21-25 31st Street
Remedial Action Work Plan

21-25 31st Street
Astoria, New York 11105
Block 831, Lot 20
BCP # C241167
NYSDEC Spill # 1402686
CEQR #10DCP019Q

Submitted to:
New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau B, Section A
625 Broadway, 12th Floor
Albany, NY 12233-7016

Prepared for:
21-25 31st Street LLC
42-01 235th Street
Douglaston, NY 11363

Prepared by:
Matthew M. Carroll, P.E.
&
TENEN ENVIRONMENTAL
121 West 27th Street, Suite 702
New York, NY 10001

June 2017

CERTIFICATIONS

I, Matthew M. Carroll, certify that I am currently a registered professional engineer licensed by the State of New York and that this Remedial Action Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

I certify that the Site description presented in this Remedial Action Work Plan (RAWP) is identical to the Site descriptions presented in the Brownfield Cleanup Agreement for the 21-25 31st Street 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 this RAWP has a plan for nuisance control during the remediation and all invasive development work, including a dust, odor and vapor 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.

091629	6/16/17	Matthew M. Carroll, P.E.
NYS Professional Engineer #	Date	Signature

Note: Include PE stamp

It is a violation of Article 145 of New York State Education Law for any person to alter this document in any way without the express written verification of adoption by any New York State licensed engineer in accordance with Section 7209(2), Article 145, New York State Education Law.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

LIST OF ACRONYMS

AGV	NYSDOH Air Guidance Value
AOC	area of concern
AS	air sparging
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
ECL	Environmental Conservation Law
BTEX	benzene, toluene, ethylbenzene and xylenes
CAMP	Community Air Monitoring Program
C&D	construction and demolition
CDS	construction dewatering system
Class GA Standards	NYSDEC TOGS 1.1.1 Class GA Ambient Water Quality Standards and Guidance Values
CEQR	City Environmental Quality Review
CFR	Code of Federal Regulations
CPP	Citizen Participation Plan
COC	Certificate of Completion
DCE	dichloroethylene
DER-10	NYSDEC Division of Environmental Remediation (DER), DER-10 / Technical Guidance for Site Investigation and Remediation
DRO	diesel range organics
DOC	dissolved organic carbon
DUSR	Data Usability Summary Report
EC	engineering control
ESA	Environmental Site Assessment
EZ	exclusion zone
FB	field blanks
FER	Final Engineering Report
ft-bs	feet below building slab
ft-bg	feet below sidewalk grade
ft-msl	feet above mean sea level
GPM	Gallons per minute
HASP	Health and Safety Plan
HSA	Hollow Stem Auger
HSO	Health and Safety Officer
IC	institutional control
ISCO	in-situ chemical oxidation
IRM	Interim Remedial Measure
MW	monitoring well
NAVD	North American Vertical Datum of 1988
NGVD	National Geodetic Vertical Datum of 1929
NIOSH	National Institute for Occupational Safety and Health
NYCDEP	New York City Department of Environmental Protection
NYCDEP Limits	NYCDEP Limitations for Effluent to Sanitary or Combined Sewers

NYCDOB	New York City Department of Buildings
NYCDOT	New York City Department of Transportation
NYCRR	New York Codes, Rules and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYSDOH-ELAP	NYSDOH Environmental Laboratory Approval Program
O&M Plan	Operations and Maintenance Plan
OSHA	Occupational Safety and Health Association
PCB	polychlorinated biphenyl
PCE	perchloroethylene, aka tetrachloroethylene
PID	photoionization detector
PGWSCOs	6 NYCRR 375-6.8(b) and CP-51 Protection of Groundwater Soil Cleanup Objectives
PP Metals	Priority Pollutant Metals
PPE	personal protective equipment
QA/QC	quality assurance / quality control
QAPP	Quality Assurance Project Plan
RAWP	Remedial Action Plan
RCNY	Rules of the City of New York
RAO	Remedial Action Objective
RE	Remedial Engineer
RI	remedial investigation
RSCOs	Recommended Soil Cleanup Objectives
RUSCOs	6 NYCRR 375-6.8(b) and CP-51 Track 2 – Residential Use Soil Cleanup Objectives
SB	soil boring
SCGs	Standards, Criteria and Guidance
SV	soil vapor
SMP	Site Management Plan
SMMP	Soil/Material Management Plan
SSDS	sub-slab depressurization system
SVE	soil vapor extraction
SVOC	semi-volatile organic compound
TAL	Target Analyte List
TAGM 4046	NYSDEC Technical and Administrative Guidance Memorandum #4046
TB	trip blanks
TCE	trichloroethylene
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
TCLP Limits	USEPA Maximum Concentrations of Contaminants for the Toxicity Characteristic
TOC	total organic carbon
USEPA	United States Environmental Protection Agency

USGS	United States Geological Survey
UST	underground storage tank
UUSCOs	6 NYCRR 375-6.8(a) Track 1 Unrestricted Use Soil Cleanup Objectives
VOC	volatile organic compound

EXECUTIVE SUMMARY

SITE DESCRIPTION/PHYSICAL SETTING/SITE HISTORY

On March 10, 2015, 21-25 31 Street LLC (the "Volunteer") entered into a Brownfield Cleanup Agreement (BCA) with the New York State Department of Environmental Conservation (NYSDEC) to investigate and remediate the property located at 21-25 31st Street (Block 831, Lot 20) in the Astoria neighborhood of Queens, New York (the "Site"). The New York State Brownfield Cleanup Agreement Index Number is C241167-02-15 and the Site Number is C241167.

The Site, located at 21-25 31st Street, Astoria, New York, is a rectangular-shaped parcel consisting of an approximately 11,875 square feet (0.27 acres) situated on the southeast side of 31st Street, between 21st Avenue and Ditmars Boulevard. The Site has approximately 125 feet of frontage along 31st Street and is approximately 95 feet deep, extending to 32nd Street. A location map for the Site is provided as Figure 1. A map of the current Site layout is included as Figure 2.

The Site is improved with a one-story building that covers approximately 11,400 square feet, with the remaining area used as an asphalt-paved driveway accessed from 32nd Street. The building has an approximately 5,000 square foot partial basement, which is located beneath the entirety of the historic dry cleaner facility and beneath a portion of the remaining structure.

The Volunteer is proposing to demolish the existing building and construct a new mixed-use building. The development project includes a cellar that will be excavated to approximately 30 feet below grade (ft-bg) across the entire lot.

The Site was vacant until sometime between 1954 and 1967 when the property was developed with a large store and dry cleaner. No changes in Site uses were depicted through 2006, the date of the most recent Sanborn map. Most recently the property was occupied by a retail clothing, linens and kitchenwares store, ABC Super Stores, through March 2017.

The Site and surrounding area were rezoned in 2010 as part of the Astoria Rezoning under City Environmental Quality Review (CEQR) # 10DCP019Q, which included the placement of a hazardous materials "E" designation on the Site. Hazardous Materials "E" designation E-245 was assigned to the Site and the New York City Mayor's Office of Environmental Remediation (OER) assigned project number 14EH-A500Qto the Site.

SUMMARY OF THE REMEDIAL INVESTIGATION

A Remedial Investigation Report (RIR) dated February 17, 2017, was prepared by Tenen Environmental LLC (Tenen).

The investigation consisted of a geophysical survey, installation of several soil borings and collection of soil samples, installation and sampling of groundwater monitoring wells, and sampling of soil vapor. Based on the results of the RI and previous investigations, the following summary has been prepared:

Site History

- A dry cleaning facility occupied the northwest portion of the Site property from as early as 1954 through at least 1981.

Geology/Hydrogeology

- Up to ten feet of fill material, containing silt, sand, and brick fragments is present from sidewalk grade. The fill material was underlain by glacial till composed of boulders, cobbles, gravel, and coarse sand with some silt. The glacial till was underlain by dense brownish gray clay at approximately 80 ft-bg. There is no evidence of dense non-aqueous phase liquid (DNAPL) on top of the clay layer.
- Shallow groundwater was encountered at depths of 33 to 40 and generally flows in a northeasterly direction.
- Deep groundwater, as screened above the top of the clay layer, generally flows to the northwest or northeast.

Chlorinated Solvents

- Tetrachloroethene (PCE) was detected in soil above the Part 375 Unrestricted Use soil cleanup objective (SCO) in one soil sample, directly below the basement slab. This detection was vertically delineated at three feet below the basement slab.
- PCE was detected in groundwater at concentrations of up to 23 micrograms per liter (ug/L) in shallow samples and up to 57 ug/L in deep samples, above the NYSDEC TOGS 1.1.1 Class GA Ambient Water Quality Standards and Guidance Values (AWQS). The highest concentrations were in samples collected near the former dry cleaner.
- PCE degradation compounds, trichloroethene (TCE), cis-1,2-dichloroethene (cis-1,2-DCE), trans-1,2- dichloroethene (trans-1,2-DCE) and vinyl chloride, were detected above the AWQS in groundwater.
- PCE was detected in soil vapor and indoor air at concentrations above those detected in the ambient air. PCE was detected in soil vapor at concentrations up to 766 micrograms per cubic meter (ug/m^3).

Petroleum Impacts

- Spill #1402686 was assigned to the Site during due diligence sampling completed in 2014.
- Petroleum-related compounds were detected in soil above the Unrestricted Use SCOs in samples collected at the groundwater interface in borings GW-6, GW-8 and GW-3D.
- Petroleum-related compounds were detected in groundwater above the AWQS in samples collected from wells in the upgradient direction; petroleum was not detected above the AWQS in samples collected near the historic dry cleaner. The highest petroleum concentrations were detected in well GW-8.

- Petroleum-related volatile organic compounds (VOCs) were detected in soil vapor and indoor air above the ambient air concentrations.

Historic Fill-Related Impacts

- Metals, including lead, silver and zinc, were detected in shallow fill material above the Unrestricted Use SCOs in samples collected from the unexcavated area of the Site.
- Fill-related semi-volatile organic compounds (SVOCs), specifically polyaromatic hydrocarbons (PAHs), were detected above the AWQS in one ground water monitoring well.
- One pesticide was detected in the fill material above the Unrestricted Use SCOs.

Qualitative Environmental Assessment

- The following potential exposure routes were identified: direct contact with surface soils, inhalation and incidental ingestion, ingestion of groundwater, direct contact with groundwater and inhalation of vapors.
- Potential impacts from these exposure routes can be mitigated through the implementation of HASP and CAMP during ground-intrusive activities and construction of the Site building and installation of an SSDS and waterproofing membrane.

Sewer Information

- A four-inch diameter sewer is present below the slab and extends to a combined sewer below 31st Street.
- The driveway drain is piped into the basement of historic dry cleaner; no sewer lines were observed that flow to the sewer along 32nd Street.
- No evidence of breaks or cracks was observed in the sewer line. Some corrosion with minor pitting was observed approximately 25 feet west of the ejector pit; this is approximately 18 feet from the GW-2S/2D well cluster where the highest concentrations of cVOCs were identified in the shallow groundwater samples.

QUALITATIVE HUMAN HEALTH EXPOSURE ASSESSMENT

The results of the remedial investigations provided sufficient data to complete a Qualitative Human Health Exposure Assessment, which identified several potential exposure pathways that include:

- direct contact with subsurface soils (and incidental ingestion);
- direct contact with groundwater;
- inhalation of volatile groundwater constituents; and,
- inhalation of vapors.

The potential exposure pathways associated with the remediation/construction phase of the redevelopment are temporary and of limited duration. Worker exposure to impacted groundwater and soil vapor and particulates will be addressed by adherence to health and safety protocols. Based upon the measured ambient air concentrations, no off-site impacts are present due to the

contaminant concentrations on-site. Potential exposure of neighborhood residents and other off-site populations will be addressed through compliance with the Community Air Monitoring Plan (CAMP). A summary of the CAMP is included in Appendix A of this Remedial Action Work Plan (RAWP). Potential for exposure of building occupants to contaminants in indoor air will be minimized by removal of soil to a depth of approximately 30 ft-bg, treatment of dissolved, shallow chlorinated VOC (cVOC) groundwater constituents, possible installation of a sub-slab depressurization system (SSDS) and implementation of institutional controls in the form of an environmental easement and Site Management Plan (SMP).

SUMMARY OF THE REMEDIAL ACTIONS

The proposed Track 4 remedy, intended to address all environmental issues associated with the Site, consists of the following:

- Demolition of the existing on-site building;
- Excavation of soil/fill to 30 ft-bg within the proposed building footprint. Excavated soil will be screened for indications of contamination including by visual means, odor and monitoring with a photoionization detector (PID);
- Disposal of impacted material from the Site in accordance with all Federal, State and local rules and regulations for handling, transport, and disposal;
- Pre-design sampling and, if necessary, in-situ treatment of dissolved chlorinated concentrations in groundwater;
- Collection and analysis of post-remedial end-point samples to document remaining concentrations of contaminants. Samples will be evaluated for attainment of Site-specific soil cleanup objectives ("SCOs"), which would support a Track 4 remedy;
- Based on the confirmation sample analytical results, an evaluation will be made whether further remediation is feasible to achieve a Track 2 remedy with soil results meeting the Part 375 Restricted Residential Use SCOs or a Conditional Track 1 remedy with soil results meeting the Part 375 Unrestricted Use SCOs;
- Collection and analysis of post-remedial soil vapor samples to determine if a sub-slab depressurization system (SSDS) is required;
- If needed, import of materials to be used for backfill and cover in compliance with: (1) the Part 375-6.7(d) and (2) all Federal, State and local rules and regulations for handling and transport of material;
- Installation of vapor barrier and composite cover system;
- Preparation of a Final Engineering Report (FER) to document the implemented remedial actions; and,
- Development of a Site Management Plan (SMP) for long term management of residual contamination as required by an Environmental Easement, including plans for: (1) Institutional and Engineering Controls, (2) monitoring, and (3) reporting.

Remedial activities will be performed at the Site in accordance with this NYSDEC-approved RAWP. Any deviations from the RAWP will be promptly reported to NYSDEC for approval and detailed in the FER.

REMEDIAL ACTION WORK PLAN

1.0 INTRODUCTION

21-25 31 Street LLC entered into a Brownfield Cleanup Agreement (BCA) with the New York State Department of Environmental Conservation (NYSDEC) on March 10, 2015, to investigate and remediate an approximately 11,875 square feet (SF) (0.27-acre) property located at 21-25 31st Street (Block 831, Lot 20) in the Astoria neighborhood of Queens, New York (the "Site"). 21-25 31 Street LLC is a Volunteer in the Brownfield Cleanup Program.

The Site is improved with a one-story building that covers approximately 11,400 square feet, with the remaining area used as an asphalt-paved driveway accessed from 32nd Street. The building has an approximately 5,000 square foot partial basement, which is located beneath the entirety of the historic dry cleaner facility and beneath a portion of the remaining structure.

The Volunteer is proposing to demolish the existing building and construct a new mixed-use building. The development project includes a cellar to approximately 30 feet below grade (ft-bg) across the entire lot.

This Remedial Action Work Plan (RAWP) summarizes the nature and extent of contamination, as determined from data gathered during the Remedial Investigation (RI) activities performed between February 2016 and October 2016, respectively.

The RAWP provides an evaluation of Track 1, 2 and 4 remedies and other applicable remedial measure alternatives, their associated costs, and the recommended and preferred remedy to address on-Site contamination. 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.

1.1 Site Location and Description

The Site, located at 21-25 31st Street, Astoria, New York, is a rectangular-shaped parcel consisting of 11,875 square feet (0.27 acres) situated on the east-southeast side of 31st Street, between 21st Avenue and Ditmars Boulevard. The property has approximately 125 feet of frontage along 31st Street and is approximately 95 feet deep, extending to 32nd Street. Other addresses associated with the Site are 21-25 through 21-33 31st Street and 21-26 through 21-34 32nd Street. The site is in Community District 1 and the tax map designation of the property is Block 831, Lot 20. The property was most recently occupied by a retail clothing, linens and kitchenware store, ABC Super Stores. The Site is subject to a New York City Office of Environmental Remediation (OER) "e" designation for hazardous materials and air quality. A location map for the Site is provided as Figure 1. A map of the current Site layout is included as Figure 2.

1.2 Proposed Site Redevelopment Plan

The Remedial Actions being performed under the RAWP are intended to make the Site protective of human health and the environment consistent with the contemplated end use. The proposed development plan and end use are described here to provide the basis for this assessment.

The proposed redevelopment of the subject property includes the demolition of all existing site improvements and the construction of a mixed-use building that is expected to include a mixed-use (commercial / residential) building with two sub-grade levels.

The proposed building plans and support of excavation (SOE) plans are included in Appendix B.

1.3 Description of Surrounding Property

The surrounding area is predominantly residential and commercial. Single and multi-family residential properties are located to the north and west of the subject property across 31st Street and to the south and east of the subject property across 32nd Street. Commercial properties are located to the northeast and southwest of the Site; 31st Street is a major commercial corridor in this area of Queens.

Based on a review of the New York City Office of Environmental Remediation (OER) Searchable Property Environmental E-Database (SPEED), no hospitals or schools are present within 500 feet of the Site; however, one day-care center is located at 31-20 21st Avenue, approximately 70 feet northeast of the Site.

2.0 DESCRIPTION OF REMEDIAL INVESTIGATION FINDINGS

The Site was investigated in accordance with the scope of work described in the July 2015 Remedial Investigation Work Plan (RIWP) and August 2016 Supplemental RIWP, which were approved by NYSDEC. An RIR dated February 17, 2017 was approved by NYSDEC in a letter dated March 6, 2017.

2.1 Site History

A review of the Site history, completed as part of the 2014 Phase I ESA, found that Site was vacant until sometime between 1954 and 1967, when the property was developed with a large store and dry cleaner. The dry cleaning operation was present until at least 1981, and the same space was used for "cleaning" through 2006. The Phase I ESA also identified the historic use of the northeast adjacent property for auto repair operations. The Site is currently occupied by ABC Super Stores, a retail clothing, linens and kitchenware store.

2.2 Geology / Hydrogeology

Site Topography

According to the Central Park, New York-New Jersey Quadrangle USGS Topographic Map (2013), the subject Site lies at an elevation of approximately 50 feet above the National Geodetic Vertical Datum of 1929 (an approximation of mean sea level). The surface topography at the Site and surrounding area is relatively flat with a downward slope to the northeast.

Site Geology and Hydrogeology

An Open File Report by the U.S. Geological Survey, titled "Reconnaissance of the Groundwater Resources of Kings and Queens Counties, New York" (Report Number 81-1186, 1981), describes general geologic and hydrogeologic conditions within the Astoria section of Queens. A general geologic section of Queens depicts crystalline bedrock of Precambrian age overlain by the Cretaceous Raritan Formation, which consists of unconsolidated sands and clays. The Raritan Formation is overlain by the Magothy Formation, also Cretaceous in age; the Pleistocene Jameco Gravel; and the Pleistocene Gardiners Clay. It is unlikely that all of these units underlie the Site. The crystalline bedrock likely lies more than 100 feet below the ground surface at the Site. Based on field observations, a marine clay layer (similar to Gardiners Clay) is approximately 80 feet below the ground surface. More recent deposits at the Site consist primarily of glacial terminal moraine, unconsolidated sediments ranging from boulders to silt, but primarily containing cobbles, gravel, and sand.

Soil borings have been performed at and around the Site as part of the BCP investigations. The boring logs from these investigations indicate that up to ten feet of fill material, containing silt, sand, and brick fragments is present from sidewalk grade. The fill material is underlain by glacial till composed of boulders, cobbles, gravel, and coarse sand with some silt. The glacial till is underlain by dense brownish gray clay at approximately 80 ft-bg. The clay layer was observed in each deep well and appears to be consistent across the Site.

Groundwater was encountered at depths between 35 and 40 ft-bg. Measured shallow groundwater elevations indicate that groundwater flow is generally to the northeast. This is generally consistent with the regional groundwater flow contours prepared by the United States Geologic Survey (USGS) which indicate that groundwater flows to the north-northwest in the area of the Site. The Site-specific shallow groundwater flow is toward the nearest surface water body, Luyster Creek, which is located northeast of 20th Avenue. Measured deep groundwater elevations indicate that groundwater flow is generally to the northwest or northeast.

Groundwater beneath the Site is characterized as Class GA. The best usage for Class "GA" groundwater is as a source of potable water. Groundwater is not utilized as a source of potable water at the Site. Potable water for the Site is supplied by the City of New York from upstate New York reservoirs.

2.3 Identification of Standards, Criteria and Guidance

The following standards, criteria, and guidance were used during the evaluation of Site data for the purpose of remedy selection.

Soil
6 NYCRR Part 375-6(a) Unrestricted Use SCOs for Track 1 remedy, as presented in Table 1.

6 NYCRR Part 375-6(b) Restricted-Residential Use for a Track 2 remedy, as presented in Table 2. The Restricted-Residential Use SCOs are appropriate given the proposed future use of the Site and would not require the use of engineering controls to prevent exposures to soil.

Post-remedial end-point samples will be evaluated for attainment of Site-specific SCOs, which would support a Track 4 remedy. The Site-specific SCOs will be based on the Restricted-Residential SCOs with limited deviations that will be managed with Engineering Controls and Institutional Controls.

Groundwater
Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations – Class GA (Class GA Standards). The Class GA Standards are presented in Table 3.

Soil Vapor
Ambient air concentrations as measured during the Remedial Investigation.

2.4 Soil/Fill Contamination

This section summarizes the 2016 soil analytical results for the Site. Historic soil concentrations are included on Tables 4 through 7 and a summary of compounds detected above the Unrestricted Use SCOs is included as Figure 3.

2.4.1 Summary of Soil/Fill Data and Comparison with SCGs

No VOCs were detected above the Residential Use SCOs. PCE was detected in one sample, SB12 (1-3) at a concentration of 1.4 milligrams/kilogram (mg/kg), which is above the Unrestricted Use SCO of 1.3 mg/kg but below the Restricted-Residential Use SCO of 19 mg/kg. Petroleum-related VOCs were detected in three samples above the Unrestricted Use SCO. In sample GW-3D (35-36')D, benzene was detected at 0.1 mg/kg, slightly above the Unrestricted Use SCO of 0.06 mg/kg and 1,2,4-trimethylbenzene was detected at 5.6 mg/kg above the Unrestricted Use SCO of 3.6 mg/kg. These impacts are vertically delineated by sample GW-3D (68-69'). Naphthalene was detected in sample GW6 (40-42) at a concentration of 20 mg/kg, above the Unrestricted Use SCO of 12 mg/kg; this sample is vertically delineated by sample GW6 (53-55). The following petroleum compounds were detected above the Unrestricted Use SCOs in sample GW8 (40-42): ethylbenzene (1.2 mg/kg, Unrestricted Use SCO: 1 mg/kg), naphthalene (38 mg/kg, Unrestricted Use SCO: 12 mg/kg) and n-propylbenzene (4.5 mg/kg, Unrestricted Use SCO: 3.9 mg/kg). This sample is vertically delineated by sample GW8 (57-59). All concentrations are below the corresponding Restricted-Residential SCOs.

One other VOC, acetone, was detected above the Unrestricted Use SCO in one sample in 2013; however, this detection is considered a laboratory artifact and not indicative of Site impacts. No other VOCs were detected above the Unrestricted Use SCOs.

The SVOCs benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene and indeno(1,2,3-cd)pyrene were detected in samples SB13 (1-3) and SB14 (1-3), above the Unrestricted Use SCOs; all compounds but benzo(k)fluoranthene and chrysene were also detected above the Restricted-Residential SCOs. These samples were collected from below the first floor of the Site, where there is no basement.

The following compounds are listed as follows: analyte (maximum concentration, Restricted-Residential Use SCO). Benzo(a)anthracene (3.6 mg/kg, 1.0 mg/kg), benzo(a)pyrene (3.4 mg/kg, 1.0 mg/kg), benzo(b)fluoranthene (4.9 mg/kg, 1.0 mg/kg), benzo(k)fluoranthene (1.7 mg/kg, 3.9 mg/kg), chrysene (3.2 mg/kg, 3.9 mg/kg), dibenzo(a,h)anthracene (0.72 mg/kg, 0.33 mg/kg) and indeno(1,2,3-cd)pyrene (2.5 mg/kg, 0.5 mg/kg). No other SVOCs were detected above the Unrestricted Use SCOs. Sample SB13 (1-3) is vertically delineated by sample SB13 (9-11) and sample SB14 (1-3) is vertically delineated by sample SB14 (3-5). No other SVOCs were detected above the Unrestricted Use SCOs.

No pesticides or PCBs were detected above the Unrestricted Use SCOs.

No metals were detected above the Restricted-Residential Use SCOs. Lead, silver and zinc were detected above the Unrestricted Use SCOs. Lead was detected in sample SB14 (1-3) at a concentration of 180 mg/kg and in sample SB9 (0-3) at a concentration of 86 mg/kg, above the Unrestricted Use SCO of 63 mg/kg. Silver was detected in sample SB14 (1-3) at a concentration of 8.4 mg/kg, above the Unrestricted Use SCO of 2 mg/kg. Zinc was detected in sample SB14 (1-3) at a concentration of 140 mg/kg, above the Unrestricted Use SCO of 109 mg/kg. Sample SB14 (1-3) is vertically delineated by sample SB14 (3-5); sample SB9 (0-3) is not vertically delineated. No other metals were detected above the Unrestricted Use SCOs.

2.5 Groundwater Contamination

This section summarizes the 2016 groundwater analytical results for the Site. Historic groundwater concentrations are included in Tables 8 through 11 and a summary of compounds detected above the Class GA Standards is included as Figure 4.

2.5.1 Summary of Groundwater Data and Comparison with SCGs

Concentrations of cVOCs were detected above the AWQS in shallow wells along 31st Street and in both deep wells. A shallow sample previously collected in the driveway contained PCE, cis-1,2-DCE and trans-1,2-DCE above the AWQS.

During the initial investigation, the concentrations of cVOCs were higher in the deep wells compared to the concentrations in the co-located shallow wells. In the shallow wells, PCE was detected in sample GW-2S at a concentration of 23 ug/L and in sample GW-4 at a concentration of 7.2 ug/L, above the AWQS of 5 ug/L. TCE was detected in sample GW-2S at a concentration of 47 ug/L, in sample GW-4 at a concentration of 39 ug/L and in well GW-3 at 20 ug/L, above the AWQS of 5 ug/L. Cis-1,2-DCE was detected in sample GW-3 at a concentration of 300 ug/L, in sample GW-4 at a concentration of 150 ug/L and in well GW-2S at 76 ug/L, above the AWQS of 5 ug/L. Trans-1,2-DCE was detected in sample GW-4 at a concentration of 200 ug/L, in sample GW-3 at a concentration of 94 ug/L and in well GW-2S at 59 ug/L, above the AWQS of 5 ug/L. Vinyl chloride was detected in sample GW-4 at a concentration of 110 ug/L and in sample GW-2S at a concentration of 13 ug/L, above the AWQS of 2 ug/L.

In the deep wells, PCE was detected in sample GW-2D at a concentration of 57 ug/L and in sample GW-5D at a concentration of 45 ug/L, above the AWQS of 5 ug/L. TCE was detected in sample GW-2D at a concentration of 140 ug/L, above the AWQS of 5 ug/L. Cis-1,2-DCE was detected in sample GW-2D at a concentration of 61 ug/L, above the AWQS of 5 ug/L. Trans-1,2-DCE was detected in sample GW-2D at a concentration of 67 ug/L, above the AWQS of 5 ug/L. Vinyl chloride was not detected in the deep wells.

During the supplemental investigation, the concentrations of cVOCs were generally higher in the shallow wells compared to the concentrations in the co-located deep wells. In the shallow wells, PCE was detected in sample GW-2S at a concentration of 14 ug/L and in sample GW-3S at a concentration of 8.3 ug/L, above the AWQS of 5 ug/L. TCE was detected in sample GW-2S at a concentration of 53 ug/L, in sample GW-3S at 40 ug/L and in sample GW-4 at a concentration of 43 ug/L and, above the AWQS of 5 ug/L. Cis-1,2-DCE was detected in sample GW-2S at 160 ug/L, in sample GW-3S at a concentration of 280 ug/L and in sample GW-4 at a concentration of 170 ug/L, above the AWQS of 5 ug/L. Trans-1,2-DCE was detected in in sample GW-2S at 160 ug/L, sample GW-3S at 160 ug/L and sample GW-4 at a concentration of 230 ug/L, above the AWQS of 5 ug/L. Vinyl chloride was detected in sample GW-2S at 3.7 ug/L and in sample GW-4 at a concentration of 100 ug/L, above the AWQS of 2 ug/L.

In the deep wells, PCE was detected in sample GW-2D at a concentration of 57 ug/L and in sample GW-5D at a concentration of 45 ug/L, above the AWQS of 5 ug/L. TCE was detected in

sample GW-2D at a concentration of 140 ug/L, above the AWQS of 5 ug/L. Cis-1,2-DCE was detected in sample GW-2D at a concentration of 61 ug/L, above the AWQS of 5 ug/L. Trans-1,2-DCE was detected in sample GW-2D at a concentration of 67 ug/L, above the AWQS of 5 ug/L. Vinyl chloride was not detected in the deep wells.

The concentrations of cVOCs are generally consistent within each round of sampling. The only cVOCs concentrations that changed by more than one order of magnitude were in monitoring well MW-2D, in which TCE, cis-1,2-DCE and trans-1,2-DCE all decreased by two orders of magnitude.

Petroleum impacts were detected in the four most-upgradient shallow wells, with the highest concentrations detected in well GW-8. Petroleum compounds were not detected above the AWQS in deep wells. The compounds detected above the AWQS were ethylbenzene, naphthalene, isopropylbenzene, sec-butylbenzene, n-propylbenzene, 1,2,4-trimethylbenzene and 1,2,4,5-tetramethylbenzene.

During the initial investigation, ethylbenzene was detected in wells GW-3 and GW-8, with the highest concentration in GW-8 at 50 ug/L, above the AWQS of 5 ug/L. Naphthalene was detected in wells GW-3, GW-4, GW-6 and GW-8, with the highest concentration in GW-8 at 340 ug/L, above the AWQS of 10 ug/L. Isopropylbenzene was detected in well GW-8 at an estimated concentration of 16 ug/L, above the AWQS of 5 ug/L. N-propylbenzene was detected in well GW-8 at an estimated concentration of 21 ug/L, above the AWQS of 5 ug/L. 1,2,4-Trimethylbenzene was detected in wells GW-3 and GW-4, with the highest concentration in GW-3 at 29 ug/L, above the AWQS of 5 ug/L. 1,2,4,5-Tetramethylbenzene was detected in wells GW-3, GW-4, GW-6 and GW-8, with the highest concentration in GW-8 at 18 ug/L, above the AWQS of 5 ug/L. Slightly elevated detection limits are associated with sample GW-8 due to dilution required by the sample matrix.

During the supplemental investigation, naphthalene was detected in wells GW-4 and GW-8, with the highest concentration in GW-8 at 54 ug/L, above the AWQS of 10 ug/L. 1,2,4-Trimethylbenzene was detected in well GW-3S at a concentration of 19 ug/L, above the AWQS of 5 ug/L. The following compounds were detected above the AWQS in well GW-8 only: ethylbenzene at a concentration of 9.6 ug/L, isopropylbenzene at a concentration of 10 ug/L, sec-butylbenzene at a concentration of 6.4 ug/L and n-propylbenzene at a concentration of 9.4 ug/L; all of which are above their corresponding AWQS of 5 ug/L.

Chloroform, a likely laboratory artifact, was also detected in the sample from well GW-2D at a concentration of 22 ug/L, above the AWQS of 7 ug/L.

SVOCs, with the exception of the petroleum-related compound naphthalene, were not detected in any groundwater samples.

One pesticide, dieldrin, was detected at estimated concentrations above the AWQS. PCBs were not detected above the AWQS.

Dissolved earth metals were detected above the AWQSs in all monitoring well groundwater

samples. In one sample, GW-4, concentrations of barium, beryllium, chromium, copper, lead, nickel, selenium and zinc were detected in the unfiltered sample above the AWQS; these compounds were not detected above the AWQS in the dissolved sample.

2.6 Soil Vapor Contamination

This section summarizes the 2016 soil vapor analytical results for the Site. Historic soil vapor concentrations are included in Table 12 and a summary of detected cVOCs is included as Figure 5.

2.6.1 Summary of Soil Vapor Data

Elevated (above ambient levels) concentrations of PCE in soil vapor were detected, with a maximum concentration of 766 ug/m^3 in SV-9 during the initial investigation and a maximum concentration of 348 ug/m^3 in SV-8 during the supplemental investigation. Concentrations of TCE were also detected above ambient concentrations, with maximum concentrations detected in sample SV8: 14.8 ug/m^3 (initial investigation) and 13.9 ug/m^3 (supplemental investigation). The concentrations of cVOCs in soil vapor samples between the Site and nearby school are low.

Several petroleum-related compounds, including benzene, xylenes, ethanol and trimethylbenzenes, were detected in soil vapor at concentrations above the ambient concentrations.

2.7 Summary of Remedial Investigation

This section presents the findings of the previous investigations conducted on-Site and off-Site as well as the findings of the 2016 remedial investigation performed by Tenen.

2.3.1 Summary of Soil/Fill Data

Investigations and sampling efforts conducted by Tenen in 2014 are described in the following reports:

- Phase I Environmental Site Assessment Report, 21-25 31st Street, Queens, New York. Tenen Environmental. May 22, 2014.
- Phase II Environmental Site Investigation, 21-25 31st Street—Astoria, NY. Tenen Environmental. June 13, 2014.
- Remedial Investigation Report, 21-25 31st Street, Astoria, NY. Tenen Environmental. February 2017.

The Tenen 2014 PHI noted that a dry cleaning facility had occupied the northwest portion of the Site from as early as 1954 through at least 1981, and an auto repair shop had occupied a northeast adjoining property in 1954. Both historical uses were identified as RECs in connection with the Site. The Site reconnaissance identified a tank fill port and vent line to the basement of the historical dry cleaning premises that were not connected to any tank. It is assumed that these lines were connected to a former aboveground storage tank (AST) used to store fuel oil for on-site

consumption.

The findings of the Tenen 2014 Phase II investigation indicated the presence of chlorinated solvents and their breakdown compounds in the soil vapor, indoor air, soil and groundwater at the Site. These results were consistent with a portion of the Site being used as a dry cleaning facility.

A supplemental investigation was completed as part of the 2016 RI (2017 RIR) to further investigate the cVOC impacts and potential sources.

The findings of the 2014 Phase II investigation and the 2016 RI and supplemental investigation are as follows:

Chlorinated Solvents

- PCE was detected in soil above the Unrestricted Use SCO in one soil sample, below the basement slab. This detection was vertically delineated at three feet below the basement slab.
- PCE was detected in groundwater at concentrations of up to 23 ug/L in shallow samples and up to 57 ug/L in deep samples, above the AWQS. The highest concentrations were in samples collected near the former dry cleaner.
- PCE degradation compounds (TCE, cis-1,2-DCE, trans-1,2-DCE and vinyl chloride) were detected above the AWQS in groundwater.
- PCE was detected in soil vapor and indoor air at concentrations above those detected in the ambient air. PCE was detected in soil vapor at concentrations up to 766 ug/m^3.

Petroleum Impacts

- Spill # 1402686 was assigned to the Site during due diligence sampling completed in 2014.
- Petroleum-related compounds were detected in soil above the Unrestricted Use SCOs in samples collected at the groundwater interface in borings GW-6, GW-8 and GW-3D.
- Petroleum-related compounds were detected in groundwater above the AWQS in samples collected from wells in the upgradient direction; petroleum was not detected above the AWQS in samples collected near the historic dry cleaner. The highest petroleum concentrations were detected in well GW-8.
  Petroleum-related VOCs were detected in soil vapor and indoor air above the ambient air concentrations.

Historic Fill-Related Impacts

- Metals, including lead, silver and zinc, were detected in shallow fill material above the Unrestricted Use SCOs in samples collected from the unexcavated area of the Site.
- Fill-related SVOCs (specifically, PAHs) were detected above the AWQS in one ground water monitoring well.
- One pesticide was detected in the fill material above the Unrestricted Use SCOs.

Qualitative Environmental Assessment

- The following potential exposure routes were identified: direct contact with surface soils,

inhalation and incidental ingestion, ingestion of groundwater, direct contact with groundwater and inhalation of vapors.

- Potential impacts from these exposure routes can be mitigated through the implementation of HASP and CAMP during ground-intrusive activities and construction of the Site building and installation of an SSDS and waterproofing membrane.

Sewer Information

- A four-inch diameter sewer is present below the slab and extends to a combined sewer below 31st Street.
- The driveway drain is piped into the basement of historic dry cleaner; no sewer lines were observed that flow to the sewer along 32nd Street.
- No evidence of breaks or cracks was observed in the sewer line. Some corrosion with minor pitting was observed approximately 25 feet west of the ejector pit; this is approximately 18 feet from the GW-2S/2D well cluster.

2.8 Significant Threat

The NYSDEC and NYSDOH have determined that this Site [does/does not] pose a significant threat to human health and the environment. Notice of that determination has been provided for public review. A copy of the notice is included in Appendix C.

3.0 CONTAMINATION CONDITIONS

3.1 Conceptual Model of Site Contamination

PCE and its breakdown compounds were detected at elevated levels in soil vapor and groundwater; PCE was also detected in soil slightly above the Unrestricted Use SCO directly below the basement slab to a maximum depth of three feet below the slab.

Petroleum-related VOCs were detected in soil vapor and groundwater at concentrations above applicable regulatory and/or ambient levels. Sampling also identified petroleum constituents above regulatory levels in soils at the groundwater interface.

The shallow fill material is historic fill impacted with SVOCs, pesticides and metals. These impacts are likely related to the quality of the historic fill material imported to the Site. The fill-related SVOCs are primarily PAHs. Several PAHs, likely associated with sediment, were detected in groundwater above the AWQS at one location. Pesticides at concentrations above applicable regulatory levels were detected in groundwater at three locations. Several metals were detected in fill material above the Unrestricted Use SCOs and in dissolved groundwater samples at concentrations above the AWQS.

The findings of the May 2014 Phase I ESA identified a dry cleaner in the northwest part of the Site in the 1967-1981 Sanborn maps, with maps dated 1985-2006 indicating a “cleaner” at that location. The highest concentrations of chlorinated solvents in soil vapor and groundwater have been detected upgradient and/or off-site. The distribution of soil and groundwater petroleum VOC contamination indicates that these impacts are likely associated with an unknown upgradient source. Metals, SVOCs and pesticides in surface soils are likely due to the presence of historic fill material.

The distribution of groundwater and soil vapor impacts supports a relationship between chlorinated solvent concentrations in groundwater and levels detected in soil vapor, with both associated with historic dry cleaning operations at the Site. Based on the cVOC distribution in off-site groundwater and soil vapor, which includes concentrations above the AWQS upgradient of the dry cleaner, the detected impacts could be related to the historic dry cleaners and/or and off-site source.

Petroleum impacts above regulatory standards are limited to the upgradient well locations and are not present in the area of the historic dry cleaner. With the exception of a minor lead exceedance at one location, all soil impacts have been vertically delineated.

4.0 ENVIRONMENTAL AND PUBLIC HEALTH ASSESSMENTS

4.1 Qualitative Human Health Exposure Assessment

A qualitative exposure assessment (EA) has been completed in accordance with Section 3.3(c)4 of DER-10 and the NYSDOH guidance for performing a qualitative EA (NYSDEC DER-10; Technical Guidance for Site Investigation and Remediation; Appendix 3 B). The qualitative exposure assessment evaluates the potential for populations to be exposed to Site contaminants.

An exposure pathway describes the means by which an individual may be exposed to contaminants originating from a site. An exposure pathway has five elements: (1) a contaminant source; (2) contaminant release and transport mechanisms to an exposed population; (3) a receptor population; (4) a route of exposure; and (5) a point of exposure to a receptor population. Potential contaminant receptors include the following populations:

- Site workers (primarily environmental professionals and contractors)
- Construction workers, visitors or trespassers
- Future residents and commercial workers
- Future on-Site workers and utility workers
- Off-Site residents/building occupants
- Off-Site maintenance workers

The following potential exposure routes are considered incomplete:

Groundwater Ingestion

New York City code and the environmental easement for the Site prohibit the use of groundwater for potable purposes. This pathway is incomplete.

Inhalation of Vapors by Future Building Occupants and Maintenance Workers

Remediation will include excavation of Site soils to a depth of approximately 30 ft-bg and installation of a continuous waterproofing/vapor barrier under the concrete slab. Post-remedial soil vapor testing will be completed to determine if a sub-slab depressurization system (SSDS) is required to eliminate this pathway.

The following potential exposure routes are considered complete:

Inhalation of Vapors and Particulates by On-Site Environmental and Construction Workers (and incidental ingestion.

During excavation and soil handling, on-Site personnel and construction workers may be exposed to dust and vapors via inhalation.

Dermal Contact with Soil by On-Site Environmental and Construction Workers

During excavation and soil handling, on-Site personnel and construction workers may be exposed to contaminants in soil via dermal contact.

Dermal Contact with Groundwater by On-Site Environmental and Construction Workers

Dermal exposure to VOCs in groundwater should be limited to environmental professionals collecting groundwater samples for environmental analysis as the groundwater is below the proposed excavation depth and dewatering is not contemplated during redevelopment. This exposure would be mitigated by adherence to a Construction Health and Safety Plan (CHASP), included in Appendix D, during sampling activities.

Inhalation of Vapors and Particulates by Off-Site Residents/Building Occupants

Soil excavation and removal may generate dust and vapors that could be inhaled by off-Site residents/building occupants and maintenance personnel.

The above potential exposures are limited to the remediation/construction phase of the proposed development. Adherence to health and safety protocols will address worker exposure to contaminated soil vapors, particulates and groundwater. Potential exposure of off-Site residents and building occupants will be addressed by implementation of the Community Air Monitoring Plan (CAMP) referenced in Section 7.4 of this RAWP and included as Appendix A.

4.2 Remedial Action Objectives

The goals of remediation are to remove the on-Site sources of chlorinated, pretroleum-related and fill-related impacts so as to allow for the Site's intended future residential and commercial use, and reduce the concentrations of contaminants in soil vapor and groundwater to levels below applicable SCGs. Based on the results of the remedial investigations conducted at the Site, the following Remedial Action Objectives (RAOs) have been identified:

4.2.1 Soil

Chlorinated solvents, specifically PCE, petroleum-related VOCs, and three metals, lead, silver, and zinc, have been detected in soil above the Unrestricted Use SCOs. Fill-related SVOCs have been detected in the shallow fill material at concentrations above the Unrestricted Use and Restricted-Residential SCOs.

RAOs for Public Health Protection

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

RAOs for Environmental Protection

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

4.2.2 Groundwater

Chlorinated VOCs, petroleum-related VOCs, and the pesticide dieldrin have been detected in the groundwater above relevant SCGs. Dissolved metals, consistent with typical earth metals and salt-water intrusion impacts, have also been detected above relevant SCGs.

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 the groundwater aquifer to pre-disposal/pre-release conditions, to the extent practicable
- Remove the source of groundwater contamination

4.2.3 Soil Vapor

Chlorinated solvents, specifically PCE, TCE and petroleum-related VOCs have been detected at elevated concentrations in the soil vapor at the Site.

RAOs for Public Health Protection

- Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into buildings at a site.

5.0 DESCRIPTION OF REMEDIAL ACTION WORK PLAN

5.1 Evaluation of Remedial Alternatives

The alternatives considered to address contamination in soil, soil vapor and groundwater are discussed below:

5.1.1 Soil

Three remedial alternatives were considered to address chlorinated VOC- and fill-related impacts in the soil.

Alternative 1 – Track 4 Excavation to Minimum 15 Feet Below Grade. Excavation as part of Site redevelopment would allow for the removal of the bulk of the contaminant mass at the Site. The excavation would extend to approximately 30 ft-bg. The existing Site structure and concrete surface cover will be demolished to facilitate excavation. Both shallow cVOC and shallow fill-related impacts will be excavated. Some petroleum impacts below the Restricted-Residential SCOs and associated with an upgradient, off-site source may remain in place in the southern portion of the Site.

End-point and sidewall samples will be collected to document the condition of soils that will be left in-place and capped. The Site cover system will cover the entire Site and consist of a concrete building slab. The cap will extend over the entire Site in order to eliminate the potential for dermal exposure to surface soil. The cap will be an engineering control and maintained under a Site Management Plan ("SMP").

Based on the existing sampling data, attainment of a Track 2 remedy may be achieved if the end-point samples meet the applicable Restricted-Residential Use SCOs. Track 2 requires remediation to the Restricted-Residential Use SCOs to depths of 15 ft-bg. In the event a Track 2 remedy is achieved, the cap would be installed but would not be considered an engineering control.

A CAMP (Appendix D of the HASP) and Soil/Materials Management Plan (Appendix E) will be implemented during the invasive site activities to prevent or minimize potential impacts to human health and the environment. Vertical, end-point and sidewall samples would confirm the removal of soil to concentrations below applicable Restricted-Residential and Protection of Groundwater SCOs.

Alternative 2 – Track 4 Shallow Excavation with Soil Vapor Extraction (SVE) and site cover system. Shallow chlorinated- and fill- related impacts above the Restricted-Residential Use SCOs would be addressed through a shallow excavation up to approximately ten ft-bg. The same actions would be completed as described in Alternative 1; however, hot-spot excavations would only be completed to remove soil with concentrations above the Restricted-Residential SCOs.

Deeper impacts, in all media, would be addressed soil vapor extraction (SVE) and site cover system.

This alternative would remove less contaminant mass and would rely on long-term institutional and engineering controls.

Alternative 3 – Track 1 Excavation. Excavation of all soil with concentrations above the Unrestricted Use SCOs would be completed. The excavation would extend beyond development depth, as described in Alternative 1.

5.1.2 Groundwater

Two remedial alternatives for groundwater have been considered and are described below.

Alternative 1 – Dewatering and Groundwater Treatment. Elevated concentrations of chlorinated and petroleum compounds have been detected on-Site. Dewatering would be required if the remedial excavation was extended beyond the groundwater interface (Soil Alternative 3). The shallow groundwater would be removed from the Site using an engineered well-point system with treatment as necessary to meet the New York City Department of Environmental Protection (NYCDEP) Limitations for Effluent to Sanitary or Combined Sewers (Sewer Limits). Pre-design sampling and testing would be required. Based on the soil type, it is likely that a Part 602 Long Island Well permit would be required; a permit will be obtained if the system capacity was above 45 GPM.

The temporary well-point system will lower the groundwater level to approximately five feet below the shallow groundwater interface. A treatment system would likely only consist of a settling tank as the most recent detected shallow groundwater concentrations were below the NYCDEP Sewer Limits, with the exception of naphthalene in one sample.

Post-remedial groundwater monitoring would be completed at the downgradient border and both upgradient and downgradient along 31st and 32nd Streets.

Alternative 2 – In-Situ Chemical Treatment. If the pre-design groundwater sampling indicates that cVOCs are expected to remain at elevated concentrations on-site, a combination of Regenesis' 3-D Microemulsion® and CRS® Chemical Reducing Solution will be injected into the groundwater. The determination for treatment will be made in coordination with NYSDEC.

Based on information from Regenesis, the 3-D Microemulsion is an injectable electron donor emulsion designed to enhance the reductive dechlorination process. CRS is an iron-based amendment for in-situ chemical reduction (ISCR) of halogenated hydrocarbon contaminants, such as TCE. CRS is designed to precipitate reduced iron sulfides, oxides, and/or hydroxides that are capable of breaking down chlorinated solvents.

5.1.3 Soil Vapor

Two remedial alternatives were considered to address the elevated levels of cVOCs present in the soil vapor at the Site.

Alternative 1 – Vapor Barrier, Composite Cover System and Vented Portion of Sub-Grade Parking Level. A vapor barrier would be installed beneath the basement slab to minimize the potential for vapor intrusion to occupied areas of the building. A W. R. Grace & Company (Grace) PrePrufe 160R (32-mil) and StegoWrap (15-mil) vapor barrier system would be installed. The vapor barrier will be applied to the bottom (StegoWrap) of the building slab and all sub-grade vertical walls (Preprufe 160R). The vapor barrier would be covered with a minimum four-inch concrete slab.

While not part of the remedial action, the proposed building would incorporate a parking area into a portion of the lowest sub-grade levels.

In this alternative, long-term institutional and engineering controls would be incorporated into the design of the proposed building and would include a vapor barrier and a composite cover system along with site management activities.

Alternative 2 – Vapor Barrier, Sub-Slab Depressurization System (SSDS) and Composite Cover System. Post-remedial soil vapor testing would be completed below the proposed building. The results of the soil vapor testing will be used to determine whether an active SSDS is required below the proposed building.

In this alternative, long-term institutional and engineering controls would be incorporated into the design of the proposed building and would include a vapor barrier, SSDS and a composite cover system along with site management activities.

5.2 Standards, Criteria and Guidance (SCGs)

The Remedial Action SCGs are listed below.

SCG	Scope / Application
NYSDEC Brownfield Cleanup Program Guide (draft 2004)	General program guidance
NYSDEC CP-51 / Soil Cleanup Guidance (2010)	Restricted Use SCOs for soil, if Track 1 is not achieved
NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation (2010)	End-point sampling methodology; underground storage tank (UST) closure
NYSDEC DER-31 Green Remediation (2011)	Green remediation components
NYSDEC TOGS 1.1.1 Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (1998)	Class GA Standards for groundwater
NYSDOH Guidance for Evaluating Soil Vapor Intrusions in the State of New York (2006)	Soil vapor guidance
NYSDOH Generic Community Air Monitoring Plan	Plan for monitoring dust and volatile organics resulting from construction activities
New York State Codes, Rules and Regulations (NYCRR) Title 6 Part 360 – Solid Waste	Off-site disposal of waste for facilities in NYC

Management Facilities	
New York State Codes, Rules and Regulations (NYCRR) Title 6 Part 364 – Waste Transporter Permits	Transporter requirements for off-site disposal of waste
6 NYCRR Part 370 – Hazardous Waste Management System	Disposal of hazardous waste, if encountered
6 NYCRR Part 375 – Environmental Remediation Programs (December 2006)	General administrative guidance
6 NYCRR Part 376 – Land Disposal Restrictions	Disposal of hazardous waste, if encountered
6 NYCRR Part 750 – State Pollutant Discharge Elimination System (SPDES) Regulations	Discharge of wastewater and stormwater
Code of Federal Regulations (CFR) Title 29 Part 1910.120 - Hazardous Waste Operations and Emergency Response Standard	Worker safety
29 CFR Title 29 Part 1926 - Safety and Health Regulations for Construction	Worker safety
40 CFR Parts 144 and 146 – Underground Injection Control Program	Injection of chemicals into the groundwater
Title 15, Rules of the City of New York (RCNY), Chapter 19 - Use of the Public Sewers	Discharge of groundwater to the municipal sewer system
NYCDEP Limitations for Effluent to Sanitary or Combined Sewers	Discharge of groundwater to the municipal sewer system

5.3 Evaluation of Alternatives

The remedial alternatives for soil, groundwater and soil vapor are discussed below. Each alternative was evaluated based on the following remedy selection factors (as defined in DER-10, Section 4.2):

- Protection of human health and the environment
- Conformance with standards, criteria and guidelines
- Short-term effectiveness and performance
- Long-term effectiveness and performance
- Reduction in toxicity, mobility or volume
- Implementability
- Cost effectiveness
- Community acceptance
- Land use

5.3.1 Protection of Human Health and the Environment

Each alternative would be protective of human health and the environment. All three soil alternatives would remove all impacts to levels consistent with the proposed use. Alternative 2

(shallow excavation to Track 4 SCOs) would require engineering and institutional controls. Groundwater in this area is not used as a source of drinking water. Potential soil vapor impacts from on- and off-site would be managed by installing long-term engineering controls.

A Health and Safety Plan (HASP), including monitoring/management for particulates and volatiles. will be implemented during remedial activities

5.3.2 Conformance with Standards, Criteria and Guidelines

Each alternative would conform to the SCGs. The soil alternatives would removal soil impacts to levels consistent with the proposed use (including Alternatives 1 and 2, Track 4 remediations in coordination with long-term engineering controls) and target compounds to below the impact to groundwater SCOs. Groundwater impacts would be treated and monitored.

On-site construction safety will conform to the HASP requirements, which incorporate OSHA requirements.

5.3.3 Short-Term Effectiveness and Performance

Each alternative would be effective over a short-term time horizon. The soil alternatives would remove all impacts consistent with the proposed use. Soil alternatives 1 (deep excavation to Track 4 SCOs) and 3 (Track 1 SCOs) are associated with the most significant short-term impacts, related to the increased duration associated with soil removal. These impacts include the potential for particulate and volatile impacts, additional truck traffic, installation of support-of-excavation elements and dewatering treatment. To a lesser extent, soil alternative 2 (shallow excavation to Track 4 SCOs) would have similar potential impacts. These potential impacts are addressed in the various control plans included in this RAWP.

5.3.4 Long-Term Effectiveness and Performance

Each alternative would be effective over a long-term time horizon. The three soil alternatives would remove all impacts consistent with the proposed use, given long-term engineering controls for soil alternatives 1 and 2. Potential for residual impacts in groundwater and soil vapor, particularly VOCs, would remain and would be managed by the installation of a vapor barrier and/or SSDS. Groundwater would be monitored for at least eight quarters to track the long-term concentration trends; in addition, groundwater in this area is not used as a source of drinking water.

5.3.5 Reduction in Toxicity, Mobility or Volume

Each alternative would reduce the toxicity, mobility and volume of the contaminants present on-site. In particular, soil alternatives 1 (deep excavation to Track 4 SCOs) and 3 (Track 1 SCOs), groundwater alternatives 1 (dewatering treatment) and 2 (in-situ chemical treatments) and soil vapor alternative 2 (vapor barrier, SSDS, composite cover and partial parking venting) would remove the bulk of the impacts present at the Site.

Soil alternative 3 (Track 4 SCOs) and soil vapor alternative 1 (vapor barrier, composite cover and partial parking venting) would reduce the toxicity, mobility and volume to a lesser extent.

5.3.6 Implementability

Each alternative would be implementable. Soil alternative 1 (deep excavation to Track 4 SCOs), groundwater alternative 2 (in-situ chemical treatments) and soil vapor alternatives 1 (vapor barrier, composite cover and partial parking venting) and 2 (vapor barrier, SSDS, composite cover and partial parking venting) can be implemented as part of the Site redevelopment plan. Soil alternative 3 (Track 1 SCOs) and groundwater alternative 1 (dewatering treatment) would be more difficult as the depth of Track 1 SCO exceedances extends to the groundwater interface, below development depth.

5.3.7 Cost Effectiveness

The implementation of soil alternative 1 (deep excavation to Track 4 SCOs), groundwater alternative 2 (in-situ chemical treatments) and soil vapor alternative 1 (vapor barrier, composite cover and partial parking venting) is estimated at approximately $1.63 million dollars, as shown in Table 13. If an SSDS is required, the costs would increase approximately $180,000. The costs to implement soil alternative 3 (Track 1 SCOs) would be higher and dependent on the depth of impacts below groundwater. The costs to implement soil vapor alternative 2 (vapor barrier, SSDS, composite cover and partial parking venting) would also be higher.

The costs to implement soil alternative 2 (shallow excavation to Track 4 SCOs) would less but leave a greater bulk of contamination.

5.3.8 Community Acceptance

Each alternative eliminates potential exposure pathways and will result in a decrease in toxicity, mobility and volume (see Section 5.3.5). These considerations, in conjunction with Site redevelopment consistent with existing commercial use and the addition of residential use, should result in acceptance by the community

Soil alternative 1 (deep excavation to Track 4 SCOs), groundwater alternative 2 (in-situ chemical treatments) and soil vapor alternatives 1 (vapor barrier, composite cover and partial parking venting) and 2 (vapor barrier, SSDS, composite cover and partial parking venting) can be implemented as part of the Site redevelopment plan. The short-term impacts (see Section 5.3.3) are greater due to the additional construction impacts, although these will be addressed by the various control plans in this RAWP. The deeper basement will allow for sub-grade parking, which will alleviate parking concerns related to the Site development, and presumably result in greater community acceptance. The selected remedy has been subject to a 45-day public comment period in accordance with the Citizen Participation Plan, included as Appendix G. Any substantive public comments received will be addressed before the remedy is approved.

5.3.9 Land Use

Each of the proposed alternatives is compatible with the proposed land use at the Site, which has been documented in the BCP Application and draft RAWP put out for public comment.

The following findings, based on a review of previous environmental and public documents, support the compatibility of the proposed Site land use with that of the surrounding area:

1. The use proposed for the Site conforms to applicable zoning laws or maps or the reasonably anticipated future use of the Site.
2. The proposed use conforms to historical and/or recent development patterns in the area.
3. The Site does not fall within the boundaries of an existing Brownfield Opportunity Area (BOA).
4. According to the New York City Planning Commission Zoning Map 9c, the Site is located in a R6A zoning district; a designation which denotes a built-up, medium density residential area; however, the Site is also within a C1-3 overlay in the R6A district, allowing for commercial uses to meet local retail needs. Properties within the C1-3 overlay can be developed as of right with commercial and residential uses in thes ame building.
5. The Site is located in an urban setting characterized by residential and commercial uses. There are no areas zoned for agricultural use in the proximity of the Site.
6. The Site was assigned an E-designation as part of the Astoria Rezoning because the potential for hazardous materials issues at the site was identified by the New York City Planning Commission and City Council. A Notice to Proceed (NTP) will be issued by the NYC Mayor's Office of Environmental Remediation (OER).
7. According to the NYSDEC database for environmental justice concerns, a portion of the Site is part of a Potential Environmental Justice Area (PEJAs); however, no environmental justice concerns have been identified.
8. There are no federal or state land designations.
9. The population growth patterns and projections support the proposed land use.
10. The Site is accessible to existing infrastructure.
11. The Site is not located in close proximity to important federal, state or local natural resources, including waterways, wildlife refuges, wetlands, or critical habitats of endangered or threatened species.
12. Municipal water supply wells are not present in this area of New York City; therefore, groundwater from the Site cannot affect municipal water supply wells or recharge areas. The Federal Emergency Management Agency (FEMA) flood insurance rate map for the Site (Map Number 3604970093F) indicates that the Site is located within the 0.2% annual chance floodplain (500-year flood). The FEMA Preliminary flood insurance rate map (Map Number 3604970093G) has the same designation. The building will be designed in accordance with New York City Department of Building's flood plain requirements.

5.4 Selection of the Preferred Remedial Actions

The preferred Track 4 remedy, intended to address all environmental issues associated with the Site, consist of the following:

- Demolition of the existing on-site building;

- Excavation of soil/fill to 30 ft-bg within the proposed building footprint. Excavated soil will be screened for indications of contamination including by visual means, odor and monitoring with a photoionization detector (PID);
- Disposal of impacted material from the Site in accordance with all Federal, State and local rules and regulations for handling, transport, and disposal;
- Pre-design sampling and, if necessary, in-situ treatment of dissolved chlorinated concentrations in groundwater;
- Collection and analysis of post-remedial end-point samples to document remaining concentrations of contaminants. Samples will be evaluated for attainment of Site-specific soil cleanup objectives ("SCOs"), which would support a Track 4 remedy;
- Based on the confirmation sample analytical results, an evaluation will be made whether further remediation is feasible to achieve a Track 2 remedy with soil results meeting the Part 375 Restricted Residential Use SCOs or a Conditional Track 1 remedy with soil results meeting the Part 375 Unrestricted Use SCOs;
- Collection and analysis of post-remedial soil vapor samples to determine if a sub-slab depressurization system (SSDS) is required;
- If needed, import of materials to be used for backfill and cover in compliance with: (1) the Part 375-6.7(d) and (2) all Federal, State and local rules and regulations for handling and transport of material;
- Installation of vapor barrier and composite cover system;
- Preparation of a Final Engineering Report (FER) to document the implemented remedial actions; and,
- Development of a Site Management Plan (SMP) for long term management of residual contamination as required by an Environmental Easement, including plans for: (1) Institutional and Engineering Controls, (2) monitoring, and (3) reporting.

Remedial activities will be performed at the Site in accordance with this NYSDEC-approved RAWP and the Department-issued Decision Document. All deviations from the RAWP and/or Decision Document will be promptly reported to NYSDEC for approval and fully explained in the FER. The Site source of chlorinated compounds (i.e., the soil beneath the historic dry cleaner) will be removed. Site soils will meet the Restricted-Residential Use and Protection of Groundwater SCOs beneath the footprint of the building; end-point sampling will document the soils left in place beneath the building. Soil vapor impacts will be mitigated by removing the source of chlorinated solvents and installing, at a minimum, a vapor barrier and composite cover system; based on post-remedial soil vapor sampling, an SSDS may be installed. If an SSDS is not installed, an indoor air quality test will be completed after the building is constructed. Groundwater beneath the Site will be tested and, if necessary, treated with an injection of chemicals; groundwater sampling will be conducted to document the post-remedial groundwater conditions.

The following land-use factors were considered in selecting these remedial measures. Land Use Factor	Remedy Evaluation Result
Zoning	Remedy is consistent

The following land-use factors were considered in selecting these remedial measures. Land Use Factor	Remedy Evaluation Result
Applicable comprehensive community master plans or land use plans	Remedy is consistent (not within a Brownfield Opportunity Area)
Surrounding property uses	Remedy is consistent
Citizen participation	Remedy is consistent; CPP requirements implemented regardless of selected remedy
Environmental justice concerns	None identified
Land use designations	Remedy is consistent
Populations growth patterns	Remedy is consistent
Accessibility to existing infrastructure	Remedy is consistent
Proximity to cultural resources	None identified
Proximity to natural resources	None identified
Off-Site groundwater impacts	Remedy removes the source of the chlorinated impacts and treats on-Site groundwater impacts. Groundwater will be monitored on-Site and at the downgradient border following implementation of the remedy.
Proximity to floodplains	Site is within the 500 year flood zone. The building will be designed to ameliorate potential flooding.
Geography and geology of the Site	Remedy is consistent
Current Institutional Controls	None currently present

Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows;

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gases and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
- Maximizing habitat value and creating habitat when possible;
- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals; and,
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development.

6.0 REMEDIAL ACTION PROGRAM

6.1 Governing Documents

6.1.1 Site Specific Health and Safety Plan

A Site Specific HASP has been created for the Site and is included in Appendix D. 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. An emergency contact sheet with names and phone numbers is included in Table 1 of the HASP and defines the specific project contacts for use by NYSDEC and NYSDOH in the case of a day or night emergency. The HASP and requirements defined in this RAWP pertain to all remedial and invasive work performed at the Site until the issuance of a Certificate of Completion.

6.1.2 Quality Assurance Project Plan

A Quality Assurance Project Plan (QAPP) has been created for the site to address quality control and quality assurance procedures for all site sampling, including post excavation end-point sampling and groundwater sampling, and is included in Appendix F.

6.1.3 Soil/Materials Management Plan

The Soil/Materials Management Plan (SMMP) includes plans for managing all soils/materials that are disturbed at the Site. The SMMP includes provisions for sediment and erosion control and stormwater management. The development is less than one acre in area and a Stormwater Pollution Prevention Plan (SWPPP) is not required.

The SMMP, which describes procedures for excavation, handling, storage, and transport and disposal, is included in Appendix E.

6.1.4 Community Air Monitoring Plan

The purpose of the Community Air Monitoring Plan (CAMP) is to protect downwind receptors (e.g., residences, businesses, schools, nearby workers, and the public) from potential airborne contaminants released as a direct result of the Remedial Action being performed at the Site. A summary of the CAMP plan is included in Appendix A.

6.1.5 Citizen Participation Plan

The Citizen Participation Plan (CPP) enables citizens to participate more fully in decisions that affect their health, environment, and social well-being. The CPP will be updated throughout the Remedial Action in response to any community feedback. The CPP is included in Appendix G.

6.1.6 Site Operations Plan

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.

6.2 General Remedial Construction Information

6.2.1 Project Organization and Emergency Contacts

The following are the principal personnel who will be assist in the management, oversight and completion of this project:

Tenen Environmental, LLC
121 West 27th Street, Suite 702, New York, NY 10001
(646) 606-2332

- Mary Manto, Technical Director: responsible for overall coordination and management of the project.
- Mohamed Ahmed, Senior Geologist: responsible for quality assurance of sampling procedures and laboratory data.
- Kristen Meisner, Project Engineer: responsible for the day-to-day field monitoring activities, including soil excavation and load-out, dust monitoring and PID monitoring. Post-remedial sampling activities and report preparation will be the function of a Project Engineer from Tenen.

Subcontractors
Laboratory:
Alpha Analytical, Inc., 8 Walkup Drive in Westborough, MA
(800) 624-9220
NYSDOH ELAP Certification No. 11148 for solid and hazardous waste

Driller:
ADT, 75 East 2nd Street, Mineola, NY 11501
(516) 596-6300

Data Validation:
Stone Environmental, Inc., 535 Stone Cutters Way, Montpelier, Vermont 05602
(802) 229-2196

Remedial Party:
21-25 31 Street LLC,
42-01 235th Street, Douglaston, NY 11363
Attn: John Petras
(718) 229-4488

Resumes of key personnel involved in the Remedial Action are presented in the QAPP, included as Appendix F.

6.2.2 Remedial Engineer

The Remedial Engineer (RE) for this project will be Matthew M. Carroll, P.E. The RE is a registered professional engineer (PE) licensed by the State of New York. The RE will have primary direct responsibility for implementation of the remedial program for the 21-25 31st Avenue Site (NYSDEC BCA Index No. C24167-02-15; Site No. C241167). The RE will certify in the Final Engineering Report (FER) that the remedial activities were observed by qualified environmental professionals under his supervision and that the remediation requirements set forth in the RAWP and any other relevant provisions of ECL 27-1419 have been achieved in conformance with that Plan. Other RE certification requirements are listed later in this RAWP.

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

The RE will review all pre-remedial plans submitted by contractors for compliance with this RAWP and will certify compliance in the FER.

6.2.3 Remedial Action Construction Schedule

A general Remedial Action construction schedule is included in Table 14.

6.2.4 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. NYSDEC will be notified by the Volunteer of any variances issued by the Department of Buildings. NYSDEC reserves the right to deny alternate remedial construction hours.

6.2.5 Mobilization

Mobilization includes field personnel orientation, equipment mobilization (including CAMP equipment), marking/staking sampling locations and utility mark-outs. Each field team member will attend an orientation meeting to become familiar with the general operation of the Site, health and safety requirements, and field procedures.

6.2.6 Erosion and Sedimentation Controls

The SMMP, included in Appendix E, includes provisions for sediment and erosion control and stormwater management, which will be in conformance with requirements presented in the New York State Guidelines for Urban Erosion and Sediment Control. This includes silt fencing along 31st Street and 32nd Street and protection of nearby catch basins. These measures are also shown on Figure 6.

6.2.7 Stabilized Construction Entrances

Two stabilized construction entrances are proposed, as shown on Figure 6.

6.2.8 Equipment and Material Staging

All equipment and materials will be stored at the Site in accordance with the requirements of this RAWP, manufacturer's recommendations, and in conformity to applicable statutes, ordinances, regulations and rulings of the public authority having jurisdiction. The Contractor shall maintain accurate records documenting the measures taken to protect each equipment item. The Contractor shall not store materials or encroach upon private property without the written consent of the owners of such private property. No work shall commence until Notice To Commence work is provided by the Remedial Engineer.

6.2.9 Decontamination Area

Two truck and equipment decontamination pads will be constructed, as shown on Figure 6. These are the same as the construction entrance/exit pads, which limit the tracking of Site soils outside the Site.

The pads will be constructed using #2 crushed stone and shall be a minimum of 8-inches thick. The construction zone exit pad will be constructed in accordance with the New York Standards and Specifications for Erosion and Sediment Control.

All construction equipment exiting the contamination reduction zone must first be decontaminated regardless of whether the equipment has come in contact with contaminated materials.

During remediation, soil and liquids adhered to construction vehicles and equipment will be removed in the decontamination area prior to such vehicles and equipment leaving the Site.

After wetting with potable water, brooms or shovels will be utilized for the gross removal of soil from vehicles and equipment. The decontamination procedure for the removal of the remaining soil and liquids will consist of washing with potable water. Soil generated by the decontamination process will be stockpiled and tested in accordance with the SMMP included in Appendix E, and transported offsite for disposal.

Decontamination liquids will percolate through the truck wash pad and be collected and treated along with the dewatering liquids.

6.2.10 Demobilization

Disturbed areas resulting from remediation activities will be restored or addressed during construction activities. This includes removal of the construction fence and installation of a new concrete sidewalk along 31st Street and 32nd Street. Restoration of disturbed access areas to pre-remediation conditions will include decommissioning any temporary curb supports for equipment access.

Sediment and erosion control measures will be removed upon completion of the remediation activities.

Equipment decontamination will take place on-Site in order to prevent dispersion of any contaminating materials.

All remediation and construction materials will be disposed of in accordance with the applicable rules and regulations. General refuse will be handled in accordance with the rules and regulations of the New York City Department of Sanitation.

6.2.11 Sheeting and Shoring

Along 31st Street and 32nd Street, the sheeting and shoring for the Site will include…

Appropriate management of structural stability of on-Site or off-Site structures during on-Site activities including excavation is the sole responsibility of the Volunteer and its contractors. The Volunteer and its contractors are solely responsible for safe execution of all invasive and other work performed under this Plan. The Volunteer and its contractors must 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.

6.2.12 Utility Markout and Easement 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 RAWP 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. Approval of this RAWP by NYSDEC does not constitute satisfaction of these requirements.

6.2.13 Required Permits

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 included as Table 15. 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 FER.

6.2.14 Site Security and Signage

A fence is currently in place around the Site. The fence will be maintained and expanded as required throughout the Remedial Action. A project sign has been erected at the entrance to the Site. Sidewalks adjacent to the Site will be maintained with barriers to protect the public.

6.2.15 Pre-Construction Meeting with NYSDEC

Prior to contractor mobilization to the site, a meeting will be held among the NYSDEC, the Remedial Engineer and the selected contractor.

6.2.16 Estimated Remedial Action Costs

The estimated cost to implement the Remedial Action is approximately $1.63 million. An itemized summary of estimated costs is included as Table 13. This table will be revised based on actual costs and included in the FER.

6.2.17 Deviations from the Remedial Action Plan

During the implementation of the RAWP, any material deviation from the RAWP will be noted and immediately brought to the attention of the RE. The RE or his/her representative will contact the NYSDEC Project Manager and determine if the deviation necessitates a formal RAWP modification and NYSDEC approval. If no formal RAWP modification is required, the deviation will be noted in the Site reports and explained in the FER.

6.3 Reporting

6.3.1 Daily Reporting

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

- An update of progress made during the reporting week;
- 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 findings, including excursions; and,
- An explanation of notable Site conditions.

Daily reporting will be conducted during active Site remediation periods including soil excavation, air monitoring, soil segregation, off-Site disposal, end point sampling, waterproofing installation, pouring of the concrete foundation slab and capping of the easement.

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

Daily reports will include a description of weekly activities keyed to an alphanumeric 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 any complaints received from the public.

A Site map that shows a predefined alphanumeric grid for use in identifying locations described in reports submitted to NYSDEC is provided as Figure 7.

The NYSDEC assigned project number will appear on all reports.

6.3.2 Monthly Reporting

Monthly reports will be submitted to NYSDEC and NYSDOH Project Managers by the 10th day of the following month 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.);
- Photographs of the work completed during the reporting period;
- Description of approved activity modifications, including changes to 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.

6.3.3 Other Reporting

Photographs will be taken of all remedial activities and submitted to NYSDEC 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 included in the daily reports as needed, and a comprehensive collection of photos will be included in the Final Engineering Report.

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.

6.3.4 Complaint Management Plan

All complaints received will be logged in by the Site Superintendent and reported in the daily report. Each complaint will be investigated as to its validity, the source determined, and a resolution adopted. Once a remedy has been put in place it will be recorded with the original complaint and reported in the daily report.

7.0 REMEDIAL ACTION IMPLEMENTATION: EXCAVATION

As discussed in Section 5.3, the components of the remedial action include excavation and off-Site disposal of soil above the Restricted-Residential Use SCOs and Protection of Groundwater SCOs for applicable contaminants to a depth of 30 ft-bg. The applicable SCOs are presented in Table 2.

The Site will be excavated to at least 30 ft-bg within the proposed building footprint. As further described below, the major components of the excavation remedial action include characterization for disposal, implementation of the SMMP and CAMP, excavation and off-Site disposal of impacted materials, closure of any encountered USTs, and end-point sampling.

Based on the maximum detected concentration of PCE, the soil does not appear to be F- or D-list hazardous; therefore, a contained-in determination will not be required.

Potential migration of off-Site contamination onto the Site will not affect the future use of the building due to the installation, operation and maintenance of a vapor barrier and a composite cover system.

7.1 Estimated Material Removal Quantities

The estimated quantity of soil/fill to be removed from the Site for remedial and development purposes is approximately 10,500 cubic yards (CY).

7.2 Soil Characterization

All soil will be disposed in accordance with NYSDEC requirements, which will require characterization sampling. Soil samples will be collected according to a grid system, as shown on Figure 8. Discrete and composite samples will be collected and analyzed in accordance with typical disposal facility requirements in order to characterize the soil. Samples will be field composited (as necessary), labeled and submitted for laboratory analysis. A field record, including PID readings, will be kept to document the materials encountered and support all sampling decisions. All samples will be analyzed for VOCs, SVOCs, pesticides, PCBs and metals on the New York Part 375 SCOs and CP-51 lists and the New Jersey combined Soil Cleanup Criteria lists. In addition, samples will be analyzed for total petroleum hydrocarbons (TPH), toxicity characteristic leachate procedure (TCLP) metals, RCRA characteristics and paint filter test (PFT). These analyses are commonly required by regulated disposal facilities.

Approximately 10,500 CY of soil will be generated during excavation for the basement. At a rate of approximately one sample per 8,000 CY and based on the Site geometry, 14 samples will be collected in order to characterize this volume of soil. This sample frequency reflects typical disposal facility requirements for soils generated in New York City. Please note that there is no standard number of samples or analytes required for all facilities and, therefore, additional samples or analytes may be required at a later date.

7.3 Soil/Materials Management Plan (SMMP)

Soil and materials management on-Site will be conducted in accordance with the SMMP and as described below. The main goal of the SMMP is to handle all potentially contaminated soil and manage activities associated with soil in a manner that prevents contamination from reaching the community, workers, future occupants and workers, and the environment. Contaminated soil must be managed in a manner that ensures removal, transport, and disposal such that it fulfills applicable regulatory requirements. The means and methods to meet this goal are included in the SMMP, included as Appendix E.

7.4 Community Air Monitoring Plan (CAMP)

The main goal of the CAMP is to keep objectionable odors, VOCs and/or particulates from reaching the surrounding community. The NYSDOH Generic CAMP, which includes monitoring for VOCs and particulates, will be implemented.

Should objectionable odors be produced during excavation, the area to be disturbed at any one time will be limited and, if necessary, foam cover will be utilized (Rusmar Incorporated AC-645 Long Duration Foam or approved equivalent), following the manufacturer's recommended application rate.

The CAMP is included as Appendix A.

7.5 Materials Transport Off-Site

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

31st Street is a two-way street, with traffic northeast to southwest. 32nd Street is a cul-de-sac, with an outlet at Ditmars Boulevard. Trucks should not leave the Site from 32nd Street. Trucks leaving the Site from 31st Street will travel northeast, turn left onto 20th Avenue, turn left onto 21st Street, and turn left onto Hoyt Avenue South. For travel south or east, trucks will continue onto Astoria Boulevard and merge onto the Grand Central Parkway or the Brooklyn-Queens Expressway (BQE). For travel to facilities to the north or west, turn left onto 33rd Street, and use the left lane to merge onto I-278 E/RFK Bridge. A map showing the truck routes is included as Figure 9.

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) limiting total distance to major highways; (d) promoting safety in access to highways; and, (e) overall safety in transport. All trucks loaded with Site materials will exit the vicinity of the Site using only the most-current New York City Department of Transportation (NYCDOT)-approved truck routes (currently the 2011-2012 New York City Truck Route Map).

Trucks will be prohibited from stopping and idling in the neighborhood outside the project Site. Egress points for truck and equipment transport from the Site will be kept clean of dirt and other materials during Site remediation and development.

Material transported by trucks exiting the Site will be secured with covers. If loads contain wet material capable of producing free liquid, truck liners will be used.

All trucks will be washed prior to entering the City streets. Truck wash waters will be collected and disposed through the dewatering system.

7.6 UST Removal

No known USTs are present at the Site. Any encountered USTs will be registered and closed in conformance with all applicable federal, state and local regulations, including those defined in DER-10 and 6NYCRR Parts 612 and 613. USTs will be registered with NYSDEC. NYSDEC will be notified seven days prior to removal of any USTs. USTs will be removed by a contractor licensed by the New York City Fire Department (FDNY) in accordance with the procedures set forth in the American Petroleum Institute (API) Recommended Practice 1604 entitled "Removal and Disposal of Used Underground Storage Tanks".

7.7 Monitoring Well Decommissioning

Existing monitoring wells that will not be part of the long-term monitoring will be decommissioned in accordance with NYSDEC Groundwater Monitoring Well Decommissioning Policy (CP-43), dated November 3, 2009.

7.8 Remedial Performance Evaluation (Post-Excavation End-Point Sampling)

End-point samples will be collected from the base of the excavation every 900 square feet (SF) and from the sidewalls of the excavation every 30 linear feet (LF), in accordance with DER-10. The end-point samples will be analyzed for VOCs, SVOCs, pesticides, PCBs and metals. Figure 10 presents a generalized post-excavation sampling location map. End-point samples will be collected from the base of and sidewalls of the excavation for the building.

Chemical labs used for all end-point sample results and contingency sampling will be NYSDOH ELAP certified.

All post-excavation sample results will be compared with the Unrestricted Use and Restricted-Residential Use SCOs. Any soils not meeting the Restricted-Residential Use within the building excavation will be removed and the area backfilled with clean fill meeting the criteria outlined in this RAWP. The Unrestricted Use and Restricted-Residential Use SCOs are listed in Tables 1 and 2, respectively. Site-specific SCOs will be negotiated with NYSDEC if the end-point samples do not meet the Restricted-Residential Use SCOs. The Restricted-Residential Use SCOs are listed in Table 2.

7.8.1 Quality Assurance / Quality Control (QA/QC)

A Quality Assurance Project Plan (QAPP) detailing the frequency of sample collection, analytical methods and the quality standards that must be achieved by the analytical laboratory is included as Appendix F.

The QAPP includes provisions for trip blanks, field blanks, duplicates, matrix spike and matrix spike duplicate (MS/MSD) samples. The QAPP also describes field sampling procedures.

7.8.2 Data Usability Summary Report (DUSR)

A qualified data validator will prepare a Data Usability Report (DUSR). The DUSR will be prepared according to the guidelines contained in Appendix 2B of DER-10.

7.8.3 Reporting of End-Point Data in FER

The FER will provide a tabular and map summary of all end-point sample results and exceedances of SCOs.

8.0 REMEDIAL ACTION IMPLEMENTATION: GROUNDWATER TREATMENT

As discussed in Section 5.3, the components of the remedial action to address groundwater impacts include additional on-site sampling and, if necessary, injection of chemicals to address residual cVOC contamination.

As necessary, the groundwater in the source area will be treated with a combination of Regenesis 3-D Microemulsion® and CRS® Chemical Reducing Solution.

8.1 Groundwater Investigation (Pre-Design)

A groundwater investigation will be completed in the area of the dry cleaner further characterize the shallow, horizontal extent of the dissolved cVOC impacts. Based on the drilling machine required due to the depth to groundwater and the lithology, the sampling cannot be completed until the building is demolished.

The groundwater investigation will consist of collecting groundwater samples at select locations in order to horizontally delineate shallow, dissolved cVOC impacts. Sample locations are shown on Figure 11. Samples will be collected from temporary well points installed with a direct-push Geoprobe®.

Samples will be collected using low-flow techniques in accordance with EPA Region 1 Low-Stress (Low-Flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells. (EQASOP-GW 001 Revision 3 dated July 30, 1996 Revised: January 19, 2010), with the exception that the groundwater interface cannot be continually monitored given the narrow diameter sampler.

Each temporary point will be abandoned by pressure grouting through the probe rod during sampler retrieval in accordance with NYSDEC Groundwater Monitoring Well Decommissioning Policy (CP-43), dated November 3, 2009.

Samples will be analyzed for VOCs.

8.2 Chemical Injections

In the event that elevated cVOC impacts are detected on-site in the shallow aquifer, as determined by the sampling described in Section 8.1, in-situ chemical injections will be completed below development depth.

Based on pre-remedy groundwater concentrations, Regenesis confirmed that the combination of 3-D Microemulsion® and CRS® Chemical Reducing Solution would be appropriate for the detected compounds.

Based on information from Regenesis, the 3-D Microemulsion is an injectable electron donor emulsion designed to enhance the reductive dechlorination process. CRS is an iron-based

amendment for in-situ chemical reduction (ISCR) of halogenated hydrocarbon contaminants, such as PCE. CRS is designed to precipitate reduced iron sulfides, oxides, and/or hydroxides that are capable of breaking down chlorinated solvents. Toxic by-products are not associated with CRS injection.

Prior to the full implementation of this technology, laboratory and on-site pilot scale studies may be conducted to more clearly define design parameters and a Remedial Design Plan will be submitted to NYSDEC for review and approval.

The application of either compound, regardless of the method, is considered a Class V Well under the EPA Underground Injection Control (UIC) Program. Class V Wells are "used to inject non-hazardous fluids underground". A UIC Permit will be obtained prior to application of either compound.

8.4 Remedial Performance Evaluation (Post-Remediation Groundwater Sampling)

Post-remedial groundwater sampling will be completed in accordance with a Site Management Plan (SMP). It is anticipated that groundwater samples will be collected quarterly for two years (i.e., eight quarters). Proposed post-remedial groundwater monitoring well locations are shown on Figure 12. Samples will be collected in accordance with the QAPP and results will be reported in the Annual Report required by the SMP, as detailed in Section 11.2.

All existing wells will be decommissioned in accordance with Section 7.7 and post-remedial monitoring wells will be installed in accordance with the SMP.

Groundwater samples will be analyzed for VOCs..

9.0 RESIDUAL CONTAMINATION TO REMAIN ON-SITE

The successful implementation of the Remedial Action will result in the following:

- All soil left on-Site will meet the Restricted-Residential Use or applicable Protection of Groundwater SCOs.
- Residual contamination may remain in the groundwater and soil vapor but on-site sources will be removed and groundwater will be treated, as necessary, with the goal of eventually meeting the Class GA Standards.

Since residual contaminated groundwater and soil vapor may remain after the remedy is complete, Engineering and Institutional Controls (ECs and ICs) are required to protect human health and the environment. These ECs and ICs are described below. Long-term management of EC/ICs and of residual contamination will be executed under a Site-specific Site Management Plan (SMP) that will be developed and included in the FER.

ECs will be implemented to protect public health and the environment by appropriately managing residual contamination. The Controlled Property (the Site) will have at least three, and potentially four, primary EC systems. This is:

- Vapor Barrier,
- Composite Cover System; and,
- Post-Remedial Groundwater Monitoring.

Based on post-remedial soil vapor sampling, the following additional EC may be required:

- Sub-slab Depressurization System.

The vapor barrier and composite cover system would be long-term ECs. While post-remedial groundwater monitoring is part of the selected remedy, it is presented as an EC because it will continue after the FER and SMP are submitted. The SSDS, if required, will be a long-term EC. The FER will report residual contamination on the Site in tabular and map form, including any exceedances of the Unrestricted Use or Protection of Groundwater SCOs.

10.0 ENGINEERING CONTROLS

10.1 Engineering Control Systems - On Site

As discussed above, three or four engineering controls (ECs) will be utilized at the Site: a vapor barrier, a composite cover systerm, post-remedial groundwater monitoring and, if necessary, an SSDS. The ECs will be established in an Environmental Easement assigned to the property by the titleholder and will be implemented under a SMP. The post-remedial groundwater monitoring is considered an EC only because it will be implemented following submittal of the FER. The conceptual approach, general system design, maintenance and monitoring (OM&M) requirements and criteria for termination of each of these systems are described below.

10.1.1 Description of Engineering Controls

10.1.1.1 Vapor Barrier and Composite Cover System

Exposure to soil, groundwater and soil vapor associated with residual contaminated groundwater and/or soil would be prevented by a vapor barrier and an engineered, composite cover system that will be constructed on the Site.

The composite cover system will be the concrete building slab. A vapor barrier will be installed beneath the minimum four-inch thick slab to minimize the potential for vapor intrusion. A W. R. Grace & Company (Grace) PrePrufe 160R (32-mil) and StegoWrap (15-mil) vapor barrier system would be installed. The vapor barrier will be applied to the bottom (StegoWrap) of the building slab and all sub-grade vertical walls (Preprufe 160R).

The vapor barrier will be installed in accordance with the manufacturer's specifications. The StegoWrap will be installed over a level and compacted base. The membrane will be placed with the smooth-side down and the plastic liner-side up. The plastic liner will be removed and discarded. Sheets will be overlapped by four inches and sealed using Stego Tape. Penetrations will be sealed using Stego Mastic. The PrePrufe® 160R be installed on the vertical walls. All surfaces will be smooth with no gaps or voids greater than 0.5 inch. All penetrations will be grouted. The membrane will be supported during installation. The membrane will be attached to the wall and rolled to ensure a wateright seal. The sheets will be overlapped and sealed according to the manufacturer's specifications (minimum 3 inches for PrePrufe® 160R with seam taped using Preprufe® Tape LT). Penetrations will be sealed using Grace Bituthene Liquid Membrane.

The extent of the vapor barrier, a cross section showing typical details and the vapor barrier specifications are included in Appendix H.

