

CHURCH AVENUE
BROOKLYN, NEW YORK

Remedial Investigation Report

NYC BCP Site Number: 11CBCP012K
E-Designation Site Number: 11EHAZ227K

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REMEDIAL INVESTIGATION REPORT

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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 BCP	New York City Brownfield 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, Timothy Fisher am a Qualified Environmental Professional, as defined in proposed RCNY § 43-1402(ar). I have primary direct responsibility for implementation of the Remedial Investigation for the Church Avenue Site, (NYC BCP Site No. 11CBP012K). 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.

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 2244 Church Avenue in Brooklyn, New York and is identified as Block 5103 and Lot 42 on the New York City Tax Map. Figure 1 shows the Site location. The Site is 23,153-square feet and is bounded by Church Avenue to the north, a retail commercial building to the east, Science, Tech. & Research High School at Erasmus to the south, and a retail commercial building to the west. A map of the site boundary is shown in Figure 1. Currently, a single story vacant building is present on site with asphalt paved parking. Public access to the site is prohibited by a chain link fence with a locked gate.

Summary of Proposed Redevelopment Plan

The proposed redevelopment plan is an 18,000 square foot (ft²) three-story building with ground floor commercial retail and second floor commercial fitness center, and third floor medical offices. The building will contain a full 18,000 ft² basement to be utilized as commercial retail or fitness center. There will be no on-site parking. The portion of the lot not covered by the proposed building will be covered by concrete and used for HVAC units. No on-site parking will be present. The layout of the proposed site development is presented in Figure 3. The current zoning designation is commercial (C-4-4A), land use of commercial and office buildings. The proposed site use is consistent with existing zoning for the property. To allow for the construction of the proposed basement, this area will be excavated to an approximate depth of 13 feet below ground surface. Based on the basement square footage (18,000 ft²) and planned depth of the excavation (13 feet) approximately 234,000 ft³ or 8,667 yd³ of soil will be excavated. Based on an estimate weight of 1.5 tons/yd³ this is a total of 13,000 tons of soil. During the recent Phase II investigation ground water was

encountered at a depth of approximately 40 feet below ground surface, therefore it is not expected the excavation will extend into the ground water table.

Summary of Past Uses of Site and Areas of Concern

According to Sanborn maps the subject site is depicted as dwellings, wagon shed, coal shed in the 1900's, stores, dwelling, vacant in the 1920's, stores, auto parking, office, unclear in the 1950's, auto parking, office, unclear from the 1960's to 1980, vacant, unclear in the mid 1980's, auto parking, office, unclear in 1986, commercial, auto parking from 1987 through the 1990's. According to knowledgeable sources, this site has been vacant for approximately four years, Veggie Castle for 11 years, prior; White Castle for an extend period of time (Phase I Environmental Assessment – Singer Environmental Group, LTD.).

The AOCs identified for this site include:

- Historic Fill

Summary of the Work Performed under the Remedial Investigation

1. Completion of five soil borings (SB-1 through SB-5) to allow for the collection of soil samples to characterize vadose zone soil – both historical fill and native soils.
2. Installation of three monitoring wells (MW-1 through MW-3) to allow for the collection of ground water samples to characterize current ground water conditions and determine ground water flow direction;
3. Installation of the two soil vapor points (VP-1 and VP-2) to allow for the collection of soil vapor samples to characterize current soil vapor conditions.

Summary of Environmental Findings

1. Elevation of the property ranges from 45 to 50 feet.
2. Depth to groundwater ranges from 40.66 to 41.57 feet at the Site.
3. Groundwater flow is generally from north to south-southwest beneath the Site.
4. Depth to bedrock is greater than 50 feet at the Site.

