FORMER
EAST COAST INDUSTRIAL UNIFORMS SITE
BCP No. C224156

39 SKILLMAN STREET
BROOKLYN NEW YORK
Block 1886 Lot 10

REMEDIAL ACTION WORK PLAN

NOVEMBER 2012

Prepared for:
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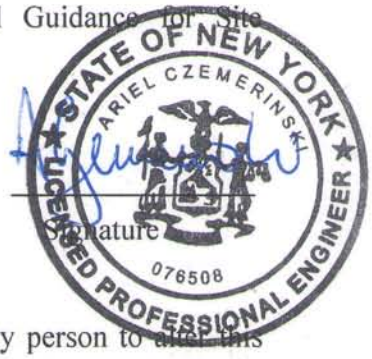
CERTIFICATIONS

I Ariel Czemerinski certify that I am currently a NYS registered professional engineer 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).



076508	4/8/2013	
NYS Professional Engineer #	Date	Signature

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.

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LIST OF ACRONYMS

Acronym	Definition
AMC	AMC Engineering
AWQS	Ambient Water Quality Standards
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
BTEX	Benzene, Toluene, Ethylbenzene and Xylene
CQMP	Construction Quality Management Plan
DUSR	Data Usability Statement Report
EBC	Environmental Business Consultants
FER	Final Engineering Report
HDPE	High Density Polyethylene
IRM	Interim Remedial Measure
NYC	New York City
NYCDEP	New York City Department of Environmental Protection
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
PS	Public School
PVC	Polyvinyl Chloride
RAO	Remedial Action Objectives
RAWP	Remedial Action Work Plan
RI	Remedial Investigation
RSCOs	Recommended Site Cleanup Objectives
SCG	Standards, Criteria, and Guidelines
SMMP	Soil/Materials Management Plan
SMP	Site Management Plan
SSDS	Sub-slab Depressurization System
SWPPP	Stormwater Pollution Prevention Plan
SVOCs	Semi-Volatile Organic Compounds
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VOCs	Volatile Organic Compounds

EXECUTIVE SUMMARY

Site Description/Physical Setting/Site History

This Remedial Action Work Plan has been prepared for a commercial property located 39 Skillman Street in the Bedford Stuyvesant section of Brooklyn (**Figure 1**). The site known as the Former East Coast Industrial Uniforms Site (the Site) was formally accepted into the New York State Department of Environmental Conservation (NYSDEC) Brownfields Cleanup Program (BCP) through a Brownfield Cleanup Agreement (BCA) executed in March 27, 2012. The applicant was accepted into this program as a Volunteer.

The Site address is 39 Skillman Street. It is located on the east side of Skillman Street between Park Avenue and Myrtle Avenue in Brooklyn, New York. The site is designated as 1886 Lot 10 on the New York City Tax Map. The Site consists of a total of 25,000 square feet (0.57-acres) and is bounded by a community / office building to the north, residential buildings to the east, residential buildings to the west and family residential buildings to the south.

The Site was developed prior to 1887 with a Brooklyn Union Gas "Gasometer" in the northern third of the property and multiple residential homes and stores on the southern portion. By 1935, the Gasometer was removed and that portion of the site was vacant. The southern portion was unchanged. A small storage building was added to the northern lot in 1947. By 1965 the houses are gone from the southern portion of the property and the north lot was used as a furniture/frame company. By 1974 the property was its current configuration and was utilized by the East Coast Industrial Uniform Company. East Coast Industrial Uniforms owned the property and operated a commercial laundry facility at the Site from 1974 until 2008. The buildings remained vacant from 2008 until they were demolished in the Spring of 2012.

Petroleum contamination was observed in soil and groundwater during the installation of soil borings at the site in September 2011. The NYSDEC was notified of these conditions and Spill No. 11-08026 was assigned.

Summary of the Remedial Investigation

A Remedial Investigation Work Plan (RIWP) was prepared for this site and approved for implementation by the NYSDEC on June 5, 2012 following a 30-day public review period from December 13, 2011 through January 13, 2012. The goals of the Remedial Investigation were to define the nature and extent of contamination in soil, groundwater and any other impacted media; to identify the source(s) of the contamination; to assess the impact of the contamination on public health and/or the environment; and to provide information to support the development of a Remedial Work Plan to address the contamination.

Activities completed under the RI:

- Sampling for non-petroleum contaminants such as pesticides, PCBs and metals in soil and groundwater including the analysis of soil and groundwater samples
- Soil sampling and analysis for petroleum compounds and industrial solvents including volatile and semi-volatile organic compounds in soil samples from soil boring locations;
- The installation of groundwater monitoring wells
- The collection and analysis of groundwater samples for volatile and semi-volatile organic compounds, pesticides, PCBs and metals;
- The collection of analysis of soil gas samples for volatile organic compounds from soil vapor implants.

The field work portion of the RI was conducted by Environmental Business Consultants (EBC) from June 4 to June 19, 2012, in accordance with the protocols and methods as established in the approved Remedial Investigation Work Plan).

The results of sampling performed during the RI and IRM identified petroleum VOCs and CVOCs in soil in the vicinity of the previously abandoned-in-place 3,000 gallon UST located in the northwest corner of Building 2. The contaminants were found along a 50 ft x 100 ft impact zone which extended from the tank area to the eastern property line. The vertical “smear zone” within this area varies from approximately 8 ft to 25 feet below grade near the tank to 22 to 23.5 feet below grade along the southeast terminus.

Groundwater impacts were reported for both petroleum VOCs and SVOCs at relatively low but elevated (above standards) concentrations. Petroleum VOC parameters included trimethylbenzenes, ethylbenzene and xylenes. Dissolved SVOC parameters primarily consist of naphthalene and phrenanthrene. Although these compounds are found in groundwater near the UST, they are highest at the eastern property line suggesting that source area contribution is no longer significant.

The petroleum VOCs and SVOCs in groundwater are migrating east in the direction of groundwater flow. The levels are generally low and migration in groundwater is limited by the physical properties (high sorption coefficient) of the constituents. In addition, based on the depth to water (>22 ft), and the absence of significant levels of petroleum VOCs in on-site soil gas, limited, if any, off-gassing is occurring of these compounds. Since the only SVOCs reported above unrestricted SCOs were in samples of deep fill associated with the former gas holder area, SVOCs in groundwater may be related to a release of fuel oil associated with the UST, the former gas holder or a combination of the two.

CVOCs in groundwater are also migrating east in the direction of groundwater flow from this source area however, some portion of the CVOCs may be the result of a documented CVOC plume which located upgradient of the site. CVOCs were reported in soil gas with the highest concentrations noted in the vicinity of the UST area and downgradient near the east property line and in the extreme northern area of the Site. This suggests the CVOCs are related to on-site affected soil as well as off-gassing from the higher concentration off-site plume or possibly migrating onto the site in vapor form from an off-site source. Total CVOCs in groundwater were reported at a concentration of 19,680 µg/L 250 feet north of the site with concentrations in sub-slab soil gas reported as high as 14,700 µg/m3 approximately 185 feet north of the site (National Grid - GEI Consultants 2/2012).

Fill materials containing elevated levels of SVOCs and / or heavy metals were documented throughout the site at a depth which ranged from 1 foot below the surface in the southern part of the site to 20 feet below grade in the northern third of the site. The significant increase in fill

thickness in the northern portion of the site is believed to be related to backfilling of the former gas holder structure sometime during the 1920's when it was removed from service.

Qualitative Human Health Exposure Assessment

The qualitative exposure assessment identified potential completed routes of exposure to construction workers and remediation workers through inhalation, ingestion and dermal contact during excavation activities. The Health and Safety Plan prepared for the site identifies such exposures and provides instructions for on-site workers to minimize potential exposure. Occupants in the proposed on-site residential buildings may be exposed to VOCs through the vapor intrusion pathway if VOCs in source area soil and groundwater are not remediated, or if preventive measures such as vapor barriers or sub-slab ventilation are not employed.

The exposure assessment also identified potential exposure to commercial workers and residents in adjacent buildings both upgradient and downgradient of the site, to vapor intrusion from an off-site CVOC source. Off-site exposure from CVOCs in groundwater to indoor air would be expected to be greater to residential properties located upgradient of the site where concentrations in both soil gas and groundwater were found to be significantly higher than those found on the site.

Potential environmental impacts through the groundwater to surface water discharge were not expected due to the distance to the nearest surface water receptor.

Summary of the Remedy

The selected remedy will achieve a Track 4 Cleanup and will include the following items:

1. Removal of petroleum and CVOC impacted soil from the former UST area in the west-central area of the Site.
2. Excavation of soil/fill as necessary to construct the basement levels and foundation of the new buildings ; Screening for indications of contamination (by visual means, odor, and monitoring with PID) of all excavated soil during any intrusive Site work;

3. Collection and analysis of end-point samples to evaluate the performance of the remedy with respect to attainment of Track 4 Site Specific SCOs;
4. Appropriate off-Site disposal of all material removed from the Site in accordance with all Federal, State and local rules and regulations for handling, transport, and disposal;
5. Import of materials to be used for backfill and cover in compliance with: (1) chemical limits and other specifications included in **Table 1**, (2) all Federal, State and local rules and regulations for handling and transport of material.
6. Injection of a chemical oxidant solution to address petroleum VOCs and CVOCs in groundwater and residual petroleum VOC contamination in soil at the water table.
7. Installation of a sub-slab depressurization system and vapor barrier beneath occupied areas of the buildings to be constructed on the Site.
8. A composite cover system consisting of the concrete building slabs will be constructed.
9. Implementation of a Site Management Plan (SMP) for long term maintenance of the Engineering Controls.
10. An Environmental Easement will be filed against the Site to ensure implementation of the SMP.

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

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

REMEDIAL ACTION WORK PLAN

1.0 INTRODUCTION

39 Skillman Street LLC entered into a Brownfield Cleanup Agreement (BCA) with the New York State Department of Environmental Conservation (NYSDEC) on March 27, 2012, to investigate and remediate a 0.57-acre property located at 39 Skillman Street, Kings County, New York. 39 Skillman Street LLC is a Volunteer in the Brownfield Cleanup Program. A residential use is proposed for the property. When completed, the Site will be redeveloped with 3 new 6-story residential buildings. Refer to the Brownfield Cleanup Program (BCP) application for additional details.

This Remedial Action Work Plan (RAWP) summarizes the nature and extent of contamination as determined from data gathered during the Remedial Investigation (RI), performed between and. It provides an evaluation of a Track 1 cleanup and other applicable Remedial Action alternatives, their associated costs, and the recommended and preferred remedy. The remedy described in this document is consistent with the procedures defined in DER-10 and complies with all applicable standards, criteria and guidance. The remedy described in this document also complies with all applicable Federal, State and local laws, regulations and requirements. The NYSDEC and New York State Department of Health (NYSDOH) have determined that this Site does not pose a significant threat to human health and the environment. The RI for this Site did not identify fish and wildlife resources. A formal Remedial Design document will not be prepared. See Section 6.0 of this RAWP for remedial design information.

1.1 SITE LOCATION AND DESCRIPTION

The Site is located in Kings County, New York City, New York and is identified as Block 1886 Lot 10 on the New York City Department of Assessment Tax Map. A United States Geological Survey (USGS) topographical quadrangle map (**Figure 1**) shows the Site location. The Site consists of a total of 25,000 square feet (0.57-acres) and is bounded by a community / office building to the north, residential buildings to the east, residential buildings to the West and family residential buildings to the south (see **Figures 2 and 3**). A boundary map is attached to

the BCA as required by Environmental Conservation Law (ECL) Title 14 Section 27-1419. The 0.57-acre property is fully described in **Attachment A – Metes and Bounds.**

1.2 CONTEMPLATED REDEVELOPMENT PLAN

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

Redevelopment plans for the Site include with the construction of three new 6-story residential apartment buildings. Current plans call for each building to have 16 apartments with a mix of 3, 4 and 5 bedroom units to better serve the needs of the community. Each building will feature a partial below grade (7 ft) basement level with utility rooms, residential living space, and 8-9 parking spaces and outdoor recreation areas on the roof.

1.3 DESCRIPTION OF SURROUNDING PROPERTY

The surrounding land use (**Figure 3**) includes three new multi-family residential buildings to the east, four new multi-family residential buildings and a vacant commercial building to the west, older multi-family walk up style buildings to the south and a community/office building to the north. The area has been changing in response to the upzoning and many of the industrial/commercial buildings are being converted to, or replaced by, new residential buildings and schools.

2.0 DESCRIPTION OF REMEDIAL INVESTIGATION FINDINGS

The Site was investigated in accordance with the scope of work presented in the NYSDEC-approved Remedial Investigation (RI) Work Plan dated May 2012. The investigation was conducted between June 4th and June 19th 2012.

2.1 SUMMARY OF REMEDIAL INVESTIGATIONS PERFORMED

The field effort included the collection and analysis of soil, groundwater and soil gas samples. Drilling services were provided by Eastern Environmental Services (Eastern) of Manorville, NY and DK Drilling of Bayside, NY. Laboratory services were provided by Phoenix Environmental Laboratories of Manchester, CT. A sample matrix showing the number, type and analysis of samples collected during the Remedial Investigation is provided as **Table 2**.

2.1.1 Borings

A total of 15 soil borings (SB1-SB15) were advanced to evaluate the extent and degree of impact in the identified source area and to obtain general soil quality information both within and below the fill materials present at the site. Soil borings were advanced on June 4, 5 and 14, 2012.

At soil boring locations SB1 to SB14, soil samples were collected continuously in 5-foot intervals using a track-mounted Geoprobe™ model 66DT sampling system. The Geoprobe™ uses a direct push hydraulic percussion system to drive and retrieve core samplers. Soil samples were retrieved using a 2-inch diameter, 5-foot long macro-core sampler with disposable acetate liners. At each soil boring location, sampling was conducted to a depth of 30 feet below building slab or parking lot grade. Note that grade level was minus 3 feet in the northern third of the site.

Refusal was encountered at a depth or 25 feet below grade at location SB15 despite repeated attempts within the same general area. A CME 75 rotary drill rig with hollow stem augers was mobilized to the site on June 14 to complete the boring. After boring through an obstruction at 25 feet using a roller cone center bit, soil samples were collected using a 140 lb drop hammer and 2-inch diameter by 2-foot long split core barrel samplers to a depth of 33 feet.

Each soil sample recovered from the soil borings was characterized by an experienced geologist and field screened for the presence of VOCs using a photo-ionization detector (PID). The geologist's field observations and PID readings were recorded for each boring in a soil boring log. The location of soil borings are shown on **Figure 4**.

2.1.2 Monitoring Wells

A total of 9 shallow (MW1S, MW2, MW3, MW4S, MW5, MW6S, MW7, MW8, MW9S) and 4 deep (MW1D, MW4D, MW6D, MW9D) groundwater monitoring wells were installed on June 6 and June 14, 2012 to establish general groundwater quality at the site and the groundwater flow direction.

Monitoring wells MW1-MW8 (shallow and deep) were constructed of 1-inch diameter PVC casing and fifteen feet of 0.010 inch slotted PVC well screen. MW9S and 9D were constructed of 2-inch diameter PVC casing and fifteen feet of 0.010 inch slotted PVC well screen. At each well a No.00 morie filter sand was placed in the borehole to within 2 feet above the top of the screen. A 1-foot hydrated bentonite seal was then placed on top of the filter sand and the remainder of the borehole was backfilled to grade. Following installation, each of the wells was surveyed to determine relative casing elevation to the nearest 0.01 ft and horizontal position to the nearest 0.1 ft.

Prior to sampling, a synoptic round of depth-to-groundwater (DTW) measurements was obtained from the wells on June 13, 2012 to determine the water table elevation and to calculate the volume of standing water in the well. Monitoring well locations are shown on **Figure 5**. A groundwater elevation map is provided in **Figure 6**.

2.1.3 Samples Collected

A summary of the sampling performed during the RI is provided in **Table 2**.

2.1.3.1 Soil Samples

Three to five samples were retained from each of the 15 soil boring locations for a total of 51 soil samples. Retained soil samples were submitted for laboratory analysis of VOCs by EPA Method

8260 and SVOCs by EPA Method 8270. In addition to VOC and SVOC analysis, 22 samples were submitted for analysis of Target Analyte List (TAL) metals, and Pesticides/PCBs by Method 8081/8082.

2.1.3.2 Groundwater Samples

Groundwater samples were obtained from temporary probe points installed at locations SB6, SB8, SB10 and SB12 on June 6, 2012 and from locations SB2 and SB4 on June 8, 2012. Groundwater samples were collected from all shallow (MW1-MW9) and deep (MW1D, MW4D, MW6D and MW9D) on June 18 and 19, 2012.

Samples were collected in accordance with the procedures outlined in Section 2.2 of the approved RIWP. A peristaltic pump and polyethylene sampling tubing fitted with a stainless steel check valve was used to purge and collect samples from each well / temporary probe location. Sample tubing and the silicone pump tubing was replaced between each sample location. Samples were collected directly into pre-cleaned laboratory supplied glassware, stored in a cooler with ice and submitted to Phoenix Environmental Laboratories of Manchester, CT, a New York State ELAP certified environmental laboratory (ELAP Certification No. 11301).

2.1.3.3 Soil Gas Samples

To assess the presence of VOCs in soil gas beneath the site, eight soil gas samples (SG1-SG8) and one outdoor control sample (OA1) were collected over a 2 hr sampling period in June 17, 2012 (see **Figure 7**). The canister connected to the SG3 vapor implant failed to show a change in vacuum over the sampling period. The problem was traced to the pre-calibrated valve and could not be corrected in the field. Under these circumstances the SG3 sample could not be analyzed.

Soil vapor and outdoor ambient air samples were collected in accordance with the procedures as described in section 2.4 of the approved RIWP and the *Guidance for Evaluating Soil Vapor Intrusion in the State of New York (NYSDOH 10/06)*.

2.1.4 Chemical Analytical Work Performed

Each soil and groundwater sample was placed in pre-cleaned laboratory supplied glassware, and placed in a cooler packed with ice for transport to the laboratory. Sample analysis was provided by C Phoenix Environmental Laboratories of Manchester, CT, a New York State ELAP certified environmental laboratory (ELAP Certification No. 11301).

Soil samples were submitted for laboratory analysis of VOCs by EPA Method 8260 and SVOCs by EPA Method 8270. In addition to VOC and SVOC analysis, 22 samples were submitted for analysis of Target Analyte List (TAL) metals, and Pesticides/PCBs by Method 8081/8082.

All groundwater samples from the shallow monitoring wells were analyzed for VOCs / SVOCs by EPA method 8260 / 8270, target analyte list (TAL) metals (total, dissolved) and pesticides/PCBs by Method 8081/8082. Groundwater samples from the temporary probe points were analyzed for VOCs / SVOCs only while groundwater samples from the deep monitoring wells were analyzed for VOCs only.

Eight soil gas samples and one ambient outdoor air sample were analyzed for VOCs by EPA method TO-15.

2.1.5 Documentation

Maps showing the locations of the soil borings, monitoring wells and soil gas sample collection points are provided in **Figures 4** through **5** and **Figure 7**. The results of sample soil, groundwater and soil gas samples collected during the RI are summarized in **Tables 3** through **13**. Below is a summary of RI findings.

The results of sampling performed during the RI and IRM identified petroleum VOCs and CVOCs in soil in the vicinity of the previously abandoned-in-place 3,000 gallon UST located in the northwest corner of Building 2. The contaminants were found along a 50 ft x 100 ft impact zone which extended from the tank area to the eastern property line. The vertical “smear zone” within this area varies from approximately 8 ft to 25 feet below grade near the tank to 22 to 23.5 feet below grade along the southeast terminus.

Groundwater impacts were reported for both petroleum VOCs and SVOCs at relatively low but elevated (above standards) concentrations. Petroleum VOC parameters included trimethylbenzenes, ethylbenzene and xylenes. Dissolved SVOC parameters primarily consist of naphthalene and phrenanthrene. Although these compounds are found in groundwater near the UST, they are highest at the eastern property line suggesting that source area contribution is no longer significant.

The petroleum VOCs and SVOCs in groundwater are migrating east in the direction of groundwater flow. The levels are generally low and migration in groundwater is limited by the physical properties (high sorption coefficient) of the constituents. In addition, based on the depth to water (>22 ft), and the absence of significant levels of petroleum VOCs in on-site soil gas, limited, if any, off-gassing is occurring of these compounds. Since the only SVOCs reported above unrestricted SCOs were in samples of deep fill associated with the former gas holder area, SVOCs in groundwater may be related to a release of fuel oil associated with the UST, the former gas holder or a combination of the two.

CVOCs in groundwater are also migrating east in the direction of groundwater flow from this source area however, some portion of the CVOCs may be the result of a documented CVOC plume which located upgradient of the site. CVOCs were reported in soil gas with the highest concentrations noted in the vicinity of the UST area and in the extreme northern area of the Site. This suggests the CVOCs are related to on-site affected soil as well as off-gassing from the higher concentration off-site plume or possibly migrating onto the site in vapor form from an off-site source. Total CVOCs in groundwater were reported at a concentration of 19,680 µg/L 250 feet north of the site with concentrations in sub-slab soil gas reported as high as14,700 µg/m3 approximately 185 feet north of the site (National Grid - GEI Consultants 2/2012)..

Fill materials containing elevated levels of SVOCs and / or heavy metals were documented throughout the site at a depth which ranged from 1 foot below the surface in the southern part of the site to 20 feet below grade in the northern third of the site. The significant increase in fill thickness in the northern portion of the site is believed to be related to backfilling of the former gas holder structure sometime during the 1920's when it was removed from service.

2.2 SIGNIFICANT THREAT

The NYSDEC and NYSDOH have reviewed the RI Report and have determined that this Site does not pose a significant threat to human health and the environment. Notice of that determination was provided during the 45-day public comment period for this RAWP and the Proposed Decision Document.

2.3 SITE HISTORY

2.3.1 Past Uses and Ownership

Previous owners and operators of the property are shown in tables below. Information regarding ownership of the property was obtained from online property records maintained by the NYC Department of Finance Office of the City Register under its Automated City Register Information System (ACRIS) and from hard copy records at the agencies regional office. Information regarding past operators was obtained from the previous property owner/operator (East Coast Industrial Uniform), Sanborn Fire Insurance maps (**Attachment B**), Certificates of Occupancy and from telephone directory listings. East Coast Industrial Uniform owned the Site from 1974 to the present and operated until 2008. Miller Hoff Parlor Frame Company owned and operated at the Site prior to 1974 and acquired the southern portion of the Site from individual lot owners from 1946 to 1960.

Table 1 – Previous Owners

Dates	Name	Comments	Contact Info
39 Skillman Street Prior to 1/46	Unreadable	Deed	402 Westminster Road, Brooklyn, NY
41 Skillman Street Prior to 12/22/50	Augusta Swartz	Deed	2125 74th Street, Brooklyn, NY
43 Skillman Street Prior to 8/24/60	Alice Vetere Elvira Vitale	Deed	135 Quincy Street, Brooklyn 1241-32 87th Avenue, Bellrose, NY
45 Skillman Street Prior to 11/4/57	Anthony Capozzi	Deed	96 Spencer Street, Brooklyn, NY
47 Skillman Street prior to 10/26/59	Asuncion Fuentes Graciano Fuentes		96 Spencer Street, Brooklyn, NY

39 Skillman St. from 1/46 to 7/31/74 41 Skillman St. from 12/22/50 to 7/31/74 43 Skillman St. from 8/24/60 to 7/31/74 45 Skillman St. from 11/4/57 to 7/31/74 47 Skillman St. from 10/26/59 to 7/31/74	Miller - Hoff Parlor Frame Co. Inc. Pauline Hoffman, Mae Marcos and Phylis Greisdorf	Deed	C/O Mac H. Marcos Northwest 99th Avenue, Tamarac FL, 33321
7/31/74 to Present	East Coast Industrial Uniform	Deed	39 Skillman Street, New York, NY

Note: 39 Skillman Street LLC is in no way affiliated with East Coast Industrial Uniform or any of the prior owners of the property.

Table 2 – Previous Operators

Dates	Name	Comments	Contact Info
prior to 1887 to sometime prior to 1935	Brooklyn Union Gas (National Grid)	Sanborn Maps *for 33-39 Skillman Street only*	287 Maspeth Avenue, Brooklyn, NY 11211
1941 to sometime prior to 1965	Parking Lot	Sanborn Maps Certificate of Occupancy *33-39 Skillman Street Only*	Unknown
After 1947 to sometime prior to 7/31/74	Miller Hoff Parlor Frame Company	Sanborn Maps Deed	C/O Mac H. Marcos Northwest 99th Avenue, Tamarac FL, 33321
1974 to 2008	East Coast Industrial Uniform	Business sold in 2008 and moved off-site	39 Skillman Street, New York, NY

Note: 39 Skillman Street LLC is in no way affiliated with East Coast Industrial Uniforms or any of the prior operators of the property.

The following resources were employed in obtaining historical information with respect to ownership:

- NYC ACRIS Database
- NYC Department of Finance records, Brooklyn Borough office

The following resources were employed in obtaining historical information with respect to operators:

- Interviews with Previous Operators
- Environmental Data Resources - City Directory Search
- Sanborn Fire Insurance Maps
- Certificate of Occupancy Records as Maintained by the Department of Buildings

2.3.2 Phase II Reports

May 2011 - Interim Data Results Report (National Grid)

A prior subsurface investigation was performed within the northern most two-story building (Bldg. No. 3) by GEI Consultants, Inc., on behalf of National Grid in February of 2011. The subsurface investigation was performed as a part of the site characterization (SC) that National Grid is completing under a NYSDEC and New York State Department of Health (NYSDOH)-approved Site Characterization Work Plan for the Skillman Street Former Holder Station Site dated July 2007 and associated Work Plan Change Notice dated August 16, 2010.

The subsurface investigation included installation of four soil borings in the north building. From each soil boring, soil samples were retained for laboratory analysis of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, and total cyanide. GEI also collected a groundwater sample from a temporary well (SSGW04), which was submitted for laboratory analysis of VOCs, SVOCs, metals, and total cyanide.

GEI noted no visual evidence of soil contamination for any of the subsurface soil samples retained at the site, and the laboratory results of the soil samples contained no VOCs above NYSDEC Part 375.6 Unrestricted Use Soil Cleanup Objectives (UUSCOs). However, GEI noted the presence of several polycyclic aromatic hydrocarbons (PAHs) and metals (barium, copper, lead, mercury, and zinc) at a concentration above the their corresponding UUSCO. Benzo(a)pyrene, was also detected at a concentration above the NYSDEC Part 375.6 Industrial Use Soil Cleanup Objective.

GEI noted the presence of benzene (8.1 ppb), cis-l,2-dichloroethene (8.1 ppb), sodium, and total cyanide at concentrations above the their corresponding NYSDEC Ambient Water Quality Standard. Other compounds detected within the SSGW04 groundwater sample include trans1,2-Dichloroethylene (1.0 ppb), trichloroethylene (1.3 ppb), and tetrachloroethylene (3.3 ppb).

The deep soil sample (20-22 feet below grade) collected from the soil boring (SSGP16) performed closest to the formerly abandoned 3,000-gallon No. 2 oil underground storage tank contained elevated concentrations of SVOCs associated with No. 2 fuel oil.

October 2011 Phase II Subsurface Investigation Report (EBC)

A total of four borings were advanced at the Site on September 22, 2011. Each of the four soil boring locations was chosen to gain representative soil and groundwater quality information from areas identified by EBC as areas of concern. The areas of concern include (1) the formerly abandoned 3,000-gallon No. 2 fuel oil storage tank located near the front entrance of building No. 2, (2) the area labeled as "hazardous waste" in the northeast corner of the same building and (3) the concrete trenches used to contain and transport wash water from the former washing machines also located in the same building. Two of the four soil borings (B1 and B2) were performed adjacent to the underground storage tank, one was performed in the "hazardous waste" storage area (B3), and the fourth soil boring (B4) was performed down gradient of the trenches.

A total of 5 soil and 4 groundwater samples were submitted for analysis of volatile organic compounds (VOCs), and/or semi-volatile organic compounds (SVOCs) depending on location and physical observations. Petroleum VOCs were detected in soil above their corresponding NYSDEC Part 375.6 unrestricted soil cleanup objectives. Petroleum VOCs, SVOCs and chlorinated VOCs were reported in groundwater above standards.

Due to the petroleum contaminated soil encountered during the site investigation, EBC contacted the NYSDEC Spills Hotline. NYSDEC Spill No. 11-08026 was assigned to the site.

The report concluded that, “The former use of the site as a laundry facility and the presence of chlorinated solvents (PCE) in groundwater noted during both this subsurface investigation within Building No. 2 and the subsurface investigation performed by GEI Consultants, Inc. in May of 2011, suggests an onsite source of chlorinated VOCs not identified during this brief property transaction Phase II.” “ Additional soil and groundwater sampling will be necessary to identify the source of the chlorinated VOC contamination.”

The report further concluded that, “Although no soil contamination was observed within the soil immediately below the abandoned-in-place 3,000-gallon No. 2 fuel oil underground storage tank,

petroleum contaminated soil including VOCs and SVOCs was encountered at the groundwater interface. The VOCs and SVOCs in soil have impacted groundwater at the site."

2.3.3 Sanborn Maps

The environmental history of the Site was previously investigated through the review of Sanborn Fire Insurance maps.

The Site was developed prior to 1887 with a Brooklyn Union Gas "Gasometer" in the northern third of the property and multiple residential homes and stores on the southern portion. By 1935, the Gasometer is gone and that area of the site is now vacant. The southern portion is unchanged. A small storage building is added to the northern lot in 1947. By 1965 the houses are gone from the southern portion of the property and the north lot is now labeled as a furniture/frame company.

By 1977 property is shown in its current configuration with two attached buildings in the northern area and a small parking lot in the southern portion of the lot. The property is labeled as East Coast Industrial Uniform Company.

2.4 GEOLOGICAL CONDITIONS

The geologic setting of Long Island is well documented and consists of crystalline bedrock overlain by layers of unconsolidated deposits. According to geologic maps of the area created by the United States Geologic Survey (USGS), the bedrock in this area of Brooklyn is an igneous intrusive classified as the Hartland formation of middle Ordovician to middle Cambrian age. Unconsolidated sediments overlie the bedrock and consist of Pleistocene aged sand, gravel and silty clays, deposited by glacial-fluvial activity. Non-native fill materials consisting of dredge spoils, rubble and / or other materials have been historically used to reinforce and extend shoreline areas and to raise and improve the drainage of low lying areas.

Subsurface soils at the site include an urban fill layer at the surface which varies from less than 1 foot thick in the southern portion of the property to at least 15 feet thick at location B15 in the northwest corner of the Site. According to the SCR prepared by GEI, fill materials beneath

building 3, on which the former gas holder was located, extended to a depth of approximately 20 feet below the surface. Surface grade (slab) in building 3 was approximately 4 feet lower than the remainder of the Site. Although the building was demolished prior to implementation of the RI, this area of the site remained 3-4 feet below street level.

Below the fill material native soils consisting of brown sand with some gravel grading to a native fine to medium brown sand with a trace amount of silt and / or gravel was observed to and below the water table.

Groundwater at the Site is present at a depth of approximately 22 to 25 feet below surface grade within the native sands. Groundwater flow is generally west to east which confirms the findings of the SCR prepared by GEI. The potentiometric difference between shallow and deep well couplets indicate a downward potential in the southern part of the site changing to an upward potential in the northern part of the site.

2.5 CONTAMINATION CONDITIONS

2.5.1 Conceptual Model of Site Contamination

Although the date(s) and circumstances surrounding the release of petroleum at the site are not known, it can be assumed that the petroleum VOCs reported in soil and groundwater are associated with the existing fuel oil UST. The evidence for this is the physical signs of petroleum contamination in shallow soil adjacent to the tank. The petroleum VOCs may be related to the use of common distribution systems for both gasoline and fuel oil products at MOSF facilities. This would result in lower VOC concentrations overall as they would be an incidental and minor component of the fuels composition.

The release scenario is unknown but is likely associated with some failure of the UST system. Released fuel from this area migrated vertically until it contacted the water table at a depth of approximately 22 feet below surface grade where it then migrated east with the direction of groundwater flow. Decomposition and weathering overtime succeeded in reducing residual SVOC concentrations to below unrestricted criteria and VOC concentrations to below restricted

residential criteria. In any case the petroleum VOCs detected consist largely of trimethylbenzenes and xylenes suggesting an old release.

The petroleum VOCs and SVOCs in groundwater are migrating east in the direction of groundwater flow. The levels are generally low and migration in groundwater is limited by the physical properties (high sorption coefficient) of the constituents. In addition, based on the depth to water (>22 ft), and the absence of significant levels of petroleum VOCs in on-site soil gas, limited, if any, off-gassing is occurring of these compounds. Since the only SVOCs reported above unrestricted SCOs were in samples of deep fill associated with the former gas holder area, SVOCs in groundwater may be related to a release of fuel oil associated with the UST, the former gas holder or a combination of the two.

CVOCs in groundwater are also migrating east in the direction of groundwater flow from this source area however, some portion of the CVOCs may be the result of a documented CVOC plume which located upgradient of the site. CVOCs were reported in soil gas with the highest concentrations noted in the vicinity of the UST area and downgradient near the east property line and in the extreme northern area of the Site. This suggests the CVOCs are related to on-site affected soil as well as off-gassing from the higher concentration off-site plume or possibly migrating onto the site in vapor form from an off-site source.

2.5.2 Description of Areas of Concern

The primary area of concern is a former 3,000 gallon fuel oil UST which was located in the northwest corner of Building 2. The fuel oil tank is related to the source of the petroleum VOCs and SVOCs detected in soil and / or groundwater at the site. CVOCs in soil were also found in soil in this area above unrestricted SCOs.

CVOCs in soil gas and groundwater beneath the site are primarily associated with this source area. However, an off-site CVOC groundwater plume is located less than 250 feet upgradient of the Site. CVOCs in the off-site plume are significantly higher then those found on the Site. In addition high concentrations of CVOCs in soil gas have been reported off-site as well. The origin of this off-site CVOC plume has not been determined.

Contaminated media documented at the site includes soil, groundwater and soil gas which were found to be contaminated with VOCs and / or SVOCs during the RI.

2.5.3 Soil/Fill Contamination

The results of sampling performed during this RI, identified petroleum VOCs and SVOCs in soil and groundwater which are likely related to a previously abandoned-in-place 3,000 gallon UST located in the northwest corner of Building 2. The contaminants were found along a 50 ft x 100 ft impact zone which extended from the tank area to the eastern property line. The vertical "smear zone" within this area varies from approximately 8 ft to 25 feet below grade near the tank to 22 to 23.5 feet below grade along the southeast terminus.

Fill materials containing elevated levels of SVOCs and / or heavy metals were documented throughout the site at a depth which ranged from 1 foot below the surface in the southern part of the site to 20 feet below grade in the northern third of the site. The significant increase in fill thickness in the northern portion of the site is believed to be related to backfilling of the former gas holder structure sometime during the 1920's when it was removed from service.

