

**WEBSTER GREEN
3100 WEBSTER AVENUE
BRONX, NEW YORK**

Remedial Action Work Plan

NYC VCP Site Number: 14CVCP179X

NYC E-Designation Site Number: 13EH-N459X

Prepared for:

Webster Avenue Housing Development Fund Corporation
345 East 102nd Street
New York, New York 10020

Prepared by:

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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, Matt Durcan, am a Professional Engineer licensed in the State of New York. I have primary direct responsibility for implementation of the remedial action for the Webster Green Site, Site number 14CVCP179X.

I, Mark Hasting am a Qualified Environmental Professional as defined in §43-140. I have primary direct responsibility for implementation of the remedial action for the Webster Green Site.

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.

MATTHEW DURCAN

Name

N45 PE # 074649

NYS PE License Number

Signature

11.18.13

Date



MARK HASTING

QEP Name

QEP Signature

11/13/2013

Date



EXECUTIVE SUMMARY

Webster Avenue Housing Development Fund Corporation has enrolled in the New York City Voluntary Brownfield Cleanup Program (NYC VCP) to investigate and remediate a 12,632-square foot site located at 3100 Webster Avenue in the Bronx, 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 3100 Webster Avenue in the Bronx, New York and is identified as Block 3330 and Lot 68 on the New York City Tax Map. Figure 1 shows the Site location. The Site is 0.29 acres and is bounded by East 204th Street to the north/northeast, an adjoining building to the south/southeast and south/southwest, and Webster Avenue to the west/northwest. A map of the site boundary is shown in Figure 2. Currently, the Site is vacant and contains an unused parking lot and a vacant (former) service station building.

Summary of Proposed Redevelopment Plan

The proposed future use of the Site will consist of an 81,175 square foot multi-story residential building. Layout of the proposed site development is presented in Figure 3. The current zoning designation is C8-2 commercial/garage. The proposed use will require rezoning for the property to residential.

Development of the property is planned with an 81,175 square foot residential building. The building will be L-shaped and be 8 stories in height in the northern section and seven stories in height in the southern section. The site will be covered by the building, landscaped or concrete areas. The maximum depth of excavation for the proposed basement is anticipated to be twelve feet below ground surface (bgs). Excavation is not expected below the water table.

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 implementation of a Citizen Participation Plan.
2. Perform a Community Air Monitoring Program for particulates and volatile organic carbon compounds.
3. Establish Track 1 Soil Cleanup Objectives (SCOs). Excavation and removal of soil/fill exceeding SCOs.
4. Construction and maintenance of an engineered composite cover consisting of the building slab (approximately 4 inches thick). The southwest rear of the property will include an outdoor terrace area landscaped with at least two feet of clean fill to prevent human exposure to residual soil/fill remaining under the Site;
5. Installation of a vapor barrier system beneath the building slab and outside foundation sidewalls below grade.
6. Collection and analysis of end-point samples to determine the performance of the remedy with respect to attainment of SCOs.
7. Removal of underground storage tanks and closure of petroleum spills in compliance with applicable local, State and Federal laws and regulations.
8. Demarcation of residual soil/fill.

9. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations.
10. 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.
11. Screening of excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID.
12. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas.
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, lists any changes from this RAWP, and describes all Engineering and Institutional Controls to be implemented at the Site.
16. 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. The property will continue to be registered with an E-Designation by the NYC Buildings Department. Establishment of Engineering Controls and Institutional Controls in this RAWP and a requirement that management of these controls must be in compliance with an approved SMP. Institutional Controls will include 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 Voluntary Cleanup Program (NYC VCP) 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 and 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 VCP, 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 Construction Health and Safety Plan (CHASP) 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 (OSHA). 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 Mark Hasting and can be reached at 908-688-7800.

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 [Mark Hasting at 908-688-7800] or NYC Office of Environmental Remediation Project Manager William Wong at 212-341-0659.

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 Monday through Friday 7:30 AM to 4:30 PM..

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 Voluntary 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 Mark Hasting at 908-688-7800, the NYC Office of Environmental Remediation Project Manager William Wong at 212-341-0659, or call 311 and mention the Site is in the NYC Voluntary 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 the New York Public Library, 285 East 205th Street, Bronx, New York..

Long-Term Site Management. If long-term protection is required 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 or established through a city environmental designation. 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

Webster Avenue Housing Development Fund Corporation has applied to enroll in the New York City Voluntary Cleanup Program (NYC VCP) to investigate and remediate a property located at 3100 Webster Avenue in the Bronx, 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 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.

1.1 SITE LOCATION AND CURRENT USAGE

The site is located at 3100 Webster Avenue in the Bronx, New York and is identified as block 3330 and lot 68 on the New York city tax map. Figure 1 shows the site location. The site is 0.29 acres and is bounded by east 204th street to the north/northeast, an adjoining building to the south/southeast and south/southwest, and Webster Avenue to the west/northwest. A map of the site boundary is shown in figure 2. Currently, the site is vacant and contains an unused parking lot and a vacant (former) service station building.

1.2 PROPOSED REDEVELOPMENT PLAN

The proposed future use of the Site will consist of 81,175 square foot multi-story residential building. Layout of the proposed site development is presented in Figure 3. The current zoning designation is C8-2 commercial/garage. The proposed use will require rezoning for the property to residential.

Development of the property is planned with an 81,175 square foot residential building. The building will be L-shaped and will be 8 stories in height in the northern section and seven stories in height in the southern section. The site will be covered by the building landscaped and concrete areas; approximately 9,753 square feet will be covered by the building and the remaining 2,747 square feet covered by a landscaped rear yard. The maximum depth of excavation for the proposed basement is anticipated to be twelve feet below ground surface (bgs). The basement will be used for storage and mechanical rooms. Excavation is not expected below the water table.

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

1.3 DESCRIPTION OF SURROUNDING PROPERTY

No sensitive receptors such as schools, hospitals or day care facilities are located within a 500 radius from the Site. The surrounding properties are zoned residential and commercial. Figure 4 shows the surrounding land usage.

Figure 4 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, Webster Green*”, dated September, 2013 (RIR).

1. Elevation of the property ranges from 85 to 95 feet.
2. Depth to groundwater ranges from 9 to 12 feet at the Site.
3. Groundwater flow is generally from east to west beneath the Site.
4. Depth to bedrock is approximately 8 to 14 feet at the Site.
5. The stratigraphy of the site, from the surface down, consists of approximately 5 to 10 feet of historic fill underlain by 5 to 10 feet of clay.
6. Soil/fill samples collected during the RI showed VOCs including benzene at 0.053 mg/Kg, ethylbenzene at 26 mg/Kg, and total xylene at 185 mg/Kg detected above Track 1

Unrestricted Use Soil Cleanup Objective (SCOs), and of these, xylenes also exceeded Track 2 Restricted Residential SCOs in one shallow soil sample. Other VOCs, methylene chloride, toluene and isopropylbenzene were also detected at concentrations well below Unrestricted Use SCOs. Seven SVOCS – all PAH related compounds including benzo(a)anthracene (max. of 9.07 ppm), benzo(a)pyrene (max. of 11.8 ppm), benzo(b)fluoranthene (max. of 10.4 ppm), benzo-(k)fluoranthene (max. of 8.13 ppm), chrysene (max. of 8.79 ppm), dibenzo(a,h)anthracene (max. of 3.33 ppm), and indeno(1,2,3-cd)pyrene (max. of 6.51 ppm) were detected above their respective Restricted Residential Use SCOs as well as Unrestricted Use SCO in the two of 14 soil samples. Metals including barium (max. of 361 ppm), copper (max. of 111 ppm), lead (max. of 216 ppm), manganese (max. of 1990 ppm), mercury (max. of 1.14 ppm), nickel (max. of 89 ppm) and zinc (max. of 222 ppm) exceeded Unrestricted Use SCOs in several soil samples. Of these metals, mercury also exceeded Restricted Residential SCOs in one shallow soil. No PCBs or Pesticides were detected above Track 1 Unrestricted Use SCOs.

7. The groundwater samples collected during the RI showed several VOCs including benzene (at 1.87 ug/L), toluene (max. of 14.9 ug/L), ethylbenzene (max. of 578 ug/L), total xylene (max. of 1740 ug/L) and isopropylbenzene (max. of 75.6 ug/L) exceeding NYSDEC 6NYCRR Part703.5 Groundwater Quality Standards (GQS) in two wells. One SVOC, naphthalene detected at 37.8 ug/L, also exceeded GQS. Metals including iron, manganese, and selenium were detected above GQS. No PCBS and Pesticide were detected in any of the groundwater samples collected at the site. Data collected during the RI is sufficient to delineate the distribution of contaminants in groundwater at the Site.
8. The soil vapor results collected during the RI were compared to the compounds listed in Table 3.1 Air Guideline Values Derived by the NYSDOH located in the New York State Department of Health (NYSDOH) Final Guidance for Evaluating Soil Vapor Intrusion. Soil vapor detected high concentrations of petroleum related and low levels of chlorinated VOCs in several soil vapor samples. Petroleum-related VOCs included BTEX compounds with benzene (2,000 $\mu\text{g}/\text{m}^3$), toluene (1,600 $\mu\text{g}/\text{m}^3$), ethylbenzene

(8,000 $\mu\text{g}/\text{m}^3$) and total xylenes (6,500 $\mu\text{g}/\text{m}^3$). Chlorinated VOCs including Tetrachloroethylene (PCE) was identified in four soil vapor samples at a maximum concentration of 99 $\mu\text{g}/\text{m}^3$, carbon tetrachloride was detected at a maximum concentration of 0.1.7 $\mu\text{g}/\text{m}^3$, trichloroethylene (TCE) was detected at a maximum concentration of 1.2 $\mu\text{g}/\text{m}^3$ and TCA was detected at maximum concentrations of 4.1 $\mu\text{g}/\text{m}^3$. The PCE, TCE, TCA and carbon tetrachloride concentrations are below the monitoring level ranges established within the State DOH soil vapor guidance matrix.3.

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:

Groundwater

- Remove contaminant sources causing impact to groundwater.
- Prevent direct exposure to contaminated groundwater.
- Prevent exposure to contaminants volatilizing from contaminated groundwater.

Soil

- Prevent direct contact with contaminated soil.
- Prevent exposure to contaminants volatilizing from contaminated soil.

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 ten 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;
- Land use; and
- Sustainability.

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

- Establishment of Unrestricted Use (Track 1) Soil Cleanup Objectives (SCOs).
- Removal of all soil/ fill exceeding Track 1 Unrestricted Use SCOs throughout the Site and confirmation that Track 1 Unrestricted Use SCOs have been achieved with post-excavation endpoint sampling. Based on the results of the remedial investigation, it is expected that this alternative would require excavation to a depth of 12 feet across the entire property to remove all historic fill at the Site. If soil/fill containing analytes at concentrations above Track 1 Unrestricted Use SCOs are still present at the base of the

excavation after removal of soil is complete, additional excavation would be performed to ensure complete removal of soil that does not meet Track 1 Unrestricted Use SCOs.

- No engineering or institutional controls are required for a Track 1 cleanup, but a vapor barrier would be installed beneath the basement foundation and behind foundation sidewalls of the new building as a part of development to prevent any potential future exposures from off-Site soil vapor.
- Placement of a final cover over the entire Site as part of construction.

Alternative 2 involves

- Establishment of Track 4 Site-Specific SCOs.
- Removal of all soil/ fill exceeding Track 4 Site-Specific SCOs and confirmation that Track 4 has been achieved with post-excavation endpoint sampling. Excavation for development purposes would take place to a depth of approximately 12 feet for the new building. If soil/fill containing VOCs, SVOCs, or metals at concentrations above Track 4 Site-Specific SCOs are still present at the base of the excavation after removal of all soil required for construction is complete, additional excavation would be performed to ensure complete removal of soil that does not meet Track 4 Site-Specific SCOs.
- Placement of a final cover over the entire Site to prevent exposure to remaining soil/fill;
- Placement of a soil vapor barrier beneath the building slab and along foundation side walls to prevent any potential future exposures from off-Site soil vapor;
- Establishment of use restrictions including prohibitions on the use of groundwater from the Site; prohibitions of sensitive Site uses, such as farming or vegetable gardening, to prevent future exposure pathways; and prohibition of a higher level of land use without OER approval;
- 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
- Continued registration as an E-designated property to memorialize the remedial action and the Engineering and Institutional Controls required by this RAWP.

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 contaminated soil/fill exceeding Track 1 SCOs and groundwater protection standards, thus eliminating potential for direct contact with contaminated soil/fill once construction is complete and eliminating the risk of contamination leaching into groundwater.

Alternative 2 would achieve comparable protections of human health and the environment by excavating the historic fill at the Site 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 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.

For both Alternatives, potential exposure to contaminated soils or groundwater during construction would be minimized by implementing a Construction Health and Safety Plan, an approved Soil/Materials Management Plan and Community Air Monitoring Plan (CAMP). Potential contact with contaminated groundwater would be prevented as its use is prohibited by city laws and regulations.

3.2. BALANCING CRITERIA

Compliance with Standards, Criteria and Guidance (SCGs)

This evaluation criterion assesses the ability of the alternative to achieve applicable standards, criteria and guidance.

Alternative 1 would achieve compliance with the remedial goals, chemical-specific SCG and RAOs for soil through removal to Track 1 Unrestricted Use SCOs. All soil/fill excavated from the Site would be managed and disposed of in accordance with all applicable regulations. Compliance with SCGs for soil vapor would also be achieved by construction of a sub-grade ventilated parking garage.

