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Sent Via FedEx Priority Overnight

July 15, 2009

Bryan Wong, Project Manager
New York State Department of Environmental Conservation
Division of Environmental Remediation
47-40 21st Street
Long Island City, New York 11101

Re: ***Final Remedial Action Work Plan (RAWP)***
OCA LIC Fifth Street Mixed-Use Housing
5-20 46th Road
Long Island City
Queens, New York 11101
BCP No C241098
EWMA Project No. 205490

Dear Mr. Wong:

Enclosed please find one original and one electronic copy of the final Remedial Action Work Plan (RAWP) for the above-referenced property prepared by EWMA, on behalf of OCA Long Island City, LLC (OCA). The June 30, 2009 draft RAWP has been revised to include verbal edits provided by New York State Department of Environmental Conservation (NYSDEC) the week of July 6, 2009.

Thank you for your assistance with this project. We look forward to a timely approval of the RAWP.

If you have any questions or require any additional information please feel free to contact me at EWMA's West Windsor, NJ office, (609) 799-7300, Ext. 196.

Sincerely,
Environmental Waste Management Associates, LLC

Sharon McSwieney
Project Manager

Enc. One (1) original and one (1) electronic copy

cc: Jane O'Connell, NYSDEC
Rory Levy, New York City Board of Standards and Appeals
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An Environmental Consulting & Remediation Firm

OCA LIC Fifth Street Mixed-Use Housing

Block 28, Lot 21 and 38

LONG ISLAND CITY, NEW YORK

Remedial Action Work Plan

NYSDEC BCP Number: C241098

VOLUME I OF III

Prepared for:

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DECEMBER 31, 2008

REVISED MARCH 5, 2009

FINAL REVISION JULY 15, 2009

CERTIFICATIONS

I, Richard D. Arnold, am currently a registered professional engineer licensed by the State of New York. I am the Project Remediation Engineer and have primary direct responsibility for implementation of the remedial program for the OCA LIC Fifth St. Mixed-Use Housing Site (NYSDEC BCA Index No. A2-0584-0307, Site No. C241098).

I certify that the Site description presented in this RAWP is identical to the Site descriptions presented in the Brownfield Cleanup Agreement for OCA LIC Fifth St. Mixed-Use Housing and related amendments.

I certify that this plan includes proposed use restrictions, Institutional Controls, Engineering Controls, and plans for all operation and maintenance requirements applicable to the Site and provision for development of an Environmental Easement to be created and recorded pursuant ECL 71-3605. This RAWP requires that all affected local governments, as defined in ECL 71-3603, will be notified that such Easement has been recorded. This RAWP requires that a Site Management Plan must be submitted by the Applicant for the continual and proper operation, maintenance, and monitoring of all Engineering Controls employed at the Site, including the proper maintenance of all remaining monitoring wells, for approval by the Department.

I certify that this RAWP has a plan for transport and disposal of all soil, fill, fluids and other material removed from the property under this Plan, and that all transport and disposal will be performed in accordance with all local, State and Federal laws and requirements. All exported material will be taken to facilities licensed to accept this material in full compliance with all Federal, State and local laws.

I certify that this RAWP has a plan for import of all soils and other material from off-Site and that all activities of this type will be in accordance with all local, State and Federal laws and requirements.

I certify that that this RAWP has a plan for nuisance control during the remediation and all invasive development work, including a dust, odor and vector suppression plan and that such plan is sufficient to control dust, odors and vectors and will prevent nuisances from occurring.

I certify that all information and statements in this certification are true. I understand that a false statement made herein is punishable as Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

Note: include PE stamp

By EWMA Engineering Services LLC.
NYS Certificate of Authorization No.0005216

7/15/2009

Richard D. Arnold, NYSPE No. 16.076202
EWMA Project Number 205490

It is a violation of Article 145 Section 7209(2) of New York State Education Law for any person, unless he is acting under the direction of a licensed professional engineer, to alter any remedial alternatives information item within this RAWP in any way.

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LIST OF ACRONYMS

AOCs – Areas of Concern

bsg - below surface grade

BCA - Brownfield Cleanup Agreement

BCP – Brownfield Cleanup Program

BNA- Base/neutral/acid extractable compound

CAMP - Community Air Monitoring Plan

CHEMTECH - Chemtech Laboratory, Mountainside, NJ

COC – Chain of Custody

CPP - Citizen Participation Plan

CRP - Concrete Removal Plan

DER – Department of Environmental Regulation

DUSR - Data Usability Summary Report

EWMA – Environmental Waste Management Associates, LLC, West Windsor, New Jersey

FER - Final Engineering Report

GA – Class GA Fresh Groundwaters

GPR – Ground Penetrating Radar

GWQS – Groundwater Quality Standards (per NYSDEC, Part 703)

HASP - Health and Safety Plan

IRM - Interim Remedial Measure

LNAPL -Light Non-Aqueous Phase Liquids

Mikula - Mikula Contracting, Inc., Parsippany

MDLs – Method Detection Limits

mg/m3 - milligrams per cubic meter

NYCDOB - New York City Department of Buildings

NYCRR - New York Code of Rules and Regulations

NYSDEC - New York State Department of Environmental Conservation

NYSDOH - New York State Department of Health

OCA LIC - OCA Long Island City, LLC

PAHs – Polynuclear aromatic hydrocarbons

PCBs – Polychlorinated biphenyls

PID - Photoionization Detector

ppb – parts per billion

ppbv – parts per billion by volume

ppm - parts per million

QAPP - Quality Assurance Project Plan

QHHEA - Qualitative Human Health Exposure Assessment

RAWP – Remedial Action Work Plan

RI - Remedial Investigation

RIR – Remedial Investigation Report

RIWP - Remedial Investigation Work Plan

RUSCO - Restricted Use Soil Cleanup Objective (per 6 NYCRR Part 375-6.8(b))

SMP - Site Management Plan

SCO - Soil Cleanup Objectives (per 6 NYCRR, Subpart 375-6)

SVOCs - Semi-volatile Organic Compounds

TAGM - NYSDEC Technical and Administrative Guidance Memorandum

TAL Metals – Target Analyte Metals

TCL/TAL - Target Compound List/Target Analyte List

USEPA - United States Environmental Protection Agency

USGS - United States Geologic Survey

UST – Underground Storage Tank

UUSCO – Unrestricted Use Soil Cleanup Objectives (per 6 NYCRR, Subpart 375-6.8(a))

VOCs or VOs - Volatile Organic Compounds

Zebra – Zebra Environmental Corp., Lynbrook, NY

EXECUTIVE SUMMARY

Site Description/Physical Setting/Site History

Environmental Waste Management Associates, LLC (EWMA) was retained by OCA Long Island City, LLC (OCA) to prepare this Remedial Action Workplan (RAWP) for the property known as OCA LIC Fifth Street Mixed-Use Housing and located at 5-20 46th Road, City of New York, Queens County, New York (the Site). This RAWP has been prepared to comply with the terms of OCA's participation in the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP) as a "Volunteer"(BCP Site C241098).

This RAWP has been prepared on behalf of OCA (the Volunteer) to fulfill the BCP requirements to address the nature and extent of the contamination at the Site and assess the potential for off-site exposure. The work was conducted in accordance with the Remedial Investigation Work Plan (RIWP) dated January 25, 2008, and subsequent RIWP Addenda, dated February 1, 2008 February 20, 2008 and June 25, 2008.

The Site is located within an old industrial portion of the City of New York, Queens County, New York. The East River is the closest water body located approximately ¼-mile west of the Site. The Site is of an L-shape with approximately 300 feet of frontage along the southern side of 46th Road, 200 feet of frontage along the eastern side of the 5th Street, and 100 feet of frontage along the northern side of 47th Avenue.

Historically, the entire Site (except for a small parking area at the east end) was covered with buildings. A number of lessees have occupied the Site, with recent operations including electrical contractor, art studio, office space, custom design furniture, marble and granite works, sheet metal duct work, motorcycle repair shop, etc. All of the lessees' spaces at the Site have been vacated. As of June 2008, all the buildings on the Site have been demolished to street grade. The concrete floor slabs have been left in place pending the approval of a Remedial Action Work Plan (RAWP). Upon the approval of the RAWP, the concrete slabs and underlying soils will be removed from the Site.

Summary of the Remedial Investigation

A total of 23 soil borings were installed and sampled as part of the RI activities during February and March 2008. Six (6) groundwater monitoring wells existed at the Site prior to the initiation of EWMA's 2008 RI activities. EWMA installed an additional 24 groundwater monitoring wells during the recent RI activities. All monitoring well locations are depicted on **Figure 2.**

The subsurface materials underlying the Site consist of 10 to 12 feet of historic fill, overlying a one to three-foot thick layer of clayey peat. The peat layer appears to be continuous beneath and adjacent to the Site. Fine to coarse sand to silty sand is present beneath the peat and extends to depths of 20 to 30 feet bsg. Discontinuous lenses of silt and clay are present within the sand. Bedrock underlies the silty sand at depths of 32 feet bsg or greater.

There are two water-bearing zones immediately beneath the Site: an upper, perched-water zone, and an underlying sand unit. The clayey peat layer acts as a local aquiclude or confining layer, forming a perched-water zone within the overlying fill material. Depths to water for wells completed in the perched zone are about seven to eight feet bsg, and the saturated thickness of the perched zone is three to four feet.

The sand unit underlies the peat layer. Depth to water for wells completed in the sand unit is approximately 10 to 11 feet bsg which is deeper than in the perched zone. The difference in water levels between the perched-water zone and the sand unit demonstrate that the peat layer is acting as a confining unit.

Groundwater flow within the perched-water zone is generally to the north and east, while groundwater flow within the sand unit is southwestward, toward the East River.

Analytical results from the soil samples collected on the Site were compared to the Soil Cleanup Objectives (SCOs) outlined in 6 NYCRR Subpart 375-6. If no Part 375 SCO was established for a particular compound, EWMA utilized the SCO from NYSDEC's *Technical and Administrative Guidance Memorandum 4046* (TAGM 4046) as directed by the NYSDEC. The groundwater data were compared to the groundwater quality standards (GWQS) for Class GA groundwaters as listed in NYSDEC Technical Operation and Guidance Series (TOGS) 1.1.1 "Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations".

Based on the RI activities conducted by EWMA as described herein, soil and groundwater contamination, including metals, SVOCs, and volatile organic compounds (VOCs), were detected above NYSDEC applicable standards. In addition, light non-aqueous phase liquid (LNAPL) was detected in the perched groundwater and fill materials. The sources of the contaminants and LNAPL appear to be historic manufacturing operations including the on-Site USTs located in the western half of the Site as well as site-wide historic fill materials. Based upon the results of the RI activities conducted, Site-related contaminants, including LNAPL, are generally confined to the Site. However, LNAPL was detected in groundwater monitoring wells installed in the sidewalk along 46th Road and 5th Street.

LNAPL was also detected in several groundwater monitoring wells screened beneath the peat in the lower sand unit and located at the most upgradient portion of the Site (based on the observed groundwater flow direction). Since the LNAPL was not observed in the upper zone at these locations, and, since these wells are located in the upgradient portion of the Site, it appears these contaminants are due to an upgradient off-Site source. PCBs were detected above the GWQS in one sand unit temporary well point, TW-1.

The soil vapor investigation results indicated several VOCs, were detected in both sub-slab and soil vapor samples at concentrations above background concentrations. In addition, PCE and methylene chloride were detected at concentrations above those provided in the NYSDOH Guidance for Evaluating Soil Vapor Intrusion. Therefore, the potential for vapor intrusion exists at the Site. This will be addressed through remediation and vapor mitigation measures implemented during Site development.

Qualitative Human Health Exposure Assessment

A Qualitative Human Health Exposure Assessment (QHHEA) was prepared for the Site and is included as Appendix 5. The QHHEA integrated the data and information gathered during the RI and provides a qualitative assessment of the potential for exposure to site-related contaminants. The proposed remedial activities associated with the identified contamination, if approved, will be the primary potential human health exposure due to disturbance of site contaminants detected above the unrestricted use standard. This proposed work will be performed by and/or under the direction of environmental remediation contractors.

Summary of the Remedy

Based on the findings of the RI, the remedial actions proposed herein are designed to follow a Track 4 cleanup under 6 NYCRR 375. The goal of the remedial program is as follows:

1) All excavation and truck loading activities as described below will be conducted under a negative pressure containment structure;

2) An IRM consisting of registration and removal of on-site underground storage tanks (USTs) in accordance with NYSDEC requirements;

3) Remove the on-site source(s) of soil contamination (i.e., LNAPL and grossly contaminated soil), to the extent practicable;

4) Remediate the soil contamination at the Site in order to achieve compliance with RUSCOs for residential use (Table 375-6.8(b)). The soil remedial mechanism will be excavation, characterization and proper off-site disposal of excavated soils and application of Oxygen Release Compound (ORC) at locations that are excavated to depths below the seasonal water table.

5) Collect and analyze end-point soil samples to evaluate the performance of the remedy with respect to attainment of restricted residential RUSCOs;

6) Construct and maintain an engineered composite cover system consisting of building structural foundation slab, asphalt paving and/or a minimum of two feet of clean fill to prevent human exposure to residual contaminated soil/fill remaining under the Site;

7) Remediate LNAPL identified on the perched groundwater table via excavation and vacuum extraction;

8) Remediate LNAPL in the perched zone if needed by injection of surfactants or chemical oxidants to reduce viscosity followed by vacuum extraction.

9) Remediate LNAPL contamination identified in the lower sand unit via installation of a capture wall, collection and recovery wells, and down-well skimming equipment to collect and remove the LNAPL. Also, install thirty eight monitoring and remediation twin nested or twin couplet wells. for future groundwater monitoring and LNAPL recovery;

10) Import of materials to be used for backfill and cover in compliance with: (1) chemical criteria identified in 6 NYCRR Part 375-6.7(d), (2) all Federal, State and local rules and regulations for handling and transport of material;

11) Implement long-term groundwater monitoring program to evaluate the performance of the remedy with respect to attainment of groundwater standards; site perimeter monitoring wells will be abandoned during construction activities and will be

replaced with a series of cluster wells to monitor the perched unit and the lower sand unit;

12) Install and operate a vapor intrusion control system consisting of a waterproofing membrane with a thickness of at least 20-mils and/or a sub-slab de-pressurization system.

13) Record an Environmental Easement, including Institutional Controls, to prevent future exposure to any residual contamination remaining at the Site;

14) Implement engineering controls via an engineering design work plan to provide design and specifications for vapor intrusion control, composite cover system, LNAPL capture wall and removal utilities, and LNAPL monitoring and remediation wells.

15) Implement a Site Management Plan for long term management of residual contamination as required by the Environmental Easement, including plans for: (1) Institutional and Engineering Controls, (2) monitoring, (3) operation and maintenance and (4) reporting;

A Fish and Wildlife Resources Impact Analysis (FWRIA) has been performed. The FWRIA concluded that the Site is heavily developed and unlikely to provide habitat for sensitive ecological receptors. Given the urban location, sensitive wildlife are not likely to use the Site, however, the Site is approximately 300 feet from the East River, a resource of ecological concern. The proposed removal and excavation of the source of the contamination will eliminate the exposure pathways. At this time, a criteria specific analysis is not recommended until after the contaminant source is removed and further environmental monitoring of the groundwater has occurred. Upon completion of the proposed remedial activities and post-remediation sampling, the preliminary findings of the Fish and Wildlife Assessment will be revaluated to determine if post-remedial engineering controls are required.

1.0 INTRODUCTION

OCA Long Island City, LLC (OCA) entered into a Brownfield Cleanup Agreement (BCA) with the New York State Department of Environmental Conservation (NYSDEC) in June 2007, to investigate and remediate a 1.1 -acre property located at 5-20 46th Road, Long Island City, Queens, New York (the Site). OCA is a Volunteer in the Brownfield Cleanup Program. Mixed-use, including residential and retail, is proposed for the Site. When completed, the Site will contain residential townhouse style apartment buildings along 46th Road, ground floor retail along 5th Street frontage, and accessory below grade parking. Refer to the Brownfield Cleanup Program (BCP) application for additional details.

This Remedial Action Work Plan (RAWP) summarizes the nature and extent of contamination as determined from data gathered during the Remedial Investigation (RI), performed between February and December 2008. The proposed remedial goal is a Track 4 residential use cleanup, and an evaluation of applicable remedial action alternatives, their associated costs, and the preferred remedy is provided in this RAWP. The remedy described in this document is consistent with the procedures defined in DER-10 and complies with all applicable standards, criteria and guidance. The remedy described in this document also complies with all applicable Federal, State and local laws, regulations and requirements. The NYSDEC and New York State Department of Health (NYSDOH) have determined that this Site does pose a significant threat to the environment. The RI for this Site did not identify fish and wildlife resources.

A Fish and Wildlife Resources Impact Analysis (FWRIA) has been performed and is included as **Appendix 1**. The Site has historically been heavily developed and unlikely to provide habitat for sensitive ecological receptors. Given the urban location, sensitive wildlife are not likely to use the Site, however, the Site is approximately 300 feet from the East River, a resource of ecological concern. The proposed removal and excavation of the source of the contamination will eliminate the exposure pathways. At this time, a criteria specific analysis is not recommended until after the contaminant source is removed and further environmental monitoring of the groundwater has occurred.

An engineering design workplan will be prepared for the sand unit LNAPL remediation and will include a capture wall with LNAPL recovery utilities and installation of thirty-eight LNAPL monitoring and remediation wells.

1.1 SITE LOCATION AND DESCRIPTION

The Site is located in the County of Queens, City of New York, New York and is identified as Block 28 and Lots 21 and 38 on the Borough of Queens Tax Map. The United States Geological Survey (USGS) 7.5 Minute Series Central Park & Brooklyn, New York Topographic Quadrangle (**Figure 1)** shows the Site location. The Site is situated on an approximately 1.1-acre area bounded by 46th Road to the north, 47th Street to the south, commercial/industrial properties to the east, and 5th Street to the west (see **Figure 1).** A boundary map is attached to the BCA as required by Environmental Conservation Law (ECL) Title 14 Section 27-1419. The 0.98-acre Site is fully described in **Appendix 2 – Metes and Bounds**. A global positioning system coordinate for the starting point is included.

1.2 CONTEMPLATED REDEVELOPMENT PLAN

The Site is intended to be redeveloped as a mixed-use project with ground floor retail along the 5th Street frontage, residential townhouse style apartment building along 46th Road, and accessory parking below grade. Floors 2-6 will be utilized as student housing as allowed for under the existing Community Facility zoning density (with a variance to allow for dormitory within Use Group-4 of the M1-4 area) and

market rate residential above as provided for under the R6-A zoning. A site plan depicting the proposed redevelopment layout is included as **Appendix 3.**

The Remedial Action to be performed under the RAWP is intended to make the Site protective of human health and the environment consistent with the contemplated end use. The proposed redevelopment plan and end use is described here to provide the basis for this assessment. However, the Remedial Action contemplated under this RAWP may be implemented independent of the proposed redevelopment plan.

1.3 DESCRIPTION OF SURROUNDING PROPERTY

The properties immediately adjacent to the Site are predominantly residential and commercial with a few light industrial properties. The properties to the west across 5th Street are a residential high-rise, a public park, and a NYSDEC Brownfield site currently in post remediation phase. The properties to the south across 47th Avenue, to the north across 46th Road, and immediately adjacent to the east are residential and commercial.

Several schools and day care facilities are located nearby the Site and are identified on the contact list in Citizen Participation Plan (CPP).

The East River, which is located approximately ¼ mile to the west, is the only sensitive receptor proximate to the Site. The East River is classified as Class I under 6 New York Codes, Rules and Regulations (NYCRR) Part 701. According to 6 NYCRR part 701, the best usage of Class I waters are "secondary contact recreation and fishing. These waters shall be suitable for fish propagation and survival."

2.0 DESCRIPTION OF REMEDIAL INVESTIGATION FINDINGS

The Site was investigated in accordance with the scope of work presented in the NYSDEC-approved Remedial Investigation (RI) Work Plan dated January 25, 2008 and subsequent Addenda dated February 1, 2008 February 20, 2008 and June 25, 2008.

The investigation was conducted between February and December 2008. The RIR was submitted to NYSDEC on September 3, 2008 and comments from NYSDEC were received in a letter dated October 10, 2008. A revised RIR was submitted by OCA on December 22, 2008 and updated March 3, 2009.

2.1 SUMMARY REMEDIAL INVESTIGATIONS PERFORMED

The recent RI sampling completed at the Site involved the collection of soil, groundwater and soil vapor samples. In general, the sample locations were targeted toward specific areas of concern. A lesser number of samples were obtained for general characterization purposes. A total of 18 AOCs have been identified and investigated at the Site.

- AOC-1: Former 10,000-Gallon #6 Fuel Oil UST/ 46th Road Sidewalk;
- AOC-2: Eastern Parking Lot;
- AOC-3: 1-Story Brick/ Concrete Block Building (Demand Electric);
- AOC-4: Motorcycle Repair Shop (Basement);
- AOC-4A: 1-Story Building;
- AOC-5: 3-Story Brick Building (Art Studios);
- AOC-6: 1-Story Brick Building (Knossos Custom Design Furniture);
- AOC-6A: 2-Story Brick Building;
- AOC-7: Two (2) Former Gasoline Storage Tanks;
- ACO-7A: Suspect Former Boiler/ Stack Area;
- AOC-8: Suspect Twenty-Two (22) 1,500-Gallon Varnoline Storage Tanks;
- AOC-9: 1-Story Building (AMN Renovation);
- AOC-10: 1-Story Building (JMJ Electrical);
- AOC-11: Former Wohl Inc. Cleaners and Dyers (Direct Air),
- AOC-12: Former Wohl Inc. Cleaners and Dyers (Liberty Contracting);
- AOC-13: 5th Street Sidewalk;
- AOC-14: Former Accurate Associates RCRA Area; and,
- AOC-15: 47th Avenue Sidewalk

2.1.1 Borings and Wells

A total of 23 soil borings were installed and sampled as part of the RI activities. The soil boring locations are depicted on **Figure 2.** Six (6) groundwater monitoring wells existed at the Site prior to the initiation of EWMA's 2008 RI activities. EWMA installed an additional 24 groundwater monitoring wells during the recent RI activities. All monitoring well locations are depicted on **Figure 2.**

2.1.2 Samples Collected

A table summarizing the samples collected during the recent RI activities is included as **Appendix 4.** The table includes the number of samples collected at each AOC, the matrices sampled, depth of sample, and the analytical parameters.

2.1.3 Chemical Analytical Work Performed

A table summarizing the samples collected during the recent RI activities is included as **Appendix 5.** The table includes the designations of the individual samples collected at each AOC, the matrices sampled and the analytical parameters.

2.1.4 Geophysical & Test Pit Investigation

A geophysical survey of accessible interior and sidewalk portions of the Site was initially conducted in February 2008. No anomalies indicative of a UST were observed during the survey. However, it was noted that reinforcing in the concrete created overwhelming interference limiting the viewing range of the geophysical instrumentation (3-4 feet bsg).

A second geophysical survey was conducted in June 2008 in the three suspect UST areas following the removal of the overlying concrete pads. However, the GPR was only able to read a maximum of three feet below the surface due to the high conductivity of the soils. Therefore, no anomalies indicative of USTs was noted.

A test pit investigation was conducted in the three (3) suspect UST areas, AOC-7, AOC-8 and AOC-10. In AOC-7, no UST was identified; however, odors and product were noted in the saturated soils. In AOC-8, the test pit excavation revealed a concrete pad at four (4) feet bsg and one (1) vertical UST and associated piping was observed to be protruding through the concrete pad. Product stained soils were observed in the excavation. In AOC-10, the test pit excavation revealed evidence of one (1) to two (2) USTs and associated piping embedded in a subsurface concrete pad.

All suspected on-site USTs will be registered and closed in accordance with NYSDEC regulations as part of this RAWP.

2.1.5 Summary of RI Findings

A detailed summary of the RI was provided in the RIR. A brief summary of the RI findings is provided below. Maps depicting the sample locations are included as **Figure 2.** Tables summarizing the exceedances of the UUSCO and GWQS are included as **Tables 1 and 2. Figure 3** depicts the location of the documented soil exceedances of the UUSCO. **Figures 4, 5, 6, and 7** depict the location of the documented groundwater exceedances of the NYSDEC GWQS.

2.1.5.1. Summary of Soil Findings

VOCs including acetone; methylene chloride; 2-butanone; benzene; and ethyl benzene were detected in soil above their UUSCO (RIR, Section 6.1.1). Acetone was the most commonly detected VOC with a maximum concentration of 2.6 ppm detected at 7-8 ft bsg in Soil Boring SB-19. Acetone concentrations in the rest of the soil samples were all below 1 ppm. The second most commonly detected VOC was ethylbenzene, with a maximum concentration of 6.9 ppm at SB-18. The remaining VOCs were each detected in only one or two samples, at concentrations that only slightly exceeded their UUSCO.

PAHs including naphthalene, acenaphthene, fluorene, phenanthrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, dibenzofuran, and dibenz(a,h)anthracene (December 2008 RIR, Section 6.1.2). PAHs were detected in soil throughout the Site, but the highest concentrations were detected in samples collected from depths of 12 ft bsg or less

indicating the source of the contaminants is from historic site operations and/or fill materials. Soil samples collected from below this depth had low or non-detectable PAH concentrations.

Several PAHs, including naphthalene, fluorene, and phenanthrene, are commonly found in fuel oil (although fluorene and phenanthrene are also found in fly ash). Naphthalene exceeded its UUSCO (12 ppm) at four boring locations (SBE-1, SBE-11, SBE-12, and SBE-RCRA-3) with a maximum concentration of 230 ppm detected in SBE-12 at 10-11 ft. Fluorene exceeded its UUSCO at two locations with a maximum concentration of 53 ppm (compared to the UUSCO of 30 ppm), detected at SBE-1, and phenanthrene exceeded its UUSCO at one location with a concentration of 130 ppm (compared to the UUSCO of 100 ppm) in SBE-1.

Elevated naphthalene concentrations were generally encountered in soil above the clayey peat (i.e., depths of 12 ft bsg or less), except for boring SBE-1. In SBE-1, naphthalene was not detected in the sample collected from above the clayey peat, but was detected (at a concentration of 84 ppm) below the clayey peat layer, at 12.5-13.5 ft bsg. Elevated concentrations of fluorene and phenanthrene were also detected at this level.

The source of the naphthalene and other PAHs in soil at this location cannot be definitively determined. Fuel oil releases from USTs located in AOC-1 are likely the source of the naphthalene detected in SBE-12, but there is no obvious source for the naphthalene detected in other borings.

In SBE-1, naphthalene and other PAHs were detected below the clayey peat layer. There are no identified naphthalene sources (i.e., fuel-oil USTs) in that area of the Site, and the sample collected from above the clayey peat in SBE-1 did not exhibit naphthalene. Therefore, it is unlikely that a nearby surface or UST spill is responsible for the detected naphthalene. Instead, naphthalene detected below the clayey peat layer at SB-1 is most likely due to an off-site source on the adjacent property to east.

Metals including arsenic, copper, lead, mercury, nickel, and zinc were detected in soils at the Site at concentrations exceeding their UUSCO (RIR, Section 6.1.3). The source of the detected metals may be the historic site operations and/or historic fill materials

The pesticide 4,4-DDD exceeded the 0.0033 mg/kg UUSCO in soil samples collected from SBE-17, SBE-18, and SBE-19 with a maximum concentration of 3.3 mg/kg detected at 5.5-6.5 ft bsg in SBE-17 (RIR, Section 6.1.4).

The pesticide 4,4-DDD has not been used in the United States since the 1970's; how it may have been used at the Site is unknown.

No PCBs were detected in soil at the Site.

2.1.5.2. Summary of Groundwater Findings

VOCs: acetone, ethylbenzene, isopropylbenzene, benzene, toluene, vinyl chloride, methylene chloride, tetrachloroethene, cis-1,2-dichloroethene, and t-1,3-dichloropropene exceeded their GWQS. The highest VOC concentrations were detected within the perched-water zone in the western portion of the Site. VOC concentrations were very low or non-detectable for groundwater samples collected in the eastern portion of the Site.

Most of the VOCs detected were detected at only one or two locations, but a few were detected more widely across the Site (see RIR, Section 6.5.1). Acetone and isopropylbenzene were detected most frequently and at the highest concentrations. The highest acetone concentrations are clustered in areas adjacent to the former Varnoline UST area (AOC 8).

The highest isopropylbenzene concentrations are also found in the western portion of the Site. Isopropylbenzene is a component of fuel oil. Several suspected fuel oil USTs are located in the western portion of the Site, and numerous wells in this area have also exhibited LNAPL. Therefore, UST releases in the western area of the Site are the likely source of the isopropylbenzene.

Similar VOCs were detected in the sand unit, however, at much lower concentrations when compared to the overlying perched-water zone concentrations. This indicates that the clayey peat is behaving as a confining layer, and limiting downward migration of VOCs in groundwater.

TW-1 was screened within the sand unit and exhibited elevated VOC concentrations in groundwater. TW-1 is located near the eastern edge of the Site. Benzene, toluene, ethylbenzene, and isopropylbenzene were detected at concentrations exceeding their GWQS. These compounds are components of fuel oil, but there are no known potential fuel oil sources in that area of the Site. Further, it would be difficult for a source that might exist to penetrate the clayey peat confining layer without also impacting the overlying perched-water zone. Groundwater flow within the sand unit is westward, so the source of these compounds is most likely located to the east on an upgradient property. The presence of LNAPL in the nearby monitoring well, MW-10I, also completed in the sand unit, indicates that there is an upgradient, off-site source of fuel oil (or other petroleum product) to the east.

SVOCs: 2,4-dimethylphenol, 1,1-biphenyl, acenaphthene, fluorene, pentachlorophenol, phenanthrene, fluoranthene, benzo(a)anthracene, chrysene, bis(2-ethylhexylphthalate), benzo(b)fluoranthene, benzo(k)fluoranthene, and indeno(1,2,3-cd)pyrene were detected at concentrations exceeding their GWQS. These SVOC's were encountered sporadically throughout the Site, in both the unfiltered and laboratory-filtered samples, and in both the perched-water zone and in the sand unit (at much lower concentrations) (See RIR, Section 6.5.2).

Several SVOC's (1,1-biphenyl, fluorene, acenaphthene, and phenanthrene) exceeded their GWQSs in the same wells that exhibited elevated levels of naphthalene. Like naphthalene, 1,1-biphenyl is also found in fuel oil. Fluorene, acenaphthene, and phenanthrene are found both in historic fill and petroleum products. Their association with naphthalene and 1,1-biphenyl suggests that they may be derived from the same petroleum-product source at these locations.

Naphthalene was detected at a maximum concentration of 3,400 ppb (compared to its GWQS of 10 ppb) in MW-8S during the July 2008 sampling event. Naphthalene concentrations also exceeded the GWQS at MW-7I during the same sampling event (though at a much lower concentration). Monitoring wells MW-8S and MW-7I are both located near the northwest corner of the Site, near suspected USTs, and where numerous wells have exhibited LNAPL. The likely source of the naphthalene detected at these locations is the LNAPL.

Monitoring Well MW-5I is completed in the sand unit near the southwest corner of the Site, upgradient from the on-site USTs. Naphthalene (and other petroleum-related compounds) detected here may be derived from upgradient off-site source to the east.

Metals were detected at concentrations exceeding their GWQSs in many of the unfiltered groundwater samples collected from the perched zone. In the filtered samples, however, the only metals that exceeded their GWQSs within the perched-water zone were antimony, iron, lead, magnesium, manganese, nickel, sodium and thallium. Iron, magnesium, manganese, and sodium were detected in nearly all the samples and are either naturally occurring or associated with the historic fill present at the Site (RIR, Section 6.5.3).

Of the remaining metals detected in filtered samples collected from the perched-water zone, antimony exceeded it's GWQS at the most locations (17), with the highest antimony concentration (54 ppb, compared to the GWQS of 3 ppb) detected at TW-17. All but one of the filtered samples with elevated levels of antimony was detected in the western half of the Site. Elevated levels of thallium were detected at four locations (all in the western half of the Site). Elevated levels of lead and nickel were detected at only a few locations. The presence of these metals in the unfiltered samples is likely due to historic site operations.

For unfiltered groundwater samples collected from the sand unit, all the metals in the TAL list were detected at concentrations exceeding their GWQS. Like the perched-water zone, metals concentrations in the filtered samples were much lower, and only antimony, iron, magnesium, manganese, and sodium were detected at concentrations exceeding their GWQSs. The maximum antimony concentration detected was 10.5 ppb.

PCBs were not detected in the groundwater at the Site, with the exception of TW-1. In this sample, Arochlor-1260 was detected at a concentration of 1,500 ppb, which exceeds its GWQS of 0.9 ppb by several orders of magnitude. Temporary Well Point TW-1 represents the water quality in the sand unit located beneath the clayey peat confining layer and is also located at the most upgradient portion of the Site. Therefore, the PCBs detected in TW-1 are from an unknown, off-site source to the east (RIR, Section 6.5.4).

Pesticide, 4,4-DDD, was detected in a groundwater sample collected from MW-4S. The 4,4-DDD concentration was 2.6 ppb, which exceeds its GWQS of 0.3. Soil samples collected in this area from borings SBE-17, SBE-18, and SBE-19 also exhibited 4,4-DD. The source of the pesticide is unknown. (See RIR, Section 6.5.4).

LNAPL: Measurable thicknesses of LNAPL have been detected in wells completed in both the perched-water zone and the underlying sand unit. However, the distribution of LNAPL within the two water-bearing zones is very different: LNAPL identified as a variety of oils (motor oil, fuel oil, waste oil, gasoline and Stoddard solvents) is found in the perched-water zone only in the western half of the Site; while LNAPL identified as No. 2 fuel oil is found in the sand unit only in the eastern half of the Site. The available subsurface information indicates that the two LNAPL plumes are completely separate, suggesting that the two plumes have different sources (See RIR, Section 6.4, 6.6).

Several known or suspected USTs (i.e., the heating-oil USTs beneath the sidewalks, and the Stoddard solvent USTs) are present in the western half of the Site within the area covered by the perched-water LNAPL plume, and one or more of these are the likely source of the LNAPL found within the perched-water zone. Monitoring Well MW-12S (screened within the perched-water zone and located hydraulically upgradient of the Site) has not exhibited LNAPL, so it is unlikely that an offsite source to the west is responsible for the LNAPL detected in the perched-water zone.

On-site USTs are the likely source(s) of the LNAPL identified within the perched-water zone. Observations from monitoring wells and soil borings, combined with the local groundwater flow directions, show that the extent of LNAPL within the perched-water zone has been delineated (**Figure 14**). The LNAPL plume in the perched-water zone appears to be derived from the on-site USTs. LNAPL has been detected in off-site (sidewalk) perched-water wells.

With regard to possible sources of the LNAPL plume in the lower sand unit, historical documents show there was a tank in the eastern end of the Site, but there was no evidence detected during EWMA's RI of an on-site source(s) of the LNAPL in the upper unit which could have migrated downward and impacted the lower sand unit. Furthermore, the presence of the clayey peat layer between the two water-bearing zones makes it difficult for LNAPL from any source on the Site to migrate from the perched-water zone into the sand unit. The absence of LNAPL in the sand unit directly beneath the perched-water LNAPL plume demonstrates that the peat layer is preventing the downward migration of LNAPL.

The LNAPL detected in the sand unit appears to be confined to the eastern half of the Site (**Figure 15**). The source of the LNAPL in the sand unit is unknown The presence of LNAPL in the sand unit only near the upgradient (eastern) edge of the Site indicates that the LNAPL source is either located on the upgradient side of the site or located off-site to the east.–. Observations from monitoring wells and soil borings indicate that the LNAPL plume in the sand unit extends from the eastern edge of the Site west to Monitoring Well MW-20I.

2.1.5.3 Summary of Soil Vapor Findings

Soil vapor samples are typically collected to determine the presence or absence of vapors in the soil. The State of New York does not have any standards, criteria or guidance values for concentrations of volatile chemicals in subsurface vapors (i.e. soil gas). The resultant data is merely utilized to determine the potential for human exposures.

The presence of soil vapors, the majority of which appear to be indicative of weathered petroleum products, most likely associated with the historic USTs and asphalt plant operations, was detected in the soil vapor points.

The results of the soil gas sample analyses were compared to the "background" air sampling results and Table 3.1 from the NYSDOH Vapor Intrusion Guidance document. The results of the January 2008 vapor sampling indicate the following VOCs above the background level: acetone, benzene, 1,3-butadiene, carbon disulfide, chloroform, cyclohexane, dichlorodifluoromethane, cis-1,2-dichloroethylene, ethylbenzene, heptane, hexane, isopropyl alcohol, methyl ethyl ketone, methyl isobutyl ketone, methylene chloride, methyl-t-butyl ether, styrene, tetrachloroethylene, toluene, 1,1,1-trichloroethane, trichloroethylene, trichlorofluoromethane, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, vinyl chloride, m or p-xylene, and o-xylene (RIR, Section 6.2).

Of these contaminants, dichlorodifluoromethane was detected in soil gas sample SG-2 (5.1 ug/m^3) and was not detected in any of the sub-slab vapor samples. Cis-1,2-dichloroethylene, isopropyl alcohol, methyl isobutyl ketone, methyl-t-butyl ether, styrene and vinyl chloride were detected in the sub-slab vapor sampling but were not detected in the soil gas.

Methylene chloride and tetrachloroethylene were detected above the NYSDOH air guideline values (Table 3.1 of the NYSDOH Guidance document) in both the soil gas and sub-slab vapor samples. Methylene chloride was detected in soil gas samples SG-2 (63 ug/m^3) and SG-3 (274 ug/m^3) and sub-slab vapor sample SS-4 (247 ug/m^3). Tetrachloroethylene was detected in soil gas sample SG-3 (136 ug/m^3). The soil vapor results summary has been included as **Table 4**. These compounds are likely associated with historic site operations.

2.2 SIGNIFICANT THREAT

NYSDOH has determined that the Site *does not* pose a significant threat to public health. However, NYSDEC has determined that this Site *does* pose a significant threat to the environment. Notice of that determination has been provided for public review. A copy of the notice is included in **Appendix 6**.

2.3 SITE HISTORY

2.3.1 Past Uses and Ownership

According to the previous Phase I Environmental Site Assessments (ESAs) by others, the subject Site had initially been developed prior to 1898 for use as an ink factory (i.e., M.L. Perlee) and a varnish works (i.e., Pratt & Lambert). Other previous occupants and uses identified at the Site included George L. Fenner (ink factory), Toch Bros. (manufacturer of paints & varnishes), Thibault & Walker Co. (varnish works), I. Wohl Inc. (cleaners & dyers), a dry cleaning and spotting facility, and Accurate Metal Casting Co., Inc. These identified occupants and uses likely used industrial solvents, lubricating and cutting oils, metal polishing materials, plating bath solutions, paint and painting products, and dye products as part of their operations.

Based on available information, a portion of the Site identified as 5-20 46th Road, Long Island City, New York (Block 28, Lot 21) was the subject of an Administrative Order (Docket No. II RCRA-7003-91-0201) issued by the United States Environmental Protection Agency (USEPA) pursuant to Resource Conservation and Recovery Act (RCRA), Section 7003. Pursuant to this Order, Accurate Associates undertook certain removal, investigative and remedial activities at the premises under USEPA's oversight. As part of the remedial activities, portions of the concrete floor and walls within this portion of the Site were encapsulated for the purpose of encapsulating residual lead, arsenic, and selenium contamination. Pursuant to EPA's RCRA Administrative Order for the Site, effective May 29, 1991, the Order's Respondents filed a Notice in Deed in the Queens County City Register on July 14, 1993, No. 47605. The Notice stated that lead, arsenic and selenium are encapsulated beneath portions of the floor and walls at the premises, and that the RCRA Order required that the encapsulation be maintained. The Deed Notice was the final action required by Respondents pursuant to the RCRA Order, as all other removal and remediation actions were satisfactorily performed.

By a letter transmitted to DEC on March 29, 2007, EPA consented to the suspension of the Notice in Deed, No. 47605, and termination of that Notice, upon completion of the remedial program carried out pursuant to the BCP, and provided that the Brownfield Cleanup Agreement be filed in the same place and manner as the Notice in Deed, No. 47605 together with a copy of the EPA consent letter.

On April 5, 2007, NYSDEC accepted OCA's request to participate in the Brownfield Cleanup Program, established under Article 27, Title 14 of the Environmental Conservation Law (ECL). The NYSDEC has accepted OCA to participate in the program as a Volunteer. NYSDEC transmitted the Brownfield Cleanup Agreement (BCA) along with this approval to OCA for signatures and return back to NYSDEC for final execution.

2.3.2 Phase I and Phase II Reports

1. Several environmental investigation activities have been completed at the subject Site on behalf of the former as well as the current owners of the Site. The following provides a list of reports that summarize the prior environmental investigation activities, and were previously submitted as part of the BCP application for the Site: "Phase I Environmental Site Assessment, 46-31, 46-33,

46-35 5th Street, Long Island City, New York", prepared by J.C. Broderick & Associates, Inc. (JCB), June 2005;

2. Letter report titled "Environmental Sampling Services Utilizing Geoprobe® Methodology at 5-36 46th Road, Long Island City, New York, Sampling Date: May 18,2005", prepared by JCB, June 09, 2005;

3. Letter report titled "Environmental Sampling Services Utilizing Geoprobe® Methodology at 5-36 46th Road, Long Island City, New York, Sampling Date: August 08 and 09, 2005", prepared by JCB, September 19, 2005;

4. "Phase I Environmental Site Assessment, 5-20 46th Road, Long Island City, New York", prepared by EEA, Inc. (EEA), May 4, 2006;

5. "Phase II Subsurface Investigation Report, 5-20 46th Road, Long Island City, New York", prepared by EEA, May 19, 2006

In addition to the investigation activities summarized in the reports above, investigation and cleanup activities were conducted during 1991-1992 at the subject Site as part of the USEPA enforcement actions under the RCRA Administrative Order at the 5-20 46th Road portion of the Site. The following reports summarize the results of these activities, and were available to EWMA as part of the preparation of this RIWP:

1. "Report of Investigation and Clean-Up Activities, Accurate Famous Castings, Inc. Site, Long Island City, New York", prepared by CA Rich Consultants, Inc. (CA Rich), March 24, 1992;

2. "Report of Soil Sample Investigation for: Accurate Famous Castings, Inc. Site, Long Island City, New York", prepared by CA Rich, July 10, 1992;

3. "Corrective Measures Plan for the Accurate Famous Casting Site, Long Island City, New York", prepared by CA Rich, July 10, 1992.

2.3.3 Sanborn Maps

Review of Sanborn maps dating back to as early as 1898 indicated that several buildings on the Site were occupied by manufacturing and cleaning companies that engaged in the manufacture of varnishes, paints, inks, and other materials considered hazardous. Other occupants depicted on the Sanborn were a wood working facility, metal caster, silver smith, cleaner and dyers, pool table manufacturer, cabinet maker, automobile shops, and a dry cleaner. An area of the Site, depicted on the site plan, is labeled as containing "22-1,500 gallon Varnoline Tanks under" concrete. Based on the Sanborn maps, a significant amount of hazardous materials were used on the Site. Based on the presence of many of the buildings dating back to the 1890's as well as areas labeled as "boilers", fuel oil tanks are likely located along the streets or under the buildings. Refer to copies of Sanborn Maps included as **Appendix 7.**

2.4 GEOLOGICAL CONDITIONS

2.4.1 Site Geology

The uppermost unit beneath the Site consists of 10 to 12 feet of historic fill material. The fill is very variable, but tends to be coarse grained (i.e., sand and/or gravel). Cinders, coal, and brick and wood fragments are common within the fill. Below the fill lies one to three feet of dark brown clayey peat. This clayey peat has been encountered in nearly all the soil borings, so it appears to be continuous beneath the Site. The clayey peat is interpreted as marsh/wetland deposits, and probably represents the natural ground surface before historic fill was emplaced at the Site.

Fine to coarse sand to silty sand underlies the clayey peat. The top of the sand is found at depths ranging from 11 to 15 feet bsg. Discontinuous lenses of silt and clay are present within the sand.

Bedrock was not encountered in any of the borings completed by EWMA, but geotechnical borings completed at the Site reportedly have encountered bedrock (gray schist) at depths ranging from 32 feet bsg to greater than 52 feet bsg.

2.4.2 Site-Specific Hydrogeology

Based on the soil boring and well installations performed by EWMA and others, there are two water-bearing zones immediately beneath the Site: an upper, perched-water zone, and an underlying sand unit.

The perched-water zone occurs within the fill material on top of the clayey peat. Depths to water in monitoring wells completed within the perched zone are about seven to eight feet bsg. The saturated thickness of the perched zone is three to four feet.

The sand unit underlies the clayey peat layer. Depths to water for monitoring wells completed in the sand unit are about 10 to 11 ft bsg.

The difference in water levels between the perched-water zone and the sand unit (two to three feet) shows that the clayey peat is acting as a confining layer, and is limiting the downward migration of groundwater from the fill into the underlying sand unit.

Based on water-level elevation contour maps (**Figures 8 through 11),** groundwater flow within the sand unit is to the southwest, toward the nearby East River (as expected). This contrasts sharply with groundwater flow within the overlying perched-water zone, which is to the north and east. The reason for the eastward flow within the perched water zone is not known, but it may reflect the surface water drainage patterns that existed in the area before the historic fill was emplaced.

Geologic cross-sections were prepared for the Site and are included as **Figure 12.**

2.5 CONTAMINATION CONDITIONS

2.5.1 Conceptual Model of Site Contamination

Soil

VOCs, including acetone, methylene chloride, 2-butanone, benzene, and ethyl benzene were detected at concentrations that exceeded their UUSCO in soils. The most elevated VOC concentrations in soils were detected above the clayey peat layer in the western half of the Site. The source for most of the VOCs appears to be spills associated with the former USTs (Varnoline, gasoline, and fuel oil) at the Site.

SVOCs, including naphthalene, acenaphthene, fluorene, phenanthrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, dibenzofuran, and dibenz(a,h)anthracene, were detected at concentrations above their UUSCO. Several SVOCs, including naphthalene, fluorine and phenanthrene, are likely due to the petroleum product releases from on-site USTs at the Site.

Metals, including arsenic, copper, lead, mercury, nickel, and zinc were detected at concentrations exceeding their UUSCOs throughout the Site and are likely due to historic site operations and/or historic fill materials.

One pesticide (4,4-DDD) was detected in three soil borings near the western edge of the Site. No PCBs were detected in soil.

The bulk of the contaminants detected in soil at the Site, including VOCs, metals and SVOCs, are derived from on-site AOCs. Several SVOCs and metals may be derived from on-site fill materials.

Groundwater

VOCs, including acetone, ethylbenzene, isopropylbenzene, benzene, toluene, vinyl chloride, methylene chloride, tetrachloroethene, cis-1,2-dichloroethene, and t-1,3-dichloropropene, exceeded their GWQS in groundwater samples. The most elevated VOC concentrations were detected within the perched-water zone in the western portion of the Site. Concentrations detected in the eastern portion of the Site and in the sand unit were significantly lower. Two VOCs, acetone and isopropylbenzene, were detected most frequently and at the highest concentrations. The source of the acetone is likely the Varnoline UST area and the fuel oil/gasoline USTs are the likely source of the isopropylbenzene, benzene and toluene.

Several SVOCs, including 2,4-dimethylphenol, 1,1-biphenyl, acenaphthene, fluorene, pentachlorophenol, phenanthrene, fluoranthene, benzo(a)anthracene, chrysene, bis(2-ethylhexylphthalate), benzo(b)fluoranthene, benzo(k)fluoranthene, and indeno(1,2,3-cd)pyrene were detected in groundwater at concentrations exceeding their GWQS,. These SVOC's were encountered sporadically throughout out the Site in both the perched-water zone and in the sand unit (at much lower concentrations). Naphthalene, fluorene, phenanthrene and 1,1-biphenyl are likely derived from petroleum products released from the USTs at the Site. The other SVOCs may be due to historic site operations and/or historic fill.

Metals including antimony, thallium and lead were detected in the groundwater above NYS GWQS. These metals are likely derived from historic site operations. Other metals, including iron, manganese, and sodium are either naturally occurring or associated with the historic fill.

PCBs were detected in a single groundwater sample, collected from Temporary Well Point TW-1. TW-1 was completed beneath the clayey peat layer within the sand unit close to the eastern edge of the Site. While the LNAPL from TW-1 was not analyzed for PCBs, an LNAPL sample was collected and analyzed for PCBs from permanent monitoring well MW-1OI (installed within 10 feet of TW-1 location) and was non detect. Groundwater flow within the sand unit is toward the west, and since there are no nearby potential PCB sources on-site, the PCB detected at this location may be derived from an upgradient, off-site source to the east.

Two off-site wells completed in the perched-water zone (MW-12S and MW-8S) exhibited elevated levels of VOCs and/or SVOCs. MW-12S is located on the hydraulically upgradient (west) of the Site, so the isopropylbenzene detected there may be derived from an off-site source. MW-8S is located hydraulically downgradient of the former gasoline and Varnoline USTs, so the naphthalene, benzene, and other VOCs detected in this well are probably derived from one or both of those sources.

LNAPL identified via GC fingerprinting as a variety of oils (motor oil, fuel oil, waste oil, gasoline and Stoddard solvents) was detected in the perched water unit in wells MW-3S, MW-4S, MW-6S, MW-7S, GW-3, GW-4, and GW-5 during at least one measurement event. The greatest LNAPL thickness measured in the perched-water zone was 3.6 ft, detected in MW-6S on July 17, 2008. The LNAPL detected in these wells is brown to black with a petroleum-hydrocarbon odor. At some wells where LNAPL was confirmed to be present (using a bailer), the LNAPL did not register on the interface probe, and the LNAPL thickness could not be determined. The LNAPL extent was determined based on LNAPL measurements in monitoring wells and the presence or absence of hydrocarbon sheens and odors in soil borings. Within the perched-water zone, LNAPL is present only in the western half of the Site.

Within the sand unit, four monitoring wells (MW-10I, MW-14I, MW-16I and MW-20I) have exhibited measurable thicknesses of LNAPL identified via GC fingerprinting as No. 2 fuel oil**.** All of these wells are located in the eastern portion of the Site and the most upgradient with regard to groundwater flow direction in the sand unit indicating an off-site source. LNAPL thicknesses detected in these wells ranges from 0.54 to 7.97 ft. A fourth well completed within the sand unit near the southern edge of the Site (MW-15I) has not exhibited measurable LNAPL, but it did produce small amounts of LNAPL during development. Monitoring Well MW-18I exhibited LNAPL when it was originally installed, but it could not be accessed during the February 2009 measurement event. Monitoring Well MW-20I did not exhibit any LNAPL when it was installed, but it did exhibit 0.54 ft of LNAPL two months later. The LNAPL extent was estimated based on LNAPL measurements in monitoring wells and the presence or absence of hydrocarbon sheens and odors in soil borings. Within the sand unit, LNAPL was found to be present only in the eastern half of the Site. Although LNAPL was detected in MW-20I, the LNAPL thickness detected here (0.54 ft) is much lower than the LNAPL thicknesses detected in wells located further to the east. This suggests that MW-20I is close to the leading (i.e. western) edge of the LNAPL plume.

Soil Vapor

The results of the January 2008 vapor sampling indicate the following VOCs above the background level: acetone, benzene, 1,3-butadiene, carbon disulfide, chloroform, cyclohexane, dichlorodifluoromethane, cis-1,2-dichloroethylene, ethylbenzene, heptane, hexane, isopropyl alcohol, methyl ethyl ketone, methyl isobutyl ketone, methylene chloride, methyl-t-butyl ether, styrene, tetrachloroethylene, toluene, 1,1,1-trichloroethane, trichloroethylene, trichlorofluoromethane, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, vinyl chloride, m or p-xylene, and o-xylene.

Of these contaminants, dichlorodifluoromethane was detected in soil gas sample SG-2 (5.1 ug/m^3) and was not detected in any of the sub-slab vapor samples. Cis-1,2-dichloroethylene, isopropyl alcohol, methyl isobutyl ketone, methyl-t-butyl ether, styrene and vinyl chloride were detected in the sub-slab vapor sampling but were not detected in the soil gas.

Methylene chloride and tetrachloroethylene were detected above the NYSDOH air guideline values (table 3.1 of the NYSDOH Guidance document) in both the soil gas and sub-slab vapor samples. Methylene chloride was detected in soil gas samples SG-2 (63 ug/m^3) and SG-3 (274 ug/m^3) and sub-slab vapor sample SS-4 (247 ug/m^3). Tetrachloroethylene was detected in soil gas sample SG-3 (136 ug/m^3).

2.5.2 Description of Areas of Concern

A total of 18 AOCs have been identified and investigated at the Site.

- AOC-1: Former 10,000-Gallon #6 Fuel Oil UST/ 46th Road Sidewalk;
- AOC-2: Eastern Parking Lot;
- AOC-3: 1-Story Brick/ Concrete Block Building (Demand Electric);
- AOC-4: Motorcycle Repair Shop (Basement);
- AOC-4A: 1-Story Building;
- AOC-5: 3-Story Brick Building (Art Studios);
- AOC-6: 1-Story Brick Building (Knossos Custom Design Furniture);
- AOC-6A: 2-Story Brick Building;
- AOC-7: Two (2) Former Gasoline Storage Tanks;
- ACO-7A: Suspect Former Boiler/ Stack Area;
- AOC-8: Suspect Twenty-Two (22) 1,500-Gallon Varnoline Storage Tanks;
- AOC-9: 1-Story Building (AMN Renovation);
- AOC-10: 1-Story Building (JMJ Electrical);
- AOC-11: Former Wohl Inc. Cleaners and Dyers (Direct Air),
- AOC-12: Former Wohl Inc. Cleaners and Dyers (Liberty Contracting);
- AOC-13: 5th Street Sidewalk;
- AOC-14: Former Accurate Associates RCRA Area; and,
- AOC-15: 47th Avenue Sidewalk

2.5.3 Identification of Standards, Criteria and Guidance

Analytical results from the soil samples collected on the Site were compared to the Unrestricted Use Soil Cleanup Objectives (UUSCOs) outlined in 6 NYCRR Subpart 375-6. If no Part 375 SCO was established for a particular compound, EWMA utilized the SCO from NYSDEC's *Technical and Administrative Guidance Memorandum 4046* (TAGM 4046) as directed by the NYSDEC. The groundwater data was compared to the groundwater quality standards (GWQS) for class GA groundwaters as listed in NYSDEC Technical Operation and Guidance Series (TOGS) 1.1.1 "Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations".

2.5.4 Soil Contamination

A detailed account of the RI findings is included in the Remedial Investigation Report. The soil samples collected during the RI phase of the investigation was targeted toward specific contaminants of concern (i.e. contaminants associated with historic site operations) as well as a full suite of analysis for non-area specific sampling.

A map depicting the sample locations is included as **Figure 2.** A table summarizing the exceedances of UUSCO is included as **Table 1. Figure 3** depicts the location of the documented soil exceedances of the UUSCO.

The following VOCs were detected in soil at concentrations exceeding the UUSCO: acetone; methylene chloride; 2-butanone; benzene; and ethyl benzene. Acetone was the most commonly detected VOC, and exceeded its UUSCO (0.05 ppm) at 14 boring locations. The highest acetone concentration (2.6 ppm) was detected at 7-8 ft bsg in Soil Boring SB-19. Acetone concentrations in the rest of the soil samples were all below 1 ppm. Acetone was detected in soil throughout the Site, and does not appear to be concentrated in any particular AOC.

The second most commonly detected VOC was ethylbenzene, which exceeded its UUSCO (1 ppm) at three boring locations. The highest ethylbenzene concentration (6.9 ppm) was detected at SB-18.

The remaining VOCs were each detected in only one or two samples, at concentrations that only slightly exceeded their UUSCO.

SUMMARY OF VOC SOIL CONTAMINANT

Parameter	UUSCO (ppm)	Total # of Samples	# Samples > UUSCO	Maximum Concentration (ppm)
Acetone	0.05	47	22	2.6
Methylene Chloride	0.05	47	1	0.05
2-Butanone	0.12	47	1	0.12
Cis-1,2-Dichloroethene	0.25	47	1	0.27
Benzene	0.06	47	2	0.4
Ethyl Benzene	1	47	3	6.9

UUSCO – Unrestricted Use Soil Cleanup Objectives. NYSDEC Subpart 375-6: Remedial Program Soil Cleanup Objectives, December 14, 2006

ppm – Parts per Million

Polynuclear aromatic hydrocarbons (PAHs) were the most commonly detected SVOCs in soil at the Site. PAHs detected at concentrations exceeding their respective UUSCO include naphthalene, acenaphthene, fluorene, phenanthrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, dibenzofuran, and dibenz(a,h)anthracene). PAHs were detected in soil throughout the Site, but the highest concentrations were detected in samples collected from, depths of 12 ft bsg or less indicating the source of the contaminants is from historic site operations and/or historic fill materials. Soil samples collected from below this depth had low or non-detectable PAH concentrations.

Several PAHs, including naphthalene, fluorene, and phenanthrene, are commonly found in fuel oil (although fluorene and phenanthrene are also found in fly ash). Naphthalene exceeded its UUSCO (12 ppm) at four boring locations (SBE-1, SBE-11, SBE-12, and SBE-RCRA-3). The highest concentration of naphthalene detected was 230 ppm, detected in SBE-12 at 10-11 ft. Fluorene exceeded its UUSCO at two locations, and phenanthrene exceeded its UUSCO at one location. The highest fluorene concentration was 53 ppm (compared to the UUSCO of 30 ppm), detected at SBE-1. The highest phenanthrene concentration was 130 ppm (compared to the UUSCO of 100 ppm), and was also detected at SBE-1.

Elevated naphthalene concentrations were generally encountered in soil above the clayey peat (i.e., depths of 12 ft bsg or less), except for boring SBE-1. In SBE-1, naphthalene was not detected in the sample collected from above the clayey peat, but was detected (at a concentration of 84 ppm) below the clayey peat layer, at 12.5-13.5 ft bsg. Elevated concentrations of fluorene and phenanthrene were also detected at this level.

The source of the naphthalene and other PAHs in soil at SBE-1 cannot be definitively determined. Fuel oil releases from USTs located in AOC-1 are likely the source of the naphthalene detected in SBE-12, but there is no obvious on-site source for the naphthalene detected in SBE-1 and other borings

In SBE-1, naphthalene and other PAHs were detected below the clayey peat layer. There are no identified naphthalene sources (i.e., fuel-oil USTs) in that area of the Site, and the sample collected from above the clayey peat in SBE-1 did not exhibit naphthalene. Therefore, it is unlikely that a nearby surface or UST spill is responsible for the detected naphthalene. Instead, naphthalene detected below the clayey peat layer at SB-1 is most likely due to an off-site source to east.

SUMMARY OF SVOC SOIL CONTAMINANT

Parameter	UUSCO (ppm)	Total # of Samples	# Samples > UUSCO	Maximum Concentration (ppm)
2-Methylphenol	0.33	47	1	0.76
3+4-Methylphenols	0.33	47	2	3.7
Naphthalene	12	47	4	230
Acenaphthene	20	47	2	67
Dibenzofuran	7	47	2	57
Fluorene	30	47	2	53
Phenanthrene	100	47	1	130
Benzo(a)anthracene	1	47	20	31
Chrysene	1	47	19	31
Benzo(b)fluoranthene	1	47	21	57
Benzo(k)fluoranthene	0.8	47	16	22
Benzo(a)pyrene	1	47	22	59
Indeno(1,2,3-cd)pyrene	0.5	47	22	51
Dibenz(a,h)anthracene	0.33	47	16	12

UUSCO – Unrestricted Use Soil Cleanup Objectives. NYSDEC Subpart 375-6: Remedial Program Soil Cleanup Objectives, December 14, 2006. ppm – Parts per Million

Metals in soil that exceeded their respective UUSCO were arsenic, copper, lead, mercury, nickel, and zinc. Elevated concentrations of one or more metals were detected in soil samples collected from 17 borings throughout the Site. The source of the detected metals may be the historic site operations and/or historic fill materials.

SUMMARY OF METALS SOIL CONTAMINANT				
PARAMETER	**UUSCO (ppm)**	**# SAMPLES**	**# SAMPLES > UUSCO**	**MAXIMUM CONCENTRATION (ppm)**
Arsenic	13	47	1	19
Copper	50	47	6	501
Lead	63	47	13	4,490
Mercury	0.18	47	19	11.3
Nickel	30	47	1	31.5
Zinc	109	47	6	401

UUSCO – Unrestricted Use Soil Cleanup Objectives. NYSDEC Subpart 375-6: Remedial Program Soil Cleanup Objectives, December 14, 2006. ppm – Parts per Million

The only pesticide detected in soil at the Site was 4,4-DDD, which exceeded it's UUSCO in soil samples collected from SBE-17, SBE-18, and SBE-19. The highest concentration of 4,4-DDD was 3.3 mg/kg (compared to the UUSCO of 0.0033 mg/kg), detected at 5.5-6.5 ft bsg in SBE-17. The pesticide 4,4-DDD has not been used in the United States since the 1970's; how it may have been used at the Site is unknown.

SUMMARY OF PESTICIDES SOIL CONTAMINANT				
Parameter	**UUSCO (ppm)**	**Total # of Samples**	**# Samples > UUSCO**	**Maximum Concentration (ppm)**
4,4-DDE	0.0033	47	1	0.0078
4,4-DDD	0.0033	47	5	3.3
4,4-DDT	0.0033	47	1	0.0076

UUSCO – Unrestricted Use Soil Cleanup Objectives. NYSDEC Subpart 375-6: Remedial Program Soil Cleanup Objectives, December 14, 2006. ppm – Parts per Million

PCBs were detected at concentrations above UUSCO in two samples. LNAPL samples were analyzed for PCBs and were non-detect. Therefore, the source of the PCBs is unknown.

SUMMARY OF PCB SOIL CONTAMINANT				
Parameter	**UUSCO (ppm)**	**Total # of Samples**	**# Samples > UUSCO**	**Maximum Concentration (ppm)**
PCB (Aroclor 1254)	0.1	47	1	1.1
PCB (Aroclor 1260)	0.1	47	2	0.2

UUSCO – Unrestricted Use Soil Cleanup Objectives. NYSDEC Subpart 375-6: Remedial Program Soil Cleanup Objectives, December 14, 2006. ppm – Parts per Million

2.5.5 On-site Groundwater Contamination

A detailed account of the RI findings is included in the revised Remedial Investigation Report. The groundwater samples collected during the RI phase of the investigation was targeted toward specific contaminants of concern (i.e. contaminants identified in the soil at concentrations above UUSCO) as well as a full suite of analysis for non-area specific sampling.

A map depicting the sample locations is included as **Figure 2.** A table summarizing the exceedances of the GWQS is included as **Table 2. Figures 4 through 7** depict the location of the documented groundwater exceedances of the GWQS.

Several VOCs have been detected in groundwater samples at concentrations exceeding the NYS GWQS. VOCs that exceeded their GWQS include acetone, ethylbenzene, isopropylbenzene, benzene, toluene, vinyl chloride, methylene chloride, tetrachloroethene, cis-1,2-dichloroethene, and t-1,3-dichloropropene.

The highest VOC concentrations were detected within the perched-water zone in the western portion of the Site (**Figure 4**); VOC concentrations were very low or non-detectable for groundwater samples collected in the eastern portion of the Site.

Most of the VOCs detected were detected at only one or two locations, but a few were detected more widely across the Site. Acetone and isopropylbenzene were detected most frequently and at the highest concentrations. Acetone was detected at concentrations which exceeded the 50 ppb GWQS at six locations, with the highest acetone concentrations detected at TW-RCRA-1 and TW-15 (both 340 ppb). Isopropylbenzene concentrations exceeded the 5 ppb GWQS at 14 locations, with the highest concentration (110 ppb) detected at TW-16.

The highest acetone concentrations are clustered in areas adjacent to the former Varnoline UST area (AOC 8). Outside of that area, acetone exceeded the standard at TW-19 only, which is located in AOC 12 (former Wohl, Inc. cleaners and dyers). These findings indicate that the presence of acetone is due to historic site operations.

The highest isopropylbenzene concentrations are also found in the western portion of the Site. Isopropylbenzene is a component of fuel oil. Several suspected fuel oil USTs are located in the western portion of the Site, and numerous wells in this area have also exhibited LNAPL. Therefore, UST releases in the western area of the Site are the likely source of the isopropylbenzene.

The distribution of VOCs in the sand unit is similar to the distribution within the perched-water zone. Isopropylbenzene and acetone are present at the highest concentrations and are concentrated in the western portion of the Site. However, it should be noted that the VOC concentrations in the sand unit are much lower when compared to the overlying perched-water zone concentrations. This indicates that the clayey peat is behaving as a confining layer, and limiting downward migration of VOCs in groundwater.

TW-1 was screened within the sand unit and exhibited elevated VOC concentrations in groundwater. TW-1 is located near the eastern edge of the Site (**Figure 5**). Benzene, toluene, ethylbenzene, and isopropylbenzene were detected at concentrations exceeding their GWQS. These compounds are components of fuel oil, and while historical documents reference a possible tank in the eastern end of the Site, there was no evidence of a tank or LNAPL detected during EWMA's remedial investigation activities in the upper unit which could have migrated downward and impacted the lower sand unit. Groundwater flow within the sand unit is westward, so the source of these compounds is most likely dissolution from the LNAPL plume. The presence of LNAPL in the nearby monitoring well, MW-10I, also completed in the sand unit, indicates that there is an upgradient, off-site source of fuel oil (or other petroleum product) to the east or an unknown on-site source.

SUMMARY OF UNFILTERED VOC GROUNDWATER CONTAMINATION [1](Perched Zone)

PARAMETER	TOGs 1.1.1 (ppb)	# SAMPLES	# SAMPLES > TOGs	MAXIMUM CONCENTRATION (ppb)
Vinyl Chloride	2	45	2	5.4
Acetone	50	45	6	340
Methylene Chloride	5	45	1	13
Cis-1,2-Dichloroethene	5	45	1	58
Benzene	1	45	5	100
Toluene	5	45	3	22
Trans-1,2-Dichloropropene	0.4	45	1	21
Tetrachloroethene	5	45	1	13
Ethyl Benzene	5	45	5	150
Isopropylbenzene	5	45	24	150

TOGS – NYSDEC Division of Water Technical and Operational Guidance Series (1.1.1) – Ambient Water Quality Standards, June 1998. ppb – Parts per Billion

[1] OCA recognized that NYSDEC does not accept the analytical results from filtered samples. However, the results of the filtered and unfiltered samples are included for discussion purposes.

SUMMARY OF UNFILTERED VOC GROUNDWATER CONTAMINATION (Sand Unit)				
PARAMETER	**TOGs 1.1.1 (ppb)**	**# SAMPLES**	**# SAMPLES > TOGs**	**MAXIMUM CONCENTRATION (ppb)**
Vinyl Chloride	2	21	1	12
Benzene	1	21	4	170
Toluene	5	21	2	140
Trans-1,2-Dichloropropene	0.4	21	1	11
Ethyl Benzene	5	21	6	530
Isopropyl Benzene	5	21	7	290

TOGS – NYSDEC Division of Water Technical and Operational Guidance Series (1.1.1) – Ambient Water Quality Standards, June 1998. ppb – Parts per Billion

Several SVOCs were detected in groundwater at concentrations exceeding their GWQS, including 2,4-dimethylphenol, 1,1-biphenyl, acenaphthene, fluorene, pentachlorophenol, phenanthrene, fluoranthene, benzo(a)anthracene, chrysene, bis(2-ethylhexylphthalate), benzo(b)fluoranthene, benzo(k)fluoranthene, and indeno(1,2,3-cd)pyrene. These SVOC's were encountered sporadically throughout the Site, in both the unfiltered and laboratory-filtered samples, and in both the perched-water zone and in the sand unit (at much lower concentrations).

Several SVOC's (1,1-biphenyl, fluorene, acenaphthene, and phenanthrene) exceeded their GWQSs in the same wells that exhibited elevated levels of naphthalene. Like naphthalene, 1,1-biphenyl is also found in fuel oil. Fluorene, acenaphthene, and phenanthrene are found both in historic fill and petroleum products. Their association with naphthalene and 1,1-biphenyl suggests that they may be derived from the same petroleum-product source at these locations.

Naphthalene was detected at a maximum concentration of 3,400 ppb (compared to its GWQS of 10 ppb) in MW-8S during the July 2008 sampling event. Naphthalene concentrations also exceeded the GWQS at MW-7I during the same sampling event (though at a much lower concentration). Monitoring wells MW-8S and MW-7I are both located near the northwest corner of the Site, near suspected USTs, and where numerous wells have exhibited LNAPL (**Figure 14**). The likely source of the naphthalene detected at these locations is the LNAPL.

Monitoring Well MW-5I is completed in the sand unit near the southwest corner of the Site, upgradient from the on-site USTs. Naphthalene (and other petroleum-related compounds) detected here may be derived from an unknown on-site or off-site source.

SUMMARY OF UNFILTERED SVOC GROUNDWATER CONTAMINATION (Perched Zone)				
PARAMETER	**TOGs 1.1.1 (ppb)**	**# SAMPLES**	**# SAMPLES > TOGs**	**MAXIMUM CONCENTRATION (ppb)**
Naphthalene	5	39	7	3400
1,1-Biphenyl	5	39	1	66
Acenaphthene	20	39	1	420
Fluorene	50	39	5	250
Phenanthrene	50	39	6	540
Anthracene	50	39	1	110
Fluoranthene	50	39	3	280
Pyrene	50	39	2	160
Benzo(a)anthracene	0.002	39	12	24
Chrysene	0.002	39	13	20
bis(2-Ethylhexyl)phthalate	5	39	5	490
Benzo(b)fluoranthene	0.002	39	12	110
Benzo(k)fluoranthene	0.002	39	6	8
Indeno(1,2,3-cd)pyrene	0.002	39	7	12

TOGS – NYSDEC Division of Water Technical and Operational Guidance Series (1.1.1) – Ambient Water Quality Standards, June 1998. ppb – Parts per Billion

SUMMARY OF FILTERED SVOC GROUNDWATER CONTAMINATION (Perched Zone)				
PARAMETER	**TOGs 1.1.1 (ppb)**	**# SAMPLES**	**# SAMPLES > TOGs**	**MAXIMUM CONCENTRATION (ppb)**
Acenaphthene	20	21	2	290
Fluorene	50	21	1	150
Pentachlorophenol	1	21	1	7.3
Phenanthrene	50	21	1	100
Chrysene	50	21	1	1.2
Benzo(b)fluoranthene	0.002	21	1	1.5

TOGS – NYSDEC Division of Water Technical and Operational Guidance Series (1.1.1) – Ambient Water Quality Standards, June 1998. ppb – Parts per Billion

SUMMARY OF UNFILTERED SVOC GROUNDWATER CONTAMINATION (Sand Unit)				
PARAMETER	**TOGs 1.1.1 (ppb)**	**# SAMPLES**	**# SAMPLES > TOGs**	**MAXIMUM CONCENTRATION (ppb)**
2,4-Dimethylphenol	1	27	4	20
Naphthalene	10	27	5	1,400
1,1-Biphenyl	5	27	4	12
Acenaphthene	20	27	3	110
Fluorene	50	27	7	950
Pentachlorophenol	1	27	1	10
Phenanthrene	50	27	2	2,100
Anthracene	50	27	2	260
Fluoranthene	50	27	2	100
Pyrene	50	27	2	210
Benzo(a)anthracene	0.002	27	2	18
Chrysene	0.002	27	2	35

TOGS – NYSDEC Division of Water Technical and Operational Guidance Series (1.1.1) – Ambient Water Quality Standards, June 1998. ppb – Parts per Billion

SUMMARY OF FILTERED SVOC GROUNDWATER CONTAMINATION (Sand Unit)				
PARAMETER	**TOGs 1.1.1 (ppb)**	**# SAMPLES**	**# SAMPLES > TOGs**	**MAXIMUM CONCENTRATION (ppb)**
2,4-Dimethylphenol	1	6	1	22
1,1-Biphenyl	5	6	3	100
Acenaphthene	20	6	3	420
Fluorene	50	6	3	750
Phenanthrene	50	6	2	1,800
Anthracene	50	6	2	210
Fluoranthene	50	6	2	64
Pyrene	50	6	2	310
Benzo(a)anthracene	0.002	6	2	22

Chrysene	0.002	6	2	34
Benzo(b)fluoranthene	0.002	6	1	0.48
Benzo(k)fluoranthene	0.002	6	1	0.34
Indeno(1,2,3-cd)pyrene	0.002	6	1	0.74

TOGS – NYSDEC Division of Water Technical and Operational Guidance Series (1.1.1) – Ambient Water Quality Standards, June 1998. ppb – Parts per Billion

Metals were detected at concentrations exceeding their GWQSs in many of the unfiltered groundwater samples collected from the perched zone. In the filtered samples, however, the only metals that exceeded their GWQSs within the perched-water zone were antimony, iron, lead, magnesium, manganese, nickel, sodium and thallium. Iron, magnesium, manganese, and sodium were detected in nearly all the samples and are either naturally occurring or associated with the historic fill present at the Site.

Of the remaining metals detected in filtered samples collected from the perched-water zone, antimony exceeded it's GWQS at the most locations (17), with the highest antimony concentration (54 ppb, compared to the GWQS of 3 ppb) detected at TW-17. All but one of the filtered samples with elevated levels of antimony was detected in the western half of the Site. Elevated levels of thallium were detected at four locations (all in the western half of the Site). Elevated levels of lead and nickel were detected at only a few locations. The presence of these metals in the unfiltered samples is likely due to historic site operations.

For unfiltered groundwater samples collected from the sand unit, all the metals in the TAL list were detected at concentrations exceeding their GWQS. Like the perched-water zone, metals concentrations in the filtered samples were much lower, and only antimony, iron, magnesium, manganese, and sodium were detected at concentrations exceeding their GWQSs. The maximum antimony concentration detected was 10.5 ppb.

SUMMARY OF <u>UNFILTERED</u> METALS GROUNDWATER CONTAMINATION (Perched Zone)				
PARAMETER	**TOGs 1.1.1 (ppb)**	**# SAMPLES**	**# SAMPLES > TOGs**	**MAXIMUM CONCENTRATION (ppb)**
Antimony	3	43	5	314
Arsenic	25	43	4	129
Barium	1000	43	6	2,060
Beryllium	3	43	3	6.4
Cadmium	5	43	2	15.8
Chromium	50	43	8	155
Copper	200	43	5	457
Iron	300	43	43	195,000
Lead	25	43	25	4,820

Magnesium	35000	43	16	91,100
Manganese	300	43	43	5,850
Mercury	0.7	43	13	103
Nickel	100	43	4	677
Selenium	10	43	1	25.4
Sodium	20000	43	42	1,200,000
Thallium	0.5	43	7	49.2
Zinc	2000	43	1	3,150

TOGS – NYSDEC Division of Water Technical and Operational Guidance Series (1.1.1) – Ambient Water Quality Standards, June 1998. ppb – Parts per Billion

SUMMARY OF <u>FILTERED</u> METALS GROUNDWATER CONTAMINATION (Perched Zone)				
PARAMETER	**TOGs 1.1.1 (ppb)**	**# SAMPLES**	**# SAMPLES > TOGs**	**MAXIMUM CONCENTRATION (ppb)**
Antimony	3	34	19	54.3
Iron	300	34	30	3,210
Lead	25	34	1	40.6
Magnesium	35000	34	12	85,900
Manganese	300	34	32	2,070
Nickel	100	34	1	161
Sodium	20000	34	34	389,000
Thallium	0.5	34	6	13.4

TOGS – NYSDEC Division of Water Technical and Operational Guidance Series (1.1.1) – Ambient Water Quality Standards, June 1998.

ppb – Parts per Billion

SUMMARY OF UNFILTERED METALS GROUNDWATER CONTAMINATION (Sand Unit)				
PARAMETER	**TOGs 1.1.1 (ppb)**	**# SAMPLES**	**# SAMPLES > TOGs**	**MAXIMUM CONCENTRATION (ppb)**
Antimony	3	19	1	7.2
Arsenic	25	19	2	34
Beryllium	3	19	3	5.5
Cadmium	5	19	1	10.1
Chromium	50	19	6	253
Copper	200	19	2	240
Iron	300	19	19	402,000
Lead	25	19	6	313
Magnesium	35000	19	10	96,500
Manganese	300	19	19	21,600
Mercury	0.7	19	6	3.35
Nickel	100	19	3	197
Sodium	20000	19	19	815,000
Thallium	0.5	19	2	22.6

TOGS – NYSDEC Division of Water Technical and Operational Guidance Series (1.1.1) – Ambient Water Quality Standards, June 1998.

ppb – Parts per Billion

SUMMARY OF FILTERED METALS GROUNDWATER CONTAMINATION (Sand Unit)				
PARAMETER	**TOGs 1.1.1 (ppb)**	**# SAMPLES**	**# SAMPLES > TOGs**	**MAXIMUM CONCENTRATION (ppb)**
Antimony	3	11	2	10.5
Iron	300	11	8	29,200
Magnesium	35000	11	5	76,900
Manganese	300	11	10	2,650
Sodium	20000	11	11	743,000

TOGS – NYSDEC Division of Water Technical and Operational Guidance Series (1.1.1) – Ambient Water Quality Standards, June 1998.

ppb – Parts per Billion

PCBs were not detected in the groundwater at the Site, with the exception of TW-1. In this sample, Arochlor-1260 was detected at a concentration of 1,500 ppb, which exceeds its GWQS of 0.9 ppb by several orders of magnitude. Temporary Well Point TW-1 represents the water quality in the sand unit at the most upgradient portion of the Site. While the LNAPL from TW-1 was not analyzed for PCBs, an LNAPL sample was collected and analyzed for PCBs from permanent monitoring well MW-1OI (installed within 10 feet of TW-1 location) and was non detect. Therefore, the PCBs detected in TW-1 are from an unknown, off-site source to the east.

SUMMARY OF PCBs GROUNDWATER CONTAMINATION (Sand Unit)				
PARAMETER	**TOGs 1.1.1 (ppb)**	**# SAMPLES**	**# SAMPLES > TOGs**	**MAXIMUM CONCENTRATION (ppb)**
PCB (Aroclor-1260)	0.09	12	2 [2]	1,500

TOGS – NYSDEC Division of Water Technical and Operational Guidance Series (1.1.1) – Ambient Water Quality Standards, June 1998. ppb – Parts per Billion

One pesticide, 4,4-DDD, was detected in a groundwater sample collected from MW-4S. The 4,4-DDD concentration was 2.6 ppb, which exceeds its GWQS of 0.3. Soil samples collected in this area from borings SBE-17, SBE-18, and SBE-19 also exhibited 4,4-DD. The source of the pesticide is unknown.

SUMMARY OF PESTICIDES GROUNDWATER CONTAMINATION (Perched Zone)				
PARAMETER	**TOGs 1.1.1 (ppb)**	**# SAMPLES**	**# SAMPLES > TOGGS**	**MAXIMUM CONCENTRATION (ppb)**
4,4-DDD	0.3	32	2	2.5

TOGS – NYSDEC Division of Water Technical and Operational Guidance Series (1.1.1) – Ambient Water Quality Standards, June 1998. ppb – Parts per Billion

2.5.6 On-Site Soil Vapor Contamination

The soil vapor intrusion investigation included collection and analysis of soil vapor, sub-slab, and ambient air samples.

The results of the soil gas sample analyses were compared to the "background" (ambient air) sampling results and Table 3.1 from the NYSDOH Vapor Intrusion Guidance document. The analytical results for the soil gas vapor samples are summarized in **Table 4** and **Figure 13**.

The results of the January 2008 vapor sampling indicate the following VOCs above the background level as established by the ambient air sample "background": acetone, benzene, 1,3-butadiene, carbon disulfide, chloroform, cyclohexane, dichlorodifluoromethane, cis-1,2-dichloroethylene, ethylbenzene, heptane, hexane, isopropyl alcohol, methyl ethyl ketone, methyl isobutyl ketone, methylene chloride, methyl-t-

[2] Includes a field duplicate sample, FD-5, which had a concentration of 1,400 ppb.

butyl ether, styrene, tetrachloroethylene, toluene, 1,1,1-trichloroethane, trichloroethylene, trichlorofluoromethane, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, vinyl chloride, m or p-xylene, and o-xylene.

Table 4 indicates the compounds with concentrations for the "background" sample. In comparison to the latest USEPA and NYSDEC/NYSDOH documents regarding soil gas and indoor/outdoor air screening levels, the background levels fall below the human health screening levels for soil gas and outdoor air The ambient air background sample indicated concentrations of several volatile compounds ranging between non-detect and 5 ppb. The presence of PCE in the "background" sample is likely due to effluent from the dry cleaning operations at the neighboring property to the east along 46th Road as chlorinated solvents were only identified in minimal concentrations at discrete locations on the site.

Several aromatic volatile compounds were detected in both the soil gas and ambient air and are likely due to either the vehicular traffic around the site or to former discharges of heating oil and other petroleum based oils at and around the site. In addition, the presence of mixed fill material containing ash and cinders may also contribute to the presence of aromatics in the soil gas and ambient air background sample.

Of these contaminants, dichlorodifluoromethane was detected in the "background sample and all soil gas samples except SG-3 at similar concentrations ranging between 3.4 and 5.1 ppb. Cis-1,2-dichloroethylene, isopropyl alcohol, methyl isobutyl ketone (MIBK), methyl-t-butyl ether (MTBE), styrene and vinyl chloride were detected in the sub-slab vapor samples but were not detected in the soil vapor samples. Of these compounds, only isopropyl alcohol was detected in the "background" ambient air sample.

Methylene chloride and tetrachloroethylene (PCE) were detected above the NYSDOH air guideline values (Table 3.1 of the NYSDOH Guidance document) in both the soil vapor and sub-slab vapor samples. Methylene chloride was detected in soil vapor samples SG-2 (63 ug/m^3) and SG-3 (274 ug/m^3) and sub-slab vapor sample SS-4 (247 ug/m^3) as well as in the "background" ambient air sample at a concentration of 4.9 ppb. Methylene chloride which is a known to be a common lab contaminant and common in the environment. PCE was detected in soil vapor sample SG-3 (136 ug/m^3) as well as all other samples including the "background" sample at concentrations below the NYSDOH level in the range of 1.5 ppb to 34 ppb.

2.6 ENVIRONMENTAL AND PUBLIC HEALTH ASSESSMENTS

2.6.1 Qualitative Human Health Exposure Assessment

A QHHEA was prepared for the Site and is included as **Appendix 5**. The QHHEA integrated the data and information gathered during the RI and provides a qualitative assessment of the potential for exposure to site-related contaminants. The proposed remedial activities associated with the identified contamination, if approved, will be the primary potential human health exposure due to disturbance of site contaminants detected above the unrestricted use standard. This proposed work will be performed under the direction of the Remedial Engineer.

2.6.2 Fish & Wildlife Remedial Impact Analysis

A Fish and Wildlife Resources Impact Analysis (FWRIA) has been performed and is included as **Appendix 1.** The Site is heavily developed and unlikely to provide habitat for sensitive ecological receptors. Given the urban location, sensitive wildlife are not likely to use the Site, however, the Site is approximately 300 feet from the East River, a resource of ecological concern. The proposed removal and

excavation of the source of the contamination will eliminate the exposure pathways. At this time, a criteria specific analysis is not recommended until after the contaminant source is removed and further environmental monitoring of the groundwater has occurred.

2.7 INTERIM REMEDIAL ACTIONS - USTs

An Interim Remedial Measures (IRM) Work Plan was approved by NYSDEC on April 30, 2009. Suspect underground storage tanks (USTs) located at the Site will be properly registered and removed as an IRM in accordance with NYSDEC requirements.

2.8 REMEDIAL ACTION OBJECTIVES

Based on the results of the Remedial Investigation and as per NYSDEC comments provided in the February 9, 2009 meeting, the following Remedial Action Objectives (RAOs) have been identified for this Site.

2.8.1 Groundwater

RAOs for Public Health Protection

- Prevent ingestion of groundwater containing contaminant levels exceeding drinking water standards.
- Prevent contact with, or inhalation of, volatiles emanating from contaminated groundwater.

RAOs for Environmental Protection

- Restore ground water aquifer, to the extent practicable, to pre-disposal/pre-release conditions.
- Prevent the discharge of contaminants to surface water.
- Remove the source of ground or surface water contamination.

2.8.2 Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation of, or exposure to, contaminants volatilizing from contaminated soil.

RAOs for Environmental Protection

- Prevent migration of contaminants that would result in groundwater or surface water contamination.

- Prevent impacts to biota due to ingestion/direct contact with contaminated soil that would cause toxicity or bioaccumulation through the terrestrial food chain.

3.0 DESCRIPTION OF REMEDIAL ACTION PLAN

This remedial action plan is to support the desired end-use of the Site, which is for mixed-use residential and commercial occupancy. The RAOs for the Site are set forth above. The BCP Track 4 program goals are to remediate contaminant sources to the extent feasible and to be protective of human health and the environment.

The Volunteer intends to remediate sources of soil, groundwater and LNAPL contamination to achieve a Track 4 cleanup that will ensure, with appropriate engineering controls and/or institutional controls, that the Site will meet the RAOs and program goals.

3.1 EVALUATION OF REMEDIAL ALTERNATIVES

Description of Alternative #1:

Alternative #1 is presented for consideration in accordance with BCP guidelines. It would achieve a Track 1 cleanup at a total estimated cost of $14,964,200 and would consist of the following remedial components:

- Installation of a cut-off wall around the entire perimeter of the Site – The cut-off wall would be installed with interlocking, steel sheet piles. The upper sheet pile boundary would be designed and completed interactively with the facility foundation elements. The lower sheet pile boundary would be driven to completion and toed into the bedrock materials at an approximate average depth of 32-feet below ground surface. The total perimeter alignment would be 1,130-feet. Earth support during the deep excavation within the sheeted area would be provided by progressively bracing the sheet pile wall with struts and walers as the excavation depth increased. The approximate cost including partial salvage of the bracing is estimated at $2,116,000.
- Installation of a negative pressure containment structure enclosing the entire open excavation area – The negative pressure containment structure (remedial enclosure) would be installed to provide the required nuisance control and would be fitted with vapor and particulate management systems. Due to the excavation depth and associated foundation issues, the structure could not be moved during the excavation work. It would be installed across the entire planned excavation area of 46,500 square feet and would be in place for a period of about nine months. The approximate cost of the negative pressure containment structure with vapor/particulate management systems is estimated at $2,604,000.
- Dewatering that would be implemented within the planned deep excavation area - The dewatering effort would drain and reduce the water content of soils to be excavated, facilitate placement and use of men and equipment within the deep excavation, remove contaminated fluids from the excavation area, and facilitate the overall soil excavation work. The water table would be

lowered about 27 feet across the excavation area, from 7 feet bgs to about 34 feet bgs. The approximate cost of the dewatering effort is estimated at $1,180,500.

- Excavation of materials within the perimeter of the Site – All overburden materials within the perimeter of the site would be excavated to an average depth of 28-feet below ground surface which would be at the approximate boundary between overburden and bedrock materials. The approximate cost of the excavation work, which would include manpower and large equipment operations at depth within the excavation, is estimated at $400,000.
- Soil management with off-site transport and disposal – The entire excavated soil volume would be about 48,000 cubic yards. The heavy, wet soil would be managed on-site, loaded into covered trucks and transported off-site for disposal. The approximate cost of the soil management, transportation, and off-site disposal work is estimated at $5,875,000.
- Backfill of the deep excavation with certified clean fill – The backfilling would be performed from excavation floor up to bottom of planned facility foundation elements, would be performed as a controlled backfill in layers with sufficient compactive effort to achieve soil stability, and would be sequenced with the removal and salvage of steel bracing. The entire backfill volume would be about 37,700 cubic yards. The approximate cost of the backfilling work, which would proceed from the excavation floor up to the bottom of the planned facility foundation elements, is estimated at $1,131,000.
- Environmental compliance support, permitting, measurement, and project control activities – These activities include regulatory interaction, compliance support, permitting support, laboratory analysis and measurement, engineering, and implementation and maintenance of project controls. The approximate cost of these activities is estimated at $1,657,600.

The Alt#1 estimated timeframe for remediation, as accomplished by containment, enclosure, dewatering, excavation, off-site transportation and disposal, and backfilling, is one year. The remediation spatial requirements would conform to the development site area and boundaries without need for adjustment of area of boundaries. There would be substantial off-site disposal of contaminated soil and of contaminated groundwater that would be treated on site and discharged to the local sewer system under the required permits. There would be no substantial technical permit requirements. The key permit items would be construction permits and water discharge permits. Institutional controls would be accomplished with an Environmental Easement that that prohibited the use of Site groundwater. Engineering controls during remediation would consist of the fabric structure. Long-term engineering controls would consist of the cut-off wall, the waterproofing membrane that is planned for installation beneath the facility foundation elements, and the cap that would be provided by the facility foundation elements. The long-term engineering controls would be addressed with an engineering design work plan. A site management plan would be implemented to ensure the effectiveness of the long-term engineering controls.

Alternative #1 has been evaluated with respect to the following BCP remedial alternative evaluation factors and the results of that evaluation are presented below:

- Protection of human health and the environment – Alt#1 would prevent ingestion/direct contact with contaminated soil, inhalation of or exposure to contaminants volatizing from contaminated soil, migration of contaminants that would result in groundwater or surface water contamination, and impacts to biota due to ingestion/direct contact with contaminated soil. Therefore, it would achieve the RAOs and be protective of human health and the environment.
- Compliance with standards, criteria, and guidelines (SCGs) – Alt#1 would be in compliance with SCGs as described subsequently in the SCG compliance evaluation and as implemented through the NYSDEC Volunteer BCP.
- Short-term effectiveness and impacts – Alt#1 would be protective of human health and the environment immediately upon completion. Therefore, it would provide short-term effectiveness. However, it could result in unacceptable local dewatering associated foundation impacts, Site and local hydrologic impacts and local migration impacts both during and after implementation.
- Long-term effectiveness and permanence – Alt#1 would be protective of human health and the environment throughout the design life of the remediation system, which is equivalent to the long-term design life of the planned facility. Therefore, it would provide long-term effectiveness. However, it could result in unacceptable Site and Local hydrologic impacts and local migration impacts both during and after implementation.
- Reduction of toxicity, mobility, or volume of contaminated material – Alt#1 would reduce the mobility and volume of contaminated material.
- Implementability – Alt#1 could be implemented technically but with great difficulty due to the length and location of the cut-off wall alignment, the excavation depth, and the need for an extensive fabric structure, deep earth support, significant dewatering effort, and significant backfilling effort.
- Cost Effectiveness - Alt#1 could not be implemented within the financial structure of the planned development due to the significant cost. The cost of Alt#1 would greatly exceed any available funding support and would greatly exceed the financial capacity of the planned development project.
- Community Acceptance – Alt#1 would likely not be acceptable to the Community due to the potential for unacceptable hydrologic and migration impacts.
- Land Use – Alt#1 would likely not be acceptable from a land use point of view due to the potential for unacceptable hydrologic and migration impacts.

Alternative #1 would be in compliance with SCGs as implemented through the NYSDEC Volunteer BCP. The follow SCGs have been evaluated for applicability to Alt#1:

- 6 NYCRR Part 375-6 Soil Cleanup Objectives – This SCG item applies to Alt#1 because the soils at this inactive Site are impacted by wastes and in some cases in excess of the SCOs.
- New York State Groundwater Quality Standards 6 NYCRR Part 703 – This SCG item applies to Alt#1 because the Site groundwater is impacted in excess of NYS groundwater quality standards.
- NYSDEC Ambient Water Quality Standards and Guidance Values TOGS 1.1.1 – This SCG item applies to Alt#1 because the up-gradient off-site groundwater is impacted in excess of ambient standards.
- NYSDEC Draft DER-10 Technical Guidance for Site Investigation and Remediation December 2002 – The SCG item is currently superceded by BCP rules and guidelines.
- NYSDEC Draft Brownfield Cleanup Program Guide May 2004 – This SCG item applies to Alt#1 because Alt#1 is a remedial alternative evaluated in accordance with the NYSDEC BCP.
- New York State Department of Health (NYSDOH) Generic Community Air Monitoring Plan – This SCG item applies to Alt#1 as a means of monitoring the effectiveness of nuisance controls as required under the NYSDEC BCP.
- NYS Waste Transporter Permits 6 NYCRR Part 364 – This SCG item applies to Alt#1 because contaminated soil off-site transportation would be a part of this alternative.
- NYS Solid Waste Management Requirements 6 NYCRR Part 360 and Part 364 – This SCG item applies to Alt#1 because off-site disposal of contaminated soil would be a part of this alternative.

Description of Alternative #2:

Alternative #2 is presented for consideration in accordance with BCP guidelines. It would achieve a Track 4 cleanup at a total estimated cost of $6,334,100 and would consist of the following remedial components:

- Installation of a cut-off wall around the north, east, and south sides of the Site – The cut-off wall would be installed with interlocking, steel sheet piles. The upper sheet pile boundary would be designed and completed interactively with the facility foundation elements. The lower sheet pile boundary would be driven to completion and toed into the bedrock materials at an approximate average depth of 32-feet below ground surface. The total perimeter alignment would be 930-feet. The approximate cost is estimated at $1,329,900.
- Installation of a negative pressure containment structure system enclosing open excavation areas- The negative pressure containment structure system would be installed in three movable panels (enclosures) to provide sequential coverage of open excavation areas. After the excavation work was completed and the excavation floor was covered in an enclosed area, the structure panels would be moved to upcoming excavation areas to provide enclosure of those areas. The movable enclosures would be fitted with vapor and particulate management systems. The estimated term of service for the negative pressure containment structure would be three months. The

approximate cost of the negative pressure containment structure with vapor/particulate management systems is estimated at $850,000.

