

VACANT COMMERCIAL PROPERTY

1465 ROCKAWAY PARKWAY

BROOKLYN, NEW YORK

Remedial Action Work Plan

NYC BCP Number: 12CVCP067K

Prepared for:

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REMEDIAL ACTION WORK PLAN

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LIST OF ACRONYMS

Acronym	Definition
AOC	Area of Concern
AS/SVE	Air Sparging/Soil Vapor Extraction
BOA	Brownfield Opportunity Area
CAMP	Community Air Monitoring Plan
C/D	Construction/Demolition
COC	Certificate of Completion
CQAP	Construction Quality Assurance Plan
CSOP	Contractors Site Operation Plan
DCR	Declaration of Covenants and Restrictions
ECs/ICs	Engineering and Institutional Controls
HASP	Health and Safety Plan
IRM	Interim Remedial Measure
BCA	Brownfield Cleanup Agreement
MNA	Monitored Natural Attenuation
NOC	Notice of Completion
NYC BCP	New York City Brownfield Cleanup Program
NYC DEP	New York City Department of Environmental Protection
NYC DOHMH	New York State Department of Health and Mental Hygiene
NYCRR	New York Codes Rules and Regulations
NYC OER	New York City Office of Environmental Remediation
NYS DEC	New York State Department of Environmental Conservation
NYS DEC DER	New York State Department of Environmental Conservation Division of Environmental Remediation
NYS DOH	New York State Department of Health
NYS DOT	New York State Department of Transportation
ORC	Oxygen-Release Compound
OSHA	United States Occupational Health and Safety Administration
PE	Professional Engineer

PID	Photo Ionization Detector
QEP	Qualified Environmental Professional
QHHEA	Qualitative Human Health Exposure Assessment
RAOs	Remedial Action Objectives
RAR	Remedial Action Report
RAWP	Remedial Action Work Plan or Plan
RCA	Recycled Concrete Aggregate
RD	Remedial Design
RI	Remedial Investigation
RMZ	Residual Management Zone
SCOs	Soil Cleanup Objectives
SCG	Standards, Criteria and Guidance
SMP	Site Management Plan
SPDES	State Pollutant Discharge Elimination System
SVOC	Semi-Volatile Organic Compound
USGS	United States Geological Survey
UST	Underground Storage Tank
VOC	Volatile Organic Compound

CERTIFICATION

I, Dale Konas, am a Professional Engineer licensed in the State of New York. I have primary direct responsibility for implementation of the remedial action for the Vacant Commercial Property Site (Number12CVCP067K).

I, Gavin Zollo, am a Qualified Environmental Professional as defined in §43-140. I have primary direct responsibility for implementation of the remedial action for the Vacant Commercial Property Site (Number 12CVCP067K).

I certify that this Remedial Action Work Plan (RAWP) has a plan for handling, transport and disposal of soil, fill, fluids and other materials removed from the property in accordance with applicable City, State and Federal laws and regulations. Importation of all soil, fill and other material from off-Site will be in accordance with all applicable City, State and Federal laws and requirements. This RAWP has provisions to control nuisances during the remediation and all invasive work, including dust and odor suppression.

Name

NYS PE License Number

Signature

Date



QEP Name

QEP Signature

Date

EXECUTIVE SUMMARY

Conklin Homes LLC has enrolled in the New York City Brownfield Cleanup Program (NYC BCP) to investigate and remediate a 2,500-square foot site located at 1465 Rockaway Parkway in Brooklyn, New York. A remedial investigation (RI) was performed to compile and evaluate data and information necessary to develop this Remedial Action Work Plan (RAWP). The remedial action described in this document provides for the protection of public health and the environment consistent with the intended property use, complies with applicable environmental standards, criteria and guidance and conforms with applicable laws and regulations.

Site Location and Current Usage

The Site is located at 1465 Rockaway Parkway in the Canarsie section in Brooklyn, New York and is identified as Block 8185 and Lot 24 on the New York City Tax Map. Figure 1 shows the Site location. The Site is 2,539-square feet and is bounded by single-story commercial building to the north, a single-story commercial building to the south, a two-story masonry building to the east and Rockaway Parkway to the west. A map of the Site boundary is shown in Figure 2. Currently, the Site is a vacant commercial lot.

Summary of Proposed Redevelopment Plan

The proposed use of the Site will consist of a three-story steel and masonry building with a full cellar. The proposed building will occupy 100% of the Site and will be a mixed used building consisting of both commercial and residential space. The layout of the proposed Site development is presented in Appendix C. The Site is zoned for commercial and residential usage.

The first floor of the building will be utilized as a household appliance store. The second and third floors will be utilized as residential space. The cellar will be utilized as storage space and will exist 12 feet below grade. Groundwater at the Site is at approximately 19 feet below grade. Therefore, the excavation required to erect the proposed building should not reach or disturb the groundwater beneath the Site.

The remedial action contemplated under this RAWP may be implemented independently of the proposed redevelopment plan.

Summary of the Remedy

The proposed remedial action achieves protection of public health and the environment for the intended use of the property. The proposed remedial action achieves all of the remedial action objectives established for the project and addresses applicable standards, criterion, and guidance; is effective in both the short-term and long-term and reduces mobility, toxicity and volume of contaminants; is cost effective and implementable; and uses standards methods that are well established in the industry.

The proposed remedial action will consist of:

1. Preparation of a Community Protection Statement and performance of all required NYC BCP citizen participation activities according to an approved Citizen Participation Plan (CPP).
2. Performance of a Community Air Monitoring Program for particulates and volatile organic compounds.
3. Establishment of Track 1 Soil Cleanup Objectives (SCOs).
4. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas.
5. Excavation and removal of soil/fill exceeding SCOs.
6. Screening of excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID.
7. Removal of USTs and closure of petroleum spills (if encountered) in compliance with applicable local, State and Federal laws and regulations.
8. Collection and analysis of end-point samples to determine the performance of the remedy with respect to attainment of SCOs/SCGs.
9. Installation of a vapor barrier system beneath the building slab.

10. Construction and maintenance of an engineered composite cover consisting of 6-inch concrete building slab to prevent human exposure to residual soil/fill remaining under the Site;
11. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations.
12. Transportation and off-Site disposal of all soil/fill material at permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities. Appropriate segregation of excavated media onsite.
13. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations.
14. Performance of all activities required for the remedial action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations.
15. Submission of a RAR that describes the remedial activities certifies that the remedial requirements have been achieved, defines the Site boundaries, and describes all Engineering and Institutional Controls to be implemented at the Site, and lists any changes from this RAWP.
16. If Track 1 is not achieved, submission of an approved Site Management Plan (SMP) in the RAR for long-term management of residual contamination, including plans for operation, maintenance, monitoring, inspection and certification of Engineering and Institutional Controls and reporting at a specified frequency.
17. If Track 1 is not achieved, recording of a Declaration of Covenants and Restrictions that includes a listing of Engineering Controls and a requirement that management of these controls must be in compliance with an approved SMP; and Institutional Controls including prohibition of the following: (1) vegetable gardening and farming; (2) use of groundwater without treatment rendering it safe for the intended use; (3) disturbance of

residual contaminated material unless it is conducted in accordance with the SMP; and
(4) higher level of land usage without OER-approval.

COMMUNITY PROTECTION STATEMENT

The Office of Environmental Remediation created the New York City Brownfield Cleanup Program (NYC BCP) to provide governmental oversight for the cleanup of contaminated property in NYC. This Remedial Action Work Plan (“cleanup plan”) describes the findings of prior environmental studies that show the location of contamination at the site, and describes the plans to clean up the site to protect public health and the environment.

This cleanup plan provides a very high level of protection for neighboring communities. This cleanup plan also includes many other elements that address common community concerns, such as community air monitoring, odor, dust and noise controls, hours of operation, good housekeeping and cleanliness, truck management and routing, and opportunities for community participation. The purpose of this Community Protection Statement is to explain these community protection measures in non-technical language to simplify community review.

Remedial Investigation and Cleanup Plan. Under the NYC BCP, a thorough cleanup study of this property (called a remedial investigation) has been performed to identify past property usage, to sample and test soils, groundwater and soil vapor, and identify contaminant sources present on the property. The cleanup plan has been designed to address all contaminant sources that have been identified during the study of this property.

Identification of Sensitive Land Uses. Prior to selecting a cleanup, the neighborhood was evaluated to identify sensitive land uses nearby, such as schools, day care facilities, hospitals and residential areas. The cleanup program was then tailored to address the special conditions of this community.

Qualitative Human Health Exposure Assessment. An important part of the cleanup planning for the Site is the performance of a study to find all of the ways that people might come in contact with contaminants at the Site now or in the future. This study is called a Qualitative Human Health Exposure Assessment (QHHEA). A QHHEA was performed for this project. This assessment has considered all known contamination at the Site and evaluated the potential for people to come in contact with this contamination. All identified public exposures will be addressed under this cleanup plan.

Health and Safety Plan. This cleanup plan includes a Health and Safety Plan that is designed to protect community residents and on-Site workers. The elements of this plan are in compliance with safety requirements of the United States Occupational Safety and Health Administration. This plan includes many protective elements including those discussed below.

Site Safety Coordinator. This project has a designated Site safety coordinator to implement the Health and Safety Plan. The safety coordinator maintains an emergency contact sheet and protocol for management of emergencies. The Site safety coordinator is Gavin Zollo and can be reached at 631-924-3001.

Worker Training. Workers participating in cleanup of contaminated material on this project are required to be trained in a 40-hour hazardous waste operators training course and to take annual refresher training. This pertains to workers performing specific tasks including removing contaminated material and installing cleanup systems in contaminated areas.

Community Air Monitoring Plan. Community air monitoring will be performed during this cleanup project to ensure that the community is properly protected from contaminants, dust and odors. Air samples will be tested in accordance with a detailed plan called the Community Air Monitoring Plan or CAMP. Results will be regularly reported to the NYC Office of Environmental Remediation. This cleanup plan also has a plan to address any unforeseen problems that might occur during the cleanup (called a ‘Contingency Plan’).

Odor, Dust and Noise Control. This cleanup plan includes actions for odor and dust control. These actions are designed to prevent off-Site odor and dust nuisances and includes steps to be taken if nuisances are detected. Generally, dust is managed by application of physical covers and by water sprays. Odors are controlled by limiting the area of open excavations, physical covers, spray foams and by a series of other actions (called operational measures). The project is also required to comply with NYC noise control standards. If you observe problems in these areas, please contact the onsite Project Manager Gavin Zollo at 631-924-3001 or NYC Office of Environmental Remediation Project Manager Hannah Moore at 212-442-6372.

Quality Assurance. This cleanup plan requires that evidence be provided to illustrate that all cleanup work required under the plan has been completed properly. This evidence will be

summarized in the final report, called the Remedial Action Report. This report will be submitted to the NYC Office of Environmental Remediation and will be thoroughly reviewed.

Storm-Water Management. To limit the potential for soil erosion and discharge, this cleanup plan has provisions for storm-water management. The main elements of the storm water management include physical barriers such as tarp covers and erosion fencing, and a program for frequent inspection.

Hours of Operation. The hours for operation of cleanup will comply with the NYC Department of Buildings construction code requirements or according to specific variances issued by that agency. For this cleanup project, the hours of operation are 8:00am to 4:00pm Monday through Friday.

Signage. While the cleanup is in progress, a placard will be prominently posted at the main entrance of the property with a laminated project Fact Sheet that states that the project is in the NYC Brownfield Cleanup Program, provides project contact names and numbers, and locations of project documents can be viewed.

Complaint Management. The contractor performing this cleanup is required to address all complaints. If you have any complaints, you can call the facility Project Manager Gavin Zollo at 631-924-3001, the NYC Office of Environmental Remediation Project Manager Hannah Moore at 212-442-6372, or call 311 and mention the Site is in the NYC Brownfield Cleanup Program.

Utility Mark-outs. To promote safety during excavation in this cleanup, the contractor is required to first identify all utilities and must perform all excavation and construction work in compliance with NYC Department of Buildings regulations.

Soil and Liquid Disposal. All soil and liquid material removed from the Site as part of the cleanup will be transported and disposed of in accordance with all applicable City, State and Federal regulations and required permits will be obtained.

Soil Chemical Testing and Screening. All excavations will be supervised by a trained and properly qualified environmental professional. In addition to extensive sampling and chemical testing of soils on the Site, excavated soil will be screened continuously using hand-held

instruments, by sight, and by smell to ensure proper material handling and management, and community protection.

Stockpile Management. Soil stockpiles will be kept covered with tarps to prevent dust, odors and erosion. Stockpiles will be frequently inspected. Damaged tarp covers will be promptly replaced. Stockpiles will be protected with silt fences. Hay bales will be used, as needed to protect storm water catch basins and other discharge points.

Trucks and Covers. Loaded trucks leaving the Site will be covered in compliance with applicable laws and regulations to prevent dust and odor. Trucks will be properly recorded in logs and records and placarded in compliance with applicable City, State and Federal laws, including those of the New York State Department of Transportation. If loads contain wet material that can leak, truck liners will be used. All transport of materials will be performed by licensed truckers and in compliance with all laws and regulations.

Imported Material. All fill materials proposed to be brought onto the Site will comply with rules outlined in this cleanup plan and will be inspected and approved by a qualified worker located on-Site. Waste materials will not be brought onto the Site. Trucks entering the Site with imported clean materials will be covered in compliance with applicable laws and regulations.

Equipment Decontamination. All equipment used for cleanup work will be inspected and washed, if needed, before it leaves the Site. Trucks will be cleaned at a truck inspection station on the property before leaving the Site.

Housekeeping. Locations where trucks enter or leave the Site will be inspected every day and cleaned regularly to ensure that they are free of dirt and other materials from the Site.

Truck Routing. Truck routes have been selected to: (a) limit transport through residential areas and past sensitive nearby properties; (b) maximize use of city-mapped truck routes; (c) limit total distance to major highways; (d) promote safety in entry to highways; (e) promote overall safety in trucking; and (f) minimize off-Site line-ups (queuing) of trucks entering the property. Operators of loaded trucks leaving the Site will be instructed not to stop or idle in the local neighborhood.

Final Report. The results of all cleanup work will be fully documented in a final report (called a Remedial Action Report) that will be available for you to review in the public document repositories located at Brooklyn Public Library, Canarsie Branch (1580 Rockaway Parkway).

Long-Term Site Management. To provide long-term protection after the cleanup is complete, the property owner will be required to comply with an ongoing Site Management Plan that calls for continued inspection of protective controls, such as Site covers. The Site Management Plan is evaluated and approved by the NYC Office of Environmental Remediation. Requirements that the property owner must comply with are defined in the property's deed. A certification of continued protectiveness of the cleanup will be required from time to time to show that the approved cleanup is still effective.

REMEDIAL ACTION WORK PLAN

1.0 SITE BACKGROUND

Conklin Homes LLC (Conklin) has enrolled in the New York City Brownfield Cleanup Program (NYC BCP) to investigate and remediate a property located at 1465 Rockaway Parkway in the Canarsie section of Brooklyn, New York (the Site). A Remedial Investigation (RI) was performed to compile and evaluate data and information necessary to develop this Remedial Action Work Plan (RAWP) in a manner that will render the Site protective of public health and the environment consistent with the contemplated end use. This RAWP establishes remedial action objectives, provides a remedial alternatives analysis that includes consideration of a permanent cleanup, and provides a description of the selected remedial action. The remedial action described in this document provides for the protection of public health and the environment, complies with applicable environmental standards, criteria and guidance and applicable laws and regulations.

SITE LOCATION AND CURRENT USAGE

The Site is located at 1465 Rockaway Parkway in the Canarsie section in Brooklyn, New York and is identified as Block 8185 and Lot 24 on the New York City Tax Map. Figure 1 shows the Site location. The Site is 2,539-square feet and is bounded by single-story commercial building to the north, a single-story commercial building to the south, a two-story masonry building to the east and Rockaway Parkway to the west. A map of the Site boundary is shown in Figure 2. Currently, the Site is a vacant commercial lot.

PROPOSED REDEVELOPMENT PLAN

The proposed use of the Site will consist of a three-story steel and masonry building with a full cellar. The proposed building will occupy 100% of the Site and will be a mixed used building consisting of both commercial and residential space. The layout of the proposed Site development is presented in Appendix C. The Site is zoned for commercial and residential usage.

The first floor of the building will be utilized as a retail household appliance store. The second and third floors will be utilized as residential space. The cellar will be utilized as storage space and will exist 12 feet below grade. Groundwater at the Site is at approximately 19 feet below grade. Therefore, the excavation required to erect the proposed building should not reach or disturb the groundwater beneath the Site.

The remedial action contemplated under this RAWP may be implemented independently of the proposed redevelopment plan.

DESCRIPTION OF SURROUNDING PROPERTY

The Site is situated in a mainly commercial area consisting of retail storefronts and food establishments along both sides of Rockaway Parkway. The adjacent property to the north is occupied by VIP Electronics & Appliance Inc (a retail electronics store). The adjacent property to the east is occupied by VIP Pro Audio Inc (a retail audio/video store). The adjacent property to the south is occupied by a McDonald's restaurant. The surrounding properties to the west across Rockaway Parkway are occupied, from south to north by, S & D Female (a retail clothing store), I-Max (a retail clothing store) and Rodeo Drive Jewelry (a retail jewelry store).

Figure 2 shows the surrounding land usage.

1.4 REMEDIAL INVESTIGATION

A remedial investigation was performed and the results are documented in a companion document called "*Remedial Investigation Report, Vacant Commercial Property*", dated May, 2012 (RIR).

Summary of Past Uses of Site and Areas of Concern

A review of ownership records indicates that Conklin Homes LLC is the current owner of the Site. The Site is listed in historical maps as a retail/commercial storefront since 1907. The Site is currently vacant, undeveloped land.

The AOC identified for the Site by OER following a review of the Phase I ESA conducted by EnviroTrac include:

1. Historic fill extending to five feet bgs throughout the property.

Summary of the Work Performed under the Remedial Investigation

EnviroTrac, on behalf of Conklin Homes LLC, performed the following scope of work:

1. Conducted a Site inspection to identify AOCs and physical obstructions (i.e. structures, buildings, etc.);
2. Installed three (3) soil borings across the entire project Site, and collected six (6) soil samples for chemical analysis from the soil borings to evaluate soil quality;
3. Installed three (3) temporary groundwater monitoring wells throughout the Site to establish groundwater flow and collected three (3) groundwater samples for chemical analysis to evaluate groundwater quality;
4. Installed three (3) soil vapor probes around Site perimeter and collected three (3) samples for chemical analysis.

Summary of Environmental Findings

1. Elevation of the Site is approximately 19 feet above mean sea level.
2. Depth to groundwater is approximately 19 feet below grade at the Site.
3. Groundwater flow is assumed to the southeast beneath the Site.
4. Depth to bedrock is unknown at the Site.
5. The stratigraphy of the Site, from the surface down, consists of approximately 5 feet of historic fill underlain by at least 20 feet of fine to coarse sands intermixed with trace gravel.
6. Soil/fill samples collected during the RI showed no PCBs or VOCs at detectable concentrations. Two SVOCs were detected within the shallow samples collected from the historic fill layer at concentrations above their Restricted Residential SCOs. These SVOCs are both PAH compounds and their concentrations and distribution indicate that they are associated with historic fill material observed in shallow samples. Four metals exceeded UUSCOs in shallow soil samples, and of these, lead (max of 617 ppm) and mercury (max of 1.46 ppm), also exceeded RRSCOs. One

pesticide 4,4,4-DDT was detected in one shallow soil sample at a concentration above its UUSCO, but well below its RRSCO. No SVOCs, pesticides, or metals were detected above Unrestricted Use SCOs within any of the deep soil samples collected at the Site. Overall, soil findings were unremarkable and do not indicate a source of contamination on the property. The soil chemistry findings were consistent with observations for other historical fill sites in Brooklyn. Gross contamination was not encountered in the field or detected by laboratory analysis.

7. Groundwater samples collected during the RI did not show any detectable concentrations of PCBs, SVOCs, or Pesticides. The only VOC identified in groundwater was chloroform, which was identified below its GQS. Dissolved manganese and sodium were detected above their respective NYSDEC GQS. The RI indicates that groundwater is not impacted by site conditions and did not reveal any sources of contaminants onsite. Gross contamination was not encountered in the field or detected by laboratory analysis.
8. Soil vapor samples collected during the RI showed petroleum and chlorinated VOCs at generally low concentrations. PCE was identified in all samples at a maximum concentration of 22.8 ug/m³. TCE was not detected in any of soil vapor samples. The results for PCE are below the monitoring level range of the State DOH soil vapor guidance matrix. No chlorinated or petroleum-related VOCs were detected within any of the soil or groundwater samples collected at the Site, and the low levels in soil vapor and findings of retail past usage of the property, suggest an offsite origin of PCE vapors.

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

2.0 REMEDIAL ACTION OBJECTIVES

Based on the results of the RI, the following Remedial Action Objectives (RAOs) have been identified for this Site:

Soil

- Prevent direct contact with contaminated soil.
- Prevent migration of contaminants that would result in groundwater contamination.

Groundwater

- Prevent direct exposure to contaminated groundwater.

Soil Vapor

- Prevent exposure to contaminants in soil vapor.
- Prevent migration of soil vapor into dwelling and other occupied structures.

3.0 REMEDIAL ALTERNATIVES ANALYSIS

The goal of the remedy selection process under is to select a remedy that is protective of human health and the environment taking into consideration the current, intended and reasonably anticipated future use of the property. The remedy selection process begins by establishing RAOs for media in which chemical constituents were found in exceedance of applicable standards, criteria and guidance values (SCGs). A remedy is then developed based on the following nine criteria:

- Protection of human health and the environment;
- Compliance with SCGs;
- Short-term effectiveness and impacts;
- Long-term effectiveness and permanence;
- Reduction of toxicity, mobility, or volume of contaminated material;
- Implementability;
- Cost effectiveness;
- Community Acceptance; and
- Land use.

The following is a detailed description of the alternatives analysis and remedy selection to address impacted media at the Site. As required, a minimum of two remedial alternatives (including a Track 1 scenario) are evaluated, as follows:

- Alternative 1 involves
 - Removal of all soil/ fill exceeding Track 1 Unrestricted Use SCOs throughout the Site (expected excavation to a depth of approximately 5 feet bgs to remove all historic fill at the Site) and confirmation that Track 1 Unrestricted Use SCOs have been achieved with post-excavation endpoint sampling.
 - Installation of a vapor barrier beneath the basement foundation and behind foundation sidewalls as part of construction to prevent any potential exposures from off-Site groundwater and soil vapor.

- Alternative 2 involves
 - Establishment of Track 4 Site-Specific SCOs. Excavation and removal of soil/ fill exceeding Track 4 Restricted Residential SCOs;
 - Placement of a final cover over the entire Site to eliminate exposure to remaining soil/fill;
 - Placement of vapor barrier beneath foundation slab and sidewalls to prevent soil vapor entering new building;
 - Establishment of use restrictions including prohibitions on the use of groundwater from the site and prohibitions on sensitive site uses, such as farming or vegetable gardening, to eliminate future exposure pathways.
 - Establishment of an approved Site Management Plan to ensure long-term management of these engineering and institutional controls including the performance of periodic inspections and certification that the controls are performing as they were intended; and
 - Placement of a deed restriction to memorialize the remedial action and the Engineering and Institutional Controls to ensure that future owners of the site continue to maintain these controls as required.