The location of each potential remedial cover type used on the Site is shown on Figure 13. The SMP will outline the procedures required in the event the vapor barrier and composite cover system and underlying residual contamination are disturbed and planned inspections of the composite cover system.

10.1.1.2 *Post-Remedial Groundwater Monitoring*

Elevated levels of VOCs have been detected in the groundwater at the Site. Residual contaminants may remain following implementation of the remedial action and, if necessary, the groundwater will be treated with injections of chemicals to destroy the bulk of any remaining contaminants.

Groundwater will be monitored by sampling existing and newly-installed monitoring wells, as shown on Figure 12. The well along 32nd Street will serve as an upgradient sample location.

New wells will be installed using hollow-stem auger. At each location a seven-foot, 20-slot PVC screen will be installed in the top five feet of groundwater. The wells will be constructed by placing a filter pack of sand in the annular space around the screens that will extend two feet above the screen. The annular area around the well casing will be sealed with bentonite pellets for an interval of two feet. A grout, consisting of a cement and bentonite mixture or an anti-shrink mixture, will then extend from the bentonite pellet seal to two feet below the cap. The remaining annular space will be sealed with a concrete cap and well apron (expanding cement). A locking well cap will be installed upon completion of the well.

All monitoring wells will be developed on the day they are installed by pumping using dedicated Teflon tubing. Turbidity will be measured using a nephelometer, and the well developed until the reading is 50 Nephelometric Turbidity Units (NTU) or less, or until at least three well volumes have been evacuated.

The monitoring wells will be sampled at least ten days after development. All sampling equipment will be decontaminated prior to use. Prior to sampling, water levels will be measured using an electronic product-water level indicator. Samples will be collected using low-flow techniques in accordance with EPA Region 1 Low-Stress (Low-Flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells. (EQASOP-GW 001 Revision 3 dated July 30, 1996 Revised: January 19, 2010).

Long-term monitoring (eight quarterly events) of the groundwater will be conducted to determine the efficacy of the Remedial Action. All quarterly monitoring samples will be analyzed for VOCs.

10.1.1.3 *Sub-Slab Depressurization System, if necessary*

If necessary, an active SSDS will be installed to minimize the potential for vapor intrusion (in combination with the vapor barrier). The potential system designs and layouts are shown on drawings X-100 (below grade components), X-101 (pressure monitoring points) and X-102 (roof) and the details are shown on drawing X-103, located in Appendix I. The principal components of the SSDS are a layer of gravel beneath the concrete slab, a network of slotted and solid-construction piping beneath the concrete slab, solid-construction piping from sub-grade network of piping to the roof. If the system is active, an exterior suction fan will be placed on the roof and temporary and permanent pressure-monitoring points will be placed through the concrete slab.

A passive system would be vented based on changes in ambient barometric pressure. The goal of an active system is to create a pressure differential of at least -0.02 inches of water column (in-

wc) between the indoor and sub-slab environments. An alarm system will be installed that will notify the building management if a drop in pressure indicates that the system is not operating as designed. The system has been designed in general accordance with NYSDOH's Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006 (NYSDOH Soil Vapor Guidance), including Section 4.2.2, *System-specific recommendations*. The exhaust location will be located on the roof and meet the requirements of the NYSDOH Soil Vapor Guidance, specifically Section 4.2.2 c (6), which reads:

> To avoid entry of extracted subsurface vapors into the building, the vent pipe's exhaust should be:
>
> i. above the eave of the roof (preferably, above the highest eave of the building at least 12 inches above the surface of the roof),
>
> ii. at least 10 feet above ground level,
>
> iii. at least 10 feet away from any opening that is less than 2 feet below the exhaust point, and
>
> iv. 10 feet from any adjoining or adjacent buildings, or HVAC intakes or supply registers.

In order to size the fan, if required, a blower test will be performed after the sub-grade components and cellar slab are installed. A Site Management Plan (SMP) will be prepared following the implementation of the RAWP and kept at the Site.

Initial Start-Up Prior to Building Occupancy for an Active System
After the system has been installed, the following will be completed to ensure that that system meets the remedial goal of a -0.02 in-wc or greater pressure differential.

- Visual inspection of basement slab for any cracks or holes. If any are identified, they will be sealed.
- Measurement of the sub-slab pressure at temporary and permanent pressure-monitoring points to ensure that the remedial goal of -0.02 in-wc has been achieved. If the start-up is not conducted during heating season, the pressure differential will also be measured during heating season to ensure that the remedial goal of -0.02 in-wc has been achieved.
- If appliances that rely on natural draft for exhaust of carbon monoxide and other combustion gases are identified, the potential for back draft will be tested. The potential for back draft will be determined using a carbon monoxide meter. If any back draft is identified, it will be corrected.

A written record of the annual monitoring will be kept with the SMP. If any of the above items suggest that the SSDS may have been impacted beyond the need for routine maintenance, the building management will contact an environmental professional. If the operation of the SSDS has been impacted, NYSDEC will be contacted. If non-routine maintenance or repairs are required based on the annual inspection or an alarm condition, the system will be restarted as described in the "Initial Start-Up Prior to Building Occupancy" section.

10.1.2 Criteria for Termination of Remedial Systems

10.1.2.1 *Vapor Barrier and Composite Cover System*

The vapor barrier and composite cover system are long-term ECs and will be maintained throughout the life of the building. Any breaches of the vapor barrier or composite cover will be repaired in accordance with the SMP.

10.1.2.2 *Post-Remedial Groundwater Monitoring*

Groundwater monitoring to assess the efficacy of the Remedial Action is planned for eight quarters after the completion of the Remedial Action.

Monitoring will continue until permission to discontinue is granted in writing by NYSDEC and NYSDOH. Monitoring activities will be outlined in the SMP.

10.1.2.3 *Sub-Slab Depressurization System, if necessary*

The operation of the SSDS will not be discontinued without written approval by NYSDEC and NYSDOH. A proposal to discontinue the SSDS may be made based on confirmatory sampling.

11.0 INSTITUTIONAL CONTROLS

An Institutional Control (IC) will be required to manage residual contamination on Site and to ensure that the Site EC remains protective of public health and the environment. The ICs consist of two elements designed to ensure continual and proper management of residual contamination in perpetuity: an Environmental Easement and a Site Management Plan.

A Site-specific Environmental Easement, as defined in Article 71 Title 36 of the Environmental Conservation Law, will be recorded with Kings 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.

11.1 Environmental Easement

The Environmental Easement renders the Site a Controlled Property. The Environmental Easement must be recorded with the Kings County Office of the City Register before the Certificate of Completion can be issued by NYSDEC. A series of Institutional Controls are required under this remedy to implement, maintain and monitor these Engineering Control systems, prevent future exposure to residual contamination by controlling disturbances of the subsurface soil and restricting the use of the Site to residential, restricted residential, commercial or industrial use(s) only. These Institutional Controls are requirements or restrictions placed on the Site that are 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 Institutional Controls that support Engineering Controls are:

- Compliance with the Environmental Easement by the Grantee and the Grantee's successors and adherence of all elements of the SMP is required;
- All Engineering Controls must be operated and maintained as specified in this SMP;
- All Engineering Controls on the Controlled Property must be inspected and certified at a frequency and in a manner defined in the SMP;
- Groundwater and other environmental or public health 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 a series of Institutional Controls in the form of Site restrictions and requirements. The Site restrictions that apply to the Controlled Property are:

- Use of groundwater underlying the Controlled Property is prohibited without treatment rendering it safe for intended purpose;
- All future activities on the Controlled Property that will disturb residual contaminated material are prohibited unless they are conducted in accordance with the soil management provisions in the Site Management Plan;
- The Controlled Property may be used for residential, restricted residential, commercial or industrial use only, provided the long-term Engineering and Institutional Controls included in the Site Management Plan are employed;
- The Controlled Property may not be used for a higher level of use, such as unrestricted use without an amendment or extinguishment of the Environmental Easement;
- Grantor agrees to submit to NYSDEC a written statement that certifies, under penalty of perjury, that: (1) controls employed at the Controlled Property are unchanged from the previous certification or that any changes to the controls were approved by the NYSDEC; and, (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP. NYSDEC retains the right to access such Controlled Property at any time in order to evaluate the continued maintenance of any and all controls. This certification shall be submitted annually, or an alternate period of time that NYSDEC may allow. This [time period] statement must be certified by an expert that the NYSDEC finds acceptable.

The Environmental Easement will incorporate the ICs required to implement, maintain and monitor the ECs, prevent future exposure to residual contamination by controlling disturbances of the subsurface soil and restrict the use of the Site to commercial uses only, unless discontinued or modified with the approval of NYSDEC.

The Environmental Easement for the controlled property will include the following requirements:

- requires the remedial party or Site owner to complete and submit to NYSDEC a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
- allows the use and development of the controlled property for residential, restricted residential, commercial and industrial uses as defined by Part 375-1.8(g), although land use is subject to local zoning laws;

- restricts the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or the New York City Department of Health (NYCDOH); and
- requires compliance with the NYSDEC-approved SMP.

11.2 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 SMP is submitted as part of the FER, but will be written as a complete and independent document. Site management requirements continue 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 SMP 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 of a plan to operate and maintain any treatment, collection, containment, or recovery systems (including, where appropriate, preparation of an Operation and Maintenance Manual); and (3) submittal of Site Management Reports, performance of inspections and certification of results, and demonstration of proper communication of Site information to NYSDEC.

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 (O&M) Plan for implementation of remedial containment systems; and (4) a Site Management Reporting Plan for submittal of data, information, recommendations, and certifications to NYSDEC.

Site management activities, reporting, and EC/IC certification will be scheduled on a certification period basis. The certification period will be annually. The Periodic Review Report (PRR) submitted under the SMP will be based on a calendar year. The first PRR will be submitted to the NYSDEC within 15 months after the date of COC issuance. Any lapses in the engineering or institutional controls noted in the PRR will be required to be corrected expeditiously and the NYSDEC notified of the correction. The SMP will include the following:

1. Introduction with purpose, summary of remediation and site conditions;
2. Institutional and Engineering Control Plan;
3. O&M Plan;
4. Site Monitoring Plan;
5. Site maintenance requirements;
6. Citizen Participation Plan;
7. Personnel organization and responsibilities;
8. Health and Safety Plan;
9. Records and forms;
10. Emergency Contingency Plan; and

11. Copies of Environmental Easement and applicable Site plans, including electronic versions.

The Institutional and Engineering Control Plan will include, but is not limited to:

- descriptions of the provisions of the environmental easement including any land use and groundwater use restrictions;
- a provision for evaluation of the potential for soil vapor intrusion for any buildings developed on the site, including a provision for implementing actions recommended to address exposures related to soil vapor intrusion;
- provisions for the management and inspection of the identified engineering controls; and,
- maintaining site access controls and NYSDEC notification; and the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

The O&M Plan will include, but is not limited to:

- compliance monitoring of treatment systems to ensure proper O&M as well as providing the data for any necessary permit or permit equivalent reporting;
- maintaining site access controls and Department notification; and
- providing NYSDEC access to the site and O&M records.

The Site Monitoring Plan will include, but is not limited to:

- monitoring of groundwater to assess the performance and effectiveness of the remedy;
- a schedule of monitoring and frequency of submittals to NYSDEC; and,
- monitoring for soil vapor intrusion for any buildings developed on the site, as may be required by the Institutional and Engineering Control Plan discussed above.

The Site Management Reporting Plan will include, but is not limited to:

- Details regarding post-COC reporting requirements, including a schedule
- The contents of the annual report, including:
    - an evaluation of the EC/ICs, EC/IC certifications, results of period Site inspections and deliverables to be generated;
    - frequency and type of the EC/IC and Site inspections;
    - inspection forms, sampling data and maintenance reports;
    - an evaluation of records and reporting; and,
    - corrective measure plans.

12.0 FINAL ENGINEERING REPORT

A Final Engineering Report (FER) will be submitted to the NYSDEC Project Manager within 90 days of completing the remedial action. 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, calculation and manufacturer documentation for treatment systems, 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.

The Final Engineering Report will include written and photographic documentation of all remedial work performed under this remedy. Photographs will be taken of all remedial activities and submitted to NYSDEC in digital format after completion of active Site remediation. 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). Each CD will have a label and a general file inventory structure that separates photos into directories and sub-directories according to logical Remedial Measure components. A photo log keyed to photo file ID numbers will be prepared to provide explanation for all representative photos.

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 left on the Site after the remedy is complete. Residual contamination includes all contamination that exceeds the Track 1 Unrestricted Use SCO in 6NYCRR Part 375-6. A table that shows exceedances from Track 1 Unrestricted 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 1 Unrestricted SCOs for all soil/fill remaining at the Site after the Remedial Action will be included in the FER.

The Final Engineering Report 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

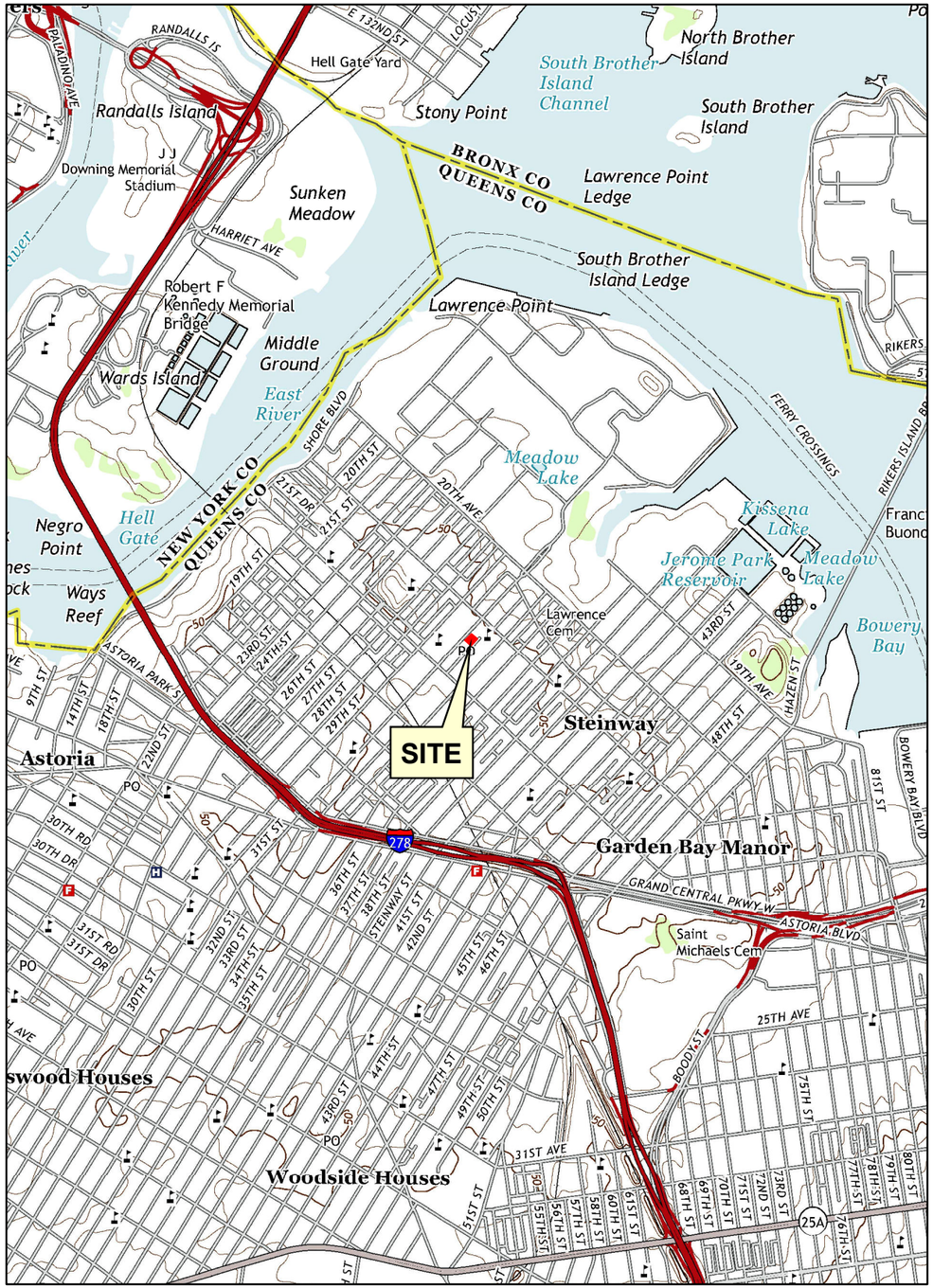
all material must also include records and approvals for receipt of the material. It will provide an accounting of the origin and chemical quality of all material imported onto the Site.

This FER will include the following:

1. Certification by the RE that the data generated is useable and meets the remedial requirements;
2. Certification by the RE that any financial assurance mechanisms required by the NYSDEC have been executed;
3. Certification by the RE that the remedial work conformed to the RAWP;
4. Certification by the RE that dust, odor, and vapor control measures were implemented during invasive work and conformed with the RAWP;
5. Certification by the RE that all the remedial waste was transported and disposed in accordance with the RAWP;
6. Certification by the RE that the source approval and sampling of imported acceptable fill was completed in a manner consistent with the methodology of the RAWP;
7. Summary of the remedy and all remedial actions completed;
8. Description of any problems encountered and their resolutions;
9. Description of the deviations from the approved RAWP;
10. Listing of waste streams, quantity of materials disposed, and where they were disposed;
11. Analytical QA/QC completed for the environmental media sampling during the remedial activities, including DUSR or other data validation;
12. List of the remediation standards applied to the remedial actions;
13. List of all applicable local, regional, and national governmental permits, certificates, or other approvals required for the remedial and development work;
14. Tables and figures containing all pre- and post-remedial data, including volumes of soil removed (as applicable);
15. Description of source and quality of fill (as applicable);
16. "As-built" drawings including remediation areas, waterproofing and permanent composite cover structures;
17. Air quality and dust monitoring data, including any supporting documentation on the decisions made based on the data;
18. Copies of all the submitted periodic reports; and
19. Copies of all manifests of off-site transport of waste material.

Before approval of a FER and issuance of a Certificate of Completion, all documents and reports will be submitted to the NYSDEC will be in both hard copy and in digital format on CD. These digital documents shall be in PDF form and, where appropriate, supplemented by photos and Microsoft Excel files. Laboratory analytical data will be submitted in an electronic data deliverable (EDD) format that complies with the NYSDEC's electronic data warehouse standards.

Figures



Basemap: USGS Central Park - NY-NJ Quandrangle, 2013
http://www.usgs.gov

Site Location

0 1,000 2,000 4,000 Feet

http://gis.nyc.gov/taxmap/map.htm

Department of Finance Digital Tax Map

0 50 100 200 Feet

Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
NYC Department of City Planning, Information Technology Division

Department of City Planning MapPLUTO - 2016 v2

0 50 100 200 Feet

21-25 31st Street Queens, New York Block 831, Lot 20

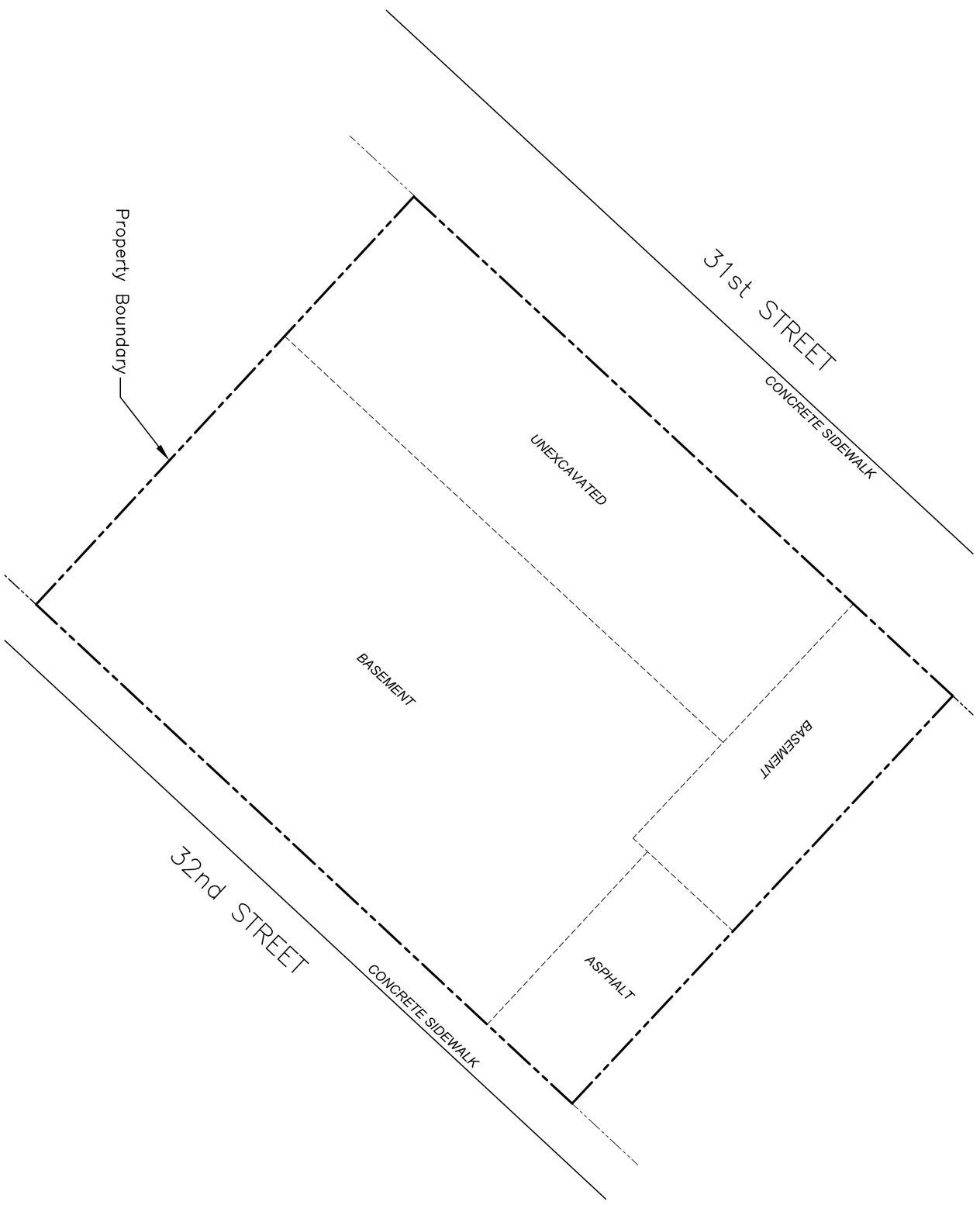
Client

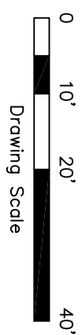
TENEN ENVIRONMENTAL
Tenen Environmental, LLC
121 West 27th Street
Suite 702
New York, NY 10001
O: (646) 606-2332
F: (646) 606-2379

Drawn By	Checked By	Date	Scale
LM	MC	March 2017	As Noted

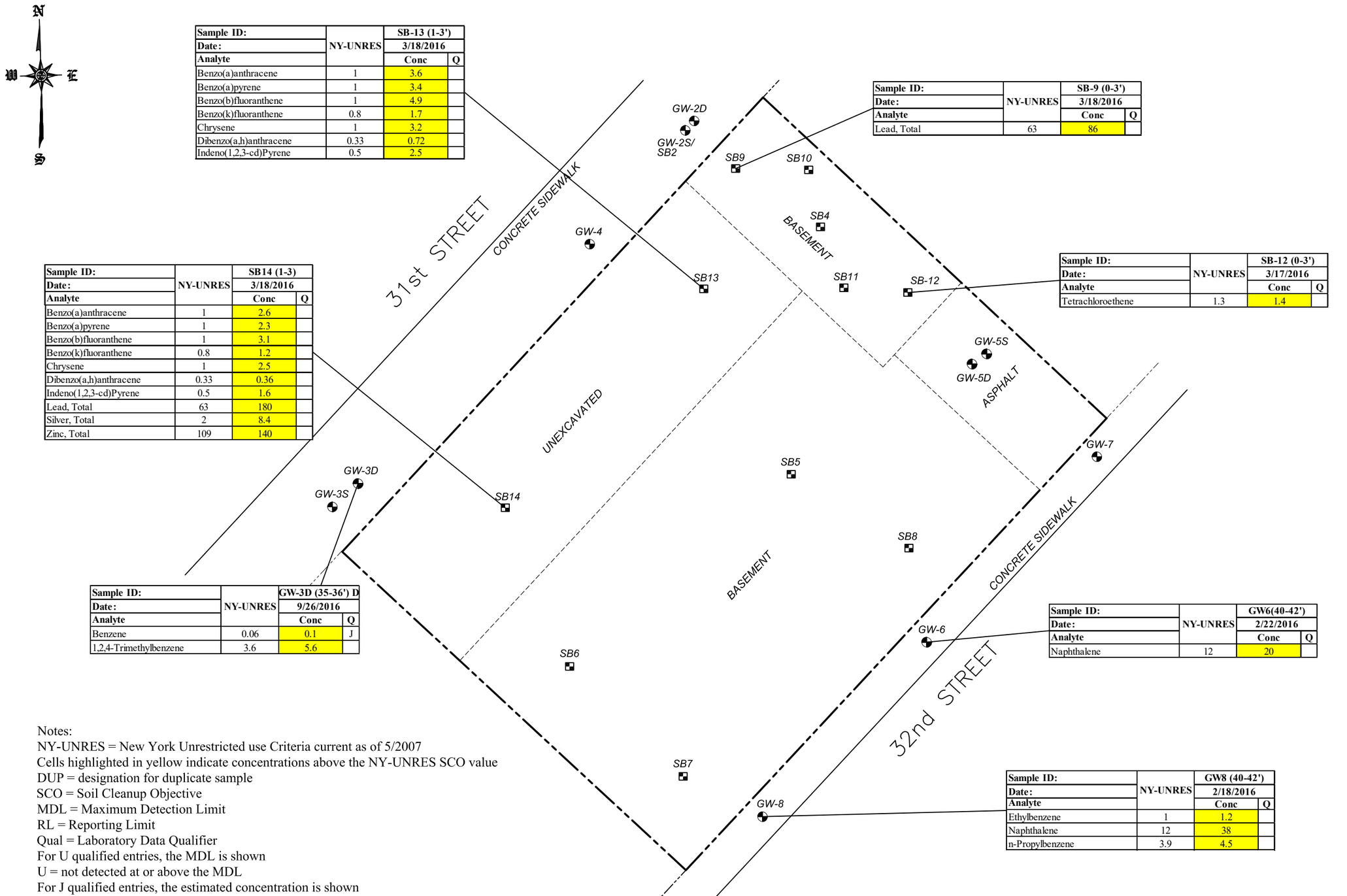
Drawing Title: **Site Location Map**

Drawing No: **Figure 1**





DRAWING TITLE. Site Layout	DRAWN BY LM CHECKED BY SB	CONSULTANT TENEN ENVIRONMENTAL TENEN ENVIRONMENTAL, LLC 121 West 27th Street Suite 702 New York, NY 10001 O: 646-606-2332 F: 646-606-2379	SITE BCP Site #C241167 21-25 31st Street Queens, New York
DRAWING NO. Figure 2	DATE March 2017 SCALE: AS NOTED		



Sample ID:	NY-UNRES	SB-13 (1-3')	
Date:		3/18/2016	
Analyte		Conc	Q
Benzo(a)anthracene	1	3.6	
Benzo(a)pyrene	1	3.4	
Benzo(b)fluoranthene	1	4.9	
Benzo(k)fluoranthene	0.8	1.7	
Chrysene	1	3.2	
Dibenzo(a,h)anthracene	0.33	0.72	
Indeno(1,2,3-cd)Pyrene	0.5	2.5	

Sample ID:	NY-UNRES	SB-9 (0-3')	
Date:		3/18/2016	
Analyte		Conc	Q
Lead, Total	63	86	

Sample ID:	NY-UNRES	SB14 (1-3)	
Date:		3/18/2016	
Analyte		Conc	Q
Benzo(a)anthracene	1	2.6	
Benzo(a)pyrene	1	2.3	
Benzo(b)fluoranthene	1	3.1	
Benzo(k)fluoranthene	0.8	1.2	
Chrysene	1	2.5	
Dibenzo(a,h)anthracene	0.33	0.36	
Indeno(1,2,3-cd)Pyrene	0.5	1.6	
Lead, Total	63	180	
Silver, Total	2	8.4	
Zinc, Total	109	140	

Sample ID:	NY-UNRES	SB-12 (0-3')	
Date:		3/17/2016	
Analyte		Conc	Q
Tetrachloroethene	1.3	1.4	

Sample ID:	NY-UNRES	GW-3D (35-36') D	
Date:		9/26/2016	
Analyte		Conc	Q
Benzene	0.06	0.1	J
1,2,4-Trimethylbenzene	3.6	5.6	

Sample ID:	NY-UNRES	GW6(40-42')	
Date:		2/22/2016	
Analyte		Conc	Q
Naphthalene	12	20	

Sample ID:	NY-UNRES	GW8 (40-42')	
Date:		2/18/2016	
Analyte		Conc	Q
Ethylbenzene	1	1.2	
Naphthalene	12	38	
n-Propylbenzene	3.9	4.5	

Notes:
NY-UNRES = New York Unrestricted use Criteria current as of 5/2007
Cells highlighted in yellow indicate concentrations above the NY-UNRES SCO value
DUP = designation for duplicate sample
SCO = Soil Cleanup Objective
MDL = Maximum Detection Limit
RL = Reporting Limit
Qual = Laboratory Data Qualifier
For U qualified entries, the MDL is shown
U = not detected at or above the MDL
For J qualified entries, the estimated concentration is shown
J = estimated value, indicating the detected value is below the RL, but above the MDL
Results and MDL values are in milligrams per kilogram (mg/kg)
Soil sample depths shown in feet (ft) within sample location
-- = No standard

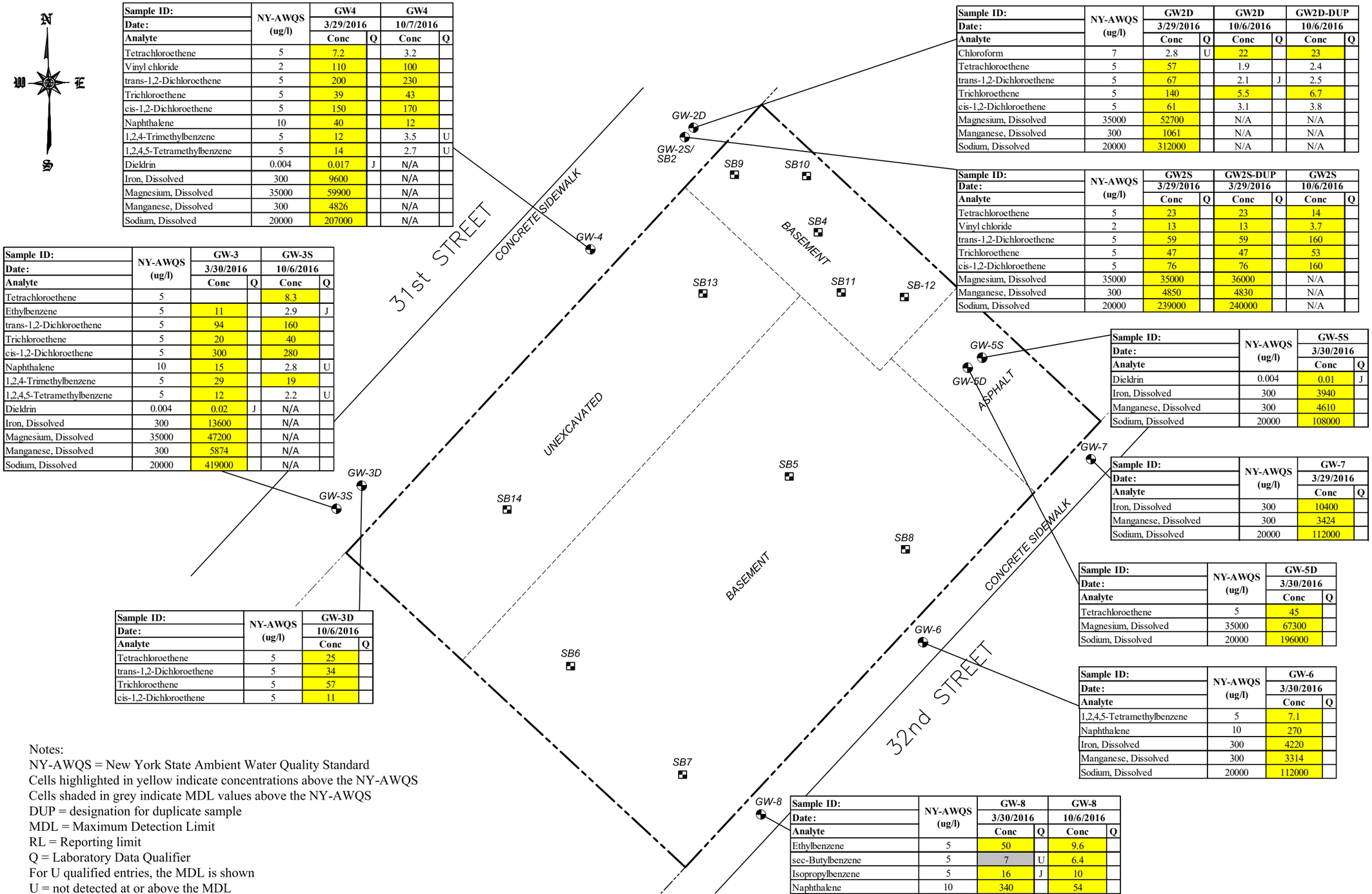
SITE
BCP Site #C241167
21-25 31st Street
Queens, New York

CONSULTANT
TENEN ENVIRONMENTAL
TENEN ENVIRONMENTAL, LLC
121 West 27th Street
Suite 702
New York, NY 10001
O: 646-606-2332
F: 646-606-2379

DRAWN BY: LM
CHECKED BY: SB
DATE: March 2017
SCALE: AS NOTED

DRAWING TITLE: Summary of Soil Concentrations above Unrestricted Use SCOs

DRAWING NO.: Figure 3



Sample ID:	NY-AWQS (ug/l)	GW4		GW4	
Date:		3/29/2016		10/7/2016	
Analyte		Conc	Q	Conc	Q
Tetrachloroethene	5	7.2		3.2	
Vinyl chloride	2	110		100	
trans-1,2-Dichloroethene	5	200		230	
Trichloroethene	5	39		43	
cis-1,2-Dichloroethene	5	150		170	
Naphthalene	10	40		12	
1,2,4-Trimethylbenzene	5	12		3.5	U
1,2,4,5-Tetramethylbenzene	5	14		2.7	U
Dieldrin	0.004	0.017	J	N/A	
Iron, Dissolved	300	9600		N/A	
Magnesium, Dissolved	35000	59900		N/A	
Manganese, Dissolved	300	4826		N/A	
Sodium, Dissolved	20000	207000		N/A	

Sample ID:	NY-AWQS (ug/l)	GW2D		GW2D		GW2D-DUP	
Date:		3/29/2016		10/6/2016		10/6/2016	
Analyte		Conc	Q	Conc	Q	Conc	Q
Chloroform	7	2.8	U	22		23	
Tetrachloroethene	5	57		1.9		2.4	
trans-1,2-Dichloroethene	5	67		2.1	J	2.5	
Trichloroethene	5	140		5.5		6.7	
cis-1,2-Dichloroethene	5	61		3.1		3.8	
Magnesium, Dissolved	35000	52700		N/A		N/A	
Manganese, Dissolved	300	1061		N/A		N/A	
Sodium, Dissolved	20000	312000		N/A		N/A	

Sample ID:	NY-AWQS (ug/l)	GW2S		GW2S-DUP		GW2S	
Date:		3/29/2016		3/29/2016		10/6/2016	
Analyte		Conc	Q	Conc	Q	Conc	Q
Tetrachloroethene	5	23		23		14	
Vinyl chloride	2	13		13		3.7	
trans-1,2-Dichloroethene	5	59		59		160	
Trichloroethene	5	47		47		53	
cis-1,2-Dichloroethene	5	76		76		160	
Magnesium, Dissolved	35000	35000		36000		N/A	
Manganese, Dissolved	300	4850		4830		N/A	
Sodium, Dissolved	20000	239000		240000		N/A	

Sample ID:	NY-AWQS (ug/l)	GW-3		GW-3S	
Date:		3/30/2016		10/6/2016	
Analyte		Conc	Q	Conc	Q
Tetrachloroethene	5			8.3	
Ethylbenzene	5	11		2.9	J
trans-1,2-Dichloroethene	5	94		160	
Trichloroethene	5	20		40	
cis-1,2-Dichloroethene	5	300		280	
Naphthalene	10	15		2.8	U
1,2,4-Trimethylbenzene	5	29		19	
1,2,4,5-Tetramethylbenzene	5	12		2.2	U
Dieldrin	0.004	0.02	J	N/A	
Iron, Dissolved	300	13600		N/A	
Magnesium, Dissolved	35000	47200		N/A	
Manganese, Dissolved	300	5874		N/A	
Sodium, Dissolved	20000	419000		N/A	

Sample ID:	NY-AWQS (ug/l)	GW-5S	
Date:		3/30/2016	
Analyte		Conc	Q
Dieldrin	0.004	0.01	J
Iron, Dissolved	300	3940	
Manganese, Dissolved	300	4610	
Sodium, Dissolved	20000	108000	

Sample ID:	NY-AWQS (ug/l)	GW-7	
Date:		3/29/2016	
Analyte		Conc	Q
Iron, Dissolved	300	10400	
Manganese, Dissolved	300	3424	
Sodium, Dissolved	20000	112000	

Sample ID:	NY-AWQS (ug/l)	GW-3D	
Date:		10/6/2016	
Analyte		Conc	Q
Tetrachloroethene	5	25	
trans-1,2-Dichloroethene	5	34	
Trichloroethene	5	57	
cis-1,2-Dichloroethene	5	11	

Sample ID:	NY-AWQS (ug/l)	GW-5D	
Date:		3/30/2016	
Analyte		Conc	Q
Tetrachloroethene	5	45	
Magnesium, Dissolved	35000	67300	
Sodium, Dissolved	20000	196000	

Sample ID:	NY-AWQS (ug/l)	GW-6	
Date:		3/30/2016	
Analyte		Conc	Q
1,2,4,5-Tetramethylbenzene	5	7.1	
Naphthalene	10	270	
Iron, Dissolved	300	4220	
Manganese, Dissolved	300	3314	
Sodium, Dissolved	20000	112000	

Sample ID:	NY-AWQS (ug/l)	GW-8		GW-8	
Date:		3/30/2016		10/6/2016	
Analyte		Conc	Q	Conc	Q
Ethylbenzene	5	50		9.6	
sec-Butylbenzene	5	7	U	6.4	
Isopropylbenzene	5	16	J	10	
Naphthalene	10	340		54	
n-Propylbenzene	5	21	J	9.4	
1,2,4,5-Tetramethylbenzene	5	18	J	4	
Naphthalene	10	12		N/A	
Iron, Dissolved	300	4460		N/A	
Manganese, Dissolved	300	6738		N/A	
Sodium, Dissolved	20000	128000		N/A	

Notes:
NY-AWQS = New York State Ambient Water Quality Standard
Cells highlighted in yellow indicate concentrations above the NY-AWQS
Cells shaded in grey indicate MDL values above the NY-AWQS
DUP = designation for duplicate sample
MDL = Maximum Detection Limit
RL = Reporting limit
Q = Laboratory Data Qualifier
For U qualified entries, the MDL is shown
U = not detected at or above the MDL
For J qualified entries, the estimated concentration is shown
J = estimated value, indicating the detected value is below the RL, but above the MDL
-- = No standard
N/A = Not Analyzed
Results and MDL values are in micrograms per liter (µg/L)

0 10' 20' 40'
Drawing Scale

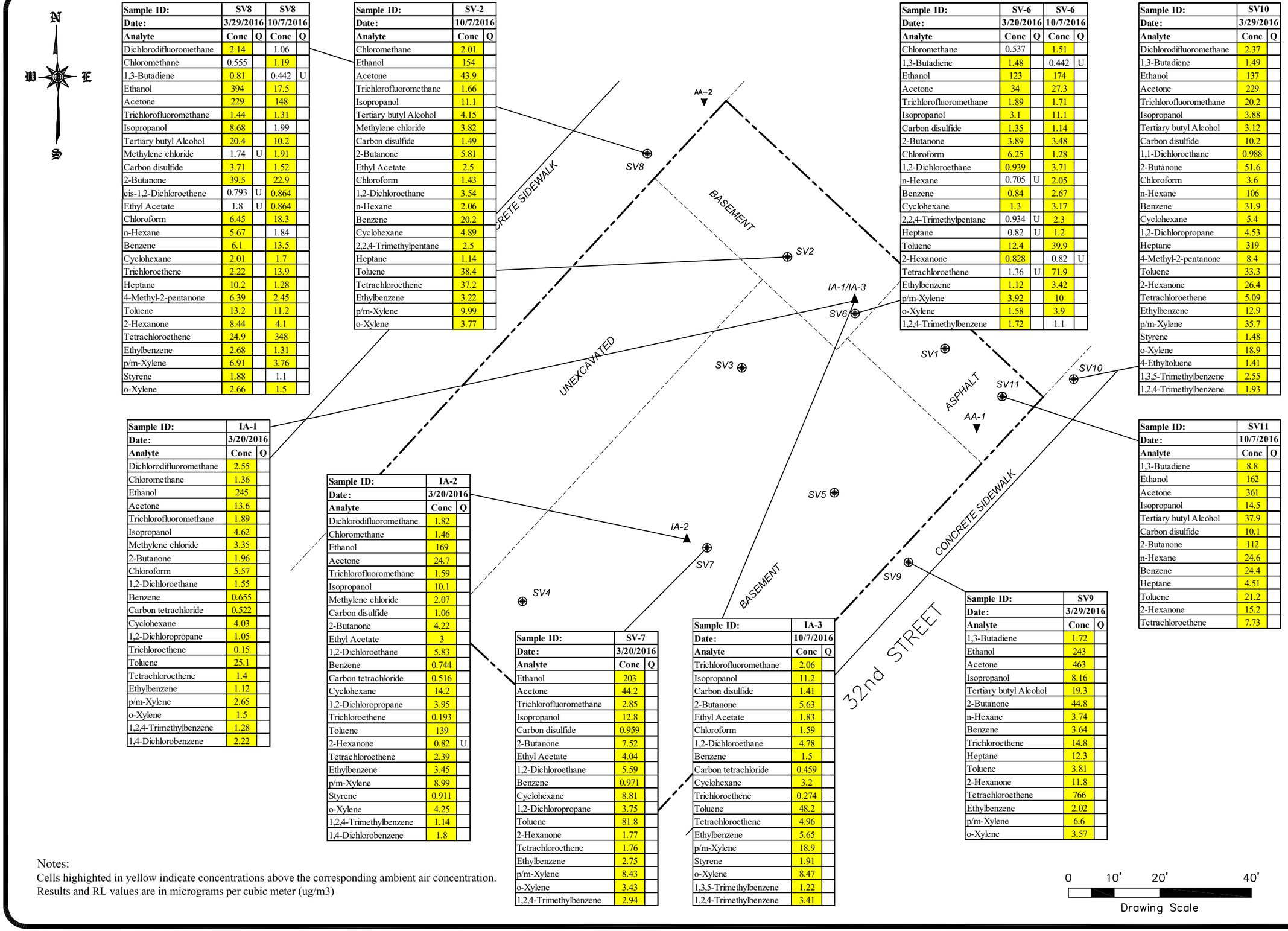
SITE
BCP Site #C241167
21-25 31st Street
Queens, New York

CONSULTANT
TENEN ENVIRONMENTAL
TENEN ENVIRONMENTAL, LLC
121 West 27th Street
Suite 702
New York, NY 10001
O: 646-606-2332
F: 646-606-2379

DRAWN BY	CHECKED BY	DATE	SCALE:
LM	SB	March 2017	AS NOTED

DRAWING TITLE:
Summary of Groundwater Concentrations above Class GA Standards

DRAWING NO.
Figure 4



Sample ID:	SV8		SV8	
Date:	3/29/2016		10/7/2016	
Analyte	Conc	Q	Conc	Q
Dichlorodifluoromethane	2.14		1.06	
Chloromethane	0.555		1.19	
1,3-Butadiene	0.81		0.442	U
Ethanol	394		17.5	
Acetone	229		148	
Trichlorofluoromethane	1.44		1.31	
Isopropanol	8.68		1.99	
Tertiary butyl Alcohol	20.4		10.2	
Methylene chloride	1.74	U	1.91	
Carbon disulfide	3.71		1.52	
2-Butanone	39.5		22.9	
cis-1,2-Dichloroethene	0.793	U	0.864	
Ethyl Acetate	1.8	U	0.864	
Chloroform	6.45		18.3	
n-Hexane	5.67		1.84	
Benzene	6.1		13.5	
Cyclohexane	2.01		1.7	
Trichloroethene	2.22		13.9	
Heptane	10.2		1.28	
4-Methyl-2-pentanone	6.39		2.45	
Toluene	13.2		11.2	
2-Hexanone	8.44		4.1	
Tetrachloroethene	24.9		348	
Ethylbenzene	2.68		1.31	
p/m-Xylene	6.91		3.76	
Styrene	1.88		1.1	
o-Xylene	2.66		1.5	

Sample ID:	SV-2	
Date:	10/7/2016	
Analyte	Conc	Q
Chloromethane	2.01	
Ethanol	154	
Acetone	43.9	
Trichlorofluoromethane	1.66	
Isopropanol	11.1	
Tertiary butyl Alcohol	4.15	
Methylene chloride	3.82	
Carbon disulfide	1.49	
2-Butanone	5.81	
Ethyl Acetate	2.5	
Chloroform	1.43	
1,2-Dichloroethane	3.54	
n-Hexane	2.06	
Benzene	20.2	
Cyclohexane	4.89	
2,2,4-Trimethylpentane	2.5	
Heptane	1.14	
Toluene	38.4	
Tetrachloroethene	37.2	
Ethylbenzene	3.22	
p/m-Xylene	9.99	
o-Xylene	3.77	

Sample ID:	SV-6		SV-6	
Date:	3/20/2016		10/7/2016	
Analyte	Conc	Q	Conc	Q
Chloromethane	0.537		1.51	
1,3-Butadiene	1.48		0.442	U
Ethanol	123		174	
Acetone	34		27.3	
Trichlorofluoromethane	1.89		1.71	
Isopropanol	3.1		11.1	
Carbon disulfide	1.35		1.14	
2-Butanone	3.89		3.48	
Chloroform	6.25		1.28	
1,2-Dichloroethane	0.939		3.71	
n-Hexane	0.705	U	2.05	
Benzene	0.84		2.67	
Cyclohexane	1.3		3.17	
2,2,4-Trimethylpentane	0.934	U	2.3	
Heptane	0.82	U	1.2	
Toluene	12.4		39.9	
2-Hexanone	0.828		0.82	U
Tetrachloroethene	1.36	U	71.9	
Ethylbenzene	1.12		3.42	
p/m-Xylene	3.92		10	
o-Xylene	1.58		3.9	
1,2,4-Trimethylbenzene	1.72		1.1	

Sample ID:	SV10
Date:	3/29/2016
Analyte	Conc	Q
Dichlorodifluoromethane	2.37	
1,3-Butadiene	1.49	
Ethanol	137	
Acetone	229	
Trichlorofluoromethane	20.2	
Isopropanol	3.88	
Tertiary butyl Alcohol	3.12	
Carbon disulfide	10.2	
1,1-Dichloroethane	0.988	
2-Butanone	51.6	
Chloroform	3.6	
n-Hexane	106	
Benzene	31.9	
Cyclohexane	5.4	
1,2-Dichloropropane	4.53	
Heptane	319	
4-Methyl-2-pentanone	8.4	
Toluene	33.3	
2-Hexanone	26.4	
Tetrachloroethene	5.09	
Ethylbenzene	12.9	
p/m-Xylene	35.7	
Styrene	1.48	
o-Xylene	18.9	
4-Ethyltoluene	1.41	
1,3,5-Trimethylbenzene	2.55	
1,2,4-Trimethylbenzene	1.93	

Sample ID:	IA-1	
Date:	3/20/2016	
Analyte	Conc	Q
Dichlorodifluoromethane	2.55	
Chloromethane	1.36	
Ethanol	245	
Acetone	13.6	
Trichlorofluoromethane	1.89	
Isopropanol	4.62	
Methylene chloride	3.35	
2-Butanone	1.96	
Chloroform	5.57	
1,2-Dichloroethane	1.55	
Benzene	0.655	
Carbon tetrachloride	0.522	
Cyclohexane	4.03	
1,2-Dichloropropane	1.05	
Trichloroethene	0.15	
Toluene	25.1	
Tetrachloroethene	1.4	
Ethylbenzene	1.12	
p/m-Xylene	2.65	
o-Xylene	1.5	
1,2,4-Trimethylbenzene	1.28	
1,4-Dichlorobenzene	2.22	

Sample ID:	IA-2	
Date:	3/20/2016	
Analyte	Conc	Q
Dichlorodifluoromethane	1.82	
Chloromethane	1.46	
Ethanol	169	
Acetone	24.7	
Trichlorofluoromethane	1.59	
Isopropanol	10.1	
Methylene chloride	2.07	
Carbon disulfide	1.06	
2-Butanone	4.22	
Ethyl Acetate	3	
1,2-Dichloroethane	5.83	
Benzene	0.744	
Carbon tetrachloride	0.516	
Cyclohexane	14.2	
1,2-Dichloropropane	3.95	
Trichloroethene	0.193	
Toluene	139	
2-Hexanone	0.82	U
Tetrachloroethene	2.39	
Ethylbenzene	3.45	
p/m-Xylene	8.99	
Styrene	0.911	
o-Xylene	4.25	
1,2,4-Trimethylbenzene	1.14	
1,4-Dichlorobenzene	1.8	

Sample ID:	SV-7	
Date:	3/20/2016	
Analyte	Conc	Q
Ethanol	203	
Acetone	44.2	
Trichlorofluoromethane	2.85	
Isopropanol	12.8	
Carbon disulfide	0.959	
2-Butanone	7.52	
Ethyl Acetate	4.04	
1,2-Dichloroethane	5.59	
Benzene	0.971	
Cyclohexane	8.81	
1,2-Dichloropropane	3.75	
Toluene	81.8	
2-Hexanone	1.77	
Tetrachloroethene	1.76	
Ethylbenzene	2.75	
p/m-Xylene	8.43	
o-Xylene	3.43	
1,2,4-Trimethylbenzene	2.94	

Sample ID:	IA-3	
Date:	10/7/2016	
Analyte	Conc	Q
Trichlorofluoromethane	2.06	
Isopropanol	11.2	
Carbon disulfide	1.41	
2-Butanone	5.63	
Ethyl Acetate	1.83	
Chloroform	1.59	
1,2-Dichloroethane	4.78	
Benzene	1.5	
Carbon tetrachloride	0.459	
Cyclohexane	3.2	
Trichloroethene	0.274	
Toluene	48.2	
Tetrachloroethene	4.96	
Ethylbenzene	5.65	
p/m-Xylene	18.9	
Styrene	1.91	
o-Xylene	8.47	
1,3,5-Trimethylbenzene	1.22	
1,2,4-Trimethylbenzene	3.41	

Sample ID:	SV11
Date:	10/7/2016
Analyte	Conc	Q
1,3-Butadiene	8.8	
Ethanol	162	
Acetone	361	
Isopropanol	14.5	
Tertiary butyl Alcohol	37.9	
Carbon disulfide	10.1	
2-Butanone	112	
n-Hexane	24.6	
Benzene	24.4	
Heptane	4.51	
Toluene	21.2	
2-Hexanone	15.2	
Tetrachloroethene	7.73	

Sample ID:	SV9
Date:	3/29/2016
Analyte	Conc	Q
1,3-Butadiene	1.72	
Ethanol	243	
Acetone	463	
Isopropanol	8.16	
Tertiary butyl Alcohol	19.3	
2-Butanone	44.8	
n-Hexane	3.74	
Benzene	3.64	
Trichloroethene	14.8	
Heptane	12.3	
Toluene	3.81	
2-Hexanone	11.8	
Tetrachloroethene	766	
Ethylbenzene	2.02	
p/m-Xylene	6.6	
o-Xylene	3.57	

Notes:
Cells highighted in yellow indicate concentrations above the corresponding ambient air concentration.
Results and RL values are in micrograms per cubic meter (ug/m3)

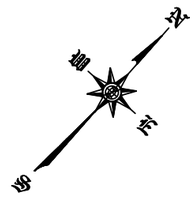
SITE
BCP Site #C241167
21-25 31st Street
Queens, New York

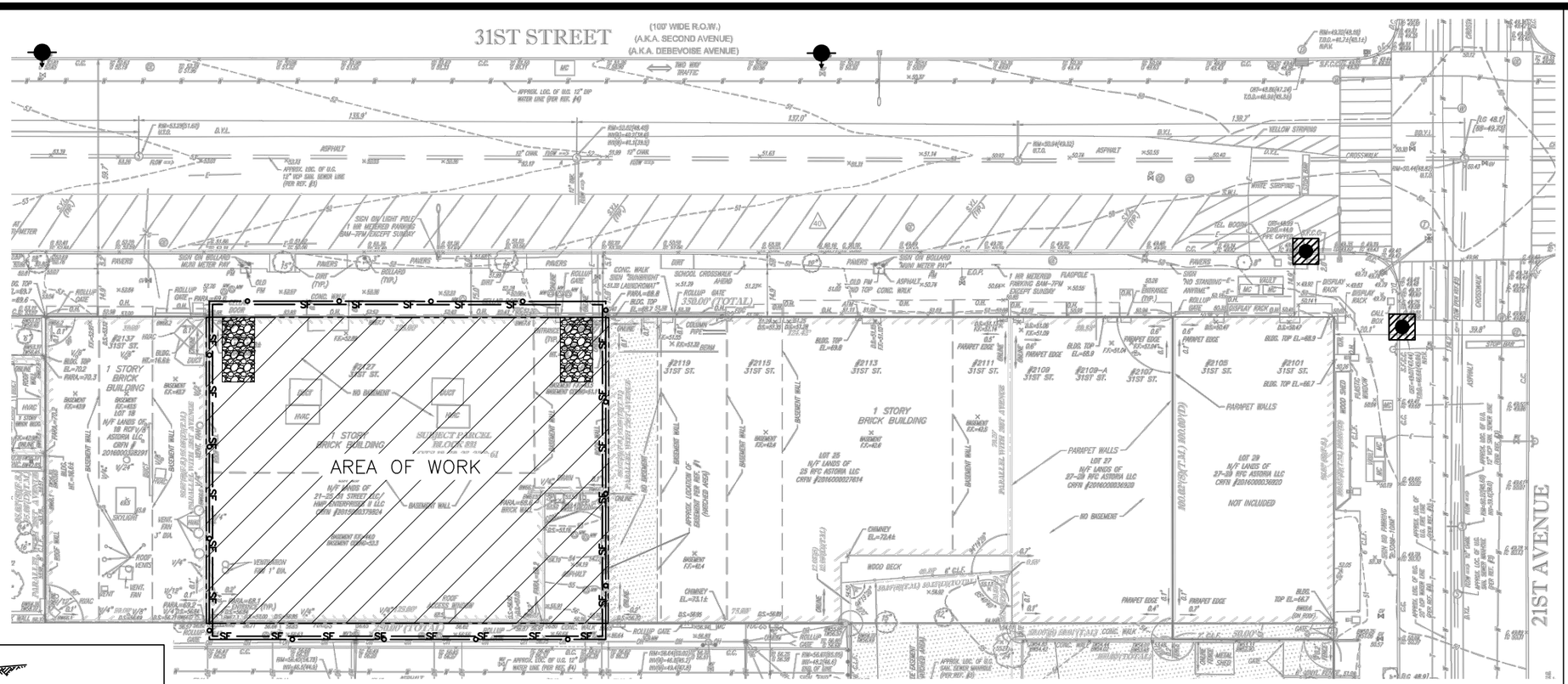
CONSULTANT
TENEN ENVIRONMENTAL
TENEN ENVIRONMENTAL, LLC
121 West 27th Street
Suite 702
New York, NY 10001
O: 646-606-2332
F: 646-606-2379

DRAWN BY: LM
CHECKED BY: SB
DATE: March 2017
SCALE: AS NOTED

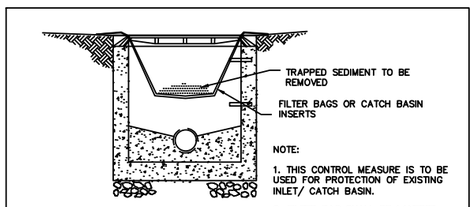
DRAWING TITLE: Summary of VOC Soil Vapor Concentrations

DRAWING NO.: Figure 5

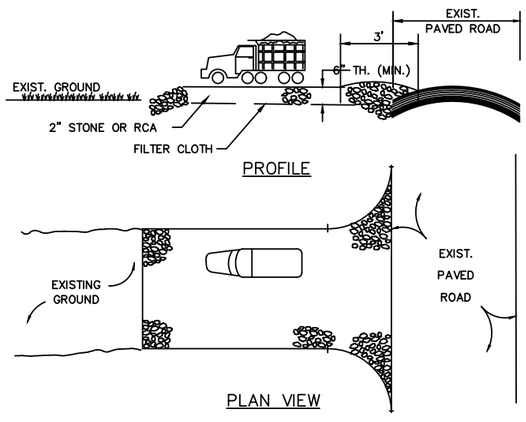




32ND STREET
(A.K.A. LEACH PLACE)



2. INLET PROTECTION FOR EXISTING INLET
N.T.S.



1. STONE SIZE: USE 2" STONE OR RECYCLED CONCRETE AGGREGATE (RCA).

2. LENGTH: 20 FT. MIN

3. THICKNESS: NOT LESS THAN 8 INCHES.

4. WIDTH: 10 FEET MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINT WHERE INGRESS OR EGRESS OCCURS.

5. FILTER CLOTH: WILL BE PLACED OVER ENTIRE AREA PRIOR TO PLACING OF STONES.

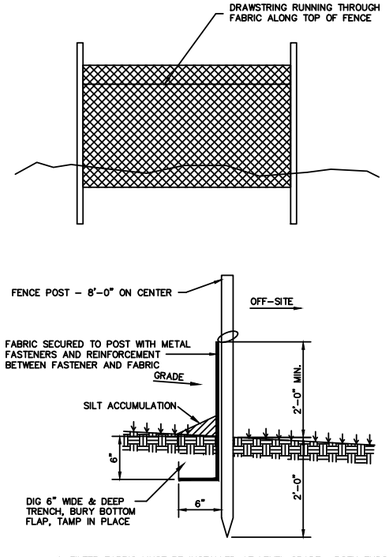
6. MAINTENANCE: THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONES AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHT-OF-WAY MUST BE REMOVED IMMEDIATELY.

7. VEHICLE WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY. WASHING SHALL BE DONE ON AN APPROVED SEDIMENT TRAPPING DEVICE. INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

8. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

1. STABILIZED CONSTRUCTION ENTRANCE
N.T.S.

3. SILT FENCE
N.T.S.



1. FILTER FABRIC MUST BE INSTALLED AT LEVEL GRADE. BOTH ENDS OF EACH FENCE SECTION MUST BE EXTENDED AT LEAST 8 FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT.

2. SEDIMENT MUST BE REMOVED WHERE ACCUMULATIONS REACH 1/2 THE ABOVE GROUND HEIGHT OF THE FENCE.

LEGEND

- STABILIZED CONSTRUCTION ENTRANCE/TRUCK WASH PAD
- HYDRANT
- PROPERTY LINE
- FENCE
- SF — SILT FENCE AT EDGE OF EARTH BERM
- CATCH BASIN

0 20' 40' 80'

Drawing Scale

Basefile Source: Control Point Associates, Inc., PC, New York, NY, Boundary & Topographic Survey Progress Plot, 2107, 2119, 2125, 2137, 31st st. & 3120 21st Ave., Queens, NY, File No. 04-160248, 1/27/2017.

SITE

BCP Site #C241167
21-25 31st Street
Queens, New York

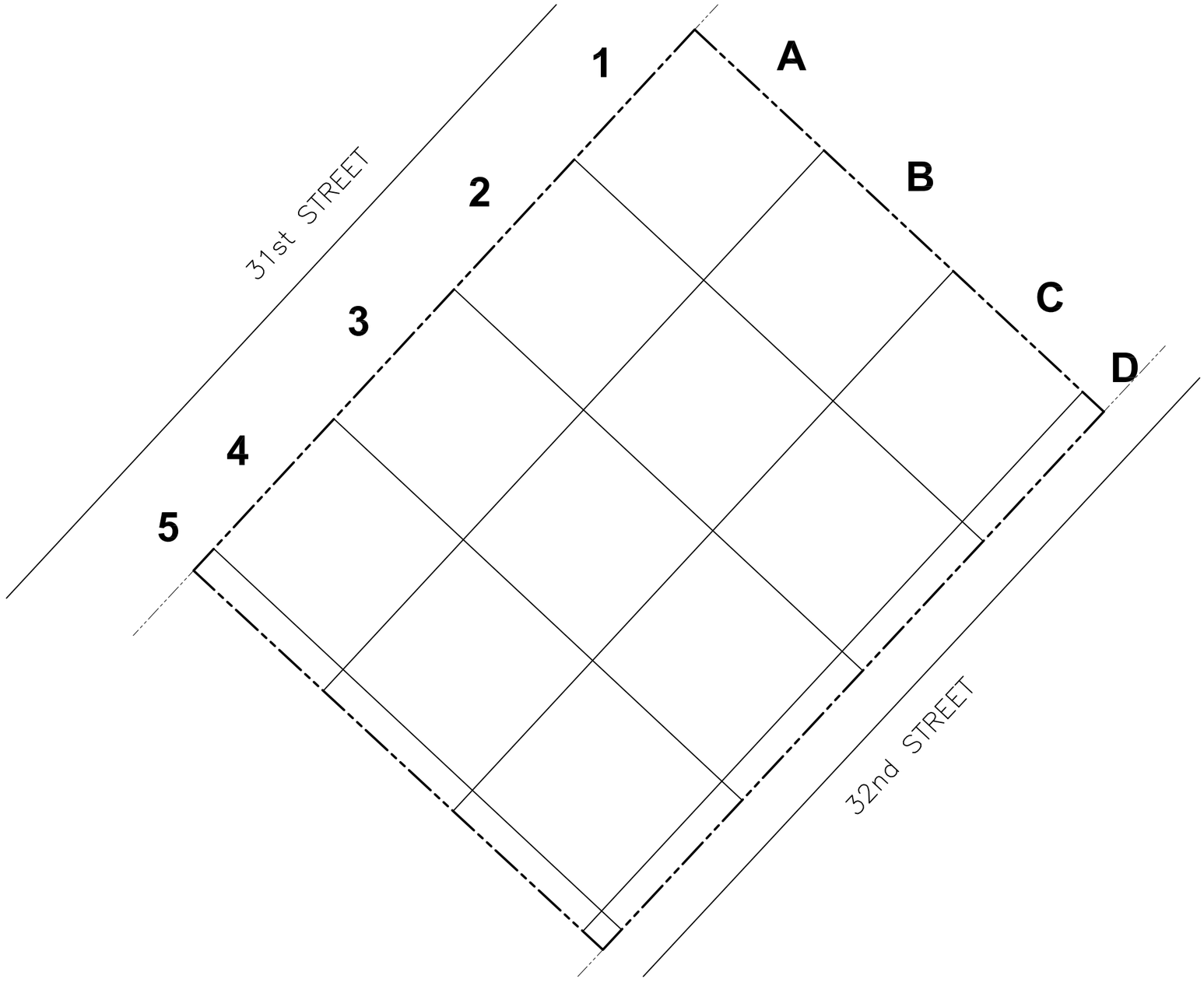
CONSULTANT

TENEN ENVIRONMENTAL, LLC
121 West 27th Street
Suite 702
New York, NY 10001
O: 646-606-2332
F: 646-606-2379

DRAWN BY	CHECKED BY	DATE	SCALE:
LM	SB	March 2017	AS NOTED

DRAWING TITLE: Erosion and Sediment Control Measures

DRAWING NO. Figure 6



SITE

BCP Site #C241167
21-25 31st Street
Queens, New York

CONSULTANT

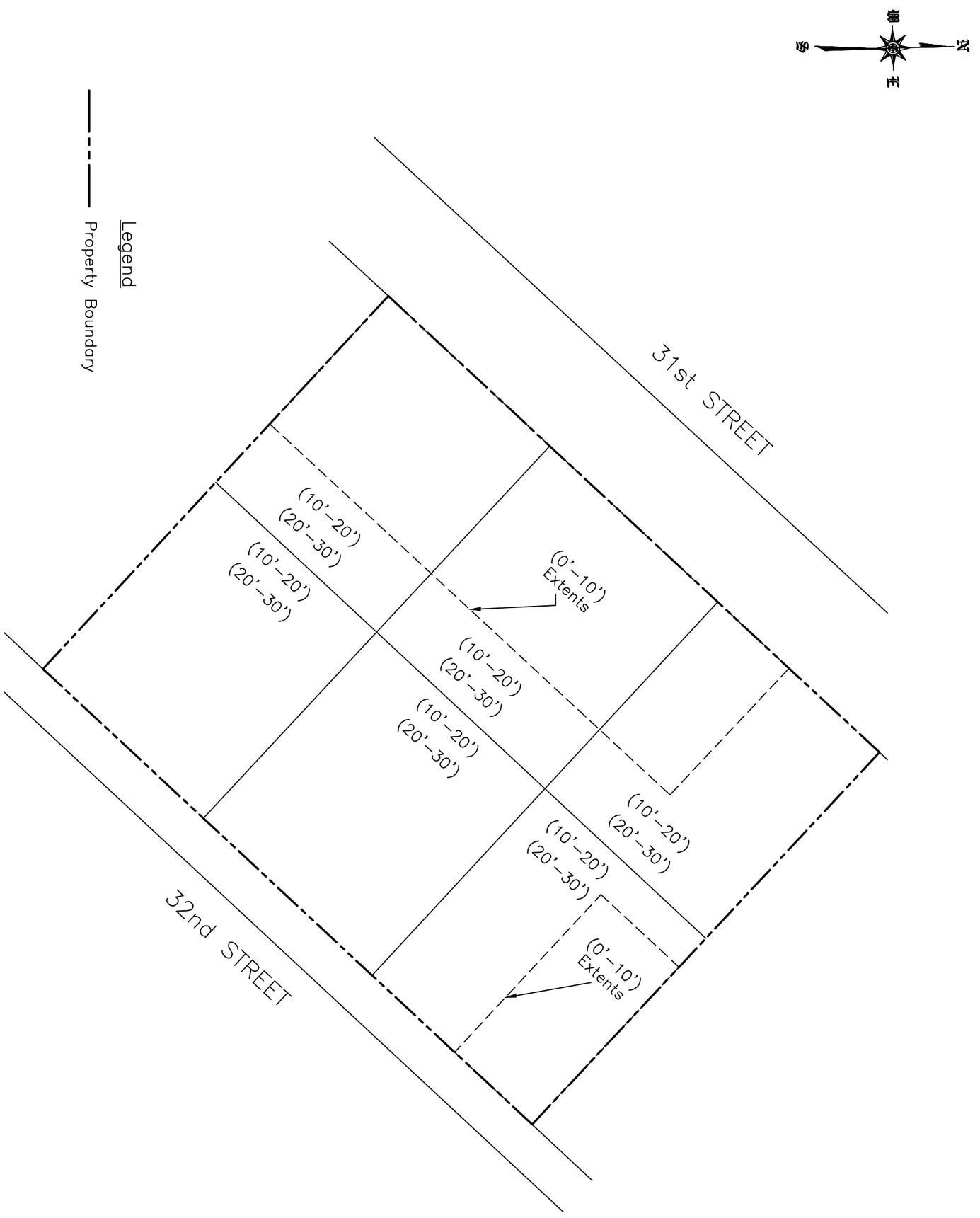
TENEN ENVIRONMENTAL

TENEN ENVIRONMENTAL, LLC
121 West 27th Street
Suite 702
New York, NY 10001
O: 646-606-2332
F: 646-606-2379

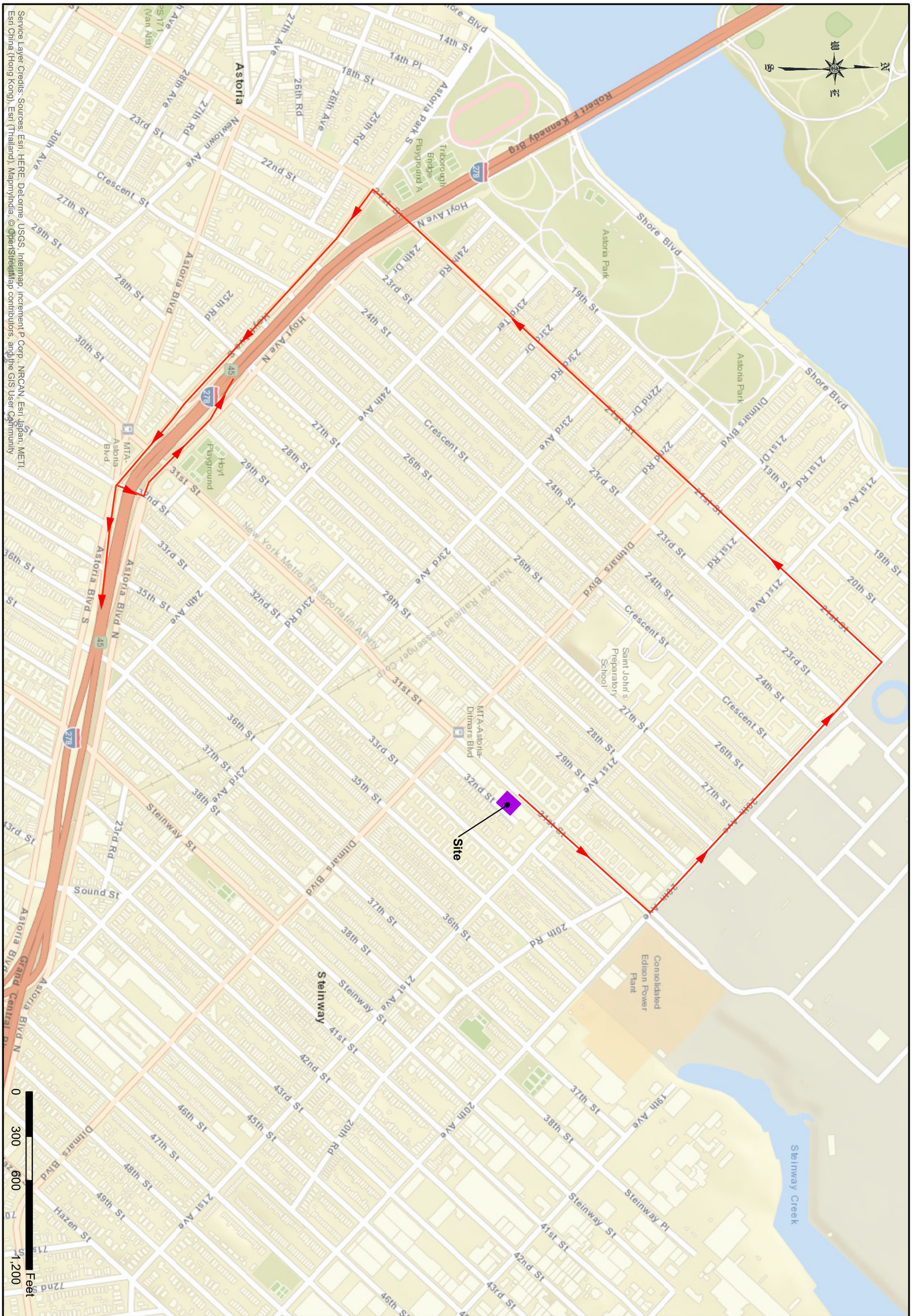
DRAWN BY	LM
CHECKED BY	SB
DATE	March 2017
SCALE:	AS NOTED

DRAWING TITLE: Alphanumeric Grid

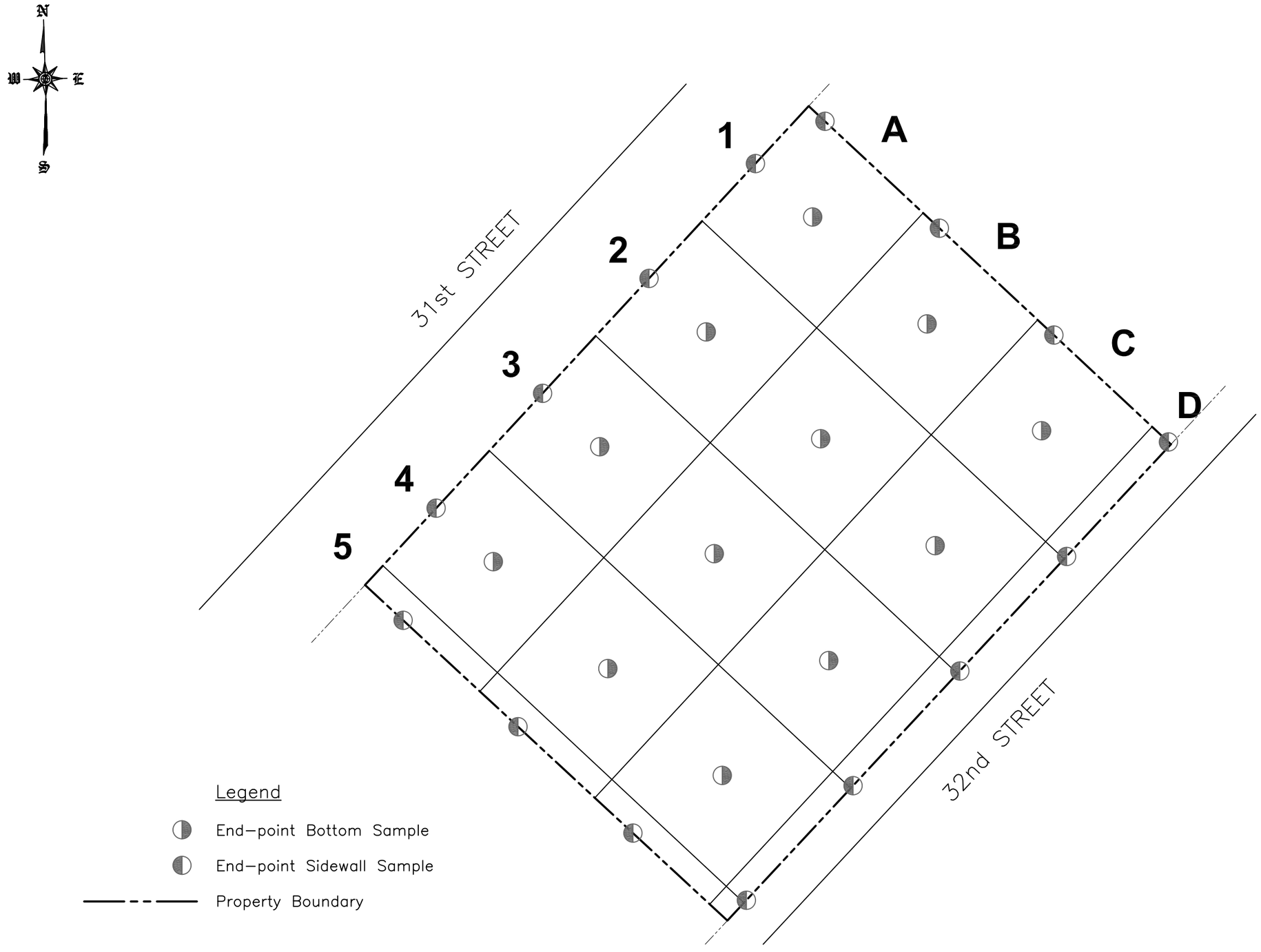
DRAWING NO. Figure 7



DRAWING TITLE. Soil Characterization Grids	DRAWN BY MC	CONSULTANT TENEN ENVIRONMENTAL TENEN ENVIRONMENTAL, LLC 121 West 27th Street Suite 702 New York, NY 10001 O: 646-606-2332 F: 646-606-2379	SITE BCP Site #C241167 21-25 31st Street Queens, New York
	CHECKED BY MM		
DRAWING NO. Figure 8	DATE March 2017		
	SCALE: AS NOTED		



Drawing Title: **Truck Routes**	Drawn By: LM	TENEN ENVIRONMENTAL Tenen Environmental, LLC 121 West 27th Street Suite 702 New York, NY 10001 O: (646) 606-2332 F: (646) 606-2379	Client: **BCP Site #C241167 21-25 31st Street Queens, New York**
	Checked By: SB		
Drawing No: **Figure 9**	Date: March 2017		
	Scale: As Noted		



Legend

- End–point Bottom Sample
- End–point Sidewall Sample
- Property Boundary

Note: If hot–spot excavations are extended below proposed excavation depths, additional end–point samples will be collected in accordance with DER–10 5.4(b)5.

