

96-98 DEGRAW STREET
BROOKLYN, NEW YORK

Remedial Action Work Plan

CEQR Number: 13BSA085K

Prepared for:

The Other Half LLC (96 Degraw)
And
The Green Witch Project (98 Degraw)
131 Union Street, Ground Floor
Brooklyn, New York 11231

Prepared by:

Laurel Environmental Associates, Ltd.
53 West Hills Road, Suite 1
Huntington Station, New York 11746

NOVEMBER 2013

REMEDIAL ACTION WORK PLAN

TABLE OF CONTENTS

TABLE OF CONTENTS.....	ii
FIGURES	iv
TABLES	iv
APPENDICES	v
LIST OF ACRONYMS	vi
CERTIFICATION	1
EXECUTIVE SUMMARY	2
REMEDIAL ACTION WORK PLAN	11
1.0 SITE BACKGROUND.....	11
1.1 Site Location and Current usage.....	11
1.2 proposed Redevelopment Plan.....	11
1.3 Description of Surrounding Property.....	12
1.4 remedial investigation.....	13
2.0 REMEDIAL ACTION OBJECTIVES.....	16
3.0 REMEDIAL ALTERNATIVES ANALYSIS.....	17
3.1 Threshold Criteria.....	19
3.2. Balancing Criteria.....	20
4.0 REMEDIAL ACTION	27
4.1 Summary of Preferred Remedial Action.....	27
4.2 Soil Cleanup Objectives and soil/Fill management.....	28
4.3 engineering Controls.....	31
4.4 Institutional Controls	33
4.5 Site Management plan.....	34
4.6 qualitative human health exposure assessment.....	35
5.0 REMEDIAL ACTION MANAGEMENT.....	40
5.1 Project Organization and oversight.....	40
5.2 Site Security	40

5.3	Work Hours.....	40
5.4	Construction Health and Safety Plan	40
5.5	Community Air Monitoring Plan.....	41
5.6	Agency Approvals	43
5.7	Site Preparation.....	43
5.8	Traffic Control	48
5.9	Demobilization.....	49
5.10	Reporting and Record Keeping.....	49
5.11	Complaint Management.....	50
5.12	Deviations from the Remedial Action Work Plan	50
5.13	Data usability sUmmary report.....	51
6.0	REMEDIAL ACTION REPORT	52
7.0	SCHEDULE	54

FIGURES

- 1.0 Site Location Map
- 2.0 Site Sketch and Proposed Endpoint Sampling Locations
- 3.0 Map of Surrounding Property Usage
- 4.0 Re-Development Plans
 - 4.1 *First Floor Plan*
 - 4.2 *Section A-A*
 - 4.3 *Front Elevation*
- 5.0 Site excavation diagrams
- 6.0 Truck Route for Soil Transport
- 7.0 Vapor barrier/waterproofing membrane layout
 - 7.1 *Vapor Barrier/Waterproofing Membrane Diagram*
- 8.0 Sub slab vapor depressurization diagram
- 9.0 Site-wide cover system plan

TABLES

- 1. List of proposed SCOs/SCGs
- 2. Quantities and disposal facilities for material removed from the site
- 3. Quantities and sources of backfill

APPENDICES

- A. Citizen Participation Plan
- B. Sustainability Statement
- C. Soil/Materials Management Plan
- D. Construction Health and Safety Plan
- E. Proposed Development Plans
- F. Previous Environmental Investigations and Reports
- G. Design Diagrams and Specifications for Vapor Barrier/Waterproofing Membrane and Sub Slab Depressurization System
- H. Example Non-Hazardous Waste Manifest

LIST OF ACRONYMS

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

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

CERTIFICATION

I, Richard D. Galli, am a Professional Engineer licensed in the State of New York. I have primary direct responsibility for implementation of the remedial action for the 98-98 Degraw Site, CEQR Number: 13BSA085K.

I, Scott A. Yanuck am a Qualified Environmental Professional as defined in §43-140. I have primary direct responsibility for implementation of the remedial action for the 96-98 Degraw Street Site.

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

Richard D. Galli

Name

59461
NYS PE License Number

Richard D Galli
Signature

11/1/13
Date

Date



Scott A. Yanuck

QEP Name

Scott A Yanuck
QEP Signature

11/1/13
Date

Date

CERTIFICATION

I, Richard D. Galli, am a Professional Engineer licensed in the State of New York. I have primary direct responsibility for implementation of the remedial action for the 98-98 Degraw Site, CEQR Number: 13BSA085K.

I, Scott A. Yanuck am a Qualified Environmental Professional as defined in §43-140. I have primary direct responsibility for implementation of the remedial action for the 96-98 Degraw Street Site.

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

Richard D. Galli

Name

NYS PE License Number

Signature

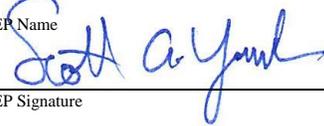
11/1/13

Date



Scott A. Yanuck

QEP Name



QEP Signature

11/1/13

Date

EXECUTIVE SUMMARY

The Other Half LLC and The Green Witch Project LLC have enrolled in the New York City Voluntary Brownfield Cleanup Program (NYC VCP) to investigate and remediate a 3,500-square foot site located at 96-98 Degraw Street, Brooklyn, New York. A remedial investigation (RI) was performed to compile and evaluate data and information necessary to develop this Remedial Action Work Plan (RAWP). The remedial action described in this document provides for the protection of public health and the environment consistent with the intended property use, complies with applicable environmental standards, criteria and guidance and conforms with applicable laws and regulations.

Site Location and Current Usage

The Site is located at 96-98 Degraw Street in the Columbia Street Water Front District of Brooklyn, New York and is identified as Block 329 and Lot 22 and 23 on the New York City Tax Map. Figure 1.0 shows the Site location. The Site is 3,500-square feet and is bounded by Degraw Street to the north, Industrial and Manufacturing buildings to the south, residential buildings to the east, and residential buildings and parking lots to the west. A map of the site boundary is shown in Figure 3.0. Currently, the Site is used as a parking lot, and maintains no structures

Summary of Proposed Redevelopment Plan

The proposed future use of the Site will consist of two (2) three-story attached single-family homes, each with a one-car garage, a paved rear patio and grass yard. The Buildings will have a combined footprint of approximately 2,200 square feet. Layout of the proposed site development is presented in Figures 4.1-4.3. The current zoning designation is M1-1, for light manufacturing. The proposed use is not consistent with existing zoning for the property, however; the Property Owners are currently seeking a use variance of ZR §42-10 to permit buildings which contain two Group 2 single-family residences (with ground level garages) and bulk variances for floor area, dwelling unit, well height, setback and sky exposure plane.

The entire proposed development redevelopment is residential, with no commercial units. Each of the two units will be constructed slab-on-grade, with no basements, and with footings no deeper than -4.0 feet below grade. The two buildings will be 17 feet and 6 inches wide, will be 63

feet and 7 inches deep, and will not exceed 31 feet and 8 inches in height. The two buildings will have a combined gross floor area of 6,438.1 square feet. The 1,050 square foot rear yard behind both buildings will be partially grass covered and partially paved patio area. The 227.5 square foot area in front of the buildings will be mainly paved for front pathways and driveways for each building, but will also maintain thin sections of grass in between.

Excavation will include the removal of soils to the bottom of the proposed redevelopment, no more than 2 feet below grade beneath the building slab, no more than 5 feet and 10 inches from the building footings, and finally, 2 feet below grade in the entire rear yard and front driveway areas. Groundwater at the site was gauged from temporary groundwater monitoring wells during this Remedial Investigation (Phase II), and was found to be between 8.4 and 9.52 feet below grade, and therefore, should not be encountered during the excavation.

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

Summary of the Remedy

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

The proposed remedial action will consist of:

1. Preparation of a Community Protection Statement and implementation of a Citizen Participation Plan.
2. Perform a Community Air Monitoring Program for particulates and volatile organic carbon compounds.
3. Establish Track 4 Soil Cleanup Objectives (SCOs). Excavation and removal of soil/fill exceeding SCOs.

4. Construction and maintenance of an engineered composite cover consisting of concrete building slab to prevent human exposure to residual soil and fill materials remaining under the site. 227.5 square feet (SF) of front yard area and 1,050 SF of landscaped rear yard areas will be capped by at-least two feet of clean soil.
5. As part of development, installation of a vapor barrier below the concrete slab underneath the building, as well as behind foundation walls of the proposed building. The vapor barrier will consist of a Grace PrePrufe 300R vapor barrier membrane.
6. Installation and operation of an active sub-slab depressurization system.
7. Collection and analysis of end-point samples to determine the performance of the remedy with respect to attainment of SCOs.
8. Removal of underground storage tanks and closure of petroleum spills in compliance with applicable local, State and Federal laws and regulations (see Table 3 for backfill quantities).
9. Demarcation of residual soil/fill.
10. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations.
11. Transportation and off-Site disposal of all soil/fill material at permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities. Appropriate segregation of excavated media onsite.
12. Screening of excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID.
13. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas.
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.

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

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

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

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

Site Safety Coordinator. This project has a designated Site safety coordinator to implement the Health and Safety Plan. The safety coordinator maintains an emergency contact sheet and protocol for management of emergencies. The Site safety coordinator is Scott A. Yanuck, and can be reached at 631-673-0612.

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

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

Odor, Dust and Noise Control. This cleanup plan includes actions for odor and dust control. These actions are designed to prevent off-Site odor and dust nuisances and includes steps to be taken if nuisances are detected. Generally, dust is managed by application of physical covers and by water sprays. Odors are controlled by limiting the area of open excavations, physical covers, spray foams and by a series of other actions (called operational measures). The project is also required to comply with NYC noise control standards. If you observe problems in these areas, please contact the onsite Project Manager Christopher J. Connolly (631-673-0612) or NYC Office of Environmental Remediation Project Manager William Wong (212-341-0659).

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

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

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

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

Signage. While the cleanup is in progress, a placard will be prominently posted at the main entrance of the property with a laminated project Fact Sheet that states that the project is in the NYC 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 Christopher J. Connolly at 631-673-0612, the NYC Office of Environmental Remediation Project Manager William Wong at 212-341-0659, or call 311 and mention the Site is in the NYC Voluntary Cleanup Program.

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

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

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

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

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

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

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

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

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

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

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

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

The Other Half LLC and The Green Witch Project LLC plan to enroll in the New York City Voluntary Cleanup Program (NYC VCP) to investigate and remediate a property located at 96-98 Degraw Street in the Columbia Street Water Front district section of Brooklyn, New York (the “Site”). A Remedial Investigation (RI) was performed to compile and evaluate data and information necessary to develop this Remedial Action Work Plan (RAWP) in a manner that will render the Site protective of public health and the environment consistent with the contemplated end use. This RAWP establishes remedial action objectives, provides a remedial alternatives analysis that includes consideration of a permanent cleanup, and provides a description of the selected remedial action. The remedial action described in this document provides for the protection of public health and the environment, complies with applicable environmental standards, criteria and guidance and applicable laws and regulations.

1.1 SITE LOCATION AND CURRENT USAGE

The Site is located at 96-98 Degraw Street in the Columbia Street Water Front District of Brooklyn, New York and is identified as Block 329 and Lot 22 and 23 on the New York City Tax Map. Figure 1.0 shows the Site location. The Site is 3,500-square feet and is bounded by Degraw Street to the north, Industrial and Manufacturing buildings to the south, residential buildings to the east, and residential buildings and parking lots to the west. A map of the site boundary is shown in Figure 3.0. Currently, the Site is used as a parking lot, and maintains no structures.

1.2 PROPOSED REDEVELOPMENT PLAN

The proposed future use of the Site will consist of two (2) three-story attached single-family homes, each with a one-car garage, a paved rear patio and grass yard. The Buildings will have a combined footprint of approximately 2,200 square feet. Layout of the proposed site development is presented in Figures 4.1-4.3. The current zoning designation is M1-1, for light manufacturing. The proposed use is not consistent with existing zoning for the property, however; the Property Owners are currently seeking a use variance of ZR §42-10 to permit buildings which contain two

Group 2 single-family residences (with ground level garages) and bulk variances for floor area, dwelling unit, well height, setback and sky exposure plane.

The entire proposed development redevelopment is residential, with no commercial units. Each of the two units will be constructed slab-on-grade, with no basements, and with footings no deeper than -4.0 feet below grade. The two buildings will be 17 feet and 6 inches wide, will be 63 feet and 7 inches deep, and will not exceed 31 feet and 8 inches in height. The two buildings will have a combined gross floor area of 6,438.1 square feet. The 1,050 square foot rear yard behind both buildings will be partially grass covered and partially paved patio area. The 227.5 square foot area in front of the buildings will be mainly paved for front pathways and driveways for each building, but will also maintain thin sections of grass in between.

Excavation will include the removal of soils to the bottom of the proposed redevelopment, no more than 2 feet below grade beneath the building slab, no more than 5 feet and 10 inches from the building footings, and finally, 2 feet below grade in the entire rear yard and front driveway areas. Groundwater at the site was gauged from temporary groundwater monitoring wells during this Remedial Investigation (Phase II), and was found to be between 8.4 and 9.52 feet below grade, and therefore, should not be encountered during the excavation.

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

1.3 DESCRIPTION OF SURROUNDING PROPERTY

The Subject Property lies within a light manufacturing neighborhood, with a number of two and three story residential homes, vacant undeveloped lots, and one story commercial and light industrial buildings. Immediately adjoining to the north and south of the Property are three-story residential houses, and adjoining to the west is a one-story industrial building. Degraw Street adjoins the Property to the east. According to NYC OER/DEP SPEED (Searchable Property Environmental E-Database) website (<https://gis.nyc.gov/mOER/DEP/speed/>) there are no sensitive receptors within a 500-foot radius of the Subject Site.

Figure 3.0 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, 96-98 Degraw Street*”, dated September, 2013 (RIR).

According to Sanborn Fire Insurance Maps, the subject property was used for residential purposes since the construction of the original buildings, sometime prior to 1886. The property has been vacant since between 1988 and 1991.

The AOCs identified for this site include:

1. The subject property was occupied by two 3-story residential buildings from as early as 1886 until between 1988 and 1991, when the buildings were likely demolished. The property has remained vacant since as early as 1991, and has most recently been utilized for vehicle storage. Past usage of the subject site should not present a recognized environmental condition at the subject property. Concern is for historical fill, building debris associated with the former structures, and former heating oil usage and former USTs on Site.

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. Conducted a thorough geophysical survey using ground penetrating radar, to detect any sub-surface anomalies, such as underground storage tanks;
3. Installed five (5) soil borings across the entire project Site, and collected 10 (not including duplicates) soil samples for chemical analysis from the soil borings to evaluate soil quality;
4. Installed three (3) temporary groundwater monitoring wells throughout the Site to establish groundwater flow and collected three (not including duplicates) groundwater samples for chemical analysis to evaluate groundwater quality;

5. Installed two (2) soil vapor probes around Site perimeter, one (1) outdoor ambient air canister, and collected three (3) samples for chemical analysis.

Summary of Environmental Findings

1. Elevation of the property is 14 feet.
2. Depth to groundwater ranges from 8.3 to 9.52 feet at the Site.
3. Groundwater flow is generally from south-southeast to north-northwest beneath the Site.
4. Depth to bedrock is expected to be over 100 feet at the Site.
5. The known stratigraphy in the area of the site is considered to be ~4 feet of urban fill, followed by fine silty sand up to 12 feet and fine to medium grained sands to 32 feet and up to 100 feet of the Upper Glacial Aquifer, which is likely underlain directly by bedrock.
6. Soil/fill samples collected during the RI showed the following:

Several Semi-Volatile Organic Compounds (SVOCs) at concentrations slightly exceeding their respective NYSDEC Track 2 Soil Cleanup Objectives, including; Benzo(a)anthracene (max. of 7.7 ppm), Benzo(a)pyrene (max. of 8.22 ppm), Benzo(b)fluoranthene (max. of 7.44 ppm), Benzo(k)fluoranthene (max of 7.38 ppm), chrysene (max of 8.61 ppm), Dibenzo(a,h)anthracene (max of 0.624 ppm), and Indeno(1,2,3-cd)pyrene (max of 1.26 ppm).

Several metals were detected in the samples collected from the Site at levels above the Track 1 and Track 2 SCOs, including: Barium (max of 951 ppm), Cadmium (max of 5.85 ppm), Chromium (trivalent) (max of 44 ppm), Copper (max of 1,210 ppm), Lead (max of 1,140 ppm), Mercury (max of 1.84 ppm), Nickel (max of 90.2 ppm), and Zinc (max of 2,050 ppm).

Several pesticides were detected in the samples collected from the Site. 4,4'-DDD was detected in four (4) of the samples, at concentrations exceeding the Track 1 SCOs (max of 0.0247 ppm). 4,4'-DDE was detected in four (4) of the samples, at concentrations exceeding the Track 1 SCOs (max of 0.0179 ppm). 4,4'-DDT was detected in nine (9) of the samples, at concentrations exceeding the Track 1 SCOs (max of 0.0711 ppm).

Total Polychlorinated biphenyls (PCBs) were detected in three of the samples, at concentrations exceeding the Track 1 SCOs (max of 0.934 ppm), and in two of the samples at concentrations exceeding the Track 2 SCOs (max of 5.66 ppm).

7. Groundwater samples collected during the RI showed the following:

Groundwater samples were analyzed (metals samples were submitted for analysis of both filtered and unfiltered samples) and various metals were detected at slightly elevated levels; however, none exceeded any respective New York State 6NYCRR Part 703.5 Class GA groundwater standards.

8. Soil vapor samples collected during the RI showed the following:

Soil vapor samples collected during the RI showed a wide variety of VOCs at low concentrations, consisting mainly of BTEX and associated compounds at concentrations generally below 33 µg/m³. These compounds are most commonly associated with a spill of automotive fuel or heating oil. Chlorinated VOCs were detected at trace levels. PCE was detected at a maximum concentration of 1.9 µg/m³ in one of three samples. TCE was detected at a maximum concentration of 0.17 µg/m³ in one of three samples. TCA, and vinyl chloride were not detected in any sample. The absence of MTBE in vapor suggests an older spill. Past uses of the property indicates former automotive fueling activities or other automotive fuel sources. Soil samples (both deep and shallow) contained no elevated levels of VOCs in excess of NYSDEC Part 375 Unrestricted SCOs for unrestricted use. Groundwater also only contained slightly elevated levels of VOCs. Together, these observations suggest a possible offsite source area. While no standards exist for soil vapor, no compounds exceed the Guidance for Evaluating Soil Vapor Intrusion in the State of New York (Final October 2006). Based on the presence of VOCs, the installation of a vapor barrier is warranted at this site.

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

2.0 REMEDIAL ACTION OBJECTIVES

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

Groundwater

- Prevent exposure to contaminants volatilizing from contaminated soil.
- Prevent migration of contaminants that would result in groundwater contamination.

Soil

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

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

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

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

Alternative 1

Alternative 1 involves:

- Establishment of Unrestricted Use (Track 1) Soil Cleanup Objectives (SCOs).
- Removal of all soil and fill material that exceeds the NYSDEC Part 375 Unrestricted Use (Track 1) Soil Cleanup Objectives (SCOs). This would include removing the soil and fill material from across the entire Site to a depth just above the groundwater table, a depth of approximately 9 feet below grade, and backfilling the site approximately to the approximate development depth of two feet below grade.

- Dewatering would not be required in order to excavate the contaminated soil and fill material, as none was encountered at the groundwater table. A vapor barrier, an engineering composite cover, and two feet of clean cover for any open/landscaped areas would be installed at the site. Site controls would be implemented at the site to prevent exposure to the on-site workers and the surrounding community. Site controls would include a Construction Health and Safety Plan (CHASP), a Soils and Materials Management Plan, and a Community Air Monitoring Plan (CAMP).
- No Engineering or Institutional Controls are required for a Track 1 cleanup, but a vapor barrier would be installed beneath the building foundation and behind the foundation sidewalls of the new buildings as part of development to prevent any potential future exposures from off-Site soil vapor.
- Installation of an active Sub-Slab Depressurization System (SSDS) as part of new construction.
- Placement of final cover over the entire Site, as part of construction.

Alternative 2

- Establishment of Track 4 Site-Specific SCOs.
- Removal of all soil and fill material that exceed the established Track 4 Site-Specific SCOs. This remedial alternative addresses the subsurface soil contaminated based on the development plans for the site. As part of the development plans, the entire property will be excavated to two feet below grade; the building footings will be excavated to four feet below grade. The planned excavations do not extend into the water table. End point samples would need to be collected in order to confirm the attainment of the Track 4 Site-Specific SCOs. Therefore, if soil/fill containing analytes at concentrations above Track 4 Site-Specific SCOs is still present after removal of all soil required for construction of the new building is complete, additional excavation will be performed to 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-on grade and along below grade foundation side walls to prevent any potential future exposures from off-Site soil vapor;
- Installation of an active sub-slab depressurization system beneath the foundation slab to prevent soil vapor entering the new building;
- Establishment of use restrictions including prohibitions on the use of groundwater from the site and prohibitions on sensitive site uses, such as farming or vegetable gardening, to eliminate future exposure pathways; and prohibition of a higher level of land use without OER/DEP/DEP approval;
- Establishment of an approved Site Management Plan to ensure long-term management of these engineering and institutional controls including the performance of periodic inspections and certification that the controls are performing as they were intended. SMP will note that the property owner and property owner's successors and assigns must comply with the approved SMP; and
- The property will continue to be registered with an E-Designation at the NYC Buildings Department.

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 is protective of public health and the environment by removing all of the contaminated soil and fill material above the Track 1 Unrestricted Use SCOs, thus eliminating potential for any direct contact with soil and fill material once construction is complete and eliminating the risk of contamination leaching into groundwater. Installing a vapor barrier and an

active SSDS along with engineered composite cover will minimize the potential for any on-site or off-site soil vapor migration into the building.

Alternative 2 would achieve comparable protections of human health and the environmental, by removing contaminated soil and fill material at the site by ensuring that remaining soil/fill on-Site meets established Track 4 Site-Specific SCOs, as well as by placement of Engineering and Institutional controls, include a vapor barrier, SSDS and an engineered composite cover. The composite cover system would prevent direct contact with remaining soil/fill material. Implementing Institutional Controls including a Site Management Plan and continued “E” designation of property would ensure that the composite cover system remains intact and protective. Establishment of Track 4 Site-Specific SCOs would minimize the risk of contamination leaching into groundwater

For both Alternatives, potential exposure to contaminated soils or groundwater during construction would be minimized by implementing a Construction Health and Safety Plan, an approved Soil and Materials Management Plan and Community Air Monitoring Plan (CAMP) would minimize potential exposure to contaminated soils during construction. Potential contact with contaminated groundwater would be prevented as City laws and regulations prohibit its use, and it is not anticipated to be encountered during construction. 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 below grade 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, chemical-specific SCGs and RAOs for soil through removal of soil to achieve Track 1 Unrestricted Use SCOs and Groundwater Protection Standards. Compliance with SCGs for soil vapor would also be

achieved by installing an active SSDS and a vapor barrier below the new building's slab and continuing the vapor barrier around foundation walls, as part of development.

Alternative #2 would also achieve compliance with the remedial goals, chemical-specific SCGs and RAOs for soil through removal of soil to meet Track 4 Site-Specific SCOs. Compliance with SCGs for soil vapor would also be achieved by installing an active SSDS and a vapor barrier below the new building's slab and continuing the vapor barrier around foundation walls. A Site Management Plan would ensure that these controls remained protective for the long term.

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

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 implementation, as each requires excavation of historic fill material. As such, both alternatives would result in short-term dust generation impacts associated with excavation, handling, load out of materials, and truck traffic. Short-term impacts would potentially be higher for Alternative #1 due to excavation of greater amounts of historical fill material to achieve Track 1 SCOs. However, a focused attention to means and methods during the remedial action including community air monitoring and appropriate truck routing, would minimize or negate the overall impact of these

activities. An additional short-term adverse impact and risks to the community associated with both remedial alternatives is increased truck traffic. Approximately 60, 25-ton capacity truck trips would be necessary to transport fill and soil excavated during Site development under Alternative 1 and approximately 14, 25-ton capacity truck trips would be necessary under Alternative 2. Truck traffic will be routed on the most direct course using major thoroughfares where possible and flaggers will be used to protect pedestrians at Site entrances and exits.

Both alternatives would 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 Construction 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 above Track 1 Unrestricted Use SCOs. Removal of on-Site contaminant sources will prevent future groundwater contamination, and would allow the property to be used for any purposes.

Alternative 2 would provide long-term effectiveness by removing most on-Site contamination and attaining Track 4 Site-Specific SCOs; a composite cover system across the Site, maintaining use restrictions, establishing an SMP to ensure long-term management of Institutional Controls (ICs), Engineering Controls (ECs), and maintaining 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 would 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 would permanently eliminate the toxicity, mobility, and volume of contaminants from all soil or fill material in excess of Unrestricted Use SCOs. Alternative 1 would remove approximately 1,515 tons of contaminated soil/fill material.

Alternative #2 would remove a portion of the contaminated soil and fill material from hotspot areas and for development purposes, and would manage the residual contaminated soil and fill material through the engineered composite cover and adherence to a site management plan. Alternative 2 would remove approximately 350 tons of contaminated soil/fill material.

Implementability

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

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

Cost effectiveness

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

The capital costs associated with Alternative #1 are higher than Alternative #2 due to more soil and fill material being excavated. Additional costs would include installation of additional shoring/underpinning, disposal of additional soil, and import of clean soil for backfill. In both cases, appropriate public health and environmental protections are achieved. However, long-term costs for Alternative 2 are likely higher than Alternative 1 based on implementation of a Site Management Plan as part of Alternative 2.

The remedial plan creates an approach that combines the remedial action with the redevelopment of the Site, including the construction of the building foundation and subgrade structures. The remedial plan is also cost effective in that it will take into consideration the selection of the closest and most appropriate disposal facilities to reduce transportation and disposal costs during the excavation of historic fill and other soils during the redevelopment of the Site.

Community Acceptance

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

Based on the overall goals of the remedial program and initial observations by the project team, both of the alternatives for the Site are acceptable to the community. This RAWP will be subject to a public review under the NYC VCP and will provide the opportunity for detailed public input on the remedial alternatives and the selected remedial action. This public comment will be considered by OER/DEP/DEP prior to approval of this plan. The Citizen Participation Plan for the project is provided in Appendix A.

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 use is not consistent with existing zoning for the property, however; the Property Owners are currently seeking a use variance of ZR §42-10 to permit buildings which contain two Group 2 single-family residences (with ground level garages) and bulk variances for floor area, dwelling unit, well height, setback and sky exposure plane.

Both alternatives provide protection of public health and the environment for both the proposed use of the Site. Both alternatives provide a remedial action that is beneficial to the surrounding community and is consistent with the goals of the City for remediating and redeveloping brownfield sites.

Both alternatives for remedial action at the site are comparable with respect to the proposed use and to land uses in the vicinity of the Site. The proposed use is consistent with the existing zoning designation and with recent development patterns. The Site is surrounded by mainly residential, with scattered commercial and manufacturing properties and both alternatives provide comprehensive protection of public health and the environment for these uses. Improvements in the current brownfield condition of the property achieved by both alternatives are also consistent with the City's goals for cleanup of contaminated land and bringing such properties into productive reuse. Both alternatives are equally protective of natural resources and cultural resources. This RAWP will be subject to undergo public review under the NYC VCP and will provide the opportunity for detailed public input on the land use factors described in this

section. This public comment will be considered by OER/DEP/DEP prior to approval of this plan.

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.

Alternative #1 will use a larger quantity of fuel and produce the most greenhouse gases, as it will have the largest volume of material to truck off site. Alternative #2 requires only the removal of minor amounts contaminated soil that would not otherwise be removed for construction. Both remedial alternatives are comparable with respect to the opportunity to achieve other sustainable remedial action elements. A Sustainability Statement can be found in Appendix B.

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 proposed remedial action will consist of:

1. Preparation of a Community Protection Statement and implementation of a Citizen Participation Plan.
2. Perform a Community Air Monitoring Program for particulates and volatile organic carbon compounds.
3. Establish Track 4 Soil Cleanup Objectives (SCOs). Excavation and removal of soil/fill exceeding SCOs.
4. Construction and maintenance of an engineered composite cover consisting of concrete building slab to prevent human exposure to residual soil and fill materials remaining under the site. 227.5 square feet (SF) of front yard area and 1,050 SF of landscaped rear yard areas will be capped by at-least two feet of clean soil.
5. As part of development, installation of a vapor barrier below the concrete slab underneath the building, as well as behind foundation walls of the proposed building. The vapor barrier will consist of a Grace PrePrufe 300R vapor barrier membrane.
6. Installation and operation of an active sub-slab depressurization system.
7. Collection and analysis of end-point samples to determine the performance of the remedy with respect to attainment of SCOs.

8. Removal of underground storage tanks and closure of petroleum spills in compliance with applicable local, State and Federal laws and regulations (see Table 3 for backfill quantities).
9. Demarcation of residual soil/fill.
10. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations.
11. Transportation and off-Site disposal of all soil/fill material at permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities. Appropriate segregation of excavated media onsite.
12. Screening of excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID.
13. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas.
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.

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 in Table 1. 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 C. The location of planned excavations is shown in Figure 5.0.

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 350 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/DEP/DEP Project Manager.

<u>Disposal Facility</u>	<u>Waste Type</u>	<u>Estimated Quantities</u>
Pure Soil Technologies 655 S. Hope Chapel Rd. Jackson, NJ 08527	Historical Fill	350 tons

End-Point Sampling

Removal actions for development purposes under this plan will be performed in conjunction with confirmation soil sampling. Six (6) confirmation samples will be collected from the base of the excavation at locations to be determined by OER/DEP/DEP. For comparison to Track 1 SCOs, analytes will include VOCs, SVOC, pesticides, PCBs and metals according to analytical methods described below. For comparison to Track 4 SCOs, analytes will only include trigger compounds and elements established on the Track 4 SCO list.

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

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

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

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

Soil analytical methods will include:

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

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

Quality Assurance/Quality Control

One duplicate sample and field and lab blank samples will be analyzed to assess sampling and lab artifacts. The chemical analytical laboratory used is NYS ELAP certified and is York Analytical Laboratories (10854) for soils and groundwater.

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 C. The estimated quantity of soil to be imported into the Site for backfill and cover soil is 130 tons. The estimated quantity of onsite soil/fill expected to be reused/relocated on Site is zero tons.

4.3 ENGINEERING CONTROLS

Engineering Controls were employed in the remedial action to address residual contamination remaining at the site. The Site has three (3) primary Engineering Control Systems. These are:

- An engineered composite cover consisting of the proposed concrete foundation slab, which will also extend to beneath the below-grade paved patio area, and two feet of clean cover material in any landscaped areas, and
- Soil vapor barrier. See Figure 7.0 for proposed vapor barrier layout.

- An active SSDS.

Composite Cover System

Exposure to residual soil/fill will be prevented by an engineered, composite cover system to be built on the Site. This composite cover system is comprised of:

- Two feet of clean fill material in landscaped areas (open space);
- Concrete foundation building 5” thick slab ; and
- Concrete sidewalks;

Figure 9.0 shows the typical design and location for each remedial cover type used on this Site.

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

Vapor Barrier

Migration of soil vapor will be mitigated with a combination of building slab and vapor barrier.

- Grace PrePrufe 300R vapor retarder system or OER/DEP approved equivalent will be installed under building slab, and sealed at all penetrations and edges using specialized vapor barrier tape. See Appendix G for details.
- Stamped design drawings detailing installation will be submitted to OER/DEP prior to construction.

Sub-Slab Depressurization System

Migration of soil vapor will be mitigated with the construction of a (active/passive) sub-slab depressurization system.

A separate active soil vapor depressurization system will be designed and installed in each of the six units within the building. The systems will consist of three (3) 4-foot sections of perforated 4" PVC piping connect via solid 4" PVC piping installed horizontally in a gravel bed below the vapor retarder in each unit. A ventilation stack will run up through the roof of each unit. Active depressurization will be supplied by either in-line Radon Fans or Solar fans installed at the roof level.

See Appendix G, Design Diagrams and Specifications for Vapor Barrier/Waterproofing Membrane and Sub Slab Depressurization System for additional information including design drawings and diagrams and manufacturer documentation.

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 established in a Declaration of Covenant and Restrictions (DCR) assigned to the property by the title holder and will be implemented under a site-specific Site Management Plan (SMP) that will be included in the RAR.

Institutional Controls for this remedial action are:

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

- Submittal of a Site Management Plan in the RAR for approval by OER/DEP 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/DEP 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/DEP; 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/DEP 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 determined by OER/DEP in the SMP and will comply with RCNY §43-1407(1)(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/DEP.

4.5 SITE MANAGEMENT PLAN

Site Management is the last phase of remediation and begins with the approval of the Remedial Action Report and issuance of the Notice of Completion (NOC) for the Remedial Action. The Site Management Plan (SMP) describes appropriate methods and procedures to ensure implementation of all ECs and ICs that are required by the DCR and this RAWP. The Site Management Plan is submitted as part of the RAR but will be written in a manner that allows its use as an independent document. Site Management continues until terminated in writing by OER/DEP. The property owner is responsible to ensure that all Site Management responsibilities defined in the DCR and the Site Management Plan are implemented.

The SMP will provide a detailed description of the procedures required to manage residual soil/fill left in place following completion of the remedial action in accordance with the Brownfield Cleanup Agreement with OER/DEP. 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/DEP on a periodic basis to be established in the SMP and will be subject to review and modification by OER/DEP. The Site Management Plan will be based on a calendar year and certification reports will be due for submission to OER/DEP by November 1st 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

Based on the RIR, known source areas onsite are limited to historical fill in the top six feet below grade, with the majority of contaminants located in the top two feet.

Soil

- Metals, including Barium, Copper, and Lead, exceeding Track 4 Commercial SCOs, found mainly in the shallow range, but in the deeper range for SB-2 and SB-5. Numerous other metals were detected at lower concentrations, but exceeding the Track 1 Unrestricted SCOs found mostly in shallower samples.
- The VOC Acetone was detected in both shallow and deep samples from SB-2, over Track 1 Unrestricted SCOs.
- SVOCs, including Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Chrysene, Dibenzo(a,h)anthracene, and Indeno(1,2,3-cd)pyrene exceeding Track 2 Residential SCOs, found in the shallow range, 0-2 feet.
- Pesticides, including 4,4'-DDD, 4,4'-DDE, and 4,4'-DDT were detected in numerous samples above the Track 1 SCOs.
- Total Bichlorinated Biphenyls were detected above the Track 4 SCOs in both the shallow and deep samples from SB-3.

Groundwater

- Numerous metals including were detected, although none exceeding their respective GQS.

Soil vapor

- A wide variety of VOCs were detected at low concentrations, consisting mainly of BTEX and associated compounds at concentrations generally below 33 µg/m³.
- PCE was detected at a maximum concentration of 1.9 µg/m³ in one of three samples.
- TCE was detected at a maximum concentration of 0.17 µg/m³ in one of three samples.
- TCA, and vinyl chloride were not detected in any sample. The absence of MTBE in vapor suggests an older spill.

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: Currently, the Site maintains a vacant and uncovered lot, allowing for several pathways to exposure including; inhalation, ingestion, and absorption of site soils. Site is served by the public water supply and groundwater use for potable supply is prohibited, groundwater is not used at the Site and there is no potential for exposure. There is currently structure onsite, accumulation of soil vapor can pose an exposure threat. The structures are scheduled to be demolished.

Construction/ Remediation Activities: The proposed development of the site will include soil/fill excavations for both remedial and construction purposes. Once redevelopment activities begin, construction workers will come into direct contact with surface and subsurface soils and groundwater, as a result of on-Site construction and excavation activities. On-Site construction workers potentially could ingest, inhale or have dermal contact with any exposed impacted soil, and fill. Similarly, off-Site receptors could be exposed to dust and vapors from on-Site activities. Limited dewatering activities will also provide direct routes of exposure to on-site workers. The exposures related to construction and/or remediation activities will be limited in duration to the intrusive portions of the work. During construction, on-Site and off-Site exposures to contaminated dust from on-Site will be addressed through the Soil/Materials Management Plan, dust controls, and through the implementation of the Community Air-Monitoring Program and a Construction Health and Safety Plan. The Construction Health and Safety Plan provided in Appendix D.

Proposed Future Conditions: Under future remediated conditions, all soils in excess of Track 4

Site Specific SCOs will be removed. The Site will be fully capped, limiting potential direct exposure to soil and groundwater remaining in place, and a vapor barrier and an active SSDS system will prevent any exposure to potential off site soil vapors in the future. The Site is served by a public water supply, and groundwater is not used at the Site for potable supply. There are no plausible off-Site pathways for ingestion, inhalation, or dermal exposure to contaminants derived from the Site under future conditions.

Receptor Populations

Currently, the Site maintains a vacant lot. On-site potential sensitive receptors include adult and child visitors and trespassers and pedestrians. The proposed redevelopment is two three-story, slab-on-grade, single-family residential buildings with a ground floor garages. There will be a ground level rear yard. During redevelopment of the Site, the on-site potential sensitive receptors will include construction workers and possibly pedestrians and nearby residents. Once the Site is redeveloped, the on-site potential sensitive receptors will include adult and child residents, visitors and maintenance staff. There will be no potential offsite receptors after development is complete. Proposed Development Plans can be found in Appendix E.

Overall Human Health Exposure Assessment

There are potential complete exposure pathways for the current site condition. There is a potential complete exposure pathway that requires mitigation during implementation of the remedy. There is no complete exposure pathway under future conditions after the site is developed. Current potential exposure pathways will be eliminated by the remedial action. During the remedial action, on-site and offsite exposure pathways will be eliminated by preventing access to the site, through implementation of soil/materials management, stormwater pollution prevention and dust controls, employment of a community air monitoring plan, and implementation of a Construction Health and Safety Plan. After the remedial action is complete, there will be no remaining exposure pathways to on-Site soil/fill, as all soil above Site Specific SCOs would have been removed and encapsulated by the building's concrete slab, the rear patio and a two-foot cap of topsoil in the rear landscaped area, and a vapor barrier and an SSDS system would have been installed as part of development.

This assessment takes into consideration the reasonably anticipated use of the site, which includes a residential structure, site-wide impervious surface cover cap, and a subsurface vapor barrier and SSDS system for the building. Potential post-construction use of groundwater is not considered an option because groundwater in this area of New York City is not used as a potable water source. There are no surface waters in close proximity to the Site that could be impacted or threatened.

5.0 REMEDIAL ACTION MANAGEMENT

5.1 PROJECT ORGANIZATION AND OVERSIGHT

Principal personnel who will participate in the remedial action include Scott A. Yanuck and Chris J. Connolly. The Professional Engineer (PE) and Qualified Environmental Professionals (QEP) for this project are Richard Galli and Scott A. Yanuck, 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 8AM to 4PM. 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 D. The Site Safety Coordinator will be Scott A. Yanuck. Remedial work performed under this RAWP will be in full compliance with applicable health and safety laws and regulations, including Site and OSHA worker safety requirements and HAZWOPER requirements. Confined space entry, if any, will comply with OSHA requirements and industry standards and will address potential risks. The parties performing the remedial construction work will ensure that performance of work is in compliance with the HASP and applicable laws and regulations. The HASP pertains to remedial and invasive work performed at the Site until the issuance of the Notice of Completion.

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

Personnel entering any exclusion zone will be trained in the provisions of the HASP and be required to sign an HASP acknowledgment. Site-specific training will be provided to field

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

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

5.5 COMMUNITY AIR MONITORING PLAN

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

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

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations will be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate

monitoring will be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment will be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

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

All readings will be recorded and be available for OER/DEP 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/DEP 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/DEP will be invited to attend the pre-construction meeting at the Site with all parties involved in the remedial process prior to the start of remedial construction activities.

Mobilization

Mobilization will be conducted as necessary for each phase of work at the Site. Mobilization includes field personnel orientation, equipment mobilization (including securing all sampling equipment needed for the field investigation), marking/staking sampling locations and utility mark-outs. Each field team member will attend an orientation meeting to become familiar with the general operation of the Site, health and safety requirements, and field procedures.

Utility Marker Layouts, Easement Layouts

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

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

Equipment and Material Staging

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

Stabilized Construction Entrance

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

Truck Inspection Station

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

Extreme Storm Preparedness and Response Contingency Plan

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

Storm Preparedness

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

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

Storm Response

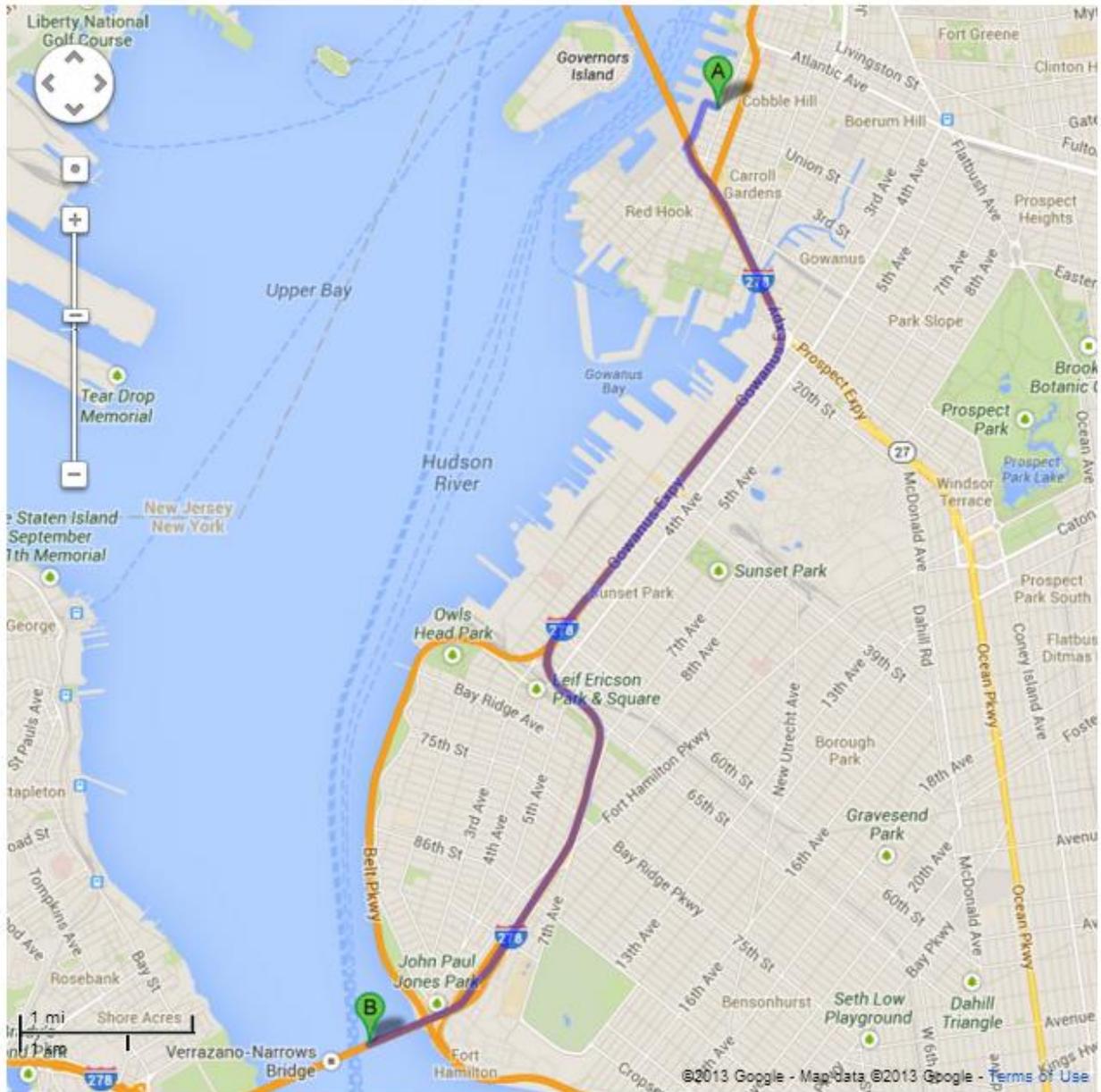
At the conclusion of an extreme storm event, as soon as it is safe to access the property, a complete inspection of the property will be performed. A site inspection report will be submitted to OER/DEP at the completion of site inspection and after the site security is assessed. Site conditions will 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/DEP. 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/DEP will be notified and corrective measure plan designed to remove and clean dislocated material will be submitted to OER/DEP and implemented following approval by OER/DEP and granting of site access by the property owner. Impacted offsite areas may require characterization based on site conditions, at the discretion of OER/DEP. If onsite petroleum spills are identified, a qualified environmental professional will determine the nature and extent of the spill and report to NYS DEC's spill hotline at DEC 800-457-7362. If the source of the spill is ongoing and can be identified, it should be stopped if this can be done safely. Potential hazards will be addressed immediately, consistent with guidance issued by NYS DEC.