3.1 THRESHOLD CRITERIA

Protection of Public Health and the Environment

This criterion is an evaluation of the remedy's ability to protect public health and the environment, and an assessment of how risks posed through each existing or potential pathway of exposure are eliminated, reduced or controlled through removal, treatment, and implementation of Engineering Controls or Institutional Controls. Protection of public health and the environment must be achieved for all approved remedial actions.

Alternative 1 would be protective of human health and the environment by removing the historic fill at the Site, thus eliminating potential for direct contact with contaminated soil/ fill once construction is complete and eliminating the risk of contamination leaching into groundwater. Potential exposure to contaminated soils during construction would be minimized by implementing an approved Soil and Materials Management Plan and Community Air

Monitoring Plan (CAMP). There is minimal potential for contact with contaminated groundwater as it is neither used nor anticipated to be encountered during construction/ the remedial action. Potential migration of soil vapors into the new building would be prevented by installing a vapor barrier as part of new construction.

Alternative 2 would achieve comparable protections of human health and the environment since soil to a depth of 12 feet will be removed for purposes of construction and by ensuring that remaining soil/ fill on-Site meets Track 4 Site-Specific SCOs as well as by placement of institutional and engineering controls, including a composite cover system. The composite cover system would prevent direct contact with any remaining on-Site soil/fill. Implementing institutional controls including a deed notice and a site management plan would ensure that the composite cover system remains intact and protective. Establishment of Track 4 Site-Specific SCOs would minimize the risk of contamination leaching into groundwater. Potential exposure to contaminated soils during construction would be minimized by implementing an approved Soil and Materials Management Plan and Community Air Monitoring Plan (CAMP). Potential contact with contaminated groundwater would be eliminated as it would be prohibited by the deed notice, and it is not anticipated to be encountered during construction. Potential migration of soil vapors into the new building would be prevented by installing a vapor barrier as part of new construction.

3.2. BALANCING CRITERIA

Compliance with Standards, Criteria and Guidance (SCGs)

Alternative 1 will achieve compliance with the remedial goals, SCGs and RAOs for soil through removal to Track 1 Unrestricted Use SCOs. Compliance with SCGs for soil vapor will also be achieved by installation of vapor barrier as part of construction.

Alternative 2 will achieve compliance with the remedial goals, SCGs and RAOs for soil through removal to Track 4 Site Specific SCOs. Compliance with SCGs for soil vapor will also be achieved by installation of vapor barrier.

Short-term effectiveness and impacts

This evaluation criterion assesses the effects of the alternative during the construction and implementation phase until remedial action objectives are met. Under this criterion, alternatives are evaluated with respect to their effects on public health and the environment during implementation of the remedial action, including protection of the community, environmental impacts, time until remedial response objectives are achieved, and protection of workers during remedial actions.

Both Track 1 and Track 4 alternatives have similar-short term effectiveness during their respective implementations, as each requires excavation of historic fill material. Short term impacts are likely to be higher for the Track 1 alternative due to excavation of greater amounts of historical fill material. However, focused attention to means and methods during the remedial action during a Track 1 removal action, including community air monitoring and appropriate truck routing, would minimize or negate the overall impact of these activities and any differences between these alternatives.

Long-term effectiveness and permanence

This evaluation criterion addresses the results of a remedial action in terms of its permanence and quantity/nature of waste or residual contamination remaining at the Site after response objectives have been met, such as permanence of the remedial alternative, magnitude of remaining contamination, adequacy of controls including the adequacy and suitability of ECs/ICs that may be used to manage contaminant residuals that remain at the Site and assessment of containment systems and ICs that are designed to eliminate exposures to contaminants, and long-term reliability of Engineering Controls.

Alternative 1 would achieve long-term effectiveness and permanence related to on-Site contamination by permanently removing all impacted soil/fill.

Alternative 2 would provide long-term effectiveness by removing most on-site contamination and attaining Track 4 Site-Specific SCOs, establishing a composite cover system across the Site, establishing use restrictions, establishing a Site Management Plan to ensure long-term management of Institutional Controls (ICs) and Engineering Controls (ECs), and placing a deed restriction to memorialize these controls for the long term. Establishment of an SMP and a deed

restriction will ensure that this protection remains effective for the long-term. The SMP will ensure long-term effectiveness of all ECs and ICs by requiring periodic inspection and certification that these controls and use restrictions continue to be in place and are functioning as they were intended assuring that protections designed into the remedy will provide continued high level of protection in perpetuity.

Reduction of toxicity, mobility, or volume of contaminated material

This evaluation criterion assesses the remedial alternative's use of remedial technologies that permanently and significantly reduce toxicity, mobility, or volume of contaminants as their principal element. The following is the hierarchy of source removal and control measures that are to be used to remediate a Site, ranked from most preferable to least preferable: removal and/or treatment, containment, elimination of exposure and treatment of source at the point of exposure. It is preferred to use treatment or removal to eliminate contaminants at a Site, reduce the total mass of toxic contaminants, cause irreversible reduction in contaminants mobility, or reduce of total volume of contaminated media.

Alternative 1 will permanently eliminate the toxicity, mobility, and volume of contaminants from on-Site soil by meeting Track 1 Unrestricted Use SCOs. Alternative 2 would permanently eliminate the toxicity, mobility, and volume of contaminants from on-Site soil excavated for development purposes, and any remaining soil/fill would meet Track 4 Site-Specific SCOs. Alternative 1 would eliminate a greater total mass of contaminants on Site.

Implementability

This evaluation criterion addresses the technical and administrative feasibility of implementing an alternative and the availability of various services and materials required during its implementation, including technical feasibility of construction and operation, reliability of the selected technology, ease of undertaking remedial action, monitoring considerations, administrative feasibility (e.g. obtaining permits for remedial activities), and availability of services and materials.

Both alternatives will utilize standard methods that are commonly available and routinely applied by the industry. They use standard materials and services that are well established technology. The reliability of each remedy is also high. There are no special difficulties associated with any of the activities proposed.

Cost effectiveness

This evaluation criterion addresses the cost of alternatives, including capital costs (such as construction costs, equipment costs, and disposal costs, engineering expenses) and site management costs (costs incurred after remedial construction is complete) necessary to ensure the continued effectiveness of a remedial action.

Initial costs associated with the Track 1 alternative may be higher than the Track 4 alternative based on soil volume. However, long-term costs higher for Alternative 2 than Alternative 1 based on implementation of a Site Management Plan and placement of a deed restriction as part of Alternative 2. In both cases, appropriate public health and environmental protections are achieved.

Community Acceptance

This evaluation criterion addresses community opinion and support for the remedial action. Observations here will be supplemented by public comment received on the RAWP.

Based on the overall goals of the remedial program and initial observations by the project team, both of the alternatives for the Site would be acceptable to the community. This RAWP will be subject to and undergo public review under the NYC BCP and will provide the opportunity for detailed public input on the remedial alternatives and the selected remedial action. This public comment will be considered by OER prior to approval of this plan.

Land use

This evaluation criterion addresses the proposed use of the property. This evaluation has considered reasonably anticipated future uses of the Site and takes into account: current use and historical and/or recent development patterns; applicable zoning laws and maps; NYS Department of State's Brownfield Opportunity Areas (BOA) pursuant to section 970-r of the general municipal law; applicable land use plans; proximity to real property currently used for

residential use, and to commercial, industrial, agricultural, and/or recreational areas; environmental justice impacts, Federal or State land use designations; population growth patterns and projections; accessibility to existing infrastructure; proximity of the site to important cultural resources and natural resources, potential vulnerability of groundwater to contamination that might emanate from the site, proximity to flood plains, geography and geology; and current Institutional Controls applicable to the Site.

The proposed redevelopment of the Site is compatible with its current R7A zoning. Both alternatives provide comprehensive protection of public health and the environment for reasonably foreseeable uses of the Site, including restricted residential uses.

Sustainability of the Remedial Action

This criterion evaluates the overall sustainability of the remedial action alternatives and the degree to which sustainable means are employed to implement the remedial action including those that take into consideration NYC's sustainability goals defined in *PlaNYC: A Greener, Greater New York*. Sustainability goals may include: maximizing the recycling and reuse of non-virgin materials; reducing the consumption of virgin and non-renewable resources; minimizing energy consumption and greenhouse gas emissions; improving energy efficiency; and promotion of the use of native vegetation and enhancing biodiversity during landscaping associated with Site development.

While Alternative 2 would potentially result in lower energy usage based on reducing the volume of material transported off-Site, both remedial alternatives are comparable with respect to the opportunity to achieve sustainable remedial action.

4.0 REMEDIAL ACTION

4.1 SUMMARY OF PREFERRED REMEDIAL ACTION

The preferred remedial action alternative is Alternative 1. The preferred remedial action alternative achieves protection of public health and the environment for the intended use of the property. The preferred remedial action alternative will achieve all of the remedial action objectives established for the project and addresses applicable SCGs. The preferred remedial action alternative is effective in both the short-term and long-term and reduces mobility, toxicity and volume of contaminants. The preferred remedial action alternative is cost effective and implementable and uses standards methods that are well established in the industry.

The proposed remedial action will consist of:

1. Preparation of a Community Protection Statement and performance of all required NYC BCP citizen participation activities according to an approved Citizen Participation Plan (CPP).
2. Performance of a Community Air Monitoring Program for particulates and volatile organic compounds.
3. Establishment of Track 1 Soil Cleanup Objectives (SCOs).
4. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas.
5. Excavation and removal of soil/fill exceeding SCOs.
6. Screening of excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID. Removal of USTs and closure of petroleum spills (if encountered) in compliance with applicable local, State and Federal laws and regulations.
7. Collection and analysis of end-point samples to determine the performance of the remedy with respect to attainment of SCOs/SCGs.
8. Installation of a vapor barrier system beneath the building slab.

9. Construction and maintenance of an engineered composite cover consisting of 6-inch concrete building slab to prevent human exposure to residual soil/fill remaining under the Site;
10. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations.
11. Transportation and off-Site disposal of all soil/fill material at permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities. Appropriate segregation of excavated media onsite.
12. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations.
13. Performance of all activities required for the remedial action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations.
14. Submission of a RAR that describes the remedial activities certifies that the remedial requirements have been achieved, defines the Site boundaries, and describes all Engineering and Institutional Controls to be implemented at the Site, and lists any changes from this RAWP.
15. If Track 1 is not achieved, submission of an approved Site Management Plan (SMP) in the RAR for long-term management of residual contamination, including plans for operation, maintenance, monitoring, inspection and certification of Engineering and Institutional Controls and reporting at a specified frequency.
16. If Track 1 is not achieved, recording of a Declaration of Covenants and Restrictions that includes a listing of Engineering Controls and a requirement that management of these controls must be in compliance with an approved SMP; and Institutional Controls including prohibition of the following: (1) vegetable gardening and farming; (2) use of groundwater without treatment rendering it safe for the intended use; (3)

disturbance of residual contaminated material unless it is conducted in accordance with the SMP; and (4) higher level of land usage without OER-approval.

4.2 SOIL CLEANUP OBJECTIVES AND SOIL/FILL MANAGEMENT

Track 1 Unrestricted Use Soil Cleanup Objectives (SCOs) are proposed for this project. If Track 1 is not achieved, the following Track 4 Site-Specific SCOs will be used:

<u>Contaminant</u>	<u>Track 4 SCOs</u>
Total SVOCs	250 ppm
Lead	1000 ppm
Mercury	2.8 ppm

On-Site soil meets Track 2 Restricted Residential SCOs as amended by the above listed Track 4 SCOs. Soil and materials management on-Site and off-Site, including excavation, handling and disposal, will be conducted in accordance with the Soil/Materials Management Plan in Appendix 3. The location of planned excavations is shown in Figure 4.

Estimated Soil/Fill Removal Quantities

The total quantity of soil/fill expected to be excavated and disposed off-Site is 650 tons.

Disposal location(s) will be reported promptly to the OER Project Manager prior to the start of the remedial action.

End-Point Sampling

Removal actions under this plan will be performed in conjunction with remedial end-point sampling. For assessment of attainment of Track 1 Unrestricted Use SCOs, the RI provided endpoint data meeting Unrestricted Use SCOs at 12-14 feet below grade across the Site. End-point sampling frequency will consist of two (2) bottom samples collected from the excavation. To evaluate attainment of Track 1 Unrestricted Use SCOs, endpoint samples will be analyzed for the full list of VOCs, SVOCs, PCBs, Pesticides, and Metals. In addition, post-removal end-point sampling and testing will be performed following removal of historic fill and completed prior to

removal of remaining material that is anticipated to meet Track 1 Unrestricted Use SCOs to verify suitability for soil recycling. Bottom samples will be taken within 24 hours of excavation, and will be taken from the zero to six-inch interval at the excavation floor. Samples taken after 24 hours will be taken at six to twelve inches.

If hotspots are identified during the remedial action or construction, hotspot removal actions under this plan will be performed in conjunction with remedial end-point sampling. Remedial end-point sampling frequency will consist of the following:

1. For excavations less than 20 feet in total perimeter, at least one bottom sample and one sidewall sample biased in the direction of surface runoff.
2. For excavations 20 to 300 feet in perimeter:
 - For surface removals, one sample from the top of each sidewall for every 30 linear feet of sidewall and one sample from the excavation bottom for every 900 square feet of bottom area.
 - For subsurface removals, one sample from each sidewall for every 30 linear feet of sidewall and one sample from the excavation bottom for every 900 square feet of bottom area.
3. For sampling of volatile organics, bottom samples should be taken within 24 hours of excavation, and should be taken from the zero to six-inch interval at the excavation floor. Samples taken after 24 hours should be taken at six to twelve inches.
4. For contaminated soil removal, post remediation soil samples for laboratory analysis should be taken immediately after contaminated soil removal. If the excavation is enlarged horizontally, additional soil samples will be taken pursuant to bullets 1-3 above.

Post-remediation sample locations and depth will be biased towards the areas and depths of highest contamination identified during previous sampling episodes unless field indicators such as field instrument measurements or visual contamination identified during the remedial action indicate that other locations and depths may be more heavily contaminated. In all cases, post-remediation samples will be biased toward locations and depths of the highest expected contamination.

A New York State ELAP certified lab will be used for all end-point sample analyses. Labs for end-point sample analyses will be reported in the RAR. The RAR will provide a tabular summary of all end-point sample results and will include all data including non-detects and applicable standards and/or guidance values. End-point samples will be analyzed for trigger analytes (those for which SCO exceedance is identified) utilizing the following methodology:

Soil analytical methods will include:

- Volatile organic compounds by EPA Method 8260;
- Semi-volatile organic compounds by EPA Method 8270;
- Target Analyte List metals; and
- Pesticides/PCBs by EPA Method 8081/8082.

If either LNAPL and/or DNAPL are detected, appropriate samples will be collected for characterization and “finger print analysis” and required regulatory reporting (i.e. spills hotline) will be performed.

Quality Assurance/Quality Control

Field QA/QC will include the following procedures:

- Calibration of field equipment, including PID, on a daily basis;
- Analysis of one (1) duplicate sample;
- Use of dedicated and/or disposable field sampling equipment;
- Proper sample handling and preservation;
- Proper sample chain of custody documentation; and
- Completion of report logs.

The above procedures will be executed as follows:

- One (1) duplicate end-point soil sample will be collected to evaluate field sampling precision or reproducibility of measurements of the same parameter under the given set of conditions;

- Disposable sampling equipment will be used to minimize cross-contamination between samples;
- For each of the parameters analyzed, a sufficient sample volume will be collected to adhere to the specific analytical protocol, and provide sufficient sample for reanalysis if necessary;
- Because plasticizers and other organic compounds inherent in plastic containers may contaminate samples requiring organic analysis, samples will be collected in glass containers;
- Appropriate sample preservation techniques, including cold temperature storage at 4° C, will be utilized to ensure that the analytical parameters concentrations do not change between the time of sample collection and analysis; and
- Samples will be analyzed prior to the expiration of the respective holding time for each analytical parameter to ensure the integrity of the analytical results.

Import and Reuse of Soils

Import of soils onto the property and reuse of soils already onsite will be performed in conformance with the Soil/Materials Management Plan in Appendix 3. The estimated quantity of soil to be imported into the Site for backfill and cover soil is 0 tons. The estimated quantity of onsite soil/fill expected to be reused/relocated on Site is 0 tons.

4.3 ENGINEERING CONTROLS

Engineering controls are not required for this Track 1 cleanup. However, as part of construction the following elements are being built to provide protections against soil vapor from surrounding properties. If Track 1 is not achieved, these two elements will constitute engineering controls that will be employed in the remedial action to address residual contamination remaining at the site: a composite cover system and a vapor barrier.

Composite Cover System

Exposure to residual soil/fill will be prevented by an engineered, composite cover system to be built on the Site. The entire property will be covered by an engineered permanent cover system comprised of a 6-inch concrete-building slab beneath the proposed building.

The composite cover system is a permanent engineering control for the Site.

Vapor Barrier

Migration of soil vapor will be mitigated with a combination of building slab and vapor barrier. A high density polyethylene vapor barrier liner (HPDE) will be installed prior to pouring the building's concrete slab. The vapor barrier will consist of a 20 mil VaporBlock Plus vapor barrier manufactured by Global Plastic Sheeting. The vapor barrier will extend throughout the area occupied by the footprint of the new building and up the sidewalls according to manufacturer specifications. The specifications state that all vapor barrier seams, penetrations, and repairs will be sealed either by the tape method or weld method, according to the manufacturer's recommendations and instructions. Product specifications are provided in Appendix F.

The Remedial Closure Report will include photographs (maximum of two photos per page) of the installation process, PE/RA certified letter (on company letterhead) from primary contractor responsible for installation oversight and field inspections, and a copy of the manufacturers certificate of warranty.

4.4 INSTITUTIONAL CONTROLS

Institutional Controls (IC) are not required for this remedial action. However, if Track 1 Unrestricted Use SCOs are not achieved, IC's will be incorporated into this remedial action to manage residual soil/fill and other media and render the Site protective of public health and the environment. Institutional Controls are listed below. Long-term employment of EC/ICs will be established in a Declaration of Covenant and Restrictions (DCR) assigned to the property by the title holder and will be implemented under a site-specific Site Management Plan (SMP) that will be included in the RAR.

Institutional Controls for this remedial action are:

- Recording of an OER-approved Declaration of Covenant and Restrictions (DCR) with the City Register or county clerk, as appropriate. The DCR will include a description of all ECs and ICs, will summarize the requirements of the Site Management Plan, and will note that the property owner and property owner's successors and assigns must comply with the DCR and the approved SMP. The recorded DCR will be submitted in the Remedial Action Report. The DCR will be recorded prior to OER issuance of the Notice of Completion;
- Submittal of a Site Management Plan in the RAR for approval by OER that provides

procedures for appropriate operation, maintenance, monitoring, inspection, reporting and certification of ECs. SMP will require that the property owner and property owner's successors and assigns will submit to OER a periodic written statement that certifies that: (1) controls employed at the Site are unchanged from the previous certification or that any changes to the controls were approved by OER; and, (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP. OER retains the right to enter the Site in order to evaluate the continued maintenance of any controls. This certification shall be submitted annually and will comply with RCNY §43-1407(1)(3).

- Vegetable gardens and farming on the Site are prohibited;
- Use of groundwater underlying the Site is prohibited without treatment rendering it safe for its intended use;
- All future activities on the Site that will disturb residual material must be conducted pursuant to the soil management provisions in an approved SMP;
- The Site will be used for restricted residential use and will not be used for a higher level of use without prior approval by OER.

4.5 SITE MANAGEMENT PLAN

A Site Management Plan (SMP) will be implemented under this Remedial Action if Track 1 Unrestricted Use SCOs are not achieved. Site Management is the last phase of remediation and begins with the approval of the Remedial Action Report and issuance of the Notice of Completion (NOC) for the Remedial Action. The Site Management Plan (SMP) describes appropriate methods and procedures to ensure implementation of all ECs and ICs that are required by the DCR and this RAWP. The Site Management Plan is submitted as part of the RAR but will be written in a manner that allows its use as an independent document. Site Management continues until terminated in writing by OER. The property owner is responsible to ensure that all Site Management responsibilities defined in the DCR and the Site Management Plan are implemented.

The SMP will provide a detailed description of the procedures required to manage residual soil/fill left in place following completion of the remedial action in accordance with the

Voluntary Cleanup Agreement with OER. This includes a plan for: (1) implementation of EC's and ICs; (2) implementation of monitoring programs; (3) operation and maintenance of EC's; (4) inspection and certification of EC's; and (5) reporting.

Site management activities, reporting, and EC/IC certification will be scheduled on a periodic basis to be established in the SMP and will be subject to review and modification by OER. The Site Management Plan will be based on a calendar year and certification reports will be due for submission to OER by March 31 of the year following the reporting period.

4.6 QUALITATIVE HUMAN HEALTH EXPOSURE ASSESSMENT

Investigations reported in the Remedial Investigation Report (RIR) are sufficient to complete a Qualitative Human Health Exposure Assessment (QHHEA).

Known and Potential Sources Historic fill material is present at the Site from grade to approximately 5 feet below grade. Based on the results of the RIR, the contaminants of concern found are:

Soil

- Metals, including lead and mercury, exceeding Track 2 Restricted Residential SCOs; and
- PAHs exceeding Track 2 Restricted Residential SCOs.

Groundwater

- Metals, including sodium and manganese, exceeding GQS.

Soil vapor

- Chlorinated VOCs detected at low concentrations including PCE.

Nature, Extent, Fate and Transport of Contaminants

SVOCs and metals are present in the historic fill materials throughout the Site. Metal contaminants found in soil were not found dissolved in groundwater above their respective GQSs, indicating that this contamination is not mobilizing into groundwater or migrating off-

Site. The metal contaminants that were found dissolved in on-Site groundwater (magnesium, manganese, and sodium) are linked with regional saline intrusion impacts, rather than any onsite source.

The chlorinated VOCs that were identified in soil gas at low concentrations at the Site were not found in any on-Site soil sample.

Receptor Populations

On-Site Receptors—The Site is currently vacant and undeveloped, and a fence restricts access to the Site. Therefore, the only potential on-Site receptors are Site Representatives and trespassers. During redevelopment of the Site, the on-Site potential receptors will include construction workers, site representatives, and visitors. Once the Site is redeveloped, the on-Site potential sensitive receptors will include adult and child building residents, workers, and visitors.