- Dewatering that would be implemented within the planned deeper excavation areas - The dewatering effort would support excavation work within areas that would be excavated to 10-feet bgs and 20-feet bgs. The dewatering effort in those areas would drain and reduce the water content of soils to be excavated, facilitate placement and use of men and equipment, remove contaminated fluids, and facilitate the overall soil excavation work. The approximate cost of the dewatering effort is estimated at $253,800.
- Excavation of materials within the perimeter of the Site – All overburden materials within the perimeter of the site would be excavated to a depth of 7-feet below ground surface. In the former tank areas, the excavation depth would be extended to a total depth of 10-feet. In the area where LNAPL is resident within a sand unit beneath a confining layer, the excavation depth would be extended to a total depth of 20-feet to remove the LNAPL resident zone. The approximate cost of the excavation work is estimated at $164,700.
- Soil management with off-site transport and disposal – The entire excavated soil volume would be about 20,210 cubic yards. The excavated soil would be managed on-site, loaded into covered trucks and transported off-site for disposal. The approximate cost of the soil management, transportation, and off-site disposal work is estimated at $2,328,200.
- Backfill of the excavation with certified clean fill – The backfilling would be performed from excavation floor up to bottom of planned facility foundation elements, and would be performed as a controlled backfill in layers with sufficient compactive effort to achieve soil stability. The entire backfill volume would be about 9,900 cubic yards. The approximate cost of the backfilling work, which would proceed from the excavation floor up to the bottom of the planned facility foundation elements, is estimated at $297,000.
- Environmental compliance support, permitting, measurement, and project control activities – These activities include regulatory interaction, compliance support, permitting support, laboratory analysis and measurement, engineering, and implementation and maintenance of project controls. The approximate cost of these activities is estimated at $1,110,500.

The Alt#2 estimated timeframe for remediation, as accomplished by containment, enclosure, dewatering, excavation, off-site transportation and disposal, and backfilling, is one year. The remediation spatial requirements would conform to the development site area and boundaries without need for adjustment of area of boundaries. There would be substantial off-site disposal of contaminated soil and of contaminated groundwater that would be treated on site and discharged to the local sewer system under the required permits. There would be no substantial technical permit requirements. The key permit items would be construction permits and water discharge permits. Institutional controls would be accomplished with an Environmental Easement that that prohibited the use of Site groundwater. Engineering controls during remediation would consist of the containment structure. Long-term engineering controls would consist of

the cut-off wall, the waterproofing membrane that is planned for installation beneath the facility foundation elements, and the cap that would be provided by the facility foundation elements. The long-term engineering controls would be addressed with an engineering design work plan. A site management plan would be implemented to ensure the effectiveness of the long-term engineering controls.

Alternative #2 has been evaluated with respect to the following BCP remedial alternative evaluation factors and the results of that evaluation are presented below:

- Protection of human health and the environment – Alt#2 would prevent ingestion/direct contact with contaminated soil, inhalation of or exposure to contaminants volatizing from contaminated soil, migration of contaminants that would result in groundwater or surface water contamination, and impacts to biota due to ingestion/direct contact with contaminated soil. Therefore, it would achieve the RAOs and be protective of human health and the environment.
- Compliance with standards, criteria, and guidelines (SCGs) – Alt#2 would be in compliance with SCGs as described subsequently in the SCG compliance evaluation and as implemented through the NYSDEC Volunteer BCP.
- Short-term effectiveness and impacts – Alt#2 would be protective of human health and the environment immediately upon completion. Therefore, it would provide short-term effectiveness. However, it could result in unacceptable local hydrologic and migration impacts both during and after implementation.
- Long-term effectiveness and impacts – Alt#2 would be protective of human health and the environment throughout the design life of the remediation system, which is equivalent to the long-term design life of the planned facility. Therefore, it would provide long-term effectiveness. However, it could result in unacceptable local hydrologic and migration impacts both during and after implementation.
- Reduction of toxicity, mobility, or volume of contaminated material – Alt#2 would reduce the mobility and volume of contaminated material.
- Implementability – Alt#2 could be implemented technically but with difficulty due to the length and location of the cut-off wall alignment, the excavation depths in some areas, the need for a fabric structure, and the dewatering effort in some areas.
- Cost Effectiveness - Alt#2 could not be implemented within the financial structure of the planned development due to the significant cost. The cost of Alt#2 would exceed any available funding support and would exceed the financial capacity of the planned development project.
- Community Acceptance – Alt#2 would likely not be acceptable to the Community due to the potential for unacceptable local hydrologic and migration impacts.
- Land Use – Alt#2 would likely not be acceptable from a land use point of view due to the potential for unacceptable Local hydrologic and migration impacts.

Alternative #2 would be in compliance with SCGs as implemented through the NYSDEC Volunteer BCP. The follow SCGs have been evaluated for applicability to Alt#2:

- 6 NYCRR Part 375-6 Soil Cleanup Objectives – This SCG item applies to Alt#2 because the soils at this inactive Site are impacted by wastes and in some cases in excess of the SCOs.
- New York State Groundwater Quality Standards 6 NYCRR Part 703 – This SCG item applies to Alt#2 because the Site groundwater is impacted in excess of NYS groundwater quality standards.
- NYSDEC Ambient Water Quality Standards and Guidance Values TOGS 1.1.1 – This SCG item applies to Alt#2 because the up-gradient off-site groundwater is impacted in excess of ambient standards.
- NYSDEC Draft DER-10 Technical Guidance for Site Investigation and Remediation December 2002 – The SCG item is currently superceded by BCP rules and guidelines.
- NYSDEC Draft Brownfield Cleanup Program Guide May 2004 – This SCG item applies to Alt#2 because Alt#2 is a remedial alternative evaluated in accordance with the NYSDEC BCP.
- New York State Department of Health (NYSDOH) Generic Community Air Monitoring Plan – This SCG item applies to Alt#2 as a means of monitoring the effectiveness of nuisance controls as required under the NYSDEC BCP.
- NYS Waste Transporter Permits 6 NYCRR Part 364 – This SCG item applies to Alt#2 because contaminated soil off-site transportation would be a part of this alternative.
- NYS Solid Waste Management Requirements 6 NYCRR Part 360 and Part 364 – This SCG item applies to Alt#2 because off-site disposal of contaminated soil would be a part of this alternative.

Description of Alternative #3:

Alternative #3 is presented for consideration in accordance with BCP guidelines. It would achieve a Track 4 cleanup at a total estimated cost of $4,253,300 and would consist of the following remedial components:

- Installation of a capture wall in the area of the planned parking garage – This capture wall would be installed directly down-gradient of the LNAPL plume that is resident in a sand unit beneath a confining layer in the northeast sector of the Site. It would be installed with interlocking, steel sheet piles and would be aligned from north to south with a shallow V-shape to provide hydraulic capture. The upper sheet pile boundary would be designed and completed interactively with the facility foundation elements. The lower sheet pile boundary would be completed at a depth of about 26-feet bgs. The total alignment length would be about 120-feet. The approximate cost is estimated at $232,000.
- Installation of a negative pressure containment structure system enclosing open excavation areas – The negative pressure containment structure system would be installed in three movable panels (enclosures) to provide sequential coverage of open excavation areas. After the excavation work was completed and the excavation floor was covered in an enclosed area, the structure panels would be moved to upcoming excavation areas to provide enclosure of those areas. The movable enclosures would be fitted with vapor and particulate management systems. The estimated term of service for the negative pressure containment structure would be three months. The approximate cost of the negative pressure containment structure with vapor/particulate management systems is estimated at $850,000.
- Dewatering that would be implemented within the planned deeper excavation areas - The dewatering effort would support excavation work within areas that would be excavated to 10-feet bgs and 20-feet bgs. The dewatering effort in those areas would drain and reduce the water content of soils to be excavated, facilitate placement and use of men and equipment, remove contaminated fluids, and facilitate the overall soil excavation work. The approximate cost of the dewatering effort is estimated at $126,900.
- Excavation of materials within the perimeter of the Site – All overburden materials within the perimeter of the site would be excavated to a depth of 7-feet below ground surface. In the former tank areas, the excavation depth would be extended to a total depth of 10-feet. In areas where necessary to remove gross contamination, the excavation depth would be extended to a total depth of 12-feet and the peat layer would be scraped. The approximate cost of the excavation work is estimated at $109,500.
- Soil management with off-site transport and disposal – The entire excavated soil volume would be about 13,430 cubic yards. The excavated soil would be managed on-site, loaded into covered

trucks and transported off-site for disposal. The approximate cost of the soil management, transportation, and off-site disposal work is estimated at $1,450,500.

- Backfill of the excavation with certified clean fill – The backfilling would be performed from excavation floor up to bottom of planned facility foundation elements, and would be performed as a controlled backfill in layers with sufficient compactive effort to achieve soil stability. The entire backfill volume would be about 3,100 cubic yards. The approximate cost of the backfilling work, which would proceed from the excavation floor up to the bottom of the planned facility foundation elements, is estimated at $93,000.
- LNAPL collection and removal from the up-gradient side of the capture wall – The up-gradient side of the capture wall would be fitted with LNAPL collection and removal equipment and utilities that would be designed and completed interactively with the facility foundation elements and suitable for continued use after completion of the facility. These utilities would consist of LNAPL collection wells, down-well skimmers, receiving equipment, conveyances, and short-term storage units. The LNAPL would periodically be removed from the Site and transported for off-site disposal in accordance with the rules governing that activity. The approximate cost of the LNAPL collection and removal including equipment and utility installation and five-years of operation is estimated at $410,000.
- Environmental compliance support, permitting, measurement, and project control activities – These activities include regulatory interaction, compliance support, permitting support, laboratory analysis and measurement, engineering, and implementation and maintenance of project controls. The approximate cost of these activities is estimated at $981,430.

The Alt#3 estimated timeframe for remediation, as accomplished by capture, enclosure, dewatering, excavation, off-site transportation and disposal, backfilling, and LNAPL collection and removal is five years. The remediation spatial requirements would conform to the development site area and boundaries without need for adjustment of area of boundaries. There would be substantial off-site disposal of contaminated soil and of contaminated groundwater that would be treated on site and discharged to the local sewer system under the required permits. There would be no substantial technical permit requirements. The key permit items would be construction permits and water discharge permits. Institutional controls would be accomplished with an Environmental Easement that that prohibited the use of Site groundwater. Engineering controls during remedial excavation would consist of the fabric structure. Long-term engineering controls would consist of the capture wall, the waterproofing membrane that is planned for installation beneath the facility foundation elements, the cap that would be provided by the facility foundation elements, and LNAPL collection and removal. The long-term engineering controls would be addressed with an engineering design work plan. A site management plan would be implemented to ensure the effectiveness of the long-term engineering controls.

Alternative #3 has been evaluated with respect to the following BCP remedial alternative evaluation factors and the results of that evaluation are presented below:

- Protection of human health and the environment – Alt#3 would prevent ingestion/direct contact with contaminated soil, inhalation of or exposure to contaminants volatizing from contaminated soil, migration of contaminants that would result in groundwater or surface water contamination, and impacts to biota due to ingestion/direct contact with contaminated soil. Therefore, it would achieve the RAOs and be protective of human health and the environment.
- Compliance with standards, criteria, and guidelines (SCGs) – Alt#3 would be in compliance with SCGs as described subsequently in the SCG compliance evaluation and as implemented through the NYSDEC Volunteer BCP.
- Short-term effectiveness and impacts – Alt#3 would be protective of human health and the environment immediately upon completion. Therefore, it would provide short-term effectiveness. However, it might not address certain specific issues of BCP concern (re-contamination and source removal).
- Long-term effectiveness and impacts – Alt#3 would be protective of human health and the environment throughout the design life of the remediation system, which is equivalent to the long-term design life of the planned facility. Therefore, it would provide long-term effectiveness. However, it might not address certain specific issues of BCP concern (re-contamination and source removal).
- Reduction of toxicity, mobility, or volume of contaminated material – Alt#3 would reduce the mobility and volume of contaminated material.
- Implementability – Alt#3 could be implemented technically but with difficulty due to the overall required level of effort.
- Cost Effectiveness - Alt#3 could be implemented within the financial structure of the planned development in the event that sufficient funding can be obtained for required engineering controls (fabric structure, capture wall, and LNAPL collection and removal).
- Community Acceptance – Alt#3 would likely be acceptable to the Community.
- Land Use – Alt#3 would likely be acceptable from a land use point of view.

Alternative #3 would be in compliance with SCGs as implemented through the NYSDEC Volunteer BCP. The follow SCGs have been evaluated for applicability to Alt#3:

- 6 NYCRR Part 375-6 Soil Cleanup Objectives – This SCG item applies to Alt#3 because the soils at this inactive Site are impacted by wastes and in some cases in excess of the SCOs.
- New York State Groundwater Quality Standards 6 NYCRR Part 703 – This SCG item applies to Alt#3 because the Site groundwater is impacted in excess of NYS groundwater quality standards.

- NYSDEC Ambient Water Quality Standards and Guidance Values TOGS 1.1.1 – This SCG item applies to Alt#3 because the up-gradient off-site groundwater is impacted in excess of ambient standards.
- NYSDEC Draft DER-10 Technical Guidance for Site Investigation and Remediation December 2002 – The SCG item is currently superceded by BCP rules and guidelines.
- NYSDEC Draft Brownfield Cleanup Program Guide May 2004 – This SCG item applies to Alt#3 because Alt#3 is a remedial alternative evaluated in accordance with the NYSDEC BCP.
- New York State Department of Health (NYSDOH) Generic Community Air Monitoring Plan – This SCG item applies to Alt#3 as a means of monitoring the effectiveness of nuisance controls as required under the NYSDEC BCP.
- NYS Waste Transporter Permits 6 NYCRR Part 364 – This SCG item applies to Alt#3 because contaminated soil off-site transportation would be a part of this alternative.
- NYS Solid Waste Management Requirements 6 NYCRR Part 360 and Part 364 – This SCG item applies to Alt#3 because off-site disposal of contaminated soil would be a part of this alternative.

Description of Alternative #4:

Alternative #4 is presented for consideration in accordance with BCP guidelines. It would achieve a Track 4 cleanup at a total estimated cost of $4,523,300 and would consist of the following remedial components:

- Installation of a capture wall in the area of the planned parking garage – This capture wall would be installed directly down-gradient of the LNAPL plume that is resident in a sand unit beneath a confining layer in the northeast sector of the Site. It would be installed with interlocking, steel sheet piles and would be aligned from north to south with a shallow V-shape to provide hydraulic capture. The upper sheet pile boundary would be designed and completed interactively with the facility foundation elements. The lower sheet pile boundary would be completed at a depth of about 26-feet bgs. The total alignment length would be about 120-feet. The approximate cost is estimated at $232,000.
- Installation of a negative pressure containment structure enclosing open excavation areas – The containment structure would be installed in three movable panels (enclosures) to provide sequential coverage of open excavation areas. The movable enclosures would be fitted with vapor and particulate management systems. After the excavation work was completed and the excavation floor was backfilled in an enclosed area, the structure panels would be moved to upcoming excavation areas to provide enclosure of those areas. The estimated term of service for the negative pressure containment structure would be three months. The approximate cost of the negative pressure containment structure with vapor/particulate management systems is estimated at $850,000.

- Dewatering that would be implemented within the planned deeper excavation areas - The dewatering effort would support excavation work within areas that would be excavated to 10-feet bgs and 20-feet bgs. The dewatering effort in those areas would drain and reduce the water content of soils to be excavated, facilitate placement and use of men and equipment, remove contaminated fluids, and facilitate the overall soil excavation work. The approximate cost of the dewatering effort is estimated at $126,900.
- Excavation and removal of materials within the perimeter of the Site – All overburden materials within the perimeter of the site would be excavated to a depth of 7-feet below ground surface. In the former tank areas, the excavation depth would be extended to a total depth of 10-feet. In areas where necessary to remove gross contamination, the excavation depth would be extended to a total depth of 10-feet and the peat layer would be scraped. In areas where the excavation is extended to depths of to 10-feet, Oxygen Release Compound (ORC) would be added to the excavation floor prior to backfilling. During the excavation work, LNAPL would be removed from the water table by pumping and vacuum extraction. If necessary, LNAPL would also be removed from the perched by injection of surfactants or chemical oxidants to reduce it's viscosity followed by vacuum extraction. The approximate cost of the excavation work is estimated at $109,500.
- Soil management with off-site transport and disposal – The entire excavated soil volume would be about 13,430 cubic yards. The excavated soil would be managed on-site, loaded into covered trucks and transported off-site for disposal. The approximate cost of the soil management, transportation, and off-site disposal work is estimated at $1,450,500.
- Backfill of the excavation with certified clean fill – The backfilling would be performed from excavation floor up to bottom of planned facility foundation elements, and would be performed as a controlled backfill in layers with sufficient compactive effort to achieve soil stability. The entire backfill volume would be about 3,100 cubic yards. The approximate cost of the backfilling work, which would proceed from the excavation floor up to the bottom of the planned facility foundation elements, is estimated at $93,000.
- LNAPL collection and removal from the sand unit below the confining layer – The up-gradient side of the capture wall would be fitted with LNAPL collection and removal equipment and utilities that would be designed and completed interactively with the facility foundation elements and suitable for continued use after completion of the facility. These utilities would consist of LNAPL collection wells, down-well skimmers, receiving equipment, conveyances, and short-term storage units. The LNAPL would periodically be removed from the Site and transported for off-site disposal in accordance with the rules governing that activity. The approximate cost of the LNAPL collection and removal including equipment and utility installation and five-years of operation is estimated at $410,000.
- Installation of LNAPL monitoring and remediation (M/R) wells – Twenty-four LNAPL M/R wells would be installed in the planned garage area, up-gradient of the capture wall, and across

the extent of the LNAPL plume within the sand unit beneath a confining layer. Four LNAPL M/R wells would be installed directly down-gradient of the capture wall. Ten LNAPL M/R wells would be installed around the perimeter of the Site. These wells would all be installed as either twin nested or twin couplet wells. They would be sealed and grouted from the bottom of the confining layer up to a flush mount completion location. One well screen would be located beneath the confining layer to a depth of about 12-feet to 20-feet below ground surface. One well screen would be located from a depth of about 20-feet to 28-feet bgs. The wells would be designed and completed interactively with the planned facility to ensure continued access at perimeter sidewalk and garage floor locations. These wells will be used for additional remedial activities if required by DEC and this will be addressed in SMP. The approximate cost is estimated at $225,000.

- Vapor intrusion controls to be integrated with the planned construction – Vapor intrusion controls would be designed and installed to be integral with the planned facility construction. In the event that the facility foundation elements are placed at depths that are within the seasonal water table across the Site, the facility would be protected from water intrusion with a minimum 20-mil thick waterproofing membrane that would also provide protection against vapor intrusion. If portions of the facility are not placed at depths within the seasonal water table, these portions would be protected against vapor intrusion either by installation of the same waterproofing membrane or by installation of a sub-slab de-pressurization system. Therefore, vapor intrusion control would be provided by a water proofing membrane or sub-slab de-pressurization. The approximate cost of this item is not estimated because the cost is included within the facility construction cost.
- Capping of the soils across the Site – As a part of the planned facility construction, the entire site would be fitted with a composite cap consisting of a minimum 2-feet of soil cover above a geotextile fabric warning barrier, or asphalt paving, or the facility foundation elements. The approximate cost of the composite cap is not estimated because the costs are already included with the backfilling cost or are included within the facility construction cost.
- Environmental compliance support, permitting, measurement, and project control activities – These activities include regulatory interaction, compliance support, permitting support, laboratory analysis and measurement, engineering, and implementation and maintenance of project controls. The approximate cost of these activities is estimated at $1,026,400.

The Alt#4 estimated timeframe for remediation, as accomplished by capture, enclosure, dewatering, excavation, off-site transportation and disposal, backfilling, capping, vapor intrusion control, and LNAPL collection and removal is five years. The remediation spatial requirements would conform to the development site area and boundaries without need for adjustment of area of boundaries. There would be substantial off-site disposal of contaminated soil and of contaminated groundwater that would be treated on site and discharged to the local sewer system under the required permits. There would be no

substantial technical permit requirements. The key permit items would be construction permits and water discharge permits. Institutional controls would be accomplished with an Environmental Easement that that prohibited the use of Site groundwater and by the afore-mentioned vapor intrusion control measures. Engineering controls during remedial excavation would consist of the fabric structure. Long-term engineering controls would consist of the capture wall, the vapor intrusion controls, the composite capping system, LNAPL collection and removal, and LNAPL monitoring and remediation wells. The long-term engineering controls would be designed and specified within an engineering design work plan. A site management plan would be implemented to ensure the effectiveness of the long-term engineering controls.

Alternative #4 has been evaluated with respect to the following BCP remedial alternative evaluation factors and the results of that evaluation are presented below:

- Protection of human health and the environment – Alt#4 would prevent ingestion/direct contact with contaminated soil, inhalation of or exposure to contaminants volatizing from contaminated soil, migration of contaminants that would result in groundwater or surface water contamination, and impacts to biota due to ingestion/direct contact with contaminated soil. Therefore, it would achieve the RAOs and be protective of human health and environment.
- Compliance with standards, criteria, and guidelines (SCGs) – Alt#4 would be in compliance with SCGs as described subsequently in the SCG compliance evaluation and as implemented through the NYSDEC Volunteer BCP.
- Short-term effectiveness and impacts – Implementation of Alt#4 would be associated with limited risks in the form of nuisance risks to the community, health & safety risks to workers, and discharge risks to the environment. Nuisance risks would be controlled as set forth within this RAWP by the CAMP program, site security measures, vapor and dust control measures, transporter cleaning and inspection, and open area excavation beneath a negative pressure containment structure. Health & safety risks would be controlled as set forth within this RAWP by implementation of the site specific health & safety plan that would require OSHA compliant site operations. Discharge risks to the environment would be controlled as set forth in this RAWP by the nuisance control measures set forth above, implementation of the SWPPP, and cleaning and inspection of trucks prior to exit from the site. The effectiveness and reliability of the afore-mentioned controls is well-demonstrated in practice, and the RAOs would be achieved in an estimated five years. Therefore, Alt#4 would provide short-term effectiveness.
- Long-term effectiveness and permanence – Alt#4 would provide a permanent remedy through removal of LNAPL and impacted soils in tandem with use of a permanent LNAPL containment system with a long-term design life equivalent to that of the planned facility. Therefore, the ability of Alt#4 to achieve RAOs would not lessen over time. After completion, there would be no significant threats, exposure pathways, or risks to the community or environment from

residual contamination. Engineering and institutional controls will be implemented, including a site-wide environmental easement, a site-wide cap, and on-going groundwater monitoring and/or product recovery. Therefore, Alt#4 would be protective of human health and the environment and would provide permanence and long-term effectiveness.

- Reduction of toxicity, mobility, or volume of contaminated material – Alt#4 would reduce the mobility and volume of contaminated material.
- Implementability – Alt#4 could be implemented technically but with difficulty due to the overall required level of effort.
- Cost Effectiveness - Alt#4 could be implemented within the financial structure of the planned development in the event that sufficient funding can be obtained for required engineering controls (fabric structure, capture wall, LNAPL collection and removal, LNAPL monitoring and remediation wells).
- Community Acceptance – Alt#4 would likely be acceptable to the Community.
- Land Use – Alt#4 would likely be acceptable from a land use point of view.

Alternative #4 would be in compliance with SCGs as implemented through the NYSDEC Volunteer BCP. The follow SCGs have been evaluated for applicability to Alt#4:

- 6 NYCRR Part 375-6 Soil Cleanup Objectives – This SCG item applies to Alt#4 because the soils at this inactive Site are impacted by wastes and in some cases in excess of the SCOs.
- New York State Groundwater Quality Standards 6 NYCRR Part 703 – This SCG item applies to Alt#4 because the Site groundwater is impacted in excess of NYS groundwater quality standards.
- NYSDEC Ambient Water Quality Standards and Guidance Values TOGS 1.1.1 – This SCG item applies to Alt#4 because the up-gradient off-site groundwater is impacted in excess of ambient standards.
- NYSDEC Draft DER-10 Technical Guidance for Site Investigation and Remediation December 2002 – The SCG item is currently superceded by BCP rules and guidelines.
- NYSDEC Draft Brownfield Cleanup Program Guide May 2004 – This SCG item applies to Alt#4 because Alt#4 is a remedial alternative evaluated in accordance with the NYSDEC BCP.
- New York State Department of Health (NYSDOH) Generic Community Air Monitoring Plan – This SCG item applies to Alt#4 as a means of monitoring the effectiveness of nuisance controls as required under the NYSDEC BCP.
- NYS Waste Transporter Permits 6 NYCRR Part 364 – This SCG item applies to Alt#4 because contaminated soil off-site transportation would be a part of this alternative.
- NYS Solid Waste Management Requirements 6 NYCRR Part 360 and Part 364 – This SCG item applies to Alt#4 because off-site disposal of contaminated soil would be a part of this alternative.

Comparison of Alternatives #1 - #4:

Based on the evaluations presented above, the four presented alternatives have been compared with respect to nine key BCP evaluation factors, using a ranking system of 1-5, (1=not sufficient and 5= completely sufficient) as follows:

COMPARATIVE FACTORS	ALT#1	ALT#2	ALT#3	ALT#4
Protection of human health/environ	5	5	5	5
Compliance with SCGs	5	5	5	5
Short-term effectiveness/impacts	1	1	5	5
Long-term effectiveness/permanence	5	3	4	4
Reduction of toxicity/mobility/volume	5	4	4	4
Implementability	1	3	5	5
Cost effectiveness	1	3	5	4
Community Acceptance	1	1	4	5
Land use	1	1	4	5
Totals =	25	26	41	42

Based on the comparison, it is clear that Alt#4 is the most suitable alternative for the Site, particularly with respect to minimization of impacts, community acceptance, and future land use viability. Therefore, Alt#4 is selected as the preferred remedy.

3.2 SELECTION OF THE PREFERRED REMEDY

Remedial Alternative 4 has been selected to remediate the Site for its intended mixed commercial/residential end use. The selected remedy consists of the following elements:

- All excavation and truck loading activities as described below will be conducted under a negative pressure containment structure;
- An IRM consisting of registration and removal of on-site underground storage tanks (USTs) in accordance with NYSDEC requirements;
- Remove the on-site source(s) of soil contamination (i.e., LNAPL and grossly contaminated soil), to the extent practicable;
- Remediate the soil contamination at the Site in order to achieve compliance with RUSCOs for residential use (Table 375-6.8(b)). The soil remedial mechanism will be excavation, characterization and proper off-site disposal of excavated soils, and application of Oxygen Release Compound (ORC) as appropriate based upon depth of excavation. As indicated herein,

where feasible, areas of petroleum product-impacted soils will be excavated for off-site disposal. For a majority of the Site, excavation will be performed to the perched groundwater table (~7 ft bsg). In the former UST areas, and if needed to remove grossly contaminated soils, excavation will be performed down to the peat layer (~10 ft bsg) and Oxygen Release Compound (ORC) will be applied. The resultant excavations will be backfilled with clean fill that has been sampled in accordance with the procedures discussed herein;

- Collect and analyze end-point soil samples to evaluate the performance of the remedy with respect to attainment of restricted residential RUSCOs;

- Construct and maintain an engineered composite cover system consisting of building structural foundation slab, asphalt paving and/or a minimum of two feet of clean fill to prevent human exposure to residual contaminated soil/fill remaining under the Site;

- Remediate LNAPL identified on the perched groundwater table via excavation and vacuum extraction;

- Remediate LNAPL in the perched zone, if necessary, by panelized surfactant or chemical oxidant injections to reduce the LNAPL viscosity followed by vacuum extraction of the LNAPL;

- Remediate LNAPL contamination identified in the lower sand unit via installation of a capture wall with collection and recovery wells and down-well skimming equipment to recover LNAPL that is collected by the capture wall. Also, install twenty-four twin nested or twin couplet monitoring and remediation wells in the LNAPL plume area, four twin nested or twin couplet monitoring and remediation wells immediately down gradient of the wall, and ten twin nested or twin couplet monitoring and remediation wells around the site perimeter;

- Import of materials to be used for backfill and cover in compliance with: (1) chemical criteria identified in 6 NYCRR Part 375-6.7(d), (2) all Federal, State and local rules and regulations for handling and transport of material;

- Implement long-term groundwater monitoring program to evaluate the performance of the remedy with respect to attainment of groundwater standards;

- Install and operate a vapor intrusion control membrane and/or sub-slab depressurization system beneath the occupied portions of buildings;

- Record an Environmental Easement, including Institutional Controls, to prevent future exposure to any residual contamination remaining at the Site;

- Implement engineering controls with an engineering design work plan to provide design and specifications for vapor intrusion control, composite cap system, capture wall with LNAPL removal utilities, and LNAPL monitoring and remediation wells.

- Implement a Site Management Plan for long term management of residual contamination as required by the Environmental Easement, including plans for: (1) Institutional and Engineering Controls, (2) monitoring, (3) operation and maintenance and (4) reporting;

3.2.1 Zoning

The Site is located partially within an M1-4 zoning district and partially within an M1-4/R6A zoning district with the Special Long Island City Mixed Used District ("LIC"). The Site has a total zoning lot area of 66,838 square feet, with 20,000 square feet located in the M1-4/R6A (LIC) zoning district fronting on 5th Street and 48,838 square feet located with an M1-4 district on the eastern portion of the Site. Pursuant to variance number 238-07-BZ, granted on September 23, 2008 by the Board of Standards and Appeals (the "Board"), as amended by a Letter of Substantial Compliance issued by the Board on June 10, 2009 (the "Variance"), the Site will be developed with a twelve-story mixed-use residential building with commercial and community facility space located on the ground floor, a six- story student dormitory and faculty housing building for the City of New York and a cellar level accessory parking garage with 91 attended parking spaces. The Variance was required because (i) student dormitory use (Use Group 3) and faculty housing use (Use Group 2) are not permitted community facility uses in an M1-4 zoning district and (ii) the 12 story residential building does not comply with New York City Zoning Resolution regulations, such as exceeding the permitted floor area ratio ("FAR"), lot coverage, front and rear setbacks and building height in the M1-4/R6A (LIC) zoning district. The Board, among other restrictions, limited the Site to a maximum FAR of 5.23 a maximum floor area permitted for each use in each zoning district and the height of the residential building. All development on the Site is required to substantially conform to the drawings approved in connection with the Variance. Development that does not substantially conform to the Variance requires an amendment to the Variance. The Board may approve the surrender of the Variance if the Site were to be developed with as-of-right uses and in compliance with zoning bulk regulations or if the area in which the Site is located were to be rezoned to allow the proposed development on an as-of-right basis (one that does not require discretionary approvals).

3.2.2 Applicable comprehensive community master plans or land use plans

The Site is not located within an Urban Renewal Area (URA), landmarked historic district, adopted 197-A or an area that is being studied for, or proposed to be, rezoned. The existing zoning was not altered by the Variance, which is only applicable to development at the Site. The Site is also not located within the Coastal Zone Management Act coastal zone.

In addition, several public policies are relevant and applicable to the Site and the proposed development as follows:

Plan for Long Island City: A Framework for Development

In 1993, the NYCDCP published the *Plan for Long Island City: A Framework for Development*, which set forth a vision for the Long Island City and surrounding areas to be implemented through zoning changes and capital investments in mass transit, streets and parkland. The proposed redevelopment meets the stated goals of the *Plan for Long Island City: A Framework for Development*, with additional investments for the area to create new housing and retail businesses in the Hunters Point mixed-use community.

Plan for the Queens Waterfront

In 1992/1993, the NYCDCP published the *Plan for the Queens Waterfront*, a part of *New York City's Comprehensive Waterfront Plan: Reclaiming the City's Edge*, which presents detailed studies of the borough's waterfront study areas. The proposed redevelopment is consistent with the goals of the *Plan*

*for the Queens Waterfron*t, by reclaiming some of the declining and underutilized industrial base near the western Queens waterfront, while enhancing the social and economic life of the area with new the proposed mixed-use development.

The New Housing Marketplace: Housing for the Next Generation

In December 2002, Mayor Bloomberg announced a $3 billion plan, *The New Housing Marketplace: Housing for the Next Generation*, with a goal to create and preserve more than 65,000 homes and apartments City-wide over the subsequent five year period. The proposed redevelopment includes the creation of 169 new market-rate housing units, along with 12 faculty townhouses and 220 student dormitory rooms. The proposed 169 new housing units is consistent with the stated need for housing at all levels, including but not limited to market-rate housing, and also is consistent with the goal of creating new land for housing development with rezoning and other plans throughout the City for it's growing population.

Long Island City Industrial Business Area

In January 2005, Mayor Bloomberg created the City's Office of Industrial and Manufacturing Businesses (IMB) to help protect and promote the City's industrial sector and to retain and grow the sector's job base, execute the goals of the industrial policy, and serve as a single point of coordination for the industrial and manufacturing sector.

The project site has been designated as part of the Ombudsman areas within the Long Island City Industrial Business Area. As such, the City is not committed to maintain industrial uses within this Ombudsman zone, but rather allow new uses within Ombudsman areas (and the project site) to further enhance the area's redevelopment. Additionally, the project site is already located adjacent to existing housing to the east and new housing to the west being constructed as part of the Queens West project.

New York City 2005 Consolidated Plan

In 2005, the NYCDCP released the *2005 Consolidated Plan*, the City of New York's application to the United States Department of Housing and Urban Development (HUD) for the following four Office of Community Planning and Development entitlement programs: Community Development Block Grant (CDBG), HOME Investment Partnership (HOME), Emergency Shelter Grant (ESG), and Housing Opportunities for Persons with AIDS (HOPWA). In addition, the Proposed Plan contains the City's submission to HUD of its 5-year strategic plan for Consolidated Plan Years 2005-2009.

The proposed action will help the City meet the goals of the *2005 Consolidated Plan*, by helping to facilitate housing production across the City (in this case, western Queens), as well as providing the targeted private investment in the community as indicated in the Plan. The proposed action will also expand the City's supply of housing and improve neighborhood quality through the elimination of the existing industrial and blighted properties on the project site, along with the promotion of greater community involvement and investment through the provision of new homeownership opportunities.

3.2.3 Surrounding property uses

The properties immediately adjacent to the Site are predominantly residential and commercial with a few light industrial properties. The properties to the west across 5th Street are a residential high-rise, a public park, and a NYSDEC Brownfield site currently in post remediation phase. The properties to the south

across 47th Avenue, to the north across 46th Road, and immediately adjacent to the east are residential and commercial.

No schools, day care facilities or hospitals currently border the Site. The East River, which is located approximately ¼ mile to the west, is the only sensitive receptor proximate to the Site. The East River is classified as Class I under 6 New York Codes, Rules and Regulations (NYCRR) Part 701. According to 6 NYCRR Part 701, the best usage of Class I waters are "secondary contact recreation and fishing. These waters shall be suitable for fish propagation and survival.

3.2.4 Citizen participation

The approved Citizens Participation Plan (CPP) is included in **Appendix 8**. To date, the following CPP activities have been completed:

- Remedial Investigation Workplan (RIW) prepared and RIW Fact Sheet #1 mailed to CPP Contact List;
- Implementation of RIW;
- Remedial Investigation Report (RIR) prepared and RIR Fact Sheet #2 mailed to CPP Contact List;
- Draft Remedial Action Workplan (RAWP) prepared and Draft RAWP Fact Sheet #3 mailed to CPP Contact List;
- Revised Draft RAWP prepared and Fact Sheet #4 mailed to CPP Contact List;
- Interim Remedial Measures (IRM) Workplan for tank removals prepared and IRM Workplan Fact Sheet #5 mailed to CPP Contact List;
- Environmental easement and Site Management Plan being developed; and
- Remedial Action anticipated to be implemented during Summer 2009 and Final Engineering Report submitted to NYSDEC in Fall 2009;

3.2.5 Environmental justice concerns

There are no known environmental justice concerns associated with the Site.

3.2.6 Land use designations

The Site is located partially within an M1-4 zoning district and partially within an M1-4/R6A zoning district with the Special Long Island City Mixed Used District ("LIC"). The eastern two thirds of the Site is located in the M1-4 district, a light manufacturing district that permits a wide range of commercial and manufacturing uses that conform to high-performance standards established for manufacturing uses. M1-4 zoning districts also permit very limited as-of-right community facility use. Residential use is not permitted as-of-right in an M1-4 zoning district. The western portion of the Site that fronts on 5th Street is located within an M1-4/R6A mixed-use zoning district. This district permits medium-density contextual residential use, community facility use, commercial use and light manufacturing use. However, uses on the Site are limited to those permitted pursuant to the Variance. The Site must be developed in substantial conformity with the Variance, which only permits the construction of a 12-story residential building with ground floor commercial and community facility use in the M1-4/R/6A and student dormitory community facility use and faculty housing residential use in the M1-4 district.

3.2.7 Population growth patterns

The proposed action has the potential to introduce an estimated total of up to 829 new residents/open space users to the area, though it should be noted that the majority of them would be students who would not reside on the Site all year long. Therefore, the population added as a result of the proposed development is not expected to have a significant impact on the surrounding community.

Development in the area surrounding the site has grown at a rapid pace in the years between 2000 and the present. State of New York City's Housing and Neighborhoods 2008 Community District Profile published by the New York City Department of City Planning estimates that close to 3,000 new building permits were issued in the years from 2000 to 2007. New Developments such as The Toll Brothers Condominiums and Queens West have added hundreds of new units to the area. With projects such as the Silvercup Studios, River East and the Rockrose Developments, it is estimated that by 2010, the population of Long Island City will have increased by approximately 5,000 households.

3.2.8 Accessibility to existing infrastructure

The Site is accessible to the existing infrastructure. Water and sewer service are available for future connection. A combined sewer line is located along 46th Street. No significant adverse impacts related to water usage and supply are not expected as a result of the proposed development, nor are significant adverse wastewater or stormwater impacts anticipated.[3]

Existing gas, electric and telecommunication facilities are located in proximity to the Site.

3.2.9 Proximity to cultural resources

The proposed development activities are not expected to impact cultural resources**.**

3.2.10 Proximity to natural resources

No regulated wetlands are mapped as existing at the Site. No significant coastal zones, lakes or NYSDEC designated Significant Habitats are located within two (2) miles of the Site. The East River, an estuarine deep water, is located approximately ¼ mile west of the Site. The East River includes Littoral Zone wetlands. The proposed action is not anticipated to result in any significant adverse impacts to natural resources.

3.2.11 Off-site groundwater impacts

Based on observations of monitoring wells located off-site, LNAPL has been detected in off-site wells installed along the sidewalk but was not observed in wells located across the street from the site Dissolved groundwater contamination exceeding UUSCO was detected in perched zone well MW-8S located on 46th Street which may be emanating from the Site.

[3] Supplemental studies to the Environmental Assessment Statement, Revised

3.2.12 Proximity to floodplains

According to the New York City flood maps, the Site is located within the 100-year floodplain boundary (Zone AE). The finished floor elevations will be above base flood elevation and in accordance with NYCDOB requirements. All infrastructure improvements will be completed in compliance with FEMA guidelines.

3.2.13 Current Institutional Controls

The Site was the subject of an Administrative Order (Docket No. II RCRA-7003-91-0201) issued by the United States Environmental Protection Agency (USEPA) pursuant to Resource Conservation and Recovery Act (RCRA), Section 7003. Pursuant to this Order, Accurate Associates undertook certain removal, investigative and remedial activities at the premises under USEPA's oversight. As part of the remedial activities, portions of the concrete floor and walls within this portion of the Site were encapsulated for the purpose of encapsulating residual lead, arsenic, and selenium contamination. Pursuant to EPA's RCRA Administrative Order for the Site, effective May 29, 1991, the Order's Respondents filed a Notice in Deed in the Queens County City Register on July 14, 1993, No. 47605. The Notice stated that lead, arsenic and selenium are encapsulated beneath portions of the floor and walls at the premises, and that the RCRA Order required that the encapsulation be maintained. The Deed Notice was the final action required by Respondents pursuant to the RCRA Order, as all other removal and remediation actions were satisfactorily performed.

By a letter transmitted to DEC on March 29, 2007, EPA consented to the suspension of the Notice in Deed, No. 47605, and termination of that Notice, upon completion of the remedial program carried out pursuant to the BCP, and provided that the Brownfield Cleanup Agreement be filed in the same place and manner as the Notice in Deed, No. 47605 together with a copy of the EPA consent letter.

3.3 SUMMARY OF SELECTED REMEDIAL ACTIONS

The proposed remedial actions are intended to protect human health and the environmental. The remedial actions will remediate soil, groundwater and LNAPL contamination, mitigate potential exposure of future occupants to soil, groundwater, LNAPL and soil vapor contaminants, prevent discharges of contaminants to surface water, and prevent LNAPL migration. The following actions are proposed and have been discussed in detail elsewhere herein:

1) All excavation and truck loading activities as described below will be conducted under a negative pressure containment structure;

2) An IRM consisting of registration and removal of on-site underground storage tanks (USTs) in accordance with NYSDEC requirements;

3) Remove the on-site source(s) of soil contamination (i.e., LNAPL and grossly contaminated soil), to the extent practicable;

4) Remediate the soil contamination at the Site in order to achieve compliance with RUSCOs for residential use (Table 375-6.8(b)). The soil remedial mechanism will be excavation, characterization and proper off-site disposal of excavated soils and

application of Oxygen Release Compound (ORC) at locations that are excavated to depths below the seasonal water table;

5) Collect and analyze end-point soil samples to evaluate the performance of the remedy with respect to attainment of restricted residential RUSCOs;

6) Construct and maintain an engineered composite cover system consisting of building structural foundation slab, asphalt paving and/or a minimum of two feet of clean fill to prevent human exposure to residual contaminated soil/fill remaining under the Site;

7) Remediate LNAPL identified on the perched groundwater table via excavation and vacuum extraction;

8) Remediate LNAPL in the perched zone if needed by injection of surfactants or chemical oxidants to reduce viscosity followed by vacuum extraction;

9) Remediate LNAPL contamination identified in the lower sand unit via installation of a capture wall, collection and recovery wells, and down-well skimming equipment to collect and remove the LNAPL. Also, install thirty eight monitoring and remediation twin nested or twin couplet wells for future groundwater monitoring and LNAPL recovery;

10) Import of materials to be used for backfill and cover in compliance with: (1) chemical criteria identified in 6 NYCRR Part 375-6.7(d), (2) all Federal, State and local rules and regulations for handling and transport of material;

11) Implement long-term groundwater monitoring program to evaluate the performance of the remedy with respect to attainment of groundwater standards; site perimeter monitoring wells will be abandoned during construction activities and will be replaced with a series of cluster wells to monitor the perched unit and the lower sand unit;

12) Install and operate a vapor intrusion control system consisting of a waterproofing membrane with a thickness of at least 20-mils and/or a sub-slab de-pressurization system;

13) Record an Environmental Easement, including Institutional Controls, to prevent future exposure to any residual contamination remaining at the Site;

14) Implement engineering controls via an engineering design work plan to provide design and specifications for vapor intrusion control, composite cover system, LNAPL capture wall and removal utilities, and LNAPL monitoring and remediation wells;

15) Implement a Site Management Plan for long term management of residual contamination as required by the Environmental Easement, including plans for: (1) Institutional and Engineering Controls, (2) monitoring, (3) operation and maintenance and (4) reporting;

All responsibilities associated with the Remedial Action, including permitting requirements and pretreatment requirements, will be addressed in accordance with all applicable Federal, State and local rules and regulations.

Remedial activities will be performed at the Site in accordance with the NYSDEC-approved RAWP and UST IRMs. All deviations from the RAWP will be promptly reported to NYSDEC for approval and fully explained in the FER.

4.0 REMEDIAL ACTION PROGRAM

4.1 GOVERNING DOCUMENTS

4.1.1 Site Specific Health & Safety Plan (HASP)

A copy of the site-specific HASP that has been developed for the remedial activities proposed herein is included as **Appendix 9.**

All remedial work performed under this plan will be in full compliance with governmental requirements, including site and worker safety requirements mandated by Federal OSHA.

The Volunteer and associated parties preparing the remedial documents submitted to the State and those performing the construction work, are completely responsible for the preparation of an appropriate HASP and for the appropriate performance of work according to that plan and applicable laws.

The HASP and requirements defined in this Remedial Action Work Plan pertain to all remedial and invasive work performed at the Site until the issuance of a Certificate of Completion.

The Site Safety Coordinator will provided by CitiStructure on behalf of the Volunteer**.** A resume will be provided to NYSDEC prior to the start of remedial construction.

Confined space entry will comply with all OSHA requirements to address the potential risk posed by combustible and toxic gasses.

4.1.2 Quality Assurance Project Plan (QAPP)

Post-remedial samples will be collected in accordance with the Quality Assurance/Quality Control Plan included in **Appendix 10.**

4.1.3 Soil/Materials Management Plan (SoMP)

The details of the Soil/Materials Management Plan (SoMP) are discussed in Section 5.4 of this RAWP. Section 5.4 includes detailed plans for managing all soils/materials that are disturbed at the Site, including excavation, handling, storage, transport and disposal. It also includes the controls that will be applied to these efforts to assure effective, nuisance-free performance in compliance with all applicable Federal, State and local laws and regulations.

4.1.4 Storm-Water Pollution Prevention Plan (SWPPP)

The details of the Storm-Water Pollution Prevention Plan (SWPPP) prepared by Dewberry-Goodkind, Inc. are discussed in Section 5.4.10 of this report. As indicated in **Appendix 16**, silt fencing or hay bales will be installed around the entire perimeter of the remedial construction area.

The SWPPP addresses requirements of New York State Storm-Water Management Regulations including physical methods to control and/or divert surface water flows and to limit the potential for erosion and migration of site soils, via wind or water.

The erosion and sediment controls will be in conformance with requirements presented in the New York State Guidelines for Urban Erosion and Sediment Control.

4.1.5 Community Air Monitoring Plan (CAMP)

A copy of the site-specific Community Air Monitoring Plan (CAMP) that has been developed for the remedial activities proposed herein is included as Appendix 11. The Purpose of the CAMP is to provide a measure of protection to the surrounding community including residences, businesses, and on site employees from potential airborne releases as a direct result of the investigative or remedial work on the site. This plan is not intended for use in establishing action levels for worker exposure protection, as this is addresses in the site-specific Health and Safety Plan (HASP).

The CAMP setup consists of three air monitoring stations setups, one upwind and two downwind of the work area and a portable setup for monitoring the work area perimeter. The CAMP setups which consist of a particulate meter and photo ionization detector are set to record continuous readings of the airborne particulate (dust) and volatile organic compounds. The monitoring data is logged on the equipment and downloaded to provide a record of the readings coming on to the site and going off the site.

A fabric structure will be erected over the work areas with an air exchange/filtration system to cycle air between the inside of the structure and the outside air. The filtration system will be set up to monitor the particulate and vapor emissions exhausted from the enclosed area. The CAMP setups will provide the outer perimeter monitoring to ensure particulate and vapor measurements leaving the site are below the mandated air levels as detailed in the site-specific HASP.

4.1.6 Contractors Site Operations Plan (SOP)

The Remedial Engineer has reviewed all plans and submittals for this remedial project (including those listed above and contractor and sub-contractor document submittals) and confirms that they are in compliance with this RAWP. The Remedial Engineer is responsible to ensure that all later document submittals for this remedial project, including contractor and sub-contractor document submittals, are in compliance with this RAWP. All remedial documents will be submitted to NYSDEC and NYSDOH in a timely manner and prior to the start of work.

If a formal Remedial Design is required, it should be incorporate all of the elements identified for this RAWP into a sect of biddable quality plans and specifications. The final design submittal of these plans and specifications must be signed and stamped by a NYS licensed professional engineer.

A detailed engineering design work plan that addresses vapor intrusion control, composite cap system, capture wall, and LNAPL removal utilities, and LNAPL monitoring and remediation wells all to be

designed integrally with the planned facility will be submitted to NYSDEC for approval by October 30, 2009.

4.1.7 Citizens Participation Plan

A certification of mailing will be sent by the Volunteer to the NYSDEC project manager following the distribution of all Fact Sheets and notices that includes: (1) certification that the Fact Sheets were mailed, (2) the date they were mailed; (3) a copy of the Fact Sheet, (4) a list of recipients (contact list); and (5) a statement that the repository was inspected on (specific date) and that it contained all of applicable project documents.

No changes will be made to approved Fact Sheets authorized for release by NYSDEC without written consent of the NYSDEC. No other information, such as brochures and flyers, will be included with the Fact Sheet mailing.

The approved Citizen Participation Plan for this project is attached in **Appendix 8.**

Document repositories have been established at the following locations and contain all applicable project documents:

Court Square Library (CitiCorp Building)

25-01 Jackson Avenue

Long Island City, NY 11101

Attn: **Quege Doumouza**

Phone: **(718) 937-2790**

Hours: Mon: 12:00 Noon to 7:00 PM

Tue: 1:00 PM to 6:00 PM

Wed: 10:00 AM to 6:00 PM

Thu: 12:00 Noon to 6:00 PM

Sat/ Sun: Closed

Queens Community Board 243-22 50th Street, 2nd Floor

Woodside, NY 11377

Attn: **Joe Conley**

Phone: (718) 533-8773

Hours: Mon – Fri: 9:00 AM to 5:00 PM

Sat/ Sun: Closed

All citizen participation activities will be conducted in accordance with ECL §27-1417 of the New York State Environmental Conservation Law. Numerous Citizen Participation activities occur throughout the timeline of the project, as detailed in the CPP.

4.2 GENERAL REMEDIAL CONSTRUCTION INFORMATION

4.2.1 Project Organization

The Remedial Action (RA) activities proposed within this work plan will be implemented upon approval by the NYSDEC and under the supervision of personnel identified in the table on the following page. The table identifies the primary personnel connected with implementing the work plan and describes their responsibilities. The list is subject to change with notification to NYSDEC. The site-specific HASP lists the actual EWMA representatives that supervise the implementation of the tasks. Resumes of key personnel involved in the Remedial Action are included in **Appendix 12**.

Personnel	Affiliation	Responsibilities
Richard Arnold	Environmental Waste Management Associates, LLC 100 Misty Lane Parsippany, New Jersey 07054 973-560-1400 x174 973-560-0400-fax	o Remedial Engineer o Review/oversight of project remediation activities with SPM and SM. o Preparation and certification of the final engineering report with the SPM.
Sharon McSwieney	Environmental Waste Management Associates, LLC 51-A Everett Drive West Windsor, New Jersey 08550 609-799-7300 x196 609-799-0108-fax	o Senior Project Manager (SPM). o Provides overall direction from the office upon consultation with the SM.
Daniel DiRocco	Environmental Waste Management Associates, LLC 100 Misty Lane Parsippany, New Jersey 07054 973-560-1400 973-560-0400-fax	o Site Manager (SM); reports to SPM. o Supervises all on-site activities in connection with the work plan. o Assures adherence with the technical requirements of the work plan. o Primary contact for on-site H&S emergencies. o Primary contact concerning activities, field personnel, contact with the SPM and public inquiries.
Kenneth Bickerton, CIH, CSP (as needed for support to CitiStructure SSM).	Phase Associates, LLC 316 Eisenhower Parkway Livingston, New Jersey 07039 973-597-0750 973-597-6445-fax	o Site Safety Manager (SSM); reports to SM. o Assures adherence with the HASP of the work plan. o Assists in ensuring adherence with the QA/QC procedures of the work plan. o Has authority in stopping work per SM approval when H&S concerns arise.

Craig Gorczyca, CHMM	Environmental Waste Management Associates, LLC 100 Misty Lane Parsippany, NJ (973) 560-1400	• Director, Operations & Waste Management • Project Hazardous Waste Manager
Frank Gherling	Frank Gherling Galli Engineering Mellville, NY	• UST Closure Engineer • Permitting. • Controlled Inspections. • Letter of Completion.
Lawrence Johnsen	Heller & Johnsen 20 Foot Of Broad Street Stratford, CT 06615	• Geotechnical Engineer • Shoring and Sheeting • Excavation Earth Support
Dave Banerjee	Impact Concrete & Control Inspections Inc 15-46 129th Street College Point, NY 11356	• Control Inspections/Impact Testing (H-piles, foundations)
Steve Fatzinger, P.E & Chander Nangia, P.E.	AllSite Structure Rental 1205 St Paul Street Baltimore, MD 21202 410.605.9216	• Tent Engineer • Calculations and Drawings • Tent Certification
Jeff Thorne	EISCO-NJ 900 Port Reading Avenue Suite B-2 Port Reading, New Jersey 070640 732-969-4888 732-969-9599-fax	• All physical activities associated with uncovering, removal and disposal of the UST. • Waste disposal (UST contents). • Backfill of excavation.

4.2.2 Remedial Engineer

The Remedial Engineer for this project will be Richard Arnold. The Remedial Engineer is a registered professional engineer licensed by the State of New York. The Remedial Engineer will have primary direct responsibility for implementation of the remedial program for the OCA-LIC fifth street site (NYSDEC BCA Index No. A2-0584-0307; Site No. C241098). The Remedial Engineer will certify in the Final Engineering Report that remedial activities were observed by qualified environmental professionals under his supervision and that the remediation requirement set forth in the Remedial Action Work Plan, and any other relevant provisions of ECL 27-1419, have been achieved in full conformance with that plan. Other Remedial Engineer certification requirements are listed later in this RAWP.

The Remedial Engineer will coordinate the work of other contractors and subcontractors involved in all aspects of remedial construction, including soil excavation, stockpiling, characterization, removal and disposal, air monitoring, emergency spill response services, import of back fill material, and management of waste transport and disposal. The Remedial Engineer will be responsible for all appropriate communication with NYSDEC and NYSDOH.

The Remedial Engineer will review all pre-remedial plans submitted by contractors for compliance with the Remedial Action Work Plan and will certify compliance in the Final Engineering Report.

The Remedial Engineer will provide the certifications listed in Section 10.1 in the Final Engineering report.

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4.2.3 Remedial Action Construction Schedule

The actual start date is dependent upon review and approval of the RAWP by the NYSDEC. A schedule denoting the specific dates for the work activities will be provided to the NYSDEC within 3 days of receipt of RAWP approval.

Task	Start Date	Duration
Equip Mobilization	5 days after RAWP approval	5 days
Construct Tent Structure	30 days after RAWP approval	10 days
Remove USTs	1 Day after Tent Constructed	10 days
Soil Excavation	10 days after RAWP approval	35 days
Remediate LNAPL	concurrent with soil excavation	35 days
Post Excavation & Disposal	concurrent with soil excavation	35 days
Complete Excavation & Disposal	60 days after tent constructed	(see above)
Post-Remedial Groundwater Monitoring	10 days after completion of soil remediation	5 days
Reporting	daily and monthly	N/A
Final Engineering Report	within 60 days of completion of remediation	N/A
Vapor Intrusion Control System	concurrent with building construction	45 days
LNAPL Monitoring and Remediation Wells	concurrent with building construction	60 days
Composite Cap System	concurrent with building construction	60 days
Capture Wall/LNAPL Recovery Utilities	concurrent with building construction	60 days
Total Duration of Remediation		**120 days**

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4.2.4 Work Hours

The hours for operation of remedial construction will conform to the New York City Department of Buildings construction code requirements or according to specific variances issued by that agency. DEC will be notified by the Applicant of any variances issued by the Department of Buildings. NYSDEC reserves the right to deny alternate remedial construction hours. Currently, all site work associated with the remedial action will be conducted on Monday – Friday between the hours of 7:00 am and 4:00 pm.

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4.2.5 Site Security

The perimeter of the Site that is accessible by land is surrounded by chain-link fence. A locking gate is situated at the entrance point located at the corner of 5th Street and 47th Avenue. These controls will be maintained for the duration of the remedial activities proposed herein.

4.2.6 Traffic Control

All vehicular traffic involved in the site remediation activities will enter the Site via an established truck entrance located on the north side of 47th Avenue. All vehicular traffic involved in the site remediation activities will be parked on the Site and at no time will the local roadways be utilized for parking or idling.

All trucks will exit the Site via 46th Road. Based on the estimated daily volume of soil anticipated to be excavated, approximately 20 loads will be going out each day. The anticipated truck route is included in Appendix 15. Volunteer is obtaining local input from Community Board II, and if necessary, revisions to the truck route will be made based on local input. Due to the expected high volume of truck traffic, traffic control will be needed and such control measures will be provided in accordance with local municipal traffic control requirements.

The need for traffic control on the local roadways entering the Site is not anticipated at this time. Should conditions change and indicate the need for such control, said control measures will be provided in a manner that conforms to local municipal traffic control requirements.

4.2.7 Worker Training and Monitoring

As detailed in the accompanying HASP, all workers associated with the remedial activities will have:

- been certified by a licensed physician as being physically able to perform their assigned field work, and to use the Personal Protective Equipment (PPE) which will be required for this project, in accordance with the provisions of OSHA Regulation 29 CFR 1910.120(f); and
- passed a Qualitative Respirator Fit Test.

All remediation personnel working on-site shall be thoroughly trained as specified in OSHA Regulations 29 CFR 1910.120(e), and 1910.1028. This training will include: (1) Attendance at an initial 40-hour basic health and safety training course off the Site; (2) At least three days of actual field experience under the direct supervision of a trained, experienced supervisor; (3) On-site, site-specific training; and (4) an 8-hour annual update in the basic health and safety training course.

In addition to the above, on-site Managers and supervisors who are directly responsible for, or who supervise employees engaged in hazardous waste operations must also receive: (1) 8-hours of site supervisor training; and (2) additional training at the time of job assignment on such topics as, but not limited to, the company's

safety and health program and the associated employee training program; personal protective equipment program; spill containment program; air quality monitoring; emergency response; monitoring equipment usage and calibration; and, health hazard monitoring procedures and techniques.

At the time of job assignment, special training will be provided to on-site personnel who may be exposed to unique or special hazards not covered by the initial 40-hour basic health and safety course. If unique or special hazards are unexpectedly encountered, specialized training will be provided before work proceeds.

4.2.8 Agency Approvals

The Applicant has addressed all CEQRA requirements for the redevelopment of this site. In connection with that SEQRA review, Volunteer has recorded a Restrictive Declaration mandating that Volunteer obtain a Notice to Proceed from the New York City Department of Environmental Protection ("NYCDEP") before applying for any building permits and obtain a Notice of Satisfaction from NYCDEP before applying for a Certificate of Occupancy for the future buildings. The Restrictive Declaration is attached as Appendix 6. All permits or government approvals required for remedial construction have been, or will be, obtained prior to the start of remedial construction.

The planned end use for the Site is in conformance with the zoning variance 238-07-BZ adopted by the New York City Board of Standards and Appeals on September 23, 2008. Resolution is included in Appendix 6.

A complete list of all local, regional and national governmental permits, certificates or other approvals or authorizations required to perform the remedial and development work is attached in **Table 5.** This list includes a citation of the law, statute or code to be complied with, the originating agency, and a contact name and phone number in that agency. This list will be updated in the Final Remediation Report.

No planned remedial work will be conducted in regulated wetlands or areas adjacent to regulated wetlands.

4.2.9 NYSDEC BCP Signage

A project sign will be erected at the main entrance to the Site prior to the start of any remedial activities. The sign will indicate that the project is being performed under the New York State Brownfield Cleanup Program. The sign will meet the detailed specifications provided by the NYSDEC Project Manager and contained in **Appendix 13.**

4.2.10 Pre-Construction Meeting with NYSDEC

A meeting among the NYSDEC Project Manager, Remedial Engineer, and the contractors will be conducted at the Site prior to the start of the remedial activities proposed herein.

4.2.11 Emergency Contact Information

An emergency contact sheet with names and phone numbers is included in Table 6 That document will define the specific project contacts for use by NYSDEC and NYSDOH in the case of a day or night emergency.

4.2.12 Remedial Action Costs

The total estimated cost of the Remedial Action is approximately $4.5 million **dollars**. This estimate has been revised to include the tent structure/vapor management controls and the capture wall/recovery well system for remediation of the lower sand unit LNAPL plume observed on the eastern, upgradient portion of the Site An itemized and detailed summary of estimated costs for the remedial activities proposed herein is attached as **Appendix 14**.

4.3 SITE PREPARATION

4.3.1 Mobilization

The mobilization of equipment related to the proposed soil excavation activities will not occur until the RWP has been approved by the NYSDEC/NYSDOH and all required SWPPP/soil erosion and sediment controls have been constructed.

4.3.2 Erosion and Sedimentation Controls

Erosion and sedimentation controls will be constructed and maintained as outlined in the SWPPP.

Erosion and sediment control measures identified in the SWPPP will be routinely inspected to ensure that they are operating correctly. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters.

4.3.3 Stabilized Construction Entrance(s)

The remedial construction entrance will be located on 47th Avenue and the remedial construction exit will be located on 46th Road. Refer to Appendix 15. The construction entrance/exit shall have a stabilized aggregate pad underlain with filter cloth to prevent vehicles from tacking sediment off-site. The stabilized construction entrance will be constructed across the full width of the gated entrance.

4.3.4 Utility Marker and Easements Layout

The presence of utilities and easements on the Site has been investigated by the Remedial Engineer. It has been determined that no risk or impediment to the planned work under this Remedial Action Work Plan is posed by utilities or easements on the Site.

The Volunteer and its contractors are solely responsible for the identification of utilities that might be affected by work under the RAWP and implementation of all required, appropriate, or necessary health and safety measures during performance of work under this RAWP. The Volunteer and its contractors are solely responsible for safe execution of all invasive and other work performed under this RAWP. The Volunteer and its contractors must obtain any local, State or Federal permits or approvals pertinent to such work that may be required to perform work under this RAWP. As mandated by the Restrictive Declaration, the Volunteer will obtain a Notice to Proceed from NYCDEP. Approval of this RAWP by NYSDEC does not constitute satisfaction of these requirements.

4.3.5 Sheeting and Shoring

During earthwork and excavation operations at the Site, earth support will be planned and implemented in accordance with OSHA 29 CFR 1926 Subpart P and in accordance with utility protection, odor control, intrusive work control, and other protective practices as set forth elsewhere (i.e. Appendix 9, Health and Safety Plan, Appendix 11, Community Air Monitoring Plan) in this Plan.

With exception to areas proximal to the site perimeter, it is anticipated that a majority of the remedial excavation work will be accomplished without sheeting or shoring. However, earth support decisions, and decisions to use or not to use sheeting or shoring will be made on a location specific basis across the Site. These decisions will consider the feasibility of alternate earth support mechanisms as may be needed to provide worker protection, protection of utilities, and protection of existing structures or facilities at specific site locations.

The Volunteer and its contractors are solely responsible for the safe execution of all excavation work and excavation related activities performed under this Plan, and are responsible to obtain any local, State or Federal permits or approvals that may be required to perform work under this Plan. Further, the Volunteer and its contractors are solely responsible for the implementation of all required, appropriate or necessary health and safety measures during performance of work under the approved Plan.

Appropriate management of structural stability of on-site or off-site structures during on-site activities include excavation is the sole responsibility of the Volunteer and its contractors.

4.3.6 Equipment and Material Staging

All materials will be stored away from storm sewers and nearby environmentally sensitive areas. Where possible, materials will be stored in a covered area.

4.3.7 Decontamination Area

Large-scale washing of trucks and equipment will be conducted . A truck washing station will be constructed at the Site (Refer to Appendix 15).The bucket of the excavation equipment will be cleaned before moving to a new area of concern by removing any solid residue, washing with an alconox/water solution and rinsing with clean water in the truck washing station area.
Disposable supplies (i.e. boot over covers, gloves, sampling scoops, etc.) will be collected in bags proximate to their area of usage and containerized in 55-gallon drums for disposal in accordance with applicable regulations.

4.3.8 Site Fencing

The perimeter of the Site is surrounded by chain-link fence. A locking gate is situated at the entrance point located at the corner of 5th Street and 47th Road. These controls will be maintained for the duration of the remedial activities proposed herein.

4.3.9 Demobilization

Since development of the Site will commence after the soil remedial activities have been completed, no site-restoration activities, other than the backfill of the remedial excavation areas is proposed at this time.

Any equipment that was utilized on site exclusively for the remediation activities will be decontaminated and removed. All materials generated during the course of the remedial activities will be disposed off-site in accordance with acceptable rules and regulations.

The sediment and erosion control measures will remain in effect for the duration of the development project.

4.4 REPORTING

As discussed in Section 4.4.1 and 4.4.2, reports will be submitted on a daily and monthly basis. Copies of all daily and monthly Reports will be included in the Final Engineering Report.

4.4.1 Daily Reports

Daily reports will be submitted to NYSDEC and NYSDOH Project Managers by the end of each day following the reporting period and will include:

- The NYSDEC assigned project number;
- An update of progress made during the reporting day;
- Locations of work and quantities of material imported and exported from the Site;
- References to alpha-numeric map for site activities;
- A summary of any and all complaints with relevant details (names, phone numbers);
- A summary of CAMP finding, including excursions;
- An explanation of notable site conditions.

Daily reports are not intended to be the mode of communication for notification to the NYSDEC of emergencies (accident, spill), requests for changes to the RAWP or other sensitive or time critical information. However, such conditions must also be included in the daily reports. Emergency conditions and changes to the RAWP will be addressed directly to NYSDEC Project Manager via personal communication.

Daily Reports will include a description of daily activities keyed to an alpha-numeric map for the Site that identifies work areas. These reports will include a summary of air sampling results, odor and dust problems and corrective actions, and all complaints received from the public.

A site map that shows a predefined alpha-numeric grid for use in identifying locations described in reports submitted to NYSDEC is attached in **Figure 16.**

4.4.2 Monthly Reports

Monthly reports will be submitted to NYSDEC and NYSDOH Project Managers within one week following the end of the month of the reporting period and will include:

- Activities relative to the Site during the previous reporting period and those anticipated for the next reporting period, including a quantitative presentation of work performed (i.e. tons of material exported and imported, etc.);

- Description of approved activity modifications, including changes of work scope and/or schedule;
- Sampling results received following internal data review and validation, as applicable; and,
- An update of the remedial schedule including the percentage of project completion, unresolved delays encountered or anticipated that may affect the future schedule, and efforts made to mitigate such delays.

4.4.3 Other Reporting

Photographs will be taken of all remedial activities and submitted to NYSDEP in digital (JPEG) format. Photos will illustrate all remedial program elements and will be of acceptable quality. Representative photos of the Site prior to any Remedial Actions will be provided. Representative photos will be provided of each contaminant source, source area and site structures before, during and after remediation. Photos will be submitted to NYSDEC on CD or other acceptable electronic media and will be sent to NYSDEC's Project Manager (2 copies) and to NYSDOH's Project Manager (1 copy). CD's will have a label and a general file inventory structure that separates photos into directories and sub-directories according to logical Remedial Action components. A photo log keyed to photo file ID numbers will be prepared to provide explanation for all representative photos. For larger and longer projects, photos should be submitted on a monthly basis or another agreed upon time interval.

Job-site record keeping for all remedial work will be appropriately documented. These records will be maintained on-site at all times during the project and be available for inspection by NYSDEC and NYSDOH staff.

4.4.4 Complaint Management Plan

In the event complaints are filed by the public regarding nuisance or other site conditions, the complaints will be addressed by either the Site Remediation or Site Development contractor, depending upon which facet of the project the complaint relates to.

The NYSDEC and NYSDOH Project Managers will be notified immediately via e-mail of any such complaints.

All complaints will be addressed in a timely manner (i.e. within 24-hours of receipt of the complaint) without a stoppage of site work. However, if the complaints address issues that are deemed by the regulatory oversight agencies (i.e. NYSDEC, NYSDOH and/or local regulatory officials) to be potentially harmful to human health and/or the environment, site work will be immediately suspended until a resolution acceptable to the regulatory agency can be implemented.

4.4.5 Deviations from the Remedial Action Work Plan

Based on the additional planned soil vapor and pre-remedial investigations, based on possible discovery during the project, and based on the response of the Site conditions to mitigation stresses, it may be necessary to modify components of the RAWP.

In the event that any deviations from the RAWP are required, the NYSDEC and NYSDOH Project Mangers will be notified in writing of the anticipated deviation. In no event will a deviation occur without first obtaining prior written approval from the NYSDEC and NYSDOH. Additionally, in no event shall a deviation affect the overall site remedy.

5.0 REMEDIAL ACTION: MATERIAL REMOVAL FROM SITE

The proposed remediation for the Site will include removal via excavation of contaminant sources, including underground storage tanks (USTs), impacted soils and LNAPL. The proposed excavation will be performed to the groundwater table (~7 feet bsg) across a majority of the Site with the exception of the UST areas which are estimated to require excavation to approximately 10 feet bgs due to tank depths and visual observations of LNAPL impacted soils. Impacted soils will be characterized and disposed of at an appropriate off-site disposal facility. Where determined to be necessary, deeper excavation may be performed to remove additional contamination. Post–remediation soil sampling will be conducted to evaluate the effectiveness of the remediation.

5.1 SOIL CLEANUP OBJECTIVES

The Soil Cleanup Objectives for this Site, where feasible, are the RUSCOs for restricted residential use listed in **Table 375-6.8(b) of 6 NYCRR Subpart 375-6.**

Table 1 summarizes all soil samples that exceed the UUSCOs proposed for this Remedial Action. A spider map that shows all soil samples that exceed the UUSCOs proposed for this Remedial Action is shown in **Figure 3.**

UST closures will, at a minimum, conform to criteria defined in DER-10.

5.2 REMEDIAL PERFORMANCE EVALUATION (POST EXCAVATION END-POINT SAMPLING)

5.2.1 End-Point Sampling Frequency

The proposed end-point sampling frequency per Section 5.4 of DER-10 requires post-excavation soil samples be collected at a frequency of one per 30 linear feet of excavation sidewall and one per 900 square feet of excavation base for a total of 82 samples. However, due to the large extent of the proposed excavation area (47,000 sq ft), OCA is requesting a reduced frequency of post-excavation sampling to one sample per 50 linear feet of sidewall and one sample per 1,500 square feet of excavation base, with the exception of the RCRA capped area and the UST areas which will be sampled per Section 5.4 of DER-10 for a total of 51 samples.

5.2.2 Methodology

All proposed end-point (i.e. post-excavation) samples will be biased toward the areas and depths of the highest contamination identified during previous sampling episodes. All excavated materials and excavation sidewalls will be examined for evidence of visual contamination (i.e. discoloration) and will be screened with a photoionization detector (PID). In the event these field indicators suggest other locations and depths may be more heavily contaminated, additional end-point samples, beyond those proposed herein will be collected.

All post-excavation samples will be collected within twenty-four hours of completion of the excavation activities from six-inches below the final excavation depth..

A table summarizing the proposed post-excavation end-point samples, their depths, designations, proposed parameters and proposed analytical methodologies is included as **Table 7**.

5.2.3 Reporting of Results

All results will be reported in a tabular format. The excavation boundaries will be surveyed by a New York licensed surveyor and will be mapped. All end-point/post-excavation sample locations will be mapped as well. Any exceedances of the RUSCO (part 375-6.8(b) for residential) will be noted.

5.2.4 DUSR

A Data Usability Summary Report (DUSR) will be prepared for the soil and groundwater samples collected during the RA phase of the investigation.

5.2.5 Reporting of End-Point Data in FER

The Final Engineering Report (FER) will include a detailed description of all remedial activities completed at the Site. The FER will include a table summarizing the end-point sampling data for each area of concern and map depicting all end-point sampling locations.

All end-point samples will be analyzed by an NYSDOH ELAP-certified analytical laboratory, and Category B deliverables are required for all end point samples.

The proposed end-point sampling frequency per Section 5.4 of DER-10 requires post-excavation soil samples be collected at a frequency of one per 30 linear feet of excavation sidewall and one per 900 square feet of excavation base for a total of 82 samples. However, due to the large extent of the proposed excavation area (42,000 sq ft), OCA is requesting a reduced frequency of post-excavation sampling to one sample per 50 linear feet of sidewall and one sample per 1,500 square feet of excavation base, with the exception of the RCRA capped area and the UST areas which will be sampled per Section 5.4 of DER-10 for a total of 51 samples

5.3 ESTIMATED MATERIAL REMOVAL QUANTITIES

The estimated quantity of soil/fill to be removed from the Site is approximately 20,150 tons. The estimated quantity of soil to be imported into the Site for backfill is 4,700 tons . No soil/fill is expected to be reused/relocated on site.

5.4 SOIL/MATERIALS MANAGEMENT PLAN

5.4.1 Soil Screening Methods

Visual, olfactory and PID soil screening and assessment will be performed by a qualified environmental professional during all remedial excavation activities Soil screening will be performed regardless of when the invasive work is done and will include all excavation and invasive work performed during the remedy phase and any excavations that may penetrate the demarcation barrier during development phase.

All primary contaminant sources identified during Site Characterization, Remedial Investigation, and Remedial Action will be surveyed by a surveyor licensed to practice in the State of New York. This information will be provided on maps in the Final Engineering Report.

Resumes will be provided for all personnel responsible for field screening (i.e. those representing the Remedial Engineer) of invasive work for unknown contaminant sources during remediation and development work. Resumes of key personnel have been included as **Appendix 12**.

5.4.2 Stockpile Methods

Stockpiling of excavated soils will be kept at a minimum during the duration of the remedial project. It is currently anticipated that no more than 200 tons of excavated soil from the proposed remediation areas will be temporarily stockpiled on-site and under the tented structure at any one time.

All excavated soil will be staged on 6 mil plastic sheeting. Any stockpiled material that remains on-site at the end of the day will be covered with appropriately anchored 6 mil plastic sheeting. Stockpiles will be inspected daily during construction activities and damaged plastic sheeting will be promptly replaced.

Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by NYSDEC.

Soil stockpiles will be surrounded with silt fences where possible. Hay bales will be used as needed near catch basins, surface waters and other discharge points.

A dedicated water truck will be available on-site for dust control.

5.4.3 Materials Excavation and Load Out

The Remedial Engineer or a qualified environmental professional under his/her supervision will oversee all invasive work and the excavation and load-out of all excavated material.

The Volunteer and its contractors are responsible for safe execution of all invasive and other work performed under this Plan.

The presence of utilities and easements on the Site will be investigated by the Remedial Engineer to determine that no risk or impediment to the planned work under this Remedial Action Work Plan is posed by utilities or easements on the Site.

Loaded vehicles leaving the Site will be appropriately lined, tarped, securely covered, manifested, and placarded in accordance with appropriate Federal, State, local, and NYSDOT requirements (and all other applicable transportation requirements).

The egress points for truck and equipment transport from the Site will be clean of dirt and other materials derived from the Site during site remediation. The location where vehicles associated with the remedial activities enter or exit the Site shall be inspected daily for evidence of off-site sediment tracking. The exterior of the loaded trucks will be inspected for evidence of soil. If observed, soil will be removed from the truck exterior prior to leaving the Site. Soil observed on truck tires will be removed on the tracking pad.

The Volunteer and associated parties preparing the remedial documents submitted to the State, and parties performing this work, are responsible for the safe performance of all invasive work, the structural integrity of excavations, and for structures that may be affected by excavations (such as building foundations).

The site development activities will not interfere with, or otherwise impair or compromise, remedial activities proposed in this Remedial Action Work Plan.

Soil hotspots and structure to be remediated (USTs, vaults and associated piping, transformers, etc.) will be removed and end-point remedial performance sampling completed, before work related to Site development commence proximal to the hotspot or structure.

Development-related grading cuts and fills will not be performed without NYSDEC approval and will not interfere with, or otherwise impair or compromise, the performance of remediation required by this plan.

On-site treatment of historical fill and contaminated soil is prohibited.

Primary contaminant sources (including but not limited to tanks and hotspots) identified during Site Characterization, Remedial Investigation, and Remedial Action will be surveyed by a surveyor licensed to practice in the State of New York. The survey information will be shown on maps to be reported in the Final Engineering Report.

5.4.4 Materials Transport Off-site

Transport of materials will be performed by licensed haulers in accordance with appropriate local, State, and Federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded.

The proposed truck transport routes are included as **Appendix 15.** Unless emergency situations block the use of proposed roadways (i.e. closure of the roadway by authorized local personnel), all trucks loaded with site materials will exit the vicinity of the Site using only these approved truck routes. Proposed in-bound and out-bound truck routes to the Site are shown on the map included in **Appendix 15**. This is the most appropriate route and takes into account: (a) limiting transport through residential areas and past sensitive sites; (b) use of city mapped truck routes; (c) prohibiting 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. Trucks will be prohibited from stopping and idling in the neighborhood outside the project site. Queuing of trucks will be performed on-site in order to minimize off-site disturbance. Off-site queuing will be prohibited. The egress points for truck and equipment transport from the Site will be kept clean of dirt and other materials during site remediation. Volunteer has requested input from Community Board II, and revisions to proposed truck routes will be made, if necessary.

Material transported by trucks exiting the Site will be secured with tight-fitting covers. Loose-fitting canvas-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used and the material will be solidified using kiln dust (or equivalent) prior to loading and transport.

Trucks will be inspected prior to leaving the Site for extraneous soil on the exterior. If noted, these materials will be removed from the exterior before the truck leaves the Site. A truck wash station will be employed for a more thorough exterior cleaning of trucks prior to leaving the Site. Truck wash waters will be collected and disposed of off-site in accordance with prevailing regulations if the truck wash station is required for remedial activities.

5.4.5 Materials Disposal Off-site

The total quantity of material expected to be disposed off-site is **20,150 tons**. The possible disposal locations are 1) Clean Earth of New Castle, New Castle, Delaware; 2) Clean Earth of Philadelphia, Philadelphia, Pennsylvania; or 3) Clean Earth of Southeast Philadelphia, Morrisville, Pennsylvania**.** Disposal locations established at a later date will be reported to the NYSDEC Project Manager

All Soil/fill/solid waste excavated and removed from the Site will be treated as contaminated and regulated material and will be disposed in accordance with all local, State (including 6NYCRR Part 360) and Federal regulations. If disposal of soil/fill from the site is proposed for unregulated disposal (i.e. clean

soil removed for development purposes), a formal request with an associated plan will be made to NYSDEC's Project manager. Unregulated off-site management of materials from this Site is prohibited without formal NYSDEC approval.

Material that does not meet Track 1 Unrestricted Use SCOs is prohibited from being taken to a New York State recycling facility (6NYCRR Part 360-16 Registration Facility).

The following documentation will be obtained and reported by the Remedial Engineer for each disposal location used in this project to fully demonstrate and document that the disposal of material derived from the Site conforms with all applicable laws: (1) a letter from the Remedial Engineer or BCP Applicant to the receiving facility describing the material to be disposed and requesting formal written acceptance of the material. This letter will state that material to be disposed is contaminated material generated at an environmental remediation site in New York State. The letter will provide the project identity and the name and phone number of the Remedial Engineer. The letter will include as an attachment a summary of all chemical data for the material being transported (including site characterization data); and (2) a letter from all receiving facilities stating it is in receipt of the correspondence (above) and is approved to accept the material. These documents will be included in the FER.

Non-hazardous historic fill and contaminated soils taken off-site will be handled, at minimum, as a Municipal Solid Waste per 6NYCRR Part 360-1.2

Historical fill and contaminated soils from the Site are prohibited from being disposed at Part 360-26 Registration Facilities (also known as soil Recycling Facilities).

Soils that are contaminated but non-hazardous and are being removed from the site are considered by the Division of Solid & Hazardous Materials (DSHM) in NYSDEC to be Construction and Demolition (C/D) materials with contamination not typical of virgin soils. These soils may be sent to a permitted part 360 landfill. They may be sent to a permitted C/D processing facility without permit modifications only upon prior notification of NYSDEC Region 2 DSHM. This material is prohibited from being sent or redirected to a part 360-16 Registration Facility. In this case, as dictated by DSHM, special procedures will include, at a minimum, a letter to the C/D facility that provides a detailed explanation that the material is derived from a DER remediation site, that the soil material is contaminated and that it must not be redirected to on-site Soil Recycling Facilities. The letter will provide the project identity and the name and phone number of the Remedial Engineer. The letter will include as an attachment of summary of all chemical data for the material being transported.

The Final Engineering Report will include an accounting of the destination of all material removed from the Site during this Remedial Action, including excavated soil, contaminated soil, historic fill, solid waste, and hazardous waste, non-regulated material, and fluids. Documentation associated with disposal of all material must also include records and approvals for receipt of the material. This information will also be presented in a tabular form in the FER.

Bill-of-Lading system, or equivalent, will be used for off-site movement of non-hazardous wastes and contaminated soils. This information will be reported in the Final Engineering Report.

Hazardous wastes derived from on-site will be stored, transported, and disposed of in full compliance with applicable local, State, and Federal regulations.

Appropriately licensed haulers will be used for material removed from this Site and will be in full compliance with all applicable local, State and Federal regulations.

Waste characterization will be performed for off-site disposal in a manner suitable to the receiving facility and in conformance with applicable permits. Sampling and analytical methods, sampling frequency, analytical results and QA/QC will be reported in the FER. All data available for soil/material to be

disposed at a given facility must be submitted to the disposal facility with suitable explanation prior to shipment and receipt.

5.4.6 Materials Reuse On-site

No on-site reuse of materials is proposed for this project. The remedial action proposes to remove all soils/materials exhibiting concentrations of contaminants above the NYSDEC RUSCO's for residential use in Table 375-6(b). These materials have been identified via extensive inspection of the Site for areas of environmental concern (AOC), investigation of these areas of concern via soil sampling and laboratory analysis by a New York certified laboratory to determine if contamination was present above the NYSDEC Unrestricted Use SCO, and delineation of any detected contamination to quantify the extent of soil/material exhibiting contamination above the proposed Residential SCO.

Please refer to **Table 7** which details the proposed samples and analytical methods for post-excavation confirmatory samples by AOC.

5.4.7 Fluids Management

Liquids to be removed from the Site, including dewatering fluids, if required, will be handled, transported and disposed in accordance with applicable local, State, and Federal regulations. Liquids discharged into the New York City sewer system will be addressed through approval by NYCDEP. Dewatered fluids will not be recharged back to the land surface or subsurface of the Site. Dewatering fluids will be managed off-site at an approved disposal facility or discharged to the New York City sewer system through prior approval by NYSDEC. An SD1 and SD2 permit application for connection and discharge to the local POTW has been prepared and filed with NYCDEP. Treatment of groundwater to facilitate discharge to a local sewer would be accomplished by a treatment train consisting of an influent tank, particulate filtration, carbon filtration, controls and appurtenances.

Discharge of water generated during remedial construction to surface waters (i.e. a local pond, stream or river or to a storm sewer) is prohibited without a SPDES permit.

5.4.8 Demarcation

After the completion of soil removal and any other invasive remedial activities and prior to backfilling, a land survey will be performed by a New York State licensed surveyor. The survey will define the top elevation of residual contaminated soils. A physical demarcation layer, consisting of orange snow fencing material or equivalent material will be placed on this surface to provide a visual reference. This demarcation layer will constitute the top of the 'Residuals Management Zone', the zone that requires adherence to special conditions for disturbance of contaminated residual soils defined in the Site Management Plan. The survey will measure the grade covered by the demarcation layer before the placement of cover soils, pavement and sub-soils, structures, or other materials. This survey and the demarcation layer placed on this grade surface will constitute the physical and written record of the upper surface of the 'Residuals Management Zone' in the Site Management Plan. A map showing the survey results will be included in the Final Remediation Report and the Site Management Plan.

5.4.9 Backfill from Off-site Sources

All materials proposed for import onto the Site will be approved by the Remedial Engineer and will be in compliance with provisions in this RAWP prior to receipt at the Site.

Material from industrial sites, spill sites, other environmental remediation sites or other potentially contaminated sites will not be imported to the Site.

The Final Engineering Report will included the following certification by the Remedial Engineer: "I certify that all import of soils from off-site, including source evaluation, approval and sampling, has been performed in a manner that is consistent with the methodology defined in the Remedial Action Work plan."

Soils that meet 'exempt' fill requirements under 6 NYCRR Part 360, but do not meet backfill or cover soil objectives for this Site, will not be imported onto the Site without prior approval by NYSDEC. Nothing in this Remedial Action Work Plan should be construed as an approval for this purpose.

Solid waste will not be imported onto the Site.

The source of the backfill that will be imported onto this Site has not been determined at this time. In addition to meeting the site-specific requirements dictated by the proposed development activities, the imported fill will demonstrate compliance with Part 375 section 6.8. Unless an alternate sampling frequency has been previously approved by the NYSDEC, all imported fill from a virgin source will be sampled for full TCL/TAL with collection of one composite sample per source. Fill from non-virgin sources will be sampled for full TCL/TAL as per the following:

1. If less than 1,000 cy of non-virgin material, one composite sample per 500 cubic yards;
2. If more than 1,000 cy of non-virgin fill, two initial screening composite samples will be collected from the first 1,000 cy and analyzed. If these samples meet criteria, sampling will be reduced to one composite sample per 2,500 cy; or
3. If greater than 5,000 cy of non-virgin fill, sample frequency will be reduced to one per 5,000 cy.

All analysis will be performed by a NYSDOH ELAP certified laboratory.

Trucks entering the Site with imported soils will be securely covered with tight fitting cover.

Information documenting the source of the fill, past use of the Site where the backfill originated, the type of fill, the amount of fill and any pertinent laboratory analytical documentation will be provided to the NYSDEC prior to importation of the fill material onto the site, unless from a source previously approved by the NYSDEC, and in the Final Engineering Report which will be appropriately certified as required by NYSDEC.

5.4.10 Stormwater Pollution Prevention

A summary of the Stormwater Pollution Prevention Plan (SWPPP) that conforms to the requirements of NYSDEC Division of Water guidelines and NYS regulations is provided below. A copy of the SWPPP and Notice of Intent (NOI), as prepared by Dewberry-Goodkind is included as **Appendix 16**.

Barriers and hay bale checks will be installed and inspected once a week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by NYSDEC. All necessary repairs shall be made immediately.

Accumulated sediments will be removed as required to keep the barrier and hay bale check functional.

All undercutting or erosion of the silt fence toe anchor shall be repaired immediately with appropriate backfill materials.

Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

Erosion and sediment control measures identified in the RAWP shall be observed to ensure that they are operating correctly. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters

Silt fencing or hay bales will be installed around the entire perimeter of the remedial construction area.

5.4.11 Contingency Plan

If underground tanks or other previously unidentified contaminant sources such as buried drums, stained soils, subsurface pits, etc. are found during on-site remedial excavation, sampling will be performed, as warranted on product, sediment and surrounding soils, etc. Chemical analytical work will be for full scan parameters (TAL metals; TCL volatiles and semi-volatiles, TCL pesticides and PCBs). These analyses will not be limited to STARS parameters where tanks are identified without prior approval by NYSDEC. Analyses will not be otherwise limited without NYSDEC approval.

Identification of unknown or unexpected contaminated media identified by screening during invasive site work will be promptly communicated by phone to NYSDEC's Project Manager. These findings will be also included in daily and periodic electronic media reports.

5.4.12 Community Air Monitoring Plan

The CAMP is presented in **Appendix 11.** The plan details, but is not limited to:

- The perimeter air monitoring program for dust and organic compounds is designed to be protective of the off-site public within close proximity to the remedial action site.
- Action levels for organic vapors and particulate levels.
- Methods for air monitoring; and
- Analytes measured and instrumentation to be used.

One upwind and two downwind perimeter monitoring stations will be located at the Site during each day that intrusive remedial actions are conducted. The location of these stations will be determined daily, based upon site-specific wind direction measurements. The predominant wind direction at this location is from the west-southwest. During the remedial activities a weather station will be setup to provide indication of the predominant wind direction during remedial activities at the site. Refer to the CAMP in **Appendix 11** for a site plan indicating the CAMP monitoring station setup.

Area-specific monitoring will also be conducted. The number of monitoring stations required for this activity will be determined by the actual number of areas that are undergoing remediation at any one time. For example, if soil excavation and loading activities are being conducted concurrently at one location, one area-specific monitoring station will exist. Alternately, if soil excavation and loading activities are being conducted concurrently at locations separated by more than fifty (50) feet, a monitoring station will be assigned to each activity.

The location of these stations will be reported to the NYSDEC Project Manager as part of the daily report.

Exceedances observed in the CAMP will be reported to NYSDEC and NYSDOH Project Managers and included in the Daily Report.

5.4.13 Odor, Dust and Nuisance Control Plan

The Final Engineering Report will document the completion of the proposed remedial actions including the implementation of odor, dust and other nuisance control plans and will be appropriately certified as required by NYSDEC. As required by NYSDEC in the February 9, 2009 meeting, a tent structure with vapor management system will be constructed for all remedial activities. A permit from NYDCOB will be obtained prior to construction of this structure. A figure showing the schematic layout of the air-handling system for the tent structure is provided in **Appendix 17**.

5.4.13.1 Odor Control Plan

This odor control plan is capable of controlling emissions of nuisance odors off-site. Specific odor control methods to be used on a routine basis are defined below. 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. NYSDEC and NYSDOH will be notified of all odor events and of all other complaints about the project. Implementation of all odor controls, including the halt of work, will be the responsibility of the Applicant's Remediation Engineer, who is responsible for certifying the Final Engineering Report.

All necessary means will be employed to prevent on- and off-site 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) using foams to cover exposed odorous soils. If odors develop and cannot be otherwise controlled, additional means to eliminate odor nuisances will include: (d) direct load-out of soils to trucks for off-site disposal; (e) use of chemical odorants in spray or misting systems; and, (f) use of staff to monitor odors in surrounding neighborhoods.

5.4.13.2 Dust Control Plan

A dust suppression plan that addresses dust management during invasive on-site work, will include, at a minimum, the items listed below:

- Dust monitoring will be performed under the CAMP to monitor fugitive dust emissions during invasive work. The following actions will be performed to ensure that dust emissions are minimized:
    - Clearing and grubbing of larger sites will be done in stages to limit the area of exposed, unvegetated soils vulnerable to dust production.
    - Gravel will be used on roadways to provide a clean and dust-free road surface.
    - On-site roads will be limited in total area to minimize the area required for water truck sprinkling.
    - On-site water truck and water hose connection will be available

5.4.13.3 Other Nuisances

A plan will be developed and utilized by the contractor for all remedial work and will conform, at a minimum, to the NYCDEP Citywide Construction Noise Mitigation (Chapter 28 of the NYC Noise Code). As required by the NYCDEP noise code, the site contractor has provided EWMA with a site specific Noise Mitigation Plan. A copy of the noise mitigation documents required by the NYCDEP has been enclosed as **Appendix 18**.

Noise is also addressed in Section 4.2.2 of the site-specific HASP. The HASP specified that hearing protection be used when noise levels exceed 85 dBA, averaged over an 8-hour day.

6.0 RESIDUAL CONTAMINATION TO REMAIN ON-SITE

The proposed remediation is intended to meet Track 4 cleanup levels utilizing the RUSCO for residential, as set forth in 6 NYCRR Subpart 375-6, and provide for restricted use with site-specific soil cleanup objectives. The proposed development activities (buildings, roadways, walkways and landscaped areas) are expected to eliminate the potential direct contact exposure pathways to the ecological community. Groundwater contamination will remain and will be addressed through engineering controls.

The remediation of LNAPL-impacted soil and groundwater is anticipated to result in a reduction in the source of soil vapor at the Site. However, a composite cover system and vapor intrusion control system will be incorporated into the development design for vapor intrusion control.

The FER will report residual contamination on the Site in tabular and map form. This will include presentation of exceedances of the RUSCO.

7.0 ENGINEERING CONTROLS: COMPOSITE COVER SYSTEM

7.1 COMPOSITE COVER SYSTEM

Exposure to residual contaminated soils will be prevented by an engineered, composite cover system that will be built on the Site. This composite cover system will be comprised of a minimum of 2 feet of clean fill or asphalt covered roads, concrete covered sidewalks, and concrete building slabs. The proposed remediation is intended to meet Track 4 cleanup levels utilizing the RUSCO for residential use, as set forth in 6 NYCRR Subpart 375-6, and provide for restricted use with site-specific soil cleanup objectives. Engineering and institutional controls are proposed for restriction of site groundwater use, for post-construction collection and extraction of LNAPL, and for vapor intrusion control purposes based on the utilization of the RUSCOs for residential use as the remedial endpoint. Attainment of the proposed SCOs will be documented by supportive analytical data. The proposed development activities (buildings, roadways, walkways and landscaped areas) and composite cover system are expected to eliminate the potential direct contact exposure pathways to the ecological community.

Excavation, removal and off-site disposal of impacted soils is proposed for soil exhibiting contaminant concentrations exceeding the RUSCO for residential use (Table 375-6.8(b). In addition, the use of remedial technologies such as biochemical and chemical injection technologies are also proposed to enhance the remediation of residual contamination.

Pre-remedial activities documented the presence of vapors in the soil column. The mitigation of the suspected product-impacted soil and separate-phase product-impacted groundwater is anticipated to result in a reduction in the mass of soil vapors at the Site. However, vapor intrusion control systems, as discussed in Section 8.0, will be installed beneath all on-site structures/garage foundation slabs.

8.0 ENGINEERING CONTROLS: LNAPL CONTAINMENT, COLLECTION AND REMOVAL SYSTEM AND VAPOR INTRUSION CONTROL SYSTEMS

Engineering controls in the form of post-construction LNAPL containment, collection and extraction, and vapor intrusion control with a vapor barrier and sub-slab ventilation/de-pressurization system.

8.1 ENGINEERING CONTROL SYSTEMS

8.1.1 Vapor Intrusion Control

Vapor intrusion controls for control of potential vapor intrusion will be installed beneath the planned on-site buildings. The vapor intrusion control installations will be installed beneath all of the building across the site. The controls will consist of a combination of waterproofing membrane at a minimum 20-mil thickness and/or sub-slab de-pressurization systems.

The use of the vapor intrusion control systems will not be discontinued without written approval by NYSDEC and NYSDOH. A proposal to discontinue a system may be submitted by the Site owner based on confirmatory data that justifies such request. Any installed systems will remain in place and operational until permission to discontinue use is granted in writing by NYSDEC and NYSDOH.

9.0 INSTITUTIONAL CONTROLS

After the remedy is complete and Track 4 SCOs met, engineering controls (ECs) for the residual contamination will be incorporated into the remedy to render the overall site remedy protective of public health and the environment. Two elements have been designed to ensure continual and proper management of residual contamination in perpetuity: an Environmental Easement and a Site Management Plan. These elements are described in this Section. A site-specific Environmental Easement will be recorded with Queens County to provide an enforceable means of ensuring the continual and proper management of residual contamination and protection of public health and the environment in perpetuity or until released in writing by NYSDEC. It requires that the grantor of the Environmental Easement and the grantor's successors and assigns adhere to all Engineering and Institutional Controls (ECs/ICs) placed on this Site by this NYSDEC-approved remedy. ICs provide restrictions on site usage and mandate operation, maintenance, monitoring and reporting measures for all ECs and ICs. The Site Management Plan (SMP) describes appropriate methods and procedures to ensure compliance with all ECs and ICs that are required by the Environmental Easement. Once the SMP has been approved by the NYSDEC, compliance with the SMP is required by the grantor of the Environmental Easement and grantor's successors and assigns.