Storm Response Reporting

A site inspection report will be submitted to OER/DEP at the completion of site inspection. An inspection report established by OER/DEP is available on OER/DEP's website (www.nyc.gov/OER/DEP) 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/DEP 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/DEP 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 shown in the following map:



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/DEP 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/DEP project manager based on planned project tasks. Daily email reports are not intended to be the primary mode of communication for notification to OER/DEP 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/DEP project manager by personal communication. Daily reports will be included as an Appendix in the Remedial Action Report.

An alpha-numeric site map will be used to identify locations described in reports submitted to OER/DEP and is shown in Figure 2.0.

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/DEP 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/DEP. Complaints will be addressed and outcomes will also be reported to OER/DEP in daily reports. Notices to OER/DEP 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/DEP 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/DEP 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/DEP 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, Richard D. Galli, 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 96-98 Degraw Street Site.

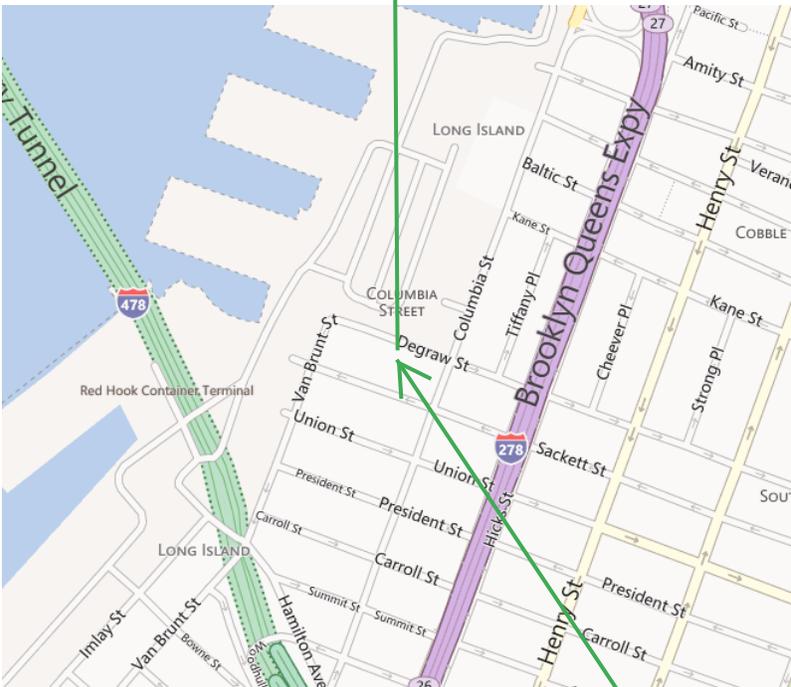
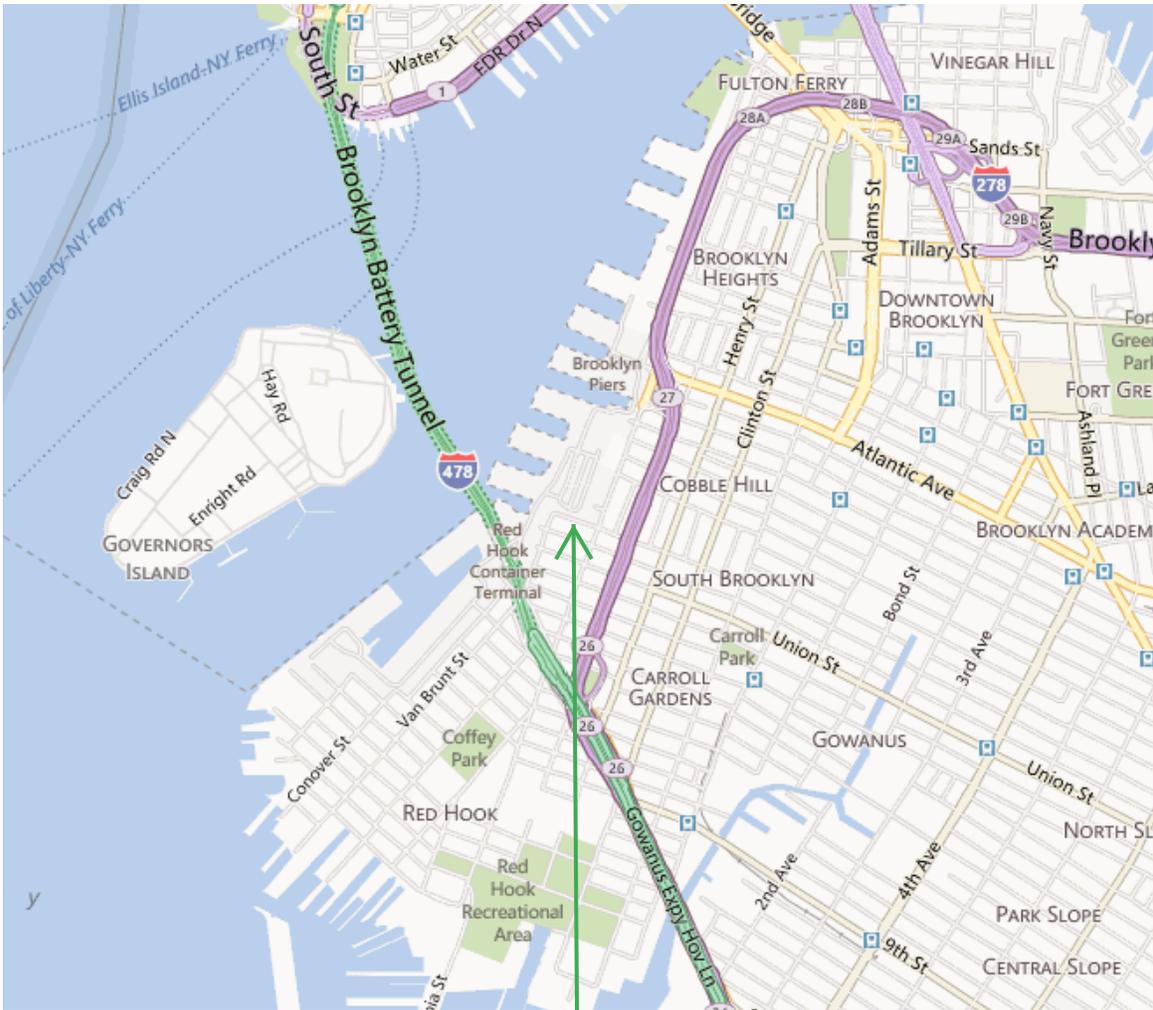
I, Scott A. Yanuck, am a qualified Environmental Professional. I had primary direct responsibility for implementation remedial program for the 96-98 Degraw Street, Brooklyn, New York Site.

I certify that the OER/DEP-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

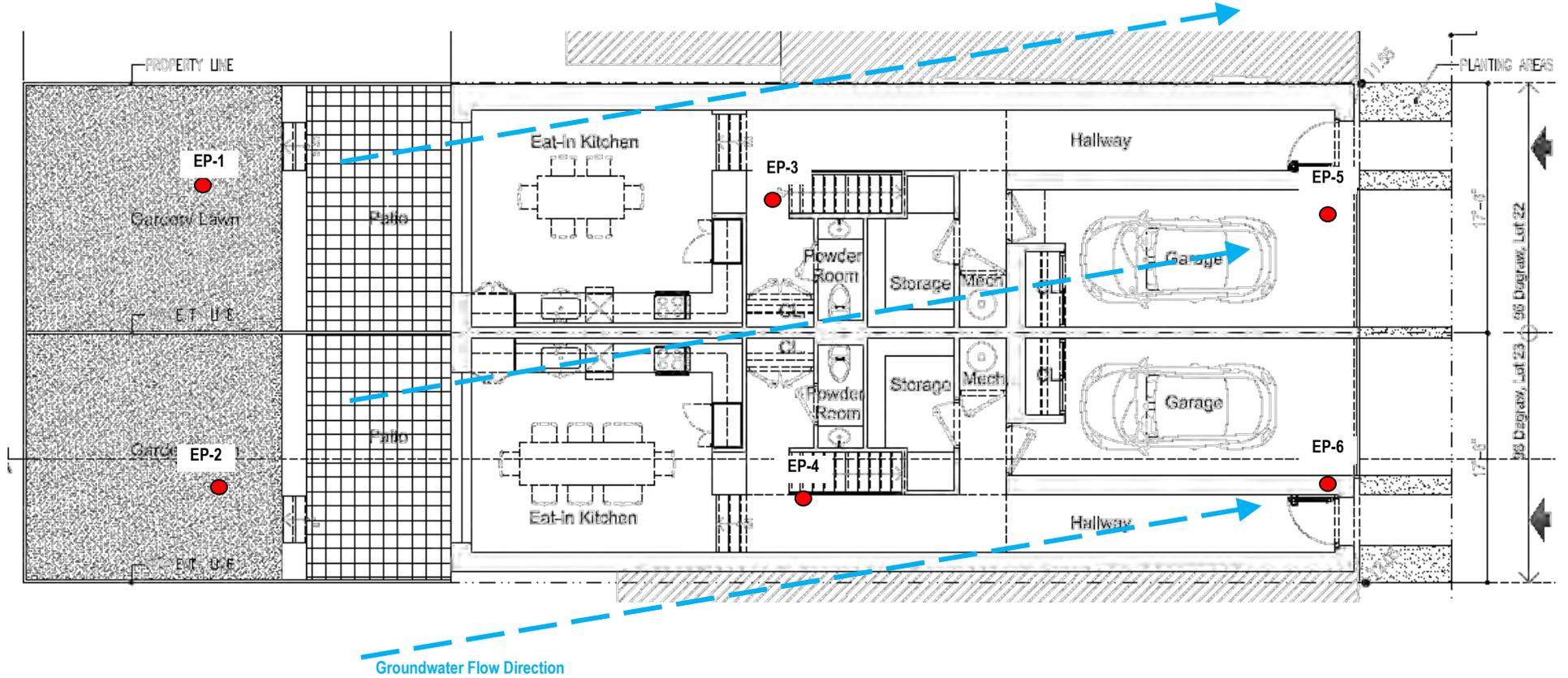
The table below presents a schedule for the proposed remedial action and reporting. If the schedule for remediation and development activities changes, it will be updated and submitted to OER/DEP. Currently, a one-month remediation period is anticipated.

Schedule Milestone	Weeks from Remedial Action Start	Duration (weeks)
OER/DEP Approval of RAWP	0	4
Fact Sheet 2 announcing start of remedy	0	1
Mobilization	1	1
Remedial Excavation	2	2
Demobilization	4	1
Record Declaration of Covenants and Restrictions	5	1
Submit Remedial Action Report	7	2



LEA, 53 West Hills Road, Suite 1, Huntington Station, New York 11746

Figure 1.0 Site Location
96-98 Degraw Street
Brooklyn, New York



Groundwater Flow Direction



53 West Hills Road, Suite 1
 Huntington Station, NY 11746
 PHONE: 631-673-0612
 FAX: 631-427-5323

FIGURE 2.0
 SITE SKETCH AND PROPOSED
 ENDPOINT SAMPLING
 LOCATIONS
 96-98 DEGRAW STREET
 BROOKLYN, NEW YORK

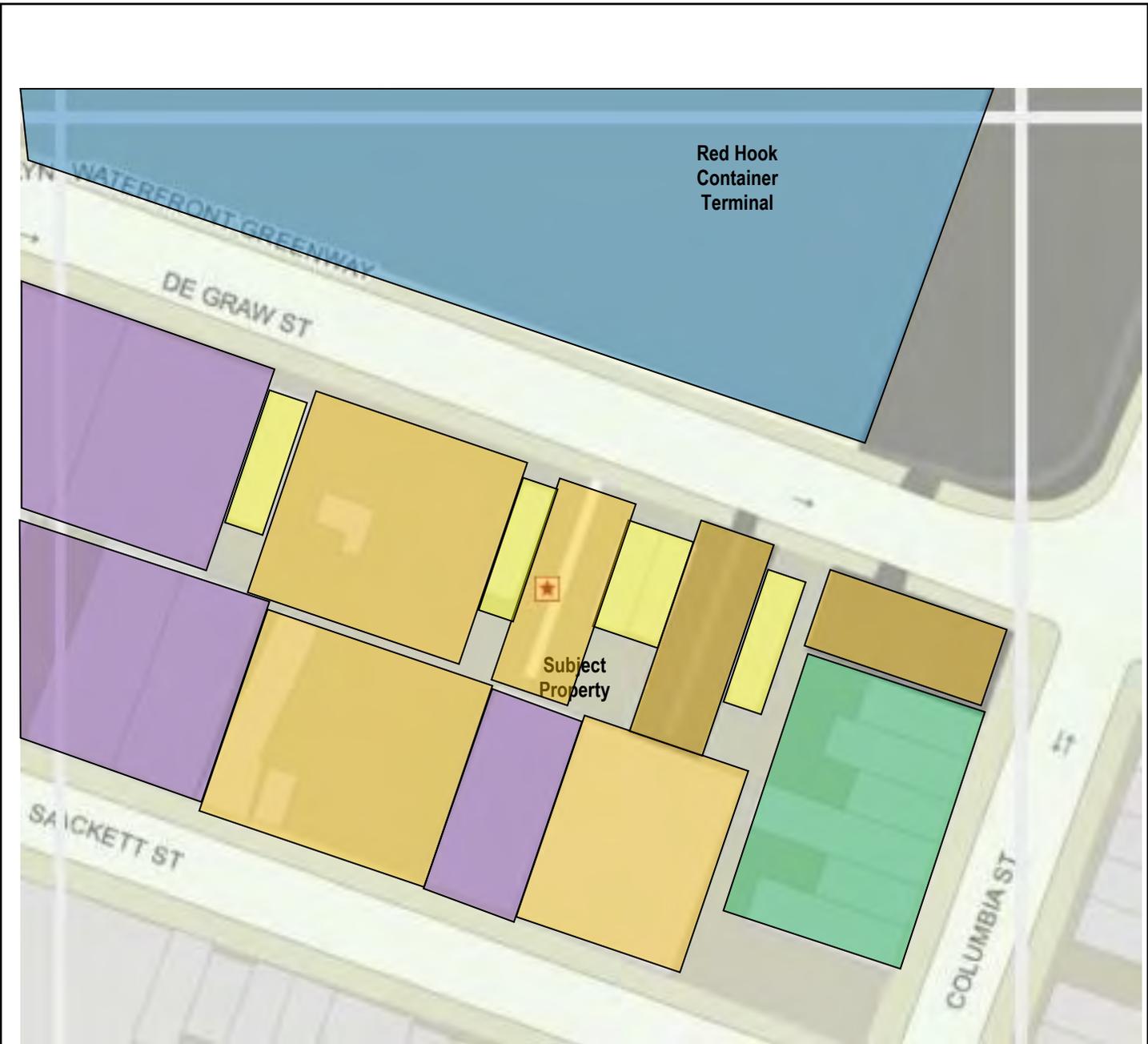
PROJECT # : 13-381
 DRAWING DATE: 9-9-2012
 DRAWN BY: CJC
 CHECKED BY: SAY

● Proposed Endpoint Sampling Locations



NOT TO SCALE

LEA makes no guarantees as to the accuracy of this drawing and it should only be used for informational purposes.



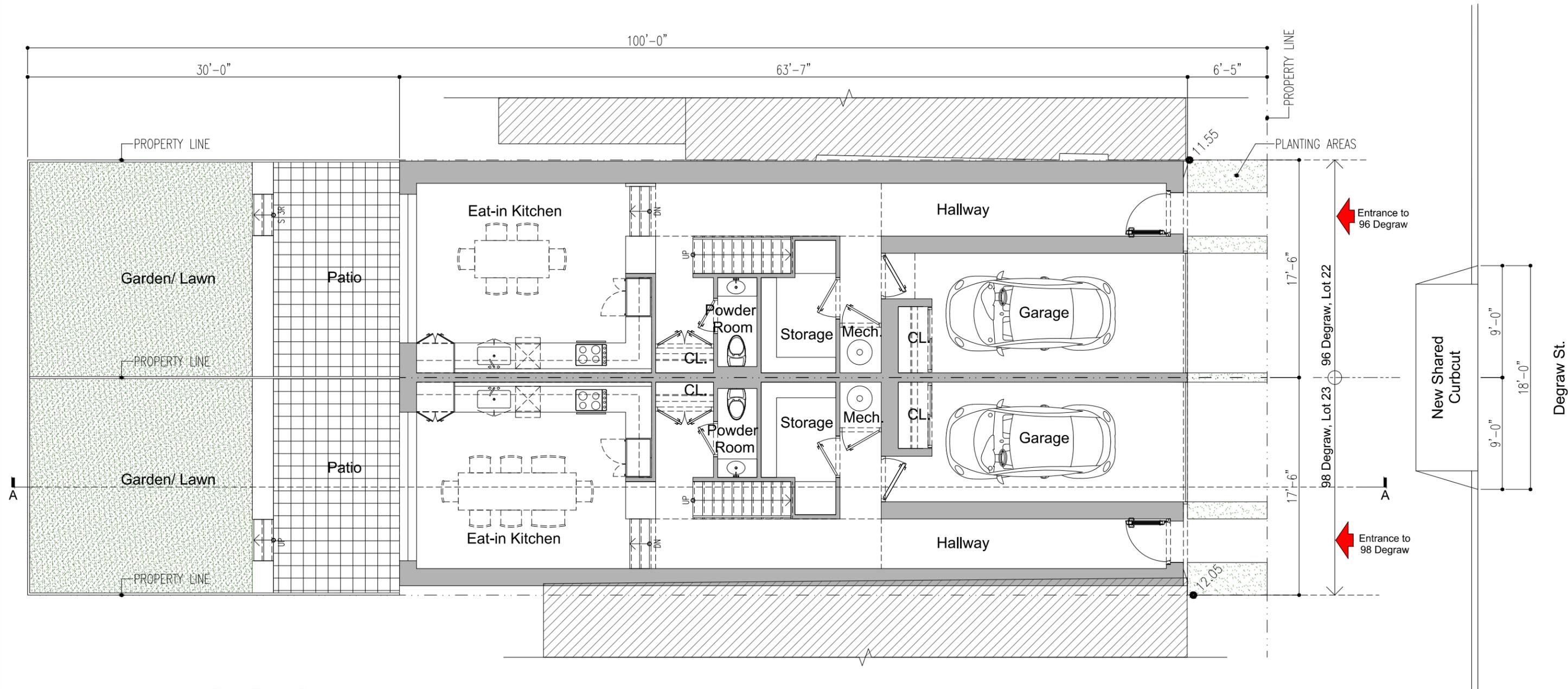

53 West Hills Road, Suite 1
 Huntington Station, NY 11746
 PHONE: 631-673-0612
 FAX: 631-427-5323
 WWW.LAUREL ENV.COM

FIGURE 3.0
 MAP OF SURROUNDING
 PROPERTY USAGE
 96-98 DEGRAW STREET
 BROOKLYN, NEW YORK

PROJECT #: 13-381
 DRAWING DATE: 9-9-13
 DRAWN BY: CJC
 CHECKED BY: SAY

N ↑
 NOT TO SCALE
 LEA makes no guarantees as to the accuracy of this drawing and it should only be used for informational purposes.

Figure 4.1
Redevelopment Plans
Ground Floor Plan



First Floor Plan
 1/8" = 1'-0"

96 Degrav st.	98 Degrav st.
1FL Gross Area: 1,107 sf	1FL Gross Area: 1,065 sf
Lot 22, Block 329 BSA Calendar: 13-13 BZ	Lot 23, Block 329 BSA Calendar: 13-14 BZ

"All partitions and exits shall be as approved by DOB."

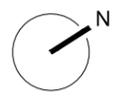
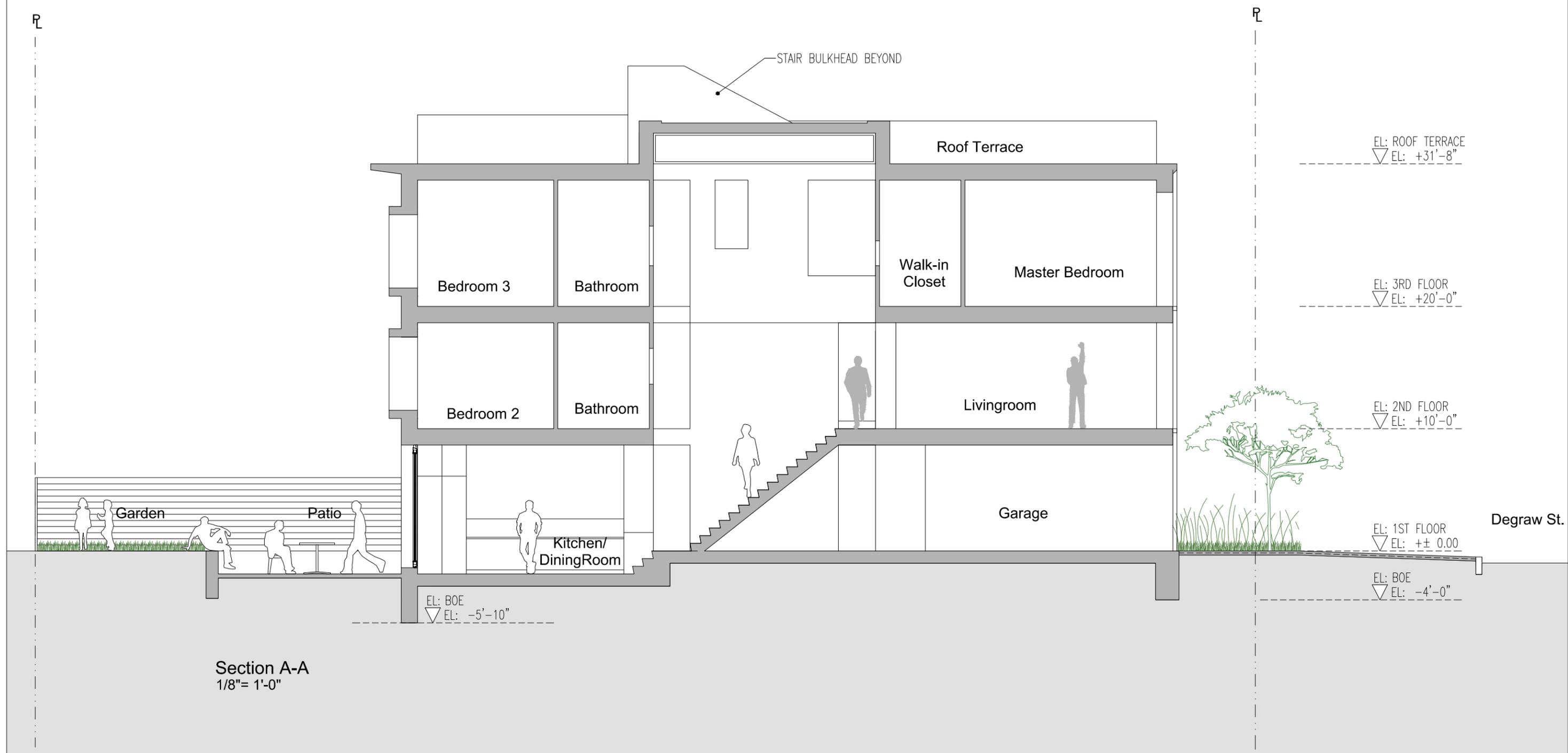


Figure 4.2
Redevelopment Plans
Section A-A

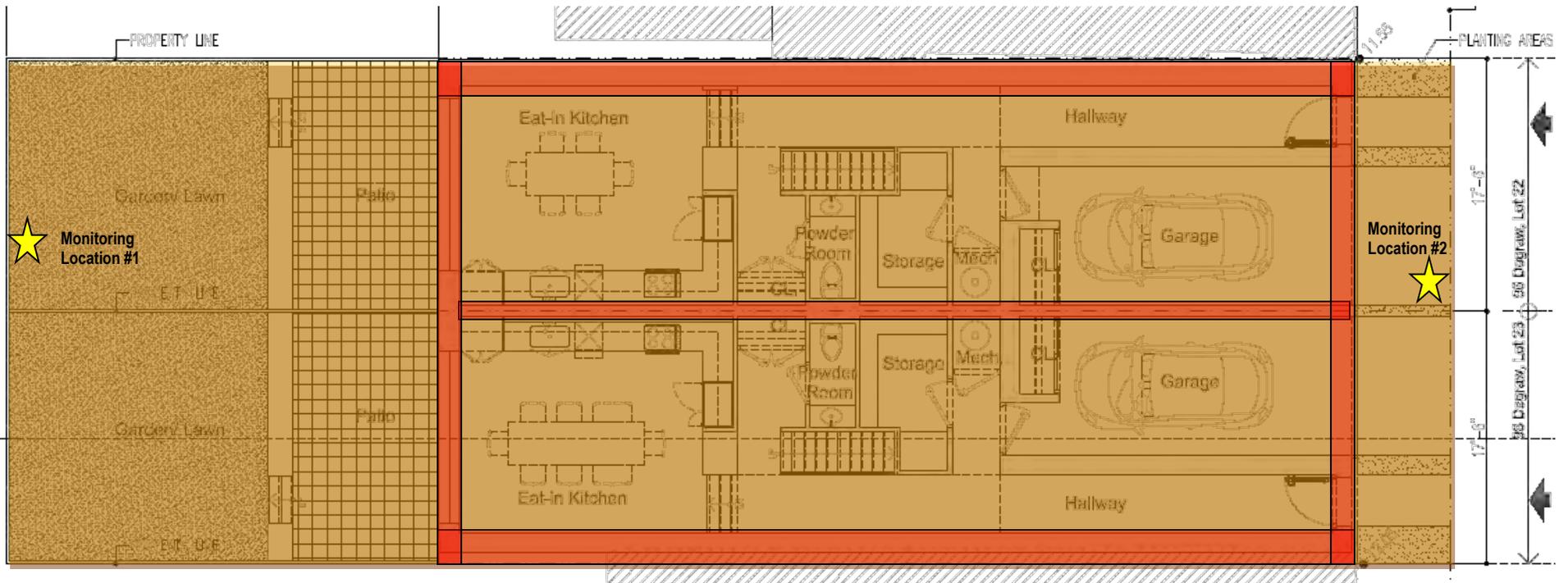


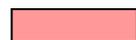
"All partitions and exits shall be as approved by DOB."

Figure 4.3
Redevelopment Plans
Front Elevation



"All partitions and exits shall be as approved by DOB."



-  2' Excavation
-  4' Footing Excavations
-  CAMP Monitoring Locations



53 West Hills Road, Suite 1
Huntington Station, NY 11746

PHONE: 631-673-0612
FAX: 631-427-5323

FIGURE 5.0
SITE SKETCH WITH EXCAVATION
LOCATIONS, AND CAMP
MONITORING LOCATIONS

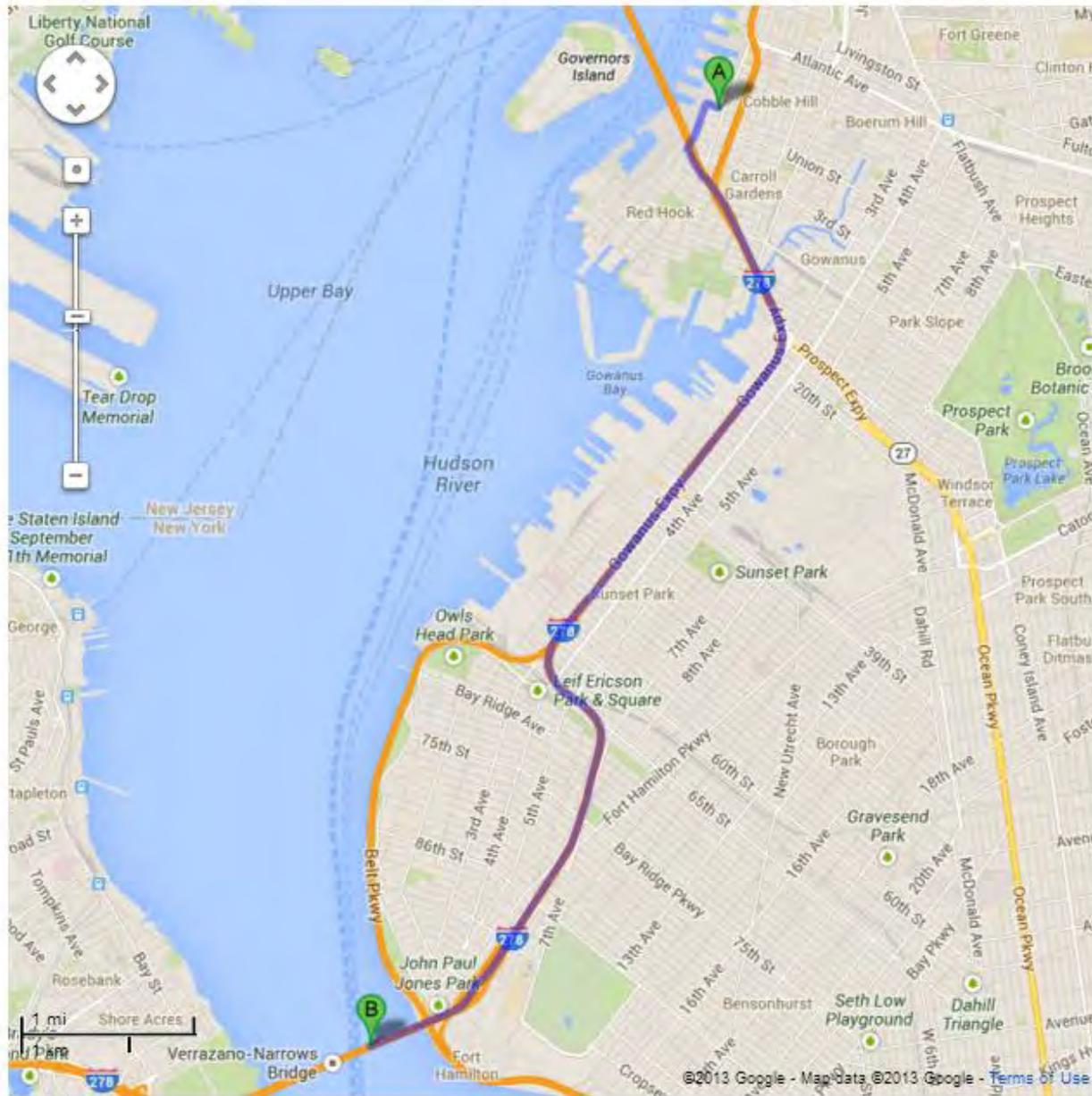
96-98 DEGRAW STREET
BROOKLYN, NEW YORK

PROJECT # : 13-381
DRAWING DATE: 10-21-2013
DRAWN BY: CJC
CHECKED BY: SAY



NOT TO SCALE

LEA makes no guarantees as to the accuracy of this drawing and it should only be used for informational purposes.



53 West Hills Road, Suite 1
Huntington Station, NY 11746

PHONE: 631-673-0612
FAX: 631-427-5323

FIGURE 6.0
TRUCK ROUTE FOR SOIL
TRANSPORT

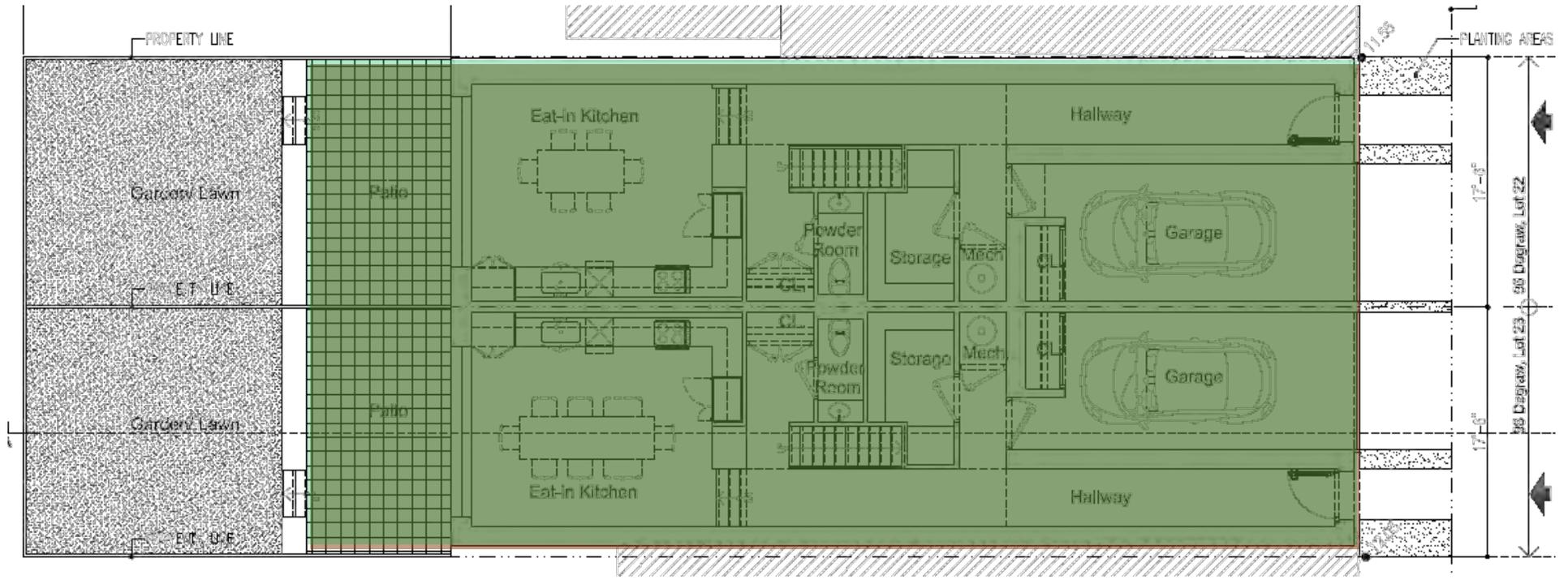
96-98 DEGRAW STREET
BROOKLYN, NEW YORK

PROJECT # : 13-381
DRAWING DATE: 10-21-2013
DRAWN BY: CJC
CHECKED BY: SAY



NOT TO SCALE

LEA makes no guarantees as to the accuracy of this drawing and it should only be used for informational purposes.



 Grace PrePrufe 300 R Vapor Barrier Layout



53 West Hills Road, Suite 1
 Huntington Station, NY 11746
 PHONE: 631-673-0612
 FAX: 631-427-5323

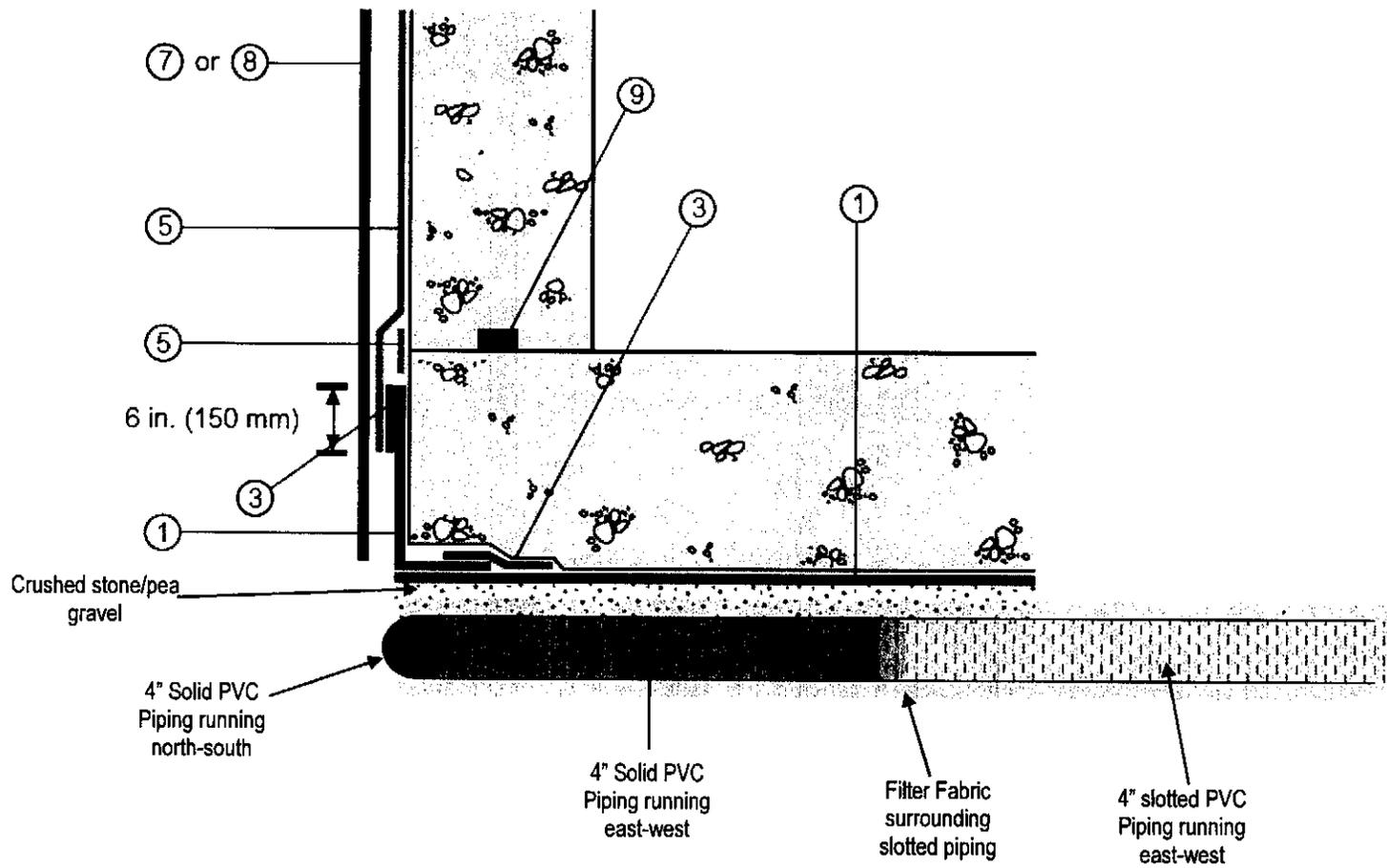
FIGURE 7.0
 VAPOR
 BARRIER/WATERPROOFING
 MEMBRANE DIAGRAM
 96-98 DEGRAW STREET
 BROOKLYN, NEW YORK

PROJECT # : 13-381
 DRAWING DATE: 10-21-2013
 DRAWN BY: CJC
 CHECKED BY: SAY



NOT TO SCALE

LEA makes no guarantees as to the accuracy of this drawing and it should only be used for informational purposes.



- 1 Preprufe 300R
- 2 Preprufe 160R
- 3 Preprufe Tape
- 4 Bituthene

- 5 Procor
- 6 Bituthene Liquid Membrane
- 7 Protection

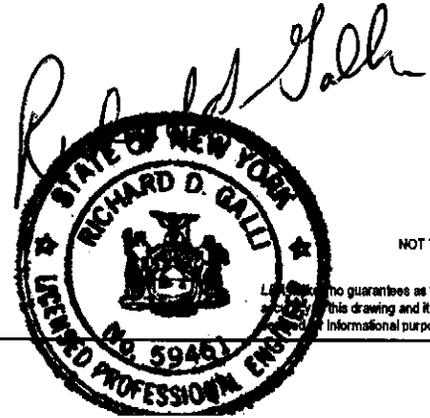
- 8 Hydroduct®
- 9 Adcor ES
- 10 Preprufe CJ Tape



53 West Hills Road
 Huntington Station, NY 11746
 PHONE: 631-673-0612
 FAX: 631-427-5323

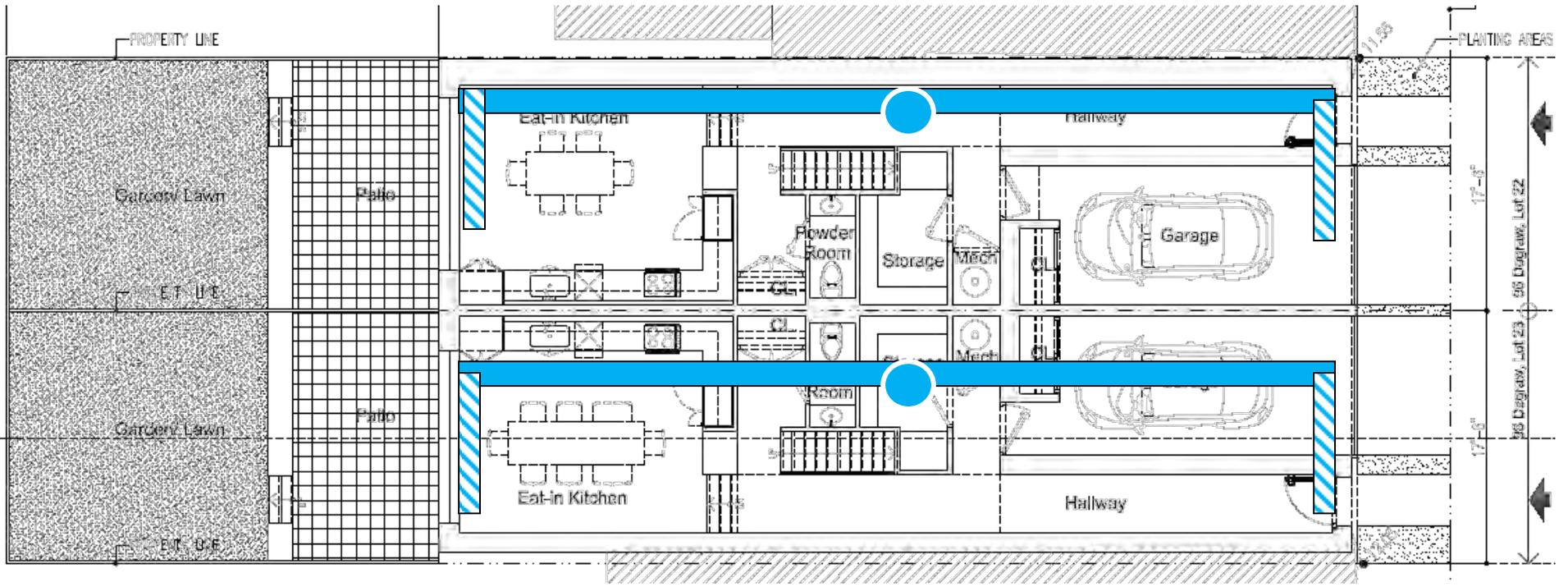
FIGURE 7.1
 VAPOR BARRIER/WATERPROOFING MEMBRANE DIAGRAM
 96-98 DEGRAW STREET
 BROOKLYN, NEW YORK

PROJECT #: 12-381
 DRAWING DATE: 10-31-13
 DRAWN BY: CJC
 CHECKED BY: SAY



NOT TO SCALE
 No guarantees as to the accuracy of this drawing and it should only be used for informational purposes.