Off-Site Receptors - Potential off-Site receptors within a 0.25-mile radius of the Site include: adult and child residents, and commercial and construction workers, pedestrians, trespassers, and cyclists, based on the following:

1. Commercial Businesses (up to 0.25 mile) – existing and future
2. Residential Buildings (up to 0.25 mile) – existing and future
3. Building Construction/Renovation (up to 0.25 mile) – existing and future
4. Pedestrians, Trespassers, Cyclists (up to .25 mile) – existing and future
5. Schools (up to .25 mile) – existing and future

Potential Points of Exposure

Existing

The Site is undeveloped, vacant and uncapped. Under current Site conditions, exposure to surficial historic fill material is possible. Groundwater is not exposed at the Site, and because the Site is served by the public water supply, groundwater is not used at the Site. There are no structures on Site where soil vapor could accumulate.

Construction/ Remediation Activities

Once redevelopment activities begin, construction workers will come into direct contact with surface and subsurface soils as a result of on-Site construction/excavation activities. Similarly, off-Site receptors could be exposed to dust from onsite activities. During construction, on-Site and off-Site exposures to contaminated dust from on-Site will be addressed through dust controls, and through the implementation of the Community Air Monitoring Plan and a Construction Health and Safety Plan. Groundwater is not anticipated to be encountered, and there will be no structures on site where soil vapor could accumulate.

Proposed Future Conditions

Once the remedial actions and redevelopment of the Site has been completed, there will be no potential on-Site or off-Site exposure pathways. Not only will historic fill be removed, but the Site will also be fully capped with the concrete building slab, which will prevent contact with any residual soils. Any exposures to vapors from off-site sources will be prevented by installation of a vapor barrier and building slab.

Potential Routes of Exposure

An exposure route is the mechanism by which a receptor comes into contact with a chemical. Three potential primary routes exist by which chemicals can enter the body:

- Ingestion of water, fill or soil;
- Inhalation of vapors and particulates; and
- Dermal contact with water, fill, or soil.

Overall Human Health Exposure Assessment

Based upon this analysis, complete on-site exposure pathways appear to be present only during the current unremediated phase and the remedial action phase. Under current conditions, on-Site exposure pathways are minimized by preventing access to the Site. During the remedial action, on-site exposure pathways will be eliminated by preventing access to the Site, through implementation of soil/materials management, stormwater pollution prevention, dust controls, employment of a community air monitoring plan, and implementation of a Construction Health

and Safety Plan. After the remedial action is complete, there will be no remaining exposure pathways to on-Site soil/ fill, as all soil that exceeds Track 1 Unrestricted Use SCOs will have been removed, and the vapor barrier and concrete building slab will interrupt potential for soil vapor intrusion.

5.0 REMEDIAL ACTION MANAGEMENT

5.1 PROJECT ORGANIZATION AND OVERSIGHT

Principal personnel who will participate in the remedial action include Gavin Zollo. The Professional Engineer (PE) and Qualified Environmental Professionals (QEP) for this project are Dale Konas and Gavin Zollo, respectively.

5.2 SITE SECURITY

Site access will be controlled by gated entrances to the fenced Site.

5.3 WORK HOURS

The hours for operation of remedial construction will be from 8:00 am to 4:00 pm. These hours conform to the New York City Department of Buildings construction code requirements.

5.4 CONSTRUCTION HEALTH AND SAFETY PLAN

The Health and Safety Plan is included in Appendix 4. The Site Safety Coordinator will be Gavin Zollo. Remedial work performed under this RAWP will be in full compliance with applicable health and safety laws and regulations, including Site and OSHA worker safety requirements and HAZWOPER requirements. Confined space entry, if any, will comply with OSHA requirements and industry standards and will address potential risks. The parties performing the remedial construction work will ensure that performance of work is in compliance with the HASP and applicable laws and regulations. The HASP pertains to remedial and invasive work performed at the Site until the issuance of the Notice of Completion.

All field personnel involved in remedial activities will participate in training required under 29 CFR 1910.120, including 40-hour hazardous waste operator training and annual 8-hour refresher training. Site Safety Officer will be responsible for maintaining workers training records.

Personnel entering any exclusion zone will be trained in the provisions of the HASP and be required to sign an HASP acknowledgment. Site-specific training will be provided to field personnel. Additional safety training may be added depending on the tasks performed.

Emergency telephone numbers will be posted at the site location before any remedial work begins. A safety meeting will be conducted before each shift begins. Topics to be discussed include task hazards and protective measures (physical, chemical, environmental); emergency procedures; PPE levels and other relevant safety topics. Meetings will be documented in a log book or specific form.

An emergency contact sheet with names and phone numbers is included in the HASP. That document will define the specific project contacts for use in case of emergency.

5.5 COMMUNITY AIR MONITORING PLAN

Real-time air monitoring for volatile organic compounds (VOCs) and particulate levels at the perimeter of the exclusion zone or work area will be performed. Continuous monitoring will be performed for all ground intrusive activities and during the handling of contaminated or potentially contaminated media. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pit excavation or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be performed during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. Periodic monitoring during sample collection, for instance, will consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. Depending upon the proximity of potentially exposed individuals, continuous monitoring may be performed during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence. Exceedences of action levels observed during performance of the Community Air Monitoring Plan (CAMP) will be reported to the OER Project Manager and included in the Daily Report.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) will be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis during invasive work.

Upwind concentrations will be measured at the start of each workday and periodically thereafter to establish background conditions. The monitoring work will be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment will be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment will be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities will be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities will resume with continued monitoring.
- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities will resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.
- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities will be shutdown.

All 15-minute readings must be recorded and be available for OER personnel to review. Instantaneous readings, if any, used for decision purposes will also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations will be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring will be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The

equipment will be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques will be employed. Work will continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed $150 \text{ mcg}/\text{m}^3$ above the upwind level and provided that no visible dust is migrating from the work area.
- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than $150 \text{ mcg}/\text{m}^3$ above the upwind level, work will be stopped and a re-evaluation of activities initiated. Work will resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within $150 \text{ mcg}/\text{m}^3$ of the upwind level and in preventing visible dust migration.

All readings will be recorded and be available for OER personnel to review.

5.6 AGENCY APPROVALS

All permits or government approvals required for remedial construction have been or will be obtained prior to the start of remedial construction. Approval of this RAWP by OER does not constitute satisfaction of these requirements and will not be a substitute for any required permit.

5.7 SITE PREPARATION

Pre-Construction Meeting

OER will be invited to attend the pre-construction meeting at the Site with all parties involved in the remedial process prior to the start of remedial construction activities.

Mobilization

Mobilization will be conducted as necessary for each phase of work at the Site. Mobilization includes field personnel orientation, equipment mobilization (including securing all sampling

equipment needed for the field investigation), marking/staking sampling locations and utility mark-outs. Each field team member will attend an orientation meeting to become familiar with the general operation of the Site, health and safety requirements, and field procedures.

Utility Marker Layouts, Easement Layouts

The presence of utilities and easements on the Site will be fully investigated prior to the performance of invasive work such as excavation or drilling under this plan by using, at a minimum, the One-Call System (811). Underground utilities may pose an electrocution, explosion, or other hazard during excavation or drilling activities. All invasive activities will be performed in compliance with applicable laws and regulations to assure safety. Utility companies and other responsible authorities will be contacted to locate and mark the locations, and a copy of the Markout Ticket will be retained by the contractor prior to the start of drilling, excavation or other invasive subsurface operations. Overhead utilities may also be present within the anticipated work zones. Electrical hazards associated with drilling in the vicinity of overhead utilities will be prevented by maintaining a safe distance between overhead power lines and drill rig masts.

Proper safety and protective measures pertaining to utilities and easements, and compliance with all laws and regulations will be employed during invasive and other work contemplated under this RAWP. The integrity and safety of on-Site and off-Site structures will be maintained during all invasive, excavation or other remedial activity performed under the RAWP.

Equipment and Material Staging

Equipment and materials will be stored and staged in a manner that complies with applicable laws and regulations.

Stabilized Construction Entrance

Steps will be taken to ensure that trucks departing the site will not track soil, fill or debris off-Site. Such actions may include use of cleaned asphalt or concrete roads or use of stone or other aggregate-based egress paths between the truck inspection station and the property exit.

Measures will be taken to ensure that adjacent roadways will be kept clean of project related soils, fill and debris.

Truck Inspection Station

An outbound-truck inspection station will be set up close to the Site exit. Before exiting the NYC BCP Site, trucks will be required to stop at the truck inspection station and will be examined for evidence of contaminated soil on the undercarriage, body, and wheels. Soil and debris will be removed. Brooms, shovels and potable water will be utilized for the removal of soil from vehicles and equipment, as necessary.

5.8 TRAFFIC CONTROL

Drivers of trucks leaving the NYC BCP Site with soil/fill will be instructed to proceed without stopping in the vicinity of the site to prevent neighborhood impacts. The planned route on local roads for trucks leaving the site will be reported to OER prior to the start of the remedial action.

5.9 DEMOBILIZATION

Demobilization will include:

- As necessary, restoration of temporary access areas and areas that may have been disturbed to accommodate support areas (e.g., staging areas, decontamination areas, storage areas, temporary water management areas, and access area);
- Removal of sediment from erosion control measures and truck wash and disposal of materials in accordance with applicable laws and regulations;
- Equipment decontamination, and;
- General refuse disposal.

Equipment will be decontaminated and demobilized at the completion of all field activities. Investigation equipment and large equipment (e.g., soil excavators) will be washed at the truck inspection station as necessary. In addition, all investigation and remediation derived waste will be appropriately disposed.

5.10 REPORTING AND RECORD KEEPING

Daily Reports

Daily reports providing a general summary of activities for each day of *active remedial work* will be emailed to the OER Project Manager by the end of the following day. Those reports will include:

- Project number and statement of the activities and an update of progress made and locations of work performed;
- Quantities of material imported and exported from the Site;
- Status of on-Site soil/fill stockpiles;
- A summary of all citizen complaints, with relevant details (basis of complaint; actions taken; etc.);
- A summary of CAMP excursions, if any;
- Photograph of notable Site conditions and activities.

The frequency of the reporting period may be revised in consultation with OER project manager based on planned project tasks. Daily email reports are not intended to be the primary mode of communication for notification to OER of emergencies (accidents, spills), requests for changes to the RAWP or other sensitive or time critical information. However, such information will be included in the daily reports. Emergency conditions and changes to the RAWP will be communicated directly to the OER project manager by personal communication. Daily reports will be included as an Appendix in the Remedial Action Report.

Record Keeping and Photo-Documentation

Job-site record keeping for all remedial work will be performed. These records will be maintained on-Site during the project and will be available for inspection by OER staff. Representative photographs will be taken of the Site prior to any remedial activities and during major remedial activities to illustrate remedial program elements and contaminant source areas.

Photographs will be submitted at the completion of the project in the RAR in digital format (i.e. jpeg files).

5.11 COMPLAINT MANAGEMENT

All complaints from citizens will be promptly reported to OER. Complaints will be addressed and outcomes will also be reported to OER in daily reports. Notices to OER will include the nature of the complaint, the party providing the complaint, and the actions taken to resolve any problems.

5.12 DEVIATIONS FROM THE REMEDIAL ACTION WORK PLAN

All changes to the RAWP will be reported to the OER Project Manager and will be documented in daily reports and reported in the Remedial Action Report. The process to be followed if there are any deviations from the RAWP will include a request for approval for the change from OER noting the following:

- Reasons for deviating from the approved RAWP;
- Effect of the deviations on overall remedy; and
- Determination that the remedial action with the deviation(s) is protective of public health and the environment.

5.13 DATA USABILITY SUMMARY REPORT

The primary objective of a Data Usability Summary Report (DUSR) is to determine whether or not data meets the site specific criteria for data quality and data use. The DUSR provides an evaluation of analytical data without third party data validation. The DUSR for post-remedial samples collected during implementation of this RAWP will be included in the Remedial Action Report (RAR).

6.0 REMEDIAL ACTION REPORT

A Remedial Action Report (RAR) will be submitted to OER following implementation of the remedial action defined in this RAWP. The RAR will document that the remedial work required under this RAWP has been completed and has been performed in compliance with this plan. The RAR will include:

- Information required by this RAWP;
- As-built drawings for all constructed remedial elements, required certifications, manifests and other written and photographic documentation of remedial work performed under this remedy;
- Site Management Plan;
- Description of any changes in the remedial action from the elements provided in this RAWP and associated design documents;
- Tabular summary of all end point sampling results and all material characterization results, QA/QC results for end-point sampling, and other sampling and chemical analysis performed as part of the remedial action and DUSR;
- Test results or other evidence demonstrating that remedial systems are functioning properly;
- Account of the source area locations and characteristics of all contaminated material removed from the Site including a map showing source areas;
- Account of the disposal destination of all contaminated material removed from the Site. Documentation associated with disposal of all material will include transportation and disposal records, and letters approving receipt of the material.
- Account of the origin and required chemical quality testing for material imported onto the Site.
- Recorded Declaration of Covenants and Restrictions.
- Reports and supporting material will be submitted in digital form.

Remedial Action Report Certification

The following certification will appear in front of the Executive Summary of the Remedial Action Report. The certification will include the following statements:

I, _____, am currently a professional engineer licensed by the State of New York. I had primary direct responsibility for implementation of the remedial program for the Vacant Commercial Property Site Number: 12CVCP06XK.

I, Gavin Zollo, am a qualified Environmental Professional. I had primary direct responsibility for implementation remedial program for the Vacant Commercial Property Site Number: 12CVCP06XK.

I certify that the OER-approved Remedial Action Work Plan dated _____; if any were implemented and that all requirements in those documents have been substantively complied with. I certify that contaminated soil, fill, liquids or other material from the property were taken to facilities licensed to accept this material in full compliance with applicable laws and regulations.

7.0 SCHEDULE

The table below presents a schedule for the proposed remedial action and reporting. If the schedule for remediation and development activities changes, it will be updated and submitted to OER. Currently, a one (1) month remediation period is anticipated.

Schedule Milestone	Weeks from Remedial Action Start	Duration (weeks)
OER Approval of RAWP	0	-
Fact Sheet 2 announcing start of remedy	0	-
Mobilization	1	1
Remedial Excavation	2	1
Demobilization	3	1
Submit Remedial Action Report	4	2

APPENDIX A

CITIZEN PARTICIPATION PLAN

The NYC Office of Environmental Remediation and Conklin Homes LLC have established this Citizen Participation Plan because the opportunity for citizen participation is an important component of the NYC Brownfield Cleanup Program. This Citizen Participation Plan describes how information about the project will be disseminated to the Community during the remedial process. As part of its obligations under the NYC BCP, Conklin Homes LLC will maintain a repository for project documents and provide public notice at specified times throughout the remedial program. This Plan also takes into account potential environmental justice concerns in the community that surrounds the project Site. Under this Citizen Participation Plan, project documents and work plans are made available to the public in a timely manner. Public comment on work plans is strongly encouraged during public comment periods. Work plans are not approved by the NYC Office of Environmental Remediation (OER) until public comment periods have expired and all comments are formally reviewed. An explanation of cleanup plans in the form of a public meeting or informational session is available upon request to OER's project manager assigned to this Site, Hannah Moore, who can be contacted about these issues or any others questions, comments or concerns that arise during the remedial process at (212) 788-8841

Project Contact List. OER has established a Site Contact List for this project to provide public notices in the form of fact sheets to interested members of the Community. Communications will include updates on important information relating to the progress of the cleanup program at the Site as well as to request public comments on the cleanup plan. The Project Contact List includes owners and occupants of adjacent buildings and homes, principal administrators of nearby schools, hospitals and day care centers, the public water supplier that serves the area, established document repositories, the representative Community Board, City Council members, other elected representatives and any local Brownfield Opportunity Area (BOA) grantee organizations. Any member of the public or organization will be added to the Site Contact List on request. A copy of the Site Contact List is maintained by OER's project manager. If you would like to be

added to the Project Contact List, contact NYC OER at (212) 788-8841 or by email at brownfields@cityhall.nyc.gov.

Repositories. A document repository is maintained in the nearest public library that maintains evening and weekend hours. This document repository is intended to house, for community review, all principal documents generated during the cleanup program including Remedial Investigation plans and reports, Remedial Action work plans and reports, and all public notices and fact sheets produced during the lifetime of the remedial project. Conklin Homes LLC will inspect the repositories to ensure that they are fully populated with project information. The repository for this project is:

Brooklyn Public Library, Canarsie Branch

1580 Rockaway Parkway

(718) 257-6547

Monday, Tuesday, Thursday & Friday: 10:00am to 6:00pm; Wednesday: 1:00pm to 8:00pm; and Saturday: 10:00am to 5:00pm

Digital Documentation. NYC OER strongly encourages the use of digital documents in repositories as a means of minimizing paper use while also increasing convenience in access and ease of use.

Public Notice and Public Comment. Public notice to all members of the Project Contact List is required at three major steps during the performance of the cleanup program (listed below) and at other points that may be required by OER. Notices will include Fact Sheets with descriptive project summaries, updates on recent and upcoming project activities, repository information, and important phone and email contact information. All notices will be prepared by Conklin Homes LLC, reviewed and approved by OER prior to distribution and mailed by Conklin Homes LLC. Public comment is solicited in public notices for all work plans developed under the NYC Brownfield Cleanup Program. Final review of all work plans by OER will consider all public comments. Approval will not be granted until the public comment period has been completed.

Citizen Participation Milestones. Public notice and public comment activities occur at several steps during a typical NYC BCP project. See flow chart on the following page, which identifies when during the NYC BCP public notices are issued: These steps include:

- **Public Notice of the availability of the Remedial Investigation Report and Remedial Action Work Plan and a 30-day public comment period on the Remedial Action Work Plan.**

Public notice in the form of a Fact Sheet is sent to all parties listed on the Site Contact List announcing the availability of the Remedial Investigation Report and Remedial Action Work Plan and the initiation of a 30-day public comment period on the Remedial Action Work Plan. The Fact Sheet summarizes the findings of the RIR and provides details of the RAWP. The public comment period will be extended an additional 15 days upon public request. A public meeting or informational session will be conducted by OER upon request.

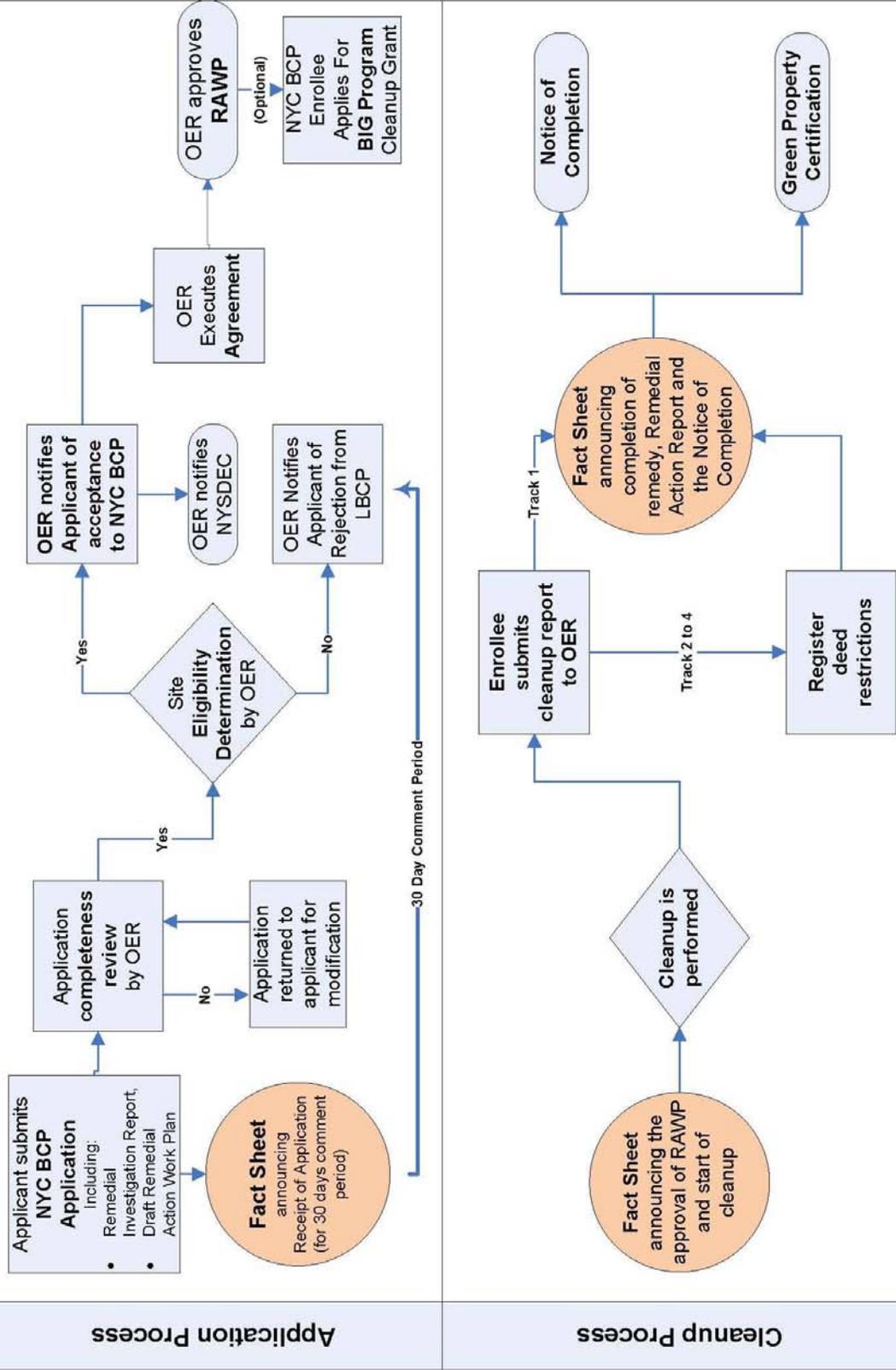
- **Public Notice announcing the approval of the RAWP and the start of remediation**

Public notice in the form of a Fact Sheet is sent to all parties listed on the Site Contact List announcing the approval of the RAWP and the start of remediation.

- **Public Notice announcing the completion of remediation, designation of Institutional and Engineering Controls and issuance of the Notice of Completion**

Public notice in the form of a Fact Sheet is sent to all parties listed on the Site Contact List announcing the completion of remediation, providing a list of all Institutional and Engineering Controls implemented for to the Site and announcing the issuance of the Notice of Completion.

Flow Chart For NYC Brownfield Cleanup Program (NYC BCP)



APPENDIX B

SUSTAINABILITY STATEMENT

This Sustainability Statement documents sustainable activities and green remediation efforts planned under this remedial action.

Reuse of Clean, Recyclable Materials. Reuse of clean, locally-derived recyclable materials reduces consumption of non-renewable virgin resources and can provide energy savings and greenhouse gas reduction.

An estimate of the quantity (in tons) of clean, non-virgin materials (reported by type of material) reused under this plan will be quantified and reported in the RAR.

Reduce Consumption of Virgin and Non-Renewable Resources. Reduced consumption of virgin and non-renewable resources lowers the overall environmental impact of the project on the region by conserving these resources.

An estimate of the quantity (in tons) of virgin and non-renewable resources, the use of which will be avoided under this plan, will be quantified and reported in the RAR.

Reduced Energy Consumption and Promotion of Greater Energy Efficiency. Reduced energy consumption lowers greenhouse gas emissions, improves local air quality, lessens in-city power generation requirements, can lower traffic congestion, and provides substantial cost savings.