0 10' 20' 40'

Drawing Scale

SITE

BCP Site #C241167
21–25 31st Street
Queens, New York

CONSULTANT

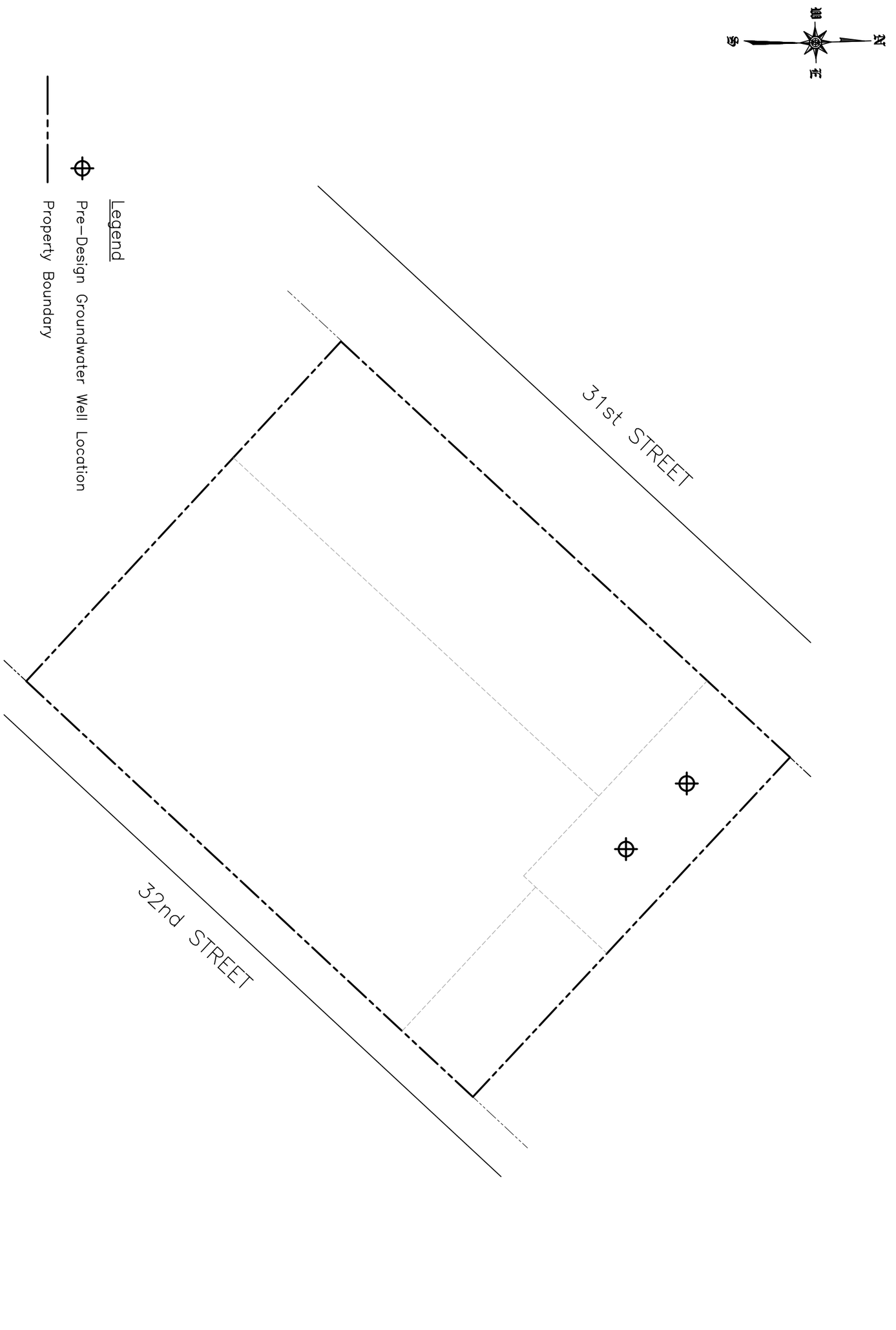
TENEN ENVIRONMENTAL

TENEN ENVIRONMENTAL, LLC
121 West 27th Street
Suite 702
New York, NY 10001
O: 646–606–2332
F: 646–606–2379

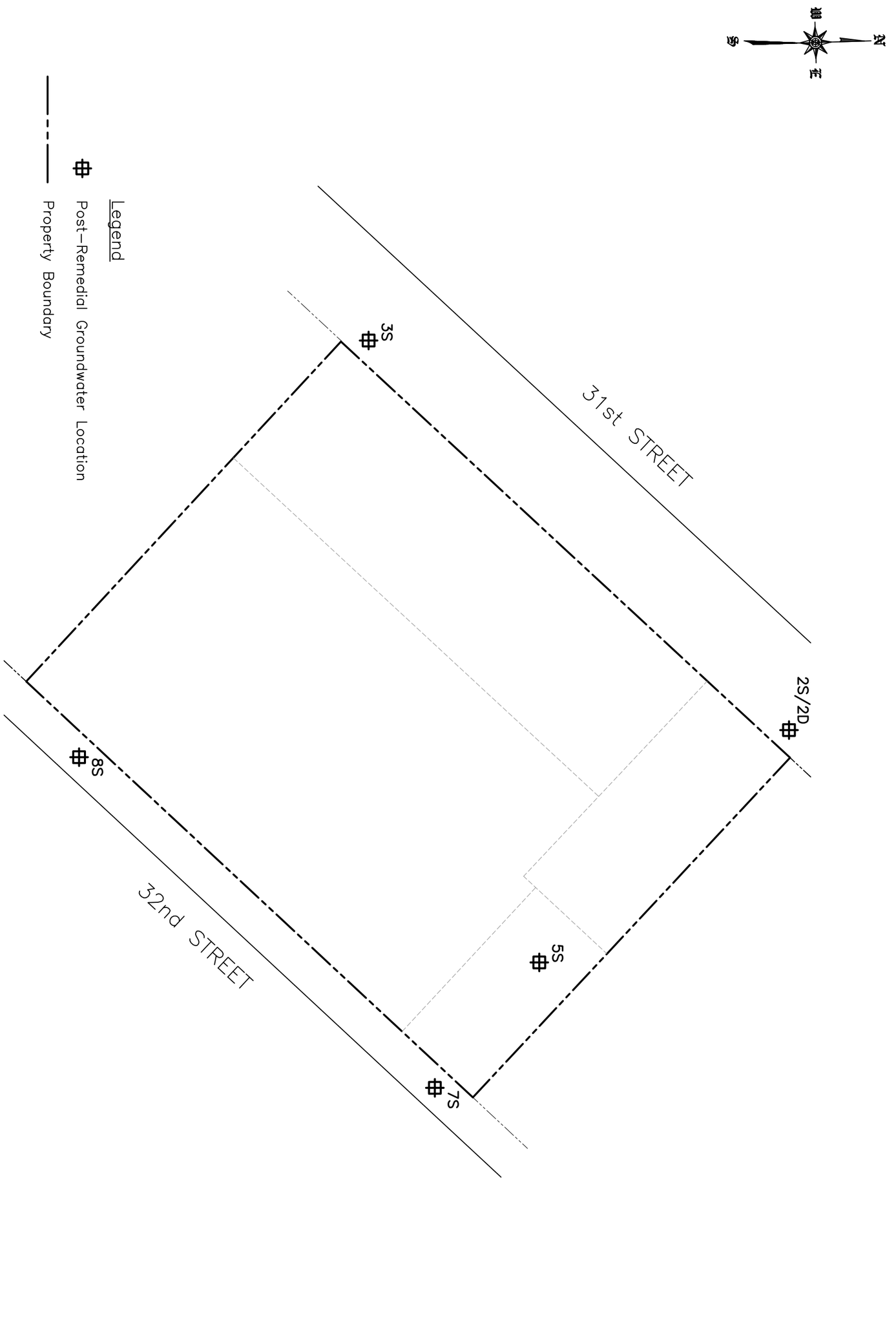
DRAWN BY	CHECKED BY	DATE	SCALE:
LM	SB	March 2017	AS NOTED

DRAWING TITLE: End–Point Sample Locations

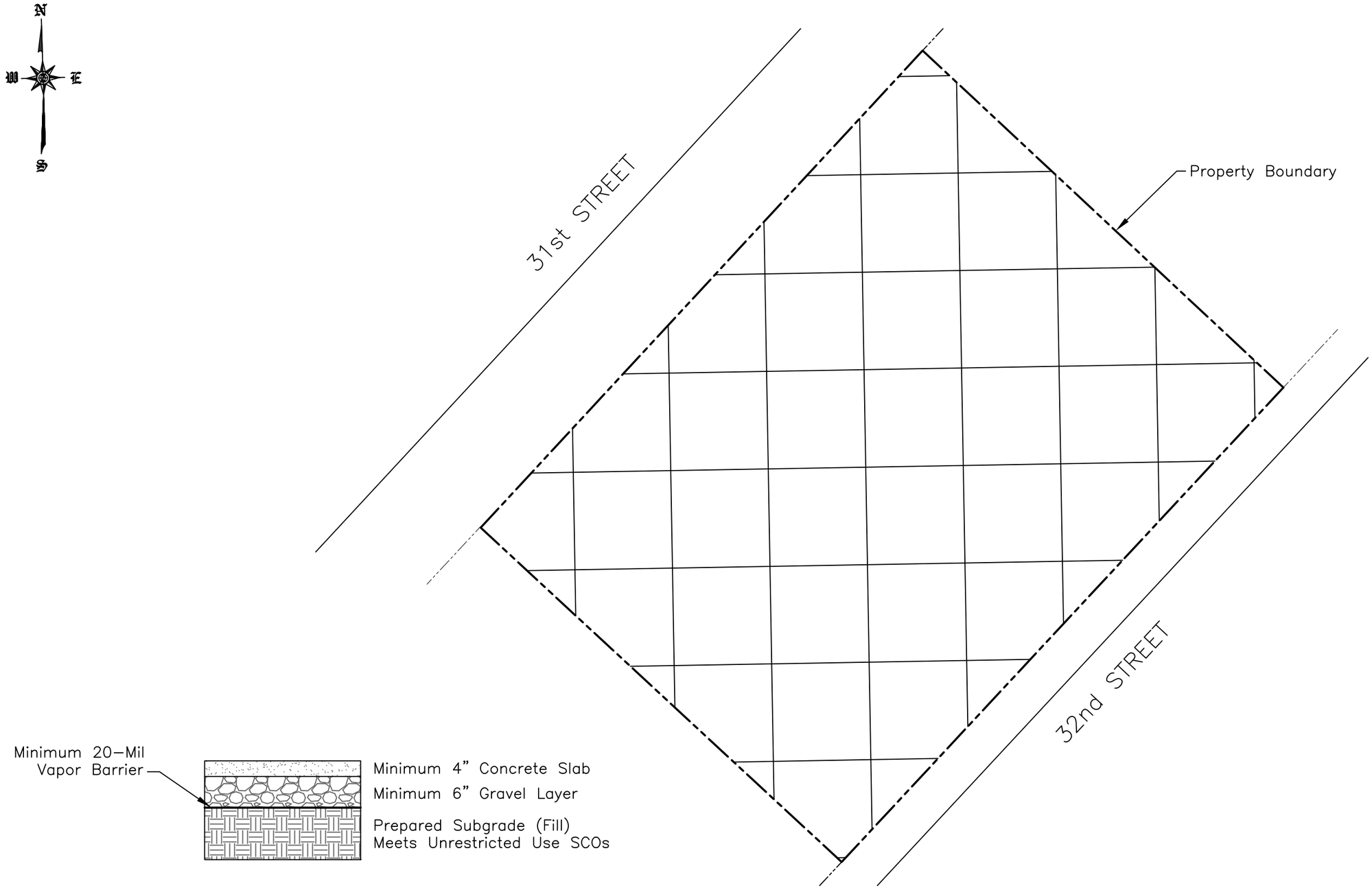
DRAWING NO. Figure 10



DRAWING TITLE. Pre-Design Groundwater Investigation	DRAWN BY LM	CONSULTANT TENEN ENVIRONMENTAL TENEN ENVIRONMENTAL, LLC 121 West 27th Street Suite 702 New York, NY 10001 O: 646-606-2332 F: 646-606-2379	SITE BCP Site #C241167 21-25 31st Street Queens, New York
DRAWING NO. Figure 11	CHECKED BY SB		
	DATE March 2017		
	SCALE: AS NOTED		



DRAWING TITLE. Post-Remedial Groundwater Monitoring Wells	DRAWN BY LM	CONSULTANT TENEN ENVIRONMENTAL TENEN ENVIRONMENTAL, LLC 121 West 27th Street Suite 702 New York, NY 10001 O: 646-606-2332 F: 646-606-2379	SITE BCP Site #C241167 21-25 31st Street Queens, New York
	CHECKED BY SB		
DRAWING NO. Figure 12	DATE March 2017		
	SCALE: AS NOTED		



(A) Typical Concrete or Asphalt Detail – Side View (Not to Scale)

Designation

0 10' 20' 40'

Drawing Scale

SITE

BCP Site #C241167
21–25 31st Street
Queens, New York

CONSULTANT

TENEN ENVIRONMENTAL, LLC
121 West 27th Street
Suite 702
New York, NY 10001
O: 646–606–2332
F: 646–606–2379

DRAWN BY	CHECKED BY	DATE	SCALE:
LM	SB	March 2017	AS NOTED

DRAWING TITLE: Remedial Cover Type

DRAWING NO. Figure 13

Tables

21-25 31st Street -Astoria, NY
BCP Site C241167
Table 1
Unrestricted Use Soil Cleanup Objectives (SCOs)

From Table 375-6.8(a) Unsrestricted Use Soil Cleanup Objectives

Contaminant	CAS Number	SCO
Metals		
Arsenic	7440-38-2	13[c]
Barium	7440-39-3	350[c]
Beryllium	7440-41-7	7.2
Cadmium	7440-43-9	2.5[c]
Chromium, hexavalent[e]	18540-29-9	1[b]
Chromium, trivalent[e]	16065-83-1	30[c]
Copper	7440-50-8	50
Total Cyanide[e,f]		27
Lead	7439-92-1	63[c]
Manganese	7439-96-5	1,600[c]
Total Mercury		0.18[c]
Nickel	7440-02-0	30
Selenium	7782-49-2	3.9[c]
Silver	7440-22-4	2
Zinc	7440-66-6	109[c]
PCBs/Pesticides		
2,4,5-TP Acid (Silvex)[f]	93-72-1	3.8
4,4'-DDE	72-55-9	0.0033[b]
4,4'-DDT	50-29-3	0.0033[b]
4,4'-DDD	72-54-8	0.0033[b]
Aldrin	309-00-2	0.005[c]
alpha-BHC	319-84-6	0.02
beta-BHC	319-85-7	0.036
Chlordane (alpha)	5103-71-9	0.094
delta-BHC[g]	319-86-8	0.04
Dibenzofuran[f]	132-64-9	7
Dieldrin	60-57-1	0.005[c]
Endosulfan I[d,f]	959-98-8	2.4
Endosulfan II[d,f]	33213-65-9	2.4
Endosulfan sulfate[d,f]	1031-07-8	2.4
Endrin	72-20-8	0.014
Heptachlor	76-44-8	0.042
Lindane	58-89-9	0.1
Polychlorinated biphenyls	1336-36-3	0.1

Contaminant	CAS Number	SCO
Semivolatiles		
Acenaphthene	83-32-9	20
Acenapthylene[f]	208-96-8	100[a]
Anthracene[f]	120-12-7	100[a]
Benz(a)anthracene[f]	56-55-3	1[c]
Benzo(a)pyrene	50-32-8	1[c]
Benzo(b)fluoranthene[f]	205-99-2	1[c]
Benzo(g,h,i)perylene[f]	191-24-2	100
Benzo(k)fluoranthene[f]	207-08-9	0.8[c]
Chrysene[f]	218-01-9	1[c]
Dibenz(a,h)anthracene[f]	53-70-3	0.33[b]
Fluoranthene[f]	206-44-0	100[a]
Fluorene[f]	86-73-7	30
Indeno(1,2,3-cd)pyrene[f]	193-39-5	0.5[c]
m-Cresol[f]	108-39-4	0.33[b]
Naphthalene[f]	91-20-3	12
o-Cresol[f]	95-48-7	0.33[b]
p-Cresol[f]	106-44-5	0.33[b]
Pentachlorophenol	87-86-5	0.8[b]
Phenanthrene[f]	85-01-8	100
Phenol	108-95-2	0.33[b]
Pyrene[f]	129-00-0	100
Volatiles		
1,1,1-Trichloroethane[f]	71-55-6	0.68
1,1-Dichloroethane[f]	75-34-3	0.27
1,1-Dichloroethene[f]	75-35-4	0.33
1,2-Dichlorobenzene[f]	95-50-1	1.1
1,2-Dichloroethane	107-06-2	0.2[c]
cis-1,2-Dichloroethene[f]	156-59-2	0.25
trans-1,2-Dichloroethene[f]	156-60-5	0.19
1,3-Dichlorobenzene[f]	541-73-1	2.4
1,4-Dichlorobenzene	106-46-7	1.8
1,4-Dioxane	123-91-1	0.1[b]
Acetone	67-64-1	0.05
Benzene	71-43-2	0.06
n-Butylbenzene[f]	104-51-8	12
Carbon tetrachloride[f]	56-23-5	0.76
Chlorobenzene	108-90-7	1.1
Chloroform	67-66-3	0.37
Ethylbenzene[f]	100-41-4	1
Hexachlorobenzene[f]	118-74-1	0.33[b]
Methyl ethyl ketone	78-93-3	0.12
Methyl tert-butyl ether[f]	1634-04-4	0.93
Methylene chloride	75-09-2	0.05
n-Propylbenzene[f]	103-65-1	3.9
sec-Butylbenzene[f]	135-98-8	11
tert-Butylbenzene[f]	98-06-6	5.9
Tetrachloroethene	127-18-4	1.3
Toluene	108-88-3	0.07
Trichloroethene	79-01-6	0.47
1,2,4-Trimethylbenzene[f]	95-63-6	3.6
1,3,5- Trimethylbenzene[f]	108-67-8	8.4
Vinyl chloride[f]	75-01-4	0.02
Xylene (mixed)	1330-20-7	0.26

Notes:
All soil cleanup objectives (SCOs) are in parts per million (ppm). NS=Not specified.
Footnotes (designations are from Table in Part 375). See Technical Support Document (TSD).
a The SCOs for unrestricted use were capped at a maximum value of 100 ppm. See TSD section 9.3.
b For constituents where the calculated SCO was lower than the contract required quantitation limit (CRQL), the CRQL is used as the Track 1 SCO value.
c For constituents where the calculated SCO was lower than the rural soil background concentration, as determined by the Department and Department of Health rural soil survey, the rural soil background concentration is used as the Track 1 SCO value for this use of the site.
d SCO is the sum of endosulfan I, endosulfan II and endosulfan sulfate.
e The SCO for this specific compound (or family of compounds) is considered to be met if the analysis for the total species of this contaminant is below the specific SCO.
f Protection of ecological resources SCOs were not developed for contaminants identified in Table 375-6.8(b) with "NS". Where such contaminants appear in Table 375-6.8(a), the applicant may be required by the Department to calculate a protection of ecological resources SCO according to the TSD.

21-25 31st Street -Astoria, NY
BCP Site C241167
Table 2
Restricted-Residential Use and Protection of Groundwater Soil Cleanup Objectives (SCOs)

From Table 375-6.8(b) or CP51 Table 1: Restricted Residential Use and Protection of Groundwater Soil Cleanup Objectives.

Contaminant	CAS Numb	Restricted-Residential	Protection of GW
Metals			
Arsenic	7440-38-2	16[f]	16[f]
Barium	7440-39-3	400	820
Beryllium	7440-41-7	72	47
Cadmium	7440-43-9	4.3	7.5
Chromium, hexavalent[h]	18540-29-9	110	19
Chromium, trivalent[h]	16065-83-1	180	NS
Copper	7440-50-8	270	1720
Total Cyanide[h]		27	40
Lead	7439-92-1	400	450
Manganese	7439-96-5	2,000[f]	2,000[f]
Total Mercury		0.81[j]	0.73
Nickel	7440-02-0	310	130
Selenium	7782-49-2	180	4[f]
Silver	7440-22-4	180	8.3
Zinc	7440-66-6	10,000[d]	2,480
PCBs/Pesticides			
2,4,5-TP Acid (Silvex)	93-72-1	100[a]	3.8
4,4'-DDE	72-55-9	8.9	17
4,4'-DDT	50-29-3	7.9	136
4,4'-DDD	72-54-8	13	14
Aldrin	309-00-2	0.097	0.19
alpha-BHC	319-84-6	0.48	0.02
beta-BHC	319-85-7	0.36	0.09
Chlordane (alpha)	5103-71-9	4.2	2.9
delta-BHC	319-86-8	100[a]	0.25
Dibenzofuran	132-64-9	59	210
Dieldrin	60-57-1	0.2	0.1
Endosulfan I	959-98-8	24[i]	102
Endosulfan II	33213-65-9	24[i]	102
Endosulfan sulfate	1031-07-8	24[i]	1000[c]
Endrin	72-20-8	11	0.06
Heptachlor	76-44-8	2.1	0.38
Lindane	58-89-9	1.3	0.1
Polychlorinated biphenyls	1336-36-3	1	3.2

Contaminant	CAS Numb	Restricted-Residential	Protection of GW
Semivolatiles			
Acenaphthene	83-32-9	100[a]	98
Acenapthylene	208-96-8	100[a]	107
Anthracene	120-12-7	100[a]	1000[c]
Aniline	62-53-3	100[a]	NS
Benz(a)anthracene	56-55-3	1[f]	1[f]
Benzo(a)pyrene	50-32-8	1[f]	22
Benzo(b)fluoranthene	205-99-2	1[f]	1.7
Benzo(g,h,i)perylene	191-24-2	100[a]	1000[c]
Benzo(k)fluoranthene	207-08-9	4	1.7
Chrysene	218-01-9	3.9	1[f]
Dibenz(a,h)anthracene	53-70-3	0.33[e]	1000[c]
Fluoranthene	206-44-0	100[a]	1000[c]
Fluorene	86-73-7	100[a]	386
Indeno(1,2,3-cd)pyrene	193-39-5	0.5[f]	8.2
m-Cresol	108-39-4	100[a]	0.33[c]
Naphthalene	91-20-3	100[a]	12
Nitrobenzene	98-95-3	15	NS
o-Cresol	95-48-7	100[a]	0.33[c]
p-Cresol	106-44-5	100[a]	0.33[c]
Pentachlorophenol	87-86-5	6.7	0.8[c]
Phenanthrene	85-01-8	100[a]	1000[c]
Phenol	108-95-2	100[a]	0.33[c]
Pyrene	129-00-0	100[a]	1000[c]
Volatiles			
1,1,1-Trichloroethane	71-55-6	100[a]	0.68
1,1-Dichloroethane	75-34-3	26	0.27
1,1-Dichloroethene	75-35-4	100[a]	0.33
1,2-Dichlorobenzene	95-50-1	100[a]	1.1
1,2-Dichloroethane	107-06-2	3.1	0.02[f]
cis-1,2-Dichloroethene	156-59-2	100[a]	0.25
trans-1,2-Dichloroethene	156-60-5	100[a]	0.19
1,3-Dichlorobenzene	541-73-1	49	2.4
1,4-Dichlorobenzene	106-46-7	13	1.8
1,4-Dioxane	123-91-1	13	0.1[c]
Acetone	67-64-1	100[b]	0.05
Benzene	71-43-2	4.8	0.06
Butylbenzene	104-51-8	100[a]	12
Carbon tetrachloride	56-23-5	2.4	0.76
Chlorobenzene	108-90-7	100[a]	1.1
Chloroform	67-66-3	49	0.37
Ethylbenzene	100-41-4	41	1
Hexachlorobenzene	118-74-1	1.2	3.2
Methyl ethyl ketone	78-93-3	100[a]	0.12
Methyl tert-butyl ether	1634-04-4	100[a]	0.93
Methylene chloride	75-09-2	100[a]	0.05
n-Propylbenzene	103-65-1	100[a]	3.9
sec-Butylbenzene	135-98-8	100[a]	11
tert-Butylbenzene	98-06-6	100[a]	5.9
Tetrachloroethene	127-18-4	19	1.3
Toluene	108-88-3	100[a]	0.7
Trichloroethene	79-01-6	21	0.47
1,2,4-Trimethylbenzene	95-63-6	52	3.6
1,3,5- Trimethylbenzene	108-67-8	52	8.4
Vinyl chloride	75-01-4	0.9	0.02
Xylene (mixed)	1330-20-7	100[a]	1.6

Notes:

All soil cleanup objectives (SCOs) are in parts per million (ppm). NS=Not specified.
Bolded and shaded values are proposed SCOs that are not the Restricted Residential Use SCOs.
Footnotes (designations are from Table in Part 375). See Technical Support Document (TSD).
a The SCOs for residential, restricted-residential and ecological resources use were capped at a maximum value of 100 ppm.
b For constituents where the calculated SCO was lower than the contract required quantitation limit (CRQL), the CRQL is used as the Track 1 SCO value.
c For constituents where the calculated SCO was lower than the rural soil background concentration, as determined by the Department and Department of Health rural soil survey, the rural soil background concentration is used as the Track 1 SCO value for this use of the site.
d The SCOs for metals were capped at a maximum value of 10,000 ppm. See TSD section 9.3.
e For constituents where the calculated SCO was lower than the contract required quantitation limit (CRQL), the CRQL is used as the SCO value.
f For constituents where the calculated SCO was lower than the rural soil background concentration as determined by the Department and Department of Health rural soil survey, the rural soil background concentration is used as the Track 2 SCO value for this use of the site.
i This SCO is for the sum of endosulfan I, endosulfan II, and endosulfan sulfate.
j This SCO is the lower of the values for mercury (elemental) or mercury (inorganic salts). See TSD Table 5.6-1.

21-25 31st Street -Astoria, NY
BCP Site C241167
Table 3
NYSDEC Division of Water TOGS 1.1.1 Class GA Standards
From Table 1: New York State Ambient Water Quality Standards and Guidance Values
(Division of Water Technical and Operational Guidance Series (1.1.1), June 1998)

Contaminant	CAS Number	Class GA Standard
Volatiles		
1,1,1,2-Tetrachloroethane	630-20-6	5*
1,1,1-Trichloroethane	71-55-6	5*
1,1,2,2-Tetrachloroethane	79-34-5	5*
1,1,2-Trichloroethane	79-00-5	1
1,1-Dichloroethane	75-34-3	5*
1,1-Dichloroethene	75-35-4	5*
1,1-Dichloropropene	563-58-6	5*
1,2,3-Trichloropropane	96-18-4	0.04
1,2,4,5-Tetramethylbenzene	95-93-2	5*
1,2,4-Trimethylbenzene	95-63-6	5*
1,2-Dibromo-3-chloropropane	96-12-8	0.04
1,2-Dichlorobenzene	95-50-1	3
1,2-Dichloroethane	107-06-2	0.6
1,2-Dichloropropane	78-87-5	1
1,3,5-Trimethylbenzene	108-67-8	5*
1,3-Dichlorobenzene	541-73-1	3
1,3-Dichloropropane	142-28-9	5*
1,4-Dichlorobenzene	106-46-7	3
2,2-Dichloropropane	594-20-7	5*
2-Hexanone	591-78-6	50**
Acetone	67-64-1	50**
Acrylonitrile	107-13-1	5*
Benzene	71-43-2	1
Bromobenzene	108-86-1	5*
Bromochloromethane	74-97-5	5*
Bromodichloromethane	75-27-4	50**
Bromoform	75-25-2	50**
Bromomethane	74-83-9	5*
Butylbenzene	104-51-8	5*
Carbon tetrachloride	56-23-5	5
Chlorobenzene	108-90-7	5*
Chloroethane	75-00-3	5*
Chloroform	75-34-3	7
Chloromethane (Methyl Chloride)	74-87-3	5*
cis-1,2-Dichloroethene	156-59-2	5*
Dibromochloromethane	124-48-1	50**
Dibromomethane	74-95-3	5*
Dichlorodifluoromethane	75-71-8	5*
Ethylbenzene	100-41-4	5*
Hexachlorobenzene	87-68-3	0.04
Hexachlorobutadiene	87-68-3	0.5
Isopropylbenzene	98-82-8	5*
Methylene chloride	75-09-2	5*
m-Xylene (1,3-Xylene)	108-38-3	5*
Naphthalene	91-20-3	10**
n-Propylbenzene	103-65-1	5*
o-Chlorotoluene	95-49-8	5*
o-Xylene (1,2-Xylene)	95-47-6	5*
p-Chlorotoluene	106-43-4	5*
p-Isopropyltoluene	99-87-6	5*
p-Xylene (1,4-Xylene)	106-42-3	5*
sec-Butylbenzene	135-98-8	5*
Styrene	100-42-5	5*
tert-Butylbenzene	98-06-6	5*
Tetrachloroethene	127-18-4	5*
Toluene	108-88-3	5*

Contaminant	CAS Number	Class GA Standard
Volatiles		
Total 1,3-Dichloropropene	542-75-6	0.4 (1)
trans-1,2-Dichloroethene	156-60-5	5*
trans-1,4-Dichloro-2-butene	110-57-6	5*
Trichloroethene	79-01-6	5*
Trichlorofluoromethane	75-69-4	5*
Vinyl chloride	75-01-4	2

Semivolatiles		
1,2,4,5-Tetrachlorobenzene	95-94-3	5*
1,2-Dichlorobenzene	95-50-1	3
1,3-Dichlorobenzene	541-73-1	3
1,4-Dichlorobenzene	106-46-7	3
3,3'-Dichlorobenzidine	91-94-1	5*
2,4-Dichlorophenol	120-83-2	5*
2,4-Dimethylphenol	105-67-9	50**
2,4-dinitrophenol	51-28-5	10**
2,4-Dinitrotoluene	121-14-2	5*
2,6-Dinitrotoluene	606-20-2	5*
2-Chloronaphthalene	91-58-7	10**
2-Nitroaniline	88-74-4	5*
3-Nitroaniline	99-09-2	5*
4-Chloroaniline	106-47-8	5*
4-Nitroaniline	100-01-6	5*
Acenaphthene	83-32-9	20**
Aniline	62-53-3	5*
Anthracene	120-12-7	50**
Benzo(a)anthracene	56-55-3	0.002**
Benzo(a)pyrene	50-32-8	0
Benzo(b)fluoranthene	205-99-2	0.002**
Benzo(k)fluoranthene	207-08-9	0.002**
Biphenyl	92-52-4	5*
Bis(2-chloroethoxy)methane	111-91-1	5*
Bis(2-chloroethyl)ether	111-44-4	1.0
Bis(2-Ethylhexyl)phthalate	117-81-7	5
Butyl benzyl phthalate	85-68- 7	50**
Chrysene	218-01-9	0.002
Diethyl phthalate	84-66-2	50**
Dimethyl phthalate	131-11-3	50**
Di-n-butylphthalate	84-74-2	50
Di-n-octylphthalate	117-84-0	50**
Fluoranthene	206-44-0	50**
Fluorene	86-73-7	50**
Hexachlorobenzene	118-74-1	0.04
Hexachlorobutadiene	87-68-3	0.5
Hexachlorocyclopentadiene	77-47-4	5*
Hexachloroethane	67-72-1	5*
Indeno(1,2,3-cd)Pyrene	193-39-5	0.002
Isophorone	78-59-1	50**
Naphthalene	91-20-3	10**
Nitrobenzene	98-95-3	0.4
NitrosoDiPhenylAmine(NDP	86-30-6	50**
Pentachlorophenol	87-86-5	1(2)
Phenanthrene	85-01-8	50**
Phenol	108-95-2	1 (2)
Pyrene	129-00-0	50**

Notes:
All Class GA Standards are in micrograms per liter (ug/l). Compounds without standards or guideline values are not shown.
*The principal organic contaminant standard for groundwater of 5 ug/l applies to this substance.
** The value shown is a Guidance Value
(1) refers to sum of cis- and trans-1,3-dichloropropene.
(2) refers to the sum of Total Phenols (phenolic compounds)

Table 4 - Volatile Organic Compounds in Soil
21-25 31st Street - Astoria, NY

SAMPLE ID:			GW5D (40-42')		GW5D (40-42D)		GW5D (48-50')		GW5D (77-79')		GW8 (7-9')		GW8 (40-42')	
LAB ID:			L1604342-03		L1604342-04		L1604342-05		L1604342-06		L1604640-01		L1604640-02	
COLLECTION DATE:	NY-RESR	NY-UNRES	2/16/2016		2/16/2016		2/16/2016		2/16/2016		2/18/2016		2/18/2016	
Volatile Organic Compounds Units: mg/kg			Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q
Methylene chloride	51	0.05	0.075	U	0.0013	U	0.0012	U	0.0013	U	0.0012	U	0.32	U
1,1-Dichloroethane	19	0.27	0.0058	U	0.0001	U	0.0001	U	0.0001	U	0.00009	U	0.024	U
Chloroform	10	0.37	0.025	U	0.00043	U	0.00041	U	0.00043	U	0.00041	U	0.1	U
Carbon tetrachloride	1.4	0.76	0.014	U	0.00024	U	0.00023	U	0.00024	U	0.00023	U	0.06	U
1,2-Dichloropropane	--	--	0.015	U	0.00026	U	0.00025	U	0.00026	U	0.00025	U	0.065	U
Dibromochloromethane	--	--	0.01	U	0.00018	U	0.00017	U	0.00018	U	0.00017	U	0.044	U
1,1,2-Trichloroethane	--	--	0.021	U	0.00035	U	0.00034	U	0.00035	U	0.00033	U	0.087	U
Tetrachloroethene	5.5	1.3	0.0095	U	0.00016	U	0.00016	U	0.0054		0.00015	U	0.04	U
Chlorobenzene	100	1.1	0.024	U	0.0004	U	0.00039	U	0.0004	U	0.00038	U	0.099	U
Trichlorofluoromethane	--	--	0.026	U	0.00045	U	0.00043	U	0.00045	U	0.00043	U	0.11	U
1,2-Dichloroethane	2.3	0.02	0.0077	U	0.00013	U	0.00013	U	0.00013	U	0.00012	U	0.032	U
1,1,1-Trichloroethane	100	0.68	0.0075	U	0.00013	U	0.00012	U	0.00013	U	0.00012	U	0.032	U
Bromodichloromethane	--	--	0.012	U	0.0002	U	0.00019	U	0.0002	U	0.00019	U	0.049	U
trans-1,3-Dichloropropene	--	--	0.0082	U	0.00014	U	0.00013	U	0.00014	U	0.00013	U	0.034	U
cis-1,3-Dichloropropene	--	--	0.008	U	0.00014	U	0.00013	U	0.00014	U	0.00013	U	0.034	U
1,3-Dichloropropene, Total	--	--	0.008	U	0.00014	U	0.00013	U	0.00014	U	0.00013	U	0.034	U
1,1-Dichloropropene	--	--	0.0096	U	0.00016	U	0.00016	U	0.00016	U	0.00016	U	0.04	U
Bromoform	--	--	0.016	U	0.00027	U	0.00026	U	0.00027	U	0.00026	U	0.067	U
1,1,2,2-Tetrachloroethane	35	--	0.0068	U	0.00012	U	0.00011	U	0.00012	U	0.00011	U	0.029	U
Benzene	2.9	0.06	0.008	U	0.00014	U	0.00013	U	0.00014	U	0.00013	U	0.034	U
Toluene	100	0.7	0.013	U	0.00022	U	0.00022	U	0.00022	U	0.00021	U	0.062	J
Ethylbenzene	30	1	0.0086	U	0.00015	U	0.00014	U	0.00015	U	0.00014	U	1.2	
Chloromethane	--	--	0.02	U	0.00034	U	0.00033	U	0.00034	U	0.00032	U	0.084	U
Bromomethane	--	--	0.023	U	0.00039	U	0.00038	U	0.00039	U	0.00037	U	0.096	U
Vinyl chloride	0.21	0.02	0.008	U	0.00014	U	0.00013	U	0.00014	U	0.00013	U	0.034	U
Chloroethane	--	--	0.021	U	0.00037	U	0.00035	U	0.00036	U	0.00035	U	0.09	U
1,1-Dichloroethene	100	0.33	0.018	U	0.0003	U	0.00029	U	0.0003	U	0.00029	U	0.075	U
trans-1,2-Dichloroethene	100	0.19	0.014	U	0.00024	U	0.00024	U	0.00024	U	0.00023	U	0.06	U
Trichloroethene	10	0.47	0.0085	U	0.00014	U	0.00014	U	0.00014	U	0.00014	U	0.036	U
1,2-Dichlorobenzene	100	1.1	0.01	U	0.00018	U	0.00017	U	0.00018	U	0.00017	U	0.044	U
1,3-Dichlorobenzene	17	2.4	0.0092	U	0.00016	U	0.00015	U	0.00016	U	0.00015	U	0.038	U
1,4-Dichlorobenzene	9.8	1.8	0.0094	U	0.00016	U	0.00015	U	0.00016	U	0.00015	U	0.04	U
Methyl tert butyl ether	62	0.93	0.0057	U	0.0001	U	0.00009	U	0.0001	U	0.00009	U	0.024	U
p/m-Xylene	--	--	0.013	U	0.00023	U	0.00022	U	0.00023	U	0.00022	U	0.056	U
o-Xylene	--	--	0.012	U	0.0002	U	0.00019	U	0.0002	U	0.00019	U	0.049	U
Xylenes, Total	100	0.26	0.012	U	0.0002	U	0.00019	U	0.0002	U	0.00019	U	0.049	U
cis-1,2-Dichloroethene	59	0.25	0.0097	U	0.00016	U	0.00016	U	0.00016	U	0.00016	U	0.041	U
1,2-Dichloroethene, Total	--	--	0.0097	U	0.00016	U	0.00016	U	0.00016	U	0.00016	U	0.041	U
Dibromomethane	--	--	0.011	U	0.00019	U	0.00018	U	0.00019	U	0.00018	U	0.047	U
Styrene	--	--	0.027	U	0.00047	U	0.00045	U	0.00046	U	0.00044	U	0.11	U
Dichlorodifluoromethane	--	--	0.013	U	0.00022	U	0.00021	U	0.00022	U	0.00021	U	0.054	U
Acetone	100	0.05	0.07	U	0.0068	J	0.0057	J	0.0067	J	0.0024	J	0.66	J
Carbon disulfide	100	--	0.9		0.0013	U	0.0012	U	0.0013	U	0.0012	U	0.31	U
2-Butanone	100	0.12	0.018	U	0.00032	U	0.0003	U	0.00031	U	0.0003	U	0.078	U
Vinyl acetate	--	--	0.009	U	0.00015	U	0.00015	U	0.00015	U	0.00014	U	0.038	U
4-Methyl-2-pentanone	--	--	0.016	U	0.00028	U	0.00027	U	0.00028	U	0.00027	U	0.07	U
1,2,3-Trichloropropane	80	--	0.011	U	0.00019	U	0.00018	U	0.00019	U	0.00018	U	0.046	U
2-Hexanone	--	--	0.045	U	0.00077	U	0.00074	U	0.00077	U	0.00073	U	0.19	U
Bromochloromethane	--	--	0.019	U	0.00032	U	0.00031	U	0.00032	U	0.0003	U	0.079	U
2,2-Dichloropropane	--	--	0.015	U	0.00026	U	0.00025	U	0.00026	U	0.00025	U	0.064	U
1,2-Dibromoethane	--	--	0.012	U	0.0002	U	0.00019	U	0.0002	U	0.00019	U	0.05	U
1,3-Dichloropropane	--	--	0.0098	U	0.00017	U	0.00016	U	0.00017	U	0.00016	U	0.041	U
1,1,1,2-Tetrachloroethane	--	--	0.022	U	0.00037	U	0.00035	U	0.00037	U	0.00035	U	0.091	U
Bromobenzene	--	--	0.014	U	0.00024	U	0.00023	U	0.00024	U	0.00023	U	0.059	U
n-Butylbenzene	100	12	0.0078	U	0.00013	U	0.00013	U	0.00013	U	0.00013	U	7.4	
sec-Butylbenzene	100	11	0.0083	U	0.00082	J	0.00014	U	0.00014	U	0.00013	U	5.5	
tert-Butylbenzene	100	5.9	0.0092	U	0.00016	U	0.00015	U	0.00016	U	0.00015	U	1	J
o-Chlorotoluene	--	--	0.011	U	0.00018	U	0.00018	U	0.00018	U	0.00018	U	0.046	U
p-Chlorotoluene	--	--	0.009	U	0.00015	U	0.00015	U	0.00015	U	0.00014	U	0.038	U
1,2-Dibromo-3-chloropropane	--	--	0.027	U	0.00046	U	0.00044	U	0.00046	U	0.00044	U	0.11	U
Hexachlorobutadiene	--	--	0.015	U	0.00026	U	0.00025	U	0.00026	U	0.00025	U	0.065	U
Isopropylbenzene	100	--	0.007	U	0.00012	U	0.00012	U	0.00012	U	0.00011	U	2	
p-Isopropyltoluene	--	--	0.0085	U	0.00014	U	0.00014	U	0.00014	U	0.00014	U	0.89	
Naphthalene	100	12	0.076	J	0.00016	U	0.00015	U	0.00016	U	0.00015	U	38	
Acrylonitrile	--	--	0.035	U	0.0006	U	0.00057	U	0.00059	U	0.00056	U	0.15	U
n-Propylbenzene	100	3.9	0.0074	U	0.00013	U	0.00012	U	0.00013	U	0.00012	U	4.5	
1,2,3-Trichlorobenzene	--	--	0.01	U	0.00017	U	0.00016	U	0.00017	U	0.00016	U	0.042	U
1,2,4-Trichlorobenzene	--	--	0.012	U	0.00021	U	0.0002	U	0.00021	U	0.0002	U	0.052	U
1,3,5-Trimethylbenzene	47	8.4	0.0097	U	0.00017	U	0.00016	U	0.00016	U	0.00016	U	0.041	U
1,2,4-Trimethylbenzene	47	3.6	0.0096	U	0.00016	U	0.00016	U	0.00016	U	0.00016	U	0.27	J
1,4-Dioxane	9.8	0.1	0.98	U	0.017	U	0.016	U	0.017	U	0.016	U	4.1	U
p-Diethylbenzene	--	--	0.011	U	0.00054	J	0.00018	U	0.00018	U	0.00018	U	5.6	
p-Ethyltoluene	--	--	0.0084	U	0.00014	U	0.00014	U	0.00014	U	0.00014	U	0.035	U
1,2,4,5-Tetramethylbenzene	--	--	0.06	J	0.0034	J	0.00014	U	0.00056	J	0.00014	U	26	
Ethyl ether	--	--	0.018	U	0.0003	U	0.00029	U	0.0003	U	0.00028	U	0.074	U
trans-1,4-Dichloro-2-butene	--	--	0.027	U	0.00045	U	0.00044	U	0.00045	U	0.00043	U	0.11	U

Notes:
NY-UNRES = New York Unrestricted use Criteria current as of 5/2007
NY-RESRR = Restricted-Residential Criteria, New York Restricted use current as of 5/2007
NY-RESR = Residential Criteria, New York Restricted use current as of 5/2007
Cells highlighted in yellow indicate concentrations above the NY-UNRES SCO value, but below the NY-RESRR SCO
Cells highlighted in orange indicate values above the NY-RESR SCO, but below the NY-RESRR SCO
Cells highlighted in blue indicate values above the NY-RESRR SCO
Cells highlighted in grey indicate an MDL above the NY-UNRES SCO, NY-RESR SCO or NY-RESRR SCO
DUP = designation for duplicate sample
SCO = Soil Cleanup Objective
MDL = Maximum Detection Limit
RL = Reporting Limit
Qual = Laboratory Data Qualifier
For U qualified entries, the MDL is shown
U = not detected at or above the MDL
For J qualified entries, the estimated concentration is shown
J = estimated value, indicating the detected value is below the RL, but above the MDL
Results and MDL values are in milligrams per kilogram (mg/kg)
Soil sample depths shown in feet (ft) within sample location
-- = No standard

Table 4 - Volatile Organic Compounds in Soil
21-25 31st Street - Astoria, NY

SAMPLE ID:			GW8 (57-59')		GW6 (10-12')		GW5D(0-2')		GW5D(8-10')		GW6(40-42')		GW6(53-55')	
LAB ID:			L1604640-03		L1604640-04		L1604906-01		L1604906-02		L1604906-03		L1604906-04	
COLLECTION DATE:	NY-RESR	NY-UNRES	2/19/2016		2/19/2016		2/22/2016		2/22/2016		2/22/2016		2/22/2016	
Volatile Organic Compounds Units: mg/kg			Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q
Methylene chloride	51	0.05	0.0015	U	0.0011	U	0.001	U	0.0012	U	0.66	U	0.0012	U
1,1-Dichloroethane	19	0.27	0.00011	U	0.00009	U	0.00008	U	0.00009	U	0.052	U	0.0001	U
Chloroform	10	0.37	0.00049	U	0.00037	U	0.00034	U	0.0004	U	0.22	U	0.00041	U
Carbon tetrachloride	1.4	0.76	0.00028	U	0.00021	U	0.0002	U	0.00023	U	0.13	U	0.00024	U
1,2-Dichloropropane	--	--	0.0003	U	0.00023	U	0.00021	U	0.00025	U	0.14	U	0.00026	U
Dibromochloromethane	--	--	0.0002	U	0.00015	U	0.00014	U	0.00017	U	0.092	U	0.00017	U
1,1,2-Trichloroethane	--	--	0.0004	U	0.0003	U	0.00028	U	0.00033	U	0.18	U	0.00034	U
Tetrachloroethene	5.5	1.3	0.00019	U	0.00069	J	0.00013	U	0.00015	U	0.084	U	0.00044	J
Chlorobenzene	100	1.1	0.00046	U	0.00035	U	0.00032	U	0.00038	U	0.21	U	0.00039	U
Trichlorofluoromethane	--	--	0.00052	U	0.00039	U	0.00036	U	0.00042	U	0.23	U	0.00043	U
1,2-Dichloroethane	2.3	0.02	0.00015	U	0.00011	U	0.0001	U	0.00012	U	0.068	U	0.00013	U
1,1,1-Trichloroethane	100	0.68	0.00015	U	0.00011	U	0.0001	U	0.00012	U	0.067	U	0.00012	U
Bromodichloromethane	--	--	0.00023	U	0.00017	U	0.00016	U	0.00019	U	0.1	U	0.00019	U
trans-1,3-Dichloropropene	--	--	0.00016	U	0.00012	U	0.00011	U	0.00013	U	0.073	U	0.00014	U
cis-1,3-Dichloropropene	--	--	0.00016	U	0.00012	U	0.00011	U	0.00013	U	0.071	U	0.00013	U
1,3-Dichloropropene, Total	--	--	0.00016	U	0.00012	U	0.00011	U	0.00013	U	0.071	U	0.00013	U
1,1-Dichloropropene	--	--	0.00019	U	0.00014	U	0.00013	U	0.00015	U	0.085	U	0.00016	U
Bromoform	--	--	0.00031	U	0.00024	U	0.00022	U	0.00026	U	0.14	U	0.00026	U
1,1,2,2-Tetrachloroethane	35	--	0.00013	U	0.0001	U	0.00009	U	0.00011	U	0.061	U	0.00011	U
Benzene	2.9	0.06	0.00016	U	0.00012	U	0.00011	U	0.00013	U	0.071	U	0.00013	U
Toluene	100	0.7	0.0003	J	0.00023	J	0.00018	U	0.00021	U	0.12	U	0.00022	U
Ethylbenzene	30	1	0.00017	U	0.00013	U	0.00012	U	0.00014	U	0.27	J	0.00014	U
Chloromethane	--	--	0.00039	U	0.0003	U	0.00027	U	0.00032	U	0.18	U	0.00033	U
Bromomethane	--	--	0.00045	U	0.00034	U	0.00032	U	0.00037	U	0.2	U	0.00038	U
Vinyl chloride	0.21	0.02	0.00016	U	0.00012	U	0.00011	U	0.00013	U	0.071	U	0.00013	U
Chloroethane	--	--	0.00042	U	0.00032	U	0.00029	U	0.00034	U	0.19	U	0.00035	U
1,1-Dichloroethene	100	0.33	0.00035	U	0.00026	U	0.00024	U	0.00029	U	0.16	U	0.00029	U
trans-1,2-Dichloroethene	100	0.19	0.00028	U	0.00021	U	0.0002	U	0.00023	U	0.13	U	0.00024	U
Trichloroethene	10	0.47	0.00017	U	0.00012	U	0.00012	U	0.00014	U	0.075	U	0.00014	U
1,2-Dichlorobenzene	100	1.1	0.0002	U	0.00015	U	0.00014	U	0.00017	U	0.092	U	0.00017	U
1,3-Dichlorobenzene	17	2.4	0.00018	U	0.00014	U	0.00012	U	0.00015	U	0.081	U	0.00015	U
1,4-Dichlorobenzene	9.8	1.8	0.00018	U	0.00014	U	0.00013	U	0.00015	U	0.083	U	0.00015	U
Methyl tert butyl ether	62	0.93	0.00011	U	0.00009	U	0.00008	U	0.00009	U	0.051	U	0.00009	U
p/m-Xylene	--	--	0.00026	U	0.0002	U	0.00018	U	0.00022	U	0.12	U	0.00022	U
o-Xylene	--	--	0.00023	U	0.00017	U	0.00016	U	0.00019	U	0.1	U	0.00019	U
Xylenes, Total	100	0.26	0.00023	U	0.00017	U	0.00016	U	0.00019	U	0.1	U	0.00019	U
cis-1,2-Dichloroethene	59	0.25	0.00019	U	0.00014	U	0.00013	U	0.00016	U	0.086	U	0.00016	U
1,2-Dichloroethene, Total	--	--	0.00019	U	0.00014	U	0.00013	U	0.00016	U	0.086	U	0.00016	U
Dibromomethane	--	--	0.00022	U	0.00016	U	0.00015	U	0.00018	U	0.098	U	0.00018	U
Styrene	--	--	0.00054	U	0.0004	U	0.00038	U	0.00044	U	0.24	U	0.00045	U
Dichlorodifluoromethane	--	--	0.00025	U	0.00019	U	0.00018	U	0.00021	U	0.11	U	0.00021	U
Acetone	100	0.05	0.0035	J	0.0041	J	0.00097	U	0.0036	J	0.62	U	0.0023	J
Carbon disulfide	100	--	0.0015	U	0.0011	U	0.001	U	0.0012	U	0.66	U	0.0012	U
2-Butanone	100	0.12	0.00036	U	0.00027	U	0.00025	U	0.0003	U	0.16	U	0.0003	U
Vinyl acetate	--	--	0.00018	U	0.00013	U	0.00012	U	0.00014	U	0.08	U	0.00015	U
4-Methyl-2-pentanone	--	--	0.00032	U	0.00024	U	0.00023	U	0.00027	U	0.15	U	0.00027	U
1,2,3-Trichloropropane	80	--	0.00022	U	0.00016	U	0.00015	U	0.00018	U	0.098	U	0.00018	U
2-Hexanone	--	--	0.00089	U	0.00067	U	0.00062	U	0.00073	U	0.4	U	0.00074	U
Bromochloromethane	--	--	0.00037	U	0.00028	U	0.00026	U	0.0003	U	0.17	U	0.00031	U
2,2-Dichloropropane	--	--	0.0003	U	0.00023	U	0.00021	U	0.00025	U	0.14	U	0.00025	U
1,2-Dibromoethane	--	--	0.00023	U	0.00017	U	0.00016	U	0.00019	U	0.1	U	0.0002	U
1,3-Dichloropropane	--	--	0.00019	U	0.00014	U	0.00014	U	0.00016	U	0.087	U	0.00016	U
1,1,1,2-Tetrachloroethane	--	--	0.00042	U	0.00032	U	0.0003	U	0.00035	U	0.19	U	0.00036	U
Bromobenzene	--	--	0.00028	U	0.00021	U	0.00019	U	0.00023	U	0.12	U	0.00023	U
n-Butylbenzene	100	12	0.00015	U	0.00012	U	0.00011	U	0.00012	U	2.8		0.00013	U
sec-Butylbenzene	100	11	0.00016	U	0.00012	U	0.00011	U	0.00013	U	2.3		0.00014	U
tert-Butylbenzene	100	5.9	0.00018	U	0.00014	U	0.00013	U	0.00015	U	0.26	J	0.00015	U
o-Chlorotoluene	--	--	0.00021	U	0.00016	U	0.00015	U	0.00017	U	0.096	U	0.00018	U
p-Chlorotoluene	--	--	0.00018	U	0.00013	U	0.00012	U	0.00014	U	0.08	U	0.00015	U
1,2-Dibromo-3-chloropropane	--	--	0.00053	U	0.0004	U	0.00037	U	0.00043	U	0.24	U	0.00044	U
Hexachlorobutadiene	--	--	0.0003	U	0.00023	U	0.00021	U	0.00025	U	0.14	U	0.00026	U
Isopropylbenzene	100	--	0.00014	U	0.0001	U	0.0001	U	0.00011	U	0.73		0.00012	U
p-Isopropyltoluene	--	--	0.00017	U	0.00012	U	0.00012	U	0.00014	U	0.075	U	0.00014	U
Naphthalene	100	12	0.00018	U	0.00014	U	0.00021	J	0.00015	U	20		0.00015	U
Acrylonitrile	--	--	0.00068	U	0.00052	U	0.00048	U	0.00056	U	0.31	U	0.00058	U
n-Propylbenzene	100	3.9	0.00014	U	0.00011	U	0.0001	U	0.00012	U	1.5		0.00012	U
1,2,3-Trichlorobenzene	--	--	0.0002	U	0.00015	U	0.00014	U	0.00016	U	0.089	U	0.00016	U
1,2,4-Trichlorobenzene	--	--	0.00024	U	0.00018	U	0.00017	U	0.0002	U	0.11	U	0.0002	U
1,3,5-Trimethylbenzene	47	8.4	0.00019	U	0.00014	U	0.00013	U	0.00016	U	0.086	U	0.00016	U
1,2,4-Trimethylbenzene	47	3.6	0.00019	U	0.00014	U	0.00013	U	0.00015	U	0.085	U	0.00016	U
1,4-Dioxane	9.8	0.1	0.019	U	0.014	U	0.013	U	0.016	U	8.7	U	0.016	U
p-Diethylbenzene	--	--	0.00021	U	0.00016	U	0.00015	U	0.00017	U	1.6	J	0.00018	U
p-Ethyltoluene	--	--	0.00016	U	0.00012	U	0.00012	U	0.00014	U	0.075	U	0.00014	U
1,2,4,5-Tetramethylbenzene	--	--	0.00017	U	0.00013	U	0.00012	U	0.00014	U	7.9		0.00014	U
Ethyl ether	--	--	0.00035	U	0.00026	U	0.00024	U	0.00028	U	0.16	U	0.00029	U
trans-1,4-Dichloro-2-butene	--	--	0.00052	U	0.00039	U	0.00036	U	0.00043	U	0.24	U	0.00044	U

Notes:
NY-UNRES = New York Unrestricted use Criteria current as of 5/2007
NY-RESRR = Restricted-Residential Criteria, New York Restricted use current as of 5/2007
NY-RESR = Residential Criteria, New York Restricted use current as of 5/2007
Cells highlighted in yellow indicate concentrations above the NY-UNRES SCO value, but below the NY-RESRR SCO
Cells highlighted in orange indicate values above the NY-RESR SCO, but below the NY-RESRR SCO
Cells highlighted in blue indicate values above the NY-RESRR SCO
Cells highlighted in grey indicate an MDL above the NY-UNRES SCO, NY-RESR SCO or NY-RESRR SCO
DUP = designation for duplicate sample
SCO = Soil Cleanup Objective
MDL = Maximum Detection Limit
RL = Reporting Limit
Qual = Laboratory Data Qualifier
For U qualified entries, the MDL is shown
U = not detected at or above the MDL
For J qualified entries, the estimated concentration is shown
J = estimated value, indicating the detected value is below the RL, but above the MDL
Results and MDL values are in milligrams per kilogram (mg/kg)
Soil sample depths shown in feet (ft) within sample location
-- = No standard

Table 4 - Volatile Organic Compounds in Soil
21-25 31st Street - Astoria, NY

SAMPLE ID:			GW7(10-12')		GW7(36-38')		GW7(40-42')		GW2D (8-10')		GW2D (38-39')		GW2D (43-45')	
LAB ID:			L1604906-05		L1604906-06		L1604906-07		L1605682-01		L1605682-02		L1605682-03	
COLLECTION DATE:	NY-RESR	NY-UNRES	2/22/2016		2/23/2016		2/23/2016		3/1/2016		3/1/2016		3/1/2016	
Volatile Organic Compounds Units: mg/kg			Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q
Methylene chloride	51	0.05	0.0011	U	0.0013	U	0.0011	U	0.0013	U	1.2	U	0.0014	U
1,1-Dichloroethane	19	0.27	0.00009	U	0.0001	U	0.00009	U	0.0001	U	0.097	U	0.00011	U
Chloroform	10	0.37	0.00038	U	0.00042	U	0.00038	U	0.00044	U	0.42	U	0.00048	U
Carbon tetrachloride	1.4	0.76	0.00022	U	0.00024	U	0.00022	U	0.00025	U	0.24	U	0.00027	U
1,2-Dichloropropane	--	--	0.00024	U	0.00026	U	0.00023	U	0.00027	U	0.26	U	0.0003	U
Dibromochloromethane	--	--	0.00016	U	0.00018	U	0.00016	U	0.00018	U	0.17	U	0.0002	U
1,1,2-Trichloroethane	--	--	0.00031	U	0.00035	U	0.00031	U	0.00036	U	0.34	U	0.0004	U
Tetrachloroethene	5.5	1.3	0.00014	U	0.00016	U	0.00038	J	0.00073	J	0.16	U	0.00018	U
Chlorobenzene	100	1.1	0.00036	U	0.0004	U	0.00036	U	0.00042	U	0.39	U	0.00045	U
Trichlorofluoromethane	--	--	0.0004	U	0.00044	U	0.0004	U	0.00047	U	0.44	U	0.00051	U
1,2-Dichloroethane	2.3	0.02	0.00012	U	0.00013	U	0.00012	U	0.00014	U	0.13	U	0.00015	U
1,1,1-Trichloroethane	100	0.68	0.00011	U	0.00013	U	0.00011	U	0.00013	U	0.12	U	0.00014	U
Bromodichloromethane	--	--	0.00018	U	0.0002	U	0.00018	U	0.00021	U	0.2	U	0.00023	U
trans-1,3-Dichloropropene	--	--	0.00012	U	0.00014	U	0.00012	U	0.00014	U	0.14	U	0.00016	U
cis-1,3-Dichloropropene	--	--	0.00012	U	0.00013	U	0.00012	U	0.00014	U	0.13	U	0.00015	U
1,3-Dichloropropene, Total	--	--	0.00012	U	0.00013	U	0.00012	U	0.00014	U	0.13	U	0.00015	U
1,1-Dichloropropene	--	--	0.00014	U	0.00016	U	0.00014	U	0.00017	U	0.16	U	0.00018	U
Bromoform	--	--	0.00024	U	0.00027	U	0.00024	U	0.00028	U	0.27	U	0.00031	U
1,1,2,2-Tetrachloroethane	35	--	0.0001	U	0.00012	U	0.0001	U	0.00012	U	0.11	U	0.00013	U
Benzene	2.9	0.06	0.00012	U	0.00014	U	0.00012	U	0.00014	U	0.13	U	0.00015	U
Toluene	100	0.7	0.0002	U	0.00022	U	0.0002	U	0.00023	U	0.22	U	0.00068	J
Ethylbenzene	30	1	0.00013	U	0.00014	U	0.00013	U	0.00015	U	0.14	U	0.00017	U
Chloromethane	--	--	0.0003	U	0.00034	U	0.0003	U	0.00035	U	0.33	U	0.00038	U
Bromomethane	--	--	0.00035	U	0.00039	U	0.00035	U	0.00041	U	0.38	U	0.00044	U
Vinyl chloride	0.21	0.02	0.00012	U	0.00013	U	0.00012	U	0.00014	U	0.13	U	0.00015	U
Chloroethane	--	--	0.00032	U	0.00036	U	0.00032	U	0.00038	U	0.36	U	0.00041	U
1,1-Dichloroethene	100	0.33	0.00027	U	0.0003	U	0.00027	U	0.00031	U	0.3	U	0.00034	U
trans-1,2-Dichloroethene	100	0.19	0.00022	U	0.00024	U	0.00022	U	0.00025	U	0.24	U	0.0003	J
Trichloroethene	10	0.47	0.00013	U	0.00014	U	0.00013	U	0.00015	U	0.14	U	0.00016	U
1,2-Dichlorobenzene	100	1.1	0.00016	U	0.00018	U	0.00016	U	0.00018	U	0.17	U	0.0002	U
1,3-Dichlorobenzene	17	2.4	0.00014	U	0.00015	U	0.00014	U	0.00016	U	0.15	U	0.00018	U
1,4-Dichlorobenzene	9.8	1.8	0.00014	U	0.00016	U	0.00014	U	0.00017	U	0.16	U	0.00018	U
Methyl tert butyl ether	62	0.93	0.00009	U	0.0001	U	0.00009	U	0.0001	U	0.096	U	0.00011	U
p/m-Xylene	--	--	0.0002	U	0.00023	U	0.0002	U	0.00024	U	0.22	U	0.00026	U
o-Xylene	--	--	0.00018	U	0.0002	U	0.00018	U	0.00021	U	0.19	U	0.00022	U
Xylenes, Total	100	0.26	0.00018	U	0.0002	U	0.00018	U	0.00021	U	0.19	U	0.00022	U
cis-1,2-Dichloroethene	59	0.25	0.00015	U	0.00016	U	0.00015	U	0.00017	U	0.16	U	0.00027	J
1,2-Dichloroethene, Total	--	--	0.00015	U	0.00016	U	0.00015	U	0.00017	U	0.16	U	0.00057	J
Dibromomethane	--	--	0.00017	U	0.00019	U	0.00017	U	0.0002	U	0.18	U	0.00021	U
Styrene	--	--	0.00041	U	0.00046	U	0.00041	U	0.00048	U	0.46	U	0.00052	U
Dichlorodifluoromethane	--	--	0.0002	U	0.00022	U	0.0002	U	0.00023	U	0.22	U	0.00025	U
Acetone	100	0.05	0.0028	J	0.0021	J	0.011		0.0012	U	1.2	U	0.0054	J
Carbon disulfide	100	--	0.0011	U	0.0013	U	0.0011	U	0.0013	U	1.2	U	0.0014	U
2-Butanone	100	0.12	0.00028	U	0.00031	U	0.002	J	0.00033	U	0.31	U	0.00036	U
Vinyl acetate	--	--	0.00014	U	0.00015	U	0.00014	U	0.00016	U	0.15	U	0.00017	U
4-Methyl-2-pentanone	--	--	0.00025	U	0.00028	U	0.00025	U	0.00029	U	0.28	U	0.00032	U
1,2,3-Trichloropropane	80	--	0.00017	U	0.00019	U	0.00017	U	0.0002	U	0.18	U	0.00021	U
2-Hexanone	--	--	0.00069	U	0.00076	U	0.00068	U	0.0008	U	0.76	U	0.00087	U
Bromochloromethane	--	--	0.00028	U	0.00032	U	0.00028	U	0.00033	U	0.31	U	0.00036	U
2,2-Dichloropropane	--	--	0.00023	U	0.00026	U	0.00023	U	0.00027	U	0.26	U	0.0003	U
1,2-Dibromoethane	--	--	0.00018	U	0.0002	U	0.00018	U	0.00021	U	0.2	U	0.00023	U
1,3-Dichloropropane	--	--	0.00015	U	0.00017	U	0.00015	U	0.00017	U	0.16	U	0.00019	U
1,1,1,2-Tetrachloroethane	--	--	0.00033	U	0.00036	U	0.00033	U	0.00038	U	0.36	U	0.00042	U
Bromobenzene	--	--	0.00021	U	0.00024	U	0.00021	U	0.00025	U	0.24	U	0.00027	U
n-Butylbenzene	100	12	0.00012	U	0.00013	U	0.00012	U	0.00014	U	1	J	0.00015	U
sec-Butylbenzene	100	11	0.00012	U	0.00014	U	0.00012	U	0.00015	U	0.8	J	0.00016	U
tert-Butylbenzene	100	5.9	0.00014	U	0.00016	U	0.00014	U	0.00016	U	0.15	U	0.00018	U
o-Chlorotoluene	--	--	0.00016	U	0.00018	U	0.00016	U	0.00019	U	0.18	U	0.00021	U
p-Chlorotoluene	--	--	0.00014	U	0.00015	U	0.00014	U	0.00016	U	0.15	U	0.00017	U
1,2-Dibromo-3-chloropropane	--	--	0.00041	U	0.00045	U	0.00041	U	0.00048	U	0.45	U	0.00052	U
Hexachlorobutadiene	--	--	0.00024	U	0.00026	U	0.00023	U	0.00027	U	0.26	U	0.0003	U
Isopropylbenzene	100	--	0.00011	U	0.00012	U	0.00011	U	0.00012	U	0.12	U	0.00014	U
p-Isopropyltoluene	--	--	0.00013	U	0.00014	U	0.00013	U	0.00015	U	0.9	J	0.00016	U
Naphthalene	100	12	0.00014	U	0.00016	U	0.00036	J	0.00017	U	0.16	U	0.00018	U
Acrylonitrile	--	--	0.00053	U	0.00059	U	0.00053	U	0.00062	U	0.58	U	0.00067	U
n-Propylbenzene	100	3.9	0.00011	U	0.00012	U	0.00011	U	0.00013	U	0.12	U	0.00014	U
1,2,3-Trichlorobenzene	--	--	0.00015	U	0.00017	U	0.00015	U	0.00018	U	0.17	U	0.00019	U
1,2,4-Trichlorobenzene	--	--	0.00019	U	0.00021	U	0.00019	U	0.00022	U	0.21	U	0.00024	U
1,3,5-Trimethylbenzene	47	8.4	0.00015	U	0.00016	U	0.00015	U	0.00017	U	0.16	U	0.00019	U
1,2,4-Trimethylbenzene	47	3.6	0.00014	U	0.00016	U	0.00014	U	0.00017	U	2.1	J	0.00018	U
1,4-Dioxane	9.8	0.1	0.015	U	0.016	U	0.015	U	0.017	U	16	U	0.019	U
p-Diethylbenzene	--	--	0.00016	U	0.00018	U	0.00016	U	0.00019	U	0.62	J	0.00021	U
p-Ethyltoluene	--	--	0.00013	U	0.00014	U	0.00013	U	0.00015	U	0.14	U	0.00016	U
1,2,4,5-Tetramethylbenzene	--	--	0.00013	U	0.00015	U	0.00013	U	0.00016	U	3.2	J	0.00017	U
Ethyl ether	--	--	0.00027	U	0.0003	U	0.00027	U	0.00031	U	0.29	U	0.00034	U
trans-1,4-Dichloro-2-butene	--	--	0.0004	U	0.00045	U	0.0004	U	0.00047	U	0.44	U	0.00051	U

Notes:
NY-UNRES = New York Unrestricted use Criteria current as of 5/2007
NY-RESRR = Restricted-Residential Criteria, New York Restricted use current as of 5/2007
NY-RESR = Residential Criteria, New York Restricted use current as of 5/2007
Cells highlighted in yellow indicate concentrations above the NY-UNRES SCO value, but below the NY-RESRR SCO
Cells highlighted in orange indicate values above the NY-RESR SCO, but below the NY-RESRR SCO
Cells highlighted in blue indicate values above the NY-RESRR SCO
Cells highlighted in grey indicate an MDL above the NY-UNRES SCO, NY-RESR SCO or NY-RESRR SCO
DUP = designation for duplicate sample
SCO = Soil Cleanup Objective
MDL = Maximum Detection Limit
RL = Reporting Limit
Qual = Laboratory Data Qualifier
For U qualified entries, the MDL is shown
U = not detected at or above the MDL
For J qualified entries, the estimated concentration is shown
J = estimated value, indicating the detected value is below the RL, but above the MDL
Results and MDL values are in milligrams per kilogram (mg/kg)
Soil sample depths shown in feet (ft) within sample location
-- = No standard

Table 4 - Volatile Organic Compounds in Soil
21-25 31st Street - Astoria, NY

SAMPLE ID:			GW2D (75-77')		GW2D (73-75')		GW2D (70-72')		SB-11 (0-3')		SB-12 (0-3')		SB-10 (0-3')	
LAB ID:			L1605903-01		L1605903-02		L1605903-03		L1607963-01		L1607963-02		L1607963-03	
COLLECTION DATE:	NY-RESR	NY-UNRES	3/2/2016		3/2/2016		3/2/2016		3/17/2016		3/17/2016		3/17/2016	
Volatile Organic Compounds Units: mg/kg			Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q
Methylene chloride	51	0.05	0.0013	U	0.0013	U	0.0013	U	0.07	U	0.069	U	0.0014	U
1,1-Dichloroethane	19	0.27	0.0001	U	0.0001	U	0.0001	U	0.0054	U	0.0054	U	0.0001	U
Chloroform	10	0.37	0.00044	U	0.00043	U	0.00044	U	0.023	U	0.023	U	0.00046	U
Carbon tetrachloride	1.4	0.76	0.00025	U	0.00024	U	0.00025	U	0.013	U	0.013	U	0.00026	U
1,2-Dichloropropane	--	--	0.00027	U	0.00026	U	0.00027	U	0.014	U	0.014	U	0.00028	U
Dibromochloromethane	--	--	0.00018	U	0.00018	U	0.00018	U	0.0097	U	0.0096	U	0.00019	U
1,1,2-Trichloroethane	--	--	0.00036	U	0.00035	U	0.00036	U	0.019	U	0.019	U	0.00037	U
Tetrachloroethene	5.5	1.3	0.00017	U	0.00016	U	0.00016	U	0.61		1.4		0.0014	
Chlorobenzene	100	1.1	0.00041	U	0.0004	U	0.00041	U	0.022	U	0.022	U	0.00043	U
Trichlorofluoromethane	--	--	0.00046	U	0.00045	U	0.00046	U	0.024	U	0.024	U	0.00048	U
1,2-Dichloroethane	2.3	0.02	0.00013	U	0.00013	U	0.00013	U	0.0072	U	0.0071	U	0.00014	U
1,1,1-Trichloroethane	100	0.68	0.00013	U	0.00013	U	0.00013	U	0.007	U	0.0069	U	0.00014	U
Bromodichloromethane	--	--	0.0002	U	0.0002	U	0.0002	U	0.011	U	0.011	U	0.00021	U
trans-1,3-Dichloropropene	--	--	0.00014	U	0.00014	U	0.00014	U	0.0076	U	0.0076	U	0.00015	U
cis-1,3-Dichloropropene	--	--	0.00014	U	0.00014	U	0.00014	U	0.0074	U	0.0074	U	0.00014	U
1,3-Dichloropropene, Total	--	--	0.00014	U	0.00014	U	0.00014	U	0.0074	U	0.0074	U	0.00014	U
1,1-Dichloropropene	--	--	0.00017	U	0.00016	U	0.00017	U	0.0089	U	0.0088	U	0.00017	U
Bromoform	--	--	0.00028	U	0.00027	U	0.00028	U	0.015	U	0.015	U	0.00029	U
1,1,2,2-Tetrachloroethane	35	--	0.00012	U	0.00012	U	0.00012	U	0.0064	U	0.0063	U	0.00012	U
Benzene	2.9	0.06	0.00014	U	0.00014	U	0.00014	U	0.0075	U	0.0074	U	0.00014	U
Toluene	100	0.7	0.00023	U	0.0013	J	0.00084	J	0.012	U	0.012	U	0.00024	U
Ethylbenzene	30	1	0.00015	U	0.00015	U	0.00015	U	0.0081	U	0.008	U	0.00016	U
Chloromethane	--	--	0.00035	U	0.00034	U	0.00035	U	0.019	U	0.018	U	0.00036	U
Bromomethane	--	--	0.0004	U	0.00039	U	0.0004	U	0.021	U	0.021	U	0.00042	U
Vinyl chloride	0.21	0.02	0.00014	U	0.00014	U	0.00014	U	0.0074	U	0.0074	U	0.00014	U
Chloroethane	--	--	0.00038	U	0.00036	U	0.00037	U	0.02	U	0.02	U	0.00039	U
1,1-Dichloroethene	100	0.33	0.00031	U	0.0003	U	0.00031	U	0.016	U	0.016	U	0.00032	U
trans-1,2-Dichloroethene	100	0.19	0.00025	U	0.0013	J	0.00025	U	0.013	U	0.013	U	0.00026	U
Trichloroethene	10	0.47	0.00015	U	0.0017		0.0012		0.0079	U	0.0078	U	0.00015	U
1,2-Dichlorobenzene	100	1.1	0.00018	U	0.00018	U	0.00018	U	0.0097	U	0.0096	U	0.00019	U
1,3-Dichlorobenzene	17	2.4	0.00016	U	0.00016	U	0.00016	U	0.0085	U	0.0084	U	0.00017	U
1,4-Dichlorobenzene	9.8	1.8	0.00016	U	0.00016	U	0.00016	U	0.0088	U	0.0087	U	0.00017	U
Methyl tert butyl ether	62	0.93	0.0001	U	0.0001	U	0.0001	U	0.0053	U	0.0053	U	0.0001	U
p/m-Xylene	--	--	0.00024	U	0.00023	U	0.00023	U	0.012	U	0.012	U	0.00024	U
o-Xylene	--	--	0.0002	U	0.0002	U	0.0002	U	0.011	U	0.011	U	0.00021	U
Xylenes, Total	100	0.26	0.0002	U	0.0002	U	0.0002	U	0.011	U	0.011	U	0.00021	U
cis-1,2-Dichloroethene	59	0.25	0.00017	U	0.00076	J	0.00017	U	0.009	U	0.0089	U	0.00018	U
1,2-Dichloroethene, Total	--	--	0.00017	U	0.0021	J	0.00017	U	0.009	U	0.0089	U	0.00018	U
Dibromomethane	--	--	0.00019	U	0.00019	U	0.00019	U	0.01	U	0.01	U	0.0002	U
Styrene	--	--	0.00048	U	0.00046	U	0.00047	U	0.025	U	0.025	U	0.00049	U
Dichlorodifluoromethane	--	--	0.00023	U	0.00022	U	0.00022	U	0.012	U	0.012	U	0.00023	U
Acetone	100	0.05	0.008	J	0.0056	J	0.0039	J	0.066	U	0.065	U	0.0049	J
Carbon disulfide	100	--	0.0013	U	0.0013	U	0.0013	U	0.07	U	0.069	U	0.0014	U
2-Butanone	100	0.12	0.00032	U	0.00031	U	0.00032	U	0.017	U	0.017	U	0.00033	U
Vinyl acetate	--	--	0.00016	U	0.00015	U	0.00016	U	0.0084	U	0.0083	U	0.00016	U
4-Methyl-2-pentanone	--	--	0.00029	U	0.00028	U	0.00029	U	0.015	U	0.015	U	0.0003	U
1,2,3-Trichloropropane	80	--	0.00019	U	0.00019	U	0.00019	U	0.01	U	0.01	U	0.0002	U
2-Hexanone	--	--	0.00079	U	0.00077	U	0.00079	U	0.042	U	0.042	U	0.00082	U
Bromochloromethane	--	--	0.00033	U	0.00032	U	0.00032	U	0.017	U	0.017	U	0.00034	U
2,2-Dichloropropane	--	--	0.00027	U	0.00026	U	0.00027	U	0.014	U	0.014	U	0.00028	U
1,2-Dibromoethane	--	--	0.00021	U	0.0002	U	0.0002	U	0.011	U	0.011	U	0.00021	U
1,3-Dichloropropane	--	--	0.00017	U	0.00017	U	0.00017	U	0.0092	U	0.0091	U	0.00018	U
1,1,1,2-Tetrachloroethane	--	--	0.00038	U	0.00037	U	0.00038	U	0.02	U	0.02	U	0.00039	U
Bromobenzene	--	--	0.00025	U	0.00024	U	0.00024	U	0.013	U	0.013	U	0.00026	U
n-Butylbenzene	100	12	0.00014	U	0.00013	U	0.00014	U	0.0073	U	0.0072	U	0.00014	U
sec-Butylbenzene	100	11	0.00014	U	0.00014	U	0.00014	U	0.0077	U	0.0076	U	0.00015	U
tert-Butylbenzene	100	5.9	0.00016	U	0.00016	U	0.00016	U	0.0086	U	0.0085	U	0.00017	U
o-Chlorotoluene	--	--	0.00019	U	0.00018	U	0.00019	U	0.01	U	0.01	U	0.0002	U
p-Chlorotoluene	--	--	0.00016	U	0.00015	U	0.00016	U	0.0084	U	0.0083	U	0.00016	U
1,2-Dibromo-3-chloropropane	--	--	0.00047	U	0.00046	U	0.00047	U	0.025	U	0.025	U	0.00049	U
Hexachlorobutadiene	--	--	0.00027	U	0.00026	U	0.00027	U	0.014	U	0.014	U	0.00028	U
Isopropylbenzene	100	--	0.00012	U	0.00012	U	0.00012	U	0.0066	U	0.0065	U	0.00013	U
p-Isopropyltoluene	--	--	0.00015	U	0.00014	U	0.00015	U	0.0079	U	0.0078	U	0.00015	U
Naphthalene	100	12	0.00016	U	0.00016	U	0.00016	U	0.0088	U	0.0087	U	0.00017	U
Acrylonitrile	--	--	0.00061	U	0.00059	U	0.00061	U	0.032	U	0.032	U	0.00063	U
n-Propylbenzene	100	3.9	0.00013	U	0.00013	U	0.00013	U	0.0069	U	0.0068	U	0.00013	U
1,2,3-Trichlorobenzene	--	--	0.00018	U	0.00017	U	0.00017	U	0.0093	U	0.0092	U	0.00018	U
1,2,4-Trichlorobenzene	--	--	0.00022	U	0.00021	U	0.00021	U	0.012	U	0.011	U	0.00022	U
1,3,5-Trimethylbenzene	47	8.4	0.00017	U	0.00016	U	0.00017	U	0.0091	U	0.009	U	0.00018	U
1,2,4-Trimethylbenzene	47	3.6	0.00017	U	0.00016	U	0.00017	U	0.0089	U	0.0088	U	0.00017	U
1,4-Dioxane	9.8	0.1	0.017	U	0.017	U	0.017	U	0.91	U	0.9	U	0.018	U
p-Diethylbenzene	--	--	0.00019	U	0.00018	U	0.00019	U	0.01	U	0.01	U	0.0002	U
p-Ethyltoluene	--	--	0.00015	U	0.00014	U	0.00015	U	0.0078	U	0.0078	U	0.00015	U
1,2,4,5-Tetramethylbenzene	--	--	0.00015	U	0.00015	U	0.00015	U	0.0082	U	0.0082	U	0.00016	U
Ethyl ether	--	--	0.00031	U	0.0003	U	0.00031	U	0.016	U	0.016	U	0.00032	U
trans-1,4-Dichloro-2-butene	--	--	0.00046	U	0.00045	U	0.00046	U	0.025	U	0.024	U	0.00048	U

Notes:
NY-UNRES = New York Unrestricted use Criteria current as of 5/2007
NY-RESRR = Restricted-Residential Criteria, New York Restricted use current as of 5/2007
NY-RESR = Residential Criteria, New York Restricted use current as of 5/2007
Cells highlighted in yellow indicate concentrations above the NY-UNRES SCO value, but below the NY-RESRR SCO
Cells highlighted in orange indicate values above the NY-RESR SCO, but below the NY-RESRR SCO
Cells highlighted in blue indicate values above the NY-RESRR SCO
Cells highlighted in grey indicate an MDL above the NY-UNRES SCO, NY-RESR SCO or NY-RESRR SCO
DUP = designation for duplicate sample
SCO = Soil Cleanup Objective
MDL = Maximum Detection Limit
RL = Reporting Limit
Qual = Laboratory Data Qualifier
For U qualified entries, the MDL is shown
U = not detected at or above the MDL
For J qualified entries, the estimated concentration is shown
J = estimated value, indicating the detected value is below the RL, but above the MDL
Results and MDL values are in milligrams per kilogram (mg/kg)
Soil sample depths shown in feet (ft) within sample location
-- = No standard

Table 4 - Volatile Organic Compounds in Soil
21-25 31st Street - Astoria, NY

SAMPLE ID:			SB-9 (0-3')		SB-13 (1-3')		SB-13 (9-11')		SB-13 (11-12.5')		SB14 (3-5)		SB14 (5-7)	
LAB ID:			L1607963-05		L1607963-06		L1607963-07		L1607963-08		L1608045-02		L1608045-03	
COLLECTION DATE:	NY-RESR	NY-UNRES	3/18/2016		3/18/2016		3/18/2016		3/18/2016		3/18/2016		3/18/2016	
Volatile Organic Compounds Units: mg/kg			Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q
Methylene chloride	51	0.05	0.072	U	0.0018	U	0.0014	U	0.0013	U	0.0012	U	0.0017	U
1,1-Dichloroethane	19	0.27	0.0056	U	0.00014	U	0.00011	U	0.0001	U	0.0001	U	0.00014	U
Chloroform	10	0.37	0.024	U	0.0006	U	0.00049	U	0.00042	U	0.00041	U	0.00058	U
Carbon tetrachloride	1.4	0.76	0.014	U	0.00034	U	0.00028	U	0.00024	U	0.00024	U	0.00033	U
1,2-Dichloropropane	--	--	0.015	U	0.00037	U	0.0003	U	0.00026	U	0.00026	U	0.00036	U
Dibromochloromethane	--	--	0.01	U	0.00025	U	0.0002	U	0.00018	U	0.00017	U	0.00024	U
1,1,2-Trichloroethane	--	--	0.02	U	0.0005	U	0.0004	U	0.00035	U	0.00034	U	0.00048	U
Tetrachloroethene	5.5	1.3	0.77		0.00023	U	0.00018	U	0.00016	U	0.00016	U	0.00022	U
Chlorobenzene	100	1.1	0.023	U	0.00057	U	0.00046	U	0.0004	U	0.00039	U	0.00055	U
Trichlorofluoromethane	--	--	0.025	U	0.00063	U	0.00051	U	0.00044	U	0.00043	U	0.00061	U
1,2-Dichloroethane	2.3	0.02	0.0074	U	0.00018	U	0.00015	U	0.00013	U	0.00013	U	0.00018	U
1,1,1-Trichloroethane	100	0.68	0.0072	U	0.00018	U	0.00015	U	0.00013	U	0.00012	U	0.00018	U
Bromodichloromethane	--	--	0.011	U	0.00028	U	0.00023	U	0.0002	U	0.00019	U	0.00027	U
trans-1,3-Dichloropropene	--	--	0.0079	U	0.0002	U	0.00016	U	0.00014	U	0.00014	U	0.00019	U
cis-1,3-Dichloropropene	--	--	0.0077	U	0.00019	U	0.00016	U	0.00013	U	0.00013	U	0.00018	U
1,3-Dichloropropene, Total	--	--	0.0077	U	0.00019	U	0.00016	U	0.00013	U	0.00013	U	0.00018	U
1,1-Dichloropropene	--	--	0.0092	U	0.00023	U	0.00019	U	0.00016	U	0.00016	U	0.00022	U
Bromoform	--	--	0.015	U	0.00039	U	0.00031	U	0.00027	U	0.00026	U	0.00037	U
1,1,2,2-Tetrachloroethane	35	--	0.0066	U	0.00016	U	0.00013	U	0.00012	U	0.00011	U	0.00016	U
Benzene	2.9	0.06	0.0077	U	0.00019	U	0.00016	U	0.00014	U	0.00013	U	0.00019	U
Toluene	100	0.7	0.013	U	0.00032	U	0.00048	J	0.00037	J	0.00022	U	0.00031	U
Ethylbenzene	30	1	0.0083	U	0.00021	U	0.00017	U	0.00015	U	0.00014	U	0.0002	U
Chloromethane	--	--	0.019	U	0.00048	U	0.00039	U	0.00034	U	0.00033	U	0.00046	U
Bromomethane	--	--	0.022	U	0.00055	U	0.00045	U	0.00039	U	0.00038	U	0.00053	U
Vinyl chloride	0.21	0.02	0.0077	U	0.00019	U	0.00015	U	0.00013	U	0.00013	U	0.00018	U
Chloroethane	--	--	0.021	U	0.00052	U	0.00042	U	0.00036	U	0.00035	U	0.0005	U
1,1-Dichloroethene	100	0.33	0.017	U	0.00043	U	0.00034	U	0.0003	U	0.00029	U	0.00041	U
trans-1,2-Dichloroethene	100	0.19	0.014	U	0.00035	U	0.00028	U	0.00024	U	0.00024	U	0.00034	U
Trichloroethene	10	0.47	0.0082	U	0.0002	U	0.00016	U	0.00014	U	0.00014	U	0.0002	U
1,2-Dichlorobenzene	100	1.1	0.01	U	0.00025	U	0.0002	U	0.00018	U	0.00017	U	0.00024	U
1,3-Dichlorobenzene	17	2.4	0.0088	U	0.00022	U	0.00018	U	0.00015	U	0.00015	U	0.00021	U
1,4-Dichlorobenzene	9.8	1.8	0.009	U	0.00023	U	0.00018	U	0.00016	U	0.00016	U	0.00022	U
Methyl tert butyl ether	62	0.93	0.0055	U	0.00014	U	0.00011	U	0.0001	U	0.00009	U	0.00013	U
p/m-Xylene	--	--	0.013	U	0.00032	U	0.00026	U	0.00023	U	0.00022	U	0.00031	U
o-Xylene	--	--	0.011	U	0.00028	U	0.00023	U	0.0002	U	0.00019	U	0.00027	U
Xylenes, Total	100	0.26	0.011	U	0.00028	U	0.00023	U	0.0002	U	0.00019	U	0.00027	U
cis-1,2-Dichloroethene	59	0.25	0.0093	U	0.00023	U	0.00019	U	0.00016	U	0.00016	U	0.00022	U
1,2-Dichloroethene, Total	--	--	0.0093	U	0.00023	U	0.00019	U	0.00016	U	0.00016	U	0.00022	U
Dibromomethane	--	--	0.011	U	0.00027	U	0.00022	U	0.00019	U	0.00018	U	0.00026	U
Styrene	--	--	0.026	U	0.00066	U	0.00053	U	0.00046	U	0.00045	U	0.00064	U
Dichlorodifluoromethane	--	--	0.012	U	0.00031	U	0.00025	U	0.00022	U	0.00021	U	0.0003	U
Acetone	100	0.05	0.068	U	0.0057	J	0.0014	U	0.0063	J	0.031		0.014	J
Carbon disulfide	100	--	0.072	U	0.0018	U	0.0014	U	0.0013	U	0.0012	U	0.0017	U
2-Butanone	100	0.12	0.018	U	0.00044	U	0.00036	U	0.00031	U	0.0032	J	0.00043	U
Vinyl acetate	--	--	0.0086	U	0.00022	U	0.00017	U	0.00015	U	0.00015	U	0.00021	U
4-Methyl-2-pentanone	--	--	0.016	U	0.0004	U	0.00032	U	0.00028	U	0.00027	U	0.00038	U
1,2,3-Trichloropropane	80	--	0.011	U	0.00027	U	0.00021	U	0.00019	U	0.00018	U	0.00026	U
2-Hexanone	--	--	0.044	U	0.0011	U	0.00088	U	0.00076	U	0.00074	U	0.001	U
Bromochloromethane	--	--	0.018	U	0.00045	U	0.00036	U	0.00032	U	0.00031	U	0.00044	U
2,2-Dichloropropane	--	--	0.015	U	0.00037	U	0.0003	U	0.00026	U	0.00025	U	0.00036	U
1,2-Dibromoethane	--	--	0.011	U	0.00028	U	0.00023	U	0.0002	U	0.0002	U	0.00028	U
1,3-Dichloropropane	--	--	0.0095	U	0.00024	U	0.00019	U	0.00017	U	0.00016	U	0.00023	U
1,1,1,2-Tetrachloroethane	--	--	0.021	U	0.00052	U	0.00042	U	0.00036	U	0.00036	U	0.0005	U
Bromobenzene	--	--	0.014	U	0.00034	U	0.00027	U	0.00024	U	0.00023	U	0.00033	U
n-Butylbenzene	100	12	0.0075	U	0.00019	U	0.00015	U	0.00013	U	0.00013	U	0.00018	U
sec-Butylbenzene	100	11	0.008	U	0.0002	U	0.00016	U	0.00014	U	0.00014	U	0.00019	U
tert-Butylbenzene	100	5.9	0.0088	U	0.00022	U	0.00018	U	0.00016	U	0.00015	U	0.00021	U
o-Chlorotoluene	--	--	0.01	U	0.00026	U	0.00021	U	0.00018	U	0.00018	U	0.00025	U
p-Chlorotoluene	--	--	0.0087	U	0.00022	U	0.00018	U	0.00015	U	0.00015	U	0.00021	U
1,2-Dibromo-3-chloropropane	--	--	0.026	U	0.00065	U	0.00052	U	0.00045	U	0.00044	U	0.00063	U
Hexachlorobutadiene	--	--	0.015	U	0.00037	U	0.0003	U	0.00026	U	0.00026	U	0.00036	U
Isopropylbenzene	100	--	0.0068	U	0.00017	U	0.00014	U	0.00012	U	0.00012	U	0.00016	U
p-Isopropyltoluene	--	--	0.0082	U	0.0002	U	0.00016	U	0.00014	U	0.00014	U	0.0002	U
Naphthalene	100	12	0.009	U	0.00023	U	0.00018	U	0.00016	U	0.00072	J	0.0018	J
Acrylonitrile	--	--	0.034	U	0.00084	U	0.00068	U	0.00059	U	0.00058	U	0.00081	U
n-Propylbenzene	100	3.9	0.0071	U	0.00018	U	0.00014	U	0.00012	U	0.00012	U	0.00017	U
1,2,3-Trichlorobenzene	--	--	0.0096	U	0.00024	U	0.00019	U	0.00017	U	0.00016	U	0.00023	U
1,2,4-Trichlorobenzene	--	--	0.012	U	0.0003	U	0.00024	U	0.00021	U	0.0002	U	0.00029	U
1,3,5-Trimethylbenzene	47	8.4	0.0094	U	0.00023	U	0.00019	U	0.00016	U	0.00016	U	0.00023	U
1,2,4-Trimethylbenzene	47	3.6	0.0092	U	0.00023	U	0.00019	U	0.00016	U	0.00016	U	0.00022	U
1,4-Dioxane	9.8	0.1	0.94	U	0.024	U	0.019	U	0.016	U	0.016	U	0.023	U
p-Diethylbenzene	--	--	0.01	U	0.00026	U	0.00021	U	0.00018	U	0.00018	U	0.00025	U
p-Ethyltoluene	--	--	0.0081	U	0.0002	U	0.00016	U	0.00014	U	0.00014	U	0.0002	U
1,2,4,5-Tetramethylbenzene	--	--	0.0085	U	0.00021	U	0.00017	U	0.00015	U	0.00014	U	0.0002	U
Ethyl ether	--	--	0.017	U	0.00042	U	0.00034	U	0.0003	U	0.00029	U	0.00041	U
trans-1,4-Dichloro-2-butene	--	--	0.026	U	0.00064	U	0.00052	U	0.00045	U	0.00044	U	0.00062	U

Notes:
NY-UNRES = New York Unrestricted use Criteria current as of 5/2007
NY-RESRR = Restricted-Residential Criteria, New York Restricted use current as of 5/2007
NY-RESR = Residential Criteria, New York Restricted use current as of 5/2007
Cells highlighted in yellow indicate concentrations above the NY-UNRES SCO value, but below the NY-RESRR SCO
Cells highlighted in orange indicate values above the NY-RESR SCO, but below the NY-RESRR SCO
Cells highlighted in blue indicate values above the NY-RESRR SCO
Cells highlighted in grey indicate an MDL above the NY-UNRES SCO, NY-RESR SCO or NY-RESRR SCO
DUP = designation for duplicate sample
SCO = Soil Cleanup Objective
MDL = Maximum Detection Limit
RL = Reporting Limit
Qual = Laboratory Data Qualifier
For U qualified entries, the MDL is shown
U = not detected at or above the MDL
For J qualified entries, the estimated concentration is shown
J = estimated value, indicating the detected value is below the RL, but above the MDL
Results and MDL values are in milligrams per kilogram (mg/kg)
Soil sample depths shown in feet (ft) within sample location
-- = No standard