SIDEWALK



-  4" Slotted PVC Piping
-  4" Solid PVC Piping
-  Stack and Depressurization fan



53 West Hills Road, Suite 1
Huntington Station, NY 11746
PHONE: 631-673-0612
FAX: 631-427-5323

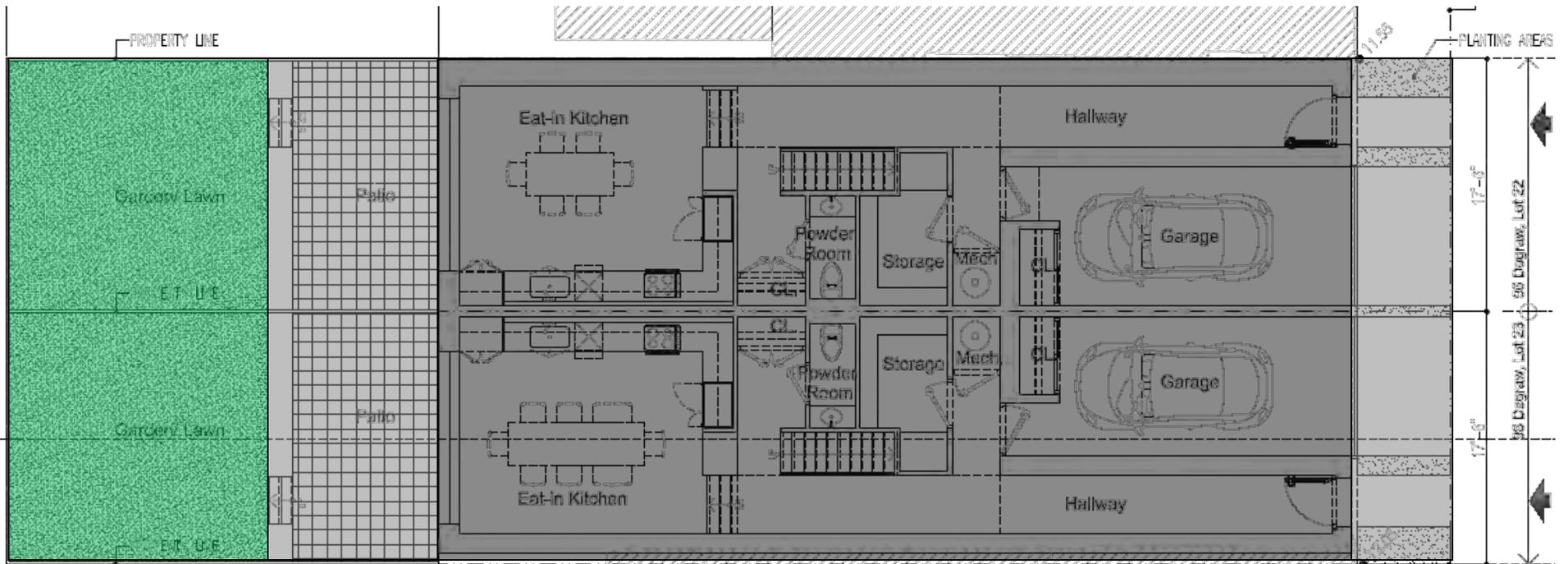
FIGURE 8.0
SUB-SLAB DEPRESSURIZATION
DIAGRAM
96-98 DEGRAW STREET
BROOKLYN, NEW YORK

PROJECT # : 13-381
DRAWING DATE: 10-21-2013
DRAWN BY: CJC
CHECKED BY: SAY



NOT TO SCALE

LEA makes no guarantees as to the accuracy of this drawing and it should only be used for informational purposes.



2 Feet of Certified Clean Fill with sod layer

Outdoor Paved patio on top of vapor barrier

Concrete Building Slab poured onto vapor barrier on underlying soils

2 Feet of Certified Clean Fill with poured concrete and asphalt layer



53 West Hills Road, Suite 1
Huntington Station, NY 11746

PHONE: 631-673-0612
FAX: 631-427-5323

FIGURE 9.0
SITE-WIDE COVER DESIGN

96-98 DEGRAW STREET
BROOKLYN, NEW YORK

PROJECT # : 13-381
DRAWING DATE: 10-21-2013
DRAWN BY: CJC
CHECKED BY: SAY



NOT TO SCALE

LEA makes no guarantees as to the accuracy of this drawing and it should only be used for informational purposes.

RAWP TABLE 1

Table 11-2. Final Restricted Use SCOs as Presented in 6 NYCRR Part 375-6.8(b).

Restricted Use Soil Cleanup Objectives							
Contaminant	CAS Number	Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
		Residential	Restricted-Residential	Commercial	Industrial		
Metals							
Arsenic	7440-38-2	16 ^f	16 ^f	16 ^f	16 ^f	13 ^f	16 ^f
Barium	7440-39-3	350 ^f	400	400	10,000 ^d	433	820
Beryllium	7440-41-7	14	72	590	2,700	10	47
Cadmium	7440-43-9	2.5 ^f	4.3	9.3	60	4	7.5
Chromium, hexavalent ^h	18540-29-9	22	110	400	800	1 ^e	19
Chromium, trivalent ^h	16065-83-1	36	180	1,500	6,800	41	NS
Copper	7440-50-8	270	270	270	10,000 ^d	50	1,720
Total Cyanide ^h		27	27	27	10,000 ^d	NS	40
Lead	7439-92-1	400	400	1,000	3,900	63 ^f	450
Manganese	7439-96-5	2,000 ^f	2,000 ^f	10,000 ^d	10,000 ^d	1600 ^f	2,000 ^f
Total Mercury		0.81 ^j	0.81 ^j	2.8 ^j	5.7 ^j	0.18 ^f	0.73
Nickel	7440-02-0	140	310	310	10,000 ^d	30	130
Selenium	7782-49-2	36	180	1,500	6,800	3.9 ^f	4 ^f
Silver	7440-22-4	36	180	1,500	6,800	2	8.3
Zinc	7440-66-6	2200	10,000 ^d	10,000 ^d	10,000 ^d	109 ^f	2,480
PCBs/Pesticides							
2,4,5-TP Acid (Silvex)	93-72-1	58	100 ^a	500 ^b	1,000 ^c	NS	3.8
4,4'-DDE	72-55-9	1.8	8.9	62	120	0.0033 ^{e1}	17
4,4'-DDT	50-29-3	1.7	7.9	47	94	0.0033 ^{e1}	136
4,4'-DDD	72-54-8	2.6	13	92	180	0.0033 ^{e1}	14

Restricted Use Soil Cleanup Objectives

Contaminant	CAS Number	Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
		Residential	Restricted-Residential	Commercial	Industrial		
Aldrin	309-00-2	0.019	0.097	0.68	1.4	0.14	0.19
alpha-BHC	319-84-6	0.097	0.48	3.4	6.8	0.04 ^k	0.02
beta-BHC	319-85-7	0.072	0.36	3	14	0.6	0.09
Chlordane (alpha)	5103-71-9	0.91	4.2	24	47	1.3	2.9
delta-BHC	319-86-8	100 ^a	100 ^a	500 ^b	1,000 ^c	0.04 ^k	0.25
Dibenzofuran	132-64-9	14	59	350	1,000 ^c	NS	210
Dieldrin	60-57-1	0.039	0.2	1.4	2.8	0.006	0.1
Endosulfan I	959-98-8	4.8 ⁱ	24 ⁱ	200 ⁱ	920 ⁱ	NS	102
Endosulfan II	33213-65-9	4.8 ⁱ	24 ⁱ	200 ⁱ	920 ⁱ	NS	102
Endosulfan sulfate	1031-07-8	4.8 ⁱ	24 ⁱ	200 ⁱ	920 ⁱ	NS	1,000 ^c
Endrin	72-20-8	2.2	11	89	410	0.014	0.06
Heptachlor	76-44-8	0.42	2.1	15	29	0.14	0.38
Lindane	58-89-9	0.28	1.3	9.2	23	6	0.1
Polychlorinated biphenyls	1336-36-3	1	1	1	25	1	3.2

Semivolatiles

Acenaphthene	83-32-9	100 ^a	100 ^a	500 ^b	1,000 ^c	20	98
Acenaphthylene	208-96-8	100 ^a	100 ^a	500 ^b	1,000 ^c	NS	107
Anthracene	120-12-7	100 ^a	100 ^a	500 ^b	1,000 ^c	NS	1,000 ^c
Benz(a)anthracene	56-55-3	1 ^f	1 ^f	5.6	11	NS	1 ^f
Benzo(a)pyrene	50-32-8	1 ^f	1 ^f	1 ^f	1.1	2.6	22
Benzo(b)fluoranthene	205-99-2	1 ^f	1 ^f	5.6	11	NS	1.7
Benzo(g,h,i)perylene	191-24-2	100 ^a	100 ^a	500 ^b	1,000 ^c	NS	1,000 ^c
Benzo(k)fluoranthene	207-08-9	1	3.9	56	110	NS	1.7

Restricted Use Soil Cleanup Objectives

Contaminant	CAS Number	Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
		Residential	Restricted-Residential	Commercial	Industrial		
Chrysene	218-01-9	1 ^f	3.9	56	110	NS	1 ^f
Dibenz(a,h)anthracene	53-70-3	0.33 ^e	0.33 ^e	0.56	1.1	NS	1,000 ^c
Fluoranthene	206-44-0	100 ^a	100 ^a	500 ^b	1,000 ^c	NS	1,000 ^c
Fluorene	86-73-7	100 ^a	100 ^a	500 ^b	1,000 ^c	30	386
Indeno(1,2,3-cd)pyrene	193-39-5	0.5 ^f	0.5 ^f	5.6	11	NS	8.2
m-Cresol	108-39-4	100 ^a	100 ^a	500 ^b	1,000 ^c	NS	0.33 ^e
Naphthalene	91-20-3	100 ^a	100 ^a	500 ^b	1,000 ^c	NS	12
o-Cresol	95-48-7	100 ^a	100 ^a	500 ^b	1,000 ^c	NS	0.33 ^e
p-Cresol	106-44-5	34	100 ^a	500 ^b	1,000 ^c	NS	0.33 ^e
Pentachlorophenol	87-86-5	2.4	6.7	6.7	55	0.8 ^e	0.8 ^e
Phenanthrene	85-01-8	100 ^a	100 ^a	500 ^b	1,000 ^c	NS	1,000 ^c
Phenol	108-95-2	100 ^a	100 ^a	500 ^b	1,000 ^c	30	0.33 ^e
Pyrene	129-00-0	100 ^a	100 ^a	500 ^b	1,000 ^c	NS	1,000 ^c
Volatiles							
1,1,1-Trichloroethane	71-55-6	100 ^a	100 ^a	500 ^b	1,000 ^c	NS	0.68
1,1-Dichloroethane	75-34-3	19	26	240	480	NS	0.27
1,1-Dichloroethene	75-35-4	100 ^a	100 ^a	500 ^b	1,000 ^c	NS	0.33
1,2-Dichlorobenzene	95-50-1	100 ^a	100 ^a	500 ^b	1,000 ^c	NS	1.1
1,2-Dichloroethane	107-06-2	2.3	3.1	30	60	10	0.02 ^f
cis-1,2-Dichloroethene	156-59-2	59	100 ^a	500 ^b	1,000 ^c	NS	0.25
trans-1,2-Dichloroethene	156-60-5	100 ^a	100 ^a	500 ^b	1,000 ^c	NS	0.19
1,3-Dichlorobenzene	541-73-1	17	49	280	560	NS	2.4

Restricted Use Soil Cleanup Objectives

Contaminant	CAS Number	Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
		Residential	Restricted-Residential	Commercial	Industrial		
1,4-Dichlorobenzene	106-46-7	9.8	13	130	250	20	1.8
1,4-Dioxane	123-91-1	9.8	13	130	250	0.1 ^e	0.1 ^e
Acetone	67-64-1	100 ^a	100 ^b	500 ^b	1,000 ^c	2.2	0.05
Benzene	71-43-2	2.9	4.8	44	89	70	0.06
n-Butylbenzene	104-51-8	100 ^a	100 ^a	500 ^b	1,000 ^c	NS	12
Carbon tetrachloride	56-23-5	1.4	2.4	22	44	NS	0.76
Chlorobenzene	108-90-7	100 ^a	100 ^a	500 ^b	1,000 ^c	40	1.1
Chloroform	67-66-3	10	49	350	700	12	0.37
Ethylbenzene	100-41-4	30	41	390	780	NS	1
Hexachlorobenzene	118-74-1	0.33 ^c	1.2	6	12	NS	3.2
Methyl ethyl ketone	78-93-3	100 ^a	100 ^a	500 ^b	1,000 ^c	100 ^a	0.12
Methyl tert-butyl ether	1634-04-4	62	100 ^a	500 ^b	1,000 ^c	NS	0.93
Methylene chloride	75-09-2	51	100 ^a	500 ^b	1,000 ^c	12	0.05
n-Propylbenzene	103-65-1	100 ^a	100 ^a	500 ^b	1,000 ^c	NS	3.9
sec-Butylbenzene	135-98-8	100 ^a	100 ^a	500 ^b	1,000 ^c	NS	11
tert-Butylbenzene	98-06-6	100 ^a	100 ^a	500 ^b	1,000 ^c	NS	5.9
Tetrachloroethene	127-18-4	5.5	19	150	300	2	1.3
Toluene	108-88-3	100 ^a	100 ^a	500 ^b	1,000 ^c	36	0.7
Trichloroethene	79-01-6	10	21	200	400	2	0.47
1,2,4-Trimethylbenzene	95-63-6	47	52	190	380	NS	3.6
1,3,5-Trimethylbenzene	108-67-8	47	52	190	380	NS	8.4
Vinyl chloride	75-01-4	0.21	0.9	13	27	NS	0.02
Xylene (mixed)	1330-20-7	100 ^a	100 ^a	500 ^b	1,000 ^c	0.26	1.6

All Soil clean up objectives (SCOs) are in parts per million (ppm).
NS=Not specified. See Technical Support Document (TSD).

Footnotes:

- ^a The SCOs for residential, restricted-residential and ecological resources use were capped at a maximum value of 100 ppm, see TSD Section 9.3.
- ^b The SCOs for commercial use were capped at a maximum value of 500 ppm, see TSD Section 9.3.
- ^c The SCOs for industrial use and the protection of groundwater were capped at a maximum value of 1000 ppm, see TSD Section 9.3.
- ^d The SCOs for metals were capped at a maximum value of 10,000 ppm, see TSD Section 9.3.
- ^e For constituents where the calculated SCO was lower than the Contract Required Quantitation Limit (CRQL), the CRQL is used as the SCO value.
- ^f For constituents where the calculated SCO was lower than the rural soil background concentration as determined by the DEC/DOH rural soil survey, the rural soil background concentration is used as the Track 2 SCO value for this use of the site.
- ^g SCO is the sum of DDD, DDE and DDT.
- ^h The SCO for this specific compound (or family of compounds) is considered to be met if the analysis for the total species of this contaminant is below the specific SCO.
- ⁱ This SCO is for the sum of Endosulfan I, Endosulfan II and Endosulfan Sulfate.
- ^j This SCO is the lower of the values for mercury (elemental) or mercury (inorganic salts), see TSD table 5.6-1.
- ^k This SCO is derived from data on mixed isomers of BHC.
- ^l This SCO is for the sum of DDD, DDE and DDT.

TABLE 2

<u>Disposal Facility</u>	<u>Waste Type</u>	<u>Estimated Quantities</u>
Permitted facility to be named	Historic Fill from entire site 2.00' cut, and footing strips 4.00' cut	~350 tons

Assumes 1.4 tons per cubic yard of material

TABLE 3

<u>Facility for Backfill Materials</u>	<u>Material Type</u>	<u>Estimated Quantities</u>
Facility to be named	Certified Clean Soil	~130 tons

APPENDIX A

CITIZEN PARTICIPATION PLAN

The NYC Office of Environmental Remediation and Laurel Environmental Associates, Ltd. 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, Laurel Environmental Associates, Ltd. 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/DEP) 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/DEP's project manager assigned to this Site, William Wong, who can be contacted about these issues or any others questions, comments or concerns that arise during the remedial process at (212) 788-8841

Project Contact List. OER/DEP 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/DEP's

project manager. If you would like to be added to the Project Contact List, contact NYC OER/DEP 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. Laurel Environmental Associates, Ltd. will inspect the repositories to ensure that they are fully populated with project information. The repository for this project is:

Carroll Garden branch of the Brooklyn Public Library
396 Clinton Street, Brooklyn, New York 11231
(718) 596-6972

Hours

Mon 10:00 AM - 6:00 PM
Tue 1:00 PM - 8:00 PM
Wed 10:00 AM - 8:00 PM
Thu 10:00 AM - 6:00 PM
Fri 10:00 AM - 6:00 PM
Sat 10:00 AM - 5:00 PM
Sun closed

Digital Documentation. NYC OER/DEP 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.

Laurel Environmental Associates, Ltd. is required to identify whether there are specific issues of concern to stakeholders proximate to the project site. Such issues include but are not limited to interests of Environmental Justice communities. Laurel Environmental Associates, Ltd. should list any site-specific issues of public concern and the method that they will be used

resolved them. If needed, contact OER/DEP for additional guidance on how to identify issues of public concern.

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/DEP. 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 Laurel Environmental Associates, Ltd., reviewed and approved by OER/DEP prior to distribution and mailed by Laurel Environmental Associates, Ltd. 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/DEP 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:

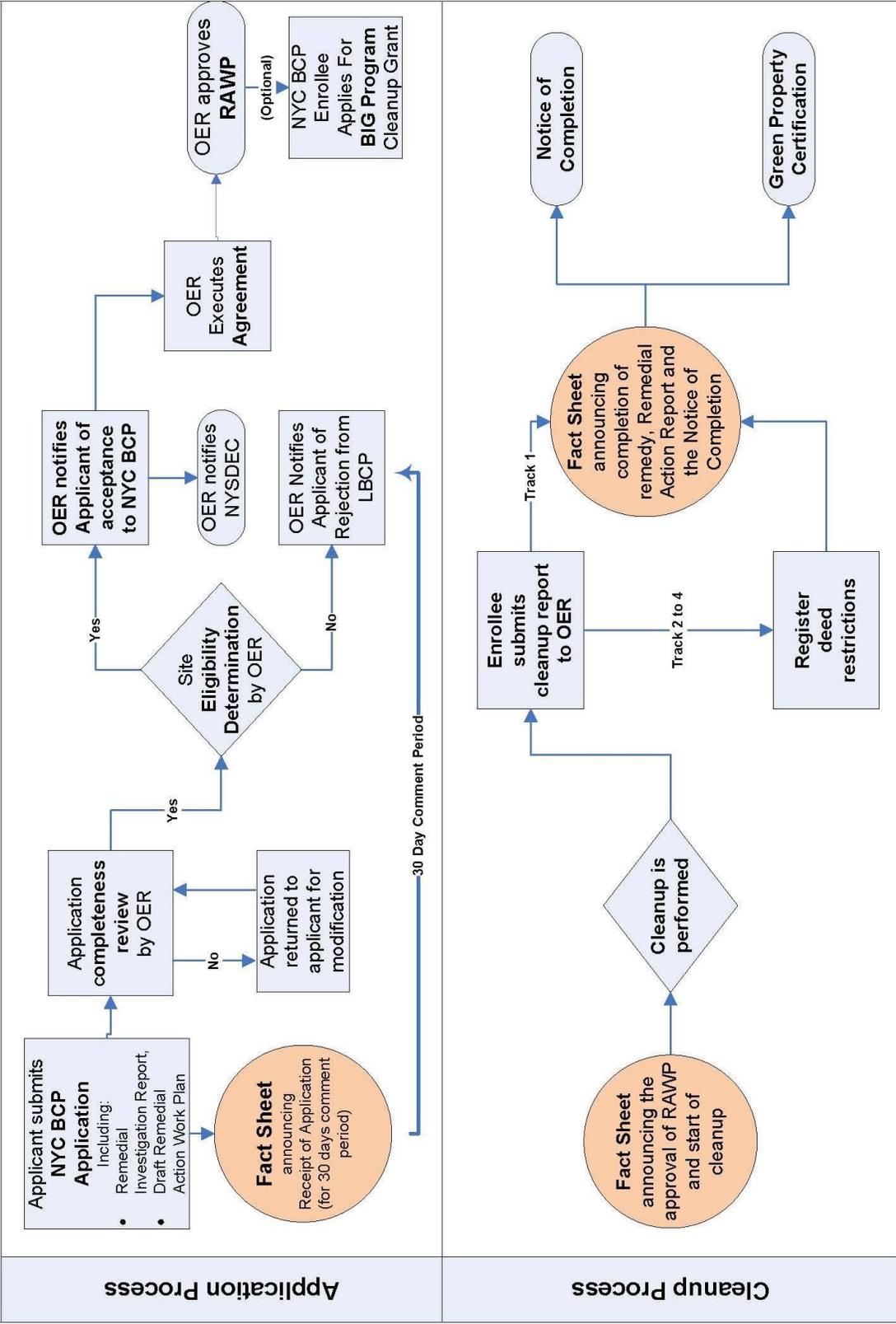
- **Public Notice of the availability of the Remedial Investigation Report and Remedial Action Work Plan and a 30-day public comment period on the Remedial Action Work Plan.**

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/DEP 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.

Flow Chart For NYC Brownfield Cleanup Program (NYC BCP)



APPENDIX B

SUSTAINABILITY STATEMENT

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

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

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

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

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

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

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

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

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

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

A vapor barrier on-site will reduce the likelihood of re-contamination at the 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.

Storm-water volume retention is a part of the remediation and redevelopment at this site. Special care to keep all storm water on-site during the remediation will be taken. 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 uses. The developer plans to construct a building that will conform to the German Passivhaus Standards.

Paperless Brownfield Cleanup Program. Laurel Environmental Associates, Ltd is participating in OER/DEP'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. Laurel Environmental Associates, Ltd is participating in OER/DEP'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.

The design of the proposed building includes the protection of existing trees, using temporary tree guards, tree pits, and the removal and planting of trees within the guidelines New York City Department of Parks and Recreation Street Tree Standards. All necessary permits will be obtained for any removal, relocation, and planting, prior to commencement of work.

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

APPENDIX C

SOIL/MATERIALS MANAGEMENT PLAN

1.1 SOIL SCREENING METHODS

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

1.2 STOCKPILE METHODS

Excavated soil from suspected areas of contamination (e.g., hot spots, USTs, drains, etc.) will be stockpiled separately and will be segregated from clean soil and construction materials. Stockpiles will be used only when necessary and will be removed as soon as practicable. While stockpiles are in place, they will be inspected daily, and before and after every storm event. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by OER/DEP. 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/DEP 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 in Figure 6. 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 Brooklyn, New York under a governmental remediation program. The letter will provide the project identity and the name and phone number of the PE/QEP or Enrollee. The letter will include as an attachment a summary of all chemical data for the material being transported; and (2) a letter from each disposal facility stating it is in receipt of the correspondence (1, above) and is approved to accept the material. These documents will be included in the RAR.

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

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

Waste characterization will be performed for off-Site disposal in a manner required by the receiving facility and in conformance with its applicable permits. Waste characterization

sampling and analytical methods, sampling frequency, analytical results and QA/QC will be reported in the RAR. A manifest system for off-Site transportation of exported materials will be employed. Manifest information will be reported in the RAR. Hazardous wastes derived from on-Site will be stored, transported, and disposed of in compliance with applicable laws and regulations.

1.7 MATERIALS REUSE ON-SITE

No materials are proposed to be re-used on site.

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/DEP-approved backfill and cover soil quality objectives for this Site. The backfill and cover soil quality objectives are listed in Table 3.

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/DEP. 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/DEP'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/DEP. 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/DEP 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/DEP 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 F

Eqpwt wevkp 'J gcnj 'c pf 'Uchgv{
Tgr qt v



CONSTRUCTION
HEALTH AND SAFETY PLAN

VACANT BROWNFIELD SITE
CEQR Number: 13BSA085K
96-98 Degraw Street, Brooklyn, NY

October 2013
LEA PROJECT # 12-248

Scott A. Yanuck
Health and Safety Officer

TABLE OF CONTENTS

TABLE OF CONTENTS	2
1.0 PURPOSE	3
2.0 HAZARD EVALUATION	4
3.0 SITE CONTROL	6
3.1 <i>SITE WORK LOCATIONS:</i>	6
3.2 <i>WORK ZONES:</i>	6
3.3 <i>DUST AND ODORS:</i>	7
3.4 <i>SECURITY:</i>	7
3.5 <i>SITE COMMUNICATIONS:</i>	8
4.0 PERSONAL PROTECTIVE EQUIPMENT	8
5.0 PERSONNEL SAFETY/HYGIENE	10
6.0 PERSONNEL TRAINING	10
7.0 DECONTAMINATION PROCEDURES	10
8.0 EMERGENCY CONTINGENCY PLAN	11
9.0 HEAT STRESS CASUALTY PREVENTION PLAN	12

**HEALTH AND SAFETY PLAN
FOR USE DURING REMEDIAL ACTION AND CONSTRUCTION**

1.0 PURPOSE

The purpose of this Construction Health and Safety Plan (CHASP) is to assign responsibilities, establish minimum personnel protection standards and operating procedures and provide for contingencies that may arise while operations are being performed at the subject site, 96-98 Degraw Street, Brooklyn, New York. The proposed Remedial Action will include the removal of historic fill from the site.

Laurel Environmental Associates, Ltd. (LEA) and its subcontractors will be responsible for providing materials, equipment and labor required by the CHASP. The protocols of the CHASP will be followed by all personnel involved in the work, including employees and agents of Contractors, Subcontractors and Owner. Mr. Chris Connolly is the Project Manager, Scott A. Yanuck is the Health and Safety Officer, and Carla Sullivan is the Quality Assurance/Quality Control Officer for the project.

This CHASP establishes the minimum level of personnel protection. Additional measures will be implemented if necessary to protect personnel involved in the work and the public at large.

Conditions at the site are not expected to warrant either Level B or Level C protection during the investigation based on known site conditions. Regardless, all workers present on site will be familiar with proper protection procedures and the CHASP. All personnel scheduled to work at the site are 40-hour OSHA HAZWOPER CFR 1910.120 trained, with 8-hour refreshers up to date.

Given the scope of the work, and the type of contaminants on-site, there is a low potential of the surrounding community being negatively impacted by activities which will be conducted during this investigation. *Laurel Environmental Associates, Ltd.* will take every possible step to avoid any type of negative impact.

The Site is currently a vacant fenced lot. Soils will be field screened with a Photoionization Detector (PID) to determine the presence of organic contamination. If an emergency occurs during the measures, which in any event may impact the surrounding community, all appropriate emergency resources listed under the Emergency Contingency Plan Section of this plan will be immediately notified.

2.0 HAZARD EVALUATION

Elevated levels of volatile organic compounds (VOCs) in the atmosphere are not expected to occur during on-site activities. However, the presence of VOCs will be evaluated using a Photoionization Detector (PID). Results from the air monitoring will determine if Level D personnel protection of workers is appropriate or a higher level of protection is required.

During all activities, *LEA* personnel will monitor the area around the excavation using a PID to ensure that the appropriate worker protection is maintained for the level of pollutants found. If air monitoring indicates contaminant concentrations pose a risk to workers, the area will be immediately evacuated. Guidelines that will be followed before continuing are noted in Table 1 on the following page. If conditions warrant, Level B and C protection will be worn.

Table 1
Atmospheric Hazard Guidelines

<u>Hazard</u>	<u>Monitoring Equipment</u>	<u>Measured Level</u>	<u>Action</u>
Explosive Atmosphere	Combustible Gas Indicator	<10% LEL	Continue investigation.
		10%-20% LEL	Continue on-site monitoring with extreme caution as higher levels are encountered.
		>20% LEL	Explosion hazard. Withdraw from area immediately.
Oxygen	Multi RAE	Oxygen conc. <19.5%	Withdraw from area. NOTE: Combustible gas readings are not valid in atmosphere with oxygen levels of less than 19.5%
		19.5% - 23.5%	Continue investigation with caution.
		>23.5%	Fire hazard potential. Discontinue investigation. Withdraw from area.
Organic gases and vapors	PID	Background	Continue work
		5 ppm	Temporarily halt work until average readings drop below 5 ppm
		5 - 25 ppm	Halt work, identify and remedy or abate source
		Above 15 ppm	Continue work once average readings drop below 5 ppm Work must be shut down. Evaluate alternative approaches

Notes:

1. LEL = Lower Explosive Limit

3.0 SITE CONTROL

3.1 Site Work Locations:

Activities involving soil, groundwater and soil vapor sampling will be performed within the fenced boundaries of the property. The work areas are the locations in which the actual activities will occur. Workers entering these areas are required to be protected as defined below. Only authorized personnel, including personnel conducting the work activities involved, and specialized personnel such as subcontractors engaged in well installation and operation of heavy equipment, will be allowed in the work areas. Within the work areas, the levels of protection will be determined based on the degree of hazard present, as detected by the measurements obtained with the PID, and/or other activity-specific monitoring equipment. As an engineering control, a regenerative air blower may be used to reduce the potential for dangerous concentrations of VOCs in the breathing zone near the excavation, if warranted.

3.2 Work Zones:

Work zones will be defined prior to the commencement of work activities. These work zones will limit equipment, operations and personnel in the areas as defined below:

Exclusion Zone - This shall include all areas where potential environmental monitoring has shown or is suspected that a potential chemical hazard may exist to workers. This will include down-wind locations. If a chemical hazard exists at downwind locations, the exclusion zone will be expanded as necessary. The level of PPE required in these areas shall be determined by the Site HSO after air monitoring and on-Site inspection has been conducted. The area shall be clearly delineated from the decontamination area. As work proceeds, the delineation boundary shall be relocated as necessary to prevent the accidental contamination of nearby people and equipment.

Contamination Reduction Zone - This zone will occur at the interface between the Exclusion Zone ("Hot Zone") and Support Zone ("Clean Zone") and shall provide a transfer of personnel and equipment to and from the Support Zone to the Exclusion Zone. This zone is for the decontamination of personnel and equipment prior to entering the Support Zone, and for the physical segregation of the Support Zone and Exclusion Zone. The contamination reduction zone will be placed along the front of the Site. Access to the Site by the public will be restricted during the Remedial Action and Construction.

Support Zone - This area is the remainder of the work Site and project Site. The support zone will be staged near company vehicles on Union Street. The function of the Support Zone includes:

- A. An entry area for personnel, material and equipment to the Exclusion Zone of site operations through the Contamination Reduction Zone
- B. An Exit for decontamination personnel, materials and equipment from the "Decon" area of Site operations
- C. The Housing of Site special services
- D. A storage area for clean safety and work equipment

Small decontamination areas may be set up adjacent to the work area to facilitate decontamination of equipment that is reused throughout the field activity.

3.3 Dust and Odors:

If during sampling, dust or odors emanating from contaminated soils are deemed excessive at adjoining properties and commercial businesses, the sampling process will include misting with water to keep dust levels to a minimum.

3.4 Security:

Periodic security patrols will be conducted to ensure that adequate security is being maintained. Only workers authorized by the field manager may be allowed to enter the Site. Warning signs will be posted to discourage entry by unauthorized personnel. The HSO will brief all visitors of all security and safety plans.

At the end of each work day, the site will be secured with a locked gate and 6 foot chain link fencing.

3.5 Site Communications:

Communications on-Site will be conducted through verbal communications. When out of audible range, verbal communications may be assisted using mobile telephones and two-way radios.

4.0 PERSONAL PROTECTIVE EQUIPMENT

All on-site workers will be familiar with proper protection procedures and this Health and Safety Plan. Level D personal protective clothing will be worn at the outset.

As stated above Level B or C protection will be worn as required. General descriptions of Level C and B protection are presented in Tables 2 and 3 on the following page, respectively. If it is necessary to wear Level B or C protection, the work area shall be separated into three Zones: an Exclusion Zone, a Contamination Reduction Zone, and a Support Zone. No one but protected personnel shall be in the Exclusion and Contamination Reduction Zones. An entrance and exit point shall be designated and monitored to ensure that no unauthorized personnel enter the area. Everyone that enters the area shall log in the field note book with the length of time spent in the area and the task performed noted.

All workers shall wear gloves when handling soil/sludge and apparatus. Gloves shall also be worn while cleaning the sampling equipment.

If any personnel must be lowered into a confined spaces additional procedures must be followed. *LEA* will provide the confined space procedures. *LEA* will monitor the confined space prior to entry and complete the confined space permit. If needed, dilution or exhaust ventilation will be provided to lower contaminant levels.

All persons working in the confined space must have confined space awareness training and a confined space supervisor must be present. *LEA* will perform continuous air monitoring for oxygen, flammability and toxins. At a minimum, carbon monoxide and hydrogen sulfide will be monitored in addition to other site-specific chemicals determined to be a hazard. All personnel working in or monitoring the confined space activities must be properly OSHA confined space entry trained. An approved safety harness and tripod will be employed. Personnel at grade will be constantly monitoring the worker in the pool for signs of fatigue, heat stress or behavior change.

Table 2
LEVEL C PROTECTION

1. Full-face or half-mask, air purifying, canister equipped respirators (NIOSH approved) for those contaminants present.
2. Hooded chemical resistant clothing: (overalls; two-piece chemical-splash-suit; disposable chemical-resistant overalls).
3. Coveralls*
4. Gloves, outer, chemical-resistant
5. Gloves, inner, chemical-resistant
6. Boots (outer), chemical-resistant, steel toe and shank
7. Boot-covers, outer, chemical-resistant, (disposable)*
8. Hard hat
9. Escape mask*
10. Two-way radios (worn under outside protective clothing)
11. Face shield*

*Optional, as applicable.

Table 3
LEVEL B PROTECTION

1. Pressure-demand, full-faceplate self-contained breathing apparatus (SCBA), or pressure demand supplied air respirator with escape SCBA (NIOSH approved)
2. Hooded chemical-resistant clothing (overalls and long-sleeved shirts) jacket; coveralls; one or two-piece chemical-splash suit; disposable chemical-resistant overalls).
3. Coveralls*
4. Gloves, outer chemical-resistant
5. Gloves, inner, chemical-resistant.
6. Boots, outer, chemical resistant steel toe and shank
7. Boot-covers, outer, chemical-resistant (disposable)
8. Hard hat
9. Two-way radios (worn inside encapsulating suit)
10. Face shield*

* Optional, as applicable

5.0 PERSONNEL SAFETY/HYGIENE

The safety practices to be followed by all on-site personnel include:

1. If Level B or C protection must be worn, eating, drinking, chewing gum or tobacco, smoking or any practice that increases the probability of hand-to-mouth transfer and ingestion of materials is prohibited in the Exclusion and Contamination Reduction Zones. All workers must be trained, medically qualified and fit tested in the use of respirators.
2. Hands and face must be thoroughly washed before eating, drinking or any other personal hygiene activities.
3. No excessive facial hair, which interferes with a satisfactory fit of the mask to face seal, is allowed for personnel to wear respiratory protective equipment.

6.0 PERSONNEL TRAINING

At the start of the job before engaging in any work, all personnel will be briefed on the following:

1. The person in charge as safety officer
2. Boundaries, entry and exit point locations of the work zones, if established
3. Use of personnel protection equipment
4. Principles of personnel hygiene
5. Location of first-aid equipment
6. Evacuation procedures to be followed in case of emergencies
7. Heat stress symptoms. All personnel will be advised to watch for signs of heat stress.

New personnel will be briefed on the same points prior to starting work at the site.

7.0 DECONTAMINATION PROCEDURES

If Level B or C protection is worn, decontamination procedures shall be performed in the Contamination Reduction Zone. All disposable garments and spent cartridges/canisters from respiratory equipment will be stored, transported, and properly disposed of in DOT approved 55-gallon drums. Potentially contaminated equipment will be cleaned before leaving the site.

8.0 EMERGENCY CONTINGENCY PLAN

In the event of physical injury, the safety officer or any other qualified person will initiate first aid and, if necessary, call the ambulance. If a chemical exposure is encountered, a physician will be informed, as specifically as possible, of the chemical(s) to which the person had been exposed and the toxicological properties of the chemical(s).

In case of any emergency, the following resources might need to be contacted:

A. Local Resource

Fire Department: **911**

Police Department: **911**

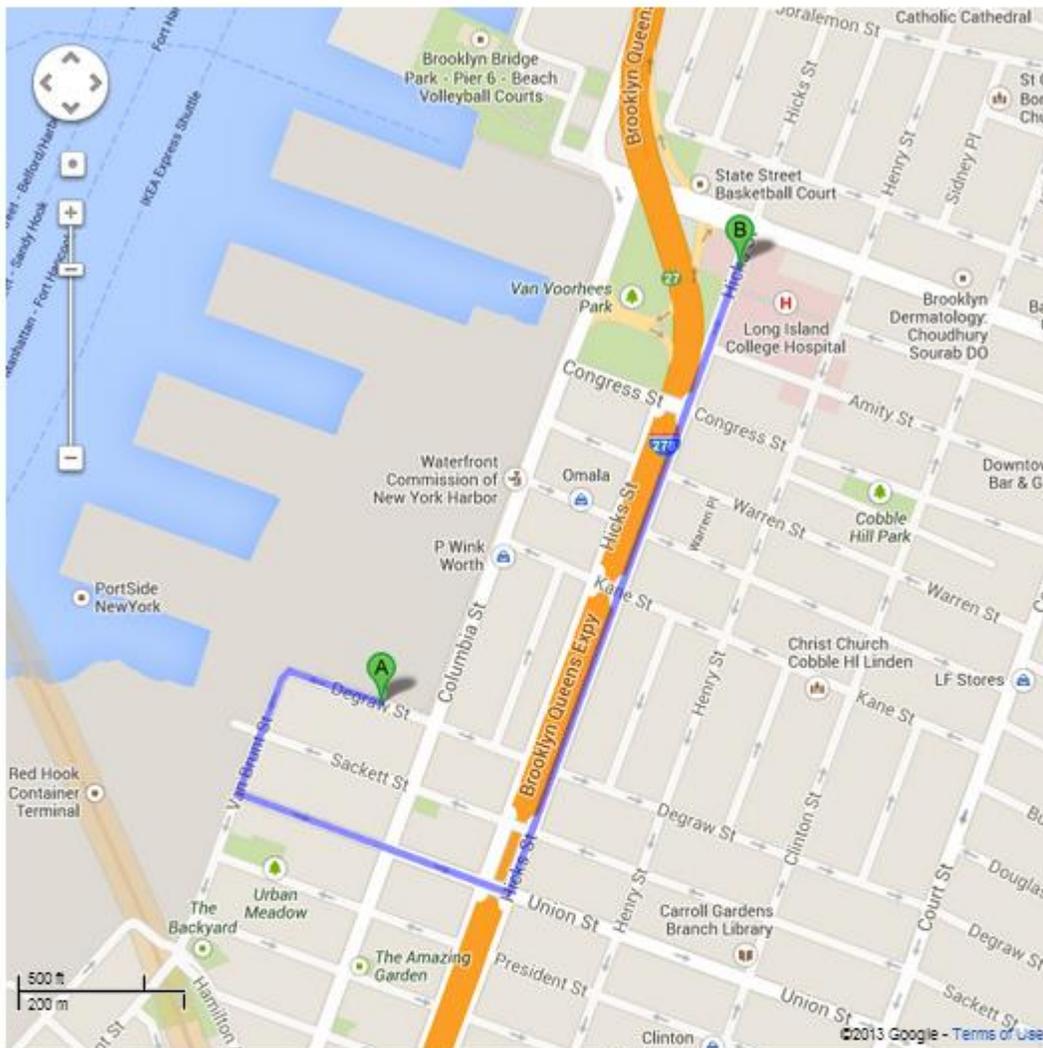
B. Hazardous Waste Spills

New York State Department of Environmental Conservation **1-800-457-7362**

New York City Health, **212-788-5099**

Laurel Environmental Associates, Ltd.: Nights and Weekend Emergencies **516-971-6332**

C. Hospital



A 98 Degraw St, Brooklyn, NY 11231

1. Head west on Degraw St toward Van Brunt St go 384 ft
total 384 ft
2. Degraw St turns left and becomes Van Brunt St go 0.1 mi
total 0.2 mi
3. Turn left onto Union St go 0.2 mi
total 0.4 mi
About 1 min
4. Take the 2nd left onto Hicks St go 0.5 mi
total 0.9 mi
Destination will be on the right
About 2 mins

B Long Island College Hospital
339 Hicks St, Brooklyn, NY 11201

9.0 HEAT STRESS CASUALTY PREVENTION PLAN

A. Identification and Treatment

1) HEAT EXHAUSTION

Symptoms: Usually begins with muscular weakness, dizziness and a staggering gait. Vomiting is frequent. The bowels may move involuntarily. The victim is very pale, his/her skin is clammy and he/she may perspire profusely. The pulse is weak and fast, breathing is shallow. He/she may faint unless he/she lies down. This may pass, but sometimes it remains and death could occur.

First Aid: Immediately remove the victim to a shady or cool area with good air circulation. Remove all protective outerwear. Call a physician. Treat the victim for shock. (Make him lie down, raise his feet 6-12 inches, and keep him warm but loosen all clothing). If the victim is conscious, it may be helpful to give him sips of a salt water solution (1 teaspoon of salt to 1 glass of water). Transport victim to a medical facility.

2) HEAT STROKE

Symptoms: This is the most serious of heat casualties due to the fact that the body excessively overheats. Body temperatures are often are between 107° -110° F. There is often pain in the head, dizziness, nausea, oppression, and a dryness of the skin and mouth. Unconsciousness follows quickly and death is imminent if exposure continues. The attack will usually occur suddenly.

First Aid: Immediately evacuate the victim to a cool and shady area. Remove all protective outer wear and all personal clothing. Lay him on his back with the head and shoulders slightly elevated. It is imperative that the body temperature be lowered immediately. This can be accomplished by applying cold wet towels, ice bags, etc., to the head. Sponge off the bare skin with cool water or rubbing alcohol, if available, or even place him in a tub of cool water. The main objective is to cool him without chilling him. Give no stimulants. Transport the victim to a medical facility as soon as possible.

B. Prevention of Heat Stress

- 1) One of the major causes of heat casualties is the depletion of body fluids. On-site there will be plenty of fluids available. Personnel should replace water and salts lost from perspiration. Salts can be replaced by either a 0.1% salt solution, more heavily salted foods, or commercial mixes such as Gatorade®.
- 2) A work schedule will be established so that the majority of the work day will be during the morning hours of the day before ambient air temperature levels reach their highs if high air temperatures are anticipated.
- 3) A work/rest guideline will be implemented for personnel required to wear Level B protection, if this situation arises. This guideline is as follows:

<u><i>Ambient Temperatures</i></u>	<u><i>Maximum Continuous Working Time</i></u>
Above 90° F	< 1 hour
80° - 90° F	1 hour
70° - 80° F	2 hours
60° - 70° F	3 hours
50° - 60° F	4 hours
40° - 50° F	5 hours
30° - 40° F	6 hours
Below 30° F	8 hours

A sufficient period will be allowed for personnel to "cool down". This may require separate shifts of workers during operations.

LOG FOR ALL PERSONNEL ENTERING THE SUBJECT PROPERTY

SITE:

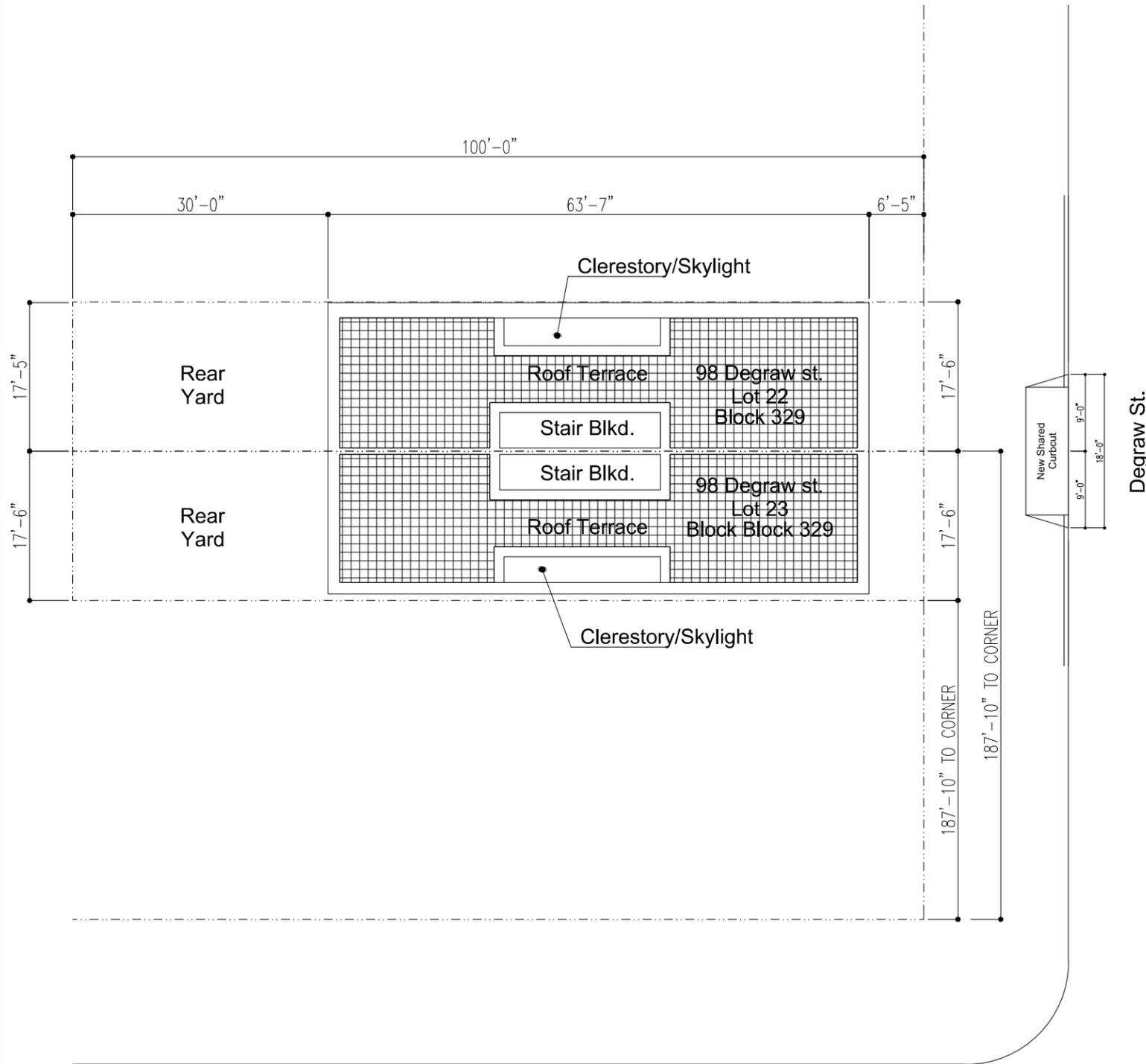
LOCATION:

The undersigned certify that they have read this Health and Safety Plan document, understand it, and will comply with its provisions.