Best efforts will be made to quantify energy efficiencies achieved during the remediation and will be reported in the Remedial Action Report (RAR). Where energy savings cannot be easily quantified, a gross indicator of the amount of energy saved or the means by which energy savings was achieved will be reported.

Conversion to Clean Fuels. Use of clean fuel improves NYC's air quality by reducing harmful emissions.

An estimate of the volume of clean fuels used during remedial activities will be quantified and reported in the RAR.

Recontamination Control. Recontamination after cleanup and redevelopment is completed undermines the value of work performed, may result in a property that is less protective of public health or the environment, and may necessitate additional cleanup work later or impede future redevelopment. Recontamination can arise from future releases that occur within the property or by influx of contamination from off-Site.

An estimate of the area of the Site that utilizes recontamination controls under this plan will be reported in the RAR in square feet.

Storm-water Retention. Storm-water retention improves water quality by lowering the rate of combined storm-water and sewer discharges to NYC's sewage treatment plants during periods of precipitation, and reduces the volume of untreated influent to local surface waters.

An estimate of the enhanced storm-water retention capability of the redevelopment project will be included in the RAR.

Linkage with Green Building. Green buildings provide a multitude of benefits to the city across a broad range of areas, such as reduction of energy consumption, conservation of resources, and reduction in toxic materials use.

The number of Green Buildings that are associated with this brownfield redevelopment property will be reported in the RAR. The total square footage of green building space created as a function of this brownfield redevelopment will be quantified for residential, commercial and industrial/manufacturing uses.

Paperless Brownfield Cleanup Program. Conklin Homes LLC is participating in OER's Paperless Brownfield Cleanup Program. Under this program, submission of electronic documents will replace submission of hard copies for the review of project documents, communications and milestone reports.

Low-Energy Project Management Program. Conklin Homes LLC is participating in OER's low-energy project management program. Under this program, whenever possible, meetings are

held using remote communication technologies, such as videoconferencing and teleconferencing to reduce energy consumption and traffic congestion associated with personal transportation.

Trees and Plantings. Trees and other plantings provide habitat and add to NYC's environmental quality in a wide variety of ways. Native plant species and native habitat provide optimal support to local fauna, promote local biodiversity, and require less maintenance.

An estimate of the land area that will be vegetated, including the number of trees planted or preserved, will be reported in square feet in the RAR.

APPENDIX C

SOIL/MATERIALS MANAGEMENT PLAN

1.1 SOIL SCREENING METHODS

Visual, olfactory and PID soil screening and assessment will be performed under the supervision of a Qualified Environmental Professional and will be reported in the RAR. Soil screening will be performed during invasive work performed during the remedy and development phases prior to issuance of the Notice of Completion.

1.2 STOCKPILE METHODS

Excavated soil from suspected areas of contamination (e.g., hot spots, USTs, drains, etc.) will be stockpiled separately and will be segregated from clean soil and construction materials. Stockpiles will be used only when necessary and will be removed as soon as practicable. While stockpiles are in place, they will be inspected daily, and before and after every storm event. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by OER. Excavated soils will be stockpiled on, at minimum, double layers of 8-mil minimum sheeting, will be kept covered at all times with appropriately anchored plastic tarps, and will be routinely inspected. Broken or ripped tarps will be promptly replaced.

All stockpile activities will be compliant with applicable laws and regulations. Soil stockpile areas will be appropriately graded to control run-off in accordance with applicable laws and regulations. Stockpiles of excavated soils and other materials shall be located at least of 50 feet from the property boundaries, where possible. Hay bales or equivalent will surround soil stockpiles except for areas where access by equipment is required. Silt fencing and hay bales will be used as needed near catch basins, surface waters and other discharge points.

1.3 CHARACTERIZATION OF EXCAVATED MATERIALS

Soil/fill or other excavated media that is transported off-Site for disposal will be sampled in a manner required by the receiving facility, and in compliance with applicable laws and regulations. Soils proposed for reuse on-Site will be managed as defined in this plan.

1.4 MATERIALS EXCAVATION, LOAD-OUT AND DEPARTURE

The PE/QEP overseeing the remedial action will:

- oversee remedial work and the excavation and load-out of excavated material;
- ensure that there is a party responsible for the safe execution of invasive and other work performed under this work plan;
- ensure that Site development activities and development-related grading cuts will not interfere with, or otherwise impair or compromise the remedial activities proposed in this RAWP;
- ensure that the presence of utilities and easements on the Site has been investigated and that any identified risks from work proposed under this plan are properly addressed by appropriate parties;
- ensure that all loaded outbound trucks are inspected and cleaned if necessary before leaving the Site;
- ensure that all egress points for truck and equipment transport from the Site will be kept clean of Site-derived materials during Site remediation.

Locations where vehicles exit the Site shall be inspected daily for evidence of soil tracking off premises. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to Site-derived materials.

Open and uncontrolled mechanical processing of historical fill and contaminated soil on-Site will not be performed without prior OER approval.

1.5 OFF-SITE MATERIALS TRANSPORT

Loaded vehicles leaving the Site will comply with all applicable materials transportation requirements (including appropriate covering, manifests, and placards) in accordance with applicable laws and regulations, including use of licensed haulers in accordance with 6 NYCRR Part 364. If loads contain wet material capable of causing leakage from trucks, truck liners will be used. Queuing of trucks will be performed on-Site, when possible in order to minimize off

Site disturbance. Off-Site queuing will be minimized. Outbound truck transport routes will be reported to OER prior to the start of the remedial action. Truck routing will take into account the following factors: (a) limiting transport through residential areas and past sensitive sites; (b) use of mapped truck routes; (c) minimizing off-Site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport. To the extent possible, all trucks loaded with Site materials will travel from the Site using these truck routes. Trucks will not stop or idle in the neighborhood after leaving the project Site.

1.6 MATERIALS DISPOSAL OFF-SITE

The following documentation will be established and reported by the PE/QEP for each disposal destination used in this project to document that the disposal of regulated material exported from the Site conforms with applicable laws and regulations: (1) a letter from the PE/QEP or Enrollee to each disposal facility describing the material to be disposed and requesting written acceptance of the material. This letter will state that material to be disposed is regulated material generated at an environmental remediation Site in Brooklyn, New York under a governmental remediation program. The letter will provide the project identity and the name and phone number of the PE/QEP or Enrollee. The letter will include as an attachment a summary of all chemical data for the material being transported; and (2) a letter from each disposal facility stating it is in receipt of the correspondence (1, above) and is approved to accept the material. These documents will be included in the RAR.

The Remedial Action Report will include an itemized account of the destination of all material removed from the Site during this remedial action. Documentation associated with disposal of all material will include records and approvals for receipt of the material. This information will be presented in the RAR.

All impacted soil/fill or other waste excavated and removed from the Site will be managed as regulated material and will be disposed in accordance with applicable laws and regulations. Historic fill and contaminated soils taken off-Site will be handled as solid waste and will not be disposed at a Part 360-16 Registration Facility (also known as a Soil Recycling Facility).

Waste characterization will be performed for off-Site disposal in a manner required by the receiving facility and in conformance with its applicable permits. Waste characterization sampling and analytical methods, sampling frequency, analytical results and QA/QC will be reported in the RAR. A manifest system for off-Site transportation of exported materials will be employed. Manifest information will be reported in the RAR. Hazardous wastes derived from on-Site will be stored, transported, and disposed of in compliance with applicable laws and regulations.

If disposal of soil/fill from this Site is proposed for unregulated disposal (i.e., clean soil removed for development purposes), including transport to a Part 360-16 Registration Facility, a formal request will be made for approval by OER with an associated plan compliant with 6NYCRR Part 360-16. This request and plan will include the location, volume and a description of the material to be recycled, including verification that the material is not impacted by site uses and that the material complies with receipt requirements for recycling under 6NYCRR Part 360. This material will be appropriately handled on-Site to prevent mixing with impacted material.

1.7 MATERIALS REUSE ON-SITE

It is not anticipated that soil and fill that is derived from the Site will be reused on-Site. Soil and fill that is derived from the property that meets the soil cleanup objectives established in this plan may be reused on-Site. The soil cleanup objectives for on-Site reuse are listed in RAWP section 4.2. 'Reuse on-Site' means material that is excavated during the remedy or development, does not leave the property, and is relocated within the same property and on comparable soil/fill material, and addressed pursuant to the NYC BCP agreement subject to Engineering and Institutional Controls. The PE/QEP will ensure that reused materials are segregated from other materials to be exported from the Site and that procedures defined for material reuse in this RAWP are followed.

Organic matter (wood, roots, stumps, etc.) or other waste derived from clearing and grubbing of the Site will not be buried on-Site. Soil or fill excavated from the site for grading or other purposes will not be reused within a cover soil layer or within landscaping berms.

1.8 IMPORT OF BACKFILL SOIL FROM OFF-SITE SOURCES

This Section presents the requirements for imported fill materials to be used below the cover layer and within the clean soil cover layer. All imported soils will meet OER-approved backfill and cover soil quality objectives for this Site.

A process will be established to evaluate sources of backfill and cover soil to be imported to the Site, and will include an examination of source location, current and historical use(s), and any applicable documentation. Material from industrial sites, spill sites, environmental remediation sites or other potentially contaminated sites will not be imported to the Site.

The following potential sources may be used pending attainment of backfill and cover soil quality objectives:

- Clean soil from construction projects at non-industrial sites in compliance with applicable laws and regulations;
- Clean soil from roadway or other transportation-related projects in compliance with applicable laws and regulations;
- Clean recycled concrete aggregate (RCA) from facilities permitted or registered by the regulations of NYS DEC.

All materials received for import to the Site will be approved by a PE/QEP and will be in compliance with provisions in this RAWP. The RAR will report the source of the fill, evidence that an inspection was performed on the source, chemical sampling results, frequency of testing, and a Site map indicating the locations where backfill or soil cover was placed.

Source Screening and Testing

Inspection of imported fill material will include visual, olfactory and PID screening for evidence of contamination. Materials imported to the Site will be subject to inspection, as follows:

- Trucks with imported fill material will be in compliance with applicable laws and regulations and will enter the Site at designated locations;

- The PE/QEP is responsible to ensure that every truck load of imported material is inspected for evidence of contamination; and
- Fill material will be free of solid waste including pavement materials, debris, stumps, roots, and other organic matter, as well as ashes, oil, perishables or foreign matter.

Composite samples of imported material will be taken at a minimum frequency of one sample for every 500 cubic yards of material. Once it is determined that the fill material meets imported backfill or cover soil chemical requirements and is non-hazardous, and lacks petroleum contamination, the material will be loaded onto trucks for delivery to the Site.

Recycled concrete aggregate (RCA) will be imported from facilities permitted or registered by NYSDEC. Facilities will be identified in the RAR. A PE/QEP is responsible to ensure that the facility is compliant with 6NYCRR Part 360 registration and permitting requirements for the period of acquisition of RCA. RCA imported from compliant facilities will not require additional testing, unless required by NYSDEC under its terms for operation of the facility. RCA imported to the Site must be derived from recognizable and uncontaminated concrete. RCA material is not acceptable for, and will not be used as cover material.

1.9 FLUIDS MANAGEMENT

All liquids to be removed from the Site, including dewatering fluids, will be handled, transported and disposed in accordance with applicable laws and regulations. Liquids discharged into the New York City sewer system will receive prior approval by New York City Department of Environmental Protection (NYC DEP). The NYC DEP regulates discharges to the New York City sewers under Title 15, Rules of the City of New York Chapter 19. Discharge to the New York City sewer system will require an authorization and sampling data demonstrating that the groundwater meets the City's discharge criteria. The dewatering fluid will be pretreated as necessary to meet the NYC DEP discharge criteria. If discharge to the City sewer system is not appropriate, the dewatering fluids will be managed by transportation and disposal at an off-Site treatment facility.

Discharge of water generated during remedial construction to surface waters (i.e. a stream or river) is prohibited without a SPDES permit issued by New York State Department of Environmental Conservation.

1.10 STORM-WATER POLLUTION PREVENTION

Applicable laws and regulations pertaining to storm-water pollution prevention will be addressed during the remedial program. Erosion and sediment control measures identified in this RAWP (silt fences and barriers, and hay bale checks) will be installed around the entire perimeter of the remedial construction area and inspected once a week and after every storm event to ensure that they are operating appropriately. Discharge locations will be inspected to determine whether erosion control measures are effective in preventing significant impacts to receptors. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by OER. All necessary repairs shall be made immediately. Accumulated sediments will be removed as required to keep the barrier and hay bale check functional. Undercutting or erosion of the silt fence toe anchor will be repaired immediately with appropriate backfill materials. Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

1.11 CONTINGENCY PLAN

This contingency plan is developed for the remedial construction to address the discovery of unknown structures or contaminated media during excavation. Identification of unknown contamination source areas during invasive Site work will be promptly communicated to OER's Project Manager. Petroleum spills will be reported to the NYS DEC Spill Hotline. These findings will be included in the daily report. If previously unidentified contaminant sources are found during on-Site remedial excavation or development-related excavation, sampling will be performed on contaminated source material and surrounding soils and reported to OER. Chemical analytical testing will be performed for TAL metals, TCL volatiles and semi-volatiles, TCL pesticides and PCBs, as appropriate.

1.12 ODOR, DUST AND NUISANCE CONTROL

Odor Control

All necessary means will be employed to prevent on- and off-Site odor nuisances. At a minimum, procedures will include: (a) limiting the area of open excavations; (b) shrouding open excavations with tarps and other covers; and (c) use of foams to cover exposed odorous soils. If odors develop and cannot otherwise be controlled, additional means to eliminate odor nuisances will include: (d) direct load-out of soils to trucks for off-Site disposal; and (e) use of chemical odorants in spray or misting systems.

This odor control plan is capable of controlling emissions of nuisance odors. If nuisance odors are identified, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. OER will be notified of all odor complaint events. Implementation of all odor controls, including halt of work, will be the responsibility of the PE/QEP's certifying the Remedial Action Report.

Dust Control

Dust management during invasive on-Site work will include, at a minimum:

- Use of a dedicated water spray methodology for roads, excavation areas and stockpiles.
- Use of properly anchored tarps to cover stockpiles.
- Exercise extra care during dry and high-wind periods.
- Use of gravel or recycled concrete aggregate on egress and other roadways to provide a clean and dust-free road surface.

This dust control plan is capable of controlling emissions of dust. If nuisance dust emissions are identified, work will be halted and the source of dusts will be identified and corrected. Work will not resume until all nuisance dust emissions have been abated. OER will be notified of all dust complaint events. Implementation of all dust controls, including halt of work, will be the responsibility of the PE/QEP's responsible for certifying the Remedial Action Report.

Other Nuisances

Noise control will be exercised during the remedial program. All remedial work will conform, at a minimum, to NYC noise control standards.

Rodent control will be provided, during Site clearing and grubbing, and during the remedial program, as necessary, to prevent nuisances.

Figures

TOPOGRAPHIC MAP

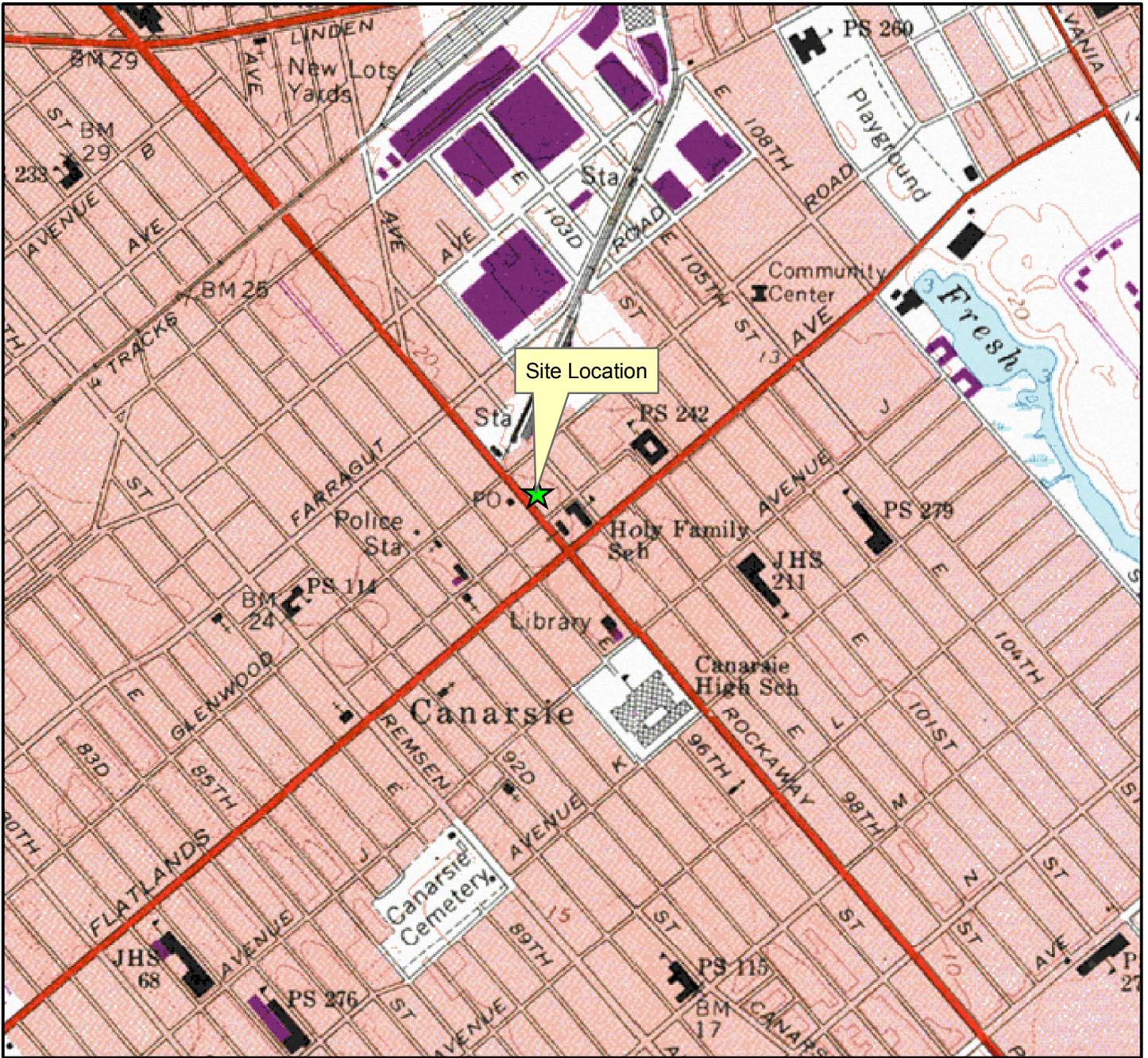


Figure 1
Topographic Map
1465 Rockaway Parkway
Brooklyn, NY

USGS Quadrangle:
Coney Island

Approx. Elevation:
19 feet



EnviroTrac
Environmental Services
5 Old Dock Road
Yaphank, NY 11980
P: 631-924-3001 F: 631-924-5001



AERIAL PHOTOGRAPH



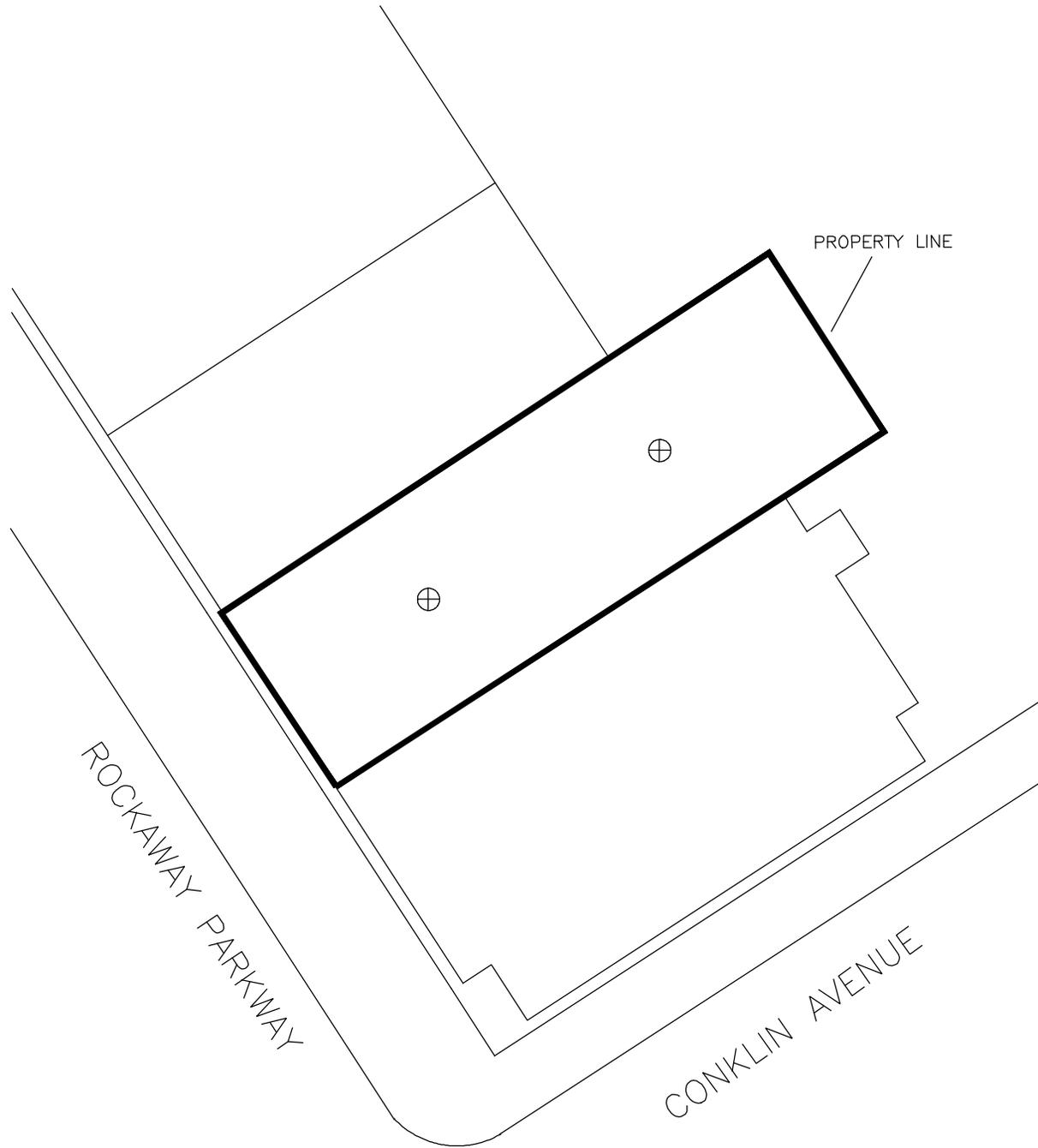
Figure 2
Aerial Photograph

1465 Rockaway Parkway
Brooklyn, NY



EnviroTrac
Environmental Services
5 Old Dock Road
Yaphank, NY 11980
P: 631-924-3001 F: 631-924-5001





LEGEND:

