Webster III – 2981 Webster Avenue
BRONX, NEW YORK

Remedial Action Work Plan

NYC OER Site Number: 13EHAN187X

NYC VCP Project Number: 13CVCP131X

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MAY 2013

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 VCP	New York City Voluntary 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, _____, 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 III, NYCOER Site numbers 13EHAN187X and 13CVCP131X.

I, _____ am a Qualified Environmental Professional as defined in §43-140. I have primary direct responsibility for implementation of the remedial action for the Webster III, NYCOER Site numbers 13EHAN187X and 13CVCP131X.

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

_____

Name

_____

NYS PE License Number

_____

Signature

_____

Date

PE Stamp

_____

QEP Name

_____

QEP Signature

_____

Date

EXECUTIVE SUMMARY

Tyler's Bronx Tunnel, LLC – Webster III has enrolled in the New York City Voluntary Brownfield Cleanup Program (NYC VCP) to investigate and remediate a 7,561-square foot site located at 2981 Webster Avenue in 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 in the Bedford Park section of Bronx, New York and is identified as Block 3280 and Lot number 48 on the New York City Tax Map. Figure number 1 is a Site location map. The Site is 7,561 square feet and is bordered to the northeast by a three-story structure which houses ground floor commercial store fronts and upper level residential apartments and East 201st Street, to the southeast by Webster Avenue and a mixed-use building (Botanical Square), to the southwest by a commercial business (Vanity Fair Bathmart - 2971 Webster Avenue), and to the northwest by residential properties (single and multi-family) located along Decatur Avenue. The site topography is generally level and at grade with neighboring roadways. See Figure 2 for surrounding land use. Currently, the Site houses a vacant commercial establishment and an empty lot which are awaiting demolition and development. The existing structure utilized by the commercial establishment includes a one-story, circa-1928 structure (~25' x120') is used as a plumbing supply storage warehouse. Active site use ceased in April of 2012. The undeveloped portion of the property is used for vehicle parking purposes. The parcel formerly contained a five-story mixed-use building that was demolished as a result of fire damage in the mid-1980's.

Summary of Proposed Redevelopment Plan

The proposed use of the Site will consist of an eight-story apartment housing structure with a cellar. Maximum excavation for the cellar is planned to be no greater than 9' 4" below sidewalk elevation. Layout of the proposed site development is presented in Figure 3. The current zoning designation is Residential R7D. The character of moderate and higher density R7D districts are generally found close to central and regional business districts and are usually mapped in proximity to mass transit. However, the character of these neighborhoods varies widely.

The rectangular shaped 0.17-acre parcel is currently awaiting demolition and development. It has 62.5 feet of lot frontage with a lot depth of 120.98 feet. Planned site improvement work includes the construction of an eight-story apartment complex with a rear yard. The building will contain forty-six units. The basement level will house mechanical and utility meter rooms, tenant laundry center, boiler room (natural gas fired system), refuse storage area, and service connections. The building will be serviced by one passenger elevator and an interior stairway. The newly developed building footprint area is 62' wide by 60' deep. Gross building square footage is approximately 25,280 feet. No on-site vehicle parking will be provided. The proposed development will not cover the entire footprint of the site as nearly half the property will be slated as a recreational area (see Figure 3). As the proposed site improvement work includes a building with a basement area, the planned maximum depth of excavation would be no greater than 9'4" below sidewalk grade. Additional site improvement also calls for the installation of an elevator with an estimated depth of excavation at five feet below basement grade. Earth moving would include the area within the building footprint, with a total maximum volume of approximately 1,274 yd^3. The excavation for the site structure is not anticipated to be below the groundwater table.

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:

The preferred remedial action alternative is Alternative 2; the Track 4 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. The proposed remedial action will consist of: Preparation of a Community Protection Statement and implementation of all required NYC VCP Citizen Participation activities according to an approved Citizen Participation Plan.
2. Perform a Community Air Monitoring Program for particulates and volatile organic carbon compounds.
3. Establishment of Track 4 Site Specific 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 Track 4 Site-Specific SCOs, including excavation of soil/fill to a depth of more than 9.5 feet below grade within the footprint of the building, and to a minimum depth of 2 feet below grade in the rear yard.
6. Screening of excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID.
7. Removal of underground storage tanks (if encountered) and closure of petroleum spills (if evidence of a spill/leak is encountered during Site excavation) 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 onsite.

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 beneath the building slab and outside foundation sidewalls below grade.

12. Construction and maintenance of an engineered composite cover will consist of building slab (approximately 62' wide by 60' deep), while the remainder of the lot is proposed as open space rear yard. Open space will be completed with a demarcation barrier and a minimum of two foot of clean cover to prevent human exposure to residual soil/fill remaining under the Site;

13. Installation of demarcation layer in open space rear yard.

14. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations.

15. Performance of all activities required for the remedial action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations.

16. 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.

17. Submission of an approved Site Management Plan (SMP) in the RAR for long-term management of residual fill, including plans for operation, maintenance, monitoring,

inspection and certification of Engineering and Institutional Controls and reporting at a specified frequency.

18. Continued registration of the property with an E-Designation; establishment of Engineering Controls and Institutional Controls in this RAWP; a requirement that management of these controls must be in compliance with an approved SMP; and Institutional Controls including prohibition of the following: (1) vegetable gardening and farming; (2) use of groundwater without treatment rendering it safe for the intended use; (3) disturbance of residual contaminated material unless it is conducted in accordance with the SMP; and (4) higher level of land usage without OER-approval.

COMMUNITY PROTECTION STATEMENT

The Office of Environmental Remediation created the New York City 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. This cleanup plan also includes many other elements that address common community concerns, such as community air monitoring, odor, dust and noise controls, hours of operation, good housekeeping and cleanliness, truck management and routing, and opportunities for community participation. The purpose of this Community Protection Statement is to explain these community protection measures in non-technical language to simplify community review.

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

Site Safety Coordinator. This project has a designated Site safety coordinator to implement the Health and Safety Plan. The safety coordinator maintains an emergency contact sheet and protocol for management of emergencies. The Site safety coordinator is Deborah J. Thompson and can be reached at 845-658-3484.

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 include 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 Jay Martino at 914-729-4986 or NYC Office of Environmental Remediation Project Manager Breanna Gribble at 212-442-7126.

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 0800 – 1700, Monday - Friday.

Signage. While the cleanup is in progress, a placard will be prominently posted at the main entrance of the property with a laminated project Fact Sheet that states that the project is in the NYC 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 Jay Martino at 914-729-4986, the NYC Office of Environmental Remediation Project Manager Breanna Gribble at 212-442-7126, 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 City Public Library at 285 East 205th Street, Bronx, New York.

Long-Term Site Management. To provide long-term protection after the cleanup is complete, the property owner may 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

Tyler's Bronx Tunnel, LLC has enrolled in the New York City Voluntary Cleanup Program (NYC VCP) to investigate and remediate a property located at 2981 Webster Avenue in the Bedford Park section of 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 a remedial alternative 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 in the Bedford Park section of Bronx, New York and is identified as Block 3280 and Lot number 48 on the New York City Tax Map. Figure number 1 is a Site location map. The Site is 7,561 square feet and is bordered to the northeast by a three-story structure which houses ground floor commercial store fronts and upper level residential apartments and East 201st Street, to the southeast by Webster Avenue and a mixed-use building (Botanical Square), to the southwest by a commercial business (Vanity Fair Bathmart - 2971 Webster Avenue), and to the northwest by residential properties (single and multi-family) located along Decatur Avenue. The site topography is generally level and at grade with neighboring roadways. See Figure 1 for surrounding land use. Currently, the Site houses a vacant commercial establishment and an empty lot which are awaiting demolition and development. The existing structure utilized by the commercial establishment includes a one-story, circa-1928 structure (~25' x120') is used as a plumbing supply storage warehouse. Active site use ceased in April of 2012. The undeveloped portion of the property is used for vehicle

parking purposes. The parcel formerly contained a five-story mixed-use building that was demolished as a result of fire damage in the mid-1980's.

1.2 PROPOSED REDEVELOPMENT PLAN

The proposed use of the Site will consist of an eight-story apartment housing structure with a cellar. Maximum excavation for the cellar is planned to be no greater than 9' 4" below sidewalk elevation. Layout of the proposed site development is presented in Figure 3. The current zoning designation is Residential R7D. The character of moderate and higher density R7D districts are generally found close to central and regional business districts and are usually mapped in proximity to mass transit. However, the character of these neighborhoods varies widely.

The rectangular shaped 0.17-acre parcel is currently awaiting demolition and development. It has 62.5 feet of lot frontage with a lot depth of 120.98 feet. Planned site improvement work includes the construction of an eight-story apartment complex with a rear yard. The building will contain forty-six units. The basement level will house mechanical and utility meter rooms, tenant laundry center, boiler room (natural gas fired system), refuse storage area, and service connections. The building will be serviced by one passenger elevator and an interior stairway. The newly developed building footprint area is 62' wide by 60' deep. Gross building square footage is approximately 25,280 feet. No on-site vehicle parking will be provided. The proposed development will not cover the entire footprint of the site as nearly half the property will be slated as a recreational area (see Figure 3). As the proposed site improvement work includes a building with a basement area, the planned maximum depth of excavation would be no greater than 9'4" below sidewalk grade. Additional site improvement also calls for the installation of an elevator with an estimated depth of excavation at five feet below basement grade. Earth moving would include the area within the building footprint, with a total maximum volume of approximately 1,274 yd^3. The excavation for the site structure is not anticipated to be below the groundwater table.

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

1.3 DESCRIPTION OF SURROUNDING PROPERTY

The subject and surrounding properties are located in an urban residential setting in the Borough of the Bronx, City and State of New York. Adjoining property usage is utilized for mainly for light commercial and multi-family residential properties. There are no identified sensitive receptors within a 250 to 500-foot radius of the site.

Figure number 1 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 III – 2981 Webster Avenue*," dated April 2013 (RIR).

Summary of Past Uses of Site and Areas of Concern

The following environmental work plans and reports were developed for the Site:

Phase I Environmental Site Assessment,

July 6, 2012, prepared by Team Environmental Consultants, Inc.

This Phase I identified no recognized environmental conditions (RECs) on the subject property.

Summary of the Work Performed under the Remedial Investigation

1. Conducted a Site inspection to identify AOCs and physical obstructions (i.e. structures, buildings, etc.);
2. Installed four soil borings across the entire project Site, and collected eight (including one duplicate sample) soil samples for chemical analysis from the soil borings to evaluate soil quality;
3. Installed three temporary groundwater monitoring wells throughout the Site to establish groundwater flow, and collected four (including one duplicate sample) groundwater samples for chemical analysis to evaluate groundwater quality;

4. Installation of three soil vapor probes around Site perimeter and collected three samples for chemical analysis.

Summary of Environmental Findings

1. Elevation of the property ranges from 62.25 to 63.75 feet.
2. Depth to groundwater ranges from 10.02 to 10.89 feet at the Site.
3. Groundwater flow is generally from west to east beneath the Site.
4. Bedrock was not encountered during the RI at the Site.
5. The stratigraphy of the site, from the surface down, consists of mixed fill underlain by fine to coarse sands.
6. Soil/fill samples collected during the RI showed no VOCs at detectable concentrations above Unrestricted Use (Track I) SCOs. Low levels of acetone (maximum 9.2 ppb) and methylene chloride (maximum 1.5 ppb) were detected in four soil samples. Three pesticides including 4-4'-DDE (at 4.45 ppb), 4-4'-DDT (ranging from 3.7 to 18.5 ppb) and dieldrin (at 7 ppb) were reported above Track I SCOs, but below Restricted Residential SCOs. Total PCBs were non detect in all samples. Several SVOCs were detected at a concentration above Restricted Residential SCOs and included benzo(a)anthracene (3,770 ppb), benzo(a) pyrene (2,800 ppb), benzo(b)fluoranthene (2,220 ppb), chrysene (3,970 ppb), and indeno(1, 2, 3)pyrene (1,340 ppb). Four metals including chromium (maximum 31 ppm), lead (maximum 309 ppm), selenium (maximum 4.8 ppm) and zinc (maximum 964 ppm) exceeded Unrestricted Use SCOs but all values were well below Track II Restricted Residential SCOs. Overall, findings for soil were unremarkable and did not show a source of contamination on this property.
7. Groundwater samples collected during the RI showed no detectable concentrations of SVOCs and PCBs in any of the groundwater samples. VOCs were not detected in groundwater except trace concentrations of chloroform (maximum 2.0 ug/L) and tetrachloroethene (maximum 3.0 ug/L) in all four groundwater samples, and below Groundwater Quality Standards (GQS). Two pesticides (dieldrin and 4,4-DDT) were detected in groundwater at trace concentrations. Several metals including aluminum

(maximum 0.066 ppm) barium (maximum 0.198 ppm), calcium (maximum 72.1 ppm), iron (maximum 0.108 ppm), magnesium (maximum 18.7 ppm), manganese (maximum 0.265 ppm), potassium (maximum 7.03 ppm), sodium (maximum 127 ppm) and zinc (maximum 0.026) were detected in groundwater, and of these, sodium was the only metal in groundwater to exceed GQS in all four samples. Overall, findings for groundwater were unremarkable and did not show a source of contamination on this property.