9.1 ENVIRONMENTAL EASEMENT

An Environmental Easement, as defined in Article 71 Title 36 of the Environmental Conservation Law, is required when residual contamination is left on-site after the Remedial Action is complete. If the Site will have residual contamination after completion of all Remedial Actions, then an Environmental Easement is required. As part of this remedy, an Environmental Easement approved by NYSDEC will be filed and recorded with the Queens County Clerk. The Environmental Easement will be submitted as part of the Final Remediation Report.

The Environmental Easement renders the Site a Controlled Property. The Environmental Easement must be recorded with the Queens County Clerk before the Certificate of Completion can be issued by NYSDEC. The Environmental Easement will document all soils that remain at concentrations above the UUSCOs.

Additionally, an Institutional Control is required under this remedy to prohibit its use on-site to ensure future residential occupants are not exposed to residual contamination detected in groundwater. This Institutional Control is a requirement or restriction placed on the Site that is listed in, and required by, the Environmental Easement. Institutional Controls can, generally, be subdivided between controls that support Engineering Controls and those that place general restrictions on Site usage or other requirements. Institutional Controls in both of these groups are closely integrated with the Site Management Plan, which provides all of the methods and procedures to be followed to comply with this remedy. The proposed Institutional Control for this Site is a groundwater use restriction.

The Institutional Controls that support Engineering Controls are:

- Compliance with the Environmental Easement by the Grantee and the Grantee's successors and adherence to all elements of the SMP is required;
- Vapor mitigation systems (i.e. vented vapor barriers and/or a sub-slab depressurization system under all building structures) have been proposed if post-remedial soil vapor sampling indicates the potential for vapor intrusion into future on-site structures. These

systems, if installed, must be inspected, certified, operated and maintained as required by the SMP;

- Groundwater and soil vapor monitoring must be performed as defined in the SMP;
- Data and information pertinent to Site Management for the Controlled Property must be reported at the frequency and in a manner defined in the SMP;
- On-site environmental monitoring devices, including but not limited to, [groundwater monitor wells and soil vapor probes], must be protected and replaced as necessary to ensure proper functioning in the manner specified in the SMP;
- Engineering Controls may not be discontinued without an amendment or extinguishment of the Environmental Easement.

Adherence to these Institutional Controls for the Site is mandated by the Environmental Easement and will be implemented under the Site Management Plan (discussed in the next section). The Controlled Property (Site) will also have an Institutional Control in the form of a groundwater use restriction. The site restrictions that apply to the Controlled Property are:

- Use of groundwater underlying the Site is prohibited;
- Contingency use of vapor mitigation systems if post-remedial soil gas sampling deems necessary.

9.2 SITE MANAGEMENT PLAN

Site Management is the last phase of remediation and begins with the approval of the Final Engineering Report and issuance of the Certificate of Completion (COC) for the Remedial Action. The Site Management Plan, if required, is submitted as part of the FER but will be written in a manner that allows its removal and use as a complete and independent document. Site Management continues in perpetuity or until released in writing by NYSDEC. The property owner is responsible to ensure that all Site Management responsibilities defined in the Environmental Easement and the Site Management Plan are performed.

The SMP is intended to provide a detailed description of the procedures required to manage residual contamination left in place at the Site following completion of the Remedial Action in accordance with the BCA with the NYSDEC. This includes: (1) development, implementation, and management of all Engineering and Institutional Controls; (2) development and implementation of monitoring systems and a Monitoring Plan; (3) development of a plan to operate and maintain any treatment, collection, containment, or recovery systems (including, where appropriate, preparation of an Operation and Maintenance Manual); (4) submittal of Site Management Reports, performance of inspections and certification of results, and demonstration of proper communication of site information to NYSDEC; and (5) defining criteria for termination of treatment system operation.

To address these needs, this SMP will include four plans: (1) an Engineering and Institutional Control Plan for implementation and management of EC/ICs; (2) a Monitoring Plan for implementation of Site Monitoring; (3) an Operation and Maintenance Plan for implementation of remedial collection, containment, treatment, and recovery systems; and (4) a Site Management Reporting Plan for submittal of data, information, recommendations, and certifications to NYCDEP. The SMP will be prepared in accordance with the requirements in NYSDEC Draft

DER-10 Technical Guidance for Site Investigation and Remediation, dated December 2002, and the guidelines provided by NYSDEC.

Site management activities, reporting, and EC/IC certification will be scheduled on an annual certification period basis. . The Site Management Plan will be based on a calendar year and will be due for submission to NYSDEC by March 1 of the year following the reporting period.

The Site Management Plan in the Final Remediation Report will include a monitoring plan for groundwater at the Site to evaluate site -wide performance of the remedy. Additional monitoring wells, if needed, will be installed to complete the monitoring network. Currently, EWMA anticipates post-remedial sampling of downgradient perched zone wells MW-6S, MW-7S0, MW-8S, and MW-9S may be conducted.

No exclusions for handling of residual contaminated soils will be provided in the Site Management Plan (SMP). All handling of residual contaminated material will be subject to provisions contained in the SMP.

10.0 FINAL ENGINEERING REPORT

A Final Engineering Report (FER) and Certificate of Completion (COC) will be submitted to NYSDEC following implementation of the Remedial Action defined in this RAWP. The FER provides the documentation that the remedial work required under this RAWP has been completed and has been performed in compliance with this plan. The FER will provide a comprehensive account of the locations and characteristics of all material removed from the Site including the surveyed map(s) of all sources. The Final Engineering Report will include as-built drawings for all constructed elements, certifications, manifests, bills of lading as well as the complete Site Management Plan (formerly the Operation and Maintenance Plan). The FER will provide a description of the changes in the Remedial Action from the elements provided in the RAWP and associated design documents. The FER will provide a tabular summary of all performance evaluation sampling results and all material characterization results and other sampling and chemical analysis performed as part of the Remedial Action. The FER will provide test results demonstrating that all mitigation and remedial systems are functioning properly. The FER will be prepared in conformance with DER-10.

Where determined to be necessary by NYSDEC, a Financial Assurance Plan will be required to ensure the sufficiency of revenue to perform long-term operations, maintenance and monitoring tasks defined in the Site Management Plan and Environmental Easement. This determination will be made by NYSDEC in the context of the Final Engineering Report review.

The FER will provide a thorough summary of all residual contamination left on the Site after the remedy is complete. Residual contamination includes all contamination that exceeds the Track 4 Restricted Use SCO for residential use in 6NYCRR Part 375-6. A table that shows exceedances from Track 4 Restricted Use SCOs for all soil/fill remaining at the Site after the Remedial Action and a map that shows the location and summarizes exceedances from Track 4 Restricted Use SCOs for all soil/fill remaining at the Site after the Remedial Action will be included in the FER. The FER will include written and photographic documentation of all remedial work performed under this remedy. The FER will include an itemized tabular description of actual costs incurred during all aspects of the Remedial Action.

The FER will provide a thorough summary of all residual contamination that exceeds the SCOs defined for the Site in the RAWP and must provide an explanation for why the material was not removed as part of the Remedial Action. A table that shows residual contamination in excess of Site SCOs and a map that shows residual contamination in excess of Site SCOs will be included in the FER.

The FER will include an accounting of the destination of all material removed from the Site, including excavated contaminated soil, historic fill, solid waste, hazardous waste, non-regulated material, and fluids. Documentation associated with disposal of all material must also include records and approvals for receipt of the material. It will provide an accounting of the origin and chemical quality of all material imported onto the Site.

Before approval of a FER and issuance of a Certificate of Completion, all project reports must be submitted in digital form on electronic media (PDF) to both the NYSDEC and NYSDOH.

11.0 SCHEDULE

The following schedule is provided which identifies remedial tasks, estimated start dates, and task duration. The actual start date is dependent upon review and approval of the RAWP by the NYSDEC. A schedule denoting the specific dates for the work activities will be provided to the NYSDEC within 3 days of receipt of RAWP approval.

Task	Start Date	Duration
Equip Mobilization	5 days after RAWP approval	5 days
Construct Tent Structure	30 days after RAWP approval	10 days
Remove USTs	1 Day after Tent Constructed	10 days
Soil Excavation	10 days after RAWP approval	35 days
Remediate LNAPL	concurrent with soil excavation	35 days
Post Excavation & Disposal	concurrent with soil excavation	35 days
Complete Excavation & Disposal	60 days after tent constructed	(see above)
Post-Remedial Groundwater Monitoring	10 days after completion of soil remediation	5 days
Reporting	daily and monthly	N/A
Final Engineering Report	within 60 days of completion of remediation	N/A
Vapor Intrusion Control System	concurrent with building construction	45 days
LNAPL Monitoring and Remediation Wells	concurrent with building construction	60 days
Composite Cap System	concurrent with building construction	60 days
Capture Wall/LNAPL Recovery Utilities	concurrent with building construction	60 days
Total Duration of Remediation		**120 days**

Tables

Table 1: Soil Exceedances of the NYSDEC UUSCO by Compound and Depth
Remedial Action Work Plan (RAWP)
OCA LIC Fifth Street Mixed-Use Housing
5-20 46th Road
City of New York, Queens County, New York 11101
EWMA# 205490
BCP Site #C241098

SUMMARY OF VOC SOIL CONTAMINANT					SUMMARY OF VOC SOIL CONTAMINANT (Depth 0 - 8')				SUMMARY OF VOC SOIL CONTAMINANT (Depth 8' +)			
Parameter	**UUSCO**	**Total # of Samples**	**# Samples > UUSCO**	**Maximum Concentration (ppm)**	**Total # of Samples (0-8')**	**# Samples > UUSCO (0-8')**	**Exceeding Sample Name (0-8')**	**Maximum Concentration (0-8")**	**Total # of Samples (8' +)**	**# Samples > UUSCO (8' +)**	**ExceedingSample Name (8' +)**	**Maximum Concentration (8' +)**
Acetone	0.05	47	22	2.6	23	12	SBE-3; 9; 10; 12; 14; 16; 17; 18; 19; SBE-R-1; 2; 4	2.6	24	10	SBE-3; 8; 9; 15; 16; 17; SBE-R-2; 4	0.56
Methylene Chloride	0.05	47	1	0.05	23	0	NA	ND	24	1	SBE-18	0.05
2-Butanone	0.12	47	1	0.12	23	1	SBE-10	0.12	24	0	NA	ND
Cis-1,2-Dichloroethene	0.25	47	1	0.27	23	1	SBE-18	0.27	24	0	NA	ND
Benzene	0.06	47	2	0.4	23	1	SBE-R-4	0.12	24	1	SBE-16	0.4
Ethyl Benzene	1	47	3	6.9	23	2	SBE-17 and 18	6.9	24	1	SBE-1	1.9

Table 1: Soil Exceedances of the NYSDEC UUSCO by Compound and Depth
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OCA LIC Fifth Street Mixed-Use Housing
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City of New York, Queens County, New York 11101
EWMA# 205490
BCP Site #C241098

SUMMARY OF SVOC SOIL CONTAMINANT					SUMMARY OF SVOC SOIL CONTAMINANT (Depth 0 - 8')				SUMMARY OF SVOC SOIL CONTAMINANT (Depth 8' +)			
Parameter	**UUSCO**	**Total # of Samples**	**# Samples > UUSCO**	**Maximum Concentration (ppm)**	**Total # of Samples (0-8')**	**# Samples > UUSCO (0-8')**	**Exceeding Sample Name (0-8')**	**Maximum Concentration (0-8")**	**Total # of Samples (8' +)**	**# Samples > UUSCO (8' +)**	**ExceedingSample Name (8' +)**	**Maximum Concentration (8' +)**
2-Methylphenol	0.33	47	1	0.76	23	1	SBE-R-4	0.76	24	0	NA	ND
3+4-Methylphenols	0.33	47	2	3.7	23	1	SBE-R-4	3.7	24	1	SBE-12	3
Naphthalene	12	47	4	230	23	1	SBE-R-3	20	24	3	SBE-1, 11, 12	230
Acenaphthene	20	47	2	67	23	1	SBE-R-1	67	24	1	SBE-1	29
Dibenzofuran	7	47	2	57	23	2	SBE-11, SBE-R-1	57	24	0	NA	ND
Fluorene	30	47	2	53	23	1	SBE-R-1	50	24	1	SBE-1	53
Phenanthrene	100	47	1	130	23	0	NA	ND	24	1	SBE-1	130
Benzo(a)anthracene	1	47	20	31	23	17	SBE-3, 4, 5, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17, SBE-R-1, 2, 4	24	24	3	SBE-3, 6, SBE-R-2	31
Chrysene	1	47	19	31	23	15	SBE-4, 5, 7, 9, 10, 11, 12, 13, 15, 16, 17, SBE-R-1, 2, 4	20	24	4	SBE-3, 6, 8, SBE-R-2	31
Benzo(b)fluoranthene	1	47	21	57	23	17	SBE-3, 4, 5, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17, SBE-R-1, 2, 4	27	24	4	SBE-3, 6, 8, SBE-R-2	57
Benzo(k)fluoranthene	0.8	47	16	22	23	13	SBE-4, 5, 7, 9, 10, 11, 12, 16, 17, SBE-R-1, 2, 4	13	24	2	SBE-3, SBE-R-2	22
Benzo(a)pyrene	1	47	22	59	23	18	SBE-3, 4, 5, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17, SBE-R-1, 2, 4	35	24	4	SBE-3, 6, 8, SBE-R-2	59
Indeno(1,2,3-cd)pyrene	0.5	47	22	51	23	18	SBE-3, 4, 5, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, SBE-R-1, 2, 4	28	24	4	SBE-3, 6, 8, SBE-R-2	51
Dibenz(a,h)anthracene	0.33	47	16	12	23	14	SBE-3, 4, 5, 7, 9, 10, 11, 13, 14, 16, SBE-R-1, 2, 4	6.9	24	2	SBE-3, SBE-R-2	12

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City of New York, Queens County, New York 11101
EWMA# 205490
BCP Site #C241098

SUMMARY OF PESTICIDES SOIL CONTAMINANT					SUMMARY OF PESTICIDES SOIL CONTAMINANT (Depth 0 - 8')				SUMMARY OF PESTICIDES SOIL CONTAMINANT (Depth 8' +)			
Parameter	**UUSCO**	**Total # of Samples**	**# Samples > UUSCO**	**Maximum Concentration (ppm)**	**Total # of Samples (0-8')**	**# Samples > UUSCO (0-8')**	**Exceeding Sample Name (0-8')**	**Maximum Concentration (0-8")**	**Total # of Samples (8' +)**	**# Samples > UUSCO (8' +)**	**ExceedingSample Name (8' +)**	**Maximum Concentration (8' +)**
4,4-DDE	0.0033	47	1	0.0078	23	0	NA	ND	24	1	SBE-15	0.0078
4,4-DDD	0.0033	47	5	3.3	23	3	SBE-16, 17	3.3	24	2	SBE-17, 18	0.043
4,4-DDT	0.0033	47	1	0.0076	23	0	NA	ND	24	1	SBE-15	0.0076

SUMMARY OF METALS SOIL CONTAMINANT					SUMMARY OF METALS SOIL CONTAMINANT (Depth 0 - 8')				SUMMARY OF METALS SOIL CONTAMINANT (Depth 8' +)			
PARAMETER	**UUSCO**	**# SAMPLES**	**# SAMPLES > UUSCO**	**MAXIMUM CONCENTRATION (ppm)**	**# SAMPLES (0-8')**	**# SAMPLES > UUSCO (0-8')**	**Sample Name exceeding 0-8'**	**Maximum Concentration (0-8")**	**# SAMPLES (8' +)**	**# SAMPLES > UUSCO (8' +)**	**Sample Name exceeding (8' +)**	**Maximum Concentration (8' +)**
Arsenic	13	47	1	19	23	1	SBE-R-2	19	24	0	NA	ND
Copper	50	47	6	501	23	6	SBE-10, 13, 17, SBE-R-1, 2, 4	501	24	0	NA	ND
Lead	63	47	13	4,490	23	10	SBE-9, 10, 12, 13, 14, 16, 17, SBE-R-2, 4	4490	24	3	SBE-6, 8, 15	942
Mercury	0.18	47	19	11.3	23	15	SBE-1, 2, 9, 10, 11, 12, 14, 15, 17, 18, SBE-R-1, 2, 4	11.3	24	4	SBE-1, 6, 15, SBE-R-2	1.6
Nickel	30	47	1	31.5	23	0	NA	ND	24	1	SBE-14	31.5
Zinc	109	47	6	401	23	3	SBE-13, SBE-R-2, 4	401	24	3	SBE-6, 8, 15	195

SUMMARY OF PCB SOIL CONTAMINANT					SUMMARY OF PCB SOIL CONTAMINANT (Depth 0 - 8')				SUMMARY OF PCB SOIL CONTAMINANT (Depth 0 - 8')			
Parameter	**UUSCO**	**Total # of Samples**	**# Samples > UUSCO**	**Maximum Concentration (ppm)**	**Total # of Samples (0-8')**	**# Samples > UUSCO (0-8')**	**Exceeding Sample Name (0-8')**	**Maximum Concentration (0-8")**	**Total # of Samples (8' +)**	**# Samples > UUSCO (8' +)**	**ExceedingSample Name (8' +)**	**Maximum Concentration (8' +)**
PCB (Aroclor 1254)	0.1	47	1	1.1	23	1	SBE-R-4	1.1	24	0	NA	ND
PCB (Aroclor 1260)	0.1	47	2	0.2	23	1	SBE-3	0.2	24	1	SBE-1	0.1

Note: Soil samples collected by EWMA between February and May 2008.
UUSCO – Unrestricted Use Soil Cleanup Objectives. NYSDEC Subpart 375-6: Remedial Program Soil Cleanup Objectives, December 14, 2006.
Maximum Concentrations in Parts per Million (ppm)

Table 2: Ground Water Exceedances of the NYSDEC Water Quality Standards by Compound and Aquifer
Remedial Action Work Plan (RAWP)
OCA LIC Fifth Street Mixed-Use Housing
5-20 46th Road
City of New York, Queens County, New York 11101
EWMA# 205490
BCP Site #C241098

SUMMARY OF VOLATILE ORGANIC COMPOUNDS IDENTIFIED IN GROUND WATER				
PARAMETER	**TOGGs 1.1.1**	**# SAMPLES**	**# SAMPLES > TOGGS**	**MAXIMUM CONCENTRATION (ppb)**
PERCHED WATER ZONE				
Vinyl Chloride	2	45	2	5.4
Acetone	50	45	6	340
Methylene Chloride	5	45	1	13
Cis-1,2-Dichloroethene	5	45	1	58
Benzene	1	45	5	100
Toluene	5	45	3	22
Trans-1,2-Dichloropropene	0.4	45	1	21
Tetrachloroethene	5	45	1	13
Ethyl Benzene	5	45	5	150
Isopropylbenzene	5	45	24	150
SAND AQUIFER				
Vinyl Chloride	2	21	1	12
Benzene	1	21	4	170
Toluene	5	21	2	140
Trans-1,2-Dichloropropene	0.4	21	1	11
Ethyl Benzene	5	21	6	530
Isopropyl Benzene	5	21	7	290

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EWMA# 205490
BCP Site #C241098

SUMMARY OF UNFILTERED SEMI-VOLATILE ORGANIC COMPOUNDS IDENTIFIED IN GROUND WATER				
PARAMETER	**TOGGs 1.1.1**	**# SAMPLES**	**# SAMPLES > TOGGS**	**MAXIMUM CONCENTRATION (ppb)**
PERCHED WATER ZONE				
Naphthalene	5	39	7	3400
1,1-Biphenyl	5	39	1	66
Acenaphthene		39	1	420
Fluorene	50	39	5	250
Phenanthrene	50	39	6	540
Anthracene	50	39	1	110
Fluoranthene	50	39	3	280
Pyrene	50	39	2	160
Benzo(a)anthracene	0.002	39	12	24
Chrysene	0.002	39	13	20
bis(2-Ethylhexyl)phthalate	5	39	5	490
Benzo(b)fluoranthene	0.002	39	12	110
Benzo(k)fluoranthene	0.002	39	6	8
Indeno(1,2,3-cd)pyrene	0.002	39	7	12
SAND AQUIFER				
2,4-Dimethylphenol	1	27	4	20
Naphthalene	10	27	5	1,400
1,1-Biphenyl	5	27	4	12
Acenaphthene	20	27	3	110
Fluorene	50	27	7	950
Pentachlorophenol	1	27	1	10
Phenanthrene	50	27	2	2,100
Anthracene	50	27	2	260
Fluoranthene	50	27	2	100
Pyrene	50	27	2	210
Benzo(a)anthracene	0.002	27	2	18
Chrysene	0.002	27	2	35

Table 2: Ground Water Exceedances of the NYSDEC Water Quality Standards by Compound and Aquifer
Remedial Action Work Plan (RAWP)
OCA LIC Fifth Street Mixed-Use Housing
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EWMA# 205490
BCP Site #C241098

SUMMARY OF FILTERED SEMI-VOLATILE ORGANIC COMPOUNDS IDENTIFIED IN GROUND WATER				
PARAMETER	**TOGGs 1.1.1**	**# SAMPLES**	**# SAMPLES > TOGGS**	**MAXIMUM CONCENTRATION (ppb)**
PERCHED WATER ZONE				
Acenaphthene	20	21	2	290
Fluorene	50	21	1	150
Pentachlorophenol	1	21	1	7.3
Phenanthrene	50	21	1	100
Chrysene	50	21	1	1.2
Benzo(b)fluoranthene	0.002	21	1	1.5
SAND AQUIFER				
2,4-Dimethylphenol	1	6	1	22
1,1-Biphenyl	5	6	3	100
Acenaphthene	20	6	3	420
Fluorene	50	6	3	750
Phenanthrene	50	6	2	1,800
Anthracene	50	6	2	210
Fluoranthene	50	6	2	64
Pyrene	50	6	2	310
Benzo(a)anthracene	0.002	6	2	22
Chrysene	0.002	6	2	34
Benzo(b)fluoranthene	0.002	6	1	0.48
Benzo(k)fluoranthene	0.002	6	1	0.34
Indeno(1,2,3-cd)pyrene	0.002	6	1	0.74

Table 2: Ground Water Exceedances of the NYSDEC Water Quality Standards by Compound and Aquifer
Remedial Action Work Plan (RAWP)
OCA LIC Fifth Street Mixed-Use Housing
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EWMA# 205490
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SUMMARY OF METALS IDENTIFIED IN GROUND WATER - PERCHED ZONE				
PARAMETER	**TOGGs 1.1.1**	**# SAMPLES**	**# SAMPLES > TOGGS**	**MAXIMUM CONCENTRATION (ppb)**
UNFILTERED METALS				
Antimony	3	43	5	314
Arsenic	25	43	4	129
Barium	1000	43	6	2,060
Beryllium	3	43	3	6.4
Cadmium	5	43	2	15.8
Chromium	50	43	8	155
Copper	200	43	5	457
Iron	300	43	43	195,000
Lead	25	43	25	4,820
Magnesium	35000	43	16	91,100
Manganese	300	43	43	5,850
Mercury	0.7	43	13	103
Nickel	100	43	4	677
Selenium	10	43	1	25.4
Sodium	20000	43	42	1,200,000
Thallium	0.5	43	7	49.2
Zinc	2000	43	1	3,150
FILTERED METALS				
Antimony	3	34	19	54.3
Iron	300	34	30	3,210
Lead	25	34	1	40.6
Magnesium	35000	34	12	85,900
Manganese	300	34	32	2,070
Nickel	100	34	1	161
Sodium	20000	34	34	389,000
Thallium	0.5	34	6	13.4

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SUMMARY OF METALS IDENTIFIED IN GROUND WATER - SAND AQUIFER				
PARAMETER	**TOGGs 1.1.1**	**# SAMPLES**	**# SAMPLES > TOGGS**	**MAXIMUM CONCENTRATION (ppb)**
UNFILTERED METALS				
Antimony	3	19	1	7.2
Arsenic	25	19	2	34
Beryllium	3	19	3	5.5
Cadmium	5	19	1	10.1
Chromium	50	19	6	253
Copper	200	19	2	240
Iron	300	19	19	402,000
Lead	25	19	6	313
Magnesium	35000	19	10	96,500
Manganese	300	19	19	21,600
Mercury	0.7	19	6	3.35
Nickel	100	19	3	197
Sodium	20000	19	19	815,000
Thallium	0.5	19	2	22.6
FILTERED METALS				
Antimony	3	11	2	10.5
Iron	300	11	8	29,200
Magnesium	35000	11	5	76,900
Manganese	300	11	10	2,650
Sodium	20000	11	11	743,000

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SUMMARY OF PESTICIDES IDENTIFIED IN GROUND WATER				
PARAMETER	**TOGGs 1.1.1**	**# SAMPLES**	**# SAMPLES > TOGGS**	**MAXIMUM CONCENTRATION (ppb)**
PERCHED WATER ZONE				
4,4-DDD	0.3	32	2	2.5

SUMMARY OF CYANIDE IDENTIFIED IN GROUND WATER				
PARAMETER	**TOGGs 1.1.1**	**# SAMPLES**	**# SAMPLES > TOGGS**	**MAXIMUM CONCENTRATION (ppb)**
PERCHED WATER ZONE				
Cyanide	200	32	2	690

SUMMARY OF PCBs IDENTIFIED IN GROUND WATER				
PARAMETER	**TOGGs 1.1.1**	**# SAMPLES**	**# SAMPLES > TOGGS**	**MAXIMUM CONCENTRATION (ppb)**
SAND AQUIFER				
PCB (Aroclor-1260)	0.09	12	2	1,500

TOGGS – NYSDEC Division of Water Technical and Operational Guidance Series (1.1.1) – Ambient Water Quality Standards, June 1998.
ppb – Parts per Billion

Table 3

OCA LIC
5th St. Mixed Use Housing EWMA Project # 205490

Water-Level Measurements and Well-Construction Summary

					Date:	March 11, 2008					May 8, 2008				
Well ID	Well Diameter (inches)	Screened Interval (ft bsg)	Water-Bearing Zone	Top of Casing (TOC) Elevation (ft amsl)		Depth to Water (DTW) (ft btoc)	Depth to LNAPL (ft btoc)	LNAPL Thickness (ft)	Corrected DTW (ft btoc)	Groundwater Elevation (ft amsl)	Depth to Water (DTW) (ft btoc)	Depth to LNAPL (ft btoc)	LNAPL Thickness (ft)	Corrected DTW (ft btoc)	Groundwater Elevation (ft amsl)
MW-3S	2	5-10	Perched Water	9.30		7.21	-	0.00	7.21	2.09	7.26	-	0.00	7.26	2.04
MW-4S	2	5-10	Perched Water	9.55		6.76	-	0.00	6.76	2.79	7.07	7.05	0.02	7.05	2.50
MW-5S	2	5-10	Perched Water	9.38		6.75	-	0.00	6.75	2.63	6.91	-	0.00	6.91	2.47
MW-6S	2	5-10	Perched Water	9.59		(1)	7.75	(2)	(2)	(2)	(1)	(3)	(2)	(2)	(2)
MW-7S	2	6-11	Perched Water	9.24		7.74	7.54	0.20	7.58	1.66	7.85	7.50	0.35	7.57	1.67
MW-8S	2	3-11	Perched Water	9.24		NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW-9S	2	3-11	Perched Water	9.21		NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW-11S	2	3-11	Perched Water	8.56		NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW-12S	2	3-11	Perched Water	10.02		NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW-13S	2	3-11	Perched Water	8.59		NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW-19S	2	3-10	Perched Water	9.29		NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW-3I	2	15-20	Sand Aquifer	9.30		9.94	-	0.00	9.94	-0.64	9.94	-	0.00	9.94	-0.64
MW-4I	2	15-20	Sand Aquifer	9.51		10.80	-	0.00	10.80	-1.29	10.80	-	0.00	10.80	-1.29
MW-5I	2	14-19	Sand Aquifer	9.57		10.46	-	0.00	10.46	-0.89	10.46	-	0.00	10.46	-0.89
MW-6I	2	15-20	Sand Aquifer	9.46		10.00	-	0.00	10.00	-0.54	10.00	-	0.00	10.00	-0.54
MW-7I	2	15-20	Sand Aquifer	9.16		9.80	-	0.00	9.80	-0.64	9.80	-	0.00	9.80	-0.64
MW-10I	2	14.5-19.5	Sand Aquifer	10.38		NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW-14I	2	13-18	Sand Aquifer	9.82		NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW-15I	2	13-18	Sand Aquifer	9.77		NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW-16I	2	13-18	Sand Aquifer	9.66		NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW-17I	2	14-19	Sand Aquifer	9.78		NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW-18I	2	14-19	Sand Aquifer	NS		NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW-20I	2	14-19	Sand Aquifer	10.03		NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW-3D	2	22.5-27.5	Sand Aquifer	9.18		10.00	-	0.00	10.00	-0.82	9.74	-	0.00	9.74	-0.56
GW-1	2	5-15	Perched Water (4)	10.06		8.70	-	0.00	8.70	1.36	8.76	-	0.00	8.76	1.30
GW-2	2	5-15	Perched Water (4)	9.96		9.19	-	0.00	9.19	0.77	9.25	-	0.00	9.25	0.71
GW-3	2	5-15	Perched Water (4)	8.97		(1)	7.70	(2)	(2)	(2)	(1)	(3)	(2)	(2)	(2)
GW-4	2	5-15	Perched Water (4)	8.86		7.70	7.05	0.65	7.18	1.68	7.60	7.10	0.50	7.20	1.66
GW-5/MW-2	1	? - 12.8(5)	Perched Water (4)	9.10		7.10	6.90	0.20	6.94	2.16	9.00	6.90	2.10	7.32	1.78
MW-1	4	? - 13.5(5)	Perched Water (4)	9.34		8.75	-	0.00	8.75	0.59	7.70	7.45	0.25	7.50	1.84

Notes:
All wells are flush mounted.
ft bsg = feet below surface grade.
ft amsl = feet above mean sea level.
ft btoc = feet below top of casing.
NI: Well not installed.
DTW's corrected using an LNAPL density of 0.8 (perched zone-density assumed) or 0.85 (sand aquifer-density measured).
(1) Water not detected by interface probe.
(2) Could not be determined.
(3) Interface probe did not respond to LNAPL; presence of LNAPL determined using a bailer.
(4) Well screen may also be partially open to the sand aquifer.
(5) Based on field measurements by EWMA; well log not available.

Table 3

OCA LIC
5th St. Mixed Use Housing EWMA Project # 205490

Water-Level Measurements and Well-Construction Summary

					Date:		July 17, 2008			November 13, 2008				
Well ID	Well Diameter (inches)	Screened Interval (ft bsg)	Water-Bearing Zone	Top of Casing (TOC) Elevation (ft amsl)	Depth to Water (DTW) (ft btoc)	Depth to LNAPL (ft btoc)	LNAPL Thickness (ft)	Corrected DTW (ft btoc)	Groundwater Elevation (ft amsl)	Depth to Water (DTW) (ft btoc)	Depth to LNAPL (ft btoc)	LNAPL Thickness (ft)	Corrected DTW (ft btoc)	Groundwater Elevation (ft amsl)
MW-3S	2	5-10	Perched Water	9.30	7.21	(3)	(3)	(2)	(2)	7.19	7.15	0.04	7.16	2.14
MW-4S	2	5-10	Perched Water	9.55	7.97	6.69	1.28	6.95	2.60	8.02	6.80	1.22	7.04	2.51
MW-5S	2	5-10	Perched Water	9.38	6.78	-	0.00	6.78	2.60	7.00	-	0.00	7.00	2.38
MW-6S	2	5-10	Perched Water	9.59	10.40	6.80	3.60	7.52	2.07	(1)	7.95	(2)	(2)	(2)
MW-7S	2	6-11	Perched Water	9.24	(1)	(3)	(3)	(2)	(2)	8.80	7.81	0.99	8.01	1.23
MW-8S	2	3-11	Perched Water	9.24	8.02	-	0.00	8.02	1.22	8.03	-	0.00	8.03	1.21
MW-9S	2	3-11	Perched Water	9.21	8.35	-	0.00	8.35	0.86	8.45	-	0.00	8.45	0.76
MW-11S	2	3-11	Perched Water	8.56	7.35	-	0.00	7.35	1.21	7.40	-	0.00	7.40	1.16
MW-12S	2	3-11	Perched Water	10.02	5.49	-	0.00	5.49	4.53	5.23	-	0.00	5.23	4.79
MW-13S	2	3-11	Perched Water	8.59	7.64	-	0.00	7.64	0.95	7.79	-	0.00	7.79	0.80
MW-19S	2	3-10	Perched Water	9.29	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW-3I	2	15-20	Sand Aquifer	9.30	9.75	-	0.00	9.75	-0.45	9.54	-	0.00	9.54	-0.24
MW-4I	2	15-20	Sand Aquifer	9.51	10.42	-	0.00	10.42	-0.91	10.14	-	0.00	10.14	-0.63
MW-5I	2	14-19	Sand Aquifer	9.57	10.30	-	0.00	10.30	-0.73	9.98	-	0.00	9.98	-0.41
MW-6I	2	15-20	Sand Aquifer	9.46	9.78	-	0.00	9.78	-0.32	9.56	-	0.00	9.56	-0.10
MW-7I	2	15-20	Sand Aquifer	9.16	9.79	-	0.00	9.79	-0.63	9.54	-	0.00	9.54	-0.38
MW-10I	2	14.5-19.5	Sand Aquifer	10.38	(1)	(3)	(3)	(2)	(2)	15.54	8.84	6.70	9.85	0.54
MW-14I	2	13-18	Sand Aquifer	9.82	NI	NI	NI	NI	NI	16.29	8.32	7.97	9.52	0.30
MW-15I	2	13-18	Sand Aquifer	9.77	NI	NI	NI	NI	NI	8.95	-	0.00	8.95	0.82
MW-16I	2	13-18	Sand Aquifer	9.66	NI	NI	NI	NI	NI	14.19	8.53	5.66	9.38	0.28
MW-17I	2	14-19	Sand Aquifer	9.78	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW-18I	2	14-19	Sand Aquifer	NS	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW-20I	2	14-19	Sand Aquifer	10.03	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW-3D	2	22.5-27.5	Sand Aquifer	9.18	10.67	-	0.00	10.67	-1.49	9.43	-	0.00	9.43	-0.25
GW-1	2	5-15	Perched Water (4)	10.06	9.11	-	0.00	9.11	0.95	8.73	-	0.00	8.73	1.33
GW-2	2	5-15	Perched Water (4)	9.96	9.11	-	0.00	9.11	0.85	9.21	-	0.00	9.21	0.75
GW-3	2	5-15	Perched Water (4)	8.97	(1)	6.98	(2)	(2)	(2)	(1)	7.67	(2)	(2)	(2)
GW-4	2	5-15	Perched Water (4)	8.86	(1)	6.98	(2)	(2)	(2)	7.24	6.96	0.28	7.02	1.84
GW-5/MW-2	1	? - 12.8(5)	Perched Water (4)	9.10	(1)	6.62	(2)	(2)	(2)	8.40	6.51	1.89	6.89	2.21
MW-1	4	? - 13.5(5)	Perched Water (4)	9.34	9.71	-	0.00	9.71	-0.37	7.93	-	0.00	7.93	1.41

Notes:
All wells are flush mounted.
ft bsg = feet below surface grade.
ft amsl = feet above mean sea level.
ft btoc = feet below top of casing.
NI: Well not installed.
DTW's corrected using an LNAPL density of 0.8 (perched zone-density assumed) (
(1) Water not detected by interface probe.
(2) Could not be determined.
(3) Interface probe did not respond to LNAPL; presence of LNAPL determined using a bailer.
(4) Well screen may also be partially open to the sand aquifer.
(5) Based on field measurements by EWMA; well log not available.

Table 3

OCA LIC
5th St. Mixed Use Housing EWMA Project # 205490

Water-Level Measurements and Well-Construction Summary

				Date:	**February 9, 2009**				
Well ID	**Well Diameter (inches)**	**Screened Interval (ft bsg)**	**Water-Bearing Zone**	**Top of Casing (TOC) Elevation (ft amsl)**	**Depth to Water (DTW) (ft btoc)**	**Depth to LNAPL (ft btoc)**	**LNAPL Thickness (ft)**	**Corrected DTW (ft btoc)**	**Groundwater Elevation (ft amsl)**
MW-3S	2	5-10	Perched Water	9.30	-	-	-	-	-
MW-4S	2	5-10	Perched Water	9.55	-	-	-	-	-
MW-5S	2	5-10	Perched Water	9.38	-	-	-	-	-
MW-6S	2	5-10	Perched Water	9.59	-	-	-	-	-
MW-7S	2	6-11	Perched Water	9.24	-	-	-	-	-
MW-8S	2	3-11	Perched Water	9.24	-	-	-	-	-
MW-9S	2	3-11	Perched Water	9.21	-	-	-	-	-
MW-11S	2	3-11	Perched Water	8.56	-	-	-	-	-
MW-12S	2	3-11	Perched Water	10.02	-	-	-	-	-
MW-13S	2	3-11	Perched Water	8.59	-	-	-	-	-
MW-19S	2	3-10	Perched Water	9.29	-	-	-	-	-
MW-3I	2	15-20	Sand Aquifer	9.30	-	-	-	-	-
MW-4I	2	15-20	Sand Aquifer	9.51	-	-	-	-	-
MW-5I	2	14-19	Sand Aquifer	9.57	-	-	-	-	-
MW-6I	2	15-20	Sand Aquifer	9.46	-	-	-	-	-
MW-7I	2	15-20	Sand Aquifer	9.16	-	-	-	-	-
MW-10I	2	14.5-19.5	Sand Aquifer	10.38	15.54	8.93	6.61	9.92	0.46
MW-14I	2	13-18	Sand Aquifer	9.82	16.44	8.38	8.06	9.59	0.79
MW-15I	2	13-18	Sand Aquifer	9.77	9.00	-	0.00	9.00	1.38
MW-16I	2	13-18	Sand Aquifer	9.66	16.16	8.48	7.68	9.63	0.75
MW-17I	2	14-19	Sand Aquifer	9.78	9.51	-	0.00	9.51	0.87
MW-18I	2	14-19	Sand Aquifer	NS	-	-	-	-	-
MW-20I	2	14-19	Sand Aquifer	10.03	10.76	10.22	0.54	10.30	0.08
MW-3D	2	22.5-27.5	Sand Aquifer	9.18	-	-	-	-	-
GW-1	2	5-15	Perched Water (4)	10.06	-	-	-	-	-
GW-2	2	5-15	Perched Water (4)	9.96	-	-	-	-	-
GW-3	2	5-15	Perched Water (4)	8.97	-	-	-	-	-
GW-4	2	5-15	Perched Water (4)	8.86	-	-	-	-	-
GW-5/MW-2	1	? - 12.8(5)	Perched Water (4)	9.10	-	-	-	-	-
MW-1	4	? - 13.5(5)	Perched Water (4)	9.34	-	-	-	-	-

Notes:
All wells are flush mounted.
ft bsg = feet below surface grade.
ft amsl = feet above mean sea level.
ft btoc = feet below top of casing.
NI: Well not installed.
DTW's corrected using an LNAPL density of 0.8 (perched zone-density assumed) (
(1) Water not detected by interface probe.
(2) Could not be determined.
(3) Interface probe did not respond to LNAPL; presence of LNAPL determined using a bailer.
(4) Well screen may also be partially open to the sand aquifer.
(5) Based on field measurements by EWMA; well log not available.

Table 4
Vapor Sampling & Analysis Summary Table (ug/m3) - Soil Gas (SG) and Subslab (SS)

Remedial Action Work Plan (RAWP)
OCA LIC Fifth Street Mixed-Use Housing
5-20 46th Road
City of New York, Queens County, New York 11101
EWMA# 205490
BCP Site #C241098

Compound	CAS #	Background E08-00859-03 ug/m3	SG-1 E08-00859-08 ug/m3	SG-2 E08-00859-05 ug/m3	SG-3 E08-00859-01 ug/m3	SS-1 E08-00859-07 ug/m3	SS-2 E08-00859-06 ug/m3	SS-3 E08-00859-04 ug/m3	SS-4 E08-00859-02 ug/m3
Acetone	67-64-1	14	**86**	**59**	**192**	ND	**80**	**56**	**204**
Benzene	71-43-2	1.9	**3.8**	**9.1**	ND	**11**	**3.7**	**5.6**	**3**
1,3-Butadiene	106-99-0	ND	**5.1**	**5.3**	ND	**2.2**	ND	**0.73**	ND
Carbon disulfide	75-15-0	ND	**7.9**	**1.3**	ND	**18**	**16**	**7.4**	**1.3**
Chloroform	67-66-3	ND	ND	**28**	ND	**1.4**	ND	**9.5**	ND
Cyclohexane	110-82-7	ND	**1.6**	**7.3**	ND	**31**	**27**	**34**	**1.7**
Dichlorodifluoromethane	75-71-8	4.8	3.4	**5.1**	ND	4.6	4.7	4.8	4.6
cis-1,2-Dichloroethylene	156-59-2	ND	ND	ND	ND	ND	ND	**2.8**	ND
Ethylbenzene	100-41-4	1.4	ND	**2.8**	ND	**1.7**	**3.2**	**3.2**	**1.7**
Heptane	142-82-5	0.86	**5.5**	**6.3**	ND	**5.4**	**62**	**69**	**7.3**
Hexane	110-54-3	0.95	**6.6**	**3.7**	ND	**11**	**17**	**17**	**2.6**
Isopropyl alcohol	67-63-0	1.3	ND	ND	ND	ND	ND	**2.1**	**14**
Methyl ethyl ketone	78-93-3	1.1	**10**	**3**	ND	**6.3**	**26**	**9.4**	**4.3**
Methyl isobutyl ketone	108-10-1	ND	ND	ND	ND	ND	**11**	**7.8**	**1.7**
Methylene chloride	75-09-2	4.9	0.7	**63**	**274**	1.3	**7.4**	**23**	**247**
Methyl-t-butyl ether	1634-04-4	ND	ND	ND	ND	**6.9**	**6.5**	ND	ND
Styrene	100-42-5	ND	ND	ND	ND	ND	ND	ND	**1.2**
Tetrachloroethylene	127-18-4	1.5	**2.4**	**34**	**136**	**6.9**	**6**	**9.8**	**2.8**
Toluene	108-88-3	3.3	**3.8**	**16**	ND	**6.1**	**67**	**47**	**21**
1,1,1-Trichloroethane	71-55-6	ND	**7.4**	ND	ND	**3.1**	ND	ND	ND
Trichloroethylene	79-01-6	ND	ND	**0.43**	ND	ND	ND	**0.43**	**0.43**
Trichlorofluoromethane	75-69-4	2.1	1.4	**4.7**	ND	1.3	1.7	**3.4**	**7.1**
1,2,4-Trimethylbenzene	95-63-6	1.5	1.2	**3.8**	ND	**2.2**	**3.8**	**4.2**	**1.6**
1,3,5-Trimethylbenzene	108-67-8	ND	ND	**1.8**	ND	ND	**1.5**	**1.6**	ND
Vinyl chloride	75-01-4	ND	ND	ND	ND	**0.59**	ND	ND	ND
m or p-Xylene	1330-20-7	5	2.7	**7.9**	ND	**5.3**	**13**	**12**	4.8
o-Xylene	95-47-6	2.2	1	**3.2**	ND	1.6	**6.2**	**5.6**	**2.5**

Notes
10 - result exceeds background level
63 - result exceeds NYSDOH air guideline value (table 3.1- See right)

NYSDOH Air Guidelines

PCE	100 ug/m3
Methylene Chloride	60 ug/m3

Table 5: List of Permits and Approvals
Remedial Action Work Plan (RAWP)
OCA LIC Fifth Street Mixed-Use Housing
5-20 46th Road
City of New York, Queens County, New York 11101
EWMA# 205490
BCP Site #C241098

NYCDOT – Department of Transportation (Access, curb, cuts, demapping)

FDNY – Fire Department (Access, roadway width, circulation and fire protection)

NYSDEC – Department of Environmental Conservation (SWPPP)

NYCDEP – Department of Environmental Protection (hydrant fire flow test, domestic water and fire service, sanitary service, amended drainage plan, sewer improvements)

NYCDOB – Department of Buildings (flood zone requirements, building permits)

New York City Board of Standards and Appeals

Table 6: Emergency Contacts
Remedial Action Work Plan (RAWP)
OCA LIC Fifth Street Mixed-Use Housing
5-20 46th Road
City of New York, Queens County, New York 11101
EWMA# 205490
BCP Site #C241098

Emergency Service	Telephone Number
Ambulance	911
Fire Department 10-40 47th Avenue, Long Island City, NY	911 or (718) 847-6600
Long Island Police Department 547 50th Avenue, Long Island City, NY	911 or (718) 784-5411
New York University Medical Center 560 1st Avenue, NY, NY 10016	911 or (212) 263-7300
Poison Control Center	(800) 962-1253
USEPA National Response Center	(800) 438-2427
Site Remediation Project Contacts	
OCA Long Island City, LLC - Brent Carrier	(212) 546-0832
Environmental Waste Management Associates - Sharon McSwieney, Project Manager - Richard Arnold, Project Remediation Engineer	 (609) 799 - 7300 (973) 560 - 1400
CitiStructures - Ravi Reddy, Construction Manager	 (201) 798-4470

Table 7: Proposed Post Excavation Sampling and Analysis Summary - Soils
Remedial Action Work Plan (RAWP)
OCA LIC Fifth Street Mixed-Use Housing
5-20 46th Road
City of New York, Queens County, New York 11101
EWMA# 205490
BCP Site #C241098

Location	Medium	Sample ID	Depth*	Analytical Parameter	Sampling Method
Southwest Sidewall	Soil	PES-1	6.5-7'	Full TCL/ TAL+30	Grab
	Soil	PES-2	6.5-7'	Full TCL/ TAL+30	Grab
Western Sidewall	Soil	PES-3	6.5-7'	Full TCL/ TAL+30	Grab
	Soil	PES-4	6.5-7'	Full TCL/ TAL+30	Grab
	Soil	PES-5	6.5-7'	Full TCL/ TAL+30	Grab
	Soil	PES-6	6.5-7'	Full TCL/ TAL+30	Grab
	Soil	PES-7	6.5-7'	Full TCL/ TAL+30	Grab
Northern Sidewall	Soil	PES-8	6.5-7'	Full TCL/ TAL+30	Grab
	Soil	PES-9	6.5-7'	Full TCL/ TAL+30	Grab
	Soil	PES-10	6.5-7'	Full TCL/ TAL+30	Grab
	Soil	PES-11	6.5-7'	Full TCL/ TAL+30	Grab
	Soil	PES-12	6.5-7'	Full TCL/ TAL+30	Grab
	Soil	PES-13	6.5-7'	Full TCL/ TAL+30	Grab
	Soil	PES-14	6.5-7'	Full TCL/ TAL+30	Grab
	Soil	PES-15	6.5-7'	Full TCL/ TAL+30	Grab
Eastern Sidewall	Soil	PES-16	6.5-7'	Full TCL/ TAL+30	Grab
	Soil	PES-17	6.5-7'	Full TCL/ TAL+30	Grab
Southeastern Sidewall	Soil	PES-18	6.5-7'	Full TCL/ TAL+30	Grab
	Soil	PES-19	6.5-7'	Full TCL/ TAL+30	Grab
Excavation Base	Soil	PEB-1	7-7.5'	Full TCL/ TAL+30	Grab
	Soil	PEB-2	7-7.5'	Full TCL/ TAL+30	Grab
	Soil	PEB-3	7-7.5'	Full TCL/ TAL+30	Grab
	Soil	PEB-4	7-7.5'	Full TCL/ TAL+30	Grab
	Soil	PEB-5	7-7.5'	Full TCL/ TAL+30	Grab
	Soil	PEB-6	7-7.5'	Full TCL/ TAL+30	Grab
	Soil	PEB-7	7-7.5'	Full TCL/ TAL+30	Grab
	Soil	PEB-8	7-7.5'	Full TCL/ TAL+30	Grab
	Soil	PEB-9	7-7.5'	Full TCL/ TAL+30	Grab
	Soil	PEB-10	7-7.5'	Full TCL/ TAL+30	Grab
	Soil	PEB-11	7-7.5'	Full TCL/ TAL+30	Grab
	Soil	PEB-12	7-7.5'	Full TCL/ TAL+30	Grab
	Soil	PEB-13	7-7.5'	Full TCL/ TAL+30	Grab
	Soil	PEB-14	7-7.5'	Full TCL/ TAL+30	Grab
	Soil	PEB-15	7-7.5'	Full TCL/ TAL+30	Grab
	Soil	PEB-16	7-7.5'	Full TCL/ TAL+30	Grab
	Soil	PEB-17	7-7.5'	Full TCL/ TAL+30	Grab
	Soil	PEB-18	7-7.5'	Full TCL/ TAL+30	Grab
	Soil	PEB-19	7-7.5'	Full TCL/ TAL+30	Grab
	Soil	PEB-20	7-7.5'	Full TCL/ TAL+30	Grab
	Soil	PEB-21	7-7.5'	Full TCL/ TAL+30	Grab
	Soil	PEB-22	7-7.5'	Full TCL/ TAL+30	Grab
	Soil	PEB-23	7-7.5'	Full TCL/ TAL+30	Grab
	Soil	PEB-24	7-7.5'	Full TCL/ TAL+30	Grab
	Soil	PEB-25	7-7.5'	Full TCL/ TAL+30	Grab

Table 7: Proposed Post Excavation Sampling and Analysis Summary - Soils
Remedial Action Work Plan (RAWP)
OCA LIC Fifth Street Mixed-Use Housing
5-20 46th Road
City of New York, Queens County, New York 11101
EWMA# 205490
BCP Site #C241098

Location	Medium	Sample ID	Depth*	Analytical Parameter	Sampling Method
Excavation Base	Soil	PEB-26	7-7.5'	Full TCL/ TAL+30	Grab
	Soil	PEB-27	7-7.5'	Full TCL/ TAL+30	Grab
	Soil	PEB-28	7-7.5'	Full TCL/ TAL+30	Grab
	Soil	PEB-29	7-7.5'	Full TCL/ TAL+30	Grab
	Soil	PEB-30	7-7.5'	Full TCL/ TAL+30	Grab
	Soil	PEB-31	7-7.5'	Full TCL/ TAL+30	Grab
	Soil	PEB-32	7-7.5'	Full TCL/ TAL+30	Grab

Notes:

*** -** Depth below surface grade

1. Samples will be collected from within the depth range given with the specific depth field determined based on field screening using visual, olfactory, and PID screening and biased towards highest potential for contamination

2. All samples will be analyzed by Chemtech of Mountainside, New Jersey

3. Full TCL/ TAL + 30 includes: TCL Volatile Organics + 10, TCL Base Neutral/ Acid Extractables + 20, PCBs, TCL Pesticides, TAL Metals

4. LFSP - Low flow sampling and purging

5. Depth of the temporary water samples will 10 feet below water level unless a confining layer is encountered

6. Exact temporary water sample locations will be basedon field/ visual observations of all soil samples collected in the respective locations

Figures

GRAPHIC SCALE

0 0.5 1 MILE

(IN MILES)

SOURCE: USGS CENTRAL PARK & BROOKLYN, N.Y. 7.5 MIN. QUADS.

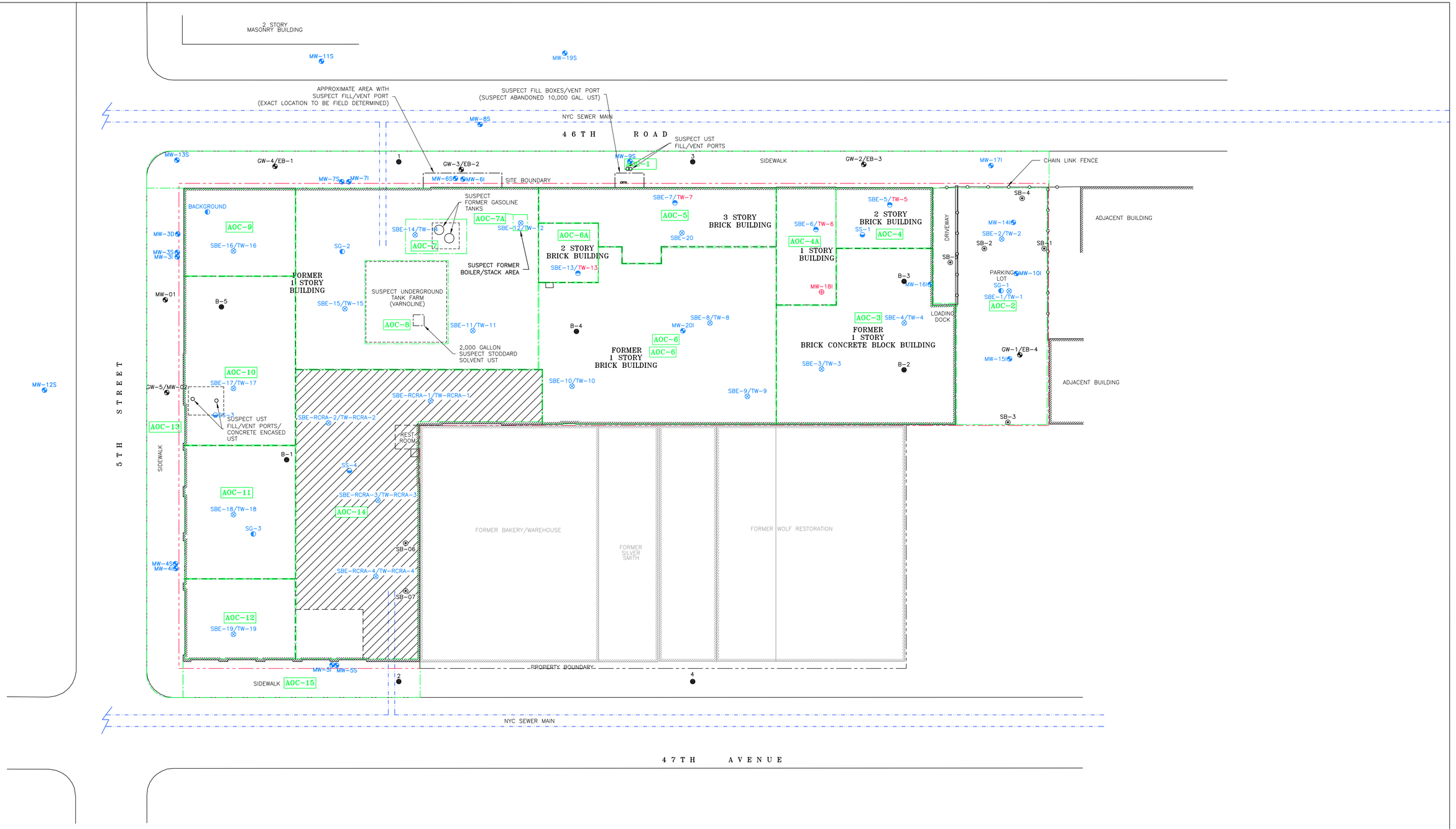
Environmental Waste Management Associates, LLC
P.O. Box 5430
Parsippany, NJ 07054
Tel: (973) 560-1400

SCALE: 1" = 2,000'	PROJECT# 205490
DATE: 8/27/08	
DRAWN BY: RR	
CHECKED BY: AK	
FILE: k:\drawings\205000\205490\20549001.dwg	

SITE LOCATION

OCA LIC FIFTH STREET MIXED-USE HOUSING
5-20 46TH ROAD
LONG ISLAND CITY, NEW YORK

FIGURE# 1



LEGEND

MW-01	J.C. BRODERICK & ASSOCIATES MONITORING WELL LOCATION – 2005
GW-1	EEA, INC. MONITORING WELL LOCATION – 2006
B-1	EEA, INC. SOIL BORING LOCATION – 2005
1	CA RICH CONSULTANTS SAMPLE LOCATION – 1992
SB-1	J.C. BRODERICK & ASSOCIATES SAMPLE LOCATION – 2005
SBE-7/TW-7	EWMA SOIL BORING OR SOIL BORING/TEMPORARY WATER SAMPLE LOCATION – 2008
SBE-6/TW-6	EWMA HAND AUGER SAMPLE LOCATION – 2008 (PROPOSED TEMPORARY WATER SAMPLE NOT COLLECTED)
	CONCRETE REMOVAL AREA / TEST PIT INVESTIGATION
MW-3S	EWMA MONITORING WELL LOCATION (SHALLOW) – 2008/2009
MW-3I	EWMA MONITORING WELL LOCATION (INTERMEDIATE) – 2008/2009
MW-3D	EWMA MONITORING WELL LOCATION (DEEP) – 2008
SS-1	EWMA SUB-SLAB AIR SAMPLE LOCATION FOR VAPOR INTRUSION INVESTIGATION – 2008
SG-1	EWMA SOIL GAS / AMBIENT AIR SAMPLE LOCATION FOR VAPOR INTRUSION INVESTIGATION – 2008
MW-18I	EWMA MONITORING WELL LOCATION (SAND AQUIFER) – 2009 LOCATION APPROXIMATE – NOT SURVEYED
	ENCAPSULATED AREA
	SITE BOUNDARY
	BUILDING OUTER WALL
	BUILDING INTERIOR WALL/MULTIPLE STORY WALL
	AOC BOUNDARY

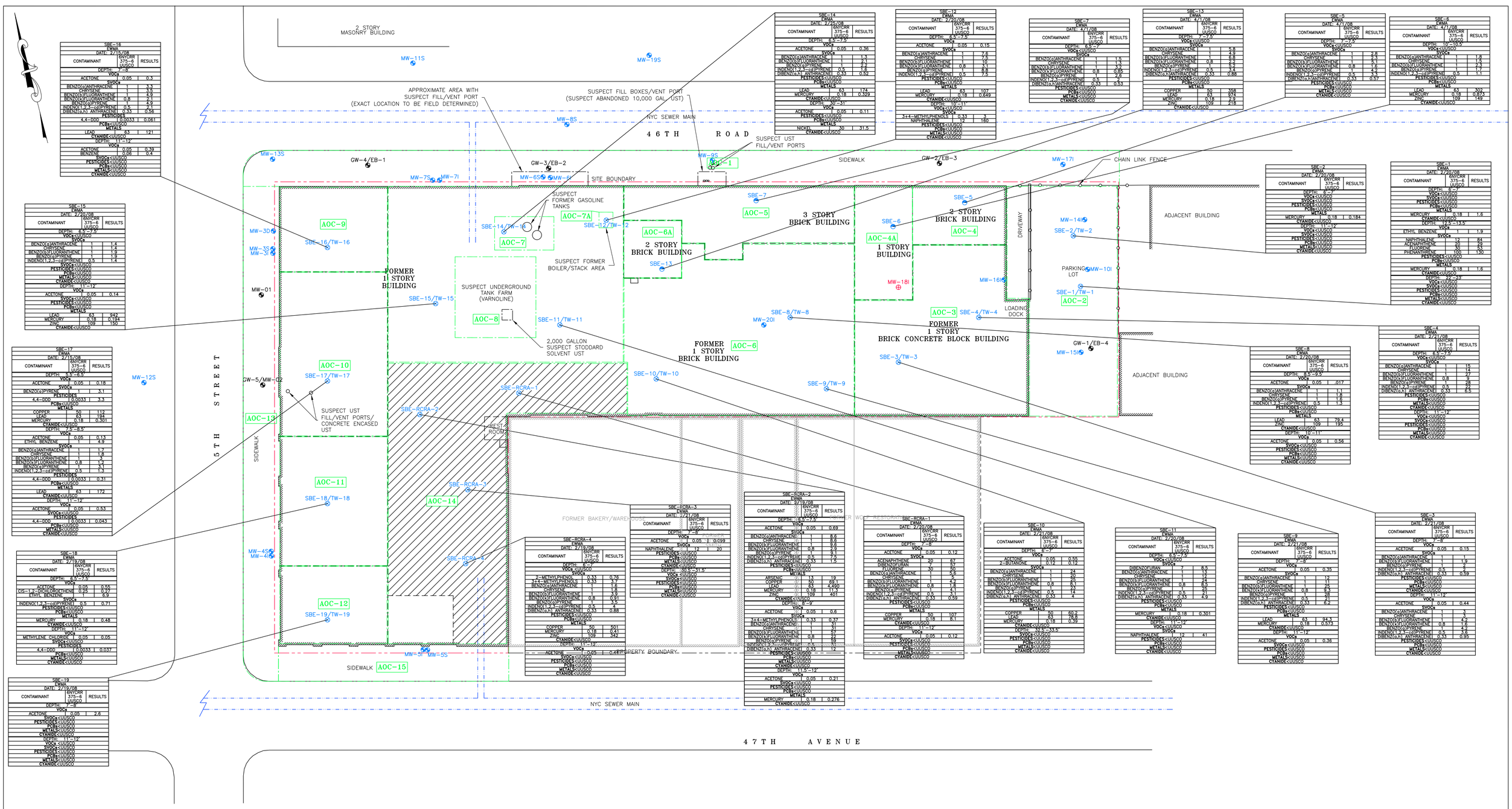
AREAS OF CONCERN

AOC-1	FORMER 10,000 GALLON #6 FUEL OIL UST/46th ROAD SIDEWALK	AOC-7A	SUSPECT FORMER BOILER/STACK AREA
AOC-2	EASTERN PARKING LOT	AOC-8	SUSPECT TWENTY-TWO (22) 1,500 GALLON VARNOLINE STORAGE TANKS
AOC-3	1-STORY BRICK/CONCRETE BLOCK BUILDING (DEMAND ELECTRIC)	AOC-9	1-STORY BUILDING (AMN RENOVATION)
AOC-4	MOTORCYCLE REPAIR SHOP (BASEMENT 2-STORY BRICK BUILDING)	AOC-10	1-STORY BUILDING (JMJ ELECTRICAL)/SUSPECT UST AND FILL/VENT PORTS
AOC-4A	1-STORY BUILDING	AOC-11	FORMER WOHL, INC. CLEANERS AND DYERS (DIRECT AIR)
AOC-5	3-STORY BRICK BUILDING (ART STUDIOS)	AOC-12	FORMER WOHL, INC. CLEANERS AND DYERS (LIBERTY CONTRACTING)
AOC-6	1-STORY BRICK BUILDING (KNOSSOS CUSTOM DESIGN FURNITURE)	AOC-13	5TH STREET SIDEWALK
AOC-6A	2-STORY BRICK BUILDING	AOC-14	FORMER ACCURATE ASSOCIATES RCRA AREA
AOC-7	TWO (2) FORMER GASOLINE STORAGE TANKS	AOC-15	47TH AVENUE SIDEWALK

GRAPHIC SCALE
20 0 10 20 40
(IN FEET)

SOURCE: "ARCHITECTURAL SURVEY" MONTROSE SURVEYING CO., LLP., RICHMOND HILL, N.Y. 4/2/07

Environmental Waste Management Associates, LLC P.O. Box 5430 Parsippany, NJ 07054 Tel: (973) 560-1400	SCALE: AS SHOWN	PROJECT# 205490
	DATE: 6/30/09	
	DRAWN BY: RR/JS CHECKED BY: RA	
SITE PLAN WITH SAMPLE LOCATION PLAN OCA LIC FIFTH STREET MIXED-USE HOUSING 5-20 46TH ROAD LONG ISLAND CITY, NEW YORK		FIGURE# 2



SBE-16 — EWMA — DATE: 2/15/08

CONTAMINANT	6NYCRR 375-6 UUSCO	RESULTS
DEPTH: 7-8		
VOCs		
ACETONE	0.05	0.3
SVOCs		
BENZO(a)ANTHRACENE	1	3.3
CHRYSENE	1	3.5
BENZO(b)FLUORANTHENE	1	4.9
BENZO(k)FLUORANTHENE	0.8	4.1
BENZO(a)PYRENE	1	4.9
INDENO(1,2,3-cd)PYRENE	0.5	4.1
DIBENZ(a,h) ANTHRACENE	0.33	0.56
PESTICIDES		
4,4-DDD	0.0033	0.061
PCBs<UUSCO		
METALS		
LEAD	63	121
CYANIDE<UUSCO		
DEPTH: 11-12'		
VOCs		
ACETONE	0.05	0.39
BENZENE	0.06	0.4
SVOCs<UUSCO		
PESTICIDES<UUSCO		
PCBs<UUSCO		
METALS<UUSCO		
CYANIDE<UUSCO		

SBE-15 — EWMA — DATE: 2/20/08

CONTAMINANT	6NYCRR 375-6 UUSCO	RESULTS
DEPTH: 6.5-7.5'		
VOCs<UUSCO		
SVOCs		
BENZO(a)ANTHRACENE	1	1.4
CHRYSENE	1	1.4
BENZO(b)FLUORANTHENE	1	1.9
BENZO(a)PYRENE	1	1.9
INDENO(1,2,3-cd)PYRENE	0.5	1.4
SVOCs<UUSCO		
PESTICIDES<UUSCO		
PCBs<UUSCO		
METALS<UUSCO		
CYANIDE<UUSCO		
DEPTH: 11-12'		
VOCs		
ACETONE	0.05	0.14
SVOCs<UUSCO		
PESTICIDES<UUSCO		
PCBs<UUSCO		
METALS		
LEAD	63	942
MERCURY	0.18	0.124
ZINC	109	150
CYANIDE<UUSCO		

SBE-17 — EWMA — DATE: 2/15/08

CONTAMINANT	6NYCRR 375-6 UUSCO	RESULTS
DEPTH: 5.5-6.5'		
VOCs		
ACETONE	0.05	0.18
SVOCs		
BENZO(a)PYRENE	1	3.1
PESTICIDES		
4,4-DDD	0.0033	3.3
PCBs<UUSCO		
METALS		
COPPER	50	112
LEAD	63	194
MERCURY	0.18	0.301
CYANIDE<UUSCO		
DEPTH: 7.5-8.5'		
VOCs		
ACETONE	0.05	0.13
ETHYL BENZENE	1	4.9
SVOCs		
BENZO(a)ANTHRACENE	1	1.7
CHRYSENE	1	1.8
BENZO(b)FLUORANTHENE	1	3
BENZO(k)FLUORANTHENE	0.8	1.4
BENZO(a)PYRENE	1	2.1
INDENO(1,2,3-cd)PYRENE	0.5	1.3
PESTICIDES		
4,4-DDD	0.0033	0.31
PCBs<UUSCO		
METALS		
LEAD	63	172
CYANIDE<UUSCO		
DEPTH: 11-12'		
VOCs		
ACETONE	0.05	0.53
SVOCs<UUSCO		
PESTICIDES		
4,4-DDD	0.0033	0.043
PCBs<UUSCO		
METALS<UUSCO		
CYANIDE<UUSCO		

SBE-18 — EWMA — DATE: 2/19/08

CONTAMINANT	6NYCRR 375-6 UUSCO	RESULTS
DEPTH: 6.5-7.5'		
VOCs		
ACETONE	0.05	0.55
CIS-1,2-DICHLOROETHENE	0.25	0.27
ETHYL BENZENE	1	6.9
SVOCs		
INDENO(1,2,3-cd)PYRENE	0.5	0.71
PESTICIDES<UUSCO		
PCBs<UUSCO		
METALS		
MERCURY	0.18	0.48
CYANIDE<UUSCO		
DEPTH: 11-12'		
VOCs		
METHYLENE CHLORIDE	0.05	0.05
SVOCs<UUSCO		
PESTICIDES		
4,4-DDD	0.0033	0.037
PCBs<UUSCO		
METALS<UUSCO		
CYANIDE<UUSCO		

SBE-19 — EWMA — DATE: 2/19/08

CONTAMINANT	6NYCRR 375-6 UUSCO	RESULTS
DEPTH: 7-8		
VOCs		
ACETONE	0.05	2.6
SVOCs<UUSCO		
PESTICIDES<UUSCO		
PCBs<UUSCO		
METALS<UUSCO		
CYANIDE<UUSCO		
DEPTH: 11-12'		
VOCs<UUSCO		
SVOCs<UUSCO		
PESTICIDES<UUSCO		
PCBs<UUSCO		
METALS<UUSCO		
CYANIDE<UUSCO		

SBE-14 — EWMA — DATE: 2/25/08

CONTAMINANT	6NYCRR 375-6 UUSCO	RESULTS
DEPTH: 6.5-7.5'		
VOCs		
ACETONE	0.05	0.36
SVOCs		
BENZO(a)ANTHRACENE	1	1.3
BENZO(b)FLUORANTHENE	1	2.1
BENZO(a)PYRENE	1	2.2
INDENO(1,2,3-cd)PYRENE	0.5	1.6
DIBENZ(a,h) ANTHRACENE	0.33	0.52
PESTICIDES<UUSCO		
PCBs<UUSCO		
METALS		
LEAD	63	174
MERCURY	0.18	0.329
CYANIDE<UUSCO		
DEPTH: 30-31'		
VOCs		
ACETONE	0.05	0.11
PESTICIDES<UUSCO		
PCBs<UUSCO		
METALS		
NICKEL	30	31.5
CYANIDE<UUSCO		

SBE-12 — EWMA — DATE: 2/20/08

CONTAMINANT	6NYCRR 375-6 UUSCO	RESULTS
DEPTH: 6.5-7.5'		
VOCs		
ACETONE	0.05	0.15
SVOCs		
BENZO(a)ANTHRACENE	1	7.6
CHRYSENE	1	7.5
BENZO(b)FLUORANTHENE	1	10
BENZO(k)FLUORANTHENE	0.8	7.1
BENZO(a)PYRENE	1	8.8
INDENO(1,2,3-cd)PYRENE	0.5	7.5
PESTICIDES<UUSCO		
PCBs<UUSCO		
METALS		
LEAD	63	107
MERCURY	0.18	0.849
CYANIDE<UUSCO		
DEPTH: 10-11'		
VOCs<UUSCO		
SVOCs		
3+4-METHYLPHENOLS	0.33	3
NAPHTHALENE	12	160
PESTICIDES<UUSCO		
PCBs<UUSCO		
METALS<UUSCO		
CYANIDE<UUSCO		

SBE-7 — EWMA — DATE: 4/1/08

CONTAMINANT	6NYCRR 375-6 UUSCO	RESULTS
DEPTH: 6.5-7'		
VOCs<UUSCO		
SVOCs		
BENZO(a)ANTHRACENE	1	1.5
CHRYSENE	1	1.3
BENZO(b)FLUORANTHENE	1	1.7
BENZO(k)FLUORANTHENE	0.8	0.85
BENZO(a)PYRENE	1	1.5
INDENO(1,2,3-cd)PYRENE	0.5	1
DIBENZ(a,h) ANTHRACENE	0.33	0.53
PESTICIDES<UUSCO		
PCBs<UUSCO		
METALS<UUSCO		
CYANIDE<UUSCO		

SBE-13 — EWMA — DATE: 4/1/08

CONTAMINANT	6NYCRR 375-6 UUSCO	RESULTS
DEPTH: 7-7.5'		
VOCs<UUSCO		
SVOCs		
BENZO(a)ANTHRACENE	1	5.8
CHRYSENE	1	4.9
BENZO(b)FLUORANTHENE	1	6.8
BENZO(k)FLUORANTHENE	0.8	5.2
BENZO(a)PYRENE	1	6.2
INDENO(1,2,3-cd)PYRENE	0.5	4.4
DIBENZ(a,h) ANTHRACENE	0.33	0.88
PESTICIDES<UUSCO		
PCBs<UUSCO		
METALS		
COPPER	50	358
LEAD	63	974
MERCURY	0.18	2.9
ZINC	109	218
CYANIDE<UUSCO		

SBE-5 — EWMA — DATE: 4/1/08

CONTAMINANT	6NYCRR 375-6 UUSCO	RESULTS
DEPTH: 7-7.5'		
VOCs<UUSCO		
SVOCs		
BENZO(a)ANTHRACENE	1	2.8
CHRYSENE	1	2.3
BENZO(b)FLUORANTHENE	1	3.1
BENZO(k)FLUORANTHENE	0.8	1.6
BENZO(a)PYRENE	1	1.7
INDENO(1,2,3-cd)PYRENE	0.5	1.1
DIBENZ(a,h) ANTHRACENE	0.33	0.57
PESTICIDES<UUSCO		
PCBs<UUSCO		
METALS<UUSCO		
CYANIDE<UUSCO		

SBE-6 — EWMA — DATE: 4/1/08

CONTAMINANT	6NYCRR 375-6 UUSCO	RESULTS
DEPTH: 10-10.5'		
VOCs<UUSCO		
SVOCs		
BENZO(a)ANTHRACENE	1	1.8
CHRYSENE	1	1.5
BENZO(b)FLUORANTHENE	1	2.3
BENZO(a)PYRENE	1	1.7
INDENO(1,2,3-cd)PYRENE	0.5	1.1
PESTICIDES<UUSCO		
PCBs<UUSCO		
METALS		
LEAD	63	302
MERCURY	0.18	0.873
ZINC	109	149
CYANIDE<UUSCO		

SBE-2 — EWMA — DATE: 2/20/08

CONTAMINANT	6NYCRR 375-6 UUSCO	RESULTS
DEPTH: 6-7'		
VOCs<UUSCO		
SVOCs<UUSCO		
PESTICIDES<UUSCO		
PCBs<UUSCO		
METALS		
MERCURY	0.18	0.184
CYANIDE<UUSCO		
DEPTH: 11-12'		
VOCs<UUSCO		
SVOCs<UUSCO		
PESTICIDES<UUSCO		
PCBs<UUSCO		
METALS<UUSCO		
CYANIDE<UUSCO		

SBE-1 — EWMA — DATE: 2/20/08

CONTAMINANT	6NYCRR 375-6 UUSCO	RESULTS
DEPTH: 6-7'		
VOCs<UUSCO		
SVOCs<UUSCO		
PESTICIDES<UUSCO		
PCBs<UUSCO		
METALS		
MERCURY	0.18	1.6
CYANIDE<UUSCO		
DEPTH: 12.5-13.5'		
ETHYL BENZENE	1	1.9
SVOCs		
NAPHTHALENE	12	84
ACENAPHTHENE	20	29
FLUORENE	30	43
PHENANTHRENE	100	130
PESTICIDES<UUSCO		
PCBs<UUSCO		
METALS		
MERCURY	0.18	1.6
CYANIDE<UUSCO		
DEPTH: 22-23'		
VOCs<UUSCO		
SVOCs<UUSCO		
PESTICIDES<UUSCO		
PCBs<UUSCO		
METALS<UUSCO		
CYANIDE<UUSCO		

SBE-4 — EWMA — DATE: 2/21/08

CONTAMINANT	6NYCRR 375-6 UUSCO	RESULTS
DEPTH: 6.5-7.5'		
VOCs<UUSCO		
SVOCs		
BENZO(a)ANTHRACENE	1	15
CHRYSENE	1	14
BENZO(b)FLUORANTHENE	1	27
BENZO(k)FLUORANTHENE	0.8	9
BENZO(a)PYRENE	1	28
INDENO(1,2,3-cd)PYRENE	0.5	22
DIBENZ(a,h) ANTHRACENE	0.33	6.5
PESTICIDES<UUSCO		
PCBs<UUSCO		
METALS<UUSCO		
CYANIDE<UUSCO		
DEPTH: 11-12'		
VOCs<UUSCO		
SVOCs<UUSCO		
PESTICIDES<UUSCO		
PCBs<UUSCO		
METALS<UUSCO		
CYANIDE<UUSCO		

SBE-8 — EWMA — DATE: 2/20/08

CONTAMINANT	6NYCRR 375-6 UUSCO	RESULTS
DEPTH: 8.5-9.5'		
VOCs		
ACETONE	0.05	.017
SVOCs		
BENZO(a)ANTHRACENE	1	1.1
CHRYSENE	1	1.8
BENZO(a)PYRENE	1	1.6
INDENO(1,2,3-cd)PYRENE	0.5	1.3
PESTICIDES<UUSCO		
PCBs<UUSCO		
METALS		
LEAD	63	78.4
ZINC	109	195
CYANIDE<UUSCO		
DEPTH: 10-11'		
VOCs		
ACETONE	0.05	0.56
SVOCs<UUSCO		
PESTICIDES<UUSCO		
PCBs<UUSCO		
METALS<UUSCO		
CYANIDE<UUSCO		

SBE-RCRA-2 — EWMA — DATE: 2/19/08

CONTAMINANT	6NYCRR 375-6 UUSCO	RESULTS
DEPTH: 6.5-7.5'		
VOCs		
ACETONE	0.05	0.69
SVOCs		
BENZO(a)ANTHRACENE	1	8.6
CHRYSENE	1	8.6
BENZO(b)FLUORANTHENE	1	9.6
BENZO(k)FLUORANTHENE	0.8	9.3
BENZO(a)PYRENE	1	9.1
INDENO(1,2,3-cd)PYRENE	0.5	7.9
DIBENZ(a,h) ANTHRACENE	0.33	1.5
PESTICIDES<UUSCO		
PCBs<UUSCO		
METALS		
ARSENIC	20	19
COPPER	50	69.1
LEAD	63	4,490
MERCURY	0.18	11.1
ZINC	109	401
CYANIDE<UUSCO		
DEPTH: 8-9'		
VOCs		
ACETONE	0.05	0.6
SVOCs		
3+4-METHYLPHENOLS	0.33	0.37
BENZO(a)ANTHRACENE	1	11
CHRYSENE	1	11
BENZO(b)FLUORANTHENE	1	12
BENZO(k)FLUORANTHENE	0.8	11
BENZO(a)PYRENE	1	11
INDENO(1,2,3-cd)PYRENE	0.5	9.7
DIBENZ(a,h) ANTHRACENE	0.33	1.2
PESTICIDES<UUSCO		
PCBs<UUSCO		
METALS<UUSCO		
CYANIDE<UUSCO		
DEPTH: 11-12'		
VOCs		
ACETONE	0.05	0.21
SVOCs<UUSCO		
PESTICIDES<UUSCO		
PCBs<UUSCO		
METALS		
MERCURY	0.18	0.276
CYANIDE<UUSCO		

SBE-RCRA-1 — EWMA — DATE: 2/20/08

CONTAMINANT	6NYCRR 375-6 UUSCO	RESULTS
DEPTH: 7-8'		
VOCs		
ACETONE	0.05	0.12
SVOCs		
ACENAPHTHENE	20	47
DIBENZOFURAN	30	50
FLUORENE	30	56
BENZO(a)ANTHRACENE	1	24
CHRYSENE	1	20
BENZO(b)FLUORANTHENE	1	25
BENZO(k)FLUORANTHENE	0.8	8.1
BENZO(a)PYRENE	1	23
INDENO(1,2,3-cd)PYRENE	0.5	14
DIBENZ(a,h) ANTHRACENE	0.33	4
PESTICIDES<UUSCO		
PCBs<UUSCO		
METALS		
COPPER	50	107
MERCURY	0.18	8.1
CYANIDE<UUSCO		
DEPTH: 11-12'		
VOCs		
ACETONE	0.05	0.12
SVOCs<UUSCO		
PESTICIDES<UUSCO		
PCBs<UUSCO		
METALS<UUSCO		
CYANIDE<UUSCO		

SBE-10 — EWMA — DATE: 2/21/08

CONTAMINANT	6NYCRR 375-6 UUSCO	RESULTS
DEPTH: 6-7'		
VOCs		
ACETONE	0.05	0.55
2-BUTANONE	0.12	0.12
SVOCs		
BENZO(a)ANTHRACENE	1	24
CHRYSENE	1	20
BENZO(b)FLUORANTHENE	1	25
BENZO(k)FLUORANTHENE	0.8	8.1
BENZO(a)PYRENE	1	23
INDENO(1,2,3-cd)PYRENE	0.5	14
DIBENZ(a,h) ANTHRACENE	0.33	4
PESTICIDES<UUSCO		
PCBs<UUSCO		
METALS		
COPPER	50	50.2
LEAD	63	78.8
MERCURY	0.18	0.39
CYANIDE<UUSCO		
DEPTH: 32.5-33.5'		
SVOCs<UUSCO		
PESTICIDES<UUSCO		
PCBs<UUSCO		
METALS<UUSCO		
CYANIDE<UUSCO		

SBE-11 — EWMA — DATE: 2/20/08

CONTAMINANT	6NYCRR 375-6 UUSCO	RESULTS
DEPTH: 6-7'		
VOCs<UUSCO		
SVOCs		
DIBENZOFURAN	7	8.5
BENZO(a)ANTHRACENE	1	13
CHRYSENE	1	12
BENZO(b)FLUORANTHENE	1	24
BENZO(k)FLUORANTHENE	0.8	8.5
BENZO(a)PYRENE	1	26
INDENO(1,2,3-cd)PYRENE	0.5	21
DIBENZ(a,h) ANTHRACENE	0.33	4.9
PESTICIDES<UUSCO		
PCBs<UUSCO		
METALS		
MERCURY	0.18	0.301
CYANIDE<UUSCO		
DEPTH: 11-12'		
VOCs<UUSCO		
SVOCs		
NAPHTHALENE	12	41
PESTICIDES<UUSCO		
PCBs<UUSCO		
METALS<UUSCO		
CYANIDE<UUSCO		

SBE-9 — EWMA — DATE: 2/21/08

CONTAMINANT	6NYCRR 375-6 UUSCO	RESULTS
DEPTH: 7-8'		
VOCs		
ACETONE	0.05	0.35
SVOCs		
BENZO(a)ANTHRACENE	1	12
CHRYSENE	1	11
BENZO(b)FLUORANTHENE	1	24
BENZO(k)FLUORANTHENE	0.8	8.5
BENZO(a)PYRENE	1	25
INDENO(1,2,3-cd)PYRENE	0.5	20
DIBENZ(a,h) ANTHRACENE	0.33	6.2
PESTICIDES<UUSCO		
PCBs<UUSCO		
METALS		
LEAD	63	94.3
MERCURY	0.18	0.573
CYANIDE<UUSCO		
DEPTH: 11-12'		
VOCs		
ACETONE	0.05	0.36
SVOCs<UUSCO		
PESTICIDES<UUSCO		
PCBs<UUSCO		
METALS<UUSCO		
CYANIDE<UUSCO		

SBE-3 — EWMA — DATE: 2/21/08

CONTAMINANT	6NYCRR 375-6 UUSCO	RESULTS
DEPTH: 7-8'		
VOCs		
ACETONE	0.05	0.15
SVOCs		
BENZO(a)ANTHRACENE	1	1
CHRYSENE	1	1.9
BENZO(a)PYRENE	1	2
INDENO(1,2,3-cd)PYRENE	0.5	1
DIBENZ(a,h) ANTHRACENE	0.33	0.59
PESTICIDES<UUSCO		
PCBs<UUSCO		
METALS<UUSCO		
CYANIDE<UUSCO		
DEPTH: 11-12'		
VOCs		
ACETONE	0.05	0.44
SVOCs		
BENZO(a)ANTHRACENE	1	3
CHRYSENE	1	3
BENZO(b)FLUORANTHENE	1	4.2
BENZO(k)FLUORANTHENE	0.8	1.6
BENZO(a)PYRENE	1	4.2
INDENO(1,2,3-cd)PYRENE	0.5	3.6
DIBENZ(a,h) ANTHRACENE	0.33	0.95
PESTICIDES<UUSCO		
PCBs<UUSCO		
METALS<UUSCO		
CYANIDE<UUSCO		

LEGEND

- MW-01 — J.C. BRODERICK & ASSOCIATES MONITORING WELL LOCATION – 2005
- GW-1 — EEA, INC. MONITORING WELL LOCATION – 2006
- MW-13S — EWMA MONITORING WELL LOCATION (PERCHED WATER ZONE) – 2008/2009
- MW-3I — EWMA MONITORING WELL LOCATION (SAND AQUIFER) – 2008/2009
- MW-3D — EWMA MONITORING WELL LOCATION (SAND AQUIFER) – 2008
- SBE-6 — EWMA HAND AUGER SAMPLE LOCATION – 2008
- SBE-8/TW-8 — EWMA SOIL BORING OR SOIL BORING/TEMPORARY WELL POINT SAMPLE LOCATION – 2008
- MW-18I — EWMA MONITORING WELL LOCATION (SAND AQUIFER) – 2009 LOCATION APPROXIMATE – NOT SURVEYED
- ENCAPSULATED AREA
- SITE BOUNDARY
- BUILDING OUTER WALL
- BUILDING INTERIOR WALL/MULTIPLE STORY WALL
- AOC BOUNDARY

AREAS OF CONCERN

AOC-1	FORMER 10,000 GALLON #6 FUEL OIL UST/46th ROAD SIDEWALK	AOC-7A	SUSPECT FORMER BOILER/STACK AREA
AOC-2	EASTERN PARKING LOT	AOC-8	SUSPECT TWENTY-TWO (22) 1,500 GALLON VARNOLINE STORAGE TANKS
AOC-3	1-STORY BRICK/CONCRETE BLOCK BUILDING (DEMAND ELECTRIC)	AOC-9	1-STORY BUILDING (AMN RENOVATION)
AOC-4	MOTORCYCLE REPAIR SHOP (BASEMENT 2-STORY BRICK BUILDING)	AOC-10	1-STORY BUILDING (JMJ ELECTRICAL)/SUSPECT UST AND FILL/VENT PORTS
AOC-4A	1-STORY BUILDING	AOC-11	FORMER WOHL, INC. CLEANERS AND DYERS (DIRECT AIR)
AOC-5	3-STORY BRICK BUILDING (ART STUDIOS)	AOC-12	FORMER WOHL, INC. CLEANERS AND DYERS (LIBERTY CONTRACTING)
AOC-6	1-STORY BRICK BUILDING (KNOSSOS CUSTOM DESIGN FURNITURE)	AOC-13	5TH STREET SIDEWALK
AOC-6A	2-STORY BRICK BUILDING	AOC-14	FORMER ACCURATE ASSOCIATES RCRA AREA
AOC-7	TWO (2) FORMER GASOLINE STORAGE TANKS	AOC-15	47TH AVENUE SIDEWALK

GRAPHIC SCALE
20 0 10 20 40
(IN FEET)

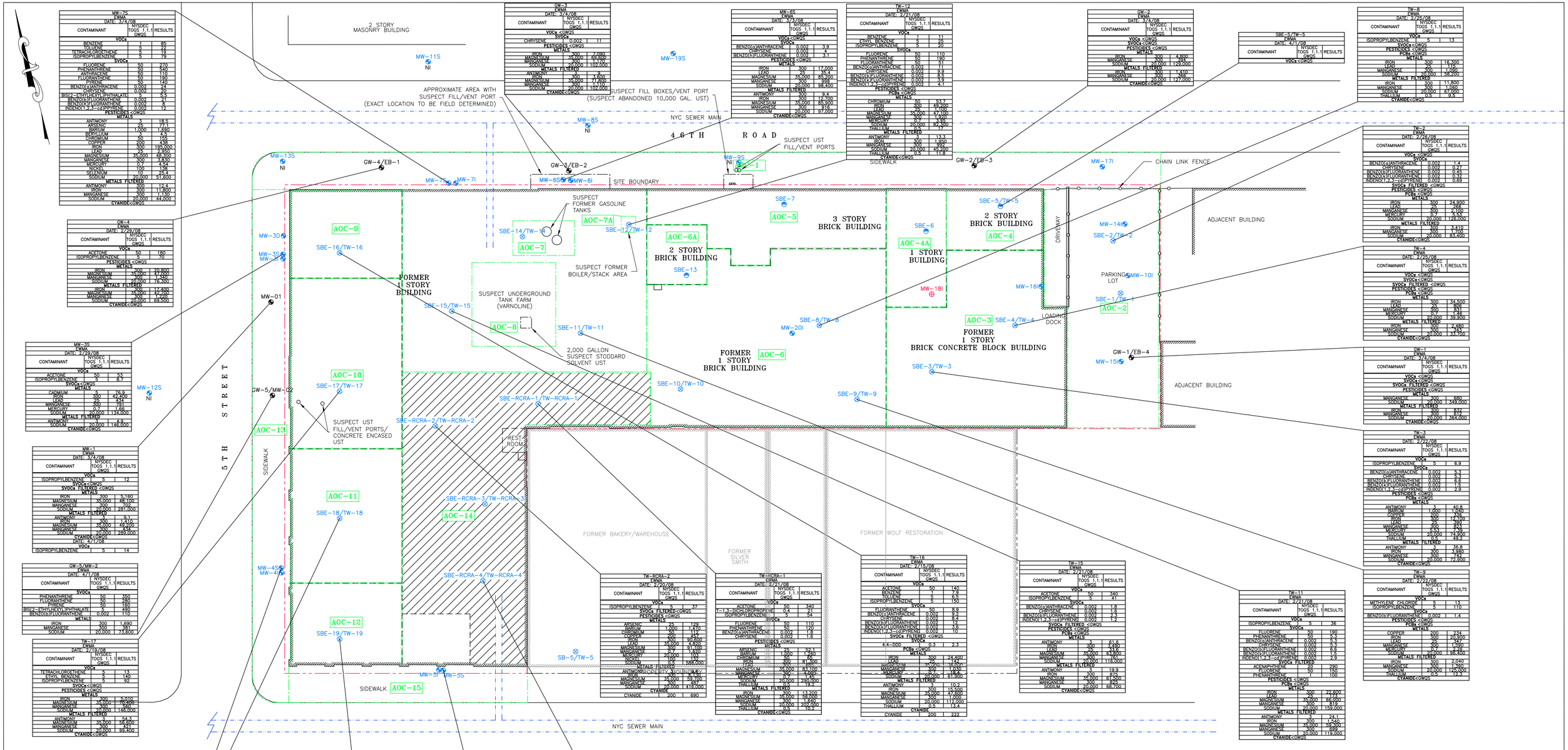
NOTES: NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION TECHNICAL AND ADMINISTRATIVE GUIDANCE MEMORANDUMS RESIDENTIAL SOIL CLEAN-UP OBJECTIVES (NYDEC TAGM RSCO); TITLE SIX OF THE OFFICIAL COMPILATION OF NEW YORK CODES, RULE AND REGULATIONS SUBPART 375-6 UNRESTRICTED USE SOIL CLEAN-UP OBJECTIVES (6NYCRR SUBPART 375-6)
SOURCE: "ARCHITECTURAL SURVEY" MONTROSE SURVEYING CO., LLP., RICHMOND HILL, N.Y. 4/2/07

Environmental Waste Management Associates, LLC
P.O. Box 5430
Parsippany, NJ 07054
Tel: (973) 560-1400

SCALE: AS SHOWN | PROJECT# 205490
DATE: 6/30/09
DRAWN BY: RR/JS
CHECKED BY: RA
FILE: S:\Wrangler\2005\05490\2008 AWP\SBE05490F2.dwg

SOIL EXCEEDANCE PLAN –FEBRUARY/MARCH 2008
OCA LIC FIFTH STREET MIXED-USE HOUSING
5-20 46TH ROAD
LONG ISLAND CITY, NEW YORK

FIGURE# 3



MW-7S EWMA DATE: 3/14/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOCs		
BENZENE	1	85
TOLUENE	5	97
TETRACHLOROETHENE	5	19
ISOPROPYLBENZENE	5	79
SVOCs		
FLUORENE	50	270
PHENANTHRENE	50	540
ANTHRACENE	50	110
FLUORANTHENE	50	190
PYRENE	50	120
BENZO(g)ANTHRACENE	0.002	24
CHRYSENE	0.002	20
BIS(2-ETHYLHEXYL)PHTHALATE	5	5.5
BENZO(b)FLUORANTHENE	0.002	21
BENZO(k)FLUORANTHENE	0.002	8
INDENO(1,2,3-cd)PYRENE	0.002	12
PESTICIDES <GWQS		
METALS		
ANTIMONY	3	18.5
ARSENIC	25	27.1
BARIUM	1,000	1,680
BERYLLIUM	3	4.5
CHROMIUM	50	155
COPPER	200	438
IRON	300	195,000
LEAD	25	24,800
MAGNESIUM	35,000	48,300
MANGANESE	300	3,830
MERCURY	0.7	4.34
NICKEL	100	136
SELENIUM	10	14.4
SODIUM	20,000	517,800
METALS FILTERED		
ANTIMONY	3	19.4
IRON	300	111,800
MANGANESE	300	11,300
SODIUM	20,000	44,000
CYANIDE <GWQS		

GW-3 EWMA DATE: 3/4/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOCs <GWQS		
SVOCs <GWQS		
CHRYSENE	0.002	11
PESTICIDES <GWQS		
METALS		
IRON	300	7,060
MANGANESE	300	10,000
MANGANESE	300	1,170
SODIUM	20,000	102,000
METALS FILTERED		
ANTIMONY	3	3.6
IRON	300	3,600
MANGANESE	300	1,160
SODIUM	20,000	102,000
CYANIDE <GWQS		

MW-6S EWMA DATE: 3/4/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOCs <GWQS		
SVOCs		
BENZO(g)ANTHRACENE	0.002	3.9
CHRYSENE	0.002	4
BENZO(b)FLUORANTHENE	0.002	3.1
PESTICIDES <GWQS		
METALS		
IRON	300	17,000
LEAD	25	38.4
MAGNESIUM	35,000	85,200
MANGANESE	300	998
SODIUM	20,000	98,400
METALS FILTERED		
ANTIMONY	3	3.8
IRON	300	14,700
MAGNESIUM	35,000	85,900
MANGANESE	300	918
SODIUM	20,000	97,000
CYANIDE <GWQS		

TW-12 EWMA DATE: 2/21/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOCs		
BENZENE	1	11
ETHYL BENZENE	5	25
ISOPROPYLBENZENE	5	20
SVOCs		
FLUORENE	50	110
PHENANTHRENE	50	190
FLUORANTHENE	50	51
BENZO(g)ANTHRACENE	0.002	5
CHRYSENE	0.002	6.3
BENZO(b)FLUORANTHENE	0.002	6.5
BENZO(k)FLUORANTHENE	0.002	2.5
INDENO(1,2,3-cd)PYRENE	0.002	4.1
PESTICIDES <GWQS		
PCBs <GWQS		
METALS		
CHROMIUM	50	53.7
IRON	300	49,000
LEAD	25	31.6
MAGNESIUM	35,000	47,100
MANGANESE	300	1,900
MERCURY	0.7	0.35
SODIUM	20,000	87,200
THALLIUM	0.5	17
METALS FILTERED		
ANTIMONY	3	13.3
IRON	300	1,950
MANGANESE	300	951
SODIUM	20,000	45,400
TIRCLIUM	0.5	11.8
CYANIDE <GWQS		

GW-2 EWMA DATE: 3/4/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOCs <GWQS		
SVOCs <GWQS		
PESTICIDES <GWQS		
METALS		
IRON	300	4,890
MANGANESE	300	925
SODIUM	20,000	123,000
METALS FILTERED		
IRON	300	1,410
MANGANESE	300	889
SODIUM	20,000	127,000
CYANIDE <GWQS		