Alternative 2 would achieve compliance with the remedial goals, chemical-specific SCGs and RAOs for soil through removal of soil to meet Track 4 Site-Specific SCOs. Compliance with SCGs for soil vapor would also be achieved by construction of a sub-grade ventilated parking garage. A Site Management Plan would ensure that these controls remained protective for the long term.

Health and safety measures contained in the CHASP and Community Air Monitoring Plan (CAMP) that comply with the applicable SCGs shall be implemented during Site redevelopment under this RAWP. For both Alternatives, focused attention on means and methods employed during the remedial action would ensure that handling and management of contaminated material would be in compliance with applicable SCGs. These measures will protect on-site workers and the surrounding community from exposure to Site-related contaminants.

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 alternatives 1 and 2 have similar-short term effectiveness during their respective implementations, as each requires excavation of historic fill material. Short term impacts would likely be higher for Alternative 1 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. Both alternatives would both employ appropriate measures to prevent short term impacts, including a Construction Health and Safety Plan, a Community Air Monitoring Plan (CAMP) and a Soil/Materials Management Plan (SMMP), during all on-Site soil disturbance activities and would minimize the release of contaminants into the environment. Both alternatives provide short term effectiveness in protecting the surrounding community by decreasing the risk of contact with on-Site contaminants. Construction workers operating under appropriate management procedures and a Health and Safety Plan (CHASP) will be protected from on-Site contaminants (personal protective equipment would be worn consistent with the documented risks within the respective work zones).

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 and enabling unrestricted usage of the property.

Alternative 2 would provide long-term effectiveness by removing most on-Site contamination and attaining Track 4 Site-Specific SCOs; establishing Engineering Controls including a composite cover system across the Site; establishing Institutional Controls to ensure long-term management including use restrictions, a Site Management Plan and continued registration as an E-designated property to memorialize these controls for the long term. The SMP would ensure long-term effectiveness of all ECs and ICs by requiring periodic inspection and certification that these controls and 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. Both alternatives would result in removal of soil contamination exceeding the SCOs providing the highest level, most effective and permanent

remedy over the long-term with respect to a remedy for contaminated soil, which will eliminate any migration to groundwater. Potential sources of soil vapor and groundwater contamination will also be eliminated as part of the remedy.

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 would permanently eliminate the toxicity, mobility, and volume of contaminants from on-Site soil by removing all soil in excess of unrestricted use SCOs. Removal of soil to the depth of bedrock would occur.

Alternative 2 would remove most of the impacted soil present on the Site and any remaining soil beneath the new building would meet Track 4 - Site-Specific SCOs. Alternative 1 would eliminate a greater total mass of contaminants on Site. Placement of a building slab and ventilated parking below grade would lower toxicity by eliminating potential exposures with remaining soil, groundwater, and vapors. Groundwater use restrictions would reduce toxicity by ensuring that there is no use of on-Site groundwater for potable purposes.

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.

The techniques, materials and equipment to implement Alternatives 1 and 2 are readily available and have been proven effective in remediating the contaminants associated with the Site. 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.

The costs for implementation of Alternative 1 are significantly higher than Alternative 2 since Alternative 1 involves removal of all impacted soil from throughout the site. Site management costs would add to the costs of Alternative 2 but are expected to be comparatively less than the additional soil required during Alternative 1.

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 the intended Site use, it is anticipated that both Alternatives 1 and 2 for the Site would be acceptable to the community. This RAWP will be subject to public review under the NYC VCP 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 site is currently zoned commercial for a garage/service station. The property will be redeveloped and rezoned for residential use. Both Alternative 1 and Alternative 2 would allow the property to be developed residential. Residential use would be consistent with other properties in the neighborhood.

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.

The planned project site will be built with green features in mind including a landscaped courtyard with plants and trees native to the New York area. The planned building will achieve at least a 20% energy reduction from baseline as well as integrate energy efficiency opportunities to fulfill the guidelines of ENERGY STAR and the USGBC's LEED for Homes Mid-rise Certification Program.

4.0 REMEDIAL ACTION

4.1 SUMMARY OF PREFERRED REMEDIAL ACTION

The preferred remedial action alternative is Alternative 1, the Track 1 Alternative. 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 VCP Citizen Participation activities according to an approved Citizen Participation Plan.
2. Performance of a Community Air Monitoring Program for particulates and volatile organic carbon 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. Entire footprint of new building will be excavated to a depth of approximately 12 feet below grade for development purposes and the rear yard will be excavated to at least two feet.
6. Screening of excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID. Appropriate segregation of excavated media on-Site.
7. Removal of two known underground storage tanks and any additional UST (if encountered) and closure of petroleum spills #03-13721 in compliance with applicable local, State and Federal laws and regulations.

8. 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 on-Site.
9. Collection and analysis of end-point samples to determine the performance of the remedy with respect to attainment of SCOs.
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. Installation of a vapor barrier system/waterproofing system beneath the building slab and outside foundation sidewalls below grade.
12. Construction and maintenance of an engineered composite cover consisting of the building slab (approximately 4 inches thick). The southwest rear of the property will include an outdoor terrace area landscaped with at least two feet of clean fill to prevent human exposure to residual soil/fill remaining under the Site;
13. Installation of a Sub Slab Depressurization system.
14. Onsite petroleum spill # 03-13721 will be remediated under the authority of NYSDEC Spills. Remedial action to close the petroleum spills will be managed under the authority of NYSDEC and will be independent of this remedial action. This RAWP does not alter or interfere with the remedial action for the petroleum spills.
15. Performance of all activities required for the remedial action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations. Since groundwater is at a depth of 10 feet below ground surface, dewatering permits will be obtained from NYCDEP.
16. Collection and analysis of end-point samples to determine the performance of the remedy with respect to attainment of SCOs.
17. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations.

18. Submission of a Remedial Action Report (RAR) that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, lists any changes from this RAWP, and, if Track 1 SCO's are not achieved, describes all Engineering and Institutional Controls to be implemented at the Site.
19. If Track 1 Unrestricted Use SCOs are 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.
20. If Track 1 Unrestricted Use SCOs are not achieved, the property will continue to be registered with an E-Designation by the NYC Buildings Department. Establishment of Engineering Controls and Institutional Controls in this RAWP and a requirement that management of these controls must be in compliance with an approved SMP. Institutional Controls will include 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 Soil Cleanup Objectives (SCOs) are proposed for this project. The SCOs for this Site are listed in Table 1. 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 VOCs	100 ppm
Total SVOCs	250 ppm
Barium	750 ppm
Lead	800 ppm
Mercury	2.0 ppm

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.

Discrete contaminant sources (such as hotspots) identified during the remedial action will be identified by GPS or surveyed. This information will be provided in the Remedial Action Report.

Estimated Soil/Fill Removal Quantities

The total quantity of soil/fill expected to be excavated and disposed off-Site is 1,500 tons.

Disposal facilities will be reported to OER when they are identified and prior to the start of remedial action.

Disposal Facility	Waste Type	Estimated Quantities
To be decided	Contaminated Non hazardous	1,500 Tons

End-Point Sampling

Removal actions for development purposes under this plan will be performed in conjunction with confirmation soil sampling. Confirmation samples will be collected from the base of the excavation at locations to be determined by OER. For comparison to Track 1 SCOs, analytes will include VOCs, SVOC, pesticides, PCBs and metals according to analytical methods described below. For comparison to Track 4 SCOs, analytes will only include trigger compounds and elements established on the Track 4 SCO list.

Hot-spot removal actions, whether established under this RAWP or identified during the remedial program, will be performed in conjunction with post remedial end-point samples to ensure that hot-spots are fully removed. Analytes for end-point sampling will be those parameters that are driving the hot-spot removal action and will be approved by OER. Frequency for hot-spot end-point sample collection is as follows:

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 end-point 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 should be biased toward locations and depths of the highest expected contamination.

New York State ELAP certified labs will be used for all confirmation and end-point sample analyses. Labs performing confirmation and end-point sample analyses will be reported in the RAR. The RAR will provide a tabular and map summary of all confirmation and end-point sample results and will include all data including non-detects and applicable standards and/or guidance values. End-point samples will be Confirmation samples will be analyzed for compounds and elements as described above 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

The fundamental QA objective with respect to accuracy, precision, and sensitivity of analysis for laboratory analytical data is to achieve the QC acceptance of the analytical protocol. The accuracy, precision and completeness requirements will be addressed by the laboratory for all data generated.

Collected samples will be appropriately packaged, placed in coolers and shipped via overnight courier or delivered directly to the analytical laboratory by field personnel. Samples will be containerized in appropriate laboratory provided glassware and shipped in plastic coolers. Samples will be preserved through the use of ice or “cold-paks” to maintain a temperature of 4°C.

Dedicated disposable sampling materials will be used for the collection endpoint samples, eliminating the need to prepare field equipment (rinsate) blanks. However, if non-disposable equipment is used, (stainless steel scoop, etc.) field rinsate blanks will be prepared at the rate of 1 for every eight samples collected. Decontamination of non-dedicated sampling equipment will consist of the following:

- Gently tap or scrape to remove adhered soil
- Rinse with tap water
- Wash withalconox® detergent solution and scrub
- Rinse with tap water
- Rinse with distilled or deionized water

Prepare field blanks by pouring distilled or deionized water over decontaminated equipment and collecting the water in laboratory provided containers. Trip blanks will be used whenever samples are transported to the laboratory for analysis of VOCs. Trip blanks will not be used for

samples to be analyzed for metals, SVOCs or pesticides. One blind duplicate sample will be prepared and submitted for analysis every 20 samples.

Import and Reuse of Soils

Import of soils onto the property and reuse of soils 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 approximately 30 tons.

4.3 ENGINEERING CONTROLS

The excavation required for the proposed Site development will achieve Track 1 Unrestricted Use SCOs. No Engineering Controls are required to address residual contamination at the Site. However, the following elements will be incorporated into the foundation design as part of the development: composite cover system, soil vapor barrier and SSDS. 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.

These are:

- Cover system consisting of concrete covered sidewalk and concrete building slab
- Cover system consisting of at least two feet of clean soil in landscaped areas.
- Soil 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. This composite cover system is comprised of:

- Building slab, approximately 4 inches thick, constructed of concrete with an additional vapor barrier.
- Concrete sidewalk, at least 4 inches thick, constructed of concrete.
- Clean fill cover in open space consisting of at least 2 feet of clean fill material.

Figure 5 shows the typical design for each remedial cover type used on this Site. Figure 6 shows the location of each cover type built at the Site.

Under Alternative 2, the composite cover system is a permanent engineering control for the Site. The system will be inspected and reported at specified intervals as required by this RAWP and the SMP. A Soil Management Plan will be included in the Site Management Plan and will outline the procedures to be followed in the event that the composite cover system and underlying residual soil/fill is disturbed after the remedial action is complete. Maintenance of this composite cover system will be described in the Site Management Plan in the RAR.

Vapor Barrier

Migration of soil vapor will be mitigated with a combination of building slab and vapor barrier. The vapor barrier will cover the entirety of the building slab and consist of a minimum of 20 millimeter High Density Polyethylene (HDPE) will be installed as an impermeable vapor barrier underneath the entire foundation of the proposed building and the sidewalls of the cellar level. The barrier is constructed of material sufficient to withstand vapor intrusion from applicable compounds of concern. Photo documentation of the vapor barrier installation will be submitted as part of the Remedial Action Report. The specifications for the vapor barrier system are included in Appendix 7.

Sub-Slab Depressurization System

The sub-slab depressurization system will consist of a penetration through the slab on soil with a 4 inch schedule 40 pipe protruding beneath the slab into the soil below. Any void space will be filled with gravel. The pipe will be ventilated above the roofline so that any vapors removed from the subsurface will be diluted and minimize the risk of impacting the indoor air. There will be three separate ventilation pipes associated with the passive system, one for each distinct portion of the building slab.

4.4 INSTITUTIONAL CONTROLS

Track 1 remedial actions do not require Engineering Controls. If Track 1 Unrestricted Use SCOs are not achieved, Institutional Controls (IC) will be utilized in 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 would

be established and would be implemented under a site-specific Site Management Plan (SMP) that will be included in the RAR. The property would continue to be registered as an E-Designated property.

If Track 1 is not achieved, the Institutional Controls for this remedial action will be:

- The property will continue to be registered with an E-Designation at the NYC Buildings Department. This RAWP includes a description of all ECs and ICs and summarizes the requirements of the Site Management Plan which will note that the property owner and property owner's successors and assigns must comply with the approved SMP;
- 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 residential use and will not be used for a higher level of use without prior approval by OER.

4.5 SITE MANAGEMENT PLAN

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 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 this RAWP 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 Brownfield 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 by OER 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 July 31 of the year following the reporting period.

4.6 QUALITATIVE HUMAN HEALTH EXPOSURE ASSESSMENT

The objective of the qualitative exposure assessment is to identify potential receptors and pathways for human exposure to the contaminants of concern (COC) that are present at, or migrating from, the Site. The identification of exposure pathways describes the route that the COC takes to travel from the source to the receptor. An identified pathway indicates that the potential for exposure exists; it does not imply that exposures actually occur.

Investigations reported in the Remedial Investigation Report (RIR) are sufficient to complete a Qualitative Human Health Exposure Assessment (QHHEA). As part of the VCP process, a QHHEA was performed to determine whether the Site poses an existing or future health hazard to the Site's exposed or potentially exposed population. The sampling data from the RI were evaluated to determine whether there is any health risk by characterizing the exposure setting, identifying exposure pathways, and evaluating contaminant fate and transport. This QHHEA was prepared in accordance with Appendix 3B and Section 3.3 (b) 8 of the NYSDEC Draft DER-10 Technical Guidance for Site Investigation and Remediation.