8. Soil vapor samples collected during the RI showed low level detections for volatile organic related compounds. With the exception of acetone (max of 140 $\mu g/m^3$) and carbon disulfide (max of 110 $\mu g/m^3$), all compounds were detected at concentrations less than 10 $\mu g/m^3$. PCE was detected in all three vapor samples ranging from 1.3 $\mu g/m^3$ – 28 $\mu g/m^3$. TCE was detected in all three vapor samples ranging from 0.62 $\mu g/m^3$ – 2.3 $\mu g/m^3$. These PCE and TCE levels were below New York State DOH soil vapor guidance matrix. Soil vapor concentrations reported within samples collected will not require mitigation according to the State DOH soil vapor guidance matrix. TCA and vinyl chloride were not detected in any of soil vapor samples. TCE was not detected in groundwater while PCE was detected at low levels (ranging from 1.7 ug/L – 3.0 ug/L) in groundwater samples.

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

2.0 REMEDIAL ACTION OBJECTIVES

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

Soil

- Prevent direct contact with contaminated soil.
- Prevent exposure to contaminants volatilizing from contaminated soil.
- Prevent migration of contaminants that would result in groundwater or surface water contamination.

Groundwater

- Prevent direct contact with groundwater.

Soil Vapor

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

3.0 REMEDIAL ALTERNATIVES ANALYSIS

The goal of the remedy selection process 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 exceedence 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 4 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 has 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 4 feet to 11 feet across the entire site to remove all historic fill. If soil/fill containing analytes at concentrations above Track 1 Unrestricted Use SCOs is still present at the base of the excavation after removal

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

- No engineering or institutional controls are required in a Track 1 cleanup, but a vapor barrier system/waterproofing membrane will be installed beneath the entire new floor slab and behind new foundation walls part of construction and will prevent potential future exposures from off-Site soil vapor.

Alternative 2 is a Track 4 alternative and 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. Based on the results of the remedial investigation, it is expected that this alternative would require excavation to a depth of 9-10 feet below the ground surface in the middle of the property. Excavation for development purposes would take place to a depth of more than 9.5 feet across the first 60 feet of the property and approximately two feet in rear yard area. If soil/fill containing SVOCs at concentrations above Track 4 Site-Specific SCOs is still present at the base of the excavation after removal of all soil required for construction of the new building, additional excavation will 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 eliminate exposure to remaining soil/fill;
- Placement of a vapor barrier beneath the building slab and along foundation side walls of partial cellar to prevent any potential future exposures from off-Site soil vapor entering the new building. Vapor barrier is not needed in rear yard area;
- Establishment of use restrictions including prohibitions on the use of groundwater from the site and prohibitions on sensitive site uses, such as farming or vegetable gardening, to eliminate future exposure pathways.
- Establishment of an approved Site Management Plan to ensure long-term management of these engineering and institutional controls including the performance of periodic inspections and certification that the controls are performing as they were intended; and
- 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 eliminating the historic fill at the Site, thus eliminating potential for direct contact with contaminated soil/fill once construction is complete and eliminating the risk of contamination leaching into groundwater. Potential exposure to contaminated soils or groundwater during construction would be minimized by implementing an approved Soil / Materials Management Plan and Community Air Monitoring Plan (CAMP). There would be minimal potential for contact with contaminated groundwater after remediation is complete as it is 40 feet deep, neither used nor anticipated to be accessible after the remedial action. Potential migration of soil vapors from offsite into the new building would be prevented by installing a vapor barrier system and waterproofing membrane beneath the entire new floor slab and behind foundation sidewalls as part of the new development.

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 and a vapor barrier. 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. 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 it is deep and its use is prohibited by city laws and regulations. Potential future migration of off-Site soil

vapors into the new building would be prevented by installing a vapor barrier below the new building's basement slab and continuing the vapor barrier around foundation walls.

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, SCGs and RAOs for soil through removal to Track 1 Unrestricted Use SCOs and groundwater protection standards. Compliance with SCGs for soil vapor would also be achieved by installing a vapor barrier below the new building's basement slab and continuing the vapor barrier around foundation walls, as part of development. 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.

Alternative 2 would achieve compliance with the remedial goals, 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 installing a vapor barrier below the new building's basement slab and continuing the vapor barrier around foundation walls. A Site Management Plan would ensure that these controls remained protective for the long term. Similar to the Track 1 alternative, 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.

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 be higher for Alternative 1 due to excavation of greater amounts of historical fill material (in rear yard area). 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 material and enabling unrestricted usage of the property. Currently, soils at the site are only marginally in excess of Track I SCO's for a select few targeted compounds.

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.

Reduction of toxicity, mobility, or volume of contaminated material

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

Alternative 1 will permanently eliminate the toxicity, mobility, and volume of contaminants from on-Site soil by removing all soil in excess of Track 1 - Unrestricted Use SCOs.

Alternative 2 will remove most of the impacted soil present on the Site and any remaining soil beneath the new building and within the rear yard will meet Track 4 - Site-Specific SCOs. Alternative 1 would eliminate a greater total mass of contaminants on Site.

Implementability

This evaluation criterion addresses the technical and administrative feasibility of implementing an alternative and the availability of various services and materials required during its implementation, including technical feasibility of construction and operation, reliability of the selected technology, ease of undertaking remedial action, monitoring considerations,

administrative feasibility (e.g. obtaining permits for remedial activities), and availability of services and materials.

The techniques, materials and equipment to implement both alternatives are readily available and have been proven effective in remediating the contaminants associated with the Site. They use identical standard materials and services and well established technology. The reliability of each remedy is high. There are no special difficulties associated with any of the activities.

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 capital costs for the Track 1 remedial alternative would be significantly higher as this alternative requires additional excavation in rear yard area and thereby increasing higher volume and associated soil disposal costs.

Both alternatives satisfy the threshold balancing criterion and other criterion listed here, and are fully protective of public health and the environment, will control migration of contaminants, will comply with SCGs, are effective for the short-term and long-term, are implementable, and reduce both mobility and toxicity.

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 Alternatives 1 and 2 for the Site would be acceptable to the community. This RAWP will be subject to and undergo public review under the NYC VCP and will provide the opportunity for detailed public input on the remedial action. This public comment will be considered by OER prior to approval of this plan. The Citizen Participation Plan for the project is provided in Attachment B.

Land use

This evaluation criterion addresses the proposed use of the property. This evaluation has considered reasonably anticipated future uses of the Site and takes into account: current use and historical and/or recent development patterns; applicable zoning laws and maps; NYS Department of State's Brownfield Opportunity Areas (BOA) pursuant to section 970-r of the general municipal law; applicable land use plans; proximity to real property currently used for residential use, and to commercial, industrial, agricultural, and/or recreational areas; environmental justice impacts, Federal or State land use designations; population growth patterns and projections; accessibility to existing infrastructure; proximity of the site to important cultural resources and natural resources, potential vulnerability of groundwater to contamination that might emanate from the site, proximity to flood plains, geography and geology; and current Institutional Controls applicable to the site.

The proposed redevelopment is consistent with the existing zoning designation for the property and is consistent with recent development patterns. The Site is surrounded by residential and commercial properties and the proposed alternative provides comprehensive protection of public health and the environment for these uses. Following remediation, the Site will meet either Track 1 Unrestricted Use or Track 4 Site-specific SCOs, which are both appropriate for its planned residential use. Improvements in the current brownfield condition of the property achieved by the alternatives are also consistent with the City's goals for cleanup of contaminated land and bringing such properties into productive reuse. Both alternatives alternatives are equally protective of natural resources and cultural resources.

Sustainability of the Remedial Action

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

While the Alternative #2 would potentially result in lower energy usage based on reducing the volume of material transported off-Site, both remedial alternatives are comparable with respect to the opportunity to achieve sustainable remedial action. This program contemplates the utilization of several green remediation methods that are compatible with the alternative. The full list of green remediation activities considered in this program is included in the Sustainability Statement.

4.0 REMEDIAL ACTION

4.1 SUMMARY OF PREFERRED REMEDIAL ACTION

The preferred remedial action alternative is Alternative 2; the Track 4 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 selected remedy includes:

1. The proposed remedial action will consist of: Preparation of a Community Protection Statement and implementation of all required NYC VCP Citizen Participation activities according to an approved Citizen Participation Plan.
2. Perform a Community Air Monitoring Program for particulates and volatile organic carbon compounds.
3. Establishment of Track 4 Site Specific 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 Track 4 Site-Specific SCOs, including excavation of soil/fill to a depth of more than 9.5 feet below grade within the footprint of the building, and to a minimum depth of 2 feet below grade in the rear yard.
6. Screening of excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID.
7. Removal of underground storage tanks (if encountered) and closure of petroleum spills (if evidence of a spill/leak is encountered during Site excavation) 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 onsite.

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 beneath the building slab and outside foundation sidewalls below grade.

12. Construction and maintenance of an engineered composite cover will consist of building slab (approximately 62' wide by 60' deep), while the remainder of the lot is proposed as open space rear yard. Open space will be completed with a demarcation barrier and a minimum of two foot of clean cover to prevent human exposure to residual soil/fill remaining under the Site;

13. Installation of demarcation layer in open space rear yard.

14. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations.

15. Performance of all activities required for the remedial action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations.

16. 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.

17. Submission of an approved Site Management Plan (SMP) in the RAR for long-term management of residual fill, including plans for operation, maintenance, monitoring,

inspection and certification of Engineering and Institutional Controls and reporting at a specified frequency.

18. Continued registration of the property with an E-Designation; establishment of Engineering Controls and Institutional Controls in this RAWP; a requirement that management of these controls must be in compliance with an approved SMP; and Institutional Controls including prohibition of the following: (1) vegetable gardening and farming; (2) use of groundwater without treatment rendering it safe for the intended use; (3) disturbance of residual contaminated material unless it is conducted in accordance with the SMP; and (4) higher level of land usage without OER-approval.

4.2 SOIL CLEANUP OBJECTIVES AND SOIL/FILL MANAGEMENT

Track 4 Soil Cleanup Objectives (SCOs) are proposed for this project. The SCOs for this Site are listed below:

The following Track 4 Site-Specific SCOs are proposed for Webster III project:

Contaminant	**Track 4 SCOs**
Total SVOCs	250 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 1274 cubic yards or approximately 1,900 tons.