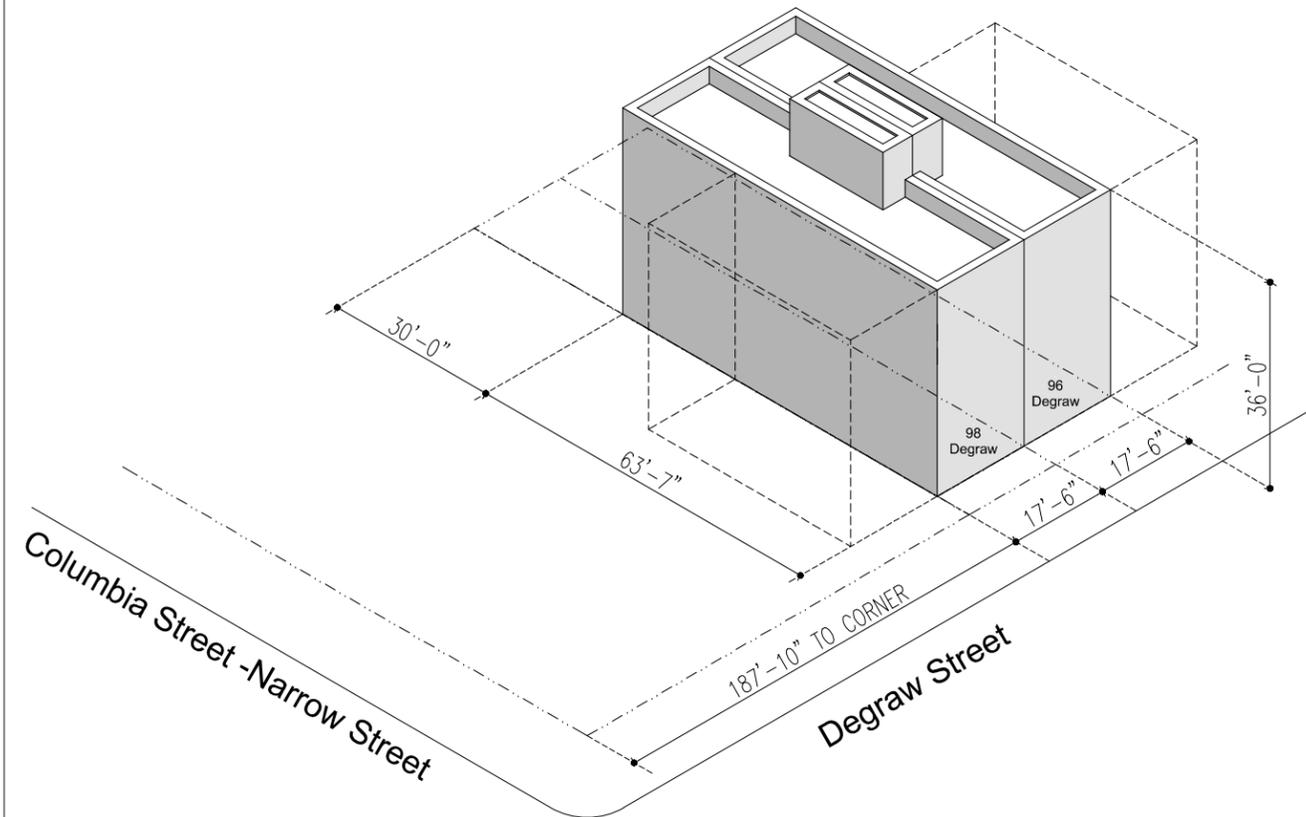
Name (Please Print)	Affiliation	Date	Time
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			

APPENDIX E

Tgf g_xg_{nr} o gpv'
Rre pu



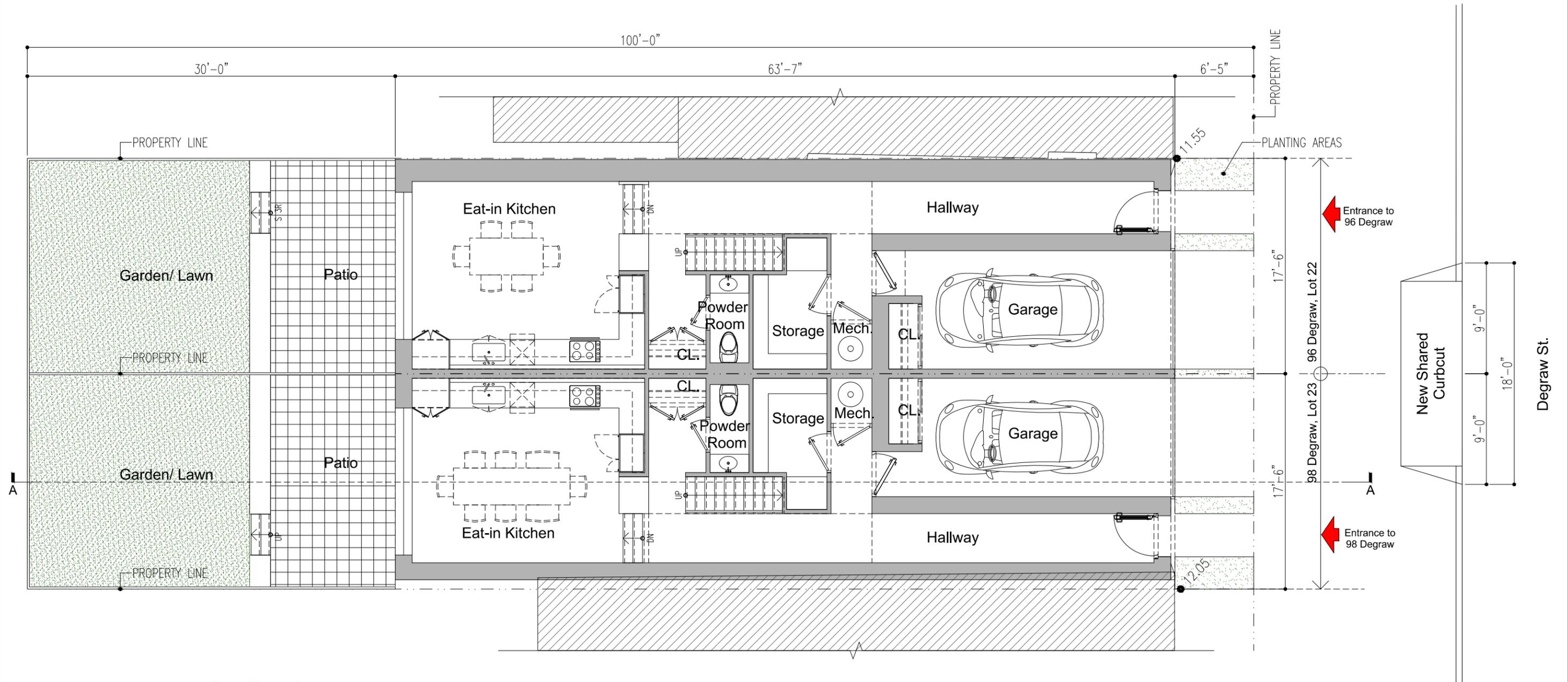
1 Site Plan
1/16" = 1'-0"



2 Axonometric View
1/32" = 1'-0"

Proposed Floor Areas 96 Degraw/ Lot 22 13-13 BZ				
Floor	Use	Gross Area	Deductions	Residential Floor Area
First	Residential	1107.00	0.00	1107.00
Second	Residential	1022.50	0.00	1022.50
Third	Residential	1022.50	0.00	1022.50
Stair Bulkhead	Residential	121.06	121.06	0.00
Total		3273.06	121.06	3152.00

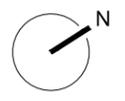
Proposed Floor Areas 98 Degraw/ Lot 23 14-13 BZ				
Floor	Use	Gross Area	Deductions	Residential Floor Area
First	Residential	1065.00	0.00	1065.00
Second	Residential	989.50	0.00	989.50
Third	Residential	989.50	0.00	989.50
Stair Bulkhead	Residential	121.06	121.06	0.00
Total		3165.06	121.06	3044.00

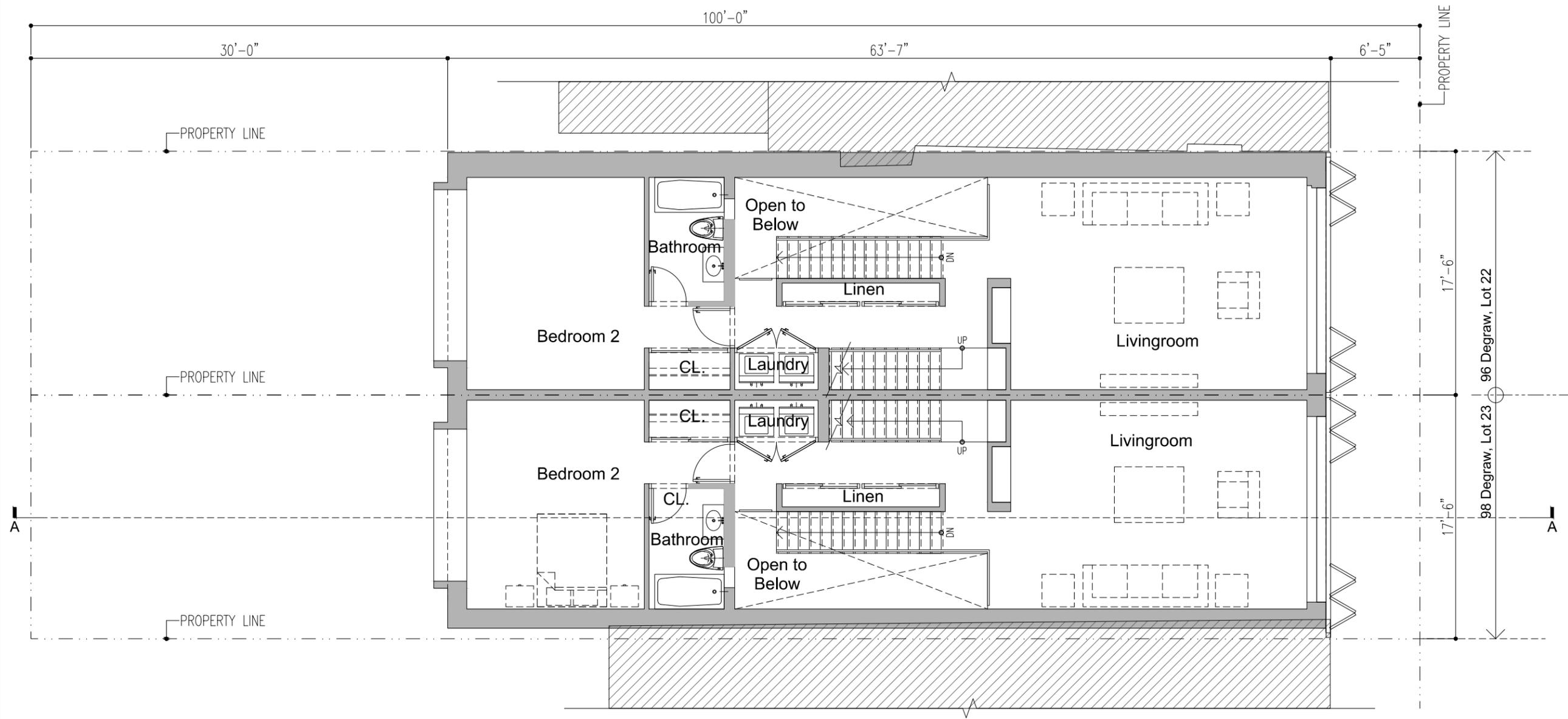


First Floor Plan
1/8" = 1'-0"

96 Degrav st.	98 Degrav st.
1FL Gross Area: 1,107 sf	1FL Gross Area: 1,065 sf
Lot 22, Block 329 BSA Calendar: 13-13 BZ	Lot 23, Block 329 BSA Calendar: 13-14 BZ

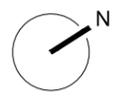
"All partitions and exits shall be as approved by DOB."



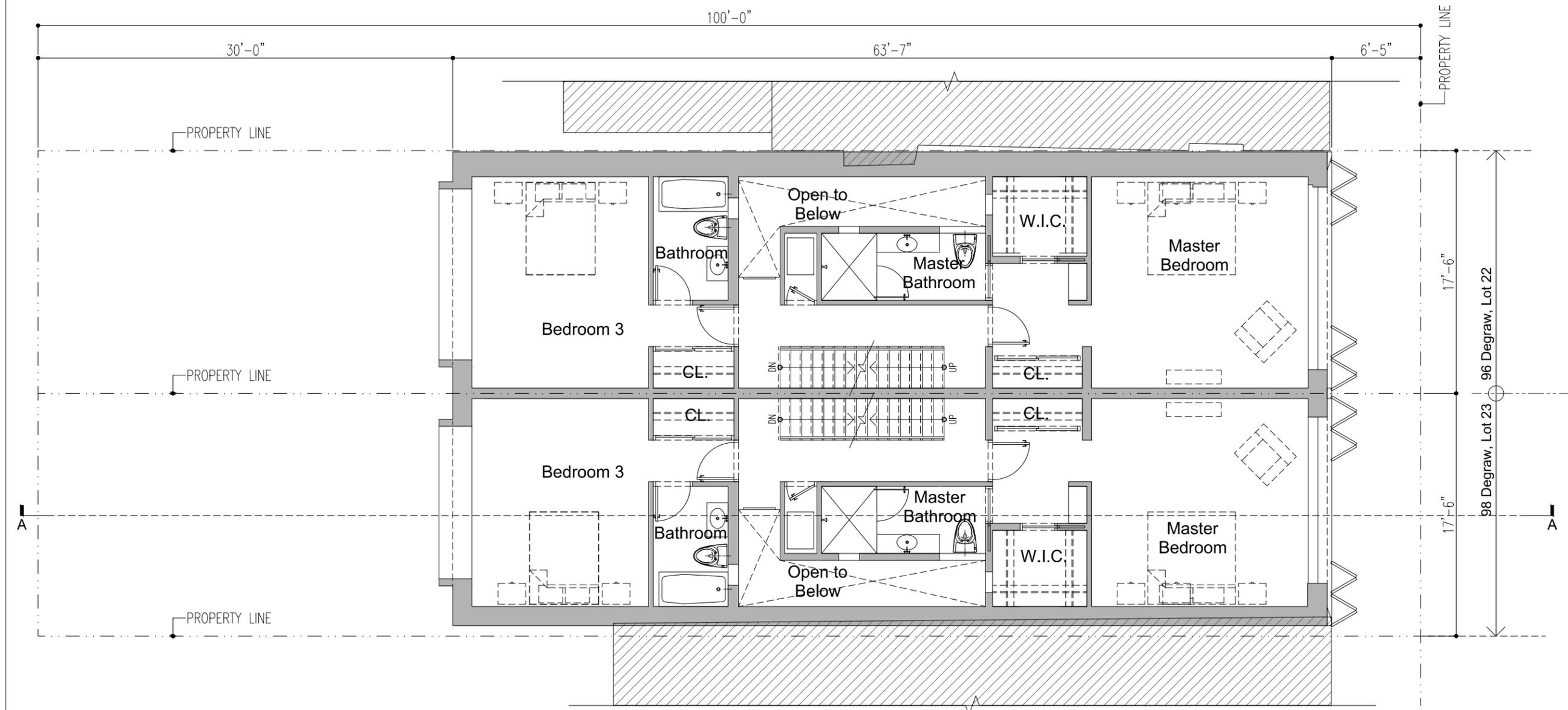


Second Floor Plan
1/8" = 1'-0"

96 Degraw st.	98 Degraw st.
2FL Gross Area: 1,022.5 sf	2FL Gross Area: 984.5 sf
Lot 22, Block 329 BSA Calendar: 13-13 BZ	Lot 23, Block 329 BSA Calendar: 13-14 BZ



"All partitions and exits shall be as approved by DOB."

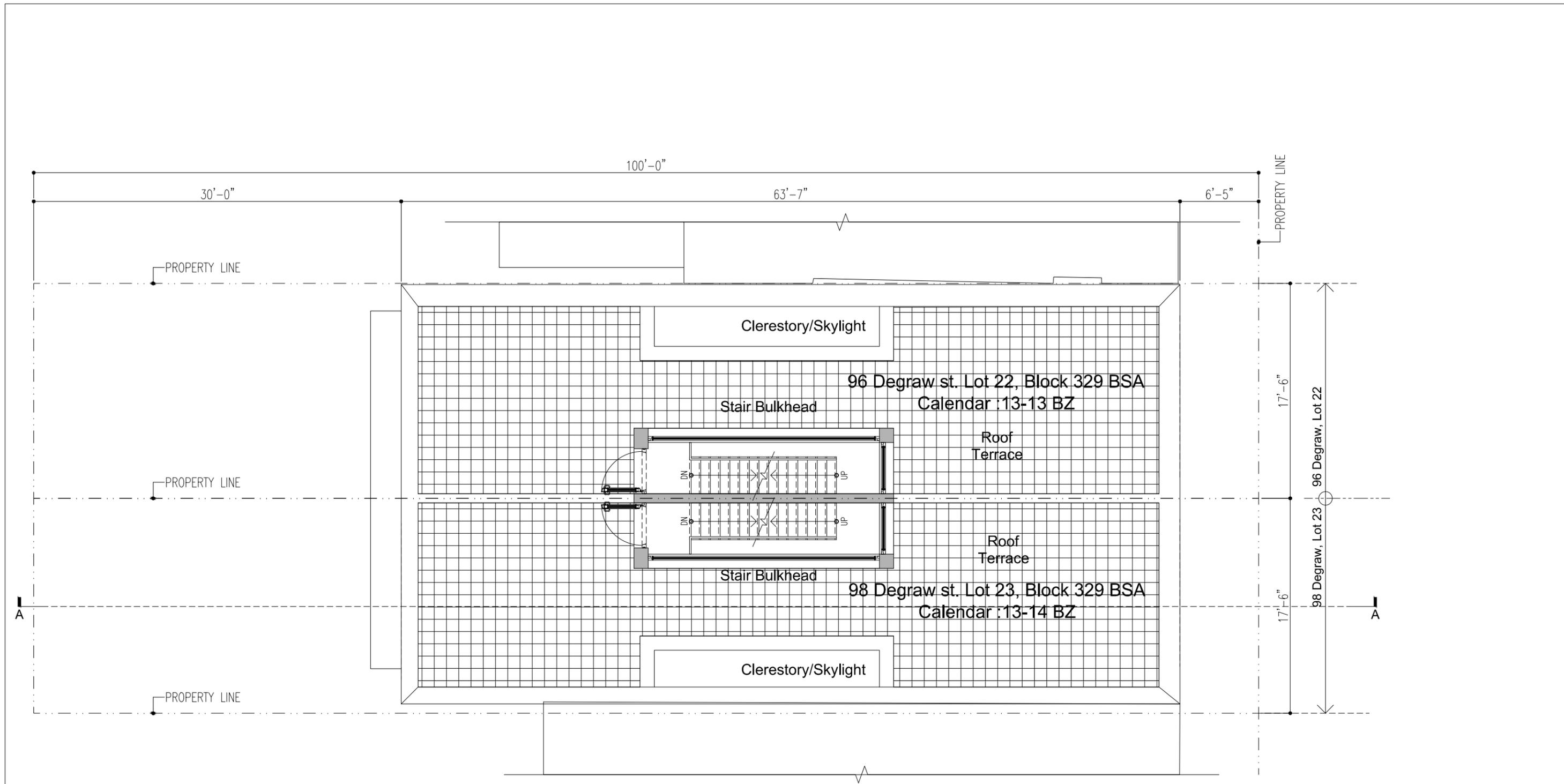


Third Floor Plan
1/8" = 1'-0"

96 Degraw st.	98 Degraw st.
3FL Gross Area: 1,022.5 sf	3FL Gross Area: 984.5 sf
Lot 22, Block 329 BSA Calendar: 13-13 BZ	Lot 23, Block 329 BSA Calendar: 13-14 BZ

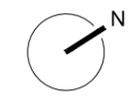


"All partitions and exits shall be as approved by DOB."



Roof Plan
1/8" = 1'-0"

96 Degraw st.	98 Degraw st.
Stair Bulkhead Gross Area: 121.06 sf	Stair Bulkhead Gross Area: 121.06 sf
Lot 22, Block 329 BSA Calendar: 13-13 BZ	Lot 23, Block 329 BSA Calendar: 13-14 BZ



"All partitions and exits shall be as approved by DOB."



Section A-A
1/8" = 1'-0"

"All partitions and exits shall be as approved by DOB."



Front Elevation (Degraw st.)
1/8" = 1'-0"

98 Degraw st.
Lot 23, Block 329
BSA Calendar :13-14 BZ

96 Degraw st.
Lot 22, Block 329
BSA Calendar :13-13 BZ

EL: ROOF TERRACE
▽ EL: +31'-8"

EL: 3RD FLOOR
▽ EL: +20'-0"

EL: 2ND FLOOR
▽ EL: +10'-0"

EL: 1ST FLOOR
▽ EL: ± 0.00

EL: BOE
▽ EL: -4'-0"

"All partitions and exits shall be as approved by DOB."

APPENDIX F

Rt gxkqwu'Gpxkt qpo gpvcn'Tgr qt vu



PHASE I
ENVIRONMENTAL
SITE ASSESSMENT

VACANT PARCELS
96 DEGRAW STREET (BLOCK: 329 LOT: 22)
AND
98 DEGRAW STREET (BLOCK: 329 LOT: 23)
BROOKLYN, NEW YORK 11231

PREPARED FOR:

THE OTHER HALF LLC (96 DEGRAW)
AND
THE GREEN WITCH PROJECT (98 DEGRAW)

131 UNION STREET, GROUND FLOOR
BROOKLYN, NEW YORK 11231

PREPARED BY:

LAUREL ENVIRONMENTAL ASSOCIATES, LTD.
53 WEST HILLS ROAD, SUITE 1
HUNTINGTON STATION, NEW YORK

DECEMBER 19, 2012
LEA PROJECT # 12-381



96 and 98 Degraw Street, Brooklyn, New York

**LAUREL ENVIRONMENTAL ASSOCIATES, LTD.
ENVIRONMENTAL CERTIFICATION**

LEA Project ID #: 12-381

Report: Phase I Environmental Site Assessment, ASTM E1527-05

Inspection Date: November 20, 2012

Resource Date: November 2012

Report Date: December 19, 2012

Site: 96 and 98 Degraw Street, Brooklyn, New York 11231
Located on the south side of Degraw Street, west of Columbia and east of Van Brunt Streets

Weather Conditions: 52°F; Overcast

Inspection Limitations: None

Clients: The Other Half, LLC and The Green Witch Project, LLC

Report Prepared By:

Christopher J. Connolly
Environmental Scientist

Carla M. Sullivan, QA/QC
VP, Senior Geologist

ENVIRONMENTAL PROFESSIONAL CERTIFICATION

I declare that, to the best of my professional knowledge and belief, we meet the definition of *Environmental Professional* as defined in § 312.10 of 40 Code of Federal Regulations (CFR) 312.

The Environmental Professional who directed this project has the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. We have developed and performed all the appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

Scott A. Yanuck
Principal

Date



EXECUTIVE SUMMARY AND FINDINGS

On-site:

1. The subject property is comprised of two adjoining undeveloped vacant lots with a combined footprint of approximately 3,500 square feet in area. The site is currently graded with gravel, and is utilized for vehicle storage. According to Sanborn Historical Maps, the property was occupied by two 3-story residential buildings until sometime between 1988 and 1991, when the buildings were likely demolished. The property has remained undeveloped since demolition and is relatively flat, and fronts along Degraw Street. The subject property is located in a residential and commercial area of the Columbia Street Waterfront District in Kings County, New York.
2. Housekeeping was noted to be good throughout the subject site. The site was observed free of debris and no staining of the ground was noted.
3. There was no evidence of a current or former private septic system or cesspool at the subject property. Sanitary waste from the former buildings was likely handled by the City of New York municipal sewer system. In addition, there was no evidence of any pits, ponds, or lagoons used in connection with waste treatment or waste disposal.
4. According to Sanborn Fire Insurance Maps, the subject property was used for residential purposes since the construction of the original buildings, sometime prior to 1886. The property has been vacant since between 1988 and 1991.
5. The subject property is currently utilized for vehicle storage purposes, with a plan to erect a multi-family building in preliminary stages.
6. As the property is undeveloped, no fill ports and/or vent pipes, which indicate the presence of USTs or ASTs, were noted at the subject property at the time of the site inspection. Based upon our site reconnaissance, interviews, and review of state and local records, **LEA** identified no evidence of existing USTs or ASTs at the subject property. However, no determination can be made as to whether any USTs or ASTs were present at the former buildings prior to their demolition.

Off-site:

1. There is one NPL listed site located within a one-mile radius of the subject property. Gowanus Canal, ID #NYN000206222, is a large, 100-foot wide, 1.8-mile long canal, with a history of industrial traffic and contamination, currently undergoing extensive investigation and remediation. This site is located 4,747 feet hydraulically cross-gradient from the subject property, and should not pose a recognized environmental condition.
2. There are eight IHWD site listings, within a one-mile radius of the subject property. Due to the geographic and hydraulic locations of these sites, with respect to the subject property, none should pose a recognized environmental condition.
3. There is one Solid Waste Facility located within a ½-mile radius of the subject property. Known as 20th Century Recycling, ID #24TA2, located 1,620 feet hydraulically side-gradient from the subject property, is listed as a large transfer station for unknown wastes. Due to the geographic and hydraulic location relative to the subject property, this site should not pose a recognized environmental condition.

4. There are four active NYSDEC listed spills and one active NYSDEC listed leaking UST located within a ½-mile radius of the subject property. Due to the geographic and hydraulic locations, relative to the subject property, magnitude of spill and/or resource affected, none should present a recognized environmental condition.

Based on the findings of this investigation, *Laurel Environmental Associates, Ltd. (LEA)* has discovered the following recognized environmental conditions at the subject property, 96 and 98 Degraw Street, Brooklyn, New York.

Recognized Environmental Conditions

- Urban fill and construction debris
- Possible former USTs

Potential Impacts

Moderate Risk
Moderate Risk

EXECUTIVE RECOMMENDATIONS

Based on the above conclusions *LEA* recommends the following:

1. Conduct a geophysical survey of the property to identify any possible underground storage tanks or other anomalies.
2. Conduct continuous soil borings around any marked anomalies, and at three additional locations at the property. Soil samples should be collected from 0-2' below grade, and either two feet into clean material if contamination is found, or 4-6' below grade (corresponding to the assumed slab level of the future building), if no signs of contamination are found. Analyze samples for VOCs, SVOCs, Metals and PCBs.
3. Collect a groundwater sample at the property using a pre-pack direct push well. Sample collected should be analyzed for VOCs, SVOCs, Metals, and PCBs.
4. Three soil vapor samples should be collected across the site, at a depth of four feet below grade, using 6-litre summa canisters with 2 hour flow controllers and analyzed for VOCs using TO-15 method.
5. Review results and compare to the appropriate regulatory standards and guidelines.

TABLE OF CONTENTS

EXECUTIVE SUMMARY AND FINDINGS	4
EXECUTIVE RECOMMENDATIONS.....	5
LIST OF FIGURES.....	8
LIST OF APPENDICES	8
REPORT SPECIFICATIONS.....	9
1.0 INTRODUCTION	10
1.1 ASTM STANDARD PRACTICE E-1527-05	10
1.1.1 PURPOSE.....	10
1.1.2 DEFINITION OF RECOGNIZED ENVIRONMENTAL CONDITIONS	10
1.2 SCOPE OF WORK.....	11
1.3 CONFLICT CERTIFICATION.....	12
1.4 VIABILITY OF PHASE I ESA	12
1.5 SIGNIFICANT ASSUMPTIONS	13
1.6 USER RELIANCE	13
1.7 DATA GAPS	13
1.8 LIMITATIONS	13
1.9 SITE DETAILS AND INSPECTION OVERVIEW	14
2.0 SITE DESCRIPTION	16
2.1 BUILDING AND PROPERTY INSPECTION.....	16
2.2 GENERAL HOUSEKEEPING PRACTICES	16
2.3 VEGETATION	16
2.4 CLASS V INJECTION WELLS.....	16
2.4.1 SEPTIC SYSTEMS	17
2.4.2 STORM WATER DRAINAGE.....	17
2.4.3 FLOOR DRAINS	17
2.5 CURRENT SITE OPERATIONS.....	17
2.6 PAST SITE OPERATIONS.....	17
2.7 CHEMICAL USE AND STORAGE	18
2.7.1 BIOHAZARDOUS WASTE.....	18
2.8 DRUM STORAGE	18
2.9 UNDERGROUND AND ABOVEGROUND STORAGE TANKS.....	18
2.9.1 EMERGENCY GENERATORS.....	18
2.10 PCBs IN ELECTRICAL TRANSFORMERS AND FLUORESCENT LIGHTING BALLASTS	19
2.11 FRIABLE AND NON-FRIABLE SUSPECT ASBESTOS CONTAINING MATERIALS.....	20
2.12 SUSPECT LEAD-BASED PAINT	20
2.13 WATER DAMAGE AND MOLD GROWTH.....	20
2.14 WETLANDS AND NYSDEC ECOLOGICAL ZONE	21
2.15 RADON	22
2.16 ELECTROMAGNETIC FIELDS.....	22
2.17 NEIGHBORING PROPERTIES.....	23
3.0 CLIENTS PROVIDED DOCUMENTS.....	24
3.1 TITLE RECORDS.....	24
3.2 ENVIRONMENTAL LIENS, ACTIVITY, AND USE LIMITATIONS.....	24
3.3 SPECIALIZED KNOWLEDGE	24
3.4 COMMONLY KNOWN OR REASONABLY ASCERTAINABLE INFORMATION.....	24
3.5 VALUATION REDUCTION FOR ENVIRONMENTAL ISSUES.....	24
3.6 OWNER, PROPERTY MANAGER, AND OCCUPANT INFORMATION	24
3.7 REASON FOR PERFORMING THIS PHASE I ESA.....	24

4.0	REVIEW OF REGULATORY AGENCY RECORDS AND DOCUMENTS.....	25
4.1	USEPA NATIONAL PRIORITY LIST AND CERCLA SITES	25
4.1.1	USEPA NPL SUPERFUND SITES	25
4.1.2	USEPA CERCLA SITES	25
4.2	NYSDEC INACTIVE HAZARDOUS WASTE DISPOSAL SITES.....	26
4.3	NYSDEC HAZARDOUS SUBSTANCE WASTE DISPOSAL SITES.....	27
4.4	NYS BROWNFIELDS SITES.....	27
4.5	NYS LANDFILLS AND SOLID WASTE FACILITIES.....	27
4.6	NYSDEC SPILL AND LEAKING UST FILE	28
4.6.1	NYSDEC ON-SITE LISTED SPILLS AND LEAKING UNDERGROUND STORAGE TANKS	28
4.6.2	NYSDEC OFF-SITE LISTED SPILLS	28
4.6.3	NYSDEC OFF-SITE LISTED LEAKING UNDERGROUND STORAGE TANKS.....	28
4.7	NYSDEC REGISTERED CHEMICAL BULK STORAGE, MAJOR OIL STORAGE, AND PETROLEUM BULK STORAGE FACILITIES.....	29
4.8	NYS AND USEPA RCRA HAZARDOUS WASTE GENERATORS, TRANSFER, STORAGE, AND DISPOSAL SITES AND CORRACT SITES	29
4.8.1	NYS AND USEPA RCRA GENERATORS	29
4.8.2	NYS AND USEPA RCRA TSD SITES AND CORRACT SITES.....	29
4.9	USEPA EMERGENCY RESPONSE NOTIFICATION SYSTEM.....	30
4.10	USEPA TOXIC RELEASE INVENTORY SITES	30
4.11	NYS WASTEWATER DISCHARGE SITES	30
4.12	USEPA AIR DISCHARGE SITES	30
4.13	USEPA CIVIL AND ADMINISTRATIVE ENFORCEMENT DOCKET FACILITIES	31
4.14	FEDERAL ENGINEERING CONTROL AND INSTITUTIONAL CONTROL REGISTRIES	31
4.15	TRIBAL LANDS	31
4.16	ORPHAN SITES.....	31
4.17	REGULATORY AGENCY DOCUMENTS REQUESTS	32
5.0	SITE HISTORY.....	32
5.1	SANBORN FIRE INSURANCE MAP REVIEW	33
5.2	HISTORICAL TOPOGRAPHIC MAP REVIEW	34
5.3	HISTORICAL AERIAL PHOTOGRAPH REVIEW	34
5.4	NYC ACRIS RECORDS	35
5.6	LITTLE E DESIGNATION SITES	36
6.0	FAIR MARKET VALUE.....	36
7.0	SITE HYDROGEOLOGY.....	37
7.1	GROUNDWATER USE	38
8.0	SUMMARY OF FINDINGS FROM RECONNAISSANCE AND RESEARCH.....	39
9.0	CONCLUSIONS.....	42
10.0	RECOMMENDATIONS	43
11.0	LIMITATIONS.....	44
12.0	TERMS AND CONDITIONS.....	45
12.1	SPECIAL TERMS AND CONDITIONS.....	45
12.2	LIMITATIONS AND EXCEPTIONS OF ASSESSMENT	45
12.3	LIMITING CONDITIONS AND METHODOLOGY USED.....	45
13.0	REFERENCES	46
14.0	DEFINITIONS.....	47
14.1	ADDITIONAL DEFINITIONS – SPECIFIC TO ESA	52
14.2	ACRONYMS.....	55

LIST OF FIGURES

- 1.0 Site Location
- 2.0 Topographic Map
- 3.0 Historical Topographic Map – 1947
- 4.0 Historical Topographic Map – 1967
- 5.0 Aerial Photograph
- 6.0 Historic Aerial Photograph – 1994
- 7.0 Wetlands Map
- 8.0 Tribal Lands Map
- 9.0 Site Sketch

LIST OF APPENDICES

Site Photographs	Appendix A
Regulatory Agency Records	Appendix B
- NYCDEP FOIL Request and Response	
New York City Department of Building Records.....	Appendix C
- NYC Automated City Register Information System (ACRIS) Records	
Toxics Targeting, Inc. Environmental Report	Appendix D
- Computerized Report from USEPA and NYSDEC and local databases	
Sanborn Fire Insurance Maps	Appendix E
ASTM Questionnaire.....	Appendix F
Personnel Qualifications.....	Appendix G

REPORT SPECIFICATIONS

This report contains (55) pages of text.

Copies and circulation of this report are as follows:

- (3) Two bound and one electronic copy to The Other Half, LLC and The Green Witch Project, LLC, c/o Mr. Hernan Galvis
- (1) One copy in the confidential clients file at *Laurel Environmental Associates, Ltd.*

This report is prepared for the exclusive use of the principal(s) noted above and is considered private and confidential. *LEA* shall not release this report or any of the findings of this report to any person or agency except with the authorization of the named principal(s).

The accuracy of the findings obtained through this environmental audit was considered to be of paramount importance during the formulation of this report. However, the accuracy of this report is limited to the information available from interviews, records, and plans released by the property owner or his representatives, and the respective regulatory agencies; their attorneys and information officers, whose interest in issues presented herein is unknown to *LEA*.



1.0 INTRODUCTION

Laurel Environmental Associates, Ltd. was retained by The Other Half, LLC and The Green Witch Project, LLC to conduct a Phase I Environmental Site Assessment (ESA) of the industrial property located at 96 and 98 Degraw Street, Brooklyn, New York (please see Figure 1.0, Site Location).

The purpose of this Phase I ESA is to determine if any recognized environmental conditions exist within the property in question. Recognized Environmental Conditions (RECs) would include, but not be limited to: hazardous/toxic wastes or raw chemicals stored, dumped, or spilled on the site; underground storage of hazardous materials; friable asbestos in building materials/structures; and identification of potential off-site sources of hazardous waste contamination, such as industrial facilities adjoining the subject site.

The conclusions of this Phase I ESA are based on findings at the time of *LEA's* site visit and review of readily ascertainable historical records, regulatory documents, and databases made available within a reasonable time period. Due to limited availability, *LEA* is not able to make any determinations with respect to portions of the subject property and structures which were not inspected or regulatory documents not provided within a timely fashion.

1.1 ASTM STANDARD PRACTICE E-1527-05

1.1.1 Purpose

The purpose of the American Society for Testing and Material (ASTM) Standard Practice for Environmental Site Assessments, E-1527-05, as well as Practice E-1528-06, is to define good commercial and customary practice in the United States of America for conducting an *ESA* of a parcel of *commercial real estate* with respect to the range of contaminants within the scope of Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and *petroleum products*. As such, this practice is intended to permit a *user* to satisfy one of the requirements to qualify for the *innocent landowner defense* to CERCLA liability: that is, the practices that constitute "all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice" as defined in 42 USC § 9601(35)(B). An evaluation of *business environmental risk* associated with a parcel of commercial real estate may necessitate investigation beyond that identified in this practice.

1.1.2 Definition of Recognized Environmental Conditions

In defining a standard of good commercial and customary practice for conducting an *environmental site assessment* of a parcel of *property*, the goal of the processes established by this practice is to identify *recognized environmental conditions*. The term *recognized environmental conditions* means the presence or likely presence of any *hazardous substances* or *petroleum products* on a *property* under conditions that indicate an existing release, a past release, or a material threat of a release of any *hazardous substances* or *petroleum products* into structures on the *property* or into the ground, groundwater, or surface water of the *property*. The term includes *hazardous substances* or *petroleum products* even under conditions in compliance with laws. The term is not intended to include *de minimis* conditions that generally do not present a material risk of harm to public health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. Conditions determined to be *de minimis* are not *recognized environmental conditions*.

It is not generally within the scope of this report to perform intrusive or aggressive testing of suspect materials observed at the site. Materials will be identified as environmentally suspect; however, a representative sampling procedure is required to fully assess the occurrence of the following materials: electrical devices containing Poly-Chlorinated Biphenyls (PCBs); the presence of radon gas; lead-based paint; asbestos containing materials; and mold.

1.2 SCOPE OF WORK

To complete the Environmental Site Assessment, the following tasks were performed in conformance with American Society for Testing and Material (ASTM) Standard Practice for Environmental Site Assessments, E-1527-05:

1. A detailed walk-through inspection of the subject property or representative areas of the property.
2. An interview with the owner and facility manager concerning past and/or present operations conducted at the subject property.
3. Comparison of fair market value and listed sale price.
4. An environmental lien search was not provided by the clients.
5. The presence of suspect asbestos containing materials (ACM) was noted.
6. The presence of suspect lead-based paints was noted.
7. A review of New York City building department, fire marshal, and/or tax assessor's office records to identify past owners, possible uses of the property, and construction details.
8. A review of state and federal regulatory agency documents concerning the location of known hazardous waste sites within proximity of the subject property.
9. A review of files/documents maintained by state and local regulatory agencies to investigate potential environmental hazards associated with the subject property when such information exists.
10. Major sources of electromagnetic fields were identified.
11. Identification of surrounding property use.
12. Sanborn Fire Insurance Maps review from 1886 to 2007
13. A review of historical aerial photograph from 1994.
14. A review of historical topographical maps from 1947 and 1967.
15. An identification of data failure and gaps.
16. Approximate the depth to groundwater and direction of regional groundwater flow beneath the subject property.
17. List recommendations for further study, as required (added to standard ASTM scope of work).

Findings, conclusions, and recommendations presented in Sections 8.0 through 10.0 (pages 39 through 42), are based on the careful consideration of the results of the above research. Any recommendations made are formulated with respect to maintaining or protecting the collateral value of the property and providing protection from toxic tort lawsuits.

Business environmental risk can have a material or environmentally-driven impact on the business associated with the current or planned use of a parcel of commercial real estate. It is not necessarily limited to those environmental issues required to be investigated in the ASTM Standard Practice for Environmental Site Assessments, E-1527-05. Consideration of business environmental risk issues may involve addressing one or more non-scope considerations, some of which are identified on the following page.

There may be environmental issues or conditions at the subject property that parties may wish to assess in connection with commercial real estate that are outside the scope of this practice. As noted by the legal analysis in Appendix X1 of the ASTM Standard Practice for Environmental Site Assessments, E-1527-05, some substances may be present on a property but are not included in CERCLA's definition of hazardous substances (42 USC § 9601(14)) or do not otherwise present potential CERCLA liability. In any case, they are beyond the scope of this report. The following listed concerns are several non-scope considerations that entities may want to assess in connection with commercial real estate. No implication is intended as to the relative importance of inquiry into such non-scope considerations and this list of non-scope considerations is not intended to be all-inclusive, but can be completed upon request.

- 1) Lead in Drinking Water
- 2) Regulatory Compliance
- 3) Cultural and Historical Resources
- 4) Industrial Hygiene
- 5) Health and Safety
- 6) Ecological Resources
- 7) Endangered Species
- 8) Indoor Air Quality, and
- 9) Mold Sampling of Air and Surfaces

1.3 CONFLICT CERTIFICATION

Laurel Environmental Associates, Ltd. has no present or contemplated future ownership interest or financial interest in the real estate that is the subject of this Environmental Assessment Report. *LEA* has no personal interest with respect to the subject matter of the Environmental Site Assessment or the parties involved, and *LEA* has no relationship with the property or the owners thereof which would prevent an independent and unbiased analysis of the environmental or other conditions of the property.

1.4 VIABILITY OF PHASE I ESA

An updated Phase I ESA should be performed if it appears that the property transaction will not close by the Phase I ESA Report Viability Date. Pursuant to Section 4.6 of ASTM E1527-05, Phase I ESAs are considered viable for 180 days. In calculating the Report Viability Date, *LEA* used the date that was the earliest of the following four tasks: the interview of those present owners identified in Section 10 of ASTM E1527-05, the government record review, and the visual inspection of the subject property and adjoining properties.

1.5 SIGNIFICANT ASSUMPTIONS

Information regarding the subject property was reasonably ascertainable and therefore, no significant assumptions have been made, unless otherwise noted in a specific section of this report.

1.6 USER RELIANCE

This report was prepared solely for the use of the clients, The Other Half, LLC and The Green Witch Project, LLC, and is not intended for use by third parties. Unauthorized third parties shall indemnify and hold **LEA** harmless against any liability for any loss arising out of, or related to, reliance by any third party on any work performed hereunder, or the contents of this report.

1.7 DATA GAPS

Any data gaps identified herein, as defined by ASTM Practice E 1527-05 § 3.2.20, are not considered to have significantly affected the ability to identify recognized environmental conditions in connection with the subject property and do not alter the conclusions of this report.

1.8 LIMITATIONS

To the best of **LEA's** knowledge, the information contained in this report is true and accurate. Due diligence has been exercised by **LEA** personnel in the compilation of the information contained herein, appropriate to environmental professionals engaged in investigations of this sort. **LEA** makes no guarantees regarding the accuracy of information gained from other sources.