2.5.3.1 Summary of Soil/Fill Data

Soil sample results from the RI are summarized in **Tables 3-6**. Further information on soil sample collection, handling and analysis can be found in the RI Report (EBC 7/12).

2.5.3.2 Comparison of Soil/Fill with SCGs

Table 7 shows sample results above Track 1 Unrestricted SCOs for all overburden soil at the Site. **Figure 8** is a spider map which summarizes soil sample results above Track 1 Unrestricted SCOs for all overburden soil.

2.5.4 On-Site and Off-Site Groundwater Contamination

Analytical results for VOCs, identified one or more petroleum VOC parameters above their respective groundwater standard in 4 of the 6 temporary probe sampling locations (SB6, SB8, SB10, SB12), 3 of the 9 shallow monitoring wells (MW4S, MW6S, MW7) and in 3 of 4 deep monitoring wells (MW4D, MW6D, MW9).

Total petroleum VOC concentrations ranged from non-detect in MW1 in the southeastern corner of the property to 929 µg/L in MW6S located in Building 2 near the east property line. In addition to MW6S, total PVOCs above 100 µg/L were reported in MW7 (185 µg/L), SB6 (333 µg/L), SB10 (146 µg/L) and (288 µg/L). All located in a west to east strip along the northern third of Building 2.

One or more chlorinated VOC compounds were reported above standards 4 of 6 temporary probe locations (SB2, SB4, SB8, SB10), 5 of 9 shallow monitoring wells (MW2, MW5, MW6S, MW7, MW8) and in 1 of the 4 deep monitoring wells (MW6D). Total CVOCs ranged from 0.7 µg/L in MW1S in the southwestern corner of the property to 648 µg/L in MW7 located near the UST and west property line. In addition to MW7, total CVOCs above 25 µg/L were reported in MW5 (42 µg/L) near the west property line, MW8 (73 µg/L) downgradient of MW7 and SB10 (50 µg/L) located on the south side of the UST.

One or more SVOC parameters were detected at concentrations above water quality standards in 3 of the 9 shallow monitoring wells (MW6S, MW7, MW8, and in 4 of the 6 temporary probe locations (SB6, SB8, SB10, SB12). SVOCs were not reported above standards in any of the deep monitoring wells. Total SVOC concentrations in the locations with individual parameters above standards ranged from 37 µg/L in MW8 to 3,060 µg/L in MW6S. In addition to MW6S, total SVOCs were reported at or above 100 µg/L in SB10 (100 µg/L), SB12 (143 µg/L) and SB6 (1,206 µg/L).

There were no reported detections of pesticides or PCBs above water quality standards.

The total concentration (unfiltered) of the metals arsenic, barium, beryllium, chromium, copper, iron, mercury, magnesium, manganese, sodium, lead, nickel and zinc were reported within at least one of the 9 groundwater samples above water quality standards.

The dissolved concentration of the metals iron, manganese and sodium were reported in nearly all nine of the groundwater samples above their corresponding water quality standards. These parameters are associated with background water quality throughout most of north Brooklyn.

2.5.4.1 Summary of Groundwater Data

The results of groundwater samples collected during the RI are summarized in **Tables 8-11**. Further information on groundwater sample collection, handling and analysis can be found in the RI Report (EBC 7/12).

2.5.4.2 Comparison of Groundwater with SCGs

Sample results above GA groundwater standards in monitor wells prior to the remedy are shown in **Table 12**. Spider maps which show groundwater sampling locations and summarize results above GA groundwater standards prior to the remedy are shown in **Figures 9** and **10**.

2.5.5 On-Site and Off-Site Soil Vapor Contamination

Multiple VOCs were detected above the laboratory method detection limit in each of the 7 soil gas samples (SG1-2, SG4-8) collected on June 17. Total petroleum related volatile organic compounds were generally low ranging from 24.1 µg/m3 in SG4 located near the 3,000 gallon UST to 381.7 µg/m3in SG2 located in the southeast corner of the parking lot. Since there were no petroleum VOCs reported in soil or groundwater samples collected from the parking lot area, there does not appear to be any correlation between PVOCs in soil and groundwater and those in soil gas. PVOCs in the outdoor control sample were also low totaling 5.6 µg/m3

Chlorinated VOCs (CVOCs) were reported in all seven samples ranging in concentration from 70.7 µg/m3in SG1 located in the southwest corner of the parking lot to 4,204 µg/m3 near the UST. CVOCs above 500 µg/m3 were reported in SG4 and SG5 located within the former wash building and in SG7 located in the northwest corner of the property. CVOCs were non-detect in the outdoor air sample.

2.5.5.1 Summary of Soil Vapor Data

A table of soil vapor data collected prior to the remedy is shown in **Table 13**. Soil vapor results are posted in **Figure 11**. Further information on soil gas sample collection, handling and analysis can be found in the RI Report (EBC 7/12).

2.6 ENVIRONMENTAL AND PUBLIC HEALTH ASSESSMENTS

2.6.1 Qualitative Human Health Exposure Assessment

The objective of the qualitative exposure assessment under the BCP is to identify potential receptors to the contaminants of concern (COC) that are present at, or migrating from, the site. The identification of exposure pathways describes the route that the COC takes to travel from the source to the receptor. An identified pathway indicates that the potential for exposure exists; it does not imply that exposures actually occur. An exposure pathway has five elements; a contaminant source, release and transport mechanisms, point of exposure, route of exposure and a receptor population.

The potential exposure pathways identified below, represent both current and future exposure scenarios.

Contaminant Source

The source of the petroleum VOCs and SVOCs detected in soil and / or groundwater at the site are generally related to the existing fuel oil UST located in the northwest corner of Building 2. However, SVOCs associated with the historic fill in the former gas holder area may also be responsible for SVOCs in groundwater.

CVOCs in soil gas and groundwater beneath the site also appear to be largely related to impacted soil in the vicinity of the UST. However, an off-site upgradient CVOC groundwater plume has been identified less than 250 feet northwest of the site and may be contributing to CVOC contamination on the property.

Contaminant Release and Transport Mechanism

Impacted soil within the UST source area has previously contributed, or is continuing to contribute, to petroleum VOC and SVOC contaminant mass in groundwater. Impacted groundwater would be expected to migrate east with groundwater flow, where the highest concentrations were reported. The distribution of dissolved VOCs and SVOCs suggests that the

source area contribution is no longer significant. However, removal of contaminated soil from the source area is expected to eliminate potential further contribution to groundwater.

Although petroleum VOCs present in on-site soil and / or groundwater may be volatilizing to air to some degree, significant levels of petroleum VOCs are not present in soil gas. CVOCs in soil gas were present at significant concentrations in some areas of the property during the RI, however, and may represent a potential vapor intrusion concern for the new buildings to be constructed on the site.

The identification and removal of CVOC impacted soil in the vicinity of the former UST was completed during the Interim Remedial Measure (IRM) performed at the Site from July through September 2012. Since the CVOC impacted soil was the primary origin of the CVOC vapors, this condition is expected to have largely improved at the site.

Point of Exposure, Route of Exposure and Potentially Exposed Populations

Potential On-Site Exposures: Remediation workers and construction workers engaged in the excavation of impacted and non-impacted soil at the site may be exposed to VOCs through several routes. Workers excavating impacted soil may be exposed to SVOCs and VOCs through inhalation, ingestion and dermal contact. Workers excavating non-impacted soil may be exposed to CVOCs in soil gas through inhalation. A site specific Health and Safety Plan has been developed to identify and minimize the potential hazards to on-site workers.

Under a future scenario, residents within the proposed buildings may be exposed to vapor intrusion if remediation of the source area is not completed, or if vapors are migrating onto the site from an off-site source. This potential route of exposure is expected to have been significantly reduced in response to the degree and success of source area remediation under the IRM program.

Potential Off-Site Exposures: The entire area is serviced by the New York City Water System which distributes water from the Croton Reservoir system. Since there are no public or private potable supply wells in the area, exposure from contact with tap water is not a concern. Off-site

exposure is therefore limited to vapor intrusion from petroleum VOCs migrating from the Site. Since there is no significant migration of dissolved petroleum VOCs from the site and no significant levels of petroleum VOCs in soil gas at the site, the potential for off-site exposure associated with on-site contaminants is minimal.

However, potential off-site exposure related to vapor intrusion from an off-site CVOC source is a concern. The potentially exposed population in this case would include residents and commercial workers in buildings located upgradient of the site. Off-site exposure from CVOCs in groundwater to indoor air would be expected to be greater to residential properties located upgradient of the site where concentrations in both soil gas and groundwater were reported to be considerably higher than those found to be migrating onto the site.

2.6.2 Fish & Wildlife Remedial Impact Analysis

Since VOCs and or SVOCs in shallow groundwater may be leaving the site at low concentrations in an easterly direction, the groundwater to surface water discharge pathway was evaluated. There are no surface water bodies present within several miles of the site in a northeast to southeast direction. Based on the absence of a surface water receptor, there are no expected impacts to surface water environments from contaminants at the Site.

2.7 INTERIM REMEDIAL ACTION

The IRM completed at the Site was performed in accordance with the procedures and specifications as detailed in the IRM Work Plan dated June, 2012. The IRM included the removal of the existing UST / piping system, the excavation and disposal of impacted soil and the excavation and disposal of the upper 7 feet of soil across the Site as necessary for the construction of the cellar level foundation of the three new buildings to be constructed at the Site. The IRM was performed between July 6th and August 31st 2012.

A total of 5,644.45 tons of petroleum-impacted and historic fill soil was disposed of at the Clean Earth of Carteret facility in Carteret, NJ. An additional 3,969.54 tons of petroleum impacted and historic fill soil was disposed of at the Soil Safe Facility in Logan, NJ. Approximately 600 cubic

yards of clean native soil excavated from the Site was tested, confirmed clean and reused as backfill.

2.8 REMEDIAL ACTION OBJECTIVES

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

2.8.1 Groundwater

RAOs for Public Health Protection

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

RAOs for Environmental Protection

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

2.8.2 Soil

RAOs for Public Health Protection

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

RAOs for Environmental Protection

- Prevent migration of contaminants that would result in groundwater or surface water contamination.
- Prevent impacts to biota due to ingestion/direct contact with contaminated soil that would cause toxicity or bioaccumulation through the terrestrial food chain.

2.8.3 Soil Vapor

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

3.0 ALTERNATIVES ANALYSIS

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

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

The following is a detailed description of the alternatives analysis and remedy selection to address impacted media at the Site. This analysis was prepared in accordance with 6 NYCRR Part 375-1.8(f) and Part 375-3.8(f) and Section 4.3(c) of NYSDEC DER-10. As required, a minimum of two remedial alternatives (including a Track 1 scenario) are evaluated, as follows:

- Alternative 1 - Track 1, remediation of all soils above bedrock to unrestricted use criteria. Excavation to a minimum depth of 7 feet across the Site as needed to accommodate cellar level of new buildings, with additional excavation to a minimum depth of 15 feet in the northern third of the Site and to a minimum depth of 25 feet in the northwestern corner of the Site to meet SCOs for SVOCs and metals. Chemical oxidant injections throughout the central portion of the site to meet SCOs for VOCs in soil and to remediate groundwater. This alternative does not allow the use of long-term institutional /engineering controls to

address impacted media or prevent exposures which may be required beneath the one or more of the three buildings

- Alternative 2 - Track 2, remediation of all soils to restricted residential criteria to a depth of 15 feet if soils below 15 feet do not represent a source of contamination. This alternative would require a lesser degree of excavation than Alternative 1 and limit the excavation to the petroleum-CVOC hotspot area and several other areas, with the remainder of the Site excavated to the planned cellar level at approximately 7 feet below grade. Alternative 2 also relies on chemical oxidant injections to remediate VOCs in soil and groundwater in central portion of the Site. Alternative 2 includes the installation of a vapor barrier and sub-slab depressurization system beneath the portion of the basement level of the new buildings which will not have mechanical ventilation. This alternative does not allow the use of long-term institutional /engineering controls to meet soil cleanup objectives. Long-term institutional /engineering controls are allowed to address or prevent exposures from other impacted media.

- Alternative 3 - Track 4, would include excavation / remediation of the petroleum-CVOC hotspot area as completed under the IRM but would limit the excavation of historic fill to that which is required to construct the basement level foundations of the new buildings. The Track 4 alternative allows the use of site specific SCOs for remaining fill materials to avoid over-excavation. This will result in some metals and /or SVOCs above restricted residential SCOs to remain in soil beneath one or more of the new buildings basement slabs. This alternative also includes the installation of a vapor barrier and sub-slab depressurization system beneath the basement levels of the new buildings which will not have continuous mechanical ventilation. Long-term institutional /engineering controls are allowed to meet soil cleanup objectives and to address or prevent exposures from other impacted media.

3.1 REMEDIAL ALTERNATIVE 1

The following sections provide an evaluation of Alternative 1 based on the nine evaluation criteria as previously discussed.

3.1.1 Overall Protection of Human Health and the Environment

Alternative 1 will be protective of human health and the environment by eliminating the VOC, SVOC and CVOC concentrations present in all subsurface affected soils at the Site and by eliminating constituents in soil related to historic fill. The potential for human and environmental exposure to these constituents on-Site will be eliminated by excavation of all historic fill soils and hot spot areas with parameters in excess of unrestricted criteria, disposing of excavated materials off-site and backfilling as needed with certified clean fill, virgin mined materials or recycled concrete materials from a NYSDEC permitted recycling facility. Injections of chemical oxidants would be required to remediate VOC contamination in soil at the water table in the central portion of the Site and VOC and CVOC impacted groundwater in this area as well.

Potential post-remediation exposures to on-site residents from soil vapors are not expected to require the long term (>5 yrs) operation of SSDS systems, though groundwater use will be restricted at the Site until groundwater quality recovers. However, CVOC vapors may continue to migrate onto the Site from an upgradient off-site source or may off-gas from the CVOC impacted groundwater plume which has been documented upgradient of the Site. If this occurs, mitigation steps would be required.

During remedial and construction activity workers and area residents may be exposed to impacted soil and vapors. Worker exposure to soil and vapors will be minimized through implementation of a Health and Safety Plan. Exposures to area residents from dust and/or vapors will be minimized through the use of engineering controls and through implementation of a Community Air Monitoring Plan (CAMP).

3.1.2 Compliance with Remedial Goals, SCGs and RAOs

Alternative 1 will achieve compliance with the remedial goals, SCGs and RAOs for soil through source removal to Track 1 unrestricted cleanup levels. SCGs for groundwater may not be achieved as impacted groundwater may be migrating on to the Site. Compliance with SCGs for soil vapor may also not be achieved if impacted groundwater or soil gas migrate onto the Site from an off-site source.

3.1.3 Long-Term Effectiveness and Permanence

Alternative 1 achieves long term effectiveness and permanence by permanently removing and/or remediating all soils affected by Site contaminants or historic fill materials. Under this Alternative, risk from soil impacts is eliminated though risk from groundwater and vapors may remain if impacted groundwater and / or soil gas migrates onto the Site. Alternative 1 will continue to meet RAOs for soil in the future, providing a permanent long-term solution for the Site.

3.1.4 Reduction in Toxicity, Mobility or Volume Through Treatment

Alternative 1 will permanently eliminate the toxicity, mobility, and volume of contaminants from on-site soil by meeting unrestricted objectives. The removal/remediation of on-site soil and remediation of on-site groundwater will also reduce the toxicity, mobility, and volume of contaminants within on-site soil vapor.

3.1.5 Short-Term Effectiveness

The potential for short-term adverse impacts and risks to the workers, the community, and the environment during the implementation of Alternative 1 is minimal.

Short-term exposure to on-site workers during excavation and loading activities will be addressed with a HASP and mitigated through the use of personal protective equipment, monitoring and engineering controls. Potential short-term exposure to the surrounding community will be addressed through the use of odor and dust-suppression techniques and through the implementation of a CAMP which will require air monitoring activities during all excavation and soil disturbance activities.

Other potential impacts to the community such as construction-related noise, vibrations and traffic, will be controlled and regulated under the terms of the NYS Department of Buildings issued building permit which can place a Stop Work Order on the property for unsafe conditions, community impacts or violation of the terms and conditions of the permit. Decontamination procedures of equipment, including trucks transporting soil to off-site disposal facilities, will

minimize the potential for impacted soil to be dispersed beyond the Site boundary. A truck traffic plan has also been prepared to minimize disturbance to the local roads and community.

3.1.6 Implementability

The techniques, materials and equipment to implement Alternative 1 are readily available and have been proven effective in remediating the contaminants associated with the Site. Excavation for the remediation of soils is both a "low tech" and reliable method which has a long and proven track record on the remediation of hazardous waste and petroleum spill sites. Excavation to 25 feet and beyond in the northwestern portion of the Site may pose a significant technical challenge to provide adequate shoring and protection for adjacent structures. Chemical oxidant treatment of residually impacted soil and groundwater is also a reliable and proven method for remediation of a wide variety of VOCs and is easily implemented with the existing site conditions.

3.1.7 Cost

Costs associated with Alternative 1 are estimated at approximately $ 2,202,936. This cost estimate includes the following elements and assumptions:

- Excavate and dispose of approximately 6,481 cy of historic fill soil as non-hazardous as per the basement foundation plans for the new buildings.
- Excavate and dispose of approximately 1,260 cy of soil from the CVOC-petroleum spill area as non-hazardous through a contained-in determination;
- Excavate an additional 2,500 cy from historic fill soil to a depth of 15 feet in the northern third of the site and to a depth of 25 feet in the northwestern corner of the site. Disposal as non-hazardous
- Shoring as needed to excavate a minimum of 25 feet in the northwestern part of the Site.
- Backfilling of 3,760 cy of certified clean, virgin mined or approved recycled concrete.
- Installation and temporary operation (<5 yrs) of a Sub Slab Depressurization System (SSDS) beneath new construction;
- HASP and CAMP monitoring for the duration of the remedial activities.

3.1.8 Compatibility with Land Use

The proposed redevelopment of the Site is compatible with its current R7A residential zoning. Following remediation, the Site will meet unrestricted use objectives which will exceed the objectives for its planned multi-tenant residential use. A groundwater use restriction will be required to prevent future exposure to affected groundwater.

3.1.9 Community Acceptance

No questions regarding the Site have been raised regarding remedial options to date. This RAWP will be subject to a 45-day public comment period to determine if the community has comments on the presented remedial alternatives and selected remedy. If no comments are received regarding Alternative 1, it will be considered to be acceptable to the community.

3.2 REMEDIAL ALTERNATIVE 2

The following sections provide an evaluation of Alternative 2 based on the nine evaluation criteria as previously discussed.

3.2.1 Overall Protection of Human Health and the Environment

Alternative 2 will be protective of human health and the environment by eliminating the SVOC and CVOC contaminants present in subsurface soils above restricted residential criteria at the Site, as completed under the IRM, and by eliminating constituents related to historic fill above restricted residential criteria to a depth of 15 feet. The potential for human and environmental exposure to these constituents on-site will be eliminated by excavation of all soils with parameters in excess of restricted residential criteria to a depth of 15 feet, disposing of excavated materials off-site and backfilling as needed with certified clean fill, virgin mined materials or recycled concrete materials from a NYSDEC permitted recycling facility. Injections of chemical oxidants would be required to remediate VOC contamination in soil at the water table in the central portion of the Site and VOC and CVOC impacted groundwater in this area as well.

Potential post-remediation exposures to on-site residents from soil vapors would be addressed through the use of a vapor barrier and SSDS beneath basement levels which are not required to

be equipped with mechanical ventilation (parking garage). Groundwater use will be restricted at the Site until groundwater quality recovers.

During remedial and construction activity, workers and area residents may be exposed to impacted soil and vapors. Worker exposure to soil and vapors will be minimized through implementation of a HASP. Exposures to area residents from dust and or vapors will be minimized through the use of engineering controls and through implementation of a CAMP.

3.2.2 Compliance with Remedial Goals, SCGs and RAOs

Alternative 2 will achieve compliance with the remedial goals, SCGs and RAOs for soil through source and fill removal to restricted residential cleanup levels for the top 15 feet. SCGs for groundwater may not be achieved as contaminated groundwater may be migrating on to the Site. Compliance with SCGs for soil vapor may also not be achieved if impacted groundwater or soil gas migrate onto the Site from an off-site source.

3.2.3 Long-term Effectiveness and Permanence

Alternative 2 achieves long term effectiveness and permanence by permanently removing and/or remediating all soils affected by Site contaminants above restricted residential objectives to a depth of 15 feet. Under this Alternative risk from soil impacts is eliminated for on-site residents though risk from groundwater and vapors may remain if impacted groundwater and / or soil gas migrates onto the Site.. Alternative 2 will continue to meet RAOs for soil in the future, providing a permanent long-term solution for the Site.

3.2.4 Reduction in Toxicity, Mobility or Volume through Treatment

Alternative 2 will permanently eliminate the toxicity, mobility, and volume of contaminants from on-site soil by remediating the petroleum-CVOC hot spot area, as completed under the IRM, and by meeting restricted residential objectives in the upper 15 feet. The removal/remediation of on-site soil and remediation of on-site groundwater will also reduce the toxicity, mobility, and volume of contaminants within on-site soil vapor.

3.2.5 Short-term Effectiveness

The potential for short-term adverse impacts and risks to the workers, the community, and the environment during the implementation of Alternative 2 is minimal. Short-term exposure to on-site workers during excavation and loading activities will be addressed with a HASP and mitigated through the use of personal protective equipment, monitoring and engineering controls. Potential short-term exposure to the surrounding community will be addressed through the use of odor and dust-suppression techniques and through the implementation of a CAMP which will require air monitoring activities during all excavation and soil disturbance activities.

Other potential impacts to the community such as construction-related noise, vibrations and traffic will be controlled and regulated under the terms of the NYS Department of Buildings issued building permit which can place a Stop Work Order on the property for unsafe conditions, community impacts or violation of the terms and conditions of the permit. Decontamination procedures of equipment, including trucks transporting soil to off-site disposal facilities will minimize the potential for impacted soil to be dispersed beyond the Site boundary. A truck traffic plan has been prepared to minimize disturbance to the local roads and community.

3.2.6 Implementability

The techniques, materials and equipment to implement Alternative 2 are readily available and have been proven effective in remediating the contaminants associated with the Site. Excavation for the remediation of soils is both a "low tech" and reliable method which has a long and proven track record on the remediation of hazardous waste and petroleum spill sites. Chemical oxidant treatment of residually impacted soil and groundwater is also a reliable and proven method for remediation of a wide variety of VOCs and is easily implemented with the existing site conditions.

3.2.7 Cost

Costs associated with Alternative 2 are estimated at approximately $1,915,597. This cost estimate includes the following elements and assumptions:

- Excavate and dispose of approximately 6,481 cy of historic fill soil as non-hazardous as per the basement foundation plans for the new buildings.

- Excavate and dispose of approximately 1,260 cy of soil from the CVOC-petroleum spill area as non-hazardous through a contained-in determination;
- Excavate an additional 1,000 cy of soil as needed to meet restrictive residential SCOs in the top 15 feet.
- Backfilling of 2,260 cy of certified clean, virgin mined or approved recycled concrete.
- Installation and operation of a Sub Slab Depressurization System (SSDS) beneath new construction;
- HASP and CAMP monitoring for the duration of the remedial activities.

3.2.8 Compatibility with Land Use

The proposed redevelopment of the Site is compatible with its current R7A residential zoning Following remediation the Site will meet restricted residential use objectives which is appropriate for its planned multi-tenant residential use. A groundwater use restriction will be required to prevent future exposure to affected groundwater.

3.2.9 Community Acceptance

No questions regarding the Site have been raised regarding remedial options to date. This RAWP will be subject to a 45-day public comment period to determine if the community has any comments on the presented remedial alternatives and selected remedy. If no comments are received, it will be considered to be acceptable to the community.

3.3 REMEDIAL ALTERNATIVE 3

The following sections provide an evaluation of Alternative 3 based on the nine evaluation criteria as previously discussed.

3.3.1 Overall Protection of Human Health and the Environment

Alternative 3 will be protective of human health and the environment by eliminating the VOC and CVOC contaminants present in subsurface soils above restricted residential criteria at the Site, as completed under the IRM, and by eliminating constituents related to historic fill above restricted residential criteria to a depth of 7 feet in accordance with the planned construction of the Site. The potential for human and environmental exposure to these constituents on-site will

be eliminated by the excavation of all soils to a minimum depth of 7 ft across the Site and backfilling as needed with certified clean fill, virgin mined materials or recycled concrete materials from a NYSDEC permitted recycling facility. Residual fill with parameters above restricted residential criteria will be effectively capped with the concrete foundation slab of the new buildings.

Injections of chemical oxidants would be required to remediate VOC contamination in soil at the water table in the central portion of the Site and VOC and CVOC impacted groundwater in this area as well.

Potential post-remediation exposures to on-site residents from soil vapors would be addressed through the use of a vapor barrier and a SSDS beneath basement levels which are not required to be equipped with mechanical ventilation (parking garage). Groundwater use will be restricted at the Site until groundwater quality recovers.

During remedial and construction activity workers and area residents may be exposed to impacted soil and vapors. Worker exposure to soil and vapors will be minimized through implementation of a HASP. Exposures to area residents from dust and/or vapors will be minimized through the use of engineering controls and through implementation of a CAMP.

3.3.2 Compliance with Remedial Goals, SCGs and RAOs

Alternative 3 will achieve compliance with the remedial goals, SCGs and RAOs for soil through source removal to restricted residential and site specific cleanup levels. SCGs for groundwater may not be achieved as contaminated groundwater may be migrating on to the Site. Compliance with SCGs for soil vapor may also not be achieved if impacted groundwater or soil gas migrate onto the Site from an off-site source.

3.3.3 Long-term Effectiveness and Permanence

Alternative 3 achieves long term effectiveness and permanence by permanently removing and/or remediating petroleum-CVOC hot spot areas and by removing historic fills to a minimum depth of 8 feet below grade. Under this Alternative risk from soil impacts is eliminated for on-site

residents though risk from groundwater and vapors may remain if impacted groundwater and / or soil gas migrates onto the Site.. Alternative 3 will continue to meet RAOs for soil in the future, providing a permanent long-term solution for the Site.

3.3.4 Reduction in Toxicity, Mobility or Volume through Treatment

Alternative 3 will permanently eliminate the toxicity, mobility, and volume of contaminants from on-site soil by remediating the petroleum-CVOC hot spot area as completed under the IRM, and by removing historic fills to a minimum depth of 7 feet below grade. The removal/remediation of on-site soil and remediation of on-site groundwater will also reduce the toxicity, mobility, and volume of contaminants within on-site soil vapor.

3.3.5 Short-term Effectiveness

The potential for short-term adverse impacts and risks to the workers, the community, and the environment during the implementation of Alternative 3 is minimal.

Short-term exposure to on-site workers during excavation and loading activities will be addressed with a HASP and mitigated through the use of personal protective equipment, monitoring and engineering controls. Potential short-term exposure to the surrounding community will be addressed through the use of odor and dust-suppression techniques and through the implementation of a CAMP which will require air monitoring activities during all excavation and soil disturbance activities.

Other potential impacts to the community such as construction-related noise, vibrations and traffic will be controlled and regulated under the terms of the NYS Department of Buildings issued building permit which can place a Stop Work Order on the property for unsafe conditions, community impacts or violation of the terms and conditions of the permit. Decontamination procedures of equipment, including trucks transporting soil to off-site disposal facilities will minimize the potential for impacted soil to be dispersed beyond the Site boundary. A truck traffic plan has been prepared to minimize disturbance to the local roads and community.

3.3.6 Implementability

The techniques, materials and equipment to implement Alternative 3 are readily available and have been proven effective in remediating the contaminants associated with the Site. Excavation for the remediation of soils is both a "low tech" and reliable method which has a long and proven track record on the remediation of hazardous waste and petroleum spill sites. Chemical oxidant treatment of residually impacted soil and groundwater is also a reliable and proven method for remediation of a wide variety of VOCs and is easily implemented with the existing site conditions.

3.3.7 Cost

Costs associated with Alternative 3 are estimated at approximately $1,631,789. This cost estimate includes the following elements and assumptions:

- Excavate and dispose of approximately 6,481 cy of historic fill soil as non-hazardous as per the basement foundation plans for the new buildings.
- Excavate and dispose of approximately 1,260 cy of soil from the CVOC-petroleum spill area as non-hazardous through a contained-in determination;
- Backfilling of 1,260 cy of certified clean, virgin mined or approved recycled concrete.
- Installation and operation of a Sub Slab Depressurization System (SSDS) beneath new construction;
- HASP and CAMP monitoring for the duration of the remedial activities.

3.3.8 Compatibility with Land Use

The proposed redevelopment of the Site is compatible with its current M1-2/R6A (MX-1) Special Mixed Use District zoning which permits light manufacturing uses, residential uses and a wider variety of community facilities. Following remediation, the Site will meet restricted residential use objectives which is appropriate for its planned multi-tenant residential use. A groundwater use restriction will be required to prevent future exposure to affected groundwater.

3.3.9 Community Acceptance

No questions regarding the Site have been raised regarding remedial options to date. This RAWP will be subject to a 45-day public comment period to determine if the community has any comments on the presented remedial alternatives and selected remedy. If no comments are received regarding the remedy, it will be considered to be acceptable to the community.

4.0 DESCRIPTION OF REMEDIAL ACTION PLAN

4.1 EVALUATION OF REMEDIAL ALTERNATIVES

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

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

4.2 STANDARDS, CRITERIA AND GUIDANCE (SCG)

A criterion for remedy selection is evaluation for conformance with SCGs that are applicable, relevant and appropriate. Principal SCGs that are applicable, relevant and appropriate for evaluating the alternatives for remediation of this BCP site include the following:

- 29 CFR Part 1910.120 - Hazardous Waste Operations and Emergency Response
- 10 NYCRR Part 67 – Lead
- 6 NYCRR Part 371 - Identification and Listing of Hazardous Wastes (November 1998)
- 6 NYCRR Part 372 - Hazardous Waste Manifest System and Related Standards for Generators, Transporters and Facilities (November 1998)
- 6 NYCRR Subpart 374-1 - Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities (November 1998)

- 6 NYCRR Part 375 - 6 NYCRR Part 375 Environmental Remediation Programs Subparts 375-1, 375-3 and 375-6 (December 2006)
- 6 NYCRR Part 376 - Land Disposal Restrictions
- 6 NYCRR Part 608 - Use and Protection of Waters
- 6 NYCRR Parts 700-706 - Water Quality Standards (June 1998)
- 6 NYCRR Part 750 through 758 - Implementation of NPDES Program in NYS ("SPDES Regulations")
- 6 NYCRR Part 375-6 Soil Cleanup Objectives
- New York State Groundwater Quality Standards – 6 NYCRR Part 703;
- NYSDEC Ambient Water Quality Standards and Guidance Values – TOGS 1.1.1;
- NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation - May 2010;
- NYSDEC Draft Brownfield Cleanup Program Guide – May 2004;
- New York State Department of Health (NYSDOH) Generic Community Air Monitoring Plan
- NYS Waste Transporter Permits – 6 NYCRR Part 364;
- NYS Solid Waste Management Requirements – 6 NYCRR Part 360 and Part 364.
- TAGM 4059 - Making Changes To Selected Remedies (May 1998)
- STARS #1 - Petroleum-Contaminated Soil Guidance Policy
- TAGM 3028 - "Contained In" Criteria for Environmental Media: Soil Action Levels (August 1997)
- DER-10, Technical Guidance for Site Investigation and Remediation, May 2010
- DER-23 / Citizen Participation Handbook for Remedial Programs, January 2010
- OSWER Directive 9200.4-17 - Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites (November 1997)

Additional regulations and guidance are applicable, relevant, and appropriate to the remedial alternatives and will be complied in connection with implementation of the remedial program; however, the list above is intended to represent the principal SCGs which should be considered in evaluating the remedial alternatives for the BCP site.

Conformance with the appropriate standards for remediation of contaminated soil is an important criterion in evaluating the remedial alternatives for the BCP site. Presently, in New York State 6 NYCRR Part 375 establishes the primary SCGs associated with remediation of contaminated soil at sites which are in the BCP. If proposing remediation pursuant to a Track other than Track 1 (Unrestricted Use), 6 NYCRR Part 375 requires evaluation of at least one remedial alternative pursuant to Track I (Unrestricted Use) and one other alternative developed by the applicant for the proposed use of the BCP site. The remedial alternatives presented in Section 3.3 of this work plan have been prepared in conformance with this requirement.

4.3 SELECTION OF THE PREFERRED REMEDY

The remedy recommended for the site is a Track 4 alternative (Alternative 3) which consists of the removal of all petroleum and CVOC contaminated soil within the former UST area through excavation as completed under the IRM. In addition all fill material excavated for the basement level foundation will be removed from the Site and properly disposed of at an off-site facility. The Track 4 alternative allows the use of site specific SCOs for remaining fill materials to avoid over-excavation. Residual soil contamination consisting of petroleum VOCs at the water table in the central portion of the Site will be addressed through chemical oxidant injections. These injections will also be used to reduce CVOCs and petroleum VOCs in groundwater. The remedy also includes the installation of a vapor barrier and sub-slab depressurization system beneath the basement levels of the new buildings which will not have continuous mechanical ventilation.

Overall Protection of Public Health and the Environment

The recommended remedial action achieves protection of the public health and the environment by eliminating petroleum and CVOC contaminants in an identified source area, and remediating both groundwater and residual soil contamination at the water table. Removal of the source area and remediating groundwater will eliminate or significantly reduce the potential for vapor intrusion in the new buildings and prevent the potential for contamination of groundwater and off-site migration of impacted groundwater originating on the property. The recommended action further achieves protection of the public health and the environment by reducing constituents in surficial soils related to historic fill The potential for human and environmental exposure to these constituents on-site will be eliminated by excavation of the majority of historic fill soil and the

Site, disposing of excavated materials off-site and by capping the remaining fill with the concrete building slabs. Although affected groundwater would not directly affect human health, groundwater use will be restricted at the Site until groundwater quality recovers.

During remedial and construction activity, workers and area residents may be exposed to impacted soil and vapors. Worker exposure to soil and vapors will be minimized through implementation of a Health and Safety Plan. Exposures to area residents from dust and/or vapors will be minimized through the use of engineering controls and through implementation of a Community Air Monitoring Plan (CAMP).

The remedy will meet all of the RAOs established for soil and groundwater at the site.

Compliance with Standards, Criteria and Guidance

The recommended remedial action meets the objectives of the RAOs by removing the potential for human and environmental exposures to chemical constituents above SCGs in soil and groundwater. The proposed action will effectively remove the source area and substantially remove historic fill soil.

Long-term Effectiveness and Permanence

The remedial action achieves long term effectiveness and permanence by permanently removing and/or remediating all soils affected by Site contaminants and substantially removing historic fill soil. Bulk reductions in groundwater contamination are expected but may not be achieved for all constituents if all or some portion of the impacts are related to an off-site source. However, groundwater improvement is expected if impacts are related to on-site sources. Bulk reduction in groundwater impacts related to the removal / remediation of soils under the remedial action will also be permanent. Under this remedy, risk from soil impacts is eliminated and risk from site-related groundwater impacts significantly reduced. The selected remedy will continue to meet RAOs for soil and groundwater in the future, providing a permanent long-term solution for the Site.