5. The stratigraphy, from ground surface to approximately 4 to 10 feet below ground surface (ft bgs), consists of historic fill underlain by a brown, poorly graded sand with some gravel extending to the water table.
6. Soil concentrations of polychlorinated biphenyls (PCBs), pesticides, and volatile organic compounds (VOCs) did not exceed Track 1 soil cleanup objectives (SCOs) for any of the ten soil samples collected. No SVOCs exceeded Track 1 SCOs in any deep (10-12) soil samples. A variety of polycyclic aromatic hydrocarbon (PAH) compounds were identified in shallow soils above Track 1 SCOs. However, only two of these PAH marginally exceed Track 2 Restricted Commercial SCOs in two samples. Track 1 Unrestricted SCOs were achieved for all metals with two exceptions. Nickel slightly exceeded Track 1 Unrestricted SCOs in several samples but did not exceed Track 2 Restricted Commercial SCOs. Similarly, mercury exceeded Track 1 Unrestricted SCOs in several shallow samples but did not exceed Track 2 Restricted Commercial SCOs in any soil sample. Overall, Track 2 Restricted Commercial SCOs are effectively achieved for this property without any remedial removal action. Soil analytical data is presented in Table 2.
7. No PCBs, pesticides or SVOCs were detected in any groundwater sample on this site. One VOC, PCE was observed in one sample slightly above Technical & Operational Guidance Series (TOGS). PCE is not observed in any onsite soil samples and site inspections and evaluation of historical land usage did not indicate any potential onsite sources. Ground water analytical data is presented in Table 3.
8. Soil vapor samples collected during the RI showed low level occurrences of BTEX compounds and their derivatives. These concentrations are low (below 50 ug/m³) in most instances but range as high as 343 ug/m³ for toluene. BTEX was not identified in any onsite soil sample or groundwater sample and soil vapor findings on this property. Similarly, TCE and PCE were identified in very low concentrations (below 4 ug/m³) in one soil vapor sample but were not identified in onsite soil. For all compounds detected in soil vapor onsite, there are no past uses that would suggest that these contaminants have their origin onsite. The area is heavily paved and offsite sub-grade releases of compounds to soil vapor will have the potential to travel substantial distances across property boundaries. Low grade BTEX, PCE and TCE

soil vapor findings are attributed to unknown offsite sources. No reported constituent concentrations were above the OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soil (Subsurface Vapor Intrusion Guidance), November 2002, Table 2(a) Target Deep Soil Gas Concentration and Target Shallow Soil Gas Concentration.

Based on the results of this RI, we conclude that there is no evidence to suspect disposal of significant quantities of hazardous waste.

REMEDIAL INVESTIGATION REPORT

1.0 SITE BACKGROUND

The Babaev Group has enrolled in the New York City Brownfield Cleanup Program (NYC BCP) to investigate and remediate a 0.53-acre site located at 2244 Church Avenue in the East Flatbush section of Brooklyn, New York. Commercial use is proposed for the property. The RI work was performed in April and May 2011. 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 2244 Church Avenue in the East Flatbush section in Brooklyn, New York and is identified as Block 5103 and Lot 42 on the New York City Tax Map. Figure 1 shows the Site location. The Site is 23,153-square feet and is bounded by Church Avenue to the north, Science, Tech & Research High School to the south, commercial building to the east, and commercial building to the west. A map of the site boundary is shown in Figure 2. Currently, a single story vacant building is present on site with asphalt paved parking. Public access to the site is prohibited by a chain link fence with a locked gate.

1.2 Proposed Redevelopment Plan

The proposed redevelopment plan is an 18,000 square foot (ft²) three-story building with ground floor commercial retail and second floor commercial fitness center, and third floor medical offices. The building will contain a full 18,000 ft² basement to be utilized as commercial retail or fitness center. The portion of the lot not covered by the proposed building will be covered by concrete and used for HVAC units. There will be no on-site parking. Layout of the proposed site development is presented in Figure 3. The current zoning designation is commercial (C-4-4A). The proposed use is consistent with existing zoning for the property.

