plants should be anticipated for field activities in wooded or heavily vegetated areas. Poison ivy is a climbing plant with alternate green to red leaves (arranged in threes) and white berries. Poison oak is similar to poison ivy and sumac but its leaves are oak-like in form. The leaves of these poisonous plants produce an irritating oil which causes an intensely itching skin rash and characteristic blister-like lesions. Contact with these plants should be avoided.

Rats, Snakes and Other Vermin. Certain animals, particularly those that feed on garbage and other wastes, can represent significant sources (vectors) of disease transmission. Therefore, precautions to avoid or minimize potential contact with biting animals (such as rats) or animal waste (such as pigeon droppings) should be considered prior to all field activities. Rats, snakes and other wild animals can inflict painful bites. The bites can poisonous (as in the case of some snakes), or disease causing (as in the case of rabid animals). Avoidance of these animals is the best protection.

MISCELLANEOUS SITE CONTROL PROCEDURES

_____

_____

_____

PLAN SIGN-OFF

PM/SSO:_____ AIC/PIC:_____

Attachment A Health and Safety Briefing/Site Orientation Record/Hazard Communication
Attachment B Hospital Map

Attachment A

Health and Safety Briefing/Site Orientation Record/Hazard Communication

This is to verify that I, the undersigned, have been provided with a site briefing, including hazard communication, regarding the safety and health considerations at the referenced site in Brooklyn, New York. I agree to abide by the site-specific health and safety plan and other safety or health requirements applicable to the site.

Name (Print)	Signature	Company	Date

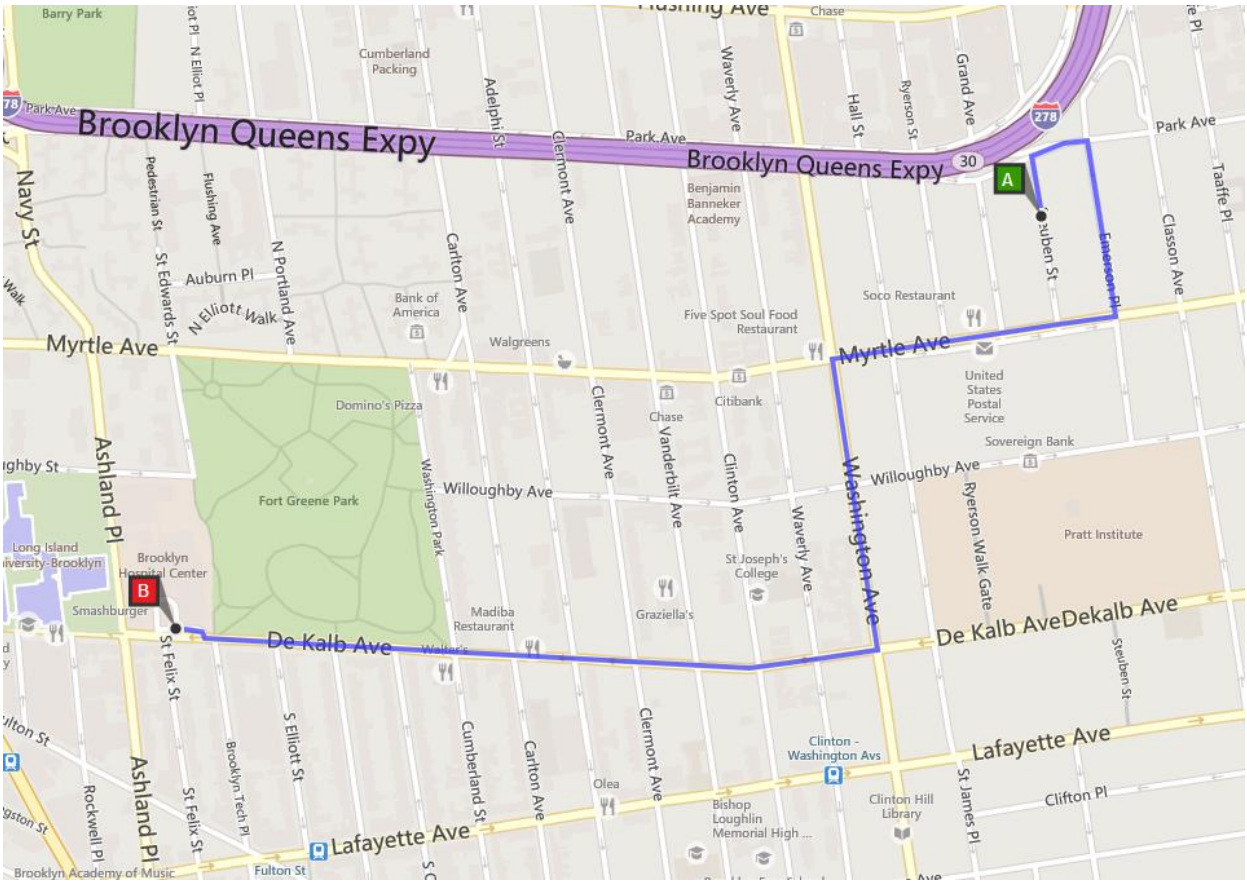
Site (orientation) briefing conducted by: _____ Date:_____

Directions to Nearest Hospital

The Brooklyn Hospital Center
121 Dekalb Avenue
Brooklyn, New York

Distance: 1.5 miles
Time: 5 minutes

Turn right onto Myrtle Avenue
Turn left onto Washington Avenue
Turn right onto Dekalb Avenue
Hospital is about 1/2-mile ahead on the right



APPENDIX C

SOIL BORING LOGS

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-1
Project: 98-102 Steuben Street, Brooklyn, NY		**SHEET NO.:** 1 of 2
Client: Clinton Hill Development II, LLC		**JOB NUMBER:** 14-131A
Drilling Contractor: General Borings, Inc.		**ELEVATION:** +43.9