The subject property location and boundaries as understood by **LEA** are depicted in the maps appended to this report. It is the responsibility of the reader to verify that the location and boundaries depicted herein are correct.

1.9 SITE DETAILS AND INSPECTION OVERVIEW

Site Details and Inspection Overview [†]		
Site Address	96 and 98 Degraw Street, Brooklyn, New York	
Cross Streets	Columbia and Van Brunt Streets	
Site Owner	The Other Half, LLC (96 Degraw) The Green Witch Project, LLC (98 Degraw)	
Site Occupant	Parking Lot	
Tax Lot	Block: 329 Lots: 22 + 23	
Municipality	Columbia Street Waterfront District, Kings County, New York	
Zoning	M1-1	
USGS Quadrangle	Jersey City	
Physical Location	Latitude 40° 41' 08.51" North Longitude 74° 00' 11.85" West	
NAICS Code Usage	531190 – Vacant lot rental or leasing	
Land Size	Approximately 3,500 square feet	
Site Elevation	15 feet	
Site Topography	Unremarkable	
Date of Construction	N/A	
Current Heating System	N/A	
Utilities	Electric	N/A
	Natural Gas	N/A
	Water	City of New York
	Sanitary System	N/A
Chemical Storage*	N/A	
Drum Storage	N/A	
Petroleum Storage Tanks	N/A	
Suspect Asbestos	N/A	
Water Damage/Mold Growth	N/A	

[†]Based on areas available for inspection, not all areas may have been accessible.

*Other than typical housekeeping and/or janitorial supplies.

2.0 SITE DESCRIPTION

Scott A. Yanuck, a **LEA** Senior Hydrogeologist and Site Inspector completed the inspection of the subject property on November 20, 2012. The inspection was conducted unassisted. The property was walked through and any indication of an environmental hazard was noted. Operations conducted at the subject property were observed, photographs were taken of the subject property, associated structures, and adjoining properties. Please refer to Appendix A of this report.

2.1 BUILDING AND PROPERTY INSPECTION

The subject property is comprised of two adjoining undeveloped parcels with a combined footprint of approximately 3,500 square feet. The site is unpaved but graded with gravel, and is utilized for vehicle storage. According to Sanborn Historical Maps, the property was occupied by two 3-story residential buildings until sometime between 1988 and 1991, when the buildings were likely demolished. The property has remained empty since as early as 1991. The site is relatively flat, and fronts along Degraw Street. The subject property is located in a residential and commercial area of the Columbia Street Waterfront District in Kings County, New York.

2.2 GENERAL HOUSEKEEPING PRACTICES

Housekeeping was noted to be good throughout the subject site. The site was observed free of debris and no staining of the ground was noted.

2.3 VEGETATION

The subject property is covered entirely with gravel and does not support any vegetation.

2.4 CLASS V INJECTION WELLS

Class V injection wells are used to inject non-hazardous fluids underground. Most Class V wells are used to dispose of wastes into or above underground sources of drinking water and can pose a threat to groundwater quality, if not managed properly. Most Class V wells are shallow disposal systems that depend on gravity to drain fluids directly into the ground. There are over 20 well sub-types that fall into the Class V category and these wells are used by individuals and businesses to inject a variety of non-hazardous fluids underground. The United States Environmental Protection Agency (USEPA) estimates that there are more than 650,000 Class V wells in operation nationwide. Most of these Class V wells are unsophisticated shallow disposal systems that include storm water drainage wells, cesspools, and septic

system leach fields. However, the Class V well category also includes more complex wells that are typically deeper and are often used at commercial and/or industrial facilities.

Other more sophisticated Class V well types could include aquifer storage and recovery wells or geothermal electric power wells - that are used to inject geothermal fluids extracted from subsurface hydrothermal systems. Complex Class V wells also include wells that are used for pilot Geologic Sequestration (GS) projects that are experimental in nature. On December 10, 2010, the USEPA finalized regulations for GS projects. These new regulations include the creation of a new class of wells, Class VI. The USEPA understands that some of the wells permitted as Class V experimental technology wells may no longer be used for experimental purposes. Following the final rule, Class V wells that are not being used for experimental purposes must be re-permitted as Class VI wells and will be subject to Class VI requirements.

Class V wells are a concern because they pose a risk to underground sources of drinking water. Because of this they are regulated by the Underground Injection Control (UIC) program under the Authority of the Safe Drinking Water Act.

2.4.1 Septic Systems

There was no evidence of a current or former private septic system or cesspool at the subject property. Former sanitary waste at buildings that previously occupied the property was likely handled by municipal sewer system, supplied by the City of New York. In addition, there was no evidence of any pits, ponds, or lagoons used in connection with waste treatment or waste disposal.

2.4.2 Storm Water Drainage

Storm water is handled by natural drainage across the site and runoff to Degraw Street.

2.4.3 Floor Drains

No floor drains are present, as the subject property is undeveloped.

2.5 CURRENT SITE OPERATIONS

The subject property is currently utilized for vehicle storage purposes, with a plan to erect a multi-family building in preliminary stages.

2.6 PAST SITE OPERATIONS

According to Sanborn Fire Insurance Maps, the subject property was used for residential purposes since the construction of the original buildings, sometime prior to 1886. The property has been vacant since between 1988 and 1991.

2.7 CHEMICAL USE AND STORAGE

No chemical storage was noted on the subject site.

2.7.1 Biohazardous Waste

No biohazardous waste is generated or stored on the subject site.

2.8 DRUM STORAGE

No drum storage was noted during the site inspection.

2.9 UNDERGROUND AND ABOVEGROUND STORAGE TANKS

The subject property was inspected for tank fill ports, vent pipes, and other signs of aboveground storage tanks (ASTs) and/or underground storage tanks (USTs). As the property is undeveloped, no fill ports and/or vent pipes, which indicate the presence of USTs or ASTs, were noted at the subject property at the time of the site inspection. Based upon our site reconnaissance, interviews, and review of state and local records, *LEA* identified no evidence of existing USTs or ASTs at the subject property. However; no determination can be made as to whether any USTs or ASTs were present at the former buildings, prior to their demolition.

2.9.1 Emergency Generators

No emergency generators and associated tanks were observed during our site reconnaissance.

2.10 PCBs IN ELECTRICAL TRANSFORMERS AND FLUORESCENT LIGHTING BALLASTS

There are three types of transformers defined in the Poly-Chlorinated Biphenyls (PCBs) regulations:

- ◆ PCB Transformer: Any transformer containing 500 parts per million (ppm) PCBs or greater.
- ◆ Non-PCB Transformer: Any transformer containing less than 50 ppm PCBs.
- ◆ PCB Contaminated Transformer: Any transformer containing 50-499 ppm PCBs. These transformers are not subject to parts of the regulations, such as marking requirements, and if drained of liquid, to disposal requirements. Any liquid drained from these transformers must be stored and disposed of in accordance with the regulations.

Transformers often contain dielectric liquid for the primary purpose of increasing resistance of the unit to arcing and acting as a heat transfer media, helping to cool the coils. The majority of transformers are filled with mineral oil, but a small percentage of these liquid-filled transformers contain PCB Askarel coolant liquid. The term “Askarel” is a generic term used for a group of nonflammable synthetic chlorinated hydrocarbons. All types of Askarels sold prior to 1979 contained 60 to 100 percent PCBs. Askarel transformers were manufactured in a variety of sizes, i.e. 3 to 3,000 gallons of PCB liquid, and are generally used in hazardous locations where flammability is of concern. PCB transformers are no longer produced because of the USEPA ban on the manufacture of new equipment containing PCBs.

Prior to the banning of PCB manufacturing in 1976, the compounds were used in small amounts during the production of fluorescent light ballasts. According to USEPA regulations, light ballasts containing less than three pounds of PCBs are exempt from special hazardous waste transportation and disposal and may be disposed of as municipal wastes; however, removal is not required by law. To determine if the light ballasts contain PCBs, the light fixtures would have to be dismantled, the make and model number obtained, and the manufacturer contacted. If the lighting is to remain, maintenance personnel should be advised of the possibility that the ballasts may contain PCBs. Workers should exercise caution when handling the ballasts, taking care not to cause leaks. Protective gloves and clothing should be worn when handling ballasts.

There are no pad or pole-mounted transformers located at the subject property. The property is undeveloped, therefore no PCB containing light fixtures are present.

2.11 FRIABLE AND NON-FRIABLE SUSPECT ASBESTOS CONTAINING MATERIALS

The USEPA designated material containing more than 1% asbestos to be considered as an Asbestos Containing Material (ACM). Where asbestos containing material is determined to be “Friable” (capable of being crushed by hand pressure and having a high potential to release airborne fibers), it is the recommendation of the USEPA that strong response action be taken. Such actions may take the form of removal, encapsulating, repair, enclosure, or an operations and maintenance program. The response action is determined depending on the severity and nature of the individual problem.

No friable or non-friable suspect asbestos containing materials were noted during the inspection.

2.12 SUSPECT LEAD-BASED PAINT

Use of lead in household paint was banned by the USEPA effective January 1, 1978. The USEPA and the U.S. Department of Housing and Urban Development (HUD) consider lead-based paint as containing a lead concentration equal to or greater than 1.0 milligram per square centimeter (mg/cm²) or 0.5% lead by weight, as defined by Title X of the 1992 Housing and Community Development Act.

No lead-based paints are present at the subject property.

2.13 WATER DAMAGE AND MOLD GROWTH

Humidity or wetness, caused by water leaks, spills from plumbing failures, or condensation, can cause mold growth on interior and exterior surfaces; including but not limited to walls, ceilings, carpets, or furniture. Mold is a living organism that produces mold spores through reproduction. These spores are tiny particles that drift through the air until finding wet, humid areas in which they thrive. Although mold does not affect everyone it can cause health problems when inhaled. Mold can trigger asthma attacks, and some produce toxins that may be hazardous if people are exposed to large quantities of these molds. Mold spores and related *mycotoxins* can also pose a serious health threat to individuals who have compromised immune systems.

A full mold inspection was not requested or completed as part of this assessment, as it is beyond the scope of this report. As the subject property does not support any structures, no evidence of mold and/or mold related odors was noted at the time of the site inspection. It should be noted that mold may be present in hidden areas not observed during *LEA's* site reconnaissance. Of particular concern would be areas that experience water damage and areas of high humidity. Caution should be taken following any future water release within the subject building. Water leaks and water damage should be addressed immediately to help prevent the formation of mold spores. Visual evidence of mold should be addressed immediately by professional remediation contractors hired to address such issues.

2.14 WETLANDS AND NYSDEC ECOLOGICAL ZONE

For regulatory purposes under the Clean Water Act, the term wetlands means "those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include streams, swamps, marshes, bogs, and similar areas". The New York State Official Tidal Wetlands Inventory is maintained by the New York State Department of Environmental Conservation (NYSDEC) Bureau of Marine Resources in the Tidal Wetlands Inventory and Geographic Information System (GIS) Unit. The statutory definition of a tidal wetland can be found in New York's Environmental Conservation Law, Article 25, entitled "Tidal Wetlands Act."

According to maps provided by the NYSDEC, the subject property does not reside within a fresh water or tidal wetlands area. An inspection of the subject property by **LEA** did not observe the presence of wetlands within its boundaries. Upper New York Bay was located within a ¼-mile radius of the subject property 750 feet hydraulically down-gradient.



ZONE I - COASTAL LOWLANDS

Geology	This zone is a terminal moraine of the great ice sheet. Topographic relief is low.
Elevation	Ranges from sea level to 200 feet
Soils	The soils are glacial outwash and deltaic sands medium to moderately coarse-textured on gravel and recent alluvium. The soils tend to be strongly acid and are of low fertility.
Vegetation	All of the Coastal Lowlands are included in the oak natural vegetation zone. Much of the forest is scrubby due to the poor soils. Oak is the principal hardwood tree, while pitch pine is the principal conifer.
Land Use	This zone continues to experience a rapid expansion of urban and suburban development.

This Data Set shows boundaries of the Ecological Regions (Ecozones) of New York State and has been modified by **LEA**.

2.15 RADON

Radon is a heavy, colorless, odorless, radioactive gas formed by the radioactive decay of radium. Radon is associated with specific geologic formations that contain granite, uranium minerals, certain shales, and phosphate related minerals. Radon, being a gas, can migrate to and accumulate in confined spaces such as building basements. Continued exposure to radon gas has been associated with increased lung cancer risk and possible genetic damage.

The USEPA has set a maximum action level of 4 picocuries per liter (pCi/l) in air. At concentrations above this level, the USEPA recommends remedial measures to lower the concentrations.

According to monitoring data completed by the NYS Department of Health, Bureau of Radiation Protection, the Kings County has an average indoor radon concentration of 0.6 pCi/l. Given this information, radon is not considered a significant environmental concern within the subject building.

2.16 ELECTROMAGNETIC FIELDS

Although there are currently no regulations concerning the proximity of residential structures to major sources of electromagnetic fields (EMFs) such as overhead high tension wires, high levels of EMFs are an unresolved public health issue. Some recent studies have linked the presence of elevated EMFs to an increased risk of certain cancers and other illnesses. Although studies are ongoing and no definitive conclusions have been reached, the existing evidence indicates that potential health risks may exist for individuals who are exposed to these fields. In any case, the general perception of a risk associated with major sources of EMFs can reduce the marketability and value of real estate.

No high tension wires or substations were noted on or adjacent to the subject property.

2.17 NEIGHBORING PROPERTIES

The properties surrounding the subject site are residential and commercial in nature. Property usage directly adjoining or nearby is as follows:

<u><i>North of the subject site:</i></u>	<u><i>Current Usage</i></u>	<u><i>Past Usage</i></u>
• Degraw Street, adjoining	Roadway	Roadway
• Red Hook Container Terminal	Commercial	Commercial
<u><i>South of the subject site:</i></u>		
• Ganuze - Lighting & Electrical, adjoining	Commercial	Commercial
• Sackett Street	Roadway	Roadway
<u><i>East of the subject site:</i></u>		
• Three Story Dwellings, adjoining	Residential	Residential
• Parking Lot	Municipal	Municipal
<u><i>West of the subject site:</i></u>		
• Three Story Dwelling, adjoining	Residential	Residential
• Vacant Lot	Vacant	Commercial

Due to the benign usage at the surrounding properties, they should not have the potential to present a recognized environmental condition at the subject property. None of the surrounding properties are associated with any NYSDEC or USEPA Superfund List.

3.0 CLIENTS PROVIDED DOCUMENTS

The following section summarizes information provided by the clients, The Other Half, LLC and The Green Witch Project, LLC, with regard to this Phase I ESA. *LEA* staff completed the Questionnaire pertaining to the site inspection, which can be found in Appendix F of this report. The Questionnaire is intended to assist in gathering information that may be pertinent to identifying recognized environmental conditions relating to the subject property.

3.1 TITLE RECORDS

Land title records provide information on previous ownership of a property. Typically, deeds signifying transfer of a land parcel are recorded in county files and can be researched to determine the identity of past owners. A “Chain of Title” is a continuous record of ownership for a specific parcel. Title record information associated with the subject property has not been provided to *LEA* by The Other Half, LLC and The Green Witch Project, LLC, and is beyond the scope of this report.

3.2 ENVIRONMENTAL LIENS, ACTIVITY, AND USE LIMITATIONS

The Other Half, LLC and The Green Witch Project, LLC has provided no information regarding environmental liens, activity, or use limitations in connection with the subject property.

3.3 SPECIALIZED KNOWLEDGE

The Other Half, LLC and The Green Witch Project, LLC has provided no specialized knowledge that pertains to recognized environmental conditions in connection with the subject property. *LEA* was not provided with or made aware of previous environmental assessments or other documentation that is material to recognized environmental conditions in connection with the subject property, except as present.

3.4 COMMONLY KNOWN OR REASONABLY ASCERTAINABLE INFORMATION

The Other Half, LLC and The Green Witch Project, LLC has provided *LEA* with no commonly known or reasonably ascertainable information within the local community about the environmental integrity of the subject property.

3.5 VALUATION REDUCTION FOR ENVIRONMENTAL ISSUES

The Other Half, LLC and The Green Witch Project, LLC has provided no information to *LEA* regarding valuation reduction for environmental issues in connection with the subject property.

3.6 OWNER, PROPERTY MANAGER, AND OCCUPANT INFORMATION

The Other Half, LLC and The Green Witch Project, LLC provided *LEA* with contact information for access to the subject property. The site inspection was conducted unassisted.

3.7 REASON FOR PERFORMING THIS PHASE I ESA

The Other Half, LLC and The Green Witch Project, LLC retained *LEA* to complete this Phase I Environmental Site Assessment in connection with a real estate transaction.

4.0 REVIEW OF REGULATORY AGENCY RECORDS AND DOCUMENTS

To determine if the subject property was listed, known, or suspected of being a hazardous waste site, federal and state databases were reviewed. In addition, a Freedom of Information Letter (FOIL) was sent to the New York City Department of Environmental Protection (NYCDEP) requesting a review of any records that may have been maintained by the agencies concerning the subject property.

The records search was conducted by Toxics Targeting, Inc. meeting the specific requirements of ASTM Standard Practice for Environmental Site Assessments, E-1527-05, including those associated with governmental databases, search distances, and data currency.

4.1 USEPA NATIONAL PRIORITY LIST AND CERCLA SITES

4.1.1 USEPA NPL Superfund Sites

The USEPA maintains a database of unmanaged and/or forsaken hazardous waste sites. The database is known as the National Priority List (NPL). Sites included in this list are given priority by the USEPA for remedial action under the Federal Superfund Program. A particular site will be included on the NPL if it equals or exceeds an established "hazard classification system" score, or if it was designated as a top environmental priority site, in a particular State. A site is classified as an NPL site if all of the following criteria are satisfied:

1. The U.S. Department of Health & Human Services issues a health advisory recommending that people be evacuated from the site to avoid exposure.
2. The USEPA determines that the site was a potentially significant environmental hazard.
3. The USEPA determines that site remediation was more cost-effective than removal.

A review of the latest edition of the NPL, published in 2012, found that the subject property is not listed as a NPL site. There is one NPL listed site located within a one-mile radius of the subject property. Gowanus Canal, ID #NYN000206222, is a large, 100-foot wide, 1.8-mile long canal, with a history of industrial traffic and contamination, currently undergoing extensive investigation and remediation. This site is located 4,747 feet hydraulically cross-gradient from the subject property, and should not pose a recognized environmental condition.

4.1.2 USEPA CERCLA Sites

The USEPA Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 was designed to allow the federal government to directly address any potential release of hazardous waste that may endanger public health or welfare; in order to "provide for liability, compensation, clean-up, and emergency response for hazardous substances released into the environment and clean-up of inactive hazardous waste disposal sites".

Examination of the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) database indicates that the subject site is not listed in the CERCLIS database. There are no CERCLIS listed sites located within a ½-mile radius of the subject property.

4.2 NYSDEC INACTIVE HAZARDOUS WASTE DISPOSAL SITES

The NYSDEC publishes a quarterly and annual report entitled "Inactive Hazardous Waste Disposal Sites in New York State" (IHWD), 2011, which lists all properties that have been found to contain, or are suspected of containing, significant amounts of hazardous or toxic contamination in one form or another.

A review of the annual report, quarterly updates, and reports from 1992 to 2012 indicates that the subject property is not listed as being an IHWD site. There are eight IHWD site listings, within a one-mile radius of the subject property. Due to the geographic and hydraulic locations of these sites, with respect to the subject property, none should pose a recognized environmental condition.

A synopsis of the nearby IHWD sites is as follows:

- ◆ **Designers Woodcraft** **ID #2-006** **455 feet hydraulically up -gradient**
 - This facility has been deleted from the reported data.
- ◆ **Fort Jay Dod Grant** **ID #231069** **4,068 feet hydraulically cross-gradient**
 - Site characterization was completed in 2008. Remedial work is underway and not yet complete.
- ◆ **K – Citizens MGP – Carroll Garden.** **ID #224012** **4,149 feet hydraulically side-gradient**
 - Listed as a dump with confirmed disposal of the following hazardous wastes; Coal Tar, Toluene, Tetrachloroethylene, and Methylene Chloride. Work is underway and not yet complete.
- ◆ **Gowanus Canal Site (two listings)** **ID #224133** **4,653 feet hydraulically cross-gradient**
 - Listed as a treatment pond, with significant threat to the public health or environment – Action Required. The following hazardous wastes were disposed of; Mercury, Copper, PCB-Archlor 1242, Coal Tar Pitch Volatiles, Lead, and DDE.
- ◆ **Castle Williams, Governors Isl.** **ID #2-020** **5,101 feet hydraulically cross-gradient**
 - This facility has been deleted from the reported data.
- ◆ **K – Fulton Works** **ID #224051** **5,200 feet hydraulically side-gradient**
 - Site characterization was completed in 2007. Remedial work is underway and not yet complete.
- ◆ **K – Metropolitan MGP** **ID #224046** **5,257 feet hydraulically cross-gradient**
 - Confirmed soil and groundwater contamination of BTEX and PAH compounds. A remedial investigation began in 2009. This site is classed as a significant threat to the public health or environment – action required.

4.3 NYSDEC HAZARDOUS SUBSTANCE WASTE DISPOSAL SITES

The NYSDEC Hazardous Substance Waste Disposal Sites (HSWD) database was reviewed to determine if the subject property or any site located within a one-mile radius of the subject property is listed as a HSWD Site. This database lists properties that are currently under study by the NYSDEC Division of Hazardous Waste Remediation, for inclusion into the IHWD program, as described in section 4.2.

After a thorough investigation, it was determined that neither the subject property nor any property within a one-mile radius is listed as a HSWD site.

4.4 NYS BROWNFIELDS SITES

The New York State (NYS) Brownfields Program was developed for sites that are abandoned, idle, or under-used industrial and/or commercial sites where expansion or redevelopment is complicated by real or perceived environmental contamination. Programs included in the 2011 Brownfields Cleanup Program (BCP) are the Voluntary Cleanup Program (VCP) and the Environmental Restoration Program (ERP).

After a thorough investigation, it was determined that neither the subject property nor any property within a one-mile radius is listed as a Brownfields site.

4.5 NYS LANDFILLS AND SOLID WASTE FACILITIES

The database of NYS Landfills identified no such facilities located within a ½-mile radius of the subject property. There is one Solid Waste Facility located within a ½-mile radius of the subject property. 20th Century Recycling, ID #24TA2, located 1,620 feet hydraulically side-gradient from the subject property, is listed as a large transfer station for unknown wastes. Due to the geographic and hydraulic location relative to the subject property, this site should not pose a recognized environmental condition.

4.6 NYSDEC SPILL AND LEAKING UST FILE

The NYSDEC Spill File was investigated for records of spills and leaking USTs located within a ½-mile radius of the subject property. A summary is presented in the table below:

NYSDEC Active Spills and Leaking USTs
Brooklyn, New York, within a ½-mile radius of the subject property

NYSDEC Spill #	Spill Type	Spill Name	Spill Location	Distance (feet)/ Direction from Site*
1201982	#2 fuel oil leaked to soil	LI College Hosp TTF	339 Hicks Street	2,380/side
9601482	Gasoline spilled to soil	76 Precinct NYPD – DDC	191 Union Street	1,057/side
0106455	Gasoline spilled to soil	Former ABM Service Station	434 Hicks Street/115-117 Kane Street	1,099/side
0612593	Gasoline spilled to soil	Pier #7	Brooklyn Port Authority	2,129/side
1009312	Gear oil spilled to soil	Gowanus Facility Upgrade Project	Columbia and Degraal St.	254/up

*Direction noted is in relation to the hydraulic gradient of the groundwater flow.

4.6.1 NYSDEC On-Site Listed Spills and Leaking Underground Storage Tanks

There are no closed or active NYSDEC listed spills or leaking underground storage tanks (USTs) located at the subject property.

4.6.2 NYSDEC Off-Site Listed Spills

There are four active NYSDEC listed spills located within a ½-mile radius of the subject property. Due to the geographic and hydraulic locations, relative to the subject property, magnitude of spill and/or resource affected, none should present a recognized environmental condition.

4.6.3 NYSDEC Off-Site Listed Leaking Underground Storage Tanks

There is one active NYSDEC listed leaking UST located within a ½-mile radius of the subject property. Due to the geographic and hydraulic location, relative to the subject property, magnitude of spill and/or resource affected, this spill should not present a recognized environmental condition.

4.7 NYSDEC REGISTERED CHEMICAL BULK STORAGE, MAJOR OIL STORAGE, AND PETROLEUM BULK STORAGE FACILITIES

The NYSDEC publishes a listing of all registered Chemical Bulk Storage (CBS), Major Oil Storage (MOS), and Petroleum Bulk Storage (PBS) Facilities in New York State, every year. This listing was investigated to determine whether the subject property or any adjoining properties are listed as such facilities.

After a thorough investigation, it was determined that neither the subject property nor any adjoining property is listed at the NYSDEC as a CBS, MOS, or PBS Facility.

4.8 NYS AND USEPA RCRA HAZARDOUS WASTE GENERATORS, TRANSFER, STORAGE, AND DISPOSAL SITES AND CORRACT SITES

Resource Conservation and Recovery Act (RCRA) 42 U.S.C. §6901 et seq. (1976) The Resource Conservation and Recovery Act (RCRA) gives EPA the authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of non-hazardous solid wastes. The 1986 amendments to RCRA enabled EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances.

4.8.1 NYS and USEPA RCRA Generators

The NYS and USEPA listing of Resource Conservation and Recovery Act (RCRA) Hazardous Waste Generators, dated 2011, was reviewed to determine whether the subject property or any adjoining properties are listed as State Facilities. After a thorough investigation, it was determined that neither the subject property nor any adjoining property is listed as a RCRA Hazardous Waste Generator.

4.8.2 NYS and USEPA RCRA TSD Sites and CORRACT Sites

The NYS and USEPA 2011 listing of Resource Conservation and Recovery Act (RCRA) Facilities with Corrective Actions (CORRACTs) and the NYSDEC 2010 listing of RCRA Treatment, Storage, and Disposal (TSD) Sites was reviewed to determine whether the subject property or properties within a one-mile radius are listed as state or federal facilities. After a thorough investigation, it was determined that the subject property is not listed as a RCRA TSD or CORRACT site. There is one property within a one-mile radius listed as a RCRA TSD and CORRACT site. Patterson Chemical Co, ID #NYD980592471, located 4,308 feet hydraulically cross-gradient from the subject property, is listed as a TSD facility, with RFA completed in 1994. No further information is disclosed. Due to the geographic and hydraulic location relative to the subject property, this site should not pose a recognized environmental condition.

4.9 USEPA EMERGENCY RESPONSE NOTIFICATION SYSTEM

The USEPA maintains a database of all spills to which the agency has responded. This database was investigated to determine the presence of an emergency response at the subject property.

After an investigation according to street address, it was determined that the subject property is not listed on the ERNS database.

4.10 USEPA TOXIC RELEASE INVENTORY SITES

Section (§) 313 of the Emergency Planning and Community Right-to-Know Act (also known as Title III) of the Superfund Amendments and Reauthorization Act (SARA) of 1986 (Public Law 99-499) requires the USEPA to establish an inventory of toxic chemical emissions from certain facilities. The reporting requirement applies to owners and operators of facilities that have ten or more full-time employees that are in Standard Industrial Classification (SIC) codes 20 through 39 (i.e., manufacturing facilities) and that manufacture, import, process, or otherwise use a listed toxic chemical in excess of specified threshold quantities. Inclusion in the list does not necessarily indicate that there has been a release of a toxic material to the environment at the site, only that listed chemicals have been used.

After a thorough investigation, it was determined that neither the subject property nor any property within a ¼-mile radius is listed as a TRI Facility.

4.11 NYS WASTEWATER DISCHARGE SITES

Wastewater treatment is one of the most common forms of pollution control. Its basic function is to speed up the natural purification processes. In many instances wastewater treatment is a two-stage process. In the primary stage of wastewater treatment, solids are allowed to settle and are then removed from wastewater. The secondary stage allows biological processes to further purify wastewater. The NYSDEC database identifies nearby Wastewater Discharge Facilities.

After a thorough investigation, it was determined that neither the subject property nor any property within a ⅛-mile radius is listed as a Wastewater Discharge Site.

4.12 USEPA AIR DISCHARGE SITES

The USEPA Aerometric Information Retrieval System (AIRS) database lists information on each air emission facility and indicates the type of air pollutant emission. Compliance information is also provided on each pollutant as well as the facility itself.

After a thorough investigation, it was determined that the subject property is not listed as an Air Discharge Site. There is one site located within a ¼-mile of the subject property listed as an Air Discharge Site. Nello Botti Cleaners, ID #3604700869, located 491 feet east of the subject property, is listed in compliance for the potential uncontrolled emissions of VOCs. Due to the resource affected and lack of traceability, no determination can be made as to the environmental threat to the subject property.

4.13 USEPA CIVIL AND ADMINISTRATIVE ENFORCEMENT DOCKET FACILITIES

This Civil and Administrative Enforcement Docket database is the USEPA's system for tracking administrative and judiciary cases filed on behalf of the agency by the Department of Justice.

After a thorough investigation, it was determined that neither the subject property nor any property within a 1/8-mile radius is listed as a Civil and Administrative Enforcement Docket site.

4.14 FEDERAL ENGINEERING CONTROL AND INSTITUTIONAL CONTROL REGISTRIES

The completion of site cleanup activities may include the implementation of engineering controls or institutional controls as part of the response action. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the instructional controls.

Neither the subject property nor any property located within a 1/2-mile radius of the subject property was identified on Federal Engineering Control or Institutional Control Registries.

4.15 TRIBAL LANDS

There are no Tribal Lands within a one-mile radius of the subject property. This was further confirmed by a search of Federal and State Tribal Land records, please refer to Figure 8.0.

4.16 ORPHAN SITES

Orphan Sites are facilities that have been identified on the Toxics Targeting Inc (TTI) Environmental Database Report; however, due to poor or inadequate address information, the facilities could not be mapped by TTI with relation to the subject property. Orphan Sites identified on the Database Report were reviewed, and none appear to be located at the subject property.

4.17 REGULATORY AGENCY DOCUMENTS REQUESTS

On November 20, 2012, *LEA* mailed a request to the New York City Department of Environmental Protection (NYCDEP) to view any records pertaining to the environmental condition of the subject property under the Freedom of Information Act (FOIA).

On December 10, 2012, *LEA* received notification from the NYCDEP, confirming their receipt of the request. As of December 19, 2012, *LEA* has not yet received a response from the NYCDEP stating whether records relevant to the environmental integrity of the subject property are available. If the agency is found to maintain such records, *LEA* will forward the information in the form of an addendum to The Other Half, LLC and The Green Witch Project, LLC.

5.0 SITE HISTORY

According to the New York City Department of Building records and Sanborn Fire Insurance Maps, past and present uses of the subject property are as follows:

- | | |
|------|--|
| 1886 | Sanborn Historical maps show the subject property to be occupied by two three story residential buildings. |
| 1904 | The subject building at 96 Degraw Street is depicted as a 'store' |
| 1977 | Both buildings are shown as three-story residential. |
| 1991 | The buildings are no longer present and the property is vacant. |
| 2003 | The subject property is shown as being used for parking. |

Historical Usage Summary:

The subject property was occupied by two 3-story residential buildings from as early as 1886 until between 1988 and 1991, when the buildings were likely demolished. The property has remained vacant since as early as 1991, and has most recently been utilized for vehicle storage. Past usage of the subject site should not present a recognized environmental condition at the subject property.

5.1 SANBORN FIRE INSURANCE MAP REVIEW

Sanborn® Fire Insurance Maps are an additional source of historical use information available for most developed areas. The maps were used for insurance purposes and indicate structures by name, type of construction, property usage, and address. **LEA** contracted EDR for a search of Sanborn Fire Insurance Maps adequate for the subject property and surrounding areas. According to Sanborn Historical Maps reviewed from 1886 - 2007, past uses of the subject site and surrounding properties are as follows:

Date	Subject Property	Surrounding Properties			
		North	South	East	West
1886	Maintains two three-story dwelling.	<i>Degraw Street</i> Dwellings	Dwellings <i>Sackett Street</i>	Dwellings	Dwellings
1904 to 1938	Maintains a three-story store and dwelling	No Change	No Change	No Change	No Change
1950	No Change	<i>Degraw Street</i> Dwellings and empty lots	Empty lot	No Change	Dwelling and an empty lot
1969	No Change	No Change	Parking lot	No Change	Dwelling and truck storage
1977 to 1981	Both buildings are shown as three-story residences	No Change	No Change	No Change	No Change
1982	No Change	No Change	Truck Storage	No Change	No Change
1986 to 1988	No Change	<i>Degraw Street</i> Vacant lot and truck storage	Warehouse <i>Sackett Street</i>	No Change	No Change
1991 to 2002	Both buildings appear to have been demolished. Now a vacant lot.	No Change	No Change	No Change	No Change
2003 to 2007	Depicted as 'Parking'	<i>Degraw Street</i> Long Island Hospital Parking	No Change	No Change	No Change

5.2 HISTORICAL TOPOGRAPHIC MAP REVIEW

Historical Topographic Maps are an additional source of useful information regarding historical site usage. The maps are generated and updated by the United States Geological Survey (USGS). Scale for the maps ranged from 1:24,000 to 1:62,500. The general elevation of the subject site and surrounding areas was noted as approximately 15 feet above sea level. **LEA** maintains Historical Topographic Maps in their Historical Database adequate for the subject property and surrounding areas.

A review of historical topographical maps from 1947 and 1967 did not show detailed information as to historical structures and usage of the subject property.

5.3 HISTORICAL AERIAL PHOTOGRAPH REVIEW

Aerial Photographs are often taken annually or bi-annually by government agencies or private entities and may be used to evaluate changes in land use patterns at specified dates to identify visible areas of potential environmental concern. A search for historical aerial photographs depicting the subject property and vicinity was conducted by EDR and **LEA**. It should be noted that the scale of the available aerial photographs precludes the distinct identification of structures and/or land uses on or in the vicinity of the subject property.

A review of an aerial photograph from 1994 showed the following:

Due to poor picture clarity, no information as to the historical structures and surrounding properties could be garnered from the image.

5.4 NYC ACRIS RECORDS

The NYC Automated City Register Information System (ACRIS) maintains property records and document images for the five boroughs from 1966 to the present. The database was searched and is included in the table below.

96 Degraw Street

Lot	Partial	Recorded / Filed	Document Type	Pages	Party1	Party2	Doc Amount
22	ENTIRE LOT	9/4/2012 3:55:18 PM	EASEMENT	9	THE GREEN WITCH PROJECT LLC	THE OTHER HALF LLC	0
22	ENTIRE LOT	9/4/2012 3:55:17 PM	EASEMENT	9	THE OTHER HALF LLC	THE GREEN WITCH PROJECT LLC	0
22	PARTIAL LOT	6/4/2012 10:25:29 AM	EASEMENT	8	THE GREEN WITCH PROJECT LLC	THE OTHER HALF LLC	0
22	PARTIAL LOT	6/4/2012 10:25:28 AM	EASEMENT	8	THE OTHER HALF LLC	THE GREEN WITCH PROJECT LLC	0
22	ENTIRE LOT	4/4/2012 3:16:20 PM	ASSUMPTION OF MORTGAGE	8	THE OTHER HALF LLC	SILVA, MANUEL	225,000
22	ENTIRE LOT	4/4/2012 3:16:19 PM	DEED	5	96 DEGRAW LLC	THE OTHER HALF LLC	300,000
22	ENTIRE LOT	12/28/2011 10:35:41 AM	MORTGAGE	7	96 DEGRAW LLC	SILVA, MANUEL	225,000
22	ENTIRE LOT	12/28/2011 10:35:40 AM	DEED	4	SILVA, MANUEL	96 DEGRAW LLC	280,000
22	ENTIRE LOT	11/2/1992	DEED	2	CITY OF NEW YORK	SILVA, MANUEL	0
22	ENTIRE LOT	8/18/1982	DEED	150	COMMISSIONER FINANCENY	NEW YORK CITY	0
22	ENTIRE LOT	3/9/1977	DEED	2	TOSPIGE REALTY LTD	KELLONG REALTY CORP	0
22	ENTIRE LOT	11/8/1976	MORTGAGE	4	TOSPIGE REALTY LTD	COSTALAS GEORGE	0
22	ENTIRE LOT	4/27/1972	DEED	2	LOPEZ REINALDO	CASTANO AL	0
22	ENTIRE LOT	5/24/1971	DEED	2	CADMAN PARKING CORP	LOPEZ REINALDO	0
22	ENTIRE LOT	5/3/1971	DEED	2	LOPEZ REINALDO	CADMAN PARKING CORP	0
22	ENTIRE LOT	8/25/1970	ASSIGNMENT, MORTGAGE	2	COBBLESVILLE RLTY LTD	SPANAKOS JOHN M	0
22	ENTIRE LOT	8/25/1970	MORTGAGE	4	LOPEZ RENALDO	COBBLESVILLES RLTY LTD	0
22	ENTIRE LOT	8/25/1970	DEED	2	COBBLESVILLES RLTY LTD	LOPEZ RENALDO	0
22	ENTIRE LOT	4/14/1970	DEED	2	CARANNANTE SAMUEL A	COBBLEVILLES RLTY LTD	0

98 Degraw Street

Lot	Partial	Recorded / Filed	Document Type	Pages	Party1	Party2	Doc Amount
23	ENTIRE LOT	9/4/2012 3:55:18 PM	EASEMENT	9	THE GREEN WITCH PROJECT LLC	THE OTHER HALF LLC	0
23	ENTIRE LOT	9/4/2012 3:55:17 PM	EASEMENT	9	THE OTHER HALF LLC	THE GREEN WITCH PROJECT LLC	0
23	PARTIAL LOT	6/4/2012 10:25:29 AM	EASEMENT	8	THE GREEN WITCH PROJECT LLC	THE OTHER HALF LLC	0
23	PARTIAL LOT	6/4/2012 10:25:28 AM	EASEMENT	8	THE OTHER HALF LLC	THE GREEN WITCH PROJECT LLC	0
23	ENTIRE LOT	12/27/2011 4:36:10 PM	DEED	5	98 DEGRAW LLC	THE GREEN WITCH PROJECT LLC	250,000
23	ENTIRE LOT	11/23/2011 9:46:06 AM	TAX LIEN SALE CERTIFICATE	83	CITY OF NEW YORK	BANK OF NEW YORK	0
23	ENTIRE LOT	8/18/2010 1:17:10 PM	TAX LIEN SALE CERTIFICATE	132	THE CITY OF NEW YORK	THE BANK OF NEW YORK MELLON	0
23	ENTIRE LOT	11/20/2001	DEED	4	CITY OF NEW YORK/DEF	98 DEGRAW LLC	0
23	ENTIRE LOT	7/27/2000	TAX LIEN SALE CERTIFICATE	31	CITY OF NEW YORK	BANK OF NEW YORK	0
23	ENTIRE LOT	1/25/1999	ASSIGNMENT OF TAX LIEN	1	NYCTL 1997-1 TRUST	BANK OF NEW YORK	0
23	ENTIRE LOT	6/18/1997	TAX LIEN SALE CERTIFICATE	34	CITY OF NEW YORK	BANK OF NEW YORK	0
23	ENTIRE LOT	4/18/1979	DEED	1	COMMISSIONER OF FINANCE OF THE CITY OF NEW YORK	THE CITY OF NEW YORK	0

5.6 LITTLE E DESIGNATION SITES

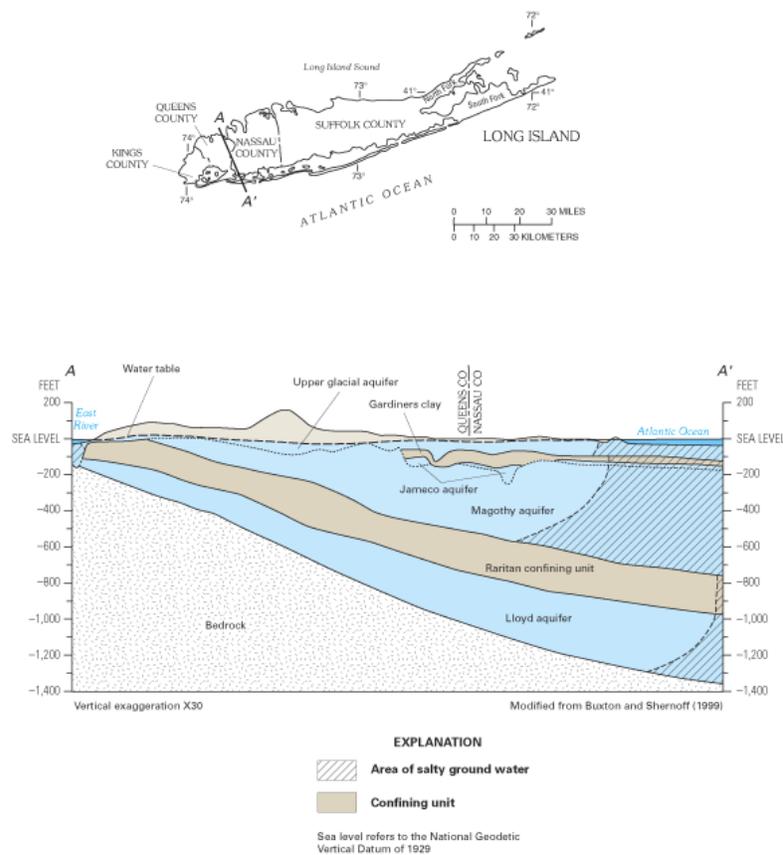
Lots designated with an “E” on the Zoning Maps of the City of New York for potential hazardous material contamination, air and/or noise quality impacts. The NYC records were searched thoroughly and **LEA** has determined the Subject property is not designated as a Little “E” site.

6.0 FAIR MARKET VALUE

The subject property is not for sale; therefore an evaluation of the environmental integrity of the property cannot be made based upon market value.

7.0 SITE HYDROGEOLOGY

Kings County is located in the Atlantic Coastal Plain physiographic province that is characterized by low hills of unconsolidated sands, gravel, and silt. According to Franke (1972), regionally, the near-surface sediments consist of the Upper Glacial deposits that are characterized by southward sloping deposits of sand, gravel, and silt. The Upper Glacial deposits have a maximum thickness of 600 feet. They are underlain by the Magothy, Raritan, and Lloyd Formations. The Gardeners clay and the Jameco gravel separate the Upper Glacial deposits and the Magothy Formation along the southwest portion of Long Island. Due to less surficial contamination and higher well yields, the Magothy aquifer is the main supply for drinking and industrial water. Consequently, the USEPA has identified it as a Sole Source Aquifer. The subject site is in the Upper Glacial aquifer. Pump test data suggests hydraulic conductivity between the Magothy and Upper Glacial aquifers. However, discontinuous clay lenses may prevent this interaction in some areas.



According to groundwater contour maps provided by the NYCDEP and the NYSDEC, Topographic Quadrangles provided by the USGS, and previous work performed by **LEA** in the area, the subject property has an elevation of approximately 15 feet above mean sea level. Regional groundwater is estimated to be 14 feet below grade at the subject property and flowing in a westerly direction, towards the East River. A site specific hydrogeologic study is warranted to confirm localized on-site groundwater flow direction, which is beyond the scope of this report.

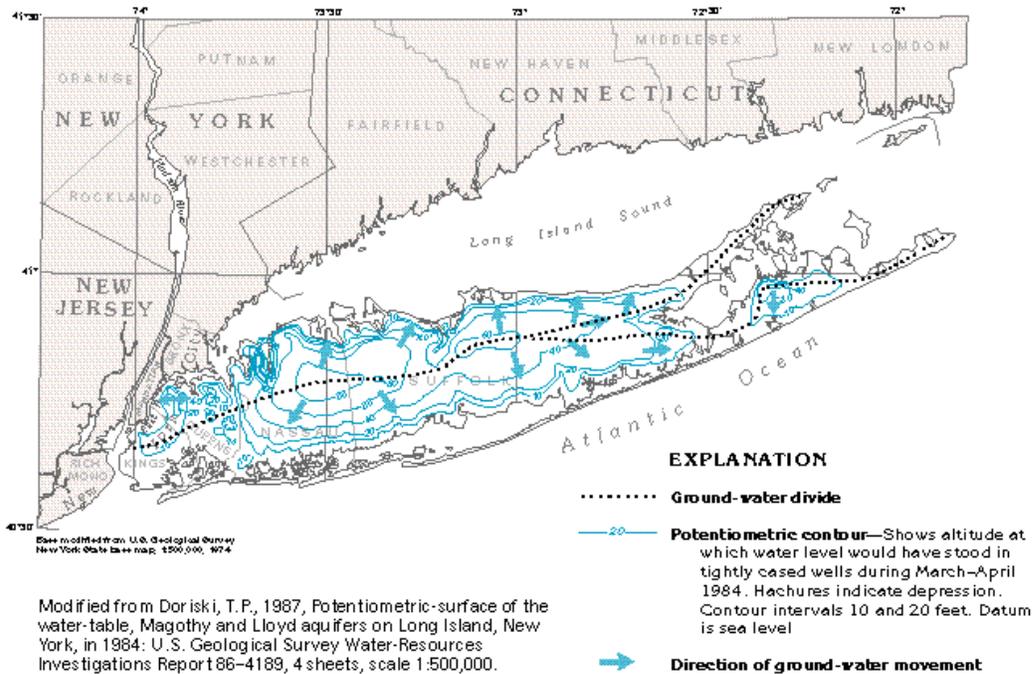


Figure 72. The potentiometric surface of the upper glacial aquifer slopes gently to the north and south from a central high, except in the western part of the island where ground-water withdrawals have lowered the water table and created cones of depression.