Table 4 - Volatile Organic Compounds in Soil
21-25 31st Street - Astoria, NY

SAMPLE ID:			FB		TB		FB		TB		TB		TB		TRIP BLANK	
LAB ID:			L1604342-07		L1604342-08		L1604640-05		L1604640-06		L1604906-08		L1605903-04		L1607963-09	
COLLECTION DATE:	NY-RESR	NY-UNRES	2/17/2016		2/17/2016		2/19/2016		2/19/2016		2/23/2016		3/2/2016		3/18/2016	
Volatile Organic Compounds Units: mg/kg			Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q
Methylene chloride	51	0.05	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
1,1-Dichloroethane	19	0.27	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
Chloroform	10	0.37	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
Carbon tetrachloride	1.4	0.76	0.13	U	0.13	U	0.13	U	0.13	U	0.13	U	0.13	U	0.13	U
1,2-Dichloropropane	--	--	0.13	U	0.13	U	0.13	U	0.13	U	0.13	U	0.13	U	0.13	U
Dibromochloromethane	--	--	0.15	U	0.15	U	0.15	U	0.15	U	0.15	U	0.15	U	0.15	U
1,1,2-Trichloroethane	--	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Tetrachloroethene	5.5	1.3	0.18	U	0.18	U	0.18	U	0.18	U	0.18	U	0.18	U	0.18	U
Chlorobenzene	100	1.1	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
Trichlorofluoromethane	--	--	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
1,2-Dichloroethane	2.3	0.02	0.13	U	0.13	U	0.13	U	0.13	U	0.13	U	0.13	U	0.13	U
1,1,1-Trichloroethane	100	0.68	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
Bromodichloromethane	--	--	0.19	U	0.19	U	0.19	U	0.19	U	0.19	U	0.19	U	0.19	U
trans-1,3-Dichloropropene	--	--	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U
cis-1,3-Dichloropropene	--	--	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U
1,3-Dichloropropene, Total	--	--	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U
1,1-Dichloropropene	--	--	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
Bromoform	--	--	0.65	U	0.65	U	0.65	U	0.65	U	0.65	U	0.65	U	0.65	U
1,1,2,2-Tetrachloroethane	35	--	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U
Benzene	2.9	0.06	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U
Toluene	100	0.7	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
Ethylbenzene	30	1	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
Chloromethane	--	--	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
Bromomethane	--	--	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
Vinyl chloride	0.21	0.02	0.07	U	0.07	U	0.07	U	0.07	U	0.07	U	0.07	U	0.07	U
Chloroethane	--	--	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
1,1-Dichloroethene	100	0.33	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U
trans-1,2-Dichloroethene	100	0.19	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
Trichloroethene	10	0.47	0.18	U	0.18	U	0.18	U	0.18	U	0.18	U	0.18	U	0.18	U
1,2-Dichlorobenzene	100	1.1	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
1,3-Dichlorobenzene	17	2.4	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
1,4-Dichlorobenzene	9.8	1.8	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
Methyl tert butyl ether	62	0.93	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
p/m-Xylene	--	--	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
o-Xylene	--	--	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
Xylenes, Total	100	0.26	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
cis-1,2-Dichloroethene	59	0.25	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
1,2-Dichloroethene, Total	--	--	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
Dibromomethane	--	--	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Styrene	--	--	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
Dichlorodifluoromethane	--	--	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Acetone	100	0.05	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
Carbon disulfide	100	--	1	U	1	U	1	U	1	U	1	U	1	U	1	U
2-Butanone	100	0.12	2.2	J	1.5	U	1.5	J	1.5	U	1.5	U	1.5	U	1.5	U
Vinyl acetate	--	--	1	U	1	U	1	U	1	U	1	U	1	U	1	U
4-Methyl-2-pentanone	--	--	1.9	U	1.9	U	1.9	U	1.9	U	1.9	U	1.9	U	1.9	U
1,2,3-Trichloropropane	80	--	1	U	1	U	1	U	1	U	1	U	1	U	1	U
2-Hexanone	--	--	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromochloromethane	--	--	1	U	1	U	1	U	1	U	1	U	1	U	1	U
2,2-Dichloropropane	--	--	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
1,2-Dibromoethane	--	--	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
1,3-Dichloropropane	--	--	0.65	U	0.65	U	0.65	U	0.65	U	0.65	U	0.65	U	0.65	U
1,1,1,2-Tetrachloroethane	--	--	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
Bromobenzene	--	--	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
n-Butylbenzene	100	12	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
sec-Butylbenzene	100	11	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
tert-Butylbenzene	100	5.9	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
o-Chlorotoluene	--	--	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
p-Chlorotoluene	--	--	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
1,2-Dibromo-3-chloropropane	--	--	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
Hexachlorobutadiene	--	--	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
Isopropylbenzene	100	--	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
p-Isopropyltoluene	--	--	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
Naphthalene	100	12	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
Acrylonitrile	--	--	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
n-Propylbenzene	100	3.9	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
1,2,3-Trichlorobenzene	--	--	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
1,2,4-Trichlorobenzene	--	--	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
1,3,5-Trimethylbenzene	47	8.4	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
1,2,4-Trimethylbenzene	47	3.6	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
1,4-Dioxane	9.8	0.1	41	U	41	U	41	U	41	U	41	U	41	U	41	U
p-Diethylbenzene	--	--	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
p-Ethyltoluene	--	--	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
1,2,4,5-Tetramethylbenzene	--	--	0.65	U	0.65	U	0.65	U	0.65	U	0.65	U	0.65	U	0.65	U
Ethyl ether	--	--	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
trans-1,4-Dichloro-2-butene	--	--	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U

Notes:
NY-UNRES = New York Unrestricted use Criteria current as of 5/2007
NY-RESRR = Restricted-Residential Criteria, New York Restricted use current as of 5/2007
NY-RESR = Residential Criteria, New York Restricted use current as of 5/2007
Cells highlighted in yellow indicate concentrations above the NY-UNRES SCO value, but below the NY-RESRR SCO
Cells highlighted in orange indicate values above the NY-RESR SCO, but below the NY-RESRR SCO
Cells highlighted in blue indicate values above the NY-RESRR SCO
Cells highlighted in grey indicate an MDL above the NY-UNRES SCO, NY-RESR SCO or NY-RESRR SCO
DUP = designation for duplicate sample
SCO = Soil Cleanup Objective
MDL = Maximum Detection Limit
RL = Reporting Limit
Qual = Laboratory Data Qualifier
For U qualified entries, the MDL is shown
U = not detected at or above the MDL.
For J qualified entries, the estimated concentration is shown
J = estimated value, indicating the detected value is below the RL, but above the MDL
Results and MDL values are in milligrams per kilogram (mg/kg)
Soil sample depths shown in feet (ft) within sample location
-- = No standard

Table 4 - Volatile Organic Compounds in Soil
21-25 31st Street - Astoria, NY

SAMPLE ID:				GW-3D (35-36')		GW-3D (35-36') D		GW-3D (68-69')		GW-3D (70-71')		TP-1 (3')	
LAB ID:				L1630422-01		L1630422-02		L1630422-03		L1630422-04		L1630422-06	
COLLECTION DATE:	NY-RESR	NY-RESRR	NY-UNRES	9/26/2016		9/26/2016		9/26/2016		9/26/2016		9/28/2016	
Volatile Organic Compounds Units: mg/kg				Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q
Methylene chloride	51	100	0.05	0.21	U	0.71	U	0.0013	U	0.001	U	0.002	J
1,1-Dichloroethane	19	26	0.27	0.016	U	0.055	U	0.0001	U	0.00008	U	0.0001	U
Chloroform	10	49	0.37	0.071	U	0.24	U	0.0018		0.00069	J	0.00042	U
Carbon tetrachloride	1.4	2.4	0.76	0.04	U	0.14	U	0.00026	U	0.0002	U	0.00024	U
1,2-Dichloropropane	--	--	--	0.044	U	0.15	U	0.00028	U	0.00022	U	0.00026	U
Dibromochloromethane	--	--	--	0.029	U	0.099	U	0.00019	U	0.00015	U	0.00017	U
1,1,2-Trichloroethane	--	--	--	0.058	U	0.2	U	0.00037	U	0.00029	U	0.00035	U
Tetrachloroethene	5.5	19	1.3	0.027	U	0.09	U	0.00063	J	0.00098		0.00059	J
Chlorobenzene	100	100	1.1	0.067	U	0.22	U	0.00042	U	0.00033	U	0.0004	U
Trichlorofluoromethane	--	--	--	0.074	U	0.25	U	0.00047	U	0.00037	U	0.00044	U
1,2-Dichloroethane	2.3	3.1	0.02	0.022	U	0.073	U	0.00014	U	0.00011	U	0.00013	U
1,1,1-Trichloroethane	100	100	0.68	0.021	U	0.071	U	0.00013	U	0.0001	U	0.00013	U
Bromodichloromethane	--	--	--	0.033	U	0.11	U	0.00021	U	0.00016	U	0.0002	U
trans-1,3-Dichloropropene	--	--	--	0.023	U	0.078	U	0.00015	U	0.00012	U	0.00014	U
cis-1,3-Dichloropropene	--	--	--	0.022	U	0.076	U	0.00014	U	0.00011	U	0.00013	U
1,3-Dichloropropene, Total	--	--	--	0.022	U	0.076	U	0.00014	U	0.00011	U	0.00013	U
1,1-Dichloropropene	--	--	--	0.027	U	0.091	U	0.00017	U	0.00014	U	0.00016	U
Bromoform	--	--	--	0.045	U	0.15	U	0.00029	U	0.00022	U	0.00027	U
1,1,2,2-Tetrachloroethane	35	--	--	0.019	U	0.065	U	0.00012	U	0.0001	U	0.00011	U
Benzene	2.9	4.8	0.06	0.023	U	0.1	J	0.00014	U	0.00011	U	0.00013	U
Toluene	100	100	0.7	0.037	U	0.12	U	0.00024	U	0.00019	U	0.00022	U
Ethylbenzene	30	41	1	0.18	J	0.23	J	0.00016	U	0.00012	U	0.00014	U
Chloromethane	--	--	--	0.056	U	0.19	U	0.00036	U	0.00028	U	0.00033	U
Bromomethane	--	--	--	0.065	U	0.22	U	0.00041	U	0.00032	U	0.00038	U
Vinyl chloride	0.21	0.9	0.02	0.022	U	0.076	U	0.00014	U	0.00011	U	0.00013	U
Chloroethane	--	--	--	0.061	U	0.2	U	0.00038	U	0.0003	U	0.00036	U
1,1-Dichloroethene	100	100	0.33	0.05	U	0.17	U	0.00032	U	0.00025	U	0.0003	U
trans-1,2-Dichloroethene	100	100	0.19	0.041	U	0.14	U	0.0004	J	0.00027	J	0.00024	U
Trichloroethene	10	21	0.47	0.024	U	0.08	U	0.0013		0.00062	J	0.00014	U
1,2-Dichlorobenzene	100	100	1.1	0.029	U	0.099	U	0.00019	U	0.00015	U	0.00017	U
1,3-Dichlorobenzene	17	49	2.4	0.026	U	0.087	U	0.00016	U	0.00013	U	0.00015	U
1,4-Dichlorobenzene	9.8	13	1.8	0.026	U	0.089	U	0.00017	U	0.00013	U	0.00016	U
Methyl tert butyl ether	62	100	0.93	0.016	U	0.054	U	0.0001	U	0.00008	U	0.0001	U
p/m-Xylene	--	--	--	0.067	U	0.23	U	0.00043	U	0.00034	U	0.0004	U
o-Xylene	--	--	--	0.065	U	0.22	U	0.00041	U	0.00032	U	0.00038	U
Xylenes, Total	100	100	0.26	0.065	U	0.22	U	0.00041	U	0.00032	U	0.00038	U
cis-1,2-Dichloroethene	59	100	0.25	0.027	U	0.092	U	0.00017	U	0.00014	U	0.00016	U
1,2-Dichloroethene, Total	--	--	--	0.027	U	0.092	U	0.0004	J	0.00027	J	0.00016	U
Dibromomethane	--	--	--	0.031	U	0.1	U	0.0002	U	0.00016	U	0.00019	U
Styrene	--	--	--	0.077	U	0.26	U	0.00049	U	0.00038	U	0.00046	U
Dichlorodifluoromethane	--	--	--	0.037	U	0.12	U	0.00023	U	0.00018	U	0.00022	U
Acetone	100	100	0.05	0.2	U	0.67	U	0.0013	U	0.00099	U	0.0012	U
Carbon disulfide	100	--	--	0.21	U	0.71	U	0.0013	U	0.001	U	0.0012	U
2-Butanone	100	100	0.12	0.052	U	0.18	U	0.00033	U	0.00026	U	0.00031	U
Vinyl acetate	--	--	--	0.025	U	0.085	U	0.00016	U	0.00013	U	0.00015	U
4-Methyl-2-pentanone	--	--	--	0.047	U	0.16	U	0.0003	U	0.00023	U	0.00028	U
1,2,3-Trichloropropane	80	--	--	0.031	U	0.1	U	0.0002	U	0.00016	U	0.00018	U
2-Hexanone	--	--	--	0.13	U	0.43	U	0.00081	U	0.00064	U	0.00076	U
Bromochloromethane	--	--	--	0.053	U	0.18	U	0.00034	U	0.00026	U	0.00031	U
2,2-Dichloropropane	--	--	--	0.043	U	0.14	U	0.00028	U	0.00022	U	0.00026	U
1,2-Dibromoethane	--	--	--	0.033	U	0.11	U	0.00021	U	0.00017	U	0.0002	U
1,3-Dichloropropane	--	--	--	0.028	U	0.094	U	0.00018	U	0.00014	U	0.00016	U
1,1,1,2-Tetrachloroethane	--	--	--	0.061	U	0.2	U	0.00039	U	0.0003	U	0.00036	U
Bromobenzene	--	--	--	0.04	U	0.13	U	0.00025	U	0.0002	U	0.00024	U
n-Butylbenzene	100	100	12	0.67		1.3		0.00014	U	0.00011	U	0.00013	U
sec-Butylbenzene	100	100	11	0.56		0.98		0.00015	U	0.00012	U	0.00014	U
tert-Butylbenzene	100	100	5.9	0.064	J	0.11	J	0.00016	U	0.00013	U	0.00015	U
o-Chlorotoluene	--	--	--	0.031	U	0.1	U	0.00019	U	0.00015	U	0.00018	U
p-Chlorotoluene	--	--	--	0.025	U	0.086	U	0.00016	U	0.00013	U	0.00015	U
1,2-Dibromo-3-chloropropane	--	--	--	0.076	U	0.26	U	0.00048	U	0.00038	U	0.00045	U
Hexachlorobutadiene	--	--	--	0.044	U	0.15	U	0.00028	U	0.00022	U	0.00026	U
Isopropylbenzene	100	--	--	0.2		0.3	J	0.00013	U	0.0001	U	0.00012	U
p-Isopropyltoluene	--	--	--	0.57		1		0.00015	U	0.00012	U	0.00014	U
Naphthalene	100	100	12	2.3		3.3		0.00017	U	0.00013	U	0.00016	U
Acrylonitrile	--	--	--	0.099	U	0.33	U	0.00062	U	0.00049	U	0.00058	U
n-Propylbenzene	100	100	3.9	0.39		0.6	J	0.00013	U	0.0001	U	0.00012	U
1,2,3-Trichlorobenzene	--	--	--	0.028	U	0.095	U	0.00018	U	0.00014	U	0.00017	U
1,2,4-Trichlorobenzene	--	--	--	0.035	U	0.12	U	0.00022	U	0.00017	U	0.00021	U
1,3,5-Trimethylbenzene	47	52	8.4	0.028	U	0.092	U	0.00017	U	0.00014	U	0.00016	U
1,2,4-Trimethylbenzene	47	52	3.6	3.5		5.6		0.00017	U	0.00014	U	0.00016	U
1,4-Dioxane	9.8	13	0.1	2.8	U	9.3	U	0.018	U	0.014	U	0.016	U
p-Diethylbenzene	--	--	--	0.031	U	0.1	U	0.00019	U	0.00015	U	0.00018	U
p-Ethyltoluene	--	--	--	0.098	J	0.18	J	0.00015	U	0.00012	U	0.00014	U
1,2,4,5-Tetramethylbenzene	--	--	--	2.1		3.8		0.00016	U	0.00012	U	0.00015	U
Ethyl ether	--	--	--	0.05	U	0.17	U	0.00032	U	0.00025	U	0.0003	U
trans-1,4-Dichloro-2-butene	--	--	--	0.075	U	0.25	U	0.00048	U	0.00037	U	0.00045	U

Notes:
NY-UNRES = New York Unrestricted use Criteria current as of 5/2007
NY-RESRR = Restricted-Residential Criteria, New York Restricted use current as of 5/2007
NY-RESR = Residential Criteria, New York Restricted use current as of 5/2007
Cells highlighted in yellow indicate concentrations above the NY-UNRES SCO value, but below the NY-RESRR SCO
Cells highlighted in orange indicate values above the NY-RESR SCO, but below the NY-RESRR SCO
Cells highlighted in blue indicate values above the NY-RESRR SCO
Cells highlighted in grey indicate an MDL above the NY-UNRES SCO, NY-RESR SCO or NY-RESRR SCO
DUP = designation for duplicate sample
SCO = Soil Cleanup Objective
MDL = Maximum Detection Limit
RL = Reporting Limit
Qual = Laboratory Data Qualifier
For U qualified entries, the MDL is shown
U = not detected at or above the MDL
For J qualified entries, the estimated concentration is shown
J = estimated value, indicating the detected value is below the RL, but above the MDL
Results and MDL values are in milligrams per kilogram (mg/kg)
Soil sample depths shown in feet (ft) within sample location
-- = No standard

Table 5 - Semivolatile Organic Compounds in Soil
21-25 31st Street - Astoria, NY

SAMPLE ID:				GW5D (0-2')		GW5D (8-10')		GW5D (40-42')		GW5D (40-42D)		GW5D (48-50')		GW5D (77-79')	
LAB ID:				L1604342-01		L1604342-02		L1604342-03		L1604342-04		L1604342-05		L1604342-06	
COLLECTION DATE:	NY-RESR	NY-RESRR	NY-UNRES	2/15/2016		2/15/2016		2/16/2016		2/16/2016		2/16/2016		2/16/2016	
Semivolatile Organic Compounds				Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q
Acenaphthene	100	100	20	0.022	U	0.018	U	0.02	U	0.02	U	0.019	U	0.02	U
1,2,4-Trichlorobenzene	--	--	--	0.025	U	0.02	U	0.022	U	0.022	U	0.021	U	0.022	U
Hexachlorobenzene	0.41	1.2	0.33	0.024	U	0.02	U	0.022	U	0.021	U	0.021	U	0.021	U
Bis(2-chloroethyl)ether	--	--	--	0.03	U	0.024	U	0.026	U	0.026	U	0.025	U	0.026	U
2-Chloronaphthalene	--	--	--	0.022	U	0.017	U	0.019	U	0.019	U	0.018	U	0.019	U
1,2-Dichlorobenzene	100	100	1.1	0.039	U	0.032	U	0.035	U	0.034	U	0.033	U	0.034	U
1,3-Dichlorobenzene	17	49	2.4	0.038	U	0.03	U	0.034	U	0.033	U	0.032	U	0.033	U
1,4-Dichlorobenzene	9.8	13	1.8	0.038	U	0.031	U	0.034	U	0.033	U	0.032	U	0.033	U
3,3'-Dichlorobenzidine	--	--	--	0.058	U	0.047	U	0.052	U	0.05	U	0.05	U	0.051	U
2,4-Dinitrotoluene	--	--	--	0.044	U	0.035	U	0.039	U	0.038	U	0.037	U	0.038	U
2,6-Dinitrotoluene	1.03	--	--	0.037	U	0.03	U	0.033	U	0.033	U	0.032	U	0.033	U
Fluoranthene	100	100	100	0.026	J	0.02	U	0.022	U	0.022	U	0.021	U	0.022	U
4-Chlorophenyl phenyl ether	--	--	--	0.023	U	0.019	U	0.021	U	0.02	U	0.02	U	0.02	U
4-Bromophenyl phenyl ether	--	--	--	0.033	U	0.027	U	0.03	U	0.029	U	0.028	U	0.029	U
Bis(2-chloroisopropyl)ether	--	--	--	0.037	U	0.03	U	0.033	U	0.032	U	0.032	U	0.032	U
Bis(2-chloroethoxy)methane	--	--	--	0.022	U	0.018	U	0.02	U	0.019	U	0.019	U	0.019	U
Hexachlorobutadiene	--	--	--	0.032	U	0.026	U	0.028	U	0.028	U	0.027	U	0.028	U
Hexachlorocyclopentadiene	--	--	--	0.2	U	0.16	U	0.18	U	0.17	U	0.17	U	0.17	U
Hexachloroethane	--	--	--	0.035	U	0.028	U	0.032	U	0.031	U	0.03	U	0.031	U
Isophorone	100	--	--	0.028	U	0.023	U	0.025	U	0.025	U	0.024	U	0.025	U
Naphthalene	100	100	12	0.026	U	0.021	U	0.024	U	0.023	U	0.023	U	0.023	U
Nitrobenzene	3.7	15	--	0.032	U	0.026	U	0.029	U	0.028	U	0.028	U	0.028	U
NitrosoDiPhenylAmine(NDPA)/DP	--	--	--	0.025	U	0.02	U	0.022	U	0.022	U	0.021	U	0.022	U
n-Nitrosodi-n-propylamine	--	--	--	0.034	U	0.027	U	0.03	U	0.029	U	0.029	U	0.029	U
Bis(2-Ethylhexyl)phthalate	50	--	--	0.075	U	0.061	U	0.068	U	0.066	U	0.064	U	0.066	U
Butyl benzyl phthalate	100	--	--	0.055	U	0.044	U	0.049	U	0.048	U	0.047	U	0.048	U
Di-n-butylphthalate	100	--	--	0.041	U	0.033	U	0.037	U	0.036	U	0.035	U	0.036	U
Di-n-octylphthalate	100	--	--	0.074	U	0.06	U	0.066	U	0.064	U	0.063	U	0.065	U
Diethyl phthalate	100	--	--	0.02	U	0.016	U	0.018	U	0.018	U	0.017	U	0.018	U
Dimethyl phthalate	100	--	--	0.046	U	0.037	U	0.041	U	0.04	U	0.039	U	0.04	U
Benzo(a)anthracene	1	1	1	0.024	U	0.02	U	0.022	U	0.021	U	0.021	U	0.021	U
Benzo(a)pyrene	1	1	1	0.053	U	0.043	U	0.048	U	0.046	U	0.045	U	0.046	U
Benzo(b)fluoranthene	1	1	1	0.037	U	0.03	U	0.033	U	0.032	U	0.031	U	0.032	U
Benzo(k)fluoranthene	1	3.9	0.8	0.035	U	0.028	U	0.031	U	0.03	U	0.03	U	0.03	U
Chrysene	1	3.9	1	0.023	U	0.018	U	0.02	U	0.02	U	0.019	U	0.02	U
Acenaphthylene	100	100	100	0.034	U	0.027	U	0.03	U	0.029	U	0.029	U	0.029	U
Anthracene	100	100	100	0.042	U	0.034	U	0.038	U	0.037	U	0.036	U	0.037	U
Benzo(ghi)perylene	100	100	100	0.026	U	0.021	U	0.023	U	0.022	U	0.022	U	0.022	U
Fluorene	100	100	30	0.021	U	0.017	U	0.019	U	0.018	U	0.018	U	0.018	U
Phenanthrene	100	100	100	0.026	U	0.021	U	0.024	U	0.023	U	0.023	U	0.023	U
Dibenzo(a,h)anthracene	0.33	0.33	0.33	0.025	U	0.02	U	0.022	U	0.022	U	0.022	U	0.022	U
Indeno(1,2,3-cd)Pyrene	0.5	0.5	0.5	0.03	U	0.024	U	0.027	U	0.026	U	0.026	U	0.026	U
Pyrene	100	100	100	0.022	U	0.017	U	0.019	U	0.019	U	0.018	U	0.019	U
Biphenyl	--	--	--	0.05	U	0.041	U	0.045	U	0.044	U	0.043	U	0.044	U
4-Chloroaniline	100	--	--	0.04	U	0.032	U	0.036	U	0.034	U	0.034	U	0.035	U
2-Nitroaniline	--	--	--	0.042	U	0.034	U	0.038	U	0.037	U	0.036	U	0.037	U
3-Nitroaniline	--	--	--	0.041	U	0.033	U	0.037	U	0.036	U	0.035	U	0.036	U
4-Nitroaniline	--	--	--	0.09	U	0.073	U	0.081	U	0.079	U	0.077	U	0.079	U
Dibenzofuran	14	59	7	0.021	U	0.017	U	0.018	U	0.018	U	0.018	U	0.018	U
2-Methylnaphthalene	0.41	--	--	0.026	U	0.021	U	0.024	U	0.023	U	0.022	U	0.023	U
1,2,4,5-Tetrachlorobenzene	--	--	--	0.023	U	0.018	U	0.02	U	0.02	U	0.019	U	0.02	U
Acetophenone	--	--	--	0.027	U	0.022	U	0.024	U	0.024	U	0.023	U	0.024	U
2,4,6-Trichlorophenol	--	--	--	0.041	U	0.033	U	0.037	U	0.036	U	0.035	U	0.036	U
P-Chloro-M-Cresol	--	--	--	0.032	U	0.026	U	0.029	U	0.028	U	0.028	U	0.028	U
2-Chlorophenol	100	--	--	0.026	U	0.021	U	0.023	U	0.022	U	0.022	U	0.022	U
2,4-Dichlorophenol	100	--	--	0.035	U	0.028	U	0.031	U	0.03	U	0.03	U	0.031	U
2,4-Dimethylphenol	--	--	--	0.072	U	0.058	U	0.064	U	0.063	U	0.061	U	0.063	U
2-Nitrophenol	--	--	--	0.082	U	0.066	U	0.073	U	0.071	U	0.07	U	0.072	U
4-Nitrophenol	--	--	--	0.089	U	0.072	U	0.08	U	0.078	U	0.076	U	0.078	U
2,4-Dinitrophenol	100	--	--	0.1	U	0.082	U	0.091	U	0.088	U	0.087	U	0.089	U
4,6-Dinitro-o-cresol	--	--	--	0.1	U	0.084	U	0.094	U	0.091	U	0.089	U	0.092	U
Pentachlorophenol	2.4	6.7	0.8	0.048	U	0.039	U	0.043	U	0.042	U	0.041	U	0.042	U
Phenol	100	100	0.33	0.033	U	0.026	U	0.029	U	0.029	U	0.028	U	0.029	U
2-Methylphenol	100	100	0.33	0.034	U	0.027	U	0.03	U	0.029	U	0.029	U	0.03	U
3-Methylphenol/4-Methylphenol	34	100	0.33	0.034	U	0.028	U	0.03	U	0.03	U	0.029	U	0.03	U
2,4,5-Trichlorophenol	100	--	--	0.042	U	0.034	U	0.037	U	0.036	U	0.036	U	0.036	U
Benzoic Acid	100	--	--	0.22	U	0.18	U	0.2	U	0.19	U	0.19	U	0.19	U
Benzyl Alcohol	--	--	--	0.067	U	0.054	U	0.06	U	0.058	U	0.057	U	0.058	U
Carbazole	--	--	--	0.021	U	0.017	U	0.019	U	0.018	U	0.018	U	0.018	U

Notes:
NY-UNRES = New York Unrestricted use Criteria current as of 5/2007
NY-RESRR = Restricted-Residential Criteria, New York Restricted use current as of 5/2007
NY-RESR = Residential Criteria, New York Restricted use current as of 5/2007
Cells highlighted in yellow indicate concentrations above the NY-UNRES SCO value, but below the NY-RESRR SCO
Cells highlighted in orange indicate values above the NY-RESR SCO, but below the NY-RESRR SCO
Cells highlighted in blue indicate values above the NY-RESRR SCO
Cells highlighted in grey indicate an MDL above the NY-UNRES SCO, NY-RESR SCO or NY-RESRR SCO
DUP = designation for duplicate sample
SCO = Soil Cleanup Objective
MDL = Maximum Detection Limit
RL = Reporting Limit
Qual = Laboratory Data Qualifier
For U qualified entries, the MDL is shown
U = not detected at or above the MDL
For J qualified entries, the estimated concentration is shown
J = estimated value, indicating the detected value is below the RL, but above the MDL
Results and MDL values are in milligrams per kilogram (mg/kg)
Soil sample depths shown in feet (ft) within sample location
-- = No standard

Table 5 - Semivolatile Organic Compounds in Soil
21-25 31st Street - Astoria, NY

SAMPLE ID:				GW8 (7-9')		GW8 (40-42')		GW8 (57-59')		GW6 (10-12')		GW6(40-42')		GW6(53-55')	
LAB ID:				L1604640-01		L1604640-02		L1604640-03		L1604640-04		L1604906-03		L1604906-04	
COLLECTION DATE:	NY-RESR	NY-RESRR	NY-UNRES	2/18/2016		2/18/2016		2/19/2016		2/19/2016		2/22/2016		2/22/2016	
Semivolatile Organic Compounds				**Conc**	**Q**	**Conc**	**Q**	**Conc**	**Q**	**Conc**	**Q**	**Conc**	**Q**	**Conc**	**Q**
Acenaphthene	100	100	20	0.02	U	2.4	J	0.02	U	0.019	U	4.1		0.02	U
1,2,4-Trichlorobenzene	--	--	--	0.023	U	0.42	U	0.022	U	0.021	U	0.1	U	0.022	U
Hexachlorobenzene	0.41	1.2	0.33	0.022	U	0.41	U	0.022	U	0.02	U	0.1	U	0.021	U
Bis(2-chloroethyl)ether	--	--	--	0.027	U	0.5	U	0.026	U	0.025	U	0.12	U	0.026	U
2-Chloronaphthalene	--	--	--	0.02	U	0.36	U	0.019	U	0.018	U	0.092	U	0.019	U
1,2-Dichlorobenzene	100	100	1.1	0.036	U	0.66	U	0.035	U	0.033	U	0.17	U	0.034	U
1,3-Dichlorobenzene	17	49	2.4	0.034	U	0.63	U	0.033	U	0.031	U	0.16	U	0.032	U
1,4-Dichlorobenzene	9.8	13	1.8	0.035	U	0.64	U	0.034	U	0.032	U	0.16	U	0.033	U
3,3'-Dichlorobenzidine	--	--	--	0.053	U	0.97	U	0.051	U	0.049	U	0.25	U	0.05	U
2,4-Dinitrotoluene	--	--	--	0.04	U	0.73	U	0.038	U	0.037	U	0.18	U	0.038	U
2,6-Dinitrotoluene	1.03	--	--	0.034	U	0.63	U	0.033	U	0.031	U	0.16	U	0.032	U
Fluoranthene	100	100	100	0.023	U	0.42	U	0.022	U	0.021	U	0.11	U	0.022	U
4-Chlorophenyl phenyl ether	--	--	--	0.021	U	0.39	U	0.021	U	0.02	U	0.099	U	0.02	U
4-Bromophenyl phenyl ether	--	--	--	0.03	U	0.56	U	0.029	U	0.028	U	0.14	U	0.029	U
Bis(2-chloroisopropyl)ether	--	--	--	0.034	U	0.62	U	0.033	U	0.031	U	0.16	U	0.032	U
Bis(2-chloroethoxy)methane	--	--	--	0.02	U	0.37	U	0.019	U	0.018	U	0.093	U	0.019	U
Hexachlorobutadiene	--	--	--	0.029	U	0.54	U	0.028	U	0.027	U	0.14	U	0.028	U
Hexachlorocyclopentadiene	--	--	--	0.18	U	3.3	U	0.17	U	0.16	U	0.84	U	0.17	U
Hexachloroethane	--	--	--	0.032	U	0.59	U	0.031	U	0.03	U	0.15	U	0.031	U
Isophorone	100	--	--	0.026	U	0.47	U	0.025	U	0.024	U	0.12	U	0.024	U
Naphthalene	100	100	12	0.024	U	12		0.023	U	0.022	U	12		0.023	U
Nitrobenzene	3.7	15	--	0.029	U	0.54	U	0.028	U	0.027	U	0.14	U	0.028	U
NitrosoDiPhenylAmine(NDPA)/DI	--	--	--	0.022	U	0.42	U	0.022	U	0.021	U	0.1	U	0.022	U
n-Nitrosodi-n-propylamine	--	--	--	0.031	U	0.56	U	0.03	U	0.028	U	0.14	U	0.029	U
Bis(2-Ethylhexyl)phthalate	50	--	--	0.11	J	1.3	U	0.067	U	0.063	U	0.32	U	0.066	U
Butyl benzyl phthalate	100	--	--	0.05	U	0.92	U	0.048	U	0.046	U	0.23	U	0.048	U
Di-n-butylphthalate	100	--	--	0.038	U	0.69	U	0.036	U	0.035	U	0.18	U	0.036	U
Di-n-octylphthalate	100	--	--	0.067	U	1.2	U	0.066	U	0.062	U	0.31	U	0.064	U
Diethyl phthalate	100	--	--	0.018	U	0.34	U	0.018	U	0.017	U	0.086	U	0.018	U
Dimethyl phthalate	100	--	--	0.042	U	0.77	U	0.04	U	0.038	U	0.19	U	0.04	U
Benzo(a)anthracene	1	1	1	0.022	U	0.41	U	0.022	U	0.021	U	0.1	U	0.021	U
Benzo(a)pyrene	1	1	1	0.048	U	0.89	U	0.047	U	0.045	U	0.22	U	0.046	U
Benzo(b)fluoranthene	1	1	1	0.033	U	0.62	U	0.032	U	0.031	U	0.16	U	0.032	U
Benzo(k)fluoranthene	1	3.9	0.8	0.032	U	0.58	U	0.031	U	0.029	U	0.15	U	0.03	U
Chrysene	1	3.9	1	0.021	U	0.38	U	0.02	U	0.019	U	0.096	U	0.02	U
Acenaphthylene	100	100	100	0.031	U	0.56	U	0.03	U	0.028	U	0.14	U	0.029	U
Anthracene	100	100	100	0.039	U	0.71	U	0.038	U	0.036	U	2.4		0.037	U
Benzo(ghi)perylene	100	100	100	0.023	U	0.43	U	0.023	U	0.022	U	0.11	U	0.022	U
Fluorene	100	100	30	0.019	U	5.4		0.019	U	0.018	U	8.2		0.018	U
Phenanthrene	100	100	100	0.024	U	11		0.023	U	0.022	U	18		0.023	U
Dibenzo(a,h)anthracene	0.33	0.33	0.33	0.023	U	0.42	U	0.022	U	0.021	U	0.11	U	0.022	U
Indeno(1,2,3-cd)Pyrene	0.5	0.5	0.5	0.028	U	0.51	U	0.027	U	0.026	U	0.13	U	0.026	U
Pyrene	100	100	100	0.02	U	0.7	J	0.019	U	0.018	U	1.2		0.019	U
Biphenyl	--	--	--	0.046	U	0.85	U	0.045	U	0.042	U	0.21	U	0.044	U
4-Chloroaniline	100	--	--	0.036	U	0.66	U	0.035	U	0.033	U	0.17	U	0.034	U
2-Nitroaniline	--	--	--	0.038	U	0.7	U	0.037	U	0.035	U	0.18	U	0.036	U
3-Nitroaniline	--	--	--	0.037	U	0.69	U	0.036	U	0.034	U	0.17	U	0.036	U
4-Nitroaniline	--	--	--	0.082	U	1.5	U	0.08	U	0.076	U	0.38	U	0.078	U
Dibenzofuran	14	59	7	0.019	U	2.5	J	0.018	U	0.017	U	3.8		0.018	U
2-Methylnaphthalene	0.41	--	--	0.024	U	56		0.023	U	0.022	U	68		0.023	U
1,2,4,5-Tetrachlorobenzene	--	--	--	0.021	U	0.38	U	0.02	U	0.019	U	0.097	U	0.02	U
Acetophenone	--	--	--	0.024	U	0.45	U	0.024	U	0.023	U	0.11	U	0.023	U
2,4,6-Trichlorophenol	--	--	--	0.038	U	0.69	U	0.036	U	0.035	U	0.18	U	0.036	U
P-Chloro-M-Cresol	--	--	--	0.03	U	0.54	U	0.029	U	0.027	U	0.14	U	0.028	U
2-Chlorophenol	100	--	--	0.023	U	0.43	U	0.023	U	0.022	U	0.11	U	0.022	U
2,4-Dichlorophenol	100	--	--	0.032	U	0.59	U	0.031	U	0.029	U	0.15	U	0.03	U
2,4-Dimethylphenol	--	--	--	0.065	U	1.2	U	0.064	U	0.06	U	0.3	U	0.062	U
2-Nitrophenol	--	--	--	0.074	U	1.4	U	0.072	U	0.069	U	0.35	U	0.071	U
4-Nitrophenol	--	--	--	0.081	U	1.5	U	0.079	U	0.075	U	0.38	U	0.077	U
2,4-Dinitrophenol	100	--	--	0.092	U	1.7	U	0.09	U	0.085	U	0.43	U	0.088	U
4,6-Dinitro-o-cresol	--	--	--	0.095	U	1.8	U	0.092	U	0.088	U	0.44	U	0.091	U
Pentachlorophenol	2.4	6.7	0.8	0.044	U	0.8	U	0.042	U	0.04	U	0.2	U	0.042	U
Phenol	100	100	0.33	0.03	U	0.55	U	0.029	U	0.028	U	0.14	U	0.029	U
2-Methylphenol	100	100	0.33	0.031	U	0.57	U	0.03	U	0.028	U	0.14	U	0.029	U
3-Methylphenol/4-Methylphenol	34	100	0.33	0.031	U	0.57	U	0.03	U	0.029	U	0.14	U	0.03	U
2,4,5-Trichlorophenol	100	--	--	0.038	U	0.7	U	0.037	U	0.035	U	0.18	U	0.036	U
Benzoic Acid	100	--	--	0.2	U	3.7	U	0.19	U	0.18	U	0.94	U	0.19	U
Benzyl Alcohol	--	--	--	0.061	U	1.1	U	0.059	U	0.056	U	0.28	U	0.058	U
Carbazole	--	--	--	0.019	U	0.36	U	0.019	U	0.018	U	0.09	U	0.018	U

Notes:
NY-UNRES = New York Unrestricted use Criteria current as of 5/2007
NY-RESRR = Restricted-Residential Criteria, New York Restricted use current as of 5/2007
NY-RESR = Residential Criteria, New York Restricted use current as of 5/2007
Cells highlighted in yellow indicate concentrations above the NY-UNRES SCO value, but below the NY-RESRR SCO
Cells highlighted in orange indicate values above the NY-RESR SCO, but below the NY-RESRR SCO
Cells highlighted in blue indicate values above the NY-RESRR SCO
Cells highlighted in grey indicate an MDL above the NY-UNRES SCO, NY-RESR SCO or NY-RESRR SCO
DUP = designation for duplicate sample
SCO = Soil Cleanup Objective
MDL = Maximum Detection Limit
RL = Reporting Limit
Qual = Laboratory Data Qualifier
For U qualified entries, the MDL is shown
U = not detected at or above the MDL
For J qualified entries, the estimated concentration is shown
J = estimated value, indicating the detected value is below the RL, but above the MDL
Results and MDL values are in milligrams per kilogram (mg/kg)
Soil sample depths shown in feet (ft) within sample location
-- = No standard

Table 5 - Semivolatile Organic Compounds in Soil
21-25 31st Street - Astoria, NY

SAMPLE ID:				GW7(10-12')		GW7(36-38')		GW7(40-42')		GW2D (8-10')		GW2D (38-39')		GW2D (43-45')	
LAB ID:				L1604906-05		L1604906-06		L1604906-07		L1605682-01		L1605682-02		L1605682-03	
COLLECTION DATE:	NY-RESR	NY-RESRR	NY-UNRES	2/22/2016		2/23/2016		2/23/2016		3/1/2016		3/1/2016		3/1/2016	
Semivolatile Organic Compounds				**Conc**	**Q**	**Conc**	**Q**	**Conc**	**Q**	**Conc**	**Q**	**Conc**	**Q**	**Conc**	**Q**
Acenaphthene	100	100	20	0.019	U	0.018	U	0.018	U	0.018	U	0.037	U	0.022	U
1,2,4-Trichlorobenzene	--	--	--	0.021	U	0.019	U	0.02	U	0.019	U	0.041	U	0.025	U
Hexachlorobenzene	0.41	1.2	0.33	0.02	U	0.019	U	0.02	U	0.019	U	0.04	U	0.024	U
Bis(2-chloroethyl)ether	--	--	--	0.025	U	0.023	U	0.024	U	0.023	U	0.049	U	0.029	U
2-Chloronaphthalene	--	--	--	0.018	U	0.017	U	0.018	U	0.017	U	0.036	U	0.022	U
1,2-Dichlorobenzene	100	100	1.1	0.033	U	0.03	U	0.032	U	0.03	U	0.065	U	0.039	U
1,3-Dichlorobenzene	17	49	2.4	0.031	U	0.029	U	0.031	U	0.029	U	0.062	U	0.037	U
1,4-Dichlorobenzene	9.8	13	1.8	0.032	U	0.03	U	0.031	U	0.03	U	0.063	U	0.038	U
3,3'-Dichlorobenzidine	--	--	--	0.049	U	0.045	U	0.047	U	0.045	U	0.096	U	0.058	U
2,4-Dinitrotoluene	--	--	--	0.036	U	0.034	U	0.036	U	0.034	U	0.072	U	0.043	U
2,6-Dinitrotoluene	1.03	--	--	0.031	U	0.029	U	0.03	U	0.029	U	0.062	U	0.037	U
Fluoranthene	100	100	100	0.021	U	0.019	U	0.02	U	0.02	U	0.042	U	0.025	U
4-Chlorophenyl phenyl ether	--	--	--	0.02	U	0.018	U	0.019	U	0.018	U	0.039	U	0.023	U
4-Bromophenyl phenyl ether	--	--	--	0.028	U	0.026	U	0.027	U	0.026	U	0.055	U	0.033	U
Bis(2-chloroisopropyl)ether	--	--	--	0.031	U	0.029	U	0.03	U	0.029	U	0.062	U	0.037	U
Bis(2-chloroethoxy)methane	--	--	--	0.018	U	0.017	U	0.018	U	0.017	U	0.036	U	0.022	U
Hexachlorobutadiene	--	--	--	0.027	U	0.025	U	0.026	U	0.025	U	0.053	U	0.032	U
Hexachlorocyclopentadiene	--	--	--	0.16	U	0.15	U	0.16	U	0.15	U	0.33	U	0.2	U
Hexachloroethane	--	--	--	0.03	U	0.027	U	0.029	U	0.028	U	0.058	U	0.035	U
Isophorone	100	--	--	0.024	U	0.022	U	0.023	U	0.022	U	0.047	U	0.028	U
Naphthalene	100	100	12	0.022	U	0.02	U	0.022	U	0.021	U	1.3		0.026	U
Nitrobenzene	3.7	15	--	0.027	U	0.025	U	0.026	U	0.025	U	0.054	U	0.032	U
NitrosoDiPhenylAmine(NDPA)/DI	--	--	--	0.021	U	0.019	U	0.02	U	0.019	U	0.041	U	0.025	U
n-Nitrosodi-n-propylamine	--	--	--	0.028	U	0.026	U	0.028	U	0.026	U	0.056	U	0.034	U
Bis(2-Ethylhexyl)phthalate	50	--	--	0.063	U	0.058	U	0.062	U	0.059	U	0.12	U	0.075	U
Butyl benzyl phthalate	100	--	--	0.046	U	0.042	U	0.045	U	0.043	U	0.091	U	0.055	U
Di-n-butylphthalate	100	--	--	0.035	U	0.032	U	0.034	U	0.032	U	0.068	U	0.041	U
Di-n-octylphthalate	100	--	--	0.062	U	0.057	U	0.06	U	0.058	U	0.12	U	0.074	U
Diethyl phthalate	100	--	--	0.017	U	0.016	U	0.016	U	0.016	U	0.033	U	0.02	U
Dimethyl phthalate	100	--	--	0.038	U	0.035	U	0.037	U	0.036	U	0.076	U	0.046	U
Benzo(a)anthracene	1	1	1	0.02	U	0.019	U	0.02	U	0.019	U	0.041	U	0.024	U
Benzo(a)pyrene	1	1	1	0.045	U	0.041	U	0.043	U	0.041	U	0.088	U	0.053	U
Benzo(b)fluoranthene	1	1	1	0.031	U	0.028	U	0.03	U	0.029	U	0.061	U	0.036	U
Benzo(k)fluoranthene	1	3.9	0.8	0.029	U	0.027	U	0.028	U	0.027	U	0.058	U	0.035	U
Chrysene	1	3.9	1	0.019	U	0.018	U	0.018	U	0.018	U	0.038	U	0.022	U
Acenaphthylene	100	100	100	0.028	U	0.026	U	0.028	U	0.026	U	0.056	U	0.034	U
Anthracene	100	100	100	0.036	U	0.033	U	0.035	U	0.033	U	0.82		0.042	U
Benzo(ghi)perylene	100	100	100	0.022	U	0.02	U	0.021	U	0.02	U	0.042	U	0.026	U
Fluorene	100	100	30	0.018	U	0.016	U	0.017	U	0.016	U	0.035	U	0.021	U
Phenanthrene	100	100	100	0.022	U	0.02	U	0.022	U	0.021	U	6.2		0.026	U
Dibenzo(a,h)anthracene	0.33	0.33	0.33	0.021	U	0.02	U	0.02	U	0.02	U	0.042	U	0.025	U
Indeno(1,2,3-cd)Pyrene	0.5	0.5	0.5	0.025	U	0.024	U	0.025	U	0.024	U	0.05	U	0.03	U
Pyrene	100	100	100	0.018	U	0.017	U	0.018	U	0.017	U	0.036	U	0.022	U
Biphenyl	--	--	--	0.042	U	0.039	U	0.041	U	0.039	U	0.084	U	0.05	U
4-Chloroaniline	100	--	--	0.033	U	0.031	U	0.032	U	0.031	U	0.066	U	0.04	U
2-Nitroaniline	--	--	--	0.035	U	0.032	U	0.034	U	0.033	U	0.07	U	0.042	U
3-Nitroaniline	--	--	--	0.034	U	0.032	U	0.034	U	0.032	U	0.068	U	0.041	U
4-Nitroaniline	--	--	--	0.076	U	0.07	U	0.074	U	0.07	U	0.15	U	0.09	U
Dibenzofuran	14	59	7	0.017	U	0.016	U	0.017	U	0.016	U	0.034	U	0.02	U
2-Methylnaphthalene	0.41	--	--	0.022	U	0.02	U	0.022	U	0.02	U	2.8		0.026	U
1,2,4,5-Tetrachlorobenzene	--	--	--	0.019	U	0.018	U	0.018	U	0.018	U	0.038	U	0.023	U
Acetophenone	--	--	--	0.023	U	0.021	U	0.022	U	0.021	U	0.045	U	0.027	U
2,4,6-Trichlorophenol	--	--	--	0.035	U	0.032	U	0.034	U	0.032	U	0.068	U	0.041	U
P-Chloro-M-Cresol	--	--	--	0.027	U	0.025	U	0.026	U	0.025	U	0.054	U	0.032	U
2-Chlorophenol	100	--	--	0.022	U	0.02	U	0.021	U	0.02	U	0.043	U	0.026	U
2,4-Dichlorophenol	100	--	--	0.029	U	0.027	U	0.029	U	0.027	U	0.058	U	0.035	U
2,4-Dimethylphenol	--	--	--	0.06	U	0.056	U	0.059	U	0.056	U	0.12	U	0.072	U
2-Nitrophenol	--	--	--	0.069	U	0.064	U	0.067	U	0.064	U	0.14	U	0.082	U
4-Nitrophenol	--	--	--	0.075	U	0.069	U	0.073	U	0.069	U	0.15	U	0.088	U
2,4-Dinitrophenol	100	--	--	0.085	U	0.079	U	0.083	U	0.079	U	0.17	U	0.1	U
4,6-Dinitro-o-cresol	--	--	--	0.088	U	0.081	U	0.086	U	0.082	U	0.17	U	0.1	U
Pentachlorophenol	2.4	6.7	0.8	0.04	U	0.037	U	0.039	U	0.037	U	0.08	U	0.048	U
Phenol	100	100	0.33	0.028	U	0.026	U	0.027	U	0.026	U	0.055	U	0.033	U
2-Methylphenol	100	100	0.33	0.028	U	0.026	U	0.028	U	0.026	U	0.056	U	0.034	U
3-Methylphenol/4-Methylphenol	34	100	0.33	0.029	U	0.026	U	0.028	U	0.027	U	0.057	U	0.034	U
2,4,5-Trichlorophenol	100	--	--	0.035	U	0.032	U	0.034	U	0.032	U	0.069	U	0.042	U
Benzoic Acid	100	--	--	0.18	U	0.17	U	0.18	U	0.17	U	0.37	U	0.22	U
Benzyl Alcohol	--	--	--	0.056	U	0.052	U	0.054	U	0.052	U	0.11	U	0.066	U
Carbazole	--	--	--	0.018	U	0.016	U	0.017	U	0.016	U	0.035	U	0.021	U

Notes:
NY-UNRES = New York Unrestricted use Criteria current as of 5/2007
NY-RESRR = Restricted-Residential Criteria, New York Restricted use current as of 5/2007
NY-RESR = Residential Criteria, New York Restricted use current as of 5/2007
Cells highlighted in yellow indicate concentrations above the NY-UNRES SCO value, but below the NY-RESRR SCO
Cells highlighted in orange indicate values above the NY-RESR SCO, but below the NY-RESRR SCO
Cells highlighted in blue indicate values above the NY-RESRR SCO
Cells highlighted in grey indicate an MDL above the NY-UNRES SCO, NY-RESR SCO or NY-RESRR SCO
DUP = designation for duplicate sample
SCO = Soil Cleanup Objective
MDL = Maximum Detection Limit
RL = Reporting Limit
Qual = Laboratory Data Qualifier
For U qualified entries, the MDL is shown
U = not detected at or above the MDL
For J qualified entries, the estimated concentration is shown
J = estimated value, indicating the detected value is below the RL, but above the MDL
Results and MDL values are in milligrams per kilogram (mg/kg)
Soil sample depths shown in feet (ft) within sample location
-- = No standard

Table 5 - Semivolatile Organic Compounds in Soil
21-25 31st Street - Astoria, NY

SAMPLE ID:				GW2D (73-75')		GW2D (70-72')		SB-11 (0-3')		SB-12 (0-3')		SB-10 (0-3')		SB-9 (0-3')	
LAB ID:				L1605903-02		L1605903-03		L1607963-01		L1607963-02		L1607963-03		L1607963-05	
COLLECTION DATE:	NY-RESR	NY-RESRR	NY-UNRES	3/2/2016		3/2/2016		3/17/2016		3/17/2016		3/17/2016		3/18/2016	
Semivolatile Organic Compounds				Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q
Acenaphthene	100	100	20	0.019	U	0.02	U	0.018	U	0.041	J	0.018	U	0.019	U
1,2,4-Trichlorobenzene	--	--	--	0.021	U	0.022	U	0.02	U	0.02	U	0.02	U	0.021	U
Hexachlorobenzene	0.41	1.2	0.33	0.021	U	0.022	U	0.02	U	0.02	U	0.019	U	0.02	U
Bis(2-chloroethyl)ether	--	--	--	0.025	U	0.026	U	0.024	U	0.024	U	0.023	U	0.025	U
2-Chloronaphthalene	--	--	--	0.018	U	0.019	U	0.017	U	0.017	U	0.017	U	0.018	U
1,2-Dichlorobenzene	100	100	1.1	0.033	U	0.035	U	0.031	U	0.032	U	0.031	U	0.033	U
1,3-Dichlorobenzene	17	49	2.4	0.032	U	0.033	U	0.03	U	0.03	U	0.03	U	0.031	U
1,4-Dichlorobenzene	9.8	13	1.8	0.032	U	0.034	U	0.03	U	0.031	U	0.03	U	0.032	U
3,3'-Dichlorobenzidine	--	--	--	0.049	U	0.051	U	0.046	U	0.047	U	0.046	U	0.048	U
2,4-Dinitrotoluene	--	--	--	0.037	U	0.039	U	0.035	U	0.035	U	0.034	U	0.036	U
2,6-Dinitrotoluene	1.03	--	--	0.032	U	0.033	U	0.03	U	0.03	U	0.03	U	0.031	U
Fluoranthene	100	100	100	0.021	U	0.022	U	0.19		0.34		0.046	J	0.24	
4-Chlorophenyl phenyl ether	--	--	--	0.02	U	0.021	U	0.019	U	0.019	U	0.018	U	0.02	U
4-Bromophenyl phenyl ether	--	--	--	0.028	U	0.029	U	0.027	U	0.027	U	0.026	U	0.028	U
Bis(2-chloroisopropyl)ether	--	--	--	0.032	U	0.033	U	0.03	U	0.03	U	0.03	U	0.031	U
Bis(2-chloroethoxy)methane	--	--	--	0.018	U	0.019	U	0.018	U	0.018	U	0.017	U	0.018	U
Hexachlorobutadiene	--	--	--	0.027	U	0.028	U	0.026	U	0.026	U	0.025	U	0.027	U
Hexachlorocyclopentadiene	--	--	--	0.17	U	0.18	U	0.16	U	0.16	U	0.16	U	0.16	U
Hexachloroethane	--	--	--	0.03	U	0.031	U	0.028	U	0.028	U	0.028	U	0.03	U
Isophorone	100	--	--	0.024	U	0.025	U	0.023	U	0.023	U	0.022	U	0.024	U
Naphthalene	100	100	12	0.022	U	0.024	U	0.021	U	0.023	J	0.021	U	0.022	U
Nitrobenzene	3.7	15	--	0.027	U	0.029	U	0.026	U	0.026	U	0.026	U	0.027	U
NitrosoDiPhenylAmine(NDPA)/DI	--	--	--	0.021	U	0.022	U	0.02	U	0.02	U	0.02	U	0.021	U
n-Nitrosodi-n-propylamine	--	--	--	0.029	U	0.03	U	0.027	U	0.027	U	0.027	U	0.028	U
Bis(2-Ethylhexyl)phthalate	50	--	--	0.064	U	0.067	U	0.06	U	0.13	J	0.11	J	0.063	U
Butyl benzyl phthalate	100	--	--	0.047	U	0.049	U	0.044	U	0.044	U	0.044	U	0.046	U
Di-n-butylphthalate	100	--	--	0.035	U	0.037	U	0.033	U	0.033	U	0.033	U	0.035	U
Di-n-octylphthalate	100	--	--	0.063	U	0.066	U	0.059	U	0.06	U	0.059	U	0.062	U
Diethyl phthalate	100	--	--	0.017	U	0.018	U	0.016	U	0.016	U	0.016	U	0.017	U
Dimethyl phthalate	100	--	--	0.039	U	0.04	U	0.037	U	0.037	U	0.036	U	0.038	U
Benzo(a)anthracene	1	1	1	0.021	U	0.022	U	0.11		0.18		0.027	J	0.13	
Benzo(a)pyrene	1	1	1	0.045	U	0.047	U	0.14		0.18		0.06	J	0.15	
Benzo(b)fluoranthene	1	1	1	0.031	U	0.032	U	0.16		0.21		0.034	J	0.17	
Benzo(k)fluoranthene	1	3.9	0.8	0.03	U	0.031	U	0.052	J	0.074	J	0.028	U	0.066	J
Chrysene	1	3.9	1	0.019	U	0.02	U	0.097	J	0.16		0.027	J	0.12	
Acenaphthylene	100	100	100	0.029	U	0.03	U	0.027	U	0.027	U	0.027	U	0.028	U
Anthracene	100	100	100	0.036	U	0.038	U	0.034	U	0.062	J	0.034	U	0.036	U
Benzo(ghi)perylene	100	100	100	0.022	U	0.023	U	0.082	J	0.095	J	0.02	U	0.084	J
Fluorene	100	100	30	0.018	U	0.019	U	0.017	U	0.029	J	0.017	U	0.018	U
Phenanthrene	100	100	100	0.022	U	0.024	U	0.081	J	0.26		0.021	U	0.13	
Dibenzo(a,h)anthracene	0.33	0.33	0.33	0.021	U	0.022	U	0.021	J	0.029	J	0.02	U	0.024	J
Indeno(1,2,3-cd)Pyrene	0.5	0.5	0.5	0.026	U	0.027	U	0.12	J	0.14		0.065	J	0.13	J
Pyrene	100	100	100	0.018	U	0.019	U	0.18		0.27		0.04	J	0.21	
Biphenyl	--	--	--	0.043	U	0.045	U	0.041	U	0.041	U	0.04	U	0.042	U
4-Chloroaniline	100	--	--	0.034	U	0.035	U	0.032	U	0.032	U	0.031	U	0.033	U
2-Nitroaniline	--	--	--	0.036	U	0.037	U	0.034	U	0.034	U	0.033	U	0.035	U
3-Nitroaniline	--	--	--	0.035	U	0.036	U	0.033	U	0.033	U	0.033	U	0.034	U
4-Nitroaniline	--	--	--	0.077	U	0.08	U	0.072	U	0.073	U	0.072	U	0.076	U
Dibenzofuran	14	59	7	0.018	U	0.018	U	0.016	U	0.016	J	0.016	U	0.017	U
2-Methylnaphthalene	0.41	--	--	0.022	U	0.023	U	0.021	U	0.021	U	0.021	U	0.022	U
1,2,4,5-Tetrachlorobenzene	--	--	--	0.019	U	0.02	U	0.018	U	0.018	U	0.018	U	0.019	U
Acetophenone	--	--	--	0.023	U	0.024	U	0.022	U	0.022	U	0.021	U	0.023	U
2,4,6-Trichlorophenol	--	--	--	0.035	U	0.037	U	0.033	U	0.033	U	0.033	U	0.035	U
P-Chloro-M-Cresol	--	--	--	0.028	U	0.029	U	0.026	U	0.026	U	0.026	U	0.027	U
2-Chlorophenol	100	--	--	0.022	U	0.023	U	0.021	U	0.021	U	0.02	U	0.022	U
2,4-Dichlorophenol	100	--	--	0.03	U	0.031	U	0.028	U	0.028	U	0.028	U	0.029	U
2,4-Dimethylphenol	--	--	--	0.061	U	0.064	U	0.058	U	0.058	U	0.057	U	0.06	U
2-Nitrophenol	--	--	--	0.07	U	0.073	U	0.066	U	0.066	U	0.065	U	0.069	U
4-Nitrophenol	--	--	--	0.076	U	0.079	U	0.071	U	0.072	U	0.07	U	0.074	U
2,4-Dinitrophenol	100	--	--	0.086	U	0.09	U	0.081	U	0.082	U	0.08	U	0.085	U
4,6-Dinitro-o-cresol	--	--	--	0.089	U	0.093	U	0.084	U	0.084	U	0.083	U	0.088	U
Pentachlorophenol	2.4	6.7	0.8	0.041	U	0.042	U	0.038	U	0.039	U	0.038	U	0.04	U
Phenol	100	100	0.33	0.028	U	0.029	U	0.026	U	0.026	U	0.026	U	0.028	U
2-Methylphenol	100	100	0.33	0.029	U	0.03	U	0.027	U	0.027	U	0.027	U	0.028	U
3-Methylphenol/4-Methylphenol	34	100	0.33	0.029	U	0.03	U	0.027	U	0.027	U	0.027	U	0.028	U
2,4,5-Trichlorophenol	100	--	--	0.036	U	0.037	U	0.033	U	0.034	U	0.033	U	0.035	U
Benzoic Acid	100	--	--	0.19	U	0.2	U	0.18	U	0.18	U	0.17	U	0.18	U
Benzyl Alcohol	--	--	--	0.057	U	0.059	U	0.053	U	0.054	U	0.053	U	0.056	U
Carbazole	--	--	--	0.018	U	0.019	U	0.017	U	0.032	J	0.017	U	0.019	J

Notes:
NY-UNRES = New York Unrestricted use Criteria current as of 5/2007
NY-RESRR = Restricted-Residential Criteria, New York Restricted use current as of 5/2007
NY-RESR = Residential Criteria, New York Restricted use current as of 5/2007
Cells highlighted in yellow indicate concentrations above the NY-UNRES SCO value, but below the NY-RESRR SCO
Cells highlighted in orange indicate values above the NY-RESR SCO, but below the NY-RESRR SCO
Cells highlighted in blue indicate values above the NY-RESRR SCO
Cells highlighted in grey indicate an MDL above the NY-UNRES SCO, NY-RESR SCO or NY-RESRR SCO
DUP = designation for duplicate sample
SCO = Soil Cleanup Objective
MDL = Maximum Detection Limit
RL = Reporting Limit
Qual = Laboratory Data Qualifier
For U qualified entries, the MDL is shown
U = not detected at or above the MDL
For J qualified entries, the estimated concentration is shown
J = estimated value, indicating the detected value is below the RL, but above the MDL
Results and MDL values are in milligrams per kilogram (mg/kg)
Soil sample depths shown in feet (ft) within sample location
-- = No standard

Table 5 - Semivolatile Organic Compounds in Soil
21-25 31st Street - Astoria, NY

SAMPLE ID:				SB-13 (1-3')		SB-13 (9-11')		SB-13 (11-12.5')		SB14 (1-3)		SB14 (5-7)		FB		FB	
LAB ID:				L1607963-06		L1607963-07		L1607963-08		L1608045-01		L1608045-03		L1604342-07		L1604640-05	
COLLECTION DATE:	NY-RESR	NY-RESRR	NY-UNRES	3/18/2016		3/18/2016		3/18/2016		3/18/2016		3/18/2016		2/17/2016		2/19/2016	
Semivolatile Organic Compounds Units: mg/kg				Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q
Acenaphthene	100	100	20	0.35		0.02	U	0.02	U	0.31		0.044	J	0.59	U	0.59	U
1,2,4-Trichlorobenzene	--	--	--	0.024	U	0.022	U	0.022	U	0.02	U	0.02	U	0.66	U	0.66	U
Hexachlorobenzene	0.41	1.2	0.33	0.024	U	0.022	U	0.022	U	0.02	U	0.019	U	0.58	U	0.58	U
Bis(2-chloroethyl)ether	--	--	--	0.029	U	0.026	U	0.026	U	0.024	U	0.023	U	0.67	U	0.67	U
2-Chloronaphthalene	--	--	--	0.021	U	0.019	U	0.019	U	0.017	U	0.017	U	0.64	U	0.64	U
1,2-Dichlorobenzene	100	100	1.1	0.038	U	0.034	U	0.035	U	0.032	U	0.031	U	0.73	U	0.73	U
1,3-Dichlorobenzene	17	49	2.4	0.036	U	0.033	U	0.034	U	0.03	U	0.03	U	0.73	U	0.73	U
1,4-Dichlorobenzene	9.8	13	1.8	0.037	U	0.034	U	0.034	U	0.031	U	0.03	U	0.71	U	0.71	U
3,3'-Dichlorobenzidine	--	--	--	0.056	U	0.051	U	0.052	U	0.047	U	0.046	U	1.4	U	1.4	U
2,4-Dinitrotoluene	--	--	--	0.042	U	0.038	U	0.039	U	0.035	U	0.034	U	0.84	U	0.84	U
2,6-Dinitrotoluene	1.03	--	--	0.036	U	0.033	U	0.034	U	0.03	U	0.03	U	1.1	U	1.1	U
Fluoranthene	100	100	100	6.5		0.022	U	0.25		5.5		0.61		0.57	U	0.57	U
4-Chlorophenyl phenyl ether	--	--	--	0.023	U	0.02	U	0.021	U	0.019	U	0.018	U	0.62	U	0.62	U
4-Bromophenyl phenyl ether	--	--	--	0.032	U	0.029	U	0.03	U	0.027	U	0.026	U	0.73	U	0.73	U
Bis(2-chloroisopropyl)ether	--	--	--	0.036	U	0.033	U	0.033	U	0.03	U	0.029	U	0.7	U	0.7	U
Bis(2-chloroethoxy)methane	--	--	--	0.021	U	0.019	U	0.02	U	0.018	U	0.017	U	0.63	U	0.63	U
Hexachlorobutadiene	--	--	--	0.031	U	0.028	U	0.028	U	0.026	U	0.025	U	0.66	U	0.66	U
Hexachlorocyclopentadiene	--	--	--	0.19	U	0.17	U	0.18	U	0.16	U	0.16	U	7.8	U	7.8	U
Hexachloroethane	--	--	--	0.034	U	0.031	U	0.032	U	0.028	U	0.028	U	0.68	U	0.68	U
Isophorone	100	--	--	0.028	U	0.025	U	0.025	U	0.023	U	0.022	U	0.6	U	0.6	U
Naphthalene	100	100	12	0.074	J	0.023	U	0.024	U	0.049	J	0.021	U	0.68	U	0.68	U
Nitrobenzene	3.7	15	--	0.031	U	0.028	U	0.029	U	0.026	U	0.026	U	0.75	U	0.75	U
NitrosoDiPhenylAmine(NDPA)/DPA	--	--	--	0.024	U	0.022	U	0.022	U	0.02	U	0.02	U	0.64	U	0.64	U
n-Nitrosodi-n-propylamine	--	--	--	0.033	U	0.03	U	0.03	U	0.027	U	0.027	U	0.7	U	0.7	U
Bis(2-Ethylhexyl)phthalate	50	--	--	0.073	U	0.066	U	0.068	U	0.37		0.33		0.91	U	2.5	J
Butyl benzyl phthalate	100	--	--	0.054	U	0.048	U	0.21		0.54		0.85		1.3	U	1.3	U
Di-n-butylphthalate	100	--	--	0.04	U	0.036	U	0.037	U	0.033	U	0.033	U	0.69	U	0.69	U
Di-n-octylphthalate	100	--	--	0.072	U	0.065	U	0.066	U	0.06	U	0.059	U	1.1	U	1.1	U
Diethyl phthalate	100	--	--	0.02	U	0.018	U	0.018	U	0.016	U	0.016	U	0.63	U	0.63	U
Dimethyl phthalate	100	--	--	0.045	U	0.04	U	0.041	U	0.037	U	0.036	U	0.65	U	0.65	U
Benzo(a)anthracene	1	1	1	3.6		0.022	U	0.13		2.6		0.29		0.61	U	0.61	U
Benzo(a)pyrene	1	1	1	3.4		0.047	U	0.16		2.3		0.25		0.54	U	0.54	U
Benzo(b)fluoranthene	1	1	1	4.9		0.032	U	0.18		3.1		0.33		0.64	U	0.64	U
Benzo(k)fluoranthene	1	3.9	0.8	1.7		0.031	U	0.063	J	1.2		0.14		0.6	U	0.6	U
Chrysene	1	3.9	1	3.2		0.02	U	0.11	J	2.5		0.27		0.54	U	0.54	U
Acenaphthylene	100	100	100	0.12	J	0.03	U	0.03	U	0.11	J	0.027	U	0.66	U	0.66	U
Anthracene	100	100	100	0.85		0.037	U	0.038	U	1		0.091	J	0.64	U	0.64	U
Benzo(ghi)perylene	100	100	100	2.6		0.022	U	0.088	J	1.4		0.15		0.61	U	0.61	U
Fluorene	100	100	30	0.24		0.019	U	0.019	U	0.3		0.038	J	0.62	U	0.62	U
Phenanthrene	100	100	100	2.8		0.023	U	0.12		3.8		0.41		0.61	U	0.61	U
Dibenzo(a,h)anthracene	0.33	0.33	0.33	0.72		0.022	U	0.022	U	0.36		0.039	J	0.55	U	0.55	U
Indeno(1,2,3-cd)Pyrene	0.5	0.5	0.5	2.5		0.027	U	0.14	J	1.6		0.17		0.71	U	0.71	U
Pyrene	100	100	100	5.7		0.019	U	0.22		4.4		0.5		0.57	U	0.57	U
Biphenyl	--	--	--	0.049	U	0.044	U	0.045	U	0.041	U	0.04	U	0.76	U	0.76	U
4-Chloroaniline	100	--	--	0.039	U	0.035	U	0.036	U	0.032	U	0.031	U	0.63	U	0.63	U
2-Nitroaniline	--	--	--	0.041	U	0.037	U	0.038	U	0.034	U	0.033	U	1.1	U	1.1	U
3-Nitroaniline	--	--	--	0.04	U	0.036	U	0.037	U	0.033	U	0.032	U	1.1	U	1.1	U
4-Nitroaniline	--	--	--	0.088	U	0.08	U	0.081	U	0.073	U	0.071	U	1.3	U	1.3	U
Dibenzofuran	14	59	7	0.1	J	0.018	U	0.018	U	0.13	J	0.022	J	0.66	U	0.66	U
2-Methylnaphthalene	0.41	--	--	0.045	J	0.023	U	0.024	U	0.048	J	0.021	U	0.72	U	0.72	U
1,2,4,5-Tetrachlorobenzene	--	--	--	0.022	U	0.02	U	0.02	U	0.018	U	0.018	U	0.67	U	0.67	U
Acetophenone	--	--	--	0.026	U	0.024	U	0.024	U	0.022	U	0.021	U	0.85	U	0.85	U
2,4,6-Trichlorophenol	--	--	--	0.04	U	0.036	U	0.037	U	0.033	U	0.033	U	0.68	U	0.68	U
P-Chloro-M-Cresol	--	--	--	0.032	U	0.029	U	0.029	U	0.026	U	0.026	U	0.62	U	0.62	U
2-Chlorophenol	100	--	--	0.025	U	0.023	U	0.023	U	0.021	U	0.02	U	0.63	U	0.63	U
2,4-Dichlorophenol	100	--	--	0.034	U	0.031	U	0.031	U	0.028	U	0.028	U	0.77	U	0.77	U
2,4-Dimethylphenol	--	--	--	0.07	U	0.063	U	0.064	U	0.058	U	0.057	U	1.6	U	1.6	U
2-Nitrophenol	--	--	--	0.08	U	0.072	U	0.073	U	0.066	U	0.065	U	1.5	U	1.5	U
4-Nitrophenol	--	--	--	0.087	U	0.078	U	0.08	U	0.072	U	0.07	U	1.8	U	1.8	U
2,4-Dinitrophenol	100	--	--	0.099	U	0.09	U	0.091	U	0.082	U	0.08	U	5.5	U	5.5	U
4,6-Dinitro-o-cresol	--	--	--	0.1	U	0.092	U	0.094	U	0.084	U	0.083	U	2.1	U	2.1	U
Pentachlorophenol	2.4	6.7	0.8	0.047	U	0.042	U	0.043	U	0.039	U	0.038	U	3.4	U	3.4	U
Phenol	100	100	0.33	0.032	U	0.029	U	0.029	U	0.026	U	0.026	U	1.9	U	1.9	U
2-Methylphenol	100	100	0.33	0.033	U	0.03	U	0.03	U	0.027	U	0.027	U	1	U	1	U
3-Methylphenol/4-Methylphenol	34	100	0.33	0.033	U	0.03	U	0.03	U	0.028	U	0.027	U	1.1	U	1.1	U
2,4,5-Trichlorophenol	100	--	--	0.041	U	0.037	U	0.037	U	0.034	U	0.033	U	0.72	U	0.72	U
Benzoic Acid	100	--	--	0.21	U	0.19	U	0.2	U	0.18	U	0.17	U	13	U	13	U
Benzyl Alcohol	--	--	--	0.065	U	0.059	U	0.06	U	0.054	U	0.072	J	0.72	U	0.72	U
Carbazole	--	--	--	0.29		0.019	U	0.019	U	0.41		0.05	J	0.63	U	0.63	U

Notes:
NY-UNRES = New York Unrestricted use Criteria current as of 5/2007
NY-RESRR = Restricted-Residential Criteria, New York Restricted use current as of 5/2007
NY-RESR = Residential Criteria, New York Restricted use current as of 5/2007
Cells highlighted in yellow indicate concentrations above the NY-UNRES SCO value, but below the NY-RESRR SCO
Cells highlighted in orange indicate values above the NY-RESR SCO, but below the NY-RESRR SCO
Cells highlighted in blue indicate values above the NY-RESRR SCO
Cells highlighted in grey indicate an MDL above the NY-UNRES SCO, NY-RESR SCO or NY-RESRR SCO
DUP = designation for duplicate sample
SCO = Soil Cleanup Objective
MDL = Maximum Detection Limit
RL = Reporting Limit
Qual = Laboratory Data Qualifier
For U qualified entries, the MDL is shown
U = not detected at or above the MDL
For J qualified entries, the estimated concentration is shown
J = estimated value, indicating the detected value is below the RL, but above the MDL
Results and MDL values are in milligrams per kilogram (mg/kg)
Soil sample depths shown in feet (ft) within sample location
-- = No standard

Table 6 - Pesticides and PCBs in Soil
21-25 31st Street - Astoria, NY

SAMPLE ID:				GW5D (0-2')		GW5D (8-10')		GW5D (40-42')		GW5D (40-42D)		GW5D (48-50')		GW5D (77-79')	
LAB ID:				L1604342-01		L1604342-02		L1604342-03		L1604342-04		L1604342-05		L1604342-06	
COLLECTION DATE:	NY-RESR	NY-RESRR	NY-UNRES	2/15/2016		2/15/2016		2/16/2016		2/16/2016		2/16/2016		2/16/2016	
Pesticides **Units: mg/kg**				Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q
Delta-BHC	100	100	0.04	0.000406	U	0.000329	U	0.000364	U	0.000343	U	0.000341	U	0.000361	U
Lindane	0.28	1.3	0.1	0.000386	U	0.000313	U	0.000346	U	0.000326	U	0.000324	U	0.000343	U
Alpha-BHC	0.097	0.48	0.02	0.000245	U	0.000199	U	0.00022	U	0.000207	U	0.000206	U	0.000218	U
Beta-BHC	0.072	0.36	0.036	0.000786	U	0.000637	U	0.000704	U	0.000665	U	0.00066	U	0.000698	U
Heptachlor	0.42	2.1	0.042	0.000465	U	0.000376	U	0.000416	U	0.000393	U	0.00039	U	0.000413	U
Aldrin	0.019	0.097	0.005	0.00073	U	0.000591	U	0.000654	U	0.000617	U	0.000612	U	0.000648	U
Heptachlor epoxide	0.077	--	--	0.00117	U	0.000945	U	0.00104	U	0.000986	U	0.000979	U	0.00104	U
Endrin	2.2	11	0.014	0.000354	U	0.000287	U	0.000317	U	0.0003	U	0.000297	U	0.000314	U
Endrin aldehyde	--	--	--	0.000907	U	0.000735	U	0.000812	U	0.000767	U	0.000761	U	0.000806	U
Endrin ketone	--	--	--	0.000534	U	0.000432	U	0.000478	U	0.000451	U	0.000448	U	0.000474	U
Dieldrin	0.039	0.2	0.005	0.000648	U	0.000525	U	0.00058	U	0.000548	U	0.000544	U	0.000575	U
4,4'-DDE	1.8	8.9	0.0033	0.00048	U	0.000388	U	0.000429	U	0.000405	U	0.000402	U	0.000426	U
4,4'-DDD	2.6	13	0.0033	0.00074	U	0.000599	U	0.000662	U	0.000625	U	0.00062	U	0.000657	U
4,4'-DDT	1.7	7.9	0.0033	0.00167	U	0.00135	U	0.00149	U	0.00141	U	0.0014	U	0.00148	U
Endosulfan I	4.8	24	2.4	0.00049	U	0.000397	U	0.000438	U	0.000414	U	0.000411	U	0.000435	U
Endosulfan II	4.8	24	2.4	0.000693	U	0.000561	U	0.00062	U	0.000586	U	0.000581	U	0.000615	U
Endosulfan sulfate	4.8	24	2.4	0.000411	U	0.000333	U	0.000368	U	0.000348	U	0.000345	U	0.000365	U
Methoxychlor	100	--	--	0.00121	U	0.00098	U	0.00108	U	0.00102	U	0.00101	U	0.00107	U
Toxaphene	--	--	--	0.0109	U	0.00882	U	0.00975	U	0.0092	U	0.00913	U	0.00967	U
cis-Chlordane	0.91	4.2	0.094	0.000722	U	0.000585	U	0.000647	U	0.000611	U	0.000606	U	0.000641	U
trans-Chlordane	0.54	--	--	0.000684	U	0.000554	U	0.000613	U	0.000578	U	0.000574	U	0.000608	U
Chlordane	--	--	--	0.00687	U	0.00556	U	0.00615	U	0.00581	U	0.00576	U	0.0061	U
Polychlorinated Biphenyls															
Aroclor 1016	1	1	0.1	0.00334	U	0.0027	U	0.00297	U	0.00292	U	0.0029	U	0.003	U
Aroclor 1221	1	1	0.1	0.0039	U	0.00316	U	0.00346	U	0.00341	U	0.00338	U	0.0035	U
Aroclor 1232	1	1	0.1	0.00496	U	0.00401	U	0.0044	U	0.00434	U	0.0043	U	0.00444	U
Aroclor 1242	1	1	0.1	0.00518	U	0.00419	U	0.0046	U	0.00453	U	0.00449	U	0.00464	U
Aroclor 1248	1	1	0.1	0.00357	U	0.00289	U	0.00317	U	0.00312	U	0.00309	U	0.0032	U
Aroclor 1254	1	1	0.1	0.00348	U	0.00282	U	0.00309	U	0.00304	U	0.00301	U	0.00312	U
Aroclor 1260	1	1	0.1	0.00322	U	0.00261	U	0.00286	U	0.00282	U	0.00279	U	0.00289	U
Aroclor 1262	1	1	0.1	0.0021	U	0.0017	U	0.00186	U	0.00183	U	0.00182	U	0.00188	U
Aroclor 1268	1	1	0.1	0.00613	U	0.00497	U	0.00545	U	0.00536	U	0.00532	U	0.0055	U
PCBs, Total	--	--	--	0.0021	U	0.0017	U	0.00186	U	0.00183	U	0.00182	U	0.00188	U

Notes:
NY-UNRES = New York Unrestricted use Criteria current as of 5/2007
NY-RESRR = Restricted-Residential Criteria, New York Restricted use current as of 5/2007
NY-RESR = Residential Criteria, New York Restricted use current as of 5/2007
Cells highlighted in yellow indicate concentrations above the NY-UNRES SCO value, but below the NY-RESRR SCO
Cells highlighted in orange indicate values above the NY-RESR SCO, but below the NY-RESRR SCO
Cells highlighted in blue indicate values above the NY-RESRR SCO
Cells highlighted in grey indicate an MDL above the NY-UNRES SCO, NY-RESR SCO or NY-RESRR SCO
DUP = designation for duplicate sample
SCO = Soil Cleanup Objective
MDL = Maximum Detection Limit
RL = Reporting Limit
Qual = Laboratory Data Qualifier
For U qualified entries, the MDL is shown
U = not detected at or above the MDL
For J qualified entries, the estimated concentration is shown
J = estimated value, indicating the detected value is below the RL, but above the MDL
Results and MDL values are in milligrams per kilogram (mg/kg)
Soil sample depths shown in feet (ft) within sample location
-- = No standard

Table 6 - Pesticides and PCBs in Soil
21-25 31st Street - Astoria, NY

SAMPLE ID:				GW8 (7-9')		GW8 (40-42')		GW8 (57-59')		GW6 (10-12')		GW6(40-42')		GW6(53-55')	
LAB ID:				L1604640-01		L1604640-02		L1604640-03		L1604640-04		L1604906-03		L1604906-04	
COLLECTION DATE:	NY-RESR	NY-RESRR	NY-UNRES	2/18/2016		2/18/2016		2/19/2016		2/19/2016		2/22/2016		2/22/2016	
Pesticides Units: mg/kg				Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q
Delta-BHC	100	100	0.04	0.000366	U	0.000331	U	0.00035	U	0.000328	U	0.000334	U	0.00035	U
Lindane	0.28	1.3	0.1	0.000348	U	0.000315	U	0.000333	U	0.000312	U	0.000317	U	0.000333	U
Alpha-BHC	0.097	0.48	0.02	0.000221	U	0.0002	U	0.000211	U	0.000198	U	0.000202	U	0.000212	U
Beta-BHC	0.072	0.36	0.036	0.000708	U	0.000641	U	0.000677	U	0.000636	U	0.000646	U	0.000678	U
Heptachlor	0.42	2.1	0.042	0.000419	U	0.000379	U	0.0004	U	0.000376	U	0.000382	U	0.000401	U
Aldrin	0.019	0.097	0.005	0.000658	U	0.000595	U	0.000629	U	0.000591	U	0.0006	U	0.000629	U
Heptachlor epoxide	0.077	--	--	0.00105	U	0.000951	U	0.001	U	0.000944	U	0.000958	U	0.001	U
Endrin	2.2	11	0.014	0.000319	U	0.000289	U	0.000305	U	0.000286	U	0.000291	U	0.000305	U
Endrin aldehyde	--	--	--	0.000818	U	0.00074	U	0.000781	U	0.000734	U	0.000745	U	0.000782	U
Endrin ketone	--	--	--	0.000481	U	0.000435	U	0.00046	U	0.000432	U	0.000439	U	0.00046	U
Dieldrin	0.039	0.2	0.005	0.000584	U	0.000528	U	0.000558	U	0.000524	U	0.000532	U	0.000559	U
4,4'-DDE	1.8	8.9	0.0033	0.000432	U	0.000391	U	0.000413	U	0.000388	U	0.000394	U	0.000413	U
4,4'-DDD	2.6	13	0.0033	0.000666	U	0.000603	U	0.000637	U	0.000598	U	0.000608	U	0.000638	U
4,4'-DDT	1.7	7.9	0.0033	0.0015	U	0.00136	U	0.00144	U	0.00135	U	0.00137	U	0.00144	U
Endosulfan I	4.8	24	2.4	0.000441	U	0.000399	U	0.000422	U	0.000396	U	0.000402	U	0.000422	U
Endosulfan II	4.8	24	2.4	0.000624	U	0.000565	U	0.000597	U	0.000561	U	0.000569	U	0.000597	U
Endosulfan sulfate	4.8	24	2.4	0.000371	U	0.000335	U	0.000354	U	0.000333	U	0.000338	U	0.000354	U
Methoxychlor	100	--	--	0.00109	U	0.000986	U	0.00104	U	0.000979	U	0.000994	U	0.00104	U
Toxaphene	--	--	--	0.00981	U	0.00888	U	0.00938	U	0.00881	U	0.00894	U	0.00938	U
cis-Chlordane	0.91	4.2	0.094	0.000651	U	0.000589	U	0.000622	U	0.000584	U	0.000593	U	0.000623	U
trans-Chlordane	0.54	--	--	0.000617	U	0.000558	U	0.000589	U	0.000554	U	0.000562	U	0.00059	U
Chlordane	--	--	--	0.00619	U	0.0056	U	0.00592	U	0.00556	U	0.00564	U	0.00592	U
Polychlorinated Biphenyls															
Aroclor 1016	1	1	0.1	0.00303	U	0.00282	U	0.00293	U	0.00283	U	0.00289	U	0.00294	U
Aroclor 1221	1	1	0.1	0.00354	U	0.00329	U	0.00342	U	0.00331	U	0.00337	U	0.00343	U
Aroclor 1232	1	1	0.1	0.0045	U	0.00419	U	0.00434	U	0.0042	U	0.00429	U	0.00436	U
Aroclor 1242	1	1	0.1	0.0047	U	0.00437	U	0.00453	U	0.00439	U	0.00448	U	0.00456	U
Aroclor 1248	1	1	0.1	0.00324	U	0.00302	U	0.00313	U	0.00303	U	0.00309	U	0.00314	U
Aroclor 1254	1	1	0.1	0.00316	U	0.00294	U	0.00304	U	0.00295	U	0.00301	U	0.00306	U
Aroclor 1260	1	1	0.1	0.00293	U	0.00272	U	0.00282	U	0.00273	U	0.00279	U	0.00284	U
Aroclor 1262	1	1	0.1	0.0019	U	0.00177	U	0.00184	U	0.00178	U	0.00182	U	0.00184	U
Aroclor 1268	1	1	0.1	0.00557	U	0.00518	U	0.00537	U	0.0052	U	0.00531	U	0.0054	U
PCBs, Total	--	--	--	0.0019	U	0.00177	U	0.00184	U	0.00178	U	0.00182	U	0.00184	U

Notes:
NY-UNRES = New York Unrestricted use Criteria current as of 5/2007
NY-RESRR = Restricted-Residential Criteria, New York Restricted use current as of 5/2007
NY-RESR = Residential Criteria, New York Restricted use current as of 5/2007
Cells highlighted in yellow indicate concentrations above the NY-UNRES SCO value, but below the NY-RESRR SCO
Cells highlighted in orange indicate values above the NY-RESR SCO, but below the NY-RESRR SCO
Cells highlighted in blue indicate values above the NY-RESRR SCO
Cells highlighted in grey indicate an MDL above the NY-UNRES SCO, NY-RESR SCO or NY-RESRR SCO
DUP = designation for duplicate sample
SCO = Soil Cleanup Objective
MDL = Maximum Detection Limit
RL = Reporting Limit
Qual = Laboratory Data Qualifier
For U qualified entries, the MDL is shown
U = not detected at or above the MDL
For J qualified entries, the estimated concentration is shown
J = estimated value, indicating the detected value is below the RL, but above the MDL
Results and MDL values are in milligrams per kilogram (mg/kg)
Soil sample depths shown in feet (ft) within sample location
-- = No standard