SB5-5/TW-5 EWMA DATE: 4/1/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOCs <GWQS		

TW-8 EWMA DATE: 2/25/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOCs		
ISOPROPYLBENZENE	5	13
SVOCs <GWQS		
PESTICIDES <GWQS		
PCBs <GWQS		
METALS		
IRON	300	16,300
LEAD	25	31.5
MANGANESE	300	1,060
SODIUM	20,000	58,000
METALS FILTERED		
IRON	300	11,800
MANGANESE	300	1,060
SODIUM	20,000	57,000
THALLIUM	0.5	0.9
CYANIDE <GWQS		

TW-3 EWMA DATE: 2/26/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOCs <GWQS		
SVOCs		
BENZO(g)ANTHRACENE	0.002	1.4
CHRYSENE	0.002	0.47
BENZO(b)FLUORANTHENE	0.002	0.43
BENZO(k)FLUORANTHENE	0.002	0.12
INDENO(1,2,3-cd)PYRENE	0.002	0.69
SVOCs FILTERED <GWQS		
PESTICIDES <GWQS		
PCBs <GWQS		
METALS		
IRON	300	24,900
LEAD	25	26.6
MANGANESE	300	2,100
MERCURY	0.7	0.43
SODIUM	20,000	128,000
METALS FILTERED		
IRON	300	3,410
MANGANESE	300	1,700
SODIUM	20,000	83,400
CYANIDE <GWQS		

TW-4 EWMA DATE: 2/22/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOCs <GWQS		
SVOCs <GWQS		
SVOCs FILTERED <GWQS		
PESTICIDES <GWQS		
PCBs <GWQS		
METALS		
IRON	300	34,500
LEAD	25	806
MANGANESE	300	831
MERCURY	0.7	1.45
SODIUM	20,000	39,900
METALS FILTERED		
IRON	300	2,480
MANGANESE	300	524
SODIUM	20,000	43,700
CYANIDE <GWQS		

GW-1 EWMA DATE: 3/4/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOCs <GWQS		
SVOCs <GWQS		
SVOCs FILTERED <GWQS		
PESTICIDES <GWQS		
METALS		
MANGANESE	300	680
SODIUM	20,000	149,000
METALS FILTERED		
IRON	300	872
MANGANESE	300	672
SODIUM	20,000	364,000
CYANIDE <GWQS		

TW-2 EWMA DATE: 2/22/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOCs		
ISOPROPYLBENZENE	5	6.9
SVOCs		
BENZO(g)ANTHRACENE	0.002	5.3
CHRYSENE	0.002	5.5
BENZO(b)FLUORANTHENE	0.002	6.6
BENZO(k)FLUORANTHENE	0.002	1.5
INDENO(1,2,3-cd)PYRENE	0.002	2.9
PESTICIDES <GWQS		
PCBs <GWQS		
METALS		
ANTIMONY	3	40.8
BARIUM	1,000	1,020
COPPER	200	316
IRON	300	14,100
LEAD	25	29.1
MANGANESE	300	961
MERCURY	0.7	1.29
SODIUM	20,000	47,000
THALLIUM	0.5	49.2
METALS FILTERED		
ANTIMONY	3	36.8
IRON	300	3,980
MANGANESE	300	742
SODIUM	20,000	72,000
CYANIDE <GWQS		

TW-9 EWMA DATE: 2/22/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOCs		
METHYLENE CHLORIDE	5	13
ISOPROPYLBENZENE	5	110
SVOCs		
BENZO(b)FLUORANTHENE	0.002	1.4
PESTICIDES <GWQS		
PCBs <GWQS		
METALS		
COPPER	200	244
IRON	300	24,900
LEAD	25	34
MANGANESE	300	1,020
MERCURY	0.7	0.68
SODIUM	20,000	88,400
METALS FILTERED		
IRON	300	2,040
MANGANESE	300	1,300
SODIUM	20,000	125,000
THALLIUM	0.5	12.3
CYANIDE <GWQS		

TW-11 EWMA DATE: 2/27/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOCs		
ISOPROPYLBENZENE	5	36
SVOCs		
FLUORENE	50	190
PHENANTHRENE	50	910
BENZO(g)ANTHRACENE	0.002	5.3
CHRYSENE	0.002	5.5
BENZO(b)FLUORANTHENE	0.002	6.6
BENZO(k)FLUORANTHENE	0.002	1.5
INDENO(1,2,3-cd)PYRENE	0.002	2.9
SVOCs FILTERED <GWQS		
ACENAPHTHENE	20	280
FLUORENE	50	140
PHENANTHRENE	50	100
PESTICIDES <GWQS		
PCBs <GWQS		
METALS		
IRON	300	22,800
LEAD	25	26.1
MAGNESIUM	35,000	66,000
MANGANESE	300	810
SODIUM	20,000	159,000
METALS FILTERED		
ANTIMONY	3	24.1
IRON	300	1,540
MAGNESIUM	35,000	66,000
MANGANESE	300	698
SODIUM	20,000	119,000
CYANIDE <GWQS		

TW-15 EWMA DATE: 2/21/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOCs		
ACETONE	50	340
ISOPROPYLBENZENE	5	41
SVOCs		
BENZO(g)ANTHRACENE	0.002	1.8
CHRYSENE	0.002	1.6
BENZO(b)FLUORANTHENE	0.002	2.3
BENZO(k)FLUORANTHENE	0.002	0.5
INDENO(1,2,3-cd)PYRENE	0.002	1.2
SVOCs FILTERED <GWQS		
PESTICIDES <GWQS		
PCBs <GWQS		
METALS		
ANTIMONY	3	61.6
IRON	300	3,490
LEAD	25	6.2
MAGNESIUM	35,000	63,800
MANGANESE	300	781
SODIUM	20,000	118,000
METALS FILTERED		
ANTIMONY	3	19.9
IRON	300	875
MAGNESIUM	35,000	61,500
MANGANESE	300	626
SODIUM	20,000	68,700

TW-16 EWMA DATE: 2/15/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOCs		
ACETONE	50	140
BENZENE	1	7.9
TOLUENE	5	4.8
ISOPROPYLBENZENE	5	150
SVOCs		
FLUORANTHENE	50	8.9
BENZO(g)ANTHRACENE	0.002	9.2
CHRYSENE	0.002	8.4
BENZO(b)FLUORANTHENE	0.002	12
BENZO(k)FLUORANTHENE	0.002	3.6
INDENO(1,2,3-cd)PYRENE	0.002	10
SVOCs FILTERED <GWQS		
SVOCs		
4,4-DDD	0.3	2.3
PCBs <GWQS		
METALS		
IRON	300	24,400
LEAD	25	34.2
MAGNESIUM	35,000	51,100
MANGANESE	300	1,600
MERCURY	0.7	0.61
SODIUM	20,000	230,000
THALLIUM	0.5	19.2
METALS FILTERED		
IRON	300	13,000
MAGNESIUM	35,000	58,000
MANGANESE	300	1,400
SODIUM	20,000	202,000
THALLIUM	0.5	13.3
CYANIDE <GWQS		
CYANIDE	200	222

GW-4 EWMA DATE: 2/28/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOCs		
ACETONE	50	180
ISOPROPYLBENZENE	5	70
PESTICIDES <GWQS		
METALS		
IRON	300	29,800
MAGNESIUM	35,000	47,200
MANGANESE	300	76,300
SODIUM	20,000	69,200
METALS FILTERED		
IRON	300	17,300
MAGNESIUM	35,000	42,200
MANGANESE	300	1,220
SODIUM	20,000	69,200
CYANIDE <GWQS		

MW-3S EWMA DATE: 2/29/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOCs		
ACETONE	50	63
ISOPROPYLBENZENE	5	8.7
SVOCs <GWQS		
METALS		
CADMIUM	5	15.9
IRON	300	42,400
LEAD	25	434
MANGANESE	300	1,910
MERCURY	0.7	1.66
SODIUM	20,000	134,000
METALS FILTERED		
ANTIMONY	3	4.9
SODIUM	20,000	146,000
CYANIDE <GWQS		

MW-1 EWMA DATE: 3/4/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOCs		
ISOPROPYLBENZENE	5	12
SVOCs <GWQS		
SVOCs FILTERED <GWQS		
METALS		
IRON	300	5,160
MAGNESIUM	35,000	46,100
MANGANESE	300	706
SODIUM	20,000	281,000
METALS FILTERED		
ANTIMONY	3	6.1
IRON	300	4,110
MAGNESIUM	35,000	46,200
MANGANESE	300	679
SODIUM	20,000	283,000
CYANIDE <GWQS		
DATE: 4/1/08		
VOCs		
ISOPROPYLBENZENE	5	14

GW-5/MW-2 EWMA DATE: 4/1/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
SVOCs		
PHENANTHRENE	50	350
FLUORANTHENE	50	280
PYRENE	50	180
BIS(2-ETHYLHEXYL)PHTHALATE	5	490
BENZO(b)FLUORANTHENE	0.002	110
METALS		
IRON	300	1,690
MANGANESE	300	931
SODIUM	20,000	73,600

TW-17 EWMA DATE: 2/19/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOCs		
TETRACHLOROETHENE	5	13
ETHYL BENZENE	5	140
ISOPROPYLBENZENE	5	92
SVOCs <GWQS		
PESTICIDES <GWQS		
METALS		
IRON	300	5,010
MAGNESIUM	35,000	76,400
MANGANESE	300	1,140
SODIUM	20,000	114,000
METALS FILTERED		
ANTIMONY	3	54.3
MAGNESIUM	35,000	58,900
MANGANESE	300	941
SODIUM	20,000	99,400
CYANIDE <GWQS		

MW-4S EWMA DATE: 3/7/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOCs		
CIS-1,2-DICHLOROETHENE	5	58
TETRACHLOROETHENE	5	18
ETHYL BENZENE	5	100
ISOPROPYLBENZENE	5	98
SVOCs		
BIS(2-ETHYLHEXYL)PHTHALATE	5	6.1
SVOCs FILTERED		
PENTACHLOROPHENOL	1	6.1
PESTICIDES		
4,4-DDD	0.3	2.5
METALS		
IRON	300	24,800
MANGANESE	300	570
SODIUM	20,000	157,000
METALS FILTERED		
ANTIMONY	3	9.8
IRON	300	13,800
MANGANESE	300	488
SODIUM	20,000	148,000
CYANIDE <GWQS		

TW-18 EWMA DATE: 2/19/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOCs		
ETHYL BENZENE	5	10
ISOPROPYLBENZENE	5	40
SVOCs		
BENZO(g)ANTHRACENE	0.002	2.4
CHRYSENE	0.002	2
BIS(2-ETHYLHEXYL)PHTHALATE	5	12
BENZO(b)FLUORANTHENE	0.002	2
PESTICIDES <GWQS		
METALS		
ANTIMONY	3	3.14
BERYLLIUM	3	6.4
CADMIUM	5	15.8
CHROMIUM	50	171.4
IRON	300	13,400
MANGANESE	300	1,080
SILVER	50	11.5
SODIUM	20,000	11,200,000
METALS FILTERED		
ANTIMONY	3	30.1
SODIUM	20,000	371,000
CYANIDE <GWQS		

TW-19 EWMA DATE: 2/20/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOCs		
ACETONE	50	93
ISOPROPYLBENZENE	5	32
SVOCs FILTERED		
ACENAPHTHENE	20	33
PESTICIDES <GWQS		
METALS		
IRON	300	18,400
MANGANESE	300	1,420
SODIUM	20,000	531,000
THALLIUM	0.5	12.5
METALS FILTERED		
IRON	300	18.4
MANGANESE	300	20,100
SODIUM	20,000	1,600
THALLIUM	0.5	347,000
CYANIDE <GWQS		

MW-5S EWMA DATE: 3/7/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOCs <GWQS		
SVOCs <GWQS		
SVOCs FILTERED <GWQS		
PESTICIDES <GWQS		
METALS		
CADMIUM	5	6
CHROMIUM	50	59.8
IRON	300	25,600
LEAD	25	28.4
MAGNESIUM	35,000	47,700
MANGANESE	300	9,500
NICKEL	100	977
SODIUM	20,000	285,000
ZINC	2,000	3,150
METALS FILTERED		
IRON	300	4,670
MANGANESE	300	2,070
NICKEL	100	181
SODIUM	20,000	56,600

TW-RCRA-4 EWMA DATE: 2/20/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOCs <GWQS		
SVOCs <GWQS		
PESTICIDES <GWQS		
METALS		
IRON	300	40,000
LEAD	25	37.7
MANGANESE	300	2,740
SODIUM	20,000	256,000
THALLIUM	0.5	19.2
METALS FILTERED		
ANTIMONY	3	12.9
IRON	300	17,800
MANGANESE	300	1,080
SODIUM	20,000	151,000
CYANIDE <GWQS		

TW-RCRA-2 EWMA DATE: 2/20/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOCs		
ISOPROPYLBENZENE	5	37
SVOCs FILTERED <GWQS		
PESTICIDES <GWQS		
METALS		
ARSENIC	25	28
BARIUM	1,000	1,470
CHROMIUM	50	57.1
COPPER	200	464
LEAD	25	90,500
MAGNESIUM	35,000	4,800
MANGANESE	300	51,000
MERCURY	0.7	1.820
NICKEL	100	110
SODIUM	20,000	588,000
METALS FILTERED		
ANTIMONY	3	3.9
IRON	300	1,870
MAGNESIUM	35,000	59,300
MANGANESE	300	687
SODIUM	20,000	418,000
CYANIDE		
CYANIDE	200	690

TW-RCRA-1 EWMA DATE: 2/21/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOCs		
ACETONE	50	340
1,1,3-TRICHLOROPROPENE	0.4	21
ISOPROPYLBENZENE	5	54
SVOCs		
FLUORENE	50	110
PHENANTHRENE	50	130
BENZO(g)ANTHRACENE	0.002	1.8
CHRYSENE	0.002	1.6
PESTICIDES <GWQS		
METALS		
ARSENIC	25	29.1
BARIUM	1,000	1,820
CHROMIUM	50	61.5
IRON	300	81,900
LEAD	25	60
MAGNESIUM	35,000	83,100
MANGANESE	300	4,660
MERCURY	0.7	0.35
SODIUM	20,000	230,000
THALLIUM	0.5	19.2
IRON	300	113,000
MAGNESIUM	35,000	58,000
MANGANESE	300	1,420
SODIUM	20,000	202,000
THALLIUM	0.5	13.3
CYANIDE <GWQS		

LEGEND

- MW-01 — J.C. BRODERICK & ASSOCIATES MONITORING WELL LOCATION – 2005
- GW-1 — EEA, INC. MONITORING WELL LOCATION – 2006
- SBE-7/TW-7 — EWMA SOIL BORING OR SOIL BORING/TEMPORARY WATER SAMPLE LOCATION – 2008
- SBE-6 — EWMA HAND AUGER SAMPLE LOCATION – 2008
- MW-3S — EWMA MONITORING WELL LOCATION (PERCHED WATER ZONE) – 2008/2009
- MW-3I — EWMA MONITORING WELL LOCATION (SAND AQUIFER) – 2008/2009
- MW-3D — EWMA MONITORING WELL LOCATION (SAND AQUIFER) – 2008
- NI — WELL NOT INSTALLED
- MW-18I — EWMA MONITORING WELL LOCATION (SAND AQUIFER) – 2009 LOCATION APPROXIMATE – NOT SURVEYED
- ENCAPSULATED AREA
- SITE BOUNDARY
- BUILDING OUTER WALL
- BUILDING INTERIOR WALL/MULTIPLE STORY WALL
- AOC BOUNDARY

SOURCE: "ARCHITECTURAL SURVEY" MONTROSE SURVEYING CO., LLP., RICHMOND HILL, N.Y. 4/2/07

AREAS OF CONCERN

AOC-1	FORMER 10,000 GALLON #6 FUEL OIL UST/46th ROAD SIDEWALK	AOC-7A	SUSPECT FORMER BOILER/STACK AREA
AOC-2	EASTERN PARKING LOT	AOC-8	SUSPECT TWENTY-TWO (22) 1,500 GALLON VARNOLINE STORAGE TANKS
AOC-3	1-STORY BRICK/CONCRETE BLOCK BUILDING (DEMAND ELECTRIC)	AOC-9	1-STORY BUILDING (AMN RENOVATION)
AOC-4	MOTORCYCLE REPAIR SHOP (BASEMENT 2-STORY BRICK BUILDING)	AOC-10	1-STORY BUILDING (JMJ ELECTRICAL)/SUSPECT UST AND FILL/VENT PORTS
AOC-4A	1-STORY BUILDING	AOC-11	FORMER WOHL, INC. CLEANERS AND DYERS (DIRECT AIR)
AOC-5	3-STORY BRICK BUILDING (ART STUDIOS)	AOC-12	FORMER WOHL, INC. CLEANERS AND DYERS (LIBERTY CONTRACTING)
AOC-6	1-STORY BRICK BUILDING (KNOSSOS CUSTOM DESIGN FURNITURE)	AOC-13	5TH STREET SIDEWALK
AOC-6A	2-STORY BRICK BUILDING	AOC-14	FORMER ACCURATE ASSOCIATES RCRA AREA
AOC-7	TWO (2) FORMER GASOLINE STORAGE TANKS	AOC-15	47TH AVENUE SIDEWALK

GRAPHIC SCALE
20 0 10 20 40
(IN FEET)

Environmental Waste Management Associates, LLC
P.O. Box 5430
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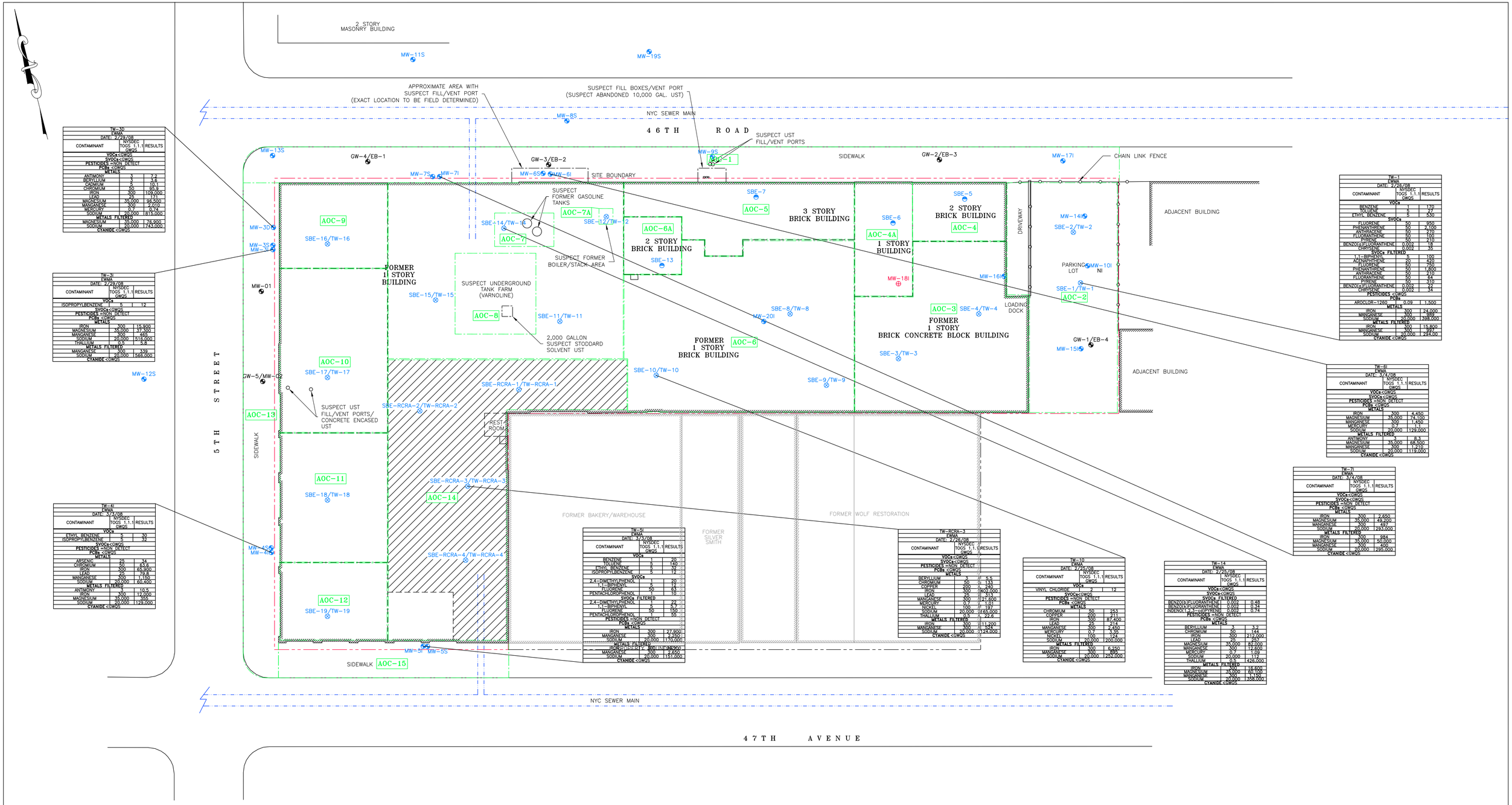
Tel: (973) 560-1400

SCALE: AS SHOWN | PROJECT# 205490
DATE: 6/30/09
DRAWN BY: RR/JS
CHECKED BY: RA
FILE: S:\drawings\205000\205490\2008 JUNE\EMMP_20549002.dwg

GROUNDWATER EXCEEDANCE PLAN PERCHED ZONE – FEBRUARY/MARCH 2008

OCA LIC FIFTH STREET MIXED-USE HOUSING
5-20 46TH ROAD
LONG ISLAND CITY, NEW YORK

FIGURE# 4



TW-3D EWMA DATE: 2/29/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOCs <GWQS		
SVOCs <GWQS		
PESTICIDES =NON DETECT		
PCBs <GWQS		
METALS		
ANTIMONY	3	7.2
BERYLLIUM	3	3.6
CADMIUM	5	10.1
CHROMIUM	50	95.9
IRON	300	109,000
LEAD	25	171
MAGNESIUM	35,000	96,500
MANGANESE	300	2,010
MERCURY	0.7	0.74
SODIUM	20,000	815,000
METALS FILTERED		
MAGNESIUM	35,000	76,900
SODIUM	20,000	743,000
CYANIDE <GWQS		

TW-3I EWMA DATE: 3/7/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOCs		
ISOPROPYLBENZENE	5	12
SVOCs<GWQS		
PESTICIDES =NON DETECT		
PCBs <GWQS		
METALS		
IRON	300	15,800
MAGNESIUM	35,000	37,500
MANGANESE	300	460
SODIUM	20,000	516,000
THALLIUM	0.5	5.8
METALS FILTERED		
MANGANESE	300	139
SODIUM	20,000	566,000
CYANIDE <GWQS		

MW-12S

TW-4I EWMA DATE: 3/7/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOCs		
ETHYL BENZENE	5	30
ISOPROPYLBENZENE	5	32
SVOCs<GWQS		
PESTICIDES =NON DETECT		
PCBs <GWQS		
METALS		
ARSENIC	25	34
CHROMIUM	50	83.6
IRON	300	65,900
LEAD	25	79.8
MANGANESE	300	1,150
SODIUM	20,000	60,400
METALS FILTERED		
ANTIMONY	3	10.5
IRON	300	12,000
MAGNESIUM	35,000	350
SODIUM	20,000	129,000
CYANIDE <GWQS		

TW-5I EWMA DATE: 3/7/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOCs		
BENZENE	1	20
TOLUENE	5	120
ETHYL BENZENE	5	12
ISOPROPYLBENZENE	5	12
SVOCs		
2,4-DIMETHYLPHENOL	1	20
1,1-BIPHENYL	5	23
FLUORENE	50	63
PENTACHLOROPHENOL	1	10
SVOCs FILTERED		
2,4-DIMETHYLPHENOL	1	22
1,1-BIPHENYL	5	27
FLUORENE	50	150
PENTACHLOROPHENOL	1	55
PESTICIDES =NON DETECT		
PCBs <GWQS		
METALS		
IRON	300	27,800
MANGANESE	300	2,250
SODIUM	20,000	170,000
METALS FILTERED		
IRON	300	28,000
MANGANESE	300	2,650
SODIUM	20,000	151,000
CYANIDE <GWQS		

TW-RCRA-3 EWMA DATE: 2/26/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOCs<GWQS		
SVOCs<GWQS		
PESTICIDES =NON DETECT		
PCBs <GWQS		
METALS		
BERYLLIUM	3	5.5
CHROMIUM	50	1,135
COPPER	200	240
IRON	300	402,000
LEAD	25	413
MANGANESE	300	21,600
MERCURY	0.7	1.01
NICKEL	100	197
SODIUM	20,000	465,000
THALLIUM	0.5	22.6
METALS FILTERED		
IRON	300	111,200
MANGANESE	300	1,250
SODIUM	20,000	124,000
CYANIDE <GWQS		

TW-10 EWMA DATE: 2/25/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOCs		
VINYL CHLORIDE	2	12
SVOCs<GWQS		
PESTICIDES =NON DETECT		
PCBs <GWQS		
METALS		
CHROMIUM	50	253
DOPPER	200	211
IRON	300	87,400
LEAD	25	216
MANGANESE	300	2,450
MERCURY	0.7	1.30
NICKEL	100	124
SODIUM	20,000	200,000
METALS FILTERED		
IRON	300	6,250
MANGANESE	300	885
SODIUM	20,000	252,000
CYANIDE <GWQS		

TW-14 EWMA DATE: 2/25/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOCs<GWQS		
SVOCs<GWQS		
SVOCs FILTERED		
BENZO(B)FLUORANTHENE	0.002	0.48
BENZO(K)FLUORANTHENE	0.002	0.41
INDENO(1,2,3-CD)PYRENE	0.002	0.74
PESTICIDES =NON DETECT		
PCBs <GWQS		
METALS		
BERYLLIUM	3	3.2
CHROMIUM	50	144
IRON	300	212,000
LEAD	25	257
MAGNESIUM	35,000	82,000
MANGANESE	300	12,600
MERCURY	0.7	1.09
SODIUM	20,000	172
THALLIUM	0.5	426,000
METALS FILTERED		
IRON	300	16,800
MAGNESIUM	35,000	60,100
MANGANESE	300	1,190
SODIUM	20,000	358,000
CYANIDE <GWQS		

TW-1 EWMA DATE: 2/26/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOCs		
BENZENE	1	170
TOLUENE	5	72
ETHYL BENZENE	5	530
SVOCs		
FLUORENE	50	950
PHENANTHRENE	50	2,100
ANTHRACENE	50	270
FLUORANTHENE	50	100
PYRENE	50	210
BENZO(g)FLUORANTHENE	0.002	18
CHRYSENE	0.002	35
SVOCs FILTERED		
1,1-BIPHENYL	5	100
ACENAPHTHENE	20	420
FLUORENE	50	760
PHENANTHRENE	50	1,800
ANTHRACENE	50	210
FLUORANTHENE	50	64
PYRENE	50	310
BENZO(g)FLUORANTHENE	0.002	22
CHRYSENE	0.002	34
PESTICIDES <GWQS		
PCBs		
AROCLOR-1260	0.09	1.500
METALS		
IRON	300	24,000
MANGANESE	300	887
SODIUM	20,000	398,000
METALS FILTERED		
IRON	300	15,800
MANGANESE	300	294.00
SODIUM	20,000	294.00
CYANIDE <GWQS		

TW-6I EWMA DATE: 3/4/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOCs<GWQS		
SVOCs<GWQS		
PESTICIDES =NON DETECT		
PCBs <GWQS		
METALS		
IRON	300	4,450
MAGNESIUM	35,000	74,100
MANGANESE	300	1,450
MERCURY	0.7	1.1
SODIUM	20,000	129,000
METALS FILTERED		
ANTIMONY	3	8.3
MAGNESIUM	35,000	68,500
MANGANESE	300	1,210
SODIUM	20,000	119,000
CYANIDE <GWQS		

TW-7I EWMA DATE: 3/4/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOCs<GWQS		
SVOCs<GWQS		
PESTICIDES =NON DETECT		
PCBs <GWQS		
METALS		
IRON	300	2,650
MAGNESIUM	35,000	49,200
MANGANESE	300	497
SODIUM	20,000	293,000
METALS FILTERED		
IRON	300	984
MAGNESIUM	35,000	50,000
MANGANESE	300	400
SODIUM	20,000	295,000
CYANIDE <GWQS		

LEGEND

MW-01	J.C. BRODERICK & ASSOCIATES MONITORING WELL LOCATION – 2005
GW-1	EEA, INC. MONITORING WELL LOCATION – 2006
SBE-7/TW-7	EWMA SOIL BORING OR SOIL BORING/TEMPORARY WATER SAMPLE LOCATION – 2008
SBE-6	EWMA HAND AUGER SAMPLE LOCATION – 2008
MW-3S	EWMA MONITORING WELL LOCATION (PERCHED WATER ZONE) – 2008/2009
MW-3I	EWMA MONITORING WELL LOCATION (SAND AQUIFER) – 2008/2009
MW-3D	EWMA MONITORING WELL LOCATION (SAND AQUIFER) – 2008
NI	WELL NOT INSTALLED
MW-18I	EWMA MONITORING WELL LOCATION (SAND AQUIFER) – 2009 LOCATION APPROXIMATE – NOT SURVEYED
	ENCAPSULATED AREA
	SITE BOUNDARY
	BUILDING OUTER WALL
	BUILDING INTERIOR WALL/MULTIPLE STORY WALL
	AOC BOUNDARY

SOURCE: "ARCHITECTURAL SURVEY" MONTROSE SURVEYING CO., LLP., RICHMOND HILL, N.Y. 4/2/07

AREAS OF CONCERN

AOC-1	FORMER 10,000 GALLON #6 FUEL OIL UST/46th ROAD SIDEWALK	AOC-7A	SUSPECT FORMER BOILER/STACK AREA
AOC-2	EASTERN PARKING LOT	AOC-8	SUSPECT TWENTY-TWO (22) 1,500 GALLON VARNOLINE STORAGE TANKS
AOC-3	1-STORY BRICK/CONCRETE BLOCK BUILDING (DEMAND ELECTRIC)	AOC-9	1-STORY BUILDING (AMN RENOVATION)
AOC-4	MOTORCYCLE REPAIR SHOP (BASEMENT 2-STORY BRICK BUILDING)	AOC-10	1-STORY BUILDING (JMJ ELECTRICAL)/SUSPECT UST AND FILL/VENT PORTS
AOC-4A	1-STORY BUILDING	AOC-11	FORMER WOHL, INC. CLEANERS AND DYERS (DIRECT AIR)
AOC-5	3-STORY BRICK BUILDING (ART STUDIOS)	AOC-12	FORMER WOHL, INC. CLEANERS AND DYERS (LIBERTY CONTRACTING)
AOC-6	1-STORY BRICK BUILDING (KNOSSOS CUSTOM DESIGN FURNITURE)	AOC-13	5TH STREET SIDEWALK
AOC-6A	2-STORY BRICK BUILDING	AOC-14	FORMER ACCURATE ASSOCIATES RCRA AREA
AOC-7	TWO (2) FORMER GASOLINE STORAGE TANKS	AOC-15	47TH AVENUE SIDEWALK

GRAPHIC SCALE
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(IN FEET)

Environmental Waste Management Associates, LLC
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SCALE: AS SHOWN | PROJECT# 205490
DATE: 7/1/09
DRAWN BY: RR/JS
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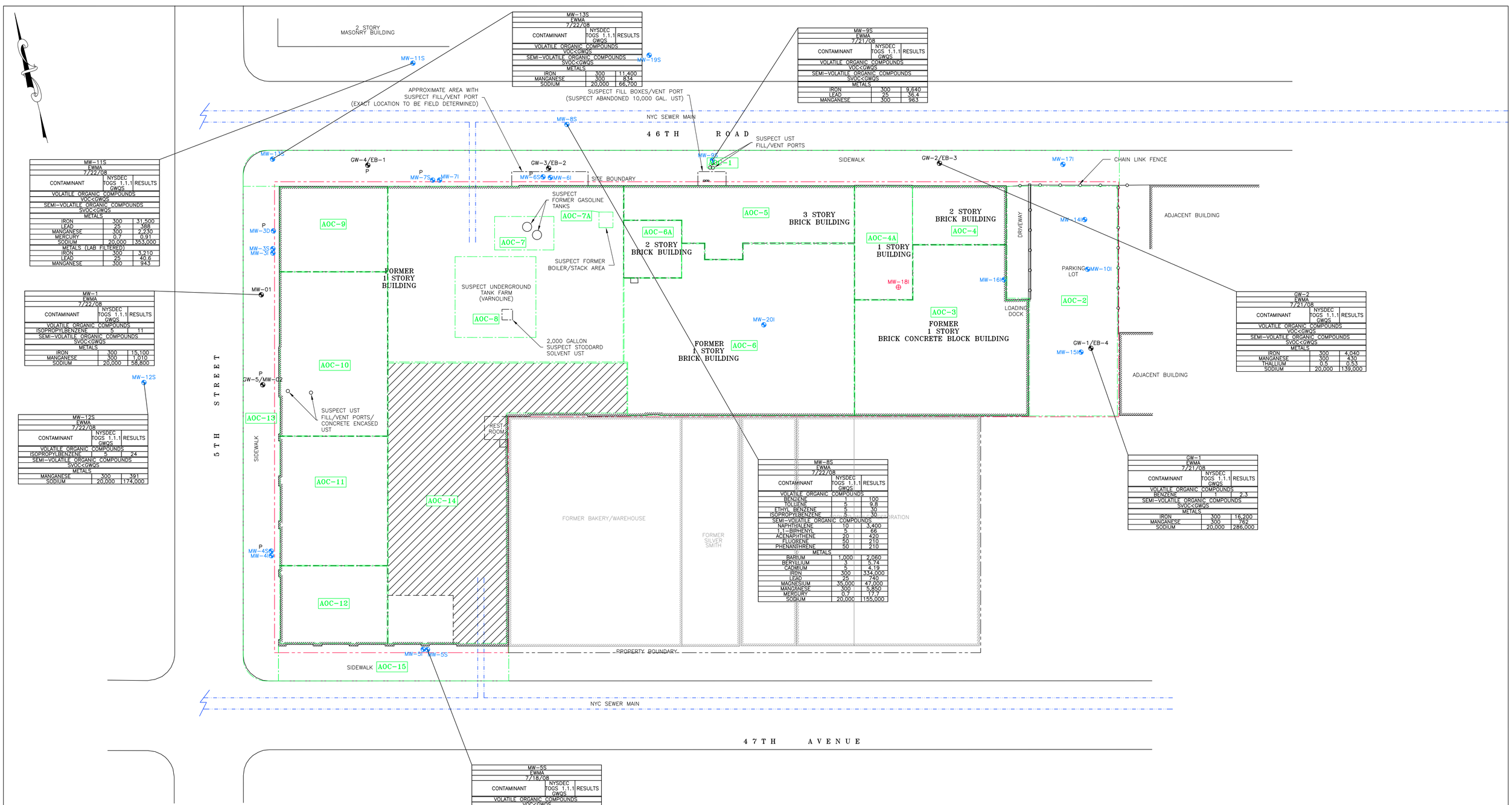
GROUND WATER EXCEEDANCE PLAN SAND AQUIFER – FEBRUARY/MARCH 2008
OCA LIC FIFTH STREET MIXED-USE HOUSING
5-20 46TH ROAD
LONG ISLAND CITY, NEW YORK

FIGURE# 5



MW-11S EWMA 7/22/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOLATILE ORGANIC COMPOUNDS		
VOC<GWQS		
SEMI-VOLATILE ORGANIC COMPOUNDS		
SVOC<GWQS		
METALS		
IRON	300	31,500
LEAD	25	388
MANGANESE	300	2,230
MERCURY	0.7	0.91
SODIUM	20,000	353,000
METALS (LAB FILTERED)		
IRON	300	3,210
LEAD	25	40.6
MANGANESE	300	943

MW-1 EWMA 7/22/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOLATILE ORGANIC COMPOUNDS		
ISOPROPYLBENZENE	5	11
SEMI-VOLATILE ORGANIC COMPOUNDS		
SVOC<GWQS		
METALS		
IRON	300	15,100
MANGANESE	300	1,010
SODIUM	20,000	58,800

MW-12S EWMA 7/22/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOLATILE ORGANIC COMPOUNDS		
ISOPROPYLBENZENE	5	24
SEMI-VOLATILE ORGANIC COMPOUNDS		
SVOC<GWQS		
METALS		
MANGANESE	300	391
SODIUM	20,000	174,000

MW-13S EWMA 7/22/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOLATILE ORGANIC COMPOUNDS		
VOC<GWQS		
SEMI-VOLATILE ORGANIC COMPOUNDS		
SVOC<GWQS		
METALS		
IRON	300	11,400
MANGANESE	300	834
SODIUM	20,000	66,700

MW-9S EWMA 7/21/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOLATILE ORGANIC COMPOUNDS		
VOC<GWQS		
SEMI-VOLATILE ORGANIC COMPOUNDS		
SVOC<GWQS		
METALS		
IRON	300	9,640
LEAD	25	36.4
MANGANESE	300	963

GW-2 EWMA 7/21/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOLATILE ORGANIC COMPOUNDS		
VOC<GWQS		
SEMI-VOLATILE ORGANIC COMPOUNDS		
SVOC<GWQS		
METALS		
IRON	300	4,040
MANGANESE	300	430
THALLIUM	0.5	0.53
SODIUM	20,000	139,000

MW-8S EWMA 7/22/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOLATILE ORGANIC COMPOUNDS		
BENZENE	1	100
TOLUENE	5	9.8
ETHYL BENZENE	5	30
ISOPROPYLBENZENE	5	30
SEMI-VOLATILE ORGANIC COMPOUNDS		
NAPHTHALENE	10	3,400
1,1-BIPHENYL	5	66
ACENAPHTHENE	20	420
FLUORENE	50	210
PHENANTHRENE	50	210
METALS		
BARIUM	1,000	2,060
BERYLLIUM	3	5.74
CADMIUM	5	4.19
IRON	300	334,000
LEAD	25	740
MAGNESIUM	35,000	47,000
MANGANESE	300	5,850
MERCURY	0.7	1.7
SODIUM	20,000	155,000

GW-1 EWMA 7/21/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOLATILE ORGANIC COMPOUNDS		
BENZENE	1	2.3
SEMI-VOLATILE ORGANIC COMPOUNDS		
SVOC<GWQS		
METALS		
IRON	300	16,200
MANGANESE	300	782
SODIUM	20,000	286,000

MW-5S EWMA 7/18/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOLATILE ORGANIC COMPOUNDS		
VOC<GWQS		
SEMI-VOLATILE ORGANIC COMPOUNDS		
SVOC<GWQS		
METALS		
ANTIMONY	3	3.6
ARSENIC	25	33.6
IRON	300	5,760
LEAD	25	34.1
MANGANESE	300	658
NICKEL	100	123
METALS (LAB FILTERED)		
MANGANESE	300	951

LEGEND

- MW-01 — J.C. BRODERICK & ASSOCIATES MONITORING WELL LOCATION – 2005
- GW-1 — EEA, INC. MONITORING WELL LOCATION – 2006
- MW-3S — EWMA MONITORING WELL LOCATION (PERCHED WATER ZONE) – 2008/2009
- MW-3I — EWMA MONITORING WELL LOCATION (SAND AQUIFER) – 2008/2009
- MW-3D — EWMA MONITORING WELL LOCATION (SAND AQUIFER) – 2008
- P — NOT SAMPLED –LNAPL PRESENT
- MW-18I — EWMA MONITORING WELL LOCATION (SAND AQUIFER) – 2009 LOCATION APPROXIMATE – NOT SURVEYED
- ENCAPSULATED AREA
- SITE BOUNDARY
- BUILDING OUTER WALL
- BUILDING INTERIOR WALL/MULTIPLE STORY WALL
- AOC BOUNDARY

SOURCE: "ARCHITECTURAL SURVEY" MONTROSE SURVEYING CO., LLP., RICHMOND HILL, N.Y. 4/2/07

AREAS OF CONCERN

- AOC-1 — FORMER 10,000 GALLON #6 FUEL OIL UST/46th ROAD SIDEWALK
- AOC-2 — EASTERN PARKING LOT
- AOC-3 — 1–STORY BRICK/CONCRETE BLOCK BUILDING (DEMAND ELECTRIC)
- AOC-4 — MOTORCYCLE REPAIR SHOP (BASEMENT 2–STORY BRICK BUILDING)
- AOC-4A — 1–STORY BUILDING
- AOC-5 — 3–STORY BRICK BUILDING (ART STUDIOS)
- AOC-6 — 1–STORY BRICK BUILDING (KNOSSOS CUSTOM DESIGN FURNITURE)
- AOC-6A — 2–STORY BRICK BUILDING
- AOC-7 — TWO (2) FORMER GASOLINE STORAGE TANKS
- AOC-7A — SUSPECT FORMER BOILER/STACK AREA
- AOC-8 — SUSPECT TWENTY–TWO (22) 1,500 GALLON VARNOLINE STORAGE TANKS
- AOC-9 — 1–STORY BUILDING (AMN RENOVATION)
- AOC-10 — 1–STORY BUILDING (JMJ ELECTRICAL)/SUSPECT UST AND FILL/VENT PORTS
- AOC-11 — FORMER WOHL, INC. CLEANERS AND DYERS (DIRECT AIR)
- AOC-12 — FORMER WOHL, INC. CLEANERS AND DYERS (LIBERTY CONTRACTING)
- AOC-13 — 5TH STREET SIDEWALK
- AOC-14 — FORMER ACCURATE ASSOCIATES RCRA AREA
- AOC-15 — 47TH AVENUE SIDEWALK

GRAPHIC SCALE
20 0 10 20 40
(IN FEET)

Environmental Waste Management Associates, LLC
P.O. Box 5430
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SCALE: AS SHOWN | PROJECT# 205490
DATE: 6/30/09
DRAWN BY: RR/JS
CHECKED BY: RA
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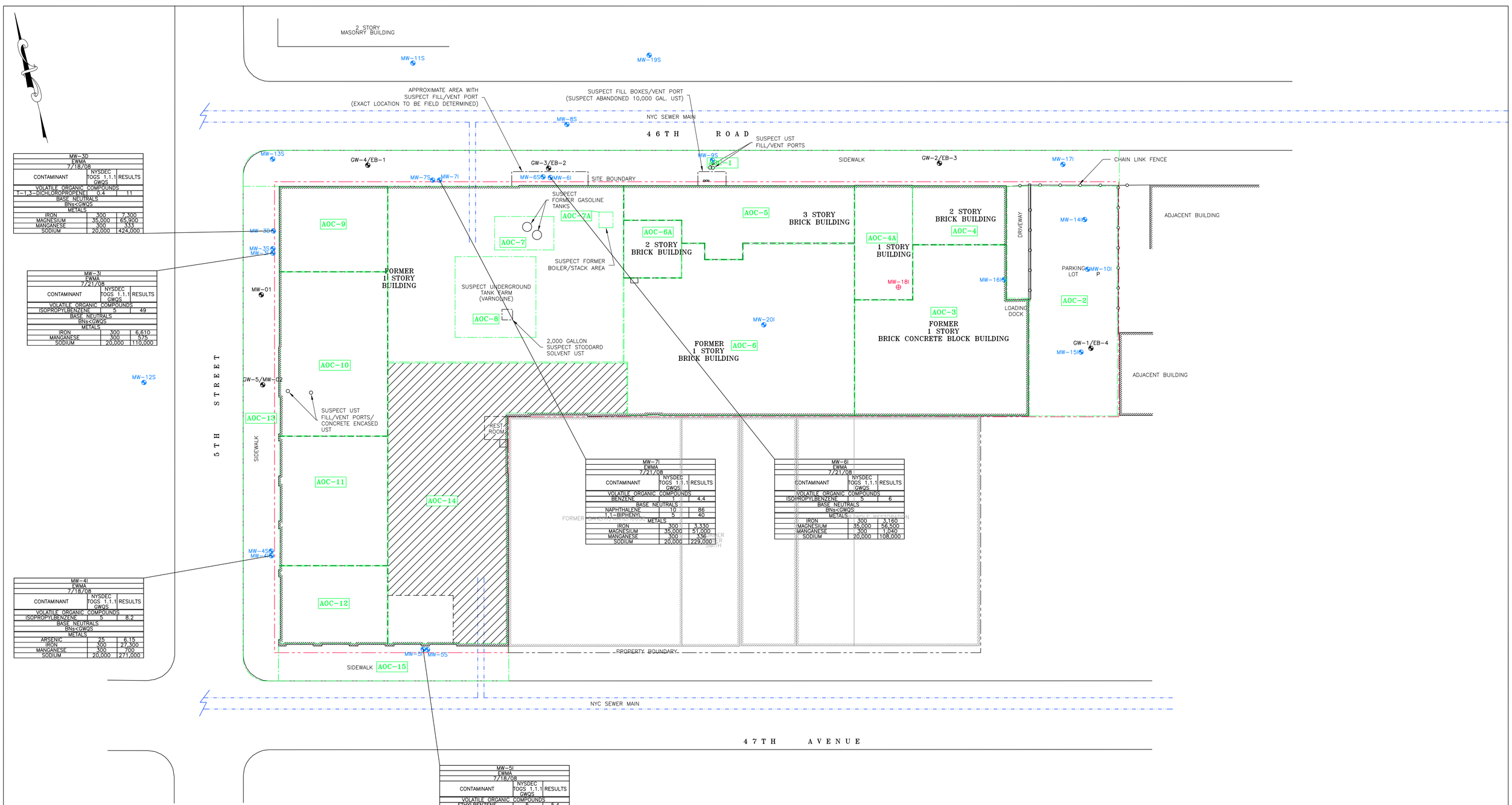
GROUNDWATER EXCEEDANCE PLAN PERCHED ZONE – JULY 2008
OCA LIC FIFTH STREET MIXED–USE HOUSING
5–20 46TH ROAD
LONG ISLAND CITY, NEW YORK

FIGURE# 6



MW-3D EWMA 7/18/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOLATILE ORGANIC COMPOUNDS		
1-1,3-DICHLOROPROPENE[	0.4	11
BASE NEUTRALS		
BNs<GWQS		
METALS		
IRON	300	7,300
MAGNESIUM	35,000	65,900
MANGANESE	300	333
SODIUM	20,000	424,000

MW-3I EWMA 7/21/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOLATILE ORGANIC COMPOUNDS		
ISOPROPYLBENZENE	5	49
BASE NEUTRALS		
BNs<GWQS		
METALS		
IRON	300	6,610
MANGANESE	300	575
SODIUM	20,000	110,000

MW-4I EWMA 7/18/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOLATILE ORGANIC COMPOUNDS		
ISOPROPYLBENZENE	5	8.2
BASE NEUTRALS		
BNs<GWQS		
METALS		
ARSENIC	25	6.15
IRON	300	27,300
MANGANESE	300	700
SODIUM	20,000	271,000

MW-5I EWMA 7/18/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOLATILE ORGANIC COMPOUNDS		
ETHYLBENZENE	5	5.4
BASE NEUTRALS		
NAPHTHALENE	10	83
1,2-BIPHENYL	5	8.7
ACENAPHTHENE	20	110
FLUORENE	50	59
METALS		
IRON	300	26,600
MANGANESE	300	2,460
SODIUM	20,000	112,000

MW-7I EWMA 7/21/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOLATILE ORGANIC COMPOUNDS		
BENZENE	1	4.4
BASE NEUTRALS		
NAPHTHALENE	10	86
1,1-BIPHENYL	5	40
METALS		
IRON	300	3,330
MAGNESIUM	35,000	51,000
MANGANESE	300	338
SODIUM	20,000	229,000

MW-6I EWMA 7/21/08		
CONTAMINANT	NYSDEC TOGS 1.1.1 GWQS	RESULTS
VOLATILE ORGANIC COMPOUNDS		
ISOPROPYLBENZENE	5	6
BASE NEUTRALS		
BNs<GWQS		
METALS		
IRON	300	3,160
MAGNESIUM	35,000	56,500
MANGANESE	300	1,040
SODIUM	20,000	108,000

AREAS OF CONCERN

AOC-1	FORMER 10,000 GALLON #6 FUEL OIL UST/46th ROAD SIDEWALK	AOC-7A	SUSPECT FORMER BOILER/STACK AREA
AOC-2	EASTERN PARKING LOT	AOC-8	SUSPECT TWENTY-TWO (22) 1,500 GALLON VARNOLINE STORAGE TANKS
AOC-3	1-STORY BRICK/CONCRETE BLOCK BUILDING (DEMAND ELECTRIC)	AOC-9	1-STORY BUILDING (AMN RENOVATION)
AOC-4	MOTORCYCLE REPAIR SHOP (BASEMENT 2-STORY BRICK BUILDING)	AOC-10	1-STORY BUILDING (JMJ ELECTRICAL)/SUSPECT UST AND FILL/VENT PORTS
AOC-4A	1-STORY BUILDING	AOC-11	FORMER WOHL, INC. CLEANERS AND DYERS (DIRECT AIR)
AOC-5	3-STORY BRICK BUILDING (ART STUDIOS)	AOC-12	FORMER WOHL, INC. CLEANERS AND DYERS (LIBERTY CONTRACTING)
AOC-6	1-STORY BRICK BUILDING (KNOSSOS CUSTOM DESIGN FURNITURE)	AOC-13	5TH STREET SIDEWALK
AOC-6A	2-STORY BRICK BUILDING	AOC-14	FORMER ACCURATE ASSOCIATES RCRA AREA
AOC-7	TWO (2) FORMER GASOLINE STORAGE TANKS	AOC-15	47TH AVENUE SIDEWALK

LEGEND

- MW-01 — J.C. BRODERICK & ASSOCIATES MONITORING WELL LOCATION – 2005
- GW-1 — EEA, INC. MONITORING WELL LOCATION – 2006
- MW-3S — EWMA MONITORING WELL LOCATION (PERCHED WATER ZONE) – 2008/2009
- MW-3I — EWMA MONITORING WELL LOCATION (SAND AQUIFER) – 2008/2009
- MW-3D — EWMA MONITORING WELL LOCATION (SAND AQUIFER) – 2008
- P — NOT SAMPLED –LNAPL PRESENT
- MW-18I — EWMA MONITORING WELL LOCATION (SAND AQUIFER) – 2009 LOCATION APPROXIMATE – NOT SURVEYED
- ENCAPSULATED AREA
- SITE BOUNDARY
- BUILDING OUTER WALL
- BUILDING INTERIOR WALL/MULTIPLE STORY WALL
- AOC BOUNDARY

SOURCE: "ARCHITECTURAL SURVEY" MONTROSE SURVEYING CO., LLP., RICHMOND HILL, N.Y. 4/2/07

GRAPHIC SCALE
20 0 10 20 40
(IN FEET)

Environmental Waste Management Associates, LLC
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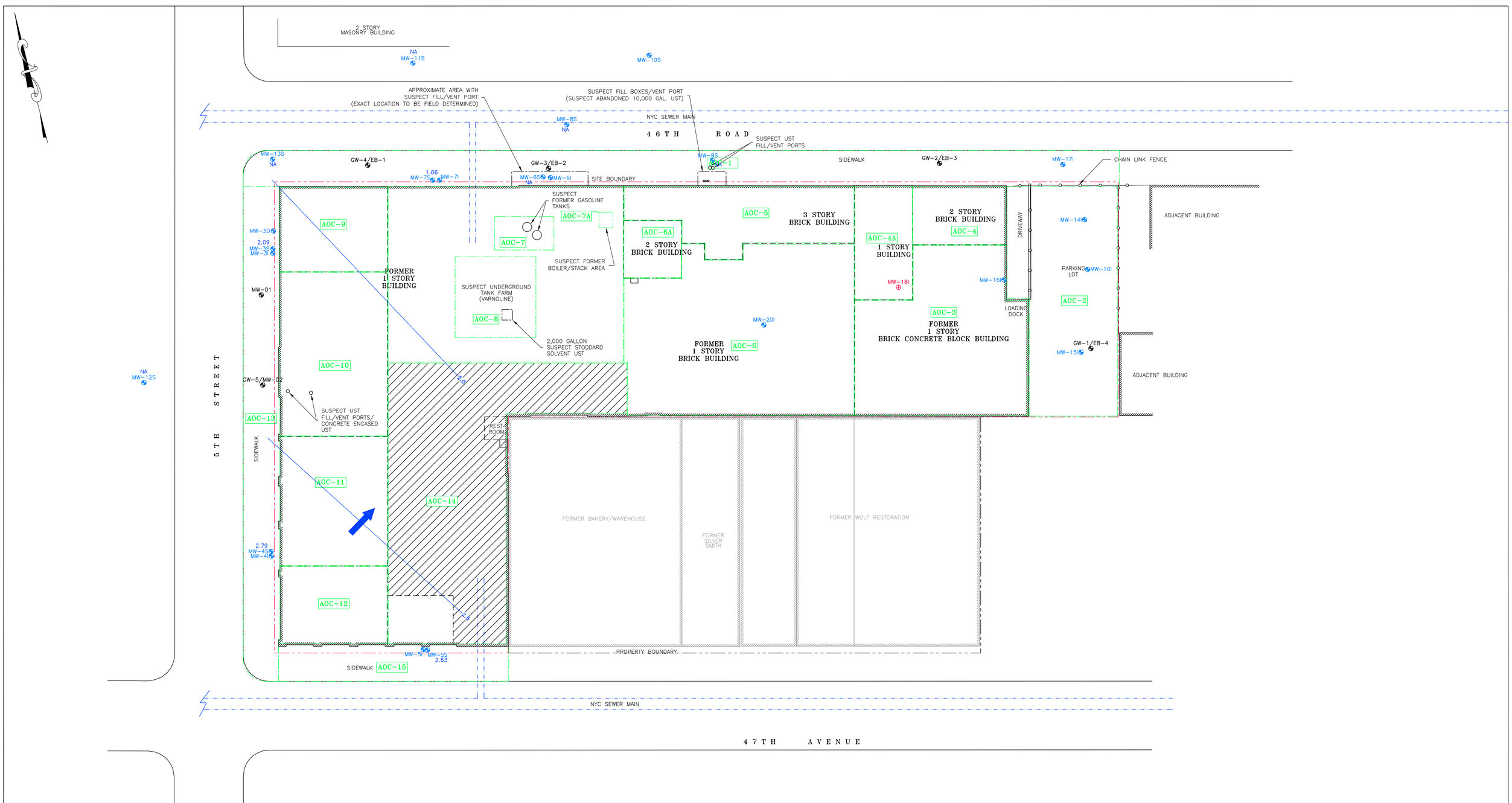
GROUND WATER EXCEEDANCE PLAN SAND AQUIFER – JULY 2008
OCA LIC FIFTH STREET MIXED-USE HOUSING
5-20 46TH ROAD
LONG ISLAND CITY, NEW YORK

FIGURE# 7



LEGEND

MW-01	J.C. BRODERICK & ASSOCIATES MONITORING WELL LOCATION – 2005
GW-1	EEA, INC. MONITORING WELL LOCATION – 2006
MW-13S 2.09	EWMA MONITORING WELL LOCATION (PERCHED WATER ZONE) WITH WATER LEVEL ELEVATION IN FEET BASED ON ASSUMED SURVEYOR ELEVATION DATUM (ASED) – 2008/2009
MW-3I	EWMA MONITORING WELL LOCATION (SAND AQUIFER) – 2008/2009
MW-3D	EWMA MONITORING WELL LOCATION (SAND AQUIFER) – 2008
2.5	GROUND WATER CONTOUR WITH ELEVATION IN FEET BASED ON (ASED) WITH FLOW DIRECTION
NA	WATER LEVEL NOT AVAILABLE
MW-18I	EWMA MONITORING WELL LOCATION (SAND AQUIFER) – 2009 LOCATION APPROXIMATE – NOT SURVEYED
	ENCAPSULATED AREA
	SITE BOUNDARY
	BUILDING OUTER WALL
	BUILDING INTERIOR WALL/MULTIPLE STORY WALL
	AOC BOUNDARY

NOTE: J.C. BRODERICK AND EEA INSTALLED WELLS WERE NOT USED IN CONSTRUCTING WATER LEVEL CONTOURS, DUE TO UNCERTAINTIES IN WELL CONSTRUCTION
SOURCE: "ARCHITECTURAL SURVEY" MONTROSE SURVEYING CO., LLP., RICHMOND HILL, N.Y. 4/2/07

AREAS OF CONCERN

AOC-1	FORMER 10,000 GALLON #6 FUEL OIL UST/46th ROAD SIDEWALK
AOC-2	EASTERN PARKING LOT
AOC-3	1-STORY BRICK/CONCRETE BLOCK BUILDING (DEMAND ELECTRIC)
AOC-4	MOTORCYCLE REPAIR SHOP (BASEMENT 2-STORY BRICK BUILDING)
AOC-4A	1-STORY BUILDING
AOC-5	3-STORY BRICK BUILDING (ART STUDIOS)
AOC-6	1-STORY BRICK BUILDING (KNOSSOS CUSTOM DESIGN FURNITURE)
AOC-6A	2-STORY BRICK BUILDING
AOC-7	TWO (2) FORMER GASOLINE STORAGE TANKS
AOC-7A	SUSPECT FORMER BOILER/STACK AREA
AOC-8	SUSPECT TWENTY-TWO (22) 1,500 GALLON VARNOLINE STORAGE TANKS
AOC-9	1-STORY BUILDING (AMN RENOVATION)
AOC-10	1-STORY BUILDING (JMJ ELECTRICAL)/SUSPECT UST AND FILL/VENT PORTS
AOC-11	FORMER WOHL, INC. CLEANERS AND DYERS (DIRECT AIR)
AOC-12	FORMER WOHL, INC. CLEANERS AND DYERS (LIBERTY CONTRACTING)
AOC-13	5TH STREET SIDEWALK
AOC-14	FORMER ACCURATE ASSOCIATES RCRA AREA
AOC-15	47TH AVENUE SIDEWALK

GRAPHIC SCALE
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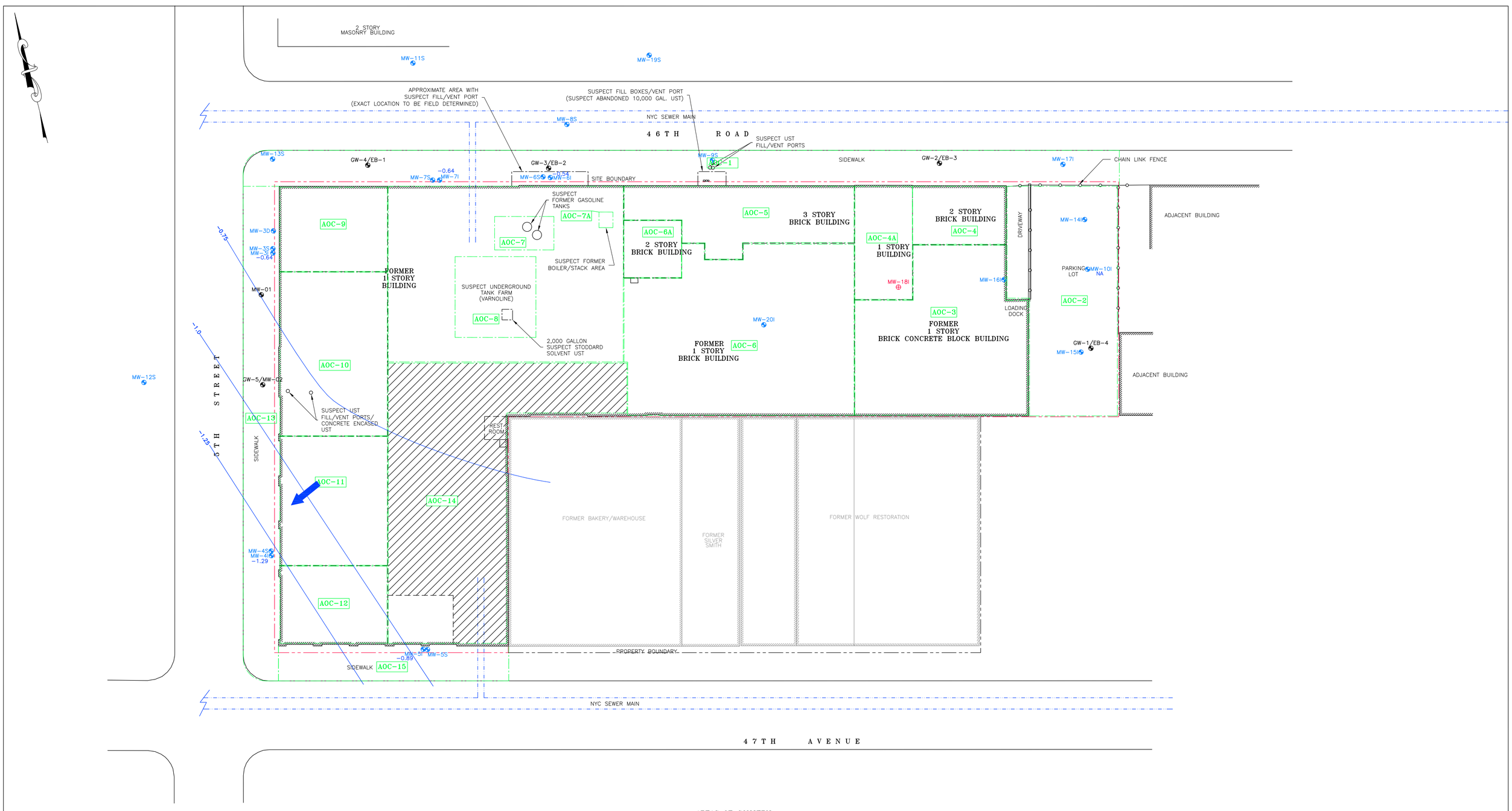
WATER LEVEL ELEVATION CONTOUR PERCHED WATER ZONE - 5/11/08

OCA LIC FIFTH STREET MIXED-USE HOUSING
5-20 46TH ROAD
LONG ISLAND CITY, NEW YORK

FIGURE# 8



LEGEND

MW-01	J.C. BRODERICK & ASSOCIATES MONITORING WELL LOCATION – 2005
GW-1	EEA, INC. MONITORING WELL LOCATION – 2006
MW-3S	EWMA MONITORING WELL LOCATION (PERCHED WATER ZONE) – 2008/2009
MW-3I −0.45	EWMA MONITORING WELL LOCATION (SAND AQUIFER) WITH WATER LEVEL ELEVATION IN FEET BASED ON ASSUMED SURVEYOR ELEVATION DATUM (ASED) – 2008/2009
MW-3D	EWMA MONITORING WELL LOCATION (SAND AQUIFER) – 2008
-1.0	GROUND WATER CONTOUR WITH ELEVATION IN FEET BASED ON (ASED) WITH FLOW DIRECTION
NA	WATER LEVEL NOT AVAILABLE
MW-18I	EWMA MONITORING WELL LOCATION (SAND AQUIFER) – 2009 LOCATION APPROXIMATE – NOT SURVEYED
	ENCAPSULATED AREA
	SITE BOUNDARY
	BUILDING OUTER WALL
	BUILDING INTERIOR WALL/MULTIPLE STORY WALL
	AOC BOUNDARY

NOTE: J.C. BRODERICK AND EEA INSTALLED WELLS WERE NOT USED IN CONSTRUCTING WATER LEVEL CONTOURS, DUE TO UNCERTAINTIES IN WELL CONSTRUCTION
SOURCE: "ARCHITECTURAL SURVEY" MONTROSE SURVEYING CO., LLP., RICHMOND HILL, N.Y. 4/2/07

AREAS OF CONCERN

AOC-1	FORMER 10,000 GALLON #6 FUEL OIL UST/46th ROAD SIDEWALK
AOC-2	EASTERN PARKING LOT
AOC-3	1-STORY BRICK/CONCRETE BLOCK BUILDING (DEMAND ELECTRIC)
AOC-4	MOTORCYCLE REPAIR SHOP (BASEMENT 2-STORY BRICK BUILDING)
AOC-4A	1-STORY BUILDING
AOC-5	3-STORY BRICK BUILDING (ART STUDIOS)
AOC-6	1-STORY BRICK BUILDING (KNOSSOS CUSTOM DESIGN FURNITURE)
AOC-6A	2-STORY BRICK BUILDING
AOC-7	TWO (2) FORMER GASOLINE STORAGE TANKS
AOC-7A	SUSPECT FORMER BOILER/STACK AREA
AOC-8	SUSPECT TWENTY-TWO (22) 1,500 GALLON VARNOLINE STORAGE TANKS
AOC-9	1-STORY BUILDING (AMN RENOVATION)
AOC-10	1-STORY BUILDING (JMJ ELECTRICAL)/SUSPECT UST AND FILL/VENT PORTS
AOC-11	FORMER WOHL, INC. CLEANERS AND DYERS (DIRECT AIR)
AOC-12	FORMER WOHL, INC. CLEANERS AND DYERS (LIBERTY CONTRACTING)
AOC-13	5TH STREET SIDEWALK
AOC-14	FORMER ACCURATE ASSOCIATES RCRA AREA
AOC-15	47TH AVENUE SIDEWALK

GRAPHIC SCALE
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(IN FEET)

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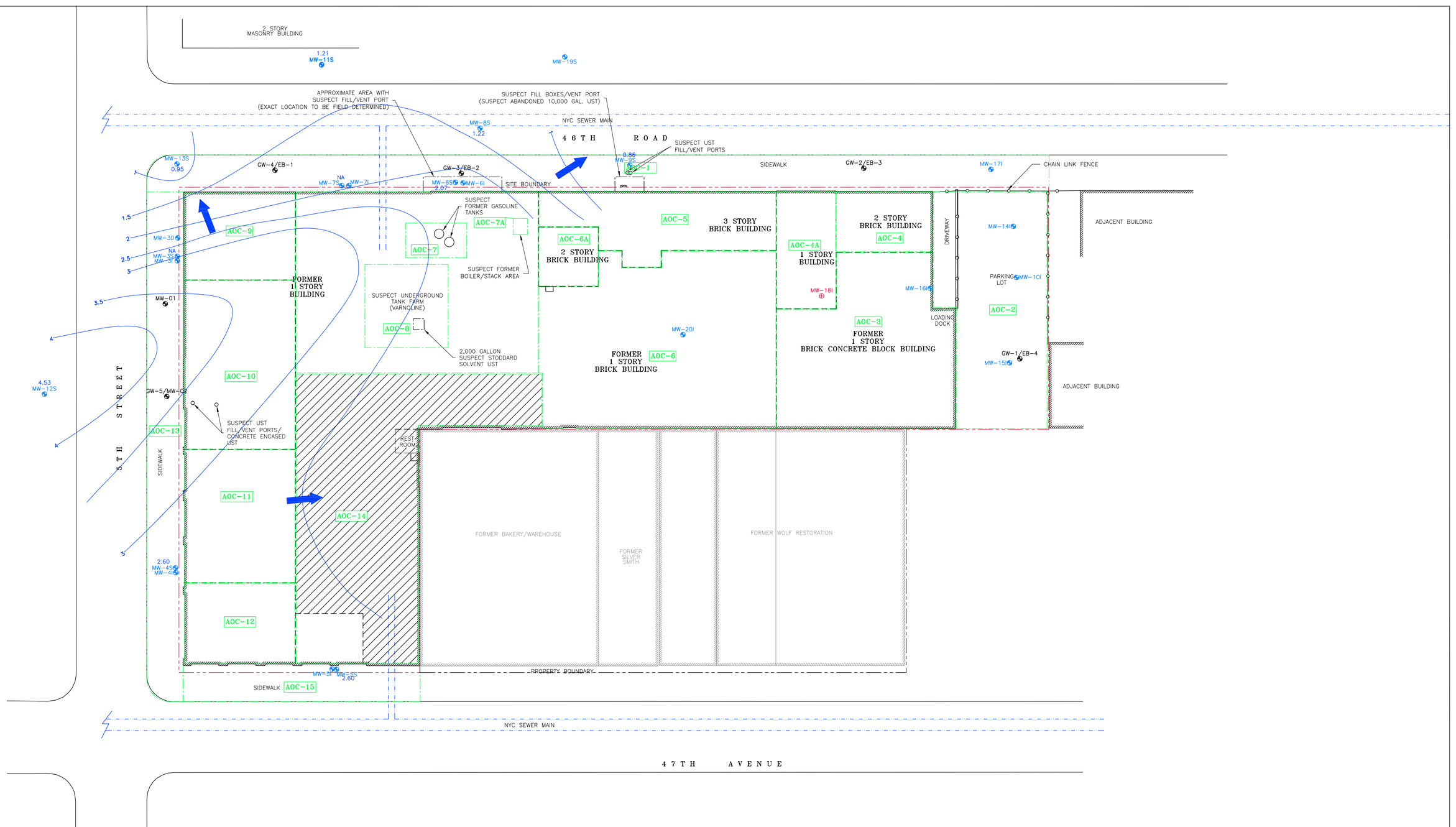
WATER LEVEL ELEVATION CONTOUR – SAND AQUIFER – 3/11/08
OCA LIC FIFTH STREET MIXED-USE HOUSING
5-20 46TH ROAD
LONG ISLAND CITY, NEW YORK

FIGURE# 9



LEGEND

MW-01	J.C. BRODERICK & ASSOCIATES MONITORING WELL LOCATION – 2005
GW-1	EEA, INC. MONITORING WELL LOCATION – 2006
MW-13S 0.95	EWMA MONITORING WELL LOCATION (PERCHED WATER ZONE) WITH WATER LEVEL ELEVATION IN FEET BASED ON ASSUMED SURVEYOR ELEVATION DATUM (ASED) – 2008/2009
MW-3I	EWMA MONITORING WELL LOCATION (SAND AQUIFER) – 2008/2009
MW-3D	EWMA MONITORING WELL LOCATION (SAND AQUIFER) – 2008
3	GROUND WATER CONTOUR WITH ELEVATION IN FEET BASED ON (ASED) WITH FLOW DIRECTION
NA	WATER LEVEL NOT AVAILABLE
MW-18I	EWMA MONITORING WELL LOCATION (SAND AQUIFER) – 2009 LOCATION APPROXIMATE – NOT SURVEYED
	ENCAPSULATED AREA
	SITE BOUNDARY
	BUILDING OUTER WALL
	BUILDING INTERIOR WALL/MULTIPLE STORY WALL
	AOC BOUNDARY

NOTE: J.C. BRODERICK AND EEA INSTALLED WELLS WERE NOT USED IN CONSTRUCTING WATER LEVEL CONTOURS, DUE TO UNCERTAINTIES IN WELL CONSTRUCTION
SOURCE: "ARCHITECTURAL SURVEY" MONTROSE SURVEYING CO., LLP., RICHMOND HILL, N.Y. 4/2/07

AREAS OF CONCERN

AOC-1	FORMER 10,000 GALLON #6 FUEL OIL UST/46th ROAD SIDEWALK
AOC-2	EASTERN PARKING LOT
AOC-3	1-STORY BRICK/CONCRETE BLOCK BUILDING (DEMAND ELECTRIC)
AOC-4	MOTORCYCLE REPAIR SHOP (BASEMENT 2-STORY BRICK BUILDING)
AOC-4A	1-STORY BUILDING
AOC-5	3-STORY BRICK BUILDING (ART STUDIOS)
AOC-6	1-STORY BRICK BUILDING (KNOSSOS CUSTOM DESIGN FURNITURE)
AOC-6A	2-STORY BRICK BUILDING
AOC-7	TWO (2) FORMER GASOLINE STORAGE TANKS
AOC-7A	SUSPECT FORMER BOILER/STACK AREA
AOC-8	SUSPECT TWENTY-TWO (22) 1,500 GALLON VARNOLINE STORAGE TANKS
AOC-9	1-STORY BUILDING (AMN RENOVATION)
AOC-10	1-STORY BUILDING (JMJ ELECTRICAL)/SUSPECT UST AND FILL/VENT PORTS
AOC-11	FORMER WOHL, INC. CLEANERS AND DYERS (DIRECT AIR)
AOC-12	FORMER WOHL, INC. CLEANERS AND DYERS (LIBERTY CONTRACTING)
AOC-13	5TH STREET SIDEWALK
AOC-14	FORMER ACCURATE ASSOCIATES RCRA AREA
AOC-15	47TH AVENUE SIDEWALK

GRAPHIC SCALE
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(IN FEET)

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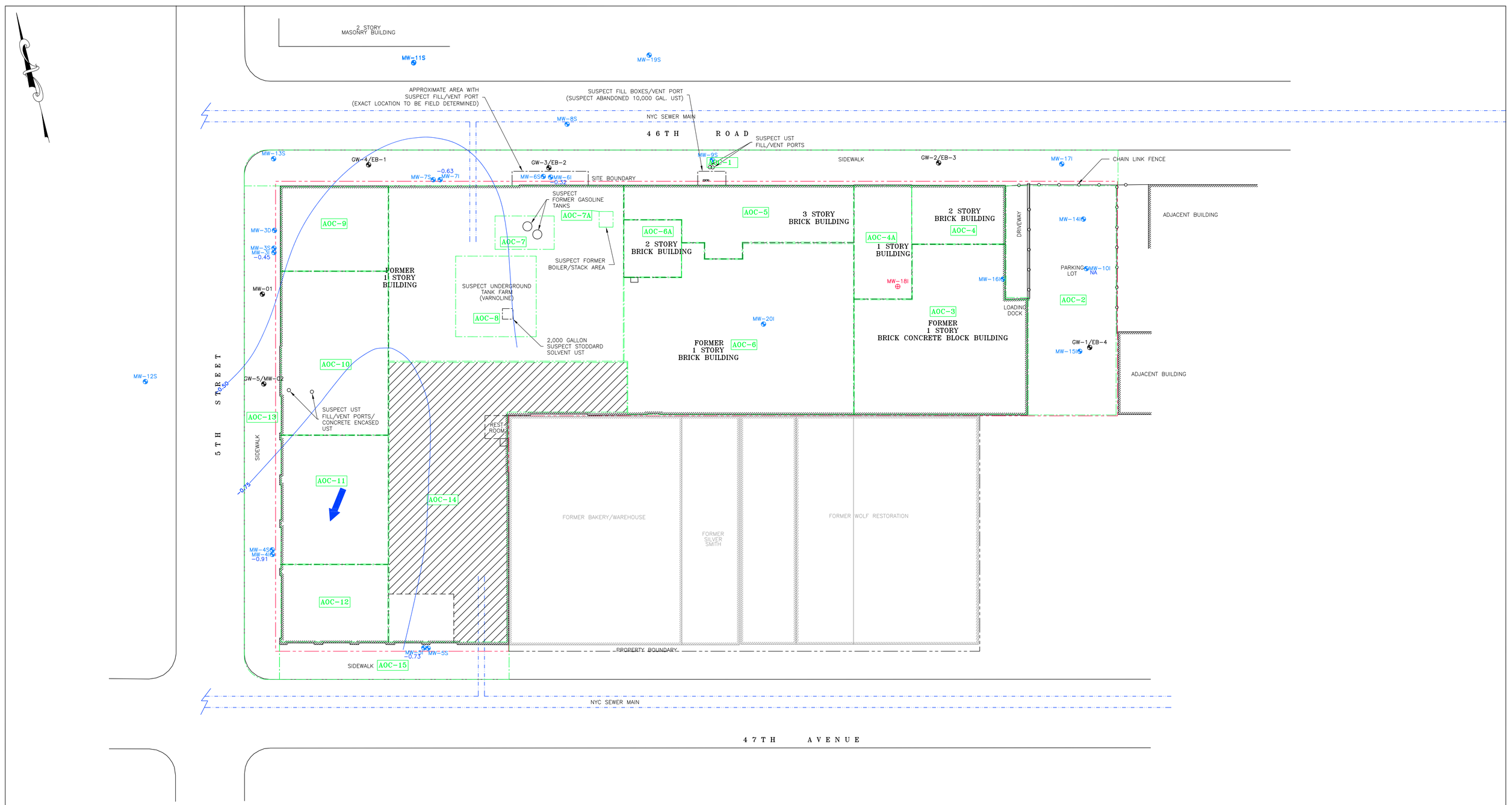
WATER LEVEL ELEVATION CONTOUR -PERCHED WATER ZONE - 7/17/08

OCA LIC FIFTH STREET MIXED-USE HOUSING
5-20 46TH ROAD
LONG ISLAND CITY, NEW YORK

FIGURE# 10



LEGEND

- MW-01 — J.C. BRODERICK & ASSOCIATES MONITORING WELL LOCATION – 2005
- GW-1 — EEA, INC. MONITORING WELL LOCATION – 2006
- MW-3S — EWMA MONITORING WELL LOCATION (PERCHED WATER ZONE) – 2008/2009
- MW-3I, -0.45 — EWMA MONITORING WELL LOCATION (SAND AQUIFER) WITH WATER LEVEL ELEVATION IN FEET BASED ON ASSUMED SURVEYOR ELEVATION DATUM (ASED) – 2008/2009
- MW-3D — EWMA MONITORING WELL LOCATION (SAND AQUIFER) – 2008
- 0.75 — GROUND WATER CONTOUR WITH ELEVATION IN FEET BASED ON (ASED) WITH FLOW DIRECTION
- NA — WATER LEVEL ELEVATION NOT AVAILABLE
- MW-18I — EWMA MONITORING WELL LOCATION (SAND AQUIFER) – 2009 LOCATION APPROXIMATE – NOT SURVEYED
- ENCAPSULATED AREA
- SITE BOUNDARY
- BUILDING OUTER WALL
- BUILDING INTERIOR WALL/MULTIPLE STORY WALL
- AOC BOUNDARY

NOTE: J.C. BRODERICK AND EEA INSTALLED WELLS WERE NOT USED IN CONSTRUCTING WATER LEVEL CONTOURS, DUE TO UNCERTAINTIES IN WELL CONSTRUCTION
SOURCE: "ARCHITECTURAL SURVEY" MONTROSE SURVEYING CO., LLP., RICHMOND HILL, N.Y. 4/2/07

AREAS OF CONCERN

AOC-1	FORMER 10,000 GALLON #6 FUEL OIL UST/46th ROAD SIDEWALK	AOC-7A	SUSPECT FORMER BOILER/STACK AREA
AOC-2	EASTERN PARKING LOT	AOC-8	SUSPECT TWENTY-TWO (22) 1,500 GALLON VARNOLINE STORAGE TANKS
AOC-3	1-STORY BRICK/CONCRETE BLOCK BUILDING (DEMAND ELECTRIC)	AOC-9	1-STORY BUILDING (AMN RENOVATION)
AOC-4	MOTORCYCLE REPAIR SHOP (BASEMENT 2-STORY BRICK BUILDING)	AOC-10	1-STORY BUILDING (JMJ ELECTRICAL)/SUSPECT UST AND FILL/VENT PORTS
AOC-4A	1-STORY BUILDING	AOC-11	FORMER WOHL, INC. CLEANERS AND DYERS (DIRECT AIR)
AOC-5	3-STORY BRICK BUILDING (ART STUDIOS)	AOC-12	FORMER WOHL, INC. CLEANERS AND DYERS (LIBERTY CONTRACTING)
AOC-6	1-STORY BRICK BUILDING (KNOSSOS CUSTOM DESIGN FURNITURE)	AOC-13	5TH STREET SIDEWALK
AOC-6A	2-STORY BRICK BUILDING	AOC-14	FORMER ACCURATE ASSOCIATES RCRA AREA
AOC-7	TWO (2) FORMER GASOLINE STORAGE TANKS	AOC-15	47TH AVENUE SIDEWALK

GRAPHIC SCALE
20 0 10 20 40
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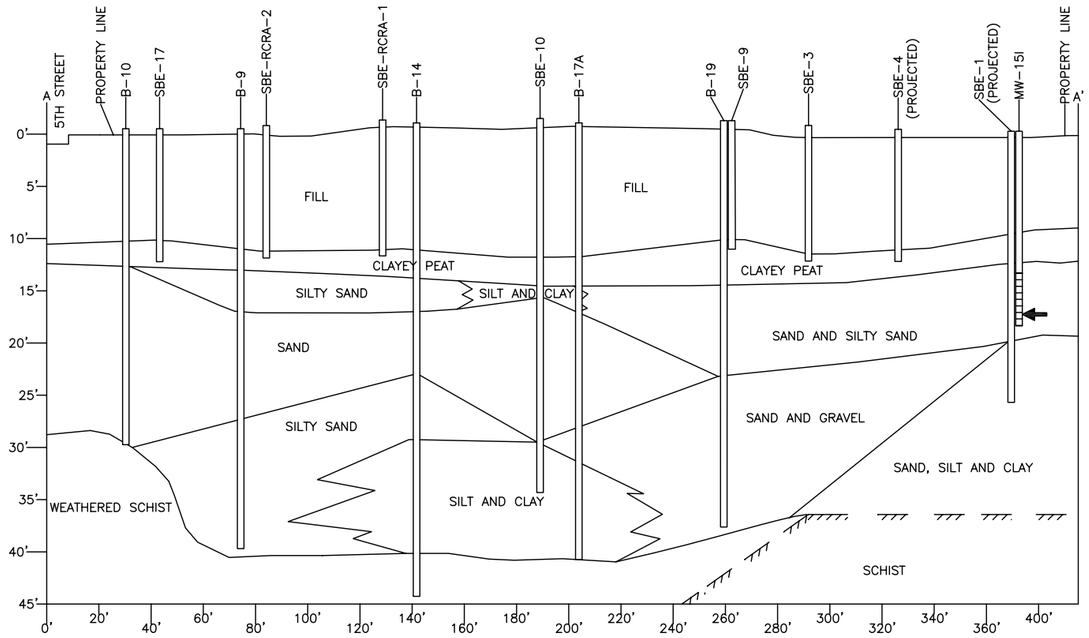
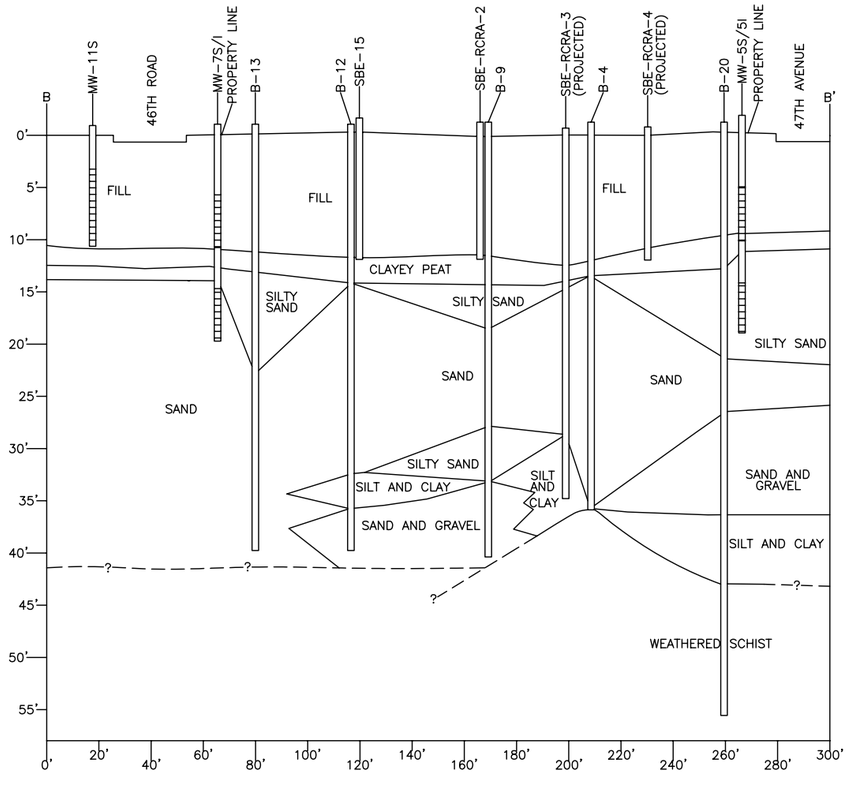
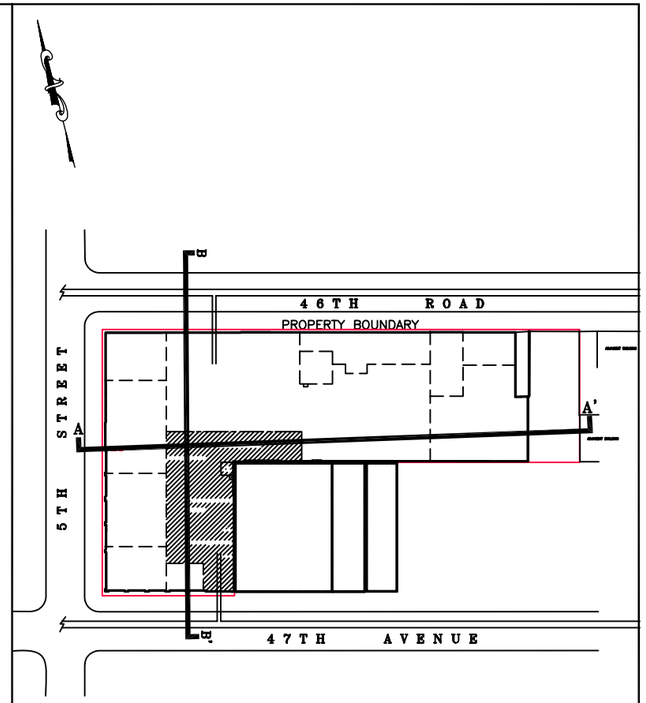
Environmental Waste Management Associates, LLC P.O. Box 5430 Parsippany, NJ 07054 Tel: (973) 560-1400	SCALE: AS SHOWN DATE: 6/30/09 DRAWN BY: RR/JS CHECKED BY: RA FILE: k:\drawings\205000\205490\2009 AMEC\MAP\205490f2.dwg	PROJECT# 205490
WATER LEVEL ELEVATION CONTOUR –SAND AQUIFER – 7/17/08 OCA LIC FIFTH STREET MIXED-USE HOUSING 5-20 46TH ROAD LONG ISLAND CITY, NEW YORK		FIGURE# 11







GRAPHIC SCALE

80 0 40 80 160

(IN FEET)

LEGEND

SBE- EWMA SOIL BORING LOCATION

MW- MONITORING WELL LOCATION WITH SCREENED INTERVAL

B- DEWBERRY GEOTECHNICAL BORING LOCATION

HYDROCARBON SHEEN ENCOUNTERED AT THIS DEPTH

VERTICAL SCALE IN FEET: 10, 0

HORIZONTAL SCALE IN FEET: 0, 40

Environmental Waste Management Associates, LLC
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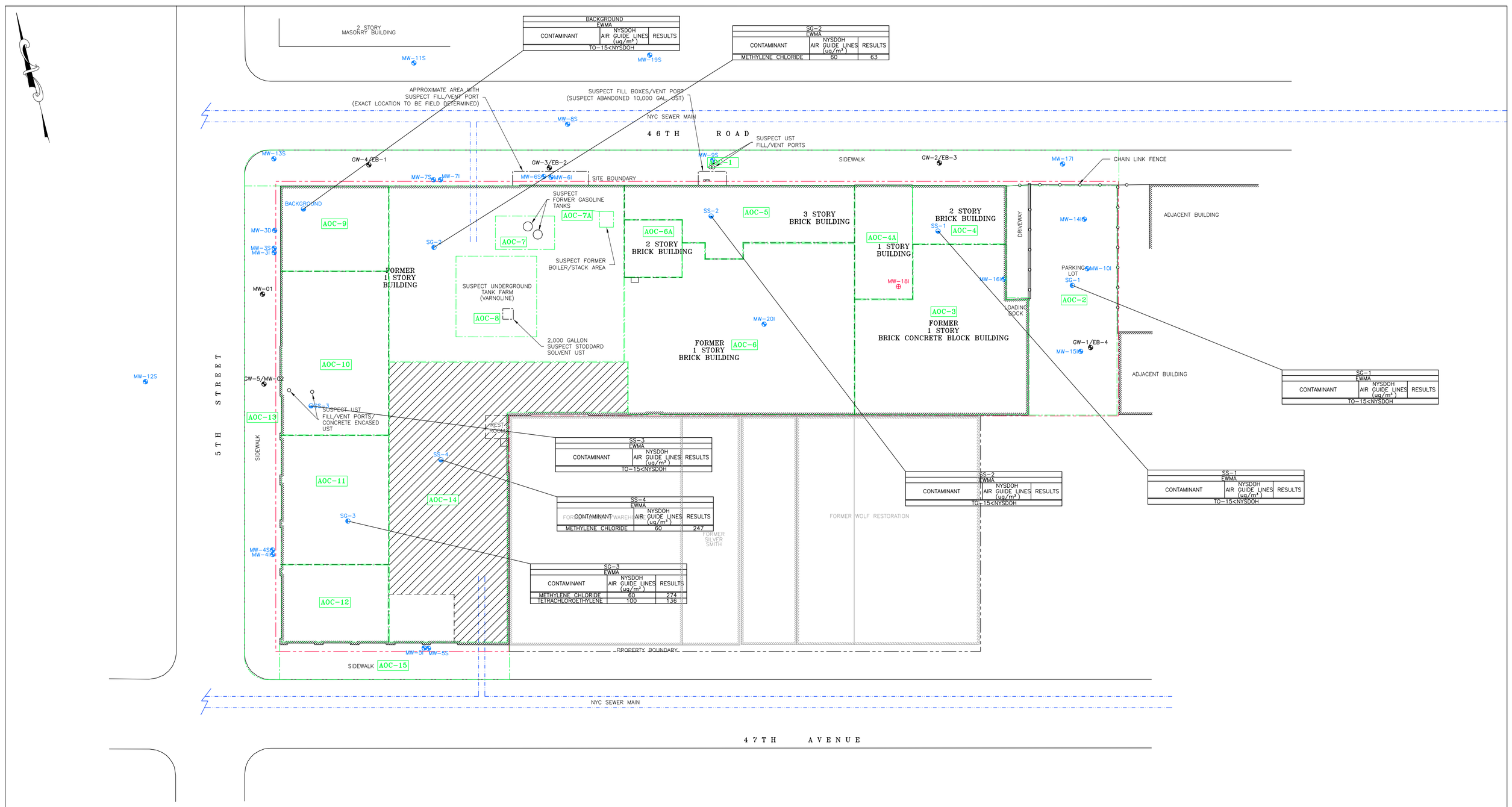
SUBSURFACE CROSS-SECTIONS A-A' & B-B'
OCA LIC FIFTH STREET MIXED-USE HOUSING
5-20 46TH ROAD
LONG ISLAND CITY, NEW YORK

FIGURE# 12



LEGEND

- MW-01 — J.C. BRODERICK & ASSOCIATES MONITORING WELL LOCATION – 2005
- GW-1 — EEA, INC. MONITORING WELL LOCATION – 2006
- MW-13S — EWMA MONITORING WELL LOCATION (PERCHED WATER ZONE) – 2008/2009
- MW-3I — EWMA MONITORING WELL LOCATION (SAND AQUIFER) – 2008/2009
- MW-3D — EWMA MONITORING WELL LOCATION (SAND AQUIFER) – 2008
- SBE-6 — EWMA HAND AUGER SAMPLE LOCATION – 2008
- SBE-8/TW-8 — EWMA SOIL BORING OR SOIL BORING/TEMPORARY WELL POINT SAMPLE LOCATION – 2008
- SG-1 — EWMA SOIL GAS SAMPLE LOCATION FOR VAPOR INTRUSION INVESTIGATION – 2008
- MW-18I — EWMA MONITORING WELL LOCATION (SAND AQUIFER) – 2009 LOCATION APPROXIMATE – NOT SURVEYED
- ENCAPSULATED AREA
- SITE BOUNDARY
- BUILDING OUTER WALL
- BUILDING INTERIOR WALL/MULTIPLE STORY WALL
- AOC BOUNDARY

SOURCE: "ARCHITECTURAL SURVEY" MONTROSE SURVEYING CO., LLP., RICHMOND HILL, N.Y. 4/2/07

AREAS OF CONCERN

AOC-1	FORMER 10,000 GALLON #6 FUEL OIL UST/46th ROAD SIDEWALK	AOC-7A	SUSPECT FORMER BOILER/STACK AREA
AOC-2	EASTERN PARKING LOT	AOC-8	SUSPECT TWENTY-TWO (22) 1,500 GALLON VARNOLINE STORAGE TANKS
AOC-3	1-STORY BRICK/CONCRETE BLOCK BUILDING (DEMAND ELECTRIC)	AOC-9	1-STORY BUILDING (AMN RENOVATION)
AOC-4	MOTORCYCLE REPAIR SHOP (BASEMENT 2-STORY BRICK BUILDING)	AOC-10	1-STORY BUILDING (JMJ ELECTRICAL)/SUSPECT UST AND FILL/VENT PORTS
AOC-4A	1-STORY BUILDING	AOC-11	FORMER WOHL, INC. CLEANERS AND DYERS (DIRECT AIR)
AOC-5	3-STORY BRICK BUILDING (ART STUDIOS)	AOC-12	FORMER WOHL, INC. CLEANERS AND DYERS (LIBERTY CONTRACTING)
AOC-6	1-STORY BRICK BUILDING (KNOSSOS CUSTOM DESIGN FURNITURE)	AOC-13	5TH STREET SIDEWALK
AOC-6A	2-STORY BRICK BUILDING	AOC-14	FORMER ACCURATE ASSOCIATES RCRA AREA
AOC-7	TWO (2) FORMER GASOLINE STORAGE TANKS	AOC-15	47TH AVENUE SIDEWALK