Known and Potential Sources

Soil:

1. VOCs (benzene and ethylbenzene) exceeded Unrestricted Use Soil Cleanup Objectives (SCOs) and xylenes exceeded Restricted Residential Soil Cleanup Objectives (SCOs).
2. SVOCs including benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, dibenz(a,h)anthracene exceeded Restricted Residential Soil Cleanup Objectives.
3. Metals including barium, copper, lead, manganese, mercury, nickel, and zinc exceeded Unrestricted Use SCOs.

Groundwater:

1. VOCs including benzene, toluene, ethylbenzene, isopropylbenzene and xylenes were detected above GQS in one well.
2. One SVOC – Naphthalene was detected above GQS in two wells.
3. Metals including iron, manganese, and selenium were detected above GQS.

Soil Vapor:

1. One VOC (Methylene chloride) was detected in soil vapor samples collected during the RI. All other results were detected below NYSDOH located in the New York State Department of Health (NYSDOH) Final Guidance for Evaluating Soil Vapor Intrusion.
2. Petroleum related VOCs were detected at elevated concentrations.

Nature, Extent, Fate and Transport of Contaminants

Soil contamination at the site is consistent with historic fill. This fill material is throughout the site, and is anticipated to extend to the top of native soil. Petroleum related VOCs were detected in all three (soil, groundwater and soil vapor) medias. Dissolved metals including iron, manganese, and selenium were detected above GQS. The chlorinated VOCs in soil vapor were not detected or were well below guidance issued by New York State DOH and were not found in any of the on-Site soil or groundwater samples collected.

Receptor Populations

On-Site Receptors

The Site is currently under construction, and receptors will include construction workers. During remediation activities, receptors will include remediation workers. Under future conditions, receptors will include tenants and visitors of the proposed residential establishments.

Off-Site Receptors

Potential off-Site receptors within a 0.25-mile radius of the Site include adult and child residents, 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. Parks (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
6. Child Health Center (up to 0.25 mile) – existing and future

Potential Routes of Exposure

The five elements of an exposure pathway are (1) a contaminant source, (2) contaminant release and transport mechanisms, (3) a point of exposure, (4) a route of exposure, and (5) a receptor population. An exposure pathway is considered complete when all five elements of an exposure pathway are documented. A potential exposure pathway exists when any one or more of the five elements comprising an exposure pathway cannot be documented. An exposure pathway may be eliminated from further evaluation when any one of the five elements comprising an exposure pathway has not existed in the past, does not exist in the present, and will never exist in the future. 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, soil, or building materials.

Existence of Human Health Exposure

Current Conditions: The Site is occupied by an unused parking lot and a vacant (former) service station building. Potential exposure to surficial historic fill exists under current conditions but is limited because the Site is capped with a slab and building slab. Groundwater is not accessible at the Site, and because the Site is served by the public water supply and groundwater use for potable supply is prohibited, groundwater is not used at the Site. As there is currently no structure onsite, accumulation of soil vapor cannot pose an exposure threat.

Construction/ Remediation Activities: The potential exposure pathways to onsite contamination are by ingestion, dermal, or inhalation exposure by onsite workers during the remedial action. Similarly, off-Site receptors could be exposed to dust from onsite activities. Once redevelopment activities begin, construction workers will come into direct contact with surface and subsurface soils, as a result of on-Site construction and excavation activities. Groundwater is not expected to be encountered during construction/ remediation, and there will be no structures on Site where soil vapor could accumulate. During the remedial action, on-site exposure pathways will be eliminated by preventing access to the site, through implementation of soil/ materials management, storm water pollution prevention, and dust controls, employment of a community air monitoring plan, and implementation of a Construction Health and Safety Plan.

Proposed Future Conditions: Under future remediated conditions, the site will be fully capped, limiting potential direct exposure to soil and groundwater remaining in place, and engineering controls will prevent potential for inhalation via soil vapor intrusion. Excavations extend below water table and will prevent accumulation of soil vapors. Any on-Site exposures to vapors from off-site sources will be prevented by installation of a soil vapor barrier system. The site is served by the public water supply, groundwater is not used at the site. There are no plausible off-site pathways for oral, inhalation, or dermal exposure to contaminants derived from the site.

Overall Human Health Exposure Assessment

Based upon this analysis, complete on-Site exposure pathways appear to be present during the remedial action phase. Under current conditions, on-Site exposure pathways exist for

contractors and others that may access the Site. During remedial construction, on-Site and off-Site exposures to contaminated dust from historic fill material will be addressed through dust controls, and through the implementation of the Community Air Monitoring Program, the Soil/Materials Management Plan, and a Construction Health and Safety Plan. After the remedial action is complete, there will be no remaining exposure pathways to on-Site soil/fill or groundwater, as all soil above Unrestricted Use SCOs will have been removed and a vapor barrier system will have been installed as part of development.

Impacted soil will be removed during construction activities; any soil not removed will be capped by the building, concrete/asphalt or at least two feet of clean fill. Groundwater in the area is not used for drinking and is not accessible at the surface. After construction activities are complete direct contact with soil and groundwater will be prevented.

5.0 REMEDIAL ACTION MANAGEMENT

5.1 PROJECT ORGANIZATION AND OVERSIGHT

The Professional Engineer (PE) and Qualified Environmental Professionals (QEP) for this project are Matt Durcan, PE and Mark Hasting, QEP.

5.2 SITE SECURITY

Site access will be controlled by gated entrances to the fenced property. Gate entry will be controlled by site employees during working hours and locked during non-working hours.

5.3 WORK HOURS

The hours for operation of remedial construction will be from 0800 to 1600. 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 Mark Hasting, CSP. 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 VCP 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.

Extreme Storm Preparedness and Response Contingency Plan

Damage from flooding or storm surge can include dislocation of soil and stockpiled materials, dislocation of site structures and construction materials and equipment, and dislocation of support of excavation structures. Damage from wind during an extreme storm event can create unsafe or unstable structures, damage safety structures and cause downed power lines creating dangerous site conditions and loss of power. In the event of emergency conditions caused by an extreme storm event, the enrollee will undertake the following steps for site preparedness prior to the event and response after the event.

Storm Preparedness

Preparations in advance of an extreme storm event will include the following: containerized hazardous materials and fuels will be removed from the property; loose materials will be secured to prevent dislocation and blowing by wind or water; heavy equipment such as excavators and generators will be removed from holes, trenches and depressions on the property to high ground or removed from the property; an inventory of the property with photographs will be performed to establish conditions for the site and equipment prior to the event; stockpile covers for soil and fill will be secured by adding weights such as sandbags for added security and worn or ripped

stockpile covers will be replaced with competent covers; stockpiled hazardous wastes will be removed from the property; stormwater management systems will be inspected and fortified, including, as necessary: clean and reposition silt fences, haybales; clean storm sewer filters and traps; and secure and protect pumps and hosing.

Storm Response

At the conclusion of an extreme storm event, as soon as it is safe to access the property, a complete inspection of the property will be performed for environmental concerns. A site inspection report will be submitted to OER at the completion of site inspection and after the site security is assessed. Site conditions will be compared to the inventory of site conditions and material performed prior to the storm event and significant differences will be noted. Damage from storm conditions that result in acute public safety threats, such as downed power lines or imminent collapse of buildings, structures or equipment will be reported to public safety authorities via appropriate means such as calling 911. Petroleum spills will be reported to NYS DEC within 2 hours of identification and consistent with State regulations. Emergency and spill conditions will also be reported to OER. Public safety structures, such as construction security fences will be repaired promptly to eliminate public safety threats. Debris will be collected and removed. Dewatering will be performed in compliance with existing laws and regulations and consistent with emergency notifications, if any, from proper authorities. Eroded areas of soil including unsafe slopes will be stabilized and fortified. Dislocated materials will be collected and appropriately managed. Support of excavation structure will be inspected and fortified as necessary by the General Contractor. Impacted stockpiles will be contained and damaged stockpile covers will be replaced. Storm-water control systems and structures will be inspected and maintained as necessary. If soil or fill materials are discharged off site to adjacent properties, property owners and OER will be notified and corrective measure plan designed to remove and clean dislocated material will be submitted to OER and implemented following approval by OER and granting of site access by the property owner. Impacted offsite areas may require characterization based on site conditions, at the discretion of OER. If onsite petroleum spills are identified, a qualified environmental professional will determine the nature and extent of the spill and report to NYS DEC's spill hotline at DEC 800-457-7362. If the source of the spill is ongoing and can be identified, it should be stopped if this can be done safely. Potential hazards will be addressed immediately, consistent with guidance issued by NYS DEC.

Storm Response Reporting

A site inspection report will be submitted to OER at the completion of site inspection. An inspection report established by OER is available on OER's website (www.nyc.gov/oer) and will be used for this purpose. Site conditions will be compared to the inventory of site conditions and material performed prior to the storm event and significant differences will be noted. The site inspection report will be sent to the OER project manager and will include the site name, address, tax block and lot, site primary and alternate contact name and phone number. Damage and soil release assessment will include: whether the project had stockpiles; whether stockpiles were damaged; photographs of damage and notice of plan for repair; report of whether soil from the site was dislocated and whether any of the soil left the site; estimates of the volume of soil that left the site, nature of impact, and photographs; description of erosion damage; description of equipment damage; description of damage to the remedial program or the construction program, such as damage to the support of excavation; presence of onsite or offsite exposure pathways caused by the storm; presence of petroleum or other spills and status of spill reporting to NYS DEC; description of corrective actions; schedule for corrective actions. This report should be completed and submitted to OER project manager with photographs within 24 hours of the time of safe entry to the property after the storm event.

5.8 TRAFFIC CONTROL

Drivers of trucks leaving the NYC VCP 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 is travel north on Webster Avenue, turn left on West 233rd, Route 87 (Deegan) out to disposal facility.

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.

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 (if Track 1 is not achieved);
- 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.
- Continue registration of the property with an E-Designation at the NYC Department of Buildings.

- 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 Webster Green.

I, _____, am a qualified Environmental Professional. I had primary direct responsibility for implementation remedial program for the Webster Green Site

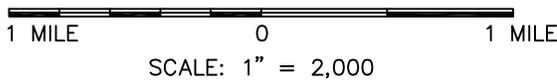
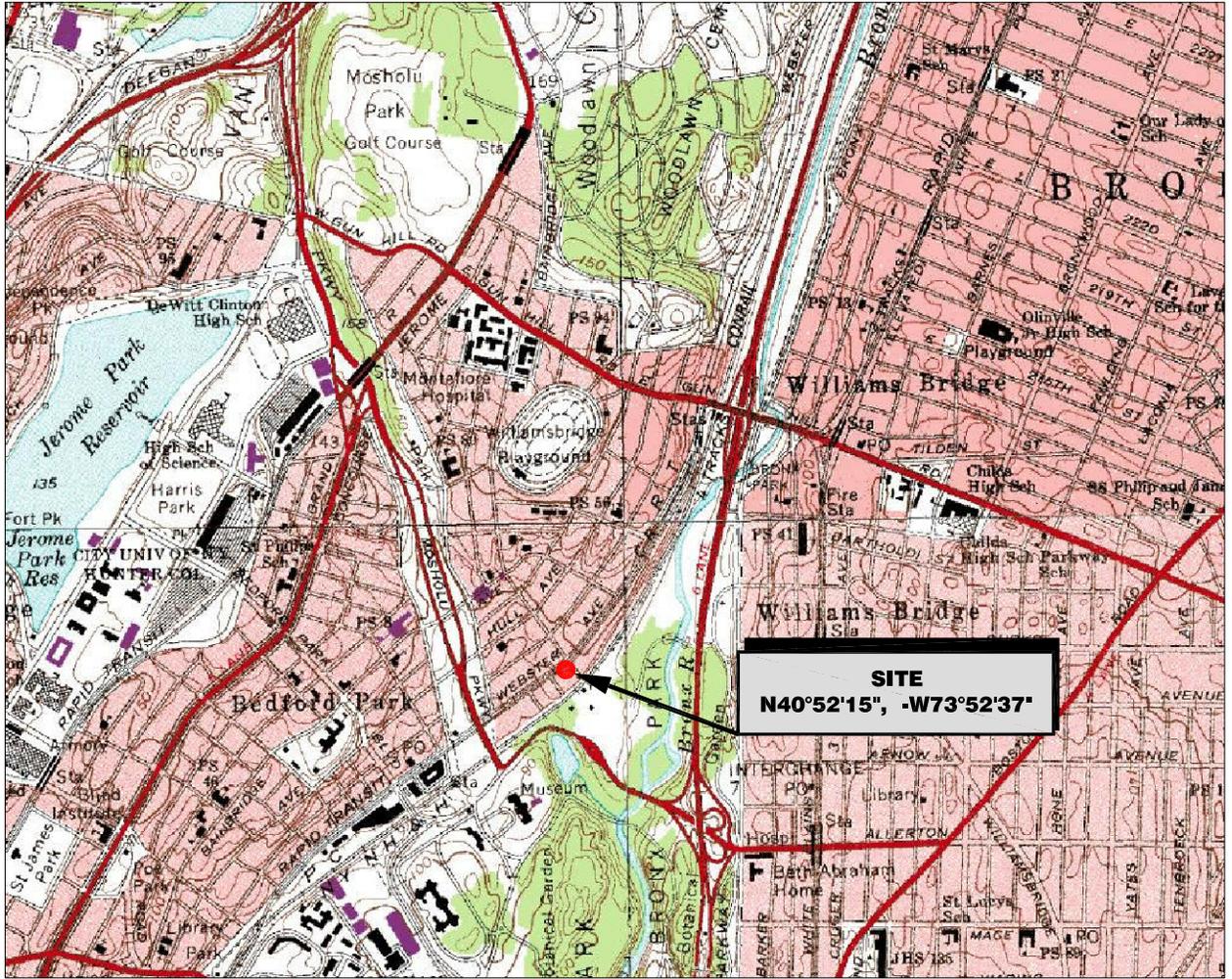
I certify that the OER-approved Remedial Action Work Plan dated September 2013r and Stipulations; if any were implemented and that all requirements in those documents have been substantively complied with. I certify that contaminated soil, fill, liquids or other material from the property were taken 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 six 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	2	1
Remedial Excavation	3	26
Demobilization	30	1
Submit Remedial Action Report	52	2