GROUNDWATER					CASING	SAMPLE	CORE	TUBE	DATUM:	
DATE	TIME	DEPTH	CASING	TYPE	HSA	SS			START DATE:	22 Dec 14
22 Dec 14	1345	39'4"	Auger	DIA.	3 1/4"	1 3/8"			FINISH DATE:	22 Dec 14
	1445	38'5"	Well	WGHT		140#			DRILLER:	Bob
				FALL		30"			INSPECTOR:	MRA

Depth (ft.)	PID (ppm)	Sample Number	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
	0		3		**Concrete** 0'6"	
1	0	**S-1**	3		FILL (Dk br cf S, l $, t cf G, w/ brick, coal, organics)	Rec = 18"
	0		3		**FILL (Dark brown coarse to fine**	moist
2	0		2		**SAND, little Silt, trace coarse to fine** 2'0"	
	0		3		**Gravel, with brick, coal, organics)**	
3	0	**S-2**	3		**[NYC Class 7]**	Rec = 14"
	0		3		Br cf S, l $	moist
4	0		5			
						SS-3 & SS-4 @ 11:50
5						0'6"-2'0"
	0		8		Br cf S, t $, t f G	
6	0	**S-3**	8			Rec = 16"
	0		6		**Brown coarse to fine SAND, trace**	moist
7	0		7		**Silt, trace medium to fine Gravel**	
	0		8		same **[NYC Class 3b]**	
8	0	**S-4**	8			Rec = 14"
	0		7			moist
9	0		8			
10						
	0		4		same, t mf G	
11	0	**S-5**	5			Rec = 12"
	0		6			moist
12	0		7		12'0	
	0		7		Gr br mf S, t $	
13	0	**S-6**	7			Rec = 18"
	0		6			moist
14	0		7			
						SS-5 @ 12:15
15						11'0"-12'6"
	0		5		same	
16	0	**S-7**	7		**Gray brown medium to fine SAND,**	Rec = 15"
	0		8		**trace Silt [NYC Class 3b]**	moist
17	0		7			
18						
19						
20						
	0		6		same	
21	0	**S-8**	7			Rec = 17"
	0		7			moist
22	0		8			

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-1
Project: 98-102 Steuben Street, Brooklyn, NY		**SHEET NO.:** 2 of 2
Client: Clinton Hill Development II, LLC		**JOB NUMBER:** 14-131A

Depth (ft.)	PID (ppm)	Sample Number	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
23						
24						
25						
	0		6		Gr br mf S, t $	
26	0	S-9	8			Rec = 16"
	0		13		**Gray brown medium to fine SAND,**	moist
27	0		14		**trace Silt [NYC Class 3b]**	
28					28'0"	
29						
30						
	0		8		Gr br mf S, s $	
31	0	S-10	9			Rec = 20"
	0		11			moist-wet
32	0		12		**Gray brown medium to fine SAND,**	
					some Silt [NYC Class 3b]	
33						
34						
35						
	0		26		same, a $ 35'6"	
36	0	S-11	27		Gr br cf S, l $, l (+) cf G	Rec = 18"
	0		37			moist-wet
37	0		30			
38						
39						
40						
	0		11		same	
41	0	S-12	12		**Gray brown coarse to fine SAND,**	Rec = 10"
	0		13		**little Silt, little (+) coarse to fine**	wet
42	0		13		**Gravel [NYC Class 3b]**	
43						
44						
45						
	0		6		same, t $, l cf G	
46	0	S-13	16			Rec = 18"
	0		35			wet
47	0		35		**End of Boring @47'0"** 47'0"	Wellpoint WP-1 set @ 47'0"

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-2
Project: 98-102 Steuben Street, Brooklyn, NY		**SHEET NO.:** 1 of 2
Client: Clinton Hill Development II, LLC		**JOB NUMBER:** 14-131A
Drilling Contractor: General Borings, Inc.		**ELEVATION:** +42.9

GROUNDWATER					CASING	SAMPLE	CORE	TUBE	DATUM:	
DATE	TIME	DEPTH	CASING	TYPE	HSA	SS			START DATE:	23 Dec 14
23 Dec 14	1005	38'6"	Auger	DIA.	3 1/4"	1 3/8"			FINISH DATE:	23 Dec 14
	1030	37'6"	Well	WGHT		140#			DRILLER:	Bob
				FALL		30"			INSPECTOR:	MRA

Depth (ft.)	PID (ppm)	Sample Number	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
	0		15		FILL (Dk br, bk cf S, l $, l cf G,w/coal, asphalt, brick)	
1	0	S-1	13			Rec = 18"
	0		9			moist
2	0		8			
	0		4		FILL (Br same, w/coal, brick)	
3	0	S-2	4		**FILL (Dark brown, brown, black coarse**	Rec = 12"
	0		5		**to fine SAND, little Silt, little coarse to**	moist
4	0		6		**fine Gravel, with coal, asphalt, brick)**	
					[NYC Class 7]	SS-8 @ 09:20
5					5'0"	0'0"-2'0"
	0		6		Br cf S, l (+) $, t mf G	
6	0	S-3	6			Rec = 22"
	0		4			moist
7	0		6			
	0		7		Br cf S, t $, t f G	
8	0	S-4	7			Rec = 12"
	0		6			moist
9	0		7		**Brown coarse to fine SAND, trace**	
					Silt, trace medium to fine Gravel	
10					**[NYC Class 3b]**	
	0		3		same	
11	0	S-5	5			Rec = 16"
	0		5			moist
12	0		7			
	0		8		Br cf S, t $, t mf G	
13	0	S-6	12			Rec = 16"
	0		9			moist
14	0		10			
					14'6"	SS-9 @ 09:35
15						11'0"-12'6"
	0		6		Gr br mf S, t $	
16	0	S-7	7			Rec = 14"
	0		9			moist
17	0		11			
					Gray brown coarse to fine SAND,	
18					**trace Silt, trace medium to fine**	
					Gravel [NYC Class 3b]	
19						
20						
	0		6		Gr br cf S, t $, t mf G	
21	0	S-8	11			Rec = 15"
	0		11			moist
22	0		16			