⊕ = ENDPOINT
SAMPLING LOCATION

NOT TO SCALE

1465 ROCKAWAY PARKWAY
BROOKLYN, NEW YORK

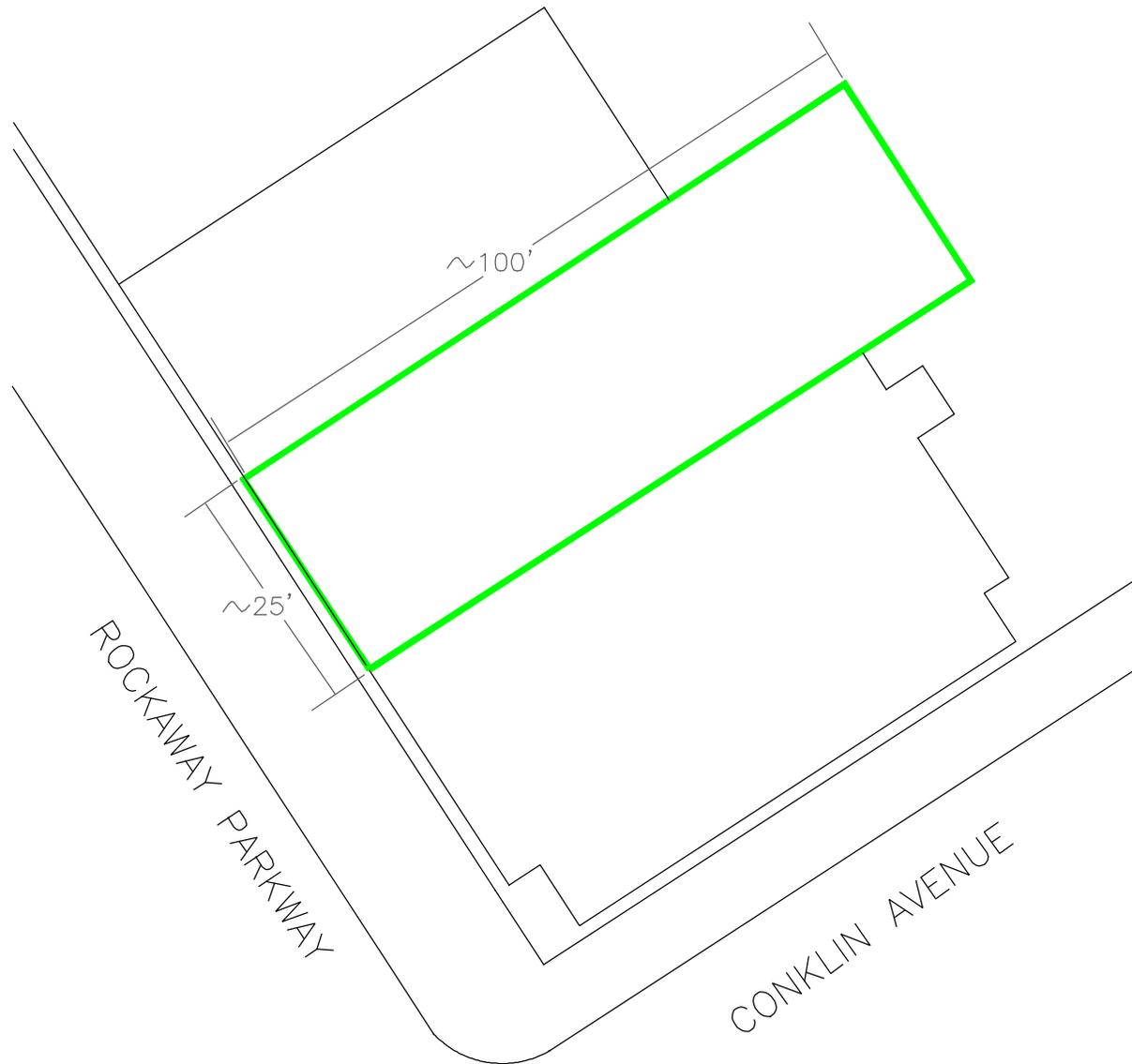
ENDPOINT SAMPLING LOCATIONS PLAN

FIGURE #

3

REVISION DATE:
MAY 24, 2012

REVISED BY: TB



LEGEND:
 = LIMITS OF EXCAVATION AREA

Tables

Table 1

Soil Boring Sample Analytical Data - PCBs

OER Project #12CVCP06XK
1465 Rockaway Parkway
Brooklyn, New York

Analytical Parameter	SB-1 0-2' 4/18/12	SB-1 12'-14" 4/18/12	SB-2 0-2' 4/18/12	SB-2 12'-14" 4/18/12	SB-3 0-2' 4/18/12	SB-3 12'-14" 4/18/12	NYSDEC Part 375 RRSCO	NYSDEC Part 375 UUSCO
<i>PCBs (ppm)</i>								
PCB-1016	ND	ND	ND	ND	ND	ND	1	0.1
PCB-1221	ND	ND	ND	ND	ND	ND	1	0.1
PCB-1232	ND	ND	ND	ND	ND	ND	1	0.1
PCB-1242	ND	ND	ND	ND	ND	ND	1	0.1
PCB-1248	ND	ND	ND	ND	ND	ND	1	0.1
PCB-1254	ND	ND	ND	ND	ND	ND	1	0.1
PCB-1260	ND	ND	ND	ND	ND	ND	1	0.1
PCB-1262	ND	ND	ND	ND	ND	ND	1	0.1
PCB-1268	ND	ND	ND	ND	ND	ND	1	0.1
Total PCBs	ND	ND	ND	ND	ND	ND	1	0.1

Notes:

1. NYSDEC = New York State Department of Environmental Conservation
2. ppm = parts per million (mg/Kg)
3. PCBs = Polychlorinated Biphenyls
4. ND = Not Detected above the method detection limit of the laboratory.
5. RRUSCO = Restricted Residential Use Soil Cleanup Objectives
6. UUSCO = Unrestricted Use Soil Cleanup Objectives



Table 2

Soil Boring Sample Analytical Data - VOCs

OER Project #12CVCP06XK
1465 Rockaway Parkway
Brooklyn, New York

Analytical Parameters	SB-1 0-2' 4/18/12	SB-1 12'-14" 4/18/12	SB-2 0-2' 4/18/12	SB-2 12'-14" 4/18/12	SB-3 0-2' 4/18/12	SB-3 12'-14" 4/18/12	NYSDEC Part 375 RRUSCO	NYSDEC Part 375 UUSCO
<i>VOCs (ppm)</i>								
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	NA	NA
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	100	0.68
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	NA	NA
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	NA	NA
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	26	0.27
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	100	0.33
1,1-Dichloropropene	ND	ND	ND	ND	ND	ND	NA	NA
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	ND	NA	NA
1,2,3-Trichloropropane	ND	ND	ND	ND	ND	ND	NA	NA
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	NA	NA
1,2,4-Trimethylbenzene	ND	ND	ND	ND	ND	ND	52	3.6
1,2-Dibromo-3-chloropropane	ND	ND	ND	ND	ND	ND	NA	NA
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	100	1.1
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	3.1	0.02
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	NA	NA
1,3,5-Trimethylbenzene	ND	ND	ND	ND	ND	ND	52	8.4
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	49	2.4
1,3-Dichloropropane	ND	ND	ND	ND	ND	ND	NA	NA
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	13	1.8
2,2-Dichloropropane	ND	ND	ND	ND	ND	ND	NA	NA
2-Chlorotoluene	ND	ND	ND	ND	ND	ND	NA	NA
2-Hexanone	ND	ND	ND	ND	ND	ND	NA	NA
2-Isopropyltoluene	ND	ND	ND	ND	ND	ND	NA	NA
4-Chlorotoluene	ND	ND	ND	ND	ND	ND	NA	NA
4-Methyl-2-pentanone	ND	ND	ND	ND	ND	ND	NA	NA
Acetone	ND	ND	ND	ND	ND	ND	100	0.05
Acrylonitrile	ND	ND	ND	ND	ND	ND	NA	NA
Benzene	ND	ND	ND	ND	ND	ND	4.8	0.06
Bromobenzene	ND	ND	ND	ND	ND	ND	NA	NA
Bromochloromethane	ND	ND	ND	ND	ND	ND	NA	NA
Bromodichloromethane	ND	ND	ND	ND	ND	ND	NA	NA
Bromoform	ND	ND	ND	ND	ND	ND	NA	NA
Bromomethane	ND	ND	ND	ND	ND	ND	NA	NA
Carbon Disulfide	ND	ND	ND	ND	ND	ND	NA	NA
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	2.4	0.76
Chlorobenzene	ND	ND	ND	ND	ND	ND	100	1.1
Chloroethane	ND	ND	ND	ND	ND	ND	NA	NA
Chloroform	ND	ND	ND	ND	ND	ND	49	0.37
Chloromethane	ND	ND	ND	ND	ND	ND	NA	NA
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	100	0.25
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	NA	NA
Dibromochloromethane	ND	ND	ND	ND	ND	ND	NA	NA
Dibromoethane	ND	ND	ND	ND	ND	ND	NA	NA
Dibromomethane	ND	ND	ND	ND	ND	ND	NA	NA
Dichlorodifluoromethane	ND	ND	ND	ND	ND	ND	NA	NA
Ethylbenzene	ND	ND	ND	ND	ND	ND	41	1
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	NA	NA
Isopropylbenzene	ND	ND	ND	ND	ND	ND	NA	NA
m&p-Xylene	ND	ND	ND	ND	ND	ND	100	0.26
Methyl Ethyl Ketone	ND	ND	ND	ND	ND	ND	100	0.12
Methyl tert-butyl ether (MTBE)	ND	ND	ND	ND	ND	ND	100	0.93
Methylene chloride	ND	ND	ND	ND	ND	ND	100	0.05
Naphthalene	ND	ND	ND	ND	ND	ND	100	NA
n-Butylbenzene	ND	ND	ND	ND	ND	ND	100	12
n-Propylbenzene	ND	ND	ND	ND	ND	ND	100	3.9
o-Xylene	ND	ND	ND	ND	ND	ND	100	0.26
p-Isopropyltoluene	ND	ND	ND	ND	ND	ND	NA	NA
sec-Butylbenzene	ND	ND	ND	ND	ND	ND	100	11
Styrene	ND	ND	ND	ND	ND	ND	NA	NA
tert-Butylbenzene	ND	ND	ND	ND	ND	ND	100	5.9
Tetrachloroethene	ND	ND	ND	ND	ND	ND	19	1.3
Tetrahydrofuran (THF)	ND	ND	ND	ND	ND	ND	NA	NA
Toluene	ND	ND	ND	ND	ND	ND	100	0.7
Total Xylenes	ND	ND	ND	ND	ND	ND	100	0.26
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	100	0.19
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	NA	NA
trans-1,4-dichloro-2-butene	ND	ND	ND	ND	ND	ND	NA	NA
Trichloroethene	ND	ND	ND	ND	ND	ND	21	0.47
Trichlorofluoromethane	ND	ND	ND	ND	ND	ND	NA	NA
Trichlorotrifluoroethane	ND	ND	ND	ND	ND	ND	NA	NA
Vinyl chloride	ND	ND	ND	ND	ND	ND	0.9	0.02

Notes:

1. NA = Not Available / Not Applicable
2. NYSDEC = New York State Department of Environmental Conservation
3. ppm = parts per million (mg/Kg)
4. VOCs = Volatile Organic Compounds
5. ND = Not Detected above the method detection limit of the laboratory.
6. RRUSCO = Restricted Residential Use Soil Cleanup Objectives
7. UUSCO = Unrestricted Use Soil Cleanup Objectives



Table 3

Soil Boring Sample Analytical Data - SVOCs

OER Project #12CVCP06XK
1465 Rockaway Parkway
Brooklyn, New York

Analytical Parameter	SB-1 0-2' 4/18/12	SB-1 12'-14" 4/18/12	SB-2 0-2' 4/18/12	SB-2 12'-14" 4/18/12	SB-3 0-2' 4/18/12	SB-3 12'-14" 4/18/12	NYSDEC Part 375 RRUSCO	NYSDEC Part 375 UUSCO
<i>SVOCs (ppm)</i>								
1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	ND	ND	NA	NA
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	NA	NA
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	NA	NA
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	NA	NA
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	NA	NA
2,4,5-Trichlorophenol	ND	ND	ND	ND	ND	ND	NA	NA
2,4,6-Trichlorophenol	ND	ND	ND	ND	ND	ND	NA	NA
2,4-Dichlorophenol	ND	ND	ND	ND	ND	ND	NA	NA
2,4-Dimethylphenol	ND	ND	ND	ND	ND	ND	NA	NA
2,4-Dinitrophenol	ND	ND	ND	ND	ND	ND	NA	NA
2,4-Dinitrotoluene	ND	ND	ND	ND	ND	ND	NA	NA
2,6-Dinitrotoluene	ND	ND	ND	ND	ND	ND	NA	NA
2-Chloronaphthalene	ND	ND	ND	ND	ND	ND	NA	NA
2-Chlorophenol	ND	ND	ND	ND	ND	ND	NA	NA
2-Methylnaphthalene	ND	ND	ND	ND	ND	ND	NA	NA
2-Methylphenol (o-cresol)	ND	ND	ND	ND	ND	ND	100	0.33
2-Nitroaniline	ND	ND	ND	ND	ND	ND	NA	NA
2-Nitrophenol	ND	ND	ND	ND	ND	ND	NA	NA
3&4-Methylphenol (m&p-cresol)	ND	ND	ND	ND	ND	ND	200	0.33
3,3'-Dichlorobenzidine	ND	ND	ND	ND	ND	ND	NA	NA
3-Nitroaniline	ND	ND	ND	ND	ND	ND	NA	NA
4,6-Dinitro-2-methylphenol	ND	ND	ND	ND	ND	ND	NA	NA
4-Bromophenyl phenyl ether	ND	ND	ND	ND	ND	ND	NA	NA
4-Chloro-3-methylphenol	ND	ND	ND	ND	ND	ND	NA	NA
4-Chloroaniline	ND	ND	ND	ND	ND	ND	NA	NA
4-Chlorophenyl phenyl ether	ND	ND	ND	ND	ND	ND	NA	NA
4-Nitroaniline	ND	ND	ND	ND	ND	ND	NA	NA
4-Nitrophenol	ND	ND	ND	ND	ND	ND	NA	NA
Acenaphthene	ND	ND	ND	ND	ND	ND	100	20
Acenaphthylene	ND	ND	ND	ND	ND	ND	100	100
Acetophenone	ND	ND	ND	ND	ND	ND	NA	NA
Aniline	ND	ND	ND	ND	ND	ND	NA	NA
Anthracene	ND	ND	ND	ND	ND	ND	100	100
Azobenzene	ND	ND	ND	ND	ND	ND	NA	NA
Benzo(a)anthracene	ND	ND	ND	ND	0.95	ND	1	1
Benzenzidine	ND	ND	ND	ND	ND	ND	NA	NA
Benzo(a)pyrene	ND	ND	ND	ND	0.9	ND	1	1
Benzo(b)fluoranthene	ND	ND	ND	ND	1.2	ND	1	1
Benzo(ghi)perylene	ND	ND	ND	ND	0.74	ND	100	100
Benzo(k)fluoranthene	ND	ND	ND	ND	0.45	ND	3.9	0.8
Benzoic acid	ND	ND	ND	ND	ND	ND	NA	NA
Benzyl butyl phthalate	ND	ND	ND	ND	ND	ND	NA	NA
Bis(2-chloroethoxy)methane	ND	ND	ND	ND	ND	ND	NA	NA
Bis(2-chloroethyl)ether	ND	ND	ND	ND	ND	ND	NA	NA
Bis(2-chloroisopropyl)ether	ND	ND	ND	ND	ND	ND	NA	NA
Bis(2-ethylhexyl)phthalate	ND	ND	ND	ND	0.82	ND	NA	NA
Carbazole	ND	ND	ND	ND	ND	ND	NA	NA
Chrysene	ND	ND	ND	ND	0.86	ND	3.9	1
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND	ND	0.33	0.33
Dibenzofuran	ND	ND	ND	ND	ND	ND	NA	NA
Diethyl phthalate	ND	ND	ND	ND	ND	ND	NA	NA
Dimethylphthalate	ND	ND	ND	ND	ND	ND	NA	NA
Di-n-butylphthalate	ND	ND	ND	ND	ND	ND	NA	NA
Di-n-octylphthalate	ND	ND	ND	ND	ND	ND	NA	NA
Fluoranthene	ND	ND	0.26	ND	2.5	ND	100	100
Fluorene	ND	ND	ND	ND	ND	ND	100	30
Hexachlorobenzene	ND	ND	ND	ND	ND	ND	NA	NA
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	NA	NA
Hexachlorocyclopentadiene	ND	ND	ND	ND	ND	ND	NA	NA
Hexachloroethane	ND	ND	ND	ND	ND	ND	NA	NA
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND	0.63	ND	0.5	0.5
Isophorone	ND	ND	ND	ND	ND	ND	NA	NA
Naphthalene	ND	ND	ND	ND	ND	ND	100	12
Nitrobenzene	ND	ND	ND	ND	ND	ND	NA	NA
N-Nitrosodimethylamine	ND	ND	ND	ND	ND	ND	NA	NA
N-Nitrosodi-n-propylamine	ND	ND	ND	ND	ND	ND	NA	NA
N-Nitrosodiphenylamine	ND	ND	ND	ND	ND	ND	NA	NA
Pentachloronitrobenzene	ND	ND	ND	ND	ND	ND	NA	NA
Pentachlorophenol	ND	ND	ND	ND	ND	ND	6.7	0.8
Phenanthrene	ND	ND	0.26	ND	1.3	ND	100	100
Phenol	ND	ND	ND	ND	ND	ND	100	0.33
Pyrene	ND	ND	0.38	ND	2.0	ND	100	100
Pyridine	ND	ND	ND	ND	ND	ND	NA	NA

Notes:

1. NA = Not Available / Not Applicable
2. NS = Not Sampled
3. NYSDEC = New York State Department of Environmental Conservation
4. ppm = parts per million (mg/Kg)
5. SVOCs = Semi Volatile Organic Compounds
6. ND = Not Detected above the method detection limit of the laboratory.
7. RRUSCO = Restricted Residential Use Soil Cleanup Objectives
8. UUSCO = Unrestricted Use Soil Cleanup Objectives

 = Concentration exceeds the Part 375 UUSCO
 = Concentration exceeds the Part 375 RRUSCO



Table 4

Soil Boring Sample Analytical Data - Metals

OER Project #12CVCP06XK
1465 Rockaway Parkway
Brooklyn, New York

Analytical Parameter	SB-1 0-2' 4/18/12	SB-1 12'-14" 4/18/12	SB-2 0-2' 4/18/12	SB-2 12'-14" 4/18/12	SB-3 0-2' 4/18/12	SB-3 12'-14" 4/18/12	NYSDEC Part 375 RRUSCO	NYSDEC Part 375 UUSCO
<i>Metals (ppm)</i>								
Aluminum	7,880	3,370	8,640	3,580	8,670	3,210	NA	NA
Antimony	<3.4	<3.4	< 3.3	< 3.2	< 3.5	< 3.1	NA	NA
Arsenic	2.12	1.02	2.98	0.69	5.67	0.62	16	13
Barium	42	30	72.7	21.4	243	19.6	400	350
Beryllium	0.4	<0.27	0.36	<0.26	0.5	<0.25	72	7.2
Calcium	1,080	564	1,990	434	1,570	397	NA	NA
Cadmium	0.63	<0.34	<0.33	<0.32	0.87	<0.31	4.3	2.5
Chromium	11.5	11.3	14.5	8.62	18.1	7.92	180	30
Cobalt	2.79	2.97	3.72	2.77	3.74	2.87	NA	NA
Copper	48.3	9.34	14.4	8.69	75.6	7.29	270	50
Iron	11,000	12,500	11,900	9,500	13,500	9,210	NA	NA
Lead	51.8	3.25	301	3.96	617	3	400	63
Magnesium	1,100	1,150	1,210	1,500	1,110	1,070	NA	NA
Manganese	210	365	271	244	431	257	2,000	1,600
Mercury	0.25	<0.08	0.31	<0.06	1.46	<0.06	0.81	0.18
Nickel	8.52	13.1	13.6	13.1	13.7	11.9	310	30
Potassium	498	460	581	539	434	438	NA	NA
Selenium	<1.3	<1.4	< 1.3	< 1.3	< 1.4	< 1.2	180	3.9
Silver	<0.5	< 0.34	< 0.33	< 0.32	< 0.35	< 0.31	180	2
Sodium	89.3	93.5	207	78.2	55.5	41.1	NA	NA
Thallium	<3.0	< 3.1	< 3.0	< 2.9	< 3.2	<2.8	NA	NA
Vanadium	14.8	17.1	17.6	11.9	21	12.6	NA	NA
Zinc	415	17.1	93.8	16.6	528	16.6	10,000	109

Notes:

1. NA = Not Available / Not Applicable
2. NS = Not Sampled
3. NYSDEC = New York State Department of Environmental Conservation
4. ppm = parts per million (mg/Kg)
5. Metals = Target Analyte Metals (TAL)
6. ND = Not Detected above the method detection limit of the laboratory.
7. RRUSCO = Restricted Residential Use Soil Cleanup Objectives
8. UUSCO = Unrestricted Use Soil Cleanup Objectives

	= Concentration exceeds the Part 375 UUSCO
	= Concentration exceeds the Part 375 RRUSCO



Table 5**Soil Boring Sample Analytical Data - Pesticides**

OER Project #12CVCP06XK
 1465 Rockaway Parkway
 Brooklyn, New York

Analytical Parameter	SB-1 0-2' 4/18/12	SB-1 12'-14" 4/18/12	SB-2 0-2' 4/18/12	SB-2 12'-14" 4/18/12	SB-3 0-2' 4/18/12	SB-3 12'-14" 4/18/12	NYSDEC Part 375 RRUSCO	NYSDEC Part 375 UUSCO
<i>Pesticides (ppm)</i>								
4,4'-DDD	ND	ND	ND	ND	ND	ND	13	0.0033
4,4'-DDE	ND	ND	ND	ND	ND	ND	8.9	0.0033
4,4'-DDT	ND	ND	ND	ND	0.054	ND	7.9	0.0033
a-BHC	ND	ND	ND	ND	ND	ND	0.48	0.02
Alachlor	ND	ND	ND	ND	ND	ND	NA	NA
Aldrin	ND	ND	ND	ND	ND	ND	0.097	0.005
b-BHC	ND	ND	ND	ND	ND	ND	0.36	0.036
Chlordane	ND	ND	ND	ND	ND	ND	4.2	0.094
d-BHC	ND	ND	ND	ND	ND	ND	100	0.04
Dieldrin	ND	ND	ND	ND	ND	ND	0.2	0.005
Endosulfan I	ND	ND	ND	ND	ND	ND	24	2.4
Endosulfan II	ND	ND	ND	ND	ND	ND	24	2.4
Endosulfan sulfate	ND	ND	ND	ND	ND	ND	24	2.4
Endrin	ND	ND	ND	ND	ND	ND	11	0.014
Endrin aldehyde	ND	ND	ND	ND	ND	ND	NA	NA
Endrin ketone	ND	ND	ND	ND	ND	ND	NA	NA
g-BHC	ND	ND	ND	ND	ND	ND	NA	NA
Heptachlor	ND	ND	ND	ND	ND	ND	2.1	0.042
Heptachlor epoxide	ND	ND	ND	ND	ND	ND	NA	NA
Methoxychlor	ND	ND	ND	ND	ND	ND	NA	NA
Toxaphene	ND	ND	ND	ND	ND	ND	NA	NA