FIGURES



CONTOUR INTERVAL 10 FEET
National Geodetic Vertical Datum of 1929



QUADRANGLE LOCATION

NOTES

THIS DRAWING WAS PREPARED USING INFORMATION TAKEN FROM:
USGS TOPOGRAPHIC MAPS
CENTRAL PARK [NY,NJ]
1999

Image: HEG-114-USGS.jpg

FIGURE 1			
USGS SITE LOCATION MAP			
3100 WEBSTER AVENUE BRONX, NEW YORK 10467			
BY	ENGR	CHD	APPVD
PROJECT MANAGER	C R H	PROJECT NO.	G6-2034
		HILLMANN CONSULTING, LLC 1600 Route 22 East, Union NJ 07083 908.688.7800 (office) - 908.688.2441 (fax) www.hillmannconsulting.com	
REV. No.	DRAWN BY/DATE	APPROVED/DATE	DRAWING NUMBER
	EBCO/03-04-13		HEG-114



Figure 2: SITE DIAGRAM

Figure 2 – Site Boundaries



Project Location: 3100 Webster Avenue
Bronx, NY

Figure 4- Surrounding Land Use

DAYCARE

SCHOOLS

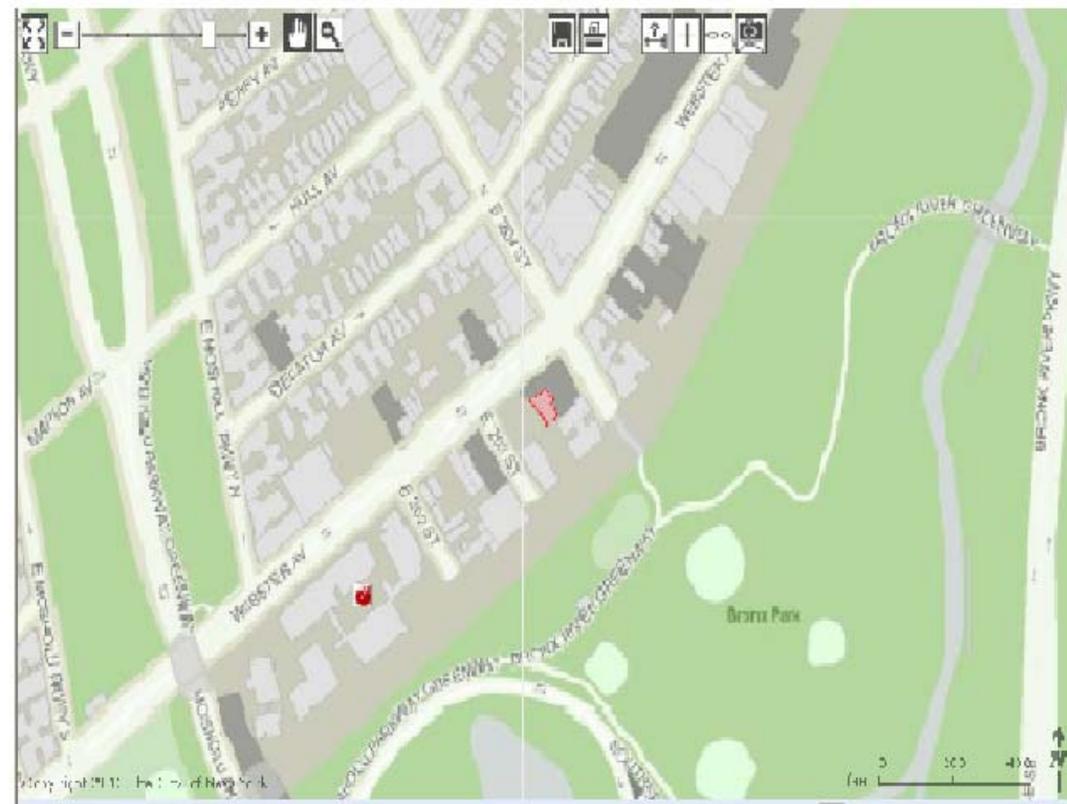
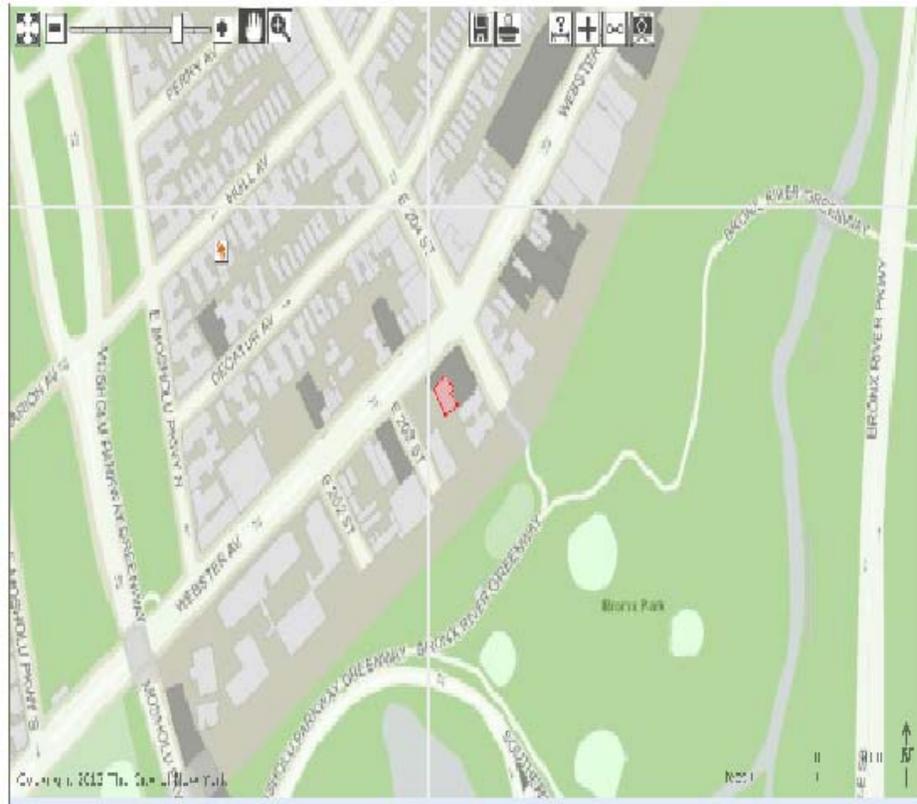




Figure 5 – AOCs



Project Location:

3100 Webster Avenue
Bronx, NY

AOC 1
AOC 2
AOC 3

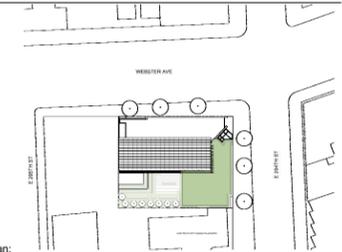
Historic Fill – Site wide
Underground Storage Tanks
Ground Water – Site wide

WEBSTER GREEN
3100 WEBSTER AVE BRONX NY

Owner:
THE DOE FUND
345 E. 102nd Street
New York, NY 10029
P. 646-672-4456
F. 212-860-8126

THE HOUSING COLLABORATIVE
222 Bloomingdale Rd #102
White Plains, NY 10605
P. 914-250-2426
F. 914-422-1550

BLOCK: 3330 LOT: 68
NYCDOB#:



Key Plan:
Issued:

NUMBER	DATE	DESCRIPTION
1	01.17.13	HFA SUBMISSION
2	05.09.13	HHAP SUBMISSION

Architect:
MAG
Magnusson Architecture & Planning PC
853 Broadway Suite 800
New York, NY 10003
Tel (212) 253 7820 Fax (212) 253 1276

Structural Engineer:
GACE
31 West 27th Street, New York, NY 10001
Tel (212) 545-7878

MEP Engineer:
Johnson & Urban, LLC
295 Route 34, Colts Neck, NJ 07722
Tel (772) 664-6975 Fax (772) 664-6976

Civil Engineer:
Philip Habib & Associates
102 Madison Avenue 11th FL, New York, NY 10016
Tel (212) 929-5656 Fax (212) 929-5605

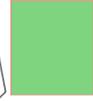
Landscape Architect:
Terrain-NYC
200 Park Avenue South, S# 1401, New York, NY 10003
Tel (212) 537-6080 Fax (212) 537-6079

Filing Representative:
Design 2147 Limited
52 Diamond Street, Brooklyn, NY 11222
Tel (718) 383-9340 Fax (718) 383-9346

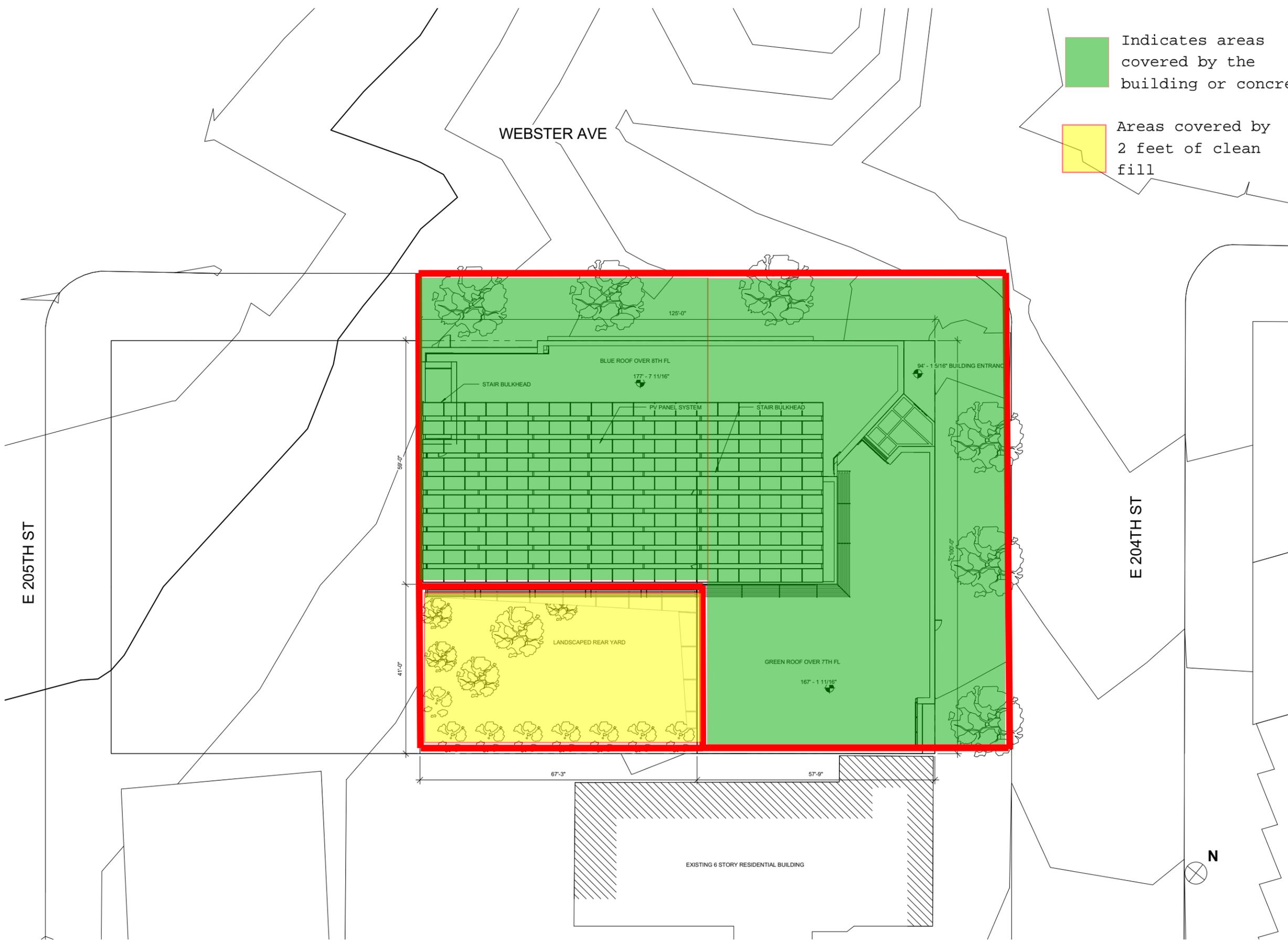
Do Not Scale Plans
Contractor to promptly notify Architect of any material variations between field conditions and existing conditions as indicated in Contract documents

Remedial Design Plan

SEAL & SIGNATURE:	PROJECT No: 12011
	DRAWING BY: EM
	CHK BY: FV
	DWG No: A-009.00
	SCALE: 3/32" = 1'-0"