The proposed disposal locations for Site-derived impacted materials are listed below. Additional disposal locations established at a later date will be reported promptly to the OER Project Manager.

Disposal locations established at a later date will be reported promptly to the OER Project Manager.

Disposal Facility	**Waste Type**	**Estimated Quantities**
Clean Earth Carteret, NJ	Historic fill/non-hazardous	1900 tons

End-Point Sampling

Removal actions for development purposes under this plan will be performed in conjunction with confirmatory end-point sampling. The RI provided endpoint data that met Track 4 - Site Specific SCOs at the 8 to 10 feet interval. However, additional confirmatory post-excavation end-point sampling and testing will be performed promptly following materials removal and completed prior to Site development activities. To evaluate attainment of Track 4 - Site-Specific SCOs, two samples will be collected from the base of the excavation at locations to be determined by OER. End point samples will be analyzed for TAL Metals and SVOCs 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.

In addition, if hotspots are encountered, hotspot removal end-point sampling frequency will consist of the following:

1. For excavations less than 20 feet in total perimeter, at least one bottom sample and one sidewall sample biased in the direction of surface runoff.

2. For excavations 20 to 300 feet in perimeter:

- For surface removals, one sample from the top of each sidewall for every 30 linear feet of sidewall and one sample from the excavation bottom for every 900 square feet of bottom area.
- For subsurface removals, one sample from each sidewall for every 30 linear feet of sidewall and one sample from the excavation bottom for every 900 square feet of bottom area.

3. For 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:

- Semi-volatile organic compounds by EPA Method 8270; and
- Target Analyte List (TAL) Barium.

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

Endpoint soil samples will be containerized in laboratory-prepared jars, labeled, sealed, and placed in a chilled cooler for shipment to the laboratory. Chain of Custody procedures outlined in the RIWP will followed. Soil samples were analyzed by an ELAP-certified laboratory approved by the NYSDOH. For every 20 soil samples, one duplicate soil sample will also be collected and analyzed for all parameters.

Import and Reuse of Soils

Import of soils onto the property and reuse of soils already onsite will be performed in conformance with the Soil/Materials Management Plan in Appendix 3. The estimated quantity of soil to be imported into the Site for backfill and cover soil is 267 yards. With OER approval, the estimated quantity of onsite soil/fill expected to be reused/relocated on Site is 60 yards.

4.3 ENGINEERING CONTROLS

Engineering Controls were employed in the remedial action to address residual contamination remaining at the site. The Site has three primary Engineering Control Systems. These are:

- Composite cover system consisting of concrete covered sidewalks, and concrete building slabs;
- Soil vapor barrier;
- Two foot clean fill cap with underlying demarcation barrier in the rear yard area;

Composite Cover System

As part of new development, the entire property will be covered by an engineered permanent cover system comprised of a concrete-building slab beneath the proposed building. This composite cover system is comprised of:

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:

- Concrete covered sidewalks;
- Minimum two foot clean fill cap with a demarcation barrier in the rear yard area;
- Concrete building slabs.

Figure 5 shows the typical design for each remedial cover type used on this Site and shows the location of each cover type to be utilized.

The composite cover system would serve as 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 consist of:

A 30-mil low permeability geo-membrane liner will be installed underneath the floor of the building extending up along the entire foundation sidewalls to sidewalk grade and attached to the foundation as per manufacturer's specifications. The liner will be protected by a geo-textile non-woven fabric (8 oz./sq. yd.) on both sides to prevent tears and the entire assembly. The VBS will be installed under the direct oversight of a DT Consulting Services, Inc. (DTCS) QEP.

The project's Professional Engineer licensed by the State of New York will have primary direct responsibility for overseeing the implementation of the vapor barrier. Figure 7 shows the installation locations and details of the vapor barrier beneath the floor slab and along the exterior foundation walls. Specifications and installation diagrams and a Chemical Compatibility Letter from the manufacturer are provided in Appendix 5.

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

4.4 INSTITUTIONAL CONTROLS

Institutional Controls (IC) have been incorporated 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 will be implemented under a site-specific Site Management Plan (SMP) that will be included in the RAR. The property will continue to be flagged with an E-Designation.

Institutional Controls for this remedial action are:

- The property will continue to be registered with an E-Designation by 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;
- Site Management Plan approved 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 at a frequency to be determine by OER in the SMP and will comply with RCNY §43-1407(l)(3).

- Vegetable gardens and farming on the Site are prohibited in contact with residual soil materials;
- 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 in this RAWP. The Site Management Plan is submitted as part of the RAR but will be written in a manner that allows its use as an independent document. Site Management continues until terminated in writing by OER. The property owner is responsible to ensure that all Site Management responsibilities defined in the 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 March 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

Historic fill is present in the top 1 to 5 feet of soil of the Site. Based on the results of the RIR, the contaminants of concern found are:

<u>Soil</u>

- Metals, including chromium, lead, selenium and zinc exceeding Track I Unrestricted Use SCOs; and
- SVOCs including Benzo(a)anthracene, Benzo(a) pyrene, Benzo(b)fluoranthene, Chrysene and Indeno(1,2,3-cd)pyrene, marginally above Track 4 SCOs.

<u>Groundwater</u>

- Groundwater samples collected during the RI showed no significant detections in the dissolved phase contaminant concentrations of VOCs, SVOCs, Pesticides and PCBs.

- Sodium (maximum 127 ppm) was the only metal in groundwater to exceed GQS in all four samples.

Soil vapor

- Chlorinated VOCs detected at low concentrations;
  PCE was detected all three vapor samples ranging from 1.3 $\mu g/m^3$ – 28 $\mu g/m^3$ and are below State DOH soil vapor guidance matrix. TCE was detected in all three vapor samples ranging from 0.62 $\mu g/m^3$ – 2.3 $\mu g/m^3$ and are below State DOH soil vapor guidance matrix.

Nature, Extent, Fate and Transport of Contaminants

The soil/fill material contains concentrations of SVOCs and Barium above applicable standards. The elevated constituents are associated with historic fill which is present throughout the full extent of the property and is several feet thick.

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 vacant and uncapped (overgrown with weeds). Under current Site conditions, exposure to surficial historic fill material is possible. Groundwater is contaminated but is not exposed at the Site, and because the Site is served by the public water supply, groundwater is not used at the Site. There are no structures on Site where soil vapor could accumulate, and existing exposure to soil vapor is unlikely.

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. 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. Any on-Site exposures to residual vapors and vapors from off-site sources will be prevented by installation of a soil vapor membrane. Long term assurance of these protections will be achieved by Site inspections and periodic certifications under an approved Site Management Plan. 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.

Receptor Populations

On-Site Receptors – The Site is currently vacant and undeveloped, and an 8-foot high chain link fence restricts access to the Site. Therefore, the only potential on-Site receptors are Site Representatives and trespassers. During redevelopment of the Site, the on-Site potential receptors will include construction workers, site representatives, and visitors. Once the Site is

redeveloped, the on-Site potential sensitive receptors will include adult and child building residents, employees, and visitors.

Off-Site Receptors - Potential off-Site receptors within a 400 foot radius of the Site include: adult and child residents, commercial and construction workers, pedestrians, and cyclists, based on the following:

1. Commercial Businesses (up to 400 feet) – existing and future
2. Residential Buildings (up to 400 feet) – existing and future
3. Building Construction/Renovation (up to 400 feet) – existing and future
4. Pedestrians, Trespassers, Cyclists (up to 400 feet) – existing and future
5. Schools (up to 400 feet) – existing and future

Overall Human Health Exposure Assessment

Based upon this analysis, complete on-site exposure pathways appear to be present only during the current unremediated phase and the remedial action phase. Under current conditions, on-Site exposure pathways are minimized by preventing access to the Site. During the remedial action, on-site exposure pathways will be minimized by preventing access to the Site, through implementation of soil/materials management, storm water pollution prevention, dust controls, employment of a community air monitoring plan, and implementation of a Construction Health and Safety Plan. After the remedial action is complete, there will be no remaining exposure pathways. The long-term site management will interrupt any remaining exposure pathways. Continued protection after the remedial action will be achieved by the implementation of site management including periodic inspection and certification of the performance of remedial controls.

5.0 REMEDIAL ACTION MANAGEMENT

5.1 PROJECT ORGANIZATION AND OVERSIGHT

Principal personnel who will participate in the remedial action include Deborah Thompson, Senior Geologist/Project Manager and Jay Martino, Senior Vice President of Construction of the Stagg Group. The Professional Engineer (PE) and Qualified Environmental Professionals (QEP) for this project are Augustine Okundaye, P.E. and Deborah Thompson respectively.

5.2 SITE SECURITY

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

5.3 WORK HOURS

The hours for operation of remedial construction will be from 07:00 to 4:00. 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 Deborah Thompson of DT Consulting Services, Inc. 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. Exceedances 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 exceedances 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 mcg/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 mcg/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 mcg/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 incompliance 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.

Dewatering

As deemed necessary, dewatering during site excavation activities may occur on-site. If analysis dictates on-site treatment, DTCS would most likely utilize a frac-tank and granular activated carbon (GAC) to process and polish the liquid waste stream during remedial procedures at the facility. The final polishing theory and operational procedures would be as follows:

Liquid Phase Adsorption – Design Considerations

Adsorption/Adsorption Capacity

Adsorption is a natural process by which molecules of a dissolved compound collect on and adhere to the surface of an adsorbent solid. Adsorption occurs when the attractive forces at the carbon surface overcome the attractive forces of the liquid. Granular activated carbon is a particularly good medium due to its high surface area to volume ratio.

The specific capacity of a granular activated carbon to adsorb organic compounds is related to:

- Molecular surface attraction.
- The total surface area available per unit weight of carbon.
- Concentration of contaminants in the influent stream.

Recommended Liquid Phase Carbon System/Usage

Upon collection and analysis of groundwater in the frac tank, DTCS proposes to polish the groundwater with GAC as necessary. The GAC system and required discharge sampling protocols will need to be designed pending the concentrations of targeted compounds reported during analysis.

Permitting

Prior to initiating site work, all local permitting (if required) will be obtained by DTCS from the local municipality. To satisfy state permitting requirements, DTCS on behalf of the Tyler's Bronx Tunnel, LLC would request the NYSDEC to grant a Stipulation Agreement pursuant to section 17-0303 of the Environmental Conservation Law and Section 176 of the Navigation Law based upon the RAWP as presented herein.

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; lose 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. 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. 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 it 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 right out of the property onto Webster Avenue.

5.9 DEMOBILIZATION

Demobilization will include:

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

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

5.10 REPORTING AND RECORD KEEPING

Daily Reports

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

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

The frequency of the reporting period may be revised in consultation with OER project manager based on planned project tasks. Daily email reports are not intended to be the primary

mode of communication for notification to OER of emergencies (accidents, spills), requests for changes to the RAWP or other sensitive or time critical information. However, such information will be included in the daily reports. Emergency conditions and changes to the RAWP will be communicated directly to the OER project manager by personal communication. Daily reports will be included as an Appendix in the Remedial Action Report.

Record Keeping and Photo-Documentation

Job-site record keeping for all remedial work will be performed. These records will be maintained on-Site during the project and will be available for inspection by OER staff. Representative photographs will be taken of the Site prior to any remedial activities and during major remedial activities to illustrate remedial program elements and contaminant source areas. Photographs will be submitted at the completion of the project in the RAR in digital format (i.e. jpeg files).

5.11 COMPLAINT MANAGEMENT

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

5.12 DEVIATIONS FROM THE REMEDIAL ACTION WORK PLAN

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

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

5.13 DATA USABILITY SUMMARY REPORT

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

6.0 REMEDIAL ACTION REPORT

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

- Information required by this RAWP;
- As-built drawings for all constructed remedial elements, required certifications, manifests and other written and photographic documentation of remedial work performed under this remedy;
- Site Management Plan (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.
- Recorded Declaration of Covenants and Restrictions.