GRAPHIC SCALE
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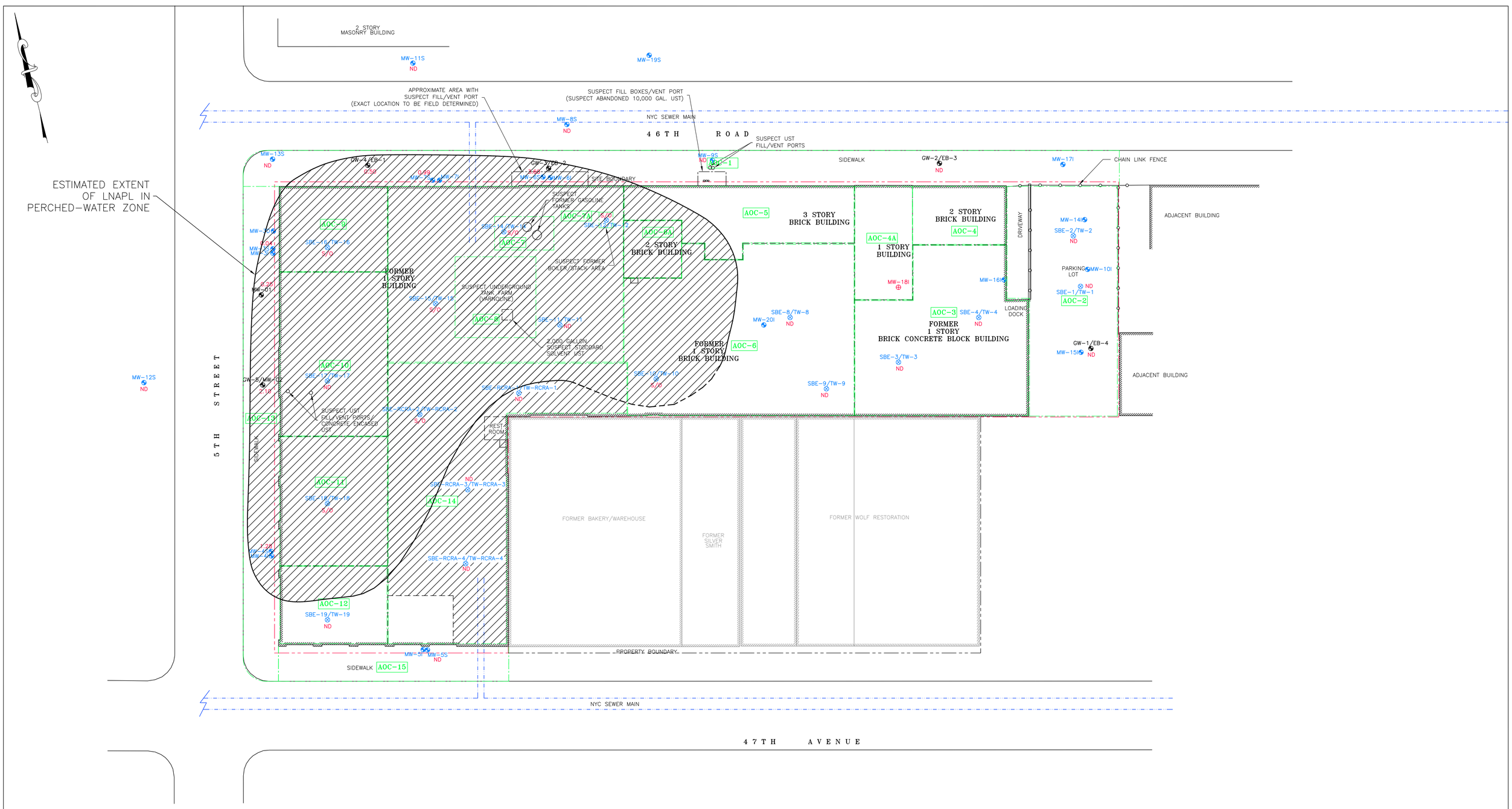
SUMMARY OF SOIL GAS DATA – JANUARY 2008
OCA LIC FIFTH STREET MIXED-USE HOUSING
5-20 46TH ROAD
LONG ISLAND CITY, NEW YORK

FIGURE# 13



LEGEND

MW-01	J.C. BRODERICK & ASSOCIATES MONITORING WELL LOCATION – 2008
GW-1	EEA, INC. MONITORING WELL LOCATION – 2008
MW-13S	EWMA MONITORING WELL LOCATION (PERCHED WATER ZONE) WITH MAXIMUM RECORDED LNAPL THICKNESS (FEET) DURING 2008/2009
MW-3I	EWMA MONITORING WELL LOCATION (SAND AQUIFER) – 2008/2009
MW-3D	EWMA MONITORING WELL LOCATION (SAND AQUIFER) – 2008
SBE-7/TW-7	EWMA SOIL BORING OR SOIL BORING/TEMPORARY WATER SAMPLE LOCATION – 2008 WITH INDICATORS FOR LNAPL IN PERCHED-WATER ZONE
MW-18I	EWMA MONITORING WELL LOCATION (SAND AQUIFER) – 2009 LOCATION APPROXIMATE – NOT SURVEYED
S/O	HYDROCARBON SHEEN OR ODOR DETECTED IN PERCHED WATER ZONE
ND	EVIDENCE FOR LNAPL NOT DETECTED
	EXTIMATED EXTENT OF LNAPL, DASHED WERE INFERRED
	SITE BOUNDARY
	BUILDING OUTER WALL
	BUILDING INTERIOR WALL/MULTIPLE STORY WALL
	AOC BOUNDARY

NOTE: LNAPL THICKNESS FROM MEASUREMENTS MADE ON 3/11/08, 5/5/08, 7/17/08 AND 10/13/08
SOURCE: "ARCHITECTURAL SURVEY" MONTROSE SURVEYING CO., LLP., RICHMOND HILL, N.Y. 4/2/07

AREAS OF CONCERN

AOC-1	FORMER 10,000 GALLON #6 FUEL OIL UST/46th ROAD SIDEWALK
AOC-2	EASTERN PARKING LOT
AOC-3	1-STORY BRICK/CONCRETE BLOCK BUILDING (DEMAND ELECTRIC)
AOC-4	MOTORCYCLE REPAIR SHOP (BASEMENT 2-STORY BRICK BUILDING)
AOC-4A	1-STORY BUILDING
AOC-5	3-STORY BRICK BUILDING (ART STUDIOS)
AOC-6	1-STORY BRICK BUILDING (KNOSSOS CUSTOM DESIGN FURNITURE)
AOC-6A	2-STORY BRICK BUILDING
AOC-7	TWO (2) FORMER GASOLINE STORAGE TANKS
AOC-7A	SUSPECT FORMER BOILER/STACK AREA
AOC-8	SUSPECT TWENTY-TWO (22) 1,500 GALLON VARNOLINE STORAGE TANKS
AOC-9	1-STORY BUILDING (AMN RENOVATION)
AOC-10	1-STORY BUILDING (JMJ ELECTRICAL)/SUSPECT UST AND FILL/VENT PORTS
AOC-11	FORMER WOHL, INC. CLEANERS AND DYERS (DIRECT AIR)
AOC-12	FORMER WOHL, INC. CLEANERS AND DYERS (LIBERTY CONTRACTING)
AOC-13	5TH STREET SIDEWALK
AOC-14	FORMER ACCURATE ASSOCIATES RCRA AREA
AOC-15	47TH AVENUE SIDEWALK

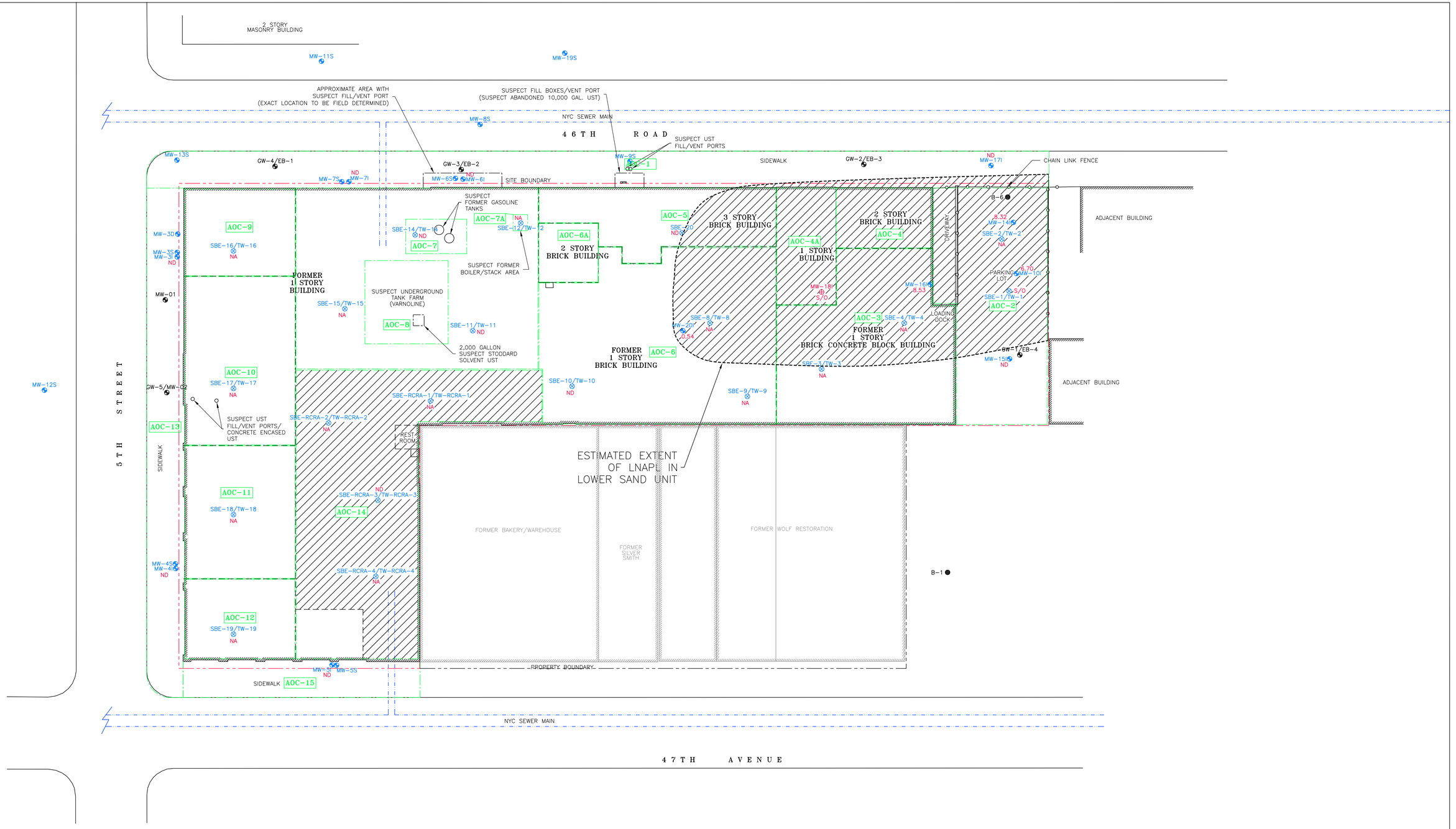
GRAPHIC SCALE
20 0 10 20 40
(IN FEET)

Environmental Waste Management Associates, LLC
P.O. Box 5430
Parsippany, NJ 07054
Tel: (973) 560-1400

SCALE: AS SHOWN | PROJECT# 205490
DATE: 6/30/09
DRAWN BY: RR/JS
CHECKED BY: RA
FILE: S:\Acad\205000\205490\205490_AMD_EMAP_20090702.dwg

MAXIMUM THICKNESS AND ESTIMATED EXTENT OF LNAPL IN THE PERCHED WATER ZONE – 2008
OCA LIC FIFTH STREET MIXED-USE HOUSING
5-20 46TH ROAD
LONG ISLAND CITY, NEW YORK

FIGURE# 14



LEGEND

MW-19S	EWMA MONITORING WELL LOCATION (PERCHED WATER ZONE) – 2008 LOCATION APPROXIMATE
MW-18I	EWMA MONITORING WELL LOCATION (SAND AQUIFER) – 2008 LOCATION APPROXIMATE
MW-01	J.C. BRODERICK & ASSOCIATES MONITORING WELL LOCATION – 2008
GW-1	EEA, INC. MONITORING WELL LOCATION – 2008
MW-13S	EWMA MONITORING WELL LOCATION (PERCHED WATER ZONE) – 2008/2009
MW-3I	EWMA MONITORING WELL LOCATION (SAND AQUIFER) – 2008/2009 WITH MAXIMUM RECORDED LNAPL THICKNESS (FEET) AS OF MARCH 2009
MW-3D	EWMA MONITORING WELL LOCATION (SAND AQUIFER) – 2008
SBE-7/TW-7	EWMA SOIL BORING OR SOIL BORING/TEMPORARY WATER SAMPLE LOCATION – 2008 WITH INDICATORS FOR LNAPL IN SAND AQUIFER
B-6	DEWBERRY GEOTECHNICAL BORING LOCATION
MW-18I	EWMA MONITORING WELL LOCATION (SAND AQUIFER) – 2009 LOCATION APPROXIMATE – NOT SURVEYED
NA	SOIL BORING DID NOT PENETRATE THE SAND AQUIFER
S/O	HYDROCARBON SHEEN OR ODOR DETECTED IN SAND AQUIFER
ND	EVIDENCE FOR LNAPL NOT DETECTED
	ESTIMATED EXTENT OF LNAPL
	SITE BOUNDARY
	BUILDING OUTER WALL
	BUILDING INTERIOR WALL/MULTIPLE STORY WALL
	AOC BOUNDARY

AREAS OF CONCERN

AOC-1	FORMER 10,000 GALLON #6 FUEL OIL UST/46th ROAD SIDEWALK
AOC-2	EASTERN PARKING LOT
AOC-3	1-STORY BRICK/CONCRETE BLOCK BUILDING (DEMAND ELECTRIC)
AOC-4	MOTORCYCLE REPAIR SHOP (BASEMENT 2-STORY BRICK BUILDING)
AOC-4A	1-STORY BUILDING
AOC-5	3-STORY BRICK BUILDING (ART STUDIOS)
AOC-6	1-STORY BRICK BUILDING (KNOSSOS CUSTOM DESIGN FURNITURE)
AOC-6A	2-STORY BRICK BUILDING
AOC-7	TWO (2) FORMER GASOLINE STORAGE TANKS
AOC-7A	SUSPECT FORMER BOILER/STACK AREA
AOC-8	SUSPECT TWENTY-TWO (22) 1,500 GALLON VARNOLINE STORAGE TANKS
AOC-9	1-STORY BUILDING (AMN RENOVATION)
AOC-10	1-STORY BUILDING (JMJ ELECTRICAL)/SUSPECT UST AND FILL/VENT PORTS
AOC-11	FORMER WOHL, INC. CLEANERS AND DYERS (DIRECT AIR)
AOC-12	FORMER WOHL, INC. CLEANERS AND DYERS (LIBERTY CONTRACTING)
AOC-13	5TH STREET SIDEWALK
AOC-14	FORMER ACCURATE ASSOCIATES RCRA AREA
AOC-15	47TH AVENUE SIDEWALK

GRAPHIC SCALE
20 0 10 20 40
(IN FEET)

NOTE: LNAPL THICKNESS FROM MEASUREMENTS MADE ON 3/11/08, 5/5/08, 7/17/08 AND 10/13/08
SOURCE: "ARCHITECTURAL SURVEY" MONTROSE SURVEYING CO., LLP., RICHMOND HILL, N.Y. 4/2/07

Environmental Waste Management Associates, LLC
P.O. Box 5430
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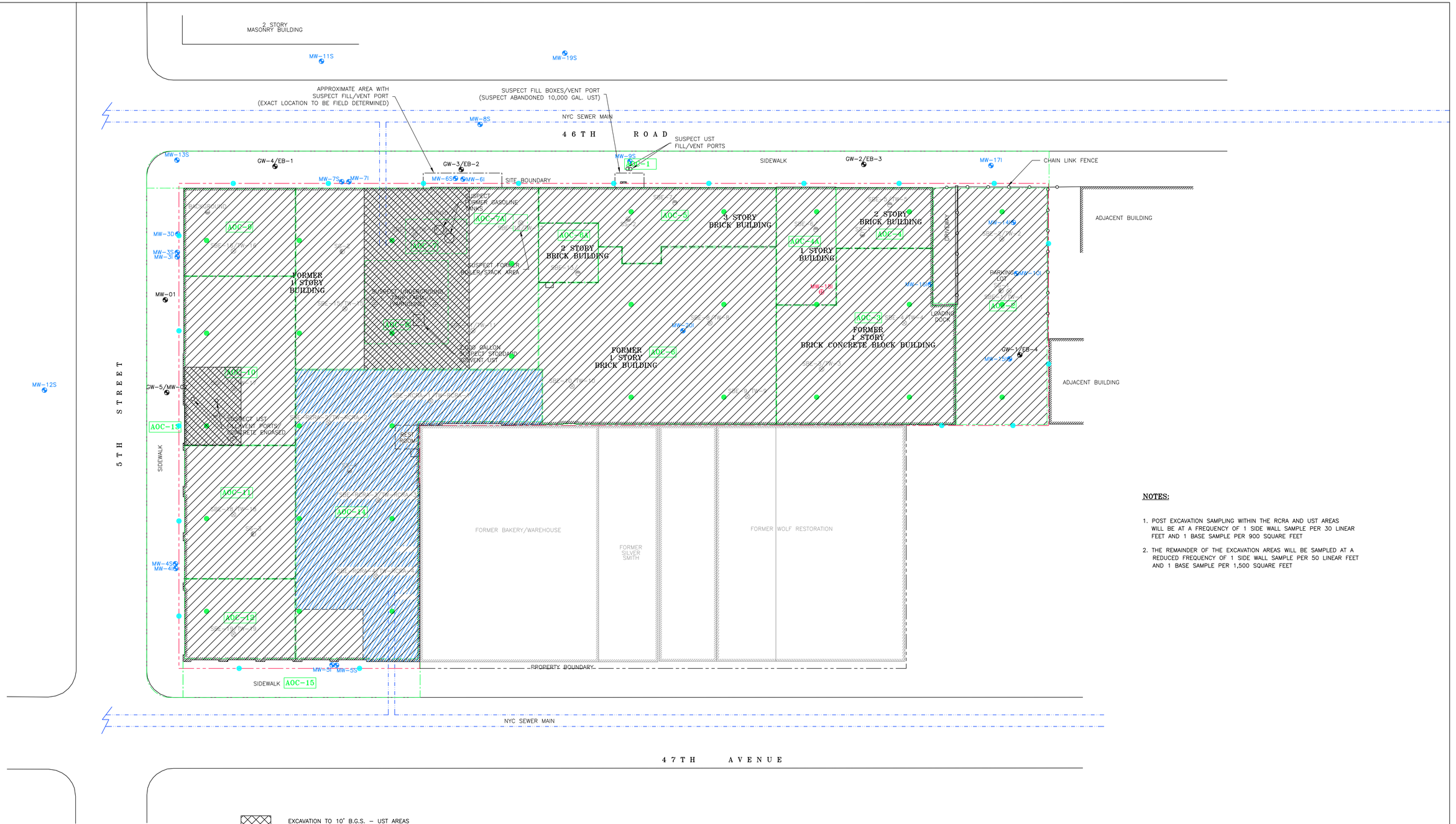
MAXIMUM THICKNESS AND ESTIMATED EXTENT OF LNAPL IN THE SAND AQUIFER – 2008-2009

OCA LIC FIFTH STREET MIXED-USE HOUSING
5-20 46TH ROAD
LONG ISLAND CITY, NEW YORK

FIGURE# 15



NOTES:

1. POST EXCAVATION SAMPLING WITHIN THE RCRA AND UST AREAS WILL BE AT A FREQUENCY OF 1 SIDE WALL SAMPLE PER 30 LINEAR FEET AND 1 BASE SAMPLE PER 900 SQUARE FEET
2. THE REMAINDER OF THE EXCAVATION AREAS WILL BE SAMPLED AT A REDUCED FREQUENCY OF 1 SIDE WALL SAMPLE PER 50 LINEAR FEET AND 1 BASE SAMPLE PER 1,500 SQUARE FEET

LEGEND

PEB-(X)	PROPOSED POST-EXCAVATION SAMPLE LOCATION (BASE 7'-7.5')
PES-(X)	PROPOSED POST-EXCAVATION SAMPLE LOCATION (SIDEWALL 6.5'-7')
MW-01	J.C. BRODERICK & ASSOCIATES MONITORING WELL LOCATION – 2008
GW-1	EEA, INC. MONITORING WELL LOCATION – 2008
MW-13S	EWMA MONITORING WELL LOCATION (PERCHED WATER ZONE) – 2008/2009
MW-3I	EWMA MONITORING WELL LOCATION (SAND AQUIFER) – 2008/2009
MW-3D	EWMA MONITORING WELL LOCATION (SAND AQUIFER) – 2008
SBE-7/TW-7	EWMA SOIL BORING OR SOIL BORING/TEMPORARY WATER SAMPLE LOCATION – 2008
	EXCAVATION TO 10' B.G.S. – UST AREAS
	EXCAVATION TO 7' B.G.S.
MW-18I	EWMA MONITORING WELL LOCATION (SAND AQUIFER) – 2009 LOCATION APPROXIMATE – NOT SURVEYED
VAL-E	TEST PIT SAMPLE LOCATION
SBE-7/TW-7	EWMA GEOPROBE SOIL BORING/TEMPORARY WELL POINT LOCATION – 2008
SBE-6	EWMA HAND AUGER SOIL BORING LOCATION – 2008
SS-1	EWMA SUB-SLAB AIR SAMPLE LOCATION FOR VAPOR INTRUSION INVESTIGATION – 2008
SG-1	EWMA SOIL GAS SAMPLE LOCATION FOR VAPOR INTRUSION INVESTIGATION – 2008
	RCRA ENCAPSULATED AREA
	SITE BOUNDARY
	AOC BOUNDARY

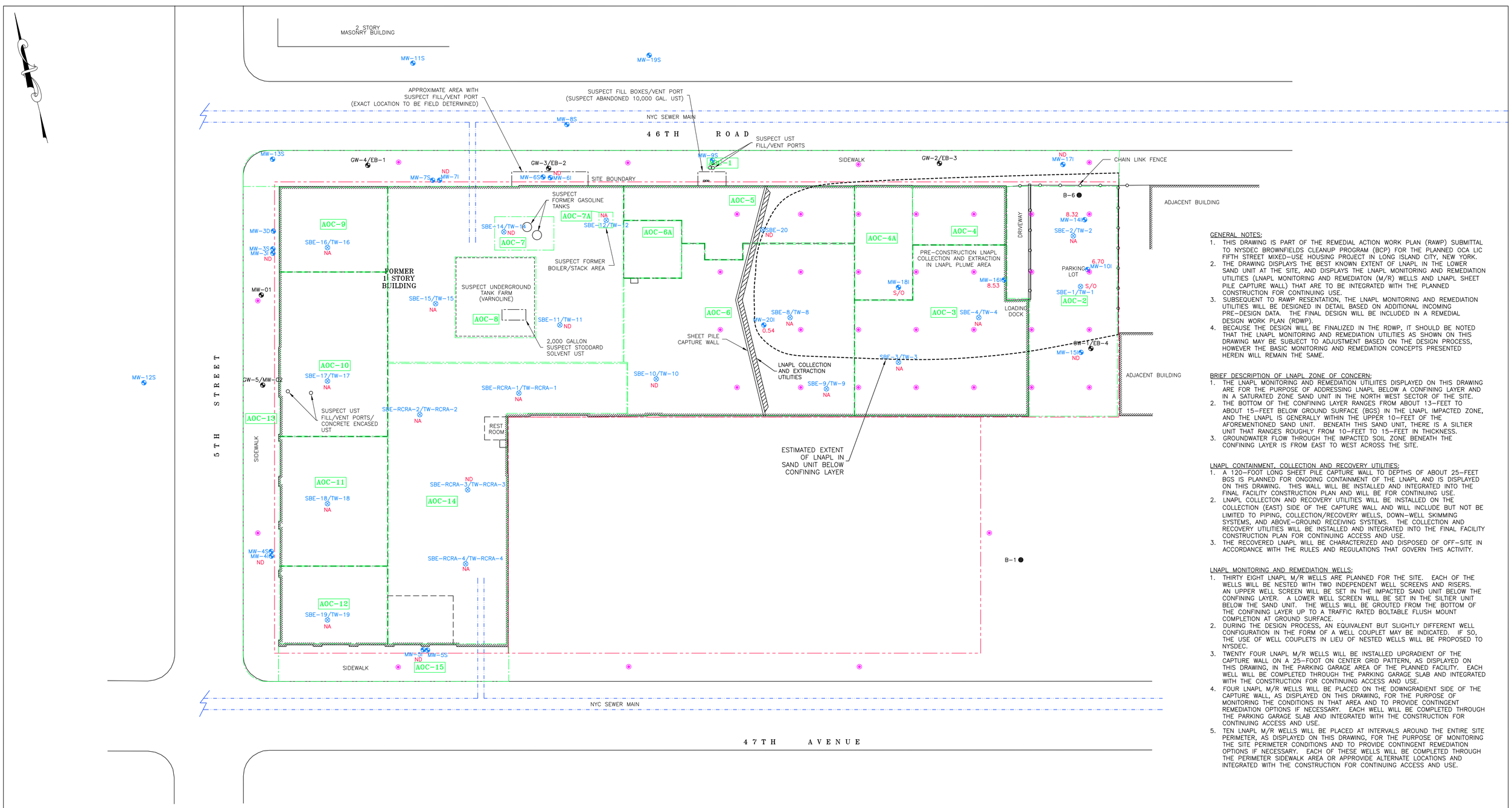
AREAS OF CONCERN

AOC-1	FORMER 10,000 GALLON #6 FUEL OIL UST/46th ROAD SIDEWALK	AOC-7A	SUSPECT FORMER BOILER/STACK AREA
AOC-2	EASTERN PARKING LOT	AOC-8	SUSPECT TWENTY-TWO (22) 1,500 GALLON VARNOLINE STORAGE TANKS
AOC-3	1-STORY BRICK/CONCRETE BLOCK BUILDING (DEMAND ELECTRIC)	AOC-9	1-STORY BUILDING (AMN RENOVATION)
AOC-4	MOTORCYCLE REPAIR SHOP (BASEMENT 2-STORY BRICK BUILDING)	AOC-10	1-STORY BUILDING (JMJ ELECTRICAL)/SUSPECT UST AND FILL/VENT PORTS
AOC-4A	1-STORY BUILDING	AOC-11	FORMER WOHL, INC. CLEANERS AND DYERS (DIRECT AIR)
AOC-5	3-STORY BRICK BUILDING (ART STUDIOS)	AOC-12	FORMER WOHL, INC. CLEANERS AND DYERS (LIBERTY CONTRACTING)
AOC-6	1-STORY BRICK BUILDING (KNOSSOS CUSTOM DESIGN FURNITURE)	AOC-13	5TH STREET SIDEWALK
AOC-6A	2-STORY BRICK BUILDING	AOC-14	FORMER ACCURATE ASSOCIATES RCRA AREA
AOC-7	TWO (2) FORMER GASOLINE STORAGE TANKS	AOC-15	47TH AVENUE SIDEWALK

GRAPHIC SCALE
20 0 10 20 40
(IN FEET)

SOURCE: "ARCHITECTURAL SURVEY" MONTROSE SURVEYING CO., LLP., RICHMOND HILL, N.Y. 4/2/07

Environmental Waste Management Associates, LLC P.O. Box 5430 Parsippany, NJ 07054 Tel: (973) 560-1400	SCALE: AS SHOWN	PROJECT# 205490
	DATE: 6/30/09	
	DRAWN BY: RR/JS CHECKED BY: RA FILE: X:\Drawings\205000\205490\2009 AWE\EWMP\205490R2.dwg	
EXCAVATION PLAN OCA LIC FIFTH STREET MIXED-USE HOUSING 5-20 46TH ROAD LONG ISLAND CITY, NEW YORK		FIGURE# 16



GENERAL NOTES:

1. THIS DRAWING IS PART OF THE REMEDIAL ACTION WORK PLAN (RAWP) SUBMITTAL TO NYSDEC BROWNFIELDS CLEANUP PROGRAM (BCP) FOR THE PLANNED OCA LIC FIFTH STREET MIXED-USE HOUSING PROJECT IN LONG ISLAND CITY, NEW YORK.
2. THE DRAWING DISPLAYS THE BEST KNOWN EXTENT OF LNAPL IN THE LOWER SAND UNIT AT THE SITE, AND DISPLAYS THE LNAPL MONITORING AND REMEDIATION UTILITIES (LNAPL MONITORING AND REMEDIATION (M/R) WELLS AND LNAPL SHEET PILE CAPTURE WALL) THAT ARE TO BE INTEGRATED WITH THE PLANNED CONSTRUCTION FOR CONTINUING USE.
3. SUBSEQUENT TO RAWP RESENTATION, THE LNAPL MONITORING AND REMEDIATION UTILITIES WILL BE DESIGNED IN DETAIL BASED ON ADDITIONAL INCOMING PRE-DESIGN DATA. THE FINAL DESIGN WILL BE INCLUDED IN A REMEDIAL DESIGN WORK PLAN (RDWP).
4. BECAUSE THE DESIGN WILL BE FINALIZED IN THE RDWP, IT SHOULD BE NOTED THAT THE LNAPL MONITORING AND REMEDIATION UTILITIES AS SHOWN ON THIS DRAWING MAY BE SUBJECT TO ADJUSTMENT BASED ON THE DESIGN PROCESS, HOWEVER THE BASIC MONITORING AND REMEDIATION CONCEPTS PRESENTED HEREIN WILL REMAIN THE SAME.

BRIEF DESCRIPTION OF LNAPL ZONE OF CONCERN:

1. THE LNAPL MONITORING AND REMEDIATION UTILIITES DISPLAYED ON THIS DRAWING ARE FOR THE PURPOSE OF ADDRESSING LNAPL BELOW A CONFINING LAYER AND IN A SATURATED ZONE SAND UNIT IN THE NORTH WEST SECTOR OF THE SITE.
2. THE BOTTOM OF THE CONFINING LAYER RANGES FROM ABOUT 13-FEET TO ABOUT 15-FEET BELOW GROUND SURFACE (BGS) IN THE LNAPL IMPACTED ZONE, AND THE LNAPL IS GENERALLY WITHIN THE UPPER 10-FEET OF THE AFOREMENTIONED SAND UNIT. BENEATH THIS SAND UNIT, THERE IS A SILTIER UNIT THAT RANGES ROUGHLY FROM 10-FEET TO 15-FEET IN THICKNESS.
3. GROUNDWATER FLOW THROUGH THE IMPACTED SOIL ZONE BENEATH THE CONFINING LAYER IS FROM EAST TO WEST ACROSS THE SITE.

LNAPL CONTAINMENT, COLLECTION AND RECOVERY UTILITIES:

1. A 120-FOOT LONG SHEET PILE CAPTURE WALL TO DEPTHS OF ABOUT 25-FEET BGS IS PLANNED FOR ONGOING CONTAINMENT OF THE LNAPL AND IS DISPLAYED ON THIS DRAWING. THIS WALL WILL BE INSTALLED AND INTEGRATED INTO THE FINAL FACILITY CONSTRUCTION PLAN AND WILL BE FOR CONTINUING USE.
2. LNAPL COLLECTON AND RECOVERY UTILITIES WILL BE INSTALLED ON THE COLLECTION (EAST) SIDE OF THE CAPTURE WALL AND WILL INCLUDE BUT NOT BE LIMITED TO PIPING, COLLECTION/RECOVERY WELLS, DOWN-WELL SKIMMING SYSTEMS, AND ABOVE-GROUND RECEIVING SYSTEMS. THE COLLECTION AND RECOVERY UTILITIES WILL BE INSTALLED AND INTEGRATED INTO THE FINAL FACILITY CONSTRUCTION PLAN FOR CONTINUING ACCESS AND USE.
3. THE RECOVERED LNAPL WILL BE CHARACTERIZED AND DISPOSED OF OFF-SITE IN ACCORDANCE WITH THE RULES AND REGULATIONS THAT GOVERN THIS ACTIVITY.

LNAPL MONITORING AND REMEDIATION WELLS:

1. THIRTY EIGHT LNAPL M/R WELLS ARE PLANNED FOR THE SITE. EACH OF THE WELLS WILL BE NESTED WITH TWO INDEPENDENT WELL SCREENS AND RISERS. AN UPPER WELL SCREEN WILL BE SET IN THE IMPACTED SAND UNIT BELOW THE CONFINING LAYER. A LOWER WELL SCREEN WILL BE SET IN THE SILTIER UNIT BELOW THE SAND UNIT. THE WELLS WILL BE GROUTED FROM THE BOTTOM OF THE CONFINING LAYER UP TO A TRAFFIC RATED BOLTABLE FLUSH MOUNT COMPLETION AT GROUND SURFACE. .
2. DURING THE DESIGN PROCESS, AN EQUIVALENT BUT SLIGHTLY DIFFERENT WELL CONFIGURATION IN THE FORM OF A WELL COUPLET MAY BE INDICATED. IF SO, THE USE OF WELL COUPLETS IN LIEU OF NESTED WELLS WILL BE PROPOSED TO NYSDEC.
3. TWENTY FOUR LNAPL M/R WELLS WILL BE INSTALLED UPGRADIENT OF THE CAPTURE WALL ON A 25-FOOT ON CENTER GRID PATTERN, AS DISPLAYED ON THIS DRAWING, IN THE PARKING GARAGE AREA OF THE PLANNED FACILITY. EACH WELL WILL BE COMPLETED THROUGH THE PARKING GARAGE SLAB AND INTEGRATED WITH THE CONSTRUCTION FOR CONTINUING ACCESS AND USE.
4. FOUR LNAPL M/R WELLS WILL BE PLACED ON THE DOWNGRADIENT SIDE OF THE CAPTURE WALL, AS DISPLAYED ON THIS DRAWING, FOR THE PURPOSE OF MONITORING THE CONDITIONS IN THAT AREA AND TO PROVIDE CONTINGENT REMEDIATION OPTIONS IF NECESSARY. EACH WELL WILL BE COMPLETED THROUGH THE PARKING GARAGE SLAB AND INTEGRATED WITH THE CONSTRUCTION FOR CONTINUING ACCESS AND USE.
5. TEN LNAPL M/R WELLS WILL BE PLACED AT INTERVALS AROUND THE ENTIRE SITE PERIMETER, AS DISPLAYED ON THIS DRAWING, FOR THE PURPOSE OF MONITORING THE SITE PERIMETER CONDITIONS AND TO PROVIDE CONTINGENT REMEDIATION OPTIONS IF NECESSARY. EACH OF THESE WELLS WILL BE COMPLETED THROUGH THE PERIMETER SIDEWALK AREA OR APPROVIDE ALTERNATE LOCATIONS AND INTEGRATED WITH THE CONSTRUCTION FOR CONTINUING ACCESS AND USE.

LEGEND

MW-01	J.C. BRODERICK & ASSOCIATES MONITORING WELL LOCATION – 2008
GW-1	EEA, INC. MONITORING WELL LOCATION – 2008
MW-13S	EWMA MONITORING WELL LOCATION (PERCHED WATER ZONE) – 2008/2009
MW-3I	EWMA MONITORING WELL LOCATION (SAND AQUIFER) – 2008/2009 WITH MAXIMUM RECORDED LNAPL THICKNESS (FEET) AS OF MARCH 2009
MW-3D	EWMA MONITORING WELL LOCATION (SAND AQUIFER) – 2008
SBE-7/TW-7	EWMA SOIL BORING OR SOIL BORING/TEMPORARY WATER SAMPLE LOCATION – 2008 WITH INDICATORS FOR LNAPL IN SAND AQUIFER
B-6	DEWBERRY GEOTECHNICAL BORING LOCATION
	LNAPL MONITORING/REMEDIATION WELL
NA	SOIL BORING DID NOT PENETRATE THE SAND AQUIFER
S/O	HYDROCARBON SHEEN OR ODOR DETECTED IN SAND AQUIFER
ND	EVIDENCE FOR LNAPL NOT DETECTED
MW-18I	EWMA MONITORING WELL LOCATION (SAND AQUIFER) – 2009 LOCATION APPROXIMATE – NOT SURVEYED
	SHEET PILE CAPTURE WALL
	EXTENT OF LNAPL
	SITE BOUNDARY
	AOC BOUNDARY

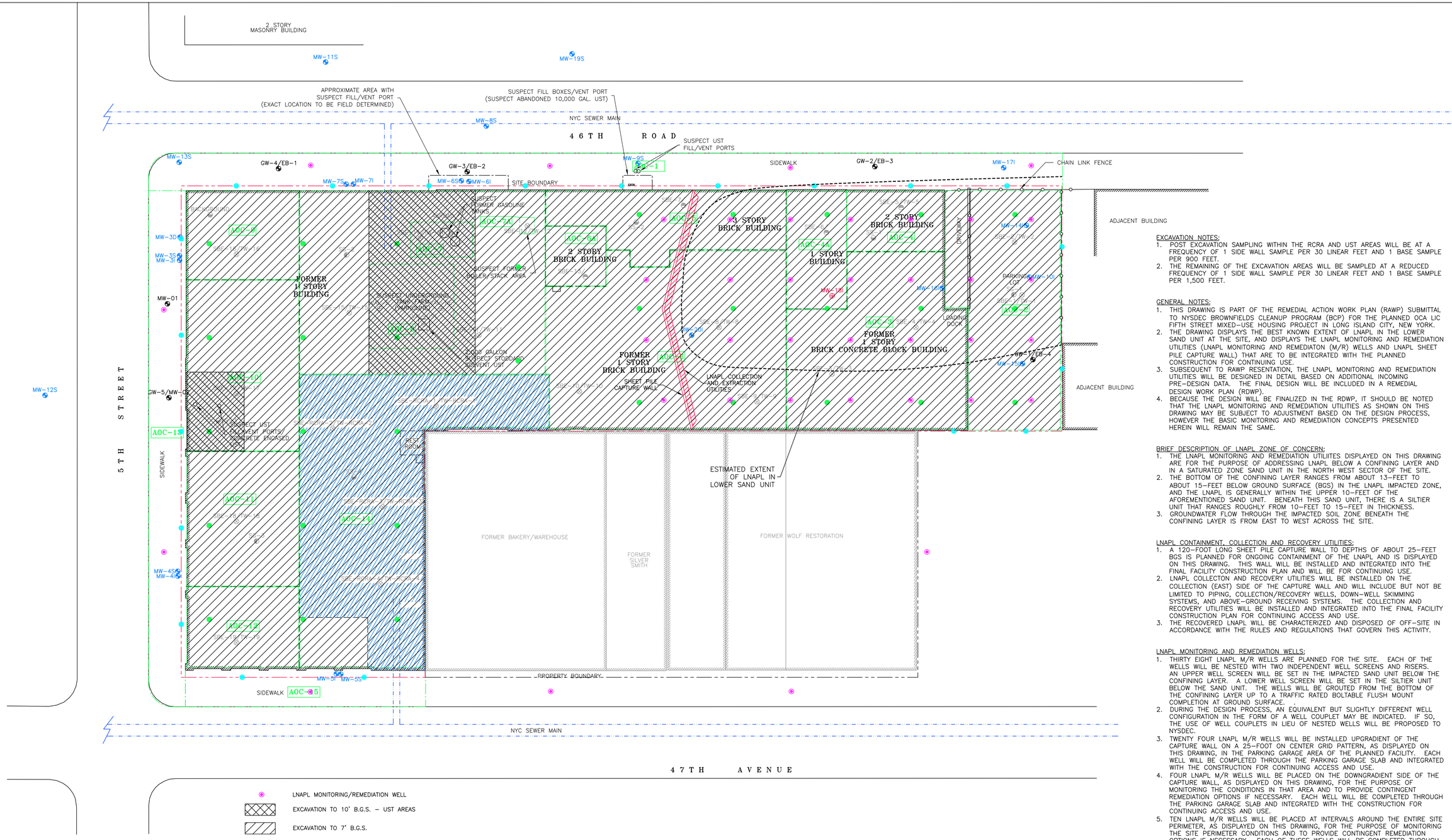
NOTE: LNAPL THICKNESS FROM MEASUREMENTS MADE ON 3/11/08, 5/5/08, 7/17/08 AND 10/13/08
SOURCE: "ARCHITECTURAL SURVEY" MONTROSE SURVEYING CO., LLP., RICHMOND HILL, N.Y. 4/2/07

AREAS OF CONCERN

AOC-1	FORMER 10,000 GALLON #6 FUEL OIL UST/46th ROAD SIDEWALK	AOC-7A	SUSPECT FORMER BOILER/STACK AREA
AOC-2	EASTERN PARKING LOT	AOC-8	SUSPECT TWENTY-TWO (22) 1,500 GALLON VARNOLINE STORAGE TANKS
AOC-3	1-STORY BRICK/CONCRETE BLOCK BUILDING (DEMAND ELECTRIC)	AOC-9	1-STORY BUILDING (AMN RENOVATION)
AOC-4	MOTORCYCLE REPAIR SHOP (BASEMENT 2-STORY BRICK BUILDING)	AOC-10	1-STORY BUILDING (JMJ ELECTRICAL)/SUSPECT UST AND FILL/VENT PORTS
AOC-4A	1-STORY BUILDING	AOC-11	FORMER WOHL, INC. CLEANERS AND DYERS (DIRECT AIR)
AOC-5	3-STORY BRICK BUILDING (ART STUDIOS)	AOC-12	FORMER WOHL, INC. CLEANERS AND DYERS (LIBERTY CONTRACTING)
AOC-6	1-STORY BRICK BUILDING (KNOSSOS CUSTOM DESIGN FURNITURE)	AOC-13	5TH STREET SIDEWALK
AOC-6A	2-STORY BRICK BUILDING	AOC-14	FORMER ACCURATE ASSOCIATES RCRA AREA
AOC-7	TWO (2) FORMER GASOLINE STORAGE TANKS	AOC-15	47TH AVENUE SIDEWALK

GRAPHIC SCALE
20 0 10 20 40
(IN FEET)

Environmental Waste Management Associates, LLC P.O. Box 5430 Parsippany, NJ 07054 Tel: (973) 560-1400	SCALE: AS SHOWN	PROJECT# 205490
	DATE: 6/30/09	
	DRAWN BY: RR/JS CHECKED BY: CV	
	FILE: X:\drawings\205000\205490\205490MT\MWP\205490T17.dwg	
PROPOSED SAND UNIT LNAPL REMEDIATION PLAN OCA LIC FIFTH STREET MIXED-USE HOUSING 5-20 46TH ROAD LONG ISLAND CITY, NEW YORK		FIGURE# 17



EXCAVATION NOTES:

1. POST EXCAVATION SAMPLING WITHIN THE RCRA AND UST AREAS WILL BE AT A FREQUENCY OF 1 SIDE WALL SAMPLE PER 30 LINEAR FEET AND 1 BASE SAMPLE PER 900 FEET.
2. THE REMAINING OF THE EXCAVATION AREAS WILL BE SAMPLED AT A REDUCED FREQUENCY OF 1 SIDE WALL SAMPLE PER 30 LINEAR FEET AND 1 BASE SAMPLE PER 1,500 FEET.

GENERAL NOTES:

1. THIS DRAWING IS PART OF THE REMEDIAL ACTION WORK PLAN (RAWP) SUBMITTAL TO NYSDEC BROWNFIELDS CLEANUP PROGRAM (BCP) FOR THE PLANNED OCA LIC FIFTH STREET MIXED-USE HOUSING PROJECT IN LONG ISLAND CITY, NEW YORK.
2. THE DRAWING DISPLAYS THE BEST KNOWN EXTENT OF LNAPL IN THE LOWER SAND UNIT AT THE SITE, AND DISPLAYS THE LNAPL MONITORING AND REMEDIATION UTILITIES (LNAPL MONITORING AND REMEDIATON (M/R) WELLS AND LNAPL SHEET PILE CAPTURE WALL) THAT ARE TO BE INTEGRATED WITH THE PLANNED CONSTRUCTION FOR CONTINUING USE.
3. SUBSEQUENT TO RAWP RESENTATION, THE LNAPL MONITORING AND REMEDIATION UTILITIES WILL BE DESIGNED IN DETAIL BASED ON ADDITIONAL INCOMING PRE-DESIGN DATA. THE FINAL DESIGN WILL BE INCLUDED IN A REMEDIAL DESIGN WORK PLAN (RDWP).
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BRIEF DESCRIPTION OF LNAPL ZONE OF CONCERN:

1. THE LNAPL MONITORING AND REMEDIATION UTILIITES DISPLAYED ON THIS DRAWING ARE FOR THE PURPOSE OF ADDRESSING LNAPL BELOW A CONFINING LAYER AND IN A SATURATED ZONE SAND UNIT IN THE NORTH WEST SECTOR OF THE SITE.
2. THE BOTTOM OF THE CONFINING LAYER RANGES FROM ABOUT 13-FEET TO ABOUT 15-FEET BELOW GROUND SURFACE (BGS) IN THE LNAPL IMPACTED ZONE, AND THE LNAPL IS GENERALLY WITHIN THE UPPER 10-FEET OF THE AFOREMENTIONED SAND UNIT. BENEATH THIS SAND UNIT, THERE IS A SILTIER UNIT THAT RANGES ROUGHLY FROM 10-FEET TO 15-FEET IN THICKNESS.
3. GROUNDWATER FLOW THROUGH THE IMPACTED SOIL ZONE BENEATH THE CONFINING LAYER IS FROM EAST TO WEST ACROSS THE SITE.

LNAPL CONTAINMENT, COLLECTION AND RECOVERY UTILITIES:

1. A 120-FOOT LONG SHEET PILE CAPTURE WALL TO DEPTHS OF ABOUT 25-FEET BGS IS PLANNED FOR ONGOING CONTAINMENT OF THE LNAPL AND IS DISPLAYED ON THIS DRAWING. THIS WALL WILL BE INSTALLED AND INTEGRATED INTO THE FINAL FACILITY CONSTRUCTION PLAN AND WILL BE FOR CONTINUING USE.
2. LNAPL COLLECTON AND RECOVERY UTILITIES WILL BE INSTALLED ON THE COLLECTION (EAST) SIDE OF THE CAPTURE WALL AND WILL INCLUDE BUT NOT BE LIMITED TO PIPING, COLLECTION/RECOVERY WELLS, DOWN-WELL SKIMMING SYSTEMS, AND ABOVE-GROUND RECEIVING SYSTEMS. THE COLLECTION AND RECOVERY UTILITIES WILL BE INSTALLED AND INTEGRATED INTO THE FINAL FACILITY CONSTRUCTION PLAN FOR CONTINUING ACCESS AND USE.
3. THE RECOVERED LNAPL WILL BE CHARACTERIZED AND DISPOSED OF OFF-SITE IN ACCORDANCE WITH THE RULES AND REGULATIONS THAT GOVERN THIS ACTIVITY.

LNAPL MONITORING AND REMEDIATION WELLS:

1. THIRTY EIGHT LNAPL M/R WELLS ARE PLANNED FOR THE SITE. EACH OF THE WELLS WILL BE NESTED WITH TWO INDEPENDENT WELL SCREENS AND RISERS. AN UPPER WELL SCREEN WILL BE SET IN THE IMPACTED SAND UNIT BELOW THE CONFINING LAYER. A LOWER WELL SCREEN WILL BE SET IN THE SILTIER UNIT BELOW THE SAND UNIT. THE WELLS WILL BE GROUTED FROM THE BOTTOM OF THE CONFINING LAYER UP TO A TRAFFIC RATED BOLTABLE FLUSH MOUNT COMPLETION AT GROUND SURFACE.
2. DURING THE DESIGN PROCESS, AN EQUIVALENT BUT SLIGHTLY DIFFERENT WELL CONFIGURATION IN THE FORM OF A WELL COUPLET MAY BE INDICATED. IF SO, THE USE OF WELL COUPLETS IN LIEU OF NESTED WELLS WILL BE PROPOSED TO NYSDEC.
3. TWENTY FOUR LNAPL M/R WELLS WILL BE INSTALLED UPGRADIENT OF THE CAPTURE WALL ON A 25-FOOT ON CENTER GRID PATTERN, AS DISPLAYED ON THIS DRAWING, IN THE PARKING GARAGE AREA OF THE PLANNED FACILITY. EACH WELL WILL BE COMPLETED THROUGH THE PARKING GARAGE SLAB AND INTEGRATED WITH THE CONSTRUCTION FOR CONTINUING ACCESS AND USE.
4. FOUR LNAPL M/R WELLS WILL BE PLACED ON THE DOWNGRADIENT SIDE OF THE CAPTURE WALL, AS DISPLAYED ON THIS DRAWING, FOR THE PURPOSE OF MONITORING THE CONDITIONS IN THAT AREA AND TO PROVIDE CONTINGENT REMEDIATION OPTIONS IF NECESSARY. EACH WELL WILL BE COMPLETED THROUGH THE PARKING GARAGE SLAB AND INTEGRATED WITH THE CONSTRUCTION FOR CONTINUING ACCESS AND USE.
5. TEN LNAPL M/R WELLS WILL BE PLACED AT INTERVALS AROUND THE ENTIRE SITE PERIMETER, AS DISPLAYED ON THIS DRAWING, FOR THE PURPOSE OF MONITORING THE SITE PERIMETER CONDITIONS AND TO PROVIDE CONTINGENT REMEDIATION OPTIONS IF NECESSARY. EACH OF THESE WELLS WILL BE COMPLETED THROUGH THE PERIMETER SIDEWALK AREA OR APPROVIDE ALTERNATE LOCATIONS AND INTEGRATED WITH THE CONSTRUCTION FOR CONTINUING ACCESS AND USE.

LEGEND

PEB-(X)	PROPOSED POST-EXCAVATION SAMPLE LOCATION (BASE 7'-7.5')
PES-(X)	PROPOSED POST-EXCAVATION SAMPLE LOCATION (SIDEWALL 6.5'-7')
MW-01	J.C. BRODERICK & ASSOCIATES MONITORING WELL LOCATION – 2008
GW-1	EEA, INC. MONITORING WELL LOCATION – 2008
MW-13S	EWMA MONITORING WELL LOCATION (PERCHED WATER ZONE) – 2008/2009
MW-3I	EWMA MONITORING WELL LOCATION (SAND AQUIFER) – 2008/2009 WITH MAXIMUM RECORDED LNAPL THICKNESS (FEET) AS OF MARCH 2009
MW-3D	EWMA MONITORING WELL LOCATION (SAND AQUIFER) – 2008
SBE-7/TW-7	EWMA SOIL BORING OR SOIL BORING/TEMPORARY WATER SAMPLE LOCATION – 2008 WITH INDICATORS FOR LNAPL IN SAND AQUIFER
	LNAPL MONITORING/REMEDIATION WELL
	EXCAVATION TO 10' B.G.S. – UST AREAS
	EXCAVATION TO 7' B.G.S.
MW-18I	EWMA MONITORING WELL LOCATION (SAND AQUIFER) – 2009 LOCATION APPROXIMATE – NOT SURVEYED
VAL-E	TEST PIT SAMPLE LOCATION
SBE-7/TW-7	EWMA GEOPROBE SOIL BORING/TEMPORARY WELL POINT LOCATION – 2008
SBE-6	EWMA HAND AUGER SOIL BORING LOCATION – 2008
SS-1	EWMA SUB-SLAB AIR SAMPLE LOCATION FOR VAPOR INTRUSION INVESTIGATION – 2008
SG-1	EWMA SOIL GAS SAMPLE LOCATION FOR VAPOR INTRUSION INVESTIGATION – 2008
	RCRA ENCAPSULATED AREA
	SHEET PILE CAPTURE WALL
	EXTENT OF LNAPL
	SITE BOUNDARY
	AOC BOUNDARY

AREAS OF CONCERN

AOC-1	FORMER 10,000 GALLON #6 FUEL OIL UST/46th ROAD SIDEWALK	AOC-7A	SUSPECT FORMER BOILER/STACK AREA
AOC-2	EASTERN PARKING LOT	AOC-8	SUSPECT TWENTY-TWO (22) 1,500 GALLON VARNOLINE STORAGE TANKS
AOC-3	1-STORY BRICK/CONCRETE BLOCK BUILDING (DEMAND ELECTRIC)	AOC-9	1-STORY BUILDING (AMN RENOVATION)
AOC-4	MOTORCYCLE REPAIR SHOP (BASEMENT 2-STORY BRICK BUILDING)	AOC-10	1-STORY BUILDING (JMJ ELECTRICAL)/SUSPECT UST AND FILL/VENT PORTS
AOC-4A	1-STORY BUILDING	AOC-11	FORMER WOHL, INC. CLEANERS AND DYERS (DIRECT AIR)
AOC-5	3-STORY BRICK BUILDING (ART STUDIOS)	AOC-12	FORMER WOHL, INC. CLEANERS AND DYERS (LIBERTY CONTRACTING)
AOC-6	1-STORY BRICK BUILDING (KNOSSOS CUSTOM DESIGN FURNITURE)	AOC-13	5TH STREET SIDEWALK
AOC-6A	2-STORY BRICK BUILDING	AOC-14	FORMER ACCURATE ASSOCIATES RCRA AREA
AOC-7	TWO (2) FORMER GASOLINE STORAGE TANKS	AOC-15	47TH AVENUE SIDEWALK

GRAPHIC SCALE
20 0 10 20 40
(IN FEET)

SOURCE: "ARCHITECTURAL SURVEY" MONTROSE SURVEYING CO., LLP., RICHMOND HILL, N.Y. 4/2/07

Environmental Waste Management Associates, LLC P.O. Box 5430 Parsippany, NJ 07054 Tel: (973) 560-1400	SCALE: AS SHOWN	PROJECT# 205490
	DATE: 6/30/09	
	DRAWN BY: RR/JS CHECKED BY: RA	
	TEL: S:\Projects\205000\205490\205490_AWP\AWP_205490.dwg	
COMPREHENSIVE REMEDIATION PLAN OCA LIC FIFTH STREET MIXED-USE HOUSING 5-20 46TH ROAD LONG ISLAND CITY, NEW YORK		FIGURE# 18

Appendix – 1

ENVIRONMENTAL WASTE MANAGEMENT ASSOCIATES, LLC

FISH AND WILDLIFE IMPACT ANALYSIS: STEPS 1 AND 2

FINAL

Submitted to:

EWMA LLC.
51 Everett Drive, Suite A-10
West Windsor, NJ 08550

October 1, 2008

Submitted by:

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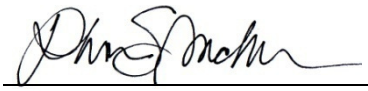
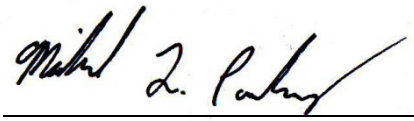
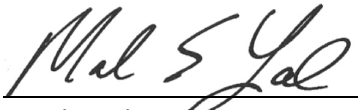


Phoebe McMellon, M.S.



Michael Parkes, M.S.

Directed, reviewed, and approved by:



Mark Laska, Ph.D.

Limitations:

This report has been prepared for the above referenced client according to their implicit instructions, for the particular objectives described in the report. The information contained herein should not be used by anyone else, or for any other purposes.

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EXECUTIVE SUMMARY

Great Ecology and Environments, Inc. (GEE) has been retained by Environmental Waste Management Associates (EWMA) to complete a Fish and Wildlife Impact Analysis (FWIA) for the property located at 5-20 46th Rd. Long Island City, NY. This initial stage of the FWIA has been prepared in accordance with the New York State Department of Environmental Conservation (NYSDEC) Division of Fish and Wildlife's *Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites.* This report contains the information required for the first step of the FWIA: site description. The report outlines the location of the site, fish and wildlife resources onsite and in the surrounding area, observations of contaminated related stress onsite, values associated with fauna and human use, and the identification of applicable fish and wildlife regulatory criteria.

Due to the variety of activities (primarily industrial) at the site, soils and ground water are contaminated with a variety of chemicals including volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) and metals.

GEE conducted an evaluation of the site in August 2008. The site is heavily developed and unlikely to provide habitat for sensitive ecological receptors. Given the urban location, sensitive wildlife are not likely to use the site, however, the site is approximately 300 ft from the East River, a resource of ecological concern.

A pathway analysis was conducted for the site evaluating ground water, stormwater, air, subsurface soil, terrestrial plants and utility lines as potential exposure to ecological receptors. The primary ecological receptor is the East River, which is located approximately 0.25 and 0.15 miles west of the site, respectively. Migration of contaminants through ground water is the only potential complete pathway for exposure to ecological receptors. All other pathways were incomplete. EWMA proposes to remove all contaminated soil and free floating product from the ground water as part of the site remediation. Proposed removal and excavation of the source of the contamination will eliminate the exposure pathways.

At this time, a criteria-specific analysis is not recommended until after the contaminant source is removed and further environmental monitoring of the ground water has occurred.

1.0 INTRODUCTION

Great Ecology and Environments, Inc. (GEE) has been retained by Environmental Waste Management Associates (EWMA) to complete a Fish and Wildlife Impact Analysis (FWIA) for the property (the site) located at 5-20 46th Road, Long Island City, New York (Figure 1). The site has been accepted in the NYSDEC's Brownfield Cleanup Program (BCP) as a "Volunteer" (BCP site C241098) and as part of the remedial investigation, a Fish and Wildlife Impact Analysis is required.

This Fish and Wildlife Impact Analysis (FWIA) has been prepared in accordance with the New York State Department of Environmental Conservation (NYSDEC) Division of Fish and Wildlife's 1994 guidelines, *Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites.* A Fish and Wildlife Impact Analysis can be separated into five (5) steps:

1) The site description, habitat and resource identification and valuation;
2) Contaminant – Specific Impact Assessment, including pathway, criteria and toxicity analysis;
3) Assessment of ecological effects associated with remedial alternatives;
4) Assessment of mitigation options for the protection of ecological resources during and post-remedial activities; and
5) Development of monitoring program during and post-remediation works.

This report contains the information required for the first and second steps of the FWIA. Specifically, the report outlines the location of the site, fish and wildlife resources onsite and in the surrounding area, includes observations of contaminated related stress onsite, values associated with fauna and human use, and the identification of applicable fish and wildlife regulatory criteria in order to assess site-related contamination and to determine remedial objectives. These criteria are used to identify contaminant impacts to fish and wildlife, and to evaluate contaminant-specific and site-specific ecological effects associated with proposed remedial alternatives (NYSDEC, 1994). Furthermore, the Contaminated – Specific Impact Assessment includes a pathway analysis to determine the potential migration pathways that may adversely impact ecological receptors on and in the vicinity of the site.

1.1 Site Description

The objectives FWIA site description are to: (1) identify the fish and wildlife resources within a two-mile radius that presently exist and that might have existed before contaminant introduction, and (2) to provide information necessary for the design of a remedial investigation, including potentially contaminated areas or pathways to fish and wildlife resources. Information obtained during the site description will affect the decision making of a media of concern and potential sampling locations during subsequent steps of the FWIA (NYSDEC, 1994).

GEE visited the site on September 18, 2008, which is located at 5-20 46th Rd. Long Island City, New York (Figure 2). Historically, the entire property, except for a small parking area at the east end, was covered by buildings. As of writing of this report, the site is under construction and the only remnant structure is a concrete slab foundation, exposed to the street on the south, west, and north sides (Photos 1-6). The eastern side of the site borders industrial buildings. Across the street on the western side are a newly constructed condominium and a small open grass recreational field. The rest of the surrounding area is dominated by single-story and two-story commercial and industrial buildings, and intermittent residential dwellings. The East River is the closest water body to the site and is located approximately 0.25 miles to the west, and 0.15 miles to the north (Figure 1).

The subsurface materials beneath the site consists of 10 to 12 feet of urban fill, overlying 1 to 3 feet of clayey peat, which according to the 2008 Remedial Investigation Report (RIR) appears to be continuous across the site. At approximately 15 feet below surface grade (bsg) is a fine to coarse sand, which overlies a dense gray silt. Bedrock is present at depths 32 feet bsg and greater. Ground water was encountered at 7 – 8 feet bsg and again at 10 to 11 feet bsg. The upper water zone is perched above the lower sand water-bearing unit, which is confined by the clayey peat layer. Ground-water flow within the perched unit is towards the north and northeast, where as Ground water flow in the sand aquifer is to west towards the East River.

1.2 Site Maps

The maps included here identify local fish and wildlife resources and potential pathways of contaminant migration affecting fish and wildlife resources.

1.1.1 Topographic Map

A topographic map modified from a U.S Geological Survey Topoquad depicts the site and the surrounding area within a two-mile radius (Figure 2). In accordance with the guidelines, resource data was analyzed to identify major resources that may be affected by site-related contaminants. Resources included in the analysis included the following:

- NYSDEC Significant Habitats as defined by the NYS Natural Heritage Program (NYSDEC, 1990);
- Habitats supporting endangered, threatened, or rare species, or species of special concern;
- Regulated wetlands;
- Wild, scenic and recreational rivers;
- Significant coastal zone areas; and
- Streams and lakes.

No regulated wetlands; wild, scenic, or recreational rivers; significant coastal zones, streams, or lakes were identified within two miles of the site.

The East River, a tidal straight that connects New York Harbor with the Long Island Sound and classified as an Estuarine Cultural Resource, and several New York City Parks, classified as Terrestrial Cultural Resources, are located within this two-mile radius of the site (Figure 2). These resources are considered NYSDEC Significant Coastal and Fish Habitat as defined by the NYS Natural Heritage Program (NYDEC, 1990).

A large portion of Manhattan Island is within the two-mile resource search radius. Tall buildings and large bridges throughout the greater New York City area provide nesting and roosting habitat for the peregrine falcon (*Falco peregrines*), an endangered species. Peregrine falcons have nested within 2 miles of the site and 10 breeding pairs were recorded nesting in New York City during 2007 (Herbert and Herbert, 1965; Louks, 2007). The osprey (*Pandion halaetus*), black skimmer (*Rynchops niger*), roseate tern (*Sterna dougallii dougallii*) and Northern harrier (*Circus cyaneus*) also breed and migrate in the area (Andrele and Carroll, 1988; NYSDEC, 2008).

1.1.2 Covertype Map

Figure 3 is a covertype map of the site and the surrounding area with one-half-mile and two-mile radii. Nearly the entire one-half-mile radius study area consists of medium and high intensity developed urban areas except for the East River. No building or waterfront in the one-half-mile area is known to have documented sightings of endangered or threatened species.

1.1.3 Drainage Map

Stormwater drains located on the streets are the suspected end points for much, if not all, the surface flow from the site (Figure 4).

1.2 Description of Fish and Wildlife Resources

In accordance with the FWIA guidelines, this section describes the fish and wildlife resources found on the site and within a two mile radius.

1.2.1 Fish and Wildlife Resources and Covertypes

No fish or wildlife resources were observed at the site. Covertypes located on the site are typical of urbanized/industrial areas within New York City (Figure 3). This habitat is dominated by urban structures, paved lots, and riprap/artificial shorelines. These indicate high levels of human disturbance. The vast majority of Site contains impervious groundcover, mostly asphalt and concrete.

The upland resources identified as Terrestrial Cultural Resources in Figure 2 are park areas managed by New York City Department of Parks and Recreation Department. These parks generally contain little shrubby vegetation, limiting vegetative structural diversity to mowed

grass and planted trees, many of which are non-native. Typically, tree species planted in these parks include the London plane tree (*Platanus x acerifolia*), northern red oak (*Quercus rubra*), tulip tree (*Liriodendron tulipifera*), linden trees (*Tilia sp.*), and a variety of others.

The East River is the dominant fish and wildlife resource within the study area, hence it is of primary concern. At its nearest point, the river lies approximately 300 ft. northwest of the site, where the river occupies what appears to be an abandoned relict shipping slip.

The average salinity of the East River is 23 ppt and turbidity ranges from 10 to 103 ntu (Riverkeeper, 2008). Additionally, dissolved oxygen ranges from 54-81% and depth ranges between 26 and 55 ft near the site (National Oceanic and Atmospheric Administration, 2008).

1.2.2 Fauna Expected Within Each Covertype and Aquatic Habitat

The fauna expected within the nearby terrestrial covertypes is typical of New York City parks and urban lots. Bird species found in these covertypes are numerous and vary seasonally. The most common bird species expected within these covertypes include:

House sparrow	(*Passer domesticus*)
Rock dove	(*Columba livia*)
Mourning dove	(*Zenaida macroura*)
White-throated sparrow	(*Zonotrichia atricapilla*)
European starling	(*Sturnus vulgaris*)
Downy woodpecker	(*Picoides pubescens*)
American crow	(*Corvus brachyrynchos*)
American robin	(*Turdus migratorius*)

The NYS Natural Heritage Program database indicates that the peregrine falcon (*Falco peregrinus*), a NYS endangered species, may be within the vicinity of the site. However, the site does not provide suitable habitat for peregrine falcon nesting and provides minimal habitat for foraging. Peregrine falcons typically nest on large structures that are between 50 – 200 ft tall, which are absent from the site.

Mammal species expected to be present in these covertypes include:

Eastern gray squirrel	(*Sciurus carlinensis*)
Norway rat	(Rattus norvegicus)
Eastern chipmunk	(*Tamias umbrinus*)
Common raccoon	(*Procyon lotor*)

See Table 1 for a list of typical fauna of urban lots in the New York City region.

The fauna expected and referenced to be found within the aquatic resources surrounding the study area includes a wide variety of phytoplankton, benthic marine algae, zooplankton,

benthic invertebrates (gastropods, bivales, molluscs, amphipods, crustaceans), including the eastern oyster (*Crassostrea virginica*), blue crab (*Callinectes sapidus*), green crab (*Carcinus maenas*); rock crab (*Hemigrapsus edwardsi*); five species of turtles (four of which are considered either threatened or endangered under the Endangered Species Act), and a variety of vertebrate fish species, which include, but are not limited to:

Alewife	(*Alosa pseudoharengus*)
American eel	(*Anguilla rostrata*)
American shad	(*Alosa sapidissima*)
Atlantic herring	(*Clupea harengus*)
Atlantic silverside	(*Menidia menidia*)
Atlantic tomcod	(*Microgadus tomcod*)
Bay anchovy	(*Anchoa mitchilli*)
Bluefish	(*Pomatomus saltatrix*)
Butterfish	(*Peprilus triacanthus*)
Grubby	(*Myoxocephalus aenaeus*)
Mummichog	(*Fundulus heteroclitus*)
Northern searobin	(*Prionotus carolinus*)
Red Hake	(*Urophycis chuss*)
Scup	(*Stenotomus chrysops*)
Shortnose sturgeon*	(*Acipenser brevirostrum*)
Striped bass	(*Morone saxatilis*)
Summer flounder	(*Paralichthys dentatus*)
White perch	(*Morone americana*)
Winter flounder	(*Pseudopleuronectes americanus*)

* Listed under the Endangered Species Act (ESA) or classified as a species of concern.

The East River Long provides an important migratory pathway between New York Harbor and the Long Island Sound and many of the vertebrate species cited above do not inhabit the East River year round.

Most of the shoreline of the East River near the site consists of hardened break walls and riprap, which support intertidal organisms that tolerate high disturbance regimes. Wading birds typically found in the New York City region may also use the intertidal habitat located nearby the site. See Table 2 for a list of typical species that commonly utilize riprap shorelines.

1.2.3 Observations of Stress

During the site investigation, no visible signs of contaminant stress, such as stained soils, leachate seeps, exposed waste, impaired vegetation or wildlife. However, the site is an under

construction and signs of contaminant stress may have been covered or removed during these activities.

1.3 Description of Fish and Wildlife Resource Value

1.3.1 Value of Habitat to Associated Fauna

The wildlife species identified in Section 1.2.2, and listed in Tables 1 and 2, are the same species likely to be found within 0.5 miles of the site's perimeter. The area surrounding the site is mixed commercial and residential use, and provides foraging, breeding and roosting habitat for those bird, mammal and invertebrate species adapted to living adjacent to areas of high human disturbance. However, due to the historic and current land use, the wildlife habitat value of the area surrounding the site is low. The site itself adds little habitat value to the area, consisting mostly of impervious materials. The terrestrial area within a half-mile surrounding the site is also low-quality habitat.

As mentioned previously, the East River is located approximately 0.25 miles west of the site, and approximately 0.15 miles northwest of the site, and as a tidal straight between New York Harbor and the Long Island Sound, provides habitat for various species. Common fish species within the East River include white perch (*Morone americana*), striped bass (*Morone saxatilis*), bluefish (*Pomatomus saltatrix*), and winter flounder (*Pleuronectes americanus*). A list of common species known to occur in the East River and along its shore is in Table 2.

The shoreline of the river is significantly altered from its natural state. Steep concrete walls and large boulders line the river, limiting potential use by shorebirds.

1.3.2 Value of Resources to Humans

The value of these fish and wildlife resources toward human use within 0.5 miles is also low. Little wildlife viewing opportunities or potential for such exists near the site. Hunting is not a viable option in an urban setting. There are no recreational rivers, scenic rivers, lakes, wetlands, parks, NYSDEC significant habitats or significant coastal zones within 0.5 miles of the site.

Limited fishing opportunities may exist close to the site. However, the nearby East River and surrounding areas provide recreational fisheries and secondary contact recreation, such as boating. The East River is classified as Class I under 6 New York Codes, Rules, and Regulations (NYCRR) Part 701. According to 6 NYCRR Part 701, the best usages of Class I waters are "secondary contact recreation and fishing. These waters shall be suitable for fish propagation and survival."

1.4 Identification of Applicable Fish and Wildlife Regulatory Criteria

The following regulatory contaminant-specific and site-specific criteria may be applicable to the remediation of fish and wildlife resources at the site:

- Ground water and Surface Water Quality
  - 6 NYCRR Part 701;
  - NYSDEC Division of Water Technical and Operational Guidance Series [TOGS] 1.1.1;
  - U.S. Environmental Protection Agency (USEPA) Region 5, RCRA Ecological Screening Levels; and
  - Oak Ridge National Laboratory Preliminary Remediation Goals for Ecological Endpoints.
- Soil Quality Criteria
  - Determination of Soil Cleanup Objectives and Cleanup Levels (TAGM 4046);
  - USEPA Region 5, RCRA Ecological Screening Levels; and
  - Toxicological Benchmarks for Wildlife: 1996 Revision.
- Pollution of Waters
  - ECL Article 11 Title 5;
  - 6 NYCRR Part 608; and
  - Clean Water Act (Title 33 Chapter 26 subchapter IV § 1342.

2.0 CONTAMINANT-SPECIFIC IMPACT ASSESSMENT

The objective of contaminant-specific impact assessment is to determine the impacts of site-related contaminants on fish and wildlife resources. The impacts are dependent on a number of factors such as the type of contaminant, the concentrations of contaminants in the media, exposure of biota to the contaminants, and the toxic effects of the exposures (NYSDEC 1994).

The development of the contaminant-specific impact assessment follows a stepwise process. This section presents three steps of increasing complexity (Pathway Analysis, Criteria-Specific Analysis, and Analysis of Toxic Effects) that assess the impacts of site-related contaminants on fish and wildlife. Each step relies on progressively more specific information and less conservative assumptions. Whether the impact assessment progresses through additional steps will depend on the conclusions reached at each step regarding the degree of impact. If minimal impact can be demonstrated at a specific step in the assessment, additional steps need not be undertaken.

2.1 Pathway Analysis

Four potential pathways for exposure are associated with the site: ground water, stormwater, subsurface soil and air.

For an exposure pathway to exist, five elements must be present:

1. A source of contamination;
2. Transport through an environmental medium;
3. A point of exposure;
4. A plausible manner (route) for the contaminant to get into the organism; and
5. An identifiable exposed population.

Exposure pathways are characterized as complete, incomplete, or eliminated. A completed pathway exists when the criteria for all elements of an exposure pathway are fulfilled. An incomplete pathway exists when any one of the five elements of an exposure pathway is missing, and therefore, incomplete, but may potentially change with changing conditions on the site and/or new data becomes available. Pathways can be eliminated when any one of the existing five elements are removed. For a receptor population to be exposed to a contaminant, the exposure pathway must be complete.

The exposure pathways considered for the site are summarized in Table 3.

2.1.1 Complete Pathways

Ground Water (Perched Aquifer)

Ground-water flow contours show that ground water flow is towards the north and west of the site (Figure 5). The presence of a light non-aqueous phase liquid (LNAPL) plume, and associated volatile and semi-volatile organic compounds (VOCs and SVOCs), and heavy metals in the perched water-table, above the NYSDEC Ambient Water Quality Standards and Guideline Values (AWQS), represents a complete pathway through ground water migration towards the East River, located 0.25 miles west and 0.15 miles north-northwest of the site. Summary tables of ground water sampling results are included in Appendix D.

Aquatic organisms and coastal wildlife can be exposed to contaminants leaching into the East River through ingestion of contaminated water and organisms through the food chain, and through dermal contact. Section 1.2 cites the many aquatic organisms and wildlife that inhabit the East River. Based on the above conditions, ground water represents a complete pathway for exposure. Offsite monitoring wells located to the north, west and south of the property (MW-11S, MW-12S and MW-5S, respectively) indicate that the contamination has not migrated offsite.

Proposed remedial works includes removal of contaminated soils and removal of LNAPL plume (free floating product). Successful removal of the LNAPL contaminant will eliminate this exposure pathway. This is discussed further in Section 2.1.3.

2.1.2 Incomplete Pathways

Air

The RIR documents the presence of VOCs, SVOCs and heavy metals on site, exposure of birds and terrestrial wildlife to compromised air represents an incomplete pathway due to the lack of identifiable bird and wildlife population on site. In addition, the site is currently capped by concrete, and therefore, there is not a plausible route for the contaminants to be inhaled by wildlife that may be present on the site.

Ground Water (Sand Aquifer)

Ground water flow contours show that ground water flow is to the west towards the East River (Figure 5). Free-floating product (LNAPL), along with associated VOCs and SVOCs were detected above the NYSDEC Ambient Water Quality Standards and Guideline Values (AWQS) for ground water in one deep well (MW-10I, TW-1), penetrating the sand aquifer, which was located on the eastern portion of the property. In addition, VOCs, SVOCs and heavy metals were also detected deep wells along the northern (MW_7I and MW-6I) and western property boundary (MW-3D, MW-3I, MW-4I) above the ground water AWQS. Summary tables of ground water sampling results are included in Appendix D.

In the RIR, EWMA concluded that the contamination in the sand aquifer is from an offsite contaminant source, which was determined by the presence of a one to three foot confining layer of clayey peat that extends across the entire site, the difference in the hydraulic heads between the perched and sand aquifers, and the distribution of contaminants on the site. Based on information and data presented by EWMA, at this time GEE has not considered the sand aquifer in the pathway analysis. Should future data indicate that migration of contaminants from the perched aquifer into the sand aquifer is occurring then this pathway would require further evaluation.

Stormwater

Stormwater runoff is likely discharged to the NYC sewer system, which in turn, may be discharged to the East River. Plans provided by EWMA show two NYC sewer mains that historically were connected to the site. GEE submitted a Freedom of Information Act (FOIA) request to the New York City Department of Environmental Protection (NYCDEP) for the site stormwater plans for the area. The NYDEP has advised that collected stormwater in the vicinity of the site is discharged to the Bowery Bay Water Treatment Plant (pers.comm., NYCDEP Queens Local Office). The site is currently capped with a concrete surface, and therefore, stormwater is not in contact with subsurface contaminants. Stormwater represents an an incomplete pathway because of the lack of a point of exposure, a viable route of exposure, and identifiable population.

Subsurface Soil

Contaminated subsurface soil is present on site and is currently capped by an impermeable cement surface. If the soil is exposed in the future, it will provide a complete pathway for exposure to terrestrial wildlife, invertebrates and migratory birds that may frequent the site. At present, soil invertebrates, burrowing mammalian species and migratory birds were not observed on the site, and, due to the urban environment, it is unlikely that the site supports a significant wildlife population. Therefore, this is an incomplete pathway because of the lack of a point of exposure, a route of exposure and an identifiable population.

Proposed remediation of the site includes removal of all contaminated soil to a depth of 7-8 feet. Removal of the contaminated soil will preclude further contamination of the ground water.

Terrestrial Vegetation

Due to the isolated gravel areas of the site, small amounts of vegetative cover occur on the site in the form of weeds and grasses. Uptake of metals and other contaminants by vegetation is possible and therefore, can provide a complete pathway for exposure. However, due to the high foot and vehicular traffic, and lack of evidence of the presence of wildlife habitat on site, it is highly unlikely that any soil invertebrates and/or burrowing mammalian species utilize the site, reducing the possibility of terrestrial receptors. Therefore, this is an incomplete pathway primarily due to the lack of an identifiable population for exposure.

Utility Services

Utility service lines can act as pathways for migration of contaminated ground water and air along pipe structures and more permeable gravel-lined excavation ditches. Although the RIR states that sewer lines have been disconnected and flow trenches and pits have been filled in with concrete, depending on the depth of the sewer lines, there is the potential that free-floating product and VOCs may migrate along sewer lines. If utility lines are discharged directly to the East River these pathways can represent a complete pathway of exposure of contaminants to aquatic organisms. Through a Freedom of Information Act (FOIA) request to the New York City Department of Environmental (NYCDEP) regarding the discharge of stormwater and sewer utility lines from the site, GEE received confirmation that all service lines are connected and discharged to the Bowery Bay Water Treatment Plant (pers. comm., NYCDEP, Queens Local Office). Therefore, this is an incomplete pathway of exposure.

2.1.3 Eliminated Pathways

Perched Aquifer

The proposed remediation for the site includes the excavation and removal of contaminated sources, including impacted soils and free product (LNAPL). The proposed excavation will extend to the ground water table at a depth of 7 – 8 feet bsg across the entire property. Where determined to be necessary, deeper excavation may be performed to remove additional contamination. Impacted soils will be characterized and disposed of at an appropriate offsite facility.

Removing the soil may eliminate the source of the contamination, but not the presence of free-floating product (LNAPL) in the shallow ground water. From a regulatory perspective, the product may be considered a new "source" of contamination, even though removal of contaminated sediment is likely to lead to a long-term reduction in overall ground water concentrations. As mentioned previously, EWMA proposes to remove all contaminated soil and all free-floating product via vacuum extraction and/or other methodology (i.e., skimmer pump). Removal of the product in the perched aquifer will eliminate this pathway.

Continued ground water monitoring of the shallow ground water wells, after soil has been excavated, and re-evaluation of exposure pathways will confirm that the source has been eliminated, offsite migration is not occurring, and the pathway is incomplete.

3.0 CONCLUSION

GEE conducted an evaluation of the site in August 2008. The site is heavily developed and unlikely to provide habitat for sensitive ecological receptors. However, the site is approximately 300 ft from the East River, a resource of ecological concern.

An analysis conducted for the site considered the following exposure pathways: air, ground water, stormwater, subsurface soils, terrestrial vegetation and utility services. Ground water represented the only potential complete pathway for exposure to the East River, the ecological receptor of concern. All other pathways were incomplete.

Proposed removal and excavation of the source of the contamination (i.e., contaminated subsurface soil and LNAPL in the perched ground water) will eliminate the ground water exposure pathway. Post-remediation/removal environmental monitoring of the ground water should be undertaken to ensure that pathways have been eliminated. At this time, a criteria-specific analysis is not recommended until after the contaminant source is removed and further environmental monitoring of the ground water has occurred.

CHAPTER 3. REFERENCES

Andrele, R. F. and J. R. Carroll, eds. The Atlas of Breeding Birds in New York State. Cornell University Press, Ithaca, New York.

Herbert, R. and K. Herbert. 1965. Behavior of peregrine falcons in the New York City region. Auk 82: 62-94.

Louks, B. A. 2007. New York State Peregrine Falcons. New York State Department of Environmental Conservation: Endangered Species Unit.

National Oceanic and Atmospheric Administration. 2008. Chart 12327, April 2008 edition. http://www.charts.noaa.gov/OnLineViewer/12327.shtml Accessed September 2008.

New York State Department of Environmental Conservation, New York Natural Heritage Program. 1990. Ecological Communities of New York State, Latham, NY.

New York State Department of Environmental Conservation, Division of Fish and Wildlife. 1994. Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites (FWIA), Albany, NY.

New York State Department of Environmental Conservation, Division of Fish and Wildlife. 2008. List of Endangered, Threatened, and Special Concern Fish and Wildlife Species of New York State. http://www.dec.ny.gov/animals/7494.html. Accessed September 2008.

New York State Department of Environmental Conservation, Division of Fish and Wildlife. 2008. Peregrine Falcon. http://www.dec.ny.gov/animals/7088.html. Accessed September 2008.

New York State Department of Environmental Conservation, Division of Fish and Wildlife. 2008. Osprey. http://www.dec.ny.gov/animals/7059.html. Accessed September 2008.

Riverkeeper. Basic Site Data: East River at Roosevelt Island. 2008. http://www.riverkeeper.org/special/swimmableriver/data.php?id=ER2. Accessed September 2008

U. S. Geological Survey. 1999. National Landcover 30 m Dataset. http://www.nyc.gov/html/dep/html/news/falcon.shtml

Appendix A: Figures

Figure 1. Site Location (Source: Google Earth, 2008).

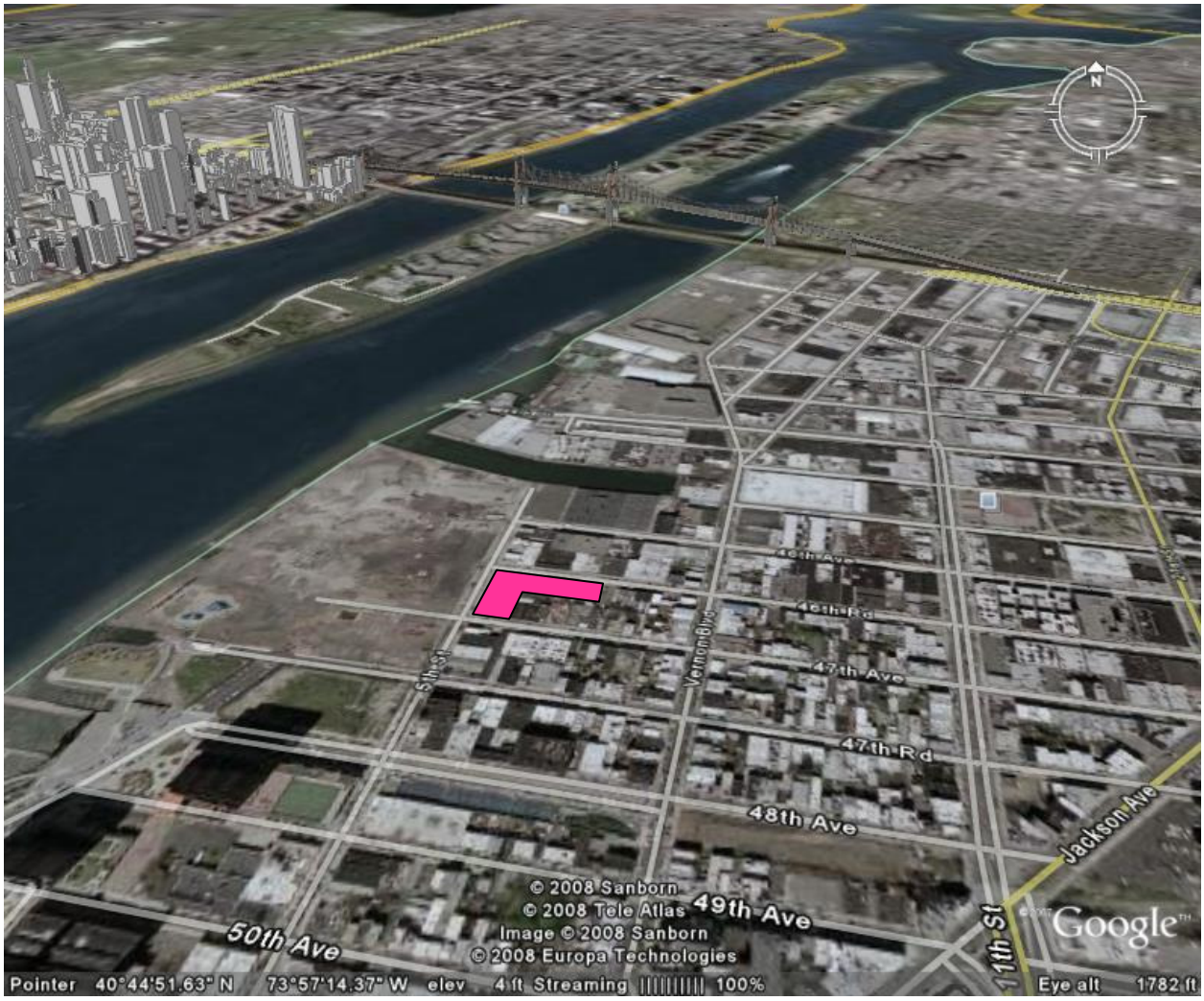


Figure 2. Topographic map of the site within ½ mile and 2 mile radii.

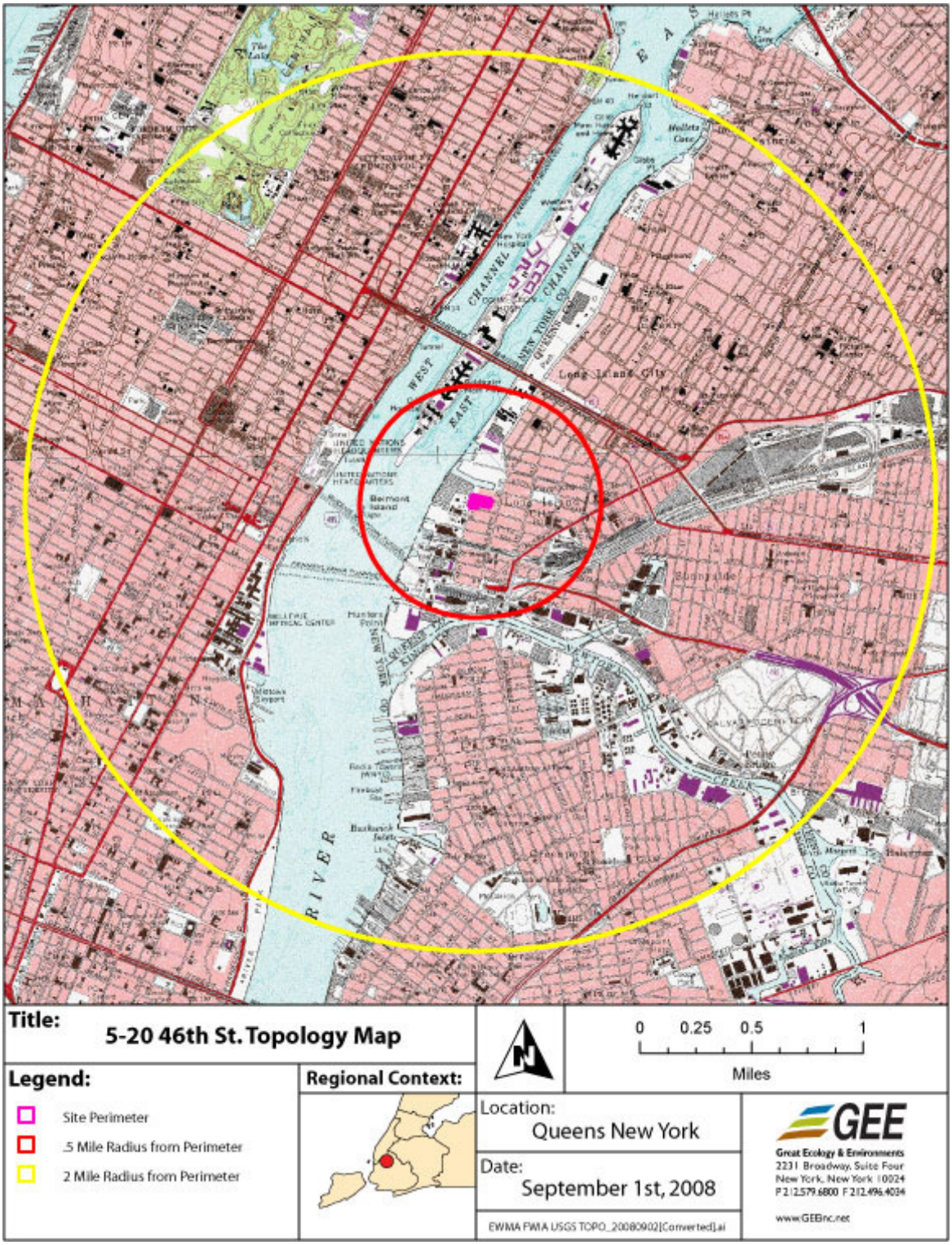


Figure 3: NYSDEC Significant Habitats as designated by the NYS Natural Heritage Program.

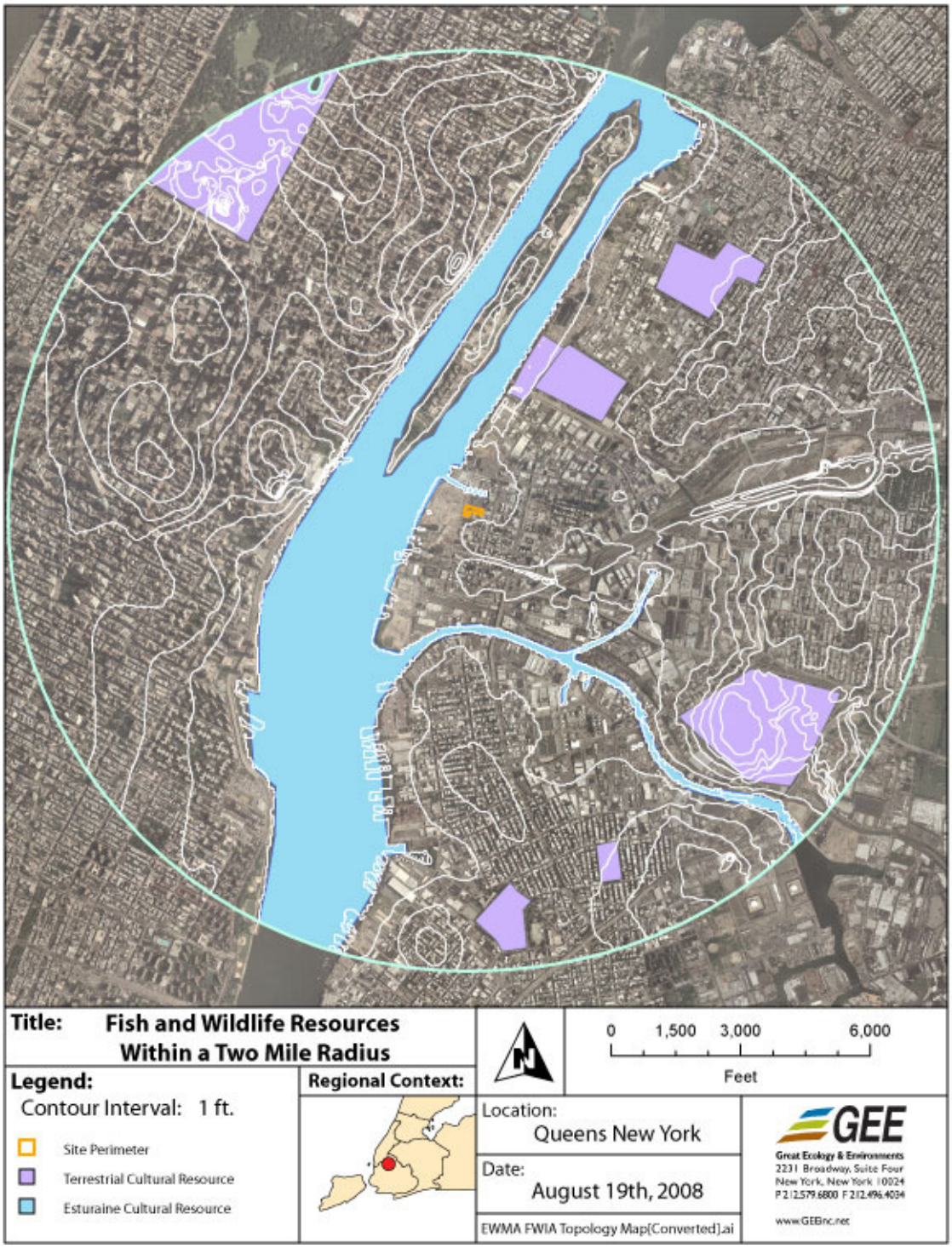


Figure 4. Land use and landcover types surrounding 5-20 46th Road, Long Island City, New York (U.S. Geological Survey, 1999).