The building will contain a 1,200 ft² basement to be utilized as a utility room. To allow for the construction of the proposed basement, this area will be excavated to an approximate depth of 10 feet below ground surface. Based on the basement square footage (1,200 ft²) and planned depth of the excavation (10 feet) approximately 12,000 ft³ or 445 yd³ of soil will be excavated. Based on an estimate weight of 1.5 tons/yd³ this is a total of 668 tons of soil. During the recent Phase II investigation ground water was encountered at a depth of approximately 40 feet below ground surface, therefore it is not expected the excavation will extend into the ground water table.

1.3 DESCRIPTION OF SURROUNDING PROPERTY

Figure 1 shows the surrounding land usage. The surrounding properties are a mix of commercial and residential use. There are no surface water bodies or regulated wetlands on or adjacent to the Site. The nearest surface water body is Prospect Lake located approximately 0.6-miles northwest of the Site.

Sensitive Receptors

A review of OER's *SPEED* application shows no hospitals are located within a 500-foot radius of the site. One day care center is located within a 500-foot radius of the site;

- C.Y.C.L.E day care center is located approximately 400 feet east of the site.

Two public schools are located within a 500-foot radius of the site, they include:

- PS 245 located approximately 120 feet west of the site, and
- Science, Technology, and Research High Scholl located adjacent to the site's southern property boundary.

Figure 1 shows the surrounding land usage.

2.0 SITE HISTORY

2.1 PAST USES AND OWNERSHIP

According to Sanborn maps the subject site is depicted as dwellings, wagon shed, coal shed in the 1900's, stores, dwelling, vacant in the 1920's, stores, auto parking, office, unclear in the 1950's, auto parking, office, unclear from the 1960's to 1980, vacant, unclear in the mid 1980's, auto parking, office, unclear in 1986, commercial, auto parking from 1987 through the 1990's. According to knowledgeable sources, this site has been vacant for approximately four years, Veggie Castle for 11 years, prior; White Castle for an extend period of time (Phase I Environmental Assessment – Singer Environmental Group, LTD.).

2.2 PREVIOUS INVESTIGATIONS

A Phase I ESA was performed in 2011 by Singer Environmental Group, LTD (Singer). Singer concluded in their Phase I ESA report dated February 15, 2011 no evidence of recognized environmental condition in connection with the site. No additional environmental investigations were performed.

2.3 AREAS OF CONCERN

Areas of Concern generally include areas where existing or former activities are known or suspected to have resulted in generation, manufacture, refinement, transport, storage, handling, treatment, discharge, release and/or disposal. Sanborn fire insurance maps available for this Site were reviewed to identify historical features of environmental significance, copies of these maps are include in Appendix A.

The AOCs identified for this site include:

- Historic Fill

Phase 1 Report is presented in Appendix A.

3.0 PROJECT MANAGEMENT

3.1 PROJECT ORGANIZATION

The Qualified Environmental Profession (QEP) responsible for preparation of this RIR is Timothy Fisher.

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. A copy of the site Health and Safety Plan is included as Appendix B.

3.3 MATERIALS MANAGEMENT

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

4.0 REMEDIAL INVESTIGATION ACTIVITIES

The Babaev Group performed the following scope of work:

1. Conducted a Site inspection to identify AOCs and physical obstructions (i.e. structures, buildings, etc.);
2. Installed five soil borings across the entire project Site, and collected 10 soil samples for chemical analysis from the soil borings to evaluate soil quality;
3. Installed three groundwater monitoring wells throughout the Site to establish groundwater flow and collected three groundwater samples for chemical analysis to evaluate groundwater quality;
4. Installed two soil vapor probes around Site perimeter and collected two samples for chemical analysis.

4.1 GEOPHYSICAL INVESTIGATION

A geophysical investigation performed on April 18, 2011 by Naeva Geophysics, Inc. under the oversight of Antea Group as part of the Phase II ESA. This investigation found no evidence of underground storage tank(s) present on-site.

4.2 BORINGS AND MONITORING WELLS

Drilling and Soil Logging

Boring logs were prepared by a geologist for all soil samples to document subsurface conditions. Boring logs include a description of the following: soil types and non-soil materials; soil screening results from field instrument measurements (photoionization detector); depth to groundwater; presence of soil mottling; presence of odor, vapors, soil discoloration; and presence of free and/or residual product. Boring logs with this information are attached in Appendix C. A map showing the location of soil borings and monitor wells is shown in Figure 2.