- Continue registration of the property with an E-Designation by 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 the Site name Site Site number.

I, _____, am a qualified Environmental Professional. I had primary direct responsibility for implementation remedial program for the Site name Site Site number . (Optional)

I certify that the OER-approved Remedial Action Work Plan dated month day year and Stipulations in a letter dated month day, year; 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.

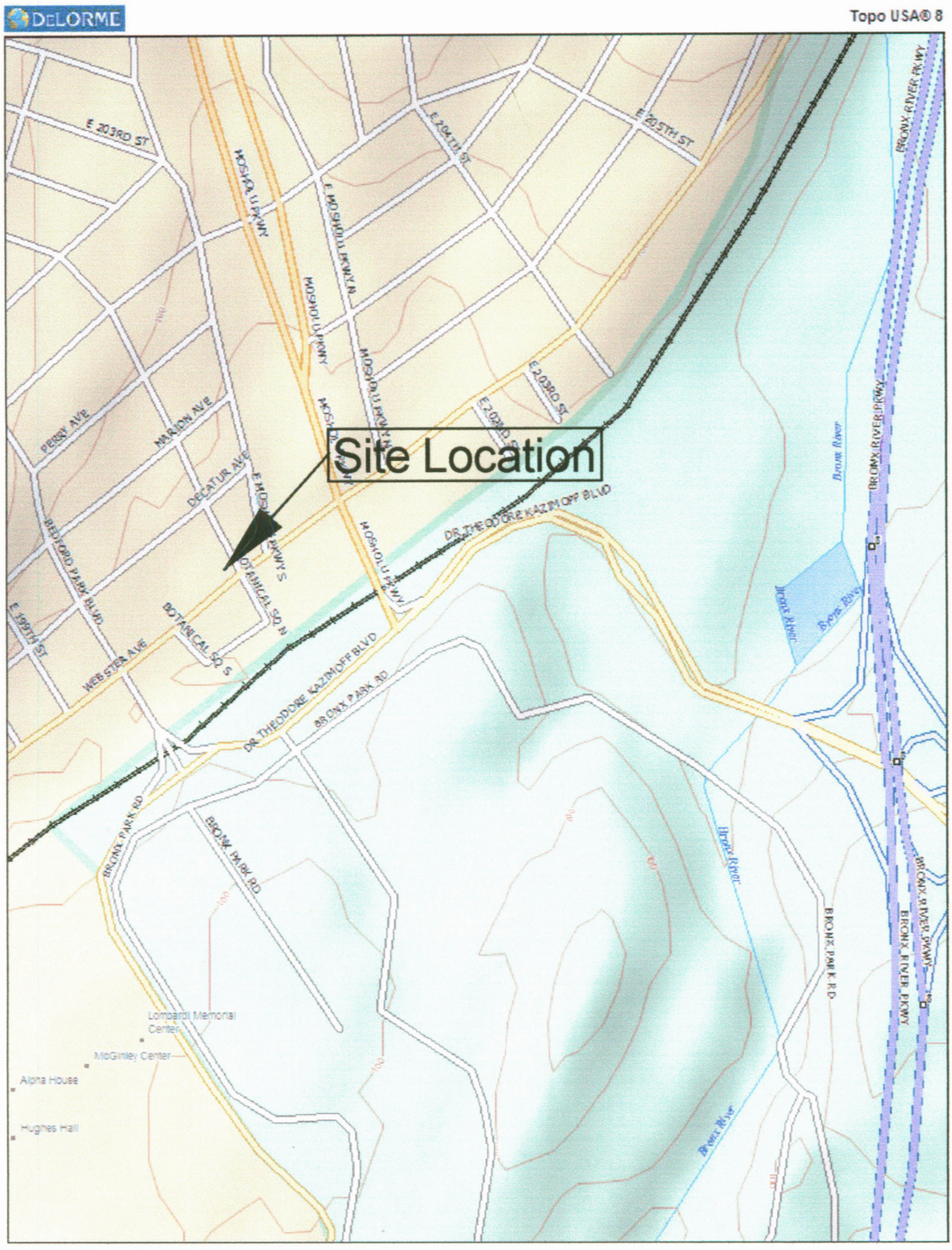
7.0 SCHEDULE

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	1
Demobilization	5	2
Record Declaration of Covenants and Restrictions	7	3
Submit Remedial Action Report	8	6

FIGURES

DT Consulting Services, Inc. 1291 Old Post Road Ulster Park, New York 12487 (845) 658-3484	Client:	Tyler's Bronx Tunnel, LLC			
	Location:	2981 Webster Avenue, Bronx, New York (Webster III)			
	Title:	Site Map			
	Scale: Graphic	Drawn By: DJT	OER No: 13EN-AN187X	Fig.#: 1	



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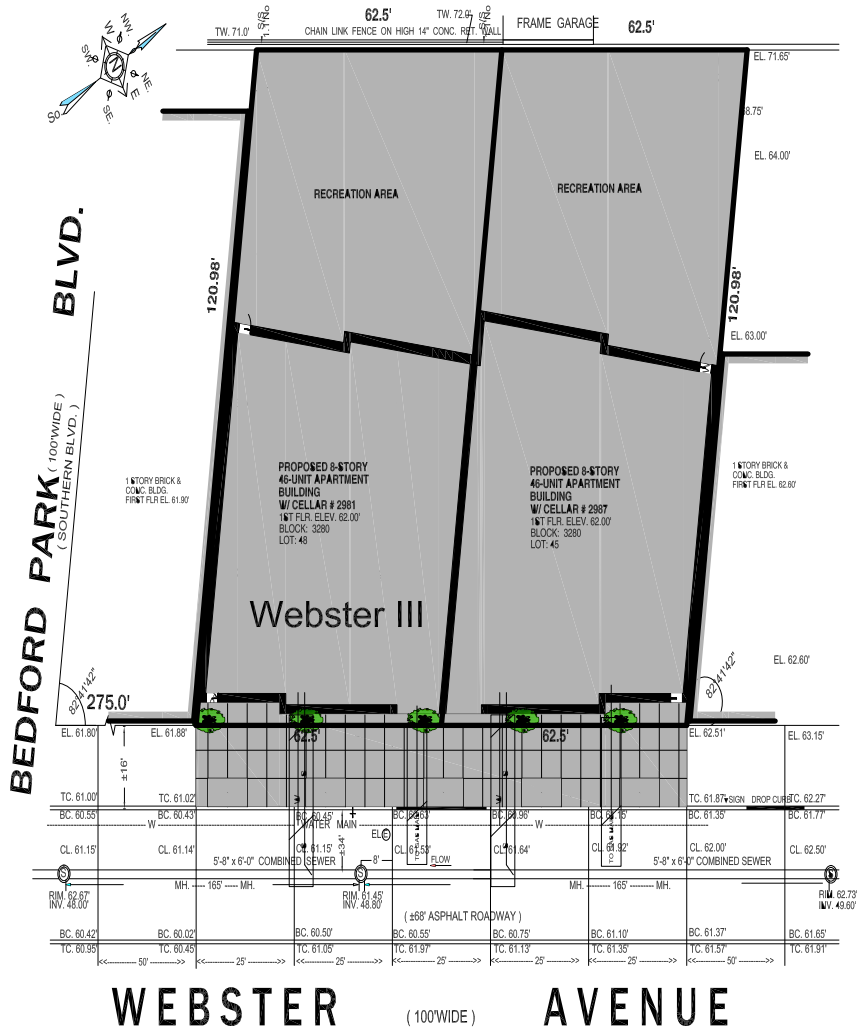
MN (13.1° W)

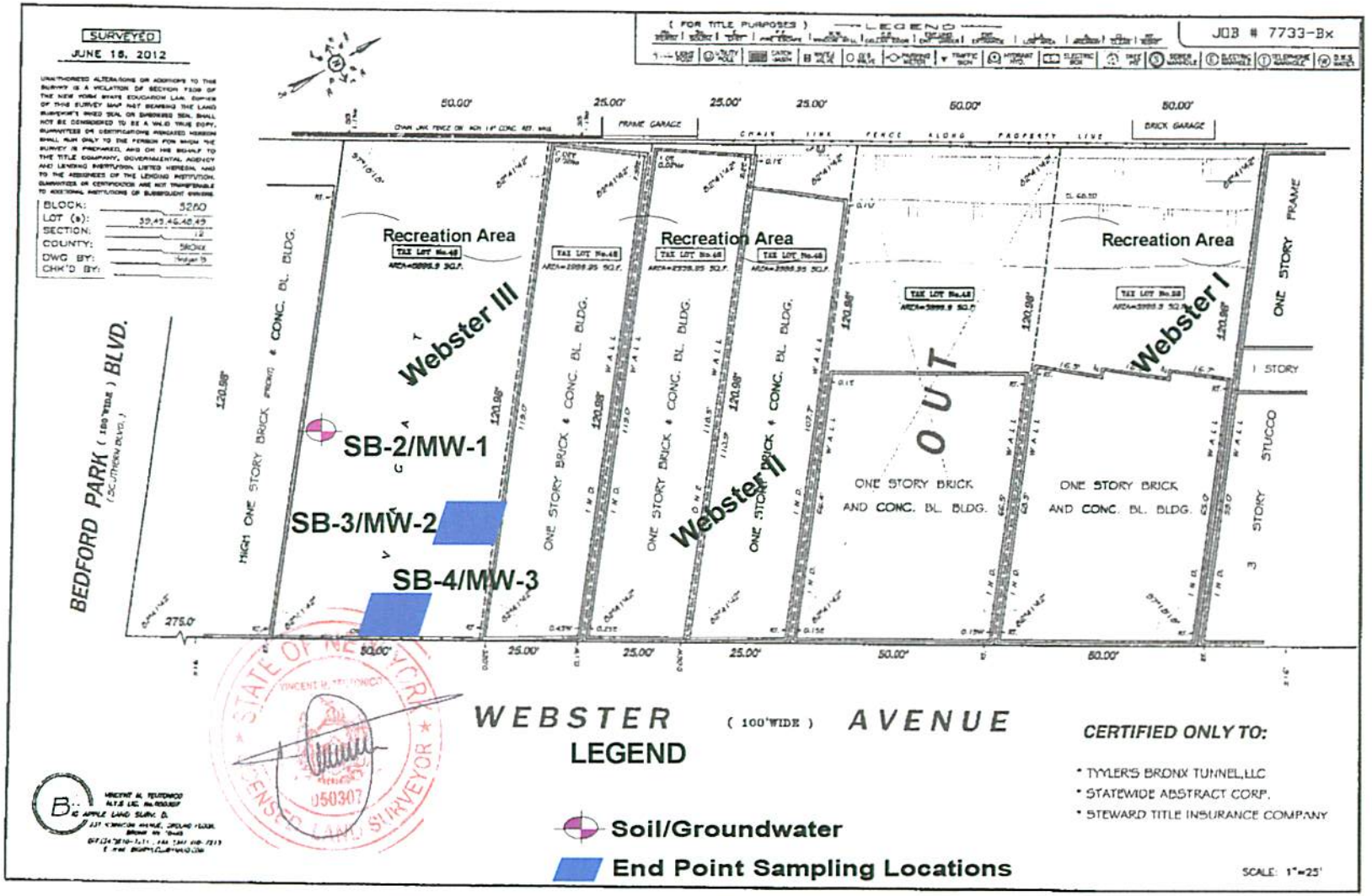
0 180 360 540 720 900 ft

Data Zoom 15-0

DT Consulting Services, Inc. 1291 Old Post Road Ulster Park, New York 12487 (845) 658-3484	Client:	Tyler's Bronx Tunnel, LLC	
	Location:	2981 Webster Avenue, Bronx, New York	
	Title:	Site Location Map	
	Scale: Graphic	OER Project #13EN-AN187X	Fig.#: 2