Notes:

1. NA = Not Available / Not Applicable
 2. NS = Not Sampled
 3. NYSDEC = New York State Department of Environmental Conservation
 4. ppm = parts per million (mg/Kg)
 5. Metals = Target Analyte Metals (TAL)
 6. ND = Not Detected above the method detection limit of the laboratory.
 7. RRUSCO = Restricted Residential Use Soil Cleanup Objectives
 8. UUSCO = Unrestricted Use Soil Cleanup Objectives
-  = Concentration exceeds the Part 375 UUSCO



Table 6**Soil Vapor Analytical Data**

OER Project #12CVCP06XK
 1465 Rockaway Parkway
 Brooklyn, New York

Analytical Parameter	SV-1	SV-2	SV-3	Matrices 1 and 2 Recommendation	Ambient Air Guideline NYSDOH
<i>VOCs TO-15 (µg/m³)</i>					
1,1,1,2-Tetrachloroethane	ND	ND	ND	-	-
1,1,1-Trichloroethane	ND	ND	ND	-	-
1,1,2,2-Tetrachloroethane	ND	ND	ND	-	-
1,1,2-Trichloroethane	ND	ND	ND	-	-
1,1-Dichloroethane	ND	ND	ND	-	-
1,1-Dichloroethene	ND	ND	ND	-	-
1,2,4-Trichlorobenzene	ND	ND	ND	-	-
1,2,4-Trimethylbenzene	163	207	162	-	-
1,2-Dibromoethane (EDB)	ND	ND	ND	-	-
1,2-Dichlorobenzene	ND	ND	ND	-	-
1,2-Dichloroethane	ND	ND	ND	-	-
1,2-Dichloropropane	ND	ND	ND	-	-
1,2-Dichlorotetrafluoroethane	ND	ND	ND	-	-
1,3,5-Trimethylbenzene	37.6	50.6	39.6	-	-
1,3-Butadiene	ND	ND	ND	-	-
1,3-Dichlorobenzene	ND	ND	ND	-	-
1,4-Dichlorobenzene	25.1	20.7	12.2	-	-
1,4-Dioxane	ND	ND	ND	-	-
2-Hexanone	20.3	31	24.8	-	-
4-Ethyltoluene	113	132	101	-	-
4-Isopropyltoluene	3.68	5.87	4.44	-	-
4-Methyl-2-pentanone	1.72	ND	2.78	-	-
Acetone	553	679	786	-	-
Acrylonitrile	ND	ND	ND	-	-
Benzene	4.44	5.33	4.95	-	-
Benzyl chloride	ND	ND	ND	-	-
Bromodichloromethane	ND	ND	ND	-	-
Bromoform	ND	ND	ND	-	-
Bromomethane	ND	ND	ND	-	-
Carbon Disulfide	ND	ND	ND	-	-
Carbon Tetrachloride	0.629	0.629	0.566	-	-
Chlorobenzene	ND	ND	ND	-	-
Chloroethane	ND	ND	ND	-	-
Chloroform	6.73	ND	ND	-	-
Chloromethane	ND	8.48	9.49	-	-
cis-1,2-Dichloroethene	ND	ND	ND	-	-
cis-1,3-Dichloropropene	ND	ND	ND	-	-
Cyclohexane	ND	ND	ND	-	-
Dibromochloromethane	ND	ND	ND	-	-
Dichlorodifluoromethane	2.96	6.92	28.3	-	-
Ethanol	20.1	36.7	36.5	-	-
Ethyl acetate	ND	ND	ND	-	-
Ethylbenzene	41	46.4	35.8	-	-
Heptane	5.73	7	4.79	-	-
Hexachlorobutadiene	ND	ND	ND	-	-
Hexane	5.14	6.34	4.9	-	-
Isopropylalcohol	10.5	11.7	14.9	-	-
Isopropylbenzene	4.62	6.78	5.16	-	-
m,p-Xylene	172	195	147	-	-
Methyl Ethyl Ketone	91.1	149	147	-	-
Methyl tert-butyl ether	ND	ND	ND	-	-
Methylene Chloride	10.9	12.9	10	-	-
n-Butylbenzene	13.6	18	15	-	-
o-Xylene	66.8	83.3	63.4	-	-
Propylene	ND	ND	ND	-	-
sec-Butylbenzene	ND	ND	ND	-	-
Styrene	1.23	1.4	1.36	-	-
Tetrachloroethene	17.9	22.8	12.1	No Further Action	100
Tetrahydrofuran	11.2	15.7	14	-	-
Toluene	50.8	58.8	47.8	-	-
trans-1,2-Dichloroethene	ND	ND	ND	-	-
trans-1,3-Dichloropropene	ND	ND	ND	-	-
Trichloroethene	ND	ND	ND	No Further Action	5
Trichlorofluoromethane	1.52	1.52	1.68	-	-
Trichlorotrifluoroethane	ND	ND	ND	-	-
Vinyl Chloride	ND	ND	ND	-	-

Notes:

1. Ambient Air Guideline values derived by NYSDOH, Table 3.1 in Final NYSDOH CEH BEEI SOIL VAPOR INTRUSION GUIDANCE
2. Matrix 1 and 2 taken from Section 3.4 of NYSDOH Vapor Intrusion Guidance
3. ND = Not detected above the method detection limits of the laboratory.
4. - = Value not provided in NYSDOH Guidance
5. µg/m³ = micrograms per cubic meter



Appendix D

CONSTRUCTION HEALTH AND SAFETY PLAN

Vacant Commercial Property
1465 Rockaway Parkway (Block 8185, Lot 24)
Brooklyn, NY 11236
NYC BCP Number: 12CVCP06XK

Prepared for:

Conklin Homes LLC
901 Essex Street
Brooklyn, NY 11208

Prepared by:

EnviroTrac Ltd.
5 Old Dock Road
Yaphank, NY 11980

*A Full Service Environmental Consulting
and Contracting Firm*



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1.0 INTRODUCTION

Conklin Homes LLC (Client) has retained EnviroTrac Ltd. (ET) to perform remedial actions at 1465 Rockaway Parkway, Brooklyn, NY, hereafter referred to as “the site”. Refer to Appendix A for the site location. This Health and Safety Plan (HASP) is written to summarize the health and safety hazards and procedures to help protect field personnel and the surrounding community. This plan was designed to reduce the potential for occupational illness or injury while performing the investigation at the site. This plan meets or exceeds the requirements of Occupational Safety and Health Administration (OSHA), 29 CFR 1910.120, for a site-specific health and safety plan and follows EnviroTrac’s Corporate Health and Safety Program.

The purpose of the HASP is to inform ET employees of the health and safety risks present at the facilities, and the proper methods of protecting themselves from those risks. Each worker must be fully aware of the risks associated with the work to be accomplished, and be dedicated to completing that work safely. Accordingly, project staff and approved ET/Client subcontractors must follow the policies and procedures established in this HASP. All personnel assigned to this project must sign the Agreement and Acknowledgment Affidavit (Appendix B) to confirm that they understand and agree to abide by the provisions of the plan. Anyone who cannot, or will not comply with this HASP will be excluded from on-site activities. Violations of this HASP or any applicable federal, state, or local health and safety regulations should be reported immediately to the Designated Health and Safety Officer or to ET’s Director of Health & Safety (DHS). This HASP will be readily available to on-site so workers can reference it when necessary.

2.0 JOB HAZARD ANALYSIS

The Job Hazard Analysis identifies potential safety, health, and environmental hazards and provides for the protection of personnel, the community and the environment. Because of the complexity and constant change of field operations, supervisors must continually inspect the work site to identify hazards that may harm site personnel, the community, or the environment. The PM must be aware of these changing conditions and discuss them with the DHS whenever these changes impact the health, safety, or project performance. The DHS will write an addendum to change associated hazard controls as necessary. This HASP addresses general safety issues associated with subsurface Investigations and operations typically involving the following tasks:

General Tasks	
• Field Survey/Walkover	• Field Soil Screening (PID Meter)
• Operation of machinery at the site	• Exposure to contaminated soil
• Excavation/Trenching	• Repair Concrete or Asphalt Surface If Applicable

A detailed description of health and safety procedures for individual tasks can be found in EnviroTracs Health and Safety Policy and Procedures Manual. All activities of this project will be carried out under Level D, Modified Level D or Level C Personal Protective Equipment (PPE). This HASP must be modified or amended when circumstances or conditions develop that are beyond the scope of the above operations. Any changes in project work scope and/or site conditions as described must be amended in writing using the Amendment Sheet (Appendix C).

2.1 Heat Stress

Site employees will be trained to recognize signs of heat stress. The SHSO will maintain a log of all site employees exposed to temperature extremes, showing the work and rest times as well as worker monitoring results. Appropriate rest periods will be provided to help site workers accommodate to temperature extremes.

2.1.1 Signs and Symptoms of Heat Stress

Heat rash may result from continuous exposure to heat or humid air.

Heavy sweating with inadequate electrolyte replacement causes heat cramps. Signs and symptoms include:

- Muscle spasms
- Pain in the hands, feet and abdomen

Heat exhaustion occurs from increased stress on various body organs, including inadequate blood circulation due to cardiovascular insufficiency or dehydration. Signs and symptoms are:

- Pale, cool, moist skin
- Heavy sweating
- Dizziness
- Nausea
- Fainting

Heat stroke is the most serious form of heat stress. Temperature regulation fails and the body temperature rises to critical levels. Immediate action must be taken to cool the body before serious injury and death occurs. Competent medical help must be obtained. Signs and symptoms are:

- Red, hot, usually dry skin
- Lack of reduced perspiration
- Nausea
- Dizziness and confusion
- Strong, rapid pulse
- Coma

2.1.2 Measures to Avoid Heat Stress

1. Establish work-rest cycles (short and frequent are more beneficial than long and seldom).
2. Identify a shaded, cool rest area.
3. Rotate personnel, alternate job functions.
4. Water intake should be equal to the sweat produced. Most workers exposed to hot conditions drink fewer fluids than needed because of an insufficient thirst. **DO NOT DEPEND ON THIRST TO SIGNAL WHEN AND HOW MUCH TO DRINK.** For an 8-hour workday, 50 ounces of fluids should be consumed.
5. Eat lightly salted foods or drink salted drinks such as Gatorade to replace lost salt.
6. Save most strenuous tasks for non-peak hours, such as the early morning or at night.
7. Avoid alcohol during prolonged periods of heat. Alcohol will cause additional dehydration.

Site personnel should monitor their pulse rate as an indicator of heat strain by the following method: At the beginning of the rest period, count the radial pulse during a 30-second period. If the rate exceeds 110 beats per minute, lengthen the rest period by one-third. If the hear rate still exceeds 110 beats per minute at the end of the rest period, shorten the next work cycle by one-third.

2.2 Cold Stress

ET will provide appropriate protective clothing and heated shelters for cold weather exposures. Furthermore, ET will provide appropriate rest periods to help site workers accommodate to temperature extremes. Site employees will be trained to recognize signs of cold stress.

2.2.1 Measures to Avoid Cold Stress

1. Wear multi-layer clothing (the outer-most layer should be of wind-resistant fabric).
2. Drink warm fluids.
3. Work in pairs.
4. Avoid heavy sweating.

The SHSO will maintain a log of all site employees exposed to temperature extremes, showing the work and rest times as well as environmental monitoring results.

3.0 HAZARD IDENTIFICATION AND CONTROL

Precautions must be taken to prevent injuries and exposures to the following potential hazards. Refer to the following table for details.

Potential Hazards and Control	
Hazard	Action and Control
Exposure to 'Petroleum Products' (Refer to MSDS Appendix C)	<ul style="list-style-type: none"> • Stand up-wind of petroleum products whenever possible. • Minimize contact time with petroleum products. • Avoid walking through discolored surface areas, puddles, leaning on drums, or contacting anything that is likely to be contaminated. • Do not eat, drink, smoke and or apply cosmetics on-site. • Wear gloves when in contact with contaminated surfaces. • Safety glasses must be worn when work conditions require them. • > A 200-ppm organic vapor in the breathing zone requires upgrade to Level C. • > 750-ppm organic vapors, work will cease until levels subside or engineering controls are implemented. Contact HSO.
Traffic	<ul style="list-style-type: none"> • If unknown materials are encountered, Contact HSO. • Wear traffic safety vest when vehicular hazard exists. • Use cones, flags, barricades, or caution tape to define work area. • Use vehicle to block work area from on-coming traffic. • PPE Modified Level D.
Vault Entry (Certified personnel only)	<ul style="list-style-type: none"> • Only certified confined space personnel may enter vault. In addition, vault entry is only allowed if PM and HSO approve. • Follow confined space entry procedures. • Obtain confined space permit. Post sign. • Remove vault cover using proper lifting techniques. • Promote natural ventilation by opening the space to fresh air. • Conduct remote air monitoring prior to entry. • Practice buddy system.
Inclement Weather	<ul style="list-style-type: none"> • Enter if safe; conduct continuous monitoring. • Stop outdoor work during electrical storms or other extreme weather conditions. • Take cover, indoors or vehicle. • Listen to local forecasts from vehicle radio about weather advisories. • Be aware of hypothermia, frostbite, and heat stress and drink plenty of liquids during hot days.
Noise	<ul style="list-style-type: none"> • Wear hearing protective equipment (plugs or muffs) when drilling, saw cutting, jack hammering, hammering, sawing or during any activity with extreme noise. • Wear hearing protection anytime you have to raise your voice above normal conversation levels.
Fire Control	<ul style="list-style-type: none"> • Do not smoke on-site. • Keep flammable liquids in closed containers and away from any possible source of ignition (electric service boxes, remediation enclosures, vehicle exhausts). • Keep site clean of debris. • Ensure fire extinguishers in trucks are fresh and fully charged.
Poisonous Plants (Poison ivy, oak, sumac)	<ul style="list-style-type: none"> • Avoid areas infested with poisonous plants. • Immediately wash affected areas if exposed.
Ladders	<ul style="list-style-type: none"> • Make sure ladders are in good working order, look for cracks or corrosion. • Use ladders with secure safety feet. • Pitch ladders at a 4:1 Ratio. Use buddy system. • Secure ladders at top when ever possible. • Do not use ladders for access to air stripper towers. • Use non-conductive ladders near electrical wires.

4.0 CHEMICAL HAZARD CONTROL

4.1 Chemical Handling Procedures

All personnel must practice the chemical-specific handling procedures outlined below. Refer to the following table for details.

Chemical Handling Procedures		
Recovered Product	Fuel oil, diesel fuel or gasoline that has been recovered from the ground-water by pump or manual bailer.	<ul style="list-style-type: none"> • Store product in sealed containers. • Always wear protective gloves and coveralls or equivalent. • No smoking and keep product away from any ignition sources.
Activated Carbon	Granular adsorbent material used to remove residual hydrocarbons from water and/or air.	<ul style="list-style-type: none"> • PPE Modified Level D. • Use respiratory protection when activated carbon creates a dusty environment. • Implement engineering controls to decrease dust or vapor release (such as spraying water or introducing fresh air). • Contact HSO for task specific evaluation. • PPE Modified Level D.

4.2 Personal Protective Equipment

Level-D is the minimum acceptable level for sites where petroleum hydrocarbons are the contaminant of concern. Modified Level-D is required for tasks at those sites where possible exposure may exist. Refer to the following table for details.

Personal Protective Equipment		
Level	Requirements	
Level D	<ul style="list-style-type: none"> • Work Boots • Protective Gloves 	
Modified Level D	<ul style="list-style-type: none"> • Long Pants and Shirt or Coveralls • Safety Glasses • Orange Safety Vest • Dust Mask • Tyvek Suit 	
Level C	<ul style="list-style-type: none"> • Hard Hat • NIOSH Approved Full-Face Respirator With Organic Vapor/Acid Gas Cartridges • Work Boots • Hard Hat • Tyvek Suit 	

Level-D is the minimum acceptable level for sites where petroleum hydrocarbons are the contaminant of concern. Modified Level-D is required for tasks at those sites where possible exposure may exist.

4.3 Site Controls

4.3.1 Site Health and Safety Meetings

In addition, the SHSO will meet daily with all ET employees prior to beginning work on site. The agenda of the meeting will include a review of important elements of this plan, any special safety items, and a discussion of the emergency response procedures. Also, everyone will agree on a schedule for periodic meetings, (for example, before beginning work each day), to review the effectiveness of this plan and make changes as necessary. If significant changes at the site occur, special meetings will be scheduled. If ET is a subcontractor for the project, all ET employees on-site will participate in the contractor's daily safety meetings.

4.3.2 Training Records

The SHSO will complete a report of the daily safety meetings, using the form in the back section of this plan, and all attending the meeting will sign the Daily Safety Meeting Log.

The training status of contractor and subcontractor employees has been verified, and their training criteria meet the requirements specified in 29 CFR 1910.120(e). A copy of all training certificates will be kept at the job site for each person working at the site.

All construction activities will be performed by workers with a minimum 8-hour training course in handling hazardous materials.

4.3.3 Lockout/Tagout Procedures

The purpose of this program is to prevent injuries caused by the accidental start-up of a machine or piece of equipment that is undergoing servicing or routine maintenance. A lockout device renders a switch, valve, or any energy source inoperable. The device may be a padlock, restraining bar, chain, or anything that positively prevents a machine or piece of equipment from becoming energized, or from releasing stored energy.

A tagout device identifies who locked out the machinery; the date and time of day the lockout took place, and where the employee works. Additional information that may be placed on the tag includes employee's beeper number, extension number, and emergency contacts. Tags must be durable, and must be securely fastened to the locking mechanism so as not to fall off. In some cases, they can serve as a lockout device. **Tags are NEVER to be removed by**

anyone except the employee who initiated the lockout/tagout procedure.

Responsibilities

All employees must follow Lockout/Tagout (LOTO) procedures during the following conditions:

1. Servicing and maintenance of machines and equipment
2. Removing or bypassing a machine guard or other safety device
3. Placing any part of their body into an area where work is actually performed (point of operation) with respect to a machine's normal operating cycle

It is the responsibility of the site Safety and Health Supervisors to administer this program, and the Director of Health and safety to review its effectiveness at least annually.

Procedures

All employees must use the following sequence whenever they perform maintenance or installation work on equipment or processes that use or store energy. The energy can be electrical, potential (due to gravity and stored in elevated masses), chemical, hydraulic, or pneumatic.

These procedures apply to all operations involving ET employees in the field as well as to maintenance or installation operations conducted at ET facilities. When at field locations, ET employees will abide by the client's requirements, unless they are not in compliance with the OSHA standard. In these situations, the ET procedure will be implemented. In all cases, ET employees will ensure the facilities' procedure is safe, and where appropriate, install their own locks and tags.

Identification

1. Identify the LOTO procedure for the piece of machinery or equipment requiring servicing or maintenance, which can be found in the O&M Manual (ET's form is included in this HASP). Note the number and location of energy sources that require locks and/or tags for the piece of equipment or machinery being serviced.
2. Note the hazards identified for the piece of equipment or machinery.

Evaluation

1. Review the surrounding area for other possible sources of energy transmission.

2. Inspect the immediate area where locks or tags will be attached.

Checks

1. Lockout and tagout energy using padlocks, locks, and tags.
2. Recheck all areas for potential sources of energy.
3. Authorized employees shall operate the switch, valve, or other energy-initiating device(s) to confirm that the energy is isolated.
4. Return operating controls to neutral, or the “off” position.
5. Ensure the locks and tags are placed properly.

Group Lockouts

1. When more than one person will be involved with maintenance or repair of a piece of machinery or equipment requiring isolation of energy source, each shall place his/her lock and tag on the energy isolating device.
2. When the machinery or equipment cannot accept more than one lock or tag, an additional hasp, or similar energy-isolating device shall be used, if feasible. Should this technique not be feasible, one lockout device can be used requiring a key and the key shall be placed in a lockout box or cabinet that accommodates multiple employees locks to secure it. As each employee no longer needs to maintain lockout protection, he/she shall remove his/her lock from the box or cabinet.
3. The SHSO shall be responsible for knowing when multiple LOTO devices are required.

Restoring Machines and Equipment to Normal Operations

1. When maintenance or servicing has been completed and the machinery or equipment is ready to be placed into normal operation, check out the immediate area to confirm that no one is exposed to any danger.
2. Check that all tools have been removed from the machinery or equipment.
3. Confirm that all guards, pulleys, and safety devices have been reinstalled and are secure.
4. Remove all locks and tags.
5. Operate the energy isolating devices to restore energy to the machine or equipment.

Equipment Connected by Plug and Cord, or Hose

When servicing or installing connected electrical, pneumatic, or hydraulically powered equipment plug connected by cord or hose, the cord or hose must be disconnected from the equipment to be worked on, prior to starting the work. An approved tag warning against reconnecting the plug or hose will be affixed to the end of the plug or hose.

Any stored energy (e.g., capacitor voltage or hydraulic pressure) must be safely released prior to the start of maintenance or installation work.

Electrically Powered Equipment

Electrically powered equipment must be de-energized, and its source of electricity disconnected prior to the removal of protective covers or the start of other maintenance or installation work. It is important to recognize that locking and tagging on/off switches is often not sufficient to prevent accidental startup or to prevent voltage from being present in the equipment. If the equipment is not wired properly (i.e., polarity is reversed), or the switch is of the single-pole type, voltage can be present even if the operating switch is in the off position. For these reasons, manual disconnects must be placed in the off position and/or the equipment's power fuses removed from the motor control center.

In the event that protective covers must be removed to make adjustments on energized equipment, appropriate guards must be constructed and attached in such a manner as to prevent employee contact with live circuitry capable of causing human injury. Such guards must be of durable construction, adequately designed to prevent injurious contact, and remain in place at all times that the equipment is energized.

Chemical and/or Pressurized Lines

Prior to working on any pressurized line or a line containing a toxic, flammable, reactive or corrosive material, the following procedure must be implemented:

1. The line to be serviced should have two block valves upstream of the work area or device to be serviced or installed, placed in the closed position and tagged. The bleed valve (between the two block valves) will be opened and tagged so that leakage of the valve upstream would be readily obvious. The line will be depressurized or drained in a safe manner. Lines will be broken in such a manner as to release pressure away from

the employee. All solids or liquids drained will be safely collected. This procedure is called double block and bleed.

2. If it is possible for pressure or line material to enter the work area from more than one direction, the line in each direction of travel will be double blocked and bled as described above.
3. In the event that double block and bleed procedures are infeasible (i.e., the line is not provided with adequate valving), alternative measures will be implemented. One alternate measure is to place a solid blind in a flange located between the available upstream valve and the work area. If blinds are used, they must be sufficiently corrosion and pressure-resistant to ensure that if the valve leaks, the blind will stop the material or pressure from reaching the work area.