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-2
Project: 98-102 Steubes Street, Brooklyn, NY		**SHEET NO.:** 2 of 2
Client: Clinton Hill Development, II LLC		**JOB NUMBER:** 14-131A

Depth (ft.)	PID (ppm)	Sample Number	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
23						
24						
25						
	0		7		Gr br cf S, t $	
26	0	S-9	11			Rec = 15"
	0		14			moist
27	0		19			
28						
29						
30						
	0		7		Gr br mf S, t $	
31	0	S-10	12			Rec = 20"
	0		11		**Gray brown coarse to fine SAND,**	moist
32	0		12		**trace Silt [NYC Class 3b]**	
33						
34						
35						
	0		7		same	
36	0	S-11	7			Rec = 18"
	0		8			moist
37	0		9			
38						
39					39'0"	
40						
	0		5		Gr br mf S, a $	
41	0	S-12	12			Rec = 20"
	0		12		**Gray brown medium to fine SAND,**	wet
42	0		16		**and Silt [NYC Class 3b]**	
43						
					43'6"	
44						
					Brown coarse to fine SAND, trace	
45					**Silt, little (+) coarse to fine Gravel**	
	0		8		**[NYC Class 3b]**	
46	0	S-13	12		Br cf S, t $, l (+) cf G	Rec = 15"
	0		12			wet
47	0		15		**End of Boring @ 47'0"** 47'0"	Wellpoint WP-2 set @ 47'0"

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-3
Project: 98-102 Steuben Street, Brooklyn, NY		**SHEET NO.:** 1 of 5
Client: Clinton Hill Development II, LLC		**JOB NUMBER:** 14-131A
Drilling Contractor: General Borings, Inc.		**ELEVATION:** +42.9

GROUNDWATER					CASING	SAMPLE	CORE	TUBE	DATUM:	
DATE	TIME	DEPTH	CASING	TYPE	HSA	SS			START DATE:	29 Dec 14
				DIA.	3 1/4"	1 3/8"			FINISH DATE:	29 Dec 14
No Water Reading				WGHT		140#			DRILLER:	Bob
				FALL		30"			INSPECTOR:	MRA/KB

Depth (ft.)	PID (ppm)	Sample Number	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
	0		7		FILL (Br, bk cf S, l $, l cf G, w/coal, concrete)	Obstruction @ 1', moved 3'
1	0	S-1	10			Rec = 10"
	0		31			moist
2	0		19		**FILL (Brown, black coarse to fine SAND, little Silt, little coarse to fine Gravel, with coal and concrete) [NYC Class 7]**	
						SS-12 @ 10:45
3						0'0"-2'0"
4						Auger thru concrete/cobbles
						2'0"-4'6"
5					5'0"	
	0		10		Br cf S, s $, t cf G	
6	0	S-2	10			Rec = 12"
	0		7			moist
7	0		7			
	0		14		same	
8	0	S-3	12			Rec = 10"
	0		12		**Brown coarse to fine SAND, some Silt, trace coarse to fine Gravel [NYC Class 3b]**	moist
9	0		14			
10						
	0		9		same, l (-) $	
11	0	S-4	10			Rec = 6"
	0		12			moist
12	0		12			
	0		9		same	
13	0	S-5	11			Rec = 6"
	0		9			moist
14	0		10			
					14'6"	SS-13 @ 11:00
15						11'0"-13'0"
	0		5		Br cf S, t $, l mf G	
16	0	S-6	6			Rec = 10"
	0		6			moist
17	0		6			
18					**Brown coarse to fine SAND, trace Silt, little medium to fine Gravel [NYC Class 3b]**	Switched to mud rotary
19						
20						
	0		6		same	
21	0	S-7	11			Rec = 10"
	0		12			moist
22	0		11			

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-3
Project: 98-102 Steuben Street, Brooklyn, NY		**SHEET NO.:** 2 of 5
Client: Clinton Hill Development II, LLC		**JOB NUMBER:** 14-131A

Depth (ft.)	PID (ppm)	Sample Number	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
23						
24						
25						
	0		8		Br cf S, t $, l mf G	
26	0	S-8	8			Rec = 8"
	0		9			moist
27	0		12			
28					**Brown coarse to fine SAND, trace Silt, little medium to fine Gravel [NYC Class 3b]**	
29						
30						
	0		10		same, t (-) $	
31	0	S-9	15			Rec = 10"
	0		17			moist
32	0		19			
33						
34					34'0"	
35						
	0		10		Br mf S, a $	
36	0	S-10	13			Rec = 12"
	0		12			moist
37	0		13			
38					**Brown medium to fine SAND, and Silt [NYC Class 3b]**	
39						
40						
	0		8		same	
41	0	S-11	14			Rec = 24"
	0		19			wet
42	0		32			
43						
44					44'0"	
45						
	0		18		Br cf S, t (+) $, s mf G	
46	0	S-12	18		**Brown coarse to fine SAND, trace (+) Silt, some medium to fine Gravel [NYC Class 3a]**	Rec = 10"
	0		22			wet
47	0		20			

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ		TEST BORING LOG	BORING NUMBER B-3
Project:	98-102 Steuben Street, Brooklyn, NY		**SHEET NO.:** 3 of 5
Client:	Clinton Hill Development II, LLC		**JOB NUMBER:** 14-131A