Groundwater Monitoring Well Construction

Three ground water monitoring wells were installed to allow for the collection of ground water samples and to determine direction of ground water flow.

Each monitoring well was constructed of 2-inch diameter PVC screen from approx. 40 to 50 feet bgs and 2-inch diameter riser from the screen to ground surface. Filter sand was placed in the annular space surrounding the screened section of the wells and bentonite seal was placed above the filter sand. Well construction details are shown on the boring logs in Appendix C and on Table 1.

Monitor well locations are shown in Figure 2.

Survey

The location of each soil boring and temporary monitoring well were marked with a hand held GPS unit. The latitude and longitude coordinates are noted on Table 1. Top of casing elevations were surveyed to an arbitrary elevation of 100 feet.

Water Level Measurement

Depth to ground water level measure measurements were collected using an electronic interface probe. These measurements were used to determine arbitrary ground water elevations at each monitoring well location. The depth to observed ground water is included in the boring logs. Depth to water level data is included in Table 1. A copy of the boring logs are included in Appendix C.

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

Ten soil samples 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 2. Figure 2 shows the location of samples collected in this investigation. Laboratories and analytical methods are shown below.

Continuous soil samples were collected from each boring location from the ground surface to the termination via two foot split spoon samplers. The soil samples were inspected for visual evidence of impacts and were screened for total volatile organic compounds (VOCs) using a photo-ionization detector (PID). In accordance with the approved work plan two soil samples from each boring location (total of ten) were submitted for laboratory analysis. The first soil sample was collected from the 0-2 feet bgs interval (SB-1_0-2ft, SB-2_0-2ft, and SB-3_0-2ft, SB-4_0-2, and SB-5_0-2). The second sample was collected from the native soil underlying the historic fill (SB-1_10-12, SB-2_10-12, SB-3_10-12, SB-4_8-10, and SB-5_4-6). The soil sample SB-1_10-12 also represents the bottom the proposed excavation for the building basement. The soil samples were forwarded, under chain-of-custody procedures, to a NYSDOH ELAP certified lab, Accutest Laboratories.

Groundwater Sampling

Three groundwater samples were collected for chemical analysis during this RI. Groundwater sample collection data is reported in Table 3. Figure 2 shows the location of groundwater sampling. Laboratories and analytical methods are shown below.

Ground water samples were collected from each well location utilizing a disposable bailer. Each well was purged a minimum of three well volumes prior to sample collection. The ground water samples were forwarded, under chain-of-custody procedures, to Accutest Laboratories.

Soil Vapor Sampling

Two soil vapor probes were installed and two soil vapor samples were collected for chemical analysis during this RI. Soil vapor sampling locations are shown in Figure 2. Soil vapor sample collection data is reported in Table 4. Methodologies used for soil vapor assessment conform to the *NYS DOH Final Guidance on Soil Vapor Intrusion, October 2006*. These methodologies include connection from the vapor point tubing to tubing that would be connected to a laboratory

certified clean 6 liter summa canister. Following the completion of this connection, plastic sheeting was placed over the well head and tubing connections. The plastic sheeting was then secured to the ground surface. Helium gas was applied to the space under the plastic sheeting, at this point helium gas surrounded the well head and the connection from the soil vapor point tubing to the tubing that would connect to the summa canister. A vapor purge pump was then connected to the tubing to pull vapors from the soil point, the purged vapors were collected in a tedlar bag. A helium detector was then used to pull the vapors from the tedlar bag to check for the presence or absence of helium. If less than 10% helium was detected, the connections and soil vapor point annular seal was determined to be tight and soil vapor sampling proceeded. The following step included purging a minimum of one volume of soil vapor from the soil vapor point. This was performed utilizing a vapor purge pump set at a purge rate of 0.2 liters per minute. Following the purging of the soil vapor point the tubing was connected to a 6 liter summa canister. The summa canister's regulator was set to allow for a 2 hour total sample time (0.05 liters per minute). Following the collection of the soil vapor samples, a helium tracer test was performed again to confirm the connections and the annular seal remained tight during the 2 hour sample collection period.