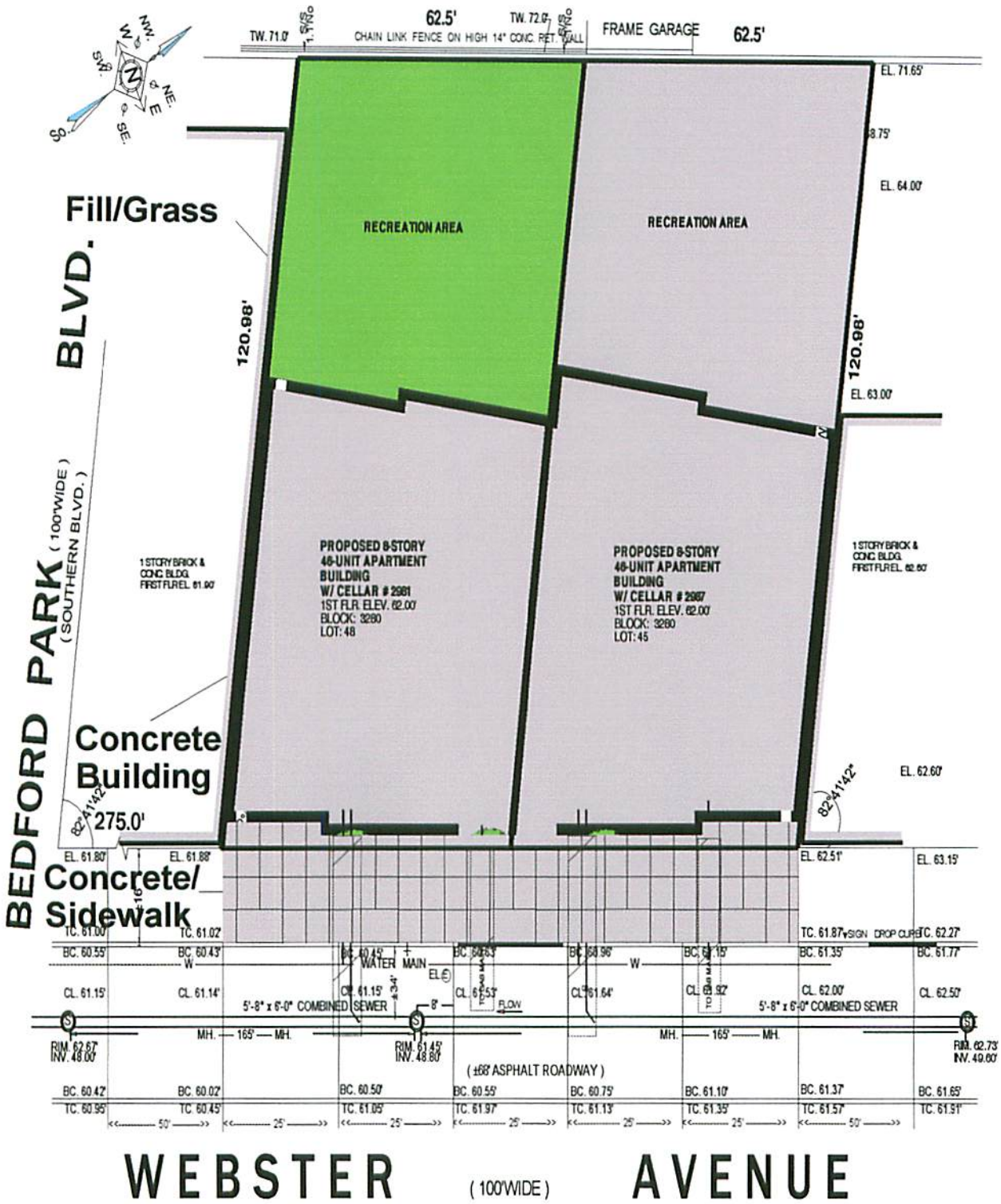


DT Consulting Services, Inc. 1291 Old Post Road Ulster Park, New York 12487 (845) 658-3484	Client:	Tyler's Bronx Tunnell, LLC	
	Location:	2981 Webster Ave, Bronx, New York	
	Title:	Proposed Site Development Map	
	Scale: Graphic	OER Project #13EN-AN187X	Fig.#: 3

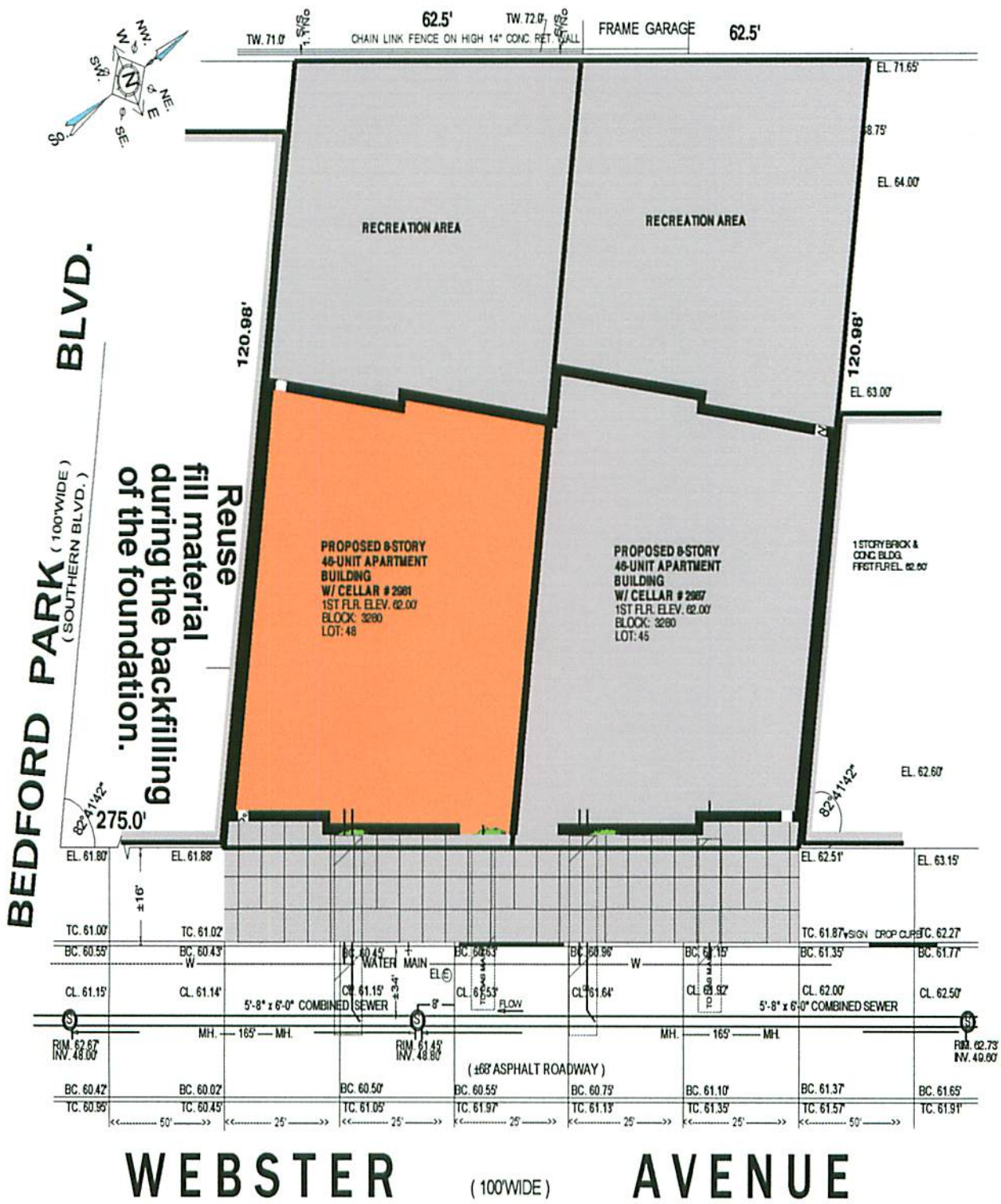


DT Consulting Services, Inc.
1291 Old Post Road
Ulster Park, New York 12487
(845) 658-3484

Location:	2981 Webster Avenue, Bronx, New York (Webster III)		
Title:	Map of End Point Sampling Locations		
Scale: Graphic	Drawn By: DT	OER No: 13EN-AN187X	Fig.#: 4



DT Consulting Services, Inc. 1291 Old Post Road Ulster Park, New York 12487 (845) 658-3484	Client:	Tyler's Bronx Tunnell, LLC	
	Location:	2981 Webster Ave, Bronx, New York	
	Title:	Site-wide cover system plan	
	Scale: Graphic	OER Project #13EN-AN187X	Fig.#: 5



DT Consulting Services, Inc. 1291 Old Post Road Ulster Park, New York 12487 (845) 658-3484	Client: Tyler's Bronx Tunnell, LLC		
	Location: 2981 Webster Ave, Bronx, New York		
	Title: Location of Reused Materials		
	Scale: Graphic	OER Project #13EN-AN187X	Fig.#: 6

TABLES

TABLE 1
Track 4 SCOs

Site:
Tyler's Bronx Tunnel, LLC - Webster III
Bronx, New York

Client Name: Tyler's Bronx Tunnel, LLC
Address: Post Office Box 9
Purchase, New York 10577
Contact Name: Michael Froning

OER Site Number: 13EH-AN187X
Consultant: DT Consulting Services, Inc.