Depth (ft.)	PID (ppm)	Sample Number	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
48						
49						
50						
51		S-13	14 17	■	Br cf S, l (-) $, l (+) mf G	Rec = 8"
52			14 18	■		wet
53						
54						
55						
56		S-14	16 19	■	same, l (-) f G	Rec = 8"
57			24 29	■		wet
58					**Brown coarse to fine SAND, little (-) Silt, little (+) medium to fine Gravel [NYC Class 3a]**	
59						
60						
61		S-15	13 15	■	same	Rec = 12"
62			16 18	■		wet
63						
64						
65						
66						
67						
68						
69						
70						
71		S-16	13 17	■	same, l (+) mf G	Rec = 10"
72			18 16	■		wet

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-3
Project: 98-102 Steuben Street, Brooklyn, NY		**SHEET NO.:** 4 of 5
Client: Clinton Hill Development II, LLC		**JOB NUMBER:** 14-131A

Depth (ft.)	PID (ppm)	Sample Number	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
73						
74						
75						
76						
77						
78						
79						
80						
			16	■	Br cf S, t (+) $, t mf G	
81		**S-17**	16	■		Rec = 12"
			15	■		wet
82			16	■		
83						
84					**Brown coarse to fine SAND, trace (+) Silt, trace medium to fine Gravel [NYC Class 3a]**	
85						
86						
87						
88						
89						
90						
			22	■	same	
91		**S-18**	28	■		Rec = 12"
			26	■		wet
92			24	■		
93						
94						
95						
96						
97						

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-3
Project: 98-102 Steuben Street, Brooklyn, NY		**SHEET NO.:** 5 of 5
Client: Clinton Hill Development II, LLC		**JOB NUMBER:** 14-131A

Depth (ft.)	PID (ppm)	Sample Number	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
98						
99					**Brown coarse to fine SAND, trace (+) Silt, trace medium to fine Gravel [NYC Class 3a]**	
100						
			9		Br cf S, t (+) $, t mf G	
101		**S-19**	13			Rec = 16"
			19			wet
102			24		102'0"	
					End of Boring @ 102'0"	
103						
104						
105						
106						
107						
108						
109						
110						
111						
112						
113						
114						
115						
116						
117						
118						
119						
120						
121						
122						

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-4

Project:	**98-102 Steuben Street, Brooklyn, NY**									**SHEET NO.:**	1 of 1
Client:	**Clinton Hill Development II, LLC**									**JOB NUMBER:**	14-131A
Drilling Contractor:	**General Borings, Inc.**									**ELEVATION:**	+36.0
GROUNDWATER					**CASING**	**SAMPLE**	**CORE**	**TUBE**		**DATUM:**	
DATE	**TIME**	**DEPTH**	**CASING**	**TYPE**		**SS**				**START DATE:**	22 Dec 14
				DIA.		**1 3/8"**				**FINISH DATE:**	22 Dec 14
No Water Encountered				**WGHT**		**140#**				**DRILLER:**	Bob
				FALL		**30"**				**INSPECTOR:**	MRA

Depth (ft.)	PID (ppm)	Sample Number	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
	0				**Brick Floor** 0'2"	
1	0					
	0	S-1			**FILL (Dark brown coarse to fine SAND,**	Rec = 12"
2	0				**little Silt, trace coarse to fine Gravel,**	moist
	0				**with coal and brick) [NYC Class 7]**	
3	0				3'0"	
	0	S-2			Br cf S, t (+) $	Rec = 14"
4	0				**Brown coarse to fine SAND,**	moist
	0				**trace (+) Silt [NYC Class 3b]**	
5	0				same, l $	
	0	S-3			5'2"	Rec = 8"
6					**End of Boring @ 5'2"**	moist
7						SS-1 @ 09:50
8						4'0"-5'2"
9						(11'0"-12'2")
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-5
Project: 98-102 Steuben Street, Brooklyn, NY		**SHEET NO.:** 1 of 1
Client: Clinton Hill Development II, LLC		**JOB NUMBER:** 14-131A
Drilling Contractor: General Borings, Inc.		**ELEVATION:** +36.0

GROUNDWATER					CASING	SAMPLE	CORE	TUBE	DATUM:	
DATE	TIME	DEPTH	CASING	TYPE		SS			START DATE:	22 Dec 14
				DIA.		1 3/8"			FINISH DATE:	22 Dec 14
No Water Encountered				WGHT		140#			DRILLER:	Bob
				FALL		30"			INSPECTOR:	MRA

Depth (ft.)	PID (ppm)	Sample Number	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
	0				**Concrete Slab** 0'5"	
1	0				Br cf S, l $	
	0	S-1				Rec = 16"
2	0				**Brown coarse to fine SAND,**	moist
	0				**little Silt [NYC Class 3b]**	
3	0				same	
	0	S-2				Rec = 12"
4	0					moist
	0					
5	0				same	
	0	S-3				Rec = 8"
6					**End of Boring @ 5'5"**	moist
7						SS-2 @ 10:40
						4'0"-5'5"
8						(11'0"-12'5")
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-6

Project:	**98-102 Steuben Street, Brooklyn, NY**								**SHEET NO.:**	1 of 2
Client:	**Clinton Hill Development II, LLC**								**JOB NUMBER:**	14-131A
Drilling Contractor:	**General Borings, Inc.**								**ELEVATION:**	+42.9
GROUNDWATER					**CASING**	**SAMPLE**	**CORE**	**TUBE**	**DATUM:**	
DATE	**TIME**	**DEPTH**	**CASING**	**TYPE**	**HSA**	**SS**			**START DATE:**	23 Dec 14
23 Dec 14	**14:25**	**37'9"**	**Auger**	**DIA.**	**3 1/4"**	**1 3/8"**			**FINISH DATE:**	23 Dec 14
				WGHT		**140#**			**DRILLER:**	Bob
				FALL		**30"**			**INSPECTOR:**	MRA