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 Susan M. Goshert
Chemical Analytical Laboratory	Chemical analytical laboratory(s) used in the RI is NYS ELAP certified and were Accutest Laboratories
Chemical Analytical Methods	Soil analytical methods: <ul style="list-style-type: none"> • TAL Metals by EPA Method 6020; • TCL VOCs by EPA Method 8260B; • TCL SVOCs by EPA Method 8270C;

	<ul style="list-style-type: none"> • Pesticides by EPA Method 8081B; • PCBs by EPA Method 8082A; <p>Groundwater analytical methods:</p> <ul style="list-style-type: none"> • TAL Metals by EPA Method 6020; • TCL VOCs by EPA Method 8260B; • TCL SVOCs by EPA Method 8270C; • Pesticides by EPA Method 8081B; • PCBs by EPA Method 8082A; <p>Soil vapor analytical methods:</p> <ul style="list-style-type: none"> • VOCs by TO-15 VOC parameters..
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Results of Chemical Analyses

Laboratory data for soil, groundwater and soil vapor are summarized in Table 2 through 4, respectively. Laboratory data deliverables for all samples evaluated in this RIR are provided in digital form in Appendix E, F, and G.

5.0 ENVIRONMENTAL EVALUATION

5.1 GEOLOGICAL AND HYDROGEOLOGICAL CONDITIONS

According to the Surficial Geologic Map of New York, Lower Hudson Sheet (Cadwell, 1989), this area of New York is underlain by outwash sand and gravel, dominantly consisting of coarse to fine gravel with sand, proglacial fluvial deposition, well rounded and stratified, generally finer texture away from ice border, thickness variable (2-20 meters). According to the United States Department of Agriculture Soil Survey Classification and Nomenclature System, this soil would likely be referred to as *Urban Land*, because the original composition and structure of the soil has been significantly altered by urbanization and development activities. Based on surrounding topography, regional ground water likely flows in a southwesterly direction.

Stratigraphy

There are no predominant geological surface features such as rock outcroppings on the subject site. Site-specific stratigraphy was gathered during soil boring advancement activities. Based on soil collected, the subject site is underlain by historic fill from approximately 4 to 10 feet below ground surface (ft bgs), below which is brown, poorly graded sand with some gravel extending to the water table. Bedrock was not encountered during this investigation.

Hydrogeology

A table of water level data for all monitor wells is included in Table 1. The average depth to groundwater is 41.18 and the range in depth is 40.66 to 41.57. A map of groundwater level elevations with groundwater contours and inferred flow lines is shown in Figure 4. Groundwater flow is from north to southeast.

5.2 SOIL CHEMISTRY

Soil analytical data is summarized in Table 2 and compared to Part 375-6.8 Track 1 Soil Cleanup Objectives (SCOs). Exceedances of the Track 1 Unrestricted SCOs are noted on Table 2. A copy of the full laboratory data deliverable in digital format is included in Appendix E. Soil concentrations of polychlorinated biphenyls (PCBs), pesticides, and volatile organic compounds (VOCs) did not exceed Track 1 Unrestricted SCOs for each of the ten soil samples

collected. Exceedances of Track 1 SCOs were found in soil samples SB-1 (0-2'), SB-4 (0-2'), and SB-5 (0-2') for select semi-volatile organic compounds (SVOCs). No SVOCs exceeded Track 1 SCOs in any deep (10-12) soil samples. A variety of polycyclic aromatic hydrocarbon (PAH) compounds were identified in shallow soils above Track 1 SCOs. However, only two of these PAH marginally exceed Track 2 Restricted Commercial SCOs in two samples. Track 1 SCOs were achieved for all metals with two exceptions. Nickel slightly exceeded Track 1 SCOs in several samples but did not exceed Track 2 Restricted Commercial SCOs. Similarly, mercury exceeds Track 1 SCOs in several shallow samples but does not exceed Track 2 Restricted Commercial SCOs in any soil sample. Overall, Track 2 Restricted Commercial SCOs are effectively achieved for this property without any remedial removal action.