Reduction of Toxicity, Mobility and Volume

The recommended action will reduce the toxicity, mobility and volume of the chemical constituents by removing the source area of contamination and substantially removing historic fill soil. The removal/remediation of on-site soil will also reduce the toxicity, mobility, and volume of contaminants within on-site groundwater and soil vapor.

Short-term Effectiveness

The potential for short-term adverse impacts and risks to the workers, the community, and the environment during the implementation of Alternative 3 is minimal.

Short-term exposure to on-site workers during excavation and loading activities were previously addressed with a HASP and mitigated through the use of personal protective equipment, monitoring and engineering controls. The HASP will also be utilized to protect remedial workers engaged in the installation of injection / monitoring wells and the application of chemical oxidants to complete the remedy. Potential short-term exposure to the surrounding community will be addressed through the use of odor and dust-suppression techniques and through the implementation of a CAMP which will require air monitoring activities during all excavation and soil disturbance activities.

Other potential impacts to the community such as construction-related noise, vibrations and traffic, will be controlled and regulated under the terms of the NYS Department of Buildings issued building permit which can place a Stop Work Order on the property for unsafe conditions, community impacts or violation of the terms and conditions of the permit. Decontamination procedures of equipment, including trucks transporting soil to off-site disposal facilities, will minimize the potential for impacted soil to be dispersed beyond the Site boundary. A truck traffic plan has also been prepared to minimize disturbance to the local roads and community.

Implementability

The techniques, materials and equipment to implement Alternative 3 are readily available and have been proven effective in remediating the contaminants associated with the Site. Excavation activities were previously and successfully completed at the Site without difficulty. Chemical

oxidant treatment of residually impacted soil and groundwater is also a reliable and proven method for remediation of a wide variety of VOCs and is easily implemented with the existing site conditions. No issues related to the design, availability or implementation of the selected remedy are anticipated.

Cost

Costs associated with the selected remedy are estimated at approximately $ 1,631,789. This cost estimate includes the following elements and assumptions:

- Excavate and dispose of approximately 6,481 cy of historic fill soil as non-hazardous as per the basement foundation plans for the new buildings.
- Excavate and dispose of approximately 1,260 cy of soil from the CVOC-petroleum spill area as non-hazardous through a contained-in determination;
- Backfilling of 1,260 cy of certified clean, virgin mined or approved recycled concrete.
- Installation and operation of a Sub Slab Depressurization System (SSDS) beneath new construction;
- HASP and CAMP monitoring for the duration of the remedial activities.

Community Acceptance

Public participation plays a large role in the BCP process. A fact sheet has been prepared and sent out to all interested parties as identified in the site contact list. A draft version of this document was placed in a local repository (NYSDEC Region 2 office and the Marcy Branch of the Brooklyn Public Library,) and made available for public review and comment for a period of 45 days. No questions regarding the Site were raised regarding the proposed remedial action. The RAWP will be subject to a 45-day public comment period to determine if the community has comments on the selected remedy.

Compatibility with Land Use

The proposed remedy will not prevent or otherwise interfere with the intended and planned future use of the site. The proposed redevelopment of the Site is compatible with its current M1-2 / R6A (MX-4) Special Mixed Use District zoning. Following remediation, the Site will meet restricted residential use objectives which will meet the objectives for its planned multi-tenant

residential use. A groundwater use restriction may be required to prevent future exposure to affected groundwater.

4.3.1 Preferred Remedy Land Use Factor Evaluation

As required by Article 27, Title 14 of the Environmental Conservation Law 27-1415, the following land use factor evaluation examines whether the preferred alternative is acceptable based on the 14 criteria presented in the following subsections.

Zoning

The proposed redevelopment project, which includes the construction of three 6-story residential apartment buildings is in compliance with the MX-4 Special Mixed Use District zoning. Therefore the project will be constructed as-of-right regardless of the remedy implemented. The preferred remedy will comply with current zoning.

Applicable Comprehensive Community Master Plans or Land Use Plans

The proposed redevelopment project and selected remedy are consistent with comprehensive master and land use plans, specifically the Flushing-Bedford rezoning action. This area-wide comprehensive re-zoning, completed by the New York City Department of City Planning and adopted by the City Council in May 2001, re-zoned the property from M1-2 manufacturing to MX-4 Special Mixed Use District which permits residential use. The preferred remedy will comply with applicable land use plans.

Surrounding Property Uses

The surrounding land use includes three new multi-family residential buildings to the east, four new multi-family residential buildings and a vacant commercial building to the west, older multi-family walk up style buildings to the south and a community/office building to the north. The area has been changing in response to the upzoning and many of the industrial/commercial buildings are being converted to, or replaced by, new residential buildings and schools. The proposed remedy will not interfere with surrounding property uses and considers the short term affects to neighboring residences.

Citizen Participation

Citizen participation for implementation of the preferred alternative will be performed in accordance with DER 23 and NYCRR Part 375-1.10 and Part 375-3.10. A Citizen Participation Plan has been prepared and is available for public review at the identified document repositories (NYSDEC Region 2 Office, Marcy Branch of the Brooklyn Public Library).

Environmental Justice Concerns

The Site is located within a potential environmental justice area. The NYSDEC defines a potential environmental justice area as a "minority or low-income community that may bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies".

Environmental justice means the fair treatment and meaningful involvement of all people regardless of race, color, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including a racial, ethnic, or socioeconomic group, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies. Since the goal of the remedy will achieve a residential level of cleanup and will remove contaminated materials from the community, the remedy poses no environmental justice concerns.

Land use designations

The proposed remedy is consistent with land-use designations.

Population growth patterns

Population growth patterns support the proposed use for the Site. The preferred remedy will not negatively affect population growth patterns.

Accessibility to existing infrastructure

The Site is accessible to existing infrastructure. The close proximity of the Site to the Brooklyn-Queens Expressway and the Long Island Expressway will assist contractor access to the Site. The Site is also accessible to mass transit and is within walking distance to bus stops on Park and Myrtle Avenues and subway stops along Marcy Avenue (G-Train). Sewer, water, natural gas and electric service is available at the property line. The preferred remedy will not alter accessibility to existing infrastructure.

Proximity to cultural resources

The proposed remedy will not negatively impact cultural resources

Proximity to natural resources

The proposed remedy will improve the local environment and will not negatively impact affect natural resources.

Off-Site groundwater impacts

The proposed remedy will improve off-site groundwater impacts by removing a source of groundwater contamination at the site. The proposed remedy will not affect natural resources other than to improve the quality of groundwater on a local basis.

Proximity to floodplains

No portion of the Site is located within a designated flood zone area. The nearest moderate risk flood zone is located 550 feet to the northwest and the nearest high risk flood zone is located 700 feet to the northwest.

Geography and geology of the Site

The selected remedy and redevelopment of the Site will remove soils to a depth of 7 feet for the basement levels of the new buildings. The selected alternative and development of the site have considered the geography and geology of the Site.

Current Institutional Controls

There are no institutional controls which currently apply to the property with the exception of those imposed through the MX-4 zoning. Institutional controls will be part of the proposed remedy.

4.4 SUMMARY OF SELECTED REMEDIAL ACTIONS

The remedy recommended for the site is a Track 4 alternative (Alternative 3) which consists of the removal of all petroleum and CVOC contaminated soil within the former UST area through excavation as completed under the IRM. In addition all fill material excavated for the basement level foundation will be removed from the Site and properly disposed of at an off-site facility. The Track 4 alternative allows the use of site specific SCOs for remaining fill materials to avoid over-excavation. Residual soil contamination consisting of petroleum VOCs at the water table in the central portion of the Site will be remediated to within SCOs for the protection of groundwater through chemical oxidant injections. These injections will also be used to reduce CVOCs and petroleum VOCs in groundwater. The remedy also includes the installation of a vapor barrier and sub-slab depressurization system beneath the basement levels of the new buildings which will not have continuous mechanical ventilation.

The remedy will include the following items:

1. Removal of petroleum and CVOC impacted soil, as previously completed under the IRM from the former UST area in the west-central area of the Site.
2. Excavation of soil/fill as necessary to construct the basement levels and foundation of the new buildings, as previously completed under the IRM ; Screening for indications of contamination (by visual means, odor, and monitoring with PID) of all excavated soil during any intrusive Site work;
3. Collection and analysis of end-point samples to evaluate the performance of the remedy with respect to attainment of Track 4 Site Specific SCOs;
4. Appropriate off-Site disposal of all material removed from the Site in accordance with all Federal, State and local rules and regulations for handling, transport, and disposal;

5. Import of materials to be used for backfill and cover in compliance with: (1) chemical limits and other specifications included in **Table 1**, (2) all Federal, State and local rules and regulations for handling and transport of material.
6. Injection of a chemical oxidant solution to address petroleum VOCs and CVOCs in groundwater and residual petroleum VOC contamination in soil at the water table.
7. Installation of a sub-slab depressurization system and vapor barrier beneath occupied areas of the buildings to be constructed on the Site.
8. A composite cover system consisting of the concrete building slabs will be constructed.
9. Implementation of a Site Management Plan (SMP) for long term maintenance of the Engineering Controls.
10. An Environmental Easement will be filed against the Site to ensure implementation of the SMP.

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

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

5.0 REMEDIAL ACTION PROGRAM

The objective of this section of the Remedial Action Work Plan, is to present a scope of work which will be approved by NYSDEC and when completely implemented will ready the BCP site for development under the Contemplated Use, which is restricted-residential use, consistent with the requirements of the Brownfield Cleanup Program. Additionally, following completion of the remedial activities and subject to any groundwater monitoring that may be required, it is an objective of this remedy that Clean Zones will be prepared beneath buildings, courtyards, and utility corridors so that construction can be implemented without the need for OSHA Hazardous Waste Operations and Emergency Response ("HAZWOPER") training for construction workers. The establishment of Clean Zones was previously completed under an IRM and construction of the new building is currently underway.

5.1 GOVERNING DOCUMENTS

Governing documents and procedures included in the Remedial Work Plan include a Site-specific Health and Safety Plan (HASP), a Community Air Monitoring Plan (CAMP), a Citizen Participation Plan, a Soil Management Plan (SoMP) analytical quality assurance/quality control (QA/QC), fluid management procedures, a Storm Water Pollution Prevention Plan SWPPP, and contractors' site operations and quality control procedures. Highlights of these documents and procedures are provided in the following sections.

5.1.1 Health & Safety Plan (HASP)

Governing documents and procedures included in the Remedial Work Plan include a Site-specific Health and Safety Plan (HASP), a Community Air Monitoring Plan (CAMP), a Citizen Participation Plan, a Soil Management Plan (SoMP) analytical quality assurance/quality control (QA/QC), fluid management procedures, a Storm Water Pollution Prevention Plan SWPPP, and contractors' site operations and quality control procedures. Highlights of these documents and procedures are provided in the following sections.

Contractors and subcontractors will have the option of adopting this HASP or developing their own site-specific document. If a contractor or subcontractor chooses to prepare their own HASP,

the Project Remedial Engineer will insure that it meets the minimum requirements as detailed in the site HASP prepared by EBC and must be made submitted to and approved by the NYSDEC. Activities performed under the HASP will comply with applicable parts of OSHA Regulations, primarily 29 CFR Parts 1910 and 1926. Modifications to the HASP may be made with the approval of the Project Remedial Engineer (RE), Site Safety Manager (SSM) and/or Project Manager (PM).

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

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

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

The Site Safety Coordinator will be Mr. Kevin Waters. A resume has previously been provided to NYSDEC. Confined space entry will comply with all OSHA requirements to address the potential risk posed by combustible and toxic gasses. A copy of the Site Specific Health and Safety Plan is provided in **Attachment C.**

5.1.2 Quality Assurance Project Plan (QAPP)

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

Collected samples will be appropriately packaged, placed in coolers and shipped via overnight courier or delivered directly to the analytical laboratory by field personnel. Samples will be containerized in appropriate laboratory provided glassware and shipped in plastic coolers. Samples will be preserved through the use of ice or a cold-pak(s) to maintain a temperature of 4^{o}C.

Dedicated disposable sampling materials will be used for both soil and groundwater samples, eliminating the need to prepare field equipment (rinsate) blanks. However, if non-disposable equipment is used, (stainless steel scoop, etc.) field rinsate blanks will be prepared at the rate of 1 for every eight samples collected.

Decontamination of non-dedicated sampling equipment will consist of the following:

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

Prepare field blanks by poring distilled or deionized water over decontaminated equipment and collecting the water in laboratory provided containers. Trip blanks will accompany samples each time they are transported to the laboratory. Matrix spike and matrix spike duplicates (MS/MSD) will be collected at the rate of one per 20 samples submitted to the laboratory. Laboratory reports will be upgradeable to ASP category B deliverables for use in the preparation of a data usability report (DUSR). The QAPP for the Site is provided in **Attachment D**.

5.1.3 Construction Quality Assurance Plan (CQAP)

All construction work related to the remedy (i.e. injection well / monitoring well installation) will be monitored by EBC field personnel under the direct supervision of the Remedial Engineer. Monitoring during well installation will be performed to protect the health of site workers and the surrounding community. A Health and Safety Plan (HASP) and Community Air Monitoring

Plan (CAMP) have been specifically developed for this project. These plans specify the monitoring procedures, action levels, and contingency measures that are required to protect public health.

All intrusive and soil disturbance activities will be monitored by a qualified environmental professional (QEP) under the direct supervision of the Remedial Engineer who will record observations in the site field book and complete a photographic log of the daily activities. The QEP will provide daily updates to the Project Manager and Remedial Engineer who will both make periodic visits to the site as needed to assure construction quality.

5.1.4 Soil/Materials Management Plan (SoMP)

An SoMP was prepared for excavation, handling, storage, transport and disposal of all soils/materials that are disturbed / excavated at the Site. The SMP includes all of the controls that will be applied to these efforts to assure effective, nuisance-free performance in compliance with all applicable Federal, State and local laws and regulations. The SoMP developed for this site is presented in **Section 2.8** of the IRM Work Plan.

5.1.5 Storm-Water Pollution Prevention Plan (SWPPP)

Erosion and sediment controls were performed during the IRM in conformance with requirements presented in the New York State Guidelines for Urban Erosion and Sediment Control. Typical measures that will be utilized at various stages of the project to limit the potential for erosion and migration of soil include the use of hay bales, temporary stabilized construction entrances/exits, placement of silt fencing and/or hay bales around soil stockpiles, and dust control measures.

5.1.6 Community Air Monitoring Plan (CAMP)

The CAMP provides measures for protection for on-site workers and the downwind community (i.e., off-site receptors including residences, businesses, and on-site workers not directly involved in the remedial work) from potential airborne contaminant releases resulting from remedial activities.

The action levels specified require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that the remedial work did not spread contamination off-site through the air.

The primary concerns for this site are vapors, nuisance odors and dust particulates. A CAMP was previously prepared for implementation of the IRM and is provided in **Attachment E**.

5.1.7 Contractors Site Operations Plan (SOP)

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

5.1.8 Citizen Participation Plan (CPP)

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

No changes will be made to approved Fact Sheets authorized for release by NYSDEC without written consent of the NYSDEC. No other information, such as brochures and flyers, will be included with the Fact Sheet mailing. The approved Citizen Participation Plan for this project is provided in **Attachment F**.

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

Marcy Library
617 DeKalb Avenue at Nostrand Ave.
Brooklyn, NY 11216
718-935-0032

Hours:
Sunday: Closed
Monday: 10am- 6pm
Tuesday: 1pm- 8pm
Wednesday, Thursday & Friday: 10am- 6pm
Saturday: Closed

NYSDEC Region 2 Office
Hunter's Point Plaza
47-40 21st Street
Long Island City, NY 11101
(718) 482-4900

Hours: By Appointment.

5.2 GENERAL REMEDIAL ACTION INFORMATION

5.2.1 Project Organization

The Project Manager for the Remedial Activity will be Mr. Kevin Brussee. Overall responsibility for the BCP project will be Mr. Charles B. Sosik, P.G., P.HG. The Remedial Engineer for this project is Mr. Ariel Czemerinski, P.E. Resumes of key personnel involved in the Remedial Action are included in **Attachment G**.

5.2.2 Remedial Engineer

The Remedial Engineer for this project will be Mr. Ariel Czemerinski, P.E. The Remedial Engineer is a registered professional engineer licensed by the State of New York. The Remedial Engineer will have primary direct responsibility for implementation of the remedial program for the Former East Coast Industrial Uniforms Site (NYSDEC BCP Site No. C224156). The Remedial Engineer will certify in the Final Engineering Report that the remedial activities were observed by qualified environmental professionals under his supervision and that the remediation requirements set forth in the Remedial Action Work Plan and any other relevant provisions of ECL 27-1419 have been achieved in full conformance with that Plan. Other Remedial Engineer certification requirements are listed later in this RAWP.

The Remedial Engineer will review all pre-remedial plans submitted by contractors for compliance with this Remedial Action Work Plan and will certify compliance in the Final Remediation Report. The Remedial Engineer will provide the certifications listed in Section 10.1 in the Final Engineering Report.

5.2.3 Remedial Action Schedule

Excavation / remediation of the UST area and removal of historic fill to a depth of 7 feet below grade were completed under an IRM. The remainder of the work as specified under this RAWP includes the installation of a monitoring well / injection well network, the injection of chemical oxidants and the installation of a vapor barrier and SSDS system beneath the occupied portions of the basement level in each building.

The monitoring / injection well installation is expected to take approximately 1 week to complete with chemical injections to begin immediately after. Injections may continue, as needed, for approximately 6 months to complete the remediation of the Site. Installation of the SSDS and vapor barrier will be performed following the completion of the chemical oxidant injections. However, if a point is reached where injections are to continue and installation of the building slab is required to prevent interference with the building construction schedule, then the vapor barrier and SSDS may be installed before oxidant injections are terminated.

5.2.4 Work Hours

The hours for operation of remedial construction will conform to the New York City Department of Buildings construction code requirements or according to specific variances issued by that agency. DEC will be notified by the Applicant of any variances issued by the Department of Buildings. NYSDEC reserves the right to deny alternate remedial construction hours.

5.2.5 Site Security

A construction fence has been erected around the entire property as required by the NYC Department of Buildings. The fence will be maintained as required and secured at the end of each work day.

5.2.6 Traffic Control

All traffic enters and leaves the Site via gates on Skillman Street. The environmental and construction contractors will direct the arrival or departure of construction vehicles, and provide flag services as needed to maintain safe travel exiting and entering the Site through the entrance on Skillman Street. Traffic related to RAWP activity will be limited to the daily arrival, parking and departure of the drillers transport vehicle and an EBC vehicle for a period of one week. Following that RAWP activity will be minimal consisting of arrival, parking and departure of the chemical oxidant contractor vehicle and an EBC vehicle once or twice a month for 6 months.

Site personnel will be required to park on Site or in legal all-day on-street parking spaces, or in an off-street parking lot/garage.

5.2.7 Worker Training and Monitoring

An environmental remediation contractor with appropriate hazardous material handling experience and training is required to install the monitoring / injection wells amd perform the chemical oxidant injections. The environmental remediation contractor contractor's on-site personnel will have a minimum of 40 hour Hazardous Waste Operations and Emergency Response Operations training.

All field personnel involved in remedial activities will participate in training, if required under 29 CFR 1910.120, including 24 and 40-hour hazardous waste operator training and annual 8-hour refresher training. The Site Safety Officer will be responsible for maintaining workers training records. Personnel entering any exclusion zone will be trained in the provisions of the HASP and be required to sign an HASP acknowledgment.

All on-site personnel engaged in remedial or sampling activities must receive adequate site-specific training in the form of an on-site Health and Safety briefing prior to participating in field work with emphasis on the following:

- Protection of the adjacent community from hazardous vapors and / or dust which may be released during intrusive activities.

- Identification of chemicals known or suspected to be present on-site and the health effects and hazards of those substances.
- The need for vigilance in personnel protection, and the importance of attention to proper use, fit and care of personnel protective equipment.
- Decontamination procedures.
- Site control including work zones, access and security.
- Hazards and protection against heat or cold.
- The proper observance of daily health and safety practices, such as entry and exit of work zones and site. Proper hygiene during lunch, break, etc.
- Emergency procedures to be followed in case of fire, explosion and sudden release of hazardous gases.

5.2.8 Agency Approvals

The Applicant has addressed all SEQRA requirements for this Site. All permits or government approvals required for remedial construction have been obtained prior to the start of remedial construction.

The planned end use for the Site is in conformance with the current zoning for the property as determined by New York City Department of Planning. A Certificate of Completion will not be issued for the project unless conformance with zoning designation is demonstrated.

A complete list of all local, regional and national governmental permits, certificates or other approvals or authorizations required to perform the remedial and development work is attached in **Table 14**. This list includes a citation of the law, statute or code to be complied with, the originating agency, and a contact name and phone number in that agency. This list will be updated in the Final Remediation Report.

All planned remedial or construction work in regulated wetlands and adjacent areas will be specifically approved by the NYSDEC Division of Natural Resources to ensure that it meets the requirements for substantive compliance with those regulations prior to the start of construction.

Nothing in the approved Remedial Action Work Plan or its approval by NYSDEC should be construed as an approval for this purpose.

5.2.9 NYSDEC BCP Signage

A project sign was previously erected at the main entrance to the Site as part of the IRM remedial activities and remains in place. The sign indicates that the project is being performed under the New York State Brownfield Cleanup Program. The sign meets the detailed specifications provided by the NYSDEC Project Manager.

5.2.10 Pre-Construction Meeting with NYSDEC

A pre-construction meeting with the Project Manager, Remedial Engineer, Construction Manager, Owner's Representative and the NYSDEC took place on July 3, 2012 prior to the start of the IRM activities at the Site.

5.2.11 Emergency Contact Information

An emergency contact sheet with names and phone numbers is included in **Table 15**. That document will define the specific project contacts for use by NYSDEC and NYSDOH in the case of a day or night emergency.

5.2.12 Remedial Action Costs

The total estimated cost of the Remedial Action is $ 1,631,789. An itemized and detailed summary of estimated costs for all remedial activity is attached as **Attachment H**. This will be revised based on actual costs and submitted as an Appendix to the Final Remediation Report.

5.3 SITE PREPARATION

5.3.1 Mobilization

Mobilization will include the delivery of drilling equipment and materials to the site. All remedial personnel will receive site orientation and training in accordance with the site specific HASP, CAMP and established policies and procedures to be followed during the implementation of the RAWP. The remediation contractor, construction manager and all associated

subcontractors will each receive a copy of the RAWP and the site specific HASP and will be briefed on their contents.

5.3.2 Erosion and Sedimentation Controls

Soil erosion and sediment control measures for management of storm water were previously addressed under the IRM and were in accordance with the New York Guidelines for Urban Erosion and Sediment Control. A silt fence was placed by the contractor at locations within the perimeter fencing as needed, to control stormwater runoff and surface water from exiting the excavation. Erosion and sedimentation controls are not required for the remaining remedial activities to be implemented under this RAWP.

5.3.3 Stabilized Construction Entrance(s)

Stabilized construction entrances were previously installed at all points of vehicle ingress and egress to the Site during implementation of the IRM. The stabilized entrances were constructed of a 4 to 6-inch bed of crushed stone or crushed concrete which was sloped back toward the interior of the Site. The stabilized entrances were inspected on a daily basis during soil loading activities and reinforced as needed with additional stone/concrete material to prevent the accumulation of ruts, mud or soil. A stabilized construction entrance is not required for the remaining remedial activities to be implemented under this RAWP.

5.3.4 Utility Marker and Easements Layout

The Applicant 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 Applicant and its contractors are solely responsible for safe execution of all invasive and other work performed under this RAWP. The Applicant 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.

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

5.3.5 Sheeting and Shoring

Additional sheeting and shoring will not be required for the remaining remedial activities to be implemented under this RAWP. However, appropriate management of structural stability of on-Site or off-Site structures during on-Site activities is the sole responsibility of the Applicant and its contractors. The Applicant and its contractors are solely responsible for safe execution of all invasive and other work performed under this Plan. The Applicant 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 Applicant 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.

5.3.6 Equipment and Material Staging

All equipment and work materials will be staged on-Site in areas as designated by the General Contractor, and / or Construction Site Superintendant.

5.3.7 Decontamination Area

A temporary truck decontamination pad was previously constructed to decontaminate trucks and other vehicles/equipment leaving the Site as part of the IRM. A decontamination area will not be required for the remaining remedial activities to be implemented under this RAWP.

5.3.8 Site Fencing

An 8-foot high temporary construction fence has been installed around the perimeter of the Site with entrance gates located on Skillman Street. This fence will be properly secured at the end of the day.

5.3.9 Demobilization

Demobilization will consist of the restoration of material staging areas and the disposal of materials and/or general refuse in accordance with acceptable rules and regulations. Materials used in remedial activities will be removed and disposed properly.

5.4 REPORTING

All daily and monthly Reports will be included in the Final Engineering Report.

5.4.1 Daily Reports

Daily reports will be submitted to NYSDEC and NYSDOH Project Managers by the end of each day in which remedial activity takes place. Daily reports will include:

- An update of progress made during the reporting day;
- Quantities of oxidant material applied at specific injection locations at the Site;
- A summary of any and all complaints with relevant details (names, phone numbers);
- A summary of CAMP finding, including excursions;
- An explanation of notable Site conditions.

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

These reports will include a summary of air sampling results, odor and dust problems and corrective actions, and all complaints received from the public.

5.4.2 Monthly Reports

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

- Activities relative to the Site during the previous reporting period and those anticipated for the next reporting period, including a quantitative presentation of work performed (i.e. injection volumes anticipated, sampling activity, etc.);
- Description of approved activity modifications, including changes of work scope and/or schedule;
- Sampling results received following internal data review and validation, as applicable; and,
- An update of the remedial schedule including the percentage of project completion, unresolved delays encountered or anticipated that may affect the future schedule, and efforts made to mitigate such delays.

5.4.3 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 well installation and injection activities. Photos will be submitted to NYSDEC on CD or other acceptable electronic media and will be sent to NYSDEC's Project Manager (2 copies) and to NYSDOH's Project Manager (1 copy). CD's will have a label and a general file inventory structure that separates photos into directories and sub-directories according to logical Remedial Action components. A photo log keyed to photo file ID numbers will be prepared to provide explanation for all representative photos. For larger and longer projects, photos should be submitted on a monthly basis or another agreed upon time interval.

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

5.4.4 Complaint Management Plan

Complaints from the public regarding nuisance or other Site conditions including noise, odor, truck traffic etc., will be recorded in the Site field book and reported to the NYSDEC in the daily status report.

5.4.5 Deviations from the Remedial Action Work Plan

Minor deviations from the RAWP will be identified in the daily update report and will be noted in the Final Engineering Report. When deviations are reported a brief discussion will be provided which will state the following:

- Reasons for deviating from the approved RAWP;
- Effect of the deviations on overall remedy.

Major changes to the scope of work must be discussed with the NYSDEC and the NYSDOH prior to implementation. If the changes are considered to be significant enough, an addendum to the RAWP Work Plan will be prepared and submitted to NYSDEC / NYSDOH for review.

6.0 REMEDIAL ACTION: CHEMICAL OXIDANT INJECTION PROGRAM

This RAWP includes the injection of a chemical oxidant solution to address affected groundwater and residual petroleum VOC contamination at the water table as identified during the Remedial Investigation. Chemical oxidant injection is intended to significantly reduce the PVICs in soil and CVOCs and PVOCs in groundwater, and thereby accelerate the improvements in groundwater and soil vapor quality.

The proposed area of injection is within the former UST area, which was the primary source of PVOC contamination at the Site, and along the entire affected soil zone (**Figure 8**). Injections at these locations will deliver oxidant through residual soil contamination in this area, allowing it to flow east with groundwater flow treating the CVOC and PVOC plume. The injection areas are located within the basement level (garage, utility area) of the middle building footprint, allowing injections to proceed during building construction as necessary.

6.1 INJECTION WELL INSTALLATION

Approximately 15 injection points will be installed within the primary source area and in the residual contaminant zone as shown on **Figure 12**. Injection points will be constructed of 1-inch PVC with a 10 ft 0.020-inch slot screened section installed 8 ft below the water table, and 2 ft above the water table. A No. 2 morie gravel back will be placed around the screen to a depth of approximately 1 ft above the screen followed by a 1 ft hydrated bentonite pellet seal. The injection wells will be finished as needed to protect the well during construction.

Injection wells will be registered with the USEPA by filing form 7520-6 with the USEPA Region 2 office.

6.2 OXIDANT INJECTION EVENTS

The oxidant selected for this project is high pH-activated sodium persulfate. Sodium persulfate is a robust oxidant which has a long residence time (anion lifetime) in the subsurface. Persulfate

activation through high pH provides fast contaminant reaction kinetics capable of destroying a wide range of organics including the PVOCs and CVOCs present at the Site.

Sodium persulfate will be delivered to the site as a dry powder which will be mixed with water on-site to provide a 20% solution. Sodium hydroxide (NaOH) will be delivered to the site as a 25% solution and added to the persulfate solution at a rate of 0.4 gallons of 25% NaOH solution per gallon of 20% persulfate solution.

The initial injection will consist of approximately 100 gallons of activated persulfate solution per injection point. The need for subsequent injections and the number and location of injection points to be utilized for subsequent injections will be determined following the collection and analysis of performance monitoring samples.

6.3 REMEDIAL PERFORMANCE EVALUATION (GROUNDWATER SAMPLING)

Groundwater performance monitoring samples will be collected on a quarterly basis from selected locations within and downgradient of the treatment zones to assess the performance of the remedy. The monitoring well network consists of ten wells including three upgradient wells located along in the sidewalk west of the property line, three interior area wells within the treatment zone to monitor the performance of the chemical injections and four wells located at the downgradient property line to the east.

6.3.1 Monitoring Well Construction

All monitoring wells will be constructed of 1-inch pvc with a 15-foot 0.010 screened section set with approximately 5 feet above and 10 feet below the water table. A No. 00 morie gravel pack will be placed around the screen to a depth of approximately 1 foot above the screen followed by a 1 foot hydrated bentonite pellet seal. The wells are completed at the surface with a locking compression-style cap and a 5-inch bolt down manhole cover.

The locations of the monitoring wells are shown in **Figure 12**.

6.3.2 Performance Sampling Frequency

Groundwater samples will be collected from the ten monitoring wells on a quarterly basis. Changes in the sampling frequency or number and location of wells included in the program will not be made without written approval from NYSDEC.

6.3.3 Methodology

Groundwater performance monitoring samples will be collected on a quarterly basis from selected locations within and downgradient of the treatment zones. Sample analysis will include the following:

- VOCs by method 8260
- Persulfate by titration
- pH

Collected samples be placed in glass vials supplied by the analytical laboratory and stored in a cooler with ice to maintain a temperature of 4 degrees C. Samples will either be picked up at the Site by a laboratory dispatched courier at the end of the day or transported back to the EBC office where they will be picked up the following day by the laboratory courier. All samples will be analyzed by a NYSDOH ELAP certified environmental laboratory

6.3.4 Reporting of Results

Sample analysis for VOCs will be provided by a New York State certified environmental laboratory. Laboratory reports will include ASP category B deliverables for use in the preparation of a data usability summary report (DUSR). All results will be provided in accordance with the NYSDEC Environmental Information Management System (EIMS) electronic data deliverable (EDD) format. Field parameter testing including persulfate and pH will be reported in results only format in the quarterly sampling report.

6.3.5 QA/QC

The fundamental QA objective with respect to accuracy, precision, and sensitivity of analysis for laboratory analytical data is to achieve the QC acceptance of the analytical protocol. The

accuracy, precision and completeness requirements will be addressed by the laboratory for all data generated.

Collected samples will be appropriately packaged, placed in coolers and shipped via overnight courier or delivered directly to the analytical laboratory by field personnel. Samples will be containerized in appropriate laboratory provided glassware and shipped in plastic coolers. Samples will be preserved through the use of ice or cold-pak(s) to maintain a temperature of $4^{o}C$.

Dedicated disposable sampling materials will be used for both soil samples (if collected) and groundwater samples, eliminating the need to prepare field equipment (rinsate) blanks. However, if non-disposable equipment is used, (stainless steel scoop, etc.) field rinsate blanks will be prepared at the rate of 1 for every eight samples collected. Field blanks will be prepared by pouring distilled or deionized water over decontaminated equipment and collecting the water in laboratory provided containers.

Trip blanks will accompany samples each time they are transported to the laboratory. Matrix spike and matrix spike duplicates (MS/MSD) will be collected at the rate of one per 20 samples submitted to the laboratory.

6.3.6 DUSR

The DUSR provides a thorough evaluation of analytical data without third party data validation. The primary objective of a DUSR is to determine whether or not the data, as presented, meets the site/project specific criteria for data quality and data use. Verification and/or performance monitoring samples collected under this RAWP will be reviewed and evaluated in accordance with the Guidance for the Development of Data Usability Summary Reports as presented in Appendix 2B of DER-10. The completed DUSR for verification/performance samples collected during implementation of this RAWP will be included in the final Engineering Report.

7.0 RESIDUAL CONTAMINATION TO REMAIN ON-SITE

Since residually contaminated soil, groundwater and soil vapor are expected to exist beneath the Site after the remedy is complete, Engineering and Institutional Controls (ECs and ICs) are required to protect human health and the environment. The IC is described hereafter. Long-term management of 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 if needed.

ECs will be implemented to protect public health and the environment by appropriately managing residual contamination. The Controlled Property (the Site) will have the following EC systems:

1. A sub-slab depressurization system and vapor barrier beneath the occupied areas of the new buildings.
2. An impervious cap consisting of the 4-inch thick concrete building slabs.

The FER will report residual contamination on the Site in tabular and map form. This will include presentation of exceedances of Track 1 objectives.

8.0 ENGINEERING CONTROLS

8.1 SUB-SLAB DEPRESSURIZATION SYSTEM (SSDS)

An SSDS and vapor barrier were designed for the portion of the basement slab in each of the 3 buildings which are to be used for mechanical and utility rooms and resident's storage rooms.

An SSDS will not be required beneath the remainder of the basement level in each building since these areas will be used as a parking garage which must be ventilated to remove vehicle fumes in accordance with the NYC Mechanical Code.

The SSDS beneath the occupied portion of each basement slab will consist of a single venting zone (2 zones per building). Each zone will provide coverage of approximately 2,200 sf of slab area. This is consistent with USEPA sub-slab depressurization design specifications which recommend a separate vent loop for every 4,000 sf of slab area.

The horizontal vent line is constructed of a continuous loop of perforated 4-inch HDPE pipe. In each zone the horizontal pipe will extend to an adjacent utility chase-way where it will be piped individually to the roof via a 6-inch schedule 40 pvc line. Fill material around the horizontal vent piping is virgin-mined, ½ inch to ¾ inch gravel.