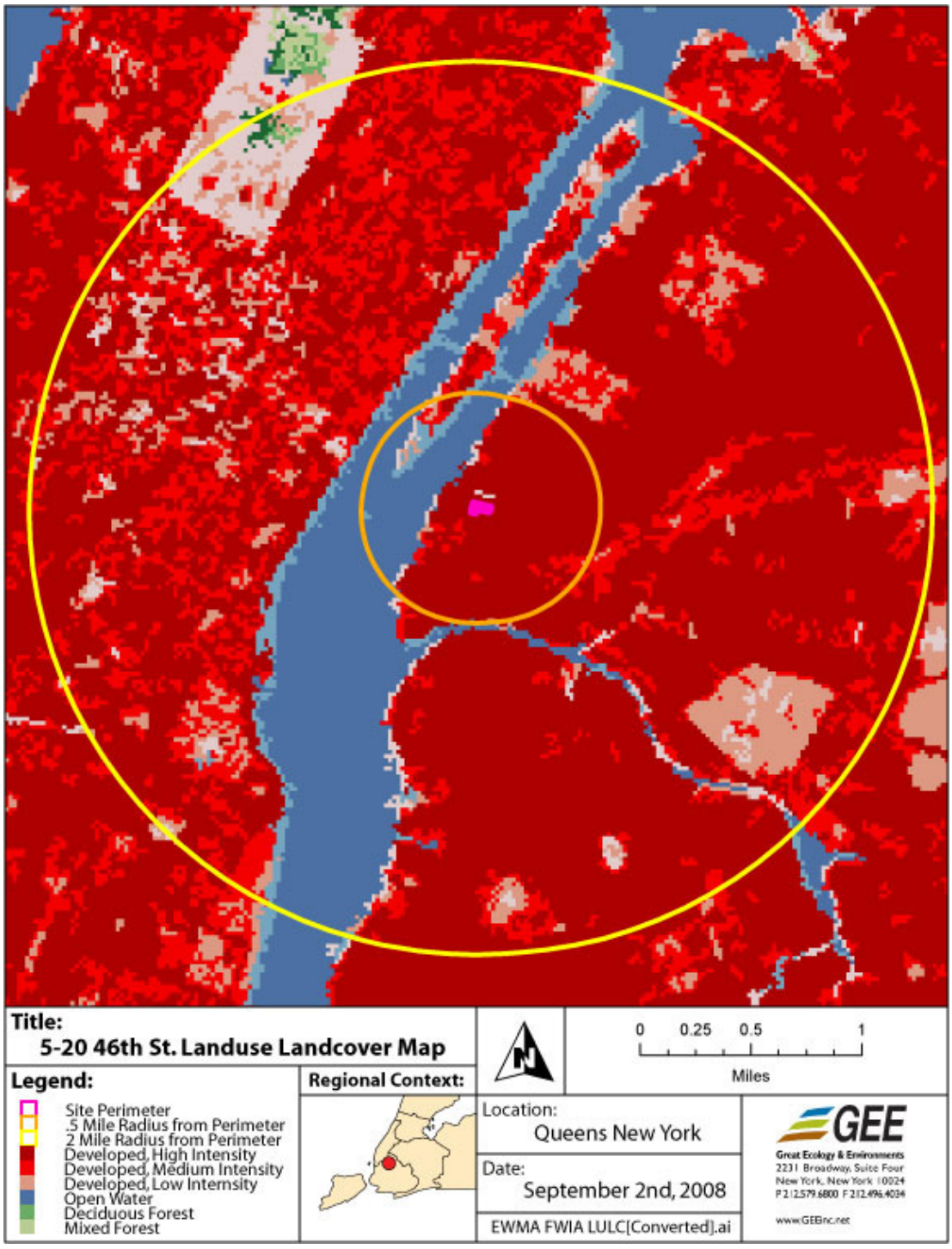


Figure 5. Ground-water Flow in Perched Aquifer (Source: EWMA, 2008)

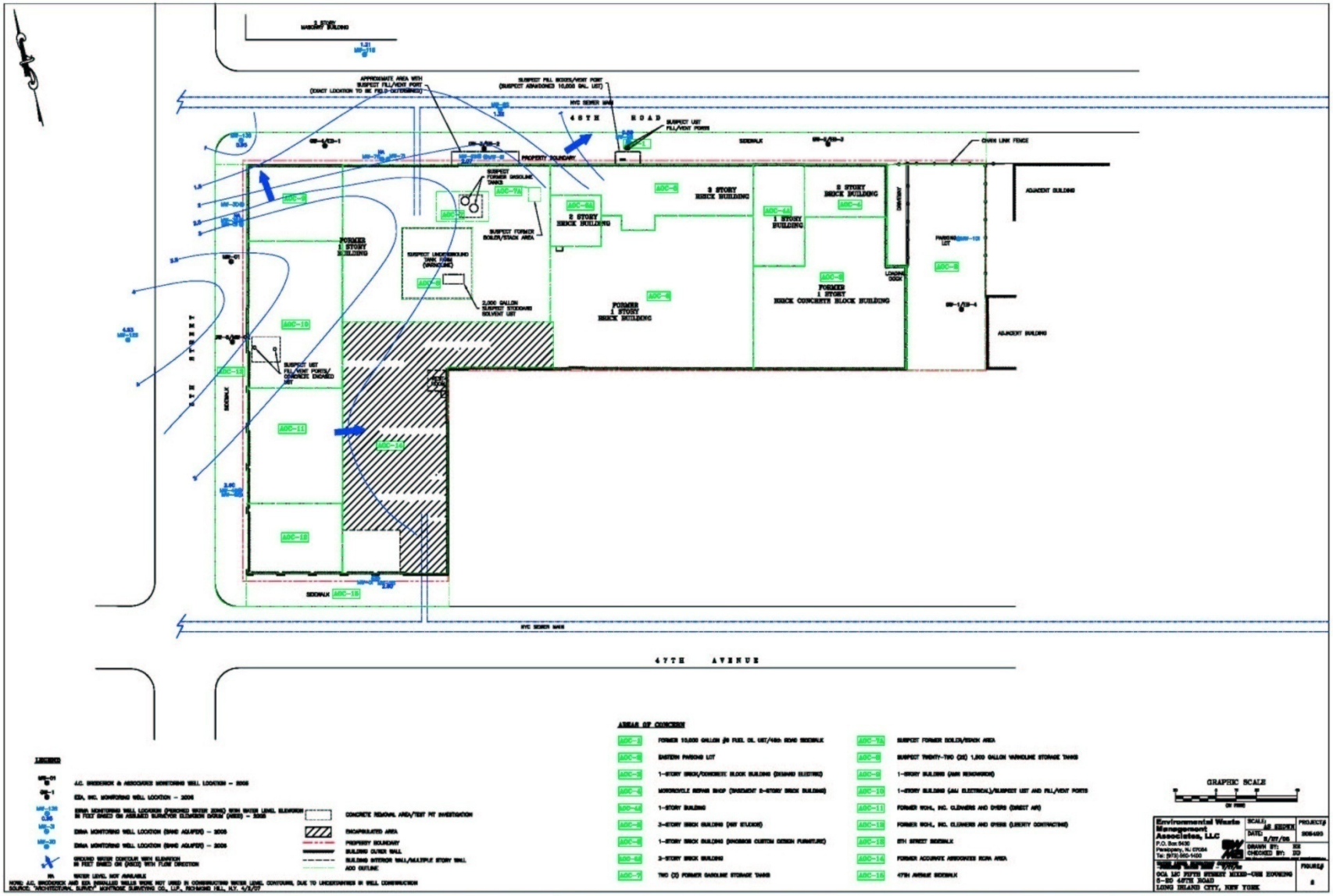
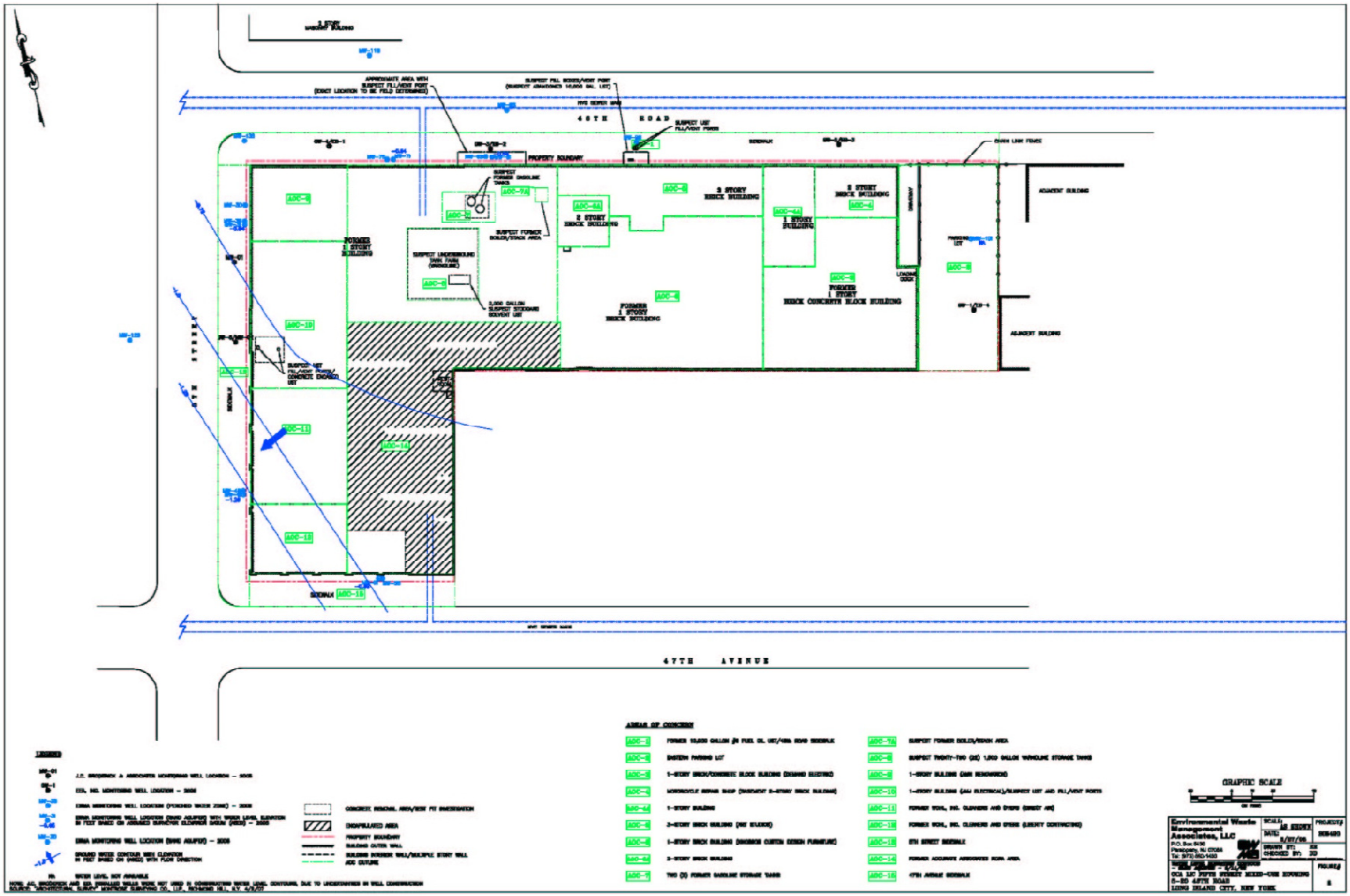


Figure 6. Ground-water Flow in Sand Aquifer (Source: EWMA, 2008)



Appendix B: Tables

Table 1. Typical species found in urban habitats and residential areas.

Common Name	Latin Name	Common Name	Latin Name
Avian			
American crow	Corvus brachyrhynchos	Northern flicker	Colaptes auratus
American goldfinch	Cardeulis tristis	Northern mockingbird	Mimus polyglottos
American kestrel	Falco sparverius	Northern oriole	Icterus galbula
American robin	Turdus migratorius	Osprey	Pandion haliaetus
Barn swallow	Hirundo rustica	Red-tailed hawk	Buteo jamaicensis
Black-capped chickadee	Parus atricapitus	Ring-necked pheasant	Phasianus colchicus
Bluejay	Cyanocitta cristata	Red-winged blackbird	Agelaius phoeniceus
Brown headed cowbird	Molothrus ater	Rock dove	Columba livia
Cedar waxwing	Bombycilla cedrorum	Song sparrow	Melospiza melodia
Chimney swift	Chaetura petagica	Striped skunk	Mephitis mephitis
Common grackle	Quisalus quiscula	Tufted titmouse	Parus bicolor
Common night hawk	Chordeiles minor	**Mammalian**	
Common yellowthroat	Geothlypis trichas	Big brown bat	Eptesicus fuscus
Downy woodpecker	Picoides pubescens	Eastern cottontail	Sylvilagus floridanus
Eastern phoebe	Sayomis phoebe	Gray squirrel	Sciurus carolinensis
Eastern screech owl	Otus asio	House mouse	Mus musculus
European starling	Sturnus vulgaris	Norway rat	Rattus norvegicus
Fish crow	Corvus ossifragus	Raccoon	Procyon lotor
Gray catbird	Dumetella carolinensis	Virginia opossum	Didelphis virginana
House finch	Carpodacus mexicanus	**Amphibian**	
House sparrow	Passer domesticus		
House wren	Troglodytes aedon	**Reptilian**	
Killdeer	Charadrius vociferus	Eastern garter snake	Thamnophis srtalis
Mourning dove	Zenaida macroura		
Northern cardinal	Cardinalis cardinalis		

Table 2. Common species utilizing riprap shorelines and the East River Estuary.

Common Name	Latin Name	Common Name	Latin Name
Avian		**Aquatic**	
Black-crowned night heron	Nycticorax nycticorax	Alewife	Alosa pseudoharengus
Canada goose	Branta canadensis	American eel	Anguilla rostrata
Double-crested cormorant	Phalocrocorax auritus	American shad	Alosa sapidissima
Great black backed gull	Larus marinus	Atlantic mackerel	Scomber scrombus
Great blue heron	Ardea herodius	Atlantic menhaden	Brevoortia tryannus
Great egret	Ardea alba	Atlantic ribbed mussel	Geukensia demissa
Herring gull	Larus argentatus	Atlantic sturgeon	Acipenser oxyrinchus
Laughing gull	Larus atricilla	Blue crab	Callinectes sapidus
Osprey	Pandion halieatus	Bluefish	Pomatomus aaltaris
Ring-billed gull	Larus delawarensis	Common mussel	Mytilus edulis
Snowy egret	Egretta thula	Fluke	Clupea harengus
Yellow-crowned night heron	Nycticorax violaceus	Horshoe crab	Limulus polyphemus
Mallard	Anas platyryncha	Japanese shore crab	Hemigrapsus sanguineus
Black skimmer	Rynchops nigra	Little gray barnacle	Chthamalus fragilis
Brant	Branta bernicla hrota	Northern rock barnacle	Balanus ballanoides
American wigeon	Anas americana	Scup	Stenatomus chrysops
Mute swan	Cygnus olor	Striped bass	Morone saxatilis
Bufflehead	Bucephata albeola	White perch	Morone americana
Common tern	Sterna hirundo	Winter flounder	Pleuronectes americanus
Least tern	Sterna antillarum	**Mammalian**	
Forster's tern	Sterna fosteri	Norway rat	Rattus norvegicus
Belted kingfisher	Coryle alcyon	Raccoon	Procyon lotor
Sharp-tailed sparrow	Ammospiza caudaculus	Virginia opossum	Didelphis virginana
Marsh wren	Cistothorus palustris		

Table 3. Pathways Analysis.

PATHWAY NAME	PRIMARY CONTAMINANTS OF CONCERN	EXPOSURE PATHWAY ELEMENTS					COMPLETE	INCOMPLETE	COMMENTS
		ENVIRONMENTAL MEDIA	POINT OF EXPOSURE	ROUTE OF EXPOSURE	EXPOSED POPULATION	TIME			
Air	VOCs SVOCs	Air	On-site	Inhalation	Birds and terrestrial wildlife	Present		√	If site remains capped, this pathway is incomplete. If contaminated soil is exposed in the pathway will be complete. If soil is removed or remediated then the pathway will be eliminated.
Ground Water	LNAPL VOCs SVOCs Heavy Metals	Ground Water	East River	Ingestion Dermal Contact	Aquatic ecosystem and coastal wildlife	Present	√		Successful removal and remediation of contaminated subsurface soil and ground water, particularly LNAPL, will be undertaken by EWMA, therefore, it is expected that this pathway will be eliminated.
Stormwater	LNAPL VOCs SVOCs Heavy Metals	Stormwater	East River	Ingestion Dermal Contact	Aquatic ecosystem and coastal wildlife	Present		√	The site is covered with impermeable surface, therefore, surface runoff is unlikely to come in contact with contaminated soil. Stormwater is not discharged into the East River, therefore,the pathway is eliminated.
Subsurface Soil	LNAPL Heavy Metals	Subsurface Soil	On-site	Ingestion Inhalation Dermal	Terrestrial wildlife and migratory birds	Present		√	If the site remains capped with an impermeable surface then pathway is incomplete. If soil is removed or remediated then the pathway will be eliminated.
Terrestrial Vegetation	Heavy Metals VOCs SVOCs	Subsurface Soil	On-site	Ingestion	Terrestrial wildlife and migratory birds	Present		√	If site remains capped then vegetation is unlikely to grow and pathway is eliminated.
Utility Lines	LNAPL Heavy Metals VOCs SVOCs	Ground water Stormwater Air	On-site Off-site	Ingestion Inhalation Dermal Contact	Aquatic ecosystem and coastal wildlife	Present		√	Stormwater and combined sewer outfall do not discharge to East River; all lines eventually discharge to Bowery Bay Water Treatment Plant.

Appendix C: Site Photos

Photo 1.

Photo 2.

Photo 3.

Photo 4.

Photo 5.

Photo 6.

Appendix D: Ground-water Sampling Results

OCA LIC
5th St. Mixed Use Housing
EWMA Project # 205490

Table 5: Ground-Water Sampling Results for the Sand Aquifer/Intermediate-Deep Wells
Volatile Organic Compounds and Cyanide

Sample ID	NYS	TW-1		FD-5 (TW-1)		TW-10		TW-14		FD-4 (TW-14)		TW-RCRA-3		MW-3I		MW-3D		MW-04-I		MW-05-I		MW-6I		MW-07I	
Lab Sample ID	TOGS	Z1679-02		Z1679-03		Z1679-17		Z1679-15		Z1679-16		Z1679-01		Z1753-02		Z1753-03		Z1850-05		Z1850-01		Z1850-19		Z1850-10	
Sampling Date	1.1.1	2/26/08		2/26/08		2/25/08		2/25/08		2/25/08		2/26/08		2/29/08		2/29/08		3/3/08		3/3/08		3/4/08		3/4/08	
Matrix	Ambient	WATER		WATER		WATER		WATER		WATER		WATER		WATER		WATER		WATER		WATER		WATER		WATER	
Dilution Factor	GW	10		10		1		1		1		1		5		1		20		10		20		20	
VO+10	ug/L	ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l	
Dichlorodifluoromethane	5	8.8	U	8.8	U	0.88	U	0.88	U	0.88	U	0.88	U	4.4	U	0.88	U	18	U	8.8	U	18	U	18	U
Chloromethane	5	3.7	U	3.7	U	0.37	U	0.37	U	0.37	U	0.37	U	1.8	U	0.37	U	7.4	U	3.7	U	7.4	U	7.4	U
Vinyl Chloride	2	3	U	3	U	12		0.3	U	0.3	U	0.3	U	1.5	U	0.3	U	6	U	3	U	6	U	6	U
Bromomethane	5	14	U	14	U	1.4	U	1.4	U	1.4	U	1.4	U	6.8	U	1.4	U	27	U	14	U	27	U	27	U
Chloroethane	5	8	U	8	U	0.8	U	0.8	U	0.8	U	0.8	U	4	U	0.8	U	16	U	8	U	16	U	16	U
Trichlorofluoromethane	5	5.3	U	5.3	U	0.53	U	0.53	U	0.53	U	0.53	U	2.6	U	0.53	U	11	U	5.3	U	11	U	11	U
1,1,2-Trichlorotrifluoroethane	5	6.1	U	6.1	U	0.61	U	0.61	U	0.61	U	0.61	U	3	U	0.61	U	12	U	6.1	U	12	U	12	U
1,1-Dichloroethene	5	6.7	U	6.7	U	0.67	U	0.67	U	0.67	U	0.67	U	3.4	U	0.67	U	13	U	6.7	U	13	U	13	U
Acetone	50	22	U	22	U	36		35		35		2.2	U	11	U	40		43	U	22	U	43	U	43	U
Carbon Disulfide	NA	2	U	2	U	0.2	U	0.2	U	0.2	U	0.2	U	1	U	0.2	U	4	U	2	U	4	UJ	4	U
Methyl tert-butyl Ether	NA	25	J	110		5.6		46		50		26		1.2	U	13		4.6	U	2.3	U	4.6	U	4.6	U
Methyl Acetate	NA	4.5	U	4.5	U	0.45	U	0.45	U	0.45	U	0.45	U	2.2	U	0.45	U	9	U	4.5	U	9	U	9	U
Methylene Chloride	5	3.8	U	3.8	U	0.38	U	0.38	U	0.38	U	0.38	U	1.9	U	0.38	U	7.6	U	3.8	U	7.6	U	7.6	U
trans-1,2-Dichloroethene	5	4.4	U	4.4	U	0.44	U	0.44	U	0.44	U	0.44	U	2.2	U	0.44	U	8.8	U	4.4	U	8.8	U	8.8	U
1,1-Dichloroethane	5	6.7	U	6.7	U	4	J	0.67	U	0.67	U	0.67	U	3.4	U	0.67	U	13	U	6.7	U	13	U	13	U
Cyclohexane	NA	5.7	U	69		0.57	U	0.57	U	0.57	U	5.2		2.8	U	2.6	J	11	U	5.7	U	11	U	11	U
2-Butanone	50	19	U	19	U	1.9	U	1.9	U	1.9	U	1.9	U	9.7	U	1.9	U	39	U	19	U	39	U	39	U
Carbon Tetrachloride	5	2.7	U	2.7	U	0.27	U	0.27	U	0.27	U	0.27	U	1.4	U	0.27	U	5.4	U	2.7	U	5.4	U	5.4	U
cis-1,2-Dichloroethene	5	7.2	U	7.2	U	0.72	U	1.6	J	1.6	J	0.72	U	3.6	U	0.72	U	14	U	7.2	U	14	U	14	U
Chloroform	7	4.5	U	4.5	U	0.45	U	0.45	U	0.45	U	0.45	U	2.2	U	0.45	U	9	UJ	4.5	[redacted]	9	UJ	9	UJ
1,1,1-Trichloroethane	5	3.9	U	3.9	U	0.39	U	0.39	U	0.39	U	0.39	U	2	U	0.39	U	7.8	U	3.9	U	7.8	U	7.8	U
Methylcyclohexane	NA	17	J	130		0.47	U	0.47	U	0.47	U	1.7	J	2.4	U	6.5		9.4	U	20	J	9.4	U	9.4	U
Benzene	1	37	J	170		0.35	U	0.35	U	0.35	U	0.35	U	1.8	U	0.35	U	7	U	20	J	7	U	7	U
1,2-Dichloroethane	0.6	4.1	U	4.1	U	0.41	U	0.41	U	0.41	U	0.41	U	2	U	0.41	U	8.2	U	4.1	U	8.2	U	8.2	U
Trichloroethene	5	3.4	U	3.4	U	0.34	U	0.34	U	0.34	U	0.34	U	1.7	U	0.34	U	6.8	U	3.4	U	6.8	U	6.8	U
1,2-Dichloropropane	1	4.6	U	4.6	U	0.46	U	0.46	U	0.46	U	0.46	U	2.3	U	0.46	U	9.2	U	4.6	U	9.2	U	9.2	U
Bromodichloromethane	50	2.3	U	2.3	U	0.23	U	0.23	U	0.23	U	0.23	U	1.2	U	0.23	U	4.6	U	2.3	U	4.6	U	4.6	U
4-Methyl-2-Pentanone	NA	18	U	18	U	1.8	U	1.8	U	1.8	U	1.8	U	8.8	U	1.8	U	35	U	18	U	35	U	35	U
Toluene	5	1.6	U	27	J	0.16	U	0.16	U	0.16	U	0.16	U	0.8	U	0.16	U	3.2	U	140	J	3.2	U	3.2	U
t-1,3-Dichloropropene	0.4	3.1	U	3.1	U	0.31	U	0.31	U	0.31	U	0.31	U	1.6	U	0.31	U	6.2	U	3.1	U	6.2	U	6.2	U
cis-1,3-Dichloropropene	0.4	2.9	U	2.9	U	0.29	U	0.29	U	0.29	U	0.29	U	1.4	U	0.29	U	5.8	U	2.9	U	5.8	U	5.8	U
1,1,2-Trichloroethane	1	3.2	U	3.2	U	0.32	U	0.32	U	0.32	U	0.32	U	1.6	U	0.32	U	6.4	U	3.2	U	6.4	U	6.4	U
2-Hexanone	50	18	U	18	U	1.8	U	1.8	U	1.8	U	1.8	U	8.8	U	1.8	U	35	U	18	U	35	U	35	U
1,2-Dibromoethane	0.0006	2.6	U	2.6	U	0.26	U	0.26	U	0.26	U	0.26	U	1.3	U	0.26	U	5.2	U	2.6	U	5.2	U	5.2	U
Tetrachloroethene	5	9.7	U	9.7	U	0.97	U	0.97	U	0.97	U	0.97	U	4.8	U	0.97	U	19	UJ	9.7	UJ	19	U	19	UJ
Chlorobenzene	5	2.8	U	2.8	U	0.28	U	0.28	U	0.28	U	0.28	U	1.4	U	0.28	U	5.6	U	2.8	U	5.6	U	5.6	U
Ethyl Benzene	5	67		530		0.05	U	0.05	U	0.05	U	0.05	U	0.25	U	0.05	U	30	J	32	J	1	U	1	U
m/p-Xylenes	NA	49	J	400		0.47	U	0.47	U	0.47	U	0.47	U	2.4	U	2.1	J	52	J	150	J	9.4	U	28	J
o-Xylene	NA	24	J	210		0.16	U	0.16	U	0.16	U	0.16	U	0.8	U	0.16	U	3.2	U	50	J	3.2	U	3.2	U
Styrene	5	1.9	U	1.9	U	0.19	U	0.19	U	0.19	U	0.19	U	0.95	U	0.19	U	3.8	U	1.9	U	3.8	U	3.8	U
Bromoform	50	4.4	U	4.4	U	0.44	U	0.44	U	0.44	U	0.44	U	2.2	U	0.44	U	8.8	U	4.4	U	8.8	U	8.8	U
Isopropylbenzene	5	3.7	U	290		2	J	1.5	J	1.1	J	0.37	U	12	J	0.37	U	32	J	12	J	7.4	U	7.4	U
1,1,2,2-Tetrachloroethane	5	3.7	U	3.7	U	0.37	U	0.37	U	0.37	U	0.37	U	1.8	U	0.37	U	7.4	U	3.7	U	7.4	U	7.4	U
1,3-Dichlorobenzene	3	2.8	U	2.8	U	0.28	U	0.28	U	0.28	U	0.28	U	1.4	U	0.28	U	5.6	U	2.8	U	5.6	U	5.6	U
1,4-Dichlorobenzene	3	2.2	U	2.2	U	0.22	U	0.22	U	0.22	U	0.22	U	1.1	U	0.22	U	4.4	U	2.2	U	4.4	U	4.4	U
1,2-Dichlorobenzene	3	4	U	4	U	0.4	U	0.4	U	0.4	U	0.4	U	2	U	0.4	U	8	U	4	U	8	U	8	U
1,2-Dibromo-3-Chloropropane	0.04	5.8	U	5.8	U	0.58	U	0.58	U	0.58	U	0.58	U	2.9	U	0.58	U	12	U	5.8	U	12	U	12	U
1,2,4-Trichlorobenzene	5	3.9	U	3.9	U	0.39	U	0.39	U	0.39	U	0.39	U	2	U	0.39	U	7.8	U	3.9	U	7.8	U	7.8	U
CYANIDE																									
Cyanide	200	10	U	17		11		10	U	10	U	10	U	10	U	10	U	10	U	10	U	12	U	10	U

OCA LIC
5th St. Mixed Use Housing
EWMA Project # 205490

Table 5: Ground-Water Sampling Results for the Sand Aquifer/Intermediate-Deep Wells
Semi-Volatile Organic Compounds (Filtered and Unfiltered)

Sample ID	NYS	TW-1		FD-5 (TW-1)		TW-10		TW-14		FD-4 (TW-14)		TW-RCRA-3		MW-3I		MW-3D		MW-04-I		MW-05-I		MW5-IDL		Spike2 (MW05I)		DUP 2		MW-6I		MW-07I	
Lab Sample Number	TOGS	Z1679-02		Z1679-03		Z1679-17		Z1679-15		Z1679-16		Z1679-01		Z1753-09		Z1753-10		Z1850-05		Z1851-07		Z1851-05		Z1850-03		Z1850-04		Z1850-19		Z1850-10		
Sampling Date	1.1.1.	2/26/08		2/26/08		2/25/08		2/25/08		2/25/08		2/26/08		2/29/08		2/29/08		3/3/08		3/3/08		3/3/08		3/3/08		3/3/08		3/4/08		3/4/08		
Matrix	Ambient	WATER		WATER		WATER		WATER		WATER		WATER		WATER		WATER		WATER		WATER		WATER		WATER		WATER		WATER		WATER		
Dilution Factor	GW	1		1		1		1		1		1		1		1		1		1		5		1		1		1		1		
Units	ug/L	ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		
SEMIVOLATILES																																
Benzaldehyde	NA	2.6	U	2.7	U	0.31	U	0.29	U	0.28	U	0.28	U	0.29	U	0.3	U	0.3	U	0.31	U	1.5	UD	0.29	U	0.28	U	0.3	U	0.29	U	
Phenol	1	5.4	U	5.4	U	0.63	U	0.6	U	0.57	U	0.57	U	0.59	U	0.61	U	0.61	U	0.62	U	3.1	UD	0.6	U	0.57	U	0.61	U	0.6	U	
bis(2-Chloroethyl)ether	1	2.7	U	2.8	U	0.32	U	0.3	U	0.29	U	0.29	U	0.3	U	0.31	U	0.31	U	0.32	U	1.6	UD	0.3	U	0.29	U	0.31	U	0.3	U	
2-Chlorophenol	NA	3.2	U	3.3	U	0.38	U	0.36	U	0.34	U	0.34	U	0.35	U	0.37	U	0.37	U	0.38	U	1.9	UD	0.36	U	0.34	U	0.37	U	0.36	U	
2-Methylphenol	NA	3.5	U	3.6	U	0.41	U	0.39	U	0.38	U	0.38	U	0.39	U	0.4	U	0.4	U	1.2	J	2	UD	0.39	U	0.37	U	0.4	U	0.39	U	
2,2-oxybis(1-Chloropropane)	NA	2.6	U	2.7	U	0.31	U	0.29	U	0.28	U	0.28	U	0.29	U	0.3	U	0.3	U	0.31	U	1.5	UD	0.29	U	0.28	U	0.3	U	0.29	U	
Acetophenone	NA	3.6	U	3.7	U	0.43	U	0.4	U	0.39	U	0.39	U	0.4	U	0.41	U	0.41	U	0.42	U	2.1	UD	0.4	U	0.38	U	0.41	U	0.4	U	
3+4-Methylphenols	NA	3.8	U	3.9	U	0.45	U	0.42	U	0.41	U	0.41	U	0.42	U	0.43	U	0.43	U	0.44	U	2.2	UD	0.42	U	0.4	U	0.43	U	0.42	U	
N-Nitroso-di-n-propylamine	NA	3.3	U	3.4	U	0.39	U	0.37	U	0.35	U	0.35	U	0.37	U	0.38	U	0.38	U	0.39	U	1.9	UD	0.37	U	0.35	U	0.38	U	0.37	U	
Hexachloroethane	5	2.3	U	2.3	U	0.26	U	0.25	U	0.24	U	0.24	U	0.25	U	0.26	U	0.26	U	0.26	U	1.3	UD	0.25	U	0.24	U	0.26	U	0.25	U	
Nitrobenzene	0.4	3.2	U	3.3	U	0.38	U	0.36	U	0.34	U	0.34	U	0.35	U	0.37	U	0.37	U	0.38	U	1.9	UD	0.36	U	0.34	U	0.37	U	0.36	U	
Isophorone	50	2.5	U	2.6	U	0.3	U	0.28	U	0.27	U	0.27	U	0.28	U	0.29	U	0.29	U	0.3	U	1.5	UD	0.28	U	0.27	U	0.29	U	0.28	U	
2-Nitrophenol	NA	2.7	U	2.8	U	0.32	U	0.3	U	0.29	U	0.29	U	0.3	U	0.31	U	0.31	U	0.32	U	1.6	UD	0.3	U	0.29	U	0.31	U	0.3	U	
2,4-Dimethylphenol	1	7.5	U	7.5	U	0.87	U	0.83	U	0.79	U	0.79	U	0.82	U	0.84	U	0.84	U	20		17	JD	8	J	13	JD	0.84	U	0.83	U	
bis(2-Chloroethoxy)methane	5	3.2	U	3.3	U	0.38	U	0.36	U	0.34	U	0.34	U	0.35	U	0.37	U	0.37	U	0.38	U	1.9	UD	0.36	U	0.34	U	0.37	U	0.36	U	
2,4-Dichlorophenol	1	3.3	U	3.4	U	0.39	U	0.37	U	0.35	U	0.35	U	0.37	U	0.38	U	0.38	U	0.39	U	1.9	UD	0.37	U	0.35	U	0.38	U	0.37	U	
Naphthalene	10	1400	E	1400	D	2.8	J	2.9	J	2	J	0.29	U	0.3	U	5.4	J	0.31	U	1.8	J	1.6	UD	0.3	U	1.3	J	0.31	U	0.3	U	
4-Chloroaniline	5	9	U	9.1	U	1.1	U	1	U	0.96	U	0.96	U	0.99	U	1	U	1	U	1	U	5.2	UD	1	U	0.95	U	1	U	1	U	
Hexachlorobutadiene	NA	3.8	U	3.9	U	0.45	U	0.42	U	0.41	U	0.41	U	0.42	U	0.43	U	0.43	U	0.44	U	2.2	UD	0.42	U	0.4	U	0.43	U	0.42	U	
Caprolactam	NA	15	U	15	U	1.7	U	1.6	U	1.5	U	1.5	U	1.6	U	1.6	U	1.6	U	1.7	U	8.4	UD	1.6	U	1.5	U	1.6	U	1.6	U	
4-Chloro-3-methylphenol	NA	2.2	U	2.2	U	0.25	U	0.24	U	0.23	U	0.23	U	0.24	U	0.24	U	0.24	U	0.25	U	1.2	UD	0.24	U	0.23	U	0.24	U	0.24	U	
2-Methylnaphthalene	NA	7800	E	8800	D	1.4	J	2.1	J	2.3	J	0.39	U	0.4	U	3.5	J	0.41	U	4.4	J	2.1	UD	1.2	J	11		0.41	U	0.4	U	
Hexachlorocyclopentadiene	5	5.5	U	5.5	U	0.64	U	0.61	U	0.58	U	0.58	U	0.6	U	0.62	U	0.62	U	0.64	U	3.2	UD	0.61	U	0.58	U	0.62	U	0.61	U	
2,4,6-Trichlorophenol	NA	3.4	U	3.5	U	0.4	U	0.38	U	0.36	U	0.36	U	0.38	U	0.39	U	0.39	U	0.4	U	2	UD	0.38	U	0.36	U	0.39	U	0.38	U	
2,4,5-Trichlorophenol	NA	3.7	U	3.8	U	0.44	U	0.41	U	0.4	U	0.4	U	0.41	U	0.42	U	0.42	U	0.43	U	2.2	UD	0.41	U	0.39	U	0.42	U	0.41	U	
1,1-Biphenyl	5	3.1	U	3.2	U	0.37	U	0.35	U	0.33	U	0.33	U	0.34	U	0.36	U	0.36	U	12		11	UD	2.1	J	12		0.36	U	0.35	U	
2-Chloronaphthalene	10	2.3	U	2.3	U	0.26	U	0.25	U	0.24	U	0.24	U	0.25	U	0.26	U	0.26	U	0.26	U	1.3	UD	0.25	U	0.24	U	0.26	U	0.25	U	
2-Nitroaniline	5	2.5	U	2.5	U	0.29	U	0.27	U	0.26	U	0.26	U	0.27	U	0.28	U	0.28	U	0.28	U	1.4	UD	0.27	U	0.26	U	0.28	U	0.27	U	
Dimethylphthalate	50	2.6	U	2.7	U	0.31	U	0.29	U	0.28	U	0.28	U	0.29	U	0.3	U	0.3	U	0.31	U	1.5	UD	0.29	U	0.28	U	0.3	U	0.29	U	
Acenaphthylene	NA	3.4	U	3.5	U	0.4	U	0.38	U	0.36	U	0.36	U	0.38	U	1.2	J	0.39	U	4.6	J	2	UD	3	J	3	J	0.39	U	0.38	U	
2,6-Dinitrotoluene	5	3.4	U	3.5	U	0.4	U	0.38	U	0.36	U	0.36	U	0.38	U	0.39	U	0.39	U	0.4	U	2	UD	0.38	U	0.36	U	0.39	U	0.38	U	
3-Nitroaniline	5	3.4	U	3.5	U	0.4	U	0.38	U	0.36	U	0.36	U	0.38	U	0.39	U	0.39	U	0.4	U	2	UD	0.38	U	0.36	U	0.39	U	0.38	U	
2,4-Dinitrophenol	1	6.3	U	6.3	U	0.74	U	0.7	U	0.67	U	0.67	U	0.69	U	0.71	U	0.71	U	0.73	U	3.6	UD	0.7	U	0.66	U	0.71	U	0.7	U	
4-Nitrophenol	NA	17	U	17	U	2	U	1.9	U	1.8	U	1.8	U	1.9	U	1.9	U	1.9	U	2	U	9.8	UD	1.9	U	1.8	U	1.9	U	1.9	U	
Dibenzofuran	NA	3	U	220		2.5	J	0.34	U	2.3	J	0.32	U	1.4	J	0.34	U	0.34	U	50		49	JD	36		59		0.34	U	0.34	U	
2,4-Dinitrotoluene	5	3.3	U	3.4	U	0.39	U	0.37	U	0.35	U	0.35	U	0.37	U	0.38	U	0.38	U	0.39	U	1.9	UD	0.37	U	0.35	U	0.38	U	0.37	U	
Diethylphthalate	50	3.1	U	3.2	U	0.37	U	0.35	U	0.33	U	0.33	U	0.34	U	0.36	U	0.36	U	0.36	U	1.8	UD	0.35	U	0.33	U	0.36	U	0.35	U	
4-Chlorophenyl-phenylether	NA	2.8	U	2.9	U	0.33	U	0.32	U	0.3	U	0.3	U	0.31	U	0.32	U	0.32	U	0.33	U	1.6	UD	0.32	U	0.3	U	0.32	U	0.32	U	
Fluorene	50	350	JD	820	JD	4	J	1.8	J	2.7	J	0.29	U	0.3	U	1.5	J	0.31	U	83		61	JD	45		74		0.31	U	0.3	U	
4-Nitroaniline	5	3.5	U	3.6	U	0.41	U	0.39	U	0.38	U	0.38	U	0.39	U	0.4	U	0.4	U	0.41	U	2	UD	0.39	U	0.37	U	0.4	U	0.39	U	
4,6-Dinitro-2-methylphenol	NA	2.8	U	2.9	U	0.33	U	0.32	U	0.3	U	0.3	U	0.31	U	0.32	U	0.32	U	0.33	U	1.6	UD	0.32	U	0.3	U	0.32	U	0.32	U	
N-Nitrosodiphenylamine	50	3.4	U	3.5	U	0.4	U	0.38	U	0.36	U	0.36	U	0.38	U	0.39	U	0.39	U	1.6	J	2	UD	0.38	U	0.36	U	0.39	U	0.38	U	
4-Bromophenyl-phenylether	NA	14	U	14	U	1.6	U	1.5	U	1.5	U	1.5	U	1.5	U	1.6	U	1.6	U	1.6	U	8	UD	1.5	U	1.4	U	1.6	U	1.5	U	
Hexachlorobenzene	0.04	2.6	U	2.7	U	0.31	U	0.29	U	0.28	U	0.28	U	0.29	U	0.3	U	0.3	U	0.31	U	1.5	UD	0.29	U	0.28	U	0.3	U	0.29	U	
Atrazine	7.5	3.6	U	3.7	U	0.43	U	0.4	U	0.39	U	0.39	U	0.4	U	0.41	U	0.41	U	0.42	U	2.1	UD	0.4	U	0.38	U	0.41	U	0.4	U	
Pentachlorophenol	1	5.1	U	5.1	U	0.6	U	0.57	U	0.54	U	0.54	U	0.56	U	0.58	U	0.58	U	10	J	3	UD	0.57	U	0.54	U	0.58	U	0.57	U	
Phenanthrene	50	2100	D	1800	D	11	J	2.1	J	2.2	J	1.8	J	1.5	U	1.5	U	1.5	U	14		12	UD	1.8	J	20		1.5	U	1.5	U	
Anthracene	50	260	JD	230		1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.6	U	1.6	U	11	J	9.4	JD	7.2	J	12		1.6	U	1.5	U	
Carbazole	NA	2.4	U	2.4	U	0.28	U	0.26	U	0.25	U	0.25	U	0.26	U	0.27	U	0.27	U	56		53	JD	40		62		0.27	U	0.26	U	
Di-n-butylphthalate	50	57	U	58	U	6.7	U	6.4	U	6.1	U	6.1	U	6.3	U	6.5	U	6.5	U	6.7	U	33	UD	6.4	U	6	U	6.5	U	6.4	U	
Fluoranthene	50	88	J	100		1.4	J	0.22	U	0.21	U	0.21	U	0.22	U	0.22	U	0.22	U	14		12	JD	14		19		0.22	U	0.22	U	
Pyrene	50	210	JD	150		1.6	U	1.5	U	1.5	U	1.5	U	1.5	U	1.6	U	1.6	U	7.1	J	8	UD	8.3	J	10		1.6	U	1.5	U	
Butylbenzylphthalate	50	4.1	U	4.2	U	0.48	U	0.46	U	0.44	U	0.44	U	0.45	U	0.47	U	0.47	U	0.48	U	2.4	UD	0.46	U	0.43	U	0.47	U	0.46	U	
3,3-Dichlorobenzidine	5	11	U	11	U	1.2	U	1.2	U	1.1	U	1.1	U	1.2	U	1.2	U	1.2	U	1.2	U	6.1	UD	1.2	U	1.1	U	1.2	U	1.2	U	
Benzo(a)anthracene	0.002	18	J	18	J	1.5	U	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.5	U	7.4	UD	1.4	U	1.3	U	1.4	U	1.4	U	
Chrysene	0.002	35	J	32	J	0.3	U	0.28	U	0.27	U	0.27	U	0.28	U	0.29	U	0.29	U	0.3	U	1.5	UD	0.28	U	0.27	U	0.29	U	0.26	U	
bis(2-Ethylhexyl)phthalate	5	13	U	13	U	3.1	JB	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.5	U	7.4	UD	1.4	U	1.3	U	1.4	U	1.4	U	
Di-n-octyl phthalate	50	2.5	U	2.6	U	0.3	U	0.28	U	0.27	U	0.27	U	0.28	U	0.29	U	0.29	U	0.3	U	1.5	UD	0.28	U	0.27	U	0.29	U	0.28	U	
Benzo(b)fluoranthene	0.002	4.2	U	4.3	U	0.49	U	0.47	U	0.45	U	0.45	U	0.46	U	0.48	U	0.48	U	0.49	U	2.4	UD	0.47	U	0.44	U	0.48	U	0.47	U	
Benzo(k)fluoranthene	0.002	2.9	U	3	U	0.34	U	0.33	U	0.31	U	0.31	U	0.32	U	0.33	U	0.33	U	0.34	U	1.7	UD	0.33	U	0.31	U	0.33	U	0.33	U	
Benzo(a)pyrene	NA	2.2	U	2.2	U	0.25	U	0.24	U	0.23	U	0.23	U	0.24	U	0.24	U	0.24	U	0.25	U	1.2	UD	0.24	U	0.23	U	0.24	U	0.24	U	
Indeno(1,2,3-cd)pyrene	0.002	6.5	U	6.5	U	0.76	U	0.72	U	0.69	U	0.69	U	0.71	U	0.73	U	0.73	U	0.75	U	3.8	UD	0.72	U	0.68	U	0.73	U	0.72	U	
Dibenz(a,h)anthracene	NA	5.3	U	5.3	U	0.62	U	0.59	U	0.56	U	0.56	U	0.58	U	0.6	U	0.6	U	0.61	U	3.1	UD	0.59	U	0.56	U	0.6	U	0.59	U	
Benzo(g,h,i)perylene	NA	3.8	U	3.9	U	0.45	U	0.42	U	0.41	U	0.41	U	0.42	U	0.43	U	0.43	U	0.44	U	2.2	UD	0.42	U	0.4	U	0.43	U	0.42	U	

OCA LIC
5th St. Mixed Use Housing
EWMA Project # 205490

Table 5: Ground-Water Sampling Results for the Sand Aquifer/Intermediate-Deep Wells
Semi-Volatile Organic Compounds (Filtered and Unfiltered)

Sample ID	NYS	TW-1		FD-5 (TW-1)		TW-10	TW-14		FD-4 (TW-14)	TW-RCRA-3	MW-3I	MW-3D	MW-04-I		MW-05-I		MW5-IDL		Spike2 (MW05I)	DUP 2	MW-6I	MW-07I	
Lab Sample Number	TOGS	Z1679-02		Z1679-03		Z1679-17	Z1679-15		Z1679-16	Z1679-01	Z1753-09	Z1753-10	Z1850-05		Z1851-07		Z1851-05		Z1850-03	Z1850-04	Z1850-19	Z1850-10	
Sampling Date	1.1.1.	2/26/08		2/26/08		2/25/08	2/25/08		2/25/08	2/26/08	2/29/08	2/29/08	3/3/08		3/3/08		3/3/08		3/3/08	3/3/08	3/4/08	3/4/08	
Matrix	Ambient	WATER		WATER		WATER	WATER		WATER	WATER	WATER	WATER	WATER		WATER		WATER		WATER	WATER	WATER	WATER	
Dilution Factor	GW	1		1		1	1		1	1	1	1	1		1		5		1	1	1	1	
Units	ug/L	ug/l		ug/l		ug/l	ug/l		ug/l	ug/l	ug/l	ug/l	ug/l		ug/l		ug/l		ug/l	ug/l	ug/l	ug/l	
LAB FILTERED SEMIVOLATILES																							
Lab SampleID Number		Z1680-02		Z1680-03		~	Z1680-08		~	~	~	~	Z1851-05		Z1851-01		Z1851-01DL		~	~	~	Z1851-09	
Benzaldehyde	NA	2.6	U	2.7	U	~	0.29	U	~	~	~	~	0.28	U	0.3	U	1.5	UD	~	~	~	0.3	U
Phenol	1	5.4	U	5.4	U	~	0.59	U	~	~	~	~	0.58	U	0.62	U	3.1	UD	~	~	~	0.6	U
bis(2-Chloroethyl)ether	1	2.7	U	2.8	U	~	0.3	U	~	~	~	~	0.29	U	0.31	U	1.6	UD	~	~	~	0.31	U
2-Chlorophenol	NA	3.2	U	3.3	U	~	0.35	U	~	~	~	~	0.35	U	0.37	U	1.9	UD	~	~	~	0.36	U
2-Methylphenol	NA	3.5	U	3.6	U	~	0.39	U	~	~	~	~	0.38	U	0.4	U	2	UD	~	~	~	0.4	U
2,2-oxybis(1-Chloropropane)	NA	2.6	U	2.7	U	~	0.29	U	~	~	~	~	0.28	U	0.3	U	1.5	UD	~	~	~	0.3	U
Acetophenone	NA	3.6	U	3.7	U	~	0.4	U	~	~	~	~	0.39	U	0.42	U	2.1	UD	~	~	~	0.41	U
3+4-Methylphenols	NA	3.8	U	3.9	U	~	0.42	U	~	~	~	~	0.41	U	0.44	U	2.2	UD	~	~	~	0.43	U
N-Nitroso-di-n-propylamine	NA	3.3	U	3.4	U	~	0.37	U	~	~	~	~	0.36	U	0.38	U	1.9	UD	~	~	~	0.37	U
Hexachloroethane	5	2.3	U	2.3	U	~	0.25	U	~	~	~	~	0.24	U	0.26	U	1.3	UD	~	~	~	0.25	U
Nitrobenzene	0.4	3.2	U	3.3	U	~	0.35	U	~	~	~	~	0.35	U	0.37	U	1.9	UD	~	~	~	0.36	U
Isophorone	50	2.5	U	2.6	U	~	0.28	U	~	~	~	~	0.27	U	0.29	U	1.5	UD	~	~	~	0.29	U
2-Nitrophenol	NA	2.7	U	2.8	U	~	0.3	U	~	~	~	~	0.29	U	0.31	U	1.6	UD	~	~	~	0.31	U
2,4-Dimethylphenol	1	7.5	U	7.5	U	~	0.82	U	~	~	~	~	0.8	U	22		14	JD	~	~	~	0.84	U
bis(2-Chloroethoxy)methane	5	3.2	U	3.3	U	~	0.35	U	~	~	~	~	0.35	U	0.37	U	1.9	UD	~	~	~	0.36	U
2,4-Dichlorophenol	1	3.3	U	3.4	U	~	0.37	U	~	~	~	~	0.36	U	0.38	U	1.9	UD	~	~	~	0.37	U
Naphthalene	NA	1200	E	1200	E	~	2.3	J	~	~	~	~	0.29	U	0.31	U	1.6	UD	~	~	~	0.31	U
4-Chloroaniline	5	9	U	9.1	U	~	0.99	U	~	~	~	~	0.97	U	1	U	5.2	UD	~	~	~	1	U
Hexachlorobutadiene	NA	3.8	U	3.9	U	~	0.42	U	~	~	~	~	0.41	U	0.44	U	2.2	UD	~	~	~	0.43	U
Caprolactam	NA	15	U	15	U	~	1.6	U	~	~	~	~	1.6	U	1.7	U	8.3	UD	~	~	~	1.6	U
4-Chloro-3-methylphenol	NA	2.2	U	2.2	U	~	0.24	U	~	~	~	~	0.23	U	0.25	U	1.2	UD	~	~	~	0.24	U
2-Methylnaphthalene	NA	7800	E	8400	E	~	2.1	J	~	~	~	~	0.39	U	3.8	J	2.1	UD	~	~	~	0.41	U
Hexachlorocyclopentadiene	5	5.5	U	5.5	U	~	0.6	U	~	~	~	~	0.59	U	0.63	U	3.1	UD	~	~	~	0.62	U
2,4,6-Trichlorophenol	NA	3.4	U	3.5	U	~	0.38	U	~	~	~	~	0.37	U	0.39	U	2	UD	~	~	~	0.38	U
2,4,5-Trichlorophenol	NA	3.7	U	3.8	U	~	0.41	U	~	~	~	~	0.4	U	0.43	U	2.1	UD	~	~	~	0.42	U
1,1-Biphenyl	5	100	JD	100	JD	~	0.34	U	~	~	~	~	0.34	U	5.7	J	1.8	JD	~	~	~	0.35	U
2-Chloronaphthalene	10	2.3	U	2.3	U	~	0.25	U	~	~	~	~	0.24	U	0.26	U	1.3	UD	~	~	~	0.25	U
2-Nitroaniline	5	2.5	U	2.5	U	~	0.27	U	~	~	~	~	0.26	U	0.28	U	1.4	UD	~	~	~	0.27	U
Dimethylphthalate	50	2.6	U	2.7	U	~	0.29	U	~	~	~	~	0.28	U	0.3	U	1.5	UD	~	~	~	0.3	U
Acenaphthylene	NA	3.4	U	87	J	~	0.38	U	~	~	~	~	0.37	U	3.4	J	2	UD	~	~	~	0.38	U
2,6-Dinitrotoluene	5	3.4	U	3.5	U	~	0.38	U	~	~	~	~	0.37	U	0.39	U	2	UD	~	~	~	0.38	U
3-Nitroaniline	5	3.4	U	3.5	U	~	0.38	U	~	~	~	~	0.37	U	0.39	U	2	UD	~	~	~	0.38	U
Acenaphthene	20	420	JD	410	JD	~	7.1	J	~	~	~	~	5.7	J	150	E	140	D	~	~	~	0.35	U
2,4-Dinitrophenol	1	6.3	U	6.3	U	~	0.69	U	~	~	~	~	0.67	U	0.72	U	3.6	UD	~	~	~	0.7	U
4-Nitrophenol	NA	17	U	17	U	~	1.9	U	~	~	~	~	1.8	U	1.9	U	9.7	UD	~	~	~	1.9	U
Dibenzofuran	NA	180		180		~	1.8	J	~	~	~	~	0.33	U	44		42	JD	~	~	~	1.1	J
2,4-Dinitrotoluene	5	3.3	U	3.4	U	~	0.37	U	~	~	~	~	0.36	U	0.38	U	1.9	UD	~	~	~	0.37	U
Diethylphthalate	50	3.1	U	3.2	U	~	0.34	U	~	~	~	~	0.34	U	0.35	U	1.8	UD	~	~	~	0.35	U
4-Chlorophenyl-phenylether	NA	2.8	U	2.9	U	~	0.31	U	~	~	~	~	0.31	U	0.33	U	1.6	UD	~	~	~	0.32	U
Fluorene	50	890	JD	750	D	~	2.6	J	~	~	~	~	2	J	55		54	D	~	~	~	0.31	U
4-Nitroaniline	5	3.5	U	3.6	U	~	0.39	U	~	~	~	~	0.38	U	0.4	U	2	UD	~	~	~	0.4	U
4,6-Dinitro-2-methylphenol	NA	2.8	U	2.9	U	~	0.31	U	~	~	~	~	0.31	U	0.33	U	1.6	UD	~	~	~	0.32	U
N-Nitrosodiphenylamine	50	3.4	U	3.5	U	~	0.38	U	~	~	~	~	0.37	U	0.39	U	2	UD	~	~	~	0.38	U
4-Bromophenyl-phenylether	NA	14	U	14	U	~	1.5	U	~	~	~	~	1.5	U	1.6	U	7.9	UD	~	~	~	1.5	U
Hexachlorobenzene	0.04	2.6	U	2.7	U	~	0.29	U	~	~	~	~	0.28	U	0.3	U	1.5	UD	~	~	~	0.3	U
Atrazine	7.5	3.6	U	3.7	U	~	0.4	U	~	~	~	~	0.39	U	0.42	U	2.1	UD	~	~	~	0.41	U
Pentachlorophenol	1	5.1	U	5.1	U	~	0.56	U	~	~	~	~	0.55	U	0.58	U	2.9	UD	~	~	~	0.57	U
Phenanthrene	50	1700	D	1800	D	~	2.8	J	~	~	~	~	1.8	J	3.6	J	7.6	JD	~	~	~	1.5	U
Anthracene	50	190		210		~	1.5	U	~	~	~	~	1.5	U	9.2	J	8.3	JD	~	~	~	1.6	U
Carbazole	NA	90	J	94	J	~	0.26	U	~	~	~	~	0.25	U	50		45	JD	~	~	~	0.26	U
Di-n-butylphthalate	50	57	U	58	U	~	6.3	U	~	~	~	~	6.2	U	6.6	U	33	UD	~	~	~	11	J
Fluoranthene	50	62	J	84	JD	~	0.22	U	~	~	~	~	0.21	U	15		14	JD	~	~	~	0.22	U
Pyrene	50	200		310		~	1.5	U	~	~	~	~	1.5	U	7.9	J	7.9	UD	~	~	~	1.5	U
Butylbenzylphthalate	50	4.1	U	4.2	U	~	0.45	U	~	~	~	~	0.44	U	0.47	U	2.4	UD	~	~	~	0.46	U
3,3-Dichlorobenzidine	5	11	U	11	U	~	1.2	U	~	~	~	~	1.1	U	1.2	U	6.1	UD	~	~	~	1.2	U
Benzo(a)anthracene	0.002	15	J	22	J	~	1.4	U	~	~	~	~	1.4	U	1.5	U	7.3	UD	~	~	~	1.4	U
Chrysene	0.002	32	J	34	J	~	0.28	U	~	~	~	~	0.27	U	0.29	U	1.5	UD	~	~	~	0.29	U
bis(2-Ethylhexyl)phthalate	5	13	U	13	U	~	1.4	U	1.5	~	~	~	1.4	U	1.5	U	7.3	UD	~	~	~	1.4	U
Di-n-octyl phthalate	50	2.5	U	2.6	U	~	0.28	U	0.29	~	~	~	0.27	U	0.29	U	1.5	UD	~	~	~	0.29	U
Benzo(b)fluoranthene	0.002	4.2	U	4.3	U	~	0.46	U	0.48	~	~	~	0.45	U	0.48	U	2.4	UD	~	~	~	0.47	U
Benzo(k)fluoranthene	0.002	2.9	U	3	U	~	0.32	U	0.34	~	~	~	0.32	U	0.34	U	1.7	UD	~	~	~	0.33	U
Benzo(a)pyrene	NA	2.2	U	2.2	U	~	0.24	U	0.25	~	~	~	0.23	U	0.25	U	1.2	UD	~	~	~	0.24	U
Indeno(1,2,3-cd)pyrene	0.002	6.5	U	6.5	U	~	0.71	U	0.74	~	~	~	0.69	U	0.74	U	3.7	UD	~	~	~	0.73	U
Dibenz(a,h)anthracene	NA	5.3	U	5.3	U	~	0.58	U	0.61	~	~	~	0.57	U	0.61	U	3	UD	~	~	~	0.59	U
Benzo(g,h,i)perylene	NA	3.8	U	3.9	U	~	0.42	U	0.44	~	~	~	0.41	U	0.44	U	2.2	UD	~	~	~	0.43	U

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Table 5: Ground-Water Sampling Results for the Sand Aquifer/Intermediate and Deep Wells
Metals (Filtered and Unfiltered)

Sample ID	NYS	TW-1		TW-10		TW-14		FD-4 (TW-14)		TW-RCRA-3		MW-3I		MW-3D		MW-04-I		MW-05-I		MW-6I		MW-07I	
Lab Sample ID	TOGS	Z1679-02		Z1679-17		Z1679-15		Z1679-16		Z1679-01		Z1753-02		Z1753-03		Z1850-05		Z1850-01		Z1850-19		Z1850-10	
Sampling Date	1.1.1.	2/26/08		2/25/08		2/25/08		2/25/08		2/26/08		2/29/08		2/29/08		3/3/08		3/3/08		3/4/08		3/4/08	
Matrix	Ambient	WATER		WATER		WATER		WATER		WATER		WATER		WATER		WATER		WATER		WATER		WATER	
Dilution Factor	GW	1		1		1		1		1		1		1		1		1		1		1	
Units	ug/L	ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l	
METALS																							
Aluminum	NA	5950		16500		17800		19900		32100		13500		31900		36700		839		1550		777	
Antimony	3	8.1	U	8.1	U	8.1	U	8.1	U	8.1	U	4.8	U	7.2	J	8.1	U	8.1	U	8.1	U	8.1	U
Arsenic	25	2.8	U	2.9	J	15.8		9.2	J	19.4		4.1	U	15.7		34	J	2.8	UJ	2.8	UJ	2.8	UJ
Barium	1000	41.2	J	584		605		617		898		75.8	J	839		301	J	146	J	265	J	129	J
Beryllium	3	0.57	J	1.8	J	2.7	J	3.2		5.5		1	J	3.6	J	2.2	J	0.5	U	0.5	U	0.5	U
Cadmium	5	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	0.52	U	10.1		1.2	UJ	1.2	UJ	1.2	UJ	1.2	UJ
Calcium	NA	57300		66200		135000		131000		118000		159000		212000		84200		68900		214000		108000	
Chromium	50	23.9		253		131		144		133		24.2		95.9		83.6		5.2		7.7		5.9	
Cobalt	NA	9.7	J	35.4		35.2		48.8		99.6		7.8	J	51.4		31.6		3	J	2.1	J	3.1	J
Copper	200	20.9		211		151		172		240		62.1		180		79.7		6.2	J	8	J	4.5	J
Iron	300	24000		87400		192000		212000		402000		15900		109000		65900		27900		4450		2650	
Lead	25	2.2	J	214		236		257		313		22.2		171		79.8		7.9	J	14.7	J	9.9	J
Magnesium	35000	6990		31000		82000		77600		29200		37300		96500		12800		19100		74100		49200	
Manganese	300	989		2450		11300		12600		21600		465		2010		1150		2250		1450		497	
Mercury	0.7	0.08	U	3.35		1.04		1.09		1.01		0.09	J	0.74		0.48	J	0.08	UJ	1.1	J	0.08	UJ
Nickel	100	15.8	J	124		96.8		112		197		25.8	J	91.9		58.4		8.8	J	4.2	J	3.6	U
Potassium	NA	33700		72500		45300		46100		76400		44500		74300		14600	J	23200	J	32500	J	49700	J
Selenium	10	3.6	U	3.6	U	3.6	U	3.6	U	3.6	U	2.3	J	1.5	U	8.8	J	3.6	U	3.6	U	3.6	U
Silver	50	7.9		2.2	U	2.2	U	2.2	U	2.2	U	0.61	U	4.5	J	2.2	U	2.2	U	2.2	U	2.2	U
Sodium	20000	398000		200000		426000		411000		165000		516000		815000		60400	J	170000	J	128000	J	293000	J
Thallium	0.5	8.1	U	8.1	U	8.1	U	8.1	U	22.6		5.8	J	4.9	U	8.1	U	8.1	U	8.1	U	8.1	U
Vanadium	NA	25.3		73.1		124		143		236		21.2	J	186		76	J	2.7	J	7.5	J	3.2	J
Zinc	2000	58.1		480		551		586		980		111		1130		236		94.8	J	90	J	118	J
FIELD FILTERED																							
Lab SampleID		Z1680-02		Z1680-10		Z1680-08		Z1680-09		Z1680-01		Z1753-09		Z1753-10		Z1851-05		Z1851-01		Z1851-18		Z1851-09	
Aluminum	NA	25	U	25	U	25	U	25	U	25	U	7.5	U	7.5	U	25	U	25	U	25	U	25	U
Antimony	3	8.1	U	8.1	U	8.1	U	8.1	U	8.1	U	4.8	U	4.8	U	10.5	J	8.1	U	8.3	J	8.1	U
Arsenic	25	2.8	U	2.8	U	2.8	U	2.8	U	3.2	J	4.1	U	4.1	U	13.1		5.1	J	6.7	J	2.8	U
Barium	1000	6.3	U	166		241		183		325		48.2	J	468		134		142		217		116	
Beryllium	3	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.29	J	0.29	J	0.5	U	0.5	U	0.7	J	0.5	U
Cadmium	5	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	0.52	U	0.52	U	3.5	J	1.2	U	4.4	J	4.8	J
Calcium	NA	57700		53900		92200		65700		70000		161000		191000		34100		80500		188000		95700	
Cobalt	NA	2	U	5	J	2	U	2	U	2	U	1.1	U	1.1	U	7	J	6.1	J	5.9	J	5.1	J
Copper	200	3.4	U	6.4	J	3.4	U	5.5	J	3.4	U	1.3	U	1.3	U	3.4	U	3.4	U	3.4	U	3.4	U
Iron	300	15800		5250		16600		12600		11200		30.4	U	200		12000		29200		209		984	
Lead	25	2.2	U	2.2	U	2.2	U	2.2	U	2.2	U	7	J	4.8	J	16.6		3.6	J	17.2		15.1	
Magnesium	35000	5480		25200		60100		43200		15300		32500		76900		23400		18900		58500		50000	
Manganese	300	997		895		1150		859		524		339		226		355		2650		1210		400	
Mercury	0.7	0.08	U	0.08	U	0.08	U	0.08	U	0.08	U	0.08	U	0.08	U	0.16	J	0.16	J	0.15	J	0.16	J
Nickel	100	3.6	U	18.4	J	3.6	U	4.2	J	5.8	J	0.54	U	0.54	U	3.6	U	8.8	J	5.8	J	3.6	U
Potassium	NA	24300		84600		33500		29300		53300		39400		64200		21700		21600		32000		54200	
Selenium	10	3.6	U	3.6	U	3.6	U	3.6	U	3.6	U	1.5	U	1.5	U	3.6	U	3.6	U	3.6	U	3.6	U
Silver	50	3.9	J	7.4		2.2	U	2.2	U	2.2	U	0.65	J	0.64	J	2.2	U	2.2	U	2.2	U	2.2	U
Sodium	20000	294000		252000		358000		283000		124000		566000		743000		129000		151000		119000		295000	
Thallium	0.5	8.1	U	8.1	U	8.1	U	8.1	U	8.1	U	4.9	U	4.9	U	8.1	U	8.1	U	8.1	U	8.1	U
Vanadium	NA	5.8	J	6	J	2.3	U	3.5	J	2.3	U	1.1	U	7	J	17	J	2.3	U	16.3	J	8.4	J
Zinc	2000	29.3		83.1		133		106		70.8		51.5		157		47		78.7		52.5		42	

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Table 5: Ground-Water Sampling Results for the Sand Aquifier/Intermediate-Deep Wells
Pesticides and PCBs

Sample ID	NYS	TW-1		FD-5 (TW-1)		TW-10		TW-14		FD-4 (TW-14)		TW-RCRA-3		MW-3I		MW-3D		MW-04-I		MW-05-I		MW-6-I		MW-07-I	
Lab Sample Number	TOGS	Z1679-02		Z1679-03		Z1679-17		Z1679-15		Z1679-16		Z1679-01		Z1753-02		Z1753-03		Z1850-05		Z1850-01		Z1850-19		Z1850-10	
Sampling Date	1.1.1.	2/26/08		2/26/08		2/25/08		2/25/08		2/25/08		2/26/08		2/29/08		2/29/08		3/3/08		3/3/08		3/4/08		3/4/08	
Matrix	Ambient	WATER		WATER		WATER		WATER		WATER		WATER		WATER		WATER		WATER		WATER		WATER		WATER	
Dilution Factor	GW	1		1		1		1		1		1		1		1		1		1		1		1	
Units	ug/L	ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l		ug/l	
PCBs																									
Aroclor-1016	0.09	139	U	141	U	0.175	U	0.156	U	0.156	U	0.153	U	0.161	U	0.161	U	0.161	U	0.161	U	0.159	U	0.145	U
Aroclor-1221	0.09	163	U	165	U	0.205	U	0.183	U	0.183	U	0.179	U	0.189	U	0.189	U	0.189	U	0.189	U	0.187	U	0.17	U
Aroclor-1232	0.09	105	U	106	U	0.131	U	0.117	U	0.117	U	0.115	U	0.121	U	0.121	U	0.121	U	0.121	U	0.12	U	0.109	U
Aroclor-1242	0.09	79.8	U	80.6	U	0.1	U	0.089	U	0.089	U	0.087	U	0.092	U	0.092	U	0.092	U	0.092	U	0.091	U	0.083	U
Aroclor-1248	0.09	40.4	U	40.8	U	0.051	U	0.045	U	0.045	U	0.044	U	0.047	U	0.047	U	0.047	U	0.047	U	0.046	U	0.042	U
Aroclor-1254	0.09	35.6	U	35.9	U	0.045	U	0.04	U	0.04	U	0.039	U	0.041	U	0.041	U	0.041	U	0.041	U	0.041	U	0.037	U
Aroclor-1260	0.09	1400		1500		0.19	U	0.17	U	0.17	U	0.16	U	0.17	U	0.17	U	0.17	U	0.17	U	0.17	U	0.16	U
TOTAL PCBs	0.09	1400		1500			U		U		U		U		U		U		U		U		U		U
PESTICIDES																									
4,4-DDE	0.2	35.15	U	34.81	U	0.0077	U	0.0075	U	0.0079	U	0.0076	U	0.008	U	0.0078	U	0.008	U	0.008	U	0.0079	U	0.0072	U
4,4-DDD	0.3	34.46	U	34.13	U	0.0076	U	0.0073	U	0.0077	U	0.0075	U	0.0078	U	0.0076	U	0.0078	U	0.0078	U	0.0077	U	0.007	U

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Table 7: Ground-Water Sampling Results for the Sand Aquifier
Volatile Organic Compounds

Sample ID	NYS Ambient	MW-3I	MW-3D	MW-4I	MW-5I-1	MW-D1 (MW-5I-2)	MW-6I	MW-D2 (MW-6I)	MW-D2RE (MW-6I)	MW-7I	FB-1	FB-2	FB-3	TB-1	TB-2
Lab Sample Number	Ground Water	Z3830-13	Z3783-01	Z3783-03	Z3783-04	Z3783-07	Z3830-11	Z3830-10	Z3830-10RE	Z3830-12	Z3783-05	Z3830-15	Z3830-16	Z3783-06	Z3830-14
Sampling Date		7/21/2008	7/18/2008	7/18/2008	7/18/2008	7/18/2008	7/21/2008	7/21/2008	7/21/2008	7/21/2008	7/18/2008	7/21/2008	7/22/2008	7/15/2008	7/21/2008
Matrix		WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
Dilution Factor		1	1	1	1	1	1	1	1	1	1	1	1	1	1
Units	ug/L	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
VO's															
Dichlorodifluoromethane	5	0.88 U	0.88 U	0.88 U	0.88 U	0.88 U	0.88 U	0.88 U	0.88 U	0.88 U	0.88 U	0.88 U	0.88 U	0.88 U	0.88 U
Chloromethane	5	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
Vinyl Chloride	2	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Bromomethane	5	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
Chloroethane	5	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
Trichlorofluoromethane	5	0.53 U	0.53 U	0.53 U	0.53 U	0.53 U	0.53 U	0.53 U	0.53 U	0.53 U	0.53 U	0.53 U	0.53 U	0.53 U	0.53 U
1,1,2-Trichlorotrifluoroethane	5	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U
1,1-Dichloroethene	5	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U
Acetone	50	39	2.2 U	17 J	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U
Carbon Disulfide	NA	0.2 U	10	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Methyl tert-butyl Ether	NA	0.23 U	4.9 J	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	16	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U
Methyl Acetate	NA	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U
Methylene Chloride	5	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U
trans-1,2-Dichloroethene	5	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U
1,1-Dichloroethane	5	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U
Cyclohexane	NA	4.3 J	0.57 U	9.6	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U
2-Butanone	50	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
Carbon Tetrachloride	5	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U
cis-1,2-Dichloroethene	5	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U
Chloroform	7	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U
1,1,1-Trichloroethane	5	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U
Methylcyclohexane	NA	4.8 J	0.47 U	8.3	0.47 U	0.47 U	0.47 U	0.47 U	0.47 U	0.47 U	0.47 U	0.47 U	0.47 U	0.47 U	0.47 U
Benzene	1	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	4.4 J	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U
1,2-Dichloroethane	0.6	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U
Trichloroethene	5	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U
1,2-Dichloropropane	1	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U
Bromodichloromethane	50	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U
4-Methyl-2-Pentanone	NA	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
Toluene	5	2.5 J	0.16 U	0.16 U	2.7 J	2.6 J	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U
t-1,3-Dichloropropene	0.4	0.31 U	11	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U
cis-1,3-Dichloropropene	0.4	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U
1,1,2-Trichloroethane	1	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
2-Hexanone	50	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
Dibromochloromethane	50	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U
1,2-Dibromoethane	0.0006	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U
Tetrachloroethene	5	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U
Chlorobenzene	5	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
Ethyl Benzene	5	0.05 U	0.05 U	2.6 J	5.3	5.4	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
m/p-Xylenes	NA	7.2 J	0.47 U	3.5 J	1.8 J	2 J	0.47 U	0.47 U	0.47 U	0.47 U	0.47 U	0.47 U	0.47 U	0.47 U	0.47 U
o-Xylene	NA	3.4 J	0.16 U	0.16 U	6.5	6.1	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U
Styrene	5	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
Bromoform	50	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U
Isopropylbenzene	5	49	0.37 U	8.2	1 J	1.2 J	4.5 J	6	4.6 J	3.6 J	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
1,1,2,2-Tetrachloroethane	5	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
1,3-Dichlorobenzene	3	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
1,4-Dichlorobenzene	3	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U
1,2-Dichlorobenzene	3	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1,2-Dibromo-3-Chloropropane	0.04	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U
1,2,4-Trichlorobenzene	5	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U

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Table 7: Ground-Water Sampling Results for the Sand Aquifier
Semi-Volatile Organic Compounds

Sample ID	NYS Ambient	MW-3I	MW-3IRE	MW-3D	MW-4I	MW-5I-1	MW-5I-1DL	MW-D1 (MW-5I-2)	MW-D1DL (MW-5I-2DL)
Lab Sample Number	Ground Water	Z3830-13	Z3830-13RE	Z3783-01	Z3783-03	Z3783-04	Z3783-04DL	Z3783-07	Z3783-07DL
Sampling Date		7/21/2008	7/21/2008	7/18/2008	7/18/2008	7/18/2008	7/18/2008	7/18/2008	7/18/2008
Matrix		WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
Dilution Factor		1	1	1	1	1	5	1	5
Units	ug/L	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
Base Neutrals									
Benzaldehyde	NA	0.27 U	0.27 U	0.28 U	0.28 U	0.27 U	1.4 UD	0.3 U	1.5 UD
Phenol	1	0.55 U	0.55 U	0.56 U	0.57 U	0.55 U	2.8 UD	0.62 U	3.1 UD
bis(2-Chloroethyl)ether	1	0.28 U	0.28 U	0.29 U	0.29 U	0.28 U	1.4 UD	0.31 U	1.6 UD
2-Chlorophenol	NA	0.33 U	0.33 U	0.34 U	0.34 U	0.33 U	1.6 UD	0.37 U	1.9 UD
2-Methylphenol	NA	0.36 U	0.36 U	0.37 U	0.37 U	0.36 U	1.8 UD	0.4 U	2 UD
2,2-oxybis(1-Chloropropane)	NA	0.27 U	0.27 U	0.28 U	0.28 U	0.27 U	1.4 UD	0.3 U	1.5 UD
Acetophenone	NA	0.37 U	0.37 U	0.38 U	0.38 U	0.37 U	1.8 UD	0.42 U	2.1 UD
3+4-Methylphenols	NA	0.39 U	0.39 U	0.4 U	0.4 U	0.39 U	2 UD	0.44 U	2.2 UD
N-Nitroso-di-n-propylamine	NA	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	1.7 UD	0.38 U	1.9 UD
Hexachloroethane	5	0.23 U	0.23 U	0.23 U	0.24 U	0.23 U	1.2 UD	0.26 U	1.3 UD
Nitrobenzene	0.4	0.33 U	0.33 U	0.34 U	0.34 U	0.33 U	1.6 UD	0.37 U	1.9 UD
Isophorone	50	0.26 U	0.26 U	0.27 U	0.27 U	0.26 U	1.3 UD	0.29 U	1.5 UD
2-Nitrophenol	NA	0.28 U	0.28 U	0.29 U	0.29 U	0.28 U	1.4 UD	0.31 U	1.6 UD
2,4-Dimethylphenol	1	0.76 U	0.76 U	0.78 U	0.78 U	0.76 U	3.8 UD	0.85 U	4.3 UD
bis(2-Chloroethoxy)methane	5	0.33 U	0.33 U	0.34 U	0.34 U	0.33 U	1.6 UD	0.37 U	1.9 UD
2,4-Dichlorophenol	1	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	1.7 UD	0.38 U	1.9 UD
Naphthalene	10	0.28 U	0.28 U	0.29 U	0.29 U	**87 E**	**83 D**	**65**	**59 D**
4-Chloroaniline	5	0.92 U	0.92 U	0.94 U	0.95 U	0.92 U	4.6 UD	1 U	5.2 UD
Hexachlorobutadiene	NA	0.39 U	0.39 U	0.4 U	0.4 U	0.39 U	2 UD	0.44 U	2.2 UD
Caprolactam	NA	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	7.4 UD	1.7 U	8.3 UD
4-Chloro-3-methylphenol	NA	0.22 U	0.22 U	0.22 U	0.23 U	0.22 U	1.1 UD	0.25 U	1.2 UD
2-Methylnaphthalene	NA	0.37 U	0.37 U	0.38 U	0.38 U	6.2 J	5.1 JD	4.8 J	2.1 UD
Hexachlorocyclopentadiene	5	0.56 U	0.56 U	0.57 U	0.58 U	0.56 U	2.8 UD	0.63 U	3.1 UD
2,4,6-Trichlorophenol	NA	0.35 U	0.35 U	0.36 U	0.36 U	0.35 U	1.8 UD	0.39 U	2 UD
2,4,5-Trichlorophenol	NA	0.38 U	0.38 U	0.39 U	0.39 U	0.38 U	1.9 UD	0.43 U	2.1 UD
1,1-Biphenyl	5	0.32 U	0.32 U	0.33 U	0.33 U	**8.7 J**	**7.6 JD**	**7.4 J**	**6.1 JD**
2-Chloronaphthalene	10	0.23 U	0.23 U	0.23 U	0.24 U	0.23 U	1.2 UD	0.26 U	1.3 UD
2-Nitroaniline	5	0.25 U	0.25 U	0.26 U	0.26 U	0.25 U	1.2 UD	0.28 U	1.4 UD
Dimethylphthalate	50	0.27 U	0.27 U	0.28 U	0.28 U	0.27 U	1.4 UD	0.3 U	1.5 UD
Acenaphthylene	NA	0.35 U	0.35 U	0.36 U	0.36 U	2.7 J	1.8 UD	2.4 J	2 UD
2,6-Dinitrotoluene	5	0.35 U	0.35 U	0.36 U	0.36 U	0.35 U	1.8 UD	0.39 U	2 UD
3-Nitroaniline	5	0.35 U	0.35 U	0.36 U	0.36 U	0.35 U	1.8 UD	0.39 U	2 UD
Acenaphthene	20	0.32 U	0.32 U	2.6 J	6.3 J	**110 E**	**110 D**	**100 E**	**95 D**
2,4-Dinitrophenol	1	0.64 U	0.64 U	0.65 U	0.66 U	0.64 U	3.2 UD	0.72 U	3.6 UD
4-Nitrophenol	NA	1.7 U	1.7 U	1.8 U	1.8 U	1.7 U	8.6 UD	1.9 U	9.7 UD
Dibenzofuran	NA	0.31 U	0.31 U	0.32 U	0.32 U	58	52 D	52	45 JD
2,4-Dinitrotoluene	5	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U	1.7 UD	0.38 U	1.9 UD
Diethylphthalate	50	0.32 U	0.32 U	8.6 J	0.33 U	0.32 U	1.6 UD	0.36 U	1.8 UD
4-Chlorophenyl-phenylether	NA	0.29 U	0.29 U	0.3 U	0.3 U	0.29 U	1.4 UD	0.33 U	1.6 UD

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Table 7: Ground-Water Sampling Results for the Sand Aquifier
Semi-Volatile Organic Compounds

Sample ID	NYS Ambient	MW-6I	MW-D2 (MW-6I)	MW-7I	MW-7IDL	FB-1	FB-2	FB-3
Lab Sample Number	Ground Water	Z3830-11	Z3830-10	Z3830-12	Z3830-12DL	Z3783-05	Z3830-15	Z3830-16
Sampling Date		7/21/2008	7/21/2008	7/21/2008	7/21/2008	7/18/2008	7/21/2008	7/22/2008
Matrix		WATER	WATER	WATER	WATER	WATER	WATER	WATER
Dilution Factor		1	1	1	2	1	1	1
Units	ug/L	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
Base Neutrals								
Benzaldehyde	NA	0.27 U	0.28 U	0.27 U	0.54 UD	0.27 U	0.27 U	0.28 U
Phenol	1	0.55 U	0.57 U	0.55 U	1.1 UD	0.56 U	0.56 U	0.58 U
bis(2-Chloroethyl)ether	1	0.28 U	0.29 U	0.28 U	0.56 UD	0.28 U	0.28 U	0.29 U
2-Chlorophenol	NA	0.33 U	0.34 U	0.33 U	0.66 UD	0.33 U	0.33 U	0.35 U
2-Methylphenol	NA	0.36 U	0.38 U	0.36 U	0.72 UD	0.36 U	0.36 U	0.38 U
2,2-oxybis(1-Chloropropane)	NA	0.27 U	0.28 U	0.27 U	0.54 UD	0.27 U	0.27 U	0.28 U
Acetophenone	NA	0.37 U	0.39 U	0.37 U	0.74 UD	0.37 U	0.37 U	0.39 U
3+4-Methylphenols	NA	0.39 U	0.41 U	0.39 U	0.78 UD	0.39 U	0.39 U	0.41 U
N-Nitroso-di-n-propylamine	NA	0.34 U	0.35 U	0.34 U	0.68 UD	0.34 U	0.34 U	0.36 U
Hexachloroethane	5	0.23 U	0.24 U	0.23 U	0.46 UD	0.23 U	0.23 U	0.24 U
Nitrobenzene	0.4	0.33 U	0.34 U	0.33 U	0.66 UD	0.33 U	0.33 U	0.35 U
Isophorone	50	0.26 U	0.27 U	0.26 U	0.52 UD	0.26 U	0.26 U	0.27 U
2-Nitrophenol	NA	0.28 U	0.29 U	0.28 U	0.56 UD	0.28 U	0.28 U	0.29 U
2,4-Dimethylphenol	1	0.76 U	0.79 U	0.76 U	1.5 UD	0.77 U	0.77 U	0.8 U
bis(2-Chloroethoxy)methane	5	0.33 U	0.34 U	0.33 U	0.66 UD	0.33 U	0.33 U	0.35 U
2,4-Dichlorophenol	1	0.34 U	0.35 U	0.34 U	0.68 UD	0.34 U	0.34 U	0.36 U
Naphthalene	10	0.28 U	0.29 U	**82 E**	**86 D**	0.28 U	0.28 U	0.29 U
4-Chloroaniline	5	0.92 U	0.96 U	0.92 U	1.8 UD	0.93 U	0.93 U	0.97 U
Hexachlorobutadiene	NA	0.39 U	0.41 U	0.39 U	0.78 UD	0.39 U	0.39 U	0.41 U
Caprolactam	NA	1.5 U	1.5 U	1.5 U	3 UD	1.5 U	1.5 U	1.6 U
4-Chloro-3-methylphenol	NA	0.22 U	0.23 U	0.22 U	0.44 UD	0.22 U	0.22 U	0.23 U
2-Methylnaphthalene	NA	0.37 U	0.39 U	5.8 J	5.6 JD	0.37 U	0.37 U	0.39 U
Hexachlorocyclopentadiene	5	0.56 U	0.58 U	0.56 U	1.1 UD	0.57 U	0.57 U	0.59 U
2,4,6-Trichlorophenol	NA	0.35 U	0.36 U	0.35 U	0.7 UD	0.35 U	0.35 U	0.37 U
2,4,5-Trichlorophenol	NA	0.38 U	0.4 U	0.38 U	0.76 UD	0.38 U	0.38 U	0.4 U
1,1-Biphenyl	5	0.32 U	0.33 U	1.7 J	0.64 UD	0.32 U	0.32 U	0.34 U
2-Chloronaphthalene	10	0.23 U	0.24 U	0.23 U	0.46 UD	0.23 U	0.23 U	0.24 U
2-Nitroaniline	5	0.25 U	0.26 U	0.25 U	0.5 UD	0.25 U	0.25 U	0.26 U
Dimethylphthalate	50	0.27 U	0.28 U	0.27 U	0.54 UD	0.27 U	0.27 U	0.28 U
Acenaphthylene	NA	0.35 U	0.36 U	0.35 U	12 JD	0.35 U	0.35 U	0.37 U
2,6-Dinitrotoluene	5	0.35 U	0.36 U	0.35 U	0.7 UD	0.35 U	0.35 U	0.37 U
3-Nitroaniline	5	0.35 U	0.36 U	0.35 U	0.7 UD	0.35 U	0.35 U	0.37 U
Acenaphthene	20	9 J	9.5 J	**40**	**39 D**	0.32 U	0.32 U	0.34 U
2,4-Dinitrophenol	1	0.64 U	0.67 U	0.64 U	1.3 UD	0.65 U	0.65 U	0.67 U
4-Nitrophenol	NA	1.7 U	1.8 U	1.7 U	3.5 UD	1.7 U	1.7 U	1.8 U
Dibenzofuran	NA	0.31 U	0.32 U	14	14 JD	0.31 U	0.31 U	0.33 U
2,4-Dinitrotoluene	5	0.34 U	0.35 U	0.34 U	0.68 UD	0.34 U	0.34 U	0.36 U
Diethylphthalate	50	0.32 U	0.33 U	0.32 U	0.64 UD	0.32 U	0.32 U	0.34 U
4-Chlorophenyl-phenylether	NA	0.29 U	0.3 U	0.29 U	0.58 UD	0.29 U	0.29 U	0.31 U

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Table 7: Ground-Water Sampling Results for the Sand Aquifier
Semi-Volatile Organic Compounds

Sample ID	NYS Ambient	MW-3I	MW-3IRE	MW-3D	MW-4I	MW-5I-1	MW-5I-1DL	MW-D1 (MW-5I-2)	MW-D1DL (MW-5I-2DL)
Lab Sample Number	Ground Water	Z3830-13	Z3830-13RE	Z3783-01	Z3783-03	Z3783-04	Z3783-04DL	Z3783-07	Z3783-07DL
Sampling Date		7/21/2008	7/21/2008	7/18/2008	7/18/2008	7/18/2008	7/18/2008	7/18/2008	7/18/2008
Matrix		WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
Dilution Factor		1	1	1	1	1	5	1	5
Units	ug/L	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
Base Neutrals									
Fluorene	50	0.28 U	0.28 U	0.29 U	1.8 J	67 E	59 D	59	51 JD
4-Nitroaniline	5	0.36 U	0.36 U	0.37 U	0.37 U	0.36 U	1.8 UD	0.4 U	2 UD
4,6-Dinitro-2-methylphenol	NA	0.29 U	0.29 U	0.3 U	0.3 U	0.29 U	1.4 UD	0.33 U	1.6 UD
N-Nitrosodiphenylamine	50	0.35 U	0.35 U	0.36 U	0.36 U	0.35 U	1.8 UD	0.39 U	2 UD
4-Bromophenyl-phenylether	NA	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	7 UD	1.6 U	7.9 UD
Hexachlorobenzene	0.04	0.27 U	0.27 U	0.28 U	0.28 U	0.27 U	1.4 UD	0.3 U	1.5 UD
Atrazine	7.5	0.37 U	0.37 U	0.38 U	0.38 U	0.37 U	1.8 UD	0.42 U	2.1 UD
Pentachlorophenol	1	0.52 U	0.52 U	0.53 U	0.54 U	0.52 U	2.6 UD	0.58 U	2.9 UD
Phenanthrene	50	1.4 U	1.4 U	1.4 U	1.4 U	43	40 JD	34	30 JD
Anthracene	50	1.4 U	1.4 U	1.4 U	1.5 U	6 J	7.1 UD	5 J	8 UD
Carbazole	NA	0.24 U	0.24 U	0.24 U	0.25 U	22	20 JD	21	18 JD
Di-n-butylphthalate	50	5.9 U	5.9 U	6 U	6 U	5.9 U	29 UD	6.6 U	33 UD
Fluoranthene	50	0.2 U	0.2 U	0.2 U	0.21 U	14	12 JD	12	10 JD
Pyrene	50	1.4 U	1.4 U	1.4 U	1.5 U	7 J	7 UD	5.9 J	7.9 UD
Butylbenzylphthalate	50	0.42 U	0.42 U	0.43 U	0.43 U	0.42 U	2.1 UD	0.47 U	2.4 UD
3,3-Dichlorobenzidine	5	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	5.4 UD	1.2 U	6.1 UD
Benzo(a)anthracene	0.002	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	6.5 UD	1.5 U	7.3 UD
Chrysene	0.002	0.26 U	0.26 U	0.27 U	0.27 U	0.26 U	1.3 UD	0.29 U	1.5 UD
bis(2-Ethylhexyl)phthalate	5	1.3 U	1.3 U	1.4 J	1.3 U	1.3 U	6.5 UD	1.5 U	7.3 UD
Di-n-octyl phthalate	50	0.26 U	0.26 U	0.27 U	0.27 U	0.26 U	1.3 UD	0.29 U	1.5 UD
Benzo(b)fluoranthene	0.002	0.43 U	0.43 U	0.44 U	0.44 U	0.43 U	2.2 UD	0.48 U	2.4 UD
Benzo(k)fluoranthene	0.002	0.3 U	0.3 U	0.31 U	0.31 U	0.3 U	1.5 UD	0.34 U	1.7 UD
Benzo(a)pyrene	NA	0.22 U	0.22 U	0.22 U	0.23 U	0.22 U	1.1 UD	0.25 U	1.2 UD
Indeno(1,2,3-cd)pyrene	0.002	0.66 U	0.66 U	0.67 U	0.68 U	0.66 U	3.3 UD	0.74 U	3.7 UD
Dibenz(a,h)anthracene	NA	0.54 U	0.54 U	0.55 U	0.56 U	0.54 U	2.7 UD	0.61 U	3 UD
Benzo(g,h,i)perylene	NA	0.39 U	0.39 U	0.4 U	0.4 U	0.39 U	2 UD	0.44 U	2.2 UD

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Table 7: Ground-Water Sampling Results for the Sand Aquifier
Semi-Volatile Organic Compounds

Sample ID	NYS Ambient	MW-6I	MW-D2 (MW-6I)	MW-7I	MW-7IDL	FB-1	FB-2	FB-3
Lab Sample Number	Ground Water	Z3830-11	Z3830-10	Z3830-12	Z3830-12DL	Z3783-05	Z3830-15	Z3830-16
Sampling Date		7/21/2008	7/21/2008	7/21/2008	7/21/2008	7/18/2008	7/21/2008	7/22/2008
Matrix		WATER	WATER	WATER	WATER	WATER	WATER	WATER
Dilution Factor		1	1	1	2	1	1	1
Units	ug/L	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
Base Neutrals								
Fluorene	50	2 J	1.7 J	12	12 JD	0.28 U	0.28 U	0.29 U
4-Nitroaniline	5	0.36 U	0.38 U	0.36 U	0.72 UD	0.36 U	0.36 U	0.38 U
4,6-Dinitro-2-methylphenol	NA	0.29 U	0.3 U	0.29 U	0.58 UD	0.29 U	0.29 U	0.31 U
N-Nitrosodiphenylamine	50	0.35 U	0.36 U	0.35 U	0.7 UD	0.35 U	0.35 U	0.37 U
4-Bromophenyl-phenylether	NA	1.4 U	1.5 U	1.4 U	2.8 UD	1.4 U	1.4 U	1.5 U
Hexachlorobenzene	0.04	0.27 U	0.28 U	0.27 U	0.54 UD	0.27 U	0.27 U	0.28 U
Atrazine	7.5	0.37 U	0.39 U	0.37 U	0.74 UD	0.37 U	0.37 U	0.39 U
Pentachlorophenol	1	0.52 U	0.54 U	0.52 U	1 UD	0.53 U	0.53 U	0.55 U
Phenanthrene	50	1.4 U	1.4 U	9.4 J	8.7 JD	1.4 U	1.4 U	1.4 U
Anthracene	50	1.4 U	1.5 U	2.5 J	2.8 UD	1.4 U	1.4 U	1.5 U
Carbazole	NA	0.24 U	0.25 U	4.4 J	4.1 JD	0.24 U	0.24 U	0.25 U
Di-n-butylphthalate	50	5.9 U	6.1 U	5.9 U	12 UD	5.9 U	5.9 U	6.2 U
Fluoranthene	50	0.2 U	0.21 U	1.4 J	0.4 UD	0.2 U	0.2 U	0.21 U
Pyrene	50	1.4 U	1.5 U	1.4 U	2.8 UD	1.4 U	1.4 U	1.5 U
Butylbenzylphthalate	50	0.42 U	0.44 U	0.42 U	0.84 UD	0.42 U	0.42 U	0.44 U
3,3-Dichlorobenzidine	5	1.1 U	1.1 U	1.1 U	2.2 UD	1.1 U	1.1 U	1.1 U
Benzo(a)anthracene	0.002	1.3 U	1.4 U	1.3 U	2.6 UD	1.3 U	1.3 U	1.4 U
Chrysene	0.002	0.26 U	0.27 U	0.26 U	0.52 UD	0.26 U	0.26 U	0.27 U
bis(2-Ethylhexyl)phthalate	5	1.3 U	1.4 U	1.3 U	2.6 UD	1.3 U	1.3 U	1.4 U
Di-n-octyl phthalate	50	0.26 U	0.27 U	0.26 U	0.52 UD	0.26 U	0.26 U	0.27 U
Benzo(b)fluoranthene	0.002	0.43 U	0.45 U	0.43 U	0.86 UD	0.43 U	0.43 U	0.45 U
Benzo(k)fluoranthene	0.002	0.3 U	0.31 U	0.3 U	0.6 UD	0.3 U	0.3 U	0.32 U
Benzo(a)pyrene	NA	0.22 U	0.23 U	0.22 U	0.44 UD	0.22 U	0.22 U	0.23 U
Indeno(1,2,3-cd)pyrene	0.002	0.66 U	0.69 U	0.66 U	1.3 UD	0.67 U	0.67 U	0.69 U
Dibenz(a,h)anthracene	NA	0.54 U	0.56 U	0.54 U	1.1 UD	0.55 U	0.55 U	0.57 U
Benzo(g,h,i)perylene	NA	0.39 U	0.41 U	0.39 U	0.78 UD	0.39 U	0.39 U	0.41 U

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Table 7: Ground-Water Sampling Results for the Sand Aquifier
Metals

Sample ID	NYS Ambient	MW-3I	MW-3D	MW-4I	MW-5I-1	MW-D1(MW-5I-2)	MW-6I	MW-D2 (MW-6I)	MW-7I	FB-1	FB-2	FB-3
Lab Sample Number	Ground Water	Z3830-13	Z3783-01	Z3783-03	Z3783-04	Z3783-07	Z3830-11	Z3830-10	Z3830-12	Z3783-05	Z3830-15	Z3830-16
Sampling Date		7/21/2008	7/18/2008	7/18/2008	7/18/2008	7/18/2008	7/21/2008	7/21/2008	7/21/2008	7/18/2008	7/21/2008	7/22/2008
Matrix		WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
Dilution Factor		1	1	1	1	1	1	1	1	1	1	1
Units	ug/L	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
TAL METALS												
Aluminum	NA	130	2070	250	223	131	495	222	132	19.3 U	19.3 U	19.3 U
Antimony	3	0.4 J	0.25 J	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
Arsenic	25	5.4 U	5.4 U	6.15 J	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U
Barium	1000	109	403	132	95.6	92.3	148	138	112	11.2 U	11.2 U	11.2 U
Beryllium	3	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Cadmium	5	0.9 U	1.27 J	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U
Calcium	NA	104000	196000	63600	70300	64100	183000	172000	87800	457 J	282 U	282 U
Chromium	50	1.4 U	7.38	1.62 J	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
Cobalt	NA	2.5 U	2.54 J	14.2 J	3.27 J	3.03 J	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Copper	200	4.13 J	13.1	3.7 U	4.02 J	3.7 U	4.41 J	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U
Iron	300	6610	7300	27300	26600	24400	3160	2770	3330	122	33.1 J	27 U
Lead	25	6.64 J	14.3	6.96 J	5.24 J	3.1 U	6.89 J	3.1 U	3.1 U	3.1 U	3.1 U	3.1 U
Magnesium	35000	26000	65900	27800	15900	13200	56500	53300	51000	291 U	291 U	291 U
Manganese	300	575	333	700	2460	2280	1040	942	336	9.43 J	0.9 U	0.9 U
Mercury	0.7	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U
Nickel	100	4.9 U	4.9 U	4.9 U	9.17 J	6.43 J	4.9 U	4.9 U	4.9 U	4.9 U	4.9 U	4.9 U
Potassium	NA	18700	35000	23900	14800	14500	25300	25300	45100	260 J	196 J	113 J
Selenium	10	4.5 U	4.5 U	4.5 U	4.5 U	4.5 U	4.5 U	4.5 U	4.5 U	4.5 U	4.5 U	4.5 U
Thallium	0.5	0.1 U	0.23 J	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Silver	50	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Sodium	20000	110000	424000	271000	112000	110000	106000	108000	229000	1600	1220	886 J
Vanadium	NA	4.1 U	16.9 J	4.79 J	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U
Zinc	2000	35.3	101	38.8	39.6	31.6	41.9	36	20.8	33.3	41.2	21.6

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Table 7: Ground-Water Sampling Results for the Perched Water Table
Analytical Table Qualifiers

Qualifiers

U - The compound was not detected at the indicated concentration.

J - Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit but greater than MDL. The concentration given is an approximate value.