Table 6 - Pesticides and PCBs in Soil
21-25 31st Street - Astoria, NY

SAMPLE ID:				GW7(10-12')		GW7(36-38')		GW7(40-42')		GW2D (8-10')		GW2D (38-39')		GW2D (43-45')	
LAB ID:				L1604906-05		L1604906-06		L1604906-07		L1605682-01		L1605682-02		L1605682-03	
COLLECTION DATE:	NY-RESR	NY-RESRR	NY-UNRES	2/22/2016		2/23/2016		2/23/2016		3/1/16		3/1/2016		3/1/2016	
Pesticides Units: mg/kg				**Conc**	**Q**	**Conc**	**Q**	**Conc**	**Q**	**Conc**	**Q**	**Conc**	**Q**	**Conc**	**Q**
Delta-BHC	100	100	0.04	0.000331	U	0.000307	U	0.000331	U	0.000313	U	0.000323	U	0.000398	U
Lindane	0.28	1.3	0.1	0.000315	U	0.000292	U	0.000315	U	0.000298	U	0.000308	U	0.000378	U
Alpha-BHC	0.097	0.48	0.02	0.0002	U	0.000186	U	0.0002	U	0.000189	U	0.000195	U	0.00024	U
Beta-BHC	0.072	0.36	0.036	0.000641	U	0.000594	U	0.000641	U	0.000606	U	0.000626	U	0.00077	U
Heptachlor	0.42	2.1	0.042	0.000379	U	0.000351	U	0.000379	U	0.000358	U	0.00037	U	0.000455	U
Aldrin	0.019	0.097	0.005	0.000595	U	0.000552	U	0.000596	U	0.000563	U	0.000582	U	0.000715	U
Heptachlor epoxide	0.077	--	--	0.000951	U	0.000882	U	0.000951	U	0.000899	U	0.000929	U	0.00114	U
Endrin	2.2	11	0.014	0.000289	U	0.000268	U	0.000289	U	0.000273	U	0.000282	U	0.000347	U
Endrin aldehyde	--	--	--	0.00074	U	0.000686	U	0.00074	U	0.000699	U	0.000723	U	0.000888	U
Endrin ketone	--	--	--	0.000435	U	0.000404	U	0.000436	U	0.000412	U	0.000425	U	0.000523	U
Dieldrin	0.039	0.2	0.005	0.000528	U	0.00049	U	0.000528	U	0.0005	U	0.000516	U	0.000634	U
4,4'-DDE	1.8	8.9	0.0033	0.000391	U	0.000362	U	0.000391	U	0.00037	U	0.000382	U	0.00047	U
4,4'-DDD	2.6	13	0.0033	0.000603	U	0.000559	U	0.000603	U	0.00057	U	0.000589	U	0.000724	U
4,4'-DDT	1.7	7.9	0.0033	0.00136	U	0.00126	U	0.00136	U	0.00128	U	0.00133	U	0.00163	U
Endosulfan I	4.8	24	2.4	0.000399	U	0.00037	U	0.0004	U	0.000378	U	0.00039	U	0.00048	U
Endosulfan II	4.8	24	2.4	0.000565	U	0.000524	U	0.000565	U	0.000534	U	0.000552	U	0.000678	U
Endosulfan sulfate	4.8	24	2.4	0.000335	U	0.000311	U	0.000335	U	0.000317	U	0.000328	U	0.000403	U
Methoxychlor	100	--	--	0.000986	U	0.000915	U	0.000987	U	0.000932	U	0.000964	U	0.00118	U
Toxaphene	--	--	--	0.00887	U	0.00823	U	0.00888	U	0.00839	U	0.00867	U	0.0107	U
cis-Chlordane	0.91	4.2	0.094	0.000589	U	0.000546	U	0.000589	U	0.000557	U	0.000575	U	0.000707	U
trans-Chlordane	0.54	--	--	0.000558	U	0.000517	U	0.000558	U	0.000528	U	0.000545	U	0.00067	U
Chlordane	--	--	--	0.0056	U	0.00519	U	0.0056	U	0.0053	U	0.00547	U	0.00673	U
Polychlorinated Biphenyls															
Aroclor 1016	1	1	0.1	0.00279	U	0.00268	U	0.00277	U	0.00265	U	0.00285	U	0.00333	U
Aroclor 1221	1	1	0.1	0.00326	U	0.00313	U	0.00323	U	0.0031	U	0.00332	U	0.00389	U
Aroclor 1232	1	1	0.1	0.00414	U	0.00398	U	0.0041	U	0.00394	U	0.00422	U	0.00494	U
Aroclor 1242	1	1	0.1	0.00432	U	0.00416	U	0.00429	U	0.00411	U	0.00441	U	0.00516	U
Aroclor 1248	1	1	0.1	0.00298	U	0.00286	U	0.00296	U	0.00284	U	0.00304	U	0.00356	U
Aroclor 1254	1	1	0.1	0.0029	U	0.00279	U	0.00288	U	0.00276	U	0.00296	U	0.00347	U
Aroclor 1260	1	1	0.1	0.00269	U	0.00259	U	0.00267	U	0.00256	U	0.00274	U	0.00321	U
Aroclor 1262	1	1	0.1	0.00175	U	0.00168	U	0.00174	U	0.00167	U	0.00179	U	0.00209	U
Aroclor 1268	1	1	0.1	0.00512	U	0.00492	U	0.00508	U	0.00487	U	0.00522	U	0.00611	U
PCBs, Total	--	--	--	0.00175	U	0.00168	U	0.00174	U	0.00167	U	0.00179	U	0.00209	U

Notes:
NY-UNRES = New York Unrestricted use Criteria current as of 5/2007
NY-RESRR = Restricted-Residential Criteria, New York Restricted use current as of 5/2007
NY-RESR = Residential Criteria, New York Restricted use current as of 5/2007
Cells highlighted in yellow indicate concentrations above the NY-UNRES SCO value, but below the NY-RESRR SCO
Cells highlighted in orange indicate values above the NY-RESR SCO, but below the NY-RESRR SCO
Cells highlighted in blue indicate values above the NY-RESRR SCO
Cells highlighted in grey indicate an MDL above the NY-UNRES SCO, NY-RESR SCO or NY-RESRR SCO
DUP = designation for duplicate sample
SCO = Soil Cleanup Objective
MDL = Maximum Detection Limit
RL = Reporting Limit
Qual = Laboratory Data Qualifier
For U qualified entries, the MDL is shown
U = not detected at or above the MDL
For J qualified entries, the estimated concentration is shown
J = estimated value, indicating the detected value is below the RL, but above the MDL
Results and MDL values are in milligrams per kilogram (mg/kg)
Soil sample depths shown in feet (ft) within sample location
-- = No standard

Table 6 - Pesticides and PCBs in Soil
21-25 31st Street - Astoria, NY

SAMPLE ID:				GW2D (73-75')		GW2D (70-72')		SB-11 (0-3')		SB-12 (0-3')		SB-10 (0-3')		SB-9 (0-3')	
LAB ID:				L1605903-02		L1605903-03		L1607963-01		L1607963-02		L1607963-03		L1607963-05	
COLLECTION DATE:	NY-RESR	NY-RESRR	NY-UNRES	3/2/2016		3/2/2016		3/17/2016		3/17/2016		3/17/2016		3/18/2016	
Pesticides Units: mg/kg				Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q
Delta-BHC	100	100	0.04	0.000336	U	0.000357	U	0.000327	U	0.000322	U	0.000328	U	0.00034	U
Lindane	0.28	1.3	0.1	0.00032	U	0.000339	U	0.000311	U	0.000306	U	0.000312	U	0.000324	U
Alpha-BHC	0.097	0.48	0.02	0.000203	U	0.000216	U	0.000198	U	0.000194	U	0.000198	U	0.000206	U
Beta-BHC	0.072	0.36	0.036	0.000651	U	0.000691	U	0.000634	U	0.000622	U	0.000636	U	0.000659	U
Heptachlor	0.42	2.1	0.042	0.000385	U	0.000408	U	0.00105		0.000368	U	0.00177		0.00039	U
Aldrin	0.019	0.097	0.005	0.000605	U	0.000642	U	0.000589	U	0.000578	U	0.000591	U	0.000612	U
Heptachlor epoxide	0.077	--	--	0.000966	U	0.00102	U	0.000941	U	0.000924	U	0.000944	U	0.000978	U
Endrin	2.2	11	0.014	0.000294	U	0.000311	U	0.000286	U	0.00028	U	0.000286	U	0.000297	U
Endrin aldehyde	--	--	--	0.000752	U	0.000797	U	0.000732	U	0.000718	U	0.000734	U	0.000761	U
Endrin ketone	--	--	--	0.000442	U	0.000469	U	0.00043	U	0.000423	U	0.000432	U	0.000448	U
Dieldrin	0.039	0.2	0.005	0.000537	U	0.000569	U	0.000522	U	0.00114		0.000524	U	0.000543	U
4,4'-DDE	1.8	8.9	0.0033	0.000397	U	0.000421	U	0.000387	U	0.00044	J	0.000415	J	0.000672	J
4,4'-DDD	2.6	13	0.0033	0.000613	U	0.00065	U	0.000596	U	0.000586	U	0.000598	U	0.00062	U
4,4'-DDT	1.7	7.9	0.0033	0.00138	U	0.00146	U	0.00134	U	0.00195	J	0.00225	J	0.00267	J
Endosulfan I	4.8	24	2.4	0.000406	U	0.00043	U	0.000395	U	0.000388	U	0.000396	U	0.000411	U
Endosulfan II	4.8	24	2.4	0.000574	U	0.000609	U	0.000559	U	0.000549	U	0.00056	U	0.000581	U
Endosulfan sulfate	4.8	24	2.4	0.000341	U	0.000361	U	0.000332	U	0.000326	U	0.000333	U	0.000345	U
Methoxychlor	100	--	--	0.001	U	0.00106	U	0.000975	U	0.000958	U	0.000978	U	0.00101	U
Toxaphene	--	--	--	0.00902	U	0.00957	U	0.00878	U	0.00862	U	0.00881	U	0.00913	U
cis-Chlordane	0.91	4.2	0.094	0.000598	U	0.000635	U	0.0013	J	0.000572	U	0.00116	J	0.000606	U
trans-Chlordane	0.54	--	--	0.000567	U	0.000601	U	0.000917	J	0.000542	U	0.000732	J	0.000574	U
Chlordane	--	--	--	0.00569	U	0.00604	U	0.0124	J	0.00544	U	0.0336	P	0.00576	U
Polychlorinated Biphenyls															
Aroclor 1016	1	1	0.1	0.0029	U	0.00302	U	0.00272	U	0.00273	U	0.00269	U	0.00289	U
Aroclor 1221	1	1	0.1	0.00339	U	0.00353	U	0.00317	U	0.00319	U	0.00314	U	0.00337	U
Aroclor 1232	1	1	0.1	0.00431	U	0.00449	U	0.00404	U	0.00405	U	0.004	U	0.00428	U
Aroclor 1242	1	1	0.1	0.0045	U	0.00468	U	0.00421	U	0.00423	U	0.00418	U	0.00447	U
Aroclor 1248	1	1	0.1	0.0031	U	0.00323	U	0.0029	U	0.00292	U	0.00288	U	0.00308	U
Aroclor 1254	1	1	0.1	0.00302	U	0.00315	U	0.00283	U	0.0111	J	0.0028	U	0.003	U
Aroclor 1260	1	1	0.1	0.0028	U	0.00292	U	0.00262	U	0.00387	J	0.0026	U	0.00278	U
Aroclor 1262	1	1	0.1	0.00182	U	0.0019	U	0.00171	U	0.00172	U	0.00169	U	0.00181	U
Aroclor 1268	1	1	0.1	0.00533	U	0.00555	U	0.00499	U	0.00501	U	0.00495	U	0.0053	U
PCBs, Total	--	--	--	0.00182	U	0.0019	U	0.00171	U	0.015	J	0.00169	U	0.00181	U

Notes:
NY-UNRES = New York Unrestricted use Criteria current as of 5/2007
NY-RESRR = Restricted-Residential Criteria, New York Restricted use current as of 5/2007
NY-RESR = Residential Criteria, New York Restricted use current as of 5/2007
Cells highlighted in yellow indicate concentrations above the NY-UNRES SCO value, but below the NY-RESRR SCO
Cells highlighted in orange indicate values above the NY-RESR SCO, but below the NY-RESRR SCO
Cells highlighted in blue indicate values above the NY-RESRR SCO
Cells highlighted in grey indicate an MDL above the NY-UNRES SCO, NY-RESR SCO or NY-RESRR SCO
DUP = designation for duplicate sample
SCO = Soil Cleanup Objective
MDL = Maximum Detection Limit
RL = Reporting Limit
Qual = Laboratory Data Qualifier
For U qualified entries, the MDL is shown
U = not detected at or above the MDL
For J qualified entries, the estimated concentration is shown
J = estimated value, indicating the detected value is below the RL, but above the MDL
Results and MDL values are in milligrams per kilogram (mg/kg)
Soil sample depths shown in feet (ft) within sample location
-- = No standard

Table 6 - Pesticides and PCBs in Soil
21-25 31st Street - Astoria, NY

SAMPLE ID:				SB-13 (1-3')		SB-13 (9-11')		SB-13 (11-12.5')		SB14 (1-3)		SB14 (5-7)		FB		FB	
LAB ID:				L1607963-06		L1607963-07		L1607963-08		L1608045-01		L1608045-03		L1604342-07		L1604640-05	
COLLECTION DATE:	NY-RESR	NY-RESRR	NY-UNRES	3/18/2016		3/18/2016		3/18/2016		3/18/2016		3/18/2016		2/17/2016		2/19/2016	
Pesticides Units: mg/kg				**Conc**	**Q**	**Conc**	**Q**	**Conc**	**Q**	**Conc**	**Q**	**Conc**	**Q**	**Conc**	**Q**	**Conc**	**Q**
Delta-BHC	100	100	0.04	0.000409	U	0.000352	U	0.00037	U	0.000333	U	0.000314	U	0.005	U	0.005	U
Lindane	0.28	1.3	0.1	0.000389	U	0.000334	U	0.000352	U	0.000317	U	0.000299	U	0.004	U	0.004	U
Alpha-BHC	0.097	0.48	0.02	0.000247	U	0.000212	U	0.000224	U	0.000201	U	0.00019	U	0.004	U	0.004	U
Beta-BHC	0.072	0.36	0.036	0.000792	U	0.000681	U	0.000717	U	0.000645	U	0.000608	U	0.006	U	0.006	U
Heptachlor	0.42	2.1	0.042	0.000468	U	0.000403	U	0.000424	U	0.000381	U	0.00036	U	0.003	U	0.003	U
Aldrin	0.019	0.097	0.005	0.000736	U	0.000632	U	0.000666	U	0.000599	U	0.000565	U	0.002	U	0.002	U
Heptachlor epoxide	0.077	--	--	0.00118	U	0.00101	U	0.00106	U	0.000957	U	0.000902	U	0.004	U	0.004	U
Endrin	2.2	11	0.014	0.000357	U	0.000307	U	0.000323	U	0.000291	U	0.000274	U	0.004	U	0.004	U
Endrin aldehyde	--	--	--	0.000914	U	0.000786	U	0.000828	U	0.000744	U	0.000702	U	0.008	U	0.008	U
Endrin ketone	--	--	--	0.000538	U	0.000462	U	0.000487	U	0.000438	U	0.000413	U	0.005	U	0.005	U
Dieldrin	0.039	0.2	0.005	0.000653	U	0.000561	U	0.000591	U	0.000532	U	0.000501	U	0.004	U	0.004	U
4,4'-DDE	1.8	8.9	0.0033	0.000483	U	0.000415	U	0.000438	U	0.000393	U	0.000371	U	0.004	U	0.004	U
4,4'-DDD	2.6	13	0.0033	0.000745	U	0.00064	U	0.000675	U	0.000607	U	0.000572	U	0.005	U	0.005	U
4,4'-DDT	1.7	7.9	0.0033	0.00168	U	0.00144	U	0.00152	U	0.00137	U	0.00129	U	0.004	U	0.004	U
Endosulfan I	4.8	24	2.4	0.000494	U	0.000424	U	0.000447	U	0.000402	U	0.000379	U	0.06		0.003	U
Endosulfan II	4.8	24	2.4	0.000698	U	0.0006	U	0.000632	U	0.000569	U	0.000536	U	0.005	U	0.005	U
Endosulfan sulfate	4.8	24	2.4	0.000414	U	0.000356	U	0.000375	U	0.000337	U	0.000318	U	0.005	U	0.005	U
Methoxychlor	100	--	--	0.00122	U	0.00105	U	0.0011	U	0.000992	U	0.000936	U	0.007	U	0.007	U
Toxaphene	--	--	--	0.011	U	0.00943	U	0.00993	U	0.00893	U	0.00842	U	0.063	U	0.063	U
cis-Chlordane	0.91	4.2	0.094	0.000728	U	0.000626	U	0.000659	U	0.000593	U	0.000559	U	0.007	U	0.007	U
trans-Chlordane	0.54	--	--	0.00069	U	0.000593	U	0.000624	U	0.000562	U	0.000529	U	0.006	U	0.006	U
Chlordane	--	--	--	0.00692	U	0.00595	U	0.00627	U	0.00564	U	0.00531	U	0.046	U	0.046	U
Polychlorinated Biphenyls																	
Aroclor 1016	1	1	0.1	0.00334	U	0.00295	U	0.00304	U	0.00279	U	0.00264	U	0.055	U	0.055	U
Aroclor 1221	1	1	0.1	0.0039	U	0.00344	U	0.00355	U	0.00326	U	0.00308	U	0.053	U	0.053	U
Aroclor 1232	1	1	0.1	0.00496	U	0.00437	U	0.00451	U	0.00414	U	0.00392	U	0.031	U	0.031	U
Aroclor 1242	1	1	0.1	0.00518	U	0.00456	U	0.00472	U	0.00432	U	0.0041	U	0.06	U	0.06	U
Aroclor 1248	1	1	0.1	0.00357	U	0.00315	U	0.00325	U	0.00298	U	0.00282	U	0.051	U	0.051	U
Aroclor 1254	1	1	0.1	0.00348	U	0.00306	U	0.00317	U	0.0029	U	0.00275	U	0.034	U	0.034	U
Aroclor 1260	1	1	0.1	0.00949	J	0.00284	U	0.00294	U	0.00848	J	0.00255	U	0.032	U	0.032	U
Aroclor 1262	1	1	0.1	0.0021	U	0.00185	U	0.00191	U	0.00175	U	0.00166	U	0.029	U	0.029	U
Aroclor 1268	1	1	0.1	0.00614	U	0.00541	U	0.00558	U	0.00512	U	0.00485	U	0.038	U	0.038	U
PCBs, Total	--	--	--	0.00949	J	0.00185	U	0.00191	U	0.00848	J	0.00166	U	0.029	U	0.029	U

Notes:
NY-UNRES = New York Unrestricted use Criteria current as of 5/2007
NY-RESRR = Restricted-Residential Criteria, New York Restricted use current as of 5/2007
NY-RESR = Residential Criteria, New York Restricted use current as of 5/2007
Cells highlighted in yellow indicate concentrations above the NY-UNRES SCO value, but below the NY-RESRR SCO
Cells highlighted in orange indicate values above the NY-RESR SCO, but below the NY-RESRR SCO
Cells highlighted in blue indicate values above the NY-RESRR SCO
Cells highlighted in grey indicate an MDL above the NY-UNRES SCO, NY-RESR SCO or NY-RESRR SCO
DUP = designation for duplicate sample
SCO = Soil Cleanup Objective
MDL = Maximum Detection Limit
RL = Reporting Limit
Qual = Laboratory Data Qualifier
For U qualified entries, the MDL is shown
U = not detected at or above the MDL
For J qualified entries, the estimated concentration is shown
J = estimated value, indicating the detected value is below the RL, but above the MDL
Results and MDL values are in milligrams per kilogram (mg/kg)
Soil sample depths shown in feet (ft) within sample location
-- = No standard

Table 7 - Metals in Soil
21-25 31st Street - Astoria, NY

SAMPLE ID:				GW2D (73-75')		GW2D (70-72')		SB-11 (0-3')		SB-12 (0-3')		SB-10 (0-3')		SB-9 (0-3')	
LAB ID:				L1605903-02		L1605903-03		L1607963-01		L1607963-02		L1607963-03		L1607963-05	
COLLECTION DATE:	NY-RESR	NY-RESRR	NY-UNRES	3/2/2016		3/2/2016		3/17/2016		3/17/2016		3/17/2016		3/18/2016	
Total Metals Units: mg/kg				**Conc**	**Q**	**Conc**	**Q**	**Conc**	**Q**	**Conc**	**Q**	**Conc**	**Q**	**Conc**	**Q**
Aluminum, Total	--	--	--	2600		2300		5400		5600		7500		8200	
Antimony, Total	--	--	--	0.7	U	0.75	U	0.67	U	0.68	U	0.65	U	0.7	U
Arsenic, Total	16	16	13	0.93		0.7	J	5.5		4		5.2		5.8	
Barium, Total	350	400	350	22		19		34		29		48		46	
Beryllium, Total	14	72	7.2	0.11	J	0.09	J	0.32	J	0.24	J	0.32	J	0.36	J
Cadmium, Total	2.5	4.3	2.5	0.06	U	0.07	U	0.06	U	0.06	U	0.07	J	0.06	U
Calcium, Total	--	--	--	5600		5800		2300		2000		6100		3200	
Chromium, Total	--	--	--	5.2		5.4		10		12		15		15	
Cobalt, Total	30	--	--	2.8		2.3		4.2		5		5.2		5.8	
Copper, Total	270	270	50	6.6		5.2		15		19		16		22	
Iron, Total	2000	--	--	6900		5900		10000		12000		12000		14000	
Lead, Total	400	400	63	0.17	U	0.19	U	18		15		41		86	
Magnesium, Total	--	--	--	2500		2100		2000		2700		2500		2700	
Manganese, Total	2000	2000	1600	190		130		260		300		290		320	
Mercury, Total	0.81	0.81	0.18	0.02	U	0.02	U	0.05	J	0.066	J	0.06	J	0.09	
Nickel, Total	140	310	30	6.1		5.6		8.6		12		11		13	
Potassium, Total	--	--	--	270		300		580		750		760		740	
Selenium, Total	36	180	3.9	0.26	U	0.31	J	0.25	U	0.25	U	0.24	U	0.26	U
Silver, Total	36	180	2	0.17	U	0.19	U	0.17	U	0.17	U	0.7	J	0.17	U
Sodium, Total	--	--	--	100	J	100	J	160	J	130	J	250		340	
Thallium, Total	--	--	--	0.35	U	0.38	U	0.33	U	0.34	U	0.32	U	0.35	U
Vanadium, Total	100	--	--	7.5		7		18		22		20		22	
Zinc, Total	2200	10000	109	13		11		39		38		60		64	

Notes:
NY-UNRES = New York Unrestricted use Criteria current as of 5/2007
NY-RESRR = Restricted-Residential Criteria, New York Restricted use current as of 5/2007
NY-RESR = Residential Criteria, New York Restricted use current as of 5/2007
Cells highlighted in yellow indicate concentrations above the NY-UNRES SCO value, but below the NY-RESRR SCO
Cells highlighted in orange indicate values above the NY-RESR SCO, but below the NY-RESRR SCO
Cells highlighted in blue indicate values above the NY-RESRR SCO
Cells highlighted in grey indicate an MDL above the NY-UNRES SCO, NY-RESR SCO or NY-RESRR SCO
DUP = designation for duplicate sample
SCO = Soil Cleanup Objective
MDL = Maximum Detection Limit
RL = Reporting Limit
Qual = Laboratory Data Qualifier
For U qualified entries, the MDL is shown
U = not detected at or above the MDL
For J qualified entries, the estimated concentration is shown
J = estimated value, indicating the detected value is below the RL, but above the MDL
Results and MDL values are in milligrams per kilogram (mg/kg)
Soil sample depths shown in feet (ft) within sample location
-- = No standard

Table 7 - Metals in Soil
21-25 31st Street - Astoria, NY

SAMPLE ID:				SB-13 (1-3')		SB-13 (9-11')		SB-13 (11-12.5')		SB14 (1-3)		SB14 (5-7)		FB		FB	
LAB ID:				L1607963-06		L1607963-07		L1607963-08		L1608045-01		L1608045-03		L1604342-07		L1604640-05	
COLLECTION DATE:	NY-RESR	NY-RESRR	NY-UNRES	3/18/2016		3/18/2016		3/18/2016		3/18/2016		3/18/2016		2/17/2016		2/19/2016	
Total Metals Units: mg/kg				Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q
Aluminum, Total	--	--	--	12000		13000		5000		5200		5300		20	U	60	J
Antimony, Total	--	--	--	0.81	U	0.72	U	0.75	U	5		0.82	J	8	U	8	U
Arsenic, Total	16	16	13	8.8		6.9		1.2		6.7		4		2	U	2	J
Barium, Total	350	400	350	63		91		35		140		31		3	U	3	U
Beryllium, Total	14	72	7.2	0.5		0.64		0.27	J	0.26	J	0.23	J	1	U	1	U
Cadmium, Total	2.5	4.3	2.5	0.07	U	0.06	U	0.07	U	0.14	J	0.06	U	0.7	U	1	U
Calcium, Total	--	--	--	1700		1200		1600		12000		4000		30	U	310	
Chromium, Total	--	--	--	19		26		15		13		11		2	U	2	U
Cobalt, Total	30	--	--	7.9		9.2		6.2		3.7		3.5		5	U	5	U
Copper, Total	270	270	50	28		22		16		34		10		2	U	2	J
Iron, Total	2000	--	--	20000		22000		11000		10000		9200		20	U	110	
Lead, Total	400	400	63	46		0.18	U	3.5	J	180		19		2	U	2	U
Magnesium, Total	--	--	--	3000		5500		3300		2000		2000		10	U	62	J
Manganese, Total	2000	2000	1600	520		480		360		240		220		2	U	8.6	J
Mercury, Total	0.81	0.81	0.18	0.08	J	0.02	U	0.04	J	0.17		0.03	J	0.09	J	0.06	U
Nickel, Total	140	310	30	16		18		11		9.2		9		4	U	4	U
Potassium, Total	--	--	--	670		1500		750		560		570		400	U	400	U
Selenium, Total	36	180	3.9	0.3	U	0.27	U	0.28	U	0.26	U	0.24	U	3	U	3	U
Silver, Total	36	180	2	0.2	U	0.18	U	0.19	U	8.4		0.16	U	2	U	2	U
Sodium, Total	--	--	--	170	J	610		270		120	J	120	J	300	U	300	U
Thallium, Total	--	--	--	0.4	U	0.36	U	0.38	U	0.34	U	0.32	U	4	U	4	U
Vanadium, Total	100	--	--	29		32		19		14		12		1	U	1	U
Zinc, Total	2200	10000	109	68		53		36		140		31		7	U	7	U

Notes:
NY-UNRES = New York Unrestricted use Criteria current as of 5/2007
NY-RESRR = Restricted-Residential Criteria, New York Restricted use current as of 5/2007
NY-RESR = Residential Criteria, New York Restricted use current as of 5/2007
Cells highlighted in yellow indicate concentrations above the NY-UNRES SCO value, but below the NY-RESRR SCO
Cells highlighted in orange indicate values above the NY-RESR SCO, but below the NY-RESRR SCO
Cells highlighted in blue indicate values above the NY-RESRR SCO
Cells highlighted in grey indicate an MDL above the NY-UNRES SCO, NY-RESR SCO or NY-RESRR SCO
DUP = designation for duplicate sample
SCO = Soil Cleanup Objective
MDL = Maximum Detection Limit
RL = Reporting Limit
Qual = Laboratory Data Qualifier
For U qualified entries, the MDL is shown
U = not detected at or above the MDL
For J qualified entries, the estimated concentration is shown
J = estimated value, indicating the detected value is below the RL, but above the MDL
Results and MDL values are in milligrams per kilogram (mg/kg)
Soil sample depths shown in feet (ft) within sample location
-- = No standard

Table 8 - Volatile Organic Compounds in Groundwater
21-25 31st Street - Astoria, NY

SAMPLE ID:	NY-AWQS (ug/l)	GW2S		GW2S-DUP		GW2D		GW-4		GW7		GW-5D	
LAB ID:		L1609068-02		L1609068-04		L1609068-03		L1609213-01		L1609068-01		L1609213-02	
COLLECTION DATE:		3/29/2016		3/29/2016		3/29/2016		3/30/2016		3/29/2016		3/30/2016	
ANALYTE:		Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q
Volatile Organic Compounds:													
Methylene chloride	5	0.7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
1,1-Dichloroethane	5	0.7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
Chloroform	7	0.7	U	0.7	U	2.8	U	0.7	U	0.7	U	2.6	
Carbon tetrachloride	5	0.13	U	0.13	U	0.54	U	0.13	U	0.13	U	0.25	J
1,2-Dichloropropane	1	0.13	U	0.13	U	0.53	U	0.13	U	0.13	U	0.13	U
Dibromochloromethane	50	0.15	U	0.15	U	0.6	U	0.15	U	0.15	U	0.15	U
1,1,2-Trichloroethane	1	0.5	U	0.5	U	2	U	0.5	U	0.5	U	0.5	U
Tetrachloroethene	5	23		23		57		7.2		0.66		45	
Chlorobenzene	5	0.7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
Trichlorofluoromethane	5	0.7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
1,2-Dichloroethane	0.6	0.13	U	0.13	U	0.53	U	0.13	U	0.13	U	0.13	U
1,1,1-Trichloroethane	5	0.7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
Bromodichloromethane	50	0.19	U	0.19	U	0.77	U	0.19	U	0.19	U	0.19	U
trans-1,3-Dichloropropene	0.4	0.16	U	0.16	U	0.66	U	0.16	U	0.16	U	0.16	U
cis-1,3-Dichloropropene	0.4	0.14	U	0.14	U	0.58	U	0.14	U	0.14	U	0.14	U
1,3-Dichloropropene, Total	--	0.14	U	0.14	U	0.58	U	0.14	U	0.14	U	0.14	U
1,1-Dichloropropene	5	0.7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
Bromoform	50	0.65	U	0.65	U	2.6	U	0.65	U	0.65	U	0.65	U
1,1,2,2-Tetrachloroethane	5	0.14	U	0.14	U	0.58	U	0.14	U	0.14	U	0.14	U
Benzene	1	0.16	U	0.16	U	0.64	U	0.16	U	0.16	U	0.16	U
Toluene	5	0.7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
Ethylbenzene	5	0.7	U	0.7	U	2.8	U	1.7	J	0.7	U	0.7	U
Chloromethane	--	0.7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
Bromomethane	5	0.7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
Vinyl chloride	2	12		13		0.28	U	110		0.35	J	0.07	U
Chloroethane	5	0.7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
1,1-Dichloroethene	5	0.2	J	0.2	J	0.57	U	0.55		0.14	U	0.14	U
trans-1,2-Dichloroethene	5	59		59		67		200		0.7	U	0.7	U
Trichloroethene	5	47		47		140		39		2.8		0.66	
1,2-Dichlorobenzene	3	0.7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
1,3-Dichlorobenzene	3	0.7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
1,4-Dichlorobenzene	3	0.7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
Methyl tert butyl ether	10	0.7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
p/m-Xylene	5	0.7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
o-Xylene	5	0.7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
Xylenes, Total	--	0.7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
cis-1,2-Dichloroethene	5	76		76		61		150		1	J	0.7	U
1,2-Dichloroethene, Total	--	140		140		130		350		1	J	0.7	U
Dibromomethane	5	0.7	U	1	U	4	U	1	U	1	U	1	U
1,2,3-Trichloropropane	0.04	0.7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
Acrylonitrile	5	1.5	U	1.5	U	6	U	1.5	U	1.5	U	1.5	U
Styrene	5	0.7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
Dichlorodifluoromethane	5	1	U	1	U	4	U	1	U	1	U	1	U
Acetone	50	1.5	U	1.5	U	5.8	U	1.5	U	1.5	U	1.5	U
Carbon disulfide	60	1	U	1	U	4	U	1	U	1	U	1	U
2-Butanone	50	1.9	U	1.9	U	7.8	U	1.9	U	1.9	U	1.9	U
Vinyl acetate	--	1	U	1	U	4	U	1	U	1	U	1	U
4-Methyl-2-pentanone	--	1	U	1	U	4	U	1	U	1	U	1	U
2-Hexanone	50	1	U	1	U	4	U	1	U	1	U	1	U
Bromochloromethane	5	0.7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
2,2-Dichloropropane	5	0.7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
1,2-Dibromoethane	0.0006	0.65	U	0.65	U	2.6	U	0.65	U	0.65	U	0.65	U
1,3-Dichloropropane	5	0.7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
1,1,1,2-Tetrachloroethane	5	0.7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
Bromobenzene	5	0.7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
n-Butylbenzene	5	0.7	U	0.7	U	2.8	U	2.9		0.7	U	0.7	U
sec-Butylbenzene	5	0.7	U	0.7	U	2.8	U	3.8		1.1	J	0.7	U
tert-Butylbenzene	5	0.7	U	0.7	U	2.8	U	0.71	J	0.7	U	0.7	U
o-Chlorotoluene	5	0.7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
p-Chlorotoluene	5	0.7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
1,2-Dibromo-3-chloropropane	0.04	0.7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
Hexachlorobutadiene	0.5	0.7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
Isopropylbenzene	5	0.7	U	0.7	U	2.8	U	2.6		1	J	0.7	U
p-Isopropyltoluene	5	0.7	U	0.7	U	2.8	U	3.1		0.7	U	0.7	U
Naphthalene	10	0.7	U	0.7	U	2.8	U	40		0.7	U	1.4	J
n-Propylbenzene	5	0.7	U	0.7	U	2.8	U	3.5		0.7	U	0.7	U
1,2,3-Trichlorobenzene	5	0.7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
1,2,4-Trichlorobenzene	5	0.7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
1,3,5-Trimethylbenzene	5	0.7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
1,2,4-Trimethylbenzene	5	0.7	U	0.7	U	2.8	U	12		0.7	U	0.7	U
1,4-Dioxane	--	0.7	U	41	U	160	U	41	U	41	U	41	U
p-Diethylbenzene	--	0.7	U	0.7	U	2.8	U	2.3		0.7	U	0.7	U
p-Ethyltoluene	--	0.7	U	0.7	U	2.8	U	0.82	J	0.7	U	0.7	U
1,2,4,5-Tetramethylbenzene	5	0.71	J	0.78	J	2.6	U	14		0.74	J	0.65	U
Ethyl ether	--	0.7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
trans-1,4-Dichloro-2-butene	5	0.7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U

Notes:
NY-AWQS = New York State Ambient Water Quality Standard
Cells highlighted in yellow indicate concentrations above the NY-AWQS
Cells shaded in grey indicate MDL values above the NY-AWQS
DUP = designation for duplicate sample
MDL = Maximum Detection Limit
RL = Reporting limit
Q = Laboratory Data Qualifier
For U qualified entries, the MDL is shown
U = not detected at or above the MDL
For J qualified entries, the estimated concentration is shown
J = estimated value, indicating the detected value is below the RL, but above the MDL
-- = No standard
Results and MDL values are in micrograms per liter (µg/L)

Table 8 - Volatile Organic Compounds in Groundwater
21-25 31st Street - Astoria, NY

SAMPLE ID:	NY-AWQS (ug/l)	GW-5S		GW-8		GW-6		GW-3		TRIP BLANK (3/29/16)		TRIP BLANK (3/30/16)		FIELD BLANK	
LAB ID:		L1609213-03		L1609213-04		L1609213-05		L1609213-06		L1609213-07		L1609213-08		L1609213-09	
COLLECTION DATE:		3/30/2016		3/30/2016		3/30/2016		3/30/2016		3/29/2016		3/30/2016		3/30/2016	
ANALYTE:		Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q
Volatile Organic Compounds:															
Methylene chloride	5	0.7	U	7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
1,1-Dichloroethane	5	0.7	U	7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
Chloroform	7	0.7	U	7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
Carbon tetrachloride	5	0.13	U	1.3	U	0.13	U	0.54	U	0.13	U	0.13	U	0.13	U
1,2-Dichloropropane	1	0.13	U	1.3	U	0.13	U	0.53	U	0.13	U	0.13	U	0.13	U
Dibromochloromethane	50	0.15	U	1.5	U	0.15	U	0.6	U	0.15	U	0.15	U	0.15	U
1,1,2-Trichloroethane	1	0.5	U	5	U	0.5	U	2	U	0.5	U	0.5	U	0.5	U
Tetrachloroethene	5	2.2		1.8	U	1		0.72	U	0.18	U	0.18	U	0.18	U
Chlorobenzene	5	0.7	U	7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
Trichlorofluoromethane	5	0.7	U	7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
1,2-Dichloroethane	0.6	0.13	U	1.3	U	0.13	U	0.53	U	0.13	U	0.13	U	0.13	U
1,1,1-Trichloroethane	5	0.7	U	7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
Bromodichloromethane	50	0.19	U	1.9	U	0.19	U	0.77	U	0.19	U	0.19	U	0.19	U
trans-1,3-Dichloropropene	0.4	0.16	U	1.6	U	0.16	U	0.66	U	0.16	U	0.16	U	0.16	U
cis-1,3-Dichloropropene	0.4	0.14	U	1.4	U	0.14	U	0.58	U	0.14	U	0.14	U	0.14	U
1,3-Dichloropropene, Total	--	0.14	U	1.4	U	0.14	U	0.58	U	0.14	U	0.14	U	0.14	U
1,1-Dichloropropene	5	0.7	U	7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
Bromoform	50	0.65	U	6.5	U	0.65	U	2.6	U	0.65	U	0.65	U	0.65	U
1,1,2,2-Tetrachloroethane	5	0.14	U	1.4	U	0.14	U	0.58	U	0.14	U	0.14	U	0.14	U
Benzene	1	0.16	U	1.6	U	0.16	U	0.64	U	0.16	U	0.16	U	0.16	U
Toluene	5	0.7	U	7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
Ethylbenzene	5	0.7	U	50		1.1	J	11		0.7	U	0.7	U	0.7	U
Chloromethane	--	0.7	U	7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
Bromomethane	5	0.7	U	7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
Vinyl chloride	2	0.48	J	0.7	U	0.2	J	0.61	J	0.16	J	0.07	U	0.07	U
Chloroethane	5	0.7	U	7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
1,1-Dichloroethene	5	0.14	U	1.4	U	0.14	U	0.65	J	0.14	U	0.14	U	0.14	U
trans-1,2-Dichloroethene	5	0.7	U	7	U	0.7	U	94		0.7	U	0.7	U	0.7	U
Trichloroethene	5	2.6		1.9	J	3.1		20		0.18	U	0.18	U	0.18	U
1,2-Dichlorobenzene	3	0.7	U	7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
1,3-Dichlorobenzene	3	0.7	U	7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
1,4-Dichlorobenzene	3	0.7	U	7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
Methyl tert butyl ether	10	0.7	U	7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
p/m-Xylene	5	0.7	U	7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
o-Xylene	5	0.7	U	7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
Xylenes, Total	--	0.7	U	7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
cis-1,2-Dichloroethene	5	1.9	J	7	U	0.7	U	300		0.7	U	0.7	U	0.7	U
1,2-Dichloroethene, Total	--	1.9	J	7	U	0.7	U	390		0.7	U	0.7	U	0.7	U
Dibromomethane	5	1	U	10	U	1	U	4	U	1	U	1	U	1	U
1,2,3-Trichloropropane	0.04	0.7	U	7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
Acrylonitrile	5	1.5	U	15	U	1.5	U	6	U	1.5	U	1.5	U	1.5	U
Styrene	5	0.7	U	7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
Dichlorodifluoromethane	5	1	U	10	U	1	U	4	U	1	U	1	U	1	U
Acetone	50	1.5	U	15	U	1.5	U	5.8	U	1.5	U	1.5	U	1.5	U
Carbon disulfide	60	1	U	10	U	1	U	4	U	1	U	1	U	1	U
2-Butanone	50	1.9	U	19	U	1.9	U	7.8	U	1.9	U	1.9	U	1.9	U
Vinyl acetate	--	1	U	10	U	1	U	4	U	1	U	1	U	1	U
4-Methyl-2-pentanone	--	1	U	10	U	1	U	4	U	1	U	1	U	1	U
2-Hexanone	50	1	U	10	U	1	U	4	U	1	U	1	U	1	U
Bromochloromethane	5	0.7	U	7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
2,2-Dichloropropane	5	0.7	U	7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
1,2-Dibromoethane	0.0006	0.65	U	6.5	U	0.65	U	2.6	U	0.65	U	0.65	U	0.65	U
1,3-Dichloropropane	5	0.7	U	7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
1,1,1,2-Tetrachloroethane	5	0.7	U	7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
Bromobenzene	5	0.7	U	7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
n-Butylbenzene	5	0.7	U	7	U	1.2	J	2.8	U	0.7	U	0.7	U	0.7	U
sec-Butylbenzene	5	1.6	J	7	U	2.7		2.8	U	0.7	U	0.7	U	0.7	U
tert-Butylbenzene	5	0.7	U	7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
o-Chlorotoluene	5	0.7	U	7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
p-Chlorotoluene	5	0.7	U	7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
1,2-Dibromo-3-chloropropane	0.04	0.7	U	7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
Hexachlorobutadiene	0.5	0.7	U	7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
Isopropylbenzene	5	0.7	U	16	J	1.2	J	4.1	J	0.7	U	0.7	U	0.7	U
p-Isopropyltoluene	5	0.7	U	7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
Naphthalene	10	0.76	J	340		24		15		0.7	U	0.7	U	0.7	U
n-Propylbenzene	5	0.7	U	21	J	1.6	J	4.9	J	0.7	U	0.7	U	0.7	U
1,2,3-Trichlorobenzene	5	0.7	U	7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
1,2,4-Trichlorobenzene	5	0.7	U	7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
1,3,5-Trimethylbenzene	5	0.7	U	7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
1,2,4-Trimethylbenzene	5	0.7	U	7	U	0.7	U	29		0.7	U	0.7	U	0.7	U
1,4-Dioxane	--	41	U	410	U	41	U	160	U	41	U	41	U	41	U
p-Diethylbenzene	--	0.7	U	7	U	1.5	J	2.8	U	0.7	U	0.7	U	0.7	U
p-Ethyltoluene	--	0.7	U	7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
1,2,4,5-Tetramethylbenzene	5	1.8	J	18	J	7.1		12		0.65	U	0.65	U	0.65	U
Ethyl ether	--	0.7	U	7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U
trans-1,4-Dichloro-2-butene	5	0.7	U	7	U	0.7	U	2.8	U	0.7	U	0.7	U	0.7	U

Notes:
NY-AWQS = New York State Ambient Water Quality Standard
Cells highlighted in yellow indicate concentrations above the NY-AWQS
Cells shaded in grey indicate MDL values above the NY-AWQS
DUP = designation for duplicate sample
MDL = Maximum Detection Limit
RL = Reporting limit
Q = Laboratory Data Qualifier
For U qualified entries, the MDL is shown
U = not detected at or above the MDL
For J qualified entries, the estimated concentration is shown
J = estimated value, indicating the detected value is below the RL, but above the MDL.
-- = No standard
Results and MDL values are in micrograms per liter (µg/L)

Table 8 - Volatile Organic Compounds in Groundwater
21-25 31st Street - Astoria, NY

SAMPLE ID:	NY-AWQS	GW-2S		GW-2D		GW-2D DUP		GW-3S		GW-3D		GW-4	
LAB ID:		L1630422-10		L1630422-11		L1630422-12		L1630422-13		L1630422-14		L1630422-20	
COLLECTION DATE:	(ug/l)	10/6/2016		10/6/2016		10/6/2016		10/6/2016		10/6/2016		10/7/2016	
ANALYTE:		Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q
Volatile Organic Compounds:													
Methylene chloride	5	1.8	U	0.7	U	0.7	U	2.8	U	0.7	U	3.5	U
1,1-Dichloroethane	5	1.8	U	0.7	U	0.7	U	2.8	U	0.7	U	3.5	U
Chloroform	7	1.8	U	22		23		2.8	U	4.1		3.5	U
Carbon tetrachloride	5	0.34	U	0.13	U	0.13	U	0.54	U	0.13	U	0.67	U
1,2-Dichloropropane	1	0.34	U	0.14	U	0.14	U	0.55	U	0.14	U	0.68	U
Dibromochloromethane	50	0.37	U	0.15	U	0.15	U	0.6	U	0.15	U	0.74	U
1,1,2-Trichloroethane	1	1.2	U	0.5	U	0.5	U	2	U	0.5	U	2.5	U
Tetrachloroethene	5	14		1.9		2.4		8.3		25		3.2	
Chlorobenzene	5	1.8	U	0.7	U	0.7	U	2.8	U	0.7	U	3.5	U
Trichlorofluoromethane	5	1.8	U	0.7	U	0.7	U	2.8	U	0.7	U	3.5	U
1,2-Dichloroethane	0.6	0.33	U	0.13	U	0.13	U	0.53	U	0.13	U	0.66	U
1,1,1-Trichloroethane	5	1.8	U	0.7	U	0.7	U	2.8	U	0.7	U	3.5	U
Bromodichloromethane	50	0.48	U	0.61		0.47	J	0.77	U	0.19	U	0.96	U
trans-1,3-Dichloropropene	0.4	0.41	U	0.16	U	0.16	U	0.66	U	0.16	U	0.82	U
cis-1,3-Dichloropropene	0.4	0.36	U	0.14	U	0.14	U	0.58	U	0.14	U	0.72	U
1,3-Dichloropropene, Total	--	0.36	U	0.14	U	0.14	U	0.58	U	0.14	U	0.72	U
1,1-Dichloropropene	5	1.8	U	0.7	U	0.7	U	2.8	U	0.7	U	3.5	U
Bromoform	50	1.6	U	0.65	U	0.65	U	2.6	U	0.65	U	3.2	U
1,1,2,2-Tetrachloroethane	5	0.42	U	0.17	U	0.17	U	0.67	U	0.17	U	0.84	U
Benzene	1	0.4	U	0.16	U	0.16	U	0.64	U	0.16	U	0.8	U
Toluene	5	1.8	U	0.7	U	0.7	U	2.8	U	0.7	U	3.5	U
Ethylbenzene	5	1.8	U	0.7	U	0.7	U	2.9	J	0.7	U	3.5	U
Chloromethane	--	1.8	U	0.7	U	0.7	U	2.8	U	0.7	U	3.5	U
Bromomethane	5	1.8	U	0.7	U	0.7	U	2.8	U	0.7	U	3.5	U
Vinyl chloride	2	3.7		0.07	U	0.07	U	0.66	J	0.07	U	100	
Chloroethane	5	1.8	U	0.7	U	0.7	U	2.8	U	0.7	U	3.5	U
1,1-Dichloroethene	5	0.42	U	0.17	U	0.17	U	0.84	J	0.17	U	0.84	U
trans-1,2-Dichloroethene	5	160		2.1	J	2.5		160		34		230	
Trichloroethene	5	53		5.5		6.7		40		57		43	
1,2-Dichlorobenzene	3	1.8	U	0.7	U	0.7	U	2.8	U	0.7	U	3.5	U
1,3-Dichlorobenzene	3	1.8	U	0.7	U	0.7	U	2.8	U	0.7	U	3.5	U
1,4-Dichlorobenzene	3	1.8	U	0.7	U	0.7	U	2.8	U	0.7	U	3.5	U
Methyl tert butyl ether	10	1.8	U	0.7	U	0.7	U	2.8	U	0.7	U	3.5	U
p/m-Xylene	5	1.8	U	0.7	U	0.7	U	2.8	U	0.7	U	3.5	U
o-Xylene	5	1.8	U	0.7	U	0.7	U	2.8	U	0.7	U	3.5	U
Xylenes, Total	--	1.8	U	0.7	U	0.7	U	2.8	U	0.7	U	3.5	U
cis-1,2-Dichloroethene	5	160		3.1		3.8		280		11		170	
1,2-Dichloroethene, Total	--	320		5.2	J	6.3		440		45		400	
Dibromomethane	5	2.5	U	1	U	1	U	4	U	1	U	5	U
1,2,3-Trichloropropane	0.04	1.8	U	0.7	U	0.7	U	2.8	U	0.7	U	3.5	U
Acrylonitrile	5	3.8	U	1.5	U	1.5	U	6	U	1.5	U	7.5	U
Styrene	5	1.8	U	0.7	U	0.7	U	2.8	U	0.7	U	3.5	U
Dichlorodifluoromethane	5	2.5	U	1	U	1	U	4	U	1	U	5	U
Acetone	50	3.6	U	1.5	U	1.5	U	5.8	U	40		7.3	U
Carbon disulfide	60	2.5	U	2.4	J	5.4		4	U	1	U	5	U
2-Butanone	50	4.8	U	1.9	U	1.9	U	7.8	U	36		9.7	U
Vinyl acetate	--	2.5	U	1	U	1	U	4	U	1	U	5	U
4-Methyl-2-pentanone	--	2.5	U	1	U	1	U	4	U	1	U	5	U
2-Hexanone	50	2.5	U	1	U	1	U	4	U	1	U	5	U
Bromochloromethane	5	1.8	U	0.7	U	0.7	U	2.8	U	0.7	U	3.5	U
2,2-Dichloropropane	5	1.8	U	0.7	U	0.7	U	2.8	U	0.7	U	3.5	U
1,2-Dibromoethane	0.0006	1.6	U	0.65	U	0.65	U	2.6	U	0.65	U	3.2	U
1,3-Dichloropropane	5	1.8	U	0.7	U	0.7	U	2.8	U	0.7	U	3.5	U
1,1,1,2-Tetrachloroethane	5	1.8	U	0.7	U	0.7	U	2.8	U	0.7	U	3.5	U
Bromobenzene	5	1.8	U	0.7	U	0.7	U	2.8	U	0.7	U	3.5	U
n-Butylbenzene	5	1.8	U	0.7	U	0.7	U	2.8	U	0.7	U	3.5	U
sec-Butylbenzene	5	1.8	U	0.7	U	0.7	U	2.8	U	0.7	U	3.5	U
tert-Butylbenzene	5	1.8	U	0.7	U	0.7	U	2.8	U	0.7	U	3.5	U
o-Chlorotoluene	5	1.8	U	0.7	U	0.7	U	2.8	U	0.7	U	3.5	U
p-Chlorotoluene	5	1.8	U	0.7	U	0.7	U	2.8	U	0.7	U	3.5	U
1,2-Dibromo-3-chloropropane	0.04	1.8	U	0.7	U	0.7	U	2.8	U	0.7	U	3.5	U
Hexachlorobutadiene	0.5	1.8	U	0.7	U	0.7	U	2.8	U	0.7	U	3.5	U
Isopropylbenzene	5	1.8	U	0.7	U	0.7	U	2.8	U	0.7	U	3.5	U
p-Isopropyltoluene	5	1.8	U	0.7	U	0.7	U	2.8	U	0.7	U	3.5	U
Naphthalene	10	1.8	U	0.7	U	0.7	U	2.8	U	0.7	U	12	
n-Propylbenzene	5	1.8	U	0.7	U	0.7	U	2.8	U	0.7	U	3.5	U
1,2,3-Trichlorobenzene	5	1.8	U	0.7	U	0.7	U	2.8	U	0.7	U	3.5	U
1,2,4-Trichlorobenzene	5	1.8	U	0.7	U	0.7	U	2.8	U	0.7	U	3.5	U
1,3,5-Trimethylbenzene	5	1.8	U	0.7	U	0.7	U	2.8	U	0.7	U	3.5	U
1,2,4-Trimethylbenzene	5	1.8	U	0.7	U	0.7	U	19		0.7	U	3.5	U
1,4-Dioxane	--	150	U	61	U	61	U	240	U	61	U	300	U
p-Diethylbenzene	--	1.8	U	0.7	U	0.7	U	4.4	J	0.7	U	6	J
p-Ethyltoluene	--	1.8	U	0.7	U	0.7	U	2.8	U	0.7	U	3.5	U
1,2,4,5-Tetramethylbenzene	5	1.4	U	0.54	U	0.54	U	2.2	U	0.54	U	2.7	U
Ethyl ether	--	1.8	U	0.7	U	0.7	U	2.8	U	0.7	U	3.5	U
trans-1,4-Dichloro-2-butene	5	1.8	U	0.7	U	0.7	U	2.8	U	0.7	U	3.5	U

Notes:
NY-AWQS = New York State Ambient Water Quality Standard
Cells highlighted in yellow indicate concentrations above the NY-AWQS
Cells shaded in grey indicate MDL values above the NY-AWQS
DUP = designation for duplicate sample
MDL = Maximum Detection Limit
RL = Reporting limit
Q = Laboratory Data Qualifier
For U qualified entries, the MDL is shown
U = not detected at or above the MDL
For J qualified entries, the estimated concentration is shown
J = estimated value, indicating the detected value is below the RL, but above the MDL
-- = No standard
Results and MDL values are in micrograms per liter (µg/L)

Table 8 - Volatile Organic Compounds in Groundwater
21-25 31st Street - Astoria, NY

SAMPLE ID:	NY-AWQS (ug/l)	GW-5S		GW-7		GW-8		FIELD BLANK		TRIP BLANK		TRIP BLANK	
LAB ID:		L1630422-15		L1630422-16		L1630422-17		L1630422-18		L1630422-19		L1630422-21	
COLLECTION DATE:		10/6/2016		10/6/2016		10/6/2016		10/6/2016		10/6/2016		10/7/2016	
ANALYTE:		Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q
Volatile Organic Compounds:													
Methylene chloride	5	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
1,1-Dichloroethane	5	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
Chloroform	7	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
Carbon tetrachloride	5	0.13	U	0.13	U	0.13	U	0.13	U	0.13	U	0.13	U
1,2-Dichloropropane	1	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U
Dibromochloromethane	50	0.15	U	0.15	U	0.15	U	0.15	U	0.15	U	0.15	U
1,1,2-Trichloroethane	1	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Tetrachloroethene	5	2.2		1.4		0.18	U	0.18	U	0.18	U	0.18	U
Chlorobenzene	5	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
Trichlorofluoromethane	5	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
1,2-Dichloroethane	0.6	0.13	U	0.13	U	0.13	U	0.13	U	0.13	U	0.13	U
1,1,1-Trichloroethane	5	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
Bromodichloromethane	50	0.19	U	0.19	U	0.19	U	0.19	U	0.19	U	0.19	U
trans-1,3-Dichloropropene	0.4	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U
cis-1,3-Dichloropropene	0.4	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U
1,3-Dichloropropene, Total	--	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U
1,1-Dichloropropene	5	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
Bromoform	50	0.65	U	0.65	U	0.65	U	0.65	U	0.65	U	0.65	U
1,1,2,2-Tetrachloroethane	5	0.17	U	0.17	U	0.17	U	0.17	U	0.17	U	0.17	U
Benzene	1	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U
Toluene	5	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
Ethylbenzene	5	0.7	U	0.7	U	9.6		0.7	U	0.7	U	0.7	U
Chloromethane	--	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
Bromomethane	5	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
Vinyl chloride	2	0.46	J	0.11	J	0.57	J	0.07	U	0.07	U	0.07	U
Chloroethane	5	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
1,1-Dichloroethene	5	0.17	U	0.17	U	0.17	U	0.17	U	0.17	U	0.17	U
trans-1,2-Dichloroethene	5	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
Trichloroethene	5	3.1		3.5		0.96		0.18	U	0.18	U	0.18	U
1,2-Dichlorobenzene	3	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
1,3-Dichlorobenzene	3	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
1,4-Dichlorobenzene	3	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
Methyl tert butyl ether	10	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
p/m-Xylene	5	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
o-Xylene	5	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
Xylenes, Total	--	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
cis-1,2-Dichloroethene	5	4.6		0.73	J	1	J	0.7	U	0.7	U	0.7	U
1,2-Dichloroethene, Total	--	4.6		0.73	J	1	J	0.7	U	0.7	U	0.7	U
Dibromomethane	5	1	U	1	U	1	U	1	U	1	U	1	U
1,2,3-Trichloropropane	0.04	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
Acrylonitrile	5	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Styrene	5	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
Dichlorodifluoromethane	5	1	U	1	U	1	U	1	U	1	U	1	U
Acetone	50	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Carbon disulfide	60	1	U	1	U	1	U	1	U	1	U	1	U
2-Butanone	50	1.9	U	1.9	U	1.9	U	1.9	U	1.9	U	1.9	U
Vinyl acetate	--	1	U	1	U	1	U	1	U	1	U	1	U
4-Methyl-2-pentanone	--	1	U	1	U	1	U	1	U	1	U	1	U
2-Hexanone	50	1	U	1	U	1	U	1	U	1	U	1	U
Bromochloromethane	5	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
2,2-Dichloropropane	5	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
1,2-Dibromoethane	0.0006	0.65	U	0.65	U	0.65	U	0.65	U	0.65	U	0.65	U
1,3-Dichloropropane	5	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
1,1,1,2-Tetrachloroethane	5	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
Bromobenzene	5	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
n-Butylbenzene	5	0.7	U	0.7	U	4.9		0.7	U	0.7	U	0.7	U
sec-Butylbenzene	5	1.4	J	1.5	J	6.4		0.7	U	0.7	U	0.7	U
tert-Butylbenzene	5	0.7	U	0.7	U	1.1	J	0.7	U	0.7	U	0.7	U
o-Chlorotoluene	5	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
p-Chlorotoluene	5	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
1,2-Dibromo-3-chloropropane	0.04	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
Hexachlorobutadiene	0.5	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
Isopropylbenzene	5	0.7	U	0.7	U	10		0.7	U	0.7	U	0.7	U
p-Isopropyltoluene	5	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
Naphthalene	10	0.7	U	0.7	U	54		1.5	J	0.7	U	0.7	U
n-Propylbenzene	5	0.7	U	0.7	U	9.4		0.7	U	0.7	U	0.7	U
1,2,3-Trichlorobenzene	5	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
1,2,4-Trichlorobenzene	5	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
1,3,5-Trimethylbenzene	5	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
1,2,4-Trimethylbenzene	5	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
1,4-Dioxane	--	61	U	61	U	61	U	61	U	61	U	61	U
p-Diethylbenzene	--	0.7	U	1.6	J	24		0.7	U	0.7	U	0.7	U
p-Ethyltoluene	--	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
1,2,4,5-Tetramethylbenzene	5	0.54	U	0.83	J	4		0.54	U	0.54	U	0.54	U
Ethyl ether	--	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
trans-1,4-Dichloro-2-butene	5	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U

Notes:
NY-AWQS = New York State Ambient Water Quality Standard
Cells highlighted in yellow indicate concentrations above the NY-AWQS
Cells shaded in grey indicate MDL values above the NY-AWQS
DUP = designation for duplicate sample
MDL = Maximum Detection Limit
RL = Reporting limit
Q = Laboratory Data Qualifier
For U qualified entries, the MDL is shown
U = not detected at or above the MDL
For J qualified entries, the estimated concentration is shown
J = estimated value, indicating the detected value is below the RL, but above the MDL
-- = No standard
Results and MDL values are in micrograms per liter (µg/L)

Table 9 - Semivolatile Organic Compounds in Groundwater
21-25 31st Street - Astoria, NY

SAMPLE ID:	NY-AWQS (ug/l)	GW2S		GW2S-DUP		GW2D		GW-4		GW7		GW-5D	
LAB ID:		L1609068-02		L1609068-04		L1609068-03		L1609213-01		L1609068-01		L1609213-02	
COLLECTION DATE:		3/29/2016		3/29/2016		3/29/2016		3/30/2016		3/29/2016		3/30/2016	
ANALYTE:		Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q
Semivolatile Organic Compounds													
1,2,4-Trichlorobenzene	5	0.66	U	0.66	U	0.66	U	0.66	U	0.66	U	0.66	U
Bis(2-chloroethyl)ether	1	0.67	U	0.67	U	0.67	U	0.67	U	0.67	U	0.67	U
1,2-Dichlorobenzene	3	0.73	U	0.73	U	0.73	U	0.73	U	0.73	U	0.73	U
1,3-Dichlorobenzene	3	0.73	U	0.73	U	0.73	U	0.73	U	0.73	U	0.73	U
1,4-Dichlorobenzene	3	0.71	U	0.71	U	0.71	U	0.71	U	0.71	U	0.71	U
3,3'-Dichlorobenzidine	5	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U
2,4-Dinitrotoluene	5	0.84	U	0.84	U	0.84	U	0.84	U	0.84	U	0.84	U
2,6-Dinitrotoluene	5	1.1	U	1.1	U	1.1	U	1.1	U	1.1	U	1.1	U
4-Chlorophenyl phenyl ether	--	0.62	U	0.62	U	0.62	U	0.62	U	0.62	U	0.62	U
4-Bromophenyl phenyl ether	--	0.73	U	0.73	U	0.73	U	0.73	U	0.73	U	0.73	U
Bis(2-chloroisopropyl)ether	5	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
Bis(2-chloroethoxy)methane	5	0.63	U	0.63	U	0.63	U	0.63	U	0.63	U	0.63	U
Hexachlorocyclopentadiene	5	7.8	U	7.8	U	7.8	U	7.8	U	7.8	U	7.8	U
Isophorone	50	0.6	U	0.6	U	0.6	U	0.6	U	0.6	U	0.6	U
Nitrobenzene	0.4	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U
NitrosoDiPhenylAmine(NDPA)/DPA	50	0.64	U	0.64	U	0.64	U	0.64	U	0.64	U	0.64	U
n-Nitrosodi-n-propylamine	--	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
Bis(2-Ethylhexyl)phthalate	5	0.91	U	0.91	U	0.91	U	0.91	U	0.91	U	0.91	U
Butyl benzyl phthalate	50	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U
Di-n-butylphthalate	50	0.69	U	0.69	U	0.69	U	0.69	U	0.69	U	0.69	U
Di-n-octylphthalate	50	1.1	U	1.1	U	1.1	U	1.1	U	1.1	U	1.1	U
Diethyl phthalate	50	0.63	U	0.63	U	0.63	U	0.63	U	0.63	U	0.63	U
Dimethyl phthalate	50	0.65	U	0.65	U	0.65	U	0.65	U	0.65	U	0.65	U
Biphenyl	--	0.76	U	0.76	U	0.76	U	0.76	U	0.76	U	0.76	U
4-Chloroaniline	5	0.63	U	0.63	U	0.63	U	0.63	U	0.63	U	0.63	U
2-Nitroaniline	5	1.1	U	1.1	U	1.1	U	1.1	U	1.1	U	1.1	U
3-Nitroaniline	5	1.1	U	1.1	U	1.1	U	1.1	U	1.1	U	1.1	U
4-Nitroaniline	5	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U
Dibenzofuran	--	0.66	U	0.66	U	0.66	U	7.4		2.2		0.66	U
1,2,4,5-Tetrachlorobenzene	5	0.67	U	0.67	U	0.67	U	0.67	U	0.67	U	0.67	U
Acetophenone	--	0.85	U	0.85	U	0.85	U	0.85	U	0.85	U	0.85	U
2,4,6-Trichlorophenol	--	0.68	U	0.68	U	0.68	U	0.68	U	0.68	U	0.68	U
P-Chloro-M-Cresol	--	0.62	U	0.62	U	0.62	U	0.62	U	0.62	U	0.62	U
2-Chlorophenol	--	0.63	U	0.63	U	0.63	U	0.63	U	0.63	U	0.63	U
2,4-Dichlorophenol	1	0.77	U	0.77	U	0.77	U	0.77	U	0.77	U	0.77	U
2,4-Dimethylphenol	50	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U
2-Nitrophenol	--	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
4-Nitrophenol	--	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U
2,4-Dinitrophenol	10	5.5	U	5.5	U	5.5	U	5.5	U	5.5	U	5.5	U
4,6-Dinitro-o-cresol	--	2.1	U	2.1	U	2.1	U	2.1	U	2.1	U	2.1	U
Phenol	1	1.9	U	1.9	U	1.9	U	1.9	U	1.9	U	1.9	U
2-Methylphenol	--	1	U	1	U	1	U	1	U	1	U	1	U
3-Methylphenol/4-Methylphenol	--	1.1	U	1.1	U	1.1	U	1.1	U	1.1	U	1.1	U
2,4,5-Trichlorophenol	--	0.72	U	0.72	U	0.72	U	0.72	U	0.72	U	0.72	U
Benzoic Acid	--	13	U	13	U	13	U	13	U	13	U	13	U
Benzyl Alcohol	--	0.72	U	0.72	U	0.72	U	0.72	U	0.72	U	0.72	U
Carbazole	--	0.63	U	0.63	U	0.63	U	6.2		0.63	U	0.63	U
Acenaphthene	20	0.46		0.44		0.04	U	7.1		0.61		0.04	U
2-Chloronaphthalene	10	0.04	U	0.04	U	0.04	U	0.35	U	0.04	U	0.04	U
Fluoranthene	50	0.04	U	0.04	U	0.04	U	0.61	J	0.04	U	0.04	U
Hexachlorobutadiene	0.5	0.04	U	0.04	U	0.04	U	0.36	U	0.04	U	0.04	U
Naphthalene	10	0.04	U	0.04	U	0.04	U	26		0.04	U	0.04	U
Benzo(a)anthracene	--	0.02	U	0.02	U	0.02	U	0.16	U	0.02	U	0.02	U
Benzo(a)pyrene	0	0.04	U	0.04	U	0.04	U	0.39	U	0.04	U	0.04	U
Benzo(b)fluoranthene	0.002	0.02	U	0.02	U	0.02	U	0.16	U	0.02	U	0.02	U
Benzo(k)fluoranthene	0.002	0.04	U	0.04	U	0.04	U	0.42	U	0.04	U	0.04	U
Chrysene	0.002	0.04	U	0.04	U	0.04	U	0.38	U	0.04	U	0.04	U
Acenaphthylene	--	0.04	U	0.04	U	0.04	U	0.35	U	0.04	U	0.04	U
Anthracene	50	0.14	J	0.16	J	0.04	U	2.1		0.24		0.04	U
Benzo(ghi)perylene	--	0.04	U	0.04	U	0.04	U	0.42	U	0.04	U	0.04	U
Fluorene	50	0.97		1		0.04	U	18		1.4		0.04	U
Phenanthrene	50	1.4		1.5		0.02	U	23		2.2		0.02	U
Dibenzo(a,h)anthracene	--	0.04	U	0.04	U	0.04	U	0.39	U	0.04	U	0.04	U
Indeno(1,2,3-cd)Pyrene	0.002	0.04	U	0.04	U	0.04	U	0.4	U	0.04	U	0.04	U
Pyrene	50	0.04	U	0.04	U	0.04	U	1.8	J	0.04	U	0.04	U
2-Methylnaphthalene	--	1.5		1.6		0.05	U	35		0.05	U	0.05	U
Pentachlorophenol	1	0.22	U	0.22	U	0.22	U	2.2	U	0.22	U	0.22	U
Hexachlorobenzene	0.04	0.03	U	0.03	U	0.03	U	0.32	U	0.03	U	0.03	U
Hexachloroethane	5	0.03	U	0.03	U	0.03	U	0.3	U	0.03	U	0.03	U

Notes:
NY-AWQS = New York State Ambient Water Quality Standard
Cells highlighted in yellow indicate concentrations above the NY-AWQS
Cells shaded in grey indicate MDL values above the NY-AWQS
DUP = designation for duplicate sample
MDL = Maximum Detection Limit
RL = Reporting limit
Q = Laboratory Data Qualifier
For U qualified entries, the MDL is shown
U = not detected at or above the MDL
For J qualified entries, the estimated concentration is shown
J = estimated value, indicating the detected value is below the RL, but above the MDL
-- = No standard
Results and MDL values are in micrograms per liter (µg/L)

Table 9 - Semivolatile Organic Compounds in Groundwater
21-25 31st Street - Astoria, NY

SAMPLE ID:	NY-AWQS (ug/l)	GW-5S		GW-8		GW-6		GW-3		FIELD BLANK	
LAB ID:		L1609213-03		L1609213-04		L1609213-05		L1609213-06		L1609213-09	
COLLECTION DATE:		3/30/2016		3/30/2016		3/30/2016		3/30/2016		3/30/2016	
ANALYTE:		Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q
Semivolatile Organic Compounds											
1,2,4-Trichlorobenzene	5	0.66	U	0.66	U	0.66	U	0.66	U	0.66	U
Bis(2-chloroethyl)ether	1	0.67	U	0.67	U	0.67	U	0.67	U	0.67	U
1,2-Dichlorobenzene	3	0.73	U	0.73	U	0.73	U	0.73	U	0.73	U
1,3-Dichlorobenzene	3	0.73	U	0.73	U	0.73	U	0.73	U	0.73	U
1,4-Dichlorobenzene	3	0.71	U	0.71	U	0.71	U	0.71	U	0.71	U
3,3'-Dichlorobenzidine	5	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U
2,4-Dinitrotoluene	5	0.84	U	0.84	U	0.84	U	0.84	U	0.84	U
2,6-Dinitrotoluene	5	1.1	U	1.1	U	1.1	U	1.1	U	1.1	U
4-Chlorophenyl phenyl ether	--	0.62	U	0.62	U	0.62	U	0.62	U	0.62	U
4-Bromophenyl phenyl ether	--	0.73	U	0.73	U	0.73	U	0.73	U	0.73	U
Bis(2-chloroisopropyl)ether	5	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
Bis(2-chloroethoxy)methane	5	0.63	U	0.63	U	0.63	U	0.63	U	0.63	U
Hexachlorocyclopentadiene	5	7.8	U	7.8	U	7.8	U	7.8	U	7.8	U
Isophorone	50	0.6	U	0.6	U	0.6	U	0.6	U	0.6	U
Nitrobenzene	0.4	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U
NitrosoDiPhenylAmine(NDPA)/DPA	50	0.64	U	0.64	U	0.64	U	0.64	U	0.64	U
n-Nitrosodi-n-propylamine	--	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U
Bis(2-Ethylhexyl)phthalate	5	0.91	U	0.91	U	0.91	U	0.91	U	0.91	U
Butyl benzyl phthalate	50	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U
Di-n-butylphthalate	50	0.69	U	0.69	U	0.69	U	0.69	U	0.69	U
Di-n-octylphthalate	50	1.1	U	1.1	U	1.1	U	1.1	U	1.1	U
Diethyl phthalate	50	0.63	U	0.63	U	0.63	U	0.63	U	0.63	U
Dimethyl phthalate	50	0.65	U	0.65	U	0.65	U	0.65	U	0.65	U
Biphenyl	--	0.76	U	0.76	U	0.76	U	0.76	U	0.76	U
4-Chloroaniline	5	0.63	U	0.63	U	0.63	U	0.63	U	0.63	U
2-Nitroaniline	5	1.1	U	1.1	U	1.1	U	1.1	U	1.1	U
3-Nitroaniline	5	1.1	U	1.1	U	1.1	U	1.1	U	1.1	U
4-Nitroaniline	5	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U
Dibenzofuran	--	2.2		6		2.7		0.66	U	0.66	U
1,2,4,5-Tetrachlorobenzene	5	0.67	U	0.67	U	0.67	U	0.67	U	0.67	U
Acetophenone	--	0.85	U	0.85	U	0.85	U	0.85	U	0.85	U
2,4,6-Trichlorophenol	--	0.68	U	0.68	U	0.68	U	0.68	U	0.68	U
P-Chloro-M-Cresol	--	0.62	U	0.62	U	0.62	U	0.62	U	0.62	U
2-Chlorophenol	--	0.63	U	0.63	U	0.63	U	0.63	U	0.63	U
2,4-Dichlorophenol	1	0.77	U	0.77	U	0.77	U	0.77	U	0.77	U
2,4-Dimethylphenol	50	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U
2-Nitrophenol	--	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
4-Nitrophenol	--	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U
2,4-Dinitrophenol	10	5.5	U	5.5	U	5.5	U	5.5	U	5.5	U
4,6-Dinitro-o-cresol	--	2.1	U	2.1	U	2.1	U	2.1	U	2.1	U
Phenol	1	1.9	U	1.9	U	1.9	U	1.9	U	1.9	U
2-Methylphenol	--	1	U	1	U	1	U	1	U	1	U
3-Methylphenol/4-Methylphenol	--	1.1	U	1.1	U	1.1	U	1.1	U	1.1	U
2,4,5-Trichlorophenol	--	0.72	U	0.72	U	0.72	U	0.72	U	0.72	U
Benzoic Acid	--	13	U	13	U	13	U	13	U	13	U
Benzyl Alcohol	--	0.72	U	0.72	U	0.72	U	0.72	U	0.72	U
Carbazole	--	0.63	U	0.85	U	0.63	U	0.63	U	0.63	U
Acenaphthene	20	0.67		8.1		2		12		0.04	U
2-Chloronaphthalene	10	0.04	U	0.7	U	0.04	U	0.35	U	0.04	U
Fluoranthene	50	0.04	U	0.76	U	0.04	U	1.3	J	0.04	U
Hexachlorobutadiene	0.5	0.04	U	0.72	U	0.04	U	0.36	U	0.04	U
Naphthalene	10	0.04	U	270		12		8.2		0.04	U
Benzo(a)anthracene	--	0.02	U	0.32	U	0.02	U	0.16	U	0.02	U
Benzo(a)pyrene	0	0.04	U	0.78	U	0.04	U	0.39	U	0.04	U
Benzo(b)fluoranthene	0.002	0.02	U	0.32	U	0.02	U	0.16	U	0.02	U
Benzo(k)fluoranthene	0.002	0.04	U	0.84	U	0.04	U	0.42	U	0.04	U
Chrysene	0.002	0.04	U	0.76	U	0.04	U	0.38	U	0.04	U
Acenaphthylene	--	0.04	U	0.7	U	0.43		0.35	U	0.04	U
Anthracene	50	0.19	J	0.7	U	0.2		0.35	U	0.04	U
Benzo(ghi)perylene	--	0.04	U	0.84	U	0.04	U	0.42	U	0.04	U
Fluorene	50	1.8		11		3.3		21		0.04	U
Phenanthrene	50	1.6		10		3.5		24		0.02	U
Dibenzo(a,h)anthracene	--	0.04	U	0.78	U	0.04	U	0.39	U	0.04	U
Indeno(1,2,3-cd)Pyrene	0.002	0.04	U	0.8	U	0.04	U	0.4	U	0.04	U
Pyrene	50	0.04	U	0.8	U	0.04	U	4.3		0.04	U
2-Methylnaphthalene	--	0.05	U	260		18		0.45	U	0.05	U
Pentachlorophenol	1	0.22	U	4.4	U	0.22	U	2.2	U	0.22	U
Hexachlorobenzene	0.04	0.03	U	0.64	U	0.03	U	0.32	U	0.03	U
Hexachloroethane	5	0.03	U	0.6	U	0.03	U	0.3	U	0.03	U

Notes:
NY-AWQS = New York State Ambient Water Quality Standard
Cells highlighted in yellow indicate concentrations above the NY-AWQS
Cells shaded in grey indicate MDL values above the NY-AWQS
DUP = designation for duplicate sample
MDL = Maximum Detection Limit
RL = Reporting limit
Q = Laboratory Data Qualifier
For U qualified entries, the MDL is shown
U = not detected at or above the MDL
For J qualified entries, the estimated concentration is shown
J = estimated value, indicating the detected value is below the RL, but above the MDL
-- = No standard
Results and MDL values are in micrograms per liter (µg/L)

Table 10 - Pesticides and Polychlorinated Biphenyls in Groundwater
21-25 31st Street - Astoria, NY

SAMPLE ID:	NY-AWQS (ug/l)	GW2S		GW2S-DUP		GW2D		GW-4		GW7		GW-5D	
LAB ID:		L1609068-02		L1609068-04		L1609068-03		L1609213-01		L1609068-01		L1609213-02	
COLLECTION DATE:		3/29/2016		3/29/2016		3/29/2016		3/30/2016		3/29/2016		3/30/2016	
ANALYTE:		Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q
Pesticides													
Delta-BHC	0.04	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
Lindane	0.05	0.004	U	0.004	U	0.004	U	0.004	U	0.004	U	0.004	U
Alpha-BHC	0.01	0.004	U	0.004	U	0.004	U	0.004	U	0.004	U	0.004	U
Beta-BHC	0.04	0.006	U	0.006	U	0.006	U	0.006	U	0.006	U	0.006	U
Heptachlor	0.04	0.003	U	0.003	U	0.003	U	0.003	U	0.003	U	0.003	U
Aldrin	0	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U
Heptachlor epoxide	0.03	0.004	U	0.004	U	0.004	U	0.004	U	0.004	U	0.004	U
Endrin	0	0.004	U	0.004	U	0.004	U	0.004	U	0.004	U	0.004	U
Endrin aldehyde	5	0.008	U	0.008	U	0.008	U	0.008	U	0.008	U	0.008	U
Endrin ketone	5	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
Dieldrin	0.004	0.004	U	0.004	U	0.004	U	0.017	J	0.004	U	0.004	U
4,4'-DDE	0.2	0.004	U	0.004	U	0.004	U	0.004	U	0.004	U	0.004	U
4,4'-DDD	0.3	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
4,4'-DDT	0.2	0.004	U	0.004	U	0.004	U	0.004	U	0.004	U	0.004	U
Endosulfan I	--	0.003	U	0.003	U	0.003	U	0.003	U	0.003	U	0.003	U
Endosulfan II	--	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
Endosulfan sulfate	--	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
Methoxychlor	35	0.007	U	0.007	U	0.007	U	0.007	U	0.007	U	0.007	U
Toxaphene	0.06	0.063	U	0.063	U	0.063	U	0.063	U	0.063	U	0.063	U
cis-Chlordane	--	0.007	U	0.007	U	0.007	U	0.007	U	0.007	U	0.007	U
trans-Chlordane	--	0.012	J	0.01	J	0.006	U	0.034	PI	0.017	J	0.006	U
Chlordane	0.05	0.046	U	0.046	U	0.046	U	0.046	U	0.046	U	0.046	U
Polychlorinated Biphenyls (PCBs)													
Aroclor 1016	0.09	0.055	U	0.055	U	0.055	U	0.055	U	0.055	U	0.055	U
Aroclor 1221	0.09	0.053	U	0.053	U	0.053	U	0.053	U	0.053	U	0.053	U
Aroclor 1232	0.09	0.031	U	0.031	U	0.031	U	0.031	U	0.031	U	0.031	U
Aroclor 1242	0.09	0.06	U	0.06	U	0.06	U	0.06	U	0.06	U	0.06	U
Aroclor 1248	0.09	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U
Aroclor 1254	0.09	0.034	U	0.034	U	0.034	U	0.034	U	0.034	U	0.034	U
Aroclor 1260	0.09	0.032	U	0.032	U	0.032	U	0.032	U	0.032	U	0.032	U
Aroclor 1262	0.09	0.029	U	0.029	U	0.029	U	0.029	U	0.029	U	0.029	U
Aroclor 1268	0.09	0.038	U	0.038	U	0.038	U	0.038	U	0.038	U	0.038	U
PCBs, Total	--	0.029	U	0.029	U	0.029	U	0.029	U	0.029	U	0.029	U

Notes:
NY-AWQS = New York State Ambient Water Quality Standard
Cells highlighted in yellow indicate concentrations above the NY-AWQS
Cells shaded in grey indicate MDL values above the NY-AWQS
DUP = designation for duplicate sample
MDL = Maximum Detection Limit
RL = Reporting limit
Q = Laboratory Data Qualifier
For U qualified entries, the MDL is shown
U = not detected at or above the MDL
For J qualified entries, the estimated concentration is shown
J = estimated value, indicating the detected value is below the RL, but above the MDL
-- = No standard
Results and MDL values are in micrograms per liter (µg/L)
P - The RPD between the results for the two columns exceeds the method-specified criteria.
I - The lower value for the two columns has been reported due to obvious interference.

Table 10 - Pesticides and Polychlorinated Biphenyls in Groundwater
21-25 31st Street - Astoria, NY

SAMPLE ID:	NY-AWQS (ug/l)	GW-5S		GW-8		GW-6		GW-3		FIELD BLANK	
LAB ID:		L1609213-03		L1609213-04		L1609213-05		L1609213-06		L1609213-09	
COLLECTION DATE:		3/30/2016		3/30/2016		3/30/2016		3/30/2016		3/30/2016	
ANALYTE:		Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q
Pesticides											
Delta-BHC	0.04	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
Lindane	0.05	0.004	U	0.004	U	0.004	U	0.004	U	0.004	U
Alpha-BHC	0.01	0.004	U	0.004	U	0.004	U	0.004	U	0.004	U
Beta-BHC	0.04	0.006	U	0.006	U	0.006	U	0.006	U	0.006	U
Heptachlor	0.04	0.003	U	0.003	U	0.003	U	0.003	U	0.003	U
Aldrin	0	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U
Heptachlor epoxide	0.03	0.004	U	0.004	U	0.004	U	0.004	U	0.004	U
Endrin	0	0.004	U	0.004	U	0.004	U	0.004	U	0.004	U
Endrin aldehyde	5	0.008	U	0.008	U	0.008	U	0.008	U	0.008	U
Endrin ketone	5	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
Dieldrin	0.004	0.01	J	0.004	U	0.004	U	0.02	J	0.004	U
4,4'-DDE	0.2	0.004	U	0.004	U	0.004	U	0.004	U	0.004	U
4,4'-DDD	0.3	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
4,4'-DDT	0.2	0.004	U	0.004	U	0.004	U	0.004	U	0.004	U
Endosulfan I	--	0.003	U	0.003	U	0.003	U	0.003	U	0.003	U
Endosulfan II	--	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
Endosulfan sulfate	--	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
Methoxychlor	35	0.007	U	0.007	U	0.007	U	0.007	U	0.007	U
Toxaphene	0.06	0.063	U	0.063	U	0.063	U	0.063	U	0.063	U
cis-Chlordane	--	0.007	U	0.007	U	0.007	U	0.007	U	0.007	U
trans-Chlordane	--	0.006	U	0.006	U	0.006	U	0.024	PI	0.006	U
Chlordane	0.05	0.046	U	0.046	U	0.046	U	0.046	U	0.046	U
Polychlorinated Biphenyls (PCBs)											
Aroclor 1016	0.09	0.055	U	0.055	U	0.055	U	0.055	U	0.055	U
Aroclor 1221	0.09	0.053	U	0.053	U	0.053	U	0.053	U	0.053	U
Aroclor 1232	0.09	0.031	U	0.031	U	0.031	U	0.031	U	0.031	U
Aroclor 1242	0.09	0.06	U	0.06	U	0.06	U	0.06	U	0.06	U
Aroclor 1248	0.09	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U
Aroclor 1254	0.09	0.034	U	0.034	U	0.034	U	0.034	U	0.034	U
Aroclor 1260	0.09	0.032	U	0.032	U	0.032	U	0.032	U	0.032	U
Aroclor 1262	0.09	0.029	U	0.029	U	0.029	U	0.029	U	0.029	U
Aroclor 1268	0.09	0.038	U	0.038	U	0.038	U	0.038	U	0.038	U
PCBs, Total	--	0.029	U	0.029	U	0.029	U	0.029	U	0.029	U

Notes:
NY-AWQS = New York State Ambient Water Quality Standard
Cells highlighted in yellow indicate concentrations above the NY-AWQS
Cells shaded in grey indicate MDL values above the NY-AWQS
DUP = designation for duplicate sample
MDL = Maximum Detection Limit
RL = Reporting limit
Q = Laboratory Data Qualifier
For U qualified entries, the MDL is shown
U = not detected at or above the MDL
For J qualified entries, the estimated concentration is shown
J = estimated value, indicating the detected value is below the RL, but above the MDL
-- = No standard
Results and MDL values are in micrograms per liter (µg/L)
P - The RPD between the results for the two columns exceeds the method-specified criteria.
I - The lower value for the two columns has been reported due to obvious interference.