VOC Parameters	Track 4 SCO	SVOC Parameters	Track 4 SCO	TAL Metal Parameters	Track 4 SCO	Pesticides and PCB Parameters	Track 4 SCO
1,1,1-Trichloroethane	500	1,2,4-Trichlorobenzene	T	Aluminum	NS	4,4'-DDD	92
1,1,2,2-Tetrachloroethane	NS	1,2-Dichlorobenzene	O	Antimony	NS	4-4'-DDE	62
1,1,2-Trichloro-1,2,2-trifluoroethane	NS	1,3-Dichlorobenzene	T	Arsenic	16	4,4'-DDT	47
1,1,2-Trichloroethane	NS	1,4-Dichlorobenzene	A	Barium	<750	Aldrin	1
1,1-Dichloroethane	240	2,4,5-Trichlorophenol	L	Beryllium	590	alpha-BHC	3.4
1,1-Dichloroethene	500	2,4,6-Trichlorophenol		Cadmium	9.3	Aroclor 1221	1
1,2,4-Trichlorobenzene	NS	2,4-Dichlorophenol	S	Calcium	NS	Aroclor 1232	1
1,2,4-Trimethylbenzene	190	2,4-Dimethylphenol	V	Chromium	400	Aroclor 1242	1
1,2-Dibromoethane	NS	2,4-Diniyrophenol	O	Cobalt	NS	Aroclor 1248	1
1,2-Dichlorobenzene	280	2,4-Dinitrotoluene	C	Copper	270	Aroclor 1254	1
1,2-Dichloroethane	30	2,6-Dinitrotoluene		Iron	NS	Aroclor 1260	1
1,2-Dichloropropane	NS	2-Chloronaphthalene	250	Lead	1,000	beta-BHC	3
1,2-Dichlorotetrafluoroethane	NS	2-Chlorophenol	PPM	Magnesium	NS	Chlordane, total	24
1,3,5-Trimethylbenzene	190	2-Methylnaphthalene		Manganese	10,000	delta-BHC	500
1,3-Butadiene	NS	2-Nitroaniline		Nickel	310	Dieldrin	1
1,3-Dichlorobenzene	280	2-Nitrophenol		Potassium	NS	Endosulfan I	200
1,4-Dichlorobenzene	130	3- &4-Methylphenols		Selenium	1500	Endosulfan II	200
1,4-Dioxane	130	3,3'-Dichlorobenzidine		Silver	1500	Endosulfan sulfate	200
2-Butanone	NS	3-Nitroaniline		Sodium	NS	Endirn	89
2-Hexanone	NS	4,6-Dinitro-2-methylphenol		Thallium	NS	Endrin aldehyde	NS
4-Methyl-2-pentanone	NS	4-Bromophenyl phenyl ether		Vanadium	NS	gamma-BHC (Lindane)	NS
Acetone	500	4-Chloro-3-methylphenol		Zinc	10,000	Heptachlor	15
Benzene	44	4-Chloroaniline		Mercury	2.8	Heptachlor epoxide	NS
Benzyl chloride	NS	4-Chlorophenyl phenyl ether				Methoxychlor	NS
Bromodichloromethane	NS	4-Nitroaniline				Total PCBs	1
Bromoform	NS	4-Nitrophenol				Toxaphene	NS
Bromomethane	NS	Acenaphthene					
Carbon Disulfide	NS	Ancenaphthylene					
Carbon Tetrachloride	22	Anthracene					
Chlorobenzene	500	Benzo(a)anthracene					
Chloroethane	NS	Benzo(a)pyrene					
Chloroform	350	Benzo(b)fluoranthene					
Chloromethane	NS	Benzo(g,h,i)perylene					
cis-1,2-Dichloroethene	500	Benzo(k)fluoranthene					
cis-1,3-Dichloropropylene	NS	Benzoic acid					
Cyclohexane	NS	Benzyl alcohol					
Dibromochloromethane	NS	Benzyl butyl phthalate					
Dichlorodifluoromethane	NS	Bis(2-chloroethoxy)methane					
Ethyl acetate	NS	Bis(2-chloroethyl)ether					
Ethyl Benzene	390	Bis(2-ethylhexyl)phthalate					
Hexachlorobutadiene	NS	Chrysene					
Isopropanol	NS	Dibenz(a,h)anthracene					
MTBE	500	Dibenzofuran					
Methylene chloride	500	Diethyl phthalate					
n-Heptane	NS	Dimethyl phthalate					
n-Hexane	NS	Di-n-butyl phthalate					
o-Xylene	500	Di-n-octyl phthalate					
p-&m- Xylenes	500	Fluoranthene					
p-Ethyltoluene	NS	Fluorene					
Propylene	NS	Hexachlorobenzene					
Styrene	NS	Hexachlorobutadiene					
Tetrachloroethene	150	Hexachlorocyclopentadiene					
Tetrahydrofuran	NS	Hexachloroethane					
Toluene	500	Indeno(1,2,3-cd)pyrene					
trans-1,2-Dichloroethene	500	Isophorone					
trans-1,3-Dichloropropylene	NS	Naphthalene					
Trichloroethene	200	Nitrobenzene					
Trichlorofluoromethane	NS	N-nitroso-di-n-propylamine					
Vinyl acetate	NS	Pentachlorophenol					
Vinyl Chloride	13	Phenanthrene					
		Phenol					
		Pyrene					

Notes:

1. All measurements recorded in parts per million or ppm.
2. NS = Not specified.

APPENDICES

APPENDIX 1

CITIZEN PARTICIPATION PLAN

The NYC Office of Environmental Remediation and Tyler's Bronx Tunnel, LLC 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, Tyler's Bronx Tunnel, LLC will maintain a repository for project documents and provide public notice at specified times throughout the remedial program. This Plan also takes into account potential environmental justice concerns in the community that surrounds the project Site. Under this Citizen Participation Plan, project documents and work plans are made available to the public in a timely manner. Public comment on work plans is strongly encouraged during public comment periods. Work plans are not approved by the NYC Office of Environmental Remediation (OER) until public comment periods have expired and all comments are formally reviewed. An explanation of cleanup plans in the form of a public meeting or informational session is available upon request to OER's project manager assigned to this Site, Breanna Gribble, 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. Tyler's Bronx Tunnel, LLC will inspect the repositories to ensure that they are fully populated with project information. The repository for this project is:

New York Public Library
285 East 205th Street
Bronx, NY 10467

(Please call (718) 882-8239 for hours of operation)

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.

Identify Issues of Public Concern. No site-specific issues of public concern are anticipated.

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 Tyler's Bronx Tunnel, LLC , reviewed and approved by OER prior to distribution and mailed by Tyler's Bronx Tunnel, LLC . 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.**

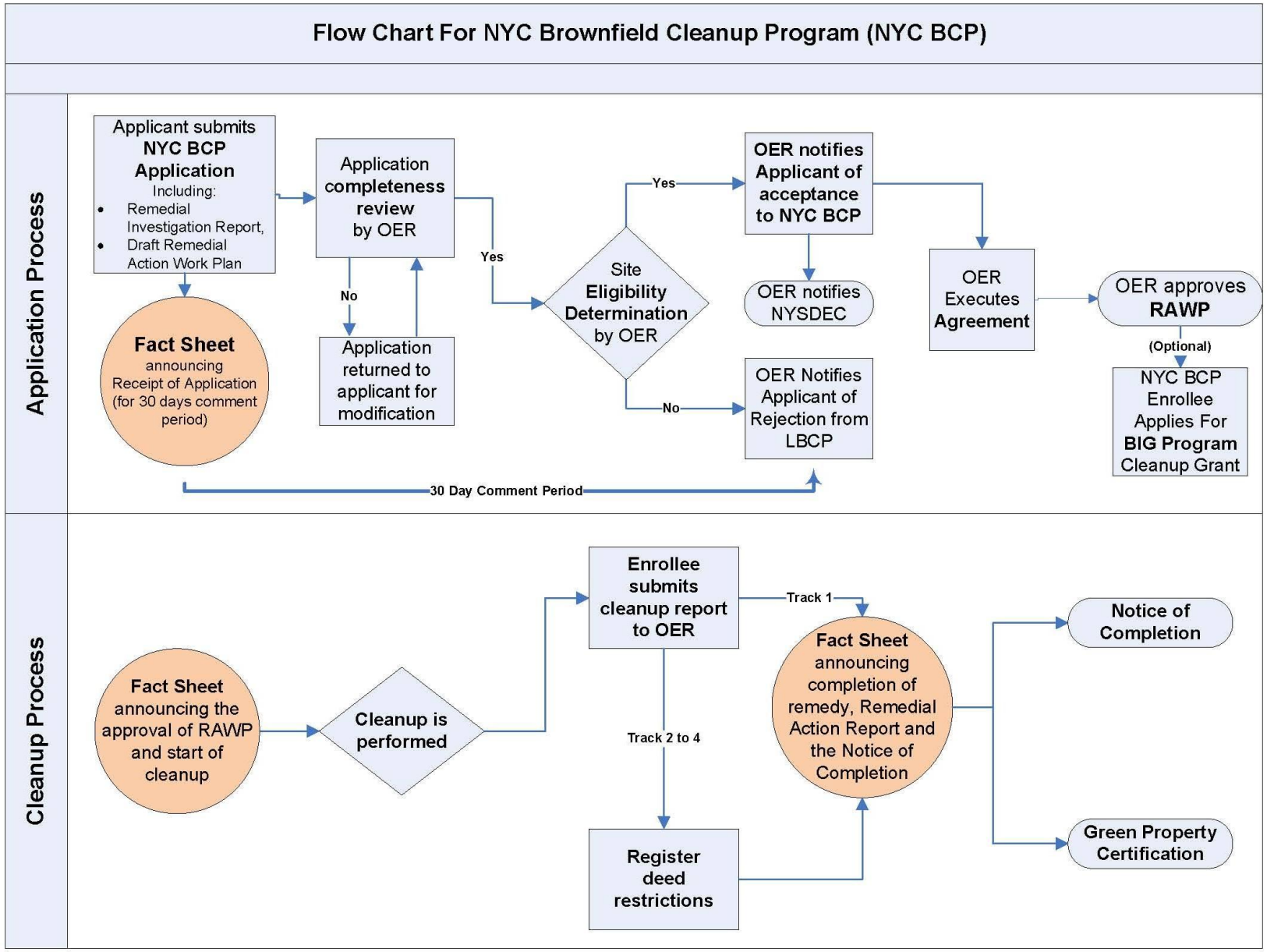
  Public notice in the form of a Fact Sheet is sent to all parties listed on the Site Contact List announcing the availability of the Remedial Investigation Report and Remedial Action Work Plan and the initiation of a 30-day public comment period on the Remedial Action Work Plan. The Fact Sheet summarizes 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.


Flow Chart For NYC Brownfield Cleanup Program (NYC BCP)
Application Process
Applicant submits NYC BCP Application Including: • Remedial Investigation Report, • Draft Remedial Action Work Plan
Fact Sheet announcing Receipt of Application (for 30 days comment period)
Application completeness review by OER
No
Application returned to applicant for modification
Yes
Site Eligibility Determination by OER
Yes
OER notifies Applicant of acceptance to NYC BCP
OER notifies NYSDEC
No
OER Notifies Applicant of Rejection from LBCP
OER Executes Agreement
OER approves RAWP
(Optional)
NYC BCP Enrollee Applies For BIG Program Cleanup Grant
30 Day Comment Period
Cleanup Process
Fact Sheet announcing the approval of RAWP and start of cleanup
Cleanup is performed
Enrollee submits cleanup report to OER
Track 1
Track 2 to 4
Register deed restrictions
Fact Sheet announcing completion of remedy, Remedial Action Report and the Notice of Completion
Notice of Completion
Green Property Certification

APPENDIX 2

SUSTAINABILITY STATEMENT

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

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

Approximately 60 yards of clean, non-virgin materials will be reused under this plan will be quantified and reported in the RAR.

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

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

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

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

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

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

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

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

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

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

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

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

Paperless Brownfield Cleanup Program. Webster III 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 III is participating in OER's low-energy project management program. Under this program, whenever possible, meetings are held

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

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

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

APPENDIX 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 right out of the site onto Webster Avenue. 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 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.

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

1.7 MATERIALS REUSE ON-SITE

Soil and fill that is derived from the property that meets the soil cleanup objectives established in this plan may be reused on-Site. The soil cleanup objectives for on-Site reuse are listed in Table 1. 'Reuse on-Site' means material that is excavated during the remedy or development, does not leave the property, and is relocated within the same property and on comparable soil/fill material, and addressed pursuant to the NYC VCP agreement subject to Engineering and Institutional Controls. The PE/QEP will ensure that reused materials are segregated from other materials to be exported from the Site and that procedures defined for material reuse in this RAWP are followed. The expected location for placement of reused material is shown in Figure 6.

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

1.8 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 1.

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

Environmental Services Health & Safety Plan

Job Name: Tyler's Bronx Tunnel, LLC – Webster III

1.0 Introduction

2.0 Organizational Structure

2.1 Safety and Health Manager
2.2 Site Safety and Health Office
2.2.1 Responsibilities

3.0 Personal Protective Equipment

3.1 Protection Levels
3.1.1 Level A
3.1.2 Level B
3.1.3 Level C
3.1.4 Level D

4.0 Work Zones

4.1 Exclusion Zone
4.2 Contamination Reduction Zone
4.3 Support Zone

5.0 Air Monitoring

6.0 Site Communications

7.0 Emergency Procedures

7.1 Injury in the exclusion zone
7.2 Injury in the support zone
7.3 Fire or explosion
7.4 Protective equipment failure

8.0 Standard Safety Practices

9.0 Daily Safety Meetings

10.0 Site Specific Plan

10.1 Detailed site information
10.2 Contaminants on site/Action Levels
10.3 Emergency Information
10.3.1 Emergency Responders
10.3.1.1 Hospital
10.3.1.2 Emergency telephone numbers
10.3.1.3 Regulatory agencies

10.4 First Aid
10.5 Work Zones
10.5.1 Command post
10.6 Site Communications
10.6.1 Telephone
10.6.2 Hand Signals
10.7 Environmental Monitoring
10.8 Personal Protective Equipment
10.8.1 Exclusion zone
10.8.2 Contamination reduction corridor
10.9 Decontamination
10.9.1 Decontamination Procedure

11.0 Key Personnel

12.0 Work Plan

12.1 Job objective / Detailed work plan

1.0 INTRODUCTION

DT Consulting Services, Inc. (DTCS) has designed a safety and health program to provide its employees with the guidelines necessary to ensure their own safety and health as well as that of the surrounding community. The goal of this plan is to minimize the risk of injury during remedial action procedures.