7.1 GROUNDWATER USE

No active drinking water wells were noted at the subject property or at any of the adjoining sites during the site inspection, although it remains possible that private wells exist. The subject building, as well as the buildings in the vicinity of the subject site, is served with municipal water from the City of New York. Groundwater is not utilized for any purpose at the subject site. **LEA** did not observe any monitoring wells at the subject property at the time of our site reconnaissance.

The subject site is not located within 1,000 feet of a 100 year floodplain.

8.0 SUMMARY OF FINDINGS FROM RECONNAISSANCE AND RESEARCH

Based on the completion of the Phase I Environmental Site Assessment, *Laurel Environmental Associates, Ltd.* has come to the following conclusions:

- The subject property is comprised of two adjoining undeveloped parcels with a combined footprint of approximately 3,500 square feet. The site is unpaved but graded with gravel, and is utilized for vehicle storage. According to Sanborn Historical Maps, the property was occupied by two 3-story residential buildings until sometime between 1988 and 1991, when the buildings were likely demolished. The property has remained empty since as early as 1991. The site is relatively flat, and fronts along Degraw Street. The subject property is located in a residential and commercial area of the Columbia Street Waterfront District in Kings County, New York.
- Housekeeping was noted to be good throughout the subject site. The site was observed free of debris and no staining of the ground was noted.
- The subject property is covered entirely with gravel and does not support any vegetation.
- There was no evidence of a current or former private septic system or cesspool at the subject property. Former sanitary waste at buildings that previously occupied the property was likely handled by municipal sewer system, supplied by the City of New York. In addition, there was no evidence of any pits, ponds, or lagoons used in connection with waste treatment or waste disposal.
- Storm water is handled by natural drainage across the site and runoff to Degraw Street.
- No floor drains are present, as the subject property is undeveloped.
- The subject property is currently utilized for vehicle storage purposes, with a plan to erect a multi-family building in preliminary stages.
- According to Sanborn Fire Insurance Maps, the subject property was used for residential purposes since the construction of the original buildings, sometime prior to 1886. The property has been vacant since between 1988 and 1991.
- No chemical storage was noted on the subject site.
- No biohazardous waste is generated or stored on the subject site.
- No drum storage was noted during the site inspection.
- As the property is undeveloped, no fill ports and/or vent pipes, which indicate the presence of USTs or ASTs, were noted at the subject property at the time of the site inspection. Based upon our site reconnaissance, interviews, and review of state and local records, LEA identified no evidence of existing USTs or ASTs at the subject property. However; no determination can be made as to whether any USTs or ASTs were present at the former buildings, prior to their demolition.
- No emergency generators and associated tanks were observed during our site reconnaissance.
- There are no pad or pole-mounted transformers located at the subject property. The property is undeveloped, therefore no PCB containing light fixtures are present.

- No friable or non-friable suspect asbestos containing materials were noted during the inspection.
- No lead-based paints are present at the subject property.
- As the subject property does not support any structures, no evidence of mold and/or mold related odors was noted at the time of the site inspection.
- According to maps provided by the NYSDEC, the subject property does not reside within a fresh water or tidal wetlands area. An inspection of the subject property by LEA did not observe the presence of wetlands within its boundaries. Upper New York Bay was located within a ¼-mile radius of the subject property 750 feet hydraulically down-gradient.
- According to monitoring data completed by the NYS Department of Health, Bureau of Radiation Protection, the Kings County has an average indoor radon concentration of 0.6 pCi/l. Given this information, radon is not considered a significant environmental concern within the subject building.
- No high tension wires or substations were noted on or adjacent to the subject property.
- Due to the benign usage at the surrounding properties, they should not have the potential to present a recognized environmental condition at the subject property. None of the surrounding properties are associated with any NYSDEC or USEPA Superfund List.
- A review of the latest edition of the NPL, published in 2012, found that the subject property is not listed as a NPL site. There is one NPL listed site located within a one-mile radius of the subject property. Gowanus Canal, ID #NYN000206222, is a large, 100-foot wide, 1.8-mile long canal, with a history of industrial traffic and contamination, currently undergoing extensive investigation and remediation. This site is located 4,747 feet hydraulically cross-gradient from the subject property, and should not pose a recognized environmental condition.
- Examination of the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) database indicates that the subject site is not listed in the CERCLIS database. There are no CERCLIS listed sites located within a ½-mile radius of the subject property.
- A review of the annual report, quarterly updates, and reports from 1992 to 2012 indicates that the subject property is not listed as being an IHWD site. There are eight IHWD site listings, within a one-mile radius of the subject property. Due to the geographic and hydraulic locations of these sites, with respect to the subject property, none should pose a recognized environmental condition.
- After a thorough investigation, it was determined that neither the subject property nor any property within a one-mile radius is listed as a HSWD site.
- After a thorough investigation, it was determined that neither the subject property nor any property within a one-mile radius is listed as a Brownfields site.
- The database of NYS Landfills identified no such facilities located within a ½-mile radius of the subject property. There is one Solid Waste Facility located within a ½-mile radius of the subject property. 20th Century Recycling, ID #24TA2, located 1,620 feet hydraulically side-gradient from the subject property, is listed as a large transfer station for unknown wastes. Due to the geographic and hydraulic location relative to the subject property, this site should not pose a recognized environmental condition.

- There are no closed or active NYSDEC listed spills or leaking underground storage tanks (USTs) located at the subject property.
- There are four active NYSDEC listed spills located within a ½-mile radius of the subject property. Due to the geographic and hydraulic locations, relative to the subject property, magnitude of spill and/or resource affected, none should present a recognized environmental condition.
- There is one active NYSDEC listed leaking UST located within a ½-mile radius of the subject property. Due to the geographic and hydraulic location, relative to the subject property, magnitude of spill and/or resource affected, this spill should not present a recognized environmental condition.
- After a thorough investigation, it was determined that neither the subject property nor any adjoining property is listed at the NYSDEC as a CBS, MOS, or PBS Facility.
- After a thorough investigation, it was determined that neither the subject property nor any adjoining property is listed as a RCRA Hazardous Waste Generator.
- After a thorough investigation, it was determined that the subject property is not listed as a RCRA TSD or CORRACT site. There is one property within a one-mile radius listed as a RCRA TSD and CORRACT site. Patterson Chemical Co, ID #NYD980592471, located 4,308 feet hydraulically cross-gradient from the subject property, is listed as a TSD facility, with RFA completed in 1994. No further information is disclosed. Due to the geographic and hydraulic location relative to the subject property, this site should not pose a recognized environmental condition.
- After an investigation according to street address, it was determined that the subject property is not listed on the ERNS database.
- After a thorough investigation, it was determined that neither the subject property nor any property within a ¼-mile radius is listed as a TRI Facility.
- After a thorough investigation, it was determined that neither the subject property nor any property within a ⅛-mile radius is listed as a Wastewater Discharge Site.
- After a thorough investigation, it was determined that the subject property is not listed as an Air Discharge Site. There is one site located within a ¼-mile of the subject property listed as an Air Discharge Site. Nello Botti Cleaners, ID #3604700869, located 491 feet east of the subject property, is listed in compliance for the potential uncontrolled emissions of VOCs. Due to the resource affected and lack of traceability, no determination can be made as to the environmental threat to the subject property.
- After a thorough investigation, it was determined that neither the subject property nor any property within a ⅛-mile radius is listed as a Civil and Administrative Enforcement Docket site.
- Neither the subject property nor any property located within a ½-mile radius of the subject property was identified on Federal Engineering Control or Institutional Control Registries.
- There are no Tribal Lands within a one-mile radius of the subject property. This was further confirmed by a search of Federal and State Tribal Land records, please refer to Figure 8.0.
- On December 10, 2012, **LEA** received notification from the NYCDEP, confirming their receipt of the request. As of December 19, 2012, **LEA** has not yet received a response from the NYCDEP stating whether records relevant to the environmental integrity of the subject property are available.

If the agency is found to maintain such records, **LEA** will forward the information in the form of an addendum to The Other Half, LLC and The Green Witch Project, LLC.

- Past usage of the subject site should not present a recognized environmental condition at the subject property.
- A review of historical topographical maps from 1947 and 1967 did not show detailed information as to historical structures and usage of the subject property.
- Due to poor picture clarity, no information as to the historical structures and surrounding properties could be garnered from the image.
- The subject property is not for sale; therefore an evaluation of the environmental integrity of the property cannot be made based upon market value.
- According to groundwater contour maps provided by the NYCDEP and the NYSDEC, Topographic Quadrangles provided by the USGS, and previous work performed by **LEA** in the area, the subject property has an elevation of approximately 15 feet above mean sea level. Regional groundwater is estimated to be 14 feet below grade at the subject property and flowing in a westerly direction, towards the East River.

9.0 CONCLUSIONS

Based on the information developed and provided as part of this Phase I Environmental Site Assessment, **LEA** has reached the following conclusions regarding recognized areas of environmental concern at the subject property, 96 and 98 Degraw Street, Brooklyn, New York:

Recognized Environmental Conditions

- Urban fill and construction debris
- Possible former USTs

Potential Impacts

Moderate Risk
Moderate Risk

10.0 RECOMMENDATIONS

Based on the above conclusions *LEA* recommends the following:

6. Conduct a geophysical survey of the property to identify any possible underground storage tanks or other anomalies.
7. Conduct continuous soil borings around any marked anomalies, and at three additional locations at the property. Soil samples should be collected from 0-2' below grade, and either two feet into clean material if contamination is found, or 4-6' below grade (corresponding to the assumed slab level of the future building), if no signs of contamination are found. Analyze samples for VOCs, SVOCs, Metals and PCBs.
8. Collect a groundwater sample at the property using a pre-pack direct push well. Sample collected should be analyzed for VOCs, SVOCs, Metals, and PCBs.
9. Three soil vapor samples should be collected across the site, at a depth of four feet below grade, using 6-litre summa canisters with 2 hour flow controllers and analyzed for VOCs using TO-15 method.
10. Review results and compare to the appropriate regulatory standards and guidelines.

Opinion of Impacts

The environmental professionals who have conducted the site visit and reviewed the results of the data collection effort have concluded that the aforementioned are “recognized environmental conditions”. The recognized environmental conditions have been quantified based on a range of qualitative impacts on the soil, water, and air resources or structures on the subject property.

As per our contractual agreement, *LEA* has provided recommendations for further study above. It is up to the user of this report, based on the individuals risk tolerance, fiduciary responsibility, or the applicable law, to determine the extent of further inquiry.

11.0 LIMITATIONS

The purpose of this investigation was to identify potential sources of contamination at the subject property and to satisfy all appropriate inquiry standards set forth in Section 9601 (35)(b) of CERCLA. The findings and conclusions set forth in this report are based upon information that was available to **LEA** during the inspection of the property and review of selected records and documents. If new information becomes available concerning the environmental integrity of the subject property after this date, or if the subject property is used in a manner other than that which is identified in this report, the findings and conclusions contained herein may have to be modified. Additionally, while this investigation was performed in accordance with good commercial and customary practice and generally accepted protocols within the consulting industry, **LEA** cannot guarantee that the property is completely free of hazardous substances or other materials or conditions that could subject The Other Half, LLC and The Green Witch Project, LLC to potential liability. The presence or absence of any such condition can only be confirmed through the collection and analysis of air, soil, and/or groundwater samples, which was beyond the scope of this investigation.

Limiting Conditions:

The preceding Environmental Site Assessment is subject to the following conditions and to such other conditions and limiting conditions as are set forth in the report.

1. **Laurel Environmental Associates, Ltd.** assumes no responsibility for hidden or latent conditions or misrepresentation by the property owner, his representatives, public information officials, or any authority consulted in connection with the compilation of this report.
2. This report is prepared for the sole and explicit purpose of assessing the potential liability with respect to the suspected presence of hazardous materials that may pose a potential health or environmental threat. It is also prepared for evaluating collateral risk associated with the same. This report is not intended to have any direct bearing on the value of the property.
3. The Environmental Site Assessment and the Environmental Site Assessment Report are for the sole use of the Principal Parties. No disclosure or reproduction shall be made of the preceding report without the prior written consent of **Laurel Environmental Associates, Ltd.**
4. **Laurel Environmental Associates, Ltd.** or any representative of **Laurel Environmental Associates, Ltd.** is not required to give testimony with reference to the opinions expressed herein without prior written arrangement.
5. **Laurel Environmental Associates, Ltd.** cannot be liable for information known only to the site owner or operator and not shared with **Laurel Environmental Associates, Ltd.**

12.0 TERMS AND CONDITIONS

The purpose of this Phase I Environmental Site Assessment (ESA) was to identify, to the extent feasible pursuant to the processes described herein to recognize environmental conditions, which are significant adverse environmental concerns in connection with the subject property. This practice is intended to permit the user to satisfy one of the requirements to qualify for the innocent landowner defense to CERCLA liability: that is, to undertake “all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice.” It also is intended to assist the user in developing information about the environmental condition of the subject property. This Phase I ESA is site specific in that it relates only to the environmental assessment of the property indicated herein.

12.1 SPECIAL TERMS AND CONDITIONS

This Phase I ESA was prepared essentially in accordance with ASTM Standards on Environmental Site Assessments: Phase I Environmental Site Assessment Process as set forth in E1527-05. No *environmental site Assessment* can wholly eliminate uncertainty regarding the potential for *recognized environmental conditions* in connection with a *property*. Performance of this practice is intended to reduce, but not eliminate, uncertainty regarding the potential for *recognized environmental conditions* in connection with a *property*, and this practice recognizes reasonable limits of time and cost.

12.2 LIMITATIONS AND EXCEPTIONS OF ASSESSMENT

This Phase I ESA was not intended to be in strict accordance with ASTM, be all inclusive, identify all potential concerns, or eliminate the possibility that the subject property may have environmental problems. Although **Laurel Environmental Associates, Ltd.** has taken great care to identify such concerns or problems, it is possible that conditions un-permitted, undocumented, not observed, or otherwise concealed on the subject property could exist. Additional information which was not found or made available to **LEA**, may result in a modification of the conclusions and recommendations presented.

12.3 LIMITING CONDITIONS AND METHODOLOGY USED

This Phase I ESA was prepared in a manner consistent with the level of skill ordinarily exhibited by members of the environmental auditing profession in this geographic region. No representations, expressed or implied, and no warranty or guarantee is included or intended in connection with this report. **LEA** cannot be responsible for any unauthorized use of, any misrepresentation of the information, or the information contained in this report. The information contained in this report has been obtained from readily ascertainable public sources, interviews, and from visual observations of the subject property, that may have been limited by secured areas, overgrown vegetation, or by other obstructions. Although great care has been taken by **LEA** in compiling and checking the information contained in this report to ensure that it is current and accurate, **LEA** disclaims any and all liability for any errors, omissions, or inaccuracies of such information and data, whether attributable to an advertence or otherwise, and for any consequences arising there-from. It is understood that **LEA** makes no representations or warranties of any kind, including, but not limited to, the warranties of fitness for a particular purpose of merchantability, nor should any such representation or warranty be implied with the respect to customer, it is employees or agents use thereof. **LEA** shall not be liable for any special, consequential, or exemplary damages resulting in whole or in part from customer use of the data. Liability on the part of **LEA** is limited to the monetary value paid for this report. This report does not constitute a legal opinion.

13.0 REFERENCES

American Society for Testing and Materials Phase I Standards, ASTM E1527-05. 2006

Bing, <http://www.bing.com/maps/>, Site Location, November 2012

Doriski, T.P., 1987. Potentiometric surface of the water table, Magothy and Lloyd aquifers on Long Island, New York in 1984: U.S. Geological Survey Water Resource Investigations Report 86-4189, 4 sheets, scale 1:500,000

EDR Sanborn Fire Insurance Maps, Reviewed November 2012

Franke, O.L., 1972. Regional Rates of Ground Water Movement on Long Island, New York: U.S. Geological Survey Prof. Paper 800-C

Franke, O.L. and McClymonds, N.E., 1972. Summary of hydrologic situation on Long Island, New York as a guide to water management alternatives: U.S. Geological Survey Prof. Paper 627-F, 59p

Google Earth 2009, Aerial Photographs, November 2012

Microsoft Research Maps, <http://msrmaps.com/Default.aspx>, Topographic Maps, November 2012

NYC ACRIS, Reviewed November 2012

NYC Department of Buildings, Reviewed, November 2012

NYCDEP FOIL, Request, November 2012

NYSDEC Ecological Regions (Ecozones) of New York State: Original boundaries and information taken from Will et al (1982) and Dickinson (1983) and modified by John Ozard of the New York State Department of Environmental Conservation.

Toxics Targeting, Inc. Environmental Report, Received November 2012 Search of all Federal, State and local databases to meet ASTM E1527-05 requirements

USFWS, Wetlands On-line Mapper, <http://wetlandsfws.er.usgs.gov/wtlnds/launch.html>, November 2012

USGS, Jersey City, New York Topographical Quadrangle Map, 1969, Photorevised 1979

14.0 DEFINITIONS

Abandoned Property – *property* that can be presumed to be deserted, or an intent to relinquish possession or control can be inferred from the general disrepair or lack of activity thereon such that a reasonable person could believe that there was an intent on the part of the current owner to surrender rights to the *property*.

Activity and use limitations – legal or physical restrictions or limitations on the use of, or access to, a site or facility: (1) to reduce or eliminate potential exposure to hazardous substances in the soil or ground water on the property, or (2) to prevent activities that could interfere with the effectiveness of a response action, in order to ensure maintenance of a condition of no significant risk to public health or the environment. These legal or physical restrictions, which may include institutional and/or engineering controls, are intended to prevent adverse impacts to individuals or populations that may be exposed to hazardous substances and petroleum products in the soil or ground water on the property.

Actual knowledge – the knowledge actually possessed by an individual who is a real person, rather than an entity. Actual knowledge is to be distinguished from constructive knowledge that is knowledge imputed to an individual or entity.

Adjoining properties – any real property or properties the border of which is contiguous or partially contiguous with that of the property; or that would be contiguous or partially contiguous with that of the property but for a street, road, or other public thoroughfare separating them.

Aerial photographs – photographs taken from an aerial platform with sufficient resolution to allow identification of development and activities of areas encompassing the property. Aerial photographs are often available from government agencies or private collections unique to a local area. See 8.3.4.1 of this practice.

All appropriate inquiry – that inquiry constituting “all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice” as defined in CERCLA, 42 USC § 9601(35) (B), that will qualify a party to a *commercial real estate* transaction for one of the threshold criteria for satisfying the LLPs to CERCLA liability (42 USC § 9601(35)(A) & (B) §9607(b) (3), §9607(q); and §9607(r)), assuming compliance with other elements of the defense. See Appendix X1 of this practice.

Approximate minimum search distance – the area for which records must be obtained and reviewed pursuant to Section 8 subject to the limitations provided in that section. This may include areas outside the property and shall be measured from the nearest property boundary. This term is used in lieu of radius to include irregularly shaped properties.

Bona Fide prospective purchaser liability protection – (42 U.S.C. §9607(r) – a person may qualify as a bona fide prospective purchaser if, among other requirements, such person made “all appropriate inquiries into the previous ownership and uses of the facility in accordance with generally accepted good commercial and customary standards and practice.” Knowledge of contamination resulting from all appropriate inquiry would not generally preclude this liability protection. A person must make all appropriate inquiry on or before the date of purchase. The facility must have been purchased after January 11th, 2002. See ASTM E1527-05 Appendix X1 for the other necessary requirements that are beyond the scope of this practice.

Brownfields amendments – amendments to CERCLA pursuant to the Small Business Liability Relief and Brownfields Revitalization Act, Pub. L. No. 107-118 (2002), 42 U.S.C. §§9601 *et seq.*

Building department records – those records of the local government in which the property is located indicating permission of the local government to construct, alter, or demolish improvements on the property. Often building department records are located in the building department of a municipality or county. See 8.3.4.7.

Commercial real estate - any real *property* except a *dwelling* or *property* with no more than four dwelling units exclusively for residential use (except that a dwelling or property with no more than four dwelling units exclusively for residential use is included in this term when it has a commercial function, as in the building of such dwelling for profit). This term includes but is not limited to undeveloped real property and real property used for industrial, retail, office, agricultural, other commercial, medical, or educational purposes; property used for residential use when it has a commercial function, as in the building of such dwellings for profit.

Commercial real estate transactions – a transfer of title to or possession of real property, except that it does not include transfer of title to or possession of real property with respect to an individual dwelling or building containing fewer than five dwelling units, nor does it include the purchase of a lot or lots to construct a dwelling for occupancy by a purchaser, but a commercial real estate transaction does include real property purchased or leased by person or entities in the business of building or developing dwelling units.

Comprehensive Environmental Response, Compensation and Liability

Information Systems (CERCLIS) – the list of sites compiled by USEPA that USEPA has investigated or is currently investigating for potential hazardous substance contamination for possible inclusion on the National Priorities List.

Construction debris – concrete, brick, asphalt, and other such building materials discarded in the construction of a building or other improvement to property.

Contaminated public wells – public wells used for drinking water that have been designated by a government entity as contaminated by hazardous substance (for example, chlorinated solvents), or as having water unsafe to drink without treatment.

Contiguous property owner liability protection-(42 U.S.C. §9607(q))-a person may qualify for the *contiguous property owner liability protection* if, among other requirements, such person owns real property that is contiguous to, and that is or may be contaminated by hazardous substance from other real property that is not owned by that person. Furthermore, such person conducted *all appropriate inquiry* at the time of acquisition of the property and did not know or have reason to know that the property was or could be contaminated by a *release* or threatened release from the contiguous property. The all appropriate inquiry must not result in knowledge of contamination. If it does, then such person did “know” or “had reason to know” of contamination and would not be eligible for the *contiguous property owner liability protection*.

See Appendix X1 for the other necessary requirements that are beyond the scope of this practice.

CORRACTS list – a list maintained by EPA of hazardous waste treatment, storage, or disposal facilities and other RCRA-regulated facilities (due to past interim status or storage of hazardous waste beyond 90 days) that have been notified by the U.S. Environmental Protection Agency to undertake corrective action under RCRA.

Data Failure – a failure to achieve the historical research objectives in 8.3.1 through 8.3.2.2 even after reviewing the standard historical sources in 8.3.4.1 through 8.3.4.8 that are reasonably ascertainable and likely to be useful. Data failure is one type of data gap.
See 8.3.2.3 of this practice.

Data gap – a lack of or inability to obtain information required by this practice despite good faith efforts by the environmental professional to gather such information. Data gaps may result from incompleteness in any of the activities required by this practice, including, but not limited to site reconnaissance (for example, an inability to interview the key site manager, regulatory officials, etc.)
See 12.7 of this practice.

Demolition debris – concrete, brick, asphalt, and other such building materials discarded in the demolition of a building or other improvement to property.

Drum – a container (typically, but not necessarily, holding 55 gal (208 L) of liquid) that may be used to store hazardous substance or petroleum products.

Drywells – underground areas where soil has been removed and replaced with pea gravel, coarse sand, or large rocks. Dry wells are used for drainage, to control storm runoff, for the collection of spilled liquids (intentional and non-intentional) and wastewater disposal (often illegal).

Dwelling-structure or portion thereof used for residential habitation.

Engineering controls – physical modifications to a site or facility (for example, capping, slurry walls, or point of use water treatment) to reduce or eliminate the potential for exposure to hazardous substances or petroleum products in the soil or ground water on the property.

Environmental lien – a charge, security, or encumbrance upon title to a *property* to secure the payment of a cost, damage, debt, obligation, or duty arising out of response actions, cleanup, or other remediation of *hazardous substances* or *petroleum products* upon a *property*, including (but not limited to) liens imposed pursuant to CERCLA 42 USC § 9607(1) & 9607 (r) and similar state or local laws.

ERNS list – USEPA’s emergency response notification system list of reported CERCLA hazardous substance releases or spills in quantities greater than the reportable quantity, as maintained at the National Response Center. Notification requirements for such releases or spills are codified in 40 CFR Parts 302 and 355.

Federal Registration (FR) - publication of the United State government published daily (except for federal holidays and weekends) containing all proposed and final regulations and some other activities of the federal government. When regulations become final, they are included in the Code of Federal Regulations (CFR), as well as published in the Federal Register.

Fill dirt - dirt, soil, sand, or other earth, that is obtained off-site, which is used to fill holes or depressions, create mounds, or otherwise artificially change the grade or elevation of real property. It does not include material that is used in limited quantities for normal landscaping activities.

Fire insurance maps – maps produced for private fire insurance map companies that indicate uses of properties at specified dates and that encompass the property. These maps are often available at local libraries, historical societies, private resellers, or from the map companies who produces them.

Good faith – the absence of any intention to seek an unfair advantage or to defraud another party; an honest and sincere intention to fulfill one’s obligations in the conduct or transaction concerned.

Hazardous substance – a substance defined as a hazardous substance pursuant to CERCLA 42 USC § 9601(14), as interpreted by USEPA regulations and the courts: “(A) any substance designated pursuant to section 1321(b)(2)(A) of Title 33, (B) any element, compound, mixture, solution, or substance designated pursuant to section 9602 of this title, (C) any hazardous waste having the characteristics identified under or listed pursuant to section 3001 of the Resource Conservation and Recovery Act of 1976 (RCRA), as amended, (42 USC § 6921) (but not including any waste the regulation of which under RCRA (42 USC §§ 6901 *et seq.*) has been suspended by Act of Congress), (D) any toxic pollutant listed under section 1317(a) of Title 33, (E) any hazardous air pollutant listed under section 112 of the Clean Air Act (42 USC § 7412), and (F) any imminently hazardous chemical substance or mixture with respect to which the Administrator (of USEPA) has taken action pursuant to section 2606 of Title 15. The term does not include petroleum, including crude oil or any fraction thereof which is not otherwise specifically listed or designated as a hazardous substance under subparagraphs (A) through (F) of this paragraph, and the term does not include natural gas, natural gas liquids, liquefied natural gas, or synthetic gas usable for fuel (or mixtures of natural gas and such synthetic gas).”

Hazardous waste – any hazardous waste having the characteristics identified under or listed pursuant to section 3001 of RCRA, as amended, (42 USC § 6921) (but not including any waste the regulation of which under RCRA (42 USC §§ 6901-6992k.) has been suspended by Act of Congress). RCRA is sometimes also identified as the Solid Waste Disposal Act. RCRA defines a hazardous waste, in 42 USC § 6903, as: “a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may- (A) cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible illness; or (B) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.”

IC/EC registries – database of institutional controls or engineering controls that may be maintained by a federal, state or local environmental agency for purposes of tracking sites that may contain residual contamination and AULs. The names for these may vary from program and state to state, and include terms such as Declaration of Environmental Use Restriction database (Arizona), list of “deed restrictions” (California), environmental real covenants list (Colorado), Brownfields site list (Indiana, Missouri, Pennsylvania).

Institutional controls – a legal or administrative restriction (for example, “deed restrictions”, restrictive covenants, easements or zoning) on the use of, or access to, a site or facility to (1) reduce or eliminate potential exposure to hazardous substances in the soil or ground water on the property, or (2) to prevent activities that could interfere with the effectiveness of a response action, in order to ensure maintenance of a condition of no significant risk to public health or the environment.

Interviews – those portions of this practice that are contained in Section 5.0 thereof and address questions to be asked of past and present owners, operators, and occupants of the property and question to be asked of local government officials.

Landfill – a place, location, tract of land, area, or premises used for disposal of solid waste as defined by state solid waste regulations. The term is synonymous with the term *solid waste disposal site* and is also known as a garbage dump, trash dump, or similar term.

Local government agencies – those agencies of municipal or county government having jurisdiction over the property. Municipal and county government agencies include but are not limited to cities, parishes, townships and similar entities.

Local street directories – directories published by private (or sometimes government) sources that show ownership, occupancy, and/or use of sites by reference to street addresses. Often local street directories are available at libraries, or historical societies, and/or local municipal offices.

See 8.3.4.6 of this practice.

LUST sites – state lists of leaking underground storage tank sites. RCRA gives USEPA and states, under cooperative agreements with USEPA, authority to clean up release from UST systems or require owner and operators to do so. (42 U.S.C. §6991b).

Major occupants – those tenants, subtenants, or other persons or entities each of which uses at least 40% of the subject property.

Material safety data sheet (MSDS) – written or printed material concerning a hazardous substance which is prepared by chemical manufacturers, importers, and employers for hazardous chemicals pursuant to OSHA’s Hazard Communication Standard, 29 CFR §1910.1200.

National Contingency Plan (NCP) – the National Oil and Hazardous Substance Pollution Contingency Plan, found at 40 CFR Part 300 that is the USEPA’s blueprint on how hazardous substances are to be cleaned up pursuant to CERCLA.

Occupants – those tenants, subtenants, or other persons or entities using the subject *property* or a portion of the subject *property*.

Owner – generally the fee owner of record of the *property*.

Petroleum exclusion – the exclusion from CERCLA liability provided in 42 USC § 9601(14), as interpreted by the courts and USEPA: “The term (hazardous substance) does not include petroleum, including crude oil or any fraction thereof which is not otherwise specifically listed or designated as a hazardous substance under subparagraphs (A) through (F) of this paragraph, and the term does not include natural gas, natural gas liquids, liquefied natural gas, or synthetic gas usable for fuel (or mixtures of natural gas and such synthetic gas).”

Petroleum products – those substances included within the meaning of the *petroleum exclusion* to CERCLA, 42 USC § 9601(14), as interpreted by the courts and USEPA, that is: petroleum, including crude oil or any fraction thereof which is not otherwise specifically listed or designated as a hazardous substance under Subparagraphs (A) through (F) of 42 USC § 9601(14), natural gas, natural gas liquids, liquefied natural gas, and synthetic gas usable for fuel (or mixtures of natural gas and such synthetic gas). (The word fraction refers to certain distillates of crude oil, including gasoline, kerosene, diesel oil, jet fuels, and fuel oil, pursuant to *Standard Definitions of Petroleum Statistics*.)

Pits, ponds, or lagoons – man-made or natural depressions in a ground surface that are likely to hold liquids or sludge containing *hazardous substances* or *petroleum products*. The likelihood of such liquids or sludge being present is determined by evidence of factors associated with the pit, pond, or lagoon, including, but not limited to, discolored water, distressed vegetation, or the presence of an obvious wastewater discharge.

Property – the real property that is the subject of the *environmental site assessment* described in this practice. Real property includes buildings and other fixtures and improvements located on the property and affixed to the land.

RCRA TSD Facilities – those facilities on which treatment, storage, and/or disposal of hazardous wastes take place, as defined and regulated by RCRA.

Solvent - a chemical compound that is capable of dissolving another substance and may itself be a *hazardous substance*, used in a number of manufacturing/industrial processes including but not limited to the manufacture of paints and coatings for industrial and household purposes, equipment clean-up, and surface degreasing in metal fabricating industries.

Sump – a pit, cistern, cesspool, or similar receptacle where liquids drain, collect, or are stored.

TSD facility – treatment, storage, or disposal facility (see RCRA TSD facilities).

Underground storage tanks (UST) – any tank, including underground piping connected to the tank, that is or has been used to contain *hazardous substances* or *petroleum products* and the volume of which is 10% or more beneath the surface of the ground.

Wastewater – water that (1) is or has been used in an industrial or manufacturing process, (2) conveys or has conveyed sewage, or (3) is directly related to manufacturing, processing, or raw materials storage areas at an industrial plant. Wastewater does not include water originating on or passing through or adjacent to a site, such as storm water flows, that has not been used in industrial or manufacturing processes, has not been combined with sewage, or is not directly related to manufacturing, processing, or raw materials storage areas at an industrial plant.

14.1 ADDITIONAL DEFINITIONS – SPECIFIC TO ESA

Business environmental risk – a risk which can have a material environmental or environmentally-driven impact on the business associated with the current or planned use of a parcel of commercial real estate, not necessarily limited to those environmental issues required to be investigated in this practice. Consideration of *business environmental risk* issues may involve addressing one or more non-scope considerations, some of which are identified in Section 13.

Due diligence – the process of inquiring into the environmental characteristics of a parcel of *commercial real estate* or other conditions, usually in connection with a commercial real estate transaction. The degree and kind of due diligence vary for different properties and differing purposes.

Environmental compliance audit – the investigative process to determine if the operations of an existing facility are in compliance with applicable environmental laws and regulations. This term should not be used to describe Practice E 1528 or 1527, although an environmental compliance audit may include an *environmental site assessment* or, if prior audits are available, may be part of an environmental site assessment.

Environmental professional – (1) a person who possesses sufficient specific education, training and experience necessary to exercise professional judgment to develop opinions and conclusions regarding conditions indicative of releases or threatened releases (see §312.1(c)), on, at, in, or to a property, sufficient to meet the objectives and performance factors in §312.20(e) and (f). (2) Such a person must: (i) hold a current Professional Engineer's or Professional Geologist's license or registration from a state, tribe, or US territory (or the Commonwealth of Puerto Rico) and have the equivalent of three (3) years of fulltime relevant experience; or (ii) be licensed or certified by the federal government, a state, tribe, or US territory (or the Commonwealth of Puerto Rico) to perform environmental inquiries as defined in §312.21 and have the equivalent of three (3) years of full-time relevant experience; or (iii) have a Baccalaureate or higher degree from an accredited institution of higher education in a discipline of engineering or science and the

equivalent of five (5) years of full-time relevant experience; or (iv) have the equivalent of ten (10) years of full-time relevant experience. The person may be an independent contractor or an employee of the *user*.

Environmental site assessment (ESA) – the process by which a person or entity seeks to determine if a particular parcel of real *property* (including improvements) is subject to *recognized environmental conditions*. At the option of the user, an environmental site assessment may include more inquiry than that which constitutes *all appropriate inquiry* or, if the user is not concerned about qualifying for the LLPs, less inquiry than that constituting *all appropriate inquiry*. An environmental site assessment is different from an *environmental compliance audit*.

Historical recognized environmental condition – environmental condition which in the past would have been considered a *recognized environmental condition*, but which may or may not be considered a *recognized environmental condition* currently. The final decision rests with the *environmental professional* and will be influenced by the current impact of the *historical recognized environmental condition* on the property. If a past release of any hazardous substances or petroleum products has occurred in connection with the property and has been remediated, with such remediation accepted by the responsible regulatory agency (for example, as evidenced by the issuance of a no further action letter or equivalent), this condition shall be considered an *historical recognized environmental condition* and included in the findings section of the Phase I *Environmental Site Assessment* report. The *environmental professional* shall provide an opinion of the current impact on the property of this *historical recognized environmental condition* in the opinion section of the report. If this *historical recognized environmental condition* is determined to be a *recognized environmental condition* at the time the Phase I *Environmental Site Assessment* is conducted, the condition shall be identified as such and listed in the conclusions section of the report.

Innocent landowner defense – (42 USC § 9601(35) and § 9607(b) (3)). A person may qualify as one of three types of innocent landowners: (i) a person who “did not know and had no reason to know” that contamination existed on the property at the time the purchaser acquired the property; (ii) a government entity which acquired the property by escheat, or through any other involuntary transfer or acquisition, or through the exercise of eminent domain authority by purchase or condemnation; and (iii) a person who “acquired the facility by inheritance or bequest.” To qualify for the first type of innocent landowner LLP, such person must have made all appropriate inquiry on or before the date of purchase. Furthermore, the all appropriate inquiry must not have resulted in knowledge of the contamination. If it does, then such person did “know” or “had reason to know” of contamination and would not be eligible for the innocent landowner defense. See ASTM E1527-05 Appendix X1.

Key site manager – the person identified by the *owner* or *operator* of a *property* as having good knowledge of the uses and physical characteristics of the property.

Landowner Liability Protections (LLPs) – landowner liability protections under CERCLA; these protections include the bona fide prospective purchaser liability protection, contiguous property owner liability protection, and innocent landowner defense from CERCLA liability, See 42 USC § §9601(35)(A), 9601(40), 9607(b), 9607(q), 9607 (r).

Material threat – a physically observable or obvious threat which is reasonably likely to lead to a release that, in the opinion of the *environmental professional*, is threatening and might result in impact to public health of the environment. An example might include an aboveground storage tank that contains a hazardous substance and which shows evidence of damage. The damage would represent a material threat if it is deemed serious enough that it may cause or contribute to tank integrity failure with a release of contents to the environment.

Obvious – that which is plain or evident; a condition or fact that could not be ignored or overlooked by a reasonable observer while visually or physically observing the *property*.

Other historical sources – any source or sources other than those designated in 7.3.4.1 through 7.3.4.8 that are credible to a reasonable person and that identify past uses of the property. The term includes, but is not limited to: miscellaneous maps, newspaper archives, internet sites, community organizations, local libraries, historical societies, current owners or occupants of neighboring properties, and records in the files and/or personal knowledge of the *property owner* and/or *occupants*. See ASTM E1527-05 Sections 3.2.58 and 8.3.4.8.

Practically reviewable – information that is *practically reviewable* means that the information is provided by the source in a manner and in a form that, upon examination, yields information relevant to the *property* without the need for extraordinary analysis or irrelevant data. The form of the information shall be such that the user can review the records for a limited geographic area. Records that cannot be feasibly retrieved by reference to the location of the *property* or a geographic area in which the *property* is located are not generally *practically reviewable*. Most databases of public records are *practically reviewable* if they can be obtained from the source agency by the county, city, zip code, or other geographic area of the facilities listed in the record system. Records that are sorted, filed, organized, or maintained by the source agency only chronologically are not generally practically reviewable. Listings in publicly available records which do not have adequate address information to be located geographically are not generally considered practically reviewable. For large databases with numerous facility records (such as RCRA hazardous waste generators and registered underground storage tanks), the records are not *practically reviewable* unless they can be obtained from the source agency in the smaller geographic area of zip codes. Even when information is provided by zip code for some large databases, it is common for an unmanageable number of sites to be identified within a given zip code. In these cases, it is not necessary to review the impact of all of the sites that are likely to be listed in any given zip code because that information would not be *practically reviewable*. In other words, when so much data is generated that it cannot be feasibly reviewed for its impact on the *property*, it is not *practically reviewable*.

Publicly available – information that is publicly available means that the source of the information allows access to the information by anyone upon request.

Reasonably ascertainable – for purposes of both Practice E 1527 and 1528, information that is (1) *publicly available*, (2) obtainable from its source within reasonable time and cost constraints, and (3) *practically reviewable*.

Recognized environmental conditions – the presence or likely presence of any *hazardous substances* or *petroleum products* on a *property* under conditions that indicate an existing release, a past release, or a material threat of a release of any *hazardous substances* or *petroleum products* into structures on the *property* or into the ground, ground water, or surface water of the *property*. The term includes *hazardous substances* or *petroleum products* even under conditions in compliance with laws. The term is not intended to include *de minimis* conditions that generally do not present a material risk of harm to public health or the environment and that generally would not be the subject of enforcement action if brought to the attention of appropriate governmental agencies. Conditions determined to be *de minimis* are not *recognized environmental conditions*.

User – the party seeking to use Practices E 1527 or E 1528 to complete an *environmental site assessment* of the *property*. A user may include, without limitation, a potential purchaser of *property*, a potential tenant of *property*, an *owner* of *property*, a lender, or a property manager.

Visually and/or physically observed – during a *site visit* pursuant to this practice, this term generally means observations made by vision while walking through a *property* and the structures located on it and observations made by the sense of smell, particularly observations of noxious or foul odors. The term “walking through” is not meant to imply that disabled persons who cannot physically walk may not conduct a *site visit*; they may do so by the means at their disposal for moving through the *property* and the structures located in it.

14.2 ACRONYMS

AULs – Activity and Use Limitations

CERCLA-Comprehensive Environmental Response, Compensation and Liability Act of 1980 (as amended, 42 USC § 9601 *et seq.*)

CERCLIS-Comprehensive Environmental Response, Compensation and Liability Information System (maintained by USEPA)

CFR-Code of Federal Regulations

CORRACTS-Facilities subject to Corrective Action under RCRA

ECs – Engineering Controls

USEPA-United States Environmental Protection Agency

EPCRA-Emergency Planning and Community Right to Know Act ((also known as SARA Title III), 42 USC § 11001 *et seq.*)

ERNS-Emergency Response Notification System

ESA-Environmental Site Assessment (different than an *environmental audit*; see 3.3.13)

FOIA-U.S. Freedom of Information Act (5 USC 552 *et seq.*)

FR-Federal Register

ICs – Institutional Controls

LLPs – Landowner Liability Protections under the Brownfields Amendments

LUST-Leaking Underground Storage Tank

MSDS-Material Safety Data Sheet

NCP-National Contingency Plan

NFRAP-Former CERCLIS sites where no further remedial action is planned under CERCLA

NPDES-National Pollutant Discharge Elimination System

NPL-National Priorities List

PCBs-Polychlorinated Biphenyls

PRP-Potentially Responsible Party (pursuant to CERCLA 42 USC § 9607(a))

RCRA-Resource Conservation and Recovery Act (as amended, 42 USC § 6901 *et seq.*)

SARA-Superfund Amendments and Reauthorization Act of 1986 (amendment to CERCLA)

96-98 DEGRAW STREET

BROOKLYN, NEW YORK

Remedial Investigation Report

(Phase II)

CEQR Number: 13BSA085K

Prepared for:

The Other Half LLC (96 Degraw)

And

The Green Witch Project (98 Degraw)

131 Union Street, Ground Floor

Brooklyn, New York 11231

Prepared by:

Laurel Environmental Associates, Ltd.

53 West Hills Road, Suite 1

Huntington Station, New York 11746

September/2013

REMEDIAL INVESTIGATION REPORT

TABLE OF CONTENTS

FIGURES.....	3
LIST OF ACRONYMS	4
CERTIFICATION	5
EXECUTIVE SUMMARY	6
REMEDIAL INVESTIGATION REPORT	10
1.0 SITE BACKGROUND.....	10
1.1 Site Location and Current Usage	10
1.2 Proposed Redevelopment Plan	10
1.3 Description of Surrounding Property.....	11
2.0 SITE HISTORY.....	12
2.1 Past Uses and Ownership.....	12
2.2 Previous Investigations	12
2.3 Site Inspection.....	12
2.4 Areas of Concern	12
3.0 PROJECT MANAGEMENT.....	13
3.1 Project Organization	13
3.2 Health and Safety.....	13
3.3 Materials Management.....	13
4.0 REMEDIAL INVESTIGATION ACTIVITIES.....	14
4.1 Geophysical Investigation.....	14
4.2 Borings and Monitoring Wells.....	14
4.3 Sample Collection and Chemical Analysis.....	15
5.0 ENVIRONMENTAL EVALUATION.....	19
5.1 Geological and Hydrogeological Conditions.....	19
5.2 Soil Chemistry	20
5.3 Groundwater Chemistry.....	21
5.4 Soil Vapor Chemistry	22
5.5 Prior Activity	22
5.6 Impediments to Remedial Action	22

FIGURES

- 1.0 Site Location Map
- 2.0 Topographic Map
- 3.0 Site Sketch and Sample Location Map
- 4.0 Map of Surrounding Property Usage
- 5.0 Redevelopment Plans

TABLES

- 1.0-4.0 Tabulated Soil Sample Analysis
- 5.0-6.0 Tabulated Groundwater Sample Analysis
- 7.0-8.0 Tabulated Soil Vapor Sample Analysis
- 9.0 Construction Details for Soil Vapor Points, Soil Borings, and Monitoring Wells
- 10.0 Groundwater Level Data
- 11.0 Analytical Methods Summary

APPENDICES

- A. *LEA* Phase 1 Report, January 15, 2013
- B. Health and Safety Plan
- C. Soil Boring Geologic Logs
- D. Soil and Groundwater Raw Laboratory Data
- E. Soil Vapor Raw Laboratory Data

LIST OF ACRONYMS

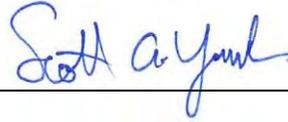
Acronym	Definition
AOC	Area of Concern
CAMP	Community Air Monitoring Plan
COC	Contaminant of Concern
CPP	Citizen Participation Plan
CSM	Conceptual Site Model
DER-10	New York State Department of Environmental Conservation Technical Guide 10
FID	Flame Ionization Detector
GPS	Global Positioning System
HASP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

CERTIFICATION

I, Scott A. Yanuck am a Qualified Environmental Professional, as defined in RCNY § 43-1402(ar). I have primary direct responsibility for implementation of the Remedial Investigation for the 96-98 Degraw Street Site, (NYC VCP Site No. to be supplied on entry into VCP program). I am responsible for the content of this Remedial Investigation Report (RIR), have reviewed its contents and certify that this RIR is accurate to the best of my knowledge and contains all available environmental information and data regarding the property.