Depth (ft.)	PID (ppm)	Sample Number	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
	0		2		FILL (Br, bk cf S, l $, l cf G, w/coal, asphalt, cinders)	
1	0	S-1	2		**FILL (Brown, black coarse to fine SAND,**	Rec = 15"
	0		3		**little Silt, little coarse to fine Gravel,**	moist
2	0		4		**with coal, asphalt, and cinders)**	
	0		1		FILL (same) 2'6"	
3	0	S-2	1		Br cf S, s $, l cf G	Rec = 12"
	0		2			wet - trapped water
4	0		4			
						SS-10 @ 12:50
5						0'0"-2'0"
	0		4		Br cf S, a $, t cf G	
6	0	S-3	3			Rec = 18"
	0		3			moist
7	0		4			
	0		4		same	
8	0	S-4	5			Rec = 12"
	0		3		**Brown coarse to fine SAND, some**	moist
9	0		4		**Silt, trace coarse to fine Gravel**	
					[NYC Class 3b]	SS-11 @ 12:55
10						2'0"-4'0"
	0		5		same, s $	
11	0	S-5	3			Rec = 12"
	0		3			moist-wet - trapped water
12	0		4			
	0		5		same	
13	0	S-6	6			Rec = 10"
	0		6			moist
14	0		8			
15						
	0		8		same	
16	0	S-7	8			Rec = 12"
	0		11			moist
17	0		10			
18						
19					19'0"	
20						
	0		7		Gr br mf S, t $	
21	0	S-8	12		**Gray brown medium to fine SAND,**	Rec = 14"
	0		13		**trace Silt [NYC Class 3b]**	moist
22	0		13			

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ					TEST BORING LOG	BORING NUMBER B-6
Project:	98-102 Steuben Street, Brooklyn, NY					**SHEET NO.:** 2 of 2
Client:	Clinton Hill Development II, LLC					**JOB NUMBER:** 14-131A
Depth (ft.)	**PID (ppm)**	**Sample Number**	**Blows on Sample Spoon per 6"**	**Sym**	**IDENTIFICATION**	**REMARKS**
23						
24						
25						
	0		10		Gr br mf S, l $	
26	0	**S-9**	12			Rec = 14"
	0		13			moist
27	0		13			
28					**Gray brown medium to fine SAND, little Silt [NYC Class 3b]**	
29						
30						
	0		10		same	
31	0	**S-10**	14			Rec = 16"
	0		14			moist
32	0		16			
33						
34						
35						
	0		15		same	
36	0	**S-11**	13			Rec = 12"
	0		15			moist-wet
37	0		17			
38					38'0"	
39						
40						
	0		16		Gr br cf S, l (-) $, l (+) cf G	
41	0	**S-12**	16			Rec = 16"
	0		18			wet
42	0		19			
43					**Gray brown coarse to fine SAND, little (-) Silt, little (+) coarse to fine Gravel [NYC Class 3a]**	
44						
45						
46						
47					**End of Boring @ 47'0"**	Wellpoint WP-3 set @ 47'0"

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-7
Project: 98-102 Steuben Street, Brooklyn, NY		**SHEET NO.:** 1 of 1
Client: Clinton Hill Development II, LLC		**JOB NUMBER:** 14-131A
Drilling Contractor: General Borings, Inc.		**ELEVATION:** +43.9

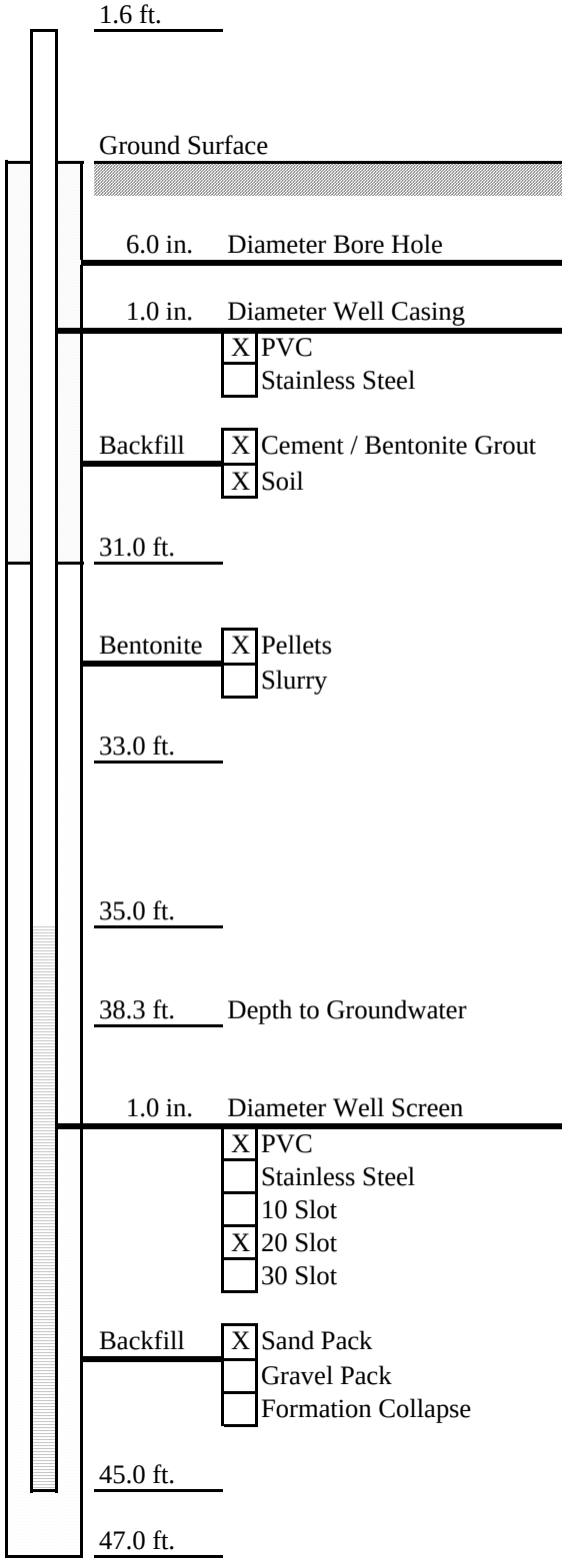
GROUNDWATER					CASING	SAMPLE	CORE	TUBE	DATUM:	
DATE	TIME	DEPTH	CASING	TYPE	HSA	SS			START DATE:	23 Dec 14
				DIA.	3 1/4"	1 3/8"			FINISH DATE:	23 Dec 14
No Water Encountered				WGHT		140#			DRILLER:	Bob
				FALL		30"			INSPECTOR:	MRA