Stored Mechanical Energy

In situations where equipment to be worked on has stored mechanical energy (e.g., in a flywheel or drop hammer), the stored energy must be released or blocked in a safe manner before starting maintenance or installation work. Effective blocking practices may include the installation of safety blocks or adequate supports. Under no circumstances will “bumper jacks” or “scissor jacks” be considered to be adequate blocks.

4.3.4 Monitoring Requirements

Monitoring is to be conducted by the SHSO, or his/her designee. The results will be interpreted by the SHSO and the DHS. Copies of monitoring results and calibration logs will be filed with the HASP.

Monitoring is designed to assess exposure to employees during site activities, and to determine if PPE is required and adequate to assure protection. Because investigation and remediation activities at hazardous waste sites are of an inconsistent nature, it is not possible to assign a monitoring protocol that excludes, or is not directly dependent upon, professional judgment in determining when monitoring is required to assess exposure. Thus, the following generic protocol must be followed at a minimum, and should be modified to be more conservative (e.g., require more monitoring) if deemed necessary by the SHSO or DHS. Under no conditions will the required frequency be decreased.

At a minimum, air monitoring will be conducted before and during each task or activities for which air monitoring has been designated. If airborne concentrations of contaminants reach action levels based on observations with the direct reading instruments, then the appropriate PPE upgrade or work stoppage order will be enforced by the SHSO. In case a work stoppage order is given, the area must be cleared of all personnel immediately.

The use of action levels and the basis for the selection of monitoring equipment is explained as follows:

Action levels determine:

1. The PPE to be used by site workers
2. Their ability to remain and work in the exclusion zone

The selection of the specified monitoring equipment is based on

The nature of the contaminants

The likely concentrations of the contaminants

The probable duration of exposure

The relative sensitivity of the monitoring equipment to the specific contaminants

4.3.5 Work Zones

Work zones will be established in order to: 1) delineate high-traffic areas, 2) identify hazardous locations and 3) contain contamination within the smallest area possible. Employees entering the work zone must wear the proper level of PPE based on the task being performed. Work and support areas will be established based on ambient air data, necessary security measures, and site-specific conditions.

4.3.6 Decontamination Procedures

Operations conducted at the site have the potential to contaminate field equipment and personal protective equipment. To prevent the transfer of contaminants to vehicles, administrative offices and personnel, the procedures presented in the following table must be followed.

Decontamination Procedures

Item	Examples	Procedures
Field Equipment	Bailers, probes, hand tools, augers, sampling equipment	<ul style="list-style-type: none">• Soap wash followed by a water rinse.
Disposable PPE	Tyvek suits, gloves, used respirator cartridges	<ul style="list-style-type: none">• Dispose in accordance to the requirements of the client, state and federal agencies.
Non-disposable PPE	Respirators	<ul style="list-style-type: none">• Wipe out with disinfecting pad prior to donning.• Decontaminate on-site at the close of each day with soap and water.

5.0 CONTINGENCY PLANS

The table below summarizes some of the situations, which may be encountered during field operations.

Contingency Plans for Site Emergencies	
Situation	Action
Evacuation	<ul style="list-style-type: none"> • Immediately notify all on-site personnel of the emergency requiring evacuation. • Leave the dangerous area and report to designated rally point. • Notify emergency services, as appropriate. • Account for all personnel. • Contact HSO and PM. • Maintain security for community safety until emergency services take over.
Medical Emergency	<ul style="list-style-type: none"> • Survey the situation. • Do not enter an area that will jeopardize your safety. • Establish the victim's level of consciousness. • Call for help and notify emergency responders 911 of victim's conditions. • Do not move victim unless a life-threatening situation occurs. • Perform Preliminary Assessment (Arousal, Airway, Breathing, Pulse). • CPR/First Aid should only be performed by trained personnel. • Check for bleeding: control with direct pressure. • Respondent should wear protective gloves if contact with body fluids. • Do not move victim unless the location is not secure. • Monitor pulse, breathing and consciousness. • Provide First Aid to your level of training. • Contact PM and HSO. • Document in Accident Report. • Refer to Appendix A for Hospital Location and Directions from the site.
Fire Emergency	<ul style="list-style-type: none"> • Evacuate the area. • Notify emergency services (911). • Extinguish small, controllable fires with fire extinguisher. • Contact HSO and PM. • Document accident.
Spill/Release	<ul style="list-style-type: none"> • Prevent problems by documenting the location of underground and overhead lines (sewer, telephone, electric, gas, etc.) before starting site work. • If you puncture a line or tank or another leak occurs, document the spill/release in writing (include dates times, actions taken, conversations of pertinent individuals and people involved). • Don appropriate PPE; stay up wind of spill/release. • Turn off all electric equipment and other sources of ignition. • If possible, mitigate spill by turning off dispenser pump or shutting valves. • If possible, attempt to mitigate leak physically by plugging puncture. • Place absorbent pads to collect spilled product. If product is on the pavement surface try to mitigate flow to prevent spreading of spill. Document if spill goes into any drainage basins or sewers. • Call the fire department if a fire emergency develops. • Contact PM and DHS. PM will contact client and state agencies and decide how to handle the problem. • If the spill impacts a waterway the PM must inform the client that he must contact the US Coast Guard and National Guard Response Center 1-800-424-8802. • Document all conversations, actions, occurrences, date, times and people involved. Immediate photo documentation should be implemented, if possible.

5.1 Emergency Response Plan

ET Personnel will reference the following procedures in the event of an accidental release or fire:

1. Keep unnecessary people away; isolate hazard area and deny entry.
2. Stay upwind; keep out of low areas. Positive pressure self-contained breathing apparatus (SCBA) and structural firefighters' protective clothing will provide limited protection. Isolate area for 1/2 mile in all directions if tank, rail car, or tank truck is involved in fire.
3. CALL Emergency Response Telephone Number: 911. If water pollution occurs, notify the appropriate authorities.

Spill/Accidental Release

1. Shut off ignition sources; no flares, smoking, or flames in hazard area.
2. Stop leak if you can do it without risk.
3. Water spray may reduce vapor, but it may not prevent ignition in closed spaces.

Small Spills:

1. Take up with sand or other noncombustible absorbent material and place into containers for later disposal.

Large Spills:

1. Dike far ahead of liquid spill for later disposal.
2. Small Fires:
3. Dry Chemical, CO₂, water spray or regular foam.

Large Fires:

1. Water spray, fog or regular foam.
2. Move container from fire area if you can do it without risk.
3. Apply cooling water to sides of containers that are exposed to flames until well after fire is out. Stay away from ends of tanks.
4. For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is not possible, withdraw from area and let fire burn.
5. Withdraw from area immediately in case of rising sound from venting safety device or any discoloration of tank due to fire.
6. In case of contact with material, immediately flush eyes with running water for at least 15 minutes. Wash skin with soap and water.
7. Move victim to fresh air and call emergency medical care; if not breathing, give artificial respiration; if breathing is difficult, give oxygen.
8. Remove and isolate contaminated clothing and shoes at the site.

In the event of a personal injury not requiring immediate medical attention, follow the first aid procedures listed on the product specific MSDS and notify the Health & Safety Officer (HSO). If the HSO is not available, notify any available project manager.

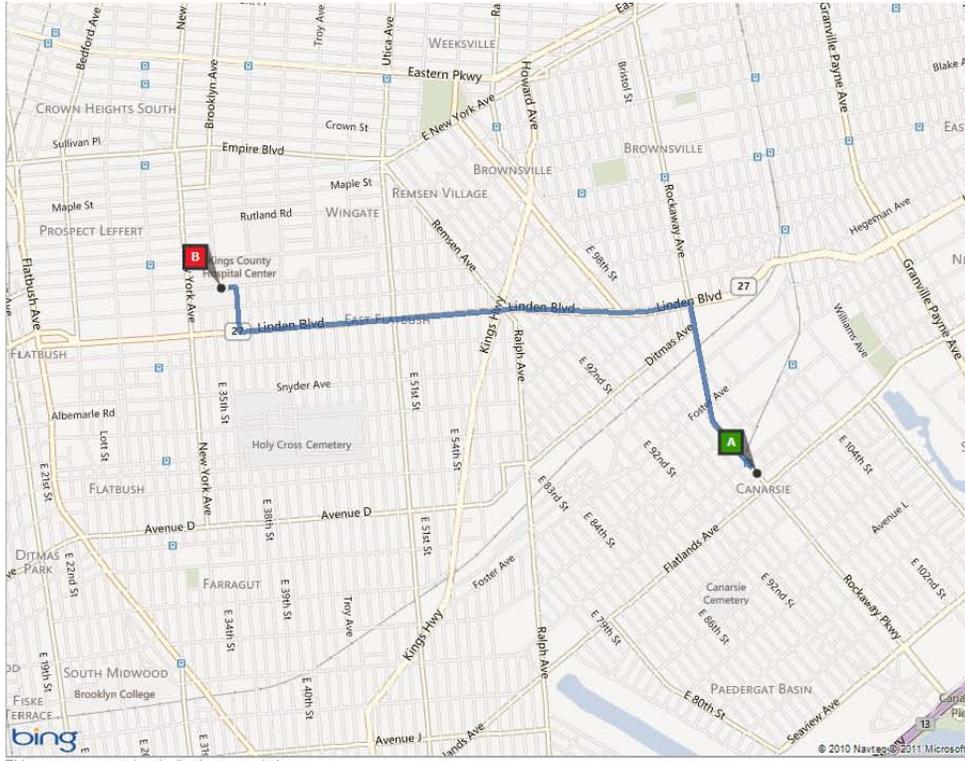
6.0 GENERAL SAFETY RULES

1. If an employee must work alone, he/she must call his/her supervisor twice a day. If the supervisor is unavailable, that supervisor's supervisor must be contacted.
2. Workers must wear all personal protective equipment required for the tasks to be performed.
3. Horseplay, scuffling, or practical jokes are forbidden on the job.
4. Compressed air must not be used to blow dirt from clothing, or played with or blown at another person.
5. Drinking of alcoholic beverages or the use drugs on the job is prohibited. Their use will cause immediate dismissal.
6. All areas must be continually cleaned to maintain good housekeeping. Trash is to be piled neatly and removed promptly. All tools and work areas are to be kept in clean and safe condition.
7. Competent workers must do welding and cutting.
8. Ladders are to be of proper design and tied off while in use. Do not go up or down a ladder without the free use of both hands. Use a rope to lift or lower materials or tools. Always face a ladder when climbing or descending.
9. Every work site must have a qualified first aid person and a complete first aid kit.
10. **ALL** accidents must be investigated and reported. Use the Accident Investigation Form in the back section of this plan.
11. Injuries sustained while on duty must be reported to supervisor immediately, or as soon as possible after injury is sustained.
12. Explosives must be handled and transported by licensed people only.
13. All tools and electrical equipment must be in proper working order.
14. Clothing appropriate to the duties performed shall be work by all workers. Large pockets, loose jewelry, cuffed trousers and loose or torn clothing are dangerous and should not be worn around machinery, or when climbing ladders, or working on structures.

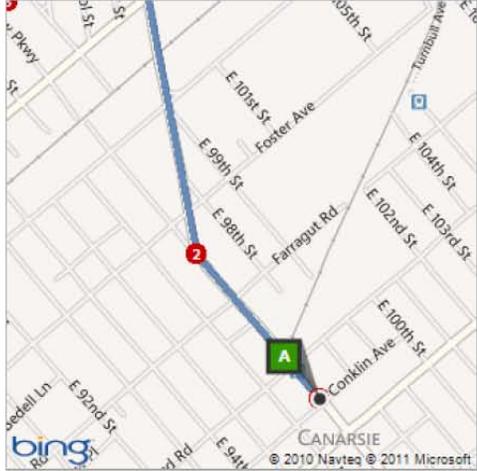
Appendix A

Hospital Directions

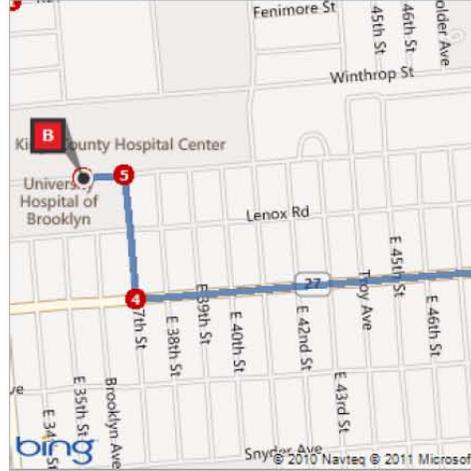
Print - Maps



A: 1465 Rockaway Pkwy, Brooklyn, N...



B: 451 Clarkson Ave, Brooklyn, NY



http://www.bing.com/...630x55763321_A6QQZbHhx0cAADgASXBLz8A&mode=D&rtop=0~0~0~&cmw=925&cmh=744&u=0 [3/28/2012 2:55:59 PM]

bing Maps

A **1465 Rockaway Pkwy, Brooklyn, NY 11236**

B **451 Clarkson Ave, Brooklyn, NY**
Kings County Hospital Ctr (718) 245-4447

Type your route notes here (up to 120 characters).

 On the go? Use m.bing.com to find maps, directions, businesses, and more

Route: **3.0 mi, 11 min**

A	1465 Rockaway Pkwy, Brooklyn, NY 11236	A-B: 3.0 mi 11 min
	1. Depart Rockaway Pkwy toward Glenwood Rd	0.3 mi
	2. Bear right onto Rockaway Ave	0.5 mi
	3. Turn left onto RT-27 West / Linden Blvd <i>Pass Hess on the left in 0.8 mi</i>	1.9 mi
	4. Turn right onto E 37th St	0.2 mi
	5. Turn left onto Clarkson Ave	328 ft
B	6. Arrive at 451 Clarkson Ave, Brooklyn, NY <i>The last intersection is E 37th St</i> <i>If you reach New York Ave, you've gone too far</i>	

These directions are subject to the Microsoft® Service Agreement and for informational purposes only. No guarantee is made regarding their completeness or accuracy. Construction projects, traffic, or other events may cause actual conditions to differ from these results. Map and traffic data © 2010 NAVTEQ™.

Route: **3.0 mi, 11 min**

Appendix B

Agreement and Acknowledgment Affidavit

I, _____ (name), of _____ (Company name)
have read the Health and Safety Plan (HASP) for _____ (site name).

I agree to conduct all on-site work in accordance with the requirements set forth in this HASP and understand that failure to comply with this HASP could lead to my removal from this site and or termination of employment.

Signed: _____ Date: _____

Appendix D

Key Project Personnel

The following describes the project position assignments, associated responsibilities, and reporting relationships.

Position	Job Description	Interactions
Project Manager	Responsible for technical and administrative performance of the project. Supports Site Supervisor and is available to him at all times. Will visit the site periodically, or as necessary. Reports progress of project on a regular basis. Assigns key personnel, and identifies, requests, secures, and monitors use of resources for project. Approves program expenditures and invoices.	Reports directly to President. Works closely with Site Supervisor.
Site Supervisor	Acts as point of contact for client and client's representative(s). Supervises all on-site personnel and subcontractors. Coordinates daily site-specific work efforts, and ensures all activities are in strict compliance with site-specific health and safety plan. Has authority to suspend all work that possesses any health and safety risk. Briefs subordinate technical personnel on task requirements. Identifies and resolves technical problems. Provides periodic review of project progress.	Reports directly to Project Manager.
Site Designated Health & Safety Officer (SHSO)	Assures compliance with HASP. Instructs site personnel in health and safety procedures through daily pre-work meetings. Performs any monitoring activities as required. Has authority to discontinue site operations if safety violations exist.	Reports directly to Project Manager. Works closely with Director, Health & Safety, and Site Supervisor.
Director, Health & Safety (DHS)	Develops, implements, and enforces the on-site safety program. Oversees all health and safety aspects of project, conducts periodic audits to ensure compliance. Available at all times to discuss project progress and health and safety related issues.	Reports directly to President. Works closely with Project Manager, Site Supervisor, and SHSO.

Appendix E

Emergency Contacts

	Town	Phone
Fire Department		911
Police Department		911
Site Contact		
Site Telephone		
Nearest Telephone		
First Aid/EMS		911
Federal Agency Representative	National Response Center	(800) 424-8802
Local Agency Representative	NYSDEC	(718) 482-4900
Pesticide Poisoning		(800) 845-7633
Poison Control Center		(800) 764-7661
CHEM TREC		(800) 424-9300
Utility	Company Name	Phone
Water Supply	NYC DEP	311
Sewer	NYC DEP	311
Telephone		
Power	Con Edison	(800) 752-6633
	Keyspan	(718) 643-4050
Gas	Con Edison	(800) 752-6633
	Keyspan	(718) 643-4050

Appendix F
Accident Report Form

Name of Reporter: _____ Date: _____

Name(s) of Victim(s): _____ Date of Accident: _____

Witnesses: _____ Time of Accident: _____

Location on Accident: _____

Description of Accident: _____

Cause of Accident: _____

<u>Persons/Agencies Notified</u>	<u>Time</u>	<u>Time of Arrival (if Applicable)</u>
----------------------------------	-------------	--

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Corrective Actions: _____

Duration of Accident: _____

Comments: _____

Appendix G

Daily Tailgate Safety Meeting Log
(to be completed on site)

Site Name _____
Location _____
Weather _____
Topics _____

Employee Names:

Signatures

Signature of SS (or designee)

Date



Appendix H

**SUBSURFACE INVESTIGATION SUMMARY ONSITE TAILGATE SAFETY MEETING
LOG**

Client: Client Contact:
Site: Project Manager:
Address:
Date:
Weather Conditions:
Consultant(s): Onsite Supervisor:
Contractor(s):
SOW Summary:
Weather Conditions:

<u>Utility Markout #(s):</u>	<u>Utility Markout</u>	<u>Company Calling in Markouts</u>	
	Yes	No	Comments
Site As-Built Plan(s):			
Other Site Plan(s):			
Subsurface SOP Documentation:			
HASP:			
Air knife/Vac Exc. Done (date):			
Hand Auger 5 feet (tbd):			
Other Documentation indicating utility locations (type):			
Permits (if applicable):			
<u>Summary of Tailgate Discussion:</u>			

Attendees: Company: Title: Signature:



Appendix I

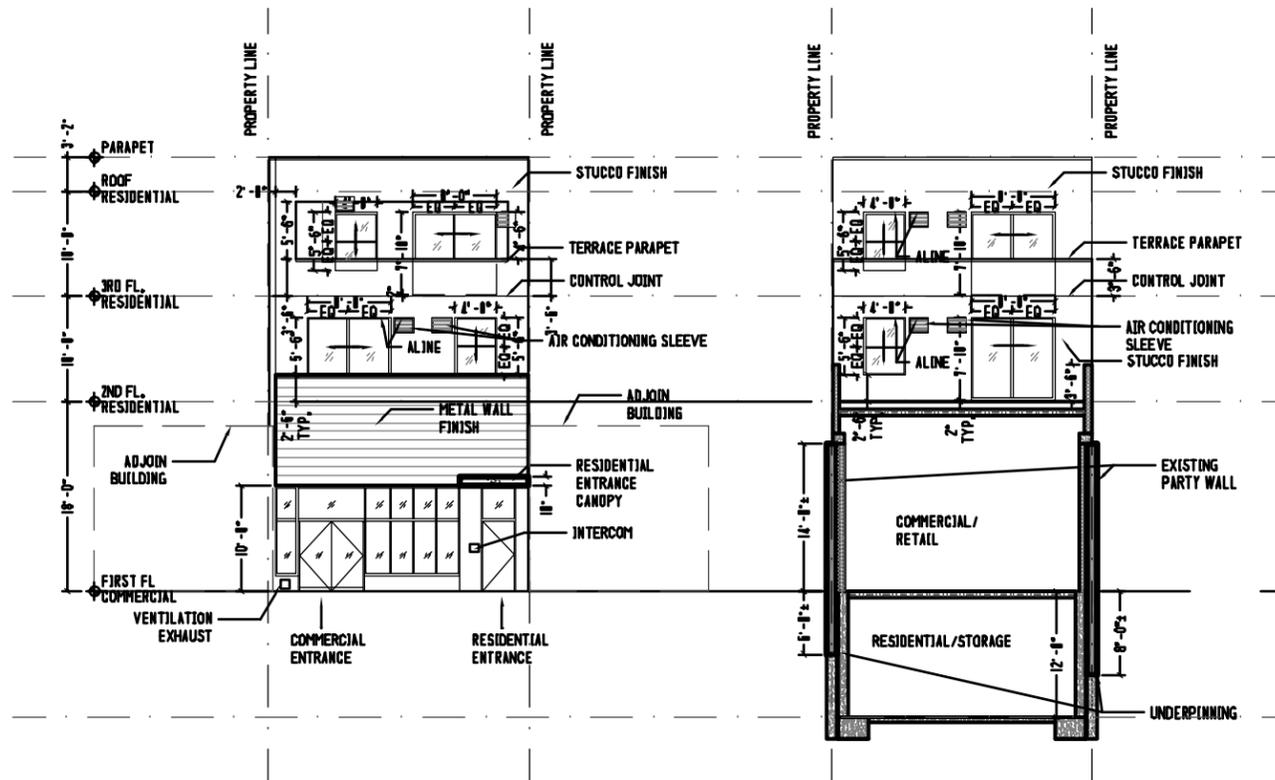
CHEMICAL PROFILES (MSDS)