 Indicates areas covered by the building or concrete

 Areas covered by 2 feet of clean fill



1 Site
3/32" = 1'-0"

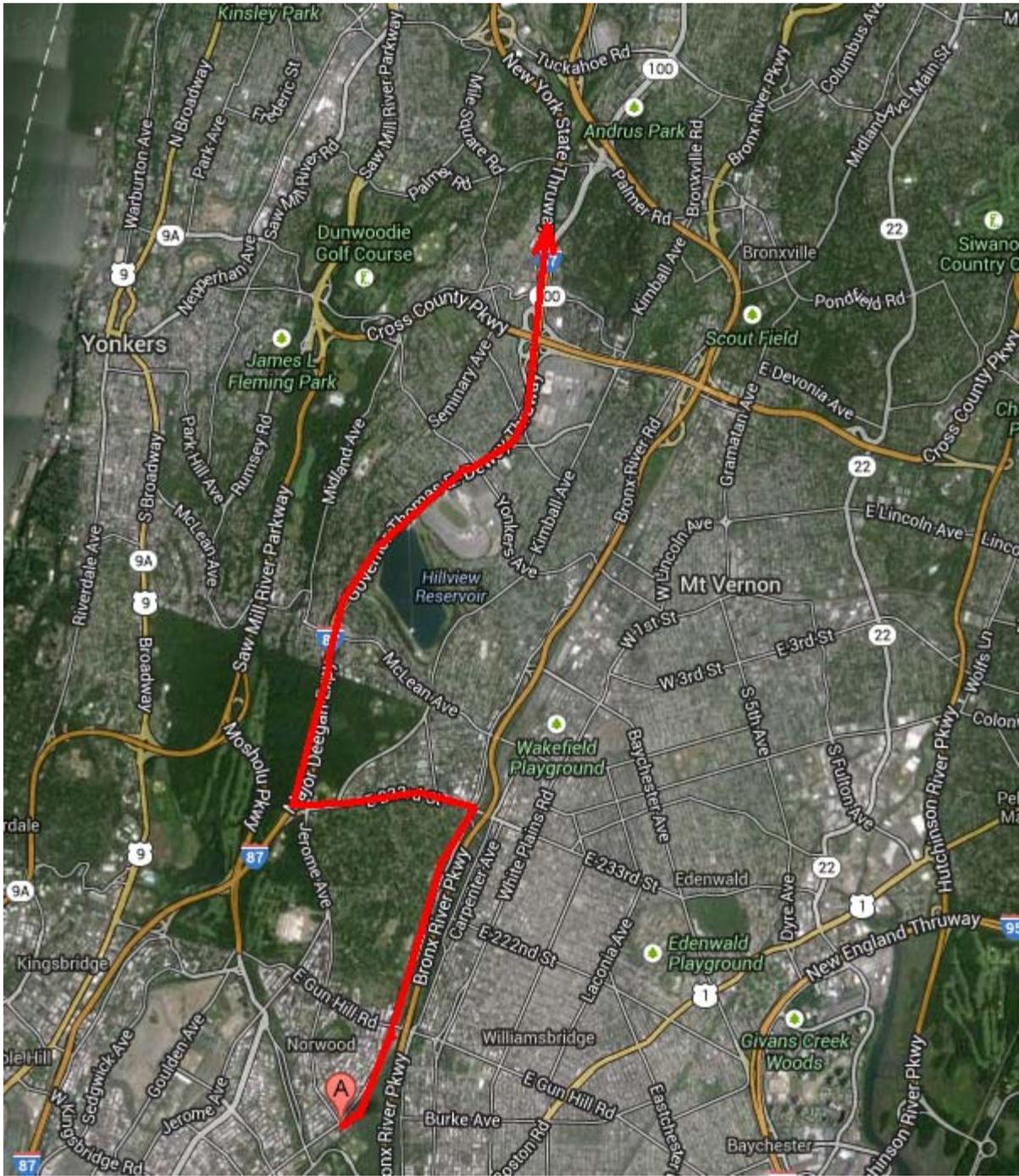


Figure 7 – Truck Route



Project Location: 3100 Webster Avenue
Bronx, NY

TABLES

Table 1 - Soil Clean Objectives - Restricted, Residential

Arsenic	16 ⁱ
Barium	400
Beryllium	72
Cadmium	4.3
Chromium, hexavalent ^h	110
Chromium, trivalent ^h	180
Copper	270
Total Cyanide ^l	27
Lead	400
Manganese	2,000 ⁱ
Total Mercury	0.81 ⁱ
Nickel	310
Selenium	180
Silver	180
Zinc	10,000 ^u
PCBs/Pesticides	
2,4,5-TP Acid (Silvex)	100 ^a
4,4'-DDE	8.9
4,4'-DDT	7.9
4,4'-DDD	13
Aldrin	0.097
alpha-BHC	0.48
beta-BHC	0.36
Chlordane (alpha)	4.2
delta-BHC	100 ^a
Dibenzofuran	59
Dieldrin	0.2
Endosulfan I	24 ⁱ
Endosulfan II	24 ⁱ
Endosulfan sulfate	24 ⁱ
Endrin	11
Heptachlor	2.1
Lindane	1.3
Polychlorinated biphenyls	1
Semivolatiles	
Acenaphthene	100 ^a
Acenaphthylene	100 ^a
Anthracene	100 ^a
Benz(a)anthracene	1 ⁱ

Benzo(a)pyrene	1 ⁱ
Benzo(b)fluoranthene	1 ^f
Benzo(g,h,i)perylene	100 ^a
Benzo(k)fluoranthene	3.9
Chrysene	3.9
Dibenz(a,h)anthracene	0.33 ^e
Fluoranthene	100 ^d
Fluorene	100 ^d
Indeno(1,2,3-cd)pyrene	0.5 ^f
m-Cresol	100 ^d
Naphthalene	100 ^d
o-Cresol	100 ^d
p-Cresol	100 ^d
Pentachlorophenol	6.7
Phenanthrene	100 ^d
Phenol	100 ^d
Pyrene	100 ^d
Volatiles	
1,1,1-Trichloroethane	100 ^a
1,1-Dichloroethane	26
1,1-Dichloroethene	100 ^d
1,2-Dichlorobenzene	100 ^a
1,2-Dichloroethane	3.1
cis-1,2-Dichloroethene	100 ^a
trans-1,2-Dichloroethene	100 ^a
1,3-Dichlorobenzene	49
1,4-Dichlorobenzene	13
1,4-Dioxane	13
Acetone	100 ^o
Benzene	4.8
Butylbenzene	100 ^d
Carbon tetrachloride	2.4
Chlorobenzene	100 ^d
Chloroform	49
Ethylbenzene	41

Hexachlorobenzene	1.2
Methyl ethyl ketone	100 ^a
Methyl tert-butyl ether	100 ^a
Methylene chloride	100 ^a
n-Propylbenzene	100 ^a
sec-Butylbenzene	100 ^a
tert-Butylbenzene	100 ^a
Tetrachloroethene	19
Toluene	100 ^a
Trichloroethene	21
1,2,4-Trimethylbenzene	52
1,3,5-Trimethylbenzene	52
Vinyl chloride	0.9
Xylene (mixed)	100 ^a

Table 2 - Backfill and Soil Cover Objectives

Metals	
Arsenic	13 ^c
Barium	350 ^c
Beryllium	7.2
Cadmium	2.5 ^c
Chromium, hexavalent ^e	1 ^b
Chromium, trivalent ^e	30 ^c
Copper	50
Total Cyanide ^{e,1}	27
Lead	63 ^c
Manganese	1600 ^c
Total Mercury	0.18 ^c
Nickel	30
Selenium	3.9 ^c
Silver	2
Zinc	109 ^c
PCBs/Pesticides	
2,4,5-TP Acid (Silvex) ¹	3.8
4,4'-DDE	0.0033 ^b
4,4'-DDT	0.0033 ^b
4,4'-DDD	0.0033 ^b
Aldrin	0.005 ^c
alpha-BHC	0.02
beta-BHC	0.036
Chlordane (alpha)	0.094
delta-BHC ^b	0.04
Dibenzofuran ¹	7
Dieldrin	0.005 ^c
Endosulfan I ^{a,1}	2.4
Endosulfan II ^{a,1}	2.4
Endosulfan sulfate ^{a,1}	2.4
Endrin	0.014
Heptachlor	0.042
Lindane	0.1
Polychlorinated biphenyls	0.1
Semivolatile organic compounds	
Acenaphthene	20
Acenaphthylene ¹	100 ^a
Anthracene ¹	100 ^a
Benz(a)anthracene ¹	1 ^c
Benzo(a)pyrene	1 ^c
Benzo(b)fluoranthene ¹	1 ^c
Benzo(g,h,i)perylene ¹	100
Benzo(k)fluoranthene ¹	0.8 ^c
Chrysene ¹	1 ^c
Dibenz(a,h)anthracene ¹	0.33 ^b
Fluoranthene ¹	100 ^a
Fluorene	30

Indeno(1,2,3-cd)pyrene ¹	0.5 ^c
m-Cresol ¹	0.33 ^d
Naphthalene ¹	12
o-Cresol ¹	0.33 ^d
p-Cresol ¹	0.33 ^d
Pentachlorophenol	0.8 ^d
Phenanthrene ¹	100
Phenol	0.33 ^d
Pyrene ¹	100
Volatile organic compounds	
1,1,1-Trichloroethane ¹	0.68
1,1-Dichloroethane ¹	0.27
1,1-Dichloroethene ¹	0.33
1,2-Dichlorobenzene ¹	1.1
1,2-Dichloroethane	0.02 ^c
cis -1,2-Dichloroethene ¹	0.25
trans-1,2-Dichloroethene ¹	0.19
1,3-Dichlorobenzene ¹	2.4
1,4-Dichlorobenzene	1.8
1,4-Dioxane	0.1 ^d
Acetone	0.05
Benzene	0.06
n-Butylbenzene ¹	12
Carbon tetrachloride ¹	0.76
Chlorobenzene	1.1
Chloroform	0.37
Ethylbenzene ¹	1
Hexachlorobenzene ¹	0.33 ^d
Methyl ethyl ketone	0.12
Methyl tert-butyl ether ¹	0.93
Methylene chloride	0.05
n - Propylbenzene ¹	3.9
sec-Butylbenzene ¹	11
tert-Butylbenzene ¹	5.9
Tetrachloroethene	1.3
Toluene	0.7
Trichloroethene	0.47
1,2,4-Trimethylbenzene ¹	3.6
1,3,5-Trimethylbenzene ¹	8.4
Vinyl chloride ¹	0.02
Xylene (mixed)	0.26

APPENDIX 1

CITIZEN PARTICIPATION PLAN

The NYC Office of Environmental Remediation and Webster Avenue Housing Development Fund Corporation have established this Citizen Participation Plan because the opportunity for citizen participation is an important component of the NYC Voluntary 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 VCP, Webster Avenue Housing Development Fund Corporation 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, William Wong, 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. Webster Avenue Housing Development Fund Corporation will inspect the repositories to ensure that they are fully populated with project information. The repository for this project is:

New York Public Library

Mosholu Library

285 East 205th Street, Bronx, NY 10467

(718) 882-8239

10:00 am to 5:00 pm

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 Webster Avenue Housing Development Fund Corporation, reviewed and approved by OER prior to distribution and mailed by Webster Avenue Housing Development Fund Corporation. Public comment is solicited in public notices for all work plans developed under the NYC Voluntary 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 VCP project. See flow chart on the following page, which identifies when during the NYC VCP 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.

APPENDIX 2

SUSTAINABILITY STATEMENT

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

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. To prevent potential recontamination a vapor barrier and passive ventilation system will be installed underneath the footprint of the building. The vapor barrier and passive ventilation system will eliminated the risk of future migration of soil-vapor contamination from off-site that may cause indoor air concerns in the future.

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

Linkage with Green Building.

Upon completion, the building will feature numerous green elements, including a large roof on the 8th Floor setback area; generous fenestration to maximize day-lighting within the corridors and outer edges of the building envelope; a high efficiency boiler on the roof; high efficiency Packaged Terminal Air Conditioning (PTAC) units for cooling of the apartments; central air conditioning for all common spaces, low-e thermally broken ENERGY STAR windows; continuous exterior insulation (insulated cavity wall); low or no VOC paints, primers, and caulks; water-saving faucets and shower heads; compact fluorescent (CFL) lamps throughout; and Kone Ecospec elevators. The building will have a 59 KW photovoltaic (PV) panel system on the roof and on a portion of the south-facing façade.

The project will participate in the NYSERDA Multifamily Building Performance Program for New Construction (MPP-NC). In so doing, the building will achieve at least a 20% energy reduction from baseline as well as integrate energy efficiency opportunities to fulfill the guidelines of ENERGY STAR and the USGBC's LEED for Homes Mid-rise Certification Program.

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. Webster Avenue Housing Development Fund Corporation 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. Webster Avenue Housing Development Fund Corporation 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. The proposed redevelopment of the site will include a landscaped courtyard with planted tree and shrub species native to the New York Area.

APPENDIX 3

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 are shown in Figure 7. This routing takes 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 the Bronx, 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.

1.8 DEMARCATION

After completion of hotspot removal and any other invasive remedial activities, and prior to backfilling, the top of the residual soil/fill will be defined by one of three methods: (1) placement of a demarcation layer. The demarcation layer will consist of geosynthetic fencing or equivalent material to be placed on the surface of residual soil/fill to provide an observable reference layer. A description or map of the approximate depth of the demarcation layer will be provided in the SMP; or (2) a land survey of the top elevation of residual soil/fill before the placement of cover soils, pavement and associated sub-soils, or other materials or structures or, (3) all materials beneath the approved cover will be considered impacted and subject to site management after the remedy is complete. Demarcation may be established by one or any combination of these three methods. As appropriate, a map showing the method of demarcation for the Site and all associated documentation will be presented in the RAR.

This demarcation will constitute the top of the site management horizon. Materials within this horizon require adherence to special conditions during future invasive activities as defined in the Site Management Plan.

1.9 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. The backfill and cover soil quality objectives are listed in Table 2.

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.

1.10 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.

1.11 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.

1.12 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.

1.13 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.