A high density polyethylene vapor barrier liner (HPDE) will be installed over the SSDS prior to pouring the building's concrete slab. The vapor barrier will consist of a 20 mil HDPE geomembrane liner manufactured by GSE Lining Technologies of North America, or equivalent. The vapor barrier will extend throughout the portion of the slab to be used for mechanical / utility rooms and resident use in each of the 3 new buildings to be constructed at the site. The specifications for installation will be provided to the construction management company and the foundation contractor or installer of the liner. The specifications state that all vapor barrier seams, penetrations, and repairs will be sealed either by the tape method or weld method, according to the manufacturer's recommendations and instructions.

An EBC field inspector under the direct supervision of a professional engineer will inspect and photograph the vapor barrier at several critical stages before during and after the installation is complete, to assure compliance with design specifications. Detailed specifications of the SSD system are provided **Attachment I**.

8.1.1 Criteria for Termination

The active SSDS in each building will not be discontinued without written approval by the NYSDEC and NYSDOH. A proposal to discontinue the active SSDS may be submitted by the property owner based on confirmatory data that justifies such a request. Systems will remain in place and operational until permission to discontinue use is granted in writing by NYSDEC and NYSDOH.

9.0 INSTITUTIONAL CONTROLS

After the remedy is complete, the Site will have residual contamination remaining in place. Engineering Controls (ECs) will be incorporated into the remedy to render the overall Site remedy protective of public health and the environment. Two elements have been designed to ensure continual and proper management of residual contamination in perpetuity: an Environmental Easement and an SMP.

A Site-Specific Environmental Easement 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 SMP describes appropriate methods and procedures to ensure compliance with all ECs and ICs that are required by the Environmental Easement. Once the SMP has been approved by the NYSDEC, compliance with the SMP is required by the grantor of the Environmental Easement and grantor's successors and assigns.

9.1 ENVIRONMENTAL EASEMENT

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

The Environmental Easement renders the Site a Controlled Property. The Environmental Easement must be recorded with the Kings County Clerk before the Certificate of Completion (COC) can be issued by NYSDEC. A series of Institutional Controls may be required under this

remedy to implement, maintain and monitor these Engineering Control systems, prevent future exposure to residual contamination by continuing chemical oxidant treatment of groundwater, by maintaining an SSDS and restricting groundwater use at the Site. These ICs are requirements or restrictions placed on the Site that are listed in, and required by, the Environmental Easement. ICs 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 SMP, which provides all of the methods and procedures to be followed to comply with this remedy.

The Institutional Controls which will be needed to 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;
- A soil vapor mitigation system consisting of a sub slab depressurization system under the occupied area of the buildings must be inspected, certified, operated and maintained as required by the 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, soil vapor, 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 ICs for the Site is mandated by the Environmental Easement and will be implemented under the SMP. The Controlled Property (Site) may also have a series of ICs in the form of Site restrictions and requirements. The Site restrictions that may apply to the Controlled Property are:

- Use of groundwater underlying the Controlled Property is prohibited without treatment rendering it safe for intended purpose;

- The Controlled Property may be used for restricted residential use provided that the EC/ICs included in this SMP are employed.

- 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 annual statement must be certified by an expert that the NYSDEC finds acceptable.

9.2 SITE MANAGEMENT PLAN

Site Management is the last phase of remediation and begins with the approval of the Final Engineering Report and issuance of the Certificate of Completion (COC) for the Remedial Action. The Site Management Plan is submitted as part of the FER but will be written in a manner that allows its removal and use as a complete and independent document. Site Management continues in perpetuity or until released in writing by NYSDEC. The property

owner is responsible to ensure that all Site Management responsibilities defined in the Environmental Easement and the Site Management Plan are performed.

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

To address these needs, this SMP will include four plans: (1) an Engineering and Institutional Control Plan for implementation and management of EC/ICs; (2) a Monitoring Plan for implementation of Site Monitoring; (3) an Operation and Maintenance Plan for implementation of remedial collection, containment, treatment, and recovery systems; and (4) a Site Management Reporting Plan for submittal of data, information, recommendations, and certifications to NYSDEC. The SMP will be prepared in accordance with the requirements in NYSDEC Draft DER-10 Technical Guidance for Site Investigation and Remediation, dated [month, year], and the guidelines provided by NYSDEC.

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

The Site Management Plan in the Final Engineering Report will include a monitoring plan for groundwater at the down-gradient Site perimeter to evaluate Site-wide performance of the remedy. Appropriately placed groundwater monitor wells will also be installed immediately

down-gradient of all volatile organic carbon remediation areas for the purpose of evaluation of the effectiveness of the remedy that is implemented.

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

10.0 FINAL ENGINEERING REPORT

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

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

The Final Engineering Report will include written and photographic documentation of all remedial work performed under this remedy. The FER will include an itemized tabular description of actual costs incurred during all aspects of the Remedial Action.

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

The 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.

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

10.1 CERTIFICATIONS

The following certification will appear in front of the Executive Summary of the Final Engineering Report. The certification will be signed by the Remedial Engineer [name] who is a Professional Engineer registered in New York State. This certification will be appropriately signed and stamped. The certification will include the following statements:

I _____certify that I am currently a NYS registered professional engineer and that this Final Engineering Report 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) and that all activities were performed in full accordance with the DER-approved work plan and any DER-approved modifications.

NYS Professional Engineer # _____ Date _____ Signature

11.0 SCHEDULE

Excavation / remediation of the UST area and removal of historic fill to a depth of 7 feet below grade were completed under an IRM. The remainder of the work as specified under this RAWP includes the installation of a monitoring well / injection well network, the injection of chemical oxidants and the installation of a vapor barrier and SSDS system beneath the occupied portions of the basement level in each building.

The monitoring / injection well installation is expected to take approximately 1 week to complete with chemical injections to begin immediately after. Injections may continue, as needed, for approximately 6 months to complete the remediation of the Site. Installation of the SSDS and vapor barrier will be performed following the completion of the chemical oxidant injections. However, if a point is reached where injections are to continue and installation of the building slab is required to prevent interference with the building construction schedule, then the vapor barrier and SSDS may be installed before oxidant injections are terminated.

The schedule of tasks to be completed under this RAWP is as follows:

Conduct pre-construction meeting with NYSDEC	Previously completed under IRM
Mobilize equipment to the site and construct truck pad and other designated areas	Previously completed under IRM
Mobilize Remediation Contractor and equipment to the Site	Previously completed under IRM
Begin removal underground storage tank	Previously completed under IRM
Complete excavation and disposal of petroleum – CVOC impacted soil from source area. Demobilize Remediation Contractor	Previously completed under IRM
Mobilize excavation contractor Begin excavation of historic fill	Previously completed under IRM
Complete excavation and disposal of historic fill soils.	Previously completed under IRM
Perform endpoint verification of entire site	Previously completed under IRM
Begin installation of injection / monitoring wells	within 2 weeks of RAWP approval
Complete installation of injection / monitoring wells	within 2 weeks of start date
Begin oxidant injections	within 1 week of well installation
Submit Draft SMP / FER	June 2013 / July 2013 / September 2013

TABLES

TABLE 1
Soil Cleanup Objectives

Contaminant	CAS Number	Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
		Residential	Restricted-Residential	Commercial	Industrial		
METALS							
Arsenic	7440-38 -2	16[f]	16[f]	16[f]	16[f]	13[f]	16[f]
Barium	7440-39 -3	350[f]	400	400	10,000 [d]	433	820
Beryllium	7440-41 -7	14	72	590	2,700	10	47
Cadmium	7440-43 -9	2.5[f]	4.3	9.3	60	4	7.5
Chromium, hexavalent [h]	18540-29-9	22	110	400	800	1[e]	19
Chromium, trivalent[h]	16065-83-1	36	180	1,500	6,800	41	NS
Copper	7440-50 -8	270	270	270	10,000 [d]	50	1,720
Total Cyanide [h]		27	27	27	10,000 [d]	NS	40
Lead	7439-92 -1	400	400	1,000	3,900	63[f]	450
Manganese	7439-96 -5	2,000[f]	2,000[f]	10,000 [d]	10,000 [d]	1600[f]	2,000[f]
Total Mercury		0.81[j]	0.81[j]	2.8[j]	5.7[j]	0.18[f]	0.73
Nickel	7440-02 -0	140	310	310	10,000 [d]	30	130
Selenium	7782-49 -2	36	180	1,500	6,800	3.9[f]	4[f]
Silver	7440-22 -4	36	180	1,500	6,800	2	8.3
Zinc	7440-66 -6	2200	10,000 [d]	10,000 [d]	10,000 [d]	109[f]	2,480
PESTICIDES / PCBs							
2,4,5-TP Acid (Silvex)	93-72-1	58	100[a]	500[b]	1,000[c]	NS	3.8
4,4'-DDE	72-55-9	1.8	8.9	62	120	0.0033 [e]	17
4,4'-DDT	50-29-3	1.7	7.9	47	94	0.0033 [e]	136
4,4'-DDD	72-54-8	2.6	13	92	180	0.0033 [e]	14
Aldrin	309-00-2	0.019	0.097	0.68	1.4	0.14	0.19
alpha-BHC	319-84-6	0.097	0.48	3.4	6.8	0.04[g]	0.02
beta-BHC	319-85-7	0.072	0.36	3	14	0.6	0.09
Chlordane (alpha)	5103-71 -9	0.91	4.2	24	47	1.3	2.9
delta-BHC	319-86-8	100[a]	100[a]	500[b]	1,000[c]	0.04[g]	0.25
Dibenzofuran	132-64-9	14	59	350	1,000[c]	NS	210
Dieldrin	60-57-1	0.039	0.2	1.4	2.8	0.006	0.1
Endosulfan I	959-98-8	4.8[i]	24[i]	200[i]	920[i]	NS	102
Endosulfan II	33213-65-9	4.8[i]	24[i]	200[i]	920[i]	NS	102
Endosulfan sulfate	1031-07 -8	4.8[i]	24[i]	200[i]	920[i]	NS	1,000[c]
Endrin	72-20-8	2.2	11	89	410	0.014	0.06
Heptachlor	76-44-8	0.42	2.1	15	29	0.14	0.38
Lindane	58-89-9	0.28	1.3	9.2	23	6	0.1
Polychlorinated biphenyls	1336-36 -3	1	1	1	25	1	3.2
SEMI-VOLATILES							
Acenaphthene	83-32-9	100[a]	100[a]	500[b]	1,000[c]	20	98
Acenapthylene	208-96-8	100[a]	100[a]	500[b]	1,000[c]	NS	107
Anthracene	120-12-7	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Benz(a)anthracene	56-55-3	1[f]	1[f]	5.6	11	NS	1[f]
Benzo(a)pyrene	50-32-8	1[f]	1[f]	1[f]	1.1	2.6	22
Benzo(b) fluoranthene	205-99-2	1[f]	1[f]	5.6	11	NS	1.7
Benzo(g,h,i) perylene	191-24-2	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Benzo(k) fluoranthene	207-08-9	1	3.9	56	110	NS	1.7
Chrysene	218-01-9	1[f]	3.9	56	110	NS	1[f]
Dibenz(a,h) anthracene	53-70-3	0.33[e]	0.33[e]	0.56	1.1	NS	1,000[c]
Fluoranthene	206-44-0	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Fluorene	86-73-7	100[a]	100[a]	500[b]	1,000[c]	30	386
Indeno(1,2,3-cd) pyrene	193-39-5	0.5[f]	0.5[f]	5.6	11	NS	8.2
m-Cresol	108-39-4	100[a]	100[a]	500[b]	1,000[c]	NS	0.33[e]
Naphthalene	91-20-3	100[a]	100[a]	500[b]	1,000[c]	NS	12
o-Cresol	95-48-7	100[a]	100[a]	500[b]	1,000[c]	NS	0.33[e]
p-Cresol	106-44-5	34	100[a]	500[b]	1,000[c]	NS	0.33[e]
Pentachlorophenol	87-86-5	2.4	6.7	6.7	55	0.8[e]	0.8[e]
Phenanthrene	85-01-8	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Phenol	108-95-2	100[a]	100[a]	500[b]	1,000[c]	30	0.33[e]
Pyrene	129-00-0	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]

TABLE 1
Soil Cleanup Objectives

Contaminant	CAS Number	Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
		Residential	Restricted-Residential	Commercial	Industrial		
VOLATILES							
1,1,1-Trichloroethane	71-55-6	100[a]	100[a]	500[b]	1,000[c]	NS	0.68
1,1-Dichloroethane	75-34-3	19	26	240	480	NS	0.27
1,1-Dichloroethene	75-35-4	100[a]	100[a]	500[b]	1,000[c]	NS	0.33
1,2-Dichlorobenzene	95-50-1	100[a]	100[a]	500[b]	1,000[c]	NS	1.1
1,2-Dichloroethane	107-06-2	2.3	3.1	30	60	10	0.02[f]
cis-1,2-Dichloroethene	156-59-2	59	100[a]	500[b]	1,000[c]	NS	0.25
trans-1,2-Dichloroethene	156-60-5	100[a]	100[a]	500[b]	1,000[c]	NS	0.19
1,3-Dichlorobenzene	541-73-1	17	49	280	560	NS	2.4
1,4-Dichlorobenzene	106-46-7	9.8	13	130	250	20	1.8
1,4-Dioxane	123-91-1	9.8	13	130	250	0.1[e]	0.1[e]
Acetone	67-64-1	100[a]	100[b]	500[b]	1,000[c]	2.2	0.05
Benzene	71-43-2	2.9	4.8	44	89	70	0.06
Butylbenzene	104-51-8	100[a]	100[a]	500[b]	1,000[c]	NS	12
Carbon tetrachloride	56-23-5	1.4	2.4	22	44	NS	0.76
Chlorobenzene	108-90-7	100[a]	100[a]	500[b]	1,000[c]	40	1.1
Chloroform	67-66-3	10	49	350	700	12	0.37
Ethylbenzene	100-41-4	30	41	390	780	NS	1
Hexachlorobenzene	118-74-1	0.33[e]	1.2	6	12	NS	3.2
Methyl ethyl ketone	78-93-3	100[a]	100[a]	500[b]	1,000[c]	100[a]	0.12
Methyl tert-butyl ether	1634-04 -4	62	100[a]	500[b]	1,000[c]	NS	0.93
Methylene chloride	75-09-2	51	100[a]	500[b]	1,000[c]	12	0.05
n-Propylbenzene	103-65-1	100[a]	100[a]	500[b]	1,000[c]	NS	3.9
sec-Butylbenzene	135-98-8	100[a]	100[a]	500[b]	1,000[c]	NS	11
tert-Butylbenzene	98-06-6	100[a]	100[a]	500[b]	1,000[c]	NS	5.9
Tetrachloroethene	127-18-4	5.5	19	150	300	2	1.3
Toluene	108-88-3	100[a]	100[a]	500[b]	1,000[c]	36	0.7
Trichloroethene	79-01-6	10	21	200	400	2	0.47
1,2,4-Trimethylbenzene	95-63-6	47	52	190	380	NS	3.6
1,3,5-Trimethylbenzene	108-67-8	47	52	190	380	NS	8.4
Vinyl chloride	75-01-4	0.21	0.9	13	27	NS	0.02
Xylene (mixed)	1330-20 -7	100[a]	100[a]	500[b]	1,000[c]	0.26	1.6

All soil cleanup objectives (SCOs) are in parts per million (ppm). NS=Not specified. See Technical Support Document (TSD). Footnotes

a The SCOs for residential, restricted-residential and ecological resources use were capped at a maximum value of 100 ppm. See TSD section 9.3.

b The SCOs for commercial use were capped at a maximum value of 500 ppm. See TSD section 9.3.

c The SCOs for industrial use and the protection of groundwater were capped at a maximum value of 1000 ppm. See TSD section 9.3.

d The SCOs for metals were capped at a maximum value of 10,000 ppm. See TSD section 9.3.

e For constituents where the calculated SCO was lower than the contract required quantitation limit (CRQL), the CRQL is used as the SCO value.

TABLE 2
SUMMARY OF
REMEDIAL INVESTIGATION SAMPLING PROGRAM

Matrix	Location	Approximate Number of Samples	Rationale for Sampling	Laboratory Analysis
Subsurface soil (0 to 30 feet bgs)	15 soil borings	49	To supplement previous sampling and delineate affected soil and groundwater.	VOCs EPA Method 8260B, SVOCs EPA Method 8270
Subsurface soil (0 to 20 feet bgs)	15 soil borings	22	To evaluate compliance with SCOs below planned excavation depth.	Pesticides/PCBs EPA Method 8081/8082, TAL metals
Subsurface Soil (0-6 ft bgs)	Composite samples from 30 test pits	6	For waste characterization and disposal facility approval	VOCs EPA Method 8260B (grab), RCRA characteristics, RCRA metals, TCLP Metals, PCBs and PAHs
Total (Soils)		77		
Shallow Groundwater	From temporary probe points installed at 6 of 15 of the soil boring locations	6	Define nature and extent of impacted groundwater.	VOCs EPA Method 8260B, SVOCs EPA Method 8270
Shallow Groundwater	From nine new monitoring wells installed at 9 of the remaining boring locations and from an existing well located in the sidewalk along Skillman Street (SSMW1).	9	Define nature and extent of impacted groundwater and evaluate overall groundater quality for non-COC parameters	VOCs, SVOCs, Pesticides/PCBs EPA Method 8081/8082, TAL metals
Deep Groundwater	From four new monitoring wells installed within the former hazardous wastewater trench and along the northwest property line.	4	Evaluate chlorinated solvents deeper in the aquifer	VOCs EPA Method 8260B
Total (Groundwater)		19		
Soil Gas (7 ft below existing slab)	Five soil gas implants to be installed in south buildings and parking lot	5	Evaluate soil gas across southern 2/3rds of the site	VOCs EPA Method TO15
Soil Gas (4 ft below existing slab	Three soil gas implants to be installed in north building	3	Evaluate soil gas across north 1/3rd of site	VOCs EPA Method TO15
Total (Soil Gas)		8		
MS/MSD	Matrix spike and Matrix spike duplicates at the rate 5%	5	To meet requirements of QA / QC program	VOCs EPA Method 8260B
Trip Blanks	One laboratory prepared trip blank to accompany samples each time they are delivered to the laboratory.	5	To meet requirements of QA / QC program	VOCs EPA Method 8260B
Total (QA / QC Samples)		10		

TABLE 3
FORMER EAST COAST
INDUSTRIAL UNIFORMS SITE
Brooklyn, New York
Soil Analytical Results
Volatile Organic Compounds

COMPOUND	NYSDEC Part 375.6 Unrestricted Use Soil Cleanup Objectives*	NYDEC Part 375.6 Restricted Residential Soil Cleanup Objectives*	SB1			SB2			SB3			SB4				SB5			
			(7-9') µg/Kg	(24-26') µg/Kg	(28-30') µg/Kg	(7-9') µg/Kg	(23-25') µg/Kg	(28-30') µg/Kg	(7-9') µg/Kg	(23-25') µg/Kg	(28-30') µg/Kg	(0-4') µg/Kg	(10-12') µg/Kg	(23-25') µg/Kg	(28-30') µg/Kg	(8-10') µg/Kg	(23-25') µg/Kg	(25-27') µg/Kg	(28-30') µg/Kg
1,1,1,2-Tetrachlorothane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	680	100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	270	26,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	330	100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloropropene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	3,600	52,000	ND	ND	ND	ND	ND	**ND**	ND	ND	ND	ND	ND	ND	ND	ND	**4,100**	**130** J	ND
1,2-Dibromo-3-chloropropane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	1,100	100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	20	3,100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	8,400	52,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**430** J	ND	ND
1,3-Dichlorobenzene	2,400	4,900	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichloropropane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	1,800	13,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,2-Dichloropropane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chlorotoluene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone (Methyl Butyl Ketone)			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Isopropyltoluene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**570**	ND	ND
4-Chlorotoluene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-Pentanone			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	50	100,000	**53 S**	ND	ND	**51 JS**	ND	ND	**52 JS**	**8.9** JS	ND	**62 S**	**62 S**	ND	ND	**51 JS**	ND	ND	ND
Acrylonitrile			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	60	4,800	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromobenzene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromochloromethane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	760	2,400	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	1,100	100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	370	49,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	250	100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromomethane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane		100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	1,000	41,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**430** J	ND	ND
m&p-Xylenes	260		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl Ethyl Ketone (2-Butanone)	120	100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl t-butyl ether (MTBE)	930	100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	50	100,000	**2** JS	**1.7** JS	**2** JS	**2.1** JS	**1.8** JS	**1.8** JS	**2.5** JS	**2.5** JS	**1.6** JS	**3.4** JS	**3.4** JS	**1.5** JS	**2** JS	**3** JS	**190 JS**	**190 JS**	**1.7** JS
Naphthalene	12,000		ND	**1.8** J	ND	ND	ND	ND	ND	ND	ND	**ND**	ND	ND	ND	ND	**2700**	ND	ND
n-Butylbenzene	12,000	100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**3400**	**110** J	ND
n-Propylbenzene	3,900	100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1100**	ND	ND
o-Xylene	260	100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
p-Isopropyltoluene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**2500**	ND	ND
sec-Butylbenzene	11,000	100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**3300**	**1200**	**6.8**
Styrene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
tert-Butylbenzene	5,900	100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	1,300	19,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.3** J	**1.6** J	ND	ND	ND	ND
Tetrahydrofuran (THF)			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	700	100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	190	100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,4-dichloro-2-butene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	470	21,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorotrifluoroethane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	20	900	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total BTEX Concentration			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2500**	**0**	**0**
Total VOCs Concentration			**55**	**3.5**	**2**	**53.1**	**1.8**	**1.8**	**54.5**	**11.4**	**1.6**	**65.4**	**65.4**	**2.8**	**3.6**	**54**	**18720**	**1630**	**8.5**

Notes:

* - 6 NYCRR Part 375-6 Remedial Program Soil Cleanup Objectives

ND - Not-detected

J - The value is estimated. This flag is used: a) on form 1 when the compound is reported above the MDL, but below the PQL, a
b) on the Tentatively Identified Compounds (TIC) form for all compounds identified.

S - This compound is a solvent that is used in the laboratory. Laboratory contamination is suspected if concentration is less than five times the reporting level.

N - The concentration is based on the response fo the nearest internal. This flag is used on the TIC form for all compounds identified.

Bold/highlighted- Indicated exceedance of the NYSDEC UUSCO Guidance Value

Bold/highlighted- Indicated exceedance of the NYSDEC RRSCO Guidance Value

TABLE 3
FORMER EAST COAST
INDUSTRIAL UNIFORMS SITE
Brooklyn, New York
Soil Analytical Results
Volatile Organic Compounds

COMPOUND	NYSDEC Part 375.6 Unrestricted Use Soil Cleanup Objectives*	NYDEC Part 375.6 Restricted Residential Soil Cleanup Objectives*	SB6			SB7			SB8			SB9			SB10			
			(8-10') µg/Kg	(23-25') µg/Kg	(28-30') µg/Kg	(8-10') µg/Kg	(22-25') µg/Kg	(28-30') µg/Kg	(7-10') µg/Kg	(22-25') µg/Kg	(25-30') µg/Kg	(7-9') µg/Kg	(21-24') µg/Kg	(28-30') µg/Kg	(7-9') µg/Kg	(19-21') µg/Kg	(22-25') µg/Kg	(28-30') µg/Kg
1,1,1,2-Tetrachlorothane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	680	100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	270	26,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	330	100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloropropene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	3,600	52,000	ND	16,000	ND	ND	2700	ND	ND	130 J	ND	ND	220 J	ND	ND	2700	10,000	ND
1,2-Dibromo-3-chloropropane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	1,100	100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	20	3,100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	8,400	52,000	ND	4100	ND	ND	370	ND	ND	ND	ND	ND	52 J	ND	ND	480	2200	ND
1,3-Dichlorobenzene	2,400	4,900	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichloropropane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	1,800	13,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,2-Dichloropropane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chlorotoluene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone (Methyl Butyl Ketone)			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Isopropyltoluene			ND	ND	ND	ND	190 J	ND	ND	51 J	ND	ND	44 J	ND	ND	120 J	340 J	ND
4-Chlorotoluene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-Pentanone			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	50	100,000	51 JS	ND	ND	32 JS	ND	ND	56 S	690 JS	ND	26 JS	ND	ND	ND	ND	ND	ND
Acrylonitrile			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	60	4,800	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromobenzene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromochloromethane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	760	2,400	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	1,100	100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	370	49,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	250	100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromomethane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane		100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	1,000	41,000	ND	680 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene			ND	970 J	ND	ND	110 J	ND	ND	ND	ND	ND	ND	ND	ND	110 J	640 J	ND
m&p-Xylenes	260		ND	650 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl Ethyl Ketone (2-Butanone)	120	100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl t-butyl ether (MTBE)	930	100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	50	100,000	4.1 JS	410 JS	1.9 JS	3.5 JS	100 JS	1.9 JS	3.1 JS	96 JS	1.5 JS	4.0 JS	63 JS	1.7 JS	3.5 JS	110 JS	320 JS	1.7 JS
Naphthalene	12,000		ND	12000	ND	ND	2200	ND	ND	320	ND	ND	290	1.9 JS	ND	2100	7500	ND
n-Butylbenzene	12,000	100,000	ND	2500	ND	ND	ND	ND	ND	200 J	ND	ND	150 J	ND	ND	630	1800	ND
n-Propylbenzene	3,900	100,000	ND	2200	ND	ND	270 J	ND	ND	ND	ND	ND	63 J	ND	ND	200 J	1300 J	ND
o-Xylene	260	100,000	ND	790 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
p-Isopropyltoluene			ND	1500	ND	ND	410	ND	ND	110 J	ND	ND	60 J	ND	ND	420	1100 J	ND
sec-Butylbenzene	11,000	100,000	ND	2500	ND	ND	1100	ND	ND	250 J	ND	ND	280 J	ND	ND	630	1800	ND
Styrene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
tert-Butylbenzene	5,900	100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	1,300	19,000	1.3 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	640	ND	ND
Tetrahydrofuran (THF)			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	700	100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	130 J	ND	ND	69 J	ND	ND
trans-1,2-Dichloroethene	190	100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,4-dichloro-2-butene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	470	21,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorotrifluoroethane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	20	900	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total BTEX Concentration			**0**	**2970**	**0**	**0**	**410**	**0**	**0**	**110**	**0**	**0.0**	**410.0**	**0.0**	**0.0**	**3189.0**	**11100.0**	**0.0**
Total VOCs Concentration			**56.4**	**44300**	**1.9**	**35.5**	**7450**	**1.9**	**59.1**	**1847**	**1.5**	**30**	**1352**	**3.6**	**3.5**	**8209**	**27000**	**1.7**

Notes:

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INDUSTRIAL UNIFORMS SITE
Brooklyn, New York
Soil Analytical Results
Volatile Organic Compounds

COMPOUND	NYSDEC Part 375.6 Unrestricted Use Soil Cleanup Objectives*	NYDEC Part 375.6 Restricted Residential Soil Cleanup Objectives*	SB11			SB12			SB13			SB14				SB15				
			(7-9') µg/Kg	(22-25') µg/Kg	(28-30') µg/Kg	(8-10') µg/Kg	(22-25') µg/Kg	(28-30') µg/Kg	(8-10') µg/Kg	(22-25') µg/Kg	(28-30') µg/Kg	(7-10') µg/Kg	(12-15') µg/Kg	(22-25') µg/Kg	(28-30') µg/Kg	(19-20') µg/Kg	(20-23') µg/Kg	(23-25') µg/Kg	(25-27') µg/Kg	(27-29') µg/Kg
1,1,1,2-Tetrachlorothane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	680	100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	270	26,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	330	100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloropropene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene			ND	ND	ND	ND	ND	ND	ND	**83** J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	3,600	52,000	ND	**14,000**	ND	ND	**9,600**	**28**	**65** J	**12,000**	**1.1** J	ND	**3.2** J	ND	ND	**7.6**	**3.2** J	**190**	ND	ND
1,2-Dibromo-3-chloropropane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	1,100	100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	20	3,100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	8,400	52,000	ND	**880** J	ND	ND	**1800**	**9.1**	ND	**2700**	ND	ND	ND	ND	ND	**1.5** J	ND	**36**	ND	ND
1,3-Dichlorobenzene	2,400	4,900	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichloropropane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	1,800	13,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,2-Dichloropropane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chlorotoluene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone (Methyl Butyl Ketone)			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Isopropyltoluene			ND	**460** J	ND	ND	**560** J	**2** J	ND	**390** J	ND	ND	ND	ND	ND	ND	ND	**2** J	ND	ND
4-Chlorotoluene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**ND**	ND	ND	ND	ND	ND	ND
4-Methyl-2-Pentanone			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	50	100,000	**47** JS	ND	ND	**9.1** JS	ND	ND	ND	ND	**17** JS	**22** JS	**15** JS	**1,300 JS**	ND	**44** JS	**10** JS	**9.2** JS	**20** JS	**33** JS
Acrylonitrile			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	60	4,800	ND	ND	ND	ND	ND	**3** J	ND	ND	ND	ND	ND	ND	ND	**1.5** J	**2.6** J	**4.6** J	ND	ND
Bromobenzene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromochloromethane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**2.1** J	ND	**2.2** J	**1.3** J	ND
Carbon tetrachloride	760	2,400	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	1,100	100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	370	49,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	250	100,000	ND	ND	ND	ND	ND	**1.4** J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromomethane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane		100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	1,000	41,000	ND	**700** J	ND	ND	**1400** J	**14**	ND	**730**	ND	ND	ND	ND	ND	**2.1** J	**1.2** J	**110**	ND	ND
Hexachlorobutadiene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene			ND	**880** J	ND	ND	**1300** J	**7**	ND	**910**	ND	ND	ND	ND	ND	ND	ND	**93**	ND	ND
m&p-Xylenes	260		ND	ND	ND	ND	ND	**6**	ND	**640**	ND	ND	ND	ND	ND	ND	ND	**130**	ND	ND
Methyl Ethyl Ketone (2-Butanone)	120	100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl t-butyl ether (MTBE)	930	100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	50	100,000	**3.8** JS	**310 JS**	**1.8** JS	**7.2** S	**300 JS**	**1.8** JS	**130 JS**	**140 JS**	**3.1** JS	**9.1** S	**39** S	2.8 JS	**1.8** JS	**1.7** JS	**1.4** JS	**1.6** JS	**18** S	**18** S
Naphthalene	12,000		ND	**18,000**	**3.7** JS	ND	**11000**	**450**	**98** J	**12000**	**2.9** J	ND	**2100**	3.1 J	**2.6** J	**860**	**3.5** J	**810**	ND	**1.8** JS
n-Butylbenzene	12,000	100,000	ND	**2700**	ND	ND	**3300**	**6.9**	ND	**2400**	ND	ND	ND	ND	ND	ND	ND	**9.3**	ND	ND
n-Propylbenzene	3,900	100,000	ND	**2100**	ND	ND	ND	**9.3**	ND	**1800**	ND	ND	ND	ND	ND	**1.4** J	ND	**45**	ND	ND
o-Xylene	260	100,000	ND	ND	ND	ND	ND	**9.1**	ND	**590**	ND	ND	ND	ND	ND	ND	ND	**34**	ND	ND
p-Isopropyltoluene			ND	**1700**	ND	ND	**2000**	**3.1** J	ND	**1400**	ND	ND	ND	ND	ND	ND	ND	**13**	ND	ND
sec-Butylbenzene	11,000	100,000	ND	**2400**	ND	ND	**3100**	**8.6**	ND	**2500**	ND	ND	ND	ND	ND	**1.4** J	ND	**4.1** J	ND	ND
Styrene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
tert-Butylbenzene	5,900	100,000	ND	ND	ND	ND	ND	ND	ND	**130** J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	1,300	19,000	ND	ND	ND	**1.6** J	ND	**120**	ND	**140** J	ND	ND	ND	ND	ND	**1.8** J	ND	**2** J	ND	ND
Tetrahydrofuran (THF)			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	700	100,000	ND	ND	**0.98** JS	ND	ND	**5.5** J	ND	ND	ND	ND	**1.1** J	ND	**5** J	**5.2** J	**0.92** J	**6.9**	ND	ND
trans-1,2-Dichloroethene	190	100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,4-dichloro-2-butene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	470	21,000	ND	ND	ND	ND	ND	**1.3** J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorotrifluoroethane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	20	900	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total BTEX Concentration			**0**	**2400**	**0.98**	**0**	**3400**	**31.7**	**0**	**2720**	**0**	**0**	**1.1**	**0**	**5**	**7.3**	**2.12**	**163.9**	**0**	**0**
Total VOCs Concentration			**50.8**	**44130**	**6.48**	**17.9**	**34360**	**686.1**	**293**	**38553**	**24.1**	**31.1**	**2158.3**	**1305.9**	**9.4**	**930.3**	**22.82**	**1502.9**	**39.3**	**52.8**

Notes:

* - 6 NYCRR Part 375-6 Remedial Program Soil Cleanup Objectives

ND - Not-detected

J - The value is estimated. This flag is used: a) on form 1 when the compound is reported above the MDL, but below the PQL, a b) on the Tentatively Identified Compounds (TIC) form for all compounds identified.

S - This compound is a solvent that is used in the laboratory. Laboratory contamination is suspected if concentration is less than five times the reporting level.