Scott A. Yanuck

9-10-13



Qualified Environmental Professional

Date

Signature

EXECUTIVE SUMMARY

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

Site Location and Current Usage

The Site is located at 96-98 Degraw Street in the Columbia Street Water Front District of Brooklyn, New York and is identified as Block 329 and Lot 22 and 23 on the New York City Tax Map. Figure 1.0 shows the Site location. The Site is 3,500-square feet and is bounded by Degraw Street to the north, Industrial and Manufacturing buildings to the south, residential buildings to the east, and residential buildings and parking lots to the west. A map of the site boundary is shown in Figure 4.0. Currently, the Site is used as a parking lot, and maintains no structures.

Summary of Proposed Redevelopment Plan

The proposed future use of the Site will consist of two (2) three-story attached single-family homes, each with a one-car garage, a paved rear patio and grass yard. The Buildings will have a combined footprint of approximately 2,200 square feet. Layout of the proposed site development is presented in Figure 5.0. The current zoning designation is M1-1, for light manufacturing. The proposed use is not consistent with existing zoning for the property, however; the Property Owners are currently seeking a use variance of ZR §42-10 to permit buildings which contain two Group 2 single-family residences (with ground level garages) and bulk variances for floor area, dwelling unit, well height, setback and sky exposure plane.

The entire proposed development redevelopment is residential, with no commercial units. Each of the two units will be constructed slab-on-grade, with no basements, and with footings no deeper than -4.0 feet below grade. The two buildings will be 17 feet and 6 inches wide, will be 63 feet and 7 inches deep, and will not exceed 31 feet and 8 inches in height. The two buildings will have a combined gross floor area of 6,438.1 square feet. The 1,050 square foot rear yard behind both buildings will be partially grass covered and partially paved patio area. The 227.5 square foot area in front of the buildings will be mainly paved for front pathways and driveways for each building, but will also maintain thin sections of grass in between.

Excavation will include the removal of soils to the bottom of the proposed redevelopment, no more than 2 feet below grade beneath the building slab, no more than 5 feet and 10 inches from the building footings, and finally, 2 feet below grade in the entire rear yard and front driveway areas. Groundwater at the site was gauged from temporary groundwater monitoring wells during this Remedial Investigation (Phase II), and was found to be between 8.4 and 9.52 feet below grade, and therefore, should not be encountered during the excavation.

Summary of Past Uses of Site and Areas of Concern

According to Sanborn Fire Insurance Maps, the subject property was used for residential purposes since the construction of the original buildings, sometime prior to 1886. The property has been vacant since between 1988 and 1991.

The AOCs identified for this site include:

1. The subject property was occupied by two 3-story residential buildings from as early as 1886 until between 1988 and 1991, when the buildings were likely demolished. The property has remained vacant since as early as 1991, and has most recently been utilized for vehicle storage. Past usage of the subject site should not present a recognized environmental condition at the subject property. Concern is for historical fill, building debris associated with the former structures, and former heating oil usage and former USTs on Site.

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. Conducted a thorough geophysical survey using ground penetrating radar, to detect any sub-surface anomalies, such as underground storage tanks;
3. Installed five (5) soil borings across the entire project Site, and collected 10 (not including duplicates) soil samples for chemical analysis from the soil borings to evaluate soil quality;
4. Installed three (3) temporary groundwater monitoring wells throughout the Site to establish groundwater flow and collected three (not including duplicates) groundwater samples for chemical analysis to evaluate groundwater quality;

5. Installed two (2) soil vapor probes around Site perimeter, one (1) outdoor ambient air canister, and collected three (3) samples for chemical analysis.

Summary of Environmental Findings

1. Elevation of the property is 14 feet.
2. Depth to groundwater ranges from 8.3 to 9.52 feet at the Site.
3. Groundwater flow is generally from south-southeast to north-northwest beneath the Site.
4. Depth to bedrock is expected to be over 100 feet at the Site.
5. The known stratigraphy in the area of the site is considered to be ~4 feet of urban fill, followed by fine silty sand up to 12 feet and fine to medium grained sands to 32 feet and up to 100 feet of the Upper Glacial Aquifer, which is likely underlain directly by bedrock.
6. Soil/fill samples collected during the RI showed the following:

Several Semi-Volatile Organic Compounds (SVOCs) at concentrations slightly exceeding their respective NYSDEC Track 2 Soil Cleanup Objectives, including; Benzo(a)anthracene (max. of 7.7 ppm), Benzo(a)pyrene (max. of 8.22 ppm), Benzo(b)fluoranthene (max. of 7.44 ppm), Benzo(k)fluoranthene (max of 7.38 ppm), chrysene (max of 8.61 ppm), Dibenzo(a,h)anthracene (max of 0.624 ppm), and Indeno(1,2,3-cd)pyrene (max of 1.26 ppm).

Several metals were detected in the samples collected from the Site at levels above the Track 1 and Track 2 SCOs, including: Barium (max of 951 ppm), Cadmium (max of 5.85 ppm), Chromium (trivalent) (max of 44 ppm), Copper (max of 1,210 ppm), Lead (max of 1,140 ppm), Mercury (max of 1.84 ppm), Nickel (max of 90.2 ppm), and Zinc (max of 2,050 ppm).

Several pesticides were detected in the samples collected from the Site. 4,4'-DDD was detected in four (4) of the samples, at concentrations exceeding the Track 1 SCOs (max of 0.0247 ppm). 4,4'-DDE was detected in four (4) of the samples, at concentrations exceeding the Track 1 SCOs (max of 0.0179 ppm). 4,4'-DDT was detected in nine (9) of the samples, at concentrations exceeding the Track 1 SCOs (max of 0.0711 ppm).

Total Polychlorinated biphenyls (PCBs) were detected in three of the samples, at concentrations exceeding the Track 1 SCOs (max of 0.934 ppm), and in two of the samples at concentrations exceeding the Track 2 SCOs (max of 5.66 ppm).

7. Groundwater samples collected during the RI showed the following:

Groundwater samples were analyzed (metals samples were submitted for analysis of both filtered and unfiltered samples) and various metals were detected at slightly elevated levels; however, none exceeded any respective New York State 6NYCRR Part 703.5 Class GA groundwater standards.

8. Soil vapor samples collected during the RI showed the following:

Soil vapor samples collected during the RI showed a wide variety of VOCs at low concentrations, consisting mainly of BTEX and associated compounds at concentrations generally below 33 $\mu\text{g}/\text{m}^3$. These compounds are most commonly associated with a spill of automotive fuel or heating oil. Chlorinated VOCs were detected at trace levels. PCE was detected at a maximum concentration of 1.9 $\mu\text{g}/\text{m}^3$ in one of three samples. TCE was detected at a maximum concentration of 0.17 $\mu\text{g}/\text{m}^3$ in one of three samples. TCA, and vinyl chloride were not detected in any sample. The absence of MTBE in vapor suggests an older spill. Past uses of the property indicates former automotive fueling activities or other automotive fuel sources. Soil samples (both deep and shallow) contained no elevated levels of VOCs in excess of NYSDEC Part 375 Unrestricted SCOs for unrestricted use. Groundwater also only contained slightly elevated levels of VOCs. Together, these observations suggest a possible offsite source area. While no standards exist for soil vapor, no compounds exceed the Guidance for Evaluating Soil Vapor Intrusion in the State of New York (Final October 2006). Based on the presence of VOCs, the installation of a vapor barrier is warranted at this site.

REMEDIAL INVESTIGATION REPORT

1.0 SITE BACKGROUND

The Other Half LLC and The Green Witch Project LLC have enrolled in the New York City Voluntary Cleanup Program (NYC VCP) to investigate and remediate a 0.08-acre site located at 96-98 Degraw Street in the Columbia Street Water Front district section of Brooklyn, New York. Residential use is proposed for the property. The RI work was performed on August 20, 2013. This RIR summarizes the nature and extent of contamination and provides sufficient information for establishment of remedial action objectives, evaluation of remedial action alternatives, and selection of a remedy that is protective of human health and the environment consistent with the use of the property pursuant to RCNY§ 43-1407(f).

1.1 Site Location and Current Usage

The Site is located at 96-98 Degraw Street in the Columbia Street Water Front District of Brooklyn, New York and is identified as Block 329 and Lot 22 and 23 on the New York City Tax Map. Figure 1.0 shows the Site location. The Site is 3,500-square feet and is bounded by Degraw Street to the north, Industrial and Manufacturing buildings to the south, residential buildings to the east, and residential buildings and parking lots to the west. A map of the site boundary is shown in Figure 4.0. Currently, the Site is used as a parking lot, and maintains no structures.

1.2 Proposed Redevelopment Plan

The proposed future use of the Site will consist of two (2) three-story attached single-family homes, each with a one-car garage, a paved rear patio and grass yard. The Buildings will have a combined footprint of approximately 2,200 square feet. Layout of the proposed site development is presented in Figure 5.0. The current zoning designation is M1-1, for light manufacturing. The proposed use is not consistent with existing zoning for the property, however; the Property Owners are currently seeking a use variance of ZR §42-10 to permit buildings which contain two Group 2 single-family residences (with ground level garages) and bulk variances for floor area, dwelling unit, well height, setback and sky exposure plane.

The entire proposed development redevelopment is residential, with no commercial units. Each of the two units will be constructed slab-on-grade, with no basements, and with footings no deeper than -4.0 feet below grade. The two buildings will be 17 feet and 6 inches wide, will be

63 feet and 7 inches deep, and will not exceed 31 feet and 8 inches in height. The two buildings will have a combined gross floor area of 6,438.1 square feet. The 1,050 square foot rear yard behind both buildings will be partially grass covered and partially paved patio area. The 227.5 square foot area in front of the buildings will be mainly paved for front pathways and driveways for each building, but will also maintain thin sections of grass in between.

Excavation will include the removal of soils to the bottom of the proposed redevelopment, no more than 2 feet below grade beneath the building slab, no more than 5 feet and 10 inches from the building footings, and finally, 2 feet below grade in the entire rear yard and front driveway areas. Groundwater at the site was gauged from temporary groundwater monitoring wells during this Remedial Investigation (Phase II), and was found to be between 8.4 and 9.52 feet below grade, and therefore, should not be encountered during the excavation.

1.3 Description of Surrounding Property

The Subject Property lies within a light manufacturing neighborhood, with a number of two and three story residential homes, vacant undeveloped lots, and one story commercial and light industrial buildings. Immediately adjoining to the north and south of the Property are three-story residential houses, and adjoining to the west is a one-story industrial building. Degraw Street adjoins the Property to the east. According to NYC OER SPEED (Searchable Property Environmental E-Database) website (<https://gis.nyc.gov/moer/speed/>) there are no sensitive receptors within a 500-foot radius of the Subject Site.

Figure 4.0 shows the surrounding land usage.

2.0 SITE HISTORY

2.1 Past Uses and Ownership

According to Sanborn Fire Insurance Maps, the subject property was used for residential purposes since the construction of the original buildings, sometime prior to 1886. The property has been vacant since between 1988 and 1991.

2.2 Previous Investigations

No previous environmental field investigations were made available to *LEA* prior to the work performed as part of this Remedial Investigation.

2.3 Site Inspection

A Phase I Environmental Site Assessment (ESA) was performed by *LEA* on December 17, 2012, prior to the completion of this Remedial Investigation. The ESA concluded that recognized environmental conditions existed in the form of urban fill and construction debris, and possible former underground storage tanks, remaining from when the former structure(s) were demolished.

2.4 Areas of Concern

The AOCs identified for this site include:

2. The subject property was occupied by two 3-story residential buildings from as early as 1886 until between 1988 and 1991, when the buildings were likely demolished. The property has remained vacant since as early as 1991, and has most recently been utilized for vehicle storage. Past usage of the subject site should not present a recognized environmental condition at the subject property. Concern is for historical fill, building debris associated with the former structures, and former heating oil usage and former USTs on Site.

Phase 1 Report is presented in Appendix A. A map showing areas of concern is presented in Figure 3.0.

3.0 PROJECT MANAGEMENT

3.1 Project Organization

The Qualified Environmental Profession (QEP) responsible for preparation of this RIR is Scott A. Yanuck.

3.2 Health and Safety

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

3.3 Materials Management

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

4.0 REMEDIAL INVESTIGATION ACTIVITIES

On behalf of The Other Half LLC, and The Green Witch Project LLC, *Laurel Environmental Associates, Ltd. (LEA)* performed the following scope of work:

1. Conducted a Site inspection to identify AOCs and physical obstructions (i.e. structures, buildings, etc.);
2. Conducted a thorough geophysical survey using ground penetrating radar, to detect any sub-surface anomalies, such as underground storage tanks;
3. Installed five (5) soil borings across the entire project Site, and collected 10 (not including duplicates) soil samples for chemical analysis from the soil borings to evaluate soil quality;
4. Installed three (3) temporary groundwater monitoring wells throughout the Site to establish groundwater flow and collected three (not including duplicates) groundwater samples for chemical analysis to evaluate groundwater quality;
5. Installed two (2) soil vapor probes around Site perimeter, one (1) outdoor ambient air canister, and collected three (3) samples for chemical analysis.

4.1 Geophysical Investigation

On August 20, 2013, *LEA* Environmental Scientist Christopher J. Connolly conducted a site-wide geophysical survey of the Property, using ground penetrating radar, as well as clearing and marking all approved soil boring locations. The survey detected no sub-surface anomalies, indicative of USTs or utility lines.

4.2 Borings and Monitoring Wells

Drilling and Soil Logging

On March 4, 2011, soil borings were completed to 10 feet below grade at five locations, using a track-mounted Geoprobe 6610 DT drill rig and the dual tube sampling system. Samples were collected utilizing a 2.25" diameter 5' dual tube sampler with acetate liner. The collected samples were cut open, photographed, field-screened by visual, olfactory and calibrated PID, and logged prior to placing in sample containers. PID readings indicated no presence of VOCs in any of the collected samples. Soils from 0-5' were comprised of some gravel, and brown and

grey/brown clay-like soils. Soils from 5-10' were comprised of dark brown and light brown clay-like soils, with moist brown soils in the 8-10' section. Visual and olfactory field screening found no evidence of contamination, and 0.0ppm was registered on the PID for all samples.

Boring logs were prepared by Christopher J. Connolly, an environmental scientist, and are attached in Appendix C. A map showing the location of soil borings and monitor wells is shown in Figure 3.0.

Groundwater Monitoring Well Construction

Three temporary PVC screen monitoring wells were installed at the three locations designated GW-1, GW-2, and GW-3. A groundwater sample was taken from each location using an inertial pump consisting of a check valve and ball. The screen interval was set at 8-12 feet below grade.

Monitoring well locations are shown in Figure 3.0.

Survey

Soil borings and monitoring wells are identified on a site sketch (Figure 3.0), utilizing an aerial photograph, overlaid with a technical diagram of the proposed redevelopment plans.

Water Level Measurement

Groundwater levels were measured utilizing a Solinst model 102 Water Level Meter. Measurements were taken from the north point of each monitoring well. Relative well casing elevations were surveyed using a Wild Heerbrugg level.

Water level data is included in Table 10.0.

4.3 Sample Collection and Chemical Analysis

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

sufficient basis for evaluation of remedial action alternatives, establishment of a qualitative human health exposure assessment, and selection of a final remedy.

Soil Sampling

Soil sampling using the GeoProbe Dual Tube DT22 sampling system provides a high level of sample quality. The outer rods provide a casing so that the deeper sample can be collected without being mixed with material that could fall into the borehole from above. A new liner is utilized for each 5 foot sampling interval. The rods and cutting shoes are decontaminated between boreholes using Alconox and rinsed with fresh water and then distilled water. One field blank sample was collected, as well as one duplicate sample, as part of the required QA/QC protocol.

Eleven (11) soil samples were collected for chemical analysis during this RI. Data on soil sample collection for chemical analyses, including dates of collection and sample depths, is reported in Table 9.0. Figure 3.0 shows the location of samples collected in this investigation. Laboratories and analytical methods are shown below.

Groundwater Sampling

Disposable polyethylene tubing was used in conjunction with an inertial pump to collect the groundwater sample, so no decontamination was necessary. Since the well was a pre-pack well which was installed and developed the same day, no additional purging was necessary. A groundwater sample was also collected from an existing permanent PVC monitoring well via disposable polyethylene tubing and an inertial pump. Approximately three well volumes were purged prior to the sampling of this well to ensure a true sample free from any excessive sediment. A duplicate sample was collected as part of the required QA/QC protocol.

Four (4) groundwater samples were collected for chemical analysis during this RI. Groundwater sample collection data is reported in Table 9.0. Figure 3.0 shows the location of groundwater sampling. Laboratories and analytical methods are shown below.

Soil Vapor Sampling

A GeoProbe 6610 was utilized to set soil vapor points at four feet below grade, a depth just below the base of the proposed building slab. Once the sampling points were set in glass bead and sealed with bentonite above, a helium tracer gas was applied using the recommended bucket apparatus and a helium detector was used to confirm a sufficient seal at the surface. A trip blank summa canister was submitted as part of the required QA/QC protocol.

Two (2) soil vapor probes were installed, along with a single indoor ambient air sample, and three soil vapor samples were collected for chemical analysis during this RI. Soil vapor sampling locations are shown in Figure 3.0. Soil vapor sample collection data is reported in Table 9.0. Methodologies used for soil vapor assessment conform to the *NYS DOH Final Guidance on Soil Vapor Intrusion, October 2006*.

Chemical Analysis

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

Factor	Description
Quality Assurance Officer	The chemical analytical quality assurance is directed by Brian McCabe
Chemical Analytical Laboratory	Chemical analytical laboratory(s) used in the RI is NYS ELAP certified and was York Analytical Laboratories, Inc., (NYS ELAP License #10854)
Chemical Analytical Methods	Soil analytical methods: <ul style="list-style-type: none">• TAL Metals by EPA Method 6010C (rev. 2007);• VOCs by EPA Method 8260C (rev. 2006);• SVOCs by EPA Method 8270D (rev. 2007);• Pesticides by EPA Method 8081B (rev. 2000);• PCBs by EPA Method 8082A (rev. 2000);

	<p>Groundwater analytical methods:</p> <ul style="list-style-type: none">• TAL Metals by EPA Method 6010C (rev. 2007);• VOCs by EPA Method 8260C (rev. 2006);• SVOCs by EPA Method 8270D (rev. 2007);• Pesticides by EPA Method 8081B (rev. 2000);• PCBs by EPA Method 8082A (rev. 2000); <p>Soil vapor analytical methods:</p> <ul style="list-style-type: none">• VOCs by TO-15 VOC parameters.
--	---

Results of Chemical Analyses

Laboratory data for soil, groundwater and soil vapor are summarized in Table 1.0, 2.0, and 3.0, respectively. Laboratory data deliverables for all samples evaluated in this RIR are provided in digital form in Appendices D and E.

5.0 ENVIRONMENTAL EVALUATION

5.1 Geological and Hydrogeological Conditions

Kings County is located in the Atlantic Coastal Plain physiographic province that is characterized by low hills of unconsolidated sands, gravel, and silt. According to Franke (1972), regionally, the near-surface sediments consist of the Upper Glacial deposits that are characterized by southward sloping deposits of sand, gravel, and silt. The Upper Glacial deposits have a maximum thickness of 600 feet. They are underlain by the Magothy, Raritan, and Lloyd Formations. The Gardeners clay and the Jameco gravel separate the Upper Glacial deposits and the Magothy Formation along the southwest portion of Long Island. Due to less surficial contamination and higher well yields, the Magothy aquifer is the main supply for drinking and industrial water. Consequently, the USEPA has identified it as a Sole Source Aquifer. The Site is in the Upper Glacial aquifer. Pump test data suggests hydraulic conductivity between the Magothy and Upper Glacial aquifers. However, discontinuous clay lenses may prevent this interaction in some areas.

According to the United States Department of Agriculture Soil Survey Classification and Nomenclature System, this soil would likely be referred to as Urban Land, because the original composition and structure of the soil has been significantly altered by urbanization and development activities. Based on groundwater contour maps obtained from the United States Geological Survey, regional ground water flows in a southerly direction.

Stratigraphy

The site soils consist of approximately 5-6 feet of historical fill material mixed with soils and poorly graded sands, cinders and brick dust, followed by a mixture of muddy soils and sands beneath the initial fill layer.

Hydrogeology

According to groundwater contour maps provided by the NYSDEC, Topographic Quadrangles provided by the USGS, and previous work performed by *LEA* in the area, the Subject Property has an elevation of approximately 14 feet above mean sea level. Regional groundwater was estimated to be 10 feet below grade at the Subject Property and flowing in a westerly direction, towards the Upper New York Bay. A table of water level data for all monitor wells is included in Table 10.0. The average depth to groundwater is 9.03 feet below grade, and the range in depth is 8.3 feet to 9.6 feet below grade. A map of groundwater level elevations with

groundwater contours and inferred flow lines is shown in Figure 3.0. Groundwater flow as gauged from onsite wells is from south-southeast to north-northwest.

5.2 Soil Chemistry

The results of chemical testing of soil and fill materials at the Site are as follows:

Soil/fill samples collected during the RI showed slightly elevated levels of a number of Volatile Organic Compounds (VOCs), none of which exceeded their respective NYSDEC Track 1 Soil Cleanup Objectives.

No chlorinated solvents (PCE, TCE, TCA or Carbon Tetrachloride) were detected in the samples collected from the Site.

Samples collected from 0-2 feet below grade showed elevated levels of several Semi-Volatile Organic Compounds (SVOCs) at concentrations slightly exceeding their respective NYSDEC Track 2 Soil Cleanup Objectives, including; Benzo(a)anthracene (max. of 7.7 ppm), Benzo(a)pyrene (max. of 8.22 ppm), Benzo(b)fluoranthene (max. of 7.44 ppm), Benzo(k)fluoranthene (max of 7.38 ppm), chrysene (max of 8.61 ppm), Dibenzo(a,h)anthracene (max of 0.624 ppm), and Indeno(1,2,3-cd)pyrene (max of 1.26 ppm).

Several metals were detected in the samples collected from the Site. Barium was detected in seven of the eleven samples collected, all at concentrations above the Track 2 Restricted Residential SCO (max. of 951 ppm). Cadmium was detected in SB-2 (0-2') and SB-3 (0-2') at concentrations exceeding the Track 2 SCO (5.85 ppm). Elevated levels of Chromium, trivalent, were detected in all eleven samples; nine (9) at concentrations exceeding the Track 1 SCOs (max. of 26.7 ppm), and two (2) at concentrations exceeding the Track 2 SCOs (max of 44 ppm). Copper was detected in SB-3 (4-6') and SB-4 (0-2') at concentrations above the NYSDEC Track 1 SCOs (max of 97.4 ppm), and in SB-2 (0-2'), SB-3 (0-2') and DUP (4-6') at concentrations exceeding the Track 2 SCOs (max of 1,210 ppm). Lead was detected in SB-1 (0-2') at concentrations exceeding the Track 1 SCOs, and in seven (7) of the samples at concentrations exceeding the Track 2 SCOs (max of 1,140 ppm). Mercury was detected in six (6) samples exceeding the Track 1 SCOs (max of 0.519 ppm), and in two samples at concentrations exceeding the Track 2 SCOs (max of 1.84 ppm). Nickel was detected in three (3) of the samples,

at concentrations exceeding the Track 1 SCOs (max of 90.2 ppm). Zinc was detected in nine (9) samples, at concentrations exceeding the Track 1 SCOs (max of 2,050 ppm).

Several pesticides were detected in the samples collected from the Site. 4,4'-DDD was detected in four (4) of the samples, at concentrations exceeding the Track 1 SCOs (max of 0.0247 ppm). 4,4'-DDE was detected in four (4) of the samples, at concentrations exceeding the Track 1 SCOs (max of 0.0179 ppm). 4,4'-DDT was detected in nine (9) of the samples, at concentrations exceeding the Track 1 SCOs (max of 0.0711 ppm).

Total Polychlorinated biphenyls (PCBs) were detected in three of the samples, at concentrations exceeding the Track 1 SCOs (max of 0.934 ppm), and in two of the samples at concentrations exceeding the Track 2 SCOs (max of 5.66 ppm).

Data collected during the RI is sufficient to delineate the vertical and horizontal distribution of contaminants in soil/fill at the Site. A summary table of data for chemical analyses performed on soil samples is included in Tables 1.0, 2.0, 3.0, and 4.0, and Figure 3.0 shows the location of the aforementioned soil samples.

5.3 Groundwater Chemistry

The results of chemical testing of groundwater at the Site are as follows:

No VOCs, SVOCs, Pesticides or PCBs were detected in any of the collected groundwater samples.

Groundwater samples were analyzed (metals samples were submitted for analysis of both filtered and unfiltered samples) and various metals were detected at slightly elevated levels; however, none exceeded any respective New York State 6NYCRR Part 703.5 Class GA groundwater standards.

Data collected during the RI is sufficient to delineate the distribution of contaminants in groundwater at the Site. Summary tables of data for chemical analyses performed on groundwater samples are included in Tables 5.0 and 6.0. Exceedance of applicable groundwater standards are shown.

Figure 3.0 shows the locations of the aforementioned groundwater samples.

5.4 Soil Vapor Chemistry

Soil vapor samples collected during the RI showed a wide variety of VOCs at low concentrations, consisting mainly of BTEX and associated compounds at concentrations generally below 33 $\mu\text{g}/\text{m}^3$. These compounds are most commonly associated with a spill of automotive fuel or heating oil. Chlorinated VOCs were detected at trace levels. PCE was detected at a maximum concentration of 1.9 $\mu\text{g}/\text{m}^3$ in one of three samples. TCE was detected at a maximum concentration of 0.17 $\mu\text{g}/\text{m}^3$ in one of three samples. TCA, and vinyl chloride were not detected in any sample. The absence of MTBE in vapor suggests an older spill. Past uses of the property indicates former automotive fueling activities or other automotive fuel sources. Soil samples (both deep and shallow) contained no elevated levels of VOCs in excess of NYSDEC Part 375 Unrestricted SCOs for unrestricted use. Groundwater also only contained slightly elevated levels of VOCs. Together, these observations suggest a possible offsite source area. While no standards exist for soil vapor, no compounds exceed the Guidance for Evaluating Soil Vapor Intrusion in the State of New York (Final October 2006). Based on the presence of VOCs the installation of a vapor barrier is warranted at this site.

Data collected during the RI is sufficient to delineate the distribution of contaminants in soil vapor at the Site. A summary of data for chemical analyses performed on soil vapor samples is included in Tables 7.0 and 8.0.

Figure 3.0 shows the location of the soil vapor samples.

5.5 Prior Activity

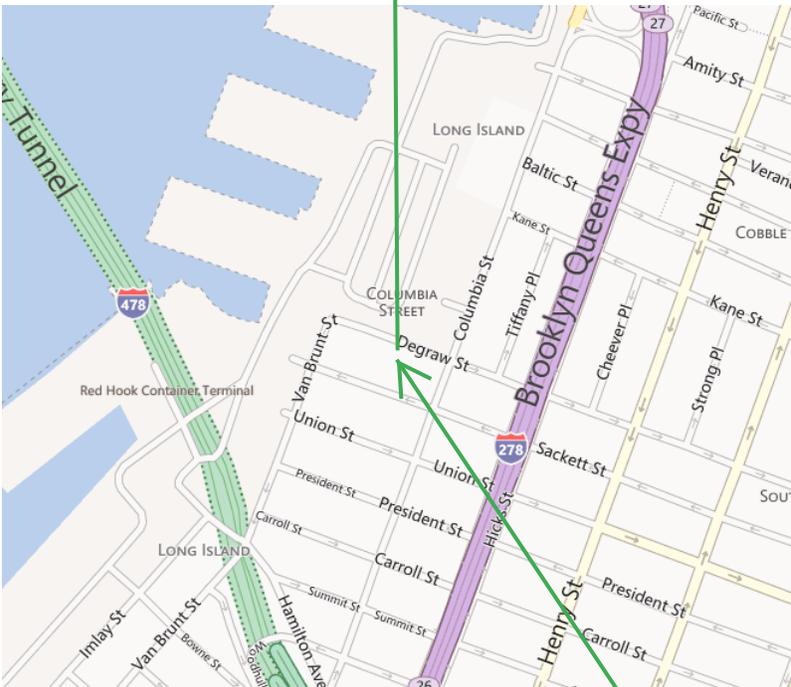
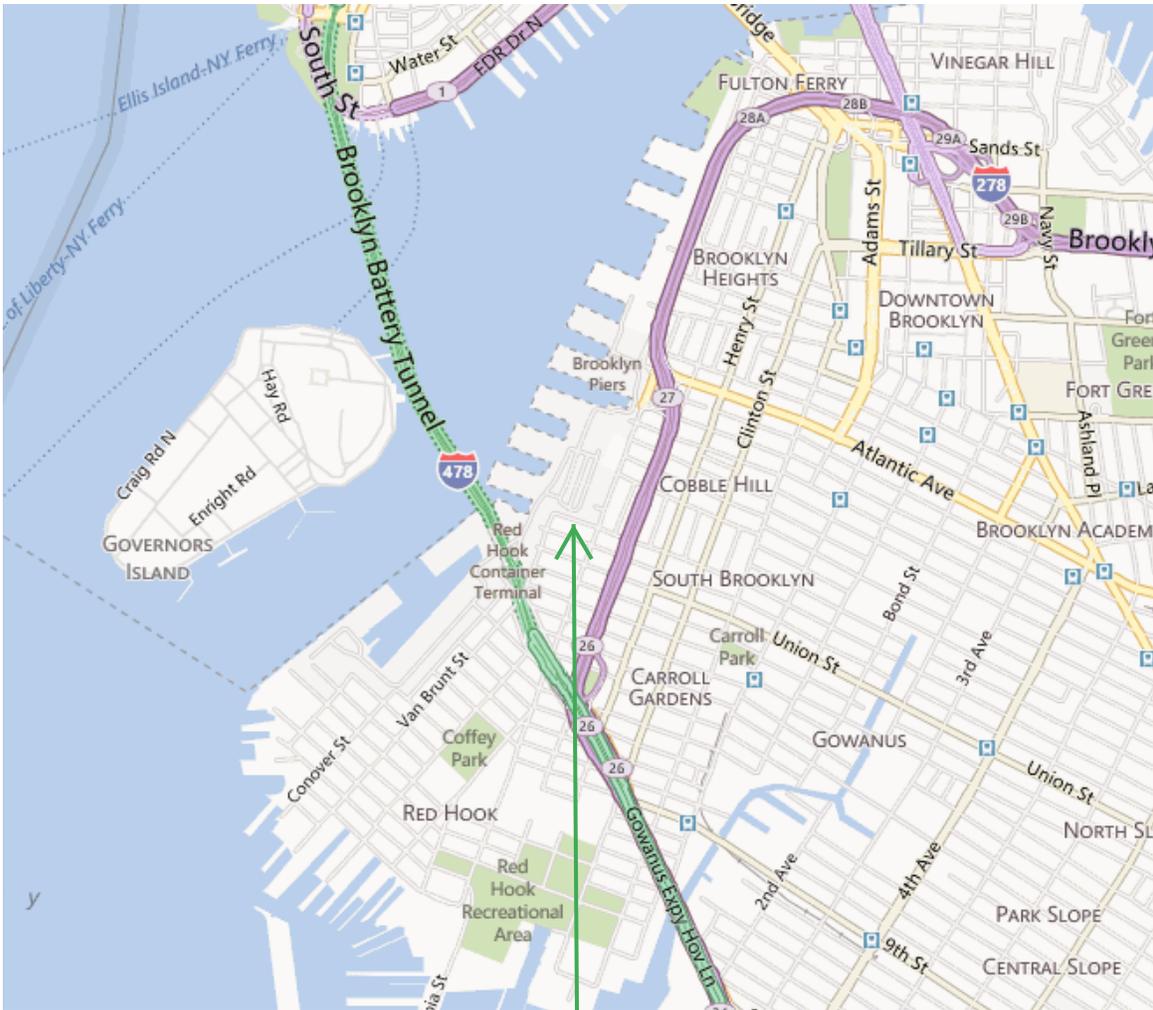
Based on an evaluation of the data and information from the RIR, disposal of significant amounts of hazardous waste is not suspected at this site.

5.6 Impediments to Remedial Action

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

Site-Specific Standards, Criteria and Guidance

- 6 NYCRR Part 371 - Identification and Listing of Hazardous Wastes
- 6 NYCRR Part 375 - Inactive Hazardous Waste Disposal Sites
- 6 NYCRR Parts 700-706 - Water Quality Standards (June 1998)
- CP-51/Soil Cleanup Guidance
- TOGS 1.1.1 - Ambient Water Quality Standards & Guidance Values and Groundwater Effluent Limitations
- Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites (October 1994)
- Technical Guidance for Screening Contaminated Sediments (January 1999)
- NYSDOH Indoor Air Sampling & Analysis Guidance (August 8, 2001 or subsequent update)
- NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York (draft October 2004 or subsequent final draft)
- DER Interim Strategy for Groundwater Remediation at Contaminated Sites in New York State
- 6 NYCRR Part 612 - Registration of Petroleum Storage Facilities (February 1992)
- 6 NYCRR Part 613 - Handling and Storage of Petroleum (February 1992)
- 6 NYCRR Part 614 - Standards for New and Substantially Modified Petroleum Storage Tanks (February 1992)
- 40 CFR Part 280 - Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks



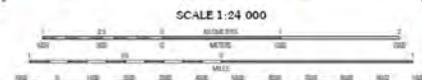
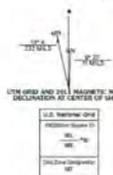
LEA, 53 West Hills Road, Suite 1, Huntington Station, New York 11746

Figure 1.0 Site Location
96-98 Degraw Street
Brooklyn, New York



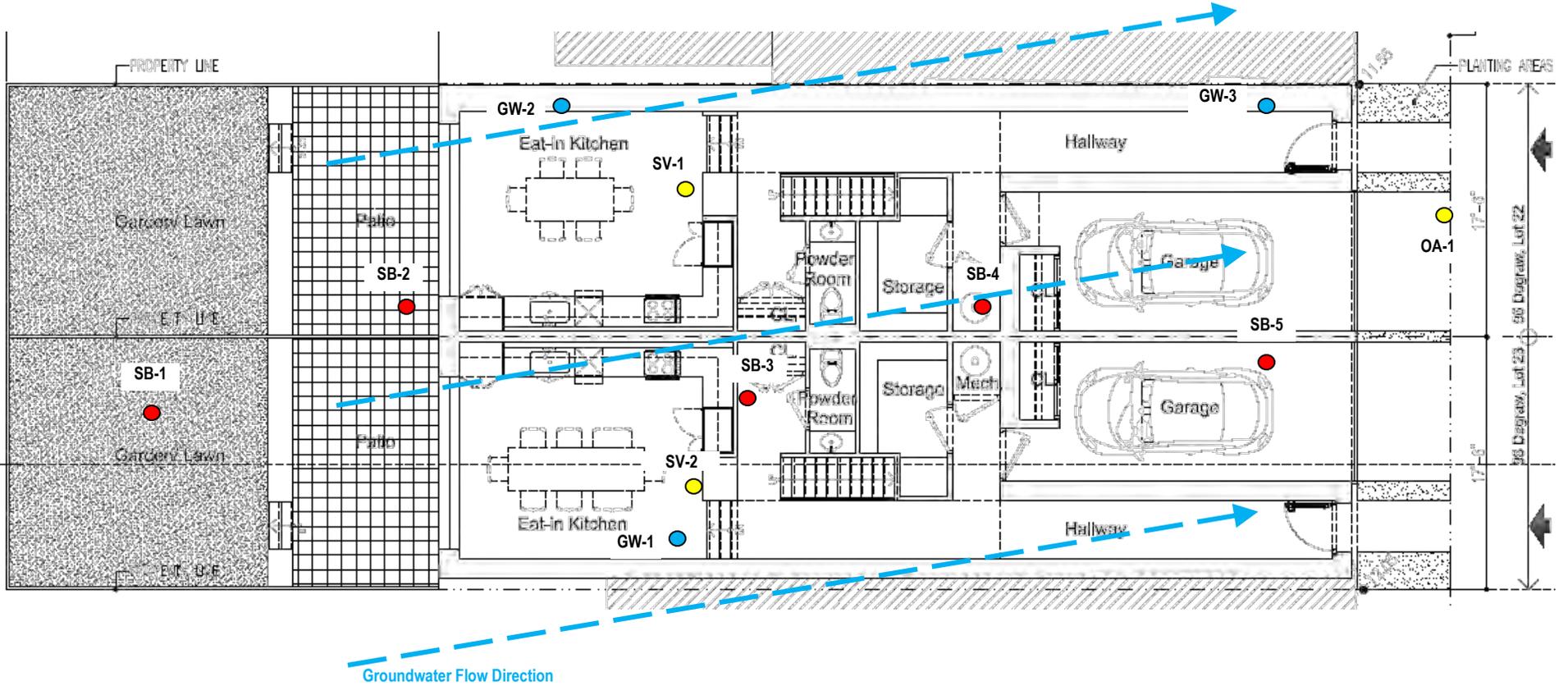
Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84): Projection and
1,000-meter grid. Universal Transverse Mercator, Zone 18T
30-degree wide. New Jersey Coordinate System of 1985
New York Coordinate System of 1983 (Ring-oid zone)

Imagery: State of New Jersey, January 2007 - January 2009
Other imagery provided by DE, NY, PA
©2006-2010 Tele Atlas
©2010 CNL
©2010 National Hydrographic Dataset, 2005
©2010 National Elevation Dataset, 2001
©2010 Boundaries - Census, ©2010 USGS, 1972 - 2010



This map was produced to conform with section 9.3.8
of the USGS US Topo Product Standard.
A metadata file associated with this product is located within the file.

Figure 2.0 Current Topographic Map
96-98 Degraw Street
Brooklyn, New York



Groundwater Flow Direction



53 West Hills Road, Suite 1
 Huntington Station, NY 11746
 PHONE: 631-673-0612
 FAX: 631-427-5323

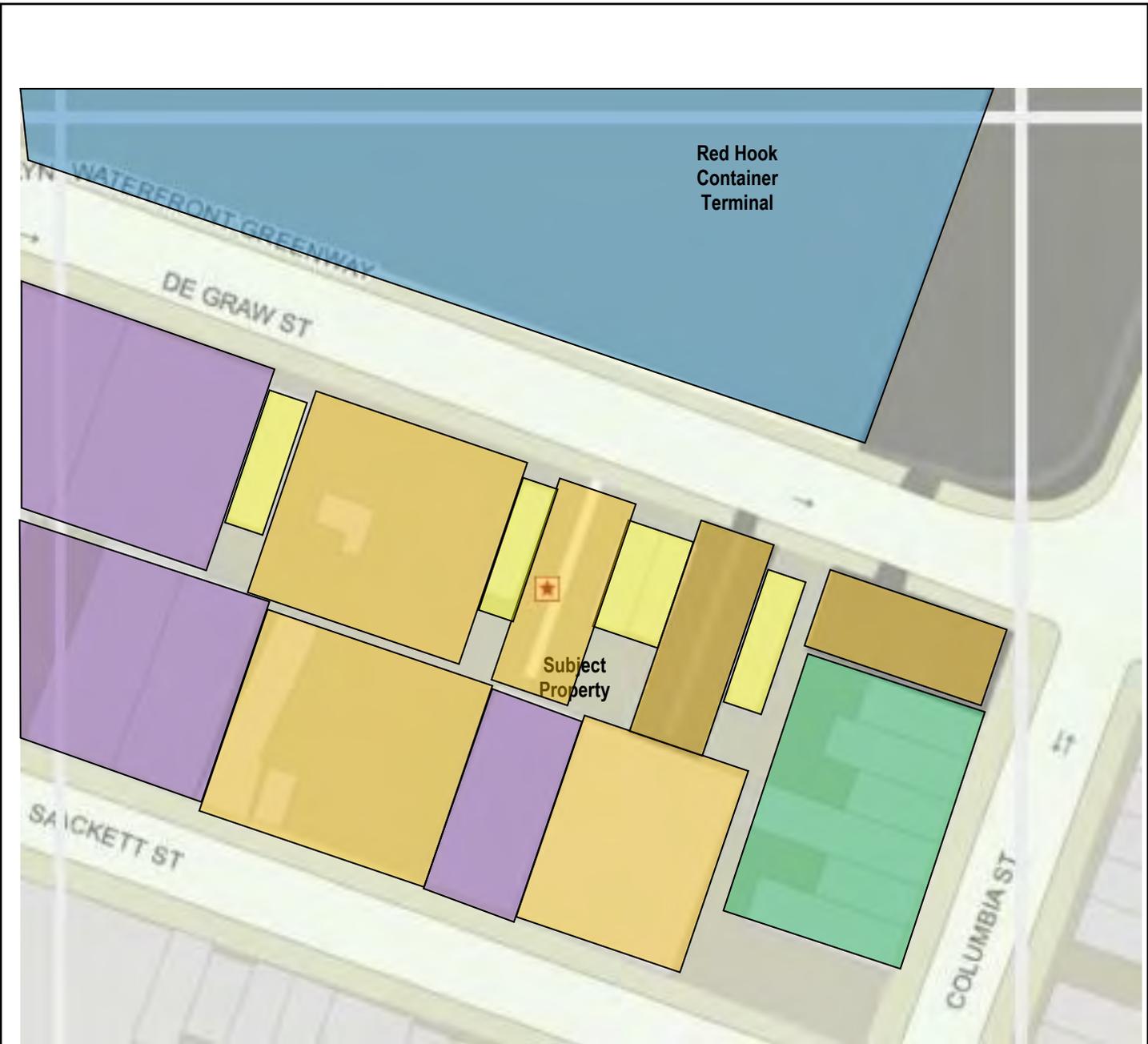
FIGURE 3.0
 SITE SKETCH AND SAMPLE
 LOCATION MAP
 96-98 DEGRAW STREET
 BROOKLYN, NEW YORK

PROJECT # : 13-381
 DRAWING DATE: 9-9-2012
 DRAWN BY: CJC
 CHECKED BY: SAY

- Soil Borings
- Groundwater
- Soil Vapor/Outdoor Air



LEA makes no guarantees as to the accuracy of this drawing and it should only be used for informational purposes.