APPENDIX 4

HEALTH AND SAFETY PLAN



HILLMANN CONSULTING, LLC
1600 Route 22 East
Union, New Jersey 07083
(908) 688-7800 • (908) 688-2441 – Fax

SITE-SPECIFIC CONSTRUCTION HEALTH AND SAFETY PLAN

Address: 3100 Webster Avenue
Bronx, New York

Project Number: G6- 2034

Plan Revisions

Number	Date	Initials
1	_____	_____
2	_____	_____
3	_____	_____
4	_____	_____

Chris Hirschmann

Chris Hirschmann

Plan Preparer

_____ Date

Chris Hirschmann

Chris Hirschmann

Site Supervisor

_____ Date

Chris Hirschmann

Chris Hirschmann

Site Health & Safety Officer

_____ Date

Mark Hasting

Mark Hasting, CSP

Health & Safety

_____ Date

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FORMS

- Material Safety Data Sheets
- HASP Sign-off
- Equipment Calibration Log
- Sampling Log
- Heat Stress Monitoring Log
- Daily Sign In/Sign Out
- Daily Safety Meeting Log
- Accident Injury Report
- Vehicle Accident Report

Introduction

This Site-Specific Construction Health and Safety Plan (HASP) has been prepared by Hillmann Consulting, LLC (Hillmann) to summarize the health and safety hazards at the subject site, located at 3100 Webster Avenue, Bronx, New York, and the requirements and procedures to protect its employees from them. 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.

This plan was designed to reduce the potential for occupational illness or injury resulting from working at this site. The purpose of the HASP is to inform Hillmann's employees and subcontractors of the health and safety risks present at this site, 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.

Existing and potential hazards at this site have been identified. As new information becomes available, this HASP will be revised. Standard practices and procedures of industrial hygiene, occupational health, safety, and environmental protection are prescribed in this plan, which was prepared and reviewed by experienced professionals.

Hillmann employees who work on this site must read the HASP and sign the form included in this plan, to indicate that they understand the plan's contents, and agree to comply with its provisions. 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 Site Health and Safety Supervisor (SHSO), or to Hillmann's Director, Health & Safety (DHS).

This HASP will be readily available on site so workers can reference it when necessary.

Site Information

Location: 3100 Webster Avenue, Bronx, New York

Directions to site from Hillmann office: US-22 E, I-78 E, 95 N, GW Bridge, Exit 2B for Webster Ave

Historical/Current Site Information: The site is currently an active service station pending property transfer.

Location/Class: Industrial Commercial Urban/Residential
 Suburban Rural

Site Regulatory Status: CERCKA/SARA US EPA NJDEP
 NPL RCRA NYCOER
 NYSDEC Not Regulated

Operations or Tasks to be Performed, and Approximate Duration of Each:

- 1- Soil Excavation**
- 2- Monitoring Well Installation**

Surrounding Population/Structures:

Currently a service station. The current structure will be razed to undertake construction of a new multi-story building.

Site and Surrounding Topography:

The topography is predominately flat

Known or Suspected Pathways of Contaminant Dispersion:

Soil and/or Groundwater

Emergency Shower, Eyewash and First Aid Equipment Located at:

Eyewash and emergency shower will not be available.

First aid provided by emergency services (911).

Personnel On-Site trained in First Aid: N/A

- | | |
|----------|----------|
| 1. _____ | 5. _____ |
| 2. _____ | 6. _____ |
| 3. _____ | 7. _____ |
| 4. _____ | 8. _____ |

Emergency Medical Care

Hospital #1

Hospital Name: Montefiore Medical Center Telephone # (718) 920-4321

Address: 111 East 210th Street, Bronx, New York

Contact: _____ ** _____ Telephone # (718) 920-4321

- Type of Service
- () Physical Trauma Only
 - (x) Physical Trauma and Chemical Exposure
 - (x) Available 24 Hours

Hospital Route: **

See Attached

**Hospital route information has been provided to satisfy OSHA requirements (29 CFR 1910.120).
However, where 911-emergency service and/or transport is available, Hillmann personnel are strictly prohibited from transporting accident victims in either company or personal vehicles.

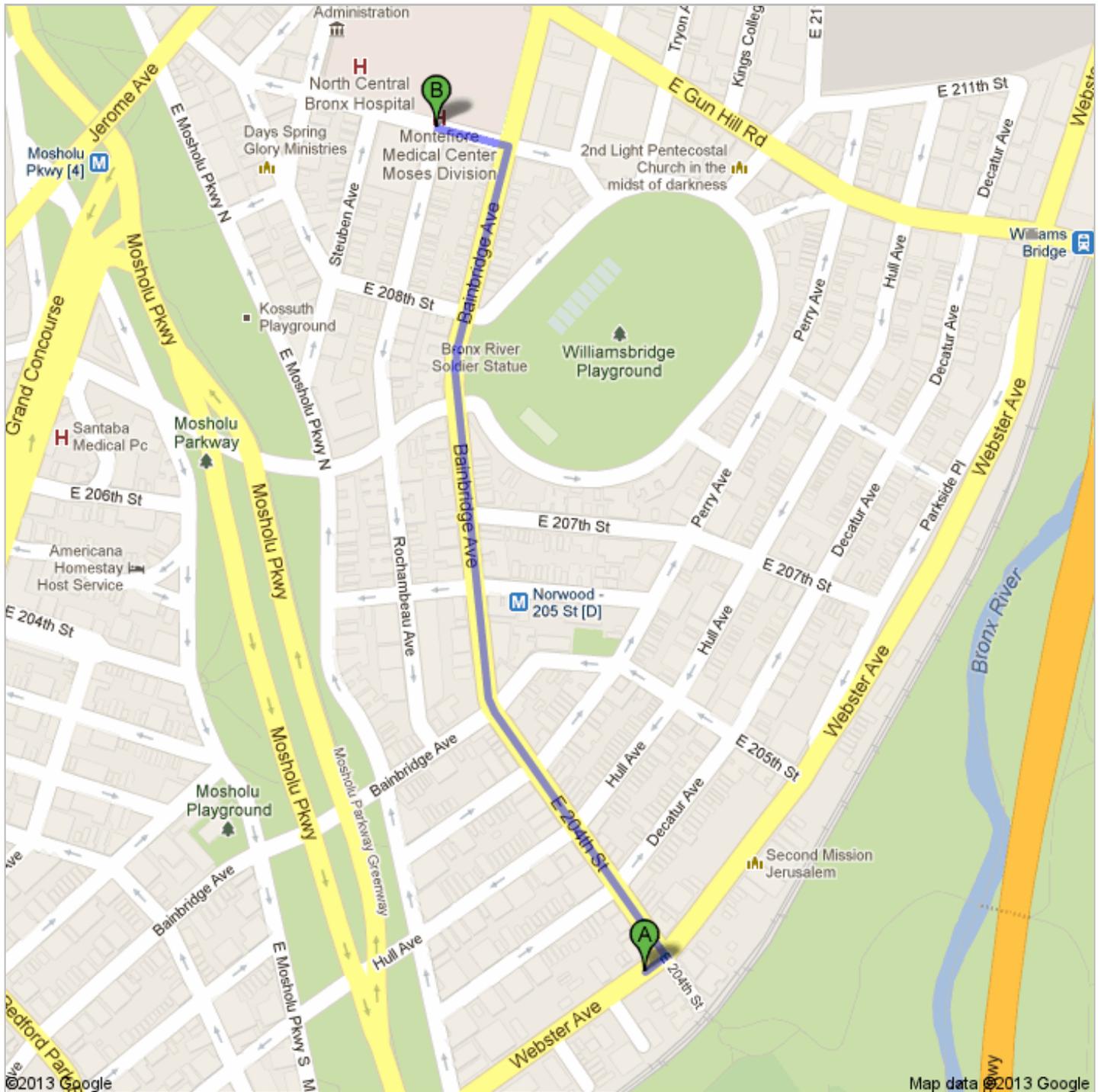
Transporting the injured in non-emergency vehicles increases the potential for motor vehicle accidents during transit to the hospital and further injury to the victim. Also, the victims' condition can worsen during transit. As a result, transportation in non-emergency vehicles can delay or even prevent treatment by trained emergency personnel during a critical time. Employees must remain at the site of the accident, administer appropriate first aid, and await the arrival of **trained emergency and/or rescue personnel.**



Directions to Montefiore Medical Center Moses Division

111 E 210th St, New York, NY 10467

0.7 mi – about 3 mins



A 3100 Webster Ave, Bronx, NY 10467

1. Head **northeast** on **Webster Ave** toward **E 204th St** go 95 ft
total 95 ft

 2. Turn left onto **E 204th St** go 0.2 mi
About 1 min total 0.2 mi

3. Continue straight onto **Bainbridge Ave** go 0.4 mi
About 1 min total 0.6 mi

 4. Turn left onto **E 210th St** go 282 ft
Destination will be on the right total 0.7 mi

B **Montefiore Medical Center Moses Division**
111 E 210th St, New York, NY 10467

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

Map data ©2013 Google

Directions weren't right? Please find your route on maps.google.com and click "Report a problem" at the bottom left.

Emergency Medical Care

Hospital #2

Hospital Name: Beth Abraham Health Services Telephone # (718) 519-4000

Address: 612 Allerton Avenue, Bronx, NY

Contact: ** Telephone # (718) 519-4000

- Type of Service
- () Physical Trauma Only
 - (x) Physical Trauma and Chemical Exposure
 - (x) Available 24 Hours

Hospital Route: **

See Attached

Hospital route information has been provided to satisfy OSHA requirements (29 CFR 1910.120). **However, where 911-emergency service and/or transport is available, Hillmann personnel are strictly prohibited from transporting accident victims in either company or personal vehicles.

Transporting the injured in non-emergency vehicles increases the potential for motor vehicle accidents during transit to the hospital and further injury to the victim. Also, the victims' condition can worsen during transit. As a result, transportation in non-emergency vehicles can delay or even prevent treatment by trained emergency personnel during a critical time. Employees must remain at the site of the accident, administer appropriate first aid, and await the arrival of **trained emergency and/or rescue personnel.**

A 3100 Webster Ave, Bronx, NY 10467

- 1. Head **southwest** on **Webster Ave** toward **E 203rd St** go 0.4 mi
total 0.4 mi
About 58 secs
-  2. Turn left onto **Bedford Park Blvd** go 0.1 mi
total 0.5 mi
About 1 min
-  3. Turn left onto **Dr Theodore Kazimiroff Blvd** go 0.8 mi
total 1.3 mi
About 2 mins
- 4. Continue onto **Allerton Ave** go 16 ft
total 1.3 mi
Destination will be on the right

B **Beth Abraham Health Services**
612 Allerton Ave, Bronx, NY 10467

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

Map data ©2013 Google

Directions weren't right? Please find your route on maps.google.com and click "Report a problem" at the bottom left.

Emergency Contacts

	Name	Phone
Fire Department	Bronx	911 / (212) 570-4293
Police Department	Bronx	911/ (718) 590-5511
Site Contact	Chris Hirschmann	908-377-8909
Site Telephone	Chris Hirschmann	908-377-8909
Nearest Telephone	Chris Hirschmann	908-377-8909
First Aid/EMS	Bronx	911 / (718) 590-5511
Federal Agency Representative	NA	NA
State Agency Representative	NA	NA
Local Agency Representative	NA	NA
NYSDEC	Albany	800-847-7332
Pesticide Poisoning	NA	NA
NY Poison Control	NYC	(800) 222-1222
CHEM TREC	Washington, DC	(800) 424-9300
Utility	Company Name	Phone
Water Supply	NYC Sewer and Water	(212) 442-1904
Sewer	NYC Sewer and Water	(212) 442-1904
Power	Con Ed	(800) 752-6633
Gas	Con Ed	(800) 752-6633
NY One Call (Dignet)	NYC	811

Hillmann Consulting, LLC Emergency Contact List Cell Phone Numbers

Chris Hirschmann	908-377-8909
Mark Hasting	908-403-2747

Key Project Personnel

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

Position	Job Description	Interactions
Director	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 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.

Hillmann is the entity responsible for managing health and safety at this site. Key project personnel are as follows:

Director:	<u>Mark Hasting</u>	<u>908-688-7800 / 908-403-2747</u>
	Name	Telephone / Cellular Number
Site Supervisor:	<u>Chris Hirschmann</u>	<u>908-688-7800 / 908-377-8909</u>
	Name	Telephone / Cellular Number
SHSO:	<u>Chris Hirschmann</u>	<u>908-688-7800 / 908-377-8909</u>
	Name	Telephone / Cellular Number
DHS:	<u>Mark Hasting</u>	<u>908-688-7800 / 908-403-2747</u>
	Name	Telephone / Cellular Number

Task Identification

Tasks covered under this plan:

Task #	Description
1	Soil excavation activities
2	Monitoring Well Installation

Off-site tasks planned? No

Describe: _____

Chemical Hazards

Task No.(s)	Chemical Name (or class)	PEL	TLV	Other Pertinent Limits (specify)	Primary Hazard			MSDS Attached
					Ingestion	Dermal	Inhalation	Y/N
1,2	Semi volatiles:							
	Benzo(a)anthracene	**				X	X	N
	Benzo(a)pyrene	0.2 mg/m3				X	X	N
	Benzo(b)fluoranthene	**				X	X	N
	Benzo(k)fluoranthene	**				X	X	N
	Dibenz(a,h)anthracene	**				X	X	N
	Indeno(1,2,3-cd)pyrene	**				X	X	N
Naphthalene	50 mg/m3				X	X	N	
1,2	Metals:							N
	Lead	0.5 mg/m3				X	X	N
	Chromium	**				X	X	N

- PEL – OSHA Permissible Exposure Limit: the maximum allowable 8-hour time weighted average (TWA) exposure concentration.
 TLV – ACGIH Threshold Limit Value: the recommended 8-hour TWA exposure concentration.
 STEL – ACGIH or OSHA Short-term Exposure Limit: the maximum allowable 15-minute TWA exposure concentration.
 Ceiling – OSHA and Cal-OSHA Ceiling Limit: the maximum exposure concentration above, which an employee shall not be exposed during any period without respiratory protection.
 IDLH – Immediately Dangerous to Life and Health: the concentration at which one could be exposed for 30 minutes without experiencing escape-impairing or irreversible health effects.