Table 11 - Total and Dissolved Metals in Groundwater
21-25 31st Stree - Astoria, NY

SAMPLE ID:	NY-AWQS (ug/l)	GW2S		GW2S-DUP		GW2D		GW-4		GW7		GW-5D	
LAB ID:		L1609068-02		L1609068-04		L1609068-03		L1609213-01		L1609068-01		L1609213-02	
COLLECTION DATE:		3/29/2016		3/29/2016		3/29/2016		3/30/2016		3/29/2016		3/30/2016	
ANALYTE:		Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q
Dissolved Metals													
Aluminum, Dissolved	--	4	J	4.06	J	5.18	J	8.02	J	6.28	J	6.26	J
Antimony, Dissolved	3	1.53	J	0.41	J	0.54	J	0.65	J	0.64	J	0.56	J
Arsenic, Dissolved	25	0.4	J	0.38	J	0.49	J	1.41		1.84		0.25	J
Barium, Dissolved	1000	203.4		203.4		235.7		503.2		293.7		290.9	
Beryllium, Dissolved	3	0.15	U	0.15	U	0.15	U	0.15	U	0.15	U	0.15	U
Cadmium, Dissolved	5	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U
Calcium, Dissolved	--	105000		107000		142000		149000		81800		178000	
Chromium, Dissolved	50	0.95	J	1.3	J	0.97	J	0.47	J	0.7	J	3.26	
Cobalt, Dissolved	--	2.44		2.26		1.05		1.32		0.93		0.29	
Copper, Dissolved	200	0.31	J	0.35	J	0.42	J	0.32	J	0.65	J	0.36	J
Iron, Dissolved	300	142		238		12	U	9600		10400		20.5	J
Lead, Dissolved	25	ND		0.12	U	0.12	U	0.12	U	0.12	U	0.12	U
Magnesium, Dissolved	35000	35000		36000		52700		59900		31000		67300	
Manganese, Dissolved	300	4850		4830		1061		4826		3424		50.45	
Mercury, Dissolved	0.7	0.06	U	0.06	J	0.06	U	0.06	U	0.06	J	0.06	U
Nickel, Dissolved	100	7.86		9.28		4.87		3.71		1.9	J	2.98	J
Potassium, Dissolved	--	5220		5450		5510		4250		3420		6600	
Selenium, Dissolved	10	1	U	1	U	1.34	J	1	U	1	U	1	U
Silver, Dissolved	50	0.07	U	0.07	U	0.07	U	0.07	U	0.07	U	0.07	U
Sodium, Dissolved	20000	239000		240000		312000		207000		112000		196000	
Thallium, Dissolved	0.5	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U
Vanadium, Dissolved	--	0.55	U	0.55	U	0.55	U	0.55	U	0.55	U	1.26	J
Zinc, Dissolved	2000	2.56	U	2.56	U	2.56	U	3.31	J	2.56	U	2.56	U
Total Metals													
Aluminum, Total	--	66.3		117		388		75700		72.9		2070	
Antimony, Total	3	1.51	J	1	J	1.08	J	0.84	J	1.02	J	0.72	J
Arsenic, Total	25	0.64		0.71		0.66		17.79		6.74		0.44	J
Barium, Total	1000	203.5		209.6		252.4		1809		350.8		320.8	
Beryllium, Total	3	0.15	U	0.15	U	0.15	U	6.97		0.15	U	0.15	U
Cadmium, Total	5	0.05	U	0.05	U	0.05	U	2.15		0.05	U	0.06	J
Calcium, Total	--	102000		106000		148000		172000		83300		177000	
Chromium, Total	50	1.34	J	2.19		2.85		276.2		1.11	J	7.85	
Cobalt, Total	--	2.32		2.49		1.59		86.9		1.03		2.12	
Copper, Total	200	0.88	J	1.59		2.46		449.4		2.63		6.02	
Iron, Total	300	1240		1510		1020		191000		24600		3340	
Lead, Total	25	0.12	U	0.24	J	1.03		214.1		0.61	J	1.74	
Magnesium, Total	35000	35800		37000		55200		104000		31500		68500	
Manganese, Total	300	4704		4990		1158		9828		3476		156.8	
Mercury, Total	0.7	0.06	U	0.06	U	0.06	U	0.06	U	0.06	U	0.06	U
Nickel, Total	100	7.24		7.23		4.93		181		3.51		7.77	
Potassium, Total	--	5180		5540		5790		11200		3400		7280	
Selenium, Total	10	1	U	1	U	1.57	J	13.2		1	U	1	U
Silver, Total	50	0.07	U	0.07	U	0.07	U	0.34	J	0.07	U	0.07	U
Sodium, Total	20000	236000		241000		322000		205000		113000		195000	
Thallium, Total	0.5	0.05	U	0.05	U	0.05	U	1.11		0.05	U	0.05	U
Vanadium, Total	--	0.55	U	0.55	U	1.99	J	133.7		0.61	J	5.74	
Zinc, Total	2000	2.56	U	2.56	U	5.71	J	374.2		2.56	U	58.15	

Notes:
NY-AWQS = New York State Ambient Water Quality Standard
Cells highlighted in yellow indicate concentrations above the NY-AWQS
Cells shaded in grey indicate MDL values above the NY-AWQS
DUP = designation for duplicate sample
MDL = Maximum Detection Limit
RL = Reporting limit
Q = Laboratory Data Qualifier
For U qualified entries, the MDL is shown
U = not detected at or above the MDL
For J qualified entries, the estimated concentration is shown
J = estimated value, indicating the detected value is below the RL, but above the MDL
-- = No standard
Results and MDL values are in micrograms per liter (µg/L)

Table 11 - Total and Dissolved Metals in Groundwater
21-25 31st Stree - Astoria, NY

SAMPLE ID:	NY-AWQS (ug/l)	GW-5S		GW-8		GW-6		GW-3		FIELD BLANK	
LAB ID:		L1609213-03		L1609213-04		L1609213-05		L1609213-06		L1609213-09	
COLLECTION DATE:		3/30/2016		3/30/2016		3/30/2016		3/30/2016		3/30/2016	
ANALYTE:		Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q
Dissolved Metals											
Aluminum, Dissolved	--	4.15	J	2.04	J	6.49	J	3.09	J	2.94	J
Antimony, Dissolved	3	0.24	J	0.33	J	0.3	J	0.47	J	0.77	J
Arsenic, Dissolved	25	1.79		1.15		0.67		0.98		0.12	U
Barium, Dissolved	1000	392.5		370.6		383.9		491.2		0.06	U
Beryllium, Dissolved	3	0.15	U	0.15	U	0.15	U	0.15	U	0.15	U
Cadmium, Dissolved	5	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U
Calcium, Dissolved	--	76100		88500		73000		144000		32	U
Chromium, Dissolved	50	0.53	J	1.43	J	0.92	J	1.48		0.8	J
Cobalt, Dissolved	--	2.67		1.66		0.81		0.43		0.06	U
Copper, Dissolved	200	0.49	J	0.26	U	0.26	U	0.35	J	0.26	U
Iron, Dissolved	300	3940		4460		4220		13600		12	U
Lead, Dissolved	25	0.12	U	0.12	U	0.12	U	0.12	U	0.12	U
Magnesium, Dissolved	35000	29300		32700		27600		47200		22.3	U
Manganese, Dissolved	300	4610		6738		3314		5874		0.3	U
Mercury, Dissolved	0.7	0.06	U	0.06	U	0.06	U	0.06	U	0.06	U
Nickel, Dissolved	100	3.99		4.32		3.28		5.13		2	J
Potassium, Dissolved	--	4050		5010		3450		4340		19.3	U
Selenium, Dissolved	10	1	U	1	U	1	U	1	U	1	U
Silver, Dissolved	50	0.07	U	0.07	U	0.07	U	0.07	U	0.07	U
Sodium, Dissolved	20000	108000		128000		112000		419000		55.4	J
Thallium, Dissolved	0.5	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U
Vanadium, Dissolved	--	0.55	U	0.55	U	0.55	U	0.55	U	0.55	U
Zinc, Dissolved	2000	2.56	U	2.56	U	2.56	U	4.67	J	2.56	U
Total Metals											
Aluminum, Total	--	34.1		41.4		21.6		8630		6.15	J
Antimony, Total	3	0.38	J	0.41	J	0.37	J	0.55	J	1.25	J
Arsenic, Total	25	3.13		1.56		4.13		4.48		0.12	U
Barium, Total	1000	401.3		373.3		448		713.2		0.08	J
Beryllium, Total	3	0.15	U	0.15	U	0.15	U	1.07		0.15	U
Cadmium, Total	5	0.05	U	0.05	U	0.05	U	0.3		0.05	U
Calcium, Total	--	75300		85400		72300		148000		143	J
Chromium, Total	50	0.51	J	0.59	J	0.6	J	30.14		0.27	J
Cobalt, Total	--	2.73		1.75		0.86		15		0.06	U
Copper, Total	200	1.52		1.46		1		49.82		0.36	J
Iron, Total	300	7960		6890		22000		44600		12	U
Lead, Total	25	0.26	J	0.38	J	0.31	J	20.5		0.13	J
Magnesium, Total	35000	29400		32000		27500		55600		22.3	U
Manganese, Total	300	4634		6540		3388		7082		0.3	U
Mercury, Total	0.7	0.06	U	0.06	U	0.06	U	0.06	U	0.06	U
Nickel, Total	100	4.25		1.48	J	1.66	J	31.04		0.49	J
Potassium, Total	--	3990		4860		3390		5530		19.3	U
Selenium, Total	10	1	U	1	U	1	U	2.2	J	1	U
Silver, Total	50	0.07	U	0.07	U	0.07	U	0.07	U	0.07	U
Sodium, Total	20000	108000		127000		110000		398000		46.3	J
Thallium, Total	0.5	0.05	U	0.05	U	0.05	U	0.2	J	0.05	U
Vanadium, Total	--	0.55	U	0.56	J	0.55	U	34.56		0.55	U
Zinc, Total	2000	2.56	U	2.56	U	2.56	U	89.93		2.56	U

Notes:
NY-AWQS = New York State Ambient Water Quality Standard
Cells highlighted in yellow indicate concentrations above the NY-AWQS
Cells shaded in grey indicate MDL values above the NY-AWQS
DUP = designation for duplicate sample
MDL = Maximum Detection Limit
RL = Reporting limit
Q = Laboratory Data Qualifier
For U qualified entries, the MDL is shown
U = not detected at or above the MDL
For J qualified entries, the estimated concentration is shown
J = estimated value, indicating the detected value is below the RL, but above the MDL
-- = No standard
Results and MDL values are in micrograms per liter (µg/L)

Table 12 - Volatile Organic Compounds in Soil Vapor and Ambient Air
21-25 31st Street - Astoria, NY

SAMPLE ID:	AAO-24 HR		AA-1		IA-1		IA-2		SV-6		SV-7		SV8		SV9		SV10	
LAB ID:	L1608131-05		L1609206-03		L1608131-04		L1608131-01		L1608131-03		L1608131-02		L1609206-01		L1609206-04		L1609206-02	
COLLECTION DATE:	3/20/2016		3/29/2016		3/20/2016		3/20/2016		3/20/2016		3/20/2016		3/29/2016		3/29/2016		3/29/2016	
Volatile Organic Compounds Units: ug/m3	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q
Dichlorodifluoromethane	4.71	U	1.75		2.55		1.82		1.14		1.14		2.14		1.98	U	2.37	
Chloromethane	1.97	U	1.1		1.36		1.46		0.537		0.822		0.555		0.859		0.413	U
Freon-114	6.65	U	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	2.8	U	1.4	U
Vinyl chloride	0.243	U	0.051	U	0.051	U	0.051	U	0.511	U	0.511	U	0.511	U	1.02	U	0.511	U
1,3-Butadiene	2.11	U	0.442	U	0.442	U	0.442	U	1.48		0.442	U	0.81		1.72		1.49	
Bromomethane	3.7	U	0.777	U	0.777	U	0.777	U	0.777	U	0.777	U	0.777	U	1.55	U	0.777	U
Chloroethane	2.51	U	0.528	U	0.528	U	0.528	U	0.528	U	0.528	U	0.528	U	1.06	U	0.528	U
Ethanol	44.8	U	9.42	U	245		169		123		203		394		243		137	
Vinyl bromide	4.16	U	0.874	U	0.874	U	0.874	U	0.874	U	0.874	U	0.874	U	1.75	U	0.874	U
Acetone	11.3	U	5.11		13.6		24.7		34		44.2		229		463		229	
Trichlorofluoromethane	5.35	U	1.12	U	1.89		1.59		1.89		2.85		1.44		2.25	U	20.2	
Isopropanol	5.85	U	1.23	U	4.62		10.1		3.1		12.8		8.68		8.16		3.88	
1,1-Dichloroethene	0.377	U	0.079	U	0.079	U	0.079	U	0.793	U	0.793	U	0.793	U	1.59	U	0.793	U
Tertiary butyl Alcohol	7.21	U	1.52	U	1.52	U	1.52	U	1.52	U	1.52	U	20.4		19.3		3.12	
Methylene chloride	8.27	U	1.74	U	3.35		2.07		1.74	U	1.74	U	1.74	U	3.47	U	1.74	U
3-Chloropropene	2.98	U	0.626	U	0.626	U	0.626	U	0.626	U	0.626	U	0.626	U	1.25	U	0.626	U
Carbon disulfide	2.96	U	0.623	U	0.623	U	1.06		1.35		0.959		3.71		1.25	U	10.2	
Freon-113	7.3	U	1.53	U	1.53	U	1.53	U	1.53	U	1.53	U	1.53	U	3.07	U	1.53	U
trans-1,2-Dichloroethene	3.77	U	0.793	U	0.793	U	0.793	U	0.793	U	0.793	U	0.793	U	1.59	U	0.793	U
1,1-Dichloroethane	3.85	U	0.809	U	0.809	U	0.809	U	0.809	U	0.809	U	0.809	U	1.62	U	0.988	
Methyl tert butyl ether	3.43	U	0.721	U	0.721	U	0.721	U	0.721	U	0.721	U	0.721	U	1.44	U	0.721	U
2-Butanone	7.02	U	1.47	U	1.96		4.22		3.89		7.52		39.5		44.8		51.6	
cis-1,2-Dichloroethene	0.377	U	0.079	U	0.079	U	0.079	U	0.793	U	0.793	U	0.793	U	1.59	U	0.793	U
Ethyl Acetate	8.58	U	1.8	U	1.8	U	3		1.8	U	4.04		1.8	U	3.6	U	1.8	U
Chloroform	4.65	U	0.977	U	5.57		0.977	U	6.25		0.977	U	6.45		1.95	U	3.6	
Tetrahydrofuran	7.02	U	1.47	U	1.47	U	1.47	U	1.47	U	1.47	U	1.47	U	2.95	U	1.47	U
1,2-Dichloroethane	3.85	U	0.809	U	1.55		5.83		0.939		5.59		0.809	U	1.62	U	0.809	U
n-Hexane	3.36	U	0.705	U	0.705	U	0.705		0.705	U	0.705	U	5.67		3.74		106	
1,1,1-Trichloroethane	0.519	U	0.109	U	0.109	U	0.109	U	1.09	U	1.09	U	1.09	U	2.18	U	1.09	U
Benzene	3.04	U	0.639	U	0.655		0.744		0.84		0.971		6.1		3.64		31.9	
Carbon tetrachloride	0.66		0.428		0.522		0.516		1.26	U	1.26	U	1.26	U	2.52	U	1.26	U
Cyclohexane	3.28	U	0.688	U	4.03		14.2		1.3		8.81		2.01		1.38	U	5.4	
1,2-Dichloropropane	4.4	U	0.924	U	1.05		3.95		0.924	U	3.75		0.924	U	1.85	U	4.53	
Bromodichloromethane	6.38	U	1.34	U	1.34	U	1.34	U	1.34	U	1.34	U	1.34	U	2.68	U	1.34	U
1,4-Dioxane	3.43	U	0.721	U	0.721	U	0.721	U	0.721	U	0.721	U	0.721	U	1.44	U	0.721	U
Trichloroethene	0.512	U	0.109	U	0.15		0.193		1.07	U	1.07	U	2.22		14.8		1.07	U
2,2,4-Trimethylpentane	4.45	U	0.934	U	0.934	U	0.934	U	0.934	U	0.934	U	0.934	U	1.87	U	0.934	U
Heptane	3.9	U	0.82	U	0.82	U	0.82	U	0.82	U	0.82	U	10.2		12.3		319	
cis-1,3-Dichloropropene	4.32	U	0.908	U	0.908	U	0.908	U	0.908	U	0.908	U	0.908	U	1.82	U	0.908	U
4-Methyl-2-pentanone	9.75	U	2.05	U	2.05	U	2.05	U	2.05	U	2.05	U	6.39		4.1	U	8.4	
trans-1,3-Dichloropropene	4.32	U	0.908	U	0.908	U	0.908	U	0.908	U	0.908	U	0.908	U	1.82	U	0.908	U
1,1,2-Trichloroethane	5.19	U	1.09	U	1.09	U	1.09	U	1.09	U	1.09	U	1.09	U	2.18	U	1.09	U
Toluene	7.54		1.39		25.1		139		12.4		81.8		13.2		3.81		33.3	
2-Hexanone	3.9	U	0.82	U	0.82	U	0.82	U	0.828		1.77		8.44		11.8		26.4	
Dibromochloromethane	8.11	U	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	3.41	U	1.7	U
1,2-Dibromoethane	7.32	U	1.54	U	1.54	U	1.54	U	1.54	U	1.54	U	1.54	U	3.07	U	1.54	U
Tetrachloroethene	0.646	U	0.203		1.4		2.39		1.36	U	1.76		24.9		766		5.09	
Chlorobenzene	4.38	U	0.921	U	0.921	U	0.921	U	0.921	U	0.921	U	0.921	U	1.84	U	0.921	U
Ethylbenzene	4.14	U	0.869	U	1.12		3.45		1.12		2.75		2.68		2.02		12.9	
p/m-Xylene	8.25	U	1.74	U	2.65		8.99		3.92		8.43		6.91		6.6		35.7	
Bromoform	9.84	U	2.07	U	2.07	U	2.07	U	2.07	U	2.07	U	2.07	U	4.14	U	2.07	U
Styrene	4.05	U	0.852	U	0.852	U	0.911		0.852	U	0.852	U	1.88		1.7	U	1.48	
1,1,2,2-Tetrachloroethane	6.54	U	1.37	U	1.37	U	1.37	U	1.37	U	1.37	U	1.37	U	2.75	U	1.37	U
o-Xylene	4.14	U	0.869	U	1.5		4.25		1.58		3.43		2.66		3.57		18.9	
4-Ethyltoluene	4.68	U	0.983	U	0.983	U	0.983	U	0.983	U	0.983	U	0.983	U	1.97	U	1.41	
1,3,5-Trimethylbenzene	4.68	U	0.983	U	0.983	U	0.983	U	0.983	U	0.983	U	0.983	U	1.97	U	2.55	
1,2,4-Trimethylbenzene	4.68	U	0.983	U	1.28		1.14		1.72		2.94		0.983	U	1.97	U	1.93	
Benzyl chloride	4.93	U	1.04	U	1.04	U	1.04	U	1.04	U	1.04	U	1.04	U	2.07	U	1.04	U
1,3-Dichlorobenzene	5.72	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	2.4	U	1.2	U
1,4-Dichlorobenzene	5.72	U	1.2	U	2.22		1.8		1.2	U	1.2	U	1.2	U	2.4	U	1.2	U
1,2-Dichlorobenzene	5.72	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	2.4	U	1.2	U
1,2,4-Trichlorobenzene	7.07	U	1.48	U	1.48	U	1.48	U	1.48	U	1.48	U	1.48	U	2.97	U	1.48	U
Hexachlorobutadiene	10.2	U	2.13	U	2.13	U	2.13	U	2.13	U	2.13	U	2.13	U	4.27	U	2.13	U

Notes:

Cells highighted in yellow indicate concentrations above the corresponding ambient air concentration.

Cells highlighted in grey indicate RL higher than background levels

RL = Reporting Limit

Results and RL values are in micrograms per cubic meter (ug/m^3)

Qual = Laboratory Data Qualifier

For U qualified entries, the RL is shown

U = not detected at or above the RL

Results and RL values are in micrograms per cubic meter (ug/m3)

Table 12 - Volatile Organic Compounds in Soil Vapor and Ambient Air
21-25 31st Street - Astoria, NY

SAMPLE ID:	AA-2		IA-3		SV-2		SV-6		SV-8		SV-11	
LAB ID:	L1632160-06		L1632160-05		L1632160-01		L1632160-02		L1632160-03		L1632160-04	
COLLECTION DATE:	10/7/2016		10/7/2016		10/7/2016		10/7/2016		10/7/2016		10/7/2016	
Volatile Organic Compounds Units: ug/m3	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q
Dichlorodifluoromethane	2.12		2.14		1.41		1.87		1.06		4.94	U
Chloromethane	1.13		1.58		2.01		1.51		1.19		2.07	U
Freon-114	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	6.99	U
Vinyl chloride	0.051	U	0.051	U	0.511	U	0.511	U	0.511	U	2.56	U
1,3-Butadiene	0.442	U	0.442	U	0.442	U	0.442	U	0.442	U	8.8	
Bromomethane	0.777	U	0.777	U	0.777	U	0.777	U	0.777	U	3.88	U
Chloroethane	0.528	U	0.528	U	0.528	U	0.528	U	0.528	U	2.64	U
Ethanol	20.5		138		154		174		17.5		162	
Vinyl bromide	0.874	U	0.874	U	0.874	U	0.874	U	0.874	U	0.874	U
Acetone	18.3		35.9		43.9		27.3		148		361	
Trichlorofluoromethane	1.27		2.06		1.66		1.71		1.31		5.62	U
Isopropanol	2.09		11.2		11.1		11.1		1.99		14.5	
1,1-Dichloroethene	0.079	U	0.079	U	0.793	U	0.793	U	0.793	U	3.96	U
Tertiary butyl Alcohol	1.52	U	1.52	U	4.15		1.52	U	10.2		37.9	
Methylene chloride	1.74	U	1.74	U	3.82		1.74		1.91		8.69	U
3-Chloropropene	0.626	U	0.626	U	0.626	U	0.626	U	0.626	U	3.13	U
Carbon disulfide	0.623	U	1.41		1.49		1.14		1.52		10.1	
Freon-113	1.53	U	1.53	U	1.53	U	1.53	U	1.53	U	7.66	U
trans-1,2-Dichloroethene	0.793	U	0.793	U	0.793	U	0.793	U	0.793	U	3.96	U
1,1-Dichloroethane	0.809	U	0.809	U	0.809	U	0.809	U	0.809	U	4.05	U
Methyl tert butyl ether	0.721	U	0.721	U	0.721	U	0.721	U	0.721	U	3.61	U
2-Butanone	1.47	U	5.63		5.81		3.48		22.9		112	
cis-1,2-Dichloroethene	0.079	U	0.079	U	0.793	U	0.793	U	0.864		3.96	U
Ethyl Acetate	1.8	U	1.83		2.5		1.8	U	1.8	U	9.01	U
Chloroform	0.977	U	1.59		1.43		1.28		18.3		4.88	U
Tetrahydrofuran	1.47	U	1.47	U	1.47	U	1.47	U	1.47	U	7.37	U
1,2-Dichloroethane	0.809	U	4.78		3.54		3.71		0.809	U	4.05	U
n-Hexane	1.89		1.7		2.06		2.05		1.84		24.6	
1,1,1-Trichloroethane	0.109	U	0.109	U	1.09	U	1.09	U	1.09	U	5.46	U
Benzene	1.23		1.5		20.2		2.67		13.5		24.4	
Carbon tetrachloride	0.434		0.459		1.26	U	1.26	U	1.26	U	6.29	U
Cyclohexane	0.688	U	3.2		4.89		3.17		1.7		3.44	U
1,2-Dichloropropane	0.924	U	0.924	U	0.924	U	0.924	U	0.924	U	4.62	U
Bromodichloromethane	1.34	U	1.34	U	1.34	U	1.34	U	1.34	U	6.7	U
1,4-Dioxane	0.721	U	0.721	U	0.721	U	0.721	U	0.721	U	3.6	U
Trichloroethene	0.107	U	0.274		1.07	U	1.07	U	13.9		**5.37**	U
2,2,4-Trimethylpentane	1.75		1.62		2.5		2.3		0.934	U	4.67	U
Heptane	0.967		0.902		1.14		1.2		1.28		4.51	
cis-1,3-Dichloropropene	0.908	U	0.908	U	0.908	U	0.908	U	0.908	U	4.54	U
4-Methyl-2-pentanone	2.05	U	2.05	U	2.05	U	2.05	U	2.45		10.2	U
trans-1,3-Dichloropropene	0.908	U	0.908	U	0.908	U	0.908	U	0.908	U	4.54	U
1,1,2-Trichloroethane	1.09	U	1.09	U	1.09	U	1.09	U	1.09	U	5.46	U
Toluene	4.6		48.2		38.4		39.9		11.2		21.2	
2-Hexanone	0.82	U	0.82	U	0.82	U	0.82	U	4.1		15.2	
Dibromochloromethane	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	8.52	U
1,2-Dibromoethane	1.54	U	1.54	U	1.54	U	1.54	U	1.54	U	7.69	U
Tetrachloroethene	0.515		4.96		37.2		71.9		348		7.73	
Chlorobenzene	0.921	U	0.921	U	0.921	U	0.921	U	0.921	U	4.61	U
Ethylbenzene	0.869	U	5.65		3.22		3.42		1.31		4.34	U
p/m-Xylene	2.71		18.9		9.99		10		3.76		8.69	U
Bromoform	2.07	U	2.07	U	2.07	U	2.07	U	2.07	U	10.3	U
Styrene	1.67		1.91		0.911		0.903		1.1		4.26	U
1,1,2,2-Tetrachloroethane	1.37	U	1.37	U	1.37	U	1.37	U	1.37	U	6.87	U
o-Xylene	1.06		8.47		3.77		3.9		1.5		4.34	U
4-Ethyltoluene	0.983	U	0.983	U	0.983	U	0.983	U	0.983	U	4.92	U
1,3,5-Trimethylbenzene	0.983	U	1.22		0.983	U	0.983	U	0.983	U	4.92	U
1,2,4-Trimethylbenzene	1.27		3.41		0.983	U	1.1		0.993		4.92	U
Benzyl chloride	1.04	U	1.04	U	1.04	U	1.04	U	1.04	U	5.18	U
1,3-Dichlorobenzene	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	6.01	U
1,4-Dichlorobenzene	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	6.01	U
1,2-Dichlorobenzene	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	6.01	U
1,2,4-Trichlorobenzene	1.48	U	1.48	U	1.48	U	1.48	U	1.48	U	7.42	U
Hexachlorobutadiene	2.13	U	2.13	U	2.13	U	2.13	U	2.13	U	10.7	U

Notes:

Cells highlighted in yellow indicate concentrations above the corresponding ambient air concentration.

Cells highlighted in grey indicate RL higher than background levels

RL = Reporting Limit

Results and RL values are in micrograms per cubic meter (ug/m^3)

Qual = Laboratory Data Qualifier

For U qualified entries, the RL is shown

U = not detected at or above the RL

Results and RL values are in micrograms per cubic meter (ug/m3)

21-25 31st Street - Queens, NY
BCP Site #C241167
Table 13
Estimated Remedial Costs

Alternative 1: Track 4 SCOs, In-situ Chemical Injections, Vapor Barrier, Composite Cover, Parking Venting		
Remediation Facilities, Mob/Demob, Permits	$20,000	Trailer, permits
Soil Characterization	$22,000	Characterization of 11,000 CY of soil to be generated
Soil Disposal	$495,000	11,000 tons of soil @ average $45 per ton, t&d
Erosion & Sediment Control	$50,000	Erosion and sediment controls and management
Soil loading	$275,000	11,000 cubic yards of soil @ $25 per cubic yard
Chemical Injections	$35,000	$20,000 for chemicals and $15,000 for injections
Post-Remedial Monitoring Well Installation	$4,000	Install one monitoring well
Monitoring Well Sampling	$60,000	Two baseline and eight post-remedial quarters of groundwater sampling for VOCs, dispose of IDW
End-Point Sampling	$36,000	30 full scan, post-remedial samples including QA/QC and DUSRs
Remedial Oversight	$150,000	CAMP/Remedial Oversight for five months
Monitoring Well Decommissioning	$10,000	Decommission monitoring wells
Reporting (FER, SMP)	$80,000	Reporting
Engineering Controls		
Composite Cover System	$126,000	12,000 SF slab and 13,000 SF sub-grade walls @ $4 and $6/SF installed, respectively
Vapor Barrier	$267,000	12,000 SF slab and 13,000 SF sub-grade walls @ $6 and $15/SF installed, respectively

Estimated Remedial Costs	$1,630,000

Sub-slab Depressurization System (alternate)	$180,000	12,000 SF slab @ $10/SF, $60,000 for components and testing

21-25 31st Street - Queens, NY
BCP Site C241167
Table 14
Remedial Action Construction Schedule

Milestone	Weeks from Remedial Action Start	Duration (weeks)	Estimated Date
Approval of RAWP	--	0	8/15/17
Fact Sheet Announcing Start of Remedial Action	0	1	8/23/17
Mobilization	1	2	9/5/17
Start of Remedial Excavation	3	36	9/1/17
Submittal of Environmental Easement (EE)	26	--	3/1/18
Submittal of Draft Site Management Plan (SMP)	26	--	3/1/18
Submittal of Draft Final Engineering Report (FER)	37	--	5/1/18
Construction Complete	39	--	5/15/18
Submit Final Engineering Report (FER)	45	--	7/1/18
Obtain Certificate of Completion (COC)	53	--	9/1/18

21-25 31st Street - Queens, NY
BCP Site C241167
Table 15
Required Permits

Permit	Law, Statute or Code	Contact
Underground Injection Control (UIC) Permit, if injections are required	40 CFR 144-147	USEPA Region 2, Luis Rodriguez, (212) 637-4274
NYCDOB Foundation Permit xxxx-FN	Title 1 RCNY Chapter 8	NYCDOB 311
NYCDOB Excavation Permit Job # xxxx	Title 1 RCNY Chapter 100	NYCDOB, Plan Examiner (TBD)

Appendix A
NYSDOH Generic Community Air Monitoring Plan (CAMP)

New York State Department of Health
Generic Community Air Monitoring Plan

Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. “Periodic” monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or

overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

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

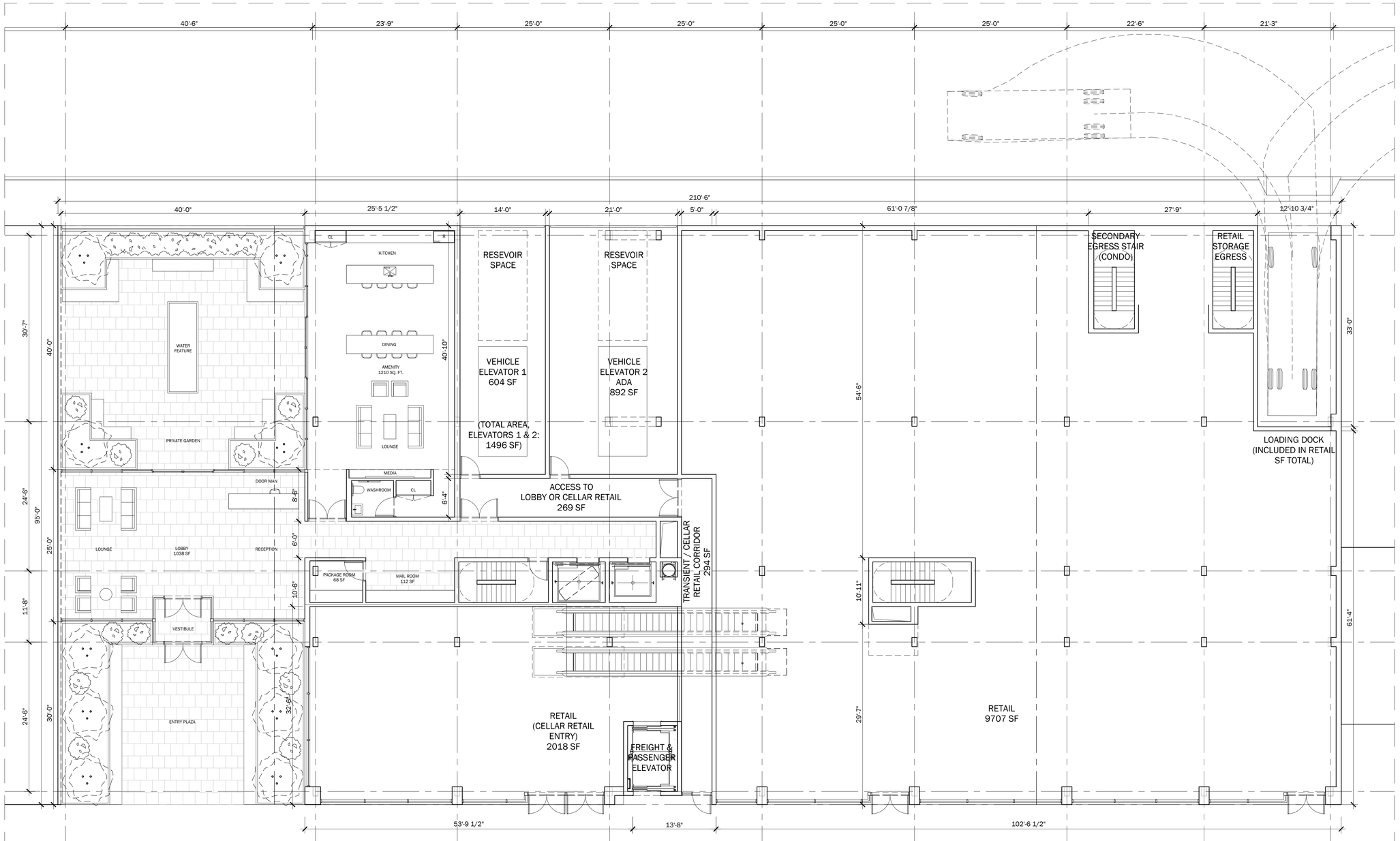
1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

December 2009

Appendix B
Proposed Building Plans



DXA studio
Architecture PLLC
www.dxastudio.com

894 6th Avenue
5th Floor
New York, NY 10001
T 212 874 0567

OWNER

Rockfarmer Properties
42-01 235th Street
Douglaston, NY 11363
T: 718-229-4488

PROJECT TEAM

STRUCTURAL CONSULTANT
Silman
32 Old Slip, 10th Floor
New York, NY 10005
T: 212 620 7970

MECHANICAL CONSULTANT
2LS
150 West 30th Street, 4th Floor
New York, NY 10001
T: 917 267 8945

FILING EXPEDITOR
JM Zoning
299 Broadway, Suite 1100
New York, NY 10007
T: 775 628 3726

PARKING CONSULTANT
Philip Habib & Associates
102 Madison Avenue, 11th Floor
New York, NY 10016
T: 212 929 5656

DESIGN DEVELOPMENT
NOT FOR CONSTRUCTION

REVISIONS

N

PROJECT NAME

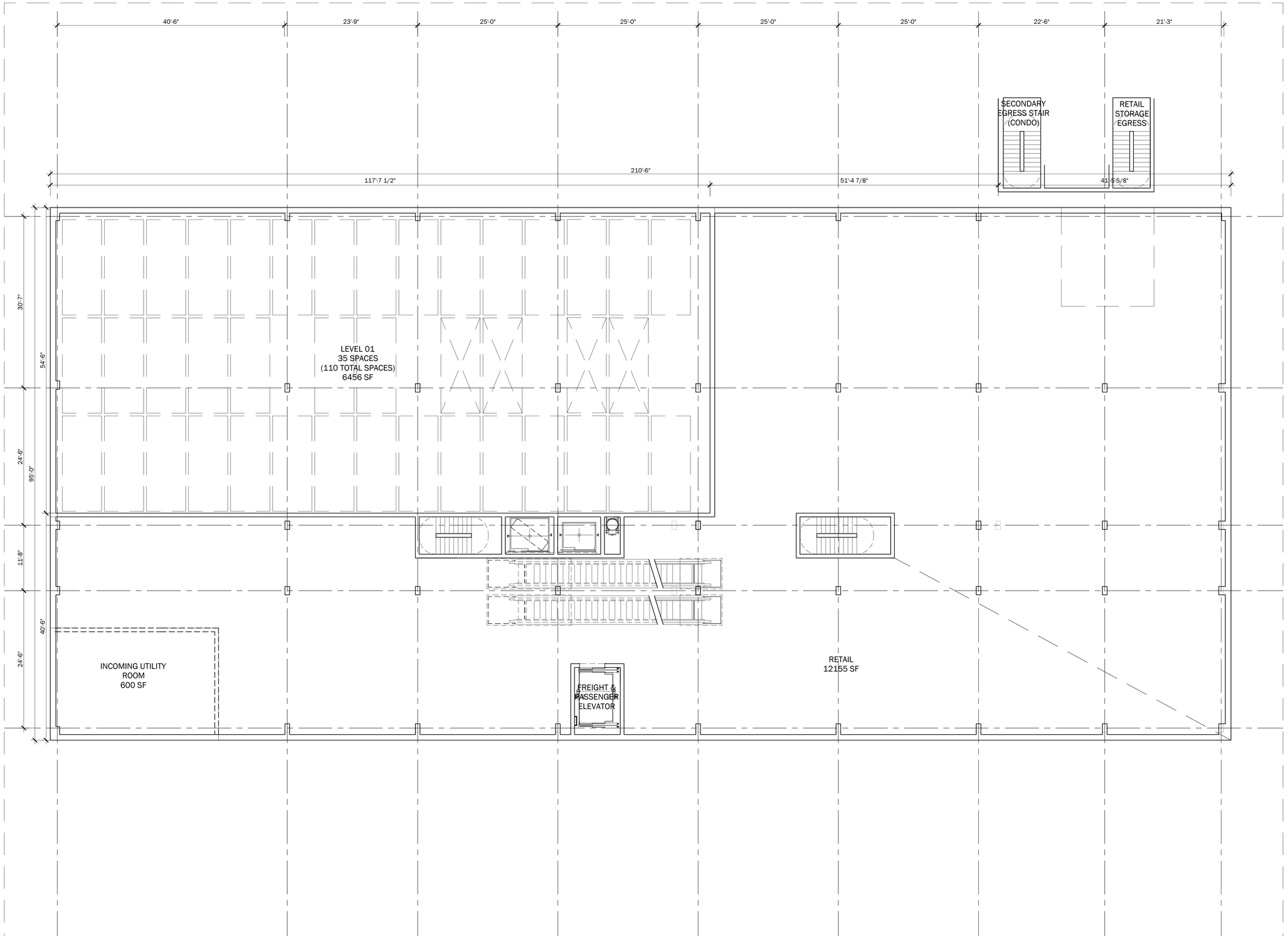
21-21 31st Street
Astoria, NY 11105

DRAWING NAME

GROUND FLOOR

SEAL+SIGNATURE	DATE 03.07.2017
	PROJECT NUMBER 15.56
	DRAWING NUMBER
	SCALE 1/8" = 1'-0"
	A-101.00
	PAGE NUMBER

NYC D.O.B. BSCAN



DXA studio
Architecture PLLC
www.dxastudio.com

894 6th Avenue
5th Floor
New York, NY 10001
T 212 874 0567

OWNER

Rockfarmer Properties
42-01 235th Street
Douglaston, NY 11363
T: 718-229-4488

PROJECT TEAM

STRUCTURAL CONSULTANT
Silman
32 Old Slip, 10th Floor
New York, NY 10005
T: 212 620 7970

MECHANICAL CONSULTANT
2LS
150 West 30th Street, 4th Floor
New York, NY 10001
T: 917 267 8945

FILING EXPEDITOR
JM Zoning
299 Broadway, Suite 1100
New York, NY 10007
T: 775 628 3726

PARKING CONSULTANT
Philip Habib & Associates
102 Madison Avenue, 11th Floor
New York, NY 10016
T: 212 929 5656

DESIGN DEVELOPMENT
NOT FOR CONSTRUCTION

REVISIONS

N

PROJECT NAME

21-21 31st Street
Astoria, NY 11105

DRAWING NAME

CELLAR

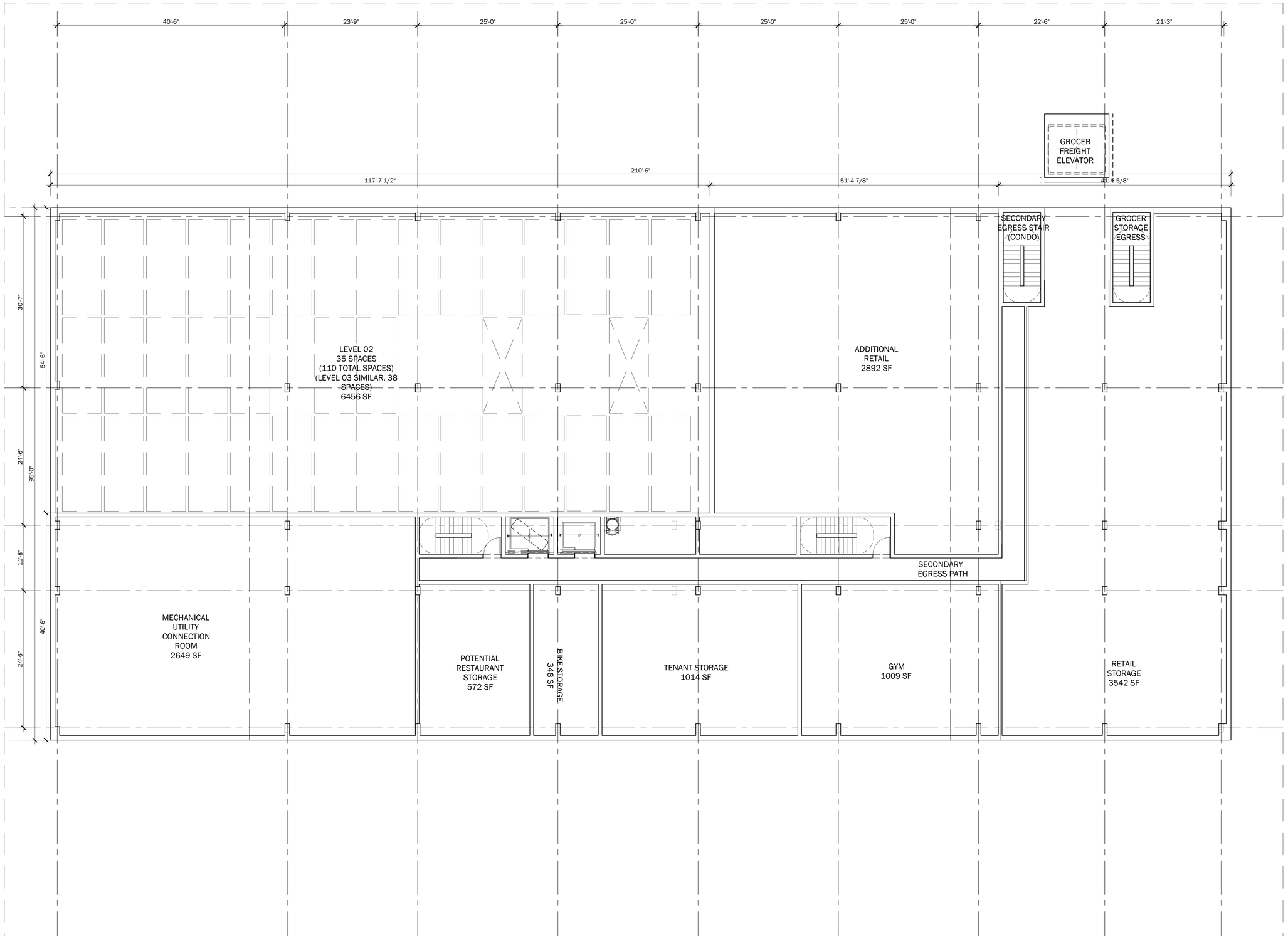
SEAL+SIGNATURE

DATE 03.07.2017
PROJECT NUMBER 15.56
DRAWING NUMBER
SCALE 1/8" = 1'-0"

A-108.00

PAGE NUMBER

NYC D.O.B. BSCAN



DXA studio
Architecture PLLC
www.dxastudio.com

894 6th Avenue
5th Floor
New York, NY 10001
T 212 874 0567

OWNER

Rockfarmer Properties
42-01 235th Street
Douglaston, NY 11363
T: 718-229-4488

PROJECT TEAM

STRUCTURAL CONSULTANT
Silman
32 Old Slip, 10th Floor
New York, NY 10005
T: 212 620 7970

MECHANICAL CONSULTANT
2LS
150 West 30th Street, 4th Floor
New York, NY 10001
T: 917 267 8945

FILING EXPEDITOR
JM Zoning
299 Broadway, Suite 1100
New York, NY 10007
T: 775 628 3726

PARKING CONSULTANT
Philip Habib & Associates
102 Madison Avenue, 11th Floor
New York, NY 10016
T: 212 929 5656

DESIGN DEVELOPMENT
NOT FOR CONSTRUCTION

REVISIONS

N

PROJECT NAME

21-21 31st Street
Astoria, NY 11105

DRAWING NAME

SUB-CELLAR

SEAL+SIGNATURE

DATE 03.07.2017
PROJECT NUMBER 15.56
DRAWING NUMBER
SCALE 1/8" = 1'-0"

A-109.00

PAGE NUMBER

NYC D.O.B. BSCAN

Appendix C
Significant Threat Determination

SIGNIFICANT THREAT DETERMINATION WORKSHEET

□ State Superfund Program
6 NYCRR 375-2.7

X Brownfield Cleanup Program
ECL 27-1411.1(c)

Site Name: 21-25 31st Street Site ID No. C241167

City/Town: Astoria County: Queens

1. Has all available and relevant evidence regarding the Site been reviewed and the factors in 375-2.7(a)(3) considered?	√□ Yes (go to 2)	□ No (stop)	□ Unsure (stop)
2. Does Site contamination result in significant adverse impacts (375-2.7(a)(1)) to:			
a. species that are endangered, threatened, or of concern?	□ Yes (go to b)	√ No (go to b)	□ Unsure (go to b)
b. protected streams, tidal/freshwater wetlands, or significant fish and wildlife habitat?	□ Yes (go to c)	√□ No (go to c)	□ Unsure (go to c)
c. flora or fauna from bioaccumulation or leads to a recommendation to limit consumption?	□ Yes (go to d)	√□ No (go to d)	□ Unsure (go to d)
d. fish, shellfish, crustacea, or wildlife from concentrations that cause adverse/chronic effects?	□ Yes (go to e)	√□ No (go to e)	□ Unsure (go to e)
e. the environment due to a fire, spill, explosion, or reaction that generates toxic gases, vapors, fumes, mists or dusts?	□ Yes (go to f)	√□ No (go to f)	□ Unsure (go to f)
f. areas where individuals or water supplies may be present and NYSDOH has determined there to be a significantly increased risk to public health (including from soil vapor)?	□ Yes (go to 3)	√□ No (go to 3)	□ Unsure (go to 3)
3. Does Site contamination result in significant environmental damage (375-2.7(a)(2))?	□ Yes (go to 4)	√□ No (go to 4)	□ Unsure (stop)
4. If any box in items 2 or 3 have been checked "Yes," the site presents a significant threat to public health or the environment; check here.	Significant threat to: □ Public Health □ Environment		
5. If no boxes in items 2 or 3 have been checked "Yes," the site does not present a significant threat to public health or the environment; check here.	√ Not a Significant Threat		

MD Hoque/EE1 — Project Manager Name/Title (Print)
Hoque — Project Manager (Signature)
01/09/2017 — Date

Gerard Burke/Director Bureau B — Bureau Director/Name/Title (Print)
Gerard W Burke — Bureau Director/ (Signature)
03/01/2017 — Date

07/29/10

Appendix D
Health and Safety Plan (HASP)

Construction Health and Safety Plan

For
21-25 31st Street
Remedial Action Work Plan

21-25 31st Street
Astoria, New York 11105
Block 831, Lot 20
BCP # C241167
NYSDEC Spill # 1402686
CEQR #10DCP019Q

Submitted to:
New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau B
625 Broadway, 12th Floor
Albany, NY 12233-7016

Prepared for:
21-25 31st Street LLC
42-01 235th Street
Douglaston, NY 11363

Prepared by:
TENEN ENVIRONMENTAL
121 West 27th Street, Suite 702
New York, NY 10001

March 2017

TABLE OF CONTENTS

1.0 INTRODUCTION

This Construction Health and Safety Plan (CHASP) has been prepared in conformance with the Occupational Safety and Health Administration (OSHA) standards and guidance that govern site investigation activities, other applicable regulations, and Tenen Environmental LLC (Tenen) health and safety policies and procedures. The purpose of this CHASP is the protection of Tenen field personnel and others during the implementation of the Remedial Action Work Plan.

The Site, located at 21-25 31st Street, Astoria, New York, is a rectangular-shaped parcel consisting of 11,875 square feet (0.27 acres) situated on the southeast side of 31st Street, between 21st Avenue and Ditmars Boulevard. The Site has approximately 125 feet of frontage along 31st Street and is approximately 95 feet deep, extending to 32nd Street. Other addresses associated with the Site are 21-25 through 21-33 31st Street and 21-26 through 21-34 32nd Street. A location map for the Site is provided as Figure 1. A map of the current Site layout is included as Figure 2.

The Site is improved with a one-story building that covers approximately 11,400 square feet, with the remaining area used as an asphalt-paved driveway accessed from 32nd Street. The building has an approximately 5,000 square foot partial basement, which is located beneath the entirety of the historic dry cleaner facility and extends beneath a portion of the remaining components of the building along 32nd Street. The basement extends from 31st Street to 32nd Street on northwest to southeast line. The asphalt driveway is sloped down to the northwest. The on-Site stormwater management devices consist of roof drains and a drain at the base of the driveway. The driveway drain is connected beneath the slab of the historic dry cleaner to an ejector pit that is plumbed to a combined sewer beneath 31st Street. The driveway drain is considered a potential preferential pathway and a video scope of the sewer is detailed in Section 4.4 of the RIR.

The property is currently occupied by ABC Superstore, a retail clothing, linens and kitchenware store. The proposed redevelopment of the subject property includes the demolition of all existing site improvements and the construction of a mixed-use building that is expected to include one full floor (approximately 12,000 square feet) of commercial space with the balance of the FAR devoted to residential apartments and possibly some community space.

1.1 Scope of CHASP

This CHASP includes safety procedures to be used by Tenen staff during the following activities:

- Implementation of remedial oversight and air monitoring activities; and,
- collection of soil and groundwater samples, from grab samples and monitoring wells, respectively.

Contractors performing remedial construction work will ensure that performance of the work is in compliance with this CHASP and applicable laws and regulations. The CHASP pertains to remedial and invasive work performed at the Site.

2.0 PROJECT SAFETY AUTHORITY

The following personnel are responsible for project health and safety under this CHASP.

- Project Manager – Mohamed Ahmed
- Health and Safety Officer (HSO) – Matthew Carroll

In addition, each individual working at the Site will be responsible for compliance with this CHASP and general safe working practices. All Site workers will have the authority to stop work if a potentially hazardous situation or event is observed.

2.1 Designated Personnel

The Project Manager is responsible for the overall operation of the project, including compliance with the CHASP and general safe work practices. The Project Manager may also act as the Health and Safety Officer (HSO) for this project.

Tenen will appoint one of its on-site personnel as the on-site HSO. This individual will be responsible for the implementation of the CHASP. The HSO will have a 4-year college degree in occupational safety or a related science/engineering field, and at least two (2) years of experience in implementation of air monitoring and hazardous materials sampling programs. The HSO will have completed a 40-hour training course that meets OSHA requirements of 29 CFR Part 1910, Occupational Safety and Health Standards.

The HSO will be present on-site during all field operations involving drilling or other subsurface disturbance, and will be responsible for all health and safety activities and the delegation of duties to the field crew. The HSO has stop-work authorization, which he/she will execute on his/her determination of an imminent safety hazard, emergency situation, or other potentially dangerous situation. If the HSO must be absent from the field, a replacement who is familiar with the Construction Health and Safety Plan, air monitoring and personnel protective equipment (PPE) will be designated.

3.0 HAZARD ASSESSMENT AND CONTROL MEASURES

Known previous uses of the site include dry cleaning operations from as early as 1954 through at least 1981. A tank fill port and vent line to the basement of the historical dry cleaning premises are present at the Site but are not connected to any tank. It is assumed that these lines were connected to a former aboveground storage tank (AST) used to store fuel oil for on-site consumption.

The findings of the Remedial Investigation (RI), conducted in February-March 2016, and the supplemental RI, conducted in September-November 2016, indicate the following:

Up to ten feet of fill material, containing silt, sand, and brick fragments is present from sidewalk grade. The fill material was underlain by glacial till composed of boulders, cobbles, gravel, and coarse sand with some silt. The glacial till was underlain by dense brownish gray clay at approximately 80 ft-bg. The clay was observed in all deep wells. Based on the measured depths, interface probe measurements and soil samples collected from the clay layer, there does not appear to be evidence of dense non-aqueous phase liquid (DNAPL) on top of the clay layer.

Shallow groundwater was encountered at depths of 33 to 40 and generally flows in a northeasterly direction.

Deep groundwater, as screened above the top of the clay layer, generally flows to the north or northeast.

Chlorinated Solvents

- PCE was detected in soil above the Unrestricted Use SCO in one soil sample, below the basement slab. This detection was vertically delineated at three feet below the basement slab.
- PCE was detected in groundwater at concentrations of up to 23 ug/L in shallow samples and up to 57 ug/L in deep samples, above the AWQS. The highest concentrations were in samples collected near the former dry cleaner.
- PCE degradation compounds (TCE, cis-1,2-DCE, trans-1,2-DCE and vinyl chloride) were detected above the AWQS in groundwater.
- PCE was detected in soil vapor and indoor air at concentrations above those detected in the ambient air. PCE was detected in soil vapor at concentrations up to 766 ug/m^3.

Petroleum Impacts

- Spill # 1402686 was assigned to the Site during due diligence sampling completed in 2014.
- Petroleum-related compounds were detected in soil above the Unrestricted Use SCOs in samples collected at the groundwater interface in borings GW-6, GW-8 and GW-3D.
- Petroleum-related compounds were detected in groundwater above the AWQS in samples collected from wells in the upgradient direction; petroleum was not detected above the

AWQS in samples collected near the historic dry cleaner. The highest petroleum concentrations were detected in well GW-8.
Petroleum-related VOCs were detected in soil vapor and indoor air above the ambient air concentrations.

Historic Fill-Related Impacts

- Metals, including lead, silver and zinc, were detected in shallow fill material above the Unrestricted Use SCOs in samples collected from the unexcavated area of the Site.
- Fill-related SVOCs (specifically, PAHs) were detected above the AWQS in one ground water monitoring well.
- One pesticide was detected in the fill material above the Unrestricted Use SCOs.

Qualitative Environmental Assessment

- The following potential exposure routes were identified: direct contact with surface soils, inhalation and incidental ingestion, ingestion of groundwater, direct contact with groundwater and inhalation of vapors.
- Potential impacts from these exposure routes can be mitigated through the implementation of HASP and CAMP during ground-intrusive activities and construction of the Site building and installation of an SSDS and waterproofing membrane.

Sewer Information

- A four-inch diameter sewer is present below the slab and extends to a combined sewer below 31st Street.
- The driveway drain is piped into the basement of historic dry cleaner; no sewer lines were observed that flow to the sewer along 32nd Street.
- No evidence of breaks or cracks was observed in the sewer line. Some corrosion with minor pitting was observed approximately 25 feet west of the ejector pit; this is approximately 18 feet from the GW-2S/2D well cluster.

No wetlands or surface water bodies are present at the Site. The nearest surface water body is the Steinway Creek approximately 2,100 feet to the east-notheast.

3.1 Human Exposure Pathways

The media of concern at the Site include potentially-impacted soil, groundwater and soil vapor. Potential exposure pathways include dermal contact, incidental ingestion and inhalation of vapors. The risk of dermal contact and incidental ingestion will be minimized through general safe work practices, a personal hygiene program and the use of PPE. The risk of inhalation will be minimized through the use of an air monitoring program for volatile organic compounds and particulates.

3.2 Chemical Hazards

Based on historic research and sampling data, the following contaminants of concern are present at the Site:

Chlorinated Solvents
- Trichloroethene (TCE)
- Tetrachloroethene (PCE)
- 1,2-dichloroethene (DCE)

Petroleum Constituents
- Toluene
- Ethylbenzene
- Naphthalene

Metals
- Lead

Semivolatile Organic Compounds
- Polyaromatic Hydrocarbons (PAHs)

Material Safety Data Sheets (MSDSs) for each contaminant of concern are included in Appendix C. All personnel are required to review the MSDSs included in this CHASP.

3.3 Physical Hazards

The physical hazards associated with the field activities likely present a greater risk of injury than the chemical constituents at the Site. Activities within the scope of this project shall comply with New York State and Federal OSHA construction safety standards.

Head Trauma
To minimize the potential for head injuries, field personnel will be required to wear National Institutes of Occupational Safety and Health (NIOSH)-approved hard hats during field activities. Hats must be worn properly and not altered in any way that would decrease the degree of protection provided.

Foot Trauma
To avoid foot injuries, field personnel will be required to wear steel-toed safety shoes while field activities are being performed. To afford maximum protection, all safety shoes must meet American National Standards Institute (ANSI) standards.

Eye Trauma
Field personnel will be required to wear eye protection (safety glasses with side shields) while field activities are being performed to prevent eye injuries caused by contact with chemical or physical agents.

Noise Exposure
Field personnel will be required to wear hearing protection (ear plugs or muffs) in high noise areas (noise from heavy equipment) while field activities are being performed.

Buried Utilities and Overhead Power Lines
Boring locations will be cleared by an underground utility locator service. In addition, prior to intrusive activities, the drilling subcontractor will contact the One Call Center to arrange for a utility mark-out, in accordance with New York State requirements. Protection from overhead power lines will be accomplished by maintaining safe distances of at least 15 feet at all times.

Thermal Stress
The effects of ambient temperature can cause physical discomfort, personal injury, and increase the probability of accidents. In addition, heat stress due to lack of body ventilation caused by protective clothing is an important consideration. Heat-related illnesses commonly consist of heat stroke and heat exhaustion.

The symptoms of heat stroke include: sudden onset; change in behavior; confusion; dry, hot and flushed skin; dilated pupils; fast pulse rate; body temperature reaching 105° or more; and/or, deep breathing later followed by shallow breathing.
The symptoms of heat exhaustion include: weak pulse; general weakness and fatigue; rapid shallow breathing; cold, pale and clammy skin; nausea or headache; profuse perspiration; unconsciousness; and/or, appearance of having fainted.

Heat-stress monitoring will be conducted if air temperatures exceed 70 degrees Fahrenheit. The initial work period will be set at 2 hours. Each worker will check his/her pulse at the wrist for 30 seconds early in each rest period. If the pulse rate exceeds 110 beats per minute, the next work period will be shortened by one-third.

One or more of the following precautions will reduce the risk of heat stress on the Site:

- Provide plenty of liquids to replace lost body fluids; water, electrolytic drinks, or both will be made available to minimize the risk of dehydration and heat stress
- Establish a work schedule that will provide appropriate rest periods
- Establish work regimens consistent with the American Conference of Governmental Industrial Hygienists (ACGIH) guidelines
- Provide adequate employee training on the causes of heat stress and preventive measures

In the highly unlikely event of extreme low temperatures, reasonable precautions will be made to avoid risks associated with low temperature exposure.

Traffic
Field activities will occur near public roadways. As a result, vehicular traffic will be a potential hazard during these activities and control of these areas will be established using barricades or

traffic cones. Additional staff will be assigned, as warranted, for the sole purpose of coordinating traffic. Personnel will also be required to wear high-visibility traffic vests while working in the vicinity of the public roadways and local requirements for lane closure will be observed as needed. All work in public rights-of-way will be coordinated with local authorities and will adhere to their requirements for working in traffic zones.

Hazardous Weather Conditions

All Site workers will be made aware of hazardous weather conditions, specifically including extreme heat, and will be requested to take the precautions described herein to avoid adverse health risks. All workers are encouraged to take reasonable, common sense precautions to avoid potential injury associated with possible rain or high wind. Conditions of sleet, snow or freezing are extremely unlikely.

Slip, Trip and Fall

Areas at the Site may be slippery from mud or water. Great care should be taken by all Site workers to avoid slip, trip and fall hazards. Workers shall not enter areas that not have adequate lighting. Additional portable lighting will be provided at the discretion of the HSO.

Biological Hazards

Drugs and alcohol are prohibited from the Site. Any on-site personnel violating this requirement will be immediately expelled from the Site.

It is the responsibility of any worker or oversight personnel with a medical condition that may require attention should inform the HSO of such condition. The HSO will describe appropriate measures to be taken if the individual should become symptomatic.

Due to the Site location in an urban area, it is highly unlikely that poisonous snakes, spiders, plants, and insects will be encountered. However, other animals (dogs, cats, etc.) may be encountered, and care should be taken to avoid contact.

4.0 AIR MONITORING

The NYSDOH Generic Community Air Monitoring Plan (CAMP), included as Appendix 1A of DER-10, will be implemented during all ground-intrusive sampling and remedial activities. Continuous monitoring will be implemented during all soil handling activities, boring installation (soil borings, monitoring wells and soil vapor points) and periodic monitoring will be implemented during sampling (groundwater and soil vapor samples).

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring should be performed using equipment appropriate for the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.
2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.
3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shut down.
4. All 15-minute readings must be recorded and be available for State (NYSDEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

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

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

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m3 above the upwind level and provided that no visible dust is migrating from the work area.
2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m3 of the upwind level and in preventing visible dust migration.
3. All readings must be recorded and be available for State (NYSDEC and NYSDOH) personnel to review.

5.0 PERSONAL PROTECTIVE EQUIPMENT

The personal protection equipment required for various kinds of site investigation tasks is based on 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response, "General Description and Discussion of the Levels of Protection and Protective Gear."

Tenen field personnel and other site personnel will wear Level D personal protective equipment. During activities such as drilling, well installation, or sampling, where there is a chance of contact with contaminated materials, modified Level D equipment will be worn. The protection will be upgraded to Level C if warranted by the results of the air monitoring. A description of the personnel protective equipment for Levels D and C is provided below.

Level D
Respiratory Protection: None
Protective Clothing: Hard hat, steel-toed shoes, long pants, nitrile gloves

Modified Level D
Respiratory Protection: None
Protective Clothing: Hard hat, steel-toed shoes, coveralls/tyvek, nitrile gloves

Level C
Respiratory Protection: Air purifying respirator with organic vapor cartridges and filters.
Protective Clothing: Same as modified Level D

6.0 EXPOSURE MONITORING

Selective monitoring of workers in the exclusion area may be conducted, as determined by the HSO, if sources of hazardous materials are identified. Personal monitoring may be conducted in the breathing zone at the discretion of the Project Manager or HSO and, if workers are wearing respiratory protective equipment, outside the face-piece.

7.0 SITE ACCESS

Access to the Site during the investigation will be controlled by the Project Manager or HSO. Unauthorized personnel will not be allowed access to the Site.

8.0 WORK AREAS

During any activities involving drilling or other subsurface disturbance, the work area must be divided into various zones to prevent the spread of contamination, clarify the type of protective equipment needed, and provide an area for decontamination.

The Exclusion Zone is defined as the area where potentially contaminated materials are generated as the result of drilling, sampling, or similar activities. The Contamination Reduction Zone (CRZ) is the area where decontamination procedures take place and is located adjacent to the Exclusion Zone. The Support Zone is the area where support facilities such as vehicles, a field phone, fire extinguisher and/or first aid supplies are located. The emergency staging area (part of the Support Zone) is the area where all Site workers will assemble in the event of an emergency. These zones shall be designated daily, depending on that day's activities. All field personnel will be informed of the location of these zones before work begins.

Control measures such as "Caution" tape and traffic cones will be placed around the perimeter of the work area when work is being done in the areas of concern (i.e., areas with exposed soil) to prevent unnecessary access.

9.0 DECONTAMINATION PROCEDURES

Personnel Decontamination
Personnel decontamination (decon), if deemed necessary by the HSO, will take place in the designated decontamination area delineated for each sampling location. Personnel decontamination will consist of the following steps:

- Soap and potable water wash and potable water rinse of gloves;
- Tyvek removal;
- Glove removal;
- Disposable clothing removal; and
- Field wash of hands and face.

Equipment Decontamination
Sampling equipment, such as split-spoons and bailers, will be decontaminated in accordance with U.S. Environmental Protection Agency methodologies, as described in the work plan. Because site soil is considered essentially non-hazardous, there is no need to decontaminate vehicles used for transporting equipment and personnel over the Site.

Disposal of Materials
Purged well water, water used to decontaminate any equipment and well cuttings will be containerized and disposed off-site in accordance with federal, state and local regulations.

10.0 GENERAL SAFE WORK PRACTICES

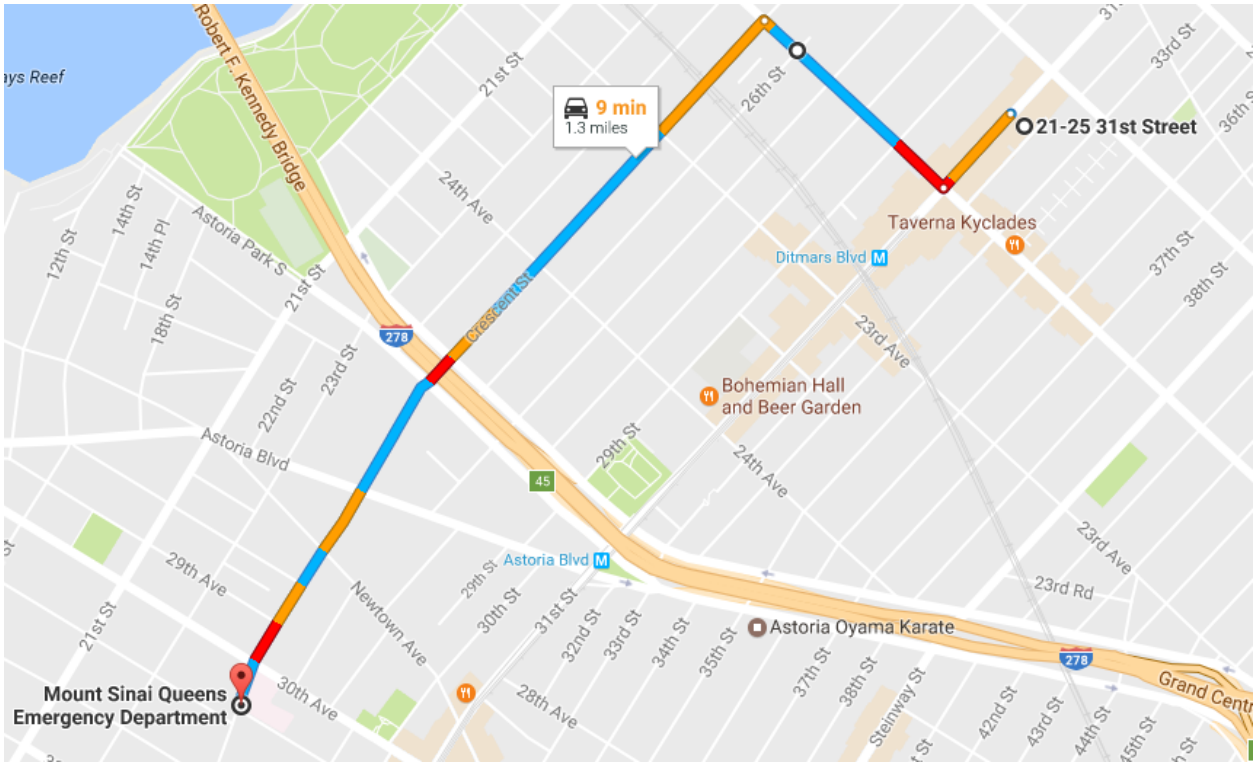
To protect the health and safety of the field personnel, all field personnel will adhere to the guidelines listed below during activities involving subsurface disturbance.

- Eating, drinking, chewing gum or tobacco, and smoking are prohibited, except in designated areas on the site. These areas will be designated by the HSO.
- Workers must wash their hands and face thoroughly on leaving the work area and before eating, drinking, or any other such activity. The workers should shower as soon as possible after leaving the site.
- Removal of potential contamination from PPE and equipment by blowing, shaking or any means that may disperse materials into the air is prohibited.
- Contact with contaminated or suspected surfaces should be avoided.
- The buddy system should always be used; each buddy should watch for signs of fatigue, exposure, and heat stress.
- Personnel will be cautioned to inform each other of symptoms of chemical exposure such as headache, dizziness, nausea, and irritation of the respiratory tract and heat stress.
- No excessive facial hair that interferes with a satisfactory fit of the face-piece of the respirator to the face will be allowed on personnel required to wear respiratory protective equipment.
- On-site personnel will be thoroughly briefed about the anticipated hazards, equipment requirements, safety practices, emergency procedures, and communications methods.

11.0 EMERGENCY PROCEDURES

The field crew will be equipped with emergency equipment, such as a first aid kit and disposable eye washes. In the case of a medical emergency, the HSO will determine the nature of the emergency and will have someone call for an ambulance, if needed. If the nature of the injury is not serious—i.e., the person can be moved without expert emergency medical personnel—on-site personnel should drive him to a hospital. **The nearest emergency room is at Mount Sinai Queens Emergency Department, located at 30-19 Crescent Street.** The route to the hospital is shown and detailed on the next page.

11.1 Route to Hospital



1. Head southwest on 31st Street toward Ditmars Blvd.
2. Turn right at the 1st cross street onto Ditmars Blvd.
3. Turn left onto 25th St/Crescent St.
4. Travel 0.9 mile and destination will be on the left. Emergency room entrance is located on Crescent Street, right before the intersection with 30th Road.

Emergency Room: (718) 932-1000.

11.2 Emergency Contacts

There will be an on-site field phone. Emergency and contact telephone numbers are listed below:

Table 1 – Emergency Contacts

Ambulance	911
Emergency Room	(718) 932-1000
NYSDEC Spill Hotline	(800) 457-7362
Tenen QEP, Mohamed Ahmed	(917) 612-6018
On-site Field Phone, Mark Acceturri	(917) 612-6276
Client, John Petras	(718) 229-4488

12.0 TRAINING

All personnel performing the field activities described in this CHASP will have received the initial safety training required by 29 CFR, 1910.120. Current refresher training status also will be required for all personnel engaged in field activities.

All those who enter the work area while intrusive activities are being performed must recognize and understand the potential hazards to health and safety. All field personnel must attend a training program covering the following areas:

- potential hazards that may be encountered;
- the knowledge and skills necessary for them to perform the work with minimal risk to health and safety;
- the purpose and limitations of safety equipment; and
- protocols to enable field personnel to safely avoid or escape from emergencies.

Each member of the field crew will be instructed in the above objectives before he/she goes onto the site. The HSO will be responsible for conducting the training program.

13.0 MEDICAL SURVEILLANCE

All Tenen and subcontractor personnel performing field work involving drilling or other subsurface disturbance at the site are required to have passed a complete medical surveillance examination in accordance with 29 CFR 1910.120 (f). The medical examination for Tenen employees will, at a minimum, be provided annually and upon termination of hazardous waste site work.

Appendix A

Acknowledgement of CHASP

ACKNOWLEDGMENT OF CHASP

Below is an affidavit that must be signed by all Tenen Environmental employees who enter the site. A copy of the CHASP must be on-site at all times and will be kept by the HSO.

AFFIDAVIT

I have read the Construction Health and Safety Plan (CHASP) for the 21-25 31st Street site. I agree to conduct all on-site work in accordance with the requirements set forth in this CHASP and understand that failure to comply with this CHASP could lead to my removal from the site.

Signature: _____ Date: _____
Signature: _____ Date: _____
Signature: _____ Date: _____
Signature: _____ Date: _____
Signature: _____ Date: _____

Appendix B

Injury Reporting Form (OSHA Form 300)

How to Fill Out the Log

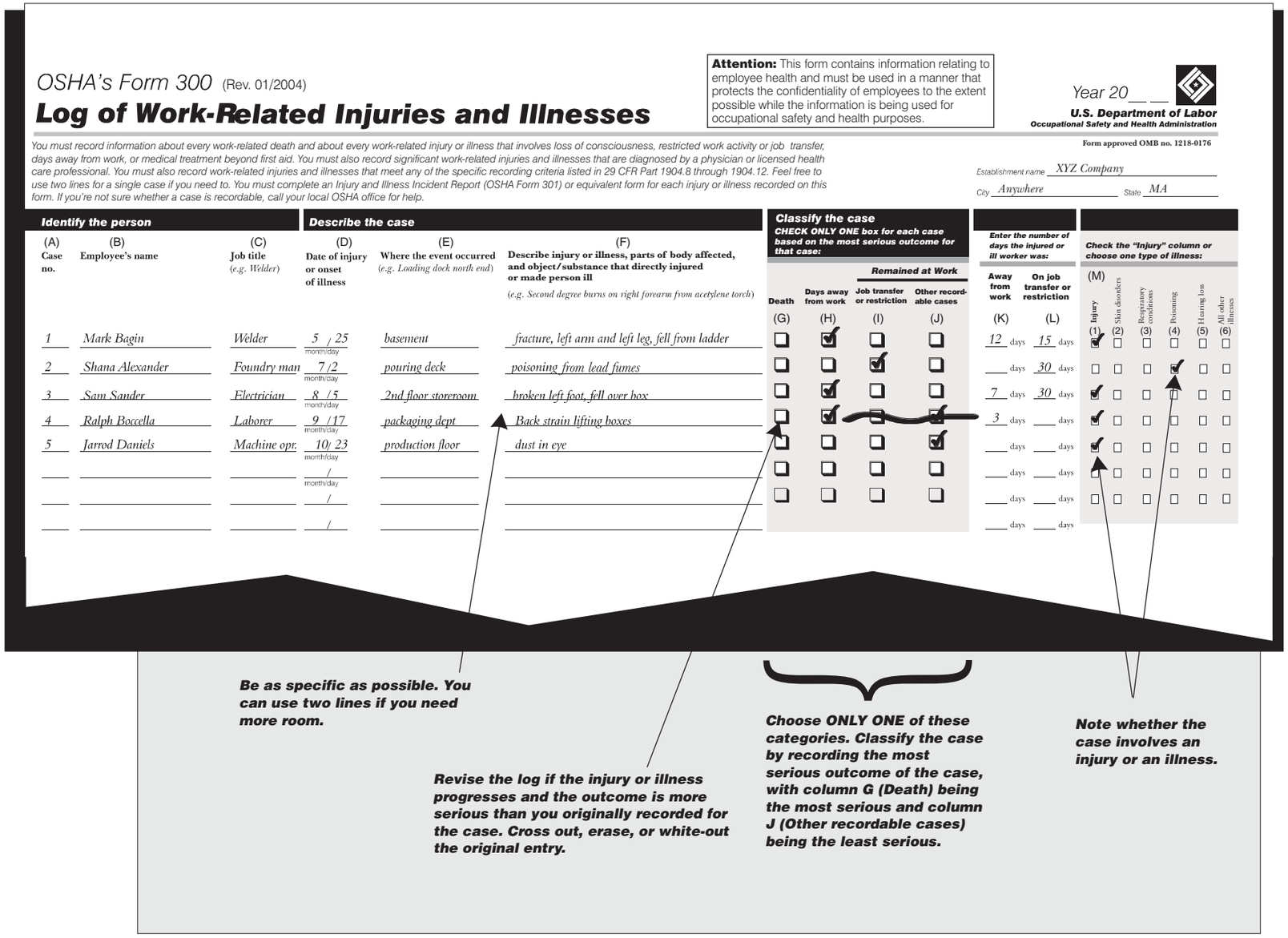
The *Log of Work-Related Injuries and Illnesses* is used to classify work-related injuries and illnesses and to note the extent and severity of each case. When an incident occurs, use the *Log* to record specific details about what happened and how it happened.

If your company has more than one establishment or site, you must keep separate records for each physical location that is expected to remain in operation for one year or longer.

We have given you several copies of the *Log* in this package. If you need more than we provided, you may photocopy and use as many as you need.

The *Summary* — a separate form — shows the work-related injury and illness totals for the year in each category. At the end of the year, count the number of incidents in each category and transfer the totals from the *Log* to the *Summary*. Then post the *Summary* in a visible location so that your employees are aware of injuries and illnesses occurring in their workplace.

You don't post the Log. You post only the Summary at the end of the year.



OSHA's Form 300 (Rev. 01/2004)

Log of Work-Related Injuries and Illnesses

Attention: This form contains information relating to employee health and must be used in a manner that protects the confidentiality of employees to the extent possible while the information is being used for occupational safety and health purposes.

Year 20__ __

U.S. Department of Labor
Occupational Safety and Health Administration

Form approved OMB no. 1218-0176

You must record information about every work-related death and about every work-related injury or illness that involves loss of consciousness, restricted work activity or job transfer, days away from work, or medical treatment beyond first aid. You must also record significant work-related injuries and illnesses that are diagnosed by a physician or licensed health care professional. You must also record work-related injuries and illnesses that meet any of the specific recording criteria listed in 29 CFR Part 1904.8 through 1904.12. Feel free to use two lines for a single case if you need to. You must complete an Injury and Illness Incident Report (OSHA Form 301) or equivalent form for each injury or illness recorded on this form. If you're not sure whether a case is recordable, call your local OSHA office for help.

Establishment name XYZ Company
City Anywhere State MA

Identify the person			Describe the case			Classify the case (CHECK ONLY ONE box for each case based on the most serious outcome for that case:)				Enter the number of days the injured or ill worker was:		Check the "Injury" column or choose one type of illness:					
							Remained at Work										
(A) Case no.	(B) Employee's name	(C) Job title (*e.g. Welder*)	(D) Date of injury or onset of illness	(E) Where the event occurred (*e.g. Loading dock north end*)	(F) Describe injury or illness, parts of body affected, and object/substance that directly injured or made person ill (*e.g. Second degree burns on right forearm from acetylene torch*)	Death (G)	Days away from work (H)	Job transfer or restriction (I)	Other recordable cases (J)	Away from work (K)	On job transfer or restriction (L)	(M) Injury (1)	Skin disorders (2)	Respiratory conditions (3)	Poisoning (4)	Hearing loss (5)	All other illnesses (6)
1	Mark Bagin	Welder	5/25	basement	fracture, left arm and left leg, fell from ladder	☐	☑	☐	☐	12 days	15 days	☑	☐	☐	☐	☐	☐
2	Shana Alexander	Foundry man	7/2	pouring deck	poisoning from lead fumes	☐	☐	☑	☐	___ days	30 days	☐	☐	☐	☑	☐	☐
3	Sam Sander	Electrician	8/5	2nd floor storeroom	broken left foot, fell over box	☐	☑	☐	☐	7 days	30 days	☑	☐	☐	☐	☐	☐
4	Ralph Boccella	Laborer	9/17	packaging dept	Back strain lifting boxes	☐	☑	☐	☐	3 days	___ days	☑	☐	☐	☐	☐	☐
5	Jarrod Daniels	Machine opr.	10/23	production floor	dust in eye	☐	☐	☐	☑	___ days	___ days	☑	☐	☐	☐	☐	☐
			/			☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
			/			☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
			/			☐	☐	☐	☐	___ days	___ days						

Be as specific as possible. You can use two lines if you need more room.

Revise the log if the injury or illness progresses and the outcome is more serious than you originally recorded for the case. Cross out, erase, or white-out the original entry.

Choose ONLY ONE of these categories. Classify the case by recording the most serious outcome of the case, with column G (Death) being the most serious and column J (Other recordable cases) being the least serious.

Note whether the case involves an injury or an illness.

OSHA's Form 300 (Rev. 01/2004)

Log of Work-Related Injuries and Illnesses

Attention: This form contains information relating to employee health and must be used in a manner that protects the confidentiality of employees to the extent possible while the information is being used for occupational safety and health purposes.

Year 20__ __

U.S. Department of Labor
Occupational Safety and Health Administration

Form approved OMB no. 1218-0176

You must record information about every work-related death and about every work-related injury or illness that involves loss of consciousness, restricted work activity or job transfer, days away from work, or medical treatment beyond first aid. You must also record significant work-related injuries and illnesses that are diagnosed by a physician or licensed health care professional. You must also record work-related injuries and illnesses that meet any of the specific recording criteria listed in 29 CFR Part 1904.8 through 1904.12. Feel free to use two lines for a single case if you need to. You must complete an Injury and Illness Incident Report (OSHA Form 301) or equivalent form for each injury or illness recorded on this form. If you're not sure whether a case is recordable, call your local OSHA office for help.

Establishment name ______________________

City ______________________ State ____________

Identify the person			Describe the case			Classify the case: CHECK ONLY ONE box for each case based on the most serious outcome for that case:				Enter the number of days the injured or ill worker was:		Check the "Injury" column or choose one type of illness: (M)					
(A) Case no.	(B) Employee's name	(C) Job title (*e.g., Welder*)	(D) Date of injury or onset of illness	(E) Where the event occurred (*e.g., Loading dock north end*)	(F) Describe injury or illness, parts of body affected, and object/substance that directly injured or made person ill (*e.g., Second degree burns on right forearm from acetylene torch*)	Death (G)	Days away from work (H)	Remained at Work: Job transfer or restriction (I)	Remained at Work: Other record-able cases (J)	Away from work (K)	On job transfer or restriction (L)	Injury (1)	Skin disorder (2)	Respiratory condition (3)	Poisoning (4)	Hearing loss (5)	All other illnesses (6)
____	____	____	__/__ month/day	____	____	☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
____	____	____	__/__ month/day	____	____	☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
____	____	____	__/__ month/day	____	____	☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
____	____	____	__/__ month/day	____	____	☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
____	____	____	__/__ month/day	____	____	☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
____	____	____	__/__ month/day	____	____	☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
____	____	____	__/__ month/day	____	____	☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
____	____	____	__/__ month/day	____	____	☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
____	____	____	__/__ month/day	____	____	☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
____	____	____	__/__ month/day	____	____	☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
____	____	____	__/__ month/day	____	____	☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
____	____	____	__/__ month/day	____	____	☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
____	____	____	__/__ month/day	____	____	☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
					Page totals ➤	____	____	____	____	____	____	____ Injury (1)	____ Skin disorder (2)	____ Respiratory condition (3)	____ Poisoning (4)	____ Hearing loss (5)	____ All other illnesses (6)

Be sure to transfer these totals to the Summary page (Form 300A) before you post it.

Public reporting burden for this collection of information is estimated to average 14 minutes per response, including time to review the instructions, search and gather the data needed, and complete and review the collection of information. Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number. If you have any comments about these estimates or any other aspects of this data collection, contact: US Department of Labor, OSHA Office of Statistical Analysis, Room N-3644, 200 Constitution Avenue, NW, Washington, DC 20210. Do not send the completed forms to this office.

Appendix C

Material Safety Data Sheets (MSDS)

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATHESON TRI-GAS, INC.
150 Allen Road Suite 302
Basking Ridge, New Jersey 07920
Information: 1-800-416-2505

Emergency Contact:
CHEMTREC 1-800-424-9300
Calls Originating Outside the US:
703-527-3887 (Collect Calls Accepted)

SUBSTANCE: CIS-1,2-DICHLOROETHYLENE

TRADE NAMES/SYNONYMS:
CIS-ACETYLENE DICHLORIDE; 1,2-DICHLOROETHYLENE; C2H2CL2; MAT05125; RTECS KV9420000

CHEMICAL FAMILY: halogenated, aliphatic

CREATION DATE: Jan 24 1989
REVISION DATE: Dec 11 2008

2. COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: CIS-1,2-DICHLOROETHYLENE
CAS NUMBER: 156-59-2
PERCENTAGE: 100.0

3. HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=2 FIRE=3 REACTIVITY=2

EMERGENCY OVERVIEW:
COLOR: colorless
PHYSICAL FORM: liquid
ODOR: pleasant odor
MAJOR HEALTH HAZARDS: respiratory tract irritation, skin irritation, eye irritation, central nervous system depression
PHYSICAL HAZARDS: Flammable liquid and vapor. Vapor may cause flash fire. May react on contact with air, heat, light or water.

POTENTIAL HEALTH EFFECTS:
INHALATION:

SHORT TERM EXPOSURE: irritation, nausea, vomiting, drowsiness, symptoms of drunkenness
LONG TERM EXPOSURE: no information on significant adverse effects
SKIN CONTACT:
SHORT TERM EXPOSURE: irritation
LONG TERM EXPOSURE: same as effects reported in short term exposure
EYE CONTACT:
SHORT TERM EXPOSURE: irritation
LONG TERM EXPOSURE: same as effects reported in short term exposure
INGESTION:
SHORT TERM EXPOSURE: symptoms of drunkenness
LONG TERM EXPOSURE: no information on significant adverse effects

4. FIRST AID MEASURES

INHALATION: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Get immediate medical attention.

SKIN CONTACT: Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention, if needed. Thoroughly clean and dry contaminated clothing and shoes before reuse.

EYE CONTACT: Flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

INGESTION: If vomiting occurs, keep head lower than hips to help prevent aspiration. If person is unconscious, turn head to side. Get medical attention immediately.

NOTE TO PHYSICIAN: For ingestion, consider gastric lavage. Consider oxygen.

5. FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS: Severe fire hazard. Moderate explosion hazard. Vapor/air mixtures are explosive above flash point. The vapor is heavier than air. Vapors or gases may ignite at distant ignition sources and flash back.

EXTINGUISHING MEDIA: regular dry chemical, carbon dioxide, water, regular foam

Large fires: Use regular foam or flood with fine water spray.

FIRE FIGHTING: Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. For fires in cargo or storage area: Cool containers with water from unmanned hose holder or monitor nozzles until well after fire is out. If this is impossible then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. Withdraw immediately in case of rising sound from venting safety device or any

discoloration of tanks due to fire. For tank, rail car or tank truck: Evacuation radius: 800 meters (1/2 mile). Do not attempt to extinguish fire unless flow of material can be stopped first. Flood with fine water spray. Do not scatter spilled material with high-pressure water streams. Cool containers with water spray until well after the fire is out. Apply water from a protected location or from a safe distance. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas. Water may be ineffective.

FLASH POINT: 39 F (4 C) (CC)
LOWER FLAMMABLE LIMIT: 9.7%
UPPER FLAMMABLE LIMIT: 12.8%
FLAMMABILITY CLASS (OSHA): IB

6. ACCIDENTAL RELEASE MEASURES

OCCUPATIONAL RELEASE:
Avoid heat, flames, sparks and other sources of ignition. Stop leak if possible without personal risk. Reduce vapors with water spray. Small spills: Absorb with sand or other non-combustible material. Collect spilled material in appropriate container for disposal. Large spills: Dike for later disposal. Remove sources of ignition. Keep unnecessary people away, isolate hazard area and deny entry.

7. HANDLING AND STORAGE

STORAGE: Store and handle in accordance with all current regulations and standards. Subject to storage regulations: U.S. OSHA 29 CFR 1910.106. Grounding and bonding required. Keep separated from incompatible substances.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:
CIS-1,2-DICHLOROETHYLENE:
1,2-DICHLOROETHYLENE (ALL ISOMERS):
200 ppm (790 mg/m3) OSHA TWA
200 ppm ACGIH TWA
200 ppm (790 mg/m3) NIOSH recommended TWA 10 hour(s)

VENTILATION: Provide local exhaust ventilation system. Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. Ensure compliance with applicable exposure limits.

EYE PROTECTION: Wear splash resistant safety goggles with a faceshield. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

CLOTHING: Wear appropriate chemical resistant clothing.

GLOVES: Wear appropriate chemical resistant gloves.

RESPIRATOR: The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA.
2000 ppm
Any supplied-air respirator operated in a continuous-flow mode.
Any powered, air-purifying respirator with organic vapor cartridge(s).
Any air-purifying respirator with a full facepiece and an organic vapor canister.
Any air-purifying full-facepiece respirator (gas mask) with a chin-style, front-mounted or back-mounted organic vapor canister.
Any self-contained breathing apparatus with a full facepiece.
Any supplied-air respirator with a full facepiece.
Emergency or planned entry into unknown concentrations or IDLH conditions -
Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.
Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.
Escape -
Any air-purifying full-facepiece respirator (gas mask) with a chin-style, front-mounted or back-mounted organic vapor canister.
Any appropriate escape-type, self-contained breathing apparatus.
For Unknown Concentrations or Immediately Dangerous to Life or Health -
Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.
Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: liquid
COLOR: colorless
ODOR: pleasant odor
MOLECULAR WEIGHT: 96.94
MOLECULAR FORMULA: C2-H2-CL2
BOILING POINT: 140 F (60 C)
FREEZING POINT: -114 F (-81 C)
VAPOR PRESSURE: 400 mmHg @ 41 C
VAPOR DENSITY (air=1): 3.34
SPECIFIC GRAVITY (water=1): 1.2837
WATER SOLUBILITY: insoluble
PH: Not available
VOLATILITY: Not available
ODOR THRESHOLD: Not available
EVAPORATION RATE: Not available

COEFFICIENT OF WATER/OIL DISTRIBUTION: Not available
SOLVENT SOLUBILITY:
Soluble: acetone, benzene, ether, alcohol

10. STABILITY AND REACTIVITY

REACTIVITY: May decompose on contact with air, light, moisture, heat or storage and use above room temperature. Releases toxic, corrosive, flammable or explosive gases.

CONDITIONS TO AVOID: Avoid heat, flames, sparks and other sources of ignition. Containers may rupture or explode if exposed to heat. Keep out of water supplies and sewers.

INCOMPATIBILITIES: bases, metals, combustible materials, oxidizing materials, acids

HAZARDOUS DECOMPOSITION:
Thermal decomposition products: phosgene, halogenated compounds, oxides of carbon

POLYMERIZATION: May polymerize. Avoid contact with incompatible materials.

11. TOXICOLOGICAL INFORMATION

CIS-1,2-DICHLOROETHYLENE:
TOXICITY DATA: 13700 ppm inhalation-rat LC50
LOCAL EFFECTS:
Irritant: inhalation, skin, eye
ACUTE TOXICITY LEVEL:
Slightly Toxic: inhalation
TARGET ORGANS: central nervous system
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: respiratory disorders
MUTAGENIC DATA: Available.