Depth (ft.)	PID (ppm)	Sample Number	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
					Concrete 0'5"	
1	0		4		FILL (Dk br cf S, l $, l cf G, w/concrete)	
	0	S-1	3		**FILL (Dark brown coarse to fine SAND,**	Rec = 12"
2	0		4		**little Silt, little coarse to fine Gravel,**	moist
	0		3		**with concrete) [NYC Class 7]**	
3	0		5		same 3'0"	
	0	S-2	4		Br cf S, s $, t cf G	Rec = 16"
4	0		5			moist
	0		6			
5					**Brown coarse to fine SAND, some**	
	0		10		same **Silt, trace coarse to fine Gravel**	
6	0	S-3	14		**[NYC Class 3b]**	Rec = 8"
	0		14			moist
7	0		12			
	0		14		same	
8	0	S-4	22			No reocvery
	0		33			pushed cobble
9	0		31		9'0"	
					End of Boring @ 9'0"	SS-6 @ 08:40
10						0'0"-2'0"
11						SS-7 @ 08:45
12						2'0"-4'0"
13						FB-1 @ 09:05
14						
15						
16						
17						
18						
19						
20						
21						
22						

APPENDIX D

WELL CONSTRUCTION LOGS

CARLIN-SIMPSON & ASSOCIATES Sayreville, New Jersey	WELL CONSTRUCTION LOG	Well No. WP-1 Job No. 14-131A



All measurements taken from ground surface

Client Clinton Hill Development II LLC

Project 98-102 Steuben Street

City Brooklyn

County Kings

State New York

Well Permit Number N/A

Ground Surface Elevation 43.9 ft.

Drilling Method Hollow Stem Augers

Drilling Contractor General Borings Inc.

Drilling Fluid N/A

Development Method and Date Bailer 12/23/14

Water Removed During Development 2.0 gal.

Depth to Static Groundwater 38.3 ft. Below Ground Surface

Depth to GW after Pumping NR Below Ground Surface

Duration of Pumping NR

Well Yield NR

Purpose for Constructing Well:

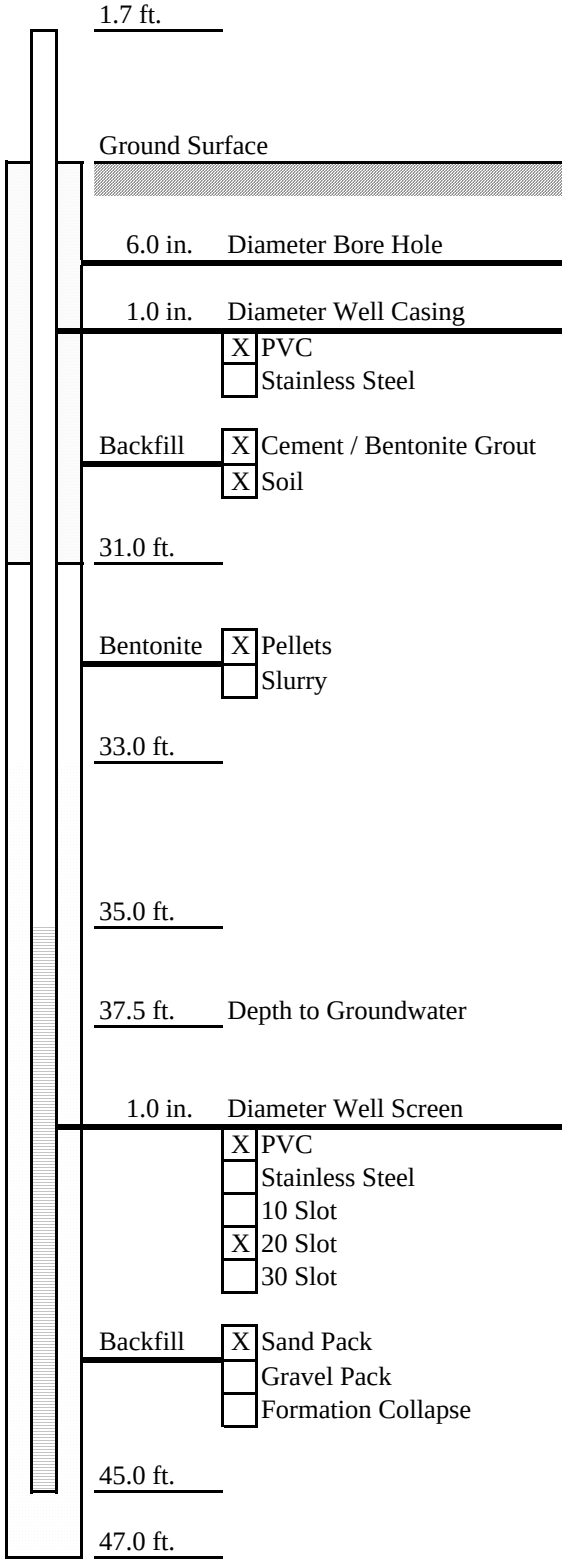
Groundwater sampling

Remarks

NR -- Not Recorded

Prepared By: Meredith Anke, P.E.