2.0 ORGANIZATIONAL STRUCTURE

2.1 SAFETY AND HEALTH MANAGER

It is the responsibility of the safety and health manager to develop the comprehensive safety and health plan. The safety and health manager will be apprised of any changes in the comprehensive safety and health plan as well as all site-specific procedural determinations. The safety and health manager for this project will be Ms. Deborah Thompson.

2.1.1 RESPONSIBILITIES

a) Initial site evaluation
b) Hazard identification
c) Determination of appropriate protection levels
d) Conduct daily safety and health meetings
e) Supervision of site sampling and monitoring
f) Supervision of decontamination procedures
g) Designate work zones to maintain site integrity

3.0 PERSONAL PROTECTIVE EQUIPMENT

The proper personal protective equipment is chosen by the site safety and health officer in consultation with the safety and health manager. The level of protection is dependent on the hazards that are likely to be encountered on-site.

3.1 PROTECTION LEVELS

DTCS utilizes four levels of protection as set forth in the OSHA guidelines, Appendix B of 1910.120.

3.1.1 Level A

Level A provides the greatest level of skin, respiratory, and eye protection with the following minimum equipment:

- Full face, self-contained breathing apparatus (SCBA) or supplied air with escape SCBA
- Fully encapsulated chemical resistant suit
- Chemical resistant boots
- Chemical resistant inner and outer gloves

3.1.2 Level B

Level B provides the greatest level of respiratory protection, but a lower level of skin protection than Level A with the following minimum equipment:

- Full face SCBA or supplied air with escape SCBA
- Chemical resistant clothing
- Chemical resistant inner and out gloves
- Chemical resistant boots

3.1.3 Level C

Level C provides the same level of skin protection as Level B, but a lower level of respiratory protection with the following minimum equipment:

- Full face piece air purifying respirator with appropriate cartridge. Cartridges are chosen based on knowledge of hazardous material
- Chemical resistant clothing
- Chemical resistant inner and outer gloves
- Chemical resistant boots

3.1.4 Level D

Level D provides the lowest level of skin protection and no respiratory protection with the following minimum equipment:

- Coveralls
- Safety boots
- Gloves
- Safety glasses or splash goggles

4.0 WORK ZONES

DTCS utilizes the standard three-zone approach to site control. These zones are the exclusion zone, the contamination reduction zone and the support zone. Movement of personnel and equipment through these zones shall be strictly regulated in order to prevent contamination of clean environments and to protect workers in the support zone from possible exposure.

4.1 EXCLUSION ZONE

The exclusion zone is the area of highest contamination. All personnel entering this zone must wear the appropriate level of protection as prescribed in the site specific safety plan. The outer boundary of the exclusion zone, referred to as the Hotline, shall be determined based upon such considerations as; extent of surface contamination, safe distance in the case of fire or explosion, physical area necessary for workers to conduct operations in a safe manner and safe distance in the event of vapor or gas emissions. Upon determination, the Hotline shall be visibly marked and secured to prevent accidental entry by unauthorized personnel.

4.2 CONTAMINATION REDUCTION ZONE

The Contamination Reduction Zone is the area between the exclusion zone and the support zone. Its purpose it to protect the clean environment from contamination as workers enter and exit the exclusion zone. The outer boundary of this zone is referred to as the Coldline and shall be clearly marked. Decontamination stations shall be set up in this zone in a line known as the contamination reduction corridor. All personnel exiting the exclusion zone must follow the steps as prescribed in the decontamination procedures prior to re-entering the support zone.

4.3 SUPPORT ZONE

The support zone is the area furthest away from the exclusion zone. It is considered a clean, non-contaminated area where workers need not wear any protective equipment. The command post, equipment trailer, first aid station and lavatory facilities are all located in this area. This area is not, however, open to traffic. Only authorized personnel may enter.

5.0 AIR MONITORING

As the initial site evaluation work plan entails minimal site intrusive activities, specific air monitoring procedures would include only the periodic recording of total volatile organic compound or VOC concentrations with a Photoionization Detector (PID) or equivalent during site activities.

6.0 SITE COMMUNICATIONS

Various methods of communication will be employed based upon site conditions and work zones. Regardless of method of communication, personnel working in the exclusion zone will remain within constant view of support crews.

DTCS has a network of devices to aid in communications. All or some of the following devices may be used depending upon job site requirements; hand held radios, headset transistor walkie-talkies and cellular telephones.

The following hand signals shall be standardized for use in emergencies and in event of radio communication breakdown.

Hand gripping throat - out of air, can't breathe
Grip partner's wrist - leave area immediately
Hands on top of head - need assistance
Thumbs up - I am all right, okay
Thumbs down - no, negative

Horn blasts may be used to gain the immediate attention of crews to indicate that dangerous conditions exist.

7.0 EMERGENCY PROCEDURES

The following procedures shall be followed by all site personnel in the event of an emergency. Any changes to this procedure shall be noted in the site-specific plan. In all situations where there has been an evacuation of exclusion zone, reentry shall not be permitted until the following conditions have been met; the cause of the emergency has been determined and corrected, the site hazards have been reassessed, the safety plan has been reviewed and all personnel have been apprised of any changes.

7.1 INJURY IN THE EXCLUSION ZONE

In the event of an injury in the exclusion zone, the emergency signal shall be sounded. All personnel in the exclusion zone will assemble at the contamination reduction corridor. First aid procedures will begin on-site and if necessary, an ambulance will be called. No personnel will be allowed to re-enter the exclusion zone until the exact nature and cause of the injury has been determined.

7.2 INJURY IN THE SUPPORT ZONE

In the event of an injury in the support zone, on-site first aid procedures will begin immediately and an ambulance called if necessary. The site safety and health officer shall determine if the nature and cause of the injury or loss of the injured person will jeopardize the smooth running of the operations. If so, the emergency signal will be sounded and all personnel will follow the same procedure as outline above.

7.3 FIRE OR EXPLOSION

In the event of fire or explosion, the emergency signal shall be sounded and all personnel will assemble at the contamination reduction corridor. The fire department will be called and all personnel will be evacuated to a safe distance.

7.4 PROTECTIVE EQUIPMENT FAILURE

In the vent of protective equipment failure, the affected worker and his/her buddy will leave the exclusion zone immediately. In the event of any other equipment failure, the site safety and health officer will determine if this failure affects the operation. If so, the emergency signal will be sounded and all personnel will leave the exclusion zone until such time as it is deemed safe.

8.0 STANDARD SAFETY PRACTICES

The following guidelines will be followed by all personnel at all times; any changes must be approved by the safety and health manager.

- All employees will attend the daily safety meetings prior to site entry.

- The buddy system will be utilized at all times.

- There will be no eating, drinking, smoking, or use of smoking material (i.e. matches) within the work area(s).

- Only authorized personnel will be allowed in designated work zones and will wear the proper personal protective clothing and equipment as prescribed in the site safety plan.

- The site safety and health officer will be appraised of any unusual circumstances immediately.

Such circumstances include but are not limited to the following; unusual odors, emissions, signs of chemical reaction, and discovery of conditions or substances not mentioned in the site safety plan. The site safety officer will then determine if these conditions warrant a shut down of operations.

9.0 DAILY SAFETY MEETINGS

Daily safety meetings will be conducted by the site safety and health officer prior to commencement of work. All personnel, regardless of job classification are required to attend.

9.1 DISCUSSIONS

1. Overview of safety and health plan.

2. Detailed discussion of substances of concern with emphasis on exposure limits, exposure symptoms and exposure hazards.

3. Review of standard safety precautions and work practices.

4. Review of work plan.

5. Review of hand signals and emergency signals.

Personnel will sign a daily attendance sheet, which shall include an overview of the topics discussed.

10.0 SITE SPECIFIC PLAN

10.1 DETAILED SITE INFORMATION

- **Plan Date** TBA
- **Job Name** Tyler's Bronx Tunnel, LLC – Webster III
- **Client** Tyler's Bronx Tunnel, LLC
- **Client Contact/Phone Number**
  Michael S. Froning – (914) 251-1374
- **Site Address** 2981 Webster Avenue
  Bronx, New York
- **Cross Street** East 201st Street & Bedford Park Blvd
- **Site Access** Direct

10.2 CONTAMINANTS ON SITE/ACTION LEVELS

The following substances have the potential to exist on-site. The general primary hazards of each are identified, associated primarily with direct skin contact and inhalation.

SUBSTANCE	PRIMARY HAZARDS
Volatile & Semi-Volatile Organics	Eye, skin and respiratory irritation, nausea, vomiting, headache, liver, kidney, lung damage, sore throat, dizziness.
PCBs	Skin irritation, liver damage, fatigue, headaches, coughs, and unusual skin sores. Potential carcinogenic and non-carcinogenic effects.
Pesticides	Nausea, vomiting, diarrhea or stomach cramps. Headache, dizziness, weakness, or confusion. Excessive sweating, tearing, chills, or thirst. Chest pains. Breathing difficulties, body aches and muscle cramps.
Metals	Cough, weakness, eye, skin and throat irritation, abdominal pain, nausea, vomiting, headache, muscle aches, chills. Lung damage.

Action Levels

Action levels shall be determined by monitoring of work zone breathing space with a portable Photoionization detector (PID) or comparable instrument. Measurement of a sustained concentration above ambient (background) conditions shall initiate action. The following criteria shall be used to determine appropriate action:

VOCs in Breathing Zone (sustained and above background)	**Level of Respiratory Protection**
0 – 5 ppm	Level D
5 – 200 ppm	Level C
200 – 1000 ppm	Level B - air line
1000+ ppm	Level B - SCBA

If the above criteria indicate the need to increase from Level D to a higher level of personal protection, all work in that particular site area will be immediately suspended until the required protective equipment is make available, or until Level D conditions return.

10.3 EMERGENCY INFORMATION

10.3.1 EMERGENCY RESPONDERS

10.3.1.1 HOSPITAL

Name: Montefiore Medical Center

Address & Telephone Number:
111 East 210th Street, Bronx, NY
(718) 920-4321

Distance from Site: 0.96 Miles

10.3.1.2 EMERGENCY TELEPHONE NUMBERS

Police 911 on Cellular Phone
Fire 911 on Cellular Phone
Ambulance 911 on Cellular Phone

10.3.1.3 REGULATORY AGENCIES

EPA Telephone Number	1-800-424-8802
NYSDEC Spills Hotline	1-800-457-7362

10.4 FIRST AID

First Aid available at the following stations:

First Aid Kit TRUCK
Emergency Eye Wash TRUCK & ON SITE

10.5 WORK ZONES

10.5.1 COMMAND POST

Command post will be mobile.