Physical and Biological Hazards

Hazard	Yes	No	Task No.(s)	Hazard	Yes	No	Task No.(s)
Electrical (overhead lines)	X		1,2	Uneven Terrain	X		1,2
Electrical (underground lines)	X		1,2	Unstable Surfaces	X		1,2
Gas Lines	X		1,2	Elevated Surfaces	X		
Water Lines	X		1,2	Lightning	X		1,2
Drilling Equipment	X		1,2	Rain	X		1,2
Excavation Equipment	X		1,2	Snow	X		1,2
Power Tools	X		1,2	Liquefied/Pressurized Gases		X	
Heat Exposure	X		1,2	Lifting Equipment		X	
Cold Exposure	X		1,2	Vermin	X		1,2
Oxygen Deficiency		X		Insects	X		1,2
Confined Spaces		X		Disease-causing organisms		X	
Noise	X		1,2	Others, e.g., marine sampling (specify)		X	
Ionizing Radiation		X					
Non-Ionizing Radiation		X					
Fire		X					
Explosive Atmospheres		X					
Shoring	X		1,2				
Scaffolding	X		1,2				
Holes/Ditches	X		1,2				
Steep Grades	X		1,2				
Slippery Surfaces	X		1,2				

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.

Employee Training Program

All personnel performing work in areas on this site covered by this HASP must have completed the appropriate training requirements specified in 29 CFR 1910.120(e). Each individual must have completed an 8-hour refresher-training course and/or initial 40-hour training course within the last year prior to performing any intrusive work on this site covered by this HASP. Also, on-site managers must have completed the specified 8-hour supervisor's training course. Records that demonstrate that all persons subject to the training requirements have actually met them will be maintained on site. The Project Manager is responsible for verifying compliance of the project team with these rules.

Prior to commencement of on-site activities, a site safety meeting will be held to review the specific information and requirements of this HASP. HASP sign-off sheets will be collected at this meeting.

Site Specific Training will include:

- Explanation of the overall site HASP.
- Health and safety personnel and organization.
- Brief site history.
- Special attention to signs and symptoms of overexposure to known and suspected site contaminants.
- Health effects of site contaminants.
- Air monitoring description.
- Physical hazards associated with the project.
- Selection, use and limitations of available safety.
- Personal hygiene and decontamination.
- Respirator facepiece fit testing.
- PPE use and maintenance.
- Site rules and regulations.
- Work zone establishment and markings.
- Site communication.
- Emergency preparedness procedures.
- Equipment decontamination.
- Medical monitoring procedures.
- Contingency plan.

Prior to work, each Hillmann employee will attend the contractor's health and safety orientation, if applicable. In addition, Hillmann's employees will review health and safety items specific to the tasks to be performed that were not covered in the contractor's orientation.

Site Health and Safety Meetings

In addition, the SHSO will meet daily with all Hillmann 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 Hillmann is a subcontractor, all Hillmann employees on site will participate in the contractor's daily safety meetings.)

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.

Personal Protective Equipment (PPE) Requirements

Task No.(s)	Level of Protection (A – D)*	Level of Upgrade	PPE Suit	PPE Gloves	PPE Feet	PPE Head	PPE Eye	PPE Ear	PPE Respirator	Additional PPE for Upgrade
1	D	NA	Std	N	Steel Toe Boots	NA	NA	Plugs **	NA	
<u>SUIT</u> Std = Standard Work Clothes Tyvek = Uncoated Tyvek Disposal Coverall PE Tyvek = Polyethylene-coated Tyvek Saranex = Saranex-laminated Tyvek PVC Suite = PVC Raingear <u>GLOVES</u> Work = Work Gloves (canvas, leather) Neo = Neoprene Gloves PVC = PVC Gloves N = Nitrile Gloves V = Vinyl Gloves L = Latex Gloves				<u>FEET</u> Steel = Steel-toe shoes or boots Steel+ = Steel-toe PVC boots Booties = PVC booties <u>HEAD</u> HH = Hardhat <u>EYE</u> Glasses = Safety glasses Goggles = Goggles Shield = Face shield <u>EAR</u> Plugs = Earplugs Muff = Ear muffs			<u>RESPIRATOR</u> APR = Air purifying respirator Full APR = Full face APR Half APR = Half face APR SAR = Airline supplied air respirator SCBA = Self contained breathing apparatus Escape = Escape SCBA OV = Organic Vapor Cartridge AG = Acid Gas Cartridge OV/AG = Organic Vapor/Acid Gas Cartridge AM = Ammonia Cartridge Dust/Mist = Dust/Mist pre-filter and cover for cartridge HEPA = High efficiency particulate air filter cartridge			

- For unspecified volatile organics (based on 1-minute breathing zone measurement using PID or OVA):

•	Up to 1 ppm above background	Level D
	1 – 5 ppm above background	Level C
	5 – 500 ppm above background	Level B
	500 ppm above background	Level A

** Earplugs will be available on-site, but are not required

Suggested Levels of Protection

Level “D” Protection

1. Coveralls
2. Gloves
3. Boots/shoes – steel toe
4. Boots (outer) chemical resistant (disposable)
5. Safety glasses or chemical splash goggles
6. Hard hat (safety shield)

Level “C” Protection

1. Full-face, air-purifying, canister-equipped respirator (NIOSH/MSHA approved)
2. Chemical resistant clothing (coveralls; hooded, two-piece, chemical splash suit; chemical resistant hood & apron; disposable, chemical-resistant coveralls)
3. Coveralls
4. Gloves (outer) chemical-resistant
5. Gloves (inner) chemical-resistant
6. Boots (outer) chemical-resistant
7. Boots (inner) chemical-resistant
8. Hard hat (face shield)
9. Escape mask
10. Two-way radio

Level “B” Protection

1. Pressure/Demand SCBA (MSHA-NIOSH approved)
2. Chemical resistant clothing (overalls and long-sleeved jacket; coveralls; hooded, one- or two-piece chemical splash suite; disposable, chemical-resistant coveralls)
3. Coveralls
4. Gloves (outer) chemical-resistant
5. Gloves (inner) chemical-resistant
6. Boots (outer) chemical-resistant
7. Boots (inner) chemical-resistant
8. Hard hat (face shield)
9. Two-way radio

Level “A” Protection

1. Pressure/Demand SCBA (MSHA-NIOSH approved)
2. Fully encapsulating, chemical-resistant suit
3. Coveralls
4. Gloves (outer) chemical-resistant
5. Gloves (inner) chemical-resistant
6. Boots, chemical-resistant, steel toe (depending on suit construction, work over or under suit boot)
7. Hard hat (under suit)
8. Two-way radio

Medical Surveillance

Requirements

All Hillmann employees covered by this HASP, who engage in on site activities governed by 29 CFR 1910.120 for 30 or more days per year, must meet the medical surveillance requirements specified in 1910.120(f). Therefore, such personnel must have completed occupational medical baseline or surveillance examination, performed by a licensed physician, within the last 24 months. The medical examination includes the following components:

- Personal Medical Questionnaire
- Occupational Exposure History
- Physical Examination
- Vision Testing
- Spirometry
- Audiometry
- Blood Chemistry Panel (e.g., SMAC-20)
- Complete Blood Count with Differential
- Urinalysis
- Chest X-Ray (every two years at a minimum)
- Electrocardiogram (at physician's discretion)

Examinations are required upon hiring, termination, and exposure to substances at or above the PEL.

Results of the examinations are communicated directly from the physician to the employee. Medical records for Hillmann's employees are kept by the physician:

Washington Occupational Health
1120 19th Street, Suite 410
Washington, DC 20036
800-777-9642 – office
800-865-6525 – fax

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

- (1) the nature of the contaminants
- (2) the likely concentrations of the contaminants
- (3) the probable duration of exposure
- (4) the relative sensitivity of the monitoring equipment to the specific contaminants

The following summarizes the calibration requirements for the air monitoring instruments used at the site:

<u>Instrument</u>	<u>Calibration Frequency</u>
PID: Mini RAE-QRAE	Beginning of each work shift

Air Monitoring and Contaminant Action Levels

Task No.(s)	Location	Contaminant	Monitoring Equipment	Monitoring Frequency	Action Level Concentration	
					Mandatory Respirator Use	Mandatory Work Stoppage
1	Work Areas	Volatile Organic	PID: Multi-Rae	Periodically during all tasks/activities.	--	10 ppm

PID = Photoionization Detector (HNU, TIP, OVM)
 FID = Flame Ionization Detector (OVA)
 LEL-O₂ = Explosivity and Oxygen Meter

Name(s) of individual(s) responsible for performing the monitoring, and certifying the results:

All Hillmann personnel

Type, make and model of instruments used: Multi-Rae PID 5 Gas Monitor

Method and frequency of calibration: 100 ppm isobutylene-calibration gas. Calibrated prior to each day's use according to manufacturer's instruction.

Procedures for Handling Anticipated Wastes

Waste Generation

Anticipated: Yes X No

Types: Liquid Solid X Sludge Gas

Quantity: Expected volume of each type:

This project X will will not generate non-hazardous, contaminated wastes. These wastes will be:

 stored treated
X transported X manifested in the following manner:

Transported under bill of lading or manifest to an appropriate disposal facility.

Packaging requirements for waste material:

Decontamination Procedures

All personnel that may be exposed to contaminated soil will wear modified level D Personal Protective Equipment to include disposable gloves. Gloves will be changed after handling potentially impacted material or equipment and placed in a plastic garbage bag for proper disposal. All personnel will wash their hands before eating or drinking and no smoking will be allowed on site.

All equipment brought onto the site will be cleaned of any contaminants prior to accessing the site to prevent offsite cross-contamination or the need to decontaminate prior to the start of field activities. After each borehole is completed, all drilling equipment used for the soil boring (augers, etc.) will be decontaminated with soap (Alconox® or equivalent) and water followed by a water rinse, using a brush as necessary, to remove soil and contaminants. At the conclusion of daily project activities, all equipment will again be decontaminated with soap and water and a water rinse. All equipment will be handled with clean gloves after cleaning to minimize cross-contamination.

Spill Prevention and Response

Potentially hazardous spill situations can be mitigated by using containment devices and materials in work areas. If site conditions are suitable, earthen berms will be constructed around specific areas. If site conditions are not suitable for this, or the potential spill is smaller, barriers will be constructed with sorbent materials such as “speedi-dry”, sorbent booms and/or straw bales. Dikes and berms will also be used to divert stormwater run-on and run-off away from critical zones.

Because a spill cleanup must be conducted under crisis conditions, it is important that the methods used for dealing with a spill be thought out beforehand. However, the steps followed cannot be inflexible, because no two spills are identical. Factors that will be assessed in the event of any and all spills include:

1. The volume of the hazardous substance released and the rate of release.
2. The nature of the spill material.
3. What danger exists to personnel in the immediate area.
4. Nature of damage and possibilities of repair.
5. If the transfer of material to an alternate containment is advisable.
6. Feasibility of the construction of a containment dike.
7. Nature of spill area.
8. Whether the spilled substance has reached a watercourse or sewer.
9. Danger of explosion or fire.
10. Equipment and supplies necessary to confine the material and carry out the cleanup.

In most cases, the success of a cleanup operation is dependent upon the time it takes to contain the spill. Therefore, Hillmann’s first attempt at spill containment will be at the point of discharge. This can often be accomplished by closing valves, reinforcing or repairing damaged containers, moving or changing the position of fallen or ruptured containers, or emptying the container by pumping to a temporary storage or holding vessel. Pumps, suction hoses and containers will be available to recover spilled materials when directed to do so by the Site Supervisor.

Handling and transport of drummed waste always must be conducted in a controlled and safe manner, which will minimize damage to structurally sound drums, repacks and overpacks. If leakage or spillage of waste occurs, the drum must immediately be placed within an overpack unit. Overpack units must be provided at each staging area, at areas of existing drums, and along all site roadways.

In the event of a spill, the drum handling team must immediately contact the SHSO, who will have all personnel evacuated from the immediate spill area. Only personnel trained in spill response procedures shall isolate and contain the spill. Where possible, spilled waste material must be collected and placed in repack containers for ultimate disposal. Following containment and collection of spilled waste, the area must be surveyed by the SHSO, who will decide if it is safe to permit re-entry of work teams.

Task/Work Area	Potential Spill or Discharge	Equipment, Materials, and Procedures for Spill Cleanup
1,2	Hydraulic Fluids from excavation equipment and/or drilling equipment	Sorbent pads will be in close proximity in case of spill
1	Oil discharge while removing Underground Storage Tank(s)	Sorbent pads will be in close proximity in case of spill. Impacted soil will be removed and disposed of offsite at an approved facility.

Emergency Procedures

Potential emergencies that may arise are most likely to be associated with physical hazards from heavy equipment operation and/or lifting and loading of debris. Emergency response will, in most cases, be performed in Level D protection.

Modifications to these emergency procedures may be necessary after the actual site set-up, based on prevailing conditions. Periodic reviews of these procedures will be performed by the SHSO to ensure that they are appropriate for all anticipated emergencies.

Responsibilities

The Site Supervisor has the authority and responsibility to commit company resources to appropriately respond to an emergency, and to exclude all personnel not directly responding to the emergency.