CARLIN-SIMPSON & ASSOCIATES Sayreville, New Jersey	WELL CONSTRUCTION LOG	Well No. WP-2 Job No. 14-131A



All measurements taken from ground surface

Client Clinton Hill Development II LLC

Project 98-102 Steuben Street

City Brooklyn

County Kings

State New York

Well Permit Number N/A

Ground Surface Elevation 42.9 ft.

Drilling Method Hollow Stem Augers

Drilling Contractor General Borings Inc.

Drilling Fluid N/A

Development Method and Date Bailer 12/23/14

Water Removed During Development 2.0 gal.

Depth to Static Groundwater 37.5 ft. Below Ground Surface

Depth to GW after Pumping NR Below Ground Surface

Duration of Pumping NR

Well Yield NR

Purpose for Constructing Well:

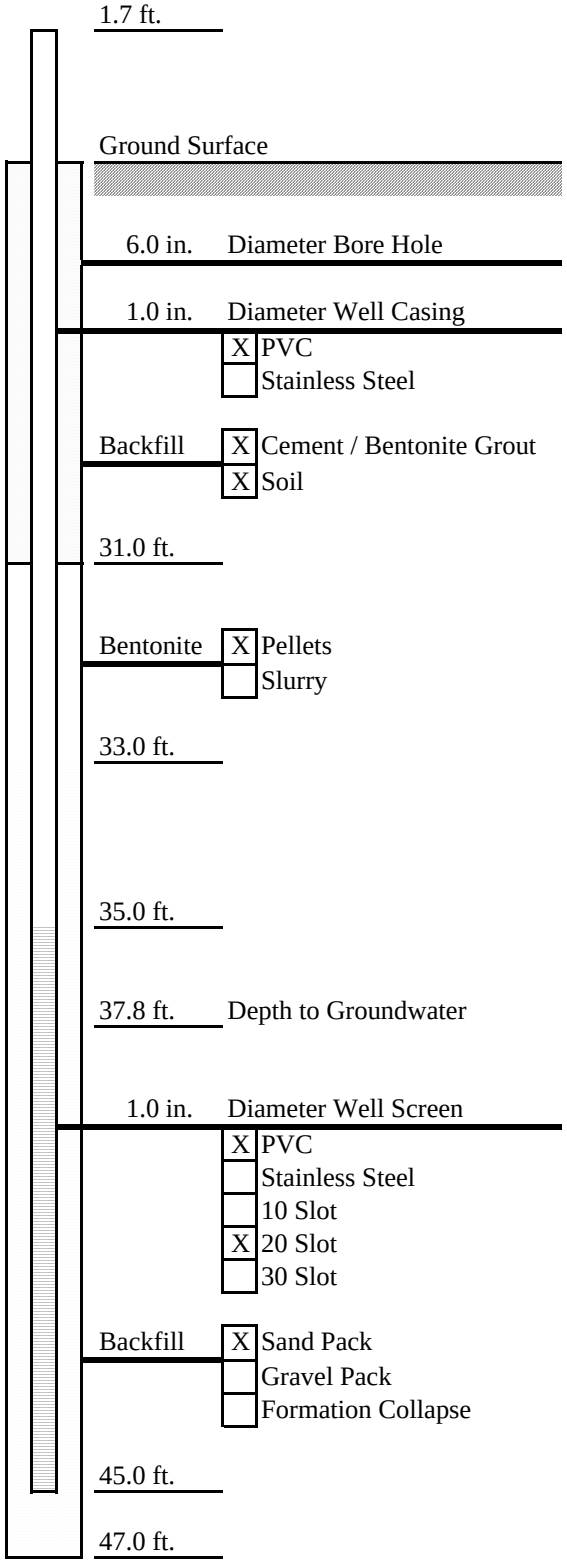
Groundwater sampling

Remarks

NR -- Not Recorded

Prepared By: Meredith Anke, P.E.

CARLIN-SIMPSON & ASSOCIATES Sayreville, New Jersey	WELL CONSTRUCTION LOG	Well No. WP-3 Job No. 14-131A



All measurements taken from ground surface

Client Clinton Hill Development II LLC

Project 98-102 Steuben Street

City Brooklyn

County Kings

State New York

Well Permit Number N/A

Ground Surface Elevation 42.9 ft.

Drilling Method Hollow Stem Augers

Drilling Contractor General Borings Inc.

Drilling Fluid N/A

Development Method and Date Bailer 12/23/14

Water Removed During Development 2.0 gal.

Depth to Static Groundwater 37.8 ft. Below Ground Surface

Depth to GW after Pumping NR Below Ground Surface

Duration of Pumping NR

Well Yield NR

Purpose for Constructing Well:

Groundwater sampling

Remarks

NR -- Not Recorded

Prepared By: Meredith Anke, P.E.

APPENDIX E

GROUNDWATER SAMPLING LOGS

GROUNDWATER SAMPLING LOG

SHEET 1 OF 1

SITE:	98-102 Steuben Street, Brooklyn, NY	**CONSULTING FIRM:**	Carlin-Simpson & Associates
DATE:	29 December 2014	**FIELD PERSONNEL:**	Meredith Anke
WEATHER:	Mostly Cloudy, 40s		

MONITOR WELL	WP-1	**WELL DEPTH:**	45 feet	**SCREENED/OPEN INTERVAL:**	35 - 45 feet
WELL PERMIT #:	N/A	**WELL DIAMETER:**	1 inches	**DEPTH TO WATER BEFORE PUMP INSTALLATION:**	38.44 feet
		PID HEADSPACE:	0.0 ppm		(Below Ground Surface)