10.6 SITE COMMUNICATIONS

10.6.1 TELEPHONE

Command Post Telephone - Cellular Phone
Number (845)943-0159

10.6.2 HAND SIGNALS

See Section 6.0

10.7 ENVIRONMENTAL MONITORING

10.7.1 MONITORING EQUIPMENT

Refer to Phase II Work Plan

10.8 PERSONAL PROTECTIVE EQUIPMENT

10.8.1 EXCLUSION ZONE, PROTECTION LEVEL

PROTECTIVE EQUIPMENT:	Level D
RESPIRATORY	None
HANDS	Nitrile or Leather
FEET	Steel Toed Boots
SUIT	None

10.8.2 CONTAMINATION REDUCTION CORRIDOR (DECON LINE)

PROTECTIVE EQUIPMENT:	Level D
RESPIRATORY	None
HANDS	Nitrile or Leather
FEET	Steel Toed
SUIT	None

10.9 DECONTAMINATION

10.9.1 DECONTAMINATION PROCEDURE

STATION 1 SOAPY WATER

STATION 2 WATER

11.0 KEY PERSONNEL

SAFETY AND HEALTH MANAGER / ON-SITE SUPERVISOR
Deborah J. Thompson

FOREMEN
TBA

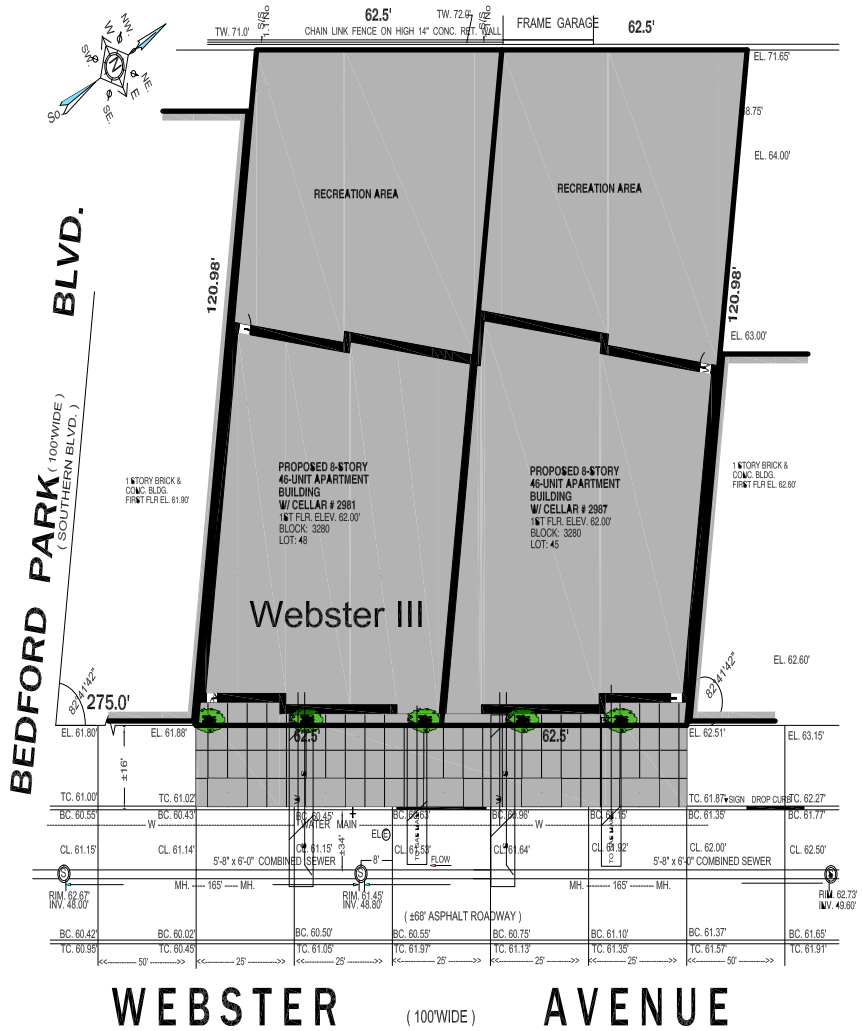
FIELD PERSONNEL
Will Vary

12.0 WORK PLAN

12.1 JOB OBJECTIVE

The objective is to execute a Remedial Action Work Plan which includes soil excavation, staging and ultimate off-site disposal. This project will be under the management of New York City Office of Environmental Remediation (OER) for Hazardous Materials E-Designation Projects. Upon completion of field work, a Remedial Action Report or RAR will be generated to document remedial actions and remedial management executed on-site.

APPENDIX 5



DT Consulting Services, Inc. 1291 Old Post Road Ulster Park, New York 12487 (845) 658-3484	Client:	Tyler's Bronx Tunnell, LLC	
	Location:	2981 Webster Ave, Bronx, New York	
	Title:	Proposed Site Development Map	
	Scale: Graphic	OER Project #13EN-AN187X	Fig.#: 3

APPENDIX 6

CLEANEARTH
Faster, smarter, greener solutions...

VOID

Manifest #

GLOBAL JOB NUMBER: _____ **FACILITY APPROVAL NUMBER:** _____

Please Check One:

☒ Clean Earth of Carteret
24 Middlesex Avenue
Carteret, NJ 07008
Ph: 732-541-8909

☐ Clean Earth of Maryland
1469 Oak Ridge Place
Hagerstown, MD 21740
Ph: 301-791-6220

☐ Clean Earth of New Castle
94 Pyles Lane
New Castle, DE 19720
Ph: 302-427-6633

☐ Other
_____
_____
_____

☐ Clean Earth of Philadelphia
3201 S. 61st Street
Philadelphia, PA 19153
Ph: 215-724-5520

☐ Clean Earth of West Virginia
3815 South State Route 2
Friendly, WV 26146
Ph: 304-652-8580

☐ Clean Earth of Southeast Pennsylvania
7 Steel Road East
Morrisville, PA 19067
Ph: 215-428-1700

Non-Hazardous Material Manifest

(Type or Print Clearly)

GENERATOR'S NAME & SITE ADDRESS:	GROSS WEIGHT: ☒ Tons ☐ Yards	
	TARE WEIGHT: ☒ Tons ☐ Yards	
GENERATOR'S PHONE: _____	NET WEIGHT: ☒ Tons ☐ Yards	

DESCRIPTION OF MATERIAL/SAMPLE ID AND LOCATION

NON-HAZ Soil

GENERATOR'S CERTIFICATION – Incomplete and/or unsigned manifests will cause the load to be delayed and/or rejected.

I hereby certify that the above named material does not contain free liquid as defined by 40 CFR Part 260.10 or any applicable state law, is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, is not a DOT hazardous substance as defined by 49 CFR Part 172 or any applicable state law, has been fully and accurately described above, classified, packaged and is in proper condition for transportation according to all applicable state and federal regulations.

Name: _____ Title: _____

Signature: _____ Date and Time: _____

TRANSPORTER

Company: _____ Phone Number: _____

Address: _____ Truck # and License Plate: _____

Driver: _____ SW Haulers Permit #: _____

(Type or Print Clearly) (applicable state permit #)

I hereby certify that the above named material was picked up at the site listed above.

Driver Signature: _____ Date and Time: _____

DESTINATION

I hereby certify that the above named material was delivered without incident to the facility noted above.

Driver Signature: _____ Date and Time: _____

I hereby certify that the above named material has been accepted at the above referenced facility.

Authorized Signature: _____ Date and Time: _____

APPENDIX 7

VAPORBLOCK® PLUS™ VBP20

Under-Slab Vapor / Gas Barrier

RAVEN INDUSTRIES

Product Description

VaporBlock® Plus™ 20 is a seven-layer co-extruded barrier made from state-of-the-art polyethylene and EVOH resins to provide unmatched impact strength as well as superior resistance to gas and moisture transmission. VaporBlock® Plus™ 20 is a highly resilient underslab / vertical wall barrier designed to restrict naturally occurring gases such as radon and/or methane from migrating through the ground and concrete slab. VaporBlock® Plus™ 20 is more than 100 times less permeable than typical high-performance polyethylene vapor retarders against Methane, Radon and other harmful VOCs.

VaporBlock® Plus™ 20 is one of the most effective underslab gas barriers in the building industry today far exceeding ASTM E-1745 (Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs) Class A, B and C requirements. Available in a 20 (Class A) mil thicknesses designed to meet the most stringent requirements. VaporBlock® Plus™ 20 is produced within the strict guidelines of our ISO 9001:2008 Certified Management System.

Product Use

VaporBlock® Plus™ 20 resists gas and moisture migration into the building envelop when properly installed to provide protection from toxic/harmful chemicals. It can be installed as part of a passive or active control system extending across the entire building including floors, walls and crawl spaces. When installed as a passive system it is recommended to also include a ventilated system with sump(s) that could be converted to an active control system with properly designed ventilation fans.

VaporBlock® Plus™ 20 works to protect your flooring and other moisture-sensitive furnishings in the building's interior from moisture and water vapor migration, greatly reducing condensation, mold and degradation.

Size & Packaging

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

Under-Slab Vapor/Gas Retarder

Product	Part #
VaporBlock Plus 20	VBP 20

APPLICATIONS

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

VaporBlock® Plus™
UNDERSLAB VAPOR RETARDER / GAS BARRIER

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VAPORBLOCK® PLUS™ VBP20

Under-Slab Vapor / Gas Barrier

ISO 9001:2008 CERTIFIED MANAGEMENT SYSTEM

		VAPORBLOCK PLUS 20	
PROPERTIES	**TEST METHOD**	**IMPERIAL**	**METRIC**
Appearance		White/Gold	
Thickness, Nominal		20 mil	0.51 mm
Weight		102 lbs/MSF	498 g/m²
Classification	ASTM E 1745	CLASS A, B & C	
Tensile Strength lbf/in (N/cm) average MD & TD (new material)	ASTM E 154 Section 9 (D-882)	58 lbf	102 N
Impact Resistance	ASTM D 1709	2600 g	
Maximum Use Temperature		180° F	82° C
Minimum Use Temperature		-70° F	-57° C
Permeance (new material)	ASTM E 154 Section 7 ASTM E 96 Procedure B	0.0098 Perms grains/(ft²·hr·in·Hg)	0.0064 Perms g/(24hr·m²·mm Hg)
(after conditioning) Perms (same measurement as above permeance)	ASTM E 154 Section 8, E96 Section 11, E96 Section 12, E96 Section 13, E96	0.0079 0.0079 0.0097 0.0113	0.0052 0.0052 0.0064 0.0074
WVTR	ASTM E 96 Procedure B	0.0040 grains/hr-ft²	0.0028 gm/hr-m²
Radon Diffusion Coeffiecient	K124/02/95	< 1.1 x 10^{-13} m²/s	
Methane Permeance	ASTM D 1434	< 1.7 x 10^{-10} m²/d• atm 0.32 GTR (Gas Transmission Rate) ml/m²•D•ATM	

VaporBlock® Plus™ Placement

All instructions on architectural or structural drawings should be reviewed and followed.
Detailed installation instructions accompany each roll of VaporBlock® Plus™ and can also be located on our website.
ASTM E-1643 also provides general installation information for vapor retarders.

VaporBlock® Plus™ UNDERSLAB VAPOR RETARDER / GAS BARRIER

VaporBlock® Plus™ is a seven-layer co-extruded barrier made using high quality virgin-grade polyethylene and EVOH resins to provide unmatched impact strength as well as superior resistance to gas and moisture transmission.

Note: To the best of our knowledge, unless otherwise stated, these are typical property values and are intended as guides only, not as specification limits. Chemical resistance, odor transmission, longevity as well as other performance criteria is not implied or given and actual testing must be performed for applicability in specific applications and/or conditions. RAVEN INDUSTRIES MAKES NO WARRANTIES AS TO THE FITNESS FOR A SPECIFIC USE OR MERCHANTABILITY OF PRODUCTS REFERRED TO, no guarantee of satisfactory results from reliance upon contained information or recommendations and disclaims all liability for resulting loss or damage. Limited Warranty available at www.RavenEFD.com

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Scan QR Code to download current technical data sheets via the Raven website.