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Bold/highlighted- Indicated exceedance of the NYSDEC UUSCO Guidance Value

Bold/highlighted- Indicated exceedance of the NYSDEC RRSCO Guidance Value

TABLE 4
FORMER EAST COAST
INDUSTRIAL UNIFORMS SITE
Brooklyn, New York
Soil Analytical Results
Semi-Volatile Organic Compounds

COMPOUND	NYSDEC Part 375.6 Unrestricted Use Soil Cleanup Objectives*	NYDEC Part 375.6 Restricted Residential Soil Cleanup Objectives*	SB1			SB2			SB3			SB4			SB5			
			(7-9') µg/Kg	(24-26') µg/Kg	(28-30') µg/Kg	(7-9') µg/Kg	(23-25') µg/Kg	(28-30') µg/Kg	(7-9') µg/Kg	(23-25') µg/Kg	(28-30') µg/Kg	(10-12') µg/Kg	(23-25') µg/Kg	(28-30') µg/Kg	(8-10') µg/Kg	(23-25') µg/Kg	(25-27') µg/Kg	(28-30') µg/Kg
1,2-Dichlorobenzene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Diphenylhydrazine			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dinitrotoluene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,6-Dinitrotoluene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chloronaphthalene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Methylnaphthalene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**14000**	ND	ND
2-Nitroaniline			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3,3'-Dichlorobenzidine			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3-Nitroaniline			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4,6-Dinitro-2-methylphenol			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Bromophenyl phenyl ether			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Chloroaniline			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Chlorophenyl phenyl ether			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Nitroaniline			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthene	20,000	100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthylene	100,000	100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1100** J	ND	ND
Anthracene	100,000	100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)anthracene	1,000	1,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzidine			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)pyrene	1,000	1,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	1,000	1,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(g,h,i)perylene	100,000	100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	800	3,900	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzoic Acid			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzyl alcohol			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Butyl benzyl phthalate			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bis(2-chloroethoxy)methane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bis(2-chloroethyl)ether			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bis(2-chloroisopropyl)ether			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bis(2-ethylhexyl)phthalate			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chrysene	1,000	3,900	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenzo(a,h)anthracene	330	330	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenzofuran			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Diethyl phthalate			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dimethyl phthalate			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-butylphthalate			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-octylphthalate			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	100,000	100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluorene	30,000	100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**2400** J	ND
Hexachlorobenzene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorocyclopentadiene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachloroethane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	500	500	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isophorone			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	12,000	100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**2200** J	ND	ND
Nitrobenzene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-Nitrosodimethylamine			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-Nitrosodi-n-propylamine			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-Nitrosodiphenylamine			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	100,000	100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**11000**	ND	ND
Pyrene	100,000	100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:

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TABLE 4
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INDUSTRIAL UNIFORMS SITE
Brooklyn, New York
Soil Analytical Results
Semi-Volatile Organic Compounds

COMPOUND	NYSDEC Part 375.6 Unrestricted Use Soil Cleanup Objectives*	NYDEC Part 375.6 Restricted Residential Soil Cleanup Objectives*	SB6			SB7			SB8			SB9			SB10			
			(8-10') µg/Kg	(23-25') µg/Kg	(28-30') µg/Kg	(8-10') µg/Kg	(22-25') µg/Kg	(28-30') µg/Kg	(7-10') µg/Kg	(22-25') µg/Kg	(25-30') µg/Kg	(7-9') µg/Kg	(21-24') µg/Kg	(28-30') µg/Kg	(7-9') µg/Kg	(19-21') µg/Kg	(22-25') µg/Kg	(28-30') µg/Kg
1,2-Dichlorobenzene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Diphenylhydrazine			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dinitrotoluene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,6-Dinitrotoluene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chloronaphthalene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Methylnaphthalene			ND	**39000**	ND	ND	**7000**	ND	ND	ND	ND	ND	ND	ND	ND	**11,000**	**17000**	ND
2-Nitroaniline			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3,3'-Dichlorobenzidine			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3-Nitroaniline			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4,6-Dinitro-2-methylphenol			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Bromophenyl phenyl ether			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Chloroaniline			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Chlorophenyl phenyl ether			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Nitroaniline			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthene	20,000	100,000	ND	**2000** J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthylene	100,000	100,000	ND	ND	ND	ND	**390**	ND	ND	ND	ND	ND	ND	ND	ND	ND	**810** J	ND
Anthracene	100,000	100,000	ND	ND	ND	ND	**270** J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)anthracene	1,000	1,000	ND	ND	ND	**ND**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzidine			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)pyrene	1,000	1,000	ND	ND	ND	**ND**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	1,000	1,000	ND	ND	ND	**ND**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(g,h,i)perylene	100,000	100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	800	3,900	ND	ND	ND	**ND**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzoic Acid			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzyl alcohol			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Butyl benzyl phthalate			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bis(2-chloroethoxy)methane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bis(2-chloroethyl)ether			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bis(2-chloroisopropyl)ether			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bis(2-ethylhexyl)phthalate			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chrysene	1,000	3,900	ND	ND	ND	**ND**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenzo(a,h)anthracene	330	330	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenzofuran			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Diethyl phthalate			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dimethyl phthalate			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-butylphthalate			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-octylphthalate			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	100,000	100,000	ND	ND	ND	**ND**	**170** J	ND	ND	ND	ND	ND	**140** J	ND	ND	ND	ND	ND
Fluorene	30,000	100,000	ND	**3800**	ND	ND	ND	ND	ND	ND	ND	ND	**580**	ND	ND	**2,000**	**2100**	ND
Hexachlorobenzene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorocyclopentadiene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachloroethane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	500	500	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isophorone			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	12,000	100,000	ND	**11000**	ND	ND	**740**	ND	ND	ND	ND	ND	ND	ND	ND	**1500** J	**4000**	ND
Nitrobenzene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-Nitrosodimethylamine			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-Nitrosodi-n-propylamine			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-Nitrosodiphenylamine			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	100,000	100,000	ND	**9000**	ND	**ND**	**3500**	ND	ND	**2200** J	ND	ND	**3600**	ND	ND	**4600**	**5500**	ND
Pyrene	100,000	100,000	ND	ND	ND	**ND**	**300** J	ND	ND	ND	ND	ND	**330** J	ND	ND	ND	ND	ND

Notes:

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Soil Analytical Results
Semi-Volatile Organic Compounds

COMPOUND	NYSDEC Part 375.6 Unrestricted Use Soil Cleanup Objectives*	NYDEC Part 375.6 Restricted Residential Soil Cleanup Objectives*	SB11			SB12		SB13			SB14			SB15					
			(7-9') µg/Kg	(22-25') µg/Kg	(28-30') µg/Kg	(22-25') µg/Kg	(28-30') µg/Kg	(8-10') µg/Kg	(22-25') µg/Kg	(28-30') µg/Kg	(7-10') µg/Kg	(12-15') µg/Kg	(22-25') µg/Kg	(8-10') µg/Kg	(19-20') µg/Kg	(20-23') µg/Kg	(23-25') µg/Kg	(25-27') µg/Kg	(27-29') µg/Kg
1,2-Dichlorobenzene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
1,2-Diphenylhydrazine			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
1,3-Dichlorobenzene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
1,4-Dichlorobenzene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
2,4-Dinitrotoluene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
2,6-Dinitrotoluene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
2-Chloronaphthalene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
2-Methylnaphthalene			ND	44000	ND	59000	480	ND	26000	ND	ND	360 J	ND	ND	170 J	ND	830		
2-Nitroaniline			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
3,3'-Dichlorobenzidine			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
3-Nitroaniline			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
4,6-Dinitro-2-methylphenol			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
4-Bromophenyl phenyl ether			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
4-Chloroaniline			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
4-Chlorophenyl phenyl ether			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
4-Nitroaniline			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
Acenaphthene	20,000	100,000	ND	ND	ND	4600	130 J	ND	ND	ND	ND	770	ND	ND	ND	ND	240 J	ND	ND
Acenaphthylene	100,000	100,000	ND	ND	ND	ND	340 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	190 J	ND	ND
Anthracene	100,000	100,000	ND	ND	ND	1300 J	450	ND	ND	ND	ND	1800	ND	ND	ND	ND	470	330	ND
Benzo(a)anthracene	1,000	1,000	ND	ND	ND	ND	630	ND	ND	ND	260 J	3,300	ND	150 J	270 J	160 J	1,300	1000	ND
Benzidine			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
Benzo(a)pyrene	1,000	1,000	ND	ND	ND	ND	810	ND	ND	ND	210 J	2,600	ND	140 J	280 J	150 J	1000	810	ND
Benzo(b)fluoranthene	1,000	1,000	ND	ND	ND	ND	630	ND	ND	ND	250 J	3,100	ND	170 J	350 J	190 J	1,300	930	ND
Benzo(g,h,i)perylene	100,000	100,000	ND	ND	ND	ND	410	ND	ND	ND	160 J	1300	ND	ND	180 J	ND	610	420	ND
Benzo(k)fluoranthene	800	3,900	ND	ND	ND	ND	220 J	ND	ND	ND	ND	980	ND	ND	ND	ND	550	400	ND
Benzoic Acid			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
Benzyl alcohol			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
Butyl benzyl phthalate			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
Bis(2-chloroethoxy)methane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
Bis(2-chloroethyl)ether			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	170 J	ND	ND	ND		
Bis(2-chloroisopropyl)ether			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	150 J	ND	ND	ND		
Bis(2-ethylhexyl)phthalate			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
Chrysene	1,000	3,900	ND	ND	ND	ND	680	ND	ND	ND	260 J	3,200	ND	ND	260 J	150 J	1,200	960	ND
Dibenzo(a,h)anthracene	330	330	ND	ND	ND	ND	120 J	ND	ND	ND	ND	370	ND	ND	ND	ND	190 J	ND	ND
Dibenzofuran			ND	ND	ND	ND	ND	ND	ND	ND	ND	670	ND	ND	ND	ND	ND		
Diethyl phthalate			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
Dimethyl phthalate			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
Di-n-butylphthalate			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
Di-n-octylphthalate			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
Fluoranthene	100,000	100,000	ND	ND	ND	3100 J	720	ND	ND	ND	600	9700	ND	310 J	520	330 J	2100	1800	ND
Fluorene	30,000	100,000	ND	4200	ND	5400	240 J	ND	2700 J	ND	ND	930	ND	ND	ND	ND	280 J	ND	ND
Hexachlorobenzene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
Hexachlorobutadiene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
Hexachlorocyclopentadiene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
Hexachloroethane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
Indeno(1,2,3-cd)pyrene	500	500	ND	ND	ND	ND	310 J	ND	ND	ND	120 J	1,100	ND	ND	150 J	ND	570	350	ND
Isophorone			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
Naphthalene	12,000	100,000	ND	11000	ND	3200 J	460	ND	4700	ND	ND	1600	ND	ND	760	250 J	1700	510	ND
Nitrobenzene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
N-Nitrosodimethylamine			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
N-Nitrosodi-n-propylamine			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
N-Nitrosodiphenylamine			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
Phenanthrene	100,000	100,000	110 J	11000	ND	18000	1600	240 J	8200	ND	490	6600	ND	230 J	230 J	140 J	1300	950	ND
Pyrene	100,000	100,000	ND	1300 J	ND	2700 J	1900	130 J	ND	ND	510	8400	ND	290 J	470	280 J	2000	1700	ND

Notes:

* - 6 NYCRR Part 375-6 Remedial Program Soil Cleanup Objectives

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Bold/highlighted- Indicated exceedance of the NYSDEC RRSCO Guidance Value

TABLE 5
FORMER EAST COAST
INDUSTRIAL UNIFORMS SITE
Brooklyn, New York
Soil Analytical Results
Pesticides / PCBs

COMPOUND	NYSDEC Part 375.6 Unrestricted Use Soil Cleanup Objectives*	NYDEC Part 375.6 Restricted Residential Soil Cleanup Objectives*	SB1	SB2	SB3		SB4		SB5		SB6		SB7
			(7-9') µg/Kg	(7-9') µg/Kg	(0-1') µg/Kg	(7-9') µg/Kg	(0-4') µg/Kg	(10-12') µg/Kg	(0-5') µg/Kg	(8-10') µg/Kg	(0-5') µg/Kg	(8-10') µg/Kg	(8-10') µg/Kg
PCB-1016	1,000	1,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1221	1,000	1,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1232	1,000	1,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1242	1,000	1,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1248	1,000	1,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1254	1,000	1,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1260	1,000	1,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1262	1,000	1,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1268	1,000	1,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4,4-DDD	3.3	13,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4,4-DDE	3.3	8,900	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4,4-DDT	3.3	7,900	ND	ND	ND	ND	ND	ND	**4.3**	ND	ND	ND	ND
a-BHC	20	480	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
a-Chlordane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aldrin	5	97	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
b-BHC	36	360	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlordane	94	4,200	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
d-BHC	40	100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dieldrin	5	200	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endosulfan I	2,400	24,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endosulfan II	2,400	24,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endosulfan Sulfate	2,400	24,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endrin	14	11,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endrin aldehyde			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endrin ketone			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
gamma-BHC			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
g-Chlordane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Heptachlor	42	2,100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Heptachlor epoxide			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methoxychlor			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toxaphene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:

* - 6 NYCRR Part 375-6 Remedial Program Soil Cleanup Objectives

ND - Not-detected

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Bold/highlighted- Indicated exceedance of the NYSDEC UUSCO Guidance Value

Bold/highlighted- Indicated exceedance of the NYSDEC RRSCO Guidance Value

TABLE 5
FORMER EAST COAST
INDUSTRIAL UNIFORMS SITE
Brooklyn, New York
Soil Analytical Results
Pesticides / PCBs

COMPOUND	NYSDEC Part 375.6 Unrestricted Use Soil Cleanup Objectives*	NYDEC Part 375.6 Restricted Residential Soil Cleanup Objectives*	SB8	SB9	SB10	SB11		SB12		SB13		SB14	SB15
			(7-10') µg/Kg	(7-9') µg/Kg	(7-9') µg/Kg	(0-1') µg/Kg	(7-9') µg/Kg	(0-1') µg/Kg	(8-10') µg/Kg	(8-10') µg/Kg	(15-20') µg/Kg	(7-10') µg/Kg	(8-10') µg/Kg
PCB-1016	1,000	1,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1221	1,000	1,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1232	1,000	1,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1242	1,000	1,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1248	1,000	1,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1254	1,000	1,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1260	1,000	1,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1262	1,000	1,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1268	1,000	1,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4,4-DDD	3.3	13,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4,4-DDE	3.3	8,900	ND	ND	ND	**14**	ND	**5.6**	ND	ND	ND	ND	ND
4,4-DDT	3.3	7,900	ND	ND	ND	**55**	ND	**23**	ND	ND	ND	ND	ND
a-BHC	20	480	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
a-Chlordane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aldrin	5	97	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
b-BHC	36	360	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlordane	94	4,200	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
d-BHC	40	100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dieldrin	5	200	ND	ND	ND	**2.9**	ND	ND	ND	ND	ND	ND	ND
Endosulfan I	2,400	24,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endosulfan II	2,400	24,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endosulfan Sulfate	2,400	24,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endrin	14	11,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endrin aldehyde			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endrin ketone			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
gamma-BHC			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
g-Chlordane			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Heptachlor	42	2,100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Heptachlor epoxide			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methoxychlor			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toxaphene			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:

* - 6 NYCRR Part 375-6 Remedial Program Soil Cleanup Objectives

ND - Not-detected

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Bold/highlighted- Indicated exceedance of the NYSDEC UUSCO Guidance Value

Bold/highlighted- Indicated exceedance of the NYSDEC RRSCO Guidance Value

TABLE 6
FORMER EAST COAST
INDUSTRIAL UNIFORMS SITE
Brooklyn, New York
Soil Analytical Results
Metals

COMPOUND	NYSDEC Part 375.6 Unrestricted Use Soil Cleanup Objectives*	NYDEC Part 375.6 Restricted Residential Soil Cleanup Objectives*	SB1	SB2	SB3		SB4		SB5		SB6		SB7	SB8
			(7-9') mg/Kg	(7-9') mg/Kg	(0-1') mg/Kg	(7-9') mg/Kg	(0-4') mg/Kg	(10-12') mg/Kg	(0-5') µg/Kg	(8-10') µg/Kg	(0-5') µg/Kg	(8-10') µg/Kg	(8-10') µg/Kg	(7-10') mg/Kg
Silver	2	180	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aluminum			3680 N	2950 N	7850 N	3679 N	5230 N	4220 N	5330 N	4720 N	5770 N	3430 N	4000 N	3420 N
Arsenic	13	16	1.01	1.01	4.54	1.05	4.04	1.21	3.67	1.35	3.87	1.15	1.41	1.05
Barium	350	400	29.8	22.8	208	21.4	157	30	148	25.6	747	22.2	27.4	25.2
Beryllium	7.2	72	0.31	ND	0.44	0.35	ND	0.3	0.37	0.33	0.44	0.32	0.33	0.31
Calcium			0.37 N	566 N	0.41	753 N	70200 N	1090 N	24700 N	1150 N	22100	1130 N	1050 N	945 N
Cadmium	2.5 c	4.3	1,260	ND	22,700	ND	0.37	ND	0.43	ND	0.7	ND	ND	ND
Cobalt			8.34	4.43	25.7	4.21	3.91	4.07	4.46	5	7.26	3.99	5.72	4.85
Chromium	30 c	180 - trivalent	4.94	7.9	6.17	12.6	21.1	10.4	18.7	12.7	29.7	10.6	10.4	9.19
Copper	50	270	11.8	9.04	65	10.9	36.2	10.3	41.3	17.2	41.5	10.4	14	13.9
Iron			16500 N	11300 N	19700 N	14300 N	14200 N	13000 N	14700 N	17000 N	19600 N	14300 N	16300 N	15700
Mercury	0.18 c	0.81	ND	ND	1.55	ND	0.25	ND	1.52	ND	0.42	ND	ND	ND
Potassium			683	512	2290	858	845	819	940	847	1320	803	944	859
Magnesium			1190 N	1040 N	11600 N	1410 N	13000 N	1490 N	4410 N	1860 N	6880 N	1270 N	1470 N	1480 N
Manganese	1600 c	2,000	307	365	355	348	284	321	314	293	394	253	378	294 N
Sodium			106 N	44 N	480 N	51 N	258 N	195 N	113 N	131 N	351 N	89 N	92 N	708 N
Nickel	30	310	9.2	7.01	19.5	9	14.1	9.87	12.3	10.8	13.6	8.49	8.71	8.87
Lead	63 c	400	ND	ND	263	ND	244	7.13	315	ND	1,110	1.13	ND	0.358 B
Antimony			1.8	ND	ND	ND	ND	ND	ND	ND	3.6	ND	ND	ND
Selenium	3.9c	180	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thallium			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium			23.8	11.8	30.1	18.3	21.4	16.1	22.7	22.5	27.9	19	23.7	22.4
Zinc	109 c	10,000	20.6	17.5	237	20.2	181	19	272	88.4	555	19.5	22.5	27.8

Notes:

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TABLE 6
FORMER EAST COAST
INDUSTRIAL UNIFORMS SITE
Brooklyn, New York
Soil Analytical Results
Metals

COMPOUND	NYSDEC Part 375.6 Unrestricted Use Soil Cleanup Objectives*	NYDEC Part 375.6 Restricted Residential Soil Cleanup Objectives*	SB9	SB10	SB11		SB12		SB13		SB14	SB15
			(7-9') mg/Kg	(7-9') mg/Kg	(0-1') mg/Kg	(7-9') mg/Kg	(0-1') mg/Kg	(8-10') mg/Kg	(8-10') mg/Kg	(15-20') mg/Kg	(7-10') mg/Kg	(8-10') mg/Kg
Silver	2	180	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aluminum			3,940	4410	6920	4240	7640	8760	5830	4660	6990	7910
Arsenic	13	16	1.16	1.29	3.17	1.43	3.07	2.29	1.42	1.4	2.43	2.84
Barium	350	400	31.7	32.3	592	38.1	162	49.7	40.1	49.5	150	97.1
Beryllium	7.2	72	0.271 B	0.32	0.44	0.41	0.41	0.58	0.4	0.39	0.38	0.35
Calcium			875	953	12500	1050	39800	872	1110	1530	4980	11600
Cadmium	2.5 c	4.3	ND	ND	0.54	ND	0.5	ND	ND	ND	ND	ND
Cobalt			3.95	4.64	5.86	5.68	4.07	7.59	5.68	6.32	5.51	4.94
Chromium	30 c	180 - trivalent	11.9	11.8	19.8	11.7	13.1	17.8	14.8	13.4	16.3	13.4
Copper	50	270	12.4	15.2	28	16.3	34.3	34.5	19.1	22.7	16.5	19.8
Iron			ND	14,800	18800	16500	19600	21100	16800	22500	13700	13600
Mercury	0.18 c	0.81	ND	ND	0.12	ND	0.13	ND	ND	ND	ND	0.36
Potassium			1140 N	1470 N	1930 N	1100 N	1030 N	1440 N	1410 N	1310 N	1020 N	1130 N
Magnesium			1560	1620	2960	1680	3360	2250	2270	1700	3420	2840
Manganese	1600 c	2,000	177	298	366	459	372	468	451	317	242	228
Sodium			1.17 N	115 N	177 N	119 N	549 N	102 N	169 N	173 N	157 N	409 N
Nickel	30	310	7.86	9.4	11.6	13	10.9	14.6	11.5	18	22.3	14.9
Lead	63 c	400	2.47	4	1,220 N	5.14	238 N	16.1	2.51	4.08	189 N	220 N
Antimony			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Selenium	3.9c	180	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thallium			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium			19.3	23.1	28.9	20.5	20.2	31.8	29.1	30	14.1	15.4
Zinc	109 c	10,000	29.2	24.3	474	27.2	234	118	31.5	31.3	57.9	87.1

Notes:

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Bold/highlighted- Indicated exceedance of the NYSDEC UUSCO Guidance Value

TABLE 7
FORMER EAST COAST INDUSTRIAL UNIFOMS SITE
Brooklyn, NY
Parameters Detected Above Track 1 Soil Cleanup Objectives

COMPOUND	Range in Exceedances	Frequency of Detection	SB1	SB2	SB3		SB4		SB5				SB6			SB7
			(7-9')	(7-9')	(0-1')	(7-9')	(0-4')	(7-9')	(0-5')	(8-10')	(23-25')	(25-27')	(0-5')	(8-10')	(23-25')	(22-25')
Sample Results in µg/kg																
1,2,4-Trimethylbenzene	1,600 - 14,000	6									4,100				1,600	
Acetone	51 -690	9	53 JS	51 S		52 S		51 JS		51 JS				51 JS		
m&p-Xylenes	640-650	2													650 J	
Methylene Chloride	63-410	11									190 JS	190 JS			410 JS	100 JS
o-Xylenes	590-790	2													790 J	
Sample Results in µg/kg																
4,4-DDE	6-14	3														
4,4-DDT	4.3-55	2							4.3							
Sample Results in mg/kg																
Barium	592	1														
Cadmium	1,260-22,700	2	1,260		22,700											
Copper	65	1			65											
Mercury	0.25-1.55	5			1.55		0.25		1.52				0.42			
Lead	189-1,220	7			263		244		315				1,110			
Zinc	118-555	7			237		181		272				555			

COMPOUND	Range in Exceedances	Frequency of Detection	SB8		SB9	SB10		SB11		SB12			SB13		SB14			SB15	
			(7-10')	(22-25')	(21-24')	(19-21')	(22-25')	(0-1')	(22-25')	(0-1')	(8-10')	(22-25')	(8-10')	(22-25')	(7-10')	(12-15')	(22-25')	(8-10')	(23-25')
Sample Results in µg/kg																			
1,2,4-Trimethylbenzene	1,600 - 14,000	6					10,000		14,000			9,600		12,000					
Acetone	51 -1,300	9	56 S	690 JS													1,300 JS		
m&p-Xylenes	640-650	2												640					
Methylene Chloride	63-410	11		96 JS	63 JS	110 JS	320 JS		310 JS			300 JS	130 JS	140 JS					
Napthalene	18,000	1							18,000										
o-Xylenes	590-790	2												590					
Sample Results in µg/kg																			
Benzo(a)anthracene	1,300-3300	2														3,300			1,300
Benzo(a)pyrene	2,600	1														2,600			
Benzo(b)fluoranthene	1,300-3100	2														3,100			1,300
Benzo(k)fluoranthene	980	1														980			
Chrysene	1,200-3200	2														3,200			1,200
Dibenzo(a,h)anthracene	370	1														370			
Dibenzofuran	670	1														670			
Indeno(1,2,3-cd)pyrene	570-1100	2														1,100			570
Sample Results in µg/kg																			
4,4-DDE	6-14	3						14	6										
4,4-DDT	4.3-55	2						55	23										
Sample Results in mg/kg																			
Barium	592	1						592											
Cadmium	1,260-22,700	2																	
Copper	65	1																	
Mercury	0.25-1.55	5																0.36	
Lead	189-1,220	7						1,220 N		238 N					189 N			220 N	
Zinc	118-555	7						474		234	118								

TABLE 8
FORMER EAST COAST
INDUSTRIAL UNIFORMS SITE
Brooklyn, New York
Groundwater Analytical Results
Volatile Organic Compounds

Compound	NYSDEC Groundwater Quality Standards µg/L	MW1S µg/L	MW1D µg/L	MW2 µg/L	MW3 µg/L	MW4S µg/L	MW4D µg/L	MW5 µg/L	MW6S µg/L	MW6D µg/L	MW7 µg/L	MW8 µg/L	MW9S µg/L	MW9D µg/L	SB2 µg/L	SB4 µg/L	SB6 µg/L	SB8 µg/L	SB10 µg/L	SB12 µg/L
1,1,1,2-Tetrachlorothane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.39 J	ND	ND	ND	ND	ND	ND	ND	0.29 J
1,1-Dichloroethene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloropropene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	5	ND	ND	ND	ND	7.1	5.8	0.91 J	290	5.2	59	ND	ND	3	0.75 J	ND	110	7.9	60	63
1,2-Dibromo-3-chloropropane		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.18 J
1,2-Dichloroethane	0.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	0.94	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	5	ND	ND	ND	0.53 J	0.33 J	0.66 J		35	0.61 J	11	ND	ND	0.54 J	ND	ND	27	1.8	9.5	6.5
1,3-Dichlorobenzene		0.25 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichloropropane		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.23 J
2,2-Dichloropropane		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chlorotoluene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone (Methyl Butyl Ketone)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Isopropyltoluene		ND	ND	ND	3	0.53 J	ND	1	4.4 J	0.4 J	1.3 J	ND	ND	ND	ND	ND	1.9 J	0.52 J	0.77 J	1.9
4-Chlorotoluene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-Pentanone		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone		12 S	ND	13 S	ND	ND	18 S	ND	ND	ND	ND	ND	ND	16	ND	ND	ND	ND	ND	ND
Acrylonitrile		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND J	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	1	ND	ND	ND	ND	ND	1.7	ND	ND	2.5	ND	0.99	5.8 S	23	ND	ND	ND	ND	ND	27
Bromobenzene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromochloromethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	5	ND	ND	0.49 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide		ND	ND	ND	ND	ND	0.54 J	ND	ND	0.39 J	1.2 J	2.2	ND	1.2 J	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.82 J
Chloroform	7	0.53 J	0.38 J	ND	ND	ND	0.38 J	ND	ND	ND	ND	0.24 J	ND	8.4 J	0.53 J	0.28 J	ND	2.7 J	2.1 J	ND
Chloromethane		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	0.46 J	5	5
cis-1,2-Dichloroethene	5	ND	0.96 J	ND	5.1	6.4	1.2	8.5	5.8	9.5	54	24	0.59 J	ND	ND	ND	3.4	0.32 J	6.8	0.91 J
cis-1,3-Dichloropropene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromoethane		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromomethane		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	5	ND	ND	ND	0.22 J	1.1	ND	ND	48	1.2	10	0.43 J	0.25 J	11	ND	ND	20	0.21 J	2.6	66
Hexachlorobutadiene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene	5	ND	ND	ND	4.8	1.9	0.53 J	ND	25	1	6	ND	ND	ND	ND	ND	10	0.34 J	4.6	14
m&p-Xylenes	5	ND	ND	ND	ND	0.69 J	ND	ND	35	0.74 J	6.3	ND	ND	4.2	ND	ND	18	ND	4.4	9.9
Methyl Ethyl Ketone (2-Butanone)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl t-butyl ether (MTBE)		ND	ND	0.21 J	ND	ND	0.86 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride		ND	ND	ND	ND	ND	ND	ND	ND	ND	0.8 J	ND	ND	0.42 JS	ND	ND	ND	ND	ND	ND
Naphthalene		0.22 J	ND	0.26 J	3.6	54	7	2.1	390	10	59	34	1.5	15	1	0.81 J	110	9	48	70
n-Butylbenzene	5	ND	ND	ND	3.4	1.5	0.36 J	1.4	24	0.99 J	5.1	ND	ND	ND	ND	ND	5.6	1.1	1.9	2.9
n-Propylbenzene	5	ND	ND	ND	8.1	2.7	0.57 J	ND	46	1.4	9.2	ND	ND	ND	ND	ND	16	0.8 J	6.4	17
o-Xylene	5	ND	ND	ND	ND	0.49 J	ND	ND	6.3	0.94 J	6.8	ND	ND	3.3	ND	ND	20	ND	2.1	ND
p-Isopropyltoluene		ND	ND	ND	5.2	0.95 J	ND	0.95 J	14	0.48 J	4.6 J	ND	ND	ND	ND	ND	4.8	0.91 J	2.1	3.1
sec-Butylbenzene		ND	ND	ND	11	3.1	0.78 J	4.1	16	1.8	8.3 J	ND	ND	ND	ND	ND	8.7	2.3	3.4	6
Styrene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
tert-Butylbenzene		ND	ND	ND	1.5	0.46	ND	0.56 J	1.8 J	0.24 J	ND	ND	ND	ND	ND	ND	0.94 J	0.23 J	0.3 J	0.81 J
Tetrachloroethene	5	0.46 J	13	16	ND	2.4	1.2	18	25	6.8	540	33	2.3	0.96 J	5.3	6.9	4.4	8.4	40	1.5
Tetrahydrofuran (THF)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	5	ND	ND	0.29 J	ND	ND	0.24 J	ND	ND	ND	ND	0.3 J	0.68 J	2.1 J	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene		ND	ND	ND	0.35 J	0.38 J	ND	0.27 J	7.2 J	2.3 J	1.1 J	1.1 J	ND	ND	ND	ND	2.5 J	ND	2 J	10
trans-1,3-Dichloropropene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trabs-1,4-dichloro-2-butene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	5	ND	14	0.7 J	2	0.67 J	1.7	15	1.9 J	2	53	15	0.74 J	ND	ND	0.19 J	0.9 J	1.6	1.7	0.25 J
Trichlorofluoromethane		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorotrifluoroethane		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride		ND	ND	ND	ND	ND	ND	ND	1.3 J	0.56 J	1.7 J	12 J	ND	ND	ND	ND	0.46 J	ND	0.29 J	1.8
TOTAL PVOCs		0.0	0.0	0.8	41.4	74.4	18.5	8.9	929.2	24.1	185.3	35.7	8.2	62.1	1.8	0.8	332.9	25.1	146.1	288.1
TOTAL CVOCs		0.7	28.0	16.7	7.5	9.9	4.1	41.8	39.9	20.6	648.1	73.1	3.6	1.0	5.3	7.1	11.2	10.3	50.5	12.7

Notes:
ND - Not detected
J - The value is estimated. This flag is used: a) on form 1 when the compound is reported above the MDL, but below the PQL, and b) on the Tentatively Identified Compounds (TIC) form for all compounds identified.
Bold/highlighted- Indicated exceedance of the NYSDEC Groundwater Standard

TABLE 9
FORMER EAST COAST INDSUSTRIAL UNIFORMS SITE
Brooklyn, NY
Groundwater Analytical Results
Semi-Volatile Organic Compounds

Compound	NYSDEC Groundwater Quality Standards µg/L	MW2 µg/L	MW3 µg/L	MW4S µg/L	MW5 µg/L	MW6S µg/L	MW6D µg/L	MW7 µg/L	MW8 µg/L	MW9S µg/L	SB2 µg/L	SB4 µg/L	SB6 µg/L	SB8 µg/L	SB10 µg/L	SB12 µg/L
1,2,4,5-Tetrachlorobenzene	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dinitrotoluene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,6-Dinitrotoluene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chloronaphthalene	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Methylnaphthalene	50	ND	ND	ND	ND	**2000**	**8**	ND	ND	ND	**13**	ND	**750**	**18**	**53**	**75**
2-Nitroaniline	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3,3'-Dichlorobenzidine	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3-Nitroaniline	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Bromophenyl phenyl ether		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Chloroaniline	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Chlorophenyl phenyl ether		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Nitroaniline	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthene	20	ND	ND	ND	ND	ND	ND	ND	**7.4**	ND	ND	ND	ND	ND	ND	**5.2**
Acenaphthylene		ND	ND	ND	ND	ND	ND	**4.8**	ND	ND	ND	ND	ND	**0.73**	**0.61**	**0.74**
Anthracene	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Azobenzene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)anthracene	0.002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**3.3**	**0.067**	**0.022**	**0.21**
Benzidine	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)pyrene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**2.2**	**0.044**	ND	**0.12**
Benzo(b)fluoranthene	0.002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**3.3**	**0.056**	ND	**0.18**
Benzo(g,h,i)perylene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	0.002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.7**	**0.022**	ND	**0.067**
Benzoic Acid		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzyl Alcohol		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Butyl benzyl phthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bis(2-chloroethoxy)methane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bis(2-chloroethyl)ether	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bis(2-chloroisopropyl)ether		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bis(2-ethylhexyl)phthalate	5	ND	ND	ND	ND	ND	ND	ND	**9.8**	ND	ND	ND	ND	ND	ND	ND
Chrysene	0.002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**3.9**	**0.089**	**0.022**	**0.19**
Dibenzo(a,h)anthracene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.022**
Dibenzofuran		ND	ND	ND	ND	ND	ND	ND	**1.7** J	ND	ND	ND	ND	ND	ND	ND
Diethylphthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dimethylphthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-butylphthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-octylphthalate	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	50	ND	ND	ND	ND	ND	ND	ND	**3.5** J	ND	ND	ND	ND	ND	ND	ND
Fluorene	50	ND	**31** J	ND	**2.1** J	**130** J	ND	ND	**4.1** J	ND	ND	ND	ND	**4.1**	**4.1**	**5.3**
Hexachlorobenzene	0.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene	0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorocyclopentadiene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	0.002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.1**	**0.022**	ND	**0.067**
Isophorone	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	10	ND	ND	ND	ND	**550**	**4.9** J	ND	**2.9** J	ND	**3.6** J	ND	**290**	**10**	**35**	**48**
Nitrobenzene	0.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-Nitrosodimethylamine		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-Nitrosodi-n-propylamine		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-Nitrosodiphenylamine	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pentachloronitrobenzene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pentachlorophenol		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	50	ND	**36**	ND	ND	**380**	ND	**52**	**4.2**	ND	**2.2**	ND	**150**	**6.2**	**6.8**	**7.5**
Pyrene	50	ND	ND	ND	ND	ND	ND	ND	**3.3** J	ND	ND	ND	ND	ND	ND	ND
TOTAL SVOCS		**0**	**67**	**0**	**2**	**3060**	**13**	**57**	**37**	**0**	**19**	**0**	**1206**	**39**	**100**	**143**

Notes:
ND - Not detected
J - The value is estimated. This flag is used: a) on form 1 when the compound is reported above the MDL, but below the PQL, and b) on the Tentatively Identified Compounds (TIC) form for all compounds identified.
Bold/highlighted- Indicated exceedance of the NYSDEC Groundwater Standard

TABLE 10
FORMER EAST COAST
INDUSTRIAL UNIFORMS SITE
Groundwater Results - Pesticides / PCBs