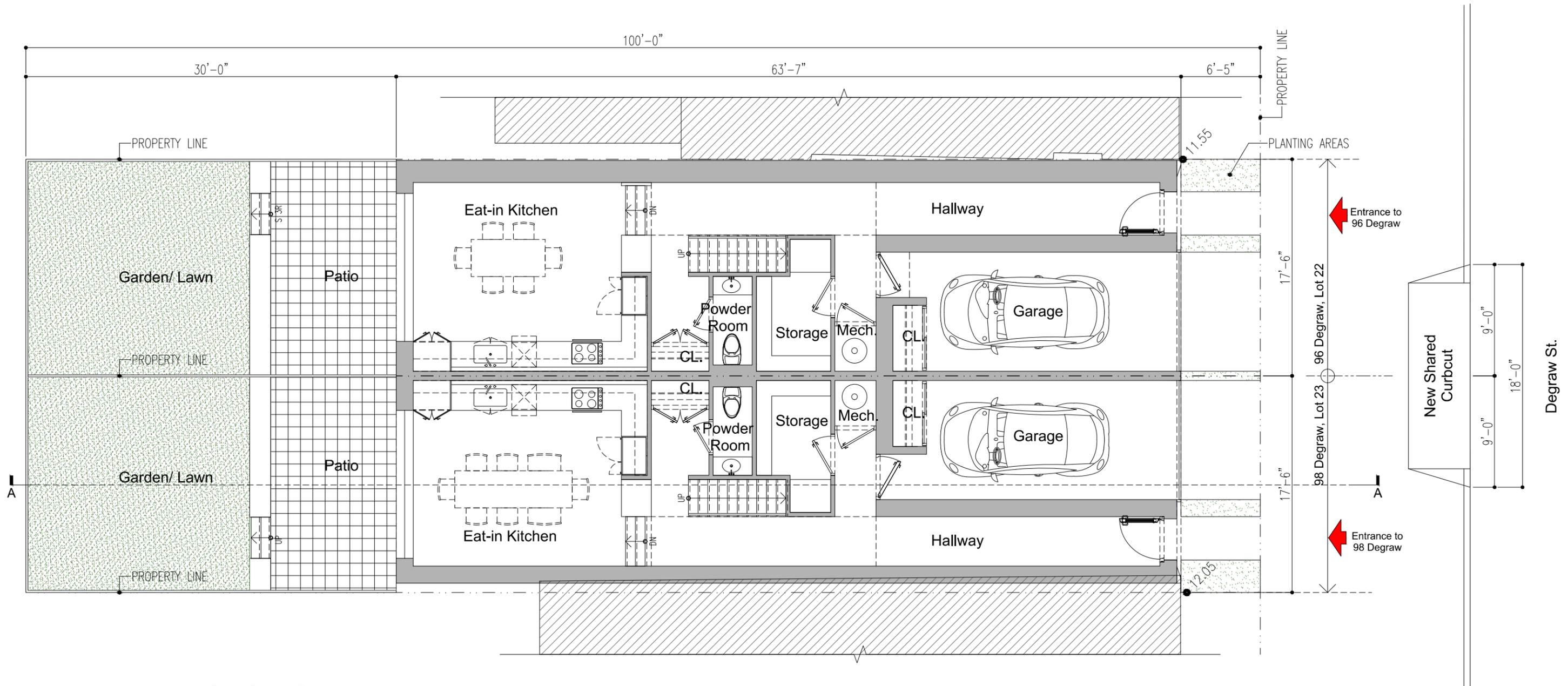



53 West Hills Road, Suite 1
 Huntington Station, NY 11746
 PHONE: 631-673-0612
 FAX: 631-427-5323
 WWW.LAURELNV.COM

FIGURE 4.0
 MAP OF SURROUNDING
 PROPERTY USAGE
 96-98 DEGRAW STREET
 BROOKLYN, NEW YORK

PROJECT #: 13-381
 DRAWING DATE: 9-9-13
 DRAWN BY: CJC
 CHECKED BY: SAY

N ↑
 NOT TO SCALE
 LEA makes no guarantees as to the accuracy of this drawing and it should only be used for informational purposes.



First Floor Plan
1/8" = 1'-0"

96 Degrav st.	98 Degrav st.
1FL Gross Area: 1,107 sf	1FL Gross Area: 1,065 sf
Lot 22, Block 329 BSA Calendar: 13-13 BZ	Lot 23, Block 329 BSA Calendar: 13-14 BZ

"All partitions and exits shall be as approved by DOB."

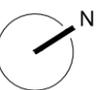


TABLE 1.0
Tabulated VOC Analytical Results

Analyte/Location	SB-1	SB-1	SB-2	SB-2	SB-3	SB-3	SB-4	SB-4	SB-5	SB-5	DUP	Unrestricted	Residential	Restricted Residential	Commerical
Depth	0-2'	4-6'	0-2'	4-6'	0-2'	4-6'	0-2'	4-6'	0-2'	4-6'	4-6'	Use SCO	Use SCO	Use SCO	Use SCO
Analyte															
Acetone	32	<5.8	63	81	8.4	25	38	<6.1	46	19	34	50	100,000	100,000	500,000
Methylene chloride	<5.5	<5.8	<5.7	<6.2	<6	<5.8	<5.6	<6.1	<5.9	<5.8	6.8	50	51,000	100,000	500,000

All concentrations are in parts per billion (ppb)

Analytes not tabulated are below laboratory quantitative levels (BQL)

Bold and Shaded= Concentration above Unrestricted Use Soil Cleanup Objective (SCO)

NA =Not Applicable or Not Analyzed

TABLE 2.0
Tabulated SVOC Analytical Results

Analyte/Location	SB-1	SB-1	SB-2	SB-2	SB-3	SB-3	SB-4	SB-4	SB-5	SB-5	DUP	Unrestricted	Residential	Restricted Residential	Commerical
Depth	0-2'	4-6'	0-2'	4-6'	0-2'	4-6'	0-2'	4-6'	0-2'	4-6'	4-6'	Use SCO	Use SCO	Use SCO	Use SCO
Analyte															
Acenaphthene	<230	<48.8	<239	<259	<2,500	<243	<237	<51.4	691	<249	<246	20,000	100,000	100,000	500,000
Acenaphthylene	<230	<48.8	<239	<259	<2,500	<243	<237	<51.4	419	<249	<246	100,000	100,000	100,000	500,000
Anthracene	<230	<48.8	306	822	10,900	1,080	1,960	<51.4	2,610	<249	481	100,000	100,000	100,000	500,000
Benzo (a) anthracene	<230	<48.8	1,040	275	7,700	720	1,290	<51.4	5,650	675	395	1,000	1,000	1,000	5,600
Benzo (a) pyrene	<230	<48.8	1,170	<259	8,220	720	1,220	<51.4	5,430	735	442	1,000	1,000	1,000	1,000
Benzo (b) fluoranthene	<230	<48.8	1,130	<259	7,440	747	1,230	<51.4	6,120	600	416	1,000	1,000	1,000	5,600
Benzo (g,h,i) perylene	<460	<97.5	<478	<518	<5,000	<485	<474	<103	1,450	<249	<493	100,000	100,000	100,000	500,000
Benzo (k) fluoranthene	<230	<48.8	1,180	<259	7,380	655	1,160	<51.4	4,380	745	411	800	1,000	3,900	56,000
Benzyl butyl phthalate	<230	<48.8	<239	<259	23,200	<243	<237	<51.4	31,100	4,270	<246	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	<230	<48.8	516	<259	41,000	2,200	<237	<51.4	1,410	3,760	19,500	NA	NA	NA	NA
Carbazole	<230	<48.8	<239	<259	<2,500	<243	<237	<51.4	1,180	<249	<246	NA	NA	NA	NA
Chrysene	<230	<48.8	1,170	319	8,610	836	1,430	<51.4	5,930	764	471	1,000	1,000	3,900	56,000
Di-n-octyl phthalate	<230	<48.8	298	<259	<2,500	<243	<237	<51.4	371	721	432	NA	NA	NA	NA
Dibenzo (a,h) anthracene	<230	<48.8	<239	<259	<2,500	<243	<237	<51.4	624	<249	<246	330	330	330	560
Dibenzofuran	<230	<48.8	<239	<259	<2,500	<243	<237	<51.4	602	<249	<246	NA	NA	NA	NA
Fluoranthene	290	<48.8	2,410	516	17,400	1,700	2,970	53.4	6,370	1,200	819	100,000	100,000	100,000	500,000
Fluorene	<230	<48.8	<239	<259	<2,500	<243	<237	<51.4	1,140	<249	<246	30,000	100,000	100,000	500,000
Indeno (1,2,3-cd) pyrene	<230	<48.8	321	<259	<2,500	<243	312	<51.4	1,260	<249	<246	500	500	500	5,600
2-Methylnaphthalene	<230	<48.8	<239	<259	<2,500	<243	<237	<51.4	358	<249	<246	NA	NA	NA	NA
Naphthalene (8270)	<230	<48.8	<239	<259	<2,500	<243	<237	<51.4	986	<249	<246	12,000	100,000	100,000	500,000
Phenanthrene	<230	<48.8	1,330	847	<2,500	1,120	2,010	<51.4	7,770	464	495	100,000	100,000	100,000	500,000
Pyrene	254	<48.8	2,200	592	15,800	1,550	2,780	<51.4	8,050	1,250	819	100,000	100,000	100,000	500,000

All concentrations are in parts per billion (ppb)

Analytes not tabulated are below laboratory quantitative levels (BQL)

Bold and Shaded= Concentration above Unrestricted Use Soil Cleanup Objective (SCO)

NA =Not Applicable or Not Analyzed

TABLE 3.0
Tabulated Metals Analytical Results

Location	SB-1	SB-1	SB-2	SB-2	SB-3	SB-3	SB-4	SB-4	SB-5	SB-5	DUP	Unrestricted	Residential	Restricted Residential	Commerical	
Depth	0-2'	4-6'	0-2'	4-6'	0-2'	4-6'	0-2'	4-6'	0-2'	4-6'	4-6'	Use SCO	Use SCO	Use SCO	Use SCO	
Analyte																
Aluminium	6,580	4,570	5,970	6,350	7,430	4,710	7,910	4,850	6,210	5,110	6,670	NA	NA	NA	NA	
Atimony	1.15	<0.580	3.88	0.958	13.4	1.16	1.94	<0.612	0.736	0.612	2.64	NA	NA	NA	NA	
Arsenic	6.45	3.24	7.69	3.92	9.07	4.16	6.64	4.18	9.39	2.89	5.49	13	16	16	16	
Barium	84.6	30.8	469	951	847	232	589	248	668	526	477	350	350	400	400	
Calcium	30,300	2,050	35,100	28,700	35,900	15,700	38,500	11,300	61,300	16,500	34,200	NA	NA	NA	NA	
Cadmium	<0.329	<0.348	2.76	0.381	5.85	0.504	0.415	<0.367	0.455	<0.348	2.1	2.5	2.5	4.3	9.3	
Chromium, trivalente	17.1	11.3	26.7	37.5	44	12.3	21.8	11.4	14.3	12.7	18.5	10	36	180	1,500	
Cobalt	5.71	5.17	8.22	5.85	14.3	5.02	6.53	5.08	4.39	3.76	5.69	NA	NA	NA	NA	
Copper	22	10.4	440	23.2	1,210	97.4	90.3	14.4	21.5	24.8	327	50	270	270	270	
Iron	13,700	10,900	40,100	15,100	51,400	19,900	14,300	18,500	11,800	10,200	18,500	NA	NA	NA	NA	
Lead	70.5	5.74	544	549	862	268	692	55.9	1,140	412	484	63	400	400	1,000	
Magnesium	4,780	2,150	4,570	5,010	3,640	2,280	4,430	3,160	4,990	2,880	3,700	NA	NA	NA	NA	
Manganese	222	266	311	263	441	178	250	193	226	141	268	1,600	2,000	2,000	10,000	
Mercury	0.0844	0.0128	0.973	0.234	1.84	0.332	0.454	0.0905	0.481	0.519	0.365	0.18	0.81	0.81	2.8	
Nickel	15.1	14.2	40.7	30.6	90.2	19.4	20.8	15.5	15.5	12.6	32	30	140	310	310	
Potassium	1,260	1,250	939	1,420	1,150	954	1,940	1,440	1,280	1,020	1,290	NA	NA	NA	NA	
Selenium	1.87	1.36	2.06	1.47	2.32	2.14	1.31	1.79	<1.19	<1.16	1.55	4	36	180	1,500	
Sodium	391	357	637	346	922	443	510	449	579	381	782	NA	NA	NA	NA	
Vanadium	17.6	16.3	18.6	19.2	22.9	14.5	20	15.8	21.8	14.7	16.7	NA	NA	NA	NA	
Zinc	114	26.7	1,100	446	2,050	921	369	92.7	465	257	851	109	2,200	10,000	10,000	

All concentrations are in parts per million (ppm)

Analytes not tabulated are below laboratory quantitative levels (BQL)

Bold and Shaded= Concentration above Unrestricted Use Soil Cleanup Objective (SCO)

NA =Not Applicable or Not Analyzed

TABLE 4.0
Tabulated Organic Pesticide and PCB Analytical Results

Location	SB-1	SB-1	SB-2	SB-2	SB-3	SB-3	SB-4	SB-4	SB-5	SB-5	DUP	Unrestricted	Residential	Restricted Residential	Commerical
Depth	0-2'	4-6'	0-2'	4-6'	0-2'	4-6'	0-2'	4-6'	0-2'	4-6'	4-6'	Use SCO	Use SCO	Use SCO	Use SCO
Analyte															
Aroclor 1260	<27.9	<29.6	98.3	<31.5	<304	<29.5	<28.8	<31.2	<2.93	<29.6	<29.9	NA	NA	NA	NA
Aroclor 1254	<27.9	<29.6	<29	<31.5	1,690	434	129	<31.2	<2.93	<29.6	<29.9	NA	NA	NA	NA
Aroclor 1248	<27.9	<29.6	835	<31.5	3,970	693	267	<31.2	<2.93	<29.6	388	NA	NA	NA	NA
Chlordane	<10.8	<11.5	<11.3	<12.2	<11.8	<11.4	<11.2	<12.1	20.7	<11.5	46.9	94	19	97	680
4,4'- DDD	<2.71	<2.87	24.7	23	<2.95	13	<2.8	<3.03	<2.93	<2.87	11.4	3.3	72	360	3,000
4,4'-DDE	11.8	<2.87	14.7	<3.05	<2.95	17.9	<2.8	<3.03	<2.93	<2.87	4.96	3.3	91	4,200	24,000
4,4'-DDT	12.3	<2.87	38	19.3	<2.95	71.1	26.8	11.7	27	8.62	55.8	3.3	100,000	100,000	500,000
Polychlorinated biphenyls	<11.2	<11.8	934	<12.6	5,660	1,130	395	<12.5	<30.2	<11.8	388	100	1,000	1,000	1,000

All concentrations are in parts per billion (ppb)

Analytes not tabulated are below laboratory quantitative levels (BQL)

Bold and Shaded= Concentration above Unrestricted Use Soil Cleanup Objective (SCO)

NA =Not Applicable or Not Analyzed

TABLE 5.0
Tabulated Heavy Metals Analytical Results

Location	GW-1	GW-2	GW-3	DUP	NYSDEC
Gradient	Up	Down	Down	Down	GW Standards
Depth	9' 2"	8' 4"	9' 5.2"		
Analyte	Total	Total	Total	Total	Total
Arsenic	0.004	<0.004	<0.004	<0.004	50
Barium	0.07	0.081	0.149	0.149	2,000
Calcium	102	206	352	334	NA
Chromium	0.006	<0.005	0.007	<0.005	100
Copper	0.005	0.006	<0.003	<0.003	1,000
Iron	0.057	0.297	0.3	0.283	600
Lead	0.003	0.008	0.017	0.011	50
Magnesium	9.07	17.7	39.5	38.2	35,000
Manganese	0.196	1.56	1.74	1.75	600
Mercury	0.1	0.2	<0.5	<0.05	1.4
Nickel	<0.005	0.006	0.007	0.007	200
Potassium	5.77	21	25.3	23.5	NA
Selenium	<0.01	0.011	0.011	<0.01	20
Sodium	133	123	125	119	NA
Zinc	0.012	0.028	0.043	0.04	5,000

All metals concentrations are in parts per million (ppb)

Analytes not tabulated are below laboratory quantitative levels (BQL)

Bold and Shaded = Concentrations above NYS GW Standards

NA = Not Applicable or Not Analyzed

TABLE 6.0
Tabulated Dissolved Heavy Metals Analytical Results

Location	GW-1	GW-2	GW-3	DUP	NYSDEC
Gradient	Up	Down	Down	Down	GW Standards
Depth	9' 2"	8' 4"	9' 5.2"		
Analyte	Total	Total	Total	Total	Total
Barium	0.069	0.08	0.147	0.148	2,000
Calcium	113	209	353	356	NA
Chromium	0.005	<0.005	<0.005	<0.005	100
Copper	0.004	0.005	<0.003	<0.003	1,000
Iron	<0.02	0.057	<0.02	<0.02	600
Magnesium	10.3	17.7	39.4	40	35,000
Manganese	0.237	1.57	1.74	1.79	600
Nickel	<0.005	0.006	0.007	0.007	200
Potassium	6.08	20.6	24.8	24.4	NA
Selenium	0.011	0.011	0.01	0.013	20
Sodium	138	123	120	128	NA
Zinc	<0.01	0.026	0.037	0.04	5,000

All metals concentrations are in parts per million (ppm)

Analytes not tabulated are below laboratory quantitative levels (BQL)

Bold and Shaded = Concentrations above NYS GW Standards

NA = Not Applicable or Not Analyzed

TABLE 7.0
Tabulated Results Indoor Air and Sub-Slab Analytical Results

Sampling Designation	OA-1	SV-1	SV-2
Sample Location	East Boundary	North Central	South Central
Sample Type	Outdoor Ambient	Soil-Gas	Soil-Gas
1,2,4 Trimethylbenzene	0.97	8.8	6.1
1,3,5 Trimethylbenzene	0.39	2.9	2.1
2-Butanone	17	140	66
Acetone	17	68	56
Benzene	1.5	4.4	2.9
Carbon Disulfide	<0.1	2.7	<1.9
Carbon tetrachloride	0.11	<0.84	<0.95
Chlorobenzene	<0.1	<1.7	2.3
Chloromethane	0.62	<1.7	<1.9
Cyclohexane	1	<1.7	<1.9
Dichlorodifluoromethane	1	<1.7	<1.9
Ethyl Benzene	1.4	6.2	4
Isopropanol	3.9	<1.7	<1.9
MTBE	0.46	<1.7	<1.9
Methylene Chloride	3.4	6.2	6
n-Heptane	1.9	5.7	4
n-Hexane	4.1	7.8	6
o-Xylene	1.2	7.1	4.8
p- & m-Xylenes	3.6	19	13
p-Ethyltoluene	1.2	8.6	<9.5
Tetrachloroethylene	0.11	1.9	<1.9
Toluene	11	33	20
Trichloroethylene	0	<0.84	<0.95
Trichlorofluoromethane (Freon 11)	0.34	23	9.5

All concentrations are in micrograms per cubic meter ($\mu\text{g}/\text{m}^3$)

See Matrix Tables 1 and 2 in NYSDOH Guidance Document for more details

All concentrations are in micrograms per cubic meter ($\mu\text{g}/\text{m}^3$)

See Matrix Tables 1 and 2 in NYSDOH Guidance Document for more details

TABLE 8.0

Tabulated Results Indoor/Outdoor Air and Sub-Slab Analytical Results

Sampling Designation	OA-1	SV-1	SV-2
Sample Location	East Boundary	North Central	South Central
Sample Type	Outdoor Ambient	Soil-Gas	Soil-Gas
1,1,1 Trichloroethane M2	<0.1	<1.7	<1.9
NYSDOH Matricies Decision	No Further Action		
Carbon tetrachloride M1	0.11	<0.84	<0.95
NYSDOH Matricies Decision	No Further Action		
Tetrachloroethylene M2	0.11	1.9	<1.9
NYSDOH Matricies Decision	No Further Action		
Trichloroethylene M1	0.17	<0.84	<0.95
NYSDOH Matricies Decision	No Further Action		

All concentrations are in micrograms per cubic meter ($\mu\text{g}/\text{m}^3$)

See Matrix Tables 1 and 2 in NYSDOH Guidance Document for more details

Table 9.0

Construction Details for Soil Vapor Points, Soil Borings, and Monitoring Wells

	Identification Number	Date of construction	Total Depth	Diameter	Ground surface elevation	Screened interval (Elevation Range)	Construction Material (PVC, steel, etc)	GPS Coordinates
Soil Vapor Points	SV-1	8-20-13	4' bgs	¾"	14'	4 – 4.5'	Steel	40°41'8.72"N 74° 0'11.88"W
	SV-2	8-20-13	4' bgs	¾"	14'	4 – 4.5'	Steel	40°41'8.67"N 74° 0'11.66"W
	OA-1	8-20-13	4' bgs	¾"	14'	4 – 4.5'	Steel	40°41'9.23"N 74° 0'11.63"W
Soil Borings	SB-1	8-20-13	10'	2"	14'	N/A	N/A	40°41'8.38"N 74° 0'11.88"W
	SB-2	8-20-13	10'	2"	14'	N/A	N/A	40°41'8.54"N 74° 0'11.86"W
	SB-3	8-20-13	10'	2"	14'	N/A	N/A	40°41'8.69"N 74° 0'11.75"W
	SB-4	8-20-13	10'	2"	14'	N/A	N/A	40°41'8.88"N 74° 0'11.70"W
	SB-5	8-20-13	10'	2"	14'	N/A	N/A	40°41'9.06"N 74° 0'11.57"W
Monitor Wells	GW-1	8-20-13	14'	1"	14'	8-12'	Prepack PVC	40°41'8.67"N 74° 0'11.59"W
	GW-2	8-20-13	14'	1"	14'	8-12'	Prepack PVC	40°41'8.67"N 74° 0'11.96"W
	GW-3	8-20-13	14'	1"	14'	8-12'	Prepack PVC	40°41'9.03"N 74° 0'11.80"W

Table 10.0**Groundwater Level Data**

Monitoring Well ID No.	Date	Water Elevation
GW-1	8-20-13	9.2'
GW-2	8-20-13	8.3'
GW-3	8-20-13	9.52'

Table 11.0**Analytical Methods Summary Table**

Matrix	Number of Samples	Analytical parameters measured	Analytical methods	Number of duplicate samples	Number and type of QA/QC samples
Soil	10	VOCs SVOCs Metals Pesticides PCBs	8260 8270 6010B 7470 8081/8082	1	2x Duplicates 2x Field Blanks
Groundwater	4	VOCs SVOCs Metals Pesticides PCBs	8260 8270 6010B 7470 8081/8082	1	1x Duplicate
Soil vapor	3	VOCs	TO-15	0	1x Trip Blank

APPENDIX G

Xcr qt 'Dct t lgt 'F ki t co u'c'pf 'F qewo gpwu

PREPRUFE® 300R & 160R

Pre-applied waterproofing membranes that bond integrally to poured concrete for use below slabs or behind basement walls on confined sites

Description

Preprufe® 300R & 160R membranes are unique composite sheets comprising a thick HDPE film, an aggressive pressure sensitive adhesive and a weather resistant protective coating.

Unlike conventional non-adhering membranes, which are vulnerable to water ingress tracking between the unbonded membrane and structure, the unique Preprufe bond to concrete prevents ingress or migration of water around the structure.

The Preprufe R System includes:

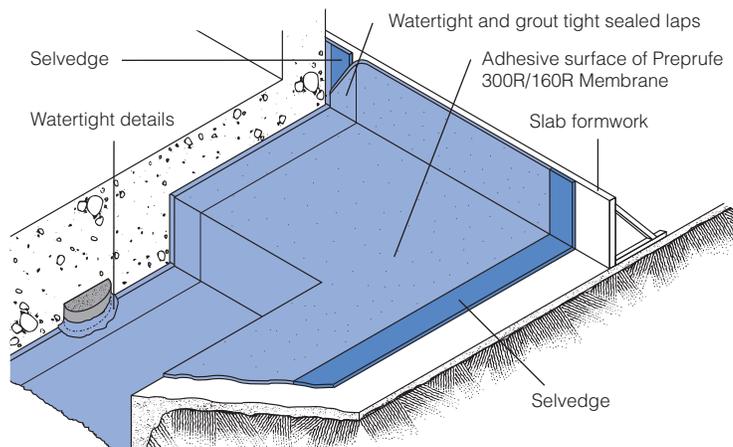
- **Preprufe 300R**—heavy-duty grade for use below slabs and on rafts (i.e. mud slabs). Designed to accept the placing of heavy reinforcement using conventional concrete spacers.
- **Preprufe 160R**—thinner grade for blindside, zero property line applications against soil retention systems.
- **Preprufe Tape LT**—for covering cut edges, roll ends, penetrations and detailing (temperatures between 25°F (-4°C) and 86°F (+30°C)).
- **Preprufe Tape HC**—as above for use in Hot Climates (minimum 50°F (10°C)).
- **Bituthene® Liquid Membrane**—for sealing around penetrations, etc.
- **Adcor™ ES**—waterstop for joints in concrete walls and floors
- **Preprufe Tieback Covers**—preformed cover for soil retention wall tieback heads
- **Preprufe Preformed Corners**—preformed inside and outside corners

Preprufe 300R & 160R membranes are applied either horizontally to smooth prepared concrete, carton forms or well rolled and compacted earth or crushed stone substrate; or vertically to permanent formwork or adjoining structures. Concrete is then cast directly against the adhesive side of the membranes. The specially developed Preprufe adhesive layers work together to form a continuous and integral seal to the structure.

Preprufe can be returned up the inside face of slab formwork but is not recommended for conventional twin-sided formwork on walls, etc. Use Bituthene self-adhesive membrane or Procor® fluid applied membrane to walls after removal of formwork for a fully bonded system to all structural surfaces.

Advantages

- **Forms a unique continuous adhesive bond to concrete poured against it**—prevents water migration and makes it unaffected by ground settlement beneath slabs
- **Fully-adhered watertight laps** and detailing
- **Provides a barrier to water, moisture and gas**—physically isolates the structure from the surrounding ground
- **BBA Certified** for basement Grades 2, 3, & 4 to BS 8102:1990
- **Zero permeance** to moisture
- **Solar reflective**—reduced temperature gain
- **Simple and quick to install**—requiring no priming or fillets
- **Can be applied to permanent formwork**—allows maximum use of confined sites
- **Self protecting**—can be trafficked immediately after application and ready for immediate placing of reinforcement
- **Unaffected by wet conditions**—cannot activate prematurely
- **Inherently waterproof, non-reactive system:**
 - not reliant on confining pressures or hydration
 - unaffected by freeze/thaw, wet/dry cycling
- **Chemical resistant**—effective in most types of soils and waters, protects structure from salt or sulphate attack



Drawings are for illustration purposes only. Please refer to graceconstruction.com for specific application details.

Installation

The most current application instructions, detail drawings and technical letters can be viewed at graceconstruction.com. For other technical information contact your local Grace representative.

Preprufe 300R & 160R membranes are supplied in rolls 4 ft (1.2 m) wide, with a selvage on one side to provide self-adhered laps for continuity between rolls. The rolls of Preprufe Membrane and Preprufe Tape are interwound with a disposable plastic release liner which must be removed before placing reinforcement and concrete.

Substrate Preparation

All surfaces—It is essential to create a sound and solid substrate to eliminate movement during the concrete pour. Substrates must be regular and smooth with no gaps or voids greater than 0.5 in. (12 mm). Grout around all penetrations such as utility conduits, etc. for stability (see Figure 1).

Horizontal—The substrate must be free of loose aggregate and sharp protrusions. Avoid curved or rounded substrates. When installing over earth or crushed stone, ensure substrate is well compacted to avoid displacement of substrate due to traffic or concrete pour. The surface does not need to be dry, but standing water must be removed.

Vertical—Use concrete, plywood, insulation or other approved facing to sheet piling to provide support to the membrane. Board systems such as timber lagging must be close butted to provide support and not more than 0.5 in. (12 mm) out of alignment.

Membrane Installation

Preprufe can be applied at temperatures of 25°F (-4°C) or above. When installing Preprufe in cold or marginal weather conditions 55°F (<13°C) the use of Preprufe Tape LT is recommended at all laps and detailing. Preprufe Tape LT should be applied to clean, dry surfaces and the release liner must be removed immediately after application. Alternatively, Preprufe Low Temperature (LT) is available for low temperature condition applications. Refer to Preprufe LT data sheet for more information.

Horizontal substrates—Place the membrane HDPE film side to the substrate with the clear plastic release liner facing towards the concrete pour. End laps should be staggered to avoid a build up of layers. Leave plastic release liner in position until overlap procedure is completed (see Figure 2).

Accurately position succeeding sheets to overlap the previous sheet 3 in. (75 mm) along the marked selvage. Ensure the underside of the succeeding sheet is clean, dry and free from contamination before attempting to overlap. Peel back the plastic release liner from between the overlaps as the two layers are bonded together. Ensure a continuous bond is achieved without creases and roll firmly with a heavy roller. Completely remove the plastic liner to expose the protective coating. Any initial tack will quickly disappear.

Refer to Grace Tech Letter 15 for information on suitable rebar chairs for Preprufe.

Vertical substrates—Mechanically fasten the membrane vertically using fasteners appropriate to the substrate with the clear plastic release liner facing towards the concrete pour. The membrane may be installed in any convenient length. Fastening can be made through the selvage using a small and low profile head fastener so that the membrane lays flat and allows firmly rolled overlaps. Immediately remove the plastic release liner.

Ensure the underside of the succeeding sheet is clean, dry and free from contamination before attempting to

overlap. Roll firmly to ensure a watertight seal.

Roll ends and cut edges—Overlap all roll ends and cut edges by a minimum 3 in. (75 mm) and ensure the area is clean and free from contamination, wiping with a damp cloth if necessary. Allow to dry and apply Preprufe Tape LT (or HC in hot climates) centered over the lap edges and roll firmly (see Figure 3). Immediately remove printed plastic release liner from the tape.

Details

Refer to Preprufe Field Application Manual, Section V Application Instructions or visit graceconstruction.com. This manual gives comprehensive guidance and standard details.

Membrane Repair

Inspect the membrane before installation of reinforcement steel, formwork and final placement of concrete. The membrane can be easily cleaned by power washing if required. Repair damage by wiping the area with a damp cloth to ensure the area is clean and free from dust, and allow to dry. Repair small punctures (0.5 in. (12 mm) or less) and slices by applying Preprufe Tape centered over the damaged area and roll firmly. Remove the release liner from the tape. Repair holes and large punctures by applying a patch of Preprufe membrane, which extends 6 in. (150 mm) beyond the damaged area. Seal all edges of the patch with Preprufe Tape. Any areas of damaged adhesive should be covered with Preprufe Tape. Remove printed plastic release liner from tape. Where exposed selvage has lost adhesion or laps have not been sealed, ensure the area is clean and dry and cover with fresh Preprufe Tape, rolling firmly. Alternatively, use a hot air gun or similar to activate adhesive and firmly roll lap to achieve continuity.

Pouring of Concrete

Ensure the plastic release liner is removed from all areas of Preprufe membrane and tape.

It is recommended that concrete be poured within 56 days (42 days in hot climates) of application of the membrane. Following proper ACI guidelines, concrete must be placed carefully and consolidated properly to avoid damage to the membrane. Never use a sharp object to consolidate the concrete.

Removal of Formwork

Preprufe membranes can be applied to removable formwork, such as slab perimeters, elevator and lift pits, etc. Once the concrete is poured the formwork must remain in place until the concrete has gained sufficient compressive strength to develop the surface bond. Preprufe membranes are not recommended for conventional twin-sided wall forming systems.

A minimum concrete compressive strength of 1500 psi (10 N/mm²) is recommended prior to stripping formwork supporting Preprufe membranes. Premature stripping may result in displacement of the membrane and/or spalling of the concrete.

Refer to Grace Tech Letter 17 for information on removal of formwork for Preprufe.

Figure 1

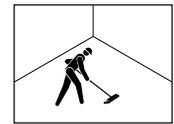


Figure 2

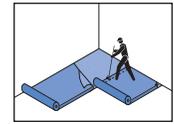
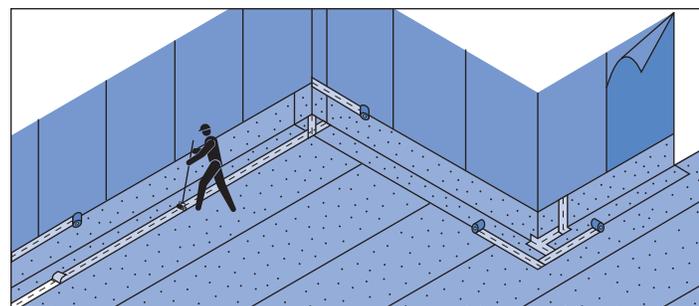
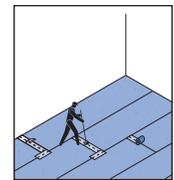


Figure 3

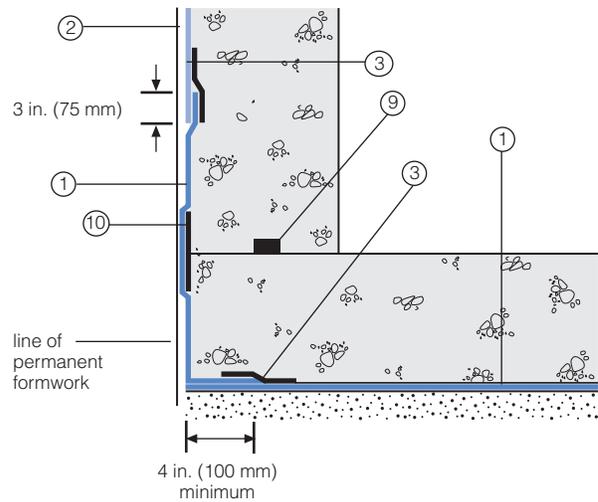


Detail Drawings

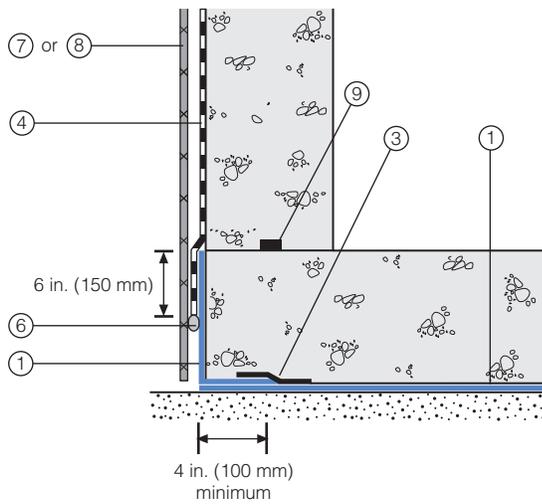
Details shown are typical illustrations and not working details. For a list of the most current details, visit us at graceconstruction.com.

For technical assistance with detailing and problem solving please call toll free at 866-333-3SBM (3726).

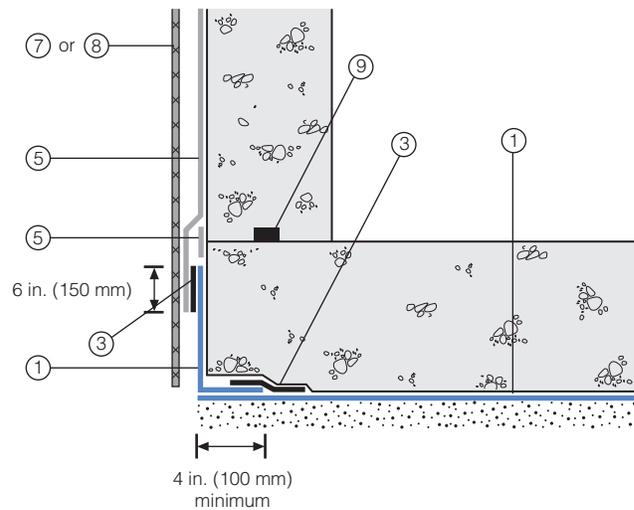
Wall base detail against permanent shutter



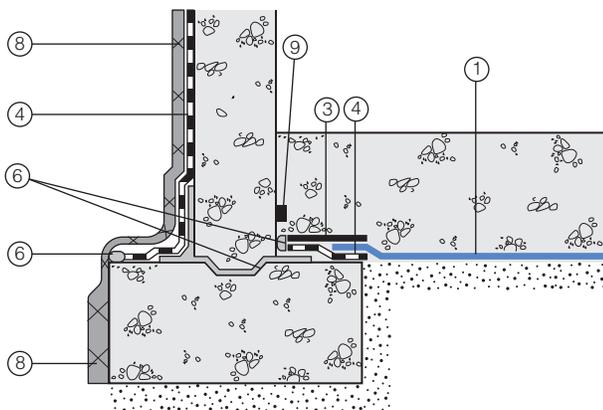
Bituthene wall base detail (Option 1)



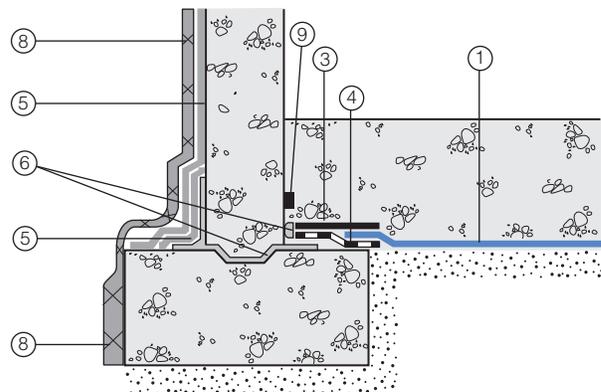
Procor wall base detail (Option 1)



Bituthene wall base detail (Option 2)



Procor wall base detail (Option 2)



- 1 Preprufe 300R
- 2 Preprufe 160R
- 3 Preprufe Tape
- 4 Bituthene

- 5 Procor
- 6 Bituthene Liquid Membrane
- 7 Protection

- 8 Hydroduct®
- 9 Adcor ES
- 10 Preprufe CJ Tape

Supply

Dimensions (Nominal)	Preprufe 300R Membrane	Preprufe 160R Membrane	Preprufe Tape (LT or HC*)
Thickness	0.046 in. (1.2 mm)	0.032 in. (0.8 mm)	
Roll size	4 ft x 98 ft (1.2 m x 30 m)	4 ft x 115 ft (1.2 m x 35 m)	4 in. x 49 ft (100 mm x 15 m)
Roll area	392 ft ² (36 m ²)	460 ft ² (42 m ²)	
Roll weight	108 lbs (50 kg)	92 lbs (42 kg)	4.3 lbs (2 kg)
Minimum side/end laps	3 in. (75 mm)	3 in. (75 mm)	3 in. (75 mm)
* LT denotes Low Temperature (between 25°F (-4°C) and 86°F (+30°C)) HC denotes Hot Climate (50°F (>+10°C))			
Ancillary Products			
Bituthene Liquid Membrane—1.5 US gal (5.7 liter) or 4 US gal (15.1 liter)			

Physical Properties

Property	Typical Value 300R	Typical Value 160R	Test Method
Color	white	white	
Thickness	0.046 in. (1.2 mm)	0.032 in. (0.8 mm)	ASTM D3767
Lateral Water Migration Resistance	Pass at 231 ft (71 m) of hydrostatic head pressure	Pass at 231 ft (71 m) of hydrostatic head pressure	ASTM D5385, modified ¹
Low temperature flexibility	Unaffected at -20°F (-29°C)	Unaffected at -20°F (-29°C)	ASTM D1970
Resistance to hydrostatic head	231 ft (71 m)	231 ft (71 m)	ASTM D5385, modified ²
Elongation	500%	500%	ASTM D412, modified ³
Tensile strength, film	4000 psi (27.6 MPa)	4000 psi (27.6 MPa)	ASTM D412
Crack cycling at -9.4°F (-23°C), 100 cycles	Unaffected, Pass	Unaffected, Pass	ASTM C836
Puncture resistance	221 lbs (990 N)	100 lbs (445 N)	ASTM E154
Peel adhesion to concrete	5 lbs/in. (880 N/m)	5 lbs/in. (880 N/m)	ASTM D903, modified ⁴
Lap peel adhesion	5 lbs/in. (880 N/m)	5 lbs/in. (880 N/m)	ASTM D1876, modified ⁵
Permeance to water vapor transmission	0.01 perms (0.6 ng/(Pa × s × m ²))	0.01 perms (0.6 ng/(Pa × s × m ²))	ASTM E96, method B
Water absorption	0.5%	0.5%	ASTM D570

Footnotes:

- Lateral water migration resistance is tested by casting concrete against membrane with a hole and subjecting the membrane to hydrostatic head pressure with water. The test measures the resistance of lateral water migration between the concrete and the membrane.
- Hydrostatic head tests of Preprufe Membranes are performed by casting concrete against the membrane with a lap. Before the concrete cures, a 0.125 in. (3 mm) spacer is inserted perpendicular to the membrane to create a gap. The cured block is placed in a chamber where water is introduced to the membrane surface up to the head indicated.
- Elongation of membrane is run at a rate of 2 in. (50 mm) per minute.
- Concrete is cast against the protective coating surface of the membrane and allowed to properly dry (7 days minimum). Peel adhesion of membrane to concrete is measured at a rate of 2 in. (50 mm) per minute at room temperature.
- The test is conducted 15 minutes after the lap is formed (per Grace published recommendations) and run at a rate of 2 in. (50 mm) per minute.

Specification Clauses

Preprufe 300R or 160R shall be applied with its adhesive face presented to receive fresh concrete to which it will integrally bond. Only Grace Construction Products approved membranes shall be bonded to Preprufe 300R/160R. All Preprufe 300R/160R system materials shall be supplied by Grace Construction Products, and applied strictly in accordance with their instructions. Specimen performance and formatted clauses are also available.

NOTE: Use Preprufe Tape to tie-in Procor with Preprufe.

Health and Safety

Refer to relevant Material Safety data sheet. Complete rolls should be handled by a minimum of two persons.

www.graceconstruction.com

For technical assistance call toll free at 866-333-3SBM (3726)

Adcor is a trademark and Preprufe, Bituthene and Hydroduct are registered trademarks of W. R. Grace & Co.—Conn. Procor is a U.S. registered trademark of W. R. Grace & Co.—Conn., and is used in Canada under license from PROCOR LIMITED.

We hope the information here will be helpful. It is based on data and knowledge considered to be true and accurate and is offered for the users' consideration, investigation and verification, but we do not warrant the results to be obtained. Please read all statements, recommendations or suggestions in conjunction with our conditions of sale, which apply to all goods supplied by us. No statement, recommendation or suggestion is intended for any use which would infringe any patent or copyright. W. R. Grace & Co.—Conn., 62 Whittemore Avenue, Cambridge, MA 02140. In Canada, Grace Canada, Inc., 294 Clements Road, West, Ajax, Ontario, Canada L1S 3C6.

This product may be covered by patents or patents pending.
PF-111H Printed in U.S.A. 07/12

Copyright 2012. W. R. Grace & Co.—Conn.
FA/PDF

GRACE

APPENDIX J

Gzco r ig'Y cuvg'Fkr qucn'O cplkguv



PURE SOIL TECHNOLOGIES

P.O. Drawer 43
Farmingdale, NJ 07727
Phone: 732.308.1113 Fax: 732.462.9626

11800

NON-HAZARDOUS MATERIAL MANIFEST

You must return 4 copies of this manifest upon delivery.

GENERATOR

AGENT / CONSULTANT

Generator Name: PASSIA Home Exports
Address: 131 UNION STREET
City, State, Zip: BROOKLYN, N.Y. 11231

Name: Innovative Earth Solutions
Contact Name: Jack DiGangi
Phone: (410) 751-3478

Description of Material

Approval Number
105771

Non Hazardous Petroleum Contaminated Soil

SITE	INITIALS
Time Arrive: _____	_____
Time Depart: _____	_____

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, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations.

<u>[Signature]</u> Generator Authorized Agent Name (Print)	<u>[Signature]</u> Signature	<u>8-1-12</u> Shipment Date
---	---------------------------------	--------------------------------

TRANSPORTER

Transporter Name: AWB AZOTIC
Address: 393 R-10
City, State, Zip: E. HANOVER, N.J.

Driver Name (Print): [Signature]
Vehicle License No/State/EPA No.: NJ 1P15 971
Truck Number: 42 Chexley

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

I hereby certify that the above named material was delivered without incident to the destination listed

<u>[Signature]</u> Driver Signature	<u>8/1</u> Date	<u>[Signature]</u> Driver Signature	<u>8-1-12</u> Date
Arrival Time: _____	Departure Time: _____	Arrival Time: _____	Departure Time: _____

DESTINATION

Site Name: PURE SOIL TECHNOLOGIES Phone: 732-657-8551
Address: 655 SOUTH HOPE CHAPEL ROAD, JACKSON, NJ 08527

Business hours are: Monday through Friday 7 AM to 5 PM. Saturday By Appointment Only.

I hereby certify that the above named material has been accepted and to the best of my knowledge the foregoing is true and accurate.

<u>[Signature]</u> Name of Authorized Agent	<u>[Signature]</u> Signature	<u>8-1-12</u> Receipt Date
--	---------------------------------	-------------------------------

Form: PST

PROFILE COPY