Prior to beginning work at the site, Hillmann will designate an employee, usually the SHSO, to be responsible for initiating any emergency response actions. In the event an injury or illness requires more than first aid treatment, the SHSO (or alternate) will accompany the injured person to the hospital, and will remain with the person until release or admittance is decided.

Evacuation Plan

The basic elements of an emergency evacuation plan include employee training, escape routes, escape procedures, critical operations or equipment, rescue and medical duty assignments, designation of responsible parties, emergency reporting procedures and methods to account for all employees after evacuation.

When appropriate, wind indicators visible to all on-site personnel will be provided by the SHSO to indicate possible routes of upwind escape. Work-area entrance and exit routes will be planned, and emergency escape routes will be delineated by the SHSO. The discovery of any condition that would suggest the existence of a situation more hazardous than anticipated, should result in the evacuation of the team and a re-evaluation of the hazard and the level of protection required. This re-evaluation will be conducted by appropriate on-site health and safety personnel.

In the highly unlikely event that barrels, canisters, or chemical gases or vapors are uncovered during site work, the following procedures shall be followed:

- 1) In the event that barrels, canisters, or any other vessels are encountered during excavation, all work shall immediately cease and all workers to be removed from the area. The SHSO shall be immediately notified, and he/she shall identify vessel contents, handling procedures and storage and disposal techniques prior to starting work.
- 2) In the event that high concentrations of gases or vapors are detected, the following actions will be taken:
 - Remove all workers from the area
 - Monitor gas or vapor concentrations to determine the type of respiratory protection that will be required before workers reenter the area.
- 3) In the highly unlikely event of a major leak of toxic gas, such as might occur if a compressed gas cylinder were ruptured during excavation or drilling, all on-site personnel will be evacuated to a safe distance. The risk will be assessed prior to restarting work.

Training

Employees will be instructed in the specific aspects of emergency evaluation applicable to the site as part of the site safety meeting prior to the commencement of all on-site activities. On-site refresher or update training is required anytime escape routes or procedures are modified or personnel assignments are changed. During the site safety meeting, all employees will be trained in, and reminded of, the location of this plan, the procedures outlined in this plan, and the communication systems and evacuation routes used during an emergency.

On a continuous basis, individual employees should be constantly alert for indicators of potentially hazardous situations, and for signs and symptoms in themselves and others that warn of hazardous conditions and exposures. Rapid recognition of dangerous situations can avert an emergency. In the event of any emergency that necessitates an evaluation of the site, on-site personnel will be notified by the use of car horns sounded in regularly spaced, repeated blasts, as detailed in the next section of this procedure. The Site Supervisor in conjunction with the SHSO will control the site until the appropriate local or state agency representatives arrive, if required.

Alarm Systems Emergency Signals

The simplest and most effective emergency communication system, in any situation, is direct voice communications. Voice communications will be supplemented anytime voices cannot be clearly perceived above ambient noise levels (e.g., noise from heavy equipment, drilling rigs or backhoes), and anytime a clear line-of-sight cannot be easily maintained among all site personnel because of distance, terrain, or other obstructions. When voice communications must be supplemented, the following emergency signals, using car horns, will be used.

- **One Horn Blast: General Warning**

One blast is used to signal relatively minor, but important events on site. An example would be a minor chemical spill where there is no immediate damage to life or health, yet personnel working on site should be aware of the situation so unnecessary problems are avoided. If one horn blast is sounded, personnel must stop all activity and equipment on site and await further instruction from the SHSO.

- **Two Horn Blasts: Medical Emergency**

Two blasts are used to signal a medical emergency where immediate first aid or emergency medical care is required. If two horn blasts are sounded, all first aid and CPR trained personnel should respond, as appropriate. All other activity and equipment should stop, and personnel should await further instructions from the SHSO.

- **Three Horn Blasts Followed by One Continuous Blast: Immediate Danger to Life or Health**

Three blasts followed by another extended or continuous horn blast signals a situation that could present an immediate danger to the life or health (IDLH) to all employees on site. Examples of possible IDLH situations could include fires, explosions, hazardous chemical spills or releases, hurricanes, tornadoes, blizzards or floods. If three horn blasts followed by a continuous blast are sounded, all activity and equipment must stop, and all personnel must evacuate the site to an appropriately designated site located outside the site gate, or further off site if necessary. (Note: unless otherwise specified, all decontamination procedures must be implemented.) All personnel must be accounted for by the SHSO or Site Supervisor, and other response actions determined by the SHSO or Site Supervisor must be followed.

Employees on site will use the “buddy” system (pairs). Buddies should pre-arrange hand signals or other means of emergency communication in case radios cannot be used, or if the radios no longer operate. The following hand signals are suggested:

1. Hand gripping throat: out of air, can't breathe.
2. Grip partner's wrist or place both hands around waste: leave area immediately, no debate.
3. Hand on top of head: need assistance.
4. Thumbs up: OK, I'm alright, I understand.
5. Thumbs down: No, negative.

Visual contact will be maintained between employee pairs. Team members will remain in close proximity to each other in order to provide assistance in case of emergencies, and will inform each other of any of the following effects of exposure to site contamination:

- headaches
- dizziness
- blurred vision
- cramps
- irritation of eyes, skin or respiratory tract

If any member of the work crew experiences any adverse symptoms while on site, the entire work crew will immediately stop work and follow the instructions provided by the SHSO.

Medical Treatment/First Aid

Eyewash stations will be available at the work activity locations, the outside of the personal decontamination facility and at the equipment decontamination area. Community emergency services (EMS, fire, and police) will be notified immediately if their resources are needed on site. If necessary, the injured or sick party shall be taken to the nearest hospital.

Fire Extinguishers

Equipment – All heavy equipment will be supplied with ABC fire extinguishers are also located in all vehicles.

Emergency Reporting

Any incident (other than minor first aid treatment) resulting in injury, illness or property damage will be reported to Hillmann. An incident investigation will be initiated as soon as emergency conditions are under control. The purpose of this investigation is not to attribute blame but to determine the pertinent facts so that repeat or similar occurrences can be avoided.

The investigations will begin while details are fresh in the mind of all involved. The person administering first aid may be able to start the fact gathering process if the injured are able to speak. Pertinent facts must be determined. Questions beginning with who, what, when, where, and how are usually most effective to discover ways to improve job performance in terms of efficiency, quality of work, as well as safety and health concerns.

On-Site Evacuation Plan – An emergency evacuation alarm (air horn, etc.) will be on site at all times. This alarm should be of sufficient power to be heard by personnel operating heavy equipment. A series of repeated blasts is the signal for all Hillmann personnel and subcontractors to evacuate the site and assemble at:

To be determined at the beginning of each field event

The criteria for activating the alarm will be the first sign of any serious problem that requires assistance or evacuation.

Should either a fire or explosion occur, all personnel will proceed immediately to the evacuation assembly point and await further instructions. At that time a personnel check will be conducted to determine if anyone is missing, and the local fire and police departments will be called for assistance. Once on site, the acting officer of the fire department and the Site Supervisor will determine if further evacuations are necessary. No Hillmann personnel will re-enter the site without clearance from the SHSO.

Subcontractor Safety

It has been and shall continue to be the policy of Hillmann that employees of all subcontractors are required to adhere to all applicable company, local, state, and federal safety rules and regulations.

When an infraction of a local, state, federal, or company safety regulation is observed, the SHSO will request verbally that the subcontractor's supervisory personnel correct the infraction immediately. If correction is not made, then the project director will request in writing that proper corrective action be taken. Subcontractors who continue to ignore proper safety procedures will have payments withheld until compliance is achieved.

Subcontractors are required to hold safety meetings for their employees when they are working on Hillmann projects, and submit documentation of such meetings to the Project Manager. Subcontractor employees are not required to attend Hillmann's safety meetings.

Forms

Job Safety & Health Protection

The Occupational Safety and Health Act of 1970 provides job safety and health protection for workers by promoting safe and healthful working conditions throughout the Nation. Provisions of the Act include the following:

Employers

All employers must furnish to employees' employment and a place of employment free from recognized hazards that are causing or are likely to cause death or serious harm to employees. Employers must comply with occupational safety and health standards issued under the Act.

Employees

Employees must comply with all occupational safety and health standards, rules, regulations and orders issued under the Act that apply to their own actions and conduct on the job.

The Occupational Safety and Health Administration (OSHA) of the U.S. Department of Labor has the primary responsibility for administering the Act. OSHA issues occupational safety and health standards, and its Compliance Safety and Health Officers conduct job site inspections to help ensure compliance with the Act.

Inspection

The Act requires that a representative of the employer and a representative authorized by the employees be given an opportunity to accompany the OSHA inspector for the purpose of aiding the inspection.

Complaint

Employees or their representatives have the right to file a complaint with the nearest OSHA office requesting an inspection. If they believe unsafe or unhealthful conditions exist in their workplace. OSHA will withhold, on request, names of employees complaining.

The Act provides that employees may not be discharged or discriminated against in any way for filing safety and health complaints or for otherwise exercising their rights under the Act.

Employees who believe they have been discriminated against may file a complaint with their nearest OSHA office within 30 days of the alleged discriminatory action.

Citation

If upon inspection OSHA believes an employer has violated the Act, a citation alleging such violations will be issued to the employer. Each citation will specify a time period with which the alleged violation must be corrected.

The OSHA citation must be prominently displayed at or near the place of alleged violation for three days, or until it is corrected, whichever is later, to warn employees of dangers that may exist there.

Proposed Penalty

The Act provides for mandatory penalties against employers of up to \$1,000 for each serious violation and for optional penalties of up to \$1,000 for each non-serious violation. Penalties of up to \$1,000 per day may be proposed for failure to correct violations within the proposed time period. Also, any employer who willfully or repeatedly violates the Act may be assessed penalties of up to \$10,000 for each such violation.

There are also provisions for criminal penalties. Any willful violation resulting in death of an employee, upon conviction, is punishable by a fine of up to \$250,000 (or \$500,000 if the employer is a corporation), or by imprisonment for up to six months or both. A second conviction of an employer doubles the possible term of imprisonment.

Voluntary Activity

While providing penalties for violation, the Act also encourages efforts by labor and management before an OSHA inspection, to reduce workplace hazards voluntarily and to develop and improve safety and health programs in all workplaces and industries. OSHA's Voluntary Protection Programs recognize outstanding efforts of this nature.

OSHA has published Safety and Health Program Management Guidelines to assist employers in establishing or perfecting programs to prevent or control employee exposure to workplace hazards. There are many public and private organizations that can provide information and assistance in this effort if requested. Also, your local OSHA office can provide considerable help and advice on solving safety and health problems or can refer you to other sources for help such as training.

Consultation

Free assistance in identifying and correcting hazards and in improving safety and health management is available to employers, without citation or penalty, through OSHA-supported programs in each State. These programs are usually administered by the State of Labor or Health Department or a State University.

Under provisions of Title 29, Code of Federal Regulations, part 1903.2(s)(1) employers must post this notice (or facsimile) in a conspicuous place where notices to employees are customarily posted.

Heat Stress Monitoring Log

Employee Name							
Start Time							
<u>Measurement 1</u> Pulse Work Minutes Rest Minutes							
<u>Measurement 2</u> Pulse Work Minutes Rest Minutes							
<u>Measurement 3</u> Pulse Work Minutes Rest Minutes							
<u>Measurement 4</u> Pulse Work Minutes Rest Minutes							
<u>Measurement 5</u> Pulse Work Minutes Rest Minutes							
<u>Measurement 6</u> Pulse Work Minutes Rest Minutes							
<u>Measurement 7</u> Pulse Work Minutes Rest Minutes							
<u>Measurement 8</u> Pulse Work Minutes Rest Minutes							

Signature of SHSO (or designee)

Date

Daily Safety Meeting Log
(to be completed on site)

Site Name G6- 2034

Location 3100 Webster Avenue, Bronx, NY

Weather _____

Topics _____

Employee Names:

Signatures

Signature of SHSO (or designee)

Date

- dusts, fumes, vapors
- Taking unsafe or awkward position
- Other
- Repetitive motion
- Servicing moving equipment
- Illumination/noise hazard
- Other
- Other

ACCIDENT DESCRIPTION (continued):

What steps have already been taken to prevent similar incidents? _____

What else can be done (engineering controls, training, enforcement, process changes) to eliminate the hazard? _____

 SHSO's Signature Date

Health and Safety Review: Is proposed action appropriate? Yes No Comments _____

 DHS's Signature Date

VEHICLE ACCIDENT REPORT

EMPLOYEE NAME: _____ DRV LIC NO.: _____
COMPANY ADDRESS: _____ INSURANCE COMPANY _____
POLICY NO.: _____

DESCRIPTION OF ACCIDENT

DATE: _____ TIME: _____ SPEED LIMIT _____:
LOCATION: _____
DIRECTION OF TRAVEL: _____
HOW DID IT HAPPEN? _____

USE SPACE BELOW TO INDICATE VEHICLE PATHS - INDICATE NORTH BY ARROW

POLICE REPORT

NAME OF OFFICER: _____ BADGE #: _____
DEPARTMENT: _____ LOCATION: _____
SUMMONS ISSUED? Y [] N [] TO WHOM? _____

YOUR VEHICLE

YEAR/MAKE: _____ REGIST #: _____
DRIVEN BY: _____ AGE: _____ TEL #: _____
ADDRESS: _____ CITY: _____ STATE: _____
NATURE OF DAMAGE: _____

OTHER DRIVER

(continue below for additional drivers and witnesses)

NAME: _____

DRV LIC NO.: _____

ADDRESS: _____

VEHICLE REGISTRATION: _____

INSURANCE COMPANY _____

POLICY NO.: _____