Compound	NYSDEC Groundwater Quality Standards µg/L	MW2 µg/L	MW3 µg/L	MW4S µg/L	MW5 µg/L	MW6S µg/L	MW7 µg/L	MW8 µg/L	MW9S µg/L
PCB-1016	**0.09**	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1221	**0.09**	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1232	**0.09**	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1242	**0.09**	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1248	**0.09**	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1254	**0.09**	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1260	**0.09**	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1262	**0.09**	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1268	**0.09**	ND	ND	ND	ND	ND	ND	ND	ND
4,4-DDD	**0.3**	ND	ND	ND	ND	ND	ND	ND	ND
4,4-DDE	**0.2**	ND	ND	ND	ND	ND	ND	ND	ND
4,4-DDT	**0.11**	ND	ND	ND	ND	ND	ND	ND	ND
a-BHC	**0.94**	ND	ND	ND	ND	ND	ND	ND	ND
Alachlor		ND	ND	ND	ND	ND	ND	ND	ND
Aldrin		ND	ND	ND	ND	ND	ND	ND	ND
b-BHC	**0.04**	ND	ND	ND	ND	ND	ND	ND	ND
Chlordane	**0.05**	ND	ND	ND	ND	ND	ND	ND	ND
d-BHC	**0.04**	ND	ND	ND	ND	ND	ND	ND	ND
Dieldrin	**0.004**	ND	ND	ND	ND	ND	ND	ND	ND
Endosulfan I		ND	ND	ND	ND	ND	ND	ND	ND
Endosulfan II		ND	ND	ND	ND	ND	ND	ND	ND
Endosulfan Sulfate		ND	ND	ND	ND	ND	ND	ND	ND
Endrin		ND	ND	ND	ND	ND	ND	ND	ND
Endrin aldehyde	**5**	ND	ND	ND	ND	ND	ND	ND	ND
Endrin ketone		ND	ND	ND	ND	ND	ND	ND	ND
gamma-BHC	**0.05**	ND	ND	ND	ND	ND	ND	ND	ND
Heptachlor	**0.04**	ND	ND	ND	ND	ND	ND	ND	ND
Heptachlor epoxide	**0.03**	ND	ND	ND	ND	ND	ND	ND	ND
Methoxychlor	**35**	ND	ND	ND	ND	ND	ND	ND	ND
Toxaphene		ND	ND	ND	ND	ND	ND	ND	ND

Notes:
ND - Non-detect
J - The value is estimated. This flag is used: a) on form 1 when the compound is reported above the MDL, but below the PQL, and b) on the Tentatively Identified Compounds (TIC) form for all compounds identif
Bold/highlighted- Indicated exceedance of the NYSDEC Groundwater Standard

TABLE 11
FORMER EAST COAST
INDUSTRIAL UNIFORMS SITE
Groundwwater Results - Metals

Compound	NYSDEC Groundwater	MW1	MW2		MW3		MW4S		MW5		MW6S		MW6D		MW7		MW8		MW9S	
		Filtered	Total	Filtered	Total	Filtered	Total	Filtered	Total	Filtered	Total	Filtered	Total	Filtered	Total	Filtered	Total	Filtered	Total	Filtered
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Silver	50	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	0.8 B	<5.0	<5.0	2.1 B	0.5 B
Aluminum	NS	790	134,000	650	3,030	230 N	2,730	210 N	5,260	210 N	1,900	160 N	3,190	400 N	155,000	500	289,000	400	1,350,000	260
Arsenic	25	<3.0	11	<3.0	<3.0	3	4	<3.0	<3.0	<3.0	4	<3.0	<3.0	<3.0	20	<3.0	33	<3.0	166	<3.0
Barium	1000	49	1,680	59	214	156	465	396	286	210	184	185	100	72	2,890	86	4,480	112	7,460	235
Beryllium	3	<1.0	11	<1.0	<1.0	<1.0	<1.0	<1.0	0.03 B	<1.0	<1.0	<1.0	<1.0	<1.0	16	<0.001	22	<1.0	61	<1.0
Calcium	NS	39,600	106,000	79,000	95,100	91,900 N	77,500	75,800 N	79,200	77,500 N	52,300	49,000 N	48,700	47,500 N	73,000	34,000	288,000	74,200	958,000	397,000
Cadmium	5	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	3.5 B	<0.004	<4.0	<4.0	<4.0	<4.0
Cobalt	NS	<5.0	166	3.3 B	2.9	<5.0	11	7	15	6	5	4 B	8	3.6 B	494	21	314	<5.0	831,000	<5.0
Chromium	50	0.9 B	466	1	13	<1.0	9	<1.0	18	<1.0	8	<1.0	18	1	436	<1.0	979	<1.0	1,600	<1.0
Copper	200	2.8 B	574	3.2 B	21	2.1 B	22	1 B	31	1.3 B	10	1.1 B	16	2.4 B	632	1.9 B	1,110	1.5 B	3,780	2.6 B
Iron	500	510	362,000	710	25,400	3,570	33,100	6,250 N	25,500	1,240 N	19,000	7,680	10,300	580 N	483,000	540	791,000	330	3,000,000	760
Mercury	0.7	<0.2	<2.0	<2.0	<2.0	<2.0	<0.2	<0.2		<0.2	<0.2	<0.2	<0.2	<0.2	0.5	<0.2	1.3	<0.2	9.3	<0.2
Potassium	NS	6,100	56,000	6,400	17,400	16,500 N	16,400	16,100 N	10,800	10,000 N	8,900	9,400 N	8,000	7,600 N	43,700	8,700	80,200	16,800	220,000	25,700
Magnesium	35000	12,200	86,000	29,000	19,100	17,700 N	13,600	12,300 N	12,500	10,400 N	11,600	9,410 N	10,400	9,230 N	57,100	6,950	169,000	30,100	546,000	130,000
Manganese	300	650	12,600	2,690	1,770	1,320	5,690	5,970	10,300	9,730	5,610	6,040	3,660	3,550	49,900	7,860	32,300	2,330	92,300	8,690
Sodium	2000	74,700	102,000	109,000	47,200	48,300 N	42,200	41,200 N	43,000	40,700 N	66,600	54,200 N	25,400	25,400 N	83,800	76,100	104,000	102,000	71,100	116,000
Nickel	100	5	344	12	18	2.5 B	17	5	23	3.6 B	8	2.2 B	22	13	455	13	582	3.4 B	1,320	1.6 B
Lead	25	5	368	<2.0	16	<2.0	5	<2.0	6	2 B	47	<2.0	15	5	272	3	990	<0.002	7,070	<0.002
Antimony	3	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Selenium	10	<4.0	<4.0	6	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
Thallium	0.5	<2.0	2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Vanadium	NS	0.8 B	390	<10	10	<10	9.5 B	<10	20	<10	6.3 B	0.4 B	10	1.8 B	520	<10	710	<10	3,270	<10
Zinc	2000	5.8 B	938	5.1 B	30	6.3 B	23	8 B	41	6.8 B	55	34	37	5.9 B	845	4.8 B	1,550	2.4 B	7,540	3.2 B

TABLE 12
FORMER EAST COAST INDUSTRIAL UNIFORMS SITE
Brooklyn, NY
Parameters Detected Above Ambient Water Quality Standards

VOCs / SVOCs

COMPOUND	Range in Detections	MW1D	MW2	MW3	MW4S	MW4D	MW5	MW6S	MW6D	MW7	MW8	MW9S	MW9D	SB2	SB4	SB6	SB8	SB10	SB12
Sample Results in (µg/L)																			
1,2,4-Trimethylbenzene	5.2-290				7.1	5.8		290	5.2	59						110	7.9	60	63
1,3,5-Trimethylbenzene	6.5-35							35		11						27		9.5	6.5
Benzene	1.7-23					1.7			2.5			5.8 S	23						27
Chloroform	8.4												8.4 J						
cis-1,2-Dichloroethene	5.1-54			5.1	6.4		8.5	5.8	9.5	54	24							6.8	
Ethyl Benzene	10-26							48		10			11			20			66
Isopropylbenzene	6-25							25		6						10			14
m/p-Xylenes	6.3-35							35		6.3									
n-Butylbenzene	5.1-24							24		5.1						5.6			
n-Propylbenzene	6.4-46			8.1				46		9.2						16		6.4	17
o-Xylene	6.3-20							6.3		6.8						20			
Tetrachloroethene	6.8-540		16				18	25	6.8	540	33			5.3	6.9		8.4	40	
Trichloroethene	14-53	14					15			53	15								
2-Methylnapthalene	53-2000							2000								750		53	75
Benzo(a)anthracene	0.022-33															3.3	0.067	0.022	0.21
Benzo(b)fluoranthene	0.056-33															3.3	0.056		0.18
Benzo(k)fluoranthene	0.022-1.7															1.7	0.022		0.067
Bis(2-ethylhexyl)phthalate	9.8										9.8								
Chrysene	0.022-3.9															3.9	0.089	0.022	0.19
Fluorene	130							130 J											
Indeno(1,2,3-cd)pyrene	0.022-1.1															1.1	0.022		0.067
Naphthalene	290-550							550								290			
Phenanthrene	52-380							380		52						150			

Metals (dissolved)

COMPOUND	Range in Detections	MW1S	MW2	MW3	MW4S	MW5	MW6S	MW6D	MW7S	MW8	MW9S
Sample Results in (µg/L)											
Iron	510-7680	510	710	3570	6250 N	1240 N	7680	580 N	540		760
Magnesium	130000										130000
Manganese	650-9730	650	2690	1320	5970	9730	6040	3550	7860	2330	8690
Sodium	25400-116000	74700	109000	48300 N	41200 N	40700 N	54200 N	25400 N	76100	102000	116000

Metals (total)

COMPOUND	Range in Detections	MW2	MW3	MW4S	MW5	MW6S	MW6D	MW7	MW8	MW9S
Sample Results in (µg/L)										
Arsenic	33								33	
Barium	1680-4480	1680						2890	4480	
Beryllium	11-22	11						16	22	
Chromium	436-979	466						436	979	
Copper	574-1110	574						632	1110	
Iron	760-791000	362000	25400	33100	25500	19000	10300	483000	791000	760
Mercury	1.3								1.3	
Magnesium	57100-169000	86000						57100	169000	130000
Manganese	1770-49900	12600	1770	5690	10300	5610	3660	49900	32300	8690
Sodium	25400-116000	102000	47200	42200	43000	66600	25400	83800	104000	116000
Nickel	344-582	344						455	582	
Lead	47-990	368				47		272	990	
Zinc	7540									7540

TABLE 13
FORMER EAST COAST
INDUSTRIAL UNIFORMS SITE
Brooklyn, NY
Soil Gas - Volatile Organic Compounds

COMPOUNDS	NYSDOH Outdoor Background Levels (µg/m³) [a]	SG1 (µg/m³)	SG2 (µg/m³)	SG4 (µg/m³)	SG5 (µg/m³)	SG6 (µg/m³)	SG7 (µg/m³)	SG8 (µg/m³)	OA1 (µg/m³)
1,1,1,2-Tetrachloroethane		ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	<2.0 - 2.8	ND	ND	**7.74**	**32.2**	**6.22**	**2.51**	ND	ND
1,1,2,2-Tetrachloroethane	<1.5	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	<1.0	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	<1.0	ND	ND	1.09	1.94	ND	ND	ND	ND
1,1-Dichloroethene	<1.0	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	NA	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	<1.0	**1.82**	**6.34**	**1.38**	**1.82**	**1.42**	**1.47**	**1.33**	ND
1,2-Dibromoethane	<1.5	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	<2.0	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	<1.0	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene	NA	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorotetrafluoroethane		ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	<1.0	ND	**2.31**	ND	ND	**1.62**	**1.77**	ND	ND
1,3-Butadiene	NA	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	<2.0	**181**	**78.1**	**63.7**	**108**	**151**	**108**	**144**	ND
1,4-Dichlorobenzene	NA	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dioxane		ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone		ND	ND	ND	ND	ND	ND	ND	ND
4-Ethyltoluene	NA	ND	**2.26**	ND	ND	ND	ND	ND	ND
4-Isopropyltoluene		ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-pentanone		ND	ND	ND	ND	ND	ND	ND	ND
Acetone	NA	**261**	**560**	**180**	**311**	**306**	**261**	**259**	**10.7**
Acrylonitrile		ND	ND	ND	ND	ND	ND	ND	ND
Benzene	<1.6 - 4.7	ND	**0.99**	**1.12**	ND	ND	**1.05**	ND	ND
Benzyl Chloride	NA	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	<5.0	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	<1.0	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	<1.0	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide	NA	ND	ND	**3.33**	ND	ND	**2.24**	ND	ND
Carbon Tetrachloride	<3.1	**0.314**	**0.44**	**0.503**	**0.44**	**0.44**	**0.314**	**0.503**	**0.566**
Chlorobenzene	<2.0	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	NA	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	<2.4	**1.8**	ND	**17**	**9.03**	**10.2**	**1.27**	**1.37**	ND
Chloromethane	<1.0 - 1.4	ND	ND	ND	ND	ND	ND	ND	**1.2**
cis-1,2-Dichloroethene	<1.0	ND	ND	**73.3**	**22.7**	ND	ND	ND	ND
cis-1,3-Dichloropropene	NA	ND	ND	ND	ND	ND	ND	ND	ND
Cyclohexane	NA	**1.68**	**3.3**	**1.79**	**2.3**	**1.17**	**1.2**	ND	ND
Dibromochloromethane	<5.0	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluromethane	NA	**2.27**	**2.32**	**2.87**	**2.42**	**2.57**	**2.47**	**2.62**	**2.62**
Ethanol		E **1,710**	E **1,830**	**1,300**	**1,840**	E **1,570**	E **1,430**	E **1,020**	**15.6**
Ethyl Acetate	NA	**5.33**	**8.72**	**4.9**	**7.24**	**4.93**	**4.79**	**4**	ND
Ethylbenzene	<4.3	**5.94**	**15.7**	**1.87**	**3.86**	**2.91**	**2.82**	**2.82**	ND
Heptane	NA	**1.35**	**3.4**	ND	**1.52**	**1.02**	**1.27**	ND	ND
Hexachlorobutadiene	NA	ND	ND	ND	ND	ND	ND	ND	ND
Hexane	<1.5	**4.12**	**7.5**	**7.43**	**4.79**	**5.14**	**5.64**	**5.04**	**4.02**
Isopropylalcohol	NA	E **2,280**	E **2,500**	**1,690**	**2,580**	E **2,280**	E **2,040**	E **1,620**	**6.22**
Isopropylbenzene		ND	ND	ND	ND	ND	ND	ND	ND
Xylene (m&p)	<4.3	**14.6**	**52.9**	**5.29**	**10.7**	**8.38**	**7.64**	**7.77**	ND
Methyl Ethyl Ketone		**48.9**	**124**	**46.9**	**70.7**	**54.2**	**51**	**41.6**	ND
MTBE	NA	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	<3.4	**2.57**	**1.6**	**10.8**	**7.95**	**1.6**	**1.6**	**1.53**	**1.6**
n-Butylbenzene		ND	ND	ND	ND	ND	ND	ND	ND
Xylene (o)	<4.3	**4.6**	**13.8**	**2.17**	**4.51**	**3.25**	**2.95**	**3.04**	ND
Propylene	NA	ND	ND	ND	ND	ND	ND	ND	ND
sec-Butylbenzene		ND	ND	ND	ND	ND	ND	ND	ND
Styrene	<1.0	**2**	**1.23**	ND	**1.58**	**1.36**	**1.06**	**1.32**	ND
Tetrachloroethene		**69.1**	**72.5**	**3,510**	**2,610**	**271**	**929**	**140**	ND
Tetrahydrofuran	NA	**43.6**	**51.3**	**35.4**	**59.8**	**44.5**	**37.7**	**36.5**	ND
Toluene	1.0 - 6.1	**96.4**	**273**	**4.14**	**6.21**	**4.86**	**15**	**4.86**	**1.62**
trans-1,2-Dichloroethene	NA	ND	ND	**7.21**	**3.6**	ND	ND	ND	ND
trans-1,3-Dichloropropene	NA	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	<1.7	**1.56**	**1.66**	**687**	**508**	**0.913**	**5.91**	**0.591**	ND
Trichlorofluoromethane	NA	**1.35**	**1.68**	**3.42**	**1.24**	**1.18**	**1.4**	**1.35**	**1.24**
Trichlorotrifluoroethane		ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	<1.0	ND	ND	ND	**0.306**	ND	ND	ND	ND
*Total PVOCs**		132.5	381.7	24.1	37.3	31.1	40.8	26.2	5.6
*Total CVOCs***		70.7	74.2	4,204.7	3,150.2	278.1	938.9	140.6	ND
*Total VOCs****		4,741.3	5,615.1	7,670.4	8,213.9	4,735.9	4,921.1	3,299.2	45.4

Notes:
NA No guidance value or standard available
(a) NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006, Summary of Background Levels for Selected Compounds (NYSDOH Database, Outdoor values)
* Petroleum Volatile Organic Compounds
** Chlorinated Volatile Organic Compounds
*** Volatile Organic Compounds

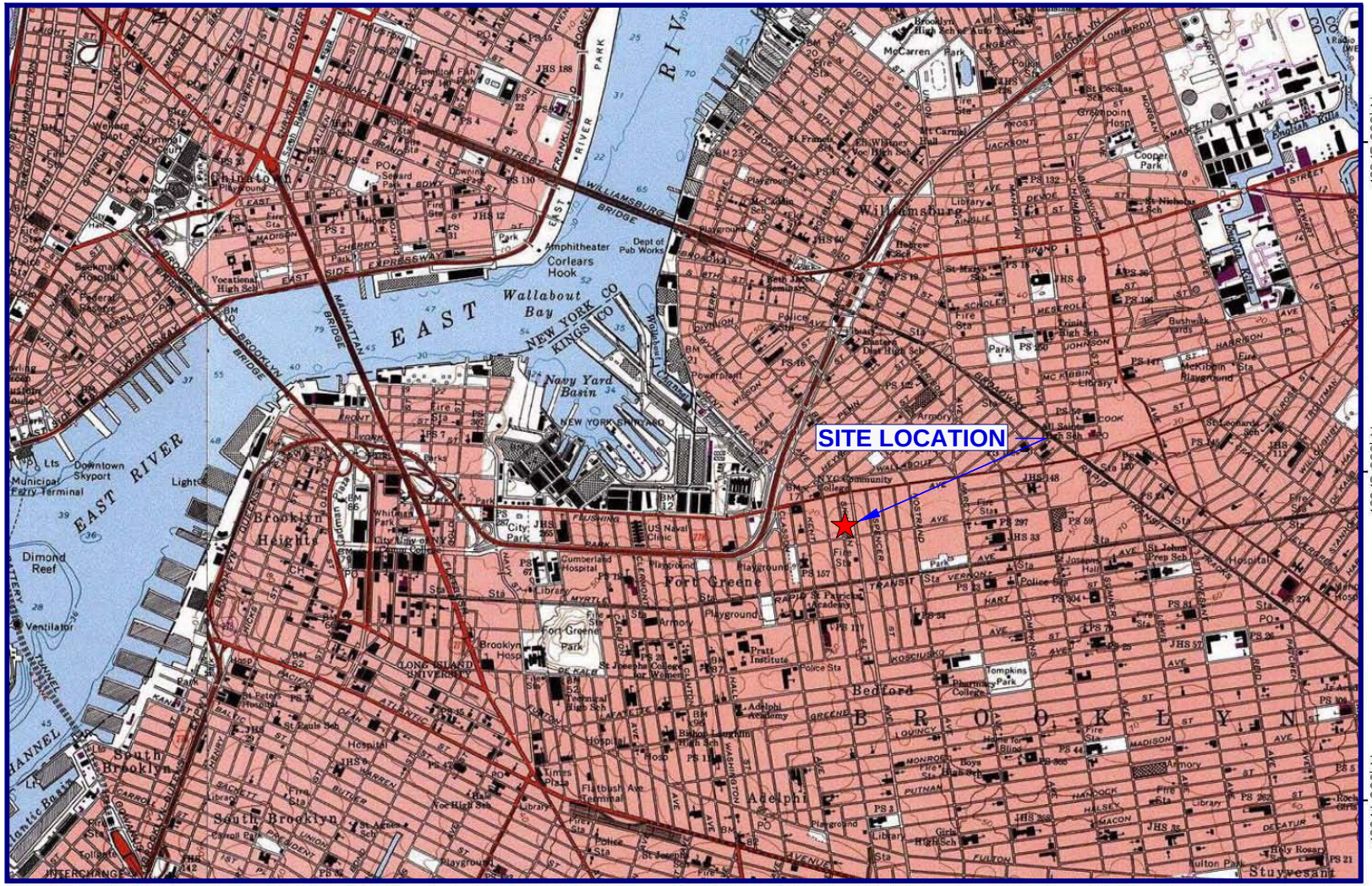
TABLE 14
Project Permit Listing
To Be Updated as Project Progresses

Permit	*Permit Number*	*Originating Agency*	*Pursuant to*	*Issued*	*Expires*	*Contact Phone*
Alteration Type 3 - Const. Equip	320454619-01-EQ SH	NYC DOB	Sidewalk Shed	3/28/2012	5/4/2012	718-496-1449

Table 15
Emergency Contact List

General Emergencies	911
NYC Police	911
NYC Fire Department	911
Woodhull Medical Center	(718) 963-8000
NYSDEC Spills Hotline	1-800-457-7362
NYSDEC Project Manager	(718) 482-4897
NYC Department of Health	(212) 676-2400
National Response Center	1-800-424-8802
Poison Control	1-800-222-1222
EBC Project Manager	1-631-504-6000
EBC BCP Program Manager	1-631-504-6000
EBC Site Safety Officer	1-631-504-6000
Remedial Engineer	1-516-987-1662
Construction Manager	1-718-599-1145

FIGURES



USGS Brooklyn Quadrangle 1995, Contour Interval = 10 feet

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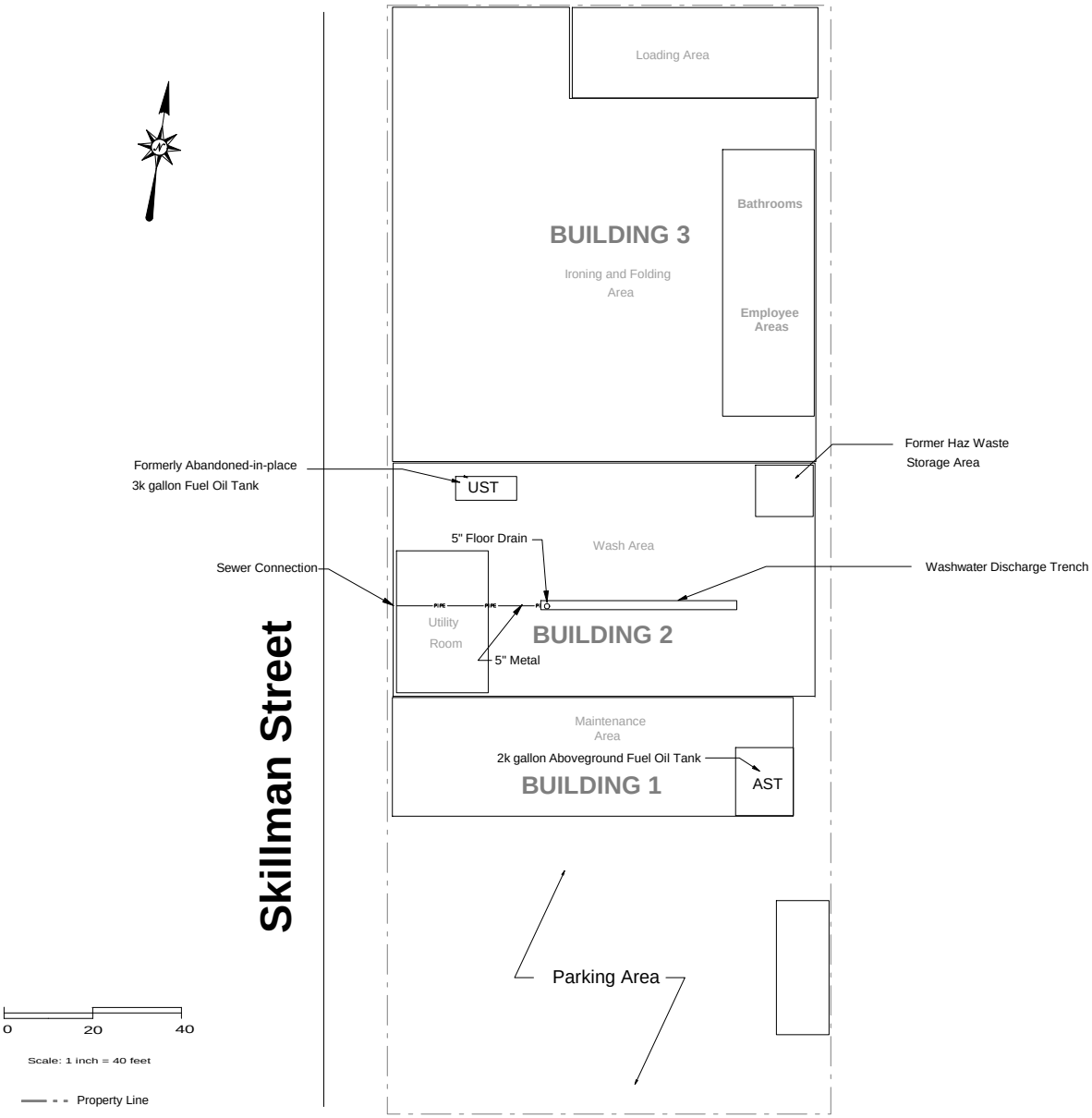
1808 MIDDLE COUNTRY ROAD. RIDGE. NY 11961
Phone 631.504.6000
Fax 631.924.2780

FORMER EAST COAST INDUSTRIAL UNIFORMS SITE
39 SKILLMAN AVENUE, BROOKLYN, NY

FIGURE 1 SITE LOCATION MAP



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Former East Coast Industrial Uniform Site
39 Skillman Street, Brooklyn, NY

FIGURE 2 Site Plan

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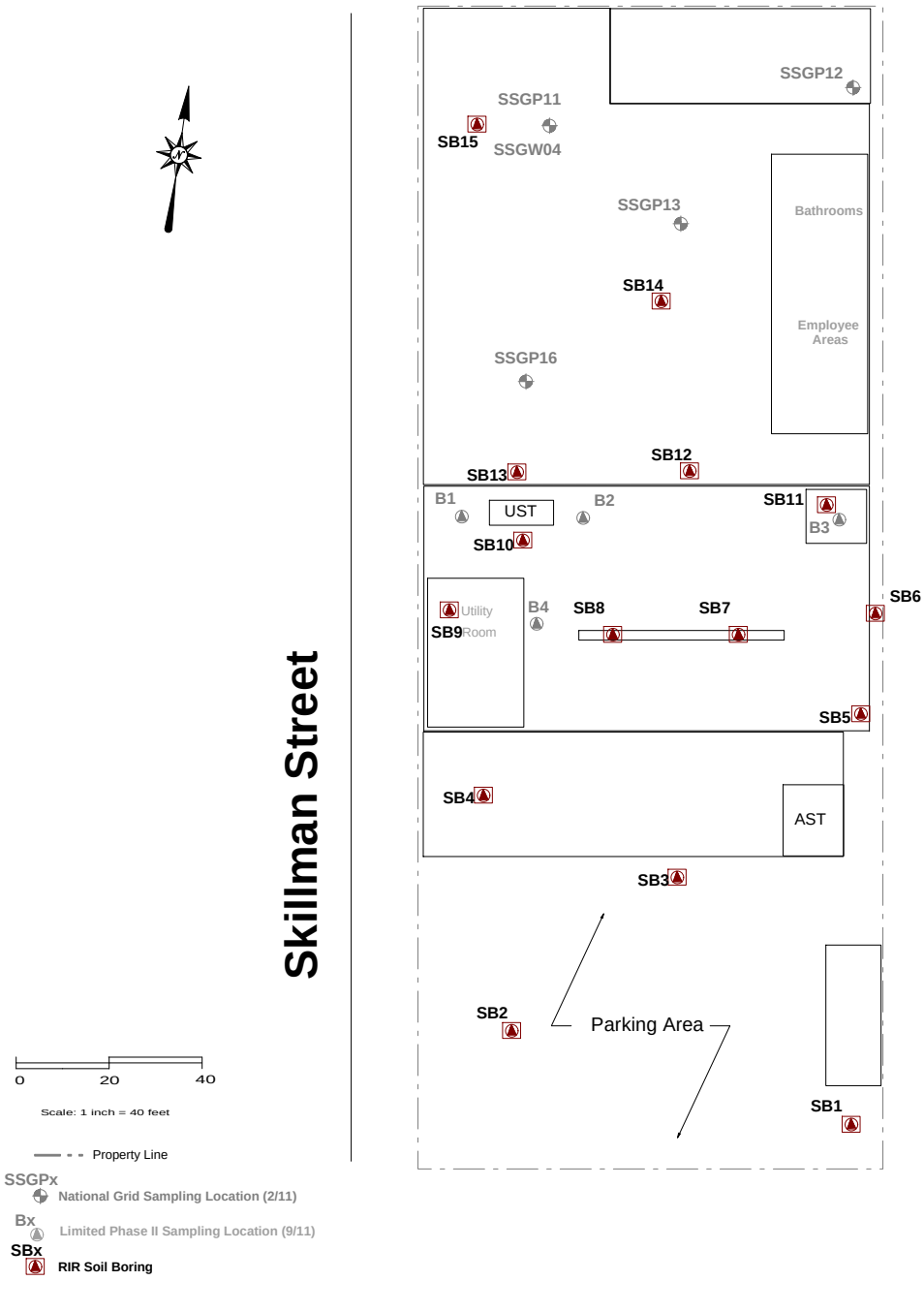
Fax: 631.924.2780

6-16 Box Street and 1121-1137 Manhattan Avenue
Brooklyn, NY 11222

FIGURE 3 Project Site and Adjacent Properties



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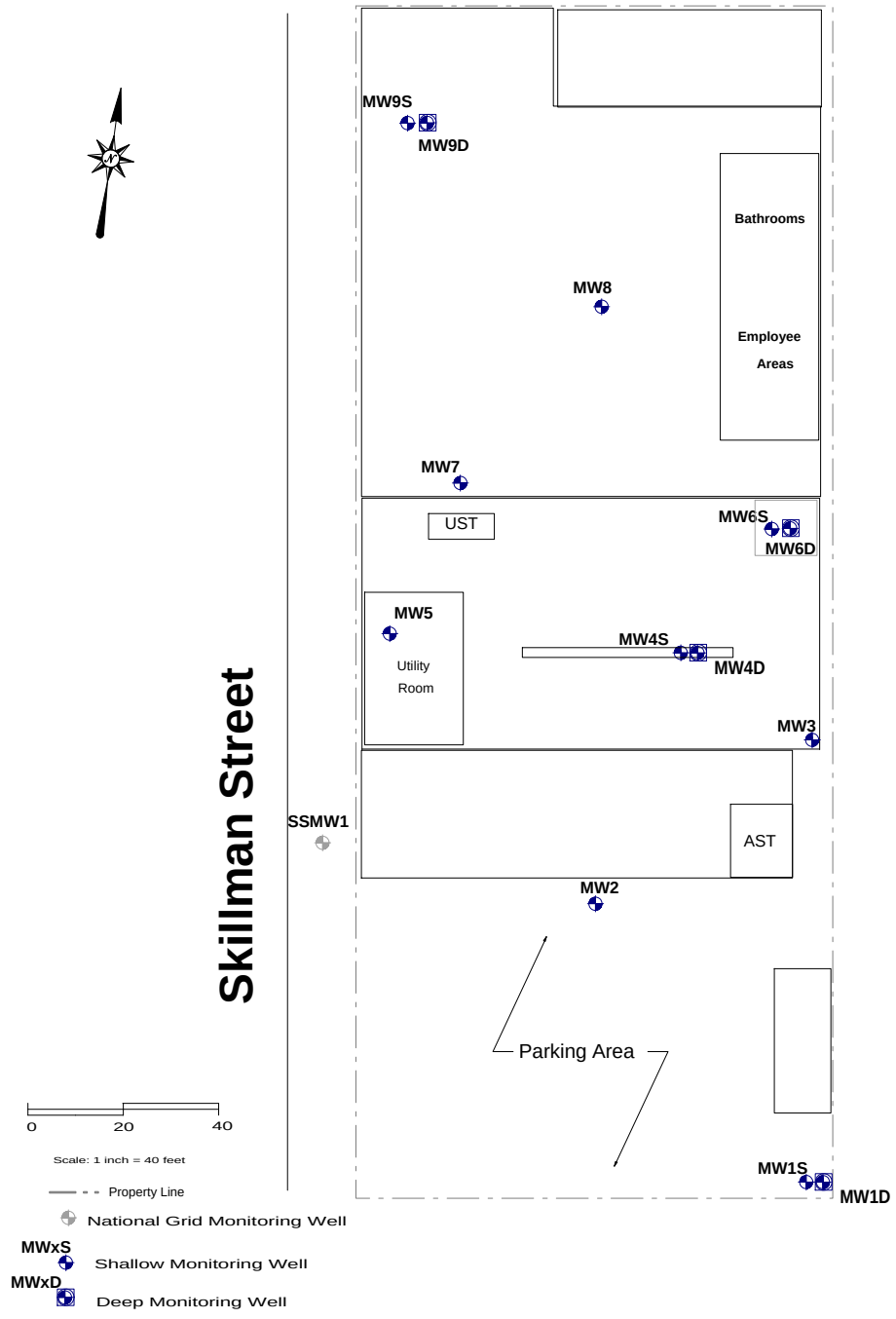
Former East Coast Industrial Uniform Site
39 Skillman Street, Brooklyn, NY

FIGURE 4 Soil Boring Locations



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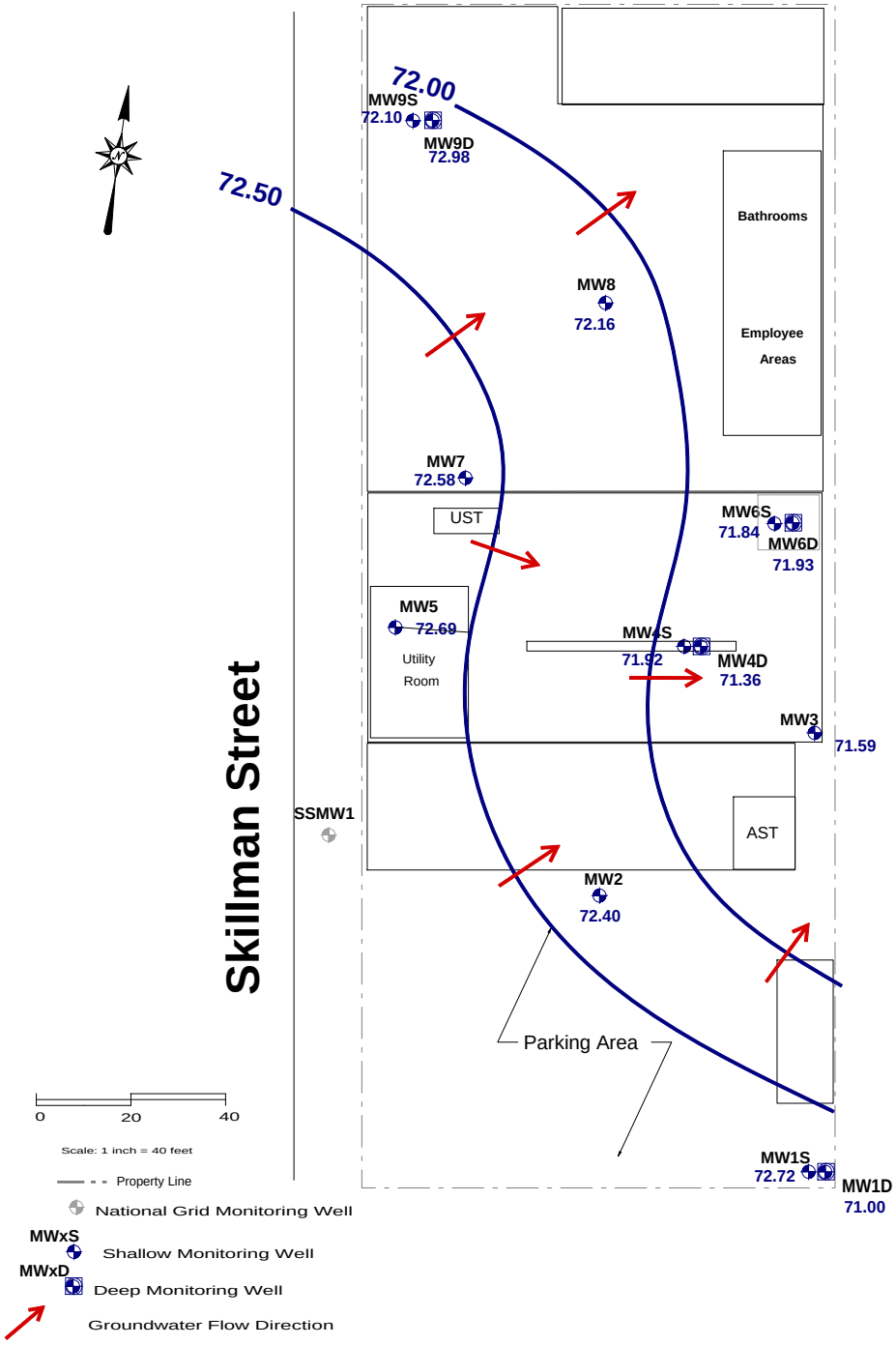
FORMER EAST COAST INDUSTRIAL UNIFORM SITE
39 SKILLMAN STREET, BROOKLYN, NY