Appendix J

OSHA CERTIFICATES

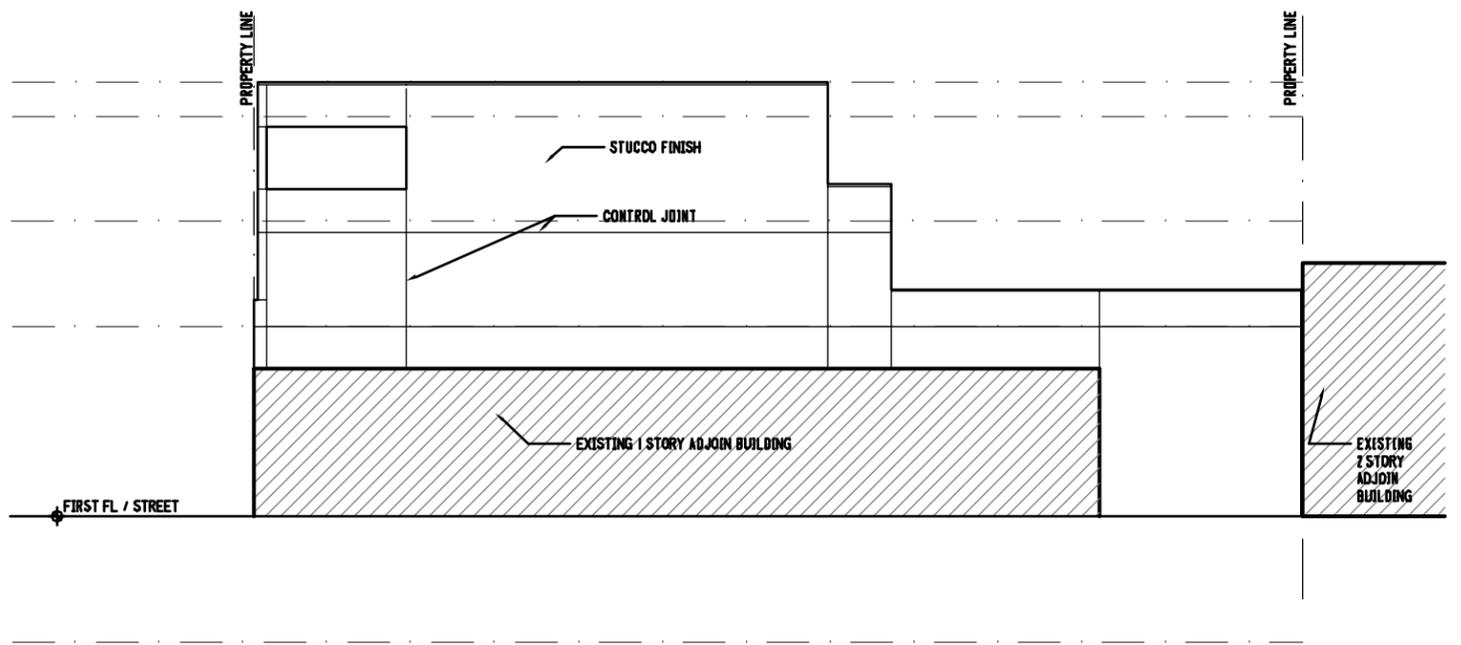
Furnished upon request

Appendix E

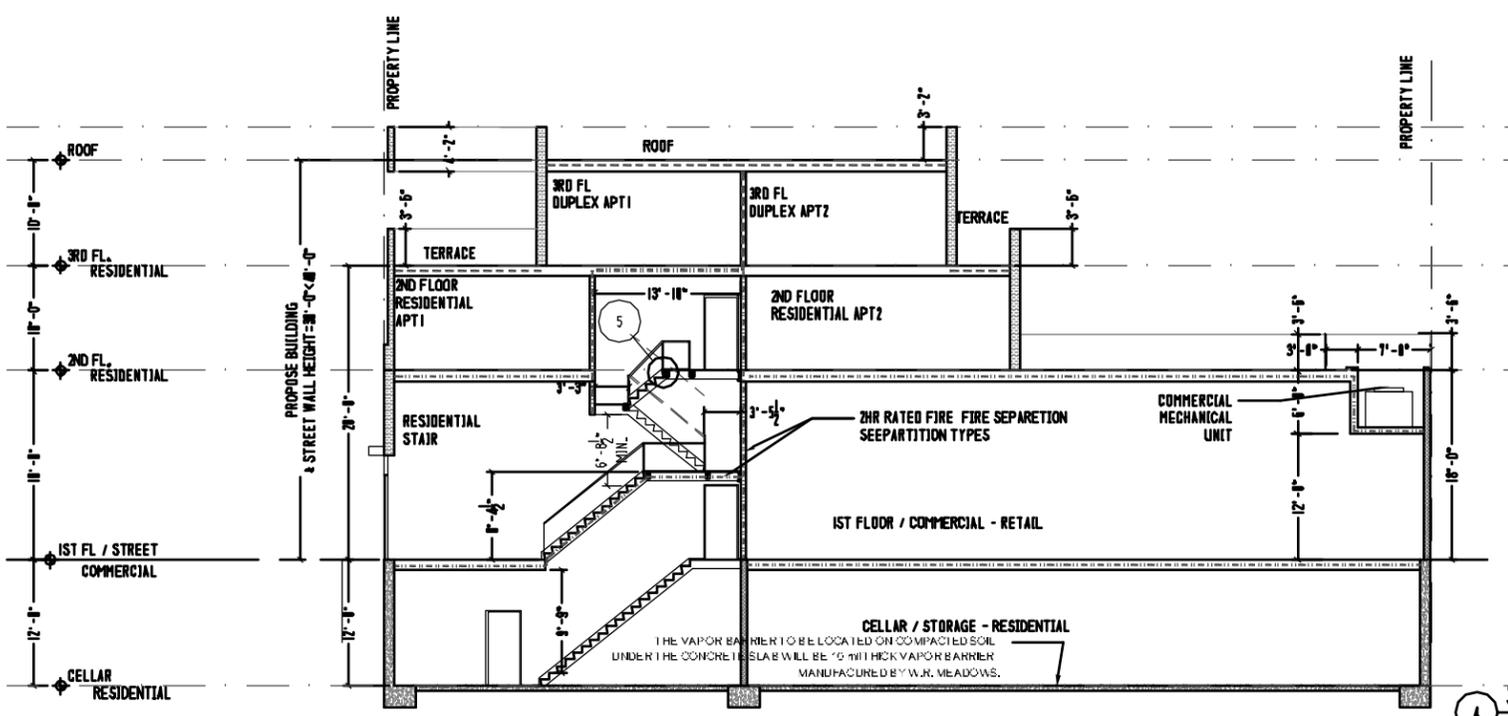


1 FRONT ELEVATION
1/8" = 1'-0"

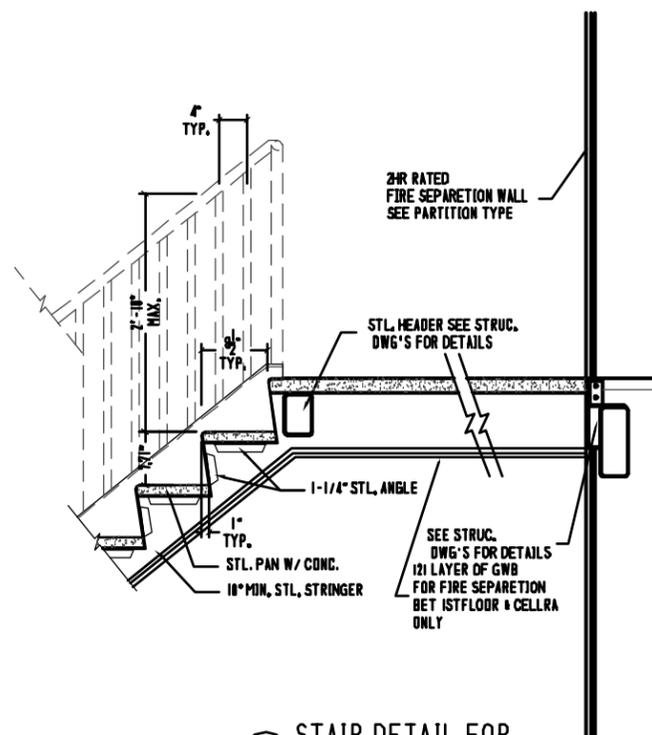
2 REAR ELEVATION
1/8" = 1'-0"



3 NORTH & SOUTH ELEVATION
1/8" = 1'-0"

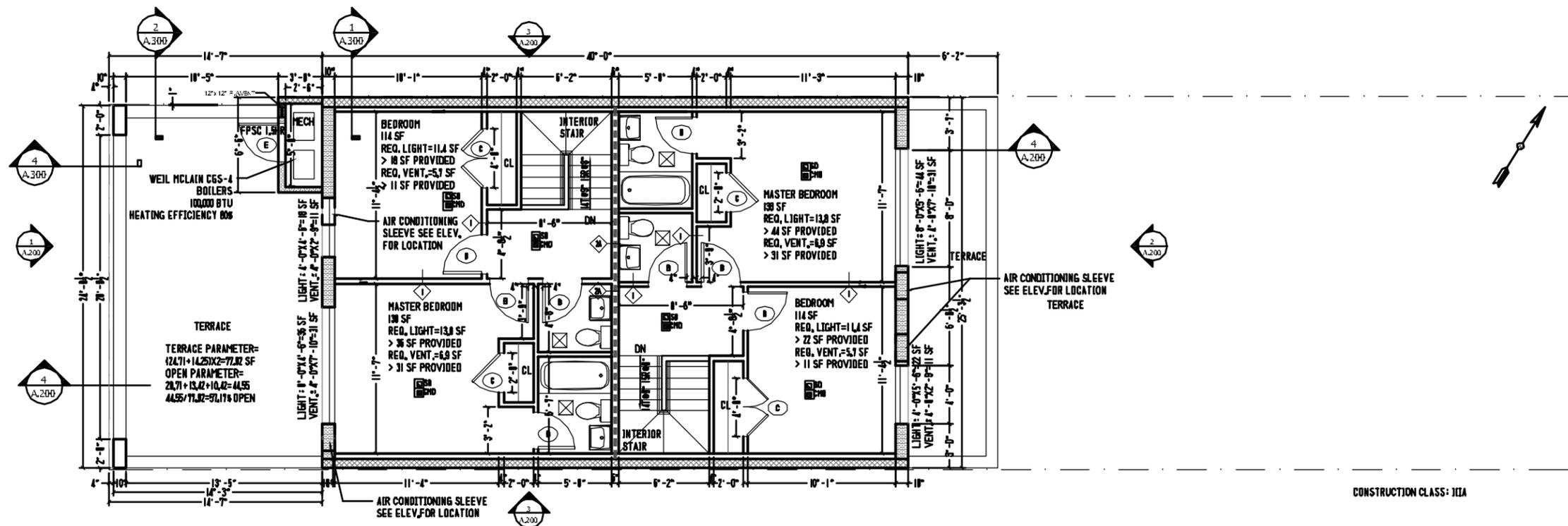


4 SECTION
1/8" = 1'-0"

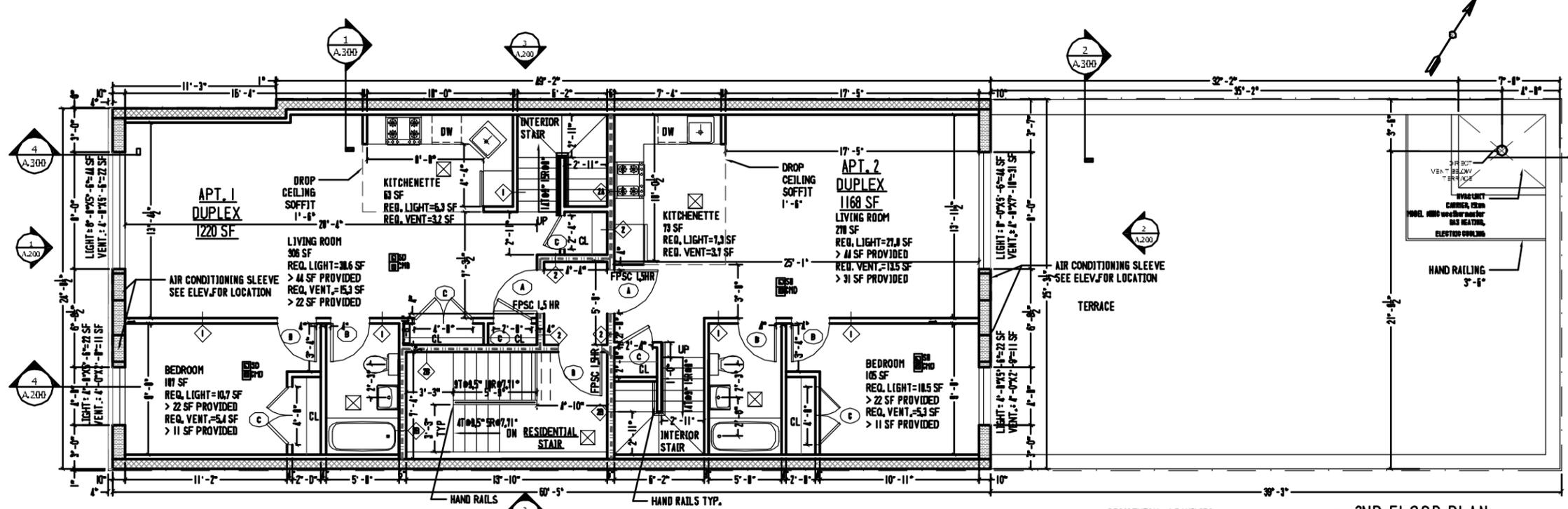


5 STAIR DETAIL FOR RESIDENTIAL COMMON STAIR
1" = 1'-0"

<p>40-25 Queens Blvd Jamaica, NY 11435 Tel: (718) 877-5004 Fax: (718) 877-2447</p>	
<p>B</p> <p>BANJI AWOSHIRA ARCHITECT P.C.</p>	
<p>PROJECT</p> <p>1465 ROCKAWAY PARKWAY Brooklyn, New York</p>	
<p>ELEVATIONS, SECTION & STAIR DETAIL</p>	
<p>SEAL & SIGNATURE</p> 	<p>DATE: 05-14-17</p> <p>PROJECT NO:</p> <p>DRAWING BY: NAK</p> <p>CHK BY: B.AWOSHIRA</p> <p>DWG NO:</p> <p>A-200.00</p> <p>D.O.B. No:</p> <p>CADD FILE No: 101 OF 12</p>



3RD FLOOR PLAN
1/4" = 1'-0"



2ND FLOOR PLAN
1/4" = 1'-0"

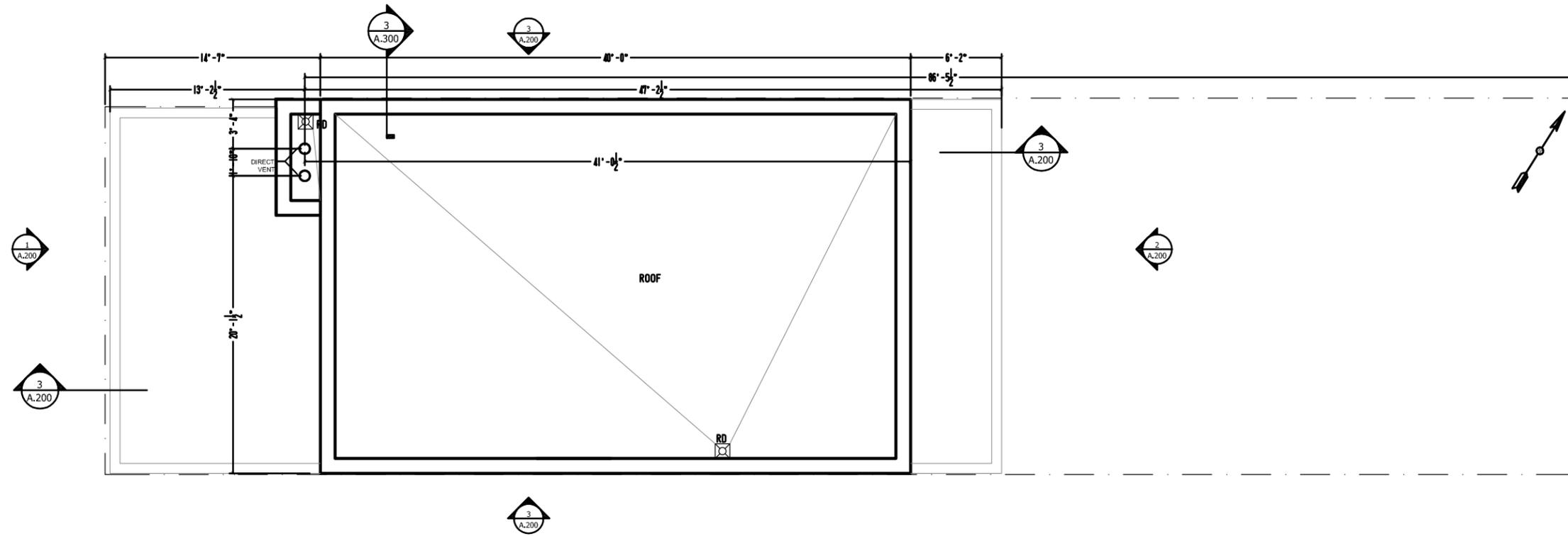
- NOTE:
- SEE DWG T-01 FOR LEGEND & SYMBOLS
 - SEE DWG A-01 FOR PARTITION TYPES & DOOR TYPES

BANJI AWOSIKA ARCHITECTURAL
 100-11 37th Ave. #100
 Bayside, NY 11361
 Tel: 718-224-9900
 Fax: 718-224-9900

PROJECT:
1465 ROCKAWAY PARKWAY
 Brooklyn, New York

2ND & 3RD FLOOR PLAN

SEAL & SIGNATURE: [Signature]
 DATE: 08/27/17
 PROJECT NO:
 DRAWING BY: MK
 CHK. BY: E.AWOSIKA
 DWG NO: **A-101.00**
 D.O.B. NO: CAD/CHEK NO: 8/27/17



1 ROOF
1/4" = 1'-0"

<p>BANJI AWOSIKA ARCHITECT P.C. ARCHITECTS PLANNERS CONSULTANTS</p>	<p>140-23 Queens Blvd. Jamaica, NY 11435 Tel. (718) 657 5004 Fax. (718) 657 2447</p>
	<p>THE ARCHITECT SHALL NOT HAVE CONTROL OR CHARGE OF AND SHALL NOT BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, QUALITY, TECHNIQUES, SEQUENCES, OR PROCEDURES, OR FOR SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK, FOR THE ACTS OR OMISSIONS OF THE CONTRACTOR, SUBCONTRACTORS OR ANY OTHER PERSONS PERFORMING ANY OF THE WORK, OR FOR THE FAILURE OF ANY OF THEM TO CARRY OUT THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. ALWAYS USE DIMENSIONS AS SHOWN. DRAWINGS ARE NOT TO BE SCALED.</p>
<p>PROJECT</p> <p>1465 ROCKAWAY PARKWAY Brooklyn, New York</p>	
<p>ROOF PLAN</p>	
<p>SEAL & SIGNATURE</p>	<p>DATE: 08-15-11</p> <p>PROJECT No:</p> <p>DRAWING BY: MJK</p> <p>CHK BY: B. AWOSIKA</p> <p>DWG No: A-102.00</p>
<p>D.O.B. Nil</p>	<p>CADD FILE No: 9 OF 12</p>

Appendix F

PRODUCT DESCRIPTION

VaporBlock Plus[™] is a seven-layer co-extruded barrier made from state-of-the-art polyethylene and barrier resins to provide unmatched impact strength as well as superior resistance to gas and moisture transmission. VaporBlock Plus is a highly resilient underslab / vertical wall barrier designed to restrict naturally occurring gases such as radon and/or methane from migrating through the ground and concrete slab. VaporBlock Plus is more than 50 times less permeable than typical high-performance polyethylene vapor retarders against Methane, Radon and other harmful VOC's.

VaporBlock Plus is one of the most effective underslab barriers in the building industry today far exceeding ASTM E-1745 (Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs) Class A, B and C requirements. Available in 6 (Class C) and 20 (Class A) mil thicknesses designed to meet the most stringent requirements. VaporBlock Plus is produced within the strict guidelines of our ISO 9001:2000 Certified Management System.

PRODUCT USE

VaporBlock Plus resists gas and moisture migration into the building envelop when properly installed. It can be installed as a passive or active control system extending across the entire building including floors, walls and crawl spaces. When installed as a passive system it is recommended to also include a ventilated system with sump(s) that could be converted to an active control system with properly designed ventilation fans.

VaporBlock Plus works to protect your flooring and other moisture-sensitive furnishings in the building's interior from moisture and water vapor migration, greatly reducing condensation, mold and degradation.

SIZE & PACKAGING

VaporBlock Plus 6 is available in 12' x 200' rolls and VaporBlock Plus 20 in 10' x 150' rolls to maximize coverage. All rolls are folded on heavy-duty cores for ease in handling and installation. Other custom sizes with factory welded seams are available based on minimum volume requirements. Installation instructions and ASTM E-1745 classifications accompany each roll.



PRODUCT

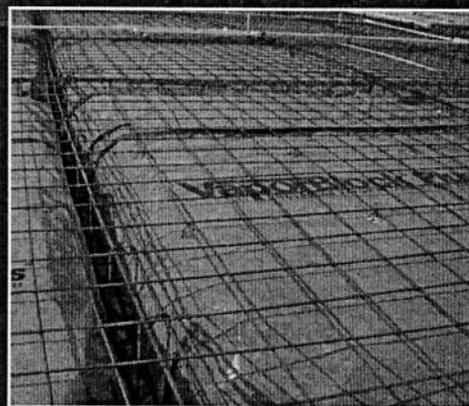
PART NUMBER

VaporBlock Plus 6 VBP 6

VaporBlock Plus 20 VBP 20

COMMON APPLICATIONS

- Radon Barrier
- Methane Barrier
- VOC's Barrier
- Under-Slab Vapor Retarder
- Foundation Wall Vapor Retarder



VaporBlock[®] Plus[™] 6 & 20

UNDERSLAB VAPOR RETARDER / GAS BARRIER

TECHNICAL DATA SHEET

PROPERTIES	TEST METHOD	VAPORBLOCK PLUS 6		VAPORBLOCK PLUS 20	
		English	Metric	English	Metric
APPEARANCE		White/Black		White/Gold	
THICKNESS, NOMINAL		6 mil	0.15 mm	20 mil	0.51 mm
WEIGHT		28 lbs/MSF	139 g/m ²	102 lbs/MSF	498 g/m ²
CLASSIFICATION	ASTM E 1745	CLASS C		CLASS A, B & C	
TENSILE STRENGTH 1" (2.54 cm) Average MD & TD (New Material)	ASTM E 154 Section 9 (D882)	22 lbs	98 N	58 lbs	258 N
PUNCTURE RESISTANCE	ASTM D 1709 *Method B	800 g		2600 g	
MAXIMUM USE TEMPERATURE		180°F	82°C	180°F	82°C
PERMEANCE (New Material)	ASTM E 154 Section 7 ASTM E 96 Procedure B	0.090 U.S. Perms	0.060 Metric Perms	0.025 U.S. Perms	0.016 Metric Perms
RADON DIFFUSION COEFFICIENT		N/A		< 0.25 x 10 ⁻¹² m ² /s	
METHANE PERMEABILITY	ASTM D 1434	N/A		< 5 x 10 ⁻¹⁰ m ² /d·atm	

*Method B conditioned at 65% humidity for 14 days.

VaporBlock Plus Placement

Instructions on architectural or structural drawings should be reviewed & followed. Detailed installation instructions accompany each roll of VaporBlock Plus. ASTM E 1643 also provides general installation information for vapor retarders.

VaporBlock[®] Plus[™]
UNDERSLAB VAPOR RETARDER / GAS BARRIER

VaporBlock Plus[™] is a seven-layer co-extruded barrier made using high quality virgin-grade polyethylene and barrier resins to provide unmatched impact strength as well as superior resistance to gas and moisture transmission. VaporBlock Plus contains a bright white on one side and a metallic gold on the other side.

Note: To the best of our knowledge, unless otherwise stated, these are typical property values and are intended as guides only, not as specification limits. NO WARRANTIES ARE MADE AS TO THE FITNESS FOR A SPECIFIC USE OR MERCHANTABILITY OF PRODUCTS REFERRED TO, no guarantee of satisfactory results from reliance upon contained information or recommendations and disclaims all liability for resulting loss or damage.



ISO 9001:2000
CERTIFIED MANAGEMENT SYSTEM