B - The analyte was found in the laboratory blank as well as the sample. This indicates possible laboratory contamination of the environmental sample.

P - For dual column analysis, the percent difference between the quantitated concentrations on the two columns is greater than 40%.

* - For dual column analysis, the lowest quantitated concentration is being reported due to coeluting interference.

E (Organics) - Indicates the analyte 's concentration exceeds the calibrated range of the instrument for that specific analysis.

E (Inorganics) - The reported value is estimated because of the presence of interference.

D - The reported value is from a secondary analysis with a dilution factor. The original analysis exceeded the calibration range.

* - For dual column analysis, the lowest quantitated concentration is being reported due to coeluting interference.

NR - Not analyzed

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Table 6: Ground-Water Sampling Results for the Perched Aquifer
Volatile Organic Compounds

Sample ID	NYS Ambient	MW-1	MW-5S	MW-8S	MW-9S	MW-11S	MW-12S	MW-D3 (MW-12S)	MW-13S	GW-1	GW-2	FB-1	FB-2	FB-3	TB-1	TB-2
Lab Sample Number	Ground Water	Z3830-02	Z3783-02	Z3830-03	Z3830-09	Z3830-04	Z3830-06	Z3830-01	Z3830-05	Z3830-07	Z3830-08	Z3783-05	Z3830-15	Z3830-16	Z3783-06	Z3830-14
Sampling Date		7/22/2008	7/18/2008	7/22/2008	7/21/2008	7/22/2008	7/22/2008	7/22/2008	7/22/2008	7/21/2008	7/21/2008	7/18/2008	7/21/2008	7/22/2008	7/15/2008	7/21/2008
Matrix		WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
Dilution Factor		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Units	ug/L	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
VO's																
Dichlorodifluoromethane	5	0.88 U	0.88 U	0.88 U	0.88 U	0.88 U	0.88 U	0.88 U	0.88 U	0.88 U	0.88 U	0.88 U	0.88 U	0.88 U	0.88 U	0.88 U
Chloromethane	5	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
Vinyl Chloride	2	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Bromomethane	5	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
Chloroethane	5	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
Trichlorofluoromethane	5	0.53 U	0.53 U	0.53 U	0.53 U	0.53 U	0.53 U	0.53 U	0.53 U	0.53 U	0.53 U	0.53 U	0.53 U	0.53 U	0.53 U	0.53 U
1,1,2-Trichlorotrifluoroethane	5	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U
1,1-Dichloroethene	5	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U
Acetone	50	2.2 U	2.2 U	12 J	2.2 U	2.2 U	2.2 U	2.2 U	18 J	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U
Carbon Disulfide	NA	4.3 J	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Methyl tert-butyl Ether	NA	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U
Methyl Acetate	NA	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U
Methylene Chloride	5	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U
trans-1,2-Dichloroethene	5	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U
1,1-Dichloroethane	5	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U
Cyclohexane	NA	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U	13	0.57 U	8.2	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U
2-Butanone	50	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
Carbon Tetrachloride	5	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U
cis-1,2-Dichloroethene	5	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U
Chloroform	7	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U
1,1,1-Trichloroethane	5	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U
Methylcyclohexane	NA	0.47 U	0.47 U	2.3 J	0.47 U	0.47 U	4.3 J	0.47 U	9.1	0.47 U	0.47 U	0.47 U	0.47 U	0.47 U	0.47 U	0.47 U
Benzene	1	0.35 U	0.35 U	100	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	2.3 J	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U
1,2-Dichloroethane	0.6	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U
Trichloroethene	5	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U
1,2-Dichloropropane	1	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U
Bromodichloromethane	50	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U
4-Methyl-2-Pentanone	NA	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
Toluene	5	0.16 U	0.16 U	9.8	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U
t-1,3-Dichloropropene	0.4	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U
cis-1,3-Dichloropropene	0.4	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U
1,1,2-Trichloroethane	1	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
2-Hexanone	50	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
Dibromochloromethane	50	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U
1,2-Dibromoethane	0.0006	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U
Tetrachloroethene	5	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U
Chlorobenzene	5	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
Ethyl Benzene	5	0.05 U	0.05 U	30	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
m/p-Xylenes	NA	0.47 U	3.8 J	44	0.47 U	0.47 U	0.47 U	0.47 U	0.47 U	0.47 U	0.47 U	0.47 U	0.47 U	0.47 U	0.47 U	0.47 U
o-Xylene	NA	0.16 U	2.9 J	23	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U
Styrene	5	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
Bromoform	50	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U
Isopropylbenzene	5	11	0.37 U	30	0.37 U	0.37 U	6.6	24	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
1,1,2,2-Tetrachloroethane	5	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
1,3-Dichlorobenzene	3	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
1,4-Dichlorobenzene	3	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U
1,2-Dichlorobenzene	3	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1,2-Dibromo-3-Chloropropane	0.04	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U
1,2,4-Trichlorobenzene	5	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U

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Table 6: Ground-Water Sampling Results for the Perched Aquifier
Semi-Volatile Organic Compounds

Sample ID	NYS Ambient	MW-1	MW-5S	MW-8S	MW-8SDL	MW-8SDL2	MW-8SDL3	MW-9S	MW-11S_	MW-11S (Filtered)	MW-12S	MW-D3 (MW-12S)	MW-13S	GW-1	GW-2
Lab Sample Number	Ground Water	Z3830-02	Z3783-02	Z3830-03	Z3830-03DL	Z3830-03DL2	Z3830-03DL3	Z3830-09	Z3830-04	Z3830-19	Z3830-06	Z3830-01	Z3830-05	Z3830-07	Z3830-08
Sampling Date		7/22/2008	7/18/2008	7/22/2008	7/22/2008	7/22/2008	7/22/2008	7/21/2008	7/22/2008	7/22/2008	7/22/2008	7/22/2008	7/22/2008	7/21/2008	7/21/2008
Matrix		WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
Dilution Factor		1	1	1	5	25	125	1	1	1	1	1	1	1	1
Units	ug/L	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
Base Neutrals															
Benzaldehyde	NA	0.3 U	0.31 U	0.27 U	1.4 UD	6.8 UD	34 UD	0.3 U	0.33 U	0.45 U	0.27 U	0.3 U	0.33 U	0.27 U	0.28 U
Phenol	1	0.6 U	0.63 U	0.55 U	2.8 UD	14 UD	69 UD	0.6 U	0.68 U	0.92 U	0.55 U	0.61 U	0.66 U	0.55 U	0.57 U
bis(2-Chloroethyl)ether	1	0.31 U	0.32 U	0.28 U	1.4 UD	7 UD	35 UD	0.31 U	0.35 U	0.47 U	0.28 U	0.31 U	0.34 U	0.28 U	0.29 U
2-Chlorophenol	NA	0.36 U	0.38 U	0.33 U	1.6 UD	8.2 UD	41 UD	0.36 U	0.41 U	0.55 U	0.33 U	0.37 U	0.4 U	0.33 U	0.34 U
2-Methylphenol	NA	0.4 U	0.41 U	0.36 U	1.8 UD	9 UD	45 UD	0.4 U	0.44 U	0.6 U	0.36 U	0.4 U	0.43 U	0.36 U	0.38 U
2,2-oxybis(1-Chloropropane)	NA	0.3 U	0.31 U	0.27 U	1.4 UD	6.8 UD	34 UD	0.3 U	0.33 U	0.45 U	0.27 U	0.3 U	0.33 U	0.27 U	0.28 U
Acetophenone	NA	0.41 U	0.43 U	0.37 U	1.8 UD	9.2 UD	46 UD	0.41 U	0.46 U	0.62 U	0.37 U	0.41 U	0.45 U	0.37 U	0.39 U
3+4-Methylphenols	NA	0.43 U	0.45 U	1.2 J	2 UD	9.8 UD	49 UD	0.43 U	0.48 U	0.65 U	0.39 U	0.43 U	0.47 U	0.39 U	0.41 U
N-Nitroso-di-n-propylamine	NA	0.37 U	0.39 U	0.34 U	1.7 UD	8.5 UD	42 UD	0.37 U	0.42 U	0.57 U	0.34 U	0.38 U	0.41 U	0.34 U	0.35 U
Hexachloroethane	5	0.25 U	0.26 U	0.23 U	1.2 UD	5.8 UD	29 UD	0.25 U	0.28 U	0.38 U	0.23 U	0.26 U	0.28 U	0.23 U	0.24 U
Nitrobenzene	0.4	0.36 U	0.38 U	0.33 U	1.6 UD	8.2 UD	41 UD	0.36 U	0.41 U	0.55 U	0.33 U	0.37 U	0.4 U	0.33 U	0.34 U
Isophorone	50	0.29 U	0.3 U	0.26 U	1.3 UD	6.5 UD	32 UD	0.29 U	0.32 U	0.43 U	0.26 U	0.29 U	0.31 U	0.26 U	0.27 U
2-Nitrophenol	NA	0.31 U	0.32 U	0.28 U	1.4 UD	7 UD	35 UD	0.31 U	0.35 U	0.47 U	0.28 U	0.31 U	0.34 U	0.28 U	0.29 U
2,4-Dimethylphenol	1	0.84 U	0.87 U	0.76 U	3.8 UD	19 UD	95 UD	0.84 U	0.94 U	1.3 U	0.76 U	0.84 U	0.92 U	0.76 U	0.79 U
bis(2-Chloroethoxy)methane	5	0.36 U	0.38 U	0.33 U	1.6 UD	8.2 UD	41 UD	0.36 U	0.41 U	0.55 U	0.33 U	0.37 U	0.4 U	0.33 U	0.34 U
2,4-Dichlorophenol	1	0.37 U	0.39 U	0.34 U	1.7 UD	8.5 UD	42 UD	0.37 U	0.42 U	0.57 U	0.34 U	0.38 U	0.41 U	0.34 U	0.35 U
Naphthalene	10	0.31 U	0.32 U	**1300 E**	**1800 ED**	**3100 ED**	**3400 D**	0.31 U	0.35 U	0.47 U	0.28 U	1.6 J	0.34 U	0.28 U	0.29 U
4-Chloroaniline	5	1 U	1.1 U	0.92 U	4.6 UD	23 UD	120 UD	1 U	1.1 U	1.5 U	0.92 U	1 U	1.1 U	0.92 U	0.96 U
Hexachlorobutadiene	NA	0.43 U	0.45 U	0.39 U	2 UD	9.8 UD	49 UD	0.43 U	0.48 U	0.65 U	0.39 U	0.43 U	0.47 U	0.39 U	0.41 U
Caprolactam	NA	1.6 U	1.7 U	1.5 U	7.4 UD	37 UD	180 UD	1.6 U	1.8 U	2.5 U	1.5 U	1.6 U	1.8 U	1.5 U	1.5 U
4-Chloro-3-methylphenol	NA	0.24 U	0.25 U	0.22 U	1.1 UD	5.5 UD	28 UD	0.24 U	0.27 U	0.37 U	0.22 U	0.24 U	0.27 U	0.22 U	0.23 U
2-Methylnaphthalene	NA	0.41 U	0.43 U	600 E	730 ED	820 D	780 JD	0.41 U	0.46 U	0.62 U	0.37 U	0.41 U	0.45 U	0.37 U	0.39 U
Hexachlorocyclopentadiene	5	0.62 U	0.64 U	0.56 U	2.8 UD	14 UD	70 UD	0.62 U	0.69 U	0.93 U	0.56 U	0.62 U	0.67 U	0.56 U	0.58 U
2,4,6-Trichlorophenol	NA	0.38 U	0.4 U	0.35 U	1.8 UD	8.8 UD	44 UD	0.38 U	0.43 U	0.58 U	0.35 U	0.39 U	0.42 U	0.35 U	0.36 U
2,4,5-Trichlorophenol	NA	0.42 U	0.44 U	0.38 U	1.9 UD	9.5 UD	48 UD	0.42 U	0.47 U	0.63 U	0.38 U	0.42 U	0.46 U	0.38 U	0.4 U
1,1-Biphenyl	5	0.35 U	0.37 U	**64 E**	**66 D**	**65 JD**	40 UD	0.35 U	0.4 U	0.53 U	0.32 U	0.36 U	0.39 U	0.32 U	0.33 U
2-Chloronaphthalene	10	0.25 U	0.26 U	0.23 U	1.2 UD	5.8 UD	29 UD	0.25 U	0.28 U	0.38 U	0.23 U	0.26 U	0.28 U	0.23 U	0.24 U
2-Nitroaniline	5	0.27 U	0.29 U	0.25 U	1.2 UD	6.2 UD	31 UD	0.27 U	0.31 U	0.42 U	0.25 U	0.28 U	0.3 U	0.25 U	0.26 U
Dimethylphthalate	50	0.3 U	0.31 U	0.27 U	1.4 UD	6.8 UD	34 UD	0.3 U	0.33 U	0.45 U	0.27 U	0.3 U	0.33 U	0.27 U	0.28 U
Acenaphthylene	NA	0.38 U	0.4 U	0.35 U	1.8 UD	8.8 UD	44 UD	0.38 U	0.43 U	0.58 U	0.35 U	0.39 U	0.42 U	0.35 U	0.36 U
2,6-Dinitrotoluene	5	0.38 U	0.4 U	0.35 U	1.8 UD	8.8 UD	44 UD	0.38 U	0.43 U	0.58 U	0.35 U	0.39 U	0.42 U	0.35 U	0.36 U
3-Nitroaniline	5	0.38 U	0.4 U	0.35 U	1.8 UD	8.8 UD	44 UD	0.38 U	0.43 U	0.58 U	0.35 U	0.39 U	0.42 U	0.35 U	0.36 U
Acenaphthene	20	0.35 U	2.8 J	**260 E**	**400 ED**	**420 D**	**400 JD**	2.5 J	0.4 U	0.53 U	2.2 J	0.36 U	0.39 U	0.32 U	0.33 U
2,4-Dinitrophenol	1	0.7 U	0.74 U	0.64 U	3.2 UD	16 UD	80 UD	0.7 U	0.79 U	1.1 U	0.64 U	0.71 U	0.77 U	0.64 U	0.67 U
4-Nitrophenol	NA	1.9 U	2 U	1.7 U	8.6 UD	43 UD	220 UD	1.9 U	2.1 U	2.9 U	1.7 U	1.9 U	2.1 U	1.7 U	1.8 U
Dibenzofuran	NA	0.34 U	0.36 U	220 E	300 ED	310 D	290 JD	0.34 U	0.38 U	0.52 U	0.31 U	0.34 U	0.37 U	0.31 U	0.32 U
2,4-Dinitrotoluene	5	0.37 U	0.39 U	0.34 U	1.7 UD	8.5 UD	42 UD	0.37 U	0.42 U	0.57 U	0.34 U	0.38 U	0.41 U	0.34 U	0.35 U
Diethylphthalate	50	0.35 U	0.37 U	0.32 U	1.6 UD	8 UD	40 UD	0.35 U	1.6 J	0.53 U	0.32 U	0.36 U	0.39 U	0.32 U	0.33 U
4-Chlorophenyl-phenylether	NA	0.32 U	0.33 U	0.29 U	1.4 UD	7.2 UD	36 UD	0.32 U	0.36 U	0.48 U	0.29 U	0.32 U	0.35 U	0.29 U	0.3 U

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Table 6: Ground-Water Sampling Results for the Perched Aquifer
Semi-Volatile Organic Compounds

Sample ID	NYS Ambient	FB-1	FB-2	FB-3
Lab Sample Number	Ground Water	Z3783-05	Z3830-15	Z3830-16
Sampling Date		7/18/2008	7/21/2008	7/22/2008
Matrix		WATER	WATER	WATER
Dilution Factor		1	1	1
Units	ug/L	ug/l	ug/l	ug/l
Base Neutrals				
Benzaldehyde	NA	0.27 U	0.27 U	0.28 U
Phenol	1	0.56 U	0.56 U	0.58 U
bis(2-Chloroethyl)ether	1	0.28 U	0.28 U	0.29 U
2-Chlorophenol	NA	0.33 U	0.33 U	0.35 U
2-Methylphenol	NA	0.36 U	0.36 U	0.38 U
2,2-oxybis(1-Chloropropane)	NA	0.27 U	0.27 U	0.28 U
Acetophenone	NA	0.37 U	0.37 U	0.39 U
3+4-Methylphenols	NA	0.39 U	0.39 U	0.41 U
N-Nitroso-di-n-propylamine	NA	0.34 U	0.34 U	0.36 U
Hexachloroethane	5	0.23 U	0.23 U	0.24 U
Nitrobenzene	0.4	0.33 U	0.33 U	0.35 U
Isophorone	50	0.26 U	0.26 U	0.27 U
2-Nitrophenol	NA	0.28 U	0.28 U	0.29 U
2,4-Dimethylphenol	1	0.77 U	0.77 U	0.8 U
bis(2-Chloroethoxy)methane	5	0.33 U	0.33 U	0.35 U
2,4-Dichlorophenol	1	0.34 U	0.34 U	0.36 U
Naphthalene	10	0.28 U	0.28 U	0.29 U
4-Chloroaniline	5	0.93 U	0.93 U	0.97 U
Hexachlorobutadiene	NA	0.39 U	0.39 U	0.41 U
Caprolactam	NA	1.5 U	1.5 U	1.6 U
4-Chloro-3-methylphenol	NA	0.22 U	0.22 U	0.23 U
2-Methylnaphthalene	NA	0.37 U	0.37 U	0.39 U
Hexachlorocyclopentadiene	5	0.57 U	0.57 U	0.59 U
2,4,6-Trichlorophenol	NA	0.35 U	0.35 U	0.37 U
2,4,5-Trichlorophenol	NA	0.38 U	0.38 U	0.4 U
1,1-Biphenyl	5	0.32 U	0.32 U	0.34 U
2-Chloronaphthalene	10	0.23 U	0.23 U	0.24 U
2-Nitroaniline	5	0.25 U	0.25 U	0.26 U
Dimethylphthalate	50	0.27 U	0.27 U	0.28 U
Acenaphthylene	NA	0.35 U	0.35 U	0.37 U
2,6-Dinitrotoluene	5	0.35 U	0.35 U	0.37 U
3-Nitroaniline	5	0.35 U	0.35 U	0.37 U
Acenaphthene	20	0.32 U	0.32 U	0.34 U
2,4-Dinitrophenol	1	0.65 U	0.65 U	0.67 U
4-Nitrophenol	NA	1.7 U	1.7 U	1.8 U
Dibenzofuran	NA	0.31 U	0.31 U	0.33 U
2,4-Dinitrotoluene	5	0.34 U	0.34 U	0.36 U
Diethylphthalate	50	0.32 U	0.32 U	0.34 U
4-Chlorophenyl-phenylether	NA	0.29 U	0.29 U	0.31 U

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Table 6: Ground-Water Sampling Results for the Perched Aquifer
Semi-Volatile Organic Compounds

Sample ID	NYS Ambient	MW-1	MW-5S	MW-8S	MW-8SDL	MW-8SDL2	MW-8SDL3	MW-9S	MW-11S_	MW-11S (Filtered)	MW-12S	MW-D3 (MW-12S)	MW-13S	GW-1	GW-2
Lab Sample Number	Ground Water	Z3830-02	Z3783-02	Z3830-03	Z3830-03DL	Z3830-03DL2	Z3830-03DL3	Z3830-09	Z3830-04	Z3830-19	Z3830-06	Z3830-01	Z3830-05	Z3830-07	Z3830-08
Sampling Date		7/22/2008	7/18/2008	7/22/2008	7/22/2008	7/22/2008	7/22/2008	7/21/2008	7/22/2008	7/22/2008	7/22/2008	7/22/2008	7/22/2008	7/21/2008	7/21/2008
Matrix		WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
Dilution Factor		1	1	1	5	25	125	1	1	1	1	1	1	1	1
Units	ug/L	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
Fluorene	50	0.31 U	0.32 U	160 E	210 D	200 JD	190 JD	0.31 U	0.35 U	0.47 U	1.7 J	0.31 U	0.34 U	0.28 U	0.29 U
4-Nitroaniline	5	0.4 U	0.41 U	0.36 U	1.8 UD	9 UD	45 UD	0.4 U	0.44 U	0.6 U	0.36 U	0.4 U	0.43 U	0.36 U	0.38 U
4,6-Dinitro-2-methylphenol	NA	0.32 U	0.33 U	0.29 U	1.4 UD	7.2 UD	36 UD	0.32 U	0.36 U	0.48 U	0.29 U	0.32 U	0.35 U	0.29 U	0.3 U
N-Nitrosodiphenylamine	50	0.38 U	0.4 U	0.35 U	1.8 UD	8.8 UD	44 UD	0.38 U	0.43 U	0.58 U	0.35 U	0.39 U	0.42 U	0.35 U	0.36 U
4-Bromophenyl-phenylether	NA	1.5 U	1.6 U	1.4 U	7 UD	35 UD	180 UD	1.5 U	1.7 U	2.3 U	1.4 U	1.6 U	1.7 U	1.4 U	1.5 U
Hexachlorobenzene	0.04	0.3 U	0.31 U	0.27 U	1.4 UD	6.8 UD	34 UD	0.3 U	0.33 U	0.45 U	0.27 U	0.3 U	0.33 U	0.27 U	0.28 U
Atrazine	7.5	0.41 U	0.43 U	0.37 U	1.8 UD	9.2 UD	46 UD	0.41 U	0.46 U	0.62 U	0.37 U	0.41 U	0.45 U	0.37 U	0.39 U
Pentachlorophenol	1	0.57 U	0.6 U	0.52 U	2.6 UD	13 UD	65 UD	0.57 U	0.64 U	0.87 U	0.52 U	0.58 U	0.63 U	0.52 U	0.54 U
Phenanthrene	50	1.5 U	1.6 U	170 E	210 D	210 JD	210 JD	1.5 U	1.7 U	2.3 U	1.4 U	1.5 U	1.6 U	1.4 U	1.4 U
Anthracene	50	1.6 U	1.6 U	30	28 JD	36 UD	180 UD	1.6 U	1.8 U	2.4 U	1.4 U	1.6 U	1.7 U	1.4 U	1.5 U
Carbazole	NA	0.26 U	13	79 E	83 D	79 JD	30 UD	0.26 U	0.3 U	0.4 U	0.24 U	0.27 U	0.29 U	0.24 U	0.25 U
Di-n-butylphthalate	50	6.4 U	6.7 U	5.9 U	29 UD	150 UD	730 UD	6.4 U	7.2 U	9.8 U	5.9 U	6.5 U	7.1 U	5.9 U	6.1 U
Fluoranthene	50	0.22 U	0.23 U	19	20 JD	5 UD	25 UD	0.22 U	0.25 U	0.33 U	1.6 J	0.22 U	0.24 U	0.2 U	0.21 U
Pyrene	50	1.5 U	1.6 U	11	10 JD	35 UD	180 UD	1.5 U	1.7 U	2.4 U	3.9 J	1.6 U	1.7 U	1.4 U	1.5 U
Butylbenzylphthalate	50	0.46 U	0.48 U	0.42 U	2.1 UD	10 UD	52 UD	0.46 U	0.52 U	0.7 U	0.42 U	0.47 U	0.51 U	0.42 U	0.44 U
3,3-Dichlorobenzidine	5	1.2 U	1.2 U	1.1 U	5.4 UD	27 UD	140 UD	1.2 U	1.3 U	1.8 U	1.1 U	1.2 U	1.3 U	1.1 U	1.1 U
Benzo(a)anthracene	0.002	1.4 U	1.5 U	1.7 J	6.5 UD	32 UD	160 UD	1.4 U	1.6 U	2.2 U	3 J	1.4 U	1.6 U	1.3 U	1.4 U
Chrysene	0.002	0.29 U	0.3 U	1.3 J	1.3 UD	6.5 UD	32 UD	0.29 U	0.32 U	0.43 U	3.7 J	0.29 U	0.31 U	0.26 U	0.27 U
bis(2-Ethylhexyl)phthalate	5	1.4 U	1.5 U	1.3 U	6.5 UD	32 UD	160 UD	1.4 U	1.6 U	2.2 U	1.3 U	1.4 U	1.6 U	1.3 U	1.4 U
Di-n-octyl phthalate	50	0.29 U	0.3 U	0.26 U	1.3 UD	6.5 UD	32 UD	0.29 U	0.32 U	0.43 U	0.26 U	0.29 U	0.31 U	0.26 U	0.27 U
Benzo(b)fluoranthene	0.002	0.47 U	0.49 U	0.43 U	2.2 UD	11 UD	54 UD	0.47 U	0.53 U	0.72 U	1.5 J	0.48 U	0.52 U	0.43 U	0.45 U
Benzo(k)fluoranthene	0.002	0.33 U	0.34 U	0.3 U	1.5 UD	7.5 UD	38 UD	0.33 U	0.37 U	0.5 U	0.3 U	0.33 U	0.36 U	0.3 U	0.31 U
Benzo(a)pyrene	NA	0.24 U	0.25 U	0.22 U	1.1 UD	5.5 UD	28 UD	0.24 U	0.27 U	0.37 U	2.3 J	0.24 U	0.27 U	0.22 U	0.23 U
Indeno(1,2,3-cd)pyrene	0.002	0.73 U	0.76 U	0.66 U	3.3 UD	16 UD	82 UD	0.73 U	0.81 U	1.1 U	0.66 U	0.73 U	0.8 U	0.66 U	0.69 U
Dibenz(a,h)anthracene	NA	0.59 U	0.62 U	0.54 U	2.7 UD	14 UD	68 UD	0.59 U	0.67 U	0.9 U	0.54 U	0.6 U	0.65 U	0.54 U	0.56 U
Benzo(g,h,i)perylene	NA	0.43 U	0.45 U	0.39 U	2 UD	9.8 UD	49 UD	0.43 U	0.48 U	0.65 U	1.6 J	0.43 U	0.47 U	0.39 U	0.41 U

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Table 6: Ground-Water Sampling Results for the Perched Aquifer
Semi-Volatile Organic Compounds

Sample ID	NYS Ambient	FB-1	FB-2	FB-3
Lab Sample Number	Ground Water	Z3783-05	Z3830-15	Z3830-16
Sampling Date		7/18/2008	7/21/2008	7/22/2008
Matrix		WATER	WATER	WATER
Dilution Factor		1	1	1
Units	ug/L	ug/l	ug/l	ug/l
Fluorene	50	0.28 U	0.28 U	0.29 U
4-Nitroaniline	5	0.36 U	0.36 U	0.38 U
4,6-Dinitro-2-methylphenol	NA	0.29 U	0.29 U	0.31 U
N-Nitrosodiphenylamine	50	0.35 U	0.35 U	0.37 U
4-Bromophenyl-phenylether	NA	1.4 U	1.4 U	1.5 U
Hexachlorobenzene	0.04	0.27 U	0.27 U	0.28 U
Atrazine	7.5	0.37 U	0.37 U	0.39 U
Pentachlorophenol	1	0.53 U	0.53 U	0.55 U
Phenanthrene	50	1.4 U	1.4 U	1.4 U
Anthracene	50	1.4 U	1.4 U	1.5 U
Carbazole	NA	0.24 U	0.24 U	0.25 U
Di-n-butylphthalate	50	5.9 U	5.9 U	6.2 U
Fluoranthene	50	0.2 U	0.2 U	0.21 U
Pyrene	50	1.4 U	1.4 U	1.5 U
Butylbenzylphthalate	50	0.42 U	0.42 U	0.44 U
3,3-Dichlorobenzidine	5	1.1 U	1.1 U	1.1 U
Benzo(a)anthracene	0.002	1.3 U	1.3 U	1.4 U
Chrysene	0.002	0.26 U	0.26 U	0.27 U
bis(2-Ethylhexyl)phthalate	5	1.3 U	1.3 U	1.4 U
Di-n-octyl phthalate	50	0.26 U	0.26 U	0.27 U
Benzo(b)fluoranthene	0.002	0.43 U	0.43 U	0.45 U
Benzo(k)fluoranthene	0.002	0.3 U	0.3 U	0.32 U
Benzo(a)pyrene	NA	0.22 U	0.22 U	0.23 U
Indeno(1,2,3-cd)pyrene	0.002	0.67 U	0.67 U	0.69 U
Dibenz(a,h)anthracene	NA	0.55 U	0.55 U	0.57 U
Benzo(g,h,i)perylene	NA	0.39 U	0.39 U	0.41 U

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Table 6: Ground-Water Sampling Results for the Perched Aquifer
Metals (Filtered and Unfiltered)

Sample ID	NYS Ambient	MW-1	MW-5S	MW-5S (filtered)	MW-8S	MW-8S	MW-9S	MW-11S	MW-11S (Filtered)
Lab Sample Number	Ground Water	Z3830-02	Z3783-02	Z3783-10	Z3830-03	Z3830-03	Z3830-09	Z3830-04	Z3830-19
Sampling Date		7/22/2008	7/18/2008	7/18/2008	7/22/2008	7/22/2008	7/21/2008	7/22/2008	7/22/2008
Matrix		WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
Dilution Factor		1	1	1	1	5	1	1	1
Units	ug/L	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
TAL METALS									
Aluminum	NA	19.3 U	2380	19.3 U	55400	55400	537	9020	1540
Antimony	3	0.39 J	3.6	2.4	0.19 U	0.19 U	0.5 J	0.49 J	0.84 J
Arsenic	25	5.4 U	33.6	5.4 U	5.4 U	5.4 U	5.4 U	8.97 J	5.4 U
Barium	1000	100	101	29.4 J	2060	2060	226	378	163
Beryllium	3	0.3 U	0.3 U	0.3 U	5.74	5.74	0.3 U	1.02 J	0.3 U
Cadmium	5	0.9 U	0.9 U	0.9 U	4.19 J	4.19 J	0.9 U	0.9 U	0.9 U
Calcium	NA	149000	55100	55500	388000	388000	174000	149000	129000
Chromium	50	1.4 U	9.16	1.4 U	92.3	92.3	1.4 U	16.6	1.77 J
Cobalt	NA	2.5 U	4.6 J	2.5 U	23.5	23.5	2.5 U	8.5 J	2.5 U
Copper	200	3.7 U	76	20.4	10	10	10.2	55.7	9.8 J
Iron	300	15100	5260	96.8 J	334000	334000	9640	31500	3210
Lead	25	4.16 J	34.1	3.1 U	740	740	36.4	388	40.6
Magnesium	35000	18900	5210	3830	47000	47000	27000	14500	13900
Manganese	300	1010	658	951	5850	5850	963	2230	943
Mercury	0.7	0.06 U	0.12 J	0.06 U	17.7	17.7	0.06 U	0.91	0.06 U
Nickel	100	4.9 U	123	76.3	56.4	56.4	4.9 U	14.4 J	4.9 U
Potassium	NA	17900	13400	14400	35900	35900	34700	29900	33200
Selenium	10	4.5 U	5.13 J	4.5 U	4.5 U	4.5 U	4.5 U	4.5 U	4.5 U
Thallium	0.5	0.1 U	0.14 J	0.1 U	0.27 J	0.27 J	0.13 J	0.17 J	0.1 U
Silver	50	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Sodium	20000	58800	32700	31800	155000	155000	104000	353000	389000
Vanadium	NA	4.1 U	10.9 J	4.1 U	216	216	4.1 U	37.5	5.69 J
Zinc	2000	46.2	988	488	1280	1280	39.6	138	46.3

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Table 6: Ground-Water Sampling Results for the Perched Aquifer
Metals (Filtered and Unfiltered)

Sample ID	NYS Ambient	MW-12S	MW-D3 (MW-12S)	MW-13S	GW-1	GW-2	FB-1	FB-2	FB-3
Lab Sample Number	Ground Water	Z3830-06	Z3830-01	Z3830-05	Z3830-07	Z3830-08	Z3783-05	Z3830-15	Z3830-16
Sampling Date		7/22/2008	7/22/2008	7/22/2008	7/21/2008	7/21/2008	7/18/2008	7/21/2008	7/22/2008
Matrix		WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
Dilution Factor		1	1	1	1	1	1	1	1
Units	ug/L	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
TAL METALS									
Aluminum	NA	883	681	542	160	112	19.3 U	19.3 U	19.3 U
Antimony	3	0.26 J	0.3 J	0.2 J	0.43 J	0.28 J	0.19 U	0.19 U	0.19 U
Arsenic	25	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U
Barium	1000	198	199	337	98.8	220	11.2 U	11.2 U	11.2 U
Beryllium	3	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Cadmium	5	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U
Calcium	NA	101000	103000	135000	73700	203000	457 J	282 U	282 U
Chromium	50	1.47 J	1.4 U	1.4 U	3.1 J	1.4 U	1.4 U	1.4 U	1.4 U
Cobalt	NA	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Copper	200	6.52 J	6.16 J	7.15 J	4.21 J	3.7 U	3.7 U	3.7 U	3.7 U
Iron	300	**2820**	**2320**	**11400**	**16200**	**4040**	122	33.1 J	27 U
Lead	25	**30.5**	**26.2**	18.1	10.9	9.21 J	3.1 U	3.1 U	3.1 U
Magnesium	35000	32300	33700	34100	4520	15000	291 U	291 U	291 U
Manganese	300	**385**	**391**	**834**	**762**	**430**	9.43 J	0.9 U	0.9 U
Mercury	0.7	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U
Nickel	100	4.9 U	4.9 U	4.9 U	4.9 U	4.9 U	4.9 U	4.9 U	4.9 U
Potassium	NA	31000	31700	19700	18300	20500	260 J	196 J	113 J
Selenium	10	4.5 U	4.5 U	4.5 U	4.5 U	4.5 U	4.5 U	4.5 U	4.5 U
Thallium	0.5	0.15 J	0.28 J	0.1 U	0.1 U	**0.53 J**	0.1 U	0.1 U	0.1 U
Silver	50	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Sodium	20000	**162000**	**174000**	**66700**	**286000**	**139000**	1600	1220	886 J
Vanadium	NA	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U
Zinc	2000	45.4	53	38.5	38.7	35.8	33.3	41.2	21.6

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Table 6: Ground-Water Sampling Results for the Perched Water Table
Analytical Table Qualifiers

Qualifiers

U - The compound was not detected at the indicated concentration.

J - Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit but greater than MDL. The concentration given is an approximate value.

B - The analyte was found in the laboratory blank as well as the sample. This indicates possible laboratory contamination of the environmental sample.

P - For dual column analysis, the percent difference between the quantitated concentrations on the two columns is greater than 40%.

* - For dual column analysis, the lowest quantitated concentration is being reported due to coeluting interference.

E (Organics) - Indicates the analyte 's concentration exceeds the calibrated range of the instrument for that specific analysis.

E (Inorganics) - The reported value is estimated because of the presence of interference.

D - The reported value is from a secondary analysis with a dilution factor. The original analysis exceeded the calibration range.

* - For dual column analysis, the lowest quantitated concentration is being reported due to coeluting interference.

NR - Not analyzed

Appendix – 2

First American Title Insurance Company of New York

Title No.: 3008-234603

EXHIBIT A

The subject tract of land with respect to which the foregoing parties are the parties in interest as aforesaid, is known as Tax Lot Number(s) **21, 38, 12, 15, 17 and 18** in Block(s) **28** as shown on the Tax Map of the City of New York, Queens County and more particularly described as follows:

AS TO LOTS 21 AND 38:

ALL THAT CERTAIN PLOT, PIECE OR PARCEL OF LAND, SITUATE, LYING AND BEING IN THE BOROUGH AND COUNTY OF QUEENS, CITY AND STATE OF NEW YORK, BOUNDED AND DESCRIBED AS FOLLOWS:-

BEGINNING AT THE CORNER BY THE INTERSECTION OF THE SOUTHERLY SIDE OF 46TH ROAD (W. NINTH STREET), 60 FEET WIDE, AND THE EASTERLY SIDE OF 5TH STREET (WEST AVENUE, 60 FEET WIDE);

RUNNING THENCE SOUTHERLY ALONG THE EASTERLY SIDE OF 5TH STREET 200 FEET 0 INCHES TO THE CORNER FORMED BY THE INTERSECTION OF THE EASTERLY SIDE OF 5TH STREET AND THE NORTHERLY SIDE OF 47TH AVENUE (W. EIGHT STREET), 60 FEET WIDE;

THENCE EASTERLY ALONG THE NORTHERLY SIDE OF 47TH AVENUE; 100 FEET 0 INCHES;

THENCE NORTHERLY AT RIGHT ANGLES TO THE NORTHERLY SIDE OF 47TH AVENUE, 100 FEET 0 INCHES;

THENCE EASTERLY AT RIGHT ANGLES TO THE LAST MENTIONED COURSE 264 FEET 11-1/8 INCHES TO A POINT;

THENCE NORTHERLY AT RIGHT ANGLES TO THE LAST MENTIONED COURSE, 100 FEET TO THE SOUTHERLY SIDE OF 46TH ROAD;

THENCE WESTERLY ALONG THE SOUTHERLY SIDE OF 46TH ROAD, 364 FEET 11-1/8 INCHES TO THE CORNER FIRST ABOVE MENTIONED TO THE POINT OR PLACE OF BEGINNING.

AS TO LOT 12:

ALL THAT CERTAIN PLOT, PIECE OR PARCEL OF LAND, SITUATE, LYING AND BEING IN THE BOROUGH AND COUNTY OF QUEENS, CITY AND STATE OF NEW YORK, BOUNDED AND DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT ON THE NORTHERLY SIDE OF 47TH AVENUE (F/K/A EIGHTH STREET), DISTANT 297.30 FEET WESTERLY FROM THE CORNER FORMED BY THE INTERSECTION OF THE NORTHERLY SIDE OF 47TH AVENUE (F/K/A EIGHTH STREET) AND THE WESTERLY SIDE OF VERNON BOULEVARD (F/K/A VERNON AVENUE);

RUNNING THENCE NORTHERLY PARALLEL WITH VERNON BOULEVARD, 100 FEET;

THENCE WESTERLY PARALLEL WITH 47TH AVENUE 40.76 FEET;

THENCE SOUTHERLY AND AGAIN PARALLEL WITH VERNON BOULEVARD 100 FEET TO THE NORTHERLY SIDE OF 47TH AVENUE; AND

THENCE EASTERLY ALONG THE NORTHERLY SIDE OF 47TH AVENUE 40.76 FEET TO THE POINT OR PLACE OF BEGINNING.

AS TO LOT 15:

ALL THAT CERTAIN PLOT, PIECE OR PARCEL OF LAND, SITUATE, LYING AND BEING AT LONG ISLAND CITY, IN THE BOROUGH OF AND COUNTY OF QUEENS, CITY AND STATE OF NEW YORK, COMPRISING ALL OF LOT 15 AND THE WESTERLY 12 FEET 8 1/4 INCHES OF LOT 14, IN BLOCK 17, AS SAID LOTS ARE SHOWN AND DESIGNATED ON A CERTAIN MAP ENTITLED "MAP OF THE HUNTER AND VAN ALST FARMS MADE BY PETER G. VAN ALST, DATED AUGUST 17, 1861", AND MORE PARTICULARLY BOUNDED AND DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT ON THE NORTHERLY SIDE OF 47TH AVENUE (FORMERLY) WEST EIGHTH STREET DISTANT EASTERLY 225.01 FEET FROM THE CORNER FORMED BY THE INTERSECTION OF THE NORTHERLY SIDE OF 47TH AVENUE WITH THE EASTERLY SIDE OF 5TH STREET;

RUNNING THENCE NORTHERLY AT RIGHT ANGLES TO 47TH AVENUE 99.99 FEET;

THENCE EASTERLY AND PARALLEL WITH 47TH AVENUE 37.69 FEET;

THENCE SOUTHERLY AND AGAIN AT RIGHT ANGLES TO 47TH AVENUE 99.99 FEET TO THE NORTHERLY SIDE OF 47TH AVENUE;

THENCE WESTERLY ALONG THE NORTHERLY SIDE OF 47TH AVENUE 37.69 FEET TO THE POINT OR PLACE OF BEGINNING.

AS TO LOT 17:

ALL THAT CERTAIN LOT, PIECE OR PARCEL OF LAND, SITUATE, LYING AND BEING AT LONG ISLAND CITY IN THE FIRST WARD OF THE BOROUGH OF QUEENS, CITY OF NEW YORK, COUNTY OF QUEENS AND STATE OF NEW YORK, BOUNDED AND DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT ON THE NORTHERLY SIDE OF 47TH AVENUE, FORMERLY EIGHTH STREET, DISTANT 174.98 FEET EASTERLY FROM THE CORNER FORMED BY THE INTERSECTION OF SAID NORTHERLY SIDE OF 47TH AVENUE WITH THE EASTERLY SIDE OF FIFTH STREET, FORMERLY WEST AVENUE;

RUNNING THENCE NORTHERLY PARALLEL WITH FIFTH STREET, 100 FEET;

THENCE EASTERLY PARALLEL WITH 47TH AVENUE, 50.02 FEET;

THENCE SOUTHERLY PARALLEL WITH FIFTH STREET, 100 FEET TO THE NORTHERLY SIDE OF 47TH AVENUE; AND

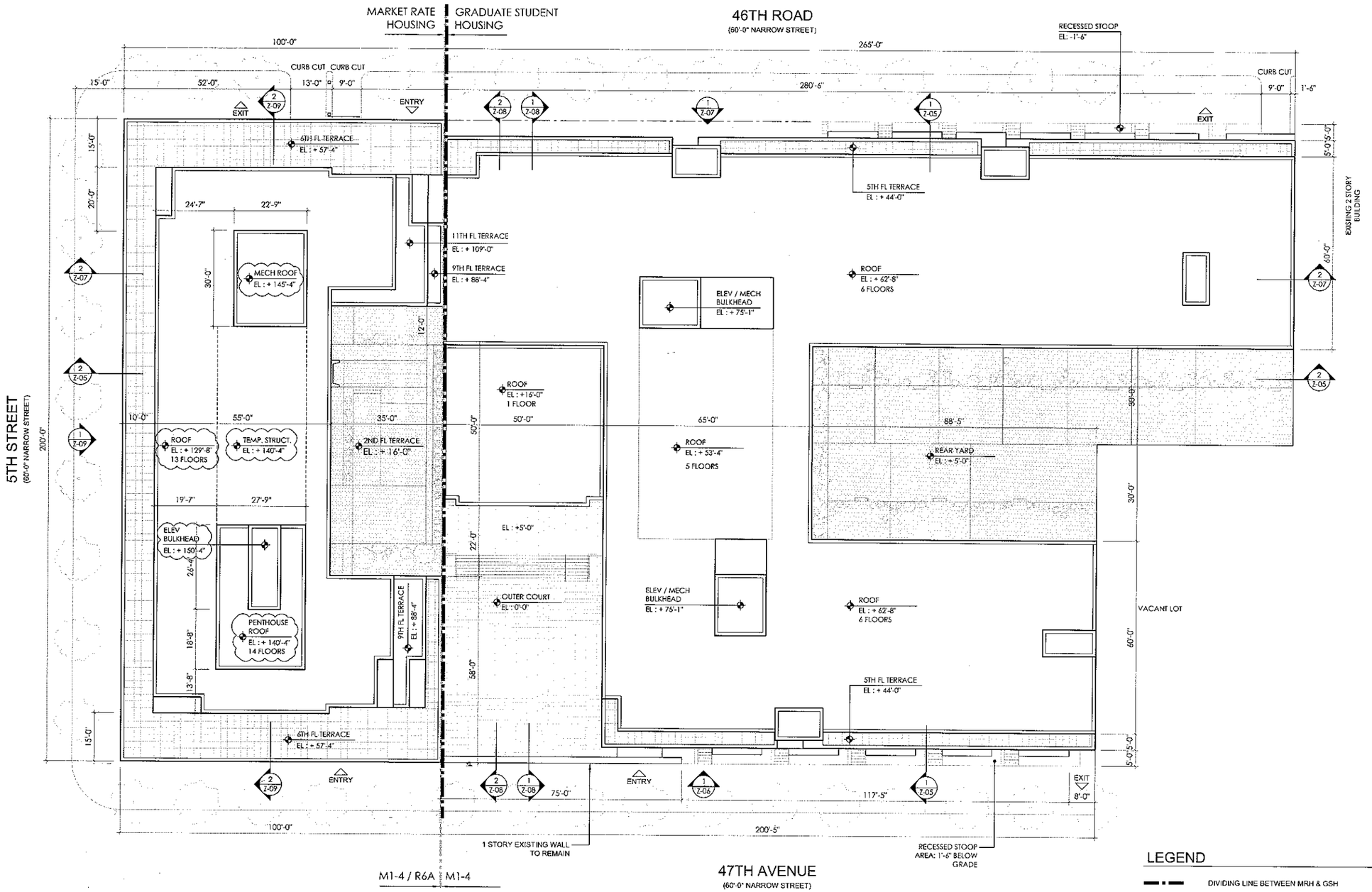
THENCE WESTERLY ALONG SAID SIDE OF 47TH AVENUE, 50.02 FEET TO THE POINT OR PLACE OF BEGINNING.

AS TO LOT 18:

ALL THAT CERTAIN PLOT, PIECE OR PARCEL OF LAND, SITUATE, LYING AND BEING IN THE BOROUGH AND COUNTY OF QUEENS, CITY AND STATE OF NEW YORK, BOUNDED AND DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT ON THE NORTHERLY SIDE OF 47TH AVENUE, FORMERLY 8TH STREET, DISTANT 100 FEET EASTERLY FROM THE CORNER FORMED BY THE INTERSECTION OF THE NORTHERLY SIDE OF 47TH AVENUE WITH THE EASTERLY SIDE OF 5TH STREET, FORMERLY WEST AVENUE;

Appendix – 3



1 PROPOSED SITE PLAN
1" = 1/32"

LEGEND

DIVIDING LINE BETWEEN MRH & GSH

DISTRICT BOUNDRY LINE

SITE INFORMATION

ADDRESS	5-11 47TH AVENUE
BLOCK NO.	28
LOT NO.	13, 15, 16, 17, 18, 21, 38 (TENATIVELY COMBINED INTO LOT 21)
COMMUNITY DISTRICT	2
ZONING MAP NO.	9b
ZONING DISTRICT	R6A / M1-4, M1-4

STUDIO V

TITLE

PROJECT NO.
06011

5-11 47TH AVENUE

ARCHITECT

Studio V Architecture
44 E 32nd St New York, NY 10016
T: 212.779.2288
F: 212.689.1325

OWNER / CLIENT

OCA LIC II-V
535 Madison Ave, 23rd Fl
New York, NY 10022
T: 212.546.0832
F: 212.546.0831

BSA CALENDAR NO.

238-07-BZ

ISSUE	DATE
BSA SUBMISSION	09.27.07
BSA SUBMISSION	02.28.08
BSA SUBMISSION	05.06.08
BSA SUBMISSION	07.15.08
BSA SUBMISSION	08.08.08
BSA SUBMISSION	09.02.08

SEAL

DATE	DRAWN BY	CHECKED BY
09.02.08		

SCALE 0 8 16 32

SHEET TITLE

PROPOSED SITE PLAN

DRAWING NO.

Z-25

Appendix - 4

APPENDIX 4
REMEDIAL INVESTIGATION SUMMARY
OCA-LIC
CUNY Graduate Center Development 47th Ave
EWMA Project # 205843

Sample Summary

AOC Designation	No. of Samples	Matrix	TCL/ TAL	VOCs	SVOCs	Metals	TO-15	GC
1	4	ground water	x					
	2	ground water		x	x	x		
2	5	soil	x					
	3	ground water	x					
	1	ground water		x	x	x		
	1	soil gas					x	
3	4	soil	x					
	2	ground water	x					
4	2	soil	x					
	1	Sub-Slab					x	
4A	1	soil	x					
5	1	soil	x					
	1	sub-slab					x	
6	6	soil	x					
	3	ground water	x					
6A	1	soil	x					
7	2	soil	x					
	1	ground water	x					
	1	Product						x
7A	6	soil	x					
	3	ground water	x					
	1	soil gas					x	
8	4	Product						x
9	2	soil	x					
	1	ground water	x					
10	3	soil	x					
	1	ground water	x					
	1	sub-slab					x	
11	2	soil	x					
	1	ground water	x					
	1	soil gas					x	
12	2	soil	x					
	1	ground water	x					
13	7	ground water	x					
	4	ground water		x	x	x		
14	9	soil	x					
	4	ground water	x					
	1	sub-slab					x	
15	5	ground water	x					
	5	ground water		x	x	x		
Offsite Delineation	3	ground water		x	x	x		
Background	1	soil vapor					x	

APPENDIX 4
COMPREHENSIVE REMEDIAL INVESTIGATION SUMMARY
OCA-LIC
5th St. Mixed Use Housing
EWMA Project # 205490

Summary of Soil, Ground Water and Soil Gas Sampling

Area of Concern	Sample ID	Media	Sampling Depth Interval (ft bsg)	Sample Date	Analytical Parameters
AOC 1: Former 10,000 Gallon #6 Fuel Oil UST/46th Road Sidewalk	GW-2	GW-Perched Water	5-14.9'	3/4/2008	Full TCL/ TAL+30
	GW-2	GW-Perched Water	5-14.9'	7/21/2008	TCL VO+10, TCL BNA+20, & TAL Metals
	GW-3	GW-Perched Water	5-15'	3/4/2008	Full TCL/ TAL+30
	GW-4	GW-Perched Water	5-14.6'	3/4/2008	Full TCL/ TAL+30
	MW-7S	GW-Perched Water	6-11	3/4/2008	Full TCL/ TAL+30
	MW-13S	GW-Perched Water	3-11	7/22/2008	TCL VO+10, TCL BNA+20, & TAL Metals
AOC 2: Eastern Parking Lot	SBE-1	Soil-AWT	6.0-7.0	2/20/2008	Full TCL/ TAL+30
	SBE-1	Soil-high PID	12.5-13.5	2/20/2008	Full TCL/ TAL+30
	SBE-1	Soil-BOB	22-23	2/20/2008	Full TCL/ TAL+30
	SBE-2	Soil-AWT	6.0-7.0	2/20/2008	Full TCL/ TAL+30
	SBE-2	Soil-BOB	11.0-12.0	2/20/2008	Full TCL/ TAL+30
	TW-1	GW-Sand Aquifer	14-18	2/26/2008	Full TCL/ TAL+30
	TW-2	GW-Perched Water	7-11	2/26/2008	Full TCL/ TAL+30
	GW-1	GW-Perched Water	5-14.7'	3/4/2008	Full TCL/ TAL+30
	GW-1	GW-Perched Water	5-14.7'	7/21/2008	TCL VO+10, TCL BNA+20, & TAL Metals
	MW-10I	GW-Sand Aquifer	14.5-19.5	NA	Not Sampled
	SG-1	Soil Gas	6.5-7.5'	1/22/2008	TO+15
AOC 3: One-Story Brick/Concrete Block Building (Demand Electric)	SBE-3	Soil-AWT	7.0-8.0	2/20/2008	Full TCL/ TAL+30
	SBE-3	Soil-BOB	11.0-12.0	2/20/2008	Full TCL/ TAL+30
	SBE-4	Soil-AWT	6.5-7.5	2/21/2008	Full TCL/ TAL+30
	SBE-4	Soil-BOB	11.0-12.0	2/21/2008	Full TCL/ TAL+30
	TW-3	GW-Perched Water	7-11	2/22/2008	Full TCL/ TAL+30
	TW-4	GW-Perched Water	7-11	2/25/2008	Full TCL/ TAL+30
AOC 4: Motorcycle Repair Shop (Basement 2-Story Brick Building)	SBE-5 *	Soil-AWT	7.5-8	4/1/2008	Full TCL/ TAL+30
	SBE-5 *	Soil-high PID	8.5-9	4/1/2008	Full TCL/ TAL+30
	SS-1	Sub-Slab Soil Gas	1.5-2'	1/22/2008	TO+15
AOC 4A- One-Story Building	SBE-6 *	Soil-AWT	8.5-9	4/1/2008	Full TCL/ TAL+30
AOC 5: Three-Story Brick Building (Art Studios)	SBE-7 *	Soil-AWT	6.5-7	4/1/2008	Full TCL/ TAL+30
	SS-2	Sub-Slab Soil Gas	1.5-2'	1/22/2008	TO+15

APPENDIX 4
COMPREHENSIVE REMEDIAL INVESTIGATION SUMMARY
OCA-LIC
5th St. Mixed Use Housing
EWMA Project # 205490

Summary of Soil, Ground Water and Soil Gas Sampling

Area of Concern	Sample ID	Media	Sampling Depth Interval (ft bsg)	Sample Date	Analytical Parameters
AOC 6: 1-Story Brick Building (Knossos Custom Design Furniture)	SBE-8	Soil-AWT	8.5-9.5	2/20/2008	Full TCL/ TAL+30
	SBE-8	Soil-BOB	10.0-11.0	2/20/2008	Full TCL/ TAL+30
	SBE-9	Soil-AWT	7.0-8.0	2/21/2008	Full TCL/ TAL+30
	SBE-9	Soil-BOB	11.0-12.0	2/21/2008	Full TCL/ TAL+30
	SBE-10	Soil-AWT	6.0-7.0	2/21/2008	Full TCL/ TAL+30
	SBE-10	Soil-BOB	32.5-33.5	2/21/2008	Full TCL/ TAL+30
	TW-8	GW-Perched Water	7-11	2/25/2008	Full TCL/ TAL+30
	TW-9	GW-Perched Water	7-11	2/22/2008	Full TCL/ TAL+30
	TW-10	GW-Sand Aquifer	25-29	2/22/2008	Full TCL/ TAL+30
AOC 6A: 2-Story Brick Building	SBE-13 *	Soil-AWT	7-7.5	4/1/2008	Full TCL/ TAL+30
AOC 7: Two (2) Former Gasoline Storage Tanks	SBE-14	Soil-AWT	6.5-7.5	2/25/2008	Full TCL/ TAL+30
	SBE-14	Soil-BOB	30.0-31.0	2/25/2008	Full TCL/ TAL+30
	46 Road	Soil/Free Product	9.5-10'	7/10/2008	GC Fingerprint
	TW-14	GW-Sand Aquifer	24-28	2/25/2008	Full TCL/ TAL+30
AOC 7A: Suspect Former Boiler/Stack Area	SBE-11	Soil-AWT	6.5-7.5	2/20/2008	Full TCL/ TAL+30
	SBE-11	Soil-BOB	11.0-12.0	2/20/2008	Full TCL/ TAL+30
	SBE-12	Soil-AWT	6.5-7.5	2/20/2008	Full TCL/ TAL+30
	SBE-12	Soil-BOB	10.0-11.0	2/20/2008	Full TCL/ TAL+30
	SBE-15	Soil-AWT	6.5-7.5	2/20/2008	Full TCL/ TAL+30
	SBE-15	Soil-BOB	11.0-12.0	2/20/2008	Full TCL/ TAL+30
	TW-11	GW-Perched Water	7-11	39499.00	Full TCL/ TAL+30
	TW-12	GW-Perched Water	7-11	2/21/2008	Full TCL/ TAL+30
	TW-15	GW-Perched Water	7-11	2/21/2008	Full TCL/ TAL+30
	SG-2	Soil Gas	6.5-7.5'	1/22/2008	TO+15
AOC 8: Suspect Varnoline Tank Farm	VAL-NE	Soil/Free Product	3-3.5'	7/10/2008	GC Fingerprint
	VAL-E	Soil/Free Product	8.5-9'	7/10/2008	GC Fingerprint
	VAL-E	Floating Free Product	8'	7/10/2008	GC Fingerprint
	VAL-UST	Product	UST Contents	7/10/2008	GC Fingerprint

APPENDIX 4
COMPREHENSIVE REMEDIAL INVESTIGATION SUMMARY
OCA-LIC
5th St. Mixed Use Housing
EWMA Project # 205490

Summary of Soil, Ground Water and Soil Gas Sampling

Area of Concern	Sample ID	Media	Sampling Depth Interval (ft bsg)	Sample Date	Analytical Parameters
AOC 9: One-Story Building (AMN Renovation)	SBE-16	Soil-AWT	7.0-8.0	2/15/2008	Full TCL/ TAL+30
	SBE-16	Soil-BOB	11.0-12.0	2/15/2008	Full TCL/ TAL+30
	TW-16	GW-Perched Water	8-12	2/15/2008	Full TCL/ TAL+30
	Background	Ambient Air	Above the surface	1/22/2008	TO+15
AOC 10: One-Story Building (JMJ Electrical)/Suspect UST & Fill/Vent Ports	SBE-17	Soil-AWT	5.5-6.5	2/15/2008	Full TCL/ TAL+30
	SBE-17	Soil-high PID	7.5-8.5	2/15/2008	Full TCL/ TAL+30
	SBE-17	Soil-BOB	11.0-12.0	2/15/2008	Full TCL/ TAL+30
	TW-17	GW-Perched Water	6-10	2/19/2008	Full TCL/ TAL+30
	SS-3	Sub-Slab Soil Gas	1.5-2'	1/22/2008	TO+15
AOC 11: Former Wohl, Inc. Cleaners and Dyers (Direct Air)	SBE-18	Soil-AWT	6.5-7.5	2/19/2008	Full TCL/ TAL+30
	SBE-18	Soil-BOB	11.0-12.0	2/19/2008	Full TCL/ TAL+30
	TW-18	GW-Perched Water	6-10	2/19/2008	Full TCL/ TAL+30
	SG-3	Soil Gas	6.5-7.5'	1/22/2008	TO+15
AOC 12: Former Wohl, Inc. Cleaners and Dyers (Liberty Contracting)	SBE-19	Soil-AWT	7.0-8.0	2/20/2008	Full TCL/ TAL+30
	SBE-19	Soil-BOB	11.0-12.0	2/20/2008	Full TCL/ TAL+30
	TW-19	GW-Perched Water	6-10	2/20/2008	Full TCL/ TAL+30
AOC 13: 5th Street Sidewalk	GW-5/MW-2	GW-Perched Water	? - 12.82	4/1/2008	Full TCL/ TAL+30
	MW-1	GW-Perched Water	?-13.5'	3/4/2008	Full TCL/ TAL+30
	MW-1	GW-Perched Water	?-13.5'	7/22/2008	TCL VO+10, TCL BNA+20, & TAL Metals
	MW-3S	GW-Perched Water	5-10	2/29/2008	Full TCL/ TAL+30
	MW-4S	GW-Perched Water	5-10	3/3/2008	Full TCL/ TAL+30
	MW-3I	GW-Sand Aquifer	15-20	2/29/2008	Full TCL/ TAL+30
	MW-3I	GW-Sand Aquifer	15-20	7/21/2008	TCL VO+10, TCL BNA+20, & TAL Metals
	MW-4I	GW-Sand Aquifer	15-20	3/3/2008	Full TCL/ TAL+30
	MW-4I	GW-Sand Aquifer	15-20	7/18/2008	TCL VO+10, TCL BNA+20, & TAL Metals
	MW-3D	GW-Sand Aquifer	22.5-27.5'	2/29/2008	Full TCL/ TAL+30
	MW-3D	GW-Sand Aquifer	22.5-27.5'	7/18/2008	TCL VO+10, TCL BNA+20, & TAL Metals

APPENDIX 4
COMPREHENSIVE REMEDIAL INVESTIGATION SUMMARY
OCA-LIC
5th St. Mixed Use Housing
EWMA Project # 205490

Summary of Soil, Ground Water and Soil Gas Sampling

Area of Concern	Sample ID	Media	Sampling Depth Interval (ft bsg)	Sample Date	Analytical Parameters
AOC 14: Former Accurate Associates RCRA Area	SBE-RCRA-1	Soil-AWT	6.0-7.0	2/20/2008	Full TCL/ TAL+30
	SBE-RCRA-1	Soil-BOB	11.0-12.0	2/20/2008	Full TCL/ TAL+30
	SBE-RCRA-2	Soil-AWT	6.5-7.5	2/19/2008	Full TCL/ TAL+30
	SBE-RCRA-2	Soil-high PID	8.0-9.0	2/19/2008	Full TCL/ TAL+30
	SBE-RCRA-2	Soil-BOB	11.5-12.0	2/19/2008	Full TCL/ TAL+30
	SBE-RCRA-3	Soil-AWT	5.5-6.5	2/21/2008	Full TCL/ TAL+30
	SBE-RCRA-3	Soil-BOB	30.5-31.5	2/21/2008	Full TCL/ TAL+30
	SBE-RCRA-4	Soil-AWT	6.0-7.0	2/19/2008	Full TCL/ TAL+30
	SBE-RCRA-4	Soil-BOB	11.0-12.0	2/19/2008	Full TCL/ TAL+30
	TW-RCRA-1	GW-Perched Water	7-11	2/21/2008	Full TCL/ TAL+30
	TW-RCRA-2	GW-Perched Water	7-11	2/20/2008	Full TCL/ TAL+30
	TW-RCRA-3	GW-Sand Aquifer	25-29	2/26/2008	Full TCL/ TAL+30
	TW-RCRA-4	GW-Perched Water	7-11	2/20/2008	Full TCL/ TAL+30
	SS-4	Sub-Slab Soil Gas	1.5-2'	1/22/2008	TO+15
AOC 15: 47th Ave Sidewalk	MW-5S	GW-Perched Water	5-10	3/3/2008	Full TCL/ TAL+30
	MW-5S	GW-Perched Water	5-10	7/18/2008	TCL VO+10, TCL BNA+20, & TAL Metals
	MW-6S	GW-Perched Water	5-10	3/3/2008	Full TCL/ TAL+30
	MW-9S	GW-Perched Water	3-11	7/21/2008	TCL VO+10, TCL BNA+20, & TAL Metals
	MW-5I	GW-Sand Aquifer	14-19	3/3/2008	Full TCL/ TAL+30
	MW-5I	GW-Sand Aquifer	14-19	7/18/2008	TCL VO+10, TCL BNA+20, & TAL Metals
	MW-6I	GW-Sand Aquifer	15-20	3/4/2008	Full TCL/ TAL+30
	MW-6I	GW-Sand Aquifer	15-20	7/21/2008	TCL VO+10, TCL BNA+20, & TAL Metals
	MW-7I	GW-Sand Aquifer	15-20	3/4/2008	Full TCL/ TAL+30
	MW-7I	GW-Sand Aquifer	15-20	7/21/2008	TCL VO+10, TCL BNA+20, & TAL Metals
Offsite	MW-8S	GW-Perched Water	3-11	7/22/2008	TCL VO+10, TCL BNA+20, & TAL Metals
	MW-11S	GW-Perched Water	3-11	7/22/2008	TCL VO+10, TCL BNA+20, & TAL Metals
	MW-12S	GW-Perched Water	3-11	7/22/2008	TCL VO+10, TCL BNA+20, & TAL Metals

* Hand auger soil boring.
NI: Not installed; location was not accessible by Geoprobe rig.
AWT: Sample collected from above the water table.
High PID: Sample collected from interval with highest PID reading.
BOB: Sample collected from bottom of the boring.
GW: Groundwater.
Full TCL/TAL+30: TCL Volatile Organics +30, Base Neutrals/Acid Extractables +20, Polychlorinated Biphenyl's (PCB), TAL Metals, TCL Pesticides, and Cyanide.

Appendix – 5

HUMAN HEALTH EXPOSURE ASSESSMENT

Property Known As:

OCA LIC Fifth Street Mixed-Use Housing
5-20 46th Road
City of New York, Queens County, New York 11101
BCP Site No C241098

Prepared for:

OCA Long Island City, LLC
c/o O'Connor Capital Partners
535 Madison Avenue, 23rd Floor
New York, NY 10022

December 2008

Submitted by:

Environmental Waste Management Associates, LLC
P. O. Box 5430
Parsippany, New Jersey 07054
EWMA Case No. 205490

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1.0 INTRODUCTION

Environmental Waste Management Associates, LLC (EWMA) has prepared this Qualitative Human Health Exposure Assessment (QHEEA) for the property known as Former Accurate Associates Site located at 5-20 46th Road, Long Island City, Queens County, New York (Property). This assessment has been included as an appendix to EWMA's August 2008 *Remedial Investigation Report* (RIR). EWMA was retained by OCA Long Island City, LLC (OCA) to complete a *Remedial Investigation* (RI) and prepare a *Remedial Investigation Report* (RIR) for the Property.

An application was previously submitted by OCA to the New York State Department of Environmental Conservation (NYSDEC) for participation in the Brownfield Cleanup Program (BCP) as a "Volunteer" (i.e. OCA) to fulfill the Brownfield Cleanup Program (BCP) requirements to address the nature and extent of the contamination at the site and any potential off-site impacts.

The purpose of this assessment is to characterize the exposure setting (including the physical environment and potentially exposed on and off-site human populations), identify exposure pathways, and evaluate contaminant fate and transport for the subject property of those contaminants identified to exist at the site, at concentrations above regulatory concern, during the remedial investigation.

An exposure pathway is the means by which an individual may be exposed to contaminants originating from the site. The exposure pathway consists of five elements: 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. In order for the exposure pathway to be complete, all five of these elements must be documented. If any one of the five elements has not existed in the past, does not exist in the present and will never exist in the future, an exposure pathway may be eliminated from consideration.

In performing this assessment, current site conditions and proposed future development actions were utilized.

2.0 SITE CHARACTERIZATION - EXISTING CONDITIONS

The subject Property is located on the southeast corner of 46th Road and 5th Street in the Long Island City section of Queens in the State of New York. The subject Property covers approximately 42,575 square feet of area. The site is located within an old industrial portion of the Long Island City, Queens County, New York. The East River is the closest water body located approximately ¼-mile west of the subject Site.

The uppermost unit beneath the Property consists of 10 to 12 feet of historic fill material. The fill is variable, but tends to be coarse grained sand and gravel, intermixed with cinders, coal, brick and wood fragments.

Below the fill lies one to three feet of dark brown clayey peat. This clayey peat has been encountered in nearly all the soil borings, so it appears to be continuous beneath the Property. The clayey peat is interpreted as marsh/wetland deposits, and probably represents the natural ground surface before historic fill was emplaced at the Property.

Fine to coarse sand underlies the clayey peat. The top of the sand is found at depths ranging from 11 to 15 feet below grade (ft bsg).

A dense gray micaceous silt is present below the sand across most of the Property; the top of the silt occurs at a depth of about 30 ft bsg. Along the eastern-most edge of the property, a dense gray till (silt, sand, and clay) underlies the sand. The top of the till was encountered at a depth of about 20 ft bsg.

Bedrock was not encountered in any of the borings completed by EWMA, but geotechnical borings completed at the Property indicate bedrock, consisting of a gray schist, is encountered at depths ranging from 32 ft bsg to greater than 52 ft bsg.

There are two water-bearing zones immediately beneath the Property: an upper, perched-water zone, and an underlying sand aquifer. The perched-water zone occurs within the fill material on top of the clayey peat. Depths to water in monitoring wells completed within the perched zone are about seven to eight feet bgs. The saturated thickness of the perched zone is three to four feet.

The sand aquifer underlies the clayey peat layer. Depths to water for monitoring wells completed in the sand aquifer are about 10 to 11 ft bsg. The gray silt and gray till encountered below the sand (at depths of 20 to 30 ft bsg) are probably acting as a lower confining unit for the sand aquifer.

The large difference in water levels between the perched-water zone and the sand aquifer (two to three feet) shows that the clayey peat is acting as a confining layer, and is greatly limiting the downward migration of groundwater from the fill into the underlying sand aquifer.

Groundwater flow within the sand aquifer is westward, toward the nearby East River Based on water-level elevations obtained during the recent remedial investigation. This contrasts sharply with groundwater flow within the overlying perched-water zone, which is to the east. The reason for the eastward flow within the perched water zone is not

known, but it may reflect the surface water drainage patterns that existed in the area before the historic fill was emplaced.

3.0 EXISTING/PROPOSED SITE USE

The BCP portion of the Property is vacant and all structures have been demolished to the street grade, with only concrete flooring, asphalt cover in the former parking lot and a limited wall area remain. The BCP Property is covered with asphalt and concrete impermeable surfacing, acting as an engineering control for contamination contained within the sub-grade fill materials. An 8' high, secured, chain link fence, with green mesh cover, encompasses the entirety of the Property perimeter as an engineering control eliminating unpermitted site access. The basement areas of the site are currently filled with building demolition debris. The Property is depicted on Figure 15, *Remediation Plan.* The area of concrete and asphalt cover on the BCP Property is located within the red dashed perimeter.

Elevated concentrations of lead, arsenic and selenium are encapsulated within a portion of the concrete and wall areas that are utilized as an engineering control under a deed notice with USEPA approval. The USEPA suspended the deed notice based on the proposed Brownfield application by the Volunteer.

The adjacent non-BCP portion of the Property has two vacant buildings and the construction command trailer on the vacant stone and soil covered lot. Demolition permitting is in process for these structures.

The site is currently zoned M1-4/R6A: Manufacturing. Land use is for industrial and manufacturing purposes. Adjacent sites within the same block are used for industrial and manufacturing purposes; and parking. Sites south of the property and 47th Avenue are used for commercial and office buildings. Land use north of the Property and 46th Street is for parking, industrial and manufacturing purposes. Land use west of Property and 5th Street is used for parking, industrial and manufacturing purposes.

The proposed endpoint includes the development of the site as a branch location for the City University of New York (CUNY). As part of the proposed development, removal of all buildings to include concrete flooring, basements and building debris, to include excavation of soil to 7-10' below grade is proposed prior to construction of new impermeable structures consisting of roadway, driveways, underground parking garage and building foundations; with adjacent landscaped areas.

4.0 Remedial History

The majority of the work conducted at the Property to date was solely for investigatory purposes and included both soil and groundwater sampling and analysis. Limited remedial activities have been completed, but these activities have been restricted to encapsulation of metal impacted floors and walls within a building interior under a deed notice. No active remediation systems were ever present at the Property, nor are future systems proposed at this time.

The work completed and detailed in the recent RIR provided the additional data required to generate a more complete understanding of environmental conditions on-site. The environmental data was utilized in the development of this QHHEA.. The opinions and conclusions purported herein are subject to modification based upon the receipt and review of any additional, previously unknown data generated during the course of the proposed remedial investigations and actions that would alter the current understanding of on-site environmental quality.

5.0 Previous Reports

The historic reports listed in the references section of the recent RIR were reviewed to facilitate the preparation of this QHHEA. These reports were previously submitted to the NYSDEC in conjunction with the BCP application for the Property.

6.0 Exposure Pathway Evaluation

6.1 Sources of Contamination

The source of the contamination is the source of contaminant release to the environment; if the original source is unknown, it is the environmental medium (soil, air, water, etc.) at the point of exposure.

Based on the previous Phase I Environmental Site Assessments (ESAs) by others, the Property had initially been developed prior to 1898 for use as an ink factory (i.e., M.L. Perlee) and a varnish works (i.e., Pratt & Lambert). Other previous occupants and uses identified at the subject Site included George L. Fenner (ink factory), Toch Bros. (manufacturer of paints & varnishes), Thibault & Walker Co. (varnish works), I. Wohl Inc. (cleaners & dyers), a dry cleaning and spotting facility, Accurate Metal Casting Co., Inc. and a basement motorcycle repair facility. These identified occupants and operations likely stored and utilized: industrial solvents; gasoline; lubricating, motor, fuel and cutting oils; metal polishing materials; plating bath solutions; paint and painting products, and dye products.

Currently identified as on-site sources of contamination are:

- RCRA arsenic, lead and selenium wastes encapsulated in concrete flooring and building materials;
- Potential fuel oil, gasoline and varnoline storage tanks, whose existence, status and environmental quality has not been established;
- Residual soil contamination for PAH and select metals due to historic fill materials; and
- Light, non-aqueous phase liquids (petroleum product) on groundwater from an unspecified source(s) and residual VO, PAH and metal contamination in groundwater due to fill materials and historic site operations; and
- Potential vapor intrusion issue for tetrachloroethylene (PCE) and methylene chloride detected at concentrations above those listed in the NYSDOH Guidance Document.

RCRA Wastes

Based on available information, a portion of the Property identified as 5-20 46th Road, Long Island City, New York (Block 28, Lot 21) was the subject of an Administrative Order (Docket No. II RCRA-7003-91-0201) issued by the United States Environmental Protection Agency (USEPA) pursuant to Resource Conservation and Recovery Act (RCRA), Section 7003. Pursuant to this Order, Accurate Associates undertook certain removal, investigative and remedial activities at the premises under USEPA's oversight. As part of the remedial activities, portions of the concrete floor and walls within this portion of the Property were encapsulated for the purpose of residual lead, arsenic, and selenium contamination. Pursuant to EPA's RCRA Administrative Order for the property, effective May 29, 1991, the Order's Respondents filed a Notice in Deed in the Queens County City Register on July 14, 1993, No. 47605. The Notice stated that lead, arsenic and selenium are encapsulated beneath portions of the floor and walls at the premises, and that the RCRA Order required that the encapsulation be maintained. The Deed Notice was the final action required by Respondents pursuant to the RCRA Order, as all other removal and remediation actions were satisfactorily performed.

By a letter transmitted to DEC on March 29, 2007, EPA consented to the suspension of the Notice in Deed, No. 47605, and termination of that Notice, upon completion of the remedial program carried out pursuant to the BCP, and provided that the Brownfield Cleanup Agreement be filed in the same place and manner as the Notice in Deed, No. 47605 together with a copy of the EPA consent letter.

On April 5, 2007, NYSDEC issued a letter approving OCA's request to participate in the Brownfield Cleanup Program, established under Article 27, Title 14 of the Environmental Conservation Law (ECL). The NYSDEC has deemed OCA to be eligible to participate in the program as a Volunteer. NYSDEC transmitted the Brownfield Cleanup Agreement

(BCA) along with this approval to OCA for signatures and return back to NYSDEC for final execution.

Storage Tanks

A number of historic storage tanks were identified during the assessment and investigation phases of site environmental work. Many of these storage tanks were reportedly located in or beneath the onsite BCP buildings, hindering investigation activities. Additionally, conflicting or no information was discovered regarding the status of the on-site storage tanks.

Currently, one 10,000 gallon #6 fuel oil tank (AOC 1) is suspected to have been abandoned-in-place and located in the sidewalk adjacent to 46th Road.

Two gasoline storage tanks (AOC 7) were identified on historic Sanborn Maps and the existence of these tanks was currently evidenced by observed vent pipes and a fill pipe with "gasoline" on the cap.

AOC 8 is twenty-two varnoline (Stoddard solvent) tanks that were identified on historic Sanborn Maps. Only one tank was identified during the inspection of the Property due to as a portion of this tank was partially extending through the basement concrete floor. Additional storage tanks were not observed during recent test pit investigative activities. Performance of this investigation was limited by the existing buildings.

It should be noted that Standard Oil historically operated large scale storage tank facilities immediately opposite of the BCP portion of the Property on the west side of 5th Street and the north side of 46th Street. Notably, LNAPL has been observed in temporary well points and monitoring wells on both of these streets.

Residual Soil Contaminants at Concentrations Above Unrestricted Use

VOCs, including acetone, methylene chloride, 2-butanone, benzene, and ethyl benzene were detected at concentrations that exceeded their UUSCO in soils. The most elevated VOC concentrations in soils were detected 6-9' below grade immediately above the clayey peat layer in the western half of the Property. The concrete flooring of the former buildings exists above these locations currently being utilized as an engineering control to prevent the release and potential transport of identified contamination.

BNAs, including naphthalene, acenaphthene, fluorene, phenanthrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, dibenzofuran, and dibenz(a,h)anthracene, were detected at concentrations above their UUSCO. A majority of the BNAs detected are likely due to the historic fill, with the exception of naphthalene, which is likely due to petroleum product release found in the UST area at the Property.

Metals, including arsenic, copper, lead, mercury, nickel, and zinc were detected at concentrations exceeding their UUSCOs throughout the Property and are likely due to the historic fill present throughout the Property.

One pesticides (4,4-DDD) was detected in three soil borings near the western edge of the property. No PCBs were detected in soil.

Based on the association of historic fill, targeted SVOC and metal detected contamination and limited surface soil analytical data, it is assumed that these contaminants may be encountered above the UUSCO in surficial soils. The concrete flooring of the former buildings exists above these locations currently being utilized as an engineering control to prevent the release and potential transport of identified contamination.

Residual Groundwater Contamination and LNAPL
LNAPL has been observed in temporary well points and monitoring wells on 5th Street and the north side of 46th Street. It should be noted that Standard Oil historically operated large scale storage tank facilities immediately opposite of the BCP portion of the Property on the west side of 5th Street and the north side of 46th Street, immediately adjacent of the BCP portion of the Property where product has been detected.

Select VO's, BN's, metals and pesticide 4,4-DDT have been detected in perched groundwater in the fill materials and sand aquifer groundwater beneath the fill materials and the peat layer at concentrations above the NYSDEC TOGS 1.1.1 Groundwater Quality Standards.

Vapor Intrusion
The soil vapor investigation results indicated PCE and methylene chloride, were detected in both sub-slab and soil vapor samples at concentrations above those provided in the NYSDOH Guidance Document. Therefore, the potential for vapor intrusion exists at the Site.

6.2 Contaminant Release and Transport Mechanisms

Contaminant release and transport mechanisms carry contaminants from the source to points where people may be exposed.

The primary contaminant release and transport mechanisms for the identified contaminants at this site include: surface water runoff containing particulates; leaching of soil-bound contaminants to the groundwater; groundwater flow carrying free phase product, dissolved and/or particulate-bound contaminants; and the airborne dispersion of vapors and contaminated particulate matter.

The concrete flooring of the former buildings and asphalt cover exists above the soil and groundwater contamination. The impermeable surface cover and security fencing is currently being utilized as temporary engineering controls to prevent the release and potential transport of identified soil and groundwater contamination by wind, storm water and vapor. The use of perimeter security fencing, along with impermeable cover significant reduces direct human contact with identified contaminants above unrestricted use concentrations.

Groundwater flow potentially carrying LNAPL petroleum product is a concern if contamination enters localized subsurface utility systems such as electric, storm sewer, sanitary sewer, water or natural gas lines or enters surface water bodies. Currently, there is no indication that utilities or surface water have been affected.

In the preliminary vapor assessment, PCE and methylene chloride were detected above corresponding concentrations listed in the NYSDOH Guidance Document. The Property is currently unoccupied and there are no on-site structures for a vapor intrusion concern. These exceedances were detected on the western side of the Property, remote from any existing, adjacent site structures. Impermeable surface cover should be effectively reducing on-site vertical vapor migration. Any fugitive vapors that may be diffusing through the impermeable cover would quickly dissipate when exposed to the atmosphere.

Finally, the proposed redevelopment will remove source soil, historic fill and should improve groundwater quality, which are the primary sources of soil vapor.

If approved, excavation activities are proposed to remove approximately 7’-10’ of soil, historic fill and concrete flooring for site development. Removal of these materials will effectively remove a majority of the source(s) of contamination groundwater on-site to include:

- RCRA encapsulated arsenic, lead and selenium wastes;
- Storage tanks encountered during excavation activities and potential residual soil contamination due to identified storage tanks; and
- Historic fill and soil contamination.

Residual groundwater contamination and LNAPL petroleum may be encountered and transported due to construction dewatering activities, based on current site information. Construction dewatering activities should include contingencies for oil/water separation with product recovery, filtration and possible treatment such as activated carbon, air stripping or off-site treatment and/or disposal for contaminated groundwater.

Current information does not indicate that contamination from the Property has migrated beyond the sidewalk areas adjacent to the Property. Historic fill is suspected on adjacent properties based a review of historical information, so elevated concentrations of SVOCs and metals in soil and groundwater may be a regional condition.

Proposed excavation activities will be performed under the Community Air Monitoring Plan (CAMP), which monitors vapors and particulate matter during the course of the future remedial disturbance. Environmental workers performing soil removal activities will be required to adhere to the site specific Health and Safety Plan (HASP), which outlines worker protection steps that will be taken to significantly reduce worker exposures to on-site contaminants. Any impacted soils that are excavated and temporarily stockpiled on site will be staged on, and covered with, plastic sheeting to prevent the migration of contaminants from the stockpiled soil.

Specification designs for mitigation of potential future release and transport mechanisms will be incorporated into the site design plan. These specifications, if deemed necessary, may include, but are not limited to, the use of vapor barriers beneath buildings, the use of sub-slab depressurization systems, capping of impacted soil areas (i.e. pavement, asphalt, building foundations, 2' clean fill layer); and groundwater use restrictions. Since the proposed site development plans include underground parking throughout the entire site, some of these controls will likely not be necessary due to the absence of any direct exposure route to the occupants at the ground and upper levels. The proposed excavation and offsite disposal of source soil/historic fill should effectively reduce engineering control requirements for proposed future use.

6.3 Exposure Points

Exposure points are locations where actual or potential human contact with a contaminated medium may occur. Concrete and asphalt cover, as well as perimeter security fencing equipped with opaque mesh cover currently exists over a majority of the BCP Property eliminating current exposure points to impacted soil and groundwater on the Property.

In the future, under proposed site development activities, the primary source of potential exposure to site contamination will be from disturbed soils and dust generated after removal of impermeable cover temporary engineering controls; and during intrusive remediation and construction activities. Proposed redevelopment activities may include construction dewatering. Dewatering activities create the potential for human contact with LNAPL and residually contaminated groundwater. Additionally, human contact is possible during installation of utility trenches. Demarcation of contaminated soil is required in these locations is required to protect workers installing and, in the future potentially repairing onsite utilities. All proposed work will be completed in accordance

with the site-specific Health and Safety Plan and the CAMP to protect worker and public safety

The proposed development, if approved, includes provisions to cover any soil contamination that is allowed to remain on site with either impermeable construction materials (i.e. pavement, concrete or buildings) or, in the case of "green" areas, a 2' clean fill layer. It should also be noted that imported clean stone layers will be required for suitable construction foundation for concrete flooring, pavement and buildings. The boundary between the clean fill and existing soils will be demarcated utilizing a high visibility mesh layer, placed on top of the existing soil. A long-term institutional control, in the form of an environmental easement, if required, may also be utilized to safeguard future workers/occupants of the property in the event intrusive work is required (i.e. utility repair work).

Groundwater at the site is not currently used nor are there any proposals for its use, either for potable or other (e.g., irrigation) purposes. It is not anticipated that wells (other than monitoring and/or recovery wells) will remain on-site once the residential development is complete. Any remaining monitoring or recovery wells will need to be secured in a way which prevents damage from vandalism and the potential for exposure, however remote. If necessary, the future use of the groundwater beneath the site will be restricted via long-term institutional control.

6.4 Routes of Exposure

Potential exposures to site contaminants may occur from one of the following scenarios:

1. Ingestion of soil or groundwater;

2. Inhalation of dusts, vapors or gases from soil or from vapors from groundwater; or

3. Direct contact with soil or groundwater (i.e. dermal absorption).

The potential for exposure to contaminated soils and groundwater at the site are discussed in detail in the following sections:

6.4.1 Soils

The potential for ingestion, inhalation and dermal absorption exposure to soil exhibiting concentrations above the unrestricted use standards is significantly reduced by the impermeable cover currently existing at the Property. Perimeter fencing covered with mesh fabric encompasses the Property eliminating unpermitted site entry. These

engineering controls will remain in force until proposed redevelopment actions are approved by DEC and subsequently performed.

Specific phases of the proposed property development will increase potential for ingestion, inhalation and dermal absorption exposure to contaminated soil. This includes the following phases:

- During any construction and earthmoving activities on-site to demolish and remove foundations and to clear and grade the property for the construction road and the development roadways and building lots;
- During any soil removal to prepare for re-grading and introduction of clean fill and/or topsoil; and
- Prior to the placement of soil, topsoil and sod on the individual lots.

There is also potential for exposure during intrusive work, e.g., during trenching for utilities or extensive landscaping. However, this potential exposure pathway will be substantially diminished through the proposed use of a mesh (demarcation) layer separating the new, clean soil from the existing soil.

There is also the potential for exposure of occupants on adjacent properties to dust created during construction activities and the tracking of impacted soils off-site by construction vehicles. However, the CAMP requires dust monitoring and the employment of dust suppression techniques. Additionally, a tracking pad will be constructed at the exit/entrances to the construction site to minimize the tracking of mud (i.e. potentially impacted soils) from the site by construction vehicles.

The proposed excavation and off-site disposal of contaminated soil and use of engineering controls such as imported stone for sub-slab layers, concrete flooring, asphalt areas and landscaped areas with imported, clean soil, will effectively replace the existing concrete areas utilized as engineering controls and effectively remove a majority of the source soil and historic fill on-site exhibiting concentrations above the unrestricted use standards, thereby significantly minimizing potential routes of exposure.

6.4.2 Groundwater

There are currently no ingestion, inhalation or direct contact human health concerns for the Property related to groundwater contamination, as impermeable cover engineering controls and perimeter fencing significantly reduce contact with groundwater at the site.

The perched groundwater zone at the site is flowing to the east-northeast. The deeper sand aquifer is flowing to the west. Groundwater delineation data does not indicate that dissolved groundwater contamination or LNAPL has migrated off-site.

During the proposed redevelopment, potential de-watering activities during construction activities may create a direct contact exposure for construction workers. It is not anticipated that any party other than the groundwater remediation specialists would have direct contact with groundwater at this site.

During the proposed redevelopment, the potential inhalation hazard of volatile vapors from groundwater is greatest in the areas of former tanks. The potential exposure pathway is substantially reduced by removing and/or treating the source of potential volatiles, which will be performed under the direction of groundwater remediation specialists.

If necessary, a vapor barrier and/or a sub-slab depressurization system will be installed beneath the concrete slab of any new buildings on the Property. Since the proposed site development plans include underground parking throughout the entire site, some of these controls will not be necessary as any vapors potentially diffusing through concrete will dissipate in the parking garage, therefore a direct exposure route to the occupants at the ground and upper levels would not exist.

6.5 Receptor Population

The receptor population is those people who are, or may be, exposed to contaminants at the point of exposure. The site is currently zoned M1-4/R6A: Manufacturing. Therefore, the current land use is for industrial and manufacturing purposes. Adjacent sites within the same block are used for industrial purposes, manufacturing and parking. Sites south of the Property and 47th Avenue are used for commercial activities and office buildings. Based on these conditions, sensitive populations such as: day-care centers; elementary, middle and high schools; and elder care facilities have not been identified in close proximity to the Property. Currently, there is not data to suggest that vapor intrusion due to site contamination is potentially impacting adjacent properties.

Land use will change with proposed redevelopment from manufacturing to post-secondary schooling. The proposed redevelopment activities will positively affect onsite environmental quality via removal and offsite disposal of all or a majority of identified contaminated soil and historic fill materials and any underground storage tanks onsite. Environmental quality should be reassessed after the removal of these sources of onsite contamination to ensure the protection of the proposed future onsite population of post-secondary students.

If contamination remains on site after the remediation is completed, environmental easements will be required. Once the site has been completely developed, exposure to the future occupant population will be significantly reduced via the engineering controls

utilized in developing the site (i.e. pavement, buildings, clean fill barriers, etc.). If necessary, long-term institutional controls will be implemented to ensure that the worker population is not exposed (i.e. for utility repairs, etc.).

All proposed future site investigative and, remedial activities will be conducted in accordance with the site-specific Health and Safety Plan and the CAMP. Therefore, exposure to the worker receptor and adjacent occupant populations will be closely monitored and steps will be employed (i.e. the use of personal protective equipment for on-site personnel, dust suppression, etc.) to significantly reduce exposure to these populations.

7.0 Tables

Historic soil and groundwater analytical tables are provided are attached to this revised QHHEA. The 2008 soil and groundwater analytical tables are provided as Tables 2,4,5,6, and 7 of the included December 2008 Remedial Investigation Report.

8.0 Figures

Maps depicting the soil and groundwater sample locations with contaminant concentrations that exceed the NYSDEC UUSCO and GWQS, and existing impermeable surface cover, are included as **Figures 8, 9, 10, 11, 12, 13, and 14** in the included December 2008 Remedial Investigation report.

9.0 Conclusions and Recommendations

Soil and groundwater impacted with concentrations of VOCs, SVOCs and metals above the NYSDEC UUSCO and GWQS have been detected throughout the Property. These contaminants are associated with chemicals from various operations in the site history dating back to at least the late 1800s, as well as historic fill material located on the property. Currently, impermeable surface cover and perimeter security fencing is being employed as engineering controls that are protective of human health.

The proposed investigation and remediation, associated with identified contamination to be performed as a precursor to development activities, if approved, will be the primary potential human health exposure due to disturbance of site contaminants detected above the unrestricted use standard. This proposed work will be performed by and/or under the direction of environmental remediation contractors.

To minimize the potential exposure to all potential populations and in preparation for proposed site remediation and construction activities, a Health and Safety Plan (HASP) and a Community Air Monitoring Plan (CAMP) have been prepared to protect the

community, as well as site environmental and construction workers, and was included as appendices to the recent RIR. The CAMP provides a measure of protection for the surrounding community (i.e., off-site receptors including residents and on-site workers not directly involved with the work activities) from potential airborne releases resulting from investigative and remedial work activities. The CAMP also helps confirm that work activities do not spread airborne contaminants off-site.

The VO contaminants also carry with them a potential secondary exposure via the migration and accumulation of soil vapors. Low concentrations of VOCs were detected in sub-slab and soil vapor samples obtained from biased locations of the Property. Current information does not indicate that on-site vapor concentrations are affecting off-site properties. The removal of a large portion of existing soil should further reduce soil vapor as an issue for future site development.

Appendix – 6

NEW YORK STATE DEPARTMENT OF

ENVIRONMENTAL CONSERVATION

Document Repository

Queens Community Board No. 2
43-22 50th Street, 2nd Floor
Woodside, NY 11377
Mon – Fri: 9:00 to 5:00 PM
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Court Square Library (CitiCorp Building)
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Long Island City, NY 11101
Mon: 12:00 Noon to 7:00 PM
Tue: 1:00 PM to 6:00 PM
Wed: 10:00 AM to 6:00 PM
Thu: 12:00 Noon to 6:00 PM
Sat/ Sun: Closed

Project Contacts

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47-40 21st Street
Long Island City, New York 11101
(718) 482-4905
yywong@gw.dec.state.ny.us

For public health related questions:

Bridget Callaghan
NYSDOH
547 River Street Room 300
Troy, New York 12180-2216
1 (800) 458-1158 ext 27860

FACT SHEET #2

BROWNFIELD CLEANUP PROGRAM

OCA LIC Fifth Street Mixed-Use Housing Long Island City, NY

December 2008

Site#: C241098
NYSDEC Region 2

Remedial Investigation Report under review

This fact sheet is being provided to you pursuant to New York State Environmental Conservation Law and the New York State Department of Environmental Conservation's ("NYSDEC") Brownfield Cleanup Program ("BCP"). You have been sent this fact sheet because you own or live on property near the OCA LIC Fifth Street Mixed-Use Housing Site ("Site") or because the NYSDEC believes you may otherwise be interested in activities at the Site.
The NYSDEC, working in conjunction with the New York State Department of Health ("NYSDOH"), is currently reviewing for approval a draft Remedial Investigation Report ("RIR"). The RIR summarizes the remedial investigation activities completed at the site in accordance with the approved Remedial Investigation Work Plan. The RIR was submitted by the Site owner, OCA Long Island City, LLC ("the Volunteer"), pursuant to a Brownfield Cleanup Agreement entered between the Volunteer and the NYSDEC. Project documents are available for public review at the document repository listed on the left-hand side of this page. *Your comments are important and strongly encouraged.* Please direct comments to the NYSDEC contact listed on the left-hand side of this page.

Background: The Site was primarily covered with 1-, 2-, and 3-story buildings which were constructed in several stages and were operated for a variety of industrial uses, including metals manufacturing. Several of these building have been demolished, and the Site is now covered with concrete building slabs and is enclosed by a chain link fence. The original portions of the Site buildings were initially constructed during the early 1900s. A majority of the buildings were constructed on concrete slabs with no basements, with the exception of the eastern section of the building along 46th Road (5-20 & 5-36 46th Road), which included basements. The buildings on the Site are a mixture of brick and concrete block construction.

Highlights of Remedial Investigation Report

- Volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and metal were detected above the NYSDEC soil cleanup objectives in subsurface soil. VOCs and SVOCs are chemicals which are used in a variety of industrial activities.
- VOCs, SVOCs, and metal were detected in groundwater above applicable standards.
- There are two water-bearing zones immediately beneath the Site: a perched-water (upper) zone and an underlying sand aquifer that are separated by a semi-impervious clayey peat layer (10 to 12 feet below ground surface).
- Light non-aqueous phase liquid (LNAPL) was detected in the perched-water zone. The sources of LNAPL appear to be related to the historic manufacturing operation on-Site, as well as on-Site underground storage tanks.
- LNAPL and polychlorinated biphenyls (PCBs) were detected in the sand aquifer at the most up-gradient portion of the Site.
- Soil gas and sub-slab sample indicated that tetrachloroethylene (PCE), Methylene chloride were detected at concentration above those provided in the New York State Department of Health (NYSDOH) guidance document.

Significant Threat Determination: As part of every BCP project NYSDEC, in conjunction with NYSDOH, is required to make a determination whether the conditions at the Site pose a significant threat to human health or the environment, as defined in the NYSDEC's regulations 6 NYCRR Part 375. Based on the results presented in the RIR, NYSDEC has determined that the site represents a significant threat to the environment. This decision is based on the nature of the existing contaminants identified at the Site; the potential for off-site migration of contaminants in the groundwater; and the potential for human exposure to site-related contaminants via soil vapors. As such, funding for a Technical Assistance Grant, or TAG, will be available to qualifying community groups. Please visit: http://www.dec.ny.gov/regulations/2590.html, or contact the NYSDEC project manager for more information on how to apply for a TAG.

Next Steps: Upon the Department approval of the RIR, volunteer will submit a Remedial Action Work Plan (RAWP) which outlines the proposed remedial activities to cleanup the contamination. Future fact sheet will be provided to keep you informed of the project progress.

You are encouraged to review the project documents located at the repository noted on the front page of this fact sheet, and to contact representatives of NYSDEC or NYSDOH at any time with questions, comments, or concerns. If you know anyone who would like to be added to the mailing list for this project, please have them contact the NYSDEC representative identified on the front page of this fact sheet.