FIGURE 5 MONITORING WELL LOCATIONS



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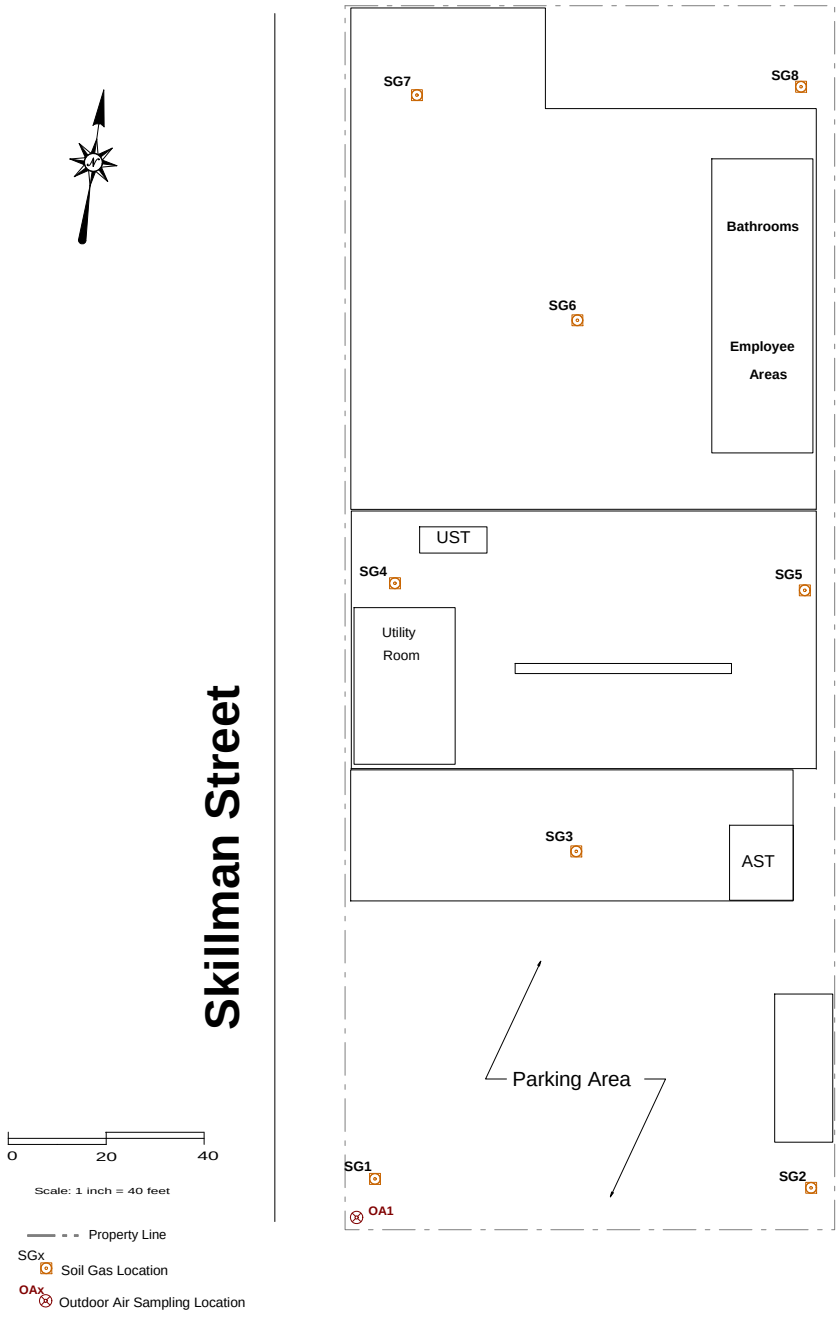
Former East Coast Industrial Uniform Site
39 Skillman Street, Brooklyn, NY

FIGURE 6 Groundwater Elevation Map



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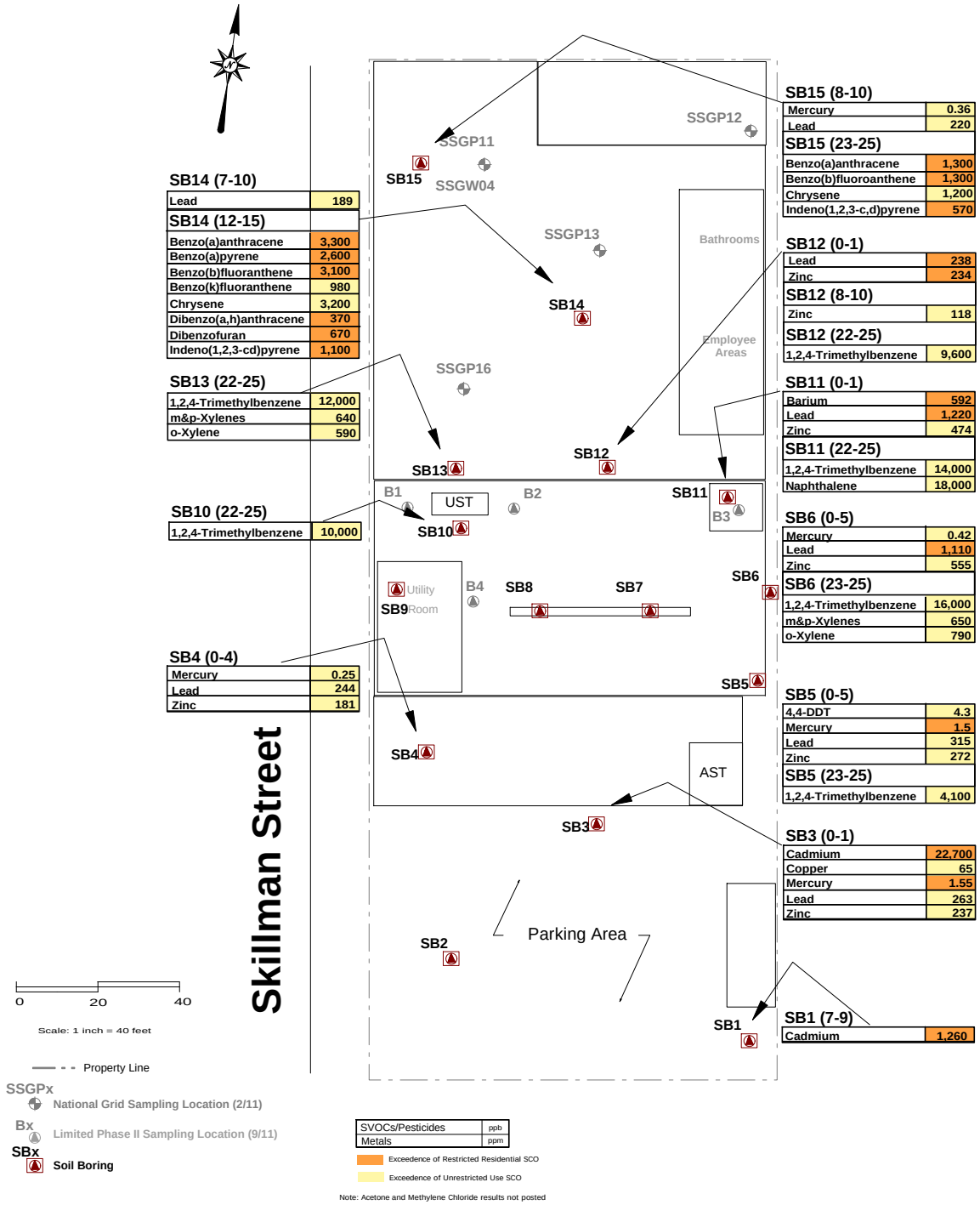
39 Skillman Street, Brooklyn, NY

FIGURE 7 Soil Gas Sampling Locations



SB14 (7-10)

Lead	189

SB14 (12-15)

Benzo(a)anthracene	3,300
Benzo(a)pyrene	2,600
Benzo(b)fluoranthene	3,100
Benzo(k)fluoranthene	980
Chrysene	3,200
Dibenzo(a,h)anthracene	370
Dibenzofuran	670
Indeno(1,2,3-cd)pyrene	1,100

SB13 (22-25)

1,2,4-Trimethylbenzene	12,000
m&p-Xylenes	640
o-Xylene	590

SB10 (22-25)

1,2,4-Trimethylbenzene	10,000

SB4 (0-4)

Mercury	0.25
Lead	244
Zinc	181

SB15 (8-10)

Mercury	0.36
Lead	220

SB15 (23-25)

Benzo(a)anthracene	1,300
Benzo(b)fluoroanthene	1,300
Chrysene	1,200
Indeno(1,2,3-c,d)pyrene	570

SB12 (0-1)

Lead	238
Zinc	234

SB12 (8-10)

Zinc	118

SB12 (22-25)

1,2,4-Trimethylbenzene	9,600

SB11 (0-1)

Barium	592
Lead	1,220
Zinc	474

SB11 (22-25)

1,2,4-Trimethylbenzene	14,000
Naphthalene	18,000

SB6 (0-5)

Mercury	0.42
Lead	1,110
Zinc	555

SB6 (23-25)

1,2,4-Trimethylbenzene	16,000
m&p-Xylenes	650
o-Xylene	790

SB5 (0-5)

4,4-DDT	4.3
Mercury	1.5
Lead	315
Zinc	272

SB5 (23-25)

1,2,4-Trimethylbenzene	4,100

SB3 (0-1)

Cadmium	22,700
Copper	65
Mercury	1.55
Lead	263
Zinc	237

SB1 (7-9)

Cadmium	1,260

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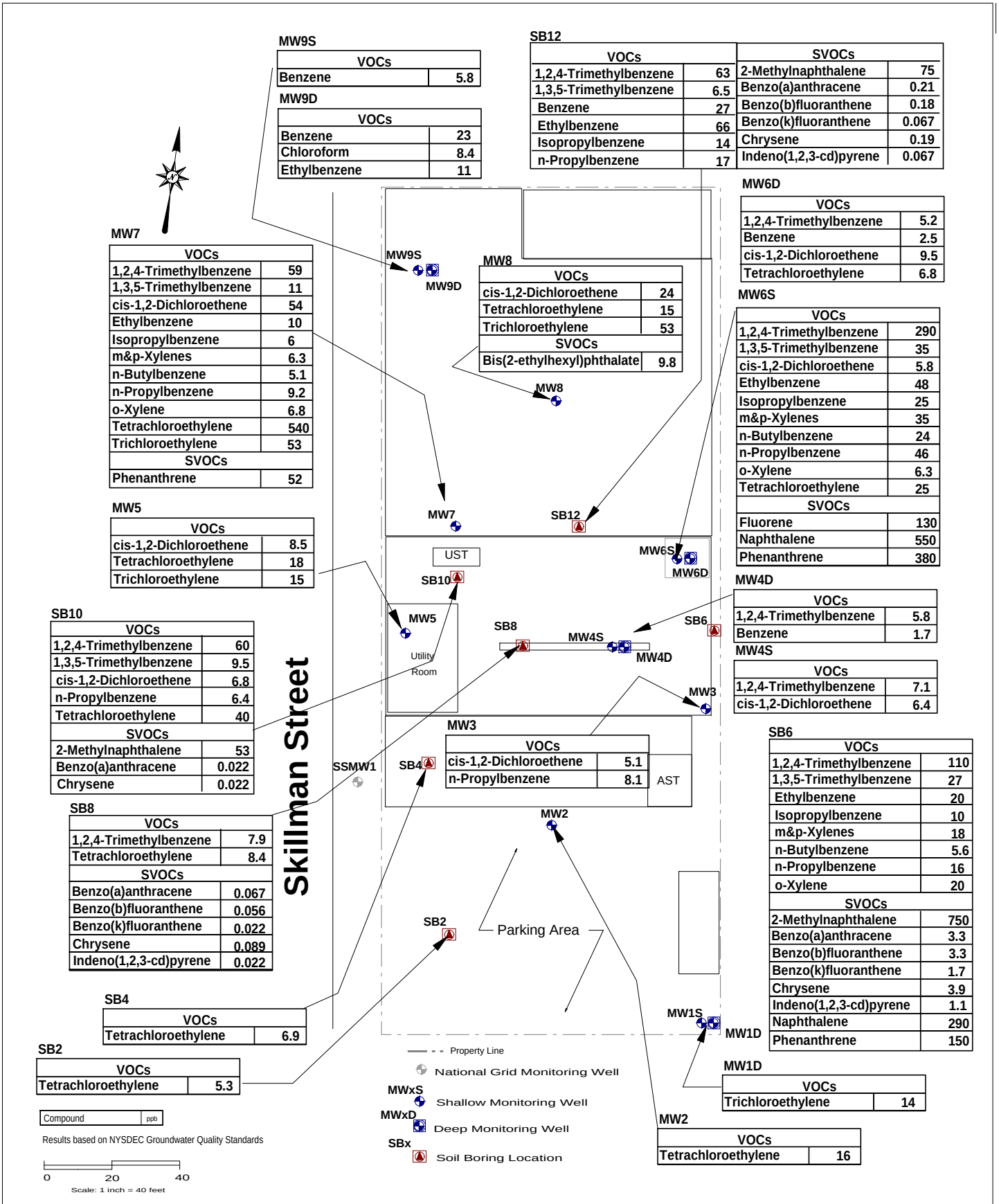
Former East Coast Industrial Uniform Site

39 Skillman Street, Brooklyn, NY

FIGURE 8 Posted Soil Results above Soil Cleanup Objectives



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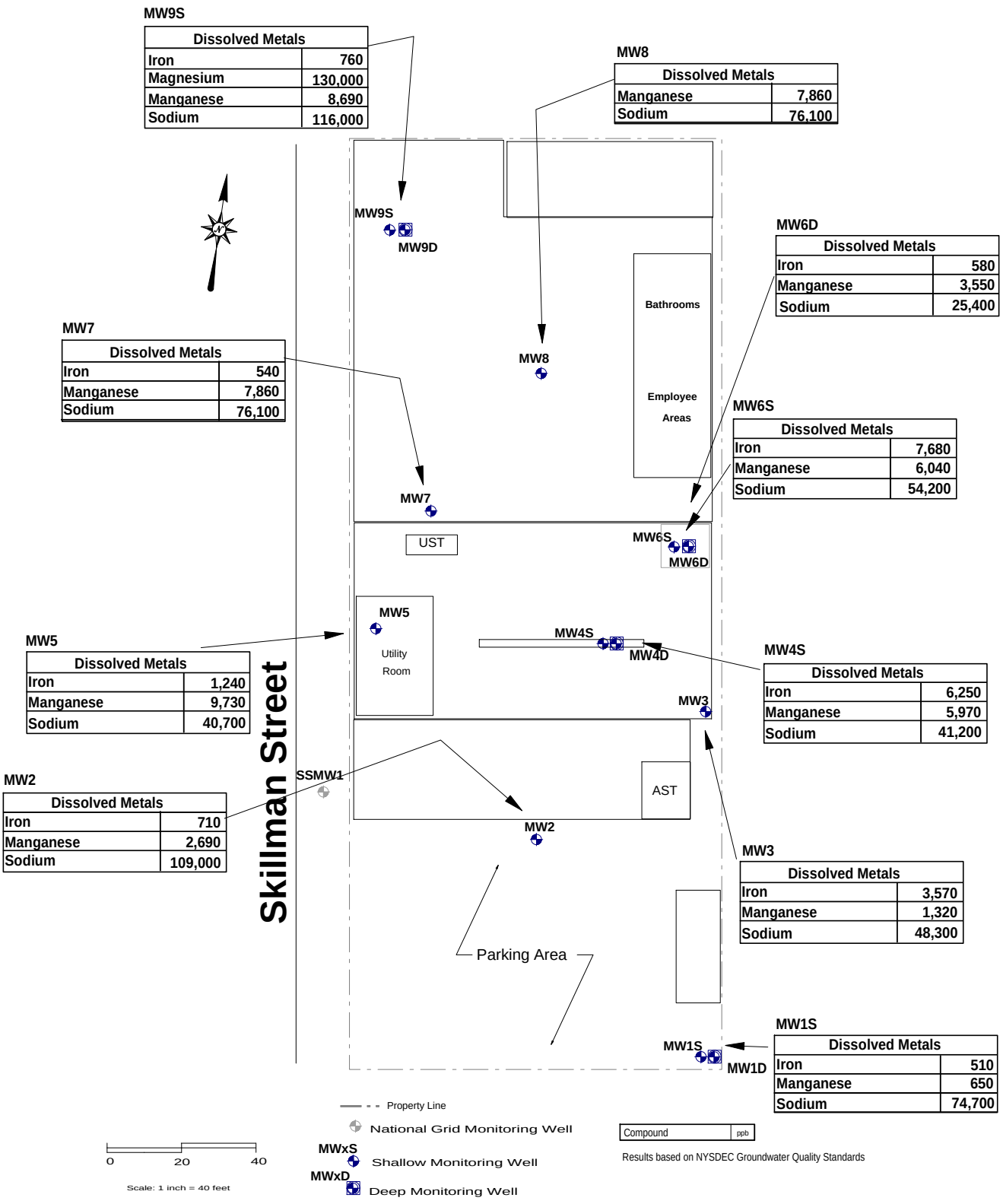
Former East Coast Industrial Uniform Site
39 Skillman Street, Brooklyn, NY

FIGURE 9 Groundwater Results Above Standards VOCs / SVOCs



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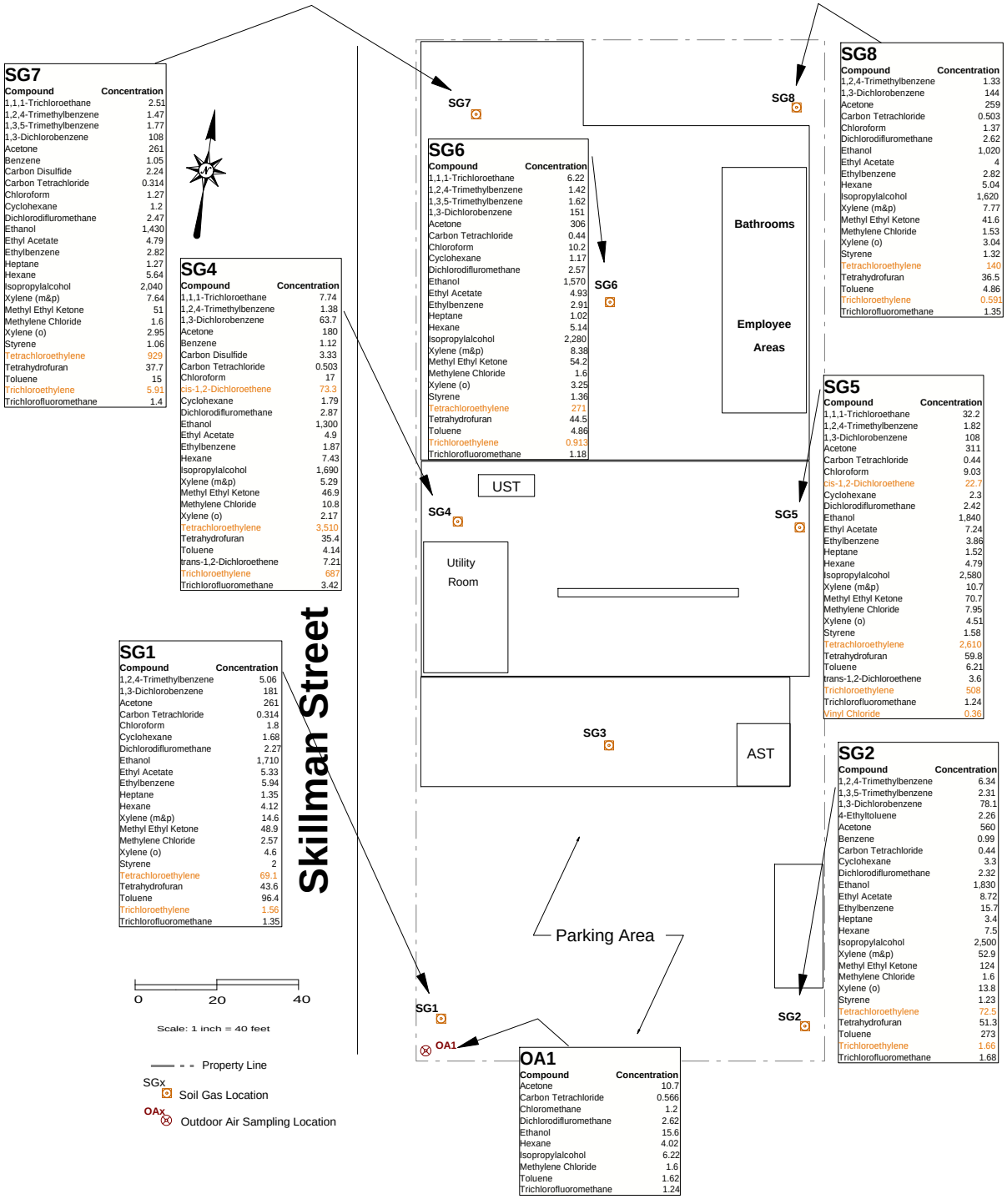
Former East Coast Industrial Uniform Site
39 Skillman Street, Brooklyn, NY

FIGURE 10 Groundwater Results above Standards Metals



SG7

Compound	Concentration
1,1,1-Trichloroethane	2.51
1,2,4-Trimethylbenzene	1.47
1,3,5-Trimethylbenzene	1.77
1,3-Dichlorobenzene	108
Acetone	261
Benzene	1.05
Carbon Disulfide	2.24
Carbon Tetrachloride	0.314
Chloroform	1.27
Cyclohexane	1.2
Dichlorodifluromethane	2.47
Ethanol	1,430
Ethyl Acetate	4.79
Ethylbenzene	2.82
Heptane	1.27
Hexane	5.64
Isopropylalcohol	2,040
Xylene (m&p)	7.64
Methyl Ethyl Ketone	51
Methylene Chloride	1.6
Xylene (o)	2.95
Styrene	1.06
Tetrachloroethylene	929
Tetrahydrofuran	37.7
Toluene	15
Trichloroethylene	5.91
Trichlorofluoromethane	1.4

SG4

Compound	Concentration
1,1,1-Trichloroethane	7.74
1,2,4-Trimethylbenzene	1.38
1,3-Dichlorobenzene	63.7
Acetone	180
Benzene	1.12
Carbon Disulfide	3.33
Carbon Tetrachloride	0.503
Chloroform	17
cis-1,2-Dichloroethene	73.3
Cyclohexane	1.79
Dichlorodifluromethane	2.87
Ethanol	1,300
Ethyl Acetate	4.9
Ethylbenzene	1.87
Hexane	7.43
Isopropylalcohol	1,690
Xylene (m&p)	5.29
Methyl Ethyl Ketone	46.9
Methylene Chloride	10.8
Xylene (o)	2.17
Tetrachloroethylene	3,510
Tetrahydrofuran	35.4
Toluene	4.14
trans-1,2-Dichloroethene	7.21
Trichloroethylene	687
Trichlorofluoromethane	3.42

SG1

Compound	Concentration
1,2,4-Trimethylbenzene	5.06
1,3-Dichlorobenzene	181
Acetone	261
Carbon Tetrachloride	0.314
Chloroform	1.8
Cyclohexane	1.68
Dichlorodifluromethane	2.27
Ethanol	1,710
Ethyl Acetate	5.33
Ethylbenzene	5.94
Heptane	1.35
Hexane	4.12
Xylene (m&p)	14.6
Methyl Ethyl Ketone	48.9
Methylene Chloride	2.57
Xylene (o)	4.6
Styrene	2
Tetrachloroethylene	69.1
Tetrahydrofuran	43.6
Toluene	96.4
Trichloroethylene	1.56
Trichlorofluoromethane	1.35

SG6

Compound	Concentration
1,1,1-Trichloroethane	6.22
1,2,4-Trimethylbenzene	1.42
1,3,5-Trimethylbenzene	1.62
1,3-Dichlorobenzene	151
Acetone	306
Carbon Tetrachloride	0.44
Chloroform	10.2
Cyclohexane	1.17
Dichlorodifluromethane	2.57
Ethanol	1,570
Ethyl Acetate	4.93
Ethylbenzene	2.91
Heptane	1.02
Hexane	5.14
Isopropylalcohol	2,280
Xylene (m&p)	8.38
Methyl Ethyl Ketone	54.2
Methylene Chloride	1.6
Xylene (o)	3.25
Styrene	1.36
Tetrachloroethylene	271
Tetrahydrofuran	44.5
Toluene	4.86
Trichloroethylene	0.913
Trichlorofluoromethane	1.18

SG8

Compound	Concentration
1,2,4-Trimethylbenzene	1.33
1,3-Dichlorobenzene	144
Acetone	259
Carbon Tetrachloride	0.503
Chloroform	1.37
Dichlorodifluromethane	2.62
Ethanol	1,020
Ethyl Acetate	4
Ethylbenzene	2.82
Hexane	5.04
Isopropylalcohol	1,620
Xylene (m&p)	7.77
Methyl Ethyl Ketone	41.6
Methylene Chloride	1.53
Xylene (o)	3.04
Styrene	1.32
Tetrachloroethylene	140
Tetrahydrofuran	36.5
Toluene	4.86
Trichloroethylene	0.591
Trichlorofluoromethane	1.35

SG5

Compound	Concentration
1,1,1-Trichloroethane	32.2
1,2,4-Trimethylbenzene	1.82
1,3-Dichlorobenzene	108
Acetone	311
Carbon Tetrachloride	0.44
Chloroform	9.03
cis-1,2-Dichloroethene	22.7
Cyclohexane	2.3
Dichlorodifluromethane	2.42
Ethanol	1,840
Ethyl Acetate	7.24
Ethylbenzene	3.86
Heptane	1.52
Hexane	4.79
Isopropylalcohol	2,580
Xylene (m&p)	10.7
Methyl Ethyl Ketone	70.7
Methylene Chloride	7.95
Xylene (o)	4.51
Styrene	1.58
Tetrachloroethylene	2,610
Tetrahydrofuran	59.8
Toluene	6.21
trans-1,2-Dichloroethene	3.6
Trichloroethylene	508
Trichlorofluoromethane	1.24
Vinyl Chloride	0.36

SG2

Compound	Concentration
1,2,4-Trimethylbenzene	6.34
1,3,5-Trimethylbenzene	2.31
1,3-Dichlorobenzene	78.1
4-Ethyltoluene	2.26
Acetone	560
Benzene	0.99
Carbon Tetrachloride	0.44
Cyclohexane	3.3
Dichlorodifluromethane	2.32
Ethanol	1,830
Ethyl Acetate	8.72
Ethylbenzene	15.7
Heptane	3.4
Hexane	7.5
Isopropylalcohol	2,500
Xylene (m&p)	52.9
Methyl Ethyl Ketone	124
Methylene Chloride	1.6
Xylene (o)	13.8
Styrene	1.23
Tetrachloroethylene	72.5
Tetrahydrofuran	51.3
Toluene	273
Trichloroethylene	1.66
Trichlorofluoromethane	1.68

OA1

Compound	Concentration
Acetone	10.7
Carbon Tetrachloride	0.566
Chloromethane	1.2
Dichlorodifluromethane	2.62
Ethanol	15.6
Hexane	4.02
Isopropylalcohol	6.22
Methylene Chloride	1.6
Toluene	1.62
Trichlorofluoromethane	1.24

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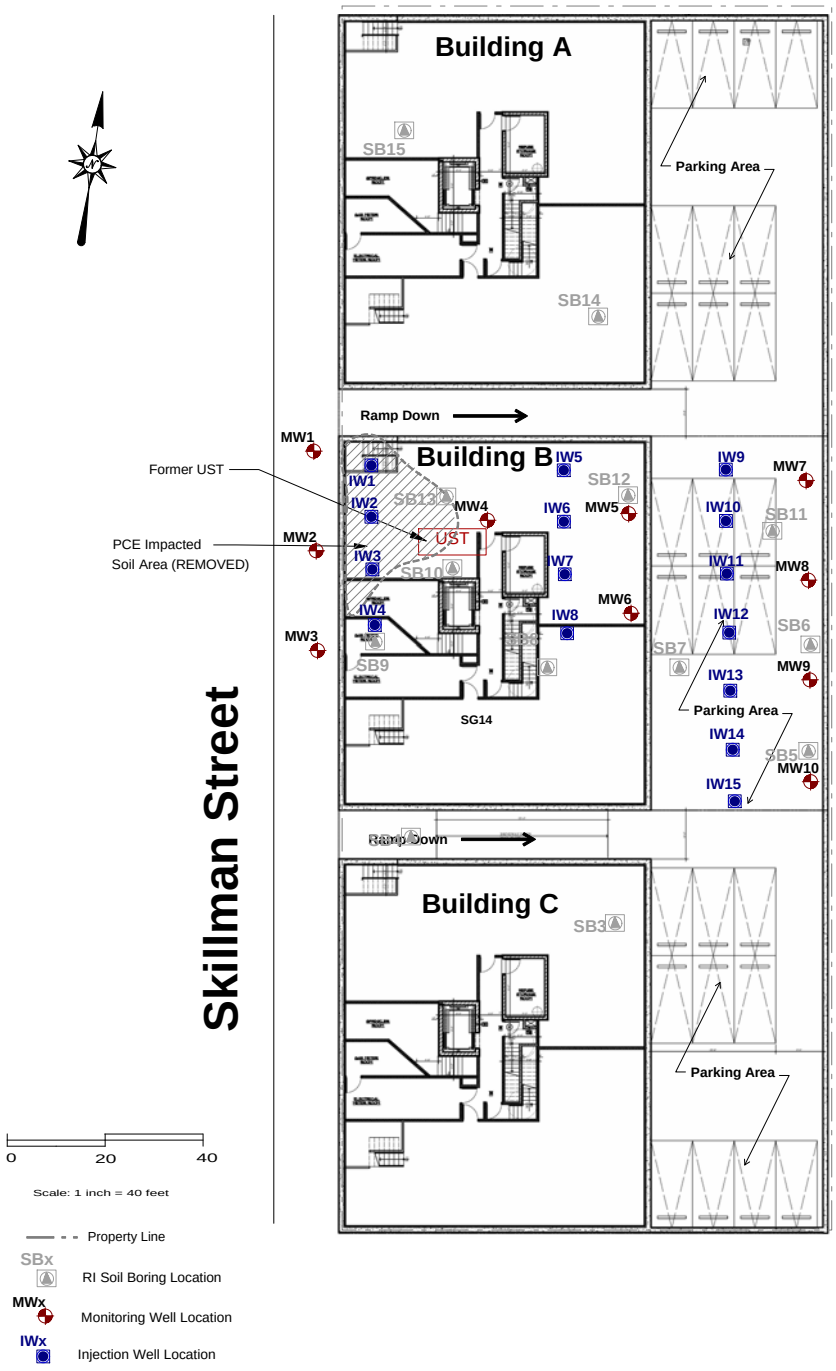
FIGURE 11 — Soil Gas and Outdoor Air Results



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Former East Coast Industrial Uniform Site
39 Skillman Street, Brooklyn, NY

FIGURE 12 Proposed Injection Well and Monitoring Well Locations

ATTACHMENT A
Metes and Bounds Description of Property

The metes and bounds description of the property is as follows:

All that certain plot, piece or parcel of land situated, lying and being in the Borough of Brooklyn, County of Kings, City and State of New York bounded and described as follows

Block 1886 Old Lot 4:

BEGINNING at a point on the easterly side of Skillman Street, 75 feet 6 inches northerly from the comer formed by the intersection of the easterly side of Skillman Street with Park Avenue;
RUNNING THENCE easterly parallel with Park Avenue, 100 feet;
THENCE northerly parallel with Skillman Street, 25 feet;
THENCE westerly again parallel with Park Avenue, 100 feet to the easterly side of Skillman Street;
THENCE southerly along the easterly side of Skillman Street, 25 feet to the point or place of BEGINNING.

Block 1886 Old Lot 5:
BEGINNING at a point on the easterly side of Skillman Street, 100 feet 6 inches northerly from the comer formed by the intersection of the easterly side of Skillman Street with the northerly side of Park Avenue, as now legally opened;
RUNNING THENCE easterly, parallel with Park Avenue, 100 feet;
THENCE northerly parallel with Skillman Street, 25 feet;
THENCE westerly, parallel with Park Avenue, 100 feet to the easterly side of Skillman Street; and
THENCE southerly, along the easterly side of Skillman Street, 25 feet to the point or place of BEGINNING.

Block 1886 p/o Old Lot 6:
BEGINNING at a point on the easterly side of Skillman Street, 125 feet 6 inches northerly from the comer formed by the intersection of the easterly side of Skillman Street with the northerly side of Park Avenue, as now legally opened;
RUNNING THENCE easterly, parallel with Park Avenue, 70 feet;
THENCE northerly, parallel with Skillman Street, 21 feet 6 inches;
THENCE westerly, parallel with Park Avenue, 70 feet to the easterly side of Skillman Street; and THENCE southerly, along the easterly side of Skillman Street, 21 feet 6 inches to the point or place of BEGINNING.

Block 1886 p/o Old Lot 6:
BEGINNING at a point on the easterly side of Skillman Street, 147 feet northerly from the corner formed by the intersection of the easterly side of Skillman Street with the northerly side of Park Avenue, as now legally opened;
RUNNING THENCE easterly, parallel with Park Avenue, 70 feet;
THENCE southerly parallel with Skillman Street, 21 feet 6 inches;
THENCE easterly, parallel with Park Avenue, 30 feet;
THENCE northerly parallel with Skillman Street, 27 feet 6 inches;
THENCE westerly, parallel with Park Avenue, 100 feet to the easterly side of Skillman Street; and

THENCE southerly, along the easterly side of Skillman Street, 6 feet to the point or place of BEGINNING.