A summary table of data for chemical analyses performed on soil samples is included in Table 2. Figure 5 shows the location values for soil/fill that exceed the 6NYCRR Part 375-6.8 Track 1 Unrestricted Soil Cleanup Objectives.

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

5.3 GROUNDWATER CHEMISTRY

Ground water analytical data is summarized in Table 3 and compared to Part 703.5 Class GA Groundwater Standards and NYSDEC Technical & Operations Guidance Series (TOGS) 1.1.1, Ambient Water Quality Standards and Guidance Values. Exceedances of the applicable standards and guidance values are noted on Table 3. A copy of the full laboratory data deliverable in digital format is included in Appendix F.

No PCBs, pesticides or SVOCs were detected in any groundwater sample on this site. One VOC, PCE was observed in one sample slightly above Technical & Operational Guidance Series (TOGS). PCE is not observed in any onsite soil samples and site inspections and evaluation of historical land usage did not indicate any potential onsite sources. Metals concentrations are observed in unfiltered samples above TOGS in groundwater and show influence of sample turbidity. Ground water analytical data is presented in Table 3.

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 3. Exceedence 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

Soil Vapor analytical data is summarized in Table 4. NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York (October 2006 final draft) explains that New York State does not have any standards, criteria, or guidance values for concentrations of compounds in soil vapor. As a result, compound concentrations detected in the soil vapor samples have been compared to the guidance concentrations listed in Table 2(a) of EPA Office of Solid Waste and Emergency Response (OSWER) Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soil (Subsurface Vapor Intrusion Guidance), November 2002. Table 2(a) is split into two categories, Target Deep Soil Gas Concentration and Target Shallow Soil Gas Concentration. Samples collected from greater than five feet below the buildings slab are compared to Target Deep Soil Gas Concentration. Samples collected from within five feet of a buildings slab are compared to Target Shallow Soil Gas Concentration. Exceedances of the applicable guidance values are noted on Table 4. A copy of the full laboratory data deliverable in digital format is included in Appendix G. As shown in Table 4, soil vapor samples collected from VP-1 and VP-2 did not exhibit compound concentrations above the shallow or deep soil gas limits.

Soil vapor samples collected during the RI showed low level occurrences of BTEX compounds and their derivatives. These concentrations are low (below 50 ug/m³) in most instances but range as high as 343 ug/m³ for toluene. BTEX was not identified in any onsite soil sample or groundwater sample and soil vapor findings on this property. Similarly, TCE and PCE were identified in very low concentrations (below 4 ug/m³) in one soil vapor sample but were not identified in onsite soil. For all compounds detected in soil vapor onsite, there are no past uses that would suggest that these contaminants have their origin onsite. The area is heavily paved and offsite sub-grade releases of compounds to soil vapor will have the potential to travel

substantial distances across property boundaries. Low grade BTEX, PCE and TCE soil vapor findings are attributed to unknown offsite sources.

Data collected during the RI is sufficient to delineate the distribution of contaminants in soil vapor at the Site. A summary table of data for chemical analyses performed on soil vapor samples is included in Table 4.

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.

APPENDIX A – PHASE 1 REPORT

APPENDIX B – HEALTH AND SAFETY PLAN

APPENDIX C – SOIL BORING GEOLOGIC LOGS

APPENDIX D – SAMPLING LOGS

**APPENDIX E – LABORATORY DATA
DELIVERABLES FOR SOIL ANALYTICAL DATA**

**APPENDIX F – LABORATORY DATA
DELIVERABLES FOR GROUNDWATER
ANALYTICAL DATA**

**APPENDIX G – LABORATORY DATA
DELIVERABLES FOR SOIL VAPOR
ANALYTICAL DATA**