OCA LIC Fifth Street Mixed-Use Housing
Site Location Map

NYC DEPARTMENT OF FINANCE
OFFICE OF THE CITY REGISTER

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RECORDING AND ENDORSEMENT COVER PAGE **PAGE 1 OF 26**

Document ID: 2008091901278001 Document Date: 09-19-2008 Preparation Date: 09-19-2008
Document Type: SUNDRY AGREEMENT
Document Page Count: 24

PRESENTER:
FIRST AMERICAN TITLE INSURANCE- PICK UP
633 THIRD AVENUE
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212-850-0670
cquartararo@firstam.com

RETURN TO:
FIRST AMERICAN TITLE INSURANCE- PICK UP
633 THIRD AVENUE
NEW YORK, NY 10017

PROPERTY DATA

Borough	Block	Lot		Unit	Address
QUEENS	28	21	Entire Lot		5-01 47TH AVENUE
Property Type: COMMERCIAL REAL ESTATE					
Borough	**Block**	**Lot**		**Unit**	**Address**
QUEENS	28	38	Entire Lot		N/A 46TH ROAD
Property Type: COMMERCIAL REAL ESTATE					

x Additional Properties on Continuation Page

CROSS REFERENCE DATA
CRFN_____ *or* Document ID_____ *or* _____ Year____ Reel ___ Page____ *or* File Number_____

PARTIES

PARTY 1:
OCA LONG ISLAND CITY LLC
C/O O'CONNOR CAPITAL PARTNERS, 535 MADISON AVENUE
NEW YORK, NY 10022
x Additional Parties Listed on Continuation Page

FEES AND TAXES

Mortgage		
Mortgage Amount:	$	0.00
Taxable Mortgage Amount:	$	0.00
Exemption:		
TAXES: County (Basic):	$	0.00
City (Additional):	$	0.00
Spec (Additional):	$	0.00
TASF:	$	0.00
MTA:	$	0.00
NYCTA:	$	0.00
Additional MRT:	$	0.00
TOTAL:	$	0.00
Recording Fee:	$	172.00
Affidavit Fee:	$	0.00

Filing Fee: $ 0.00
NYC Real Property Transfer Tax: $ 0.00
NYS Real Estate Transfer Tax: $ 0.00

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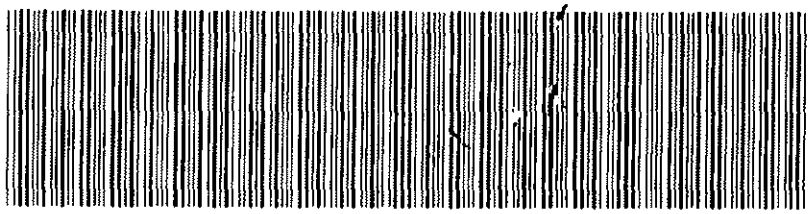

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RECORDING AND ENDORSEMENT COVER PAGE (CONTINUATION)

Document ID: 2008091901278001 Document Date: 09-19-2008 Preparation Date: 09-19-2008
Document Type: SUNDRY AGREEMENT

PROPERTY DATA

Borough	Block	Lot		Unit	Address
QUEENS	28	12	Entire Lot		N/A 47TH AVENUE
Property Type:	COMMERCIAL REAL ESTATE				
Borough	**Block**	**Lot**		**Unit**	**Address**
QUEENS	28	15	Entire Lot		5-23 47TH AVENUE
Property Type:	OTHER				
Borough	**Block**	**Lot**		**Unit**	**Address**
QUEENS	28	17	Entire Lot		5-19 47TH AVENUE
Property Type:	COMMERCIAL REAL ESTATE				
Borough	**Block**	**Lot**		**Unit**	**Address**
QUEENS	28	18	Entire Lot		5-11 47TH AVENUE
Property Type:	COMMERCIAL REAL ESTATE				

PARTIES

PARTY 1:
OCA LONG ISLAND CITY II LLC
C/O O'CONNOR CAPITAL PARTNERS, 535 MADISON AVENUE
NEW YORK, NY 10022

PARTY 1:
OCA LONG ISLAND CITY III LLC
C/O O'CONNOR CAPITAL PARTNERS, 535 MADISON AVENUE
NEW YORK, NY 10022

DECLARATION

This DECLARATION made as of the 19th day of September 2008, by OCA LONG ISLAND CITY LLC, OCA LONG ISLAND CITY II LLC and OCA LONG ISLAND CITY III LLC, having an office located at c/o O'Connor Capital Partners, 535 Madison Avenue, New York, NY 10022 (hereinafter collectively referred to as "Declarant");

WITNESSETH

WHEREAS, Declarant is the fee owner of certain real property located in the County of Queens, City and State of New York, designated for real property tax purposes as Lot(s) 21, 38, 12, 15, 17 and 18 of Tax Block 28 commonly known by the street address as 5-11 47th Avenue (the "Subject Property") and is more particularly described in Exhibit A, annexed hereto and made part hereof; and

WHEREAS, First American Title Insurance Company has issued a Certification of Parties in Interest, annexed hereto as Exhibit B and made a part hereof, that as of the 5th day of June 2008, Declarant, and Bank of America, N.A. herein after also referred to as a ("Party-in-Interest"), are the only Parties-in-Interest (as defined in subdivision (c) of the definition of "zoning lot" set forth in Section 12-10 of the Zoning Resolution of the City of New York) in the Subject Property; and

WHEREAS, all Parties-in-Interest to the Subject Property have either executed this Declaration or waived their rights to execute this Declaration by written instrument annexed hereto as Exhibit B-1 and made a part hereof, which instrument is intended to be recorded simultaneously with this Declaration; and

WHEREAS, Declarant has applied to the New York City Board of Standards and Appeals (the "BSA") for a variance for use and bulk waivers to allow the construction of two mid-rise buildings consisting of a 12 story residential building and a dormitory, faculty housing and community facility building on the Subject Property in a M1-4/R6A (LIC) and M1-4 zoning district and has submitted to the BSA an application numbered 238-07-BZ (the "Application") for review pursuant to the Rules of Practice and Procedure for the BSA, the requirements set forth in the New York City Charter, sections 666 and 668, the New York City Zoning Resolution (the "ZR") sections 72-21 and the procedures set forth in the paragraph immediately following; and

WHEREAS, an environmental assessment of the Subject Property pursuant to the State Environmental Quality Review Act (the "SEQRA") and the City Environmental Quality Review (the "CEQR") is under review in connection with the Application (CEQR # 08BSA28Q/08DEPTECH188Q) and, pursuant to the SEQRA and CEQR, the Department of Environmental Protection (the "DEP") has reviewed the environmental assessment, including the historic land use of the Subject Property; and

Record & Return
First American Title Insurance
Attn: Recording Dept
633 Third Avenue, NEW YORK 10017
(212) 922-9700 (800) 437-1234
Title No: 3008-250171

WHEREAS, the results of such review as documented in DEP's June 5 , 2008 letter attached hereto as Exhibit C and made a part hereof, indicate the potential presence of hazardous materials; and

WHEREAS, Declarant desires to identify the existence of any potential hazardous materials and remediate any such hazardous materials found in connection with the development or redevelopment of the Subject Property and Declarant has agreed to submit a hazardous materials sampling protocol prepared by a qualified consultant and including a health and safety plan, (the "Sampling Protocol"), which shall be submitted for the approval of DEP and agrees to test and identify any potential hazardous materials pursuant to the approved Sampling Protocol and, if such hazardous materials are found, to submit a hazardous materials remediation plan, including a health and safety plan, (the "Remediation Plan") for DEP review and approval and upon the approval of the Remediation Plan by DEP, the Declarant shall provide for the remediation of such hazardous materials; and

WHEREAS, Declarant agrees to implement the Sampling Protocol and all hazardous material remediation required by the Remediation Plan, if any, and desires to restrict the manner in which the Subject Property may be developed or redeveloped by having the implementation of the Sampling Protocol and Remediation Plan, if any, performed to the satisfaction of DEP, as evidenced by a writing as set forth herein, be a condition precedent to any change of use or soil disturbance for any such development or redevelopment; and

WHEREAS, Declarant intends this Declaration to be binding upon all successors and assigns; and

WHEREAS, Declarant intends this Declaration to benefit all land owners and tenants including the City of New York ("the City") without consenting to the enforcement of this Declaration by any party or entity other than the City.

NOW, THEREFORE, Declarant does hereby declare and agree that the Subject Property shall be held, sold, transferred, and conveyed, subject to the restrictions and obligations which are for the purpose of protecting the value and desirability of the Subject Property and which shall run with the land, binding the successors and assigns of Declarant so long as they have any right, title or interest in the Subject Property or any part thereof:

1. (a) Declarant covenants and agrees that no application for grading, excavation, foundation, alteration, building or other permit respecting the Subject Property which permits soil disturbance shall be submitted to or accepted from the Department of Buildings (the "DOB") by the Declarant until DEP has issued to DOB, as applicable, either a Notice of No Objection as set forth in Paragraph 2(a), a Notice to Proceed as set forth in Paragraph 2(b), a Notice of Satisfaction as set forth in Paragraph 2(c) or a Final Notice of Satisfaction as set forth in Paragraph 2(d). Declarant shall submit a copy of the Notice of No Objection, Notice to Proceed,

Notice of Satisfaction or Final Notice of Satisfaction to the DOB at the time of filing of any application set forth in this Paragraph 1(a).

(b) Declarant further covenants and agrees that no application for a temporary or permanent Certificate of Occupancy that reflects a change in use group respecting the Subject Property shall be submitted to or accepted from DOB by the Declarant until DEP has issued to DOB, as applicable, either a Notice of No Objection as set forth in Paragraph 2(a), a Notice of Satisfaction as set forth in Paragraph 2(c) or a Final Notice of Satisfaction as set forth in Paragraph 2(d). Declarant shall submit a copy of the Notice of No Objection, Notice of Satisfaction or Final Notice of Satisfaction to the DOB at the time of filing of any application set forth in this Paragraph 1(b).

2. (a) Notice of No Objection - DEP shall issue a Notice of No Objection after the Declarant has completed the work set forth in the DEP approved Sampling Protocol and DEP has determined in writing that the results of such sampling demonstrate that no hazardous materials remediation is required for the proposed project.

(b) Notice to Proceed - DEP shall issue a Notice to Proceed after it determines that: (i) the Remediation Plan has been approved by DEP and (ii) the permit(s) respecting the Subject Property that permit grading, excavation, foundation, alteration, building or other permit respecting the Subject Property which permits soil disturbance or construction of the superstructure are necessary to further the implementation of the DEP approved Remediation Plan.

(c) Notice of Satisfaction - DEP shall issue a Notice of Satisfaction after the Remediation Plan has been prepared and accepted by DEP and DEP has determined in writing that the Remediation Plan has been completed to the satisfaction of DEP.

(d) Final Notice of Satisfaction - DEP shall issue a Final Notice of Satisfaction after DEP has set forth in writing, that 1) the Remediation Plan has been completed to the satisfaction of DEP and 2) all potential hazardous materials have been removed or remediated and no further investigation or hazardous material remediation is required on the Subject Property as determined by DEP.

3. Declarant represents and warrants with respect to the Subject Property, that no restrictions of record, nor any present or presently existing estate or interest in the Subject Property nor any lien, encumbrance, obligation, covenant of any kind preclude, presently or potentially, the imposition of the obligations and agreements of this Declaration.

4. Declarant acknowledges that the City is an interested party to this Declaration and consents to the enforcement of this Declaration solely by the City, administratively or at law or at equity, of the obligations, restrictions and agreements pursuant to this Declaration.

5. The provisions of this Declaration shall inure to the benefit of and be binding upon the respective successors and assigns of the Declarant, and references to the Declarant shall be deemed to include such successors and assigns as well as successors to their interest in the Subject Property. References in this Declaration to agencies or instrumentalities of the City shall be deemed to include agencies or instrumentalities succeeding to the jurisdiction thereof.

6. Declarant shall be liable in the performance of any term, provision, or covenant in this Declaration, subject to the following provisions:

The City and any other party relying on this Declaration will look solely to the fee estate interest of the Declarant in the Subject Property for the collection of any money judgment recovered against Declarant, and no other property of the Declarant shall be subject to levy, execution, or other enforcement procedure for the satisfaction of the remedies of the City or any other person or entity with respect to this Declaration. The Declarant including its officers, managers and members, shall have no personal liability under this Declaration.

7. The obligations, restrictions and agreements herein shall be binding on the Declarant or other parties in interest only for the period during which the Declarant and any such Party-in-Interest holds an interest in the Subject Property; provided, however, that the obligations, restrictions and agreements contained in this Declaration may not be enforced against the holder of any mortgage unless and until such holder succeeds to the fee interest of the Declarant by way of foreclosure or deed in lieu of foreclosure.

8. Declarant shall indemnify the City, its respective officers, employees and agents from all claims, actions, or judgments for loss, damage or injury, including death or property damage of whatsoever kind or nature, arising from Declarant's obligations under this Declaration, including without limitation, the negligence or carelessness of the Declarant, its agents, servants or employees in undertaking such obligations; provided, however, that should such a claim be made or action brought, Declarant shall have the right to defend such claim or action with attorneys reasonably acceptable to the City and no such claim or action shall be settled without the written consent of the City.

9. If Declarant is found by a court of competent jurisdiction to have been in default in the performance of its obligations under this Declaration, and such finding is upheld on a final appeal by a court of competent jurisdiction or by other proceeding or the time for further review of such finding or appeal has lapsed, Declarant shall indemnify and hold harmless the City from and against all reasonable legal and administrative expenses arising out of or in connection with the enforcement of Declarant's obligations under this Declaration as well as any reasonable legal and administrative expenses arising out of or in connection with the enforcement of any judgment obtained against the Declarant, including but not limited to the cost of undertaking the Remediation Plan, if any.

10. Declarant shall cause every individual or entity that between the date hereof and the date of recordation of this Declaration, becomes a Party-in-Interest (as defined in subdivision (c) of the definition of "zoning lot" set forth in Section 12-10 of the Zoning Resolution of the City of New York) to all or a portion of the Subject Property to waive its right to execute this Declaration and subordinate its interest in the Subject Property to this Declaration. Any mortgage or other lien encumbering the Subject Property in effect after the recording date of this Declaration shall be subject and subordinate hereto as provided herein. Such waivers and subordination shall be attached to this Declaration as Exhibits and recorded in the Office of the County or City Register.

11. This Declaration and the provisions hereof shall become effective as of the date of this Declaration. Within five (5) business days of the date hereof, Declarant shall submit this Declaration for recording or shall cause this Declaration to be submitted for recording in the Office of the County or City Register, where it will be indexed against the Subject Property Declarant shall promptly deliver to the DEP and the Board of Standards and Appeals proof of recording in the form of an affidavit of recording attaching the filing receipt and a copy of the Declaration as submitted for recording. Declarant shall also provide a certified copy of this Declaration as recorded to DEP and BSA as soon as a certified copy is available.

12. This Declaration may be amended or modified by Declarant only with the approval of DEP or the agency succeeding to its jurisdiction and no other approval or consent shall be required from any other public body, private person or legal entity of any kind. A statement signed by the Deputy Commissioner of the Bureau of Environmental Planning and Assessment of DEP, or such person as authorized by the Deputy Commissioner, certifying approval of an amendment or modification of this Declaration shall be annexed to any instrument embodying such amendment or modification.

13. Any submittals necessary under this Declaration from Declarant to DEP shall be addressed to the Deputy Commissioner of the Bureau of Environmental Planning and Assessment of DEP, or such person as authorized by the Deputy Commissioner. As of the date of this Declaration DEP's address is:

New York City Department of Environmental Protection
59-17 Junction Blvd
Flushing, New York 11373

14. Declarant expressly acknowledges that this Declaration is an essential element of the SEQRA review conducted in connection with the Application and as such the filing and recordation of this Declaration may be a precondition to the determination of significance pursuant to the SEQRA Regulations, Title 6 New York Code of Rules and Regulations ("NYCRR") Part 617.7.

15. Declarant acknowledges that the satisfaction of the obligations set forth in this

Declaration does not relieve Declarant of any additional requirements imposed by Federal, State or Local laws.

16. This Declaration shall be governed by and construed in accordance with the laws of the State of New York.

17. Wherever in this Declaration, the certification, consent, approval, notice or other action of Declarants, DEP or the City is required or permitted, such certification, consent, approval, notice or other action shall not be unreasonably withheld or delayed.

18. In the event that any provision of this Declaration is deemed, decreed, adjudged or determined to be invalid or unlawful by a court of competent jurisdiction, such provision shall be severable and the remainder of this Declaration shall continue to be in full force and effect.

19. This Declaration and its obligations and agreements are in contemplation of Declarant receiving approvals or modified approvals of the Application. In the event that the Declarant withdraws the Application before a final determination or the Application is not approved, the obligations and agreements pursuant to this Declaration shall have no force and effect and this Declaration shall be cancelled.

20. Notice of Cancellation - Declarant may request that DEP issue a Notice of Cancellation upon the occurrence of the following steps: (i) Declarant has withdrawn the Application in writing before a final determination on the Application; (ii) the Application was not approved by the Board of Standards and Appeals; or (iii) DEP has issued a Final Notice of Satisfaction indicating that all potential hazardous materials have been removed or remediated and no further hazardous remediation is required on the Subject Property. Upon such request, DEP shall issue a Notice of Cancellation after it has determined, to DEP's own satisfaction, that the above referenced steps, as applicable, have occurred. Upon receipt of a Notice of Cancellation from DEP, Declarant shall cause such Notice to be recorded in the same manner as the Declaration herein, thus rendering this Restrictive Declaration null and void. Declarant shall promptly deliver to DEP and the BSA a certified copy of such Notice of Cancellation as recorded.

IN WITNESS WHEREOF, Declarant has executed this Declaration as of the day and year first above written.

OCA Long Island
City LLC, OCA Long Island City II, LLC and OCA Long Island City III, LLC

By: _____

Title: Senior Vice President

CERTIFICATE OF ACKNOWLEDGMENT

STATE OF NEW YORK)
) .ss.:
COUNTY OF New York)

On the 19th day of Sept in the year 2008 before me, the undersigned, personally appeared William O'Connor, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name(s) is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity (ies), and that by his/her/their signature on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

Angela Cotrone
Notary Public

ANGELA COTRONE
Notary Public, State of New York
No. 01CO6070998
Qualified in Nassau County
Certificate Filed in New York County
Commission Expires March 11, 2010

SEAL

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First American Title Insurance Company of New York

Title No.: 3008-234603

EXHIBIT A

The subject tract of land with respect to which the foregoing parties are the parties in interest as aforesaid, is known as Tax Lot Number(s) **21, 38, 12, 15, 17 and 18** in Block(s) **28** as shown on the Tax Map of the City of New York, Queens County and more particularly described as follows:

AS TO LOTS 21 AND 38:

ALL THAT CERTAIN PLOT, PIECE OR PARCEL OF LAND, SITUATE, LYING AND BEING IN THE BOROUGH AND COUNTY OF QUEENS, CITY AND STATE OF NEW YORK, BOUNDED AND DESCRIBED AS FOLLOWS:-

BEGINNING AT THE CORNER BY THE INTERSECTION OF THE SOUTHERLY SIDE OF 46TH ROAD (W. NINTH STREET), 60 FEET WIDE, AND THE EASTERLY SIDE OF 5TH STREET (WEST AVENUE, 60 FEET WIDE);

RUNNING THENCE SOUTHERLY ALONG THE EASTERLY SIDE OF 5TH STREET 200 FEET 0 INCHES TO THE CORNER FORMED BY THE INTERSECTION OF THE EASTERLY SIDE OF 5TH STREET AND THE NORTHERLY SIDE OF 47TH AVENUE (W. EIGHT STREET), 60 FEET WIDE;

THENCE EASTERLY ALONG THE NORTHERLY SIDE OF 47TH AVENUE; 100 FEET 0 INCHES;

THENCE NORTHERLY AT RIGHT ANGLES TO THE NORTHERLY SIDE OF 47TH AVENUE, 100 FEET 0 INCHES;

THENCE EASTERLY AT RIGHT ANGLES TO THE LAST MENTIONED COURSE 264 FEET 11-1/8 INCHES TO A POINT;

THENCE NORTHERLY AT RIGHT ANGLES TO THE LAST MENTIONED COURSE, 100 FEET TO THE SOUTHERLY SIDE OF 46TH ROAD;

THENCE WESTERLY ALONG THE SOUTHERLY SIDE OF 46TH ROAD, 364 FEET 11-1/8 INCHES TO THE CORNER FIRST ABOVE MENTIONED TO THE POINT OR PLACE OF BEGINNING.

AS TO LOT 12:

ALL THAT CERTAIN PLOT, PIECE OR PARCEL OF LAND, SITUATE, LYING AND BEING IN THE BOROUGH AND COUNTY OF QUEENS, CITY AND STATE OF NEW YORK, BOUNDED AND DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT ON THE NORTHERLY SIDE OF 47TH AVENUE (F/K/A EIGHTH STREET), DISTANT 297.30 FEET WESTERLY FROM THE CORNER FORMED BY THE INTERSECTION OF THE NORTHERLY SIDE OF 47TH AVENUE (F/K/A EIGHTH STREET) AND THE WESTERLY SIDE OF VERNON BOULEVARD (F/K/A VERNON AVENUE);

RUNNING THENCE NORTHERLY PARALLEL WITH VERNON BOULEVARD, 100 FEET;

THENCE WESTERLY PARALLEL WITH 47TH AVENUE 40.76 FEET;

THENCE SOUTHERLY AND AGAIN PARALLEL WITH VERNON BOULEVARD 100 FEET TO THE NORTHERLY SIDE OF 47TH AVENUE; AND

THENCE EASTERLY ALONG THE NORTHERLY SIDE OF 47TH AVENUE 40.76 FEET TO THE POINT OR PLACE OF BEGINNING.

AS TO LOT 15:

ALL THAT CERTAIN PLOT, PIECE OR PARCEL OF LAND, SITUATE, LYING AND BEING AT LONG ISLAND CITY, IN THE BOROUGH OF AND COUNTY OF QUEENS, CITY AND STATE OF NEW YORK, COMPRISING ALL OF LOT 15 AND THE WESTERLY 12 FEET 8 1/4 INCHES OF LOT 14, IN BLOCK 17, AS SAID LOTS ARE SHOWN AND DESIGNATED ON A CERTAIN MAP ENTITLED "MAP OF THE HUNTER AND VAN ALST FARMS MADE BY PETER G. VAN ALST, DATED AUGUST 17, 1861", AND MORE PARTICULARLY BOUNDED AND DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT ON THE NORTHERLY SIDE OF 47TH AVENUE (FORMERLY) WEST EIGHTH STREET DISTANT EASTERLY 225.01 FEET FROM THE CORNER FORMED BY THE INTERSECTION OF THE NORTHERLY SIDE OF 47TH AVENUE WITH THE EASTERLY SIDE OF 5TH STREET;

RUNNING THENCE NORTHERLY AT RIGHT ANGLES TO 47TH AVENUE 99.99 FEET;

THENCE EASTERLY AND PARALLEL WITH 47TH AVENUE 37.69 FEET;

THENCE SOUTHERLY AND AGAIN AT RIGHT ANGLES TO 47TH AVENUE 99.99 FEET TO THE NORTHERLY SIDE OF 47TH AVENUE;

THENCE WESTERLY ALONG THE NORTHERLY SIDE OF 47TH AVENUE 37.69 FEET TO THE POINT OR PLACE OF BEGINNING.

AS TO LOT 17:

ALL THAT CERTAIN LOT, PIECE OR PARCEL OF LAND, SITUATE, LYING AND BEING AT LONG ISLAND CITY IN THE FIRST WARD OF THE BOROUGH OF QUEENS, CITY OF NEW YORK, COUNTY OF QUEENS AND STATE OF NEW YORK, BOUNDED AND DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT ON THE NORTHERLY SIDE OF 47TH AVENUE, FORMERLY EIGHTH STREET, DISTANT 174.98 FEET EASTERLY FROM THE CORNER FORMED BY THE INTERSECTION OF SAID NORTHERLY SIDE OF 47TH AVENUE WITH THE EASTERLY SIDE OF FIFTH STREET, FORMERLY WEST AVENUE;

RUNNING THENCE NORTHERLY PARALLEL WITH FIFTH STREET, 100 FEET;

THENCE EASTERLY PARALLEL WITH 47TH AVENUE, 50.02 FEET;

THENCE SOUTHERLY PARALLEL WITH FIFTH STREET, 100 FEET TO THE NORTHERLY SIDE OF 47TH AVENUE; AND

THENCE WESTERLY ALONG SAID SIDE OF 47TH AVENUE, 50.02 FEET TO THE POINT OR PLACE OF BEGINNING.

AS TO LOT 18:

ALL THAT CERTAIN PLOT, PIECE OR PARCEL OF LAND, SITUATE, LYING AND BEING IN THE BOROUGH AND COUNTY OF QUEENS, CITY AND STATE OF NEW YORK, BOUNDED AND DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT ON THE NORTHERLY SIDE OF 47TH AVENUE, FORMERLY 8TH STREET, DISTANT 100 FEET EASTERLY FROM THE CORNER FORMED BY THE INTERSECTION OF THE NORTHERLY SIDE OF 47TH AVENUE WITH THE EASTERLY SIDE OF 5TH STREET, FORMERLY WEST AVENUE;

First American Title Insurance Company of New York

Title No.: 3008-234603

EXHIBIT B

CERTIFICATION PURSUANT TO ZONING LOT SUBDIVISION D OF SECTION 12-10 OF THE ZONING RESOLUTION OF DECEMBER 15, 1961 OF THE CITY OF NEW YORK - AS AMENDED EFFECTIVE AUGUST 18, 1977

FIRST AMERICAN TITLE INSURANCE COMPANY OF NEW YORK, a title insurance company licensed to do business in the State of New York and having its principal office at 633 THIRD AVENUE, NEW YORK, NEW YORK hereby certifies that as to the land hereinafter described being a tract of land, either un-subdivided or consisting of two or more lots of record, contiguous for a minimum of ten linear feet, located within a single block, that all the parties in interest constituting a "party in interest" as defined in Section 12-10, Subdivision (D) of the Zoning Resolution of the City of New York, effective December 15, 1961, as amended, are the following:

	NAME	ADDRESS	NATURE OF INTEREST
1	OCA Long Island City, LLC	535 Madison Avenue New York, NY 10022	Fee owner of Lots 21 and 38
2	OCA Long Island City III, LLC	535 Madison Avenue New York, NY 10022	Fee Owner Lots 12, 15 and 17
3	OCA Long Island City II, LLC	535 Madison Avenue New York, NY 10022	Fee Owner Lot 18
4	Bank of America N.A	1185 Avenue of the Americas New York, NY 10036	Mortgagee and Secured Party Lots 21 and 38

RUNNING THENCE NORTHERLY PARALLEL WITH 5TH STREET AND PART OF THE DISTANCE THROUGH A FRAME SHED, 100 FEET;

THENCE EASTERLY PARALLEL WITH 47TH AVENUE, 74 FEET 11 7/8 INCHES;

THENCE SOUTHERLY PARALLEL WITH 5TH STREET, 100 FEET TO THE NORTHERLY SIDE OF 47TH AVENUE;

THENCE WESTERLY ALONG SAID SIDE OF 47TH AVENUE 74 FEET 11 7/8 INCHES TO THE POINT OR PLACE OF BEGINNING.

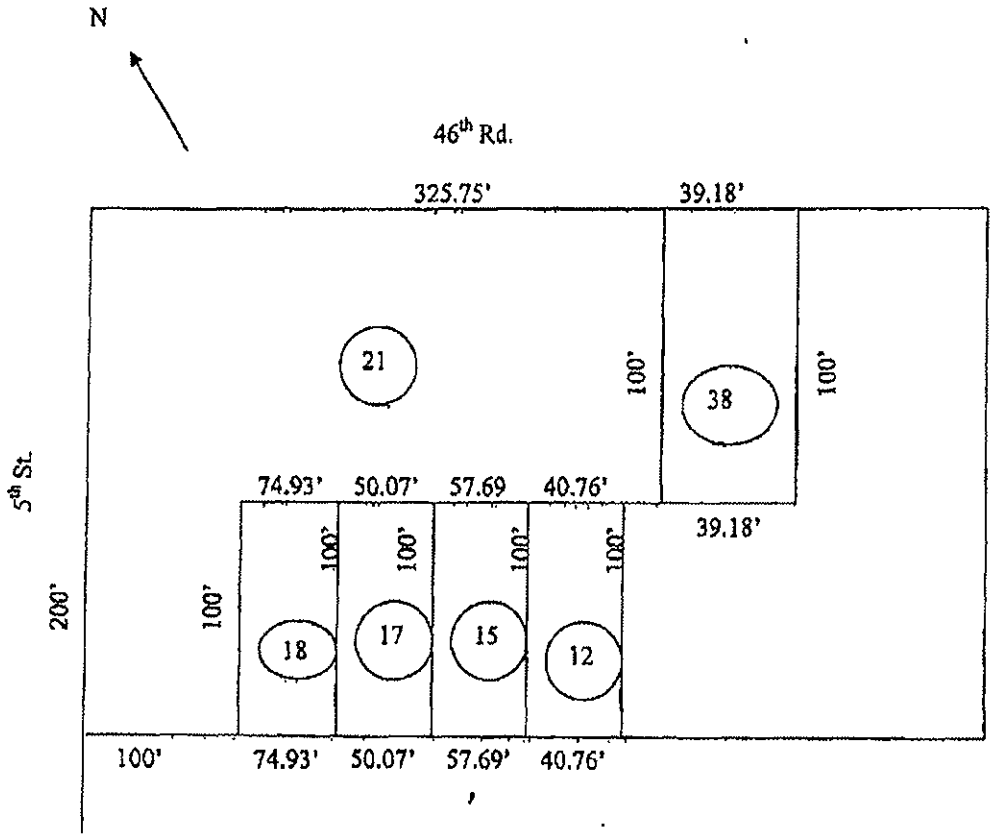
First American Title Insurance Company of New York

Title No.: 3008-234603

That the said premises are known as and by street address(s): 5-20 46th Road, 5-29 47th Avenue, 5-23 47th Avenue, 5-19 47th Avenue, 5-21 47th Avenue and 5-15 47th Avenue, New York, New York as shown on the following DIAGRAM.

BLOCK(S): 28

LOT(S): 21, 38, 12, 15, 17 and 18



First American Title Insurance Company of New York

Title No.: 3008-234603

NOTE: A Zoning Lot may or may not coincide with a lot as shown on the Official Tax Map of the City of New York, or on any recorded subdivision plot or deed. A Zoning Lot may by subdivided into two or more zoning lots provided all the resulting zoning lots and all the buildings thereon shall comply with the applicable provisions of the zoning lot resolution.

THIS CERTIFICATE IS MADE FOR AND ACCEPTED BY THE APPLICANT UPON THE EXPRESS UNDERSTANDING THAT LIABILITY HEREUNDER IS LIMITED TO ONE THOUSAND ($1,000.00) DOLLARS.

Dated: June 5, 2008

FIRST AMERICAN TITLE INSURANCE COMPANY OF NEW YORK

BY: _____

MATTHEW CAHILL
VICE PRESIDENT AND COUNSEL

State of New York, County of New York ss.:

On the 16th day of JUNE in the year 2008 before me, the undersigned, personally appeared Matthew Cahill, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name(s) is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

_____

Signature and Office of individual taking acknowledgment

CHARLES H. DAVIS
Notary Public, State of New York
No. 01DA6126386
Qualified in New York County
Commission Expires May 2, 2009

First American Title Insurance Company of New York

Title No.: 3008-234603

SCHEDULE A

The subject tract of land with respect to which the foregoing parties are the parties in interest as aforesaid, is known as Tax Lot Number(s) **21, 38, 12, 15, 17 and 18** in Block(s) **28** as shown on the Tax Map of the City of New York, Queens County and more particularly described as follows:

AS TO LOTS 21 AND 38:

ALL THAT CERTAIN PLOT, PIECE OR PARCEL OF LAND, SITUATE, LYING AND BEING IN THE BOROUGH AND COUNTY OF QUEENS, CITY AND STATE OF NEW YORK, BOUNDED AND DESCRIBED AS FOLLOWS:-

BEGINNING AT THE CORNER BY THE INTERSECTION OF THE SOUTHERLY SIDE OF 46TH ROAD (W. NINTH STREET), 60 FEET WIDE, AND THE EASTERLY SIDE OF 5TH STREET (WEST AVENUE, 60 FEET WIDE);

RUNNING THENCE SOUTHERLY ALONG THE EASTERLY SIDE OF 5TH STREET 200 FEET 0 INCHES TO THE CORNER FORMED BY THE INTERSECTION OF THE EASTERLY SIDE OF 5TH STREET AND THE NORTHERLY SIDE OF 47TH AVENUE (W. EIGHT STREET), 60 FEET WIDE;

THENCE EASTERLY ALONG THE NORTHERLY SIDE OF 47TH AVENUE; 100 FEET 0 INCHES;

THENCE NORTHERLY AT RIGHT ANGLES TO THE NORTHERLY SIDE OF 47TH AVENUE, 100 FEET 0 INCHES;

THENCE EASTERLY AT RIGHT ANGLES TO THE LAST MENTIONED COURSE 264 FEET 11-1/8 INCHES TO A POINT;

THENCE NORTHERLY AT RIGHT ANGLES TO THE LAST MENTIONED COURSE, 100 FEET TO THE SOUTHERLY SIDE OF 46TH ROAD;

THENCE WESTERLY ALONG THE SOUTHERLY SIDE OF 46TH ROAD, 364 FEET 11-1/8 INCHES TO THE CORNER FIRST ABOVE MENTIONED TO THE POINT OR PLACE OF BEGINNING.

AS TO LOT 12:

ALL THAT CERTAIN PLOT, PIECE OR PARCEL OF LAND, SITUATE, LYING AND BEING IN THE BOROUGH AND COUNTY OF QUEENS, CITY AND STATE OF NEW YORK, BOUNDED AND DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT ON THE NORTHERLY SIDE OF 47TH AVENUE (F/K/A EIGHTH STREET), DISTANT 297.30 FEET WESTERLY FROM THE CORNER FORMED BY THE INTERSECTION OF THE NORTHERLY SIDE OF 47TH AVENUE (F/K/A EIGHTH STREET) AND THE WESTERLY SIDE OF VERNON BOULEVARD (F/K/A VERNON AVENUE);

RUNNING THENCE NORTHERLY PARALLEL WITH VERNON BOULEVARD, 100 FEET;

THENCE WESTERLY PARALLEL WITH 47TH AVENUE 40.76 FEET;

THENCE SOUTHERLY AND AGAIN PARALLEL WITH VERNON BOULEVARD 100 FEET TO THE NORTHERLY SIDE OF 47TH AVENUE; AND

THENCE EASTERLY ALONG THE NORTHERLY SIDE OF 47TH AVENUE 40.76 FEET TO THE POINT OR PLACE OF BEGINNING.

AS TO LOT 15:

ALL THAT CERTAIN PLOT, PIECE OR PARCEL OF LAND, SITUATE, LYING AND BEING AT LONG ISLAND CITY, IN THE BOROUGH OF AND COUNTY OF QUEENS, CITY AND STATE OF NEW YORK, COMPRISING ALL OF LOT 15 AND THE WESTERLY 12 FEET 8 1/4 INCHES OF LOT 14, IN BLOCK 17, AS SAID LOTS ARE SHOWN AND DESIGNATED ON A CERTAIN MAP ENTITLED "MAP OF THE HUNTER AND VAN ALST FARMS MADE BY PETER G. VAN ALST, DATED AUGUST 17, 1861", AND MORE PARTICULARLY BOUNDED AND DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT ON THE NORTHERLY SIDE OF 47TH AVENUE (FORMERLY) WEST EIGHTH STREET DISTANT EASTERLY 225.01 FEET FROM THE CORNER FORMED BY THE INTERSECTION OF THE NORTHERLY SIDE OF 47TH AVENUE WITH THE EASTERLY SIDE OF 5TH STREET;

RUNNING THENCE NORTHERLY AT RIGHT ANGLES TO 47TH AVENUE 99.99 FEET;

THENCE EASTERLY AND PARALLEL WITH 47TH AVENUE 37.69 FEET;

THENCE SOUTHERLY AND AGAIN AT RIGHT ANGLES TO 47TH AVENUE 99.99 FEET TO THE NORTHERLY SIDE OF 47TH AVENUE;

THENCE WESTERLY ALONG THE NORTHERLY SIDE OF 47TH AVENUE 37.69 FEET TO THE POINT OR PLACE OF BEGINNING.

AS TO LOT 17:

ALL THAT CERTAIN LOT, PIECE OR PARCEL OF LAND, SITUATE, LYING AND BEING AT LONG ISLAND CITY IN THE FIRST WARD OF THE BOROUGH OF QUEENS, CITY OF NEW YORK, COUNTY OF QUEENS AND STATE OF NEW YORK, BOUNDED AND DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT ON THE NORTHERLY SIDE OF 47TH AVENUE, FORMERLY EIGHTH STREET, DISTANT 174.98 FEET EASTERLY FROM THE CORNER FORMED BY THE INTERSECTION OF SAID NORTHERLY SIDE OF 47TH AVENUE WITH THE EASTERLY SIDE OF FIFTH STREET, FORMERLY WEST AVENUE;

RUNNING THENCE NORTHERLY PARALLEL WITH FIFTH STREET, 100 FEET;

THENCE EASTERLY PARALLEL WITH 47TH AVENUE, 50.02 FEET;

THENCE SOUTHERLY PARALLEL WITH FIFTH STREET, 100 FEET TO THE NORTHERLY SIDE OF 47TH AVENUE; AND

THENCE WESTERLY ALONG SAID SIDE OF 47TH AVENUE, 50.02 FEET TO THE POINT OR PLACE OF BEGINNING.

AS TO LOT 18:

ALL THAT CERTAIN PLOT, PIECE OR PARCEL OF LAND, SITUATE, LYING AND BEING IN THE BOROUGH AND COUNTY OF QUEENS, CITY AND STATE OF NEW YORK, BOUNDED AND DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT ON THE NORTHERLY SIDE OF 47TH AVENUE, FORMERLY 8TH STREET, DISTANT 100 FEET EASTERLY FROM THE CORNER FORMED BY THE INTERSECTION OF THE NORTHERLY SIDE OF 47TH AVENUE WITH THE EASTERLY SIDE OF 5TH STREET, FORMERLY WEST AVENUE;

First American Title Insurance Company of New York

RUNNING THENCE NORTHERLY PARALLEL WITH 5TH STREET AND PART OF THE DISTANCE THROUGH A FRAME SHED, 100 FEET;

THENCE EASTERLY PARALLEL WITH 47TH AVENUE, 74 FEET 11 7/8 INCHES;

THENCE SOUTHERLY PARALLEL WITH 5TH STREET, 100 FEET TO THE NORTHERLY SIDE OF 47TH AVENUE;

THENCE WESTERLY ALONG SAID SIDE OF 47TH AVENUE 74 FEET 11 7/8 INCHES TO THE POINT OR PLACE OF BEGINNING.

Exhibit B-1

WAIVER OF EXECUTION OF RESTRICTIVE DECLARATION AND SUBORDINATION OF MORTGAGE

WAIVER OF EXECUTION OF RESTRICTIVE DECLARATION AND SUBORDINATION OF MORTGAGE, made this 18th day of August, 2008 by BANK OF AMERICA, N.A., a federally chartered bank (the "Mortgagee"), having its principal place of business at 1185 Avenue of the Americas, New York, New York 10036.

W I T N E S S E T H :

WHEREAS, the Mortgagee is the lawful holder of that certain mortgage, dated as of January 29, 2007 (the "Mortgage") made by OCA LONG ISLAND CITY, LLC, a Delaware limited liability company (the "Mortgagor"), in favor of the Mortgagee, in the original principal amount of $13,983,649, recorded in the Office of the Register/Clerk of the City of New York, County of Queens, on February 12, 2007 at CRFN 2007000081409;

WHEREAS, the Mortgage encumbers all or a portion of the property (the "Premises") known as Block 28, Lot(s) 21 and 38 on the Tax Map of the City of New York, County of Queens, and more particularly described in **Schedule A** attached hereto and made a part hereof, and any improvements thereon (such improvements and the Premises are collectively referred to herein as the "Subject Property"), which Subject Property is the subject of a restrictive declaration dated as of July 1, 2008, (the "Declaration"), made by OCA LONG ISLAND CITY LLC, OCA LONG ISLAND CITY II, LLC and LONG ISLAND CITY III, LLC ; and

WHEREAS, Mortgagee represents that the Mortgage represents its sole interest in the Subject Property; and

WHEREAS, the Declaration, which is intended to be recorded in the Office of said Register/Clerk simultaneously with the recording hereof, shall subject the Subject Property and the sale, conveyance, transfer, assignment, lease, occupancy, mortgage and encumbrance thereof to certain restrictions, covenants, obligations, easements and agreements contained in the Declaration; and

WHEREAS, the Mortgagee agrees, at the request of the Mortgagor, to waive its right to execute the Declaration and to subordinate the Mortgage to the Declaration.

NOW, THEREFORE, the Mortgagee (i) hereby waives any rights it has to execute, and consents to the execution by the Mortgagor of, the Declaration and (ii) hereby agrees that the Mortgage, any liens, operations and effects thereof, and any extensions, renewals, modifications and consolidations of the Mortgage, shall in all respects be subject and subordinate to the terms and provisions of the Declaration.

This Waiver of Execution of Restrictive Declaration and Subordination of Mortgage shall be binding upon the Mortgagee and its heirs, legal representatives, successors and assigns.

IN WITNESS WHEREOF, the Mortgagee has duly executed this Waiver of Execution of Restrictive Declaration and Subordination of Mortgage as of the date and year first above written.

MORTGAGEE: BANK OF AMERICA, N.A.

By: _____
Name: Roy E. Alexander, Jr.
Title: VP

LAH Jan. 2000
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ACKNOWLEDGMENT

State of New York
County of NEW YORK

On the 18th day of AUGUST in the year 2008 before me, the undersigned, a notary public in and for said state, personally appeared ROY E. ALEXANDER, JR., VP., personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name(s) is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

PASCALE ANDRE
Notary Public, State of New York
No. 01AN6018911
Qualified in Nassau County
Commission Expires Jan. 25, 2011

LAH Jan. 2000
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First American Title Insurance Company of New York

Title No.: 3008-234603

SCHEDULE A

The subject tract of land with respect to which the foregoing parties are the parties in interest as aforesaid, is known as Tax Lot Number(s) **21, 38, 12, 15, 17 and 18** in Block(s) **28** as shown on the Tax Map of the City of New York, Queens County and more particularly described as follows:

AS TO LOTS 21 AND 38:

ALL THAT CERTAIN PLOT, PIECE OR PARCEL OF LAND, SITUATE, LYING AND BEING IN THE BOROUGH AND COUNTY OF QUEENS, CITY AND STATE OF NEW YORK, BOUNDED AND DESCRIBED AS FOLLOWS:-

BEGINNING AT THE CORNER BY THE INTERSECTION OF THE SOUTHERLY SIDE OF 46TH ROAD (W. NINTH STREET), 60 FEET WIDE, AND THE EASTERLY SIDE OF 5TH STREET (WEST AVENUE, 60 FEET WIDE);

RUNNING THENCE SOUTHERLY ALONG THE EASTERLY SIDE OF 5TH STREET 200 FEET 0 INCHES TO THE CORNER FORMED BY THE INTERSECTION OF THE EASTERLY SIDE OF 5TH STREET AND THE NORTHERLY SIDE OF 47TH AVENUE (W. EIGHT STREET), 60 FEET WIDE;

THENCE EASTERLY ALONG THE NORTHERLY SIDE OF 47TH AVENUE; 100 FEET 0 INCHES;

THENCE NORTHERLY AT RIGHT ANGLES TO THE NORTHERLY SIDE OF 47TH AVENUE, 100 FEET 0 INCHES;

THENCE EASTERLY AT RIGHT ANGLES TO THE LAST MENTIONED COURSE 264 FEET 11-1/8 INCHES TO A POINT;

THENCE NORTHERLY AT RIGHT ANGLES TO THE LAST MENTIONED COURSE, 100 FEET TO THE SOUTHERLY SIDE OF 46TH ROAD;

THENCE WESTERLY ALONG THE SOUTHERLY SIDE OF 46TH ROAD, 364 FEET 11-1/8 INCHES TO THE CORNER FIRST ABOVE MENTIONED TO THE POINT OR PLACE OF BEGINNING.

AS TO LOT 12:

ALL THAT CERTAIN PLOT, PIECE OR PARCEL OF LAND, SITUATE, LYING AND BEING IN THE BOROUGH AND COUNTY OF QUEENS, CITY AND STATE OF NEW YORK, BOUNDED AND DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT ON THE NORTHERLY SIDE OF 47TH AVENUE (F/K/A EIGHTH STREET), DISTANT 297.30 FEET WESTERLY FROM THE CORNER FORMED BY THE INTERSECTION OF THE NORTHERLY SIDE OF 47TH AVENUE (F/K/A EIGHTH STREET) AND THE WESTERLY SIDE OF VERNON BOULEVARD (F/K/A VERNON AVENUE);

RUNNING THENCE NORTHERLY PARALLEL WITH VERNON BOULEVARD, 100 FEET;

THENCE WESTERLY PARALLEL WITH 47TH AVENUE 40.76 FEET;

THENCE SOUTHERLY AND AGAIN PARALLEL WITH VERNON BOULEVARD 100 FEET TO THE NORTHERLY SIDE OF 47TH AVENUE; AND

First American Title Insurance Company of New York

RUNNING THENCE NORTHERLY PARALLEL WITH 5TH STREET AND PART OF THE DISTANCE THROUGH A FRAME SHED, 100 FEET;

THENCE EASTERLY PARALLEL WITH 47TH AVENUE, 74 FEET 11 7/8 INCHES;

THENCE SOUTHERLY PARALLEL WITH 5TH STREET, 100 FEET TO THE NORTHERLY SIDE OF 47TH AVENUE;

THENCE WESTERLY ALONG SAID SIDE OF 47TH AVENUE 74 FEET 11 7/8 INCHES TO THE POINT OR PLACE OF BEGINNING.

THENCE EASTERLY ALONG THE NORTHERLY SIDE OF 47TH AVENUE 40.76 FEET TO THE POINT OR PLACE OF BEGINNING.

AS TO LOT 15:

ALL THAT CERTAIN PLOT, PIECE OR PARCEL OF LAND, SITUATE, LYING AND BEING AT LONG ISLAND CITY, IN THE BOROUGH OF AND COUNTY OF QUEENS, CITY AND STATE OF NEW YORK, COMPRISING ALL OF LOT 15 AND THE WESTERLY 12 FEET 8 1/4 INCHES OF LOT 14, IN BLOCK 17, AS SAID LOTS ARE SHOWN AND DESIGNATED ON A CERTAIN MAP ENTITLED "MAP OF THE HUNTER AND VAN ALST FARMS MADE BY PETER G. VAN ALST, DATED AUGUST 17, 1861", AND MORE PARTICULARLY BOUNDED AND DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT ON THE NORTHERLY SIDE OF 47TH AVENUE (FORMERLY) WEST EIGHTH STREET DISTANT EASTERLY 225.01 FEET FROM THE CORNER FORMED BY THE INTERSECTION OF THE NORTHERLY SIDE OF 47TH AVENUE WITH THE EASTERLY SIDE OF 5TH STREET;

RUNNING THENCE NORTHERLY AT RIGHT ANGLES TO 47TH AVENUE 99.99 FEET;

THENCE EASTERLY AND PARALLEL WITH 47TH AVENUE 37.69 FEET;

THENCE SOUTHERLY AND AGAIN AT RIGHT ANGLES TO 47TH AVENUE 99.99 FEET TO THE NORTHERLY SIDE OF 47TH AVENUE;

THENCE WESTERLY ALONG THE NORTHERLY SIDE OF 47TH AVENUE 37.69 FEET TO THE POINT OR PLACE OF BEGINNING.

AS TO LOT 17:

ALL THAT CERTAIN LOT, PIECE OR PARCEL OF LAND, SITUATE, LYING AND BEING AT LONG ISLAND CITY IN THE FIRST WARD OF THE BOROUGH OF QUEENS, CITY OF NEW YORK, COUNTY OF QUEENS AND STATE OF NEW YORK, BOUNDED AND DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT ON THE NORTHERLY SIDE OF 47TH AVENUE, FORMERLY EIGHTH STREET, DISTANT 174.98 FEET EASTERLY FROM THE CORNER FORMED BY THE INTERSECTION OF SAID NORTHERLY SIDE OF 47TH AVENUE WITH THE EASTERLY SIDE OF FIFTH STREET, FORMERLY WEST AVENUE;

RUNNING THENCE NORTHERLY PARALLEL WITH FIFTH STREET, 100 FEET;

THENCE EASTERLY PARALLEL WITH 47TH AVENUE, 50.02 FEET;

THENCE SOUTHERLY PARALLEL WITH FIFTH STREET, 100 FEET TO THE NORTHERLY SIDE OF 47TH AVENUE; AND

THENCE WESTERLY ALONG SAID SIDE OF 47TH AVENUE, 50.02 FEET TO THE POINT OR PLACE OF BEGINNING.

AS TO LOT 18:

ALL THAT CERTAIN PLOT, PIECE OR PARCEL OF LAND, SITUATE, LYING AND BEING IN THE BOROUGH AND COUNTY OF QUEENS, CITY AND STATE OF NEW YORK, BOUNDED AND DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT ON THE NORTHERLY SIDE OF 47TH AVENUE, FORMERLY 8TH STREET, DISTANT 100 FEET EASTERLY FROM THE CORNER FORMED BY THE INTERSECTION OF THE NORTHERLY SIDE OF 47TH AVENUE WITH THE EASTERLY SIDE OF 5TH STREET, FORMERLY WEST AVENUE;

EXHIBIT C

The City of New York

DEPARTMENT OF ENVIRONMENTAL PROTECTION
59-17 Junction Boulevard
Flushing, New York 11373

Emily Lloyd
Commissioner

Tel. (718) 595-6565
Fax (718) 595-3525
elloyd@dep.nyc.gov

Angela Licata
Deputy Commissioner

Bureau of Environmental Planning & Analysis

Tel. (718) 595-4398
Fax: (718) 595-4479
alicata@dep.nyc.gov

June 5, 2008

Rory Levy
New York City Board of Standards and Appeals
40 Rector Street, 9th Floor
New York, NY 10006

Re: 5-11 47th Avenue, Long Island City
Mixed-Use Residential and CUNY Graduate Center Development
Block 28, Lots 12, 15, 17, 18, 21 & 38 (tentatively Lot 21)
08BSA028Q/ 08DEPTECH188Q

Dear Mr. Levy:

The New York City Department of Environmental Protection Bureau of Environmental Planning and Analysis (DEP) has reviewed the April 2008 Phase II Subsurface Investigation Workplan (Phase II Workplan) and the March 2007 Health and Safety Plan (HASP) prepared by Environmental Waste Management Associates (EWMA) LLC for the above referenced site. It is our understanding that the applicant is seeking variance for use and bulk waivers from the Board of Standards and Appeals (BSA) to permit construction of two mid-rise buildings with cellar in a M1-4 and M1-4/R6A zoning district. The subject site (Block 28, Lot 12, 15, 17, 18, 21 & 38) is located at 5-11 47th Avenue on a block bound by Vernon Boulevard, 48th Road, 5th Street and 47th Avenue in Queens Community District 2. Currently, the 66,838 square feet lot is occupied by a mixture of one to three- story industrial/ manufacturing buildings. Under the current development plans, the existing buildings will be demolished.

The Phase II Workplan proposes four soil borings to be completed on the subject site. Based on further discussions with EWMA, DEP understands that, six soil borings will be completed at the site and two soil samples must be collected at each of the soil borings (one at 0-2 feet below grade and the other at the interval exhibiting highest PID or bottom of proposed excavation). If groundwater is 30 feet below grade or less, four of the six soil borings will be completed as temporary monitoring wells and sampled. Soil and groundwater samples will be analyzed by a New York State Department of Health ELAP-certified laboratory for the presence of Target Compound List (TCL) Volatile Organic Contaminants (VOCs) by method 8260, Semi-VOCs by method 8270, polychlorinated biphenyls/pesticides by method 8081/8082 and Target Analyte List metals.

DEP finds the Phase II Workplan and HASP acceptable. Upon completion of the subsurface investigation activities, the consultant must submit a Phase II subsurface investigation report to DEP for review and approval. The report must include at a minimum; an executive summary, a narrative of the field activities, laboratory data and conclusions, comparison of soil and groundwater analytical results to the New York State Department of Environmental Conservation

NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
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Technical and Administrative Guidance Memorandum 4046, updated site plans depicting sample locations, boring logs, and remedial recommendations (Remedial Action Plan and Construction Health and Safety Plan). DEP will continue review of the project upon receipt of the requested information.

Please include DEP tracking number 08DEPTECH188Q on all future correspondence and submittals for this project. If you have any questions or comments, feel free to contact me at 718-595-4473.

Sincerely,

Terrell Estesen
Director, Office of City Project Review

cc: J. Wuthenow
I. Taziva
T. Estesen

238-07-BZ
CEQR #08-BSA-028Q
APPLICANT – Law Offices of Howard Goldman, for OCA Long Island City, LLC, c/o O'Connor Capital Partners, owners; OCA Long Island City, LLC, lessees.
SUBJECT – Application October 23, 2007 – Variance (§72-21) to allow a 13-story residential building (UG 2) contrary to regulations for FAR (§117-21 & §23-145), lot coverage (§117-21 & §23-145), minimum distance between windows (§117-21 & §23-711(b)) and height and setback (§117-21, §23-633 & §23-663). Student dormitory (UG 3) and faculty housing (UG 2) for CUNY Graduate Center is also proposed contrary to use regulations (§42-00). M1-4/R6A (LIC) and M1-4 districts.
PREMISES AFFECTED – 5-11 47th Avenue, easterly half of Block 28 on the east side of Fifth Street between 46th Road and 47th Avenue, 135-180' west of Vernon Boulevard, Block 28, Lots 13, 15, 17, 18, 21 and 38, Borough of Queens.
COMMUNITY BOARD #2Q
APPEARANCES –
For Applicant: Howard Goldman.
ACTION OF THE BOARD – Application granted on condition.
THE VOTE TO GRANT –
Affirmative: Chair Srinivasan, Vice-Chair Collins, Commissioner Ottley-Brown, Commissioner Hinkson and Commissioner Montanez.....5
Negative:.....0
THE RESOLUTION:

WHEREAS, the decision of the Queens Borough Commissioner, dated May 6, 2008, acting on Department of Buildings Application No. 402661945, reads, in pertinent part:

"1. Proposed College Dormitory use (UG 3), residential use (UG 2), and non-profit community facility without sleeping accommodation (UG 4) in M1-4 district are contrary to ZR § 42-00;
2. Proposed commercial and residential FAR in lot portion of M1-4/R6A (LIC) district exceeds maximum permitted and is contrary to ZR § 117-21 and ZR § 23-145;
3. Proposed building lot coverage in lot portion of M1-4/R6A exceeds maximum permitted and is contrary to ZR § 117-21 and § 23-145;
4. Proposed building setback above the maximum base height in lot portion of M1-4/R6A (LIC) district is less than the minimum 15'-0" required and is contrary to ZR § 117-21 and § 23-633.
5. Proposed building height in lot portion of M1-4/R6A (LIC) district exceeds maximum permitted 70'-0" and is contrary to ZR § 117-21 and § 23-633.
6. Rear Setback in lot portion of M1-4/R6A (LIC) district is not provided and is contrary to ZR §117-21 and § 23-663.
7. Minimum distance required between building segments for window to window, window to wall and wall to wall are not adequately provided and contrary to ZR §117-21 & 23-711 (b).
8. Proposed wide outer court in M1-4 district is contrary to ZR § 24-632"; and

WHEREAS, this is an application under ZR § 72-21, to permit, on a site partially within an M1-4 district and partially within an M1-4/R6A district within the Special Long Island City Mixed-Use District, the proposed construction of a twelve-story mixed-use residential / commercial retail building and a six-story student dormitory and faculty housing building, connected by a cellar-level accessory parking garage, that does not comply with zoning parameters for use, FAR, lot coverage, building height, minimum distance between building segments, court, front setback, and rear yard setback contrary to ZR §§ 42-00, 117-21, 23-145, 24-632, 23-633, 23-663 and 23-711; and

WHEREAS, this application is brought on behalf of OCA Long Island City, LLC, which proposes to develop a market-rate residential building with ground floor commercial uses and a City University of New York ("CUNY") Graduate Center student and faculty residence on the subject site, and

WHEREAS, a public hearing was held on this application on April 8, 2008, after due notice by publication in the *City Record*, with continued hearings on May 20, 2008, July 1, 2008 and August 19, 2008, and then to decision on September 23, 2008; and

WHEREAS, the premises and surrounding area had site and neighborhood examinations by Chair Srinivasan, Vice-Chair Collins, Commissioner Hinkson, Commissioner Montanez, and Commissioner Ottley-Brown; and

WHEREAS, Community Board 2 (Queens) recommends approval of this application subject to the following conditions, that: (1) a deed restriction limit the population of the proposed CUNY Graduate Center residence to CUNY graduate students and faculty; (2) the Queens Council on the Arts increase its outreach to Long Island City-based artists and residents; (3) the proposed garden courtyard be open to the public; (4) 20 percent of the residential dwelling units be set aside for affordable housing; (5) brownfield tax credits be directed to a local library or other community use, and (6) CUNY establish a mentoring relationship with a local school; [1] and

WHEREAS, the Queens Borough President

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1 The Board notes that the Community Board's conditions fall outside its jurisdiction, but that the applicant has agreed to open the court to the public.

submitted a letter in support and a representative testified at hearing in support of the subject application; and

WHEREAS, Council Member Eric Gioia submitted a letter in support of the subject application; and

WHEREAS, the Co-Chair of the Doctoral Students Council of the CUNY Graduate Center testified in support of the subject application; and

WHEREAS, a number of area residents testified in support and in opposition to the application; and

WHEREAS, additionally, a group of neighbors represented by counsel testified at hearing and made submissions into the record in opposition to the application (the "Opposition"); the arguments made by the Opposition related to the required findings for a variance, and are addressed below; and

WHEREAS, the subject site is a through-block site bounded by Fifth Street to the west, 46th Road to the north, and 47th Avenue on the south; and

WHEREAS, subject site consists of Tax Lots 12 (a/k/a Tax Lot 13), 15, 17, 18, 21, and 38, which comprise one zoning lot (the "Zoning Lot"); and

WHEREAS, the site has a total lot area of 66,838 sq. ft., with a lot area of 20,000 sq. ft. located within an M1-4/R6A (LIC) zoning district on Fifth Street and a lot area of approximately 46,838 sq. ft. located within an M1-4 district on the eastern portion of the subject site; and

WHEREAS, the subject site is developed with a mix of one-story to three-story vacant industrial buildings which are proposed to be demolished; and

WHEREAS, the applicant proposes: (i) a twelve-story mixed-use building containing residential use (U.G. 2), community facility (U.G.4), and commercial retail use (U.G. 6) (hereinafter "the mixed-use building"); and (ii) a six-story building containing living quarters for CUNY faculty (U.G. 2) and graduate students (U.G. 3); community facility use (U.G. 4) and (iii) 91 spaces of accessory parking (hereinafter "the CUNY building"); and

WHEREAS, the mixed-use building and the CUNY building are proposed to be connected at the cellar level where the accessory parking would be located; and

WHEREAS, the proposed project will have a total floor area of 349,400 sq. ft. (FAR of 5.23) over the entire zoning lot, comprising 169,185 sq. ft. of residential (U.G. 2) floor area, 172,815 sq. ft. of community facility floor area (U.G. 3 and U.G. 4) and 7,400 sq. ft. of commercial floor area (U.G. 6); and

WHEREAS, the mixed-use building is almost entirely within the M1-4/R6A portion of the Zoning Lot (on part of Lot 21); the CUNY building is entirely within the M1-4 portion of the Zoning Lot (on Lots 12, 15, 17, 18, part of Lot 21,and Lot 38), other than a small portion of the shared accessory garage; and

WHEREAS, the mixed-use building is proposed to have a total floor area of 163,920 sq. ft., a residential floor area of 151,520 sq. ft., community facility floor area of 5,000 sq. ft., and commercial retail floor area of 7,400 sq. ft.; and

WHEREAS, the mixed-use building is proposed to have 200 dwelling units, ground floor retail space, office, exhibition and program space to be occupied by the Queens Council for the Arts, a nonprofit organization, and a small portion of the below-grade parking garage floor space; and

WHEREAS, the CUNY building is proposed to contain 15,666 sq. ft. of Use Group 2 faculty housing (21 units) and 167,815 sq. ft. of Use Group 3 student dormitory suites (228 units housing 380 students) and 91 unattended accessory parking spaces located partially below grade (to be available to residents of both the mixed-use building and the CUNY building); and

WHEREAS, the proposed mixed-use building will have an FAR of 8.2 within the M1-4/R6A district (3.0 is the maximum permitted in an M1-4/R6A zoning district); a front setback of 10'-0" above the maximum base height (a 15'-0" setback is the minimum required on a narrow street in an M1-4/R6A zoning district); a total height of 129'-8" (70'-0" is the maximum permitted in an M1-4/R6A zone); a rear setback of 15'-0" is provided at 109'-0" in height (10'-0" is required in an M1-4/R6A zone above the maximum base height of 60 ft.), a minimum distance between windows of 50'-0" and between windows and a wall of 35'-0" (a minimum window-to window distance of 60'-0" and a minimum window-to-wall distance of 40'-0" are required); and a corner lot coverage of 84.5 percent (80 percent is the maximum permitted lot coverage); and

WHEREAS, the CUNY building will have the following parameters: an outer court on Lot 18 measuring 50'-0" in width and 80'-0" in depth (a width of 80'-0" would be required in an M1-4 zoning district); and

WHEREAS, graduate student housing and faculty housing are not permitted uses in the M1-4 district; and

WHEREAS, thus the subject application was filed to permit the proposed residential and community facility uses; and

WHEREAS, the applicant initially proposed a mixed-use building with thirteen-stories and a total floor area of 171,474 sq. ft., a residential floor area of 158,574 sq. ft., a community facility floor area of 4,500 sq. ft. and a commercial floor area of 7,500 sq. ft., and

WHEREAS, the original application has been slightly modified with respect to the number of CUNY faculty units and graduate student units and community facility floor area; and

WHEREAS, the applicant also modified the proposal to eliminate 7,054 sq. ft of residential floor area, and reduced the height of the building from 140'-0" to

129'-8", thereby reducing the variances requested for FAR and maximum building height; and

ZR § 72-21 (a) – Unique Physical Conditions Finding

WHEREAS, under § 72-21 (a) of the Zoning Resolution, the Board must find that there are unique physical conditions inherent to the Zoning Lot which create practical difficulties or unnecessary hardship in strictly complying with the zoning requirements (the "(a) finding"); and

WHEREAS, the applicant states that the site's unique degree of contamination creates an unnecessary hardship in complying with the zoning requirements for commercial and residential FAR, lot coverage, height, front and rear setback, and minimum distance between buildings; and

WHEREAS, the applicant states that the site has a long industrial history and site assessment activities have confirmed the presence of heavy metals, petroleum, chlorinated solvents and hazardous wastes in soils and groundwater; and

WHEREAS, the applicant represents that extensive soil sampling of site has identified the presence of arsenic, mercury, cadmium, chromium, selenium, acetone and cyanide and that benzene, toluene and ethylbenzene have been detected in groundwater at upgradient and downgradient locations at concentrations significantly above New York State Class GA groundwater standards; and

WHEREAS, the applicant further represents that soil testing has also revealed the presence of naphthalene at concentrations as high as 160 mg. per kg. and chlorinated solvents at concentrations exceeding Class GA groundwater standards; and

WHEREAS, at hearing, the applicant stated that PCBs (polychlorinated biphenyls) have also been identified on the site, probably resulting from the dumping of electrical transformers; and

WHEREAS, a submission by the applicant states that the parcels were developed prior to 1898 for use by an ink factory and a varnish works; previous site occupants also included a dry cleaning and spotting facility, a metal caster and dyer; and

WHEREAS, the applicant represents that these identified occupants were likely to have used industrial solvents, lubricating and cutting oils, plating bath solutions, paint, painting products and dye products as part of their operations; and

WHEREAS, the applicant further represents that Tax Lot 21 and Tax Lot 38 are subject to a federal Environmental Protection Agency (EPA) Administrative Order requiring hazardous material remediation, including encapsulation of contaminated soil containing lead, arsenic and selenium, and mandates that all renovations meet certain standards to ensure that the integrity of the encapsulation is maintained; and

WHEREAS, the applicant states that the requirements of the Administrative Order are incorporated into a deed restriction which is the only such deed restriction identified in Long Island City; and

WHEREAS, the applicant states that, in order to remove the deed restriction, the EPA requires that Lots 21 and 38 be placed in the New York State Brownfield Cleanup Program administered by the New York State Department of Environmental Conservation ("DEC") to assist in the cleanup of heavily contaminated sites; and

WHEREAS, the applicant represents that a Brownfield Cleanup application for Lots 21 and 38 was filed in 2006 and that DEC has accepted the applicant's remedial investigation work plan ("RIWP") defining the nature and extent of the site contamination, the contaminant source areas, and an assessment of the contaminant disposal and transport; and

WHEREAS, based on the RIWP, the applicant began the remedial investigation process which has been substantially completed; and

WHEREAS, the applicant states that, based on the findings of its investigation, a remedial work plan (RWP) will be developed and implemented that will be designed to achieve a "Track 1 – Unrestricted Use" standard for the cleanup of the property, allowing for residential use without any land use restrictions; and

WHEREAS, upon completion of remediation, and its verification and approval by DEC, DEC will issue a certificate of completion ("COC") certifying that the site may be safely developed and permitting removal of the deed restriction; and

WHEREAS, the applicant represents that the issuance of a COC does not however guarantee approval of BCP tax credits; and

WHEREAS, according to a remediation plan submitted by the applicant, a Track 1 cleanup the subject site would require excavation to a depth of approximately 15 feet and the removal of approximately 10,000 cubic yards of soil; approximately 75 percent (7,500 cubic yards) requires disposal as petroleum-impacted soil and 25 percent (2,500 cubic yards) requires disposal as hazardous waste, as well as another 1,000 cubic yards of building rubble which encapsulates hazardous waste which requires removal as hazardous waste; and

WHEREAS, the applicant states that the remediation plan also includes the installation of a vapor barrier below grade to prevent the migration of soil vapor onto the site and into the proposed buildings, and the installation of steel sheeting in conjunction with a dewatering system around the perimeter of the site; and

WHEREAS, the applicant further states that the excavation of the site is additionally complicated by the DEC requirement that the applicant characterize the entire subsurface of the property and re-characterize the soils prior to disposal, by the need to avoid breaching a clay layer 15 feet below grade which protects the aquifer from being contaminated, as well as by the necessary

development of an on-site dewatering facility; and

WHEREAS, the applicant represents that the need to protect the surrounding community from the release of hazardous materials during excavation, and the difficulty in disposing of PCBs also complicates the site's remediation and adds to its expense; and

WHEREAS, the applicant states that excavation to a depth of 15 feet is required on the Brownfield portion of the site to meet DEC's cleanup requirements and that excavation of the entire site including the non-Brownfield portion (Tax Lots 12, 15, 17 and 18) is necessary to protect the health of residents and the surrounding community; and

WHEREAS, the applicant represents that enclosing the entire site within steel sheeting prevents the off-site migration of contaminants, which is of particular concern due to the potential effect of recently installed sheeting along the East River to Anable Basin, and the proposed sheeting along the eastern boundary of the BCP site, which might otherwise combine to shift the flow of groundwater toward the southeast, thereby discharging contaminants to the untreated non-BCP portion of the site; and

WHEREAS, the applicant states that cleanup of the entire site is also necessary because procuring financing for redevelopment projects in the current financial climate is becoming more difficult and a lender may be reluctant to finance a project with a separate and inconsistent cleanup on the site, particularly if residual material is allowed to remain on a non-Brownfield area, and

WHEREAS, the Opposition argues that the applicant has failed to prove that the degree of environmental contamination on Lots 21 and 38 is unique in Long Island City, where contaminated conditions are "a common occurrence" given the long history of industrial use in the area; and

WHEREAS, the Opposition states that an EPA map of zip code area 11101 indicates contamination of 545 sites within Long Island City and Astoria, and that the prevalence of these conditions defies a finding of uniqueness; and

WHEREAS, the Board notes that the Opposition has proffered no evidence, to show that other sites within the surrounding area exhibit a similar degree of contamination, or that their cleanup would have to meet similar standards of remediation; and

WHEREAS, the Opposition also argues that the proposed Track 1 level cleanup, estimated to cost approximately $10.2 million, is unnecessary and that a "Track 2" level Brownfield cleanup, which allows contamination to remain on the site, could be applied instead at far less expense; and

WHEREAS, the applicant states that it cannot remediate the site less expensively because the decision as to the appropriate level of site remediation is determined by DEC, and the agency is increasingly requiring cleanups to meet Track 1 objectives unless doing so is physically or economically infeasible; and

WHEREAS, the applicant further states that the requirements for the cleanup proposed by the Opposition can be just as expensive to meet as the proposed cleanup and would result in recorded environmental easement and land use restrictions, including post-remediation soil management, monitoring and reporting requirements, that are not required for Track 1 cleanups; and

WHEREAS, the applicant represents that these sustained land use restrictions could therefore give the appearance of a continuing environmental problem which would not be viable for lenders or for CUNY; and

WHEREAS, the Board agrees that the site cleanup proposed by the applicant is necessary and rational; and

WHEREAS, the Opposition additionally argues that costly excavation and remediation would not be necessary if the applicant had chosen instead to develop the site with a slab-on-grade foundation, as was the case with several other projects recently developed as-of-right on contaminated sites in the surrounding area; and

WHEREAS, the applicant states that new developments in the surrounding area cited by the Opposition were able to be developed with a slab on grade foundation because the extraordinary conditions requiring removal of subsurface soils or groundwater treatment were absent, and their excavation and full-site remediation were not necessitated by an EPA deed restriction, as is the case with the subject site; and

WHEREAS, because the cited projects were not burdened by similar remediation costs, variances to height and bulk were not needed to ensure their financial feasibility; and

WHEREAS, the Opposition also contends that the applicant has not provided sufficient information about the contamination of Lots 12, 15, 17 and 18 and the soil in the surrounding neighborhood to establish that the property is singularly burdened by its environmental conditions; and

WHEREAS, the Board notes that Lots 12, 15, 17 and 18 are among those lots proposed to be occupied by CUNY, a nonprofit educational institution, and a showing of physical hardship or practical difficulty is not necessary; and

WHEREAS, the CUNY Graduate Center proposes to provide 228 graduate student units and 21 faculty housing units within the CUNY building, which it will own and operate; and

WHEREAS, the applicant represents that the waivers to use and court are sought to enable the CUNY Graduate Center to meet its programmatic needs; and

WHEREAS, the Board notes at the outset that the CUNY Graduate Center, as a non-profit educational institution, may use its programmatic needs as a basis for the requested waivers; and

WHEREAS, under well-established precedents of the courts and this Board, applications for variances that are needed in order meet the programmatic needs of educational institutions, are entitled to significant deference by zoning boards (see, e.g., Cornell University v. Bagnardi, 68 N.Y.2d 583 (1986); and

WHEREAS, the applicant represents that providing housing to its graduate students and faculty is a significant programmatic need of CUNY and that, unlike New York's private universities, CUNY has no graduate student or faculty housing; and

WHEREAS, at hearing, the President of the CUNY Graduate Center testified that graduate students enrolled in the CUNY Graduate Center serve as part-time instructors throughout the CUNY system under academic fellowships with stipends of $18,000 per year; and

WHEREAS, the applicant submitted a study of the student housing market in New York City which found that the rents of private housing units were 21 percent to 54 percent higher than the rents at university-sponsored facilities; and

WHEREAS, the study noted that 709 of the 3,393 full-time students then enrolled in the CUNY Graduate Center came from outside New York City and would therefore be likely to need university-sponsored housing; and

WHEREAS, at hearing, the Executive Officer of the CUNY Graduate Program for Speech and Language testified that the lack of CUNY-sponsored housing had hampered her ability to recruit high-achieving students to her program; and

WHEREAS, the Co-Chair of the Doctoral Students Council of the CUNY Graduate Center testified at hearing as to the hardship imposed by rental costs on the 4,300 students now enrolled; and

WHEREAS, the applicant states that the project site was selected by CUNY for its dormitory and faculty housing because of its accessibility to the Graduate Center which is located only one subway stop away from the project site; and

WHEREAS, the Board finds that the applicant has established the programmatic need of the CUNY Graduate Center for the development of the CUNY building and has demonstrated that the extreme contamination and costly remediation of the portion of the site within the M1-4/R6A district presents an unnecessary hardship and practical difficulty to its development in compliance with the applicable zoning regulation; and

ZR § 72-21 (b) – Financial Return Finding

WHEREAS, under ZR § 72-21 (b), the Board must establish that the physical conditions of the site preclude any reasonable possibility that its development in strict conformity with the zoning requirements will yield a reasonable return, and that the grant of a variance is therefore necessary to realize a reasonable return (the "(b) finding"), unless the applicant is a nonprofit organization, in which case the (b) finding is not required for the granting of a variance; and

WHEREAS, since the CUNY Graduate Center is a non-profit institution and the waivers to permit dormitory and faculty units are associated with its community facility use and are sought to further its non-profit mission, the finding set forth at ZR § 72-21(b) does not have to be made in order to grant the requested variance, and therefore the financial analysis is adjusted accordingly; and

WHEREAS, an analysis which evaluated the financial feasibility of a conforming development of the entire site was provided by the applicant; and

WHEREAS, the applicant states that the overall environmental cleanup cost for the project site is estimated at $10.2 million, and that the requested variances are necessary in order to achieve a reasonable economic return from its development; and

WHEREAS, the applicant initially submitted a financial analysis examining the feasibility of: (i) a development scenario that includes a conforming residential use on the M1-4/R6A portion of the site and a conforming industrial development on the portion of the site within the M1-4 zoning district; (ii) a lesser alternative with an as-of-right mixed-use development on the M1-4/R6A portion of the site and the proposed CUNY development within the M1-4 portion; (iii) a lesser alternative with the proposed residential square footage, an increased retail component and a smaller CUNY building; as well as (iv) the original proposed project; the analysis demonstrated that only the proposed project achieved a reasonable rate of return; and

WHEREAS, at hearing, the Board raised concerns as to whether the market rate portion of the development was subsidizing the CUNY facility, and whether this subsidy was the cause for the requested variance; and

WHEREAS, a submission by the applicant explained that CUNY is paying fair market value for its portion of the subject site and is assuming the cost of construction and operation of its facility; and

WHEREAS, the applicant stated that a letter of intent between the developer and CUNY initially set the total of land value and cleanup costs for the CUNY development at approximately $20 million, apportioned between the fair market value of CUNY's share of the site (approximately $13.9 million) and the remediation costs of CUNY's share of the site ($6.7 million); and

WHEREAS, during the course of the hearing, the applicant subsequently lowered the CUNY land value to $18.8 million to reflect the reduction of building net floor area by 1,550 sq. ft., and the reduced value attributable to dwelling units being developed below-grade; and

WHEREAS, at hearing the Board asked the applicant to examine lesser variance alternatives which request less additional floor area for the mixed-use building, and to explain the basis for the projected construction financing rate used in the financial analysis; and

WHEREAS, in response to the Board's request, the applicant examined three alternatives; (i) a fifty percent reduction in the 13th floor; (ii) a 12-story mixed-use building; and (iii) an 11-story mixed-use building and lowered the construction financing rate to conform to recent interest rate reductions; and

WHEREAS, the revised financial analysis showed that none of these three scenarios yielded a reasonable rate of return, while the proposed project provided a marginally positive rate of return; and

WHEREAS, the Opposition contends that the cost of remediation could be offset by the available Brownfield Cleanup tax credits, and that the financial analysis is undermined by its failure to account for the potential offset; and

WHEREAS, the applicant represents that the receipt of Brownfield Cleanup tax credits granted by the New York State Department of Taxation and Finance is speculative, and

WHEREAS, the applicant states that, under the regulations in effect at the time of its application, the value of the tax credit could range from 12 percent to 14 percent of (i) the costs of investigation, remediation, demolition, excavation, grading and temporary fencing, and (ii) tangible property costs associated with the development of the site, including buildings and structural components and that tax credits received under the Brownfield program would be subject to federal income taxes at an effective rate of 50 percent, thereby reducing the projected the after-tax value of the maximum Brownfield credit available to subsidize the remediation of the project site to $3 million; and

WHEREAS, at hearing, the Board raised a concern that the omission of the potential Brownfield tax credits from the financial analysis could inflate the requested variance; and

WHEREAS, in response, the applicant revised the financial analysis to reflect the reduction in floor area and the effect of the Brownfield tax credit; the revised analysis examines the mixed-use project's rate of return with and without the tax credits, as well as the effect of the tax credits on an as-of-right development scenario; and

WHEREAS, the financial analysis demonstrates that, even with the Brownfield tax credit, an as-of-right project could not achieve a reasonable financial return while the project at the reduced height but with the tax credit achieved a modest financial return; and

WHEREAS, the applicant has modified the proposed project to reflect the projected receipt of approximately $3 million in after-tax Brownfield tax credits by reducing the height of the mixed-use building by one floor, with a consequential overall reduction in residential floor area of 7,054 sq. ft., which the applicant represents is roughly equivalent to the projected value of the potential tax credits; and

WHEREAS, the Opposition asserts that the financial analysis is flawed because it failed to consider alternative conforming scenarios, such as a commercial/ retail use of the 95,880 sq. ft. of floor area within the M1-4 portion of the site; and

WHEREAS, the Opposition further argues that the proposed excavation and remediation would be unnecessary if the site were instead developed with conforming commercial/ retail uses; and

WHEREAS, a response by the applicant indicates that the scenario proposed by the Opposition would be infeasible because: (i) it would require two levels but could not provide loading, parking or servicing on site; (ii) the proposed $40 per sq. foot rent could not be generated for space on a second level; (iii) there is no proven market in that location for the proposed volume of retail space; (iv) the construction costs and operating costs of a retail project far exceed that of an industrial development, particularly because typical retail leases require owners to provide heat and to pay the base year taxes; and

WHEREAS, the applicant submitted a pro forma of a single level retail project containing 54,000 sq. ft. of floor area over the project site at the same rents proposed by the Opposition, which demonstrated that using the higher levels of construction finishes, plumbing and demising walls required by such a project would render it financially infeasible; and

WHEREAS, the applicant also notes that the infeasibility of a conforming development can be inferred from the site's vacancy over a period of many years; and

WHEREAS, the Opposition also argues that the financial feasibility analysis is flawed because the applicant has not performed sufficient testing to establish the contamination of the site and to support the estimated cost of its cleanup; and

WHEREAS, the applicant represents that sufficient testing has been performed to establish the $10.2 million estimate and, further, that any additional findings will only serve to increase the cost of remediation; and

WHEREAS, the Opposition also asked the applicant to explore certain design changes to the mixed-use building, specifically, the adoption of loft-style apartment layouts and multiple setbacks that it contends would create increase the square footage of penthouse units and enhance the unit values, consequently allowing a reduction in the building's height and bulk; and

WHEREAS, a submission by the applicant

explains that the unit design for the mixed- use project was based on assessment of the current real estate market, and that the proposed design had been found to offer a higher financial return than a design with larger unit sizes and higher floor to floor heights; and

WHEREAS, the applicant further stated that the setbacks proposed by the Opposition had been incorporated into the project design and that the financial analysis before the Board reflected the increased resulting value; and

WHEREAS, the Board notes that the Opposition has presented no evidence supporting its contention that its alternate design would generate a higher return than the design proposed by the Applicant; and

WHEREAS, based upon its review of the applicant's financial analysis, the Board has determined that because of the subject site's unique physical conditions, there is no reasonable possibility that development in strict compliance with applicable zoning requirements will provide a reasonable return; and

ZR § 72-21 (c) – Neighborhood Character Finding

WHEREAS, the applicant represents that the waivers of FAR, lot coverage, building height, minimum distance between building segments, front setback, and rear yard setback sought to permit the mixed-use building, and the waiver for use sought for the CUNY building, will not alter the essential neighborhood character, impair the use or development of adjacent property, or be detrimental to the public welfare; and

WHEREAS, the applicant proposes an overall development of the subject site with an FAR of 5.2 (347,400 sq. ft.), with an FAR of 8.2 proposed for the westerly portion of the site within the M1-4/ R6A district, and an FAR of 3.92 proposed for the easterly portion of the site within the M1-4 district; and

WHEREAS, the applicant represents that the proposed floor area is within the overall envelope for the site, which would permit an overall FAR of 5.45 (364,447 sq. ft.), based on the maximum FAR of 3.0 within the M1-4/R6A portion and the maximum FAR of 6.5 permitted for community facility uses within the M1-4 portion; and

WHEREAS, the Board notes that the proposed overall FAR of 5.2 is within the FAR contemplated by the zoning of the subject site; and

WHEREAS, the applicant further represents that the heights and massing of the proposed project are compatible with the scale of the development in the surrounding area, stating that the project massing places the bulk of the floor area on Fifth Street opposite a new park and open area and proximate to the high density buildings of the Queens West Development located to the west of the project site; and

WHEREAS, the applicant states that the Queens West development includes building heights of 44 stories, 39 stories and 32 stories and that later phases of the project include seven residential towers ranging from 200 to 400 feet in height; and

WHEREAS, the applicant states that additional projects at the Silvercup site and Anable Basin, three blocks to the southwest and northwest of the project site, respectively, are proposed at heights ranging from 31 to 48 stories; and

WHEREAS, the applicant further states that the proposed 12-story mixed-use building at approximately 130'-0" complies with relevant light and air requirements and is considerably shorter than the 20 to 50-story buildings which have approved to the south, west and north of the subject site; and

WHEREAS, the applicant notes that the westerly portion of the subject site comprising 20,000 sq. ft., is located within the Hunters Point Subdistrict rezoning area and was rezoned to permit mixed-use developments like the proposed project, and that the blocks to the south of the project site extending to Borden Avenue are mixed-use in character and were rezoned to permit residential and community facility use consistent with the proposed CUNY building; and

WHEREAS, the applicant states that the CUNY building complies with all the applicable height and setback regulations of the M1-4 zoning district and its six-story height conforms to the predominant midblock character of the surrounding area; and

WHEREAS, the Opposition asserts that the project is inconsistent with the intent of the Hunters Point rezoning to preserve the character and scale of the "uplands" Long Island City neighborhood and to differentiate that part of the community from the high-rise residential towers of the Queens West Waterfront Project; and

WHEREAS, the Opposition submitted a series of computer-generated streetscapes demonstrating that the proposed development would be significantly out of scale with the surrounding community; and

WHEREAS, at hearing the applicant demonstrated with "before" and "after" montages that the images submitted by the Opposition had exaggerated the height of the proposed development by eliminating all tall existing buildings surrounding it and by distorting the perspectives; and

WHEREAS, the applicant submitted a map showing recent and proposed developments indicating that both the mixed-use building and the CUNY building are considerably shorter than other recent uplands developments proposed within two blocks to the north south and east; and

WHEREAS, the applicant further states and that the east-west view corridor will be maintained and extended, that setbacks are provided on all street frontages above the fifth floor and that each of the faculty units in the CUNY project will set back by five

feet; and

WHEREAS, the applicant further states that the project has been designed to facilitate its integration within the surrounding community; and

WHEREAS, the applicant represents that a publicly accessible-interior garden of approximately 5,000 sq. ft. will be provided, as well as street trees surrounding the three frontages, and that the four project components have been architecturally coordinated to provide active street frontages; and

WHEREAS, the applicant states that represents that accessory parking is provided below-grade within the building to preserve active street frontages, and that the parking facility has been designed to permit ingress and egress from entrances along 46th Road to minimize traffic congestion along 5th Street and Vernon Boulevard; and

WHEREAS, the applicant further states that providing accessory parking reduces the demand for on-street parking spaces; and

WHEREAS, a shadow analysis of the proposed project indicates that incremental shadows would be cast by the mixed-use building on a new open space under construction to its west during morning hours beginning an hour and a half after sunrise; however, the surface will consist of artificial turf with a surrounding running track and will therefore not be light sensitive; and

WHEREAS, based upon the above, the Board finds that the subject variances, if granted will not alter the essential character of the surrounding neighborhood, impair the appropriate use and development of adjacent property or be detrimental to the public welfare; and

ZR § 72-21 (d) - Self Created Hardship Finding

WHEREAS, as pertains to the (d) finding under ZR § 72-21, the Board is required to find that the practical difficulties or unnecessary hardship burdening the site have not been created by the owner or by a predecessor in title; and

WHEREAS, the applicant states and the Board agrees, that the practical difficulties and unnecessary hardship associated with the environmental remediation of the project site have not been created by the applicant or a predecessor in title; and

ZR § 72-21 (e) – Minimum Variance Finding

WHEREAS, as pertains to the (e) finding under ZR § 72-21, the Board is required to find that the variance sought is the minimum necessary to afford relief; and

WHEREAS, the applicant states that the requested the waivers of FAR, lot coverage, building height, front setback, and rear yard setback represent the minimum variance necessary to allow the mixed-use building to achieve a reasonable financial return, given its extensive environmental remediation costs, and to meet CUNY's programmatic needs; and

WHEREAS, the applicant originally proposed a project with a total floor area of 356,454 sq. ft., and a 13-story mixed-use building; the applicant modified the proposal to reduce the height of the mixed-use building by one floor to 12 stories and to reduce the total floor area of the project to 349,400 sq. ft., thereby offsetting the value of the potential receipt of the Brownfield tax credits; and

WHEREAS, the Board notes that the applicant also evaluated the economic feasibility of two lesser variance alternatives, which demonstrated that only the proposed project achieved a reasonable rate of return; and

WHEREAS, the Opposition has argued that a grant of use and bulk variances is unusual and excessive; and

WHEREAS, the Board finds that there is practical difficulty due to the unique conditions of the site which requires additional floor area to offset the remediation costs and other bulk waivers to accommodate the added bulk in a manner most compatible with the scale and bulk of the property and the surrounding area; and

WHEREAS, the Opposition contends that the minimum variance is unknown because testing on the site is incomplete and the ultimate remediation costs are therefore unknown; and

WHEREAS, as discussed above, the applicant represents and the Board finds that sufficient testing has been performed to establish the $10.2 million estimate for the cost of site remediation and, further, that the financial analysis was adjusted to incorporated the potential receipt of the Brownfield tax credit; and

WHEREAS, Opposition argues that the proposed parking is unnecessary and increases the construction costs and proposes that it be removed to reduce the requested height and bulk variances; and

WHEREAS, the applicant states that because excavation of the site to a depth of 15 feet is necessary for its remediation, the development cost of the parking garage is low but that the elimination of its anticipated revenue would undermine the financial feasibility of the project, further, that providing on-site parking within the project will be an asset to the surrounding community as available on-street parking in the area is limited; and

WHEREAS, based upon its review of the record and its site visits, the Board finds that the applicant has provided sufficient evidence to support each of the findings required for the requested variances; and

WHEREAS, the project is classified as an Unlisted action pursuant to Section 617.2 of 6 NYCRR; and

WHEREAS, the Board has conducted an environmental review of the proposed action and has identified and considered relevant areas of environmental concern about the project documented in the Final Environmental Assessment Statement (EAS) CEQR No. 08BSA28Q, dated August 2008; and

WHEREAS, the EAS documents that the project

as proposed would not have significant adverse impacts on Land Use, Zoning, and Public Policy; Socioeconomic Conditions; Community Facilities and Services; Open Space; Shadows; Historic Resources; Urban Design and Visual Resources; Neighborhood Character; Natural Resources; Waterfront Revitalization Program; Infrastructure; Hazardous Materials; Solid Waste and Sanitation Services; Energy; Traffic and Parking; Transit and Pedestrians; Air Quality; Noise; and Public Health; and

WHEREAS, the New York City Department of Transportation ("DOT") reviewed the proposed project and issued a sign-off letter on August 13, 2008; and

WHEREAS, the New York City Landmarks Preservation Commission reviewed this project and confirmed that the project site does not contain any areas of historic/architectural or archaeological significance; therefore, no impacts on historic/architectural or archaeological resources are expected as a result from the proposed action; and

WHEREAS, the New York City Department of Environmental Protection ("DEP") Office of Environmental Planning and Assessment has evaluated the following submissions from the applicant: (1) an August 2008 Environmental Assessment Statement; (2) an October 2007 Phase I Environmental Site Assessment; (3) an April 2008 Phase II Subsurface Investigation Workplan; (4) a March 2007 Health and Safety Plan Report ("HASP"); (5) an August 2008 Remedial Investigation Report (Phase II sampling results); (6) a September 2008 Stationary Source Screening Analysis; and (7) a September 2008 Industrial Source Analysis; and

WHEREAS, the applicant has agreed to implement hazardous materials remediation pursuant to a Restrictive Declaration executed on September 19, 2008 and submitted for recording against the subject property on September 22, 2008; and

WHEREAS, a Remedial Action Plan ("RAP") and a Construction Health and Safety Plan Report ("CHASP")must be submitted to DEP for review and approval; and

WHEREAS, the RAP and the remedial work plan to be submitted to DEC will both include the installation of a below grade vapor barrier to prevent the migration of soil vapor onto the site; and

WHEREAS, DEP review and approval of the manufacturer's specifications and a sample of the vapor barrier material is required prior to its installation; and

WHEREAS, after approval of the RAP and CHASP, DEP will remit a Notice to Proceed to the Department of Buildings ("DOB"); and

WHEREAS, after implementation of the remediation, one or more Remedial Closure Report(s) certified by a professional engineer shall be submitted to DEP; subsequent to its approval, DEP will forward Notice(s) of Satisfaction to DOB; and

WHEREAS, DEP also evaluated air quality analysis submissions to examine the potential stationary and mobile source air quality impacts of the proposed action; and

WHEREAS, a stationary source screening analysis for the heating, ventilating, and air conditioning equipment (HVAC) performed using CEQR Technical Manual methodology determined that the proposed project is not anticipated to result in potential significant impacts on adjacent receptors; and

WHEREAS, another screening analysis determined that the emission stack of the CUNY building must be located at least 160 feet from the façade of the mixed-use building to avoid any significant air quality impacts; and

WHEREAS, an industrial source impact assessment demonstrated that the air quality of the proposed project would not be adversely affected by surrounding industrial/ manufacturing uses; and

WHEREAS, a stationary source screening analysis and mobile source screening analysis determined that the proposed project would not result in any significant noise impacts as a result of using the building mechanical systems at sensitive receptor locations; and

WHEREAS, based on the traffic study, the proposed project would not double traffic levels in passenger car equivalents; therefore the project is not expected to create significant adverse impacts from mobile source emissions; and

WHEREAS, the applicant will provide a minimum of 35 dBA window/wall attenuation to achieve an interior noise level of 45 dBA and use a dedicated HVAC system as an alternate means of ventilation in order to maintain a closed-window condition, therefore satisfying CEQR interior noise requirements and requirements of the Special Long Island City Mixed-use District; and

WHEREAS, the environmental assessment found that the mixed-use building would cast incremental shadows on a new open space under construction to its west during morning hours; however, since the park's surface will not be light-sensitive, such shadows are not considered to have a significant effect on the environment; and

WHEREAS, no other significant effects upon the environment that would require an Environmental Impact Statement are foreseeable; and

WHEREAS, the Board has determined that the proposed action will not have a significant adverse impact on the environment; and

Therefore it is Resolved that the Board of Standards and Appeals issues a Type I Negative Declaration prepared in accordance with Article 8 of the New York State Environmental Conservation Law

and 6 NYCRR Part 617, the Rules of Procedure for City Environmental Quality Review and Executive Order No. 91 of 1977, as amended, and makes each and every one of the required findings under ZR § 72-21 and grants a variance to permit, on a site partially within an M1-4 district and partially within an M1-4/R6A district within the Special Long Island City Mixed-Use District, the proposed construction of a twelve-story mixed-use residential/commercial retail building and a six-story student dormitory building and faculty housing building connected by a cellar-level accessory parking garage that does not comply with zoning parameters for use, FAR, lot coverage, building height, minimum distance between building segments, court, front setback, and rear yard setback contrary to ZR §§ 42-00, 117-21, 23-145, 24-632, 23-633, 23-633 and 23-711; *on condition* that any and all work shall substantially conform to drawings as they apply to the objections above noted, filed with this application marked "Received September 17, 2008"- (19) sheets; and *on further condition*:

THAT the proposed Zoning Lot shall have a maximum FAR of 5.23,

THAT the building on within the M1-4/R6A portion of the zoning lot shall have the following parameters: a floor area of 163,920 sq. ft.; a front setback of 10'-0" above the maximum base height; a total height of 129'-8"; a rear setback of 15'-0" at a height of 109'-0"; a minimum distance between windows of 50'-0" and between windows and a wall of 35'-0"; and a corner lot coverage of 84.5 percent; and the building within the M1-4 portion of the Zoning Lot will have a floor area of 183,480 sq. ft. and an outer court measuring 50'-0" in width and 80'-0" in depth;

THAT a RAP and CHASP shall be submitted to DEP for review and approval;

THAT the applicant shall submit its Remedial Work Plan to DEP;

THAT the emission stack of the building within the M1-4 portion of the Zoning Lot shall be located at least 160 feet from the façade of the building within the M1-4/R6A portion of the zoning lot;

THAT a minimum of 35 dBA window/wall attenuation shall be provided;

THAT issuance of building permits shall be conditioned on DEP review and approval of the specifications and sample material of its proposed vapor barrier;

THAT the issuance of building permits shall be conditioned on the receipt of a DEP Notice to Proceed;

THAT issuance of building permits shall be conditioned on the issuance of a certificate of completion by DEC;

THAT issuance of a permanent certificate of occupancy shall be conditioned on the issuance by DEP of a Notice of Satisfaction;

THAT DEP review and approval is required prior to the approval by DOB of any changes to the BSA-approved site plan or building plans;

THAT construction will be substantially completed in accordance with the requirements of ZR § 72-23; and

THAT this approval is limited to the relief granted by the Board, in response to specifically cited and filed DOB/other jurisdiction objection(s) only;

THAT the approved plans shall be considered approved only for the portions related to the specific relief granted;

THAT the Department of Buildings must ensure compliance with all other applicable provisions of the Zoning Resolution, the Administrative Code, and any other relevant laws under its jurisdiction irrespective of plan(s)/configuration(s) not related to the relief granted.

Adopted by the Board of Standards and Appeals, September 23, 2008.

A true copy of resolution adopted by the Board of Standards and Appeals, September 23, 2008.
Printed in Bulletin No. 39, Vol. 93.
Copies Sent
To Applicant
Fire Com'r.
Borough Com'r.

CERTIFIED RESOLUTION

Chair/Commissioner of the Board