12. ECOLOGICAL INFORMATION

Not available

13. DISPOSAL CONSIDERATIONS

Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001. Dispose in accordance with all applicable regulations.

14. TRANSPORT INFORMATION

U.S. DOT 49 CFR 172.101:
PROPER SHIPPING NAME: 1,2-Dichloroethylene
ID NUMBER: UN1150
HAZARD CLASS OR DIVISION: 3
PACKING GROUP: II
LABELING REQUIREMENTS: 3

CANADIAN TRANSPORTATION OF DANGEROUS GOODS:
SHIPPING NAME: 1,2-Dichloroethylene
UN NUMBER: UN1150
CLASS: 3
PACKING GROUP/CATEGORY: II

15. REGULATORY INFORMATION

U.S. REGULATIONS:
CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4): Not regulated.

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355 Subpart B): Not regulated.

SARA TITLE III SECTION 304 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355 Subpart C): Not regulated.

SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370 Subparts B and C):
ACUTE: Yes
CHRONIC: No
FIRE: Yes
REACTIVE: Yes
SUDDEN RELEASE: No

SARA TITLE III SECTION 313 (40 CFR 372.65):
1,2-DICHLOROETHYLENE (ALL ISOMERS)

OSHA PROCESS SAFETY (29 CFR 1910.119): Not regulated.

STATE REGULATIONS:
California Proposition 65: Not regulated.

CANADIAN REGULATIONS:
WHMIS CLASSIFICATION: BD2

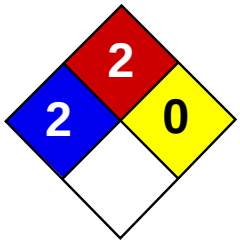
NATIONAL INVENTORY STATUS:
U.S. INVENTORY (TSCA): Listed on inventory.

TSCA 12(b) EXPORT NOTIFICATION: Not listed.

CANADA INVENTORY (DSL/NDSL): Not determined.

16. OTHER INFORMATION

MATHESON TRI-GAS, INC. MAKES NO EXPRESS OR IMPLIED WARRANTIES, GUARANTEES OR REPRESENTATIONS REGARDING THE PRODUCT OR THE INFORMATION HEREIN, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR USE. MATHESON TRI-GAS, INC. SHALL NOT BE LIABLE FOR ANY PERSONAL INJURY, PROPERTY OR OTHER DAMAGES OF ANY NATURE, WHETHER COMPENSATORY, CONSEQUENTIAL, EXEMPLARY, OR OTHERWISE, RESULTING FROM ANY PUBLICATION, USE OR RELIANCE UPON THE INFORMATION HEREIN.



Health	2
Fire	2
Reactivity	0
Personal Protection	E

Material Safety Data Sheet
Naphthalene MSDS

Section 1: Chemical Product and Company Identification

Product Name: Naphthalene

Catalog Codes: SLN1789, SLN2401

CAS#: 91-20-3

RTECS: QJ0525000

TSCA: TSCA 8(b) inventory: Naphthalene

CI#: Not available.

Synonym:

Chemical Name: Not available.

Chemical Formula: C10H8

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Naphthalene	91-20-3	100

Toxicological Data on Ingredients: Naphthalene: ORAL (LD50): Acute: 490 mg/kg [Rat]. 533 mg/kg [Mouse]. 1200 mg/kg [Guinea pig]. DERMAL (LD50): Acute: 20001 mg/kg [Rabbit]. VAPOR (LC50): Acute: 170 ppm 4 hour(s) [Rat].

Section 3: Hazards Identification

Potential Acute Health Effects:
Very hazardous in case of ingestion. Hazardous in case of eye contact (irritant), of inhalation. Slightly hazardous in case of skin contact (irritant, permeator). Severe over-exposure can result in death.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Classified Development toxin [POSSIBLE]. The substance is toxic to blood, kidneys, the nervous system, the reproductive system, liver, mucous membranes, gastrointestinal tract, upper respiratory tract, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage. Repeated exposure to an highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Do not use an eye ointment. Seek medical attention.

Skin Contact:
After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cover the irritated skin with an emollient. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.

Serious Skin Contact: Not available.

Inhalation: Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

Ingestion:
Do not induce vomiting. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Flammable.

Auto-Ignition Temperature: 567°C (1052.6°F)

Flash Points: CLOSED CUP: 88°C (190.4°F). OPEN CUP: 79°C (174.2°F).

Flammable Limits: LOWER: 0.9% UPPER: 5.9%

Products of Combustion: These products are carbon oxides (CO, CO2).

Fire Hazards in Presence of Various Substances: Not available.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
Flammable solid. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill: Use appropriate tools to put the spilled solid in a convenient waste disposal container.

Large Spill:
Flammable solid. Stop leak if without risk. Do not touch spilled material. Use water spray curtain to divert vapor drift. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all ignition sources. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe dust. Avoid contact with eyes Wear suitable protective clothing In case of insufficient ventilation, wear suitable respiratory equipment If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents.

Storage:
Flammable materials should be stored in a separate safety storage cabinet or room. Keep away from heat. Keep away from sources of ignition. Keep container tightly closed. Keep in a cool, well-ventilated place. Ground all equipment containing material. Keep container dry. Keep in a cool place.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection:
Splash goggles. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
Israel: TWA: 10 (ppm) TWA: 10 STEL: 15 (ppm) from ACGIH (TLV) [1995] TWA: 52 STEL: 79 (mg/m3) from ACGIH [1995] Australia: STEL: 15 (ppm) Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Crystalline solid.)

Odor: Aromatic.

Taste: Not available.

Molecular Weight: 128.19 g/mole

Color: White.

pH (1% soln/water): Not available.

Boiling Point: 218°C (424.4°F)

Melting Point: 80.2°C (176.4°F)

Critical Temperature: Not available.

Specific Gravity: 1.162 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: 4.4 (Air = 1)

Volatility: Not available.

Odor Threshold: 0.038 ppm

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties:
Partially dispersed in hot water, methanol, n-octanol. Very slightly dispersed in cold water. See solubility in methanol, n-octanol.

Solubility:
Partially soluble in methanol, n-octanol. Very slightly soluble in cold water, hot water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances: Highly reactive with oxidizing agents.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity: Not available.

Special Remarks on Corrosivity: May attack some forms of rubber and plastic

Polymerization: No.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 490 mg/kg [Rat]. Acute dermal toxicity (LD50): 20001 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 170 ppm 4 hour(s) [Rat].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH. DEVELOPMENTAL TOXICITY: Classified Development toxin [POSSIBLE]. The substance is toxic to blood, kidneys, the nervous system, the reproductive system, liver, mucous membranes, gastrointestinal tract, upper respiratory tract, central nervous system (CNS).

Other Toxic Effects on Humans:
Very hazardous in case of ingestion. Hazardous in case of inhalation. Slightly hazardous in case of skin contact (irritant, permeator).

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans: Not available.

Section 12: Ecological Information

Ecotoxicity: Ecotoxicity in water (LC50): 305.2 ppm 96 hour(s) [Trout].

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are more toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Section 14: Transport Information

DOT Classification: CLASS 4.1: Flammable solid.

Identification: : Naphthalene, refined : UN1334 PG: III

Special Provisions for Transport: Marine Pollutant

Section 15: Other Regulatory Information

Federal and State Regulations:
Rhode Island RTK hazardous substances: Naphthalene Pennsylvania RTK: Naphthalene Florida: Naphthalene Minnesota: Naphthalene Massachusetts RTK: Naphthalene TSCA 8(b) inventory: Naphthalene TSCA 8(a) PAIR: Naphthalene TSCA 8(d) H and S data reporting: Naphthalene: 06/01/87 SARA 313 toxic chemical notification and release reporting: Naphthalene: 1% CERCLA: Hazardous substances.: Naphthalene: 100 lbs. (45.36 kg)

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS B-4: Flammable solid. CLASS D-1B: Material causing immediate and serious toxic effects (TOXIC). CLASS D-2B: Material causing other toxic effects (TOXIC).

DSCL (EEC):
R36- Irritating to eyes. R40- Possible risks of irreversible effects. R48/22- Harmful: danger of serious damage to health by prolonged exposure if swallowed. R48/23- Toxic: danger of serious damage to health by prolonged exposure through inhalation. R63- Possible risk of harm to the unborn child.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 2

Reactivity: 0

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 2

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

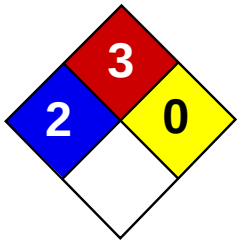
Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/11/2005 01:30 PM

Last Updated: 11/01/2010 12:00 PM



Material Safety Data Sheet
Ethylbenzene MSDS

Section 1: Chemical Product and Company Identification

Product Name: Ethylbenzene

Catalog Codes: SLE2044

CAS#: 100-41-4

RTECS: DA0700000

TSCA: TSCA 8(b) inventory: Ethylbenzene

CI#: Not available.

Synonym: Ethyl Benzene; Ethylbenzol; Phenylethane

Chemical Name: Ethylbenzene

Chemical Formula: C8H10

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Ethylbenzene	100-41-4	100

Toxicological Data on Ingredients: Ethylbenzene: ORAL (LD50): Acute: 3500 mg/kg [Rat].

Section 3: Hazards Identification

Potential Acute Health Effects:
Hazardous in case of eye contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (irritant, permeator).

Potential Chronic Health Effects:
Slightly hazardous in case of skin contact (irritant, sensitizer). CARCINOGENIC EFFECTS: Classified 2B (Possible for human.) by IARC. MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. WARM water MUST be used. Get medical attention.

Skin Contact: Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops.

Serious Skin Contact: Not available.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Flammable.

Auto-Ignition Temperature: 432°C (809.6°F)

Flash Points:
CLOSED CUP: 15°C (59°F). (Tagliabue.) OPEN CUP: 26.667°C (80°F) (Cleveland) (CHRIS, 2001) CLOSED CUP: 12.8 C (55 F) (Bingham et al, 2001; NIOSH, 2001) CLOSED CUP: 21 C (70 F) (NFPA)

Flammable Limits: LOWER: 0.8% - 1.6%UPPER: 6.7% - 7%

Products of Combustion: These products are carbon oxides (CO, CO2).

Fire Hazards in Presence of Various Substances: Highly flammable in presence of open flames and sparks, of heat.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available. Slightly explosive in presence of heat.

Fire Fighting Media and Instructions:
Flammable liquid, soluble or dispersed in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog.

Special Remarks on Fire Hazards:
Vapor may travel considerable distance to source of ignition and flash back. Vapors may form explosive mixtures with air. When heated to decomposition it emits acrid smoke and irritating fumes.

Special Remarks on Explosion Hazards: Vapors may form explosive mixtures in air.

Section 6: Accidental Release Measures

Small Spill: Absorb with an inert material and put the spilled material in an appropriate waste disposal.

Large Spill:
Flammable liquid. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Avoid contact with eyes. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents.

Storage:
Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame). Sensitive to light. Store in light-resistant containers.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 100 STEL: 125 (ppm) from OSHA (PEL) [United States] TWA: 435 STEL: 545 from OSHA (PEL) [United States] TWA: 435 STEL: 545 (mg/m3) from NIOSH [United States] TWA: 100 STEL: 125 (ppm) from NIOSH [United States] TWA: 100 STEL: 125 (ppm) from ACGIH (TLV) [United States] TWA: 100 STEL: 125 (ppm) [United Kingdom (UK)] TWA: 100 STEL: 125 (ppm) [Belgium] TWA: 100 STEL: 125 (ppm) [Finland] TWA: 50 (ppm) [Norway] Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Sweetish. Gasoline-like. Aromatic.

Taste: Not available.

Molecular Weight: 106.16 g/mole

Color: Colorless.

pH (1% soln/water): Not available.

Boiling Point: 136°C (276.8°F)

Melting Point: -94.9 (-138.8°F)

Critical Temperature: 617.15°C (1142.9°F)

Specific Gravity: 0.867 (Water = 1)

Vapor Pressure: 0.9 kPa (@ 20°C)

Vapor Density: 3.66 (Air = 1)

Volatility: 100% (v/v).

Odor Threshold: 140 ppm

Water/Oil Dist. Coeff.: The product is more soluble in oil; log(oil/water) = 3.1

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, diethyl ether.

Solubility:
Easily soluble in diethyl ether. Very slightly soluble in cold water or practically insoluble in water. Soluble in all proportions in Ethyl alcohol. Soluble in Carbon tetrachloride, Benzene. Insoluble in Ammonia. Slightly soluble in Chloroform. Solubility in Water: 169 mg/l @ 25 deg. C.; 0.014 g/100 ml @ 15 deg. C.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Heat, ingnition sources (flames, sparks, static), incompatible materials, light

Incompatibility with various substances: Reactive with oxidizing agents.

Corrosivity: Not considered to be corrosive for metals and glass.

Special Remarks on Reactivity:
Can react vigorously with oxidizing materials. Sensitive to light.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Inhalation.

Toxicity to Animals: Acute oral toxicity (LD50): 3500 mg/kg [Rat].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified 2B (Possible for human.) by IARC. MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast. May cause damage to the following organs: central nervous system (CNS).

Other Toxic Effects on Humans:
Hazardous in case of ingestion, of inhalation. Slightly hazardous in case of skin contact (irritant, permeator).

Special Remarks on Toxicity to Animals:
Lethal Dose/Conc 50% Kill: LD50 [Rabbit] - Route: Skin; Dose: 17800 ul/kg Lowest Published Lethal Dose/Conc: LDL[Rat] - Route: Inhalation (vapor); Dose: 4000 ppm/4 H

Special Remarks on Chronic Effects on Humans:
May cause adverse reproductive effects and birth defects (teratogenic) based on animal test data. May cause cancer based on animals data. IARC evidence for carcinogenicity in animals is sufficient. IARC evidence of carcinogenicity in humans inadequate. May affect genetic material (mutagenic).

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: Can cause mild skin irritation. It can be absorbed through intact skin. Eyes: Contact with vapor or liquid can cause severe eye irritation depending on concentration. It may also cause conjunctivitis. At a vapor exposure level of 85 - 200 ppm , it is mildly and transiently irritating to the eyes; 1000 ppm causes further irritation and tearing; 2000 ppm results in immediate and severe irritation and tearing; 5,000 ppm is intolerable (ACGIH, 1991; Clayton and Clayton, 1994). Standard draize test for eye irritation using 500 mg resulted in severe irritation (RTECS) Inhalation: Exposure to high concentrations can cause nasal, mucous membrane and respiratory tract irritation and can also result in chest constriction and, trouble breathing, respiratory failure, and even death. It can also affect behavior/Central Nervous System. The effective dose for CNS depression in experimental animals was 10,000 ppm (ACGIH, 1991). Symptoms of CNS depression include

headache, nausea, weakness, dizziness, vertigo, irritability, fatigue, lightheadedness, sleepiness, tremor, loss of coordination, judgement and conciousness, coma, and death. It can also cause pulmonary edema. Inhalation of 85 ppm can produce fatigue, insomnia, headache, and mild irritation of the respiratory tract (Haley & Berndt, 1987). Ingestion: Do not drink, pipet or siphon by mouth. May cause gastroinestinal/digestive tract irritation with Abdominal pain, nausea, vomiting. Ethylbenzene is a pulmonary aspiration hazard. Pulmonary aspiration of even small amounts of the liquid may cause fatal pneumonitis. It may also affect behavior/central nervous system with

Section 12: Ecological Information

Ecotoxicity:
Ecotoxicity in water (LC50): 14 mg/l 96 hours [Fish (Trout)] (static). 12.1 mg/l 96 hours [Fish (Fathead Minnow)] (flow-through)]. 150 mg/l 96 hours [Fish (Blue Gill/Sunfish)] (static). 275 mg/l 96 hours [Fish (Sheepshead Minnow)]. 42.3 mg/l 96 hours [Fish (Fathead Minnow)](soft water). 87.6mg/l 96 hours [Shrimp].

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: CLASS 3: Flammable liquid.

Identification: : Ethylbenzene UNNA: 1175 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
Connecticut hazardous material survey.: Ethylbenzene Illinois toxic substances disclosure to employee act: Ethylbenzene Illinois chemical safety act: Ethylbenzene New York release reporting list: Ethylbenzene Rhode Island RTK hazardous substances: Ethylbenzene Pennsylvania RTK: Ethylbenzene Minnesota: Ethylbenzene Massachusetts RTK: Ethylbenzene Massachusetts spill list: Ethylbenzene New Jersey: Ethylbenzene New Jersey spill list: Ethylbenzene Louisiana spill reporting: Ethylbenzene California Director's List of Hazardous Substances: Ethylbenzene TSCA 8(b) inventory: Ethylbenzene TSCA 4(a) proposed test rules: Ethylbenzene TSCA 8(d) H and S data reporting: Ethylbenzene: Effective Date: 6/19/87; Sunset Date: 6/19/97 SARA 313 toxic chemical notification and release reporting: Ethylbenzene

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLASS D-2A: Material causing other toxic effects (VERY TOXIC). CLASSE D-2B: Material causing other toxic effects (TOXIC).

DSCL (EEC):
R11- Highly flammable. R20- Harmful by inhalation. S16- Keep away from sources of ignition - No smoking. S24/25- Avoid contact with skin and eyes. S29- Do not empty into drains.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 3

Reactivity: 0

Personal Protection: h

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 3

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

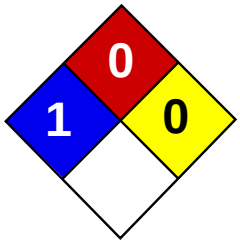
Section 16: Other Information

References:
-Manufacturer's Material Safety Data Sheet. -Fire Protection Guide to Hazardous Materials, 13th ed., National Fire Protection Association (NFPA) -Registry of Toxic Effects of Chemical Substances (RTECS) -Chemical Hazard Response Information System (CHRIS) -Hazardous Substance Data Bank (HSDB) -New Jersey Hazardous Substance Fact Sheet -Ariel Global View -Reprotext System

Other Special Considerations: Not available.

Created: 10/09/2005 05:28 PM

Last Updated: 11/01/2010 12:00 PM



Material Safety Data Sheet
Lead MSDS

Section 1: Chemical Product and Company Identification

Product Name: Lead

Catalog Codes: SLL1291, SLL1669, SLL1081, SLL1459, SLL1834

CAS#: 7439-92-1

RTECS: OF7525000

TSCA: TSCA 8(b) inventory: Lead

CI#: Not available.

Synonym: Lead Metal, granular; Lead Metal, foil; Lead Metal, sheet; Lead Metal, shot

Chemical Name: Lead

Chemical Formula: Pb

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Lead	7439-92-1	100

Toxicological Data on Ingredients: Lead LD50: Not available. LC50: Not available.

Section 3: Hazards Identification

Potential Acute Health Effects: Slightly hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation.

Potential Chronic Health Effects:
Slightly hazardous in case of skin contact (permeator). CARCINOGENIC EFFECTS: Classified A3 (Proven for animal.) by ACGIH, 2B (Possible for human.) by IARC. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to blood, kidneys, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.

Skin Contact: Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops.

Serious Skin Contact: Not available.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation: Not available.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: Not available.

Flash Points: Not available.

Flammable Limits: Not available.

Products of Combustion: Some metallic oxides.

Fire Hazards in Presence of Various Substances: Non-flammable in presence of open flames and sparks, of shocks, of heat.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards: When heated to decomposition it emits highly toxic fumes of lead.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill:
Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill:
Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up.. Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not ingest. Do not breathe dust. Wear suitable

protective clothing. If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection: Safety glasses. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 0.05 (mg/m3) from ACGIH (TLV) [United States] TWA: 0.05 (mg/m3) from OSHA (PEL) [United States] TWA: 0.03 (mg/m3) from NIOSH [United States] TWA: 0.05 (mg/m3) [Canada]Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Metal solid.)

Odor: Not available.

Taste: Not available.

Molecular Weight: 207.21 g/mole

Color: Bluish-white. Silvery. Gray

pH (1% soln/water): Not applicable.

Boiling Point: 1740°C (3164°F)

Melting Point: 327.43°C (621.4°F)

Critical Temperature: Not available.

Specific Gravity: 11.3 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility: Insoluble in cold water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatible materials, excess heat

Incompatibility with various substances: Reactive with oxidizing agents.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Can react vigorously with oxidizing materials. Incompatible with sodium carbide, chlorine trifluoride, trioxane + hydrogen peroxide, ammonium nitrate, sodium azide, disodium acetylide, sodium acetylide, hot concentrated nitric acid, hot concentrated hydrochloric acid, hot concentrated sulfuric acid, zirconium.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Inhalation. Ingestion.

Toxicity to Animals:
LD50: Not available. LC50: Not available.

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified A3 (Proven for animal.) by ACGIH, 2B (Possible for human.) by IARC. May cause damage to the following organs: blood, kidneys, central nervous system (CNS).

Other Toxic Effects on Humans: Slightly hazardous in case of skin contact (irritant), of ingestion, of inhalation.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans:
Acute Potential: Skin: Lead metal granules or dust: May cause skin irritation by mechanical action. Lead metal foil, shot or sheets: Not likely to cause skin irritation Eyes: Lead metal granules or dust: Can irritate eyes by mechanical action. Lead metal foil, shot or sheets: No hazard. Will not cause eye irritation. Inhalation: In an industrial setting, exposure to lead mainly occurs from inhalation of dust or fumes. Lead dust or fumes: Can irritate the upper respiratory tract (nose, throat) as well as the bronchi and lungsby mechanical action. Lead dust can be absorbed through the respiratory system. However, inhaled lead does not accumulate in the lungs. All of an inhaled dose is eventually abssorbed or transferred to the gastrointestinal tract. Inhalation effects of exposure to fumes or dust of inorganic lead may not develop quickly. Symptoms may include metallic taste, chest pain, decreased physical fitness, fatigue, sleep disturbance, headache, irritability, reduces memory, mood and personality changes, aching bones and muscles, constipation, abdominal pains, decreasing appetite. Inhalation of large amounts may lead to ataxia, deliriuim, convulsions/seizures, coma, and death. Lead metal foil, shot, or sheets: Not an inhalation hazard unless metal is heated. If metal is heated, fumes will be released. Inhalation of these fumes may cause "fume metal fever", which is characterized by flu-like symptoms. Symptoms may include metallic taste, fever, nausea, vomiting, chills, cough, weakness, chest pain, generalized muscle pain/aches, and increased white blood cell count. Ingestion: Lead metal granules or dust: The symptoms of lead poisoning include abdominal pain or cramps (lead cholic), spasms, nausea, vomiting, headache, muscle weakness, hallucinations, distorted perceptions, "lead line" on the gums, metallic taste, loss of appetite, insomnia, dizziness and other symptoms similar to that of inhalation. Acute poisoning may result in high lead levels in the blood and urine, shock, coma and death in extreme cases. Lead metal foil, shot or sheets: Not an ingestion hazard for usual industrial handling.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Lead California prop. 65: This product contains the following ingredients for which the State of California has found to cause reproductive harm (female) which would require a warning under the statute: Lead California prop. 65: This product contains the following ingredients for which the State of California has found to cause reproductive harm (male) which would require a warning under the statute: Lead California prop. 65 (no significant risk level): Lead: 0.0005 mg/day (value) California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: Lead California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Lead Connecticut hazardous material survey.: Lead Illinois toxic substances disclosure to employee act: Lead Illinois chemical safety act: Lead New York release reporting list: Lead Rhode Island RTK hazardous substances: Lead Pennsylvania RTK: Lead

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada): CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):
R20/22- Harmful by inhalation and if swallowed. R33- Danger of cumulative effects. R61- May cause harm to the unborn child. R62- Possible risk of impaired fertility. S36/37- Wear suitable protective clothing and gloves. S44- If you feel unwell, seek medical advice (show the label when possible). S53- Avoid exposure - obtain special instructions before use.

HMIS (U.S.A.):

Health Hazard: 1

Fire Hazard: 0

Reactivity: 0

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 1

Flammability: 0

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Safety glasses.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/10/2005 08:21 PM

Last Updated: 11/01/2010 12:00 PM

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall ScienceLab.com be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if ScienceLab.com has been advised of the possibility of such damages.

MATERIAL SAFETY DATA SHEET

Polyaromatic Hydrocarbons

SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION	
IDENTITY Decanter Tank Tar Sludge Polyaromatic Hydrocarbons (TDG name - Toxic Solid, organic NOS (Waste) (Pyrene)	**DATE PREPARED** February 7, 2007
SYNONYMS, CHEMICAL NAMES, COMMON NAMES Aromatics, PAH, Yellow Sludge	**USE:** Waste Sludge
MANUFACTURER'S NAME Cancarb Ltd.	**EMERGENCY TELEPHONE NUMBER (Health)** (403) 502-6614
ADDRESS P.O. Box 1000, Station M Calgary, Alberta Canada, T2P 4K5	**TELEPHONE NUMBER – TECHNICALINFORMATION** (403)-527-1121

SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS			
HAZARDOUS COMPONENTS	**OSHA PEL**	**ACGIH TLV**	**%/wt**
Variable blend of Polynuclear Aromatic Hydrocarbons (PAHs) plus inert solids in water. Concentrations will vary depending upon the extent of product dryness. Hazardous ingredients may include:			
Pyrene (CAS# 129-00-0)	0.2 mg m^{3*}	None established	<7%
Benzo (g,h,i) Fluoroanthrene (CAS# 203-12-3)	None established	None established	<6%
Fluoroanthene (CAS# 206-44-0)	None established	None established	<4%
Phenanthrene (CAS# 85-01-8)	0.2 mg/m^{3*}	None established	<2%
Cyclopenta(d,e,f)Phenanthrene (CAS#203-64-5)	None established	None established	<2%
Anthracene (CAS# 120-12-7)	0.2 mg/m^{3*}	None established	<1%
Benzo(a)Pyrene (CAS# 50-32-8)		None established	<0.1%
Benzo(a)Anthracene (CAS# 56-55-3)	0.2 mg/m^{3*}	None established	<0.1%
Benzo(b)Fluoroanthene CAS # 205-99-2)	None established	None established	<0.1%
Benzo(j)Fluoroanthene (CAS# 205-82-3)	None established	None established	<0.1%
Benzo(k)Fluoroanthene (CAS# 207-08-9)	None established	None established	<0.1%
Indeno(1,2,3)Pyrene (CAS# 193-39-5)	None established	None established	<0.1%
	None established		
*Coal Tar Pitch Volatile. Remaining components are not hazardous.			

EMERGENCY OVERVIEW
Black, brown or yellow aqueous sludge May cause skin and eye irritation Suspected carcinogenic components.

SECTION 3 -HAZARDS IDENTIFICATION

PRIMARY ROUTE(s) OF EXPOSURE: Skin; Eyes. Inhalation if Sludge is Dry

IRRITATION DATA: May cause irritation to skin and eyes and burns to skin with sunlight..

INHALATION:

ACUTE: Not a likely route of exposure in sludge state. Mist may cause respiratory irritation.

CHRONIC: Repeated and prolonged exposure may cause toxicity to the liver and blood. Suspected carcinogenicity .

SKIN CONTACT:

ACUTE: Prolonged and repeated contact may cause irritation. Contact in the presence of sunlight may enhance irritant effects leading to skin burns..

CHRONIC: Systemic toxicity. Suspected carcinogenicity.

EYE CONTACT:

ACUTE: May be irritating, resulting in tearing, reddening, and swelling.

CHRONIC: None known.

INGESTION:

ACUTE: May cause gastric irritation and disturbance.

CHRONIC: Chronic effects of phenanthrene ingestion include liver effects; chronic effects of pyrene ingestion include muscle contraction or spasticity and blood changes; effects of chronic fluoranthene ingestion include kidney, urethra, and bladder effects.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE

Persons with pre-existing skin disorders may be at increased risk from exposure.

SECTION 4 - EMERGENCY AND FIRST AID PROCEDURES

INHALATION: Remove from exposure to fresh air immediately. If breathing has stopped, give artificial respiration. Oxygen may be given if breathing is difficult. Get medical attention.

SKIN CONTACT: Remove contaminated clothing and shoes immediately. Wash affected area with soap and water until no evidence of the chemical remains. Get medical attention if irritation develops.

EYE CONTACT: Flush thoroughly with water for at least 15 minutes, occasionally lifting the upper and lower lids, until no evidence of the chemical remains. Get medical attention if irritation develops.

INGESTION: Do not induce vomiting. Treat symptomatically and supportively. Get medical attention if irritation develops.

SECTION 5 - FIRE FIGHTING MEASURES

FLASH POINT: None	**FLAMMABLE LIMITS:**	**LEL:** Not applicable	**UEL:** Not applicable

AUTOIGNITION TEMPERATURE: Will not ignite as aqueous solution. If dried, will support combustion.

EXTINGUISHING MEDIA

Water spray, foam, or dry chemical powder. Carbon dioxide may be ineffective on large fires.

SPECIAL FIRE FIGHTING PROCEDURES

Firefighters should wear full protective NIOSH approved self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS

None Known.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

Stop discharge and control spill to avoid discharge to the environment. Use wet vacuum to limit spreading and place in suitable container for further handling and disposal. For dry material avoid generation of dust, use limited wetting to prevent spreading and use wet vacuum. Place in metal drum for disposal.

SECTION 7 - HANDLING AND STORAGE

Handling: KEEP WET. Do not allow to dry. Place wet vacuum discharge in metal drum. Empty drum into settling pond tanks. Avoid prolonged or repeated skin contact. Observe good personal and industrial hygiene practices.

Storage: Do not freeze.

SECTION 8 – EXPOSURE CONTROLS, PERSONAL PROTECTION

RESPIRATORY PROTECTION

Where airborne concentrations may exceed guidelines for permissible air concentrations, choose a respirator in accordance with OSHA Respirator Standard 29 CFR 1910.134. (i.e. organic vapor and P100 cartridges, powered air hoods.

VENTILATION

Use general dilution or local exhaust ventilation to maintain exposure below the exposure limits.

PROTECTIVE GLOVES

Choose appropriate gloves in accordance with OSHA Personal Protective Equipment Standard 29 CFR 1910.132.

EYE PROTECTION:

Safety glasses with side shields or choose in accordance with OSHA 29 CFR 1910.133.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT

Appropriate protective clothing to minimize repeated and prolonged skin contact. (i.e. Sarnex or Coated Sarnex).

RECOMMENDED EXPOSURE LIMITS

OH&S, OSHA and ACGIH have not set exposure limits for this waste mixture.
See Section 2 for exposure guidelines for the components of this waste.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES			
BOILING POINT	100° C	**SPECIFIC GRAVITY**	> 1
pH	Not available	**FREEZING POINT**	0° C
VAPOR PRESSURE (mm Hg)	Same as Water	**SOFTENING POINT**	Not applicable
VAPOR DENSITY (Air = 1)	Not available	**EVAPORATION RATE**	Not applicable
SOLUBILITY IN WATER	PAHs low solubility		
SOLUBILITY	Dry material soluble in hydrocarbon solvents		
COEFFICIENT OF WATER/OIL DISTRIBUTION:	Not available .		
APPEARANCE AND ODOR:	Black, Brown or Yellow Sludge.		

SECTION 10 - STABILITY AND REACTIVITY			
STABILITY	**Unstable**		**Conditions to Avoid**
	Stable	X	None Known. Stable under normal temperature and pressure.
INCOMPATIBILITY (Materials to Avoid) Strong oxidizing agents.			
HAZARDOUS DECOMPOSITION PRODUCTS Thermal decomposition may release toxic and/or hazardous gases from dried sludge.			
HAZARDOUS	**May Occur**		**Conditions to Avoid**
POLYMERIZATION	**Will Not Occur**	X	None known.

SECTION 11 - TOXICOLOGICAL INFORMATION

This waste sludge has not been tested for acute or chronic toxicity. The following data is for its components >1%:

Pyrene	Oral LD_{50} (mouse): 800 mg/kg
	Inhalation LC_{50} (rat): 170 mg/m^3
Fluoranthene	Oral LD_{50} (rat): 2 gm/kg
	Dermal LD_{50}(rabbit): 3180 mg/kg
Phenanthrene	Oral LD_{50} (mouse): 700 mg/kg

TARGET ORGANS: Skin and eyes

CARCINOGENICITY: Some low level PAH components have been identified as suspected carcinogens by IARC and ACGIH. These include benzo(a)anthracene, benzo(a)pyrene, benz(b,j&k)fluoranthene, and indeno(1,2,3-cd) pyrene.

TUMORIGENIC DATA (RTECS): Phenanthrene, Clclopenta (def) phenanthrene, Benzo fluoranthrene, Pyrene, and fluoranthene.

MUTAGEN DATA (RTECS): Phenanthrene, Cyclopenta (def) phenanthrene, Pyrene, Benzo fluoroanthrene, Fluoranthene, Benzo (ghi) fluoranthene.

OTHER EFFECTS:

PAHs contained in the sludge have the property of photoallergenicity. In the presence of sunlight, these materials have the capacity to irritate the skin to a much greater degree, possibility leading to skin burns, than exposure without sunlight.

SECTION 12 - ECOLOGICAL INFORMATION

Sludge has not been tested for ecotoxicity.

SECTION 13 - DISPOSAL CONSIDERATIONS

Dispose in accordance with all applicable federal, provincial, and local environmental regulations. Residual solids may be present in any containers used to handle this sludge. Do not reuse for food, clothing or products for human or animal consumption.

SECTION 14 - TRANSPORT INFORMATION

PROPER SHIPPING NAME	TDG CLASSIFICATION	TDG UN/NA
Waste Type 97 Decantar Tank Tar Sludge	6.1 PG II	UN 9397

SECTION 15 - REGULATORY INFORMATION

OSHA: This material is classified as hazardous under OSHA regulations.

WHMS: This material is considered a D2A, D2B Controlled Product.
This material has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

IDL: The following components are on the Canadian Ingredient Disclosure List:

Pyrene
Fluoranthene
Benzanthracene
Phenanthrene
Indeno (1,2,3-cd) pyrene
Benzopyrene
Naphthalene
Anthacene

SARA Title III - Toxic chemicals list 40 CFR 372.65:

Pyrene
Naphthalene
Anthracene

CERCLA Toxic Chemicals List 40 CFR 302:

Pyrene	RQ: 5000 pounds
Fluoranthene	RQ: 100 pounds
Benzanthrcene	RQ: 10 pounds
Phenanthrene	RQ: 5000 pounds
Indeno (1,2,3-cd) pyrene	RQ: 100 pounds
Benzopyrene	RQ: 1 pound
Naphthalene	RQ: 100 pounds
Anthracene	RQ: 5000 pounds

RCRA Hazardous Waste Codes 40 CFR 261.24, 261.33 :

Fluoranthene	U120
Benzanthracene	U108
Indeno(1,2,3-cd)pyrene	U137
Benzopyrene	U022
Naphthalene	U165

SECTION 16 - OTHER INFORMATION

HMIS Ratings:

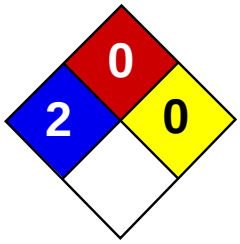
Health	2*
Flammability	1
Reactivity	0

where 0=minimal, 1=slight, 2=moderate, 3=serious, 4=severe

This MSDS was prepared by: CANCARB Health, Safety & Environment Department
Telephone Number (403) 527-1121

R: 45; 36/37/38
S: 36/37/39

The information and recommendations set forth herein are made in good faith and are believed to be accurate as of the date of preparation. CANCARB makes no warranty, either express or implied, with respect to this information and disclaims all liability from reliance thereon.



Health	2
Fire	0
Reactivity	0
Personal Protection	G

Material Safety Data Sheet
Tetrachloroethylene MSDS

Section 1: Chemical Product and Company Identification

Product Name: Tetrachloroethylene

Catalog Codes: SLT3220

CAS#: 127-18-4

RTECS: KX3850000

TSCA: TSCA 8(b) inventory: Tetrachloroethylene

CI#: Not available.

Synonym: Perchloroethylene; 1,1,2,2-Tetrachloroethylene; Carbon bichloride; Carbon dichloride; Ankilostin; Didakene; Dilatin PT; Ethene, tetrachloro-; Ethylene tetrachloride; Perawin; Perchlor; Perclene; Perclene D; Percosolvel; Tetrachloroethene; Tetraleno; Tetralex; Tetravec; Tetroguer; Tetropil

Chemical Name: Ethylene, tetrachloro-

Chemical Formula: C2-Cl4

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Tetrachloroethylene	127-18-4	100

Toxicological Data on Ingredients: Tetrachloroethylene: ORAL (LD50): Acute: 2629 mg/kg [Rat]. DERMAL (LD): Acute: >3228 mg/kg [Rabbit]. MIST(LC50): Acute: 34200 mg/m 8 hours [Rat]. VAPOR (LC50): Acute: 5200 ppm 4 hours [Mouse].

Section 3: Hazards Identification

Potential Acute Health Effects:
Hazardous in case of skin contact (irritant), of inhalation. Slightly hazardous in case of skin contact (permeator), of eye contact (irritant), of ingestion.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Classified A3 (Proven for animal.) by ACGIH. Classified 2A (Probable for human.) by IARC, 2 (anticipated carcinogen) by NTP. MUTAGENIC EFFECTS: Mutagenic for bacteria and/or yeast. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to kidneys, liver, peripheral nervous system, respiratory tract, skin, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.

Skin Contact:
In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if symptoms appear.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: Not applicable.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions: Not applicable.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill: Absorb with an inert material and put the spilled material in an appropriate waste disposal.

Large Spill:
Absorb with an inert material and put the spilled material in an appropriate waste disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Do not ingest. Do not breathe gas/fumes/ vapor/spray. Avoid contact with skin. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents, metals, acids, alkalis.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value.

Personal Protection:
Safety glasses. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 25 (ppm) from OSHA (PEL) [United States] TWA: 25 STEL: 100 (ppm) from ACGIH (TLV) [United States] TWA: 170 (mg/m3) from OSHA (PEL) [United States] Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Ethereal.

Taste: Not available.

Molecular Weight: 165.83 g/mole

Color: Clear Colorless.

pH (1% soln/water): Not available.

Boiling Point: 121.3°C (250.3°F)

Melting Point: -22.3°C (-8.1°F)

Critical Temperature: 347.1°C (656.8°F)

Specific Gravity: 1.6227 (Water = 1)

Vapor Pressure: 1.7 kPa (@ 20°C)

Vapor Density: 5.7 (Air = 1)

Volatility: Not available.

Odor Threshold: 5 - 50 ppm

Water/Oil Dist. Coeff.: The product is more soluble in oil; log(oil/water) = 3.4

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility:
Miscible with alcohol, ether, chloroform, benzene, hexane. It dissolves in most of the fixed and volatile oils. Solubility in water: 0.015 g/100 ml @ 25 deg. C It slowly decomposes in water to yield Trichloroacetic and Hydrochloric acids.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatible materials

Incompatibility with various substances: Reactive with oxidizing agents, metals, acids, alkalis.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Oxidized by strong oxidizing agents. Incompatible with sodium hydroxide, finely divided or powdered metals such as zinc, aluminum, magnesium, potassium, chemically active metals such as lithium, beryllium , barium. Protect from light.

Special Remarks on Corrosivity: Slowly corrodes aluminum, iron, and zinc.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 2629 mg/kg [Rat]. Acute dermal toxicity (LD50): >3228 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 5200 4 hours [Mouse].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified A3 (Proven for animal.) by ACGIH. Classified 2A (Probable for human.) by IARC, 2 (Some evidence.) by NTP. MUTAGENIC EFFECTS: Mutagenic for bacteria and/or yeast. May cause damage to the following organs: kidneys, liver, peripheral nervous system, upper respiratory tract, skin, central nervous system (CNS).

Other Toxic Effects on Humans:
Hazardous in case of skin contact (irritant), of inhalation. Slightly hazardous in case of skin contact (permeator), of ingestion.

Special Remarks on Toxicity to Animals:
Lowest Publishe Lethal Dose/Conc: LDL [Rabbit] - Route: Oral; Dose: 5000 mg/kg LDL [Dog] - Route: Oral; Dose: 4000 mg/kg LDL [Cat] - Route: Oral; Dose: 4000 mg/kg

Special Remarks on Chronic Effects on Humans:
May cause adverse reproductive effects and birth defects(teratogenic). May affect genetic material (mutagenic). May cause cancer.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: Causes skin irritation with possible dermal blistering or burns. Symtoms may include redness, itching, pain, and possible dermal blistering or burns. It may be absorbed through the skin with possible systemic effects. A single prolonged skin exposure is not likely to result in the material being absorbed in harmful amounts. Eyes: Contact causes transient eye irritation, lacrimation. Vapors cause eye/conjunctival irritation. Symptoms may include redness and pain. Inhalation: The main route to occupational exposure is by inhalation since it is readily absorbed through the lungs. It causes respiratory tract irritation, . It can affect behavior/central nervous system (CNS depressant and anesthesia ranging from slight inebriation to death, vertigo, somnolence, anxiety, headache, excitement, hallucinations, muscle incoordination, dizziness, lightheadness, disorentiation, seizures, enotional instability, stupor, coma). It may cause pulmonary edema Ingestion: It can cause nausea, vomiting, anorexia, diarrhea, bloody stool. It may affect the liver, urinary system (proteinuria, hematuria, renal failure, renal tubular disorder), heart (arrhythmias). It may affect behavior/central nervous system with symptoms similar to that of inhalation. Chronic Potential Health Effects: Skin: Prolonged or repeated skin contact may result in excessive drying of the skin, and irritation. Ingestion/Inhalation: Chronic exposure can affect the liver(hepatitis,fatty liver degeneration), kidneys, spleen, and heart (irregular heartbeat/arrhythmias, cardiomyopathy, abnormal EEG), brain, behavior/ central nervous system/peripheral nervous system (impaired memory, numbness of extremeties, peripheral neuropathy and other

Section 12: Ecological Information

Ecotoxicity:
Ecotoxicity in water (LC50): 18.4 mg/l 96 hours [Fish (Fatthead Minnow)]. 18 mg/l 48 hours [Daphnia (daphnia)]. 5 mg/l 96 hours [Fish (Rainbow Trout)]. 13 mg/l 96 hours [Fish (Bluegill sunfish)].

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The product itself and its products of degradation are not toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: CLASS 6.1: Poisonous material.

Identification: : Tetrachloroethylene UNNA: 1897 PG: III

Special Provisions for Transport: Marine Pollutant

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Tetrachloroethylene California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Tetrachloroethylene Connecticut hazardous material survey.: Tetrachloroethylene Illinois toxic substances disclosure to employee act: Tetrachloroethylene Illinois chemical safety act: Tetrachloroethylene New York release reporting list: Tetrachloroethylene Rhode Island RTK hazardous substances: Tetrachloroethylene Pennsylvania RTK: Tetrachloroethylene Minnesota: Tetrachloroethylene Michigan critical material: Tetrachloroethylene Massachusetts RTK: Tetrachloroethylene Massachusetts spill list: Tetrachloroethylene New Jersey: Tetrachloroethylene New Jersey spill list: Tetrachloroethylene Louisiana spill reporting: Tetrachloroethylene California Director's List of Hazardous Substances: Tetrachloroethylene TSCA 8(b) inventory: Tetrachloroethylene TSCA 8(d) H and S data reporting: Tetrachloroethylene: Effective date: 6/1/87; Sunset date: 6/1/97 SARA 313 toxic chemical notification and release reporting: Tetrachloroethylene CERCLA: Hazardous substances.: Tetrachloroethylene: 100 lbs. (45.36 kg)

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS D-1B: Material causing immediate and serious toxic effects (TOXIC). CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):
R40- Possible risks of irreversible effects. R51/53- Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. S23- Do not breathe gas/fumes/vapour/spray S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S37- Wear suitable gloves. S61- Avoid release to the environment. Refer to special instructions/Safety data sheets.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 0

Reactivity: 0

Personal Protection: g

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 0

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Safety glasses.

Section 16: Other Information

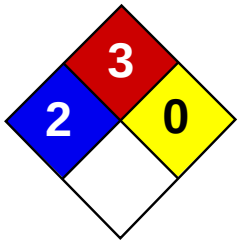
References: Not available.

Other Special Considerations: Not available.

Created: 10/10/2005 08:29 PM

Last Updated: 05/21/2013 12:00 PM

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall ScienceLab.com be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if ScienceLab.com has been advised of the possibility of such damages.



Health	2
Fire	3
Reactivity	0
Personal Protection	H

Material Safety Data Sheet
Toluene MSDS

Section 1: Chemical Product and Company Identification

Product Name: Toluene

Catalog Codes: SLT2857, SLT3277

CAS#: 108-88-3

RTECS: XS5250000

TSCA: TSCA 8(b) inventory: Toluene

CI#: Not available.

Synonym: Toluol, Tolu-Sol; Methylbenzene; Methacide; Phenylmethane; Methylbenzol

Chemical Name: Toluene

Chemical Formula: C6-H5-CH3 or C7-H8

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Toluene	108-88-3	100

Toxicological Data on Ingredients: Toluene: ORAL (LD50): Acute: 636 mg/kg [Rat]. DERMAL (LD50): Acute: 14100 mg/kg [Rabbit]. VAPOR (LC50): Acute: 49000 mg/m 4 hours [Rat]. 440 ppm 24 hours [Mouse].

Section 3: Hazards Identification

Potential Acute Health Effects:
Hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (permeator).

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to blood, kidneys, the nervous system, liver, brain, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.

Skin Contact:
In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Flammable.

Auto-Ignition Temperature: 480°C (896°F)

Flash Points: CLOSED CUP: 4.4444°C (40°F). (Setaflash) OPEN CUP: 16°C (60.8°F).

Flammable Limits: LOWER: 1.1% UPPER: 7.1%

Products of Combustion: These products are carbon oxides (CO, CO2).

Fire Hazards in Presence of Various Substances:
Flammable in presence of open flames and sparks, of heat. Non-flammable in presence of shocks.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
Flammable liquid, insoluble in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray or fog.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards:
Toluene forms explosive reaction with 1,3-dichloro-5,5-dimethyl-2,4-imidazolididione; dinitrogen tetraoxide; concentrated nitric acid, sulfuric acid + nitric acid; N2O4; AgClO4; BrF3; Uranium hexafluoride; sulfur dichloride. Also forms an explosive mixture with tetranitromethane.

Section 6: Accidental Release Measures

Small Spill: Absorb with an inert material and put the spilled material in an appropriate waste disposal.

Large Spill:
Toxic flammable liquid, insoluble or very slightly soluble in water. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents.

Storage:
Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 200 STEL: 500 CEIL: 300 (ppm) from OSHA (PEL) [United States] TWA: 50 (ppm) from ACGIH (TLV) [United States] SKIN TWA: 100 STEL: 150 from NIOSH [United States] TWA: 375 STEL: 560 (mg/m3) from NIOSH [United States] Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Sweet, pungent, Benzene-like.

Taste: Not available.

Molecular Weight: 92.14 g/mole

Color: Colorless.

pH (1% soln/water): Not applicable.

Boiling Point: 110.6°C (231.1°F)

Melting Point: -95°C (-139°F)

Critical Temperature: 318.6°C (605.5°F)

Specific Gravity: 0.8636 (Water = 1)

Vapor Pressure: 3.8 kPa (@ 25°C)

Vapor Density: 3.1 (Air = 1)

Volatility: Not available.

Odor Threshold: 1.6 ppm

Water/Oil Dist. Coeff.: The product is more soluble in oil; log(oil/water) = 2.7

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, diethyl ether, acetone.

Solubility:
Soluble in diethyl ether, acetone. Practically insoluble in cold water. Soluble in ethanol, benzene, chloroform, glacial acetic acid, carbon disulfide. Solubility in water: 0.561 g/l @ 25 deg. C.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Heat, ignition sources (flames, sparks, static), incompatible materials

Incompatibility with various substances: Reactive with oxidizing agents.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Incompatible with strong oxidizers, silver perchlorate, sodium difluoride, Tetranitromethane, Uranium Hexafluoride. Frozen Bromine Trifluoride reacts violently with Toluene at -80 deg. C. Reacts chemically with nitrogen oxides, or halogens to form nitrotoluene, nitrobenzene, and nitrophenol and halogenated products, respectively.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 636 mg/kg [Rat]. Acute dermal toxicity (LD50): 14100 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 440 24 hours [Mouse].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC. May cause damage to the following organs: blood, kidneys, the nervous system, liver, brain, central nervous system (CNS).

Other Toxic Effects on Humans:
Hazardous in case of skin contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (permeator).

Special Remarks on Toxicity to Animals:
Lowest Published Lethal Dose: LDL [Human] - Route: Oral; Dose: 50 mg/kg LCL [Rabbit] - Route: Inhalation; Dose: 55000 ppm/40min

Special Remarks on Chronic Effects on Humans:
Detected in maternal milk in human. Passes through the placental barrier in human. Embryotoxic and/or foetotoxic in animal. May cause adverse reproductive effects and birth defects (teratogenic). May affect genetic material (mutagenic)

Special Remarks on other Toxic Effects on Humans:

Acute Potential Health Effects: Skin: Causes mild to moderate skin irritation. It can be absorbed to some extent through the skin. Eyes: Cauess mild to moderate eye irritation with a burning sensation. Splash contact with eyes also causes conjunctivitis, blepharospasm, corneal edema, corneal abraisons. This usually resolves in 2 days. Inhalation: Inhalation of vapor may cause respiratory tract irritation causing coughing and wheezing, and nasal discharge. Inhalation of high concentrations may affect behavior and cause central nervous system effects characterized by nausea, headache, dizziness, tremors, restlessness, lightheadedness, exhilaration, memory loss, insomnia, impaired reaction time, drowsiness, ataxia, hallucinations, somnolence, muscle contraction or spasticity, unconsciousness and coma. Inhalation of high concentration of vapor may also affect the cardiovascular system (rapid heart beat, heart palpitations, increased or decreased blood pressure, dysrhythmia,), respiration (acute pulmonary edema, respiratory depression, apnea, asphyxia), cause vision disturbances and dilated pupils, and cause loss of appetite. Ingestion: Aspiration hazard. Aspiration of Toluene into the lungs may cause chemical pneumonitis. May cause irritation of the digestive tract with nausea, vomiting, pain. May have effects similar to that of acute inhalation. Chronic Potential Health Effects: Inhalation and Ingestion: Prolonged or repeated exposure via inhalation may cause central nervous system and cardiovascular symptoms similar to that of acute inhalation and ingestion as well liver damage/failure, kidney damage/failure (with hematuria, proteinuria, oliguria, renal tubular acidosis), brain damage, weight loss, blood (pigmented or nucleated red blood cells, changes in white blood cell count), bone marrow changes, electrolyte imbalances (Hypokalemia, Hypophostatemia), severe, muscle weakness and Rhabdomyolysis. Skin: Repeated or prolonged skin contact may cause defatting dermatitis.

Section 12: Ecological Information

Ecotoxicity:
Ecotoxicity in water (LC50): 313 mg/l 48 hours [Daphnia (daphnia)]. 17 mg/l 24 hours [Fish (Blue Gill)]. 13 mg/l 96 hours [Fish (Blue Gill)]. 56 mg/l 24 hours [Fish (Fathead minnow)]. 34 mg/l 96 hours [Fish (Fathead minnow)]. 56.8 ppm any hours [Fish (Goldfish)].

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: CLASS 3: Flammable liquid.

Identification: : Toluene UNNA: 1294 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Toluene California prop. 65 (no significant risk level): Toluene: 7 mg/day (value) California prop. 65 (acceptable daily intake level): Toluene: 7 mg/day (value) California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: Toluene Connecticut hazardous material survey.: Toluene Illinois

toxic substances disclosure to employee act: Toluene Illinois chemical safety act: Toluene New York release reporting list: Toluene Rhode Island RTK hazardous substances: Toluene Pennsylvania RTK: Toluene Florida: Toluene Minnesota: Toluene Michigan critical material: Toluene Massachusetts RTK: Toluene Massachusetts spill list: Toluene New Jersey: Toluene New Jersey spill list: Toluene Louisiana spill reporting: Toluene California Director's List of Hazardous Substances.: Toluene TSCA 8(b) inventory: Toluene TSCA 8(d) H and S data reporting: Toluene: Effective date: 10/04/82; Sunset Date: 10/0/92 SARA 313 toxic chemical notification and release reporting: Toluene CERCLA: Hazardous substances.: Toluene: 1000 lbs. (453.6 kg)

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):
R11- Highly flammable. R20- Harmful by inhalation. S16- Keep away from sources of ignition - No smoking. S25- Avoid contact with eyes. S29- Do not empty into drains. S33- Take precautionary measures against static discharges.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 3

Reactivity: 0

Personal Protection: h

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 3

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

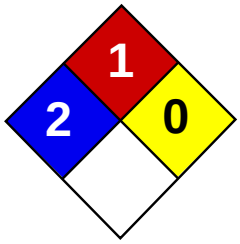
Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/10/2005 08:30 PM

Last Updated: 11/01/2010 12:00 PM



Material Safety Data Sheet
Trichloroethylene MSDS

Section 1: Chemical Product and Company Identification

Product Name: Trichloroethylene

Catalog Codes: SLT3310, SLT2590

CAS#: 79-01-6

RTECS: KX4560000

TSCA: TSCA 8(b) inventory: Trichloroethylene

CI#: Not available.

Synonym:

Chemical Formula: C2HCl3

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Trichloroethylene	79-01-6	100

Toxicological Data on Ingredients: Trichloroethylene: ORAL (LD50): Acute: 5650 mg/kg [Rat]. 2402 mg/kg [Mouse]. DERMAL (LD50): Acute: 20001 mg/kg [Rabbit].

Section 3: Hazards Identification

Potential Acute Health Effects: Hazardous in case of skin contact (irritant, permeator), of eye contact (irritant), of ingestion, of inhalation.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Classified + (PROVEN) by OSHA. Classified A5 (Not suspected for human.) by ACGIH. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to kidneys, the nervous system, liver, heart, upper respiratory tract. Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:

Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Do not use an eye ointment. Seek medical attention.

Skin Contact:
After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cover the irritated skin with an emollient. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.

Inhalation: Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

Ingestion:
Do not induce vomiting. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: 420°C (788°F)

Flash Points: Not available.

Flammable Limits: LOWER: 8% UPPER: 10.5%

Products of Combustion: These products are carbon oxides (CO, CO2), halogenated compounds.

Fire Hazards in Presence of Various Substances: Not available.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill: Absorb with an inert material and put the spilled material in an appropriate waste disposal.

Large Spill:
Absorb with an inert material and put the spilled material in an appropriate waste disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapour/

spray. Wear suitable protective clothing In case of insufficient ventilation, wear suitable respiratory equipment If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes

Storage:
Keep container dry. Keep in a cool place. Ground all equipment containing material. Carcinogenic, teratogenic or mutagenic materials should be stored in a separate locked safety storage cabinet or room.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 50 STEL: 200 (ppm) from ACGIH (TLV) TWA: 269 STEL: 1070 (mg/m3) from ACGIH Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Not available.

Taste: Not available.

Molecular Weight: 131.39 g/mole

Color: Clear Colorless.

pH (1% soln/water): Not available.

Boiling Point: 86.7°C (188.1°F)

Melting Point: -87.1°C (-124.8°F)

Critical Temperature: Not available.

Specific Gravity: 1.4649 (Water = 1)

Vapor Pressure: 58 mm of Hg (@ 20°C)

Vapor Density: 4.53 (Air = 1)

Volatility: Not available.

Odor Threshold: 20 ppm

Water/Oil Dist. Coeff.: The product is equally soluble in oil and water; log(oil/water) = 0

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, methanol, diethyl ether, acetone.

Solubility:
Easily soluble in methanol, diethyl ether, acetone. Very slightly soluble in cold water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances: Not available.

Corrosivity:
Extremely corrosive in presence of aluminum. Non-corrosive in presence of glass.

Special Remarks on Reactivity: Not available.

Special Remarks on Corrosivity: Not available.

Polymerization: No.

Section 11: Toxicological Information

Routes of Entry: Dermal contact. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:
Acute oral toxicity (LD50): 2402 mg/kg [Mouse]. Acute dermal toxicity (LD50): 20001 mg/kg [Rabbit].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified + (PROVEN) by OSHA. Classified A5 (Not suspected for human.) by ACGIH. The substance is toxic to kidneys, the nervous system, liver, heart, upper respiratory tract.

Other Toxic Effects on Humans: Hazardous in case of skin contact (irritant, permeator), of ingestion, of inhalation.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Passes through the placental barrier in human. Detected in maternal milk in human.

Special Remarks on other Toxic Effects on Humans: Not available.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are more toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Section 14: Transport Information

DOT Classification: CLASS 6.1: Poisonous material.

Identification: : Trichloroethylene : UN1710 PG: III

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Trichloroethylene California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Trichloroethylene Pennsylvania RTK: Trichloroethylene Florida: Trichloroethylene Minnesota: Trichloroethylene Massachusetts RTK: Trichloroethylene New Jersey: Trichloroethylene TSCA 8(b) inventory: Trichloroethylene CERCLA: Hazardous substances.: Trichloroethylene

Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

Other Classifications:

WHMIS (Canada):
CLASS D-1B: Material causing immediate and serious toxic effects (TOXIC). CLASS D-2B: Material causing other toxic effects (TOXIC).

DSCL (EEC):
R36/38- Irritating to eyes and skin. R45- May cause cancer.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 1

Reactivity: 0

Personal Protection: h

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 1

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/10/2005 08:54 PM

Last Updated: 11/01/2010 12:00 PM

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall ScienceLab.com be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if ScienceLab.com has been advised of the possibility of such damages.

Appendix E
Soil/Materials Management Plan (SMMP)

Appendix E
Soil/Materials Management Plan

for
21-25 31st Street
Remedial Action Work Plan

21-25 31st Street
Astoria, New York 11105
Block 831, Lot 20
BCP # C241167
NYSDEC Spill # 1402686
CEQR #10DCP019Q

Submitted to:
New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau B
625 Broadway, 12th Floor
Albany, NY 12233-7016

Prepared for:
21-25 31st Street LLC
42-01 235th Street
Douglaston, NY 11363

Prepared by:
Matthew M. Carroll, P.E.
&
TENEN ENVIRONMENTAL
121 West 27th Street, Suite 702
New York, NY 10001

March 2017

TABLE OF CONTENTS

1.0 INTRODUCTION

This Soil/Materials Management Plan (SMMP) has been developed for the Remedial Action Work Plan (RAWP) prepared for 21-25 31st Street (Site). This plan pertains to management of all soils and materials that are disturbed at the Site and includes provisions for sediment and erosion control and stormwater management.

The Site, located at 21-25 31st Street, Astoria, New York, is a rectangular-shaped parcel of 11,875 square feet bounded to the east by 32nd Street, to the west by 31st Street, to the north by 21st Avenue, and to the south by Ditmars Boulevard. The tax map designation of the property is Block 831, Lot 20. A location map for the Site is provided as Figure 1. A map of the current Site layout is included as Figure 2. The Site is zoned as residential (R6A), denoting a built-up medium density residential area, with a commercial (C1-3) overlay, allowing for uses to meet local retail needs. The property is currently occupied by a retail clothing, linens, and kitchenwares store, ABC Super Stores. Redevelopment of the Site will entail construction of a mixed-use commercial/residential building.

1.1 Soil Screening Methods

Visual, olfactory and photoionization detector (PID) soil screening and assessment will be performed under the supervision of the Remedial Engineer (RE) and will be reported in the Final Engineering Report (FER). Soil screening will be performed during invasive work during the RAWP implementation.

1.2 Soil Stockpiling Methods

Excavated soil from suspected areas of contamination will be stockpiled separately and will be segregated from clean soil and construction materials. Stockpiles will be used only when necessary and will be removed as soon as practicable. While stockpiles are in place, they will be inspected daily, and before and after every storm event. Results of inspections will be recorded in a logbook, maintained at the Site and available for inspection by the New York State Department of Environmental Conservation (NYSDEC). Excavated soils will be stockpiled on double layers of 8-mil minimum-thickness sheeting, at a minimum. Stockpiles will be kept covered when not in use with appropriately anchored plastic tarps and will be routinely inspected. Broken or ripped tarps will be promptly replaced.

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

1.3 Characterization of Excavated Materials

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

1.4 Materials Excavation, Load-Out and Departure

The RE overseeing the remedial activities, or a qualified environmental professional under his/her supervision, will:

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

Locations where vehicles exit the Site shall be inspected daily for evidence of soil tracking off premises. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to Site-derived materials. Open and uncontrolled mechanical processing of historical fill and contaminated soil on the Site will not be performed without prior NYSDEC.

1.5 Off-Site Materials Transport

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

Trucks leaving from the 21-25 31st Street Site will exit onto 31st Street going northeast to 20th Avenue, turn left onto 20th Avenue, turn left onto 21st Street, and turn left onto Hoyt Avenue South. For travel south or east, trucks will continue onto Astoria Boulevard and merge onto the Grand Central Parkway or the Brooklyn-Queens Expressway (BQE). For travel to facilities to the north or west, turn left onto 33rd Street, and use the left lane to merge onto I-278 E/RFK Bridge.

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) limiting total distance to major highways; (d) promoting safety in access to highways; and, (e) overall safety in transport. All trucks loaded with Site materials will exit the vicinity of the Site using only the most-current New York City Department of Transportation (NYCDOT)-approved truck routes (currently the 2011-2012 New York City Truck Route Map).

Trucks will be prohibited from stopping and idling in the neighborhood outside the project Site.

Egress points for truck and equipment transport from the Site will be kept clean of dirt and other materials during Site remediation and development.

Material transported by trucks exiting the Site will be secured with tight-fitting covers. If loads contain wet material capable of producing free liquid, truck liners will be used.

1.6 Materials Disposal Off-Site

To document that the disposal of regulated material exported from the Site complies with applicable laws and regulations, the following documentation will be established and reported by the RE for each disposal destination used in this project:

(1) a letter from the RE or Applicant to each disposal facility describing the material to be disposed and requesting written acceptance of the material. This letter will state that material to be disposed is regulated material generated at an environmental remediation Site in New York under a governmental remediation program. The letter will provide the project identity and the name and phone number of the RE or Applicant, and will include as an attachment a summary of all chemical data for the material being transported; and,
(2) a letter from each disposal facility stating it is in receipt of the correspondence, (1) above, and is approved to accept the material.

These documents will be included in the FER.

The FER will include an itemized account of the destination of all material removed from the Site during this RAWP. Documentation associated with disposal of all material will include records and approvals for receipt of the material. This information will be presented in the FER.

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

Waste characterization will be performed for off-Site disposal in a manner required by the receiving facility and in conformance with its applicable permits. Waste characterization sampling and analytical methods, sampling frequency, analytical results and QA/QC will be reported in the FER. A manifest system for off-Site transportation of exported materials will be

employed. Manifest information will be reported in the FER. Hazardous wastes derived from on-Site will be stored, transported and disposed of in compliance with applicable laws and regulations.

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

1.7 Materials Reuse On-Site

"Reuse on-Site" means material that is excavated during the remedy or development does not leave the property, and is relocated within the same property and on comparable soil/fill material, and addressed pursuant to Engineering Controls. The RE will ensure that reused materials are segregated from other materials to be exported from the Site and that procedures defined for material reuse in the RAWP are followed. Soil reuse is not proposed. Reused soil must be non-hazardous and meet the Use-based SCOs and Protection of Groundwater SCOs in accordance with the predetermined beneficial use determination listed in 6 NYCRR Part 360-1.15(b). If any of the waste materials are used for an end use specified in 6 NYCRR Part 360-1.15(b), it will not be considered a solid waste. Reuse of soil will be coordinated in advance with the NYSDEC project manager.

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

1.8 Demarcation

After completion of hotspot removal and any other invasive remedial activities, and prior to backfilling, the top of the residual soil/fill will be defined by one of three methods:

(1) Placement of a demarcation layer. The demarcation layer will consist of geo-synthetic fencing or equivalent material to be placed on the surface of residual soil/fill to provide an observable reference layer. A description or map of the approximate depth of the demarcation layer will be provided in the FER;
(2) A land survey of the top elevation of residual soil/fill before the placement of cover soils, pavement and associated sub-soils, or other materials or structures; and,
(3) All materials beneath the approved cover will be considered impacted and subject to Site management after the remedy is complete.

Demarcation may be established by one or any combination of the above three methods. As appropriate, a map showing the method of demarcation for the Site and all associated

documentation will be presented in the FER. This demarcation will constitute the top of the Site management horizon, if necessary.

1.9 Import of Backfill Soil from Off-Site Sources

This section presents the requirements for imported fill materials to be used below the cover layer and/or within the clean soil cover layer. At this time, fill material is not proposed to be imported to the Site. All imported soils will meet NYSDEC-approved backfill and cover soil quality objectives for this Site. The backfill and cover soil quality objectives are listed in this Soil/Materials Management Plan.

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

Grab samples will be taken for VOCs analysis. Sampling protocol will comply with DER-10 table 5.4(e)10. Any imported soil for backfill must be meet the requirements of 6 NYCRR Part 375-6.7(d) and DER-10 Section 5.4(e), Table 5.4(e)10 and Appendix 5.

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

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

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

Source Screening and Testing

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

- Trucks with imported fill material will be in compliance with applicable laws and regulations and will enter the Site at designated locations;
- The RE is responsible to ensure that every truck load of imported material is inspected for evidence of contamination; and,
- Fill material will be free of solid waste including pavement materials, debris, stumps, roots and other organic matter, as well as ashes, oil, perishables or foreign matter.

Composite samples of imported material will be taken at a minimum frequency of one sample for every 500 cubic yards of material. Once it is determined that the fill material meets imported backfill or cover soil chemical requirements and is non-hazardous, and lacks petroleum contamination, the material will be loaded into trucks for delivery to the Site. The chemical requirements include the lower of the Part 375 Residential or Protection of Groundwater SCOs.

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

1.10 Fluids Management

All liquids to be removed from the Site will be handled, transported and disposed in accordance with applicable laws and regulations. No liquids are proposed to be generated at the Site as part of this RAWP. Liquids discharged into the New York City sewer system will receive prior approval by New York City Department of Environmental Protection (NYC DEP). The NYCDEP regulates discharges to the New York City sewers under Title 15, Rules of the City of New York Chapter 19. Discharge to the New York City sewer system will require an authorization and sampling data demonstrating that the groundwater meets the City's discharge criteria. The dewatering fluid will be pretreated as necessary to meet the NYCDEP discharge criteria. If discharge to the City sewer system is not appropriate, the dewatering fluids will be managed by transportation and disposal at an off-Site treatment facility.

Discharge of water generated during remedial construction to surface waters (i.e., a stream of river) is prohibited without a SPDES permit issued by NYSDEC.

1.11 Stormwater Pollution Prevention

Applicable laws and regulations pertaining to stormwater pollution prevention will be addressed during the remedial program. Since the development is less than one acre in area, a Stormwater Pollution Prevention Plan (SWPPP) is not required to be submitted to NYSDEC Division of Water.

Erosion and sediment control measures identified in this Soil/Materials Management Plan will be installed around the entire perimeter of the remedial construction area and inspected once a week and after every storm event to ensure that they are operating appropriately. Discharge locations will be inspected to determine whether erosion control measures are effective in preventing significant impacts to receptors. Results of inspections will be recorded in a logbook, 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. Undercutting or erosion off the silt fence anchor will be repaired

immediately with appropriate backfill materials. Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

1.12 Contingency Plan

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

1.13 Odor, Dust and Nuisance Control

Odor Control

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

This odor control plan is capable of controlling emissions of nuisance odors. If nuisance odors are identified, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. NYSDEC will be notified of all odor complaint events. Implementation of all odor controls, including halt of work, will be the responsibility of the Volunteer's Remedial Engineer (RE), who is responsible for certifying the FER.

Dust Control

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

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

This dust control plan is capable of controlling emissions of dust. If nuisance dust emissions are identified, work will be halted and the source of dusts will be identified and corrected. Work will not resume until all nuisance dust emissions have been abated. NYSDEC will be notified of all dust complaint events. Implementation of all dust controls, including halt of work, will be the responsibility of the RE.

Other Nuisances

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

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

1.14 Import of Clean Cover and Fill Material

Soil is not anticipated to be imported to the Site for use as clean cover. If applicable, any imported soil will be uncontaminated soil that meets the lower of the appropriate NYSDEC 6 NYCRR Part 375-6.8(a) Unrestricted Use soil cleanup objectives (SCOs) and the NYSDEC 6 NYCRR Part 375-6.8(b) Protection of Groundwater SCOs.

Any imported uncontaminated soil cover will be from an approved source/facility and will be evaluated by the RE to ensure the following:

(1) That a segregated stockpile for less than 750 tons (500 cubic yards) is properly maintained at the source and will not be comingled with any other material prior to importing and grading the clean soil material at the Site;
(2) That the material does not include any solid waste, including construction and demolition material, as it is prohibited;
(3) That screening for evidence of contamination by visual, olfactory and PID soil screening practices prior to testing at the source, as well as upon importing to the Site for grading, is completed; and
(4) That a maximum five-part composite sample will be collected from the segregated stockpile at the source at a minimum frequency of one sample per 250 cubic yards and analyzed for the following Full List parameters:
    - VOCs by EPA Method 8260C (rev. 2006)
    - SVOCs by EPA Method 8270D (rev. 2007)
    - Pesticides by EPA Method 8081B (rev. 2000)
    - PCBs by EPA Method 8082A (rev. 2000)
    - TAL Metals by EPA Method 6010C (rev. 2007)

Upon receipt of the segregated stockpile analytical results collected at the source, a Clean Soil Sampling Report will be submitted to NYSDEC for review/approval prior to importing. The report will include the following:

(1) A summary of sample quantities collected and analyzed, tabulated data and comparison to the Unrestricted Use SCOs;
(2) Analytical data sheets and chain-of-custody (COC) documentation;
(3) Estimate of the amount of soil/material stockpiled in tons and cubic yards;
(4) Photographs from the segregated stockpile at the source with sample point locations identified;

(5) An affidavit from the source/facility on company letterhead stating that the segregated stockpile has been properly maintained at the source and complies with the requirements listed above; and
(6) A copy of the source/facility NYSDEC permit(s).

If fill material is imported, a highly visible demarcation barrier (i.e. orange geo-synthetic material or equivalent) will be installed beneath the clean soil/fill surface cover. Upon importing and grading any NYSDEC-approved clean soil cover on top of a highly visible demarcation barrier, the following documentation will be presented in the FER:

(1) Copies of purchase invoices;
(2) Truck transportation slips from the source to the Site;
(3) Confirmation of the number of tons and cubic yards or NYSDEC-approved clean soil cover material imported and graded at the Site on top of highly visible demarcation barrier;
(4) A Site plan depicting all areas where the NYSDEC-approved clean soil cover has been placed; and
(5) Photographs documenting the importing and grading of the NYSDEC-approved clean soil cover across the Site with the underlying highly visible demarcation barrier (i.e., orange geo-synthetic material or equivalent).

Appendix F
Quality Assurance Project Plan (QAPP), including Resumes of Key Personnel

Quality Assurance Project Plan

for
21-25 31st Street
Remedial Action Work Plan

21-25 31st Street
Astoria, New York 11105
Block 831, Lot 20
BCP # C241167
NYSDEC Spill # 1402686
CEQR #10DCP019Q

Submitted to:
New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau B, Section A
625 Broadway, 12th Floor
Albany, NY 12233-7016

Prepared for:
21-25 31st Street LLC
42-01 235th Street
Douglaston, NY 11363

Prepared by:
TENEN ENVIRONMENTAL
121 West 27th Street, Suite 702
New York, NY 10001

March 2017

TABLE OF CONTENTS

Appendices
Appendix A – Resumes

1.0 INTRODUCTION

This Quality Assurance Project Plan (QAPP) has been developed for the Remedial Action Work Plan (RAWP) prepared for the 21-25 31st Street project in the Astoria neighborhood of Queens, New York (the "Site").

The Site, located at 21-25 31st Street, Astoria, New York, is a rectangular-shaped parcel consisting of 11,875 square feet (0.27 acres) situated on the southeast side of 31st Street, between 21st Avenue and Ditmars Boulevard. The Site has approximately 125 feet of frontage along 31st Street and is approximately 95 feet deep, extending to 32nd Street. Other addresses associated with the Site are 21-25 through 21-33 31st Street and 21-26 through 21-34 32nd Street. A location map for the Site is provided as Figure 1. A map of the current Site layout is included as Figure 2.

The proposed redevelopment of the Site includes the demolition of all existing site improvements and the construction of a mixed-use building that is expected to include one full floor (approximately 12,000 square feet) of commercial space with the balance of the FAR devoted to residential apartments and possibly some community space.

1.1 Project Scope and QAPP Objective

The proposed scope of work includes the following:

- collection of end-point sample locations.

The objective of the QAPP is to detail the policies, organization, objectives, functional activities and specific quality assurance/quality control activities designed to achieve the data quality goals or objectives of the Remedial Action Work Plan. This QAPP addresses how the acquisition and handling of samples and the review and reporting of data will be documented for quality control (QC) purposes. Specifically, this QAPP address the following:

- The procedures to be used to collect, preserve, package, and transport samples;
- Field data collection and record keeping;
- Data management;
- Chain-of-custody procedures; and,
- Determination of precision, accuracy, completeness, representativeness, decision rules, comparability and level of quality control effort.

2.0 PROJECT ORGANIZATION

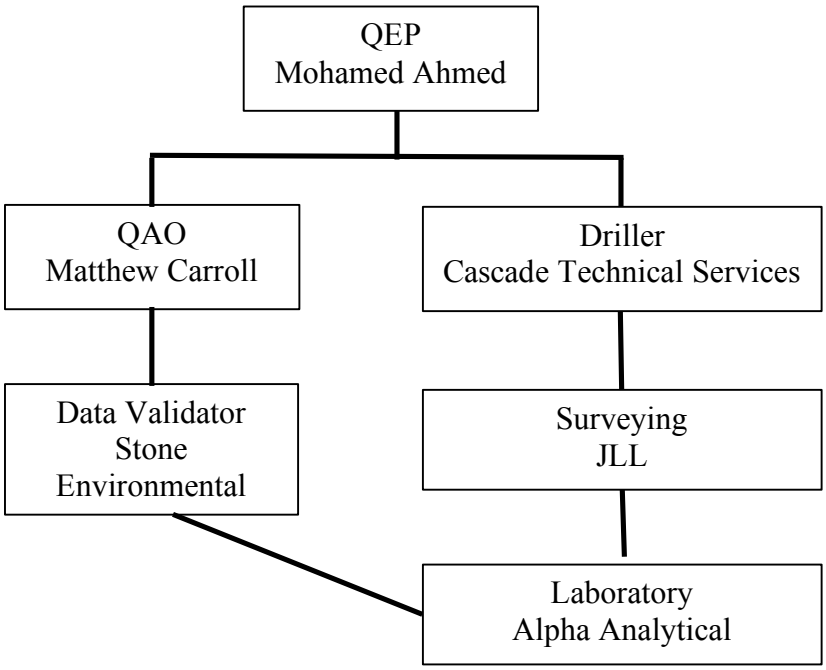
The personnel detailed are responsible for the implementation of the QAPP. Tenen Environmental, LLC (Tenen) will implement the RAWP on behalf of 21-25 31st Street LLC (Volunteer) once it has been approved by the New York State Department of Environmental Conservation (NYSDEC).

The Project Manager and Qualified Environmental Professional (QEP) will be Mohamed Ahmed, Ph.D., CPG, principal at Tenen. Dr. Ahmed is a certified professional geologist with over 20 years of experience in the New York City metropolitan area. He has designed and implemented subsurface investigations and is proficient in groundwater modeling, design of groundwater treatment systems, and soil remediation. He has managed numerous projects focused on compliance with the requirements of the New York State Brownfield Cleanup Program and spills programs and the New York City E-designation program. Dr. Ahmed also has extensive experience in conducting regulatory negotiations with the New York State Department of Environmental Conservation, the New York City Department of Environmental Protection, the NYC Office of Housing Preservation and Development, and the Mayor's Office of Environmental Remediation. Dr. Ahmed holds advanced degrees in geology and Earth and Environmental Sciences from Brooklyn College and the Graduate Center of the City University of New York; his resume is included in Appendix A.

The Quality Assurance Officer will be Mr. Matthew Carroll, P.E., principal at Tenen. Mr. Carroll is an environmental engineer experienced in all aspects of site assessment and development and implementation of remedial strategies. His experience involves projects from inception through investigation, remediation and closure. His expertise includes soil, soil vapor and groundwater remediation; remedial selection and design; field/health and safety oversight and preparation of work plans and reports to satisfy the requirements of various regulatory agencies. Mr. Carroll received his Bachelor of Engineering from Stevens Institute of Technology and Bachelor of Science in Chemistry from New York University and is a New York State professional engineer; his resume is included in Appendix A.

In addition, Tenen will utilize subcontractors for drilling (Cascade Technical Services, LLC of Lynbrook, NY), surveying (JLL of New York, NY), laboratory services (Alpha Laboratories of Mahwah, NJ) and data validation (Stone Environmental Inc. of Montpelier, Vermont). The resume for the DUSR preparer, Ms. Kim Watson is included in Appendix A.

An organization chart for the implementation of the Site Characterization Work Plan and QAPP is below.



3.0 SAMPLING AND DECONTAMINATION PROCEDURES

A detailed description of the procedures to be used during this program for collection of the soil samples is provided below. Proposed sample locations are shown on Figure 10 of the RAWP. An Analytical Methods/Quality Assurance Summary is provided in Table 1, included in Section 3.11.

3.1 Level of Effort for QC Samples

Field blank, trip blank, field duplicate and matrix spike (MS) / matrix spike duplicate (MSD) samples will be analyzed to assess the quality of the data resulting from the field sampling and analytical programs. Each type of QC sample is discussed below.

- Field and trip blanks consisting of distilled water will be submitted to the analytical laboratories to provide the means to assess the quality of the data resulting from the field-sampling program. Field (equipment) blank samples are analyzed to check for procedural chemical constituents that may cause sample contamination. Trip blanks are used to assess the potential for contamination of samples due to contaminant migration during sample shipment and storage.

- Duplicate samples are analyzed to check for sampling and analytical reproducibility.

- MS/MSD samples provide information about the effect of the sample matrix on the digestion and measurement methodology.

The general level of QC effort will be one field duplicate and one field blank (when non-dedicated equipment is used) for every 20 or fewer investigative samples of a given matrix. Additional sample volume will also be provided to the laboratory to allow one site-specific MS/MSD for every 20 or fewer investigative samples of a given matrix. One trip blank will be included along with each sample delivery group of volatile organic compound (VOC) samples.

The analytical laboratory will be certified under the New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP). NYSDEC Analytical Services Protocol (ASP) Category B deliverables will be prepared by the laboratory.

3.2 Sample Handling

Samples will be handled by any of the following methods: picked up by the laboratory, delivered to the laboratory in person by the sampler, or transported to the laboratory by overnight courier. All samples will be shipped to the laboratory to arrive within 48 hours after collection, and the laboratory will adhere to the analytical holding times for these analyses, as listed in the current version of the New York State Analytical Services Protocol (ASP).

3.3 Custody Procedures

Sample custody will be controlled and maintained through the chain-of-custody procedures. The chain of custody is the means by which the possession and handling of samples is tracked from the site to the laboratory. Sample containers will be cleaned and preserved at the laboratory before shipment to the Site. The following sections (Sections 3.4 and 3.5) describe procedures for maintaining sample custody from the time samples are collected to the time they are received by the analytical laboratory.

3.4 Sample Storage

Samples will be stored in secure limited-access areas. Walk-in coolers or refrigerators will be maintained at 4°C, +/- 2°C, or as required by the applicable regulatory program. The temperatures of all refrigerated storage areas are monitored and recorded a minimum of once per day. Deviations of temperature from the applicable range require corrective action, including moving samples to another storage location, if necessary.

3.5 Sample Custody

Sample custody is defined by this QAPP as the following:

- The sample is in someone's actual possession;
- The sample is in someone's view after being in his or her physical possession;
- The sample was in someone's possession and then locked, sealed, or secured in a manner that prevents unsuspected tampering; or,
- The sample is placed in a designated and secured area.

Samples will be removed from storage areas by the sample custodian or laboratory personnel and transported to secure laboratory areas for analysis. Access to the laboratory and sample storage areas is restricted to laboratory personnel and escorted visitors only; all areas of the laboratory are therefore considered secure.

Laboratory documentation used to establish chain of custody and sample identification may include the following:

- Field chains of custody or other paperwork that arrives with the sample;
- Laboratory chain of custody;
- Sample labels or tags attached to each sample container;
- Sample custody seals;
- Sample preparation logs (i.e., extraction and digestion information) recorded in hardbound laboratory books, filled out in legible handwriting, and signed and dated by the chemist;
- Sample analysis logs (e.g., metals, GC/MS, etc.) information recorded in hardbound laboratory books that are filled out in legible handwriting, and signed and dated by the chemist;

- Sample storage log (same as the laboratory chain of custody); and,
- Sample disposition log, which documents sample disposal by a contracted waste disposal company.

3.6 Sample Tracking

All samples will be maintained in the appropriate coolers prior to and after analysis. Laboratory analysts will remove and return their samples, as needed. Samples that require internal chain of custody procedures will be relinquished to the analysts by the sample custodians. The analyst and sample custodian will sign the original chain of custody relinquishing custody of the samples from the sample custodian to the analyst. When the samples are returned, the analyst will sign the original chain of custody returning sample custody to the sample custodian. Sample extracts will be relinquished to the instrumentation analysts by the preparatory analysts. Each preparation department will track internal chain of custody through their logbooks/spreadsheets.

Any change in the sample during the time of custody will be noted on the chain of custody (e.g., sample breakage or depletion).

3.7 End-point Soil Sampling

Soil samples will be collected using dedicated sample equipment. Soil will be screened along the sidewalls and within each alphanumeric grid, as shown on Figure 10 in the RAWP.

New, dedicated disposable sampling equipment will be used for all soil samples. Each sample will be scanned for volatile organic compounds VOCs using a photoionization detector (PID) and geologically described using the Unified Soil Classification System, including documentation of observations regarding potential contamination such as odors, staining, etc. All descriptions and observations will be documented in a field notebook.

Within each quadrant, the soil sample with the highest suspected contamination will be analyzed. All collected soil samples will be placed in pre-cleaned, pre-preserved laboratory provided sample bottles or En Core samplers (En Novative Technologies, Inc.), cooled to 4°C in the field, and transported under chain-of-custody command to the designated laboratory for analysis.

Soil samples will be analyzed for VOCs by EPA Method 8260, SVOCs by EPA Method 8270,Target Analyte List (TAL) metals by EPA Method 6010, and pesticides/polychlorinated biphenyls (PCBs) by EPA Method 8081/8082 with a Category B data package.

3.8 Analytical Methods/Quality Assurance Summary Table

A summary of the analytical methods and quality assurance methods are included in Table 1, below.

Table 1
Analytical Methods/Quality Assurance Summary

Matrix	Proposed Samples	QA/QC Samples				Total # Samples	Analytical Parameter	Method	Preservative	Holding Time	Container
		TB	FB	DUP	MS/MSD						
Soil	28 (max)	1	2	2	2	37	VOCs	8260	Cool to 4°C	14 days to analysis	(3) 5-gram En Core
	28 (max)	0	2	2	2	36	SVOCs	8270	Cool to 4°C		(2) 250 mL clear glass bottle
	28 (max)	0	2	2	2	36	Pesticides	8081	Cool to 4°C		
	28 (max)	0	2	2	2	36	PCBs	8082	Cool to 4°C		
	28 (max)	0	2	2	2	36	TAL Metals	6010	Cool to 4°C		

TB – Trip Blank FB – Field Blank DUP – Duplicate MS – Matrix Spike MSD – Matrix Spike Duplicate
°C – degrees Celsius mL – milliliter L - liter

3.9 Decontamination

Where possible, samples will be collected using new, dedicated sampling equipment so that decontamination is not required. All non-dedicated drilling tools and equipment will be decontaminated between boring locations using potable tap water and a phosphate-free detergent (e.g., Alconox) and/or a steam cleaner. All non-dedicated sampling equipment will also have a final rinse with deionized water. Decontamination water will be collected and disposed as investigation-derived waste (IDW).

3.10 Data Review and Reporting

The NYSDEC ASP Category B data package will be validated by an independent data validation subconsultant and a DUSR summarizing the results of the data validation process will be prepared. All reported analytical results will be qualified as necessary by the data validation and will be reviewed and compared against background concentrations and/or applicable New York State criteria:

- *Soil* – Unrestricted and Restricted Residential Soil Cleanup Objectives (SCOs) and Supplemental Soil Cleanup Levels (SCLs) as listed in 6NYCRR Part 375 and NYSDEC Commissioner's Policy CP-51; and,

A report documenting the post-excavation soil sampling will be prepared, and will describe Site conditions and document applicable observations made during the sample collection. In addition, the report will include a description of the sampling procedures, tabulated sample results and an assessment of the data and conclusions. The laboratory data packages, DUSR, geologic logs, well construction diagrams, and field notes will be included in the report as appendices. All data will also be submitted electronically to NYSDEC via the Environmental Information Management System (EIMS) in EqUIS format.

Appendix A

Resumes

Matthew Carroll, P.E.
Environmental Engineer/Principal

Experience Summary

Matthew Carroll is an environmental engineer experienced in all aspects of site assessment and development and implementation of remedial strategies. He has managed projects from inception through investigation, remediation and closure. His expertise includes soil, soil gas, and groundwater remediation, preparation of cost estimates, remedial alternative selection and design, soil characterization for disposal, field safety oversight, and preparation of work plans and reports to satisfy New York and New Jersey state requirements, and New York City "e" designation and restrictive declarations. Mr. Carroll's project management experience includes past management of a New York City School Construction Authority hazardous materials contract. He is responsible for all engineering work performed by Tenen and is currently the project manager and remedial engineer for several New York State Brownfield Cleanup Program sites.