TIME	PURGING	SAMPLING	pH (pH units)		SPECIFIC CONDUCTIVITY (mS/cm)		DISSOLVED OXYGEN (mg/l)		TURBIDITY (NTU)		TEMPERATURE (degrees C)		REDOX POTENTIAL (mv)		PUMP RATE (ml/min)	DEPTH TO WATER (feet)
			READING	CHANGE*	READING	CHANGE*	READING	CHANGE*	READING	CHANGE*	READING	CHANGE*	READING	CHANGE*		
0900	X		6.79		1.41		8.10		200+		10.91		232		350	38.44
0910	X		6.78		1.38		7.89		100+		10.89		232		350	
0920	X		6.75		1.38		7.59		100+		10.72		230		350	
0930	X		6.89		1.29		7.38		100+		10.98		230		350	
0940	X		7.00		1.29		7.18		50		10.93		224		350	
0950	X		7.05		1.27		7.08		20		10.49		215		350	
1000	X		7.09		1.25		6.70		10		10.52		199		350	
1010	X		7.10		1.25		6.68		10		10.54		190		350	
1020	X		7.11		1.26		6.78		10		10.54		188		350	
1030		X														

COMMENTS: Sample GW-1 and GW-2 started @ 10:30

*INDICATOR PARAMETERS HAVE STABLIZED WHEN 3 CONSECUTIVE READINGS ARE WITHIN: ± 0.1 for pH; ± 3% for Specific Conductivity and Temperature; ± 10 mv for Redox Potential; and ± 10% for Dissolved Oxygen and Turbidity

GROUNDWATER SAMPLING LOG

SHEET 1 OF 1

SITE:	98-102 Steuben Street, Brooklyn, NY	**CONSULTING FIRM:**	Carlin-Simpson & Associates
DATE:	29 December 2014	**FIELD PERSONNEL:**	Meredith Anke
WEATHER:	Mostly Cloudy, 40s		

MONITOR WELL	WP-2	**WELL DEPTH:**	45	feet	**SCREENED/OPEN INTERVAL:**	35 - 45	feet
WELL PERMIT #:	N/A	**WELL DIAMETER:**	1	inches	**DEPTH TO WATER BEFORE PUMP INSTALLATION:**	37.54	feet
		PID HEADSPACE:	0.0	ppm			(Below Ground Surface)

TIME	PURGING	SAMPLING	pH (pH units)		SPECIFIC CONDUCTIVITY (mS/cm)		DISSOLVED OXYGEN (mg/l)		TURBIDITY (NTU)		TEMPERATURE (degrees C)		REDOX POTENTIAL (mv)		PUMP RATE (ml/min)	DEPTH TO WATER (feet)
			READING	CHANGE*	READING	CHANGE*	READING	CHANGE*	READING	CHANGE*	READING	CHANGE*	READING	CHANGE*		
1520	X		7.02		0.789		6.84		200+		10.57		242		350	37.54
1530	X		6.96		0.751		7.10		100+		10.66		240		350	
1540	X		6.72		0.753		5.34		90		11.77		238		350	
1550	X		6.69		0.748		5.17		75		11.69		235		350	
1600	X		6.66		0.745		5.15		50		11.68		234		350	
1610	X		6.62		0.647		5.48		45		11.67		235		350	
1620	X		6.59		0.656		5.54		35		11.67		235		350	
1630	X		6.60		0.652		5.56		35		11.64		234		350	
1640		X														

COMMENTS: Sample GW-3 started @ 16:40 – slightly turbid

*INDICATOR PARAMETERS HAVE STABLIZED WHEN 3 CONSECUTIVE READINGS ARE WITHIN: ± 0.1 for pH; ± 3% for Specific Conductivity and Temperature; ± 10 mv for Redox Potential; and ± 10% for Dissolved Oxygen and Turbidity

GROUNDWATER SAMPLING LOG

SHEET 1 OF 1

SITE:	98-102 Steuben Street, Brooklyn, NY	**CONSULTING FIRM:**	Carlin-Simpson & Associates
DATE:	29 December 2014	**FIELD PERSONNEL:**	Meredith Anke
WEATHER:	Mostly Cloudy, 40s		

MONITOR WELL	WP-3	**WELL DEPTH:**	45	feet	**SCREENED/OPEN INTERVAL:**	35 - 45	feet
WELL PERMIT #:	N/A	**WELL DIAMETER:**	1	inches	**DEPTH TO WATER BEFORE PUMP INSTALLATION:**	37.54	feet
		PID HEADSPACE:	0.0	ppm			(Below Ground Surface)

TIME	PURGING	SAMPLING	pH (pH units)		SPECIFIC CONDUCTIVITY (mS/cm)		DISSOLVED OXYGEN (mg/l)		TURBIDITY (NTU)		TEMPERATURE (degrees C)		REDOX POTENTIAL (mv)		PUMP RATE (ml/min)	DEPTH TO WATER (feet)
			READING	CHANGE*	READING	CHANGE*	READING	CHANGE*	READING	CHANGE*	READING	CHANGE*	READING	CHANGE*		
1255	X		7.25		0.970		9.44		200+		10.55		178		350	37.54
1305	X		7.17		0.970		9.42		200+		10.60		180		350	
1315	X		6.98		0.921		8.14		200+		10.77		198		350	
1325	X		6.99		0.919		8.04		200+		10.73		200		350	
1335	X		7.04		0.903		7.69		200+		10.84		205		350	
1345	X		7.09		0.900		7.51		200+		10.78		207		350	
1355	X		7.11		0.899		7.39		200+		10.79		210		350	
1405	X		7.15		0.897		7.01		50		10.90		214		350	
1415	X		7.18		0.893		6.90		50		11.00		213		350	
1425	X		7.18		0.889		6.85		45		11.02		214		350	
1435		X														

COMMENTS: Sample GW-4 started @ 14:35 – slightly turbid

*INDICATOR PARAMETERS HAVE STABLIZED WHEN 3 CONSECUTIVE READINGS ARE WITHIN: ± 0.1 for pH; ± 3% for Specific Conductivity and Temperature; ± 10 mv for Redox Potential; and ± 10% for Dissolved Oxygen and Turbidity

APPENDIX F

LABORATORY DATA DELIVERABLES FOR SOIL AND GROUNDWATER