Selected Project Experience

470 Kent Avenue, Brooklyn
As project manager, supported the client in due diligence and transactional activities, including a Phase I ESA, preliminary site investigation, and remedial cost estimate; preparation of BCP application and remedial investigation work plan. The former manufactured gas plant, sugar refinery and lumberyard will be developed as a mixed-use project with market rate and affordable housing and public waterfront access. As remedial engineer, will be responsible for development of remedial alternatives and oversight and certification of all remedial activities.

500 Exterior Street, Bronx
Designed and implemented the investigation of this former lumberyard and auto repair shop that will be redeveloped as mixed use development with an affordable housing component; prepared BCP application and subsequent work plans and reports. Designed a remedial strategy incorporating both interim remedial measures (IRMs) and remediation during the development phase.

Gateway Elton I and II, Brooklyn
Conducted soil disposal characterization, prepared Remedial Action Work Plans and designed methane mitigation systems for two phases of a nine-building residential development and commercial space; prepared and oversaw implementation of a Stormwater Pollution Prevention Plan during construction and prepared and certified the remedial closure reports for the project.

Affordable Housing Development, Rye, NY
Consultant to the City of Rye on environmental issues pertaining to a county-owned development site slated for an afford senior housing; reviewed environmental documentation for the project and prepared summary memorandum for City Council review; recommended engineering controls to address potential exposure to petroleum constituents, presented report findings at public meetings and currently providing ongoing environmental support during project implementation.

Queens West Development BCP Site, Long Island City, New York
Assistant Project Manager for two developers involved in the site.

- Responsible for oversight of remediation under the New York State Brownfield Cleanup Program
- Technical review of work plans and reports and coordination of the Applicant's investigation and oversight efforts
- Provided input for mass calculations and well placement for an in-situ oxidation remedy implemented on a proposed development parcel and within a City street
- Conducted technical review of work pertaining to a former refinery. Documents reviewed included work plans for characterization and contaminant delineation; pilot test (chemical oxidation); remediation (excavation and groundwater treatment). Managed field personnel conducting full time oversight and prepared progress summaries for distribution to project team
- Following implementation of remedial action, implemented the Site Management Plan and installation/design of engineering controls (SSDS, vapor barrier/concrete slab, NAPL recovery). Also responsible for coordination with NYSDEC

Brownfield Cleanup Program Redevelopment Sites – West Side, New York City
Managed remediation of a development consisting of four parcels being addressed under one or more State and city regulatory programs (NYS Brownfield Cleanup Program, NYS Spills, and NYC "e" designation program). Remediation includes soil removal, screening and disposal; treatment of groundwater during construction dewatering and implementation of a worker health and safety plan and community air monitoring plan (HASP/CAMP)

Managed an additional BCP site, supported the Applicant in coordination with MTA to create station access for the planned No. 7 subway extension; also provided support the client in coordination with Amtrak to obtain access for remedial activities on the portion of the site that is within an Amtrak easement. The site will eventually be used for construction of a mixed-use high-rise building.

BCP Site, Downtown Brooklyn, New York
Performed investigation on off-site properties and designed an SSDS for an adjacent building, retrofitting the system within the constraints of the existing structure; coordinated the installation of the indoor HVAC controls and vapor barrier; provided input to the design of a SVE system to address soil vapor issues on the site.

West Chelsea Brownfield Cleanup Program Site
Designed an in-situ remediation program and sub-slab depressurization system to address contamination remaining under the High Line Viaduct; SSDS design included specification of sub-grade components, fan modeling and selection, identifying exhaust location within building constraints and performance modeling; prepared the Operations Maintenance and Monitoring Plan and Site Management Plan sections pertaining to the SSDS.

Historic Creosote Spill Remediation – Queens, New York – New York State Voluntary Cleanup Program
Modeled contamination volume and extent and prepared mass estimates of historic fill constituents and creosote-related contamination; designed a soil vapor extraction (SVE) and dewatering system to address historic creosote release both above and below static

water table; coordinated with the Metropolitan Transit Authority and prepared drawings to secure approval to drill in the area of MTA subway tunnels.

NYSDEC Spill Site– Far West Side, Manhattan
Provided support to client during negotiations with a major oil company regarding allocation of remedial costs. Worked with client's attorney to develop a regulatory strategy to address the client's obligations under the NYSDEC Spills Program and the New York City "e" designation requirements.

Affordable Housing Site, Brooklyn, New York
Modified prior work plans for soil, soil vapor and groundwater investigation to address requirements for site entry into the New York City Brownfield Cleanup Program. Prepared technical basis for use of prior data previously disallowed by OER. Currently conducting site investigation.

New York City School Construction Authority Hazardous Materials Contract
Provided work scopes and cost estimates, managed and implemented concurrent projects, including Phase I site assessments, Phase II soil, groundwater and soil gas investigations, review of contractor bid documents, preparation of SEQR documents, specifications and field oversight for above- and underground storage tank removal, and emergency response and spill control.

Former Manufacturing Facility, Hoboken, New Jersey
Evaluated site investigation data to support a revision of the current property use to unrestricted; modified the John & Ettinger vapor intrusion model to apply the model to a site-specific, mixed use commercial/residential development; implemented a Remedial Action Work Plan that included the characterization, removal and separation of 9,500 cubic yards of historic fill; designed and implemented a groundwater characterization/delineation program using a real-time Triad approach; designed and implemented an innovative chemical oxidation technology for the property.

F**ormer Varnish Manufacturer – Newark, New Jersey**
Prepared a Phase I environmental site assessment; implemented soil and groundwater sampling to assess presence of petroleum and chlorinated compounds; prepared alternate cost remediation scenarios for settlement purposes and implemented a groundwater investigation plan, including pump tests and piezometer installation to assess the effect of subsurface utilities and unique drainage pathways upon contaminant transport.

Education and Certifications

Professional Engineer, New York
Bachelor of Engineering, Environmental; Stevens Institute of Technology, 2002
Bachelor of Science, Chemistry, New York University, 2002
Technical and Regulatory Training in Underground Storage Tanks, Cook College, Rutgers University, 2006

Mohamed Ahmed, Ph.D., C.P.G.
Sr. Geologist/Principal

Experience Summary

Mohamed Ahmed is a certified professional geologist with nearly 23 years of experience in the New York City metropolitan area. He has designed and implemented subsurface investigations and is proficient in groundwater modeling, design of groundwater treatment systems and soil remediation. He has managed numerous projects focused on compliance with the New York State Brownfield Cleanup and Spills programs and the New York City "e" designation program. Dr. Ahmed also has extensive experience in conducting regulatory negotiations with the New York State Department of Environmental Conservation, the NYC Office of Housing Preservation and Development, and the Mayor's Office of Environmental Remediation.

Selected Project Experience

Willoughby Square, Downtown Brooklyn
As Project Manager, directs all regulatory interaction and investigation on this joint public-private sector redevelopment that will include a public park and four-level underground parking garage. Prepared the remedial investigation work plan and remedial action work plan, conducted investigation activities and waste characterization, and negotiated with the NYC Department of Environmental Protection and the Mayor's Office of Environmental Remediation to transition the site into the NYC Voluntary Cleanup Program.

School Facility, Borough Park, Brooklyn
Managed all regulatory agency coordination, work plan and report preparation and remedial oversight; worked with OER to determine measures to retroactively address the hazardous materials and air quality E-designations on a previously constructed school building and prepared supporting documentation to justify the use of electrical units rather than natural gas.

LGA Hotel Site, East Elmhurst, Queens
Project manager for all work conducted at this former gasoline service station which is being remediated under the NYS Brownfield Cleanup Program; technical oversight of work plans, reports, and design and implementation of field and soil disposal characterization.

436 10th Avenue, Manhattan
As project manager and technical lead, assisted client in developing remedial cost estimates used for property transaction, developed regulatory strategy to address NYS Spills and NYC E-designation requirements, and currently overseeing remedial activities which include removal and disposal of petroleum-contaminated bedrock and dewatering and disposal of impacted groundwater.

Brownfield Cleanup Program Site, Downtown Brooklyn
Managed investigation and remediation under the BCP program for a proposed mixed-use development; designed the remedial investigation and prepared the remedial action work plan which includes an SVE system monitored natural attenuation. Prepared remedial cost

estimates for several scenarios. The project will include a 53-story mixed-use structure and parking garage.

Queens West Development, Long Island City
Directed project team and subcontractors for soil investigation/remediation studies on multiple properties; provided technical support for negotiations with NYSDEC during investigation and remediation.

Former Creosote Site, Long Island City
Designed and implemented a complex investigation to assess the nature and extent of historic creosote contamination at this former industrial site; conducted studies to optimize recovery of LNAPL and DNAPL and developed strategies using bioremediation and natural attenuation in conjunction with conventional remedial approaches. Performed pilot tests for soil vapor extraction system design and coordinated with NYSDEC and NYSDOH to implement sub-slab soil vapor sampling.

NYSDEC Spill Site – Far West Side, Manhattan
Developed a detailed remedial cost estimate for to support client negotiations with a major oil company. The estimate included costs pertaining to: chipping, removal and disposal of petroleum-impacted bedrock; removal/disposal of recycled concrete; costs for dewatering and disposal of impacted groundwater during construction; and design and installation of a vapor barrier below the redevelopment.

Active Industrial Facility, Newburgh, New York
Designed remedial investigation of soil and groundwater contaminated with trichloroethane; performed soil vapor pilot test and pump test to aid in design of soil and groundwater remediation alternatives; conducted sub-slab vapor sampling in accordance with NYSDOH guidance.

Former Dry Cleaning Facility, New York City
Conducted soil and groundwater investigations, designed and installed a soil vapor extraction system and performed extensive testing of indoor air. Negotiated the scope of the RI and IRM with NYSDEC.

Waterfront Redevelopment, Yonkers, NY
Designed and performed geophysics survey of six parcels to determine locations of subsurface features; supervised test pit excavation to confirm geophysics results and evaluate and classify soil conditions prior to development activities.

Prince's Point, Staten Island, New York
Performed soil, groundwater and sediment sampling to delineate the extent of contamination; used field-screening techniques to control analytical costs and supervised soil excavation and disposal.

Apartment Complex, New York City, New York
Coordinated with Con Edison, the owner of the adjacent property and NYSDEC to determine oil recovery protocol; assessed hydrogeological conditions and conducted pilot tests to design cost-effective recovery system; designed and supervised installation of recovery system.

Publications

"Impact of Toxic Waste Dumping on the Submarine Environment: A Case Study from the New York Bight". Northeastern Geology and Environmental Sciences, V. 21, No. 12, p. 102-120. (With G. Friedman)

Metals Fluxes Across the Water/Sediment Interface and the Influence of pH. Northeastern Geology and Environmental Sciences, in press. (With G. Friedman)

"Water and Organic Waste Near Dumping Ground in the New York Bight". International Journal of Coal Geology, volume 43. (With G. Friedman)

Education and Certifications

Ph.D., Earth and Environmental Sciences, Graduate Center of the City of New York (2001)
M.Ph., Earth and Environmental Sciences, City University of New York (1998)
M.A. Geology, Brooklyn College (1993)
B.S. Geology, Alexandria University, Egypt (1982)

American Institute of Professional Geologists, Certified Professional Geologist, 1997-2015

Kim Watson, RQAP-GLP / *QA Manager / Health & Safety Officer*

Ms. Watson has over 34 years of experience in all phases of production and laboratory procedures, quality control and quality assurance, QA management and project management in an environmental analytical laboratory in the context of EPA regulated environments (GLP, RCRA and CERCLA). She has over 24 years of experience in private quality assessment consulting, data and method validation, environmental project planning and coordination, field and laboratory audits, third party review, and single and double blind performance testing programs.

Years of Experience / 35

Years of Experience at Stone / 15

Education
B.S., Environmental Engineering Technology, cum laude, 1981, Norwich University, Vermont

Environmental Applications of Gas Chromatographic Mass Spectrometry, 1995, Indiana University

Professional Certifications
Registered Quality Assurance Professional in Good Laboratory Practices, RQAP-GLP, April 2004 - 2017

Skills
Current Trainer of 8-Hr Refresher of the 40-Hour (29 CFR 1910.120) OSHA health and safety training for hazardous waste operations and emergency response, November, 1995-present.

Trained auditor in laboratory and field sampling and measurement activities.

Trained in environmental and agrochemical sample collection and analysis; soil, water and air.

Department of Justice, expert witness in environmental chemistry principals.

Honors and Awards
Engineering Technology Award, Norwich University, 1981

Employee of the Month – April 19, 2006, September 2012 and December 2014

Professional and Community Activities
See last page

Employment History

Stone Environmental Inc., Montpelier, Vermont
Quality Assurance Manager, 10/2001 – Present
Health and Safety Officer, 2004-Present

Manages compliance with Good Laboratory Practices (GLP) and other Quality Assurance (QA) programs such as OECD GLPs. Manages and tracks regulatory requirements associated with The National Environmental Accreditation Program (NELAP), National Environmental Field Activities Program (NEFAP) under TNI (The NELAC Institute), and ISO 17025 Quality Standards. Supervises Stone's QA/QC internal procedures, and performs both internal and external field and GLP audits. 2013-2015 Chair, NEFAP Executive Committee.

Acts as the Quality Assurance Unit (QAU) for EPA related environmental and agrochemical field studies. Responsible for reviewing outgoing protocols/reports for GLP compliance. Assesses field activities assessors for compliance to NEFAP standards and ISO 17025 standards. Responsible for reviewing for compliance Environmental Impact Assessments (EIA) for veterinary medicines under the FDA.

Responsible for providing assistance in writing and reviewing Standard Operating Procedures (SOPs). Manages corporate quality practices and developed the Quality Management Plan (QMP), Quality Systems Manual (QSM) for Field Sampling and Analysis.

Responsible for developing and implementing quality systems for company processes both project and non-project related. Approves Site Specific and Generic Quality Assurance Project Plans (QAPPs).

Administers the Corporate Health and Safety Management Program; acts as a resource for employees of the company and manage the Safety Committee. Reviews all accident and injury reports and report to Safety Committee. Reviews and approves project-specific site Health and Safety Plans for field investigations. Trainer of staff (internal and external) on 29 CFR 1910.120 standards (8 Hr. OSHA refresher) and QA/GLP Standards.

Assists in conducting all aspects of pesticide fate and transport studies under FIFRA groundwater monitoring studies including database management and report writing. Has performed modeling scenarios in CXTFIT2, SETBACK, PRZM3, PE5, APEX and EXPRESS.

Project Management in QA Services with master service agreements with Phoenix Chemistry Services and other consultants which includes all Tiers of data validation, data assessment, data production and auditing (laboratory

audits, facility audits). Responsible for the marketing and sales of Stone's QA services such as data validation and outside auditing and field inspections.

Severn Trent Laboratories (TestAmerica Burlington), Colchester, Vermont
Quality Assurance Manager, 1997-2001

Responsible for the overall laboratory quality assurance. Responsible for the continuous development, documentation of QA procedures dealing with the day to day operation of the laboratory, and the implementation of the QA Program for inorganic and organic analyses of environmental samples.

Inchcape Testing Services, Aquatec Laboratory, South Burlington, Vermont
GC/MS Data Review Group Leader, Chemistry Project Director, QA/QC Data Review Specialist, Extraction Lab Technician, 1983-1995

Responsible for a group of seven people working on the review of data, publication, and mass spectral interpretation. Analytical experience in the VOA HP5971A MSD GC/MS Systems.

Project Director for USEPA Special Analytical Service Solicitations Contracts, CLP government contracts, and other private client contracts.

LCIC (Love Canal) Habitability Study; reviewed final data deliverables and responsible for daily electronic upload of GC/MS analytical data to project bulletin board.

PCB Study, New Bedford, MA: Performed review and quality control of GC/MS analysis for the development of analytical procedures published in "Application of a Mixed-Method Analytical Scheme for Analysis of PCB in Water and Sediment Samples from a Polluted Estuary," Richard A. McGrath, William Steinhauer and Siegfried Stockinger (1987)

Trillium, Inc. Home Office, Montpelier, Vermont
Quality Assessment Manager, 4/1995-6/1997

Reviewed and validated CLP-type data packages generated in support of sampling analysis program at clients' industrial/commercial plant sites. Validation was conducted in accordance with EPA's National Functional Guidelines, regional guidelines, other agency procedures, method specific standard operating procedures, and professional judgment as appropriate.

Responsibilities included compilation and evaluation of site data from various on-site analytical programs. Gained experience in design and development of an on-site analytical laboratory.

Upon request from USEPA Region I, provided extensive review and comments on Parts I and II of the Region I, EPA-New England Data Validation Functional Guidelines for Evaluation Environmental Analyses.

Facilitated education seminars on environmental chemistry for Engineers and Lawyers.

Vermont Agency of Environmental Conservation Solid Waste Program, Montpelier, Vermont
Air and Solid Waste Technician, 1981-1982

Responsible for the environmental engineering design of solid waste and waste disposal facilities and water quality monitoring at the solid waste facilities throughout the State of Vermont.

Related Project Experience

Data Assessment Services, Data Validation, Site Chemist. Watermark Environmental Inc., 2001-present, Project No. 082065 and 011234, 14-003.

Silresim Site Data Validation and Permit Reporting. Site Chemist.

GLP Field Studies, AgroChemical Companies, Independent QAU, 2001-Present
Stone Projects: 95410, 97154, 97155, 97255, 98257, 991106, 001124, 001162, 001198, 011206, 021281, 021292, 021352, 031385, 031387, 031454, 031462, 031475, 061763, 082018, 082045, 102317, 102324, 112549, 13-085, 14-043, 14-234, 15-014, 15-107 and 15-250.

Field Inspections, sampling, instrumentations and applications Multiple Sites and Multiple Studies, Florida, Iowa, Indiana, Georgia, PEI, Canada, 2013-2015

EPA GLP-Quality Assurance Unit, auditor laboratory and field sampling. Reports and reporting.

Modeling scenarios in CXTFIT2, SETBACK, PRZM3, PE5 and EXPRESS. AgroChemical Companies, 2008-Present, 102434, 102364, 112468, 12-194. QC data output for spray drift modeling – Agdisp 15-080

Assist in conducting all aspects of pesticide fate and transport studies under FIFRA groundwater monitoring studies including database management and report writing. Perform modeling scenarios in PRZM3 and PE5.

Data Validation Services, Gradient Corporation, 112590

Data review and validation services. Manual data validation organic and inorganic analyses.

Data Validation Services, Various Sites, 082074, 13-152, HTRW, Ipswich Antennae Site, 12-106, Camp Kilmer 14-166, West Point 15-285

Data review and validation services. Manual data validation organic and inorganic analyses.

Data Validation Services, Phoenix Chemistry Services, Various Sites, 12-093

Data review and validation services. Manual data validation organic and inorganic analyses.

Data Usability Report Summaries (DUSR). Various clients and Sites, 14-020

Data review and validation services all organic and inorganic parameters for completion of the DUSR for NYS clients and sites.

FIU. Database system setup, Chemical Company, 12-162

Work for Florida International University to set up a Laboratory Information Management System to handle generation of electronic data deliverables.

Washwater Inspections and reporting on Toxic Scan for discharge land application permits, 14-066; Cheese Companies, VT clients

Audit washwater systems and land application of the washwater for compliance with IDP permits. Review TCLP environmental analyses for completeness and evaluate data sets through mass spectral interpretations to determine the identifications of tentatively identified compounds (TIC) that are not on the TCLP list. These determinate the presence / absence of these TICs.

Publications and Presentations

Watson, Kim. 2016, NAICC, "Things I wish I knew when I started in QA"—Lab/Field Perspective, Panel Discussion.

Watson, Kim. 2014, Presented – NEMC Trials and Tribulations of Being a Mobile Laboratory – Methodologies and Accreditations.

Watson, Kim. Gaynor, Ph.D., Deborah, 2013, Presented – NEMC, Legal Defensibility of Data. How to Choose a Laboratory that Will Meet Your Data Assessment and Testing Needs?

Watson, Kim. 2013. TNI/NELAP – Presented / Article TNI-Newsletter, Organizations: What Are the Benefits of Accreditation?

Watson, Kim. May 2013. OELA – Presented TNI NEFAP- Field Sampling & Measurement Organization Accreditation Program

Watson, Kim & SQA EPA GLP Specialty Group. February 2005. GLP Inspection Experiences from the Regulated Communities Perspective. 2005 SQA World Conference.

Watson, Kim. April, 2004. The New NELAC and ELAB Update. Presented to SQA Annual Meeting.

Watson, Kim, 2004. Quality Assurance Training. Data Integrity Procedures and Ethics and Laboratory Quality Assurance. Full Day Workshop for ITLA (Independent Testing Laboratory Association), New England.

Watson, Kim. 2003. Manual Integration Basics, Techniques in Manual Integration. Presented to NY&PA AAEL August 2003

Watson, Kim. 2002. GOT ETHICS, Ethics Training, Fraud Prevention and Detection. Presented to NERCSQA November 2002.

Additional Education

Leadership Development and Communication Training, Co-Chair Market Segmentation Team, @1, November 2014-June 2015

Scientific Integrity in Federal Agencies Lessons from the Environmental Protection Agency, August 8, 2014

DOD Quality Systems Manual Training, January 30, 2014

GLP Training, Quality System Consultants, Inc. Patricia Royal, M.S.;D.A.B.T., QAP/GLP Registered, January 2002

Gearing Up for NELAP, National Laboratory Training Network, November 1998

Management Problems of the Technical Person in a Leadership Role, Fred Pryor Seminar, September 1997.

Supervisory Skills in Positive Discipline, October, 1997

Water Environment Federation, "Environmental Labs: Testing the Waters", Cincinnati, Ohio, August 13-16, 1995.

PACS Training Course in Mass Spectral Interpretation, May 4-6, 1994

Inchcape Managerial Skills Training Workshop I: April 12-13, 1993, Training Workshop II: July 7-8, 1994

Professional and Community Activities

TNI, The NELAC Institute, member 2001-present

NEFAP, National Environmental Field Activities Program Executive Committee, Chair, 2009-present

NEMC, National Environmental Monitoring Conference Succession Chair, 2013-2016

TNI NGAB, Non-Governmental Accreditation Body Committee Member, 2014-present

FSMO, Field Sampling Measurement Organization Standard Training (AB Evaluator Training), February 14, 2011; Member, 2007-present

NEMC/TNI, Session Chair, 2013, 2014, 2015.

NAICC, National Alliance of Independent Crop Consultants – Ethics Committee; GLP QA Committee; Member, 2013-present

ACS, American Chemical Society , member 1995-present

ASQ, American Society for Quality, member 1995-present

SQA, Society of Quality Assurance, member 2001-present

Uniform Federal Policy for Quality Assurance Project Plans Course #06042, 2006

TNI FSMO Standard Training (AB Evaluator Training): February 14, 2011

East Montpelier Planning Commission: Member (Elected), 2010-Present; Secretary, 2006-present

East Montpelier Development Review Board: Member (Appointed), 2010-present

Norwich University Engineering Society: President and Co-Founder of Chi Beta Chapter of Tau Alpha Phi

Appendix G
Citizen Participation Plan (CPP)

New York State Department of Environmental Conservation

Brownfield Cleanup Program

Citizen Participation Plan

for

21-25 31st Street
Site No. C241167

21-25 31st Street

Astoria, NY 11105

August 2017

Contents

* * * * *

Note: The information presented in this Citizen Participation Plan was current as of the date of its approval by the New York State Department of Environmental Conservation. Portions of this Citizen Participation Plan may be revised during the site's investigation and cleanup process.

Applicant: **21-25 31 Street LLC c/o Douglaston Realty Management Corp. (Applicant)**
Site Name: **21-25 31st Street ("Site")**
Site Address: **21-25 31st Street, Astoria, NY 11105**
Site County: **Queens**
Site Number: **C241167**

1. What is New York's Brownfield Cleanup Program?

New York's Brownfield Cleanup Program (BCP) works with private developers to encourage the voluntary cleanup of contaminated properties known as "brownfields" so that they can be reused and developed. These uses include recreation, housing, and business.

A *brownfield* is any real property that is difficult to reuse or redevelop because of the presence or potential presence of contamination. A brownfield typically is a former industrial or commercial property where operations may have resulted in environmental contamination. A brownfield can pose environmental, legal, and financial burdens on a community. If a brownfield is not addressed, it can reduce property values in the area and affect economic development of nearby properties.

The BCP is administered by the New York State Department of Environmental Conservation (NYSDEC), which oversees Applicants that conduct brownfield site investigation and cleanup activities. An Applicant is a person who has requested to participate in the BCP and has been accepted by NYSDEC. The BCP contains investigation and cleanup requirements, ensuring that cleanups protect public health and the environment. When NYSDEC certifies that these requirements have been met, the property can be reused or redeveloped for the intended use.

For more information about the BCP, go online at: http://www.dec.ny.gov/chemical/8450.html.

2. Citizen Participation Activities

Why NYSDEC Involves the Public and Why It Is Important

NYSDEC involves the public to improve the process of investigating and cleaning up contaminated sites, and to enable citizens to participate more fully in decisions that affect their health, environment, and social well being. NYSDEC provides opportunities for citizen involvement and encourages early two-way communication with citizens before decision makers form or adopt final positions.

Involving citizens affected and interest in site investigation and cleanup programs is important for many reasons. These include:

- Promoting the development of timely, effective site investigation and cleanup programs that protect public health and the environment

- Improving public access to, and understanding of, issues and information related to a particular site and that site's investigation and cleanup process;

- Providing citizens with early and continuing opportunities to participate in NYSDEC's site investigation and cleanup process;

- Ensuring that NYSDEC makes site investigation and cleanup decisions that benefit from input that reflects the interests and perspectives found within the affected community; and

- Encouraging dialogue to promote the exchange of information among the affected/interested public, State agencies, and other interested parties that strengthens trust among the parties, increases understanding of site and community issues and concerns, and improves decision-making.

This Citizen Participation (CP) Plan provides information about how NYSDEC will inform and involve the public during the investigation and cleanup of the Site identified above. The public information and involvement program will be carried out with assistance, as appropriate, from the Applicant.

Project Contacts

Appendix A identifies NYSDEC project contact(s) to whom the public should address questions or request information about the site's investigation and cleanup program. The public's suggestions about this CP Plan and the CP program for the Site are always welcome. Interested people are encouraged to share their ideas and suggestions with the project contacts at any time.

Locations of Reports and Information

The locations of the reports and information related to the site's investigation and cleanup program also are identified in Appendix A. These locations provide convenient access to important project documents for public review and comment. Some documents may be placed on the NYSDEC website. If this occurs, NYSDEC will inform the public in fact sheets distributed about the Site and by other means, as appropriate.

Site Contact List

Appendix B contains the site contact list. This list has been developed to keep the community informed about, and involved in, the site's investigation and cleanup process. The site contact list will be used periodically to distribute fact sheets that provide updates about the status of the project. These will include notifications of upcoming activities at the Site (such as fieldwork), as well as availability of project documents and announcements about public comment periods. The site contact list includes, at a minimum:

- Chief executive officer and planning board chairperson of each county, city, town and village in which the Site is located;
- Residents, owners, and occupants of the Site and properties adjacent to the Site;
- The public water supplier which services the area in which the Site is located;
- Any person who has requested to be placed on the site contact list;
- The administrator of any school or day care facility located on or near the Site for purposes of posting and/or dissemination of information at the facility; and
- Location(s) of reports and information.

The site contact list will be reviewed periodically and updated as appropriate. Individuals and organizations will be added to the site contact list upon request. Such requests should be submitted to the NYSDEC project contact(s) identified in Appendix A. Other additions to the site contact list may be made at the discretion of the NYSDEC project manager, in consultation with other NYSDEC staff as appropriate.

CP Activities

The table at the end of this section identifies the CP activities, at a minimum, that have been and will be conducted during the site's investigation and cleanup program. The flowchart in Appendix D shows how these CP activities integrate with the site investigation and cleanup process. The public is informed about these CP activities through fact sheets and notices distributed at significant points during the program. Elements of the investigation and cleanup process that match up with the CP activities are explained briefly in Section 5.

- **Notices and fact sheets** help the interested and affected public to understand contamination issues related to a site, and the nature and progress of efforts to investigate and clean up a site.

- **Public forums, comment periods and contact with project managers** provide opportunities for the public to contribute information, opinions and perspectives that have potential to influence decisions about a site's investigation and cleanup.

The public is encouraged to contact project staff at any time during the site's investigation and cleanup process with questions, comments, or requests for information.

This CP Plan may be revised due to changes in major issues of public concern identified in Section 3 or in the nature and scope of investigation and cleanup activities. Modifications may include additions to the site contact list and changes in planned citizen participation activities.
Technical Assistance Grant

NYSDEC must determine if the Site poses a significant threat to public health or the environment. This determination generally is made using information developed during the investigation of the Site, as described in Section 5.

If the Site is determined to be a significant threat, a qualifying community group may apply for a Technical Assistance Grant (TAG). The purpose of a TAG is to provide funds to the qualifying group to obtain independent technical assistance. This assistance helps the TAG recipient to interpret and understand existing environmental information about the nature and extent of contamination related to the Site and the development/implementation of a remedy.

An eligible community group must certify that its membership represents the interests of the community affected by the Site, and that its members' health, economic well-being or enjoyment of the environment may be affected by a release or threatened release of contamination at the Site.

For more information about TAGs, go online at http://www.dec.ny.gov/regulations/2590.html.

Note: The table identifying the citizen participation activities related to the site's investigation and cleanup program follows on the next page:

Citizen Participation Requirements (Activities)	Timing of CP Activity(ies)
Application Process:	
• Prepare site contact list • Establish document repositories	At time of preparation of application to participate in the BCP.
• Publish notice in Environmental Notice Bulletin (ENB) announcing receipt of application and 30-day public comment period • Publish above ENB content in local newspaper • Mail above ENB content to site contact list • Conduct 30-day public comment period	When NYSDEC determines that BCP application is complete. The 30-day public comment period begins on date of publication of notice in ENB. End date of public comment period is as stated in ENB notice. Therefore, ENB notice, newspaper notice, and notice to the site contact list should be provided to the public at the same time.
After Execution of Brownfield Site Cleanup Agreement:	
• Prepare Citizen Participation (CP) Plan	Before start of Remedial Investigation
Before NYSDEC Approves Remedial Investigation (RI) Work Plan:	
• Distribute fact sheet to site contact list about proposed RI activities and announcing 30-day public comment period about draft RI Work Plan • Conduct 30-day public comment period	Before NYSDEC approves RI Work Plan. If RI Work Plan is submitted with application, public comment periods will be combined and public notice will include fact sheet. Thirty-day public comment period begins/ends as per dates identified in fact sheet.
After Applicant Completes Remedial Investigation:	
• Distribute fact sheet to site contact list that describes RI results	Before NYSDEC approves RI Report
Before NYSDEC Approves Remedial Work Plan (RWP):	
• Distribute fact sheet to site contact list about proposed RWP and announcing 45-day public comment period • Public meeting by NYSDEC about proposed RWP (if requested by affected community or at discretion of NYSDEC project manager) • Conduct 45-day public comment period	Before NYSDEC approves RWP. Forty-five day public comment period begins/ends as per dates identified in fact sheet. Public meeting would be held within the 45-day public comment period.
Before Applicant Starts Cleanup Action:	
• Distribute fact sheet to site contact list that describes upcoming cleanup action	Before the start of cleanup action.
After Applicant Completes Cleanup Action:	
• Distribute fact sheet to site contact list that announces that cleanup action has been completed and that summarizes the Final Engineering Report • Distribute fact sheet to site contact list announcing issuance of Certificate of Completion (COC)	At the time NYSDEC approves Final Engineering Report. These two fact sheets are combined if possible if there is not a delay in issuing the COC.

3. Major Issues of Public Concern

This section of the CP Plan identifies major issues of public concern that relate to the Site. Additional major issues of public concern may be identified during the course of the Site's investigation and cleanup process. In addition, there may be impacts with regards to noise, odor or truck traffic resulting from the cleanup process.

The Site is located within a Potential Environmental Justice Area. Environmental justice is defined as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Based on neighborhood 2010 census data, there is a sizable Hispanic-American community near the Site. Therefore, all future fact sheets will be translated into Spanish.

Environmental justice efforts focus on improving the environment in communities, specifically minority and low-income communities, and addressing disproportionate adverse environmental impacts that may exist in those communities.

No major issues of public concern have been identified during the review of the BCP Application. The area surrounding the site is served by a public water supply system that is regularly monitored thereby preventing exposure of the general public to non-potable groundwater. If issues are identified in the future, this CP Plan will be amended to address any additional CP activities that may need to be implemented.

4. Site Information

Appendix C contains a map identifying the location of the Site.

Site Description

The Site is located on the east-southeast side of 31st Street, between Ditmars Boulevard and 21st Avenue, in the Astoria neighborhood of Queens. The property is 11,875 square feet, approximately 0.27 acres. The Site is located in Queens Community Board 1 and is generally identified as Block 831, Lot 20.

The Property is improved with two buildings; a larger one-and-a-half story building to the southwest and a smaller one-story building to the northeast. The buildings are connected on the first floor and have separate basements. A small paved and pitched asphalt parking area is located behind the smaller building. The Property is currently occupied by a retail clothing, linens and kitchenware store, ABC Super Stores.

The area surrounding the Site is predominantly residential and commercial. Commercial buildings are located to the northeast and southwest of the subject property. 31st Street is a major commercial corridor in this area of Queens.

History of Site Use, Investigation, and Cleanup

The Site is currently occupied by a retail clothing, linens and kitchenware store. Based on historic information, the Site was vacant until sometime between 1954 and 1967, when the property was developed with a large store and dry cleaner. The dry cleaning operation was present until at least 1981, and the same space was used for "cleaning" through 2006.

Environmental investigations completed at the Site have included analysis of soil, soil vapor and groundwater. The investigations were completed in 2014 as part of the Applicant's due diligence.

Previous Environmental Studies

Phase I Environmental Site Assessment (2014)

Based upon a review of historic information sources, the following two conditions were identified as having the potential for negative environmental impacts:

- Historic use of the Site for dry cleaning operations; and
- Historic use of the northeast adjacent property for auto repair operations.

Phase II Subsurface Investigation Report (2014)

Soil, soil vapor and groundwater sampling was completed to further investigate the Phase I Environmental Site Assessment findings. Twelve soil samples were collected from eight soil borings; five sub-slab soil vapor samples and two indoor air samples were collected for full scan analysis; an additional 18 soil vapor screening samples were screened using a mobile laboratory; and four groundwater samples were collected.

The results of the sample analysis showed that tetrachloroethene (or "PCE") was detected in all 23 soil vapor samples. Some concentrations were above the New York State Department of Health (NYSDOH) Air Guidance Value (AGV). Some petroleum-related compounds were also detected at elevated levels in the soil vapor samples.

PCE and its degradation compounds were detected in groundwater above NYSDEC standards. The highest detected concentrations were one to two orders of magnitude higher than the NYSDEC standards and were collected in the area of the historic dry cleaner.

Petroleum-related compounds were also above NYSDEC standards in groundwater at one location and a petroleum sheen was observed on the groundwater purged from this well. A petroleum release was reported to NYSDEC and Spill No. 1402686 was assigned.

While PCE was detected in several soil samples, the concentrations were all below the NYSDEC Unrestricted Use Soil Cleanup Objectives (SCOs). Two pesticides (4,4'-DDT and 4,4'-DDE) and two metals (copper and lead) were detected above the NYSDEC Unrestricted Use SCOs .

5. Investigation and Cleanup Process

Application

The Applicant has applied for and been accepted into New York's Brownfield Cleanup Program as a **Volunteer**. This means **that the Applicant was not responsible for the disposal or discharge of the contaminants or whose ownership or operation of the Site took place after the discharge or disposal of contaminants. The Volunteer must fully characterize the nature and extent of contamination onsite, and must conduct a qualitative exposure assessment, a process that characterizes the actual or potential exposures of people, fish and wildlife to contaminants on the Site and to contamination that has migrated from the Site.**

The Applicant in its Application proposes that the Site will be used for **restricted** purposes.

To achieve this goal, the Applicant will conduct **investigation and cleanup** activities at the Site with oversight provided by NYSDEC. The Brownfield Cleanup Agreement executed by NYSDEC and the Applicant sets forth the responsibilities of each party in conducting these activities at the site.

Investigation

The Applicant will conduct an investigation of the site officially called a "remedial investigation" (RI). This investigation will be performed with NYSDEC oversight. The Applicant must develop a remedial investigation workplan, which is subject to public comment.

The site investigation has several goals:

1) Define the nature and extent of contamination in soil, surface water, groundwater and any other parts of the environment that may be affected;
2) Identify the source(s) of the contamination;
3) Assess the impact of the contamination on public health and the environment; and
4) Provide information to support the development of a proposed remedy to address the contamination or the determination that cleanup is not necessary.

When the investigation is complete, the Applicant will prepare and submit a report that summarizes the results. This report also will recommend whether cleanup action is needed to address site-related contamination. The investigation report is subject to review and approval by NYSDEC.

NYSDEC will use the information in the investigation report to determine if the Site poses a significant threat to public health or the environment. If the Site is a significant threat, it must be cleaned up using a remedy selected by NYSDEC from an analysis of alternatives prepared by the Applicant and approved by NYSDEC. If the Site does not pose a significant threat, the Applicant may select the remedy from the approved analysis of alternatives.

Remedy Selection

When the investigation of the site has been determined to be complete, the project likely would proceed in one of two directions:

1. The Applicant may recommend in its investigation report that no action is necessary at the Site. In this case, NYSDEC would make the investigation report available for public comment for 45 days. NYSDEC then would complete its review, make any necessary revisions, and, if appropriate, approve the investigation report. NYSDEC would then issue a Certificate of Completion (described below) to the Applicant.

or

2. The Applicant may recommend in its investigation report that action needs to be taken to address site contamination. After NYSDEC approves the investigation report, the Applicant may then develop a cleanup plan, officially called a Remedial Work Plan. The Remedial Work Plan describes the Applicant's proposed remedy for addressing contamination related to the Site.

When the Applicant submits a proposed Remedial Work Plan for approval, NYSDEC would announce the availability of the proposed plan for public review during a 45-day public comment period.

Cleanup Action

NYSDEC will consider public comments, and revise the draft cleanup plan if necessary, before approving the proposed remedy. The New York State Department of Health (NYSDOH) must concur with the proposed remedy. After approval, the proposed remedy becomes the selected remedy.

The Applicant may then design and perform the cleanup action to address the site contamination. NYSDEC and NYSDOH oversee the activities. When the Applicant completes cleanup activities, it will prepare a Final Engineering Report (FER) that certifies that cleanup requirements have been achieved or will be achieved within a specific time frame. NYSDEC will review the report to be certain that the cleanup is protective of public health and the environment for the intended use of the Site.

Certificate of Completion

When NYSDEC is satisfied that cleanup requirements have been achieved or will be achieved

for the Site, it will approve the FER. NYSDEC then will issue a Certificate of Completion (COC) to the Applicant. The COC states that cleanup goals have been achieved, and relieves the Applicant from future liability for site-related contamination, subject to certain conditions. The Applicant would be eligible to redevelop the Site after it receives a COC.

Site Management

Site management is the last phase of the site cleanup program. This phase begins when the COC is issued. Site management may be conducted by the Applicant under NYSDEC oversight, if contamination will remain in place. Site management incorporates any institutional and engineering controls required to ensure that the remedy implemented for the Site remains protective of public health and the environment. All significant activities are detailed in a Site Management Plan.

An institutional control is a non-physical restriction on use of the Site, such as a deed restriction that would prevent or restrict certain uses of the property. An institutional control may be used when the cleanup action leaves some contamination that makes the Site suitable for some, but not all uses.

An engineering control is a physical barrier or method to manage contamination. Examples include: caps, covers, barriers, fences, and treatment of water supplies.

Site management also may include the operation and maintenance of a component of the remedy, such as a system that is pumping and treating groundwater. Site management continues until NYSDEC determines that it is no longer needed.

Appendix A
Project Contacts and Locations of Reports and Information

Project Contacts

For information about the site's investigation and cleanup program, the public may contact any of the following project staff:

New York State Department of Environmental Conservation (NYSDEC):

MD Hoque
Project Manager
NYSDEC Remedial Bureau B
Division of Environmental Remediation-
Bureau B
625 Broadway, Albany, NY 12233-7016
Tel: (518) 402-9767
Email: md.hoque@dec.ny.gov

New York State Department of Health (NYSDOH):

Wendy Kuehner
Public Health Engineer
NYSDOH
Bureau of Env. Exposure Investigation
Empire State Plaza Corning Tower, Rm 1787
Albany, NY 12237
Tel: (518) 402-7880

Locations of Reports and Information
The facilities identified below are being used to provide the public with convenient access to important project documents:

Queens Library, Steinway Branch
21-45 31st St
Astoria, NY 11105
(718) 728-1965

NYSDEC Remedial Bureau B
625 Broadway, Albany, NY 12233-7016
Attn: MD Hoque
Hours: Monday – Friday, 9am – 5pm
Phone: (518) 402-9767 (call for appointment)

Appendix B Site Contact List

B1. Chief Executive Officer and Planning Board Chairperson

Mayor Bill de Blasio
City of New York
City Hall
New York, NY 10007-1200

Hon. Scott Stringer
NYC Comptroller
1 Centre Street
New York, NY 10007

Hon. Letitia James
Public Advocate
1 Centre Street
New York, NY 10007

Nilda Mesa, Director
NYC Office of Environmental Sustainability
100 Gold Street - 2nd Floor
New York, NY 10038

Hon. Costa Constantinides
Council Member - District 22
31-09 Newtown Avenue
Suite 209
Astoria NY 11102

Hon. Melinda Katz
Queens Borough President
120-55 Queens Boulevard
Kew Gardens, New York 11424
(718) 286-3000

Hon. Aravella Simotas
NYS Assembly – District 36
31-09 Newtown Avenue
Suite 401
Astoria NY 11102

Carl Weisbrod
Director of the Department of City Planning
City of New York
22 Reade Street
New York, New York 10007
(212) 720-3300

John Young
Director, Planning & Development
Queens County
120-55 Queens Boulevard
Kew Gardens, New York 11424
(718) 286-3000

Hon. Jose Peralta
NYS Senator
32-37 Junction Boulevard
East Elmhurst NY 11369

Hon. Joseph Crowley
U.S. House of Representatives
82-11 37th Avenue, Suite 402
Jackson Heights, NY 11372

Hon. Charles Schumer
U.S. Senator
780 Third Avenue, Suite 2301
New York, NY 10017

Hon. Kirsten Gillibrand
U.S. Senator
780 Third Avenue, Suite 2601
New York, NY 10017

Queens County Clerk
Queens County Clerk's Office
88-11 Sutphin Boulevard, 1st Floor
Jamaica, NY 11439

B2. Residents, Owners and Occupants of the Property and Properties Adjacent to the Property

Gregory Andruk
21-37 31st Street
Astoria, NY 11105

21-01 31 Partners
128 South Road
Stanfordville, New York 12581

JFS Ditmars Realty LLC
32-79 35th Street
Astoria, NY 11106

Joseph William Gehebe, Jr.
19 Ada Drive
Staten Island, New York 10314

William J. Petz
13-01 133rd Place
College Point, NY 11356

Manjoor Choudhury
33-38 72nd Street
Jackson Heights, NY 11372

Lou Wang
14 Orchard Street
New York, NY 10002

Dimitri Diapoulis
21-29 32nd Street
Astoria, NY 11105

Viviana Rivera
21-19 32nd Street
Astoria, New York 11105

Peter & Sam Karalis
21-15 32nd Street
Astoria, NY 11105

Peter Karalis
28-62 208th Street
Bayside, NY 11360

Rizwan Ahmed
21-21 32nd Street
Astoria, NY 11105

Maria Karalis
21-15 32nd Street
Astoria, NY 11105

Oneota Associates, LLC
c/o Swartz & Swartz
80 Cutter Mill Road
Great Neck, NY 11021

Acropolis Gardens
C/o Building Management
21-77 33rd Street
Astoria, NY 11105

B3. Local News Media

New York Daily News
4 New York Plaza
New York, NY 10004

Queens Tribune
150-50 14th Road
Whitestone, NY 11357

Western Queens Gazette
42-16 34th Avenue
Long Island City, NY 11101

Times-Ledger Newspapers
41-02 Bell Boulevard, 2nd Floor
Bayside, NY 11361

Queens Chronicle
P.O. Box 74-7769
Rego Park, NY 11374

NY1 News
75 Ninth Avenue
New York, NY 10011

Hoy Nueva York
1 MetroTech Center, 18th Floor
Brooklyn, NY 11201

El Diario La Prensa
1 MetroTech Center, 18th Floor
Brooklyn, NY 11201

B4. Public Water Supplier Which Services the Area in Which the Property is Located

New York City Department of Environmental Conservation
Attn: Emily Lloyd, Commissioner
59-17 Junction Boulevard
Flushing, New York 11373

B5. Any Persons Who Have Requested To Be Placed On The Contact List

At this time, no one has requested to be placed on the contact list.

B6. The Administrator of Any School or Day Care Facility On or Near the Property

Mary-Elaine Leake
Principal/Director
Queens Lutheran School
31-20 21st Avenue
Astoria, NY 11105

Pamela Sabel, Principal
Public School 122
21-21 Ditmars Boulevard
Astoria, NY 11105

Lori Adamo, Assistant Principal
I.S. 141 The Steinway
37-11 21st Ave
Astoria, NY 11105

Ms. Eileen Harnischfege, Principal
Immaculate Conception Catholic School
21-63 29th St
Astoria, NY 11105

Mr. William Higgins, Principal
Saint John's Preparatory School
21-21 Crescent St
Astoria, NY 11105

Ann Gordon-Chang, Principal
P.S. 85 Judge Charles Vallone
23-70 31st St
Astoria, NY 11105

Anastasios Koularmanis, Principal
St. Demetrios School
22-30 33rd St
Astoria, NY 11105

Happy Bees Day Care
Attn: Executive Director
21-60 33rd Street
Astoria, NY 11105

Melissa Chin, Education Director/President
Kid Krazy Inc
21-25 21st Ave
Astoria, NY 11105

B7. Local Community Board

Queens Community Board 1
45-02 Ditmars Boulevard
LL Suite 125
Astoria, NY 11105
(718) 626-1021
Attn: Vinicio Donato, Chairman
Lucille Hartmann, District Manager
Joan Asselin, Chairwoman, Environmental Committee

Community, Civic, Religious and Other Educational Institutions:

Grace Lutheran Church
31-20 31st Avenue
Astoria, NY 11105
Attn: Pastor

Astoria Islamic Center
22-21 33rd Street
Astoria, NY 11105
Attn: Executive Director

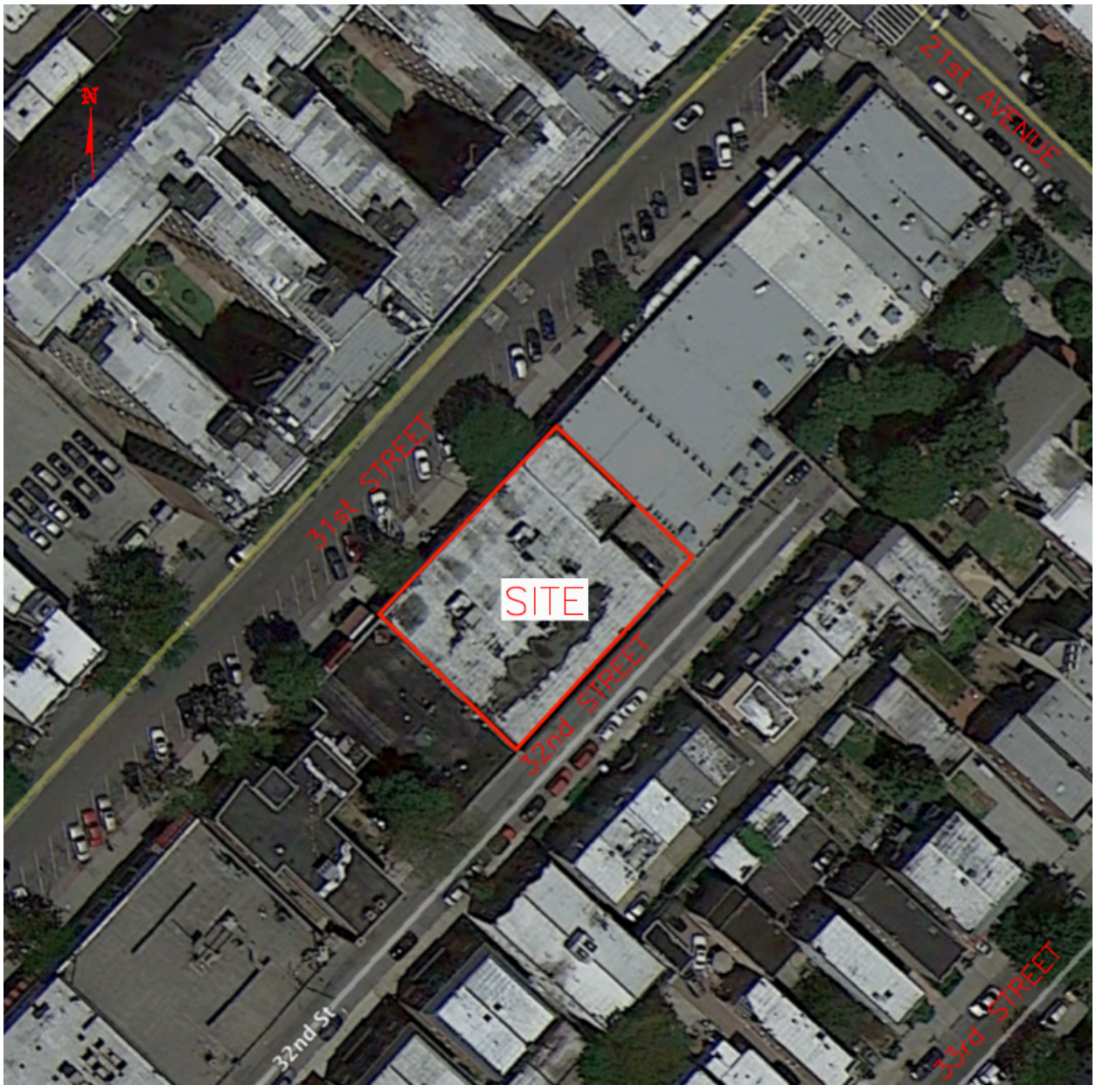
Church of the Immaculate Conception
21-47 29th Street
Astoria, NY 11105
Attn: Pastor

Astoria Civic Association
22-45 31st Street
Astoria, NY 11105
Attn: President

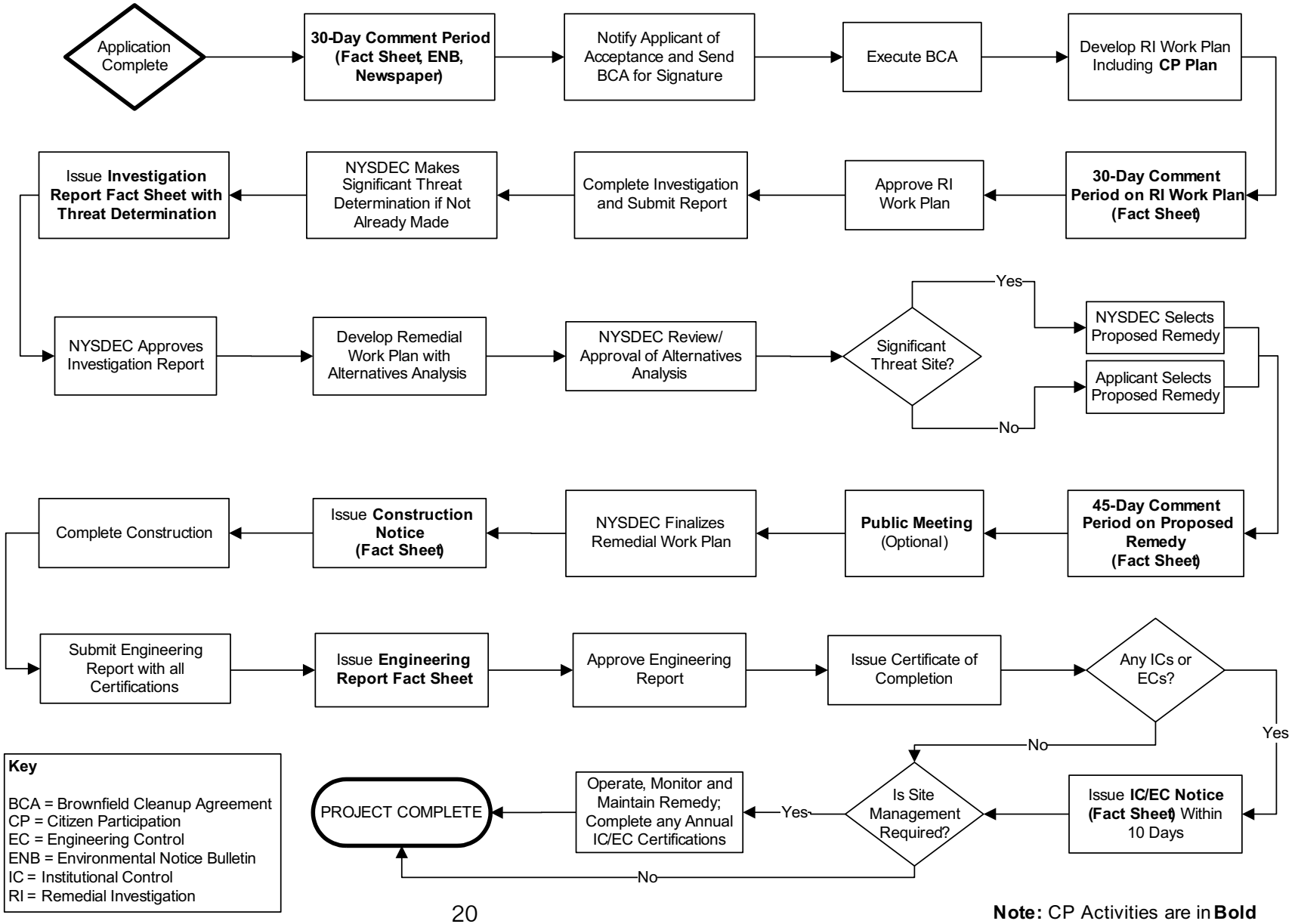
B8. Location of the Document Repository

Queens Library, Steinway Branch
21-45 31st St
Astoria, NY 11105
(718) 728-1965

Appendix C Site Location Map



Appendix D– Brownfield Cleanup Program Process



Note: CP Activities are in **Bold**

Appendix H
Vapor Barrier Details

Stego® Wrap Vapor Barrier

STEGO INDUSTRIES, LLC

Vapor Retarders
07 26 00, 03 30 00

1. Product Name

Stego Wrap Vapor Barrier

2. Manufacturer

Stego Industries, LLC
216 Avenida Fabricante, Suite 101
San Clemente, CA 92672
Sales, Technical Assistance
Ph: (877) 464-7834
Fx: (949) 257-4113
www.stegoindustries.com

3. Product Description

USES: Stego Wrap Vapor Barrier is used as a below-slab vapor barrier.

COMPOSITION: Stego Wrap Vapor Barrier is a multi-layer plastic extrusion manufactured with only high grade prime, virgin, polyolefin resins.

ENVIRONMENTAL FACTORS:
Stego Wrap Vapor Barrier can be used in systems for the control of soil gases (radon, methane), soil poisons (oil by-products) and sulfates.

5. Installation

UNDER SLAB: Unroll Stego Wrap Vapor Barrier over an aggregate, sand or tamped earth base. Overlap all seams a minimum of six inches and tape using Stego Tape or Crete Claw® Tape. All penetrations must be sealed using a combination of Stego Wrap and Stego accessories.

For additional information, please refer to Stego's complete installation instructions.

6. Availability & Cost

Stego Wrap Vapor Barrier is available nationally via building supply distributors. For current cost information, contact your local Stego Wrap distributor or Stego Industries' sales department.

7. Warranty

Stego Industries, LLC believes to the best of its knowledge, that specifications and recommendations herein are accurate and reliable. However, since site conditions are not within its control, Stego Industries does not guarantee results from the use of the information provided and disclaims all liability from any loss or damage. NO WARRANTY, EXPRESS, IMPLIED OR STATUTORY, IS GIVEN AS TO THE MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR OTHERWISE WITH RESPECT TO THE PRODUCTS REFERRED TO. Please see www.stegoindustries.com/legal.

8. Maintenance

None required.

9. Technical Services

Technical advice, custom CAD drawings, and additional information can be obtained by contacting Stego Industries' technical assistance department or via the website.

10. Filing Systems

- Stego Industries' website
- Buildsite

4. Technical Data

TABLE 1: PHYSICAL PROPERTIES OF STEGO WRAP VAPOR BARRIER

PROPERTY	TEST	RESULTS
Under Slab Vapor Retarders	ASTM E1745 Class A, B & C – Standard Specification for Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs	Exceeds Class A, B & C
Water Vapor Permeance	ASTM F1249 – Test Method for Water Vapor Transmission Rate Through Plastic Film and Sheeting Using a Modulated Infrared Sensor	0.0086 perms *0.0036 WVTR
Puncture Resistance	ASTM D1709 – Test Methods for Impact Resistance of Plastic Film by Free-Falling Dart Method	2266 grams
Tensile Strength	ASTM D882 – Test Method for Tensile Properties of Thin Plastic Sheeting	70.6 lbf/in.
Permeance After Conditioning (ASTM E1745 Sections 7.1.2 - 7.1.5)	ASTM E154 Section 8, F1249 – Permeance after wetting, drying, and soaking ASTM E154 Section 11, F1249 – Permeance after heat conditioning ASTM E154 Section 12, F1249 – Permeance after low temperature conditioning ASTM E154 Section 13, F1249 – Permeance after soil organism exposure	0.0098 perms 0.0091 perms 0.0097 perms 0.0095 perms
Methane Transmission Rate	ASTM D1434 – Standard Test Method for Determining Gas Permeability Characteristics of Plastic Film and Sheeting	**192.8 GTR mL(STP)/m^2*day
Radon Diffusion Coefficient	K124/02/95	8.8 x 10^{-12}m^2/second
Thickness		15 mils
Roll Dimensions		14 ft. wide x 140 ft. long or 1,960 ft^2
Roll Weight		140 lbs.

Note: perm unit = grains/(ft^2 *hr* in.Hg) * WVTR = Water Vapor Transmission Rate ** GTR = Gas Transmission Rate

GRACE

PREPRUFE® 300R & 160R

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

Description

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

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

The Preprufe R System includes:

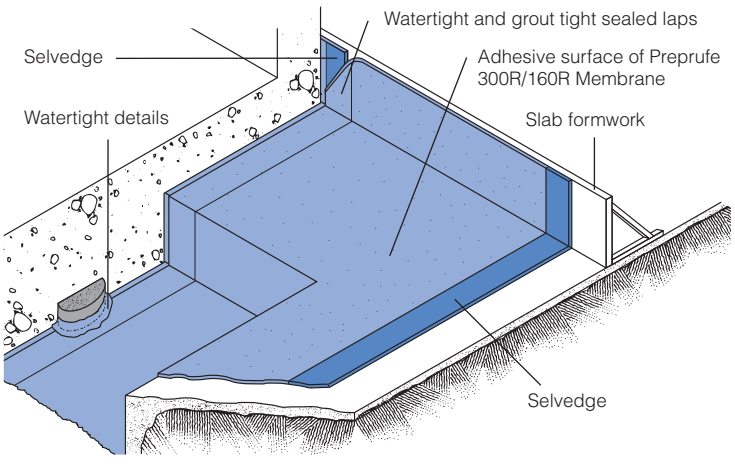
- **Preprufe 300R**—heavy-duty grade for use below slabs and on rafts (i.e. mud slabs). Designed to accept the placing of heavy reinforcement using conventional concrete spacers.
- **Preprufe 160R**—thinner grade for blindside, zero property line applications against soil retention systems.
- **Preprufe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

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

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

Advantages

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



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

BBA BRITISH BOARD OF AGREMENT CERTIFICATE No. 97/3325

Installation

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

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

Substrate Preparation

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

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

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

Membrane Installation

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

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

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

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

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

Ensure the underside of the succeeding sheet is clean, dry and free from contamination before attempting to overlap. Roll firmly to ensure a watertight seal.

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

Details

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

Membrane Repair

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

Pouring of Concrete

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

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

Removal of Formwork

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

A minimum concrete compressive strength of 1500 psi (10 N/mm^2) is recommended prior to stripping formwork supporting Preprufe membranes. Premature stripping may result in displacement of the membrane and/or spalling of the concrete.

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

Figure 1

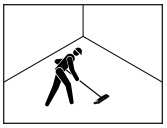


Figure 2

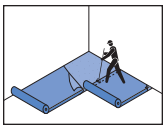
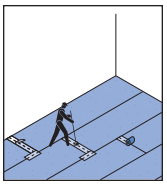
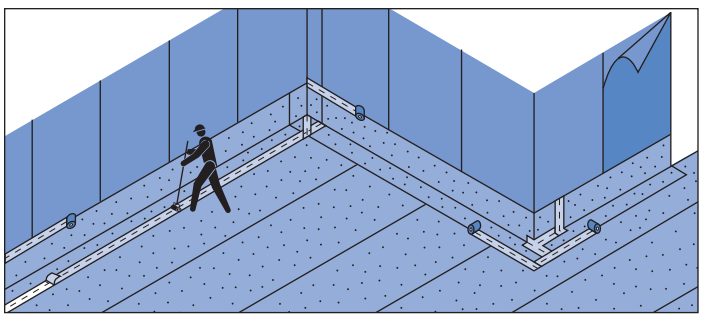


Figure 3

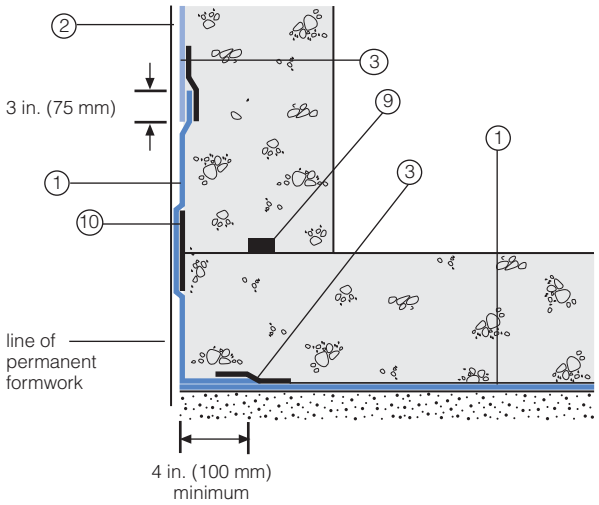




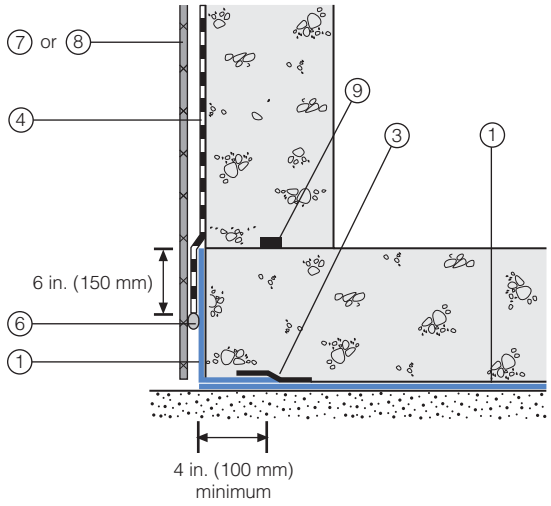
Detail Drawings

Details shown are typical illustrations and not working details. For a list of the most current details, visit us at graceconstruction.com. For technical assistance with detailing and problem solving please call toll free at 866-333-3SBM (3726).

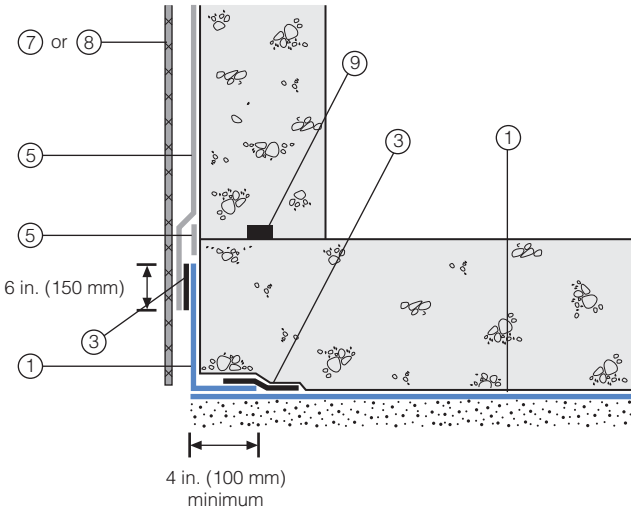
Wall base detail against permanent shutter



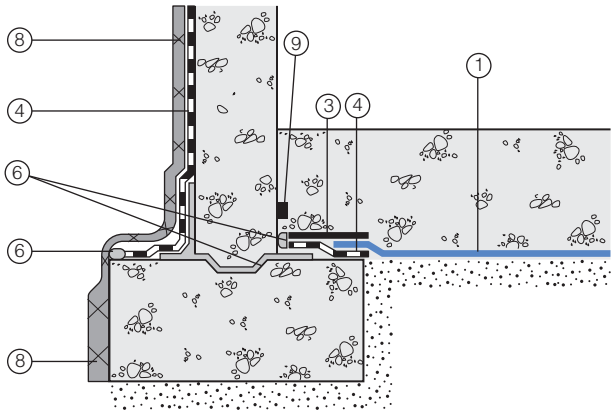
Bituthene wall base detail (Option 1)



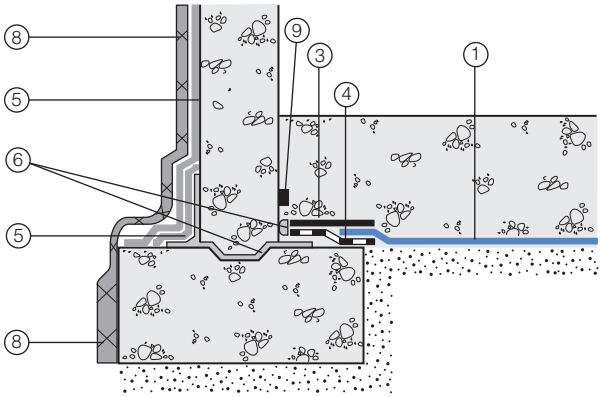
Procor wall base detail (Option 1)



Bituthene wall base detail (Option 2)



Procor wall base detail (Option 2)



1 Preprufe 300R
2 Preprufe 160R
3 Preprufe Tape
4 Bituthene
5 Procor
6 Bituthene Liquid Membrane
7 Protection
8 Hydroduct®
9 Adcor ES
10 Preprufe CJ Tape

Supply

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

Physical Properties

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

Footnotes:

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

Specification Clauses

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

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

Health and Safety

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

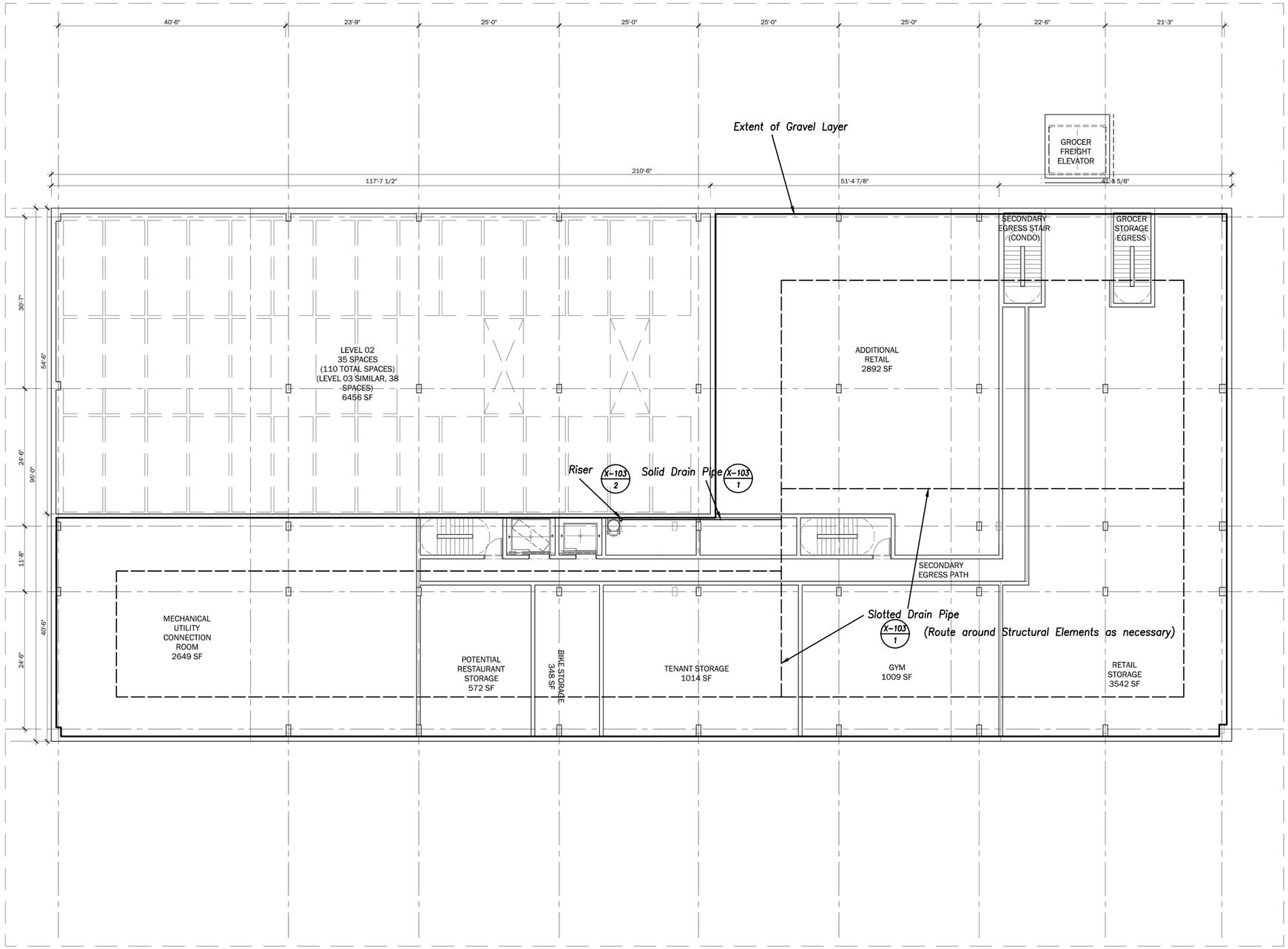
www.graceconstruction.com

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

PF-111H Printed in U.S.A. 07/12 FA/PDF

GRACE

Appendix I
Sub-Slab Depressurization System (SSDS) Details



DXA studio
Architecture PLLC
www.dxastudio.com
894 6th Avenue
5th Floor
New York, NY 10001
T 212 874 0567

OWNER

Rockfarmer Properties
42-01 235th Street
Douglaston, NY 11363
T: 718-229-4488

PROJECT TEAM

STRUCTURAL CONSULTANT
Silman
32 Old Slip, 10th Floor
New York, NY 10005
T: 212 620 7970

MECHANICAL CONSULTANT
2LS
150 West 30th Street, 4th Floor
New York, NY 10001
T: 917 267 8945

FILING EXPEDITOR
JM Zoning
299 Broadway, Suite 1100
New York, NY 10007
T: 775 628 3726

PARKING CONSULTANT
Philip Habib & Associates
102 Madison Avenue, 11th Floor
New York, NY 10016
T: 212 929 5656

DESIGN DEVELOPMENT
NOT FOR CONSTRUCTION

REVISIONS

N

PROJECT NAME
21-21 31st Street
Astoria, NY 11105

DRAWING NAME
SUB-CELLAR

SEAL+SIGNATURE

DATE 03.07.2017
PROJECT NUMBER 15.56
DRAWING NUMBER
SCALE 1/8" = 1'-0"

A-109.00

PAGE NUMBER

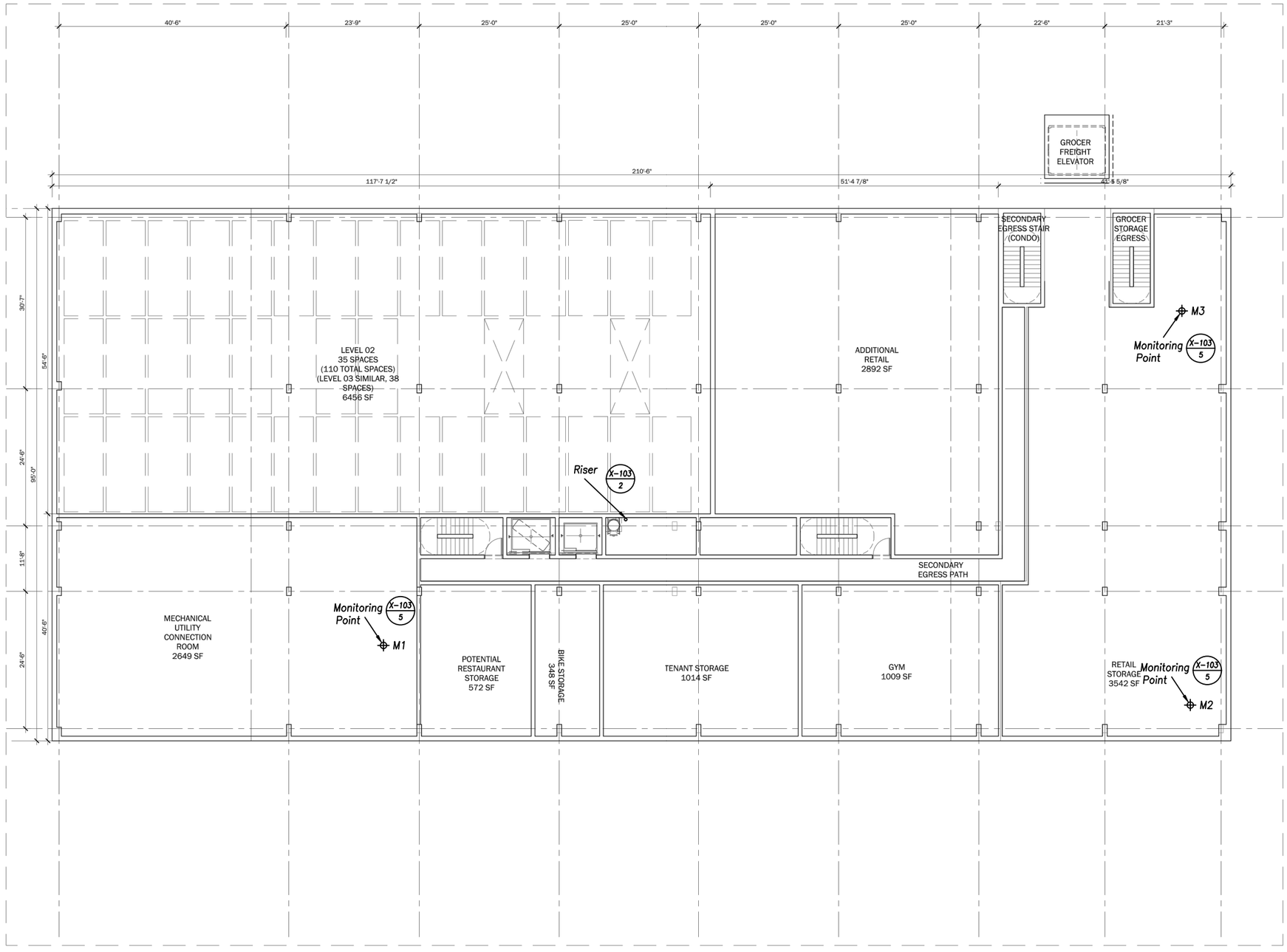
NYC D.O.B. BSCAN

SITE
BCP Site #C241167
21-25 31st Street
Queens, New York

CONSULTANT
TENEN ENVIRONMENTAL
TENEN ENVIRONMENTAL, LLC
121 West 27th Street
Suite 702
New York, NY 10001
O: 646-606-2332
F: 646-606-2379

DRAWN BY: MC
CHECKED BY: MM
DATE: APRIL 2017
SCALE: AS NOTED

DRAWING TITLE: X-100
DRAWING NO.: SSDS SUBGRADE LAYOUT



DXA studio
Architecture PLLC
www.dxastudio.com
894 6th Avenue
5th Floor
New York, NY 10001
T 212 874 0567

OWNER

Rockfarmer Properties
42-01 235th Street
Douglaston, NY 11363
T: 718-229-4488

PROJECT TEAM

STRUCTURAL CONSULTANT
Silman
32 Old Slip, 10th Floor
New York, NY 10005
T: 212 620 7970

MECHANICAL CONSULTANT
2LS
150 West 30th Street, 4th Floor
New York, NY 10001
T: 917 267 8945

FILING EXPEDITOR
JM Zoning
299 Broadway, Suite 1100
New York, NY 10007
T: 775 628 3726

PARKING CONSULTANT
Philip Habib & Associates
102 Madison Avenue, 11th Floor
New York, NY 10016
T: 212 929 5656

DESIGN DEVELOPMENT
NOT FOR CONSTRUCTION

REVISIONS

PROJECT NAME

21-21 31st Street
Astoria, NY 11105

DRAWING NAME

SUB-CELLAR

SEAL+SIGNATURE

DATE	03.07.2017
PROJECT NUMBER	15.56
DRAWING NUMBER	
SCALE	1/8" = 1'-0"
	A-109.00
PAGE NUMBER	

NYC D.O.B. BSCAN

SITE
BCP Site #C241167
21-25 31st Street
Queens, New York

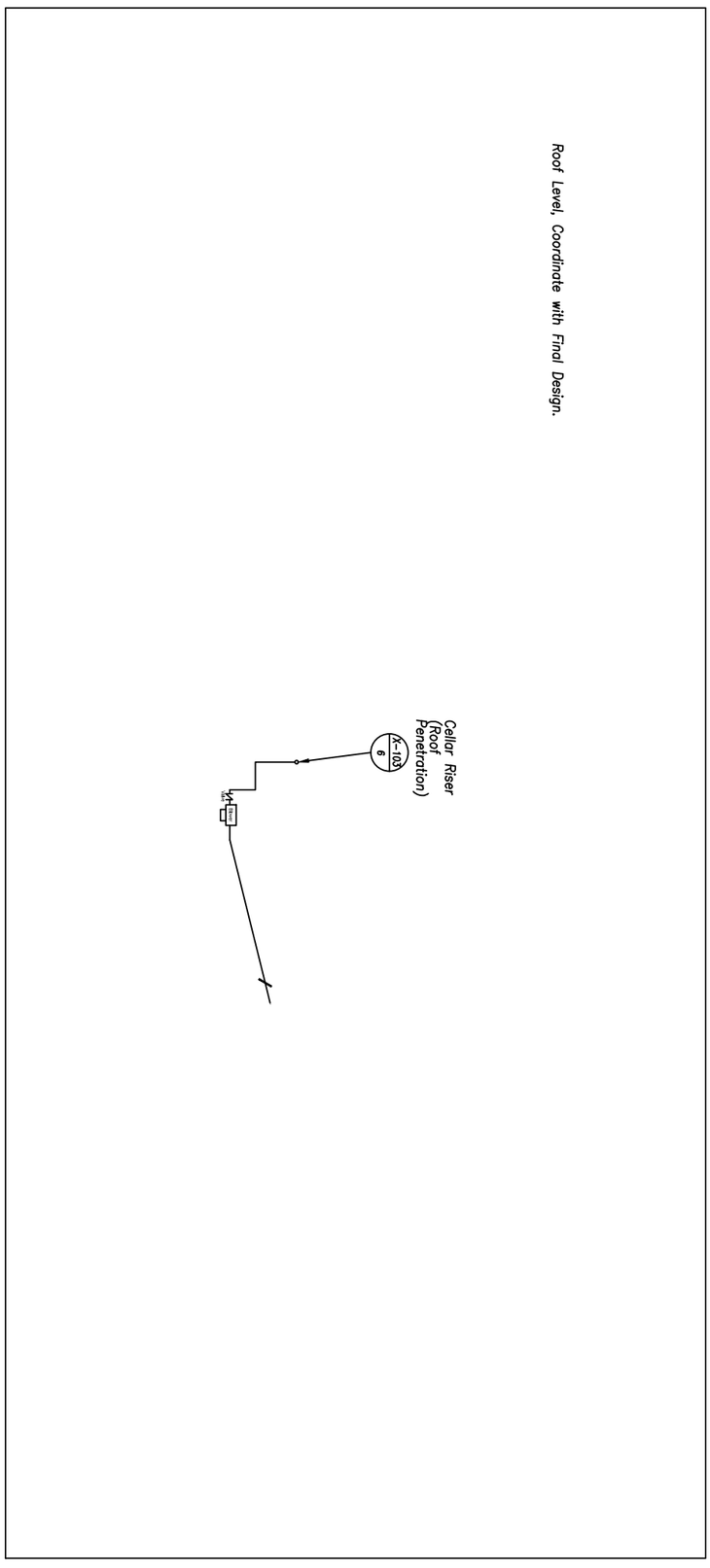
CONSULTANT
TENEN ENVIRONMENTAL

TENEN ENVIRONMENTAL, LLC
121 West 27th Street
Suite 702
New York, NY 10001
O: 646-606-2332
F: 646-606-2379

DRAWN BY	CHECKED BY	DATE	SCALE:
MC	MM	APRIL 2017	AS NOTED

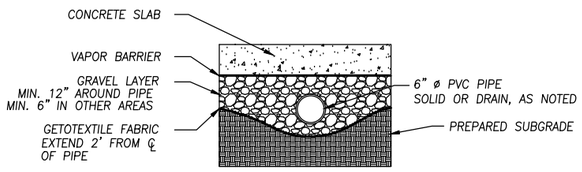
DRAWING TITLE.
X-101

DRAWING NO.
SSDS SUB-CELLAR LAYOUT

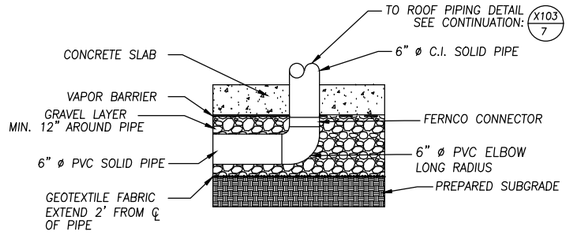


SCALE: 1" = 20'
0
10
20

DRAWING TITLE. X-102	DRAWN BY MC	CONSULTANT TENEN ENVIRONMENTAL TENEN ENVIRONMENTAL, LLC 121 West 27th Street Suite 702 New York, NY 10001 O: 646-606-2332 F: 646-606-2379	SITE BCP Site #C241167 21-25 31st Street Queens, New York
	CHECKED BY MM		
DRAWING NO. SSDS ROOF LAYOUT	DATE APRIL 2017		
	SCALE: AS NOTED		

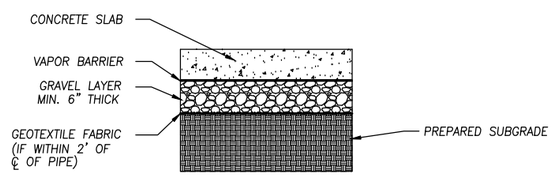


X103 / 1 — Sub–Slab Depressurization Pipe – Through Slab – Side View
Not To Scale

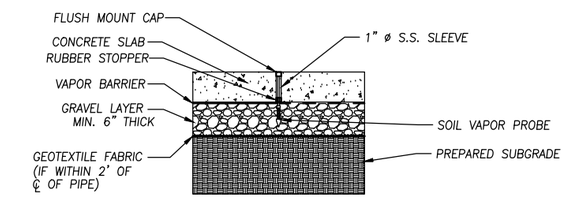


SEAL PENETRATION PER VAPOR BARRIER MANUFACTURER'S SPECIFICATIONS

X103 / 2 — Sub–Slab Pipe to Riser – Through Slab – Side View
Not To Scale

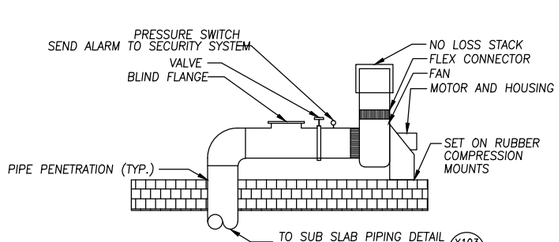


X103 / 3 — Typical Sub–Slab Details – Through Slab – Side View
Not To Scale

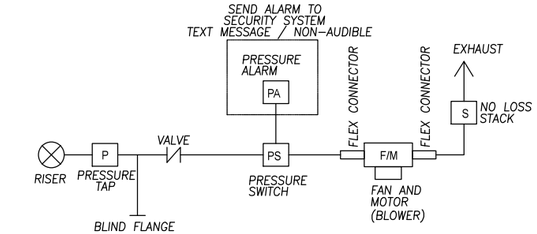


SEAL PENETRATION PER VAPOR BARRIER MANUFACTURER'S SPECIFICATIONS

X103 / 5 — Pressure Monitoring Point – Through Slab – Side View
Not To Scale



X103 / 6 — Suction Fan Detail – Through Roof – Side View
Not To Scale



X103 / 7 — Sub–Slab Depressurization System Schematic
Not To Scale – On Bulkhead Roof Unless Specified

0 10 20
SCALE: 1" = 20'

SITE
BCP Site #C241167
21-25 31st Street
Queens, New York

CONSULTANT
TENEN ENVIRONMENTAL
TENEN ENVIRONMENTAL, LLC
121 West 27th Street
Suite 702
New York, NY 10001
O: 646-606-2332
F: 646-606-2379

DRAWN BY: MC
CHECKED BY: MM
DATE: APRIL 2017
SCALE: AS NOTED

DRAWING TITLE: X-103
DRAWING NO.: SSDS DETAILS