Block 1886 Old Lot 7:
BEGINNING at a point on the easterly side of Skillman Street, at a point distant 153 feet northerly from the northeasterly corner of Skillman Street and Park Avenue, as now legally opened;
RUNNING THENCE northerly, along Skillman Street, 22 feet 6 inches;
THENCE easterly, parallel with Park Avenue, 100 feet;
THENCE southerly, parallel with Skillman Street, 22 feet 6 inches; and·
THENCE westerly, parallel with Park Avenue, 100 feet to the point or place of BEGINNING.

Block 1886 Old Lot 8:
ALL that certain lot, piece or parcel of land, situate, lying and being in the 7th Ward of the Borough of Brooklyn, County of Kings, City and State of New York, as laid down and designated as and by No 45 on a certain map entitled "Map of valuable property situate in the 7th Ward of Brooklyn, lately belonging to John Skillman, Esq., Jan. 1835", described as follows:
BEGINNING at a point on the easterly side of Skillman Street, as laid down on said map, which point is distant 175 feet northerly from the northeasterly corner of Skillman Street and Park Avenue (formerly Tillary Street) as the same is laid down on said map, which said point is distant 175 feet 6 inches northerly from the corner formed by the intersection of the easterly side of Skillman Street with the northerly side of Park Avenue, as now legally opened;
RUNNING THENCE easterly, parallel with Park Avenue (formerly Tillary Street), 100 feet;
THENCE northerly, parallel with Skillman Street, 25 feet;
THENCE westerly, parallel with Park Avenue (formerly Tillary Street), 100 feet to Skillman Street; and
THENCE southerly along the easterly side of Skillman Street, 25 feet to the point or place of BEGINNING.

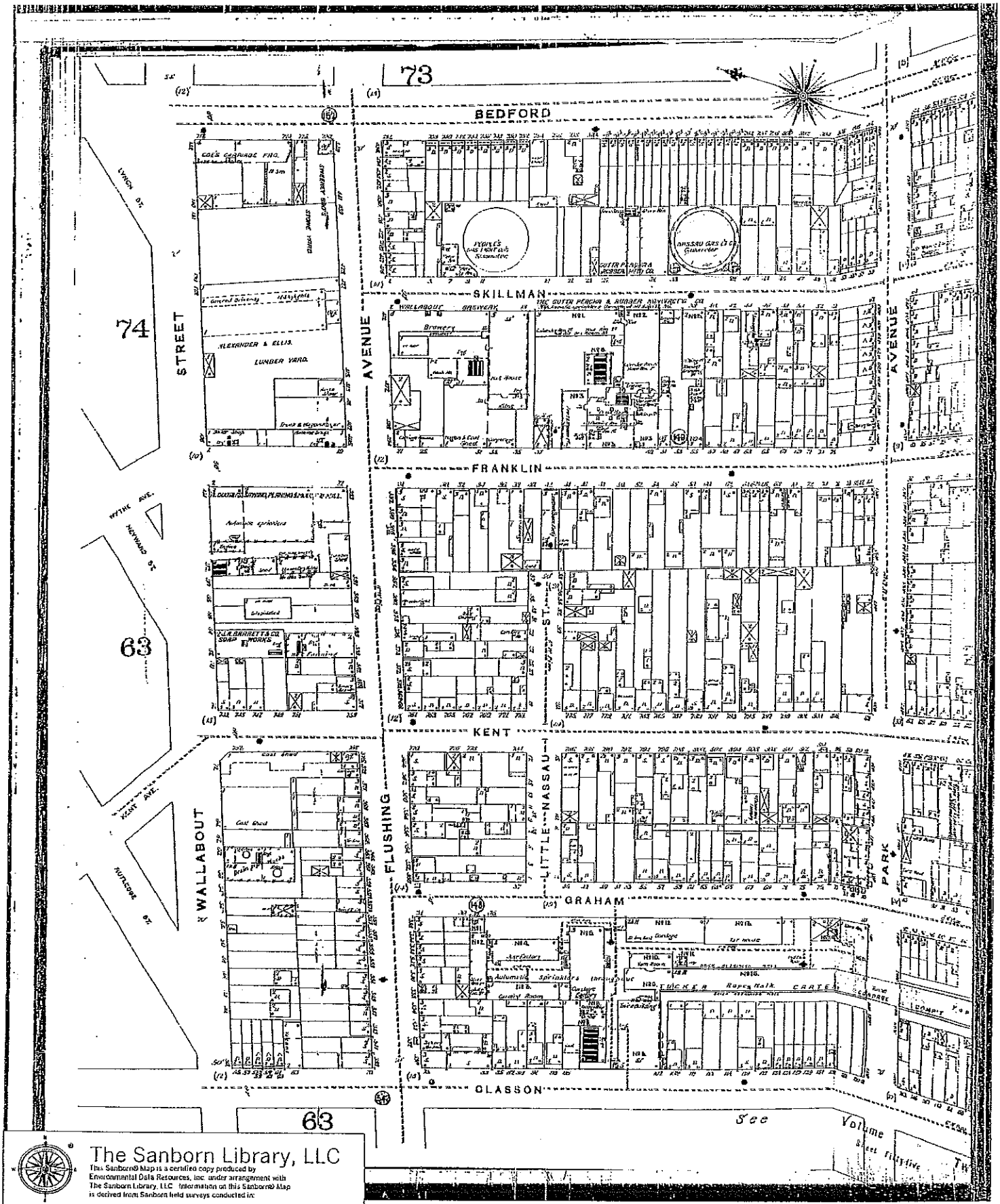
Block 1886 *p/o* Old Lot 10:
BEGINNING at a point on the easterly side of Skillman Street, distant 325 feet 6 inches northerly from the comer formed by the intersection of the easterly side of Skillman Street with the northerly side of Park Avenue, as now legally opened;
RUNNING THENCE easterly parallel with Park Avenue, 100 feet;
THENCE northerly 1-1/2 inches to a point;
THENCE westerly through lands of Miller-Hoff Parlor Frame Co. Inc., 100 feet, more or less to the easterly side of Skillman Street;
THENCE southerly along the easterly side of Skillman Street, 2-1/2 inches to the point or place of BEGINNING.

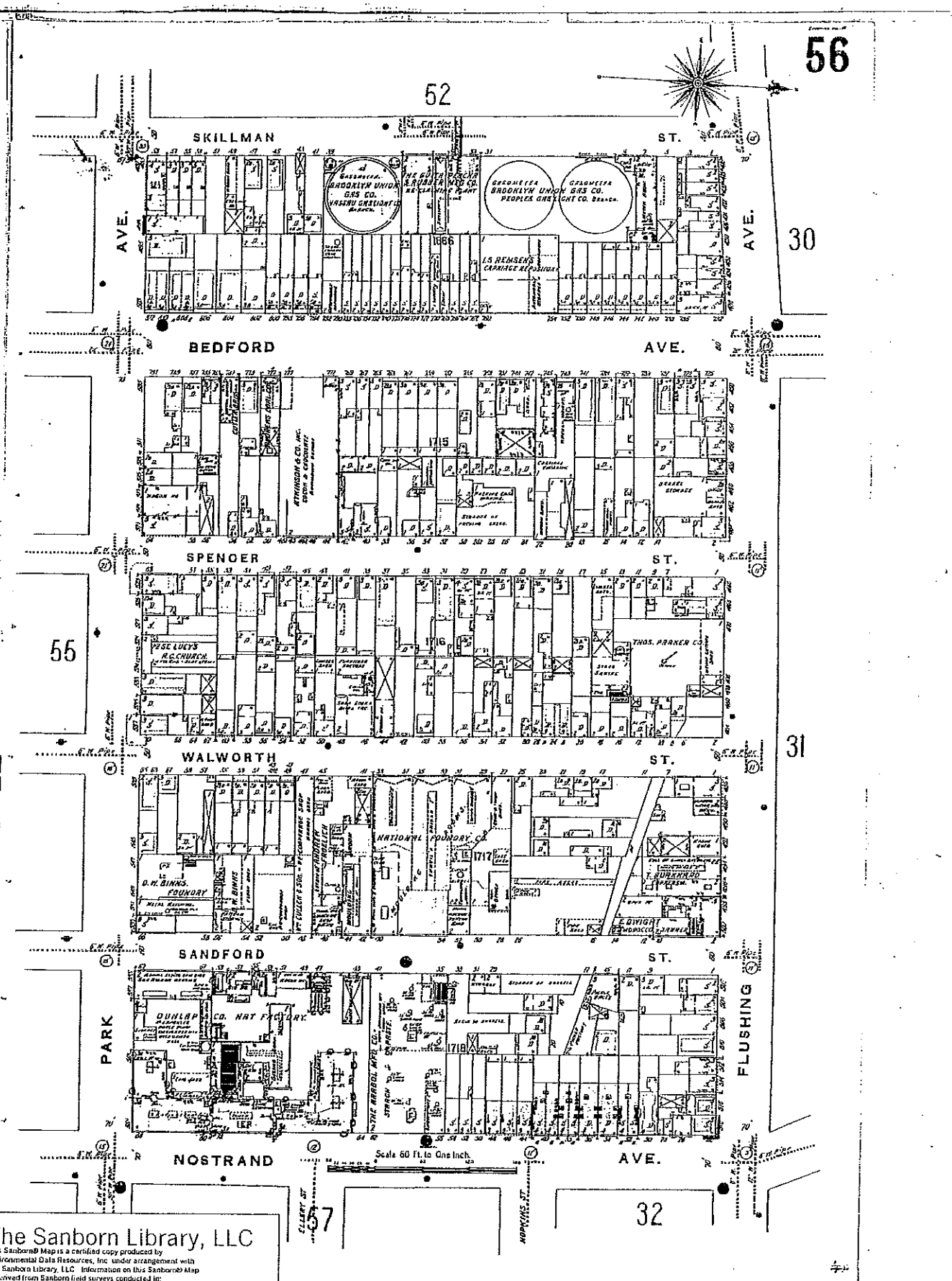
BLOCK 1886 Old Lots 9 and 10:
BEGINNING at a point on the easterly side of Skillman Street, distant 200 feet 6 inches northerly from the comer formed by the intersection of the easterly side of Skillman Street with the northerly side of Park Avenue, as now legally opened;
RUNNING THENCE easterly parallel with Park Avenue, 100 feet;
THENCE northerly, parallel with Skillman Street, 125 feet;
THENCE westerly, parallel with Park Avenue, 100 feet to the easterly side of Skillman Street;
and THENCE southerly, along the easterly side of Skillman Street, 125 feet to the point or place of

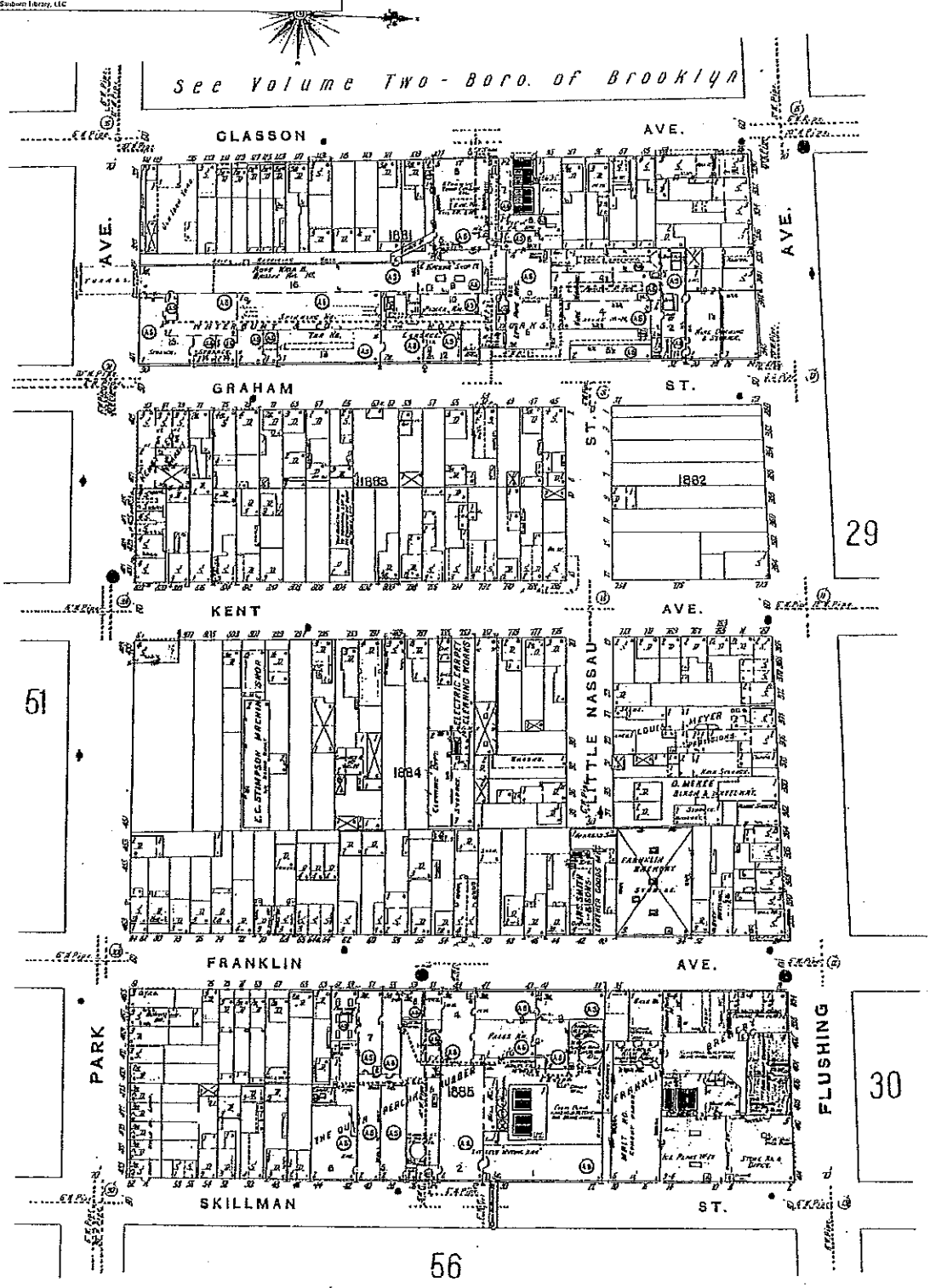
BEGINNING.

Note: Address, Block & Lot shown for informational purposes only.
Designated as Block 1886 Lot 10 and also known as 39 Skillman Street Brooklyn NY.

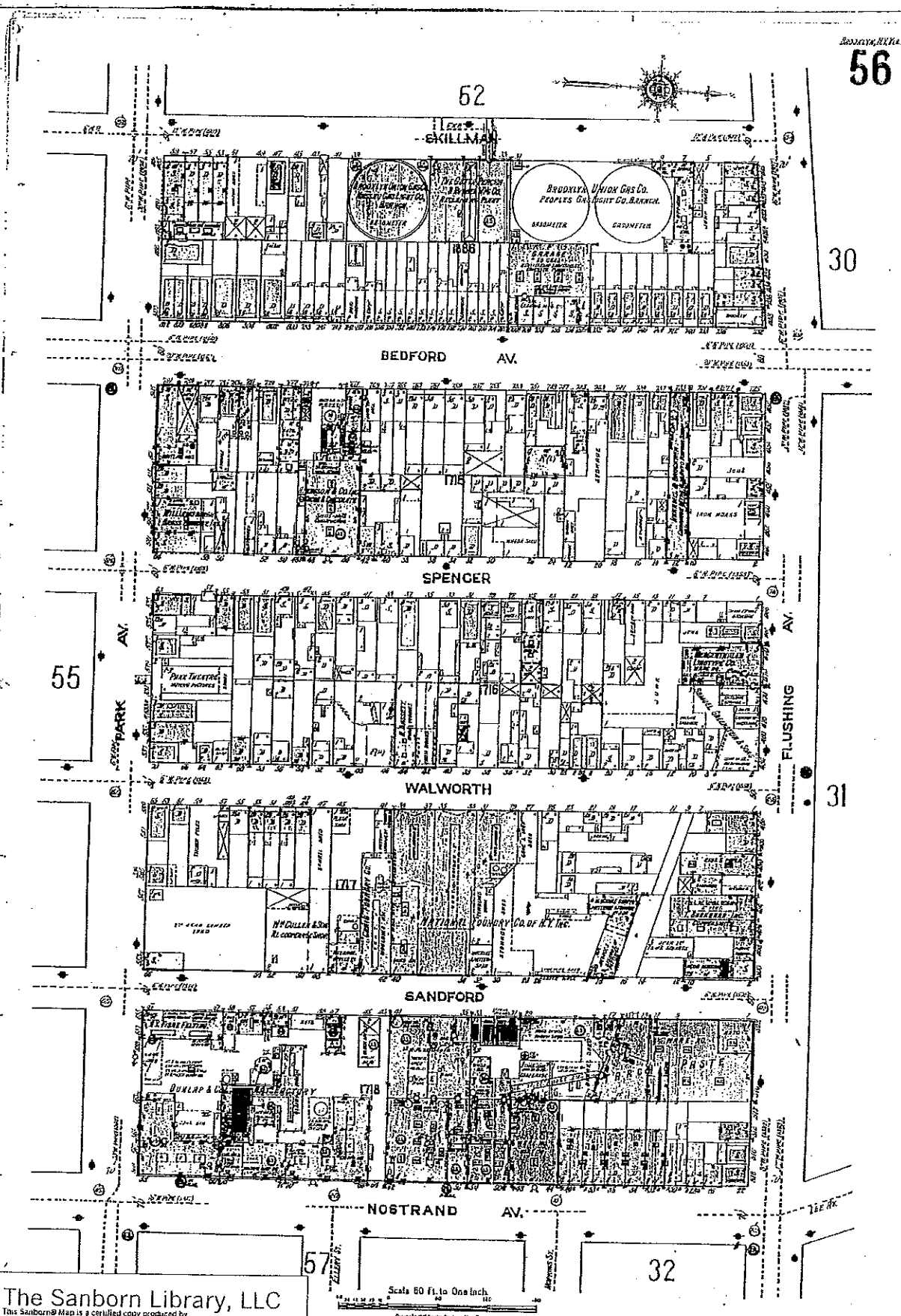
ATTACHMENT B
Sanborn Maps







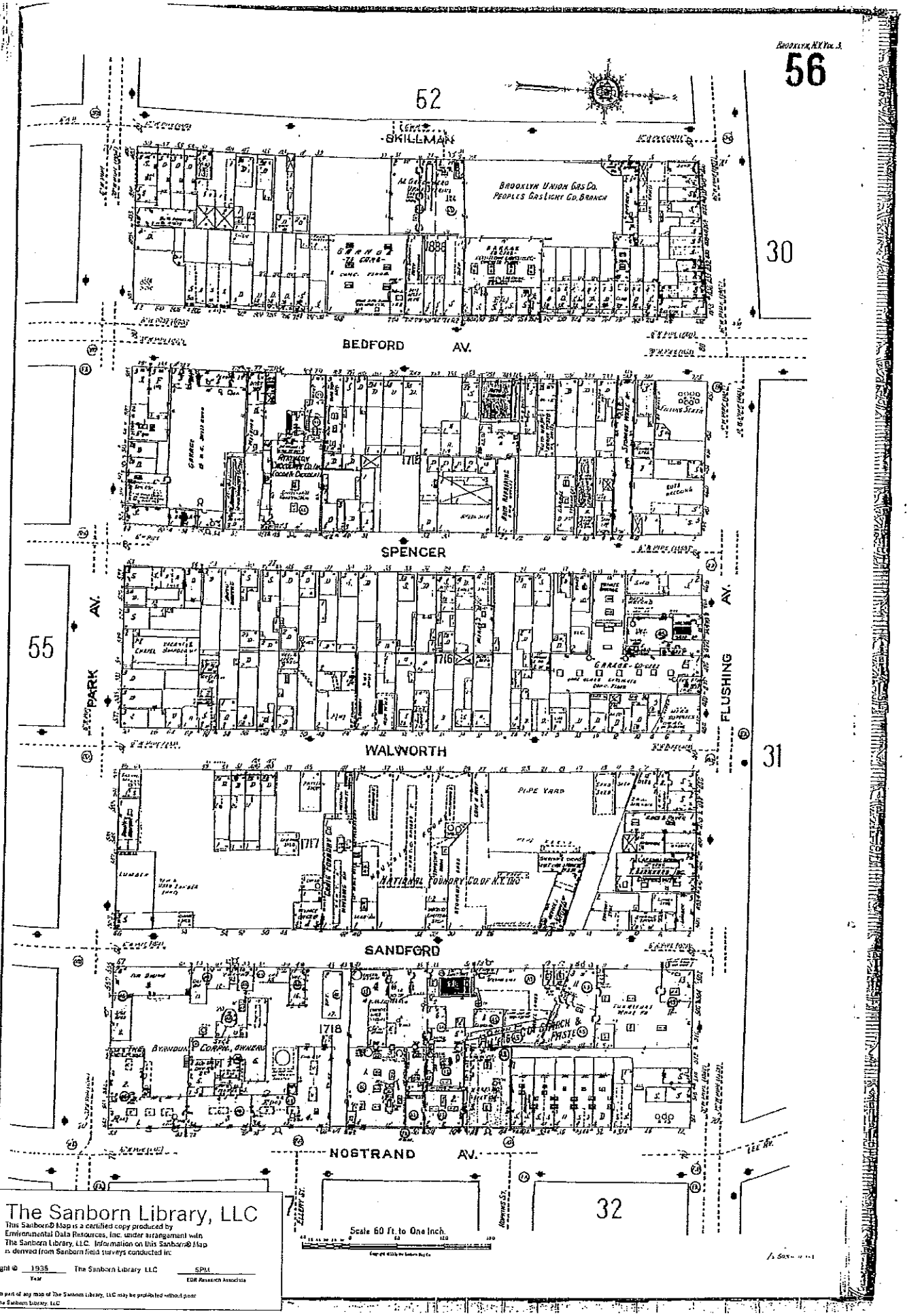
Scale 60 Ft. to One Inch.



See Volume Two - Borough of Brooklyn

CLASSON AV.
TAAFFE PL.
KENT AV.
FRANKLIN AV.
SKILLMAN
PARK AV.
NASSAU AV.
LITTLE
FLUSHING
51
29
30
56
883
882
884
888
WATERBURY WORKS
St. Luke's P.E. Church
Dept. of Street Cleaning
Louis Meyer Provisions
Franklin Brewery

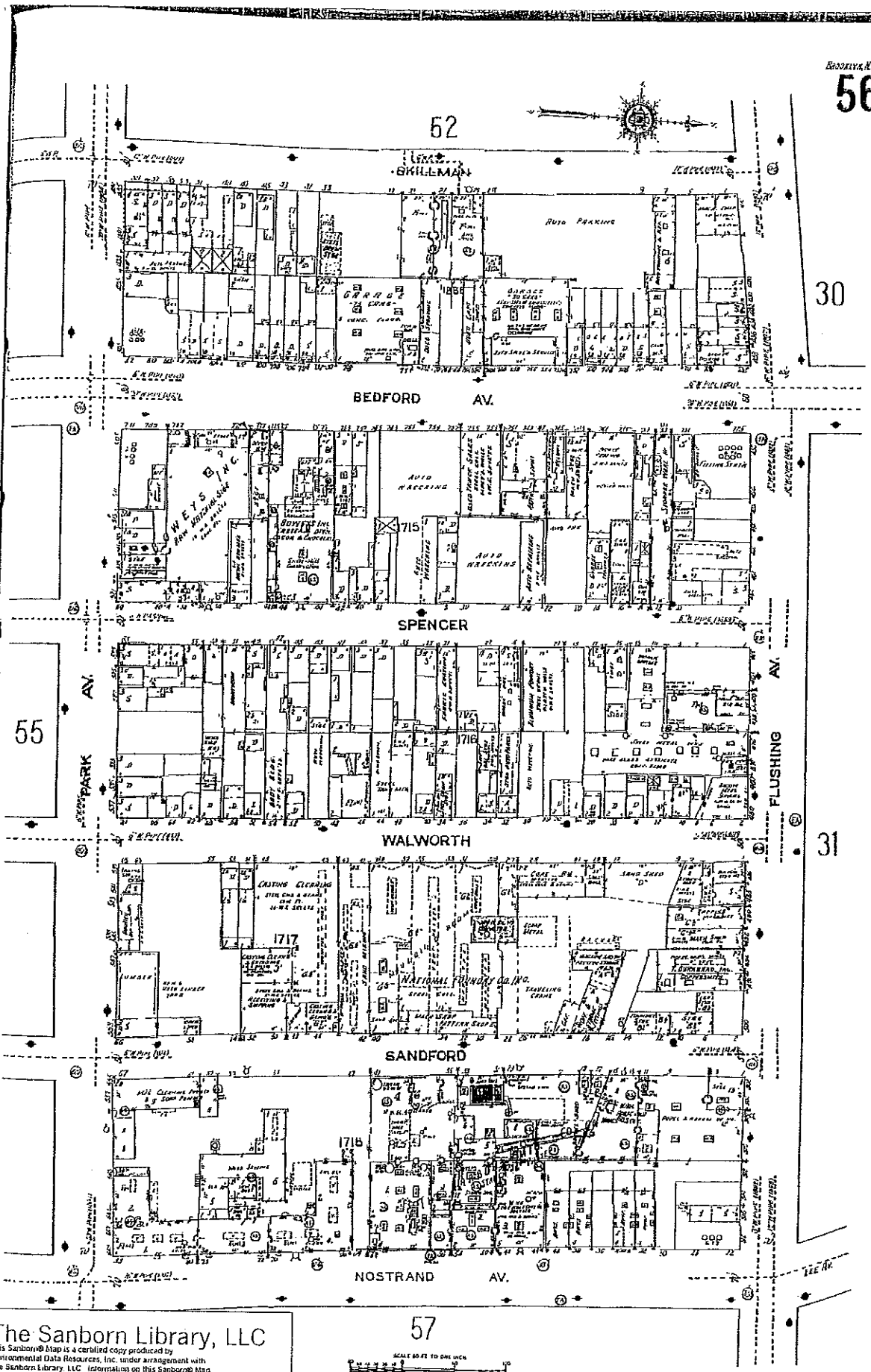
Scale 50 Ft. to One Inch.



See Volume Two = Borough of Brooklyn

CLASSON AV.
TAAFFE PL.
KENT AV.
FRANKLIN
SKILLMAN
PARK AV.
NASSAU AV.
LITTLE
FLUSHING
51
29
30
56
1883
1882
1884
1885
WATERBURY
WORKS
ST. LUCY'S R.C. CHURCH
DEPT. OF STREET CLEANING
E.B. STIMPSON
STIMPSON FLOOR METAL
CONSOLIDATED PAPER CO. INC.
GARAGE AUTO REPAIRS
WALLABOUT BASIN
GENERAL STORAGE
FURNITURE STORAGE & OFFICE

Scale 60 Ft. to One Inch

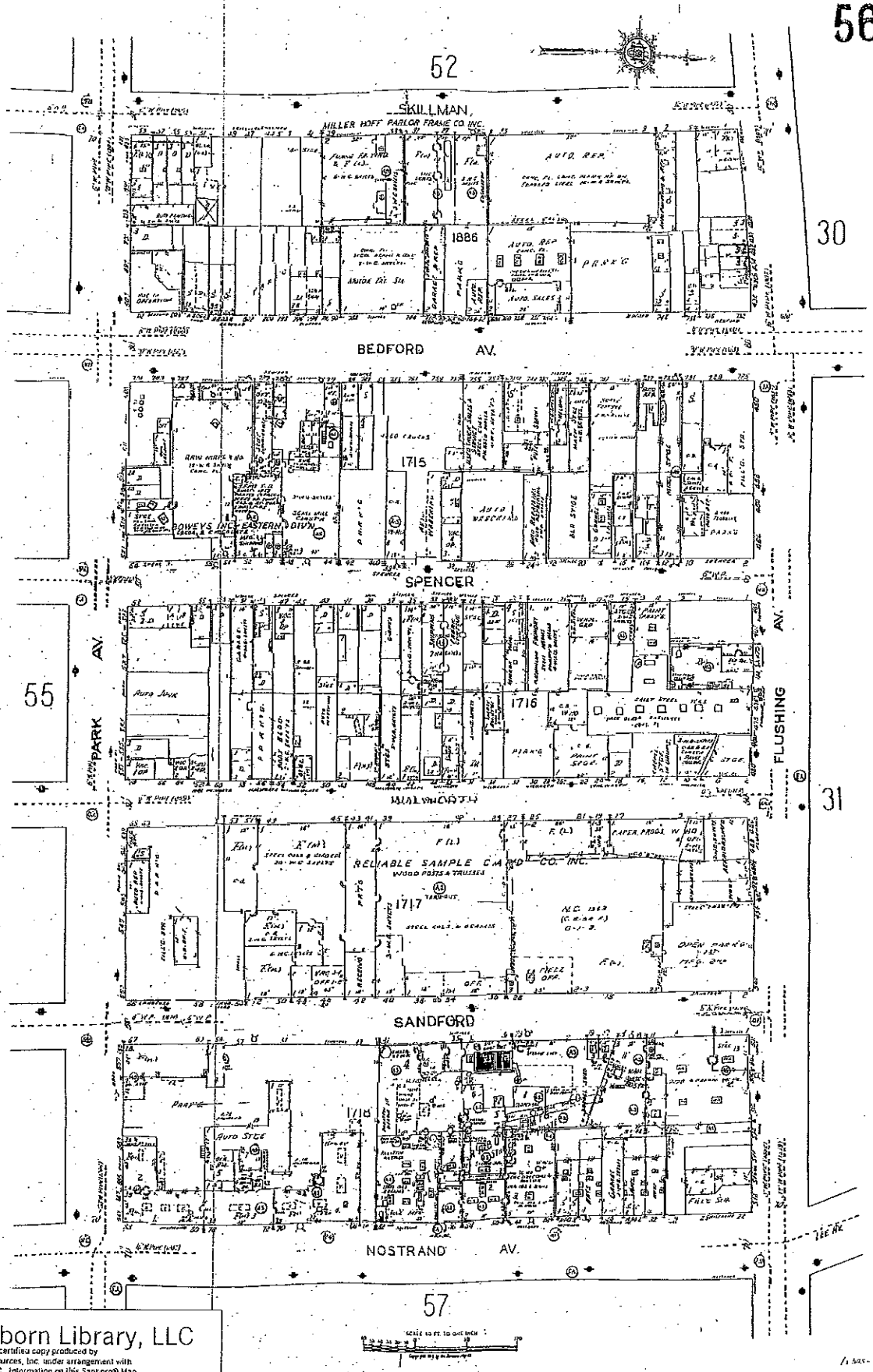


See Volume Two - Borough of Brooklyn

CLASSON AV.
TAAFFE PL.
KENT AV.
FRANKLIN AV.
SKILLMAN
PARK AV.
NASSAU AV.
LITTLE
FLUSHING AV.

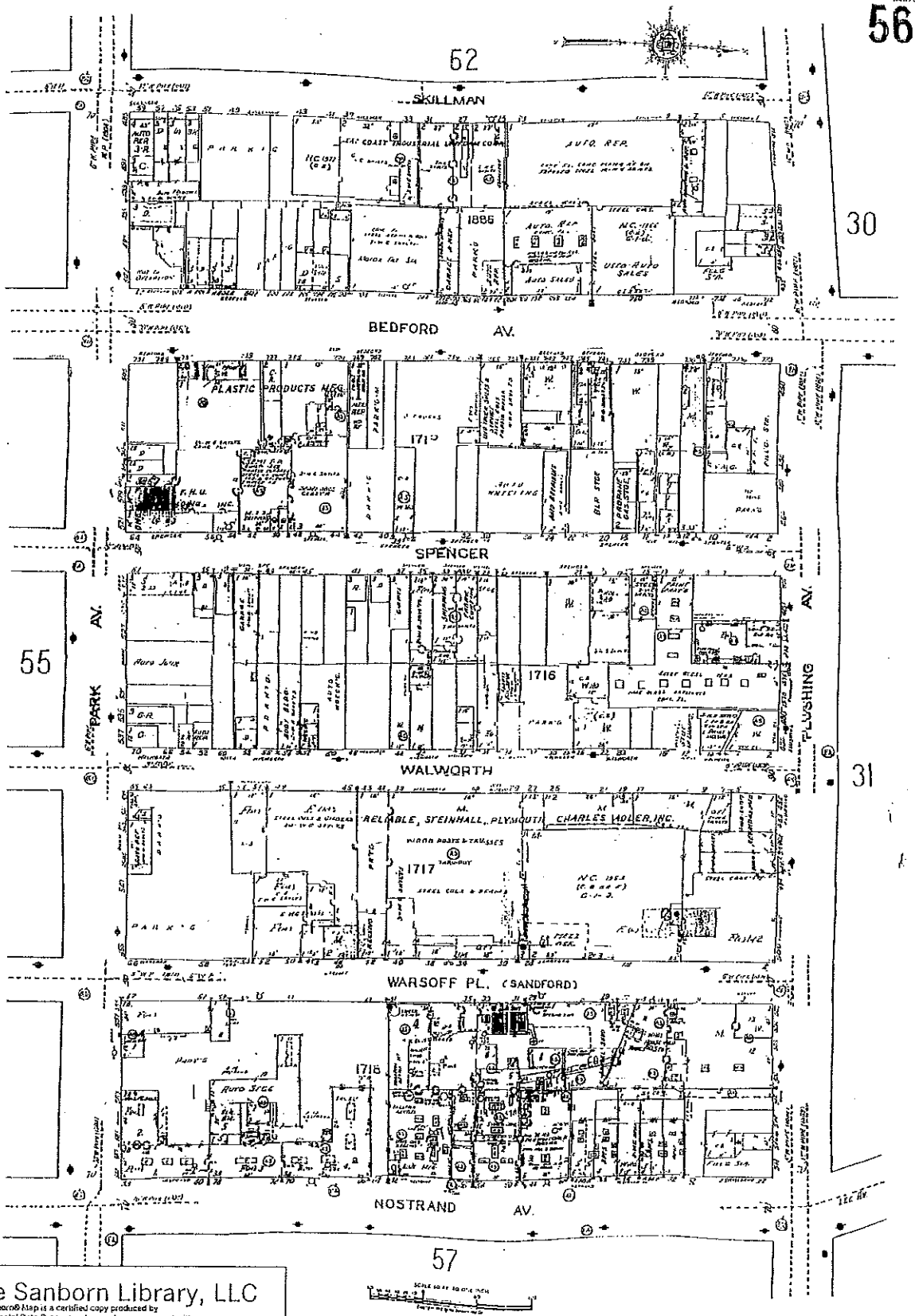
1883
1882
1885
188
29
30
51
56

Scale 60 ft. to One Inch



See Volume Two - Borough of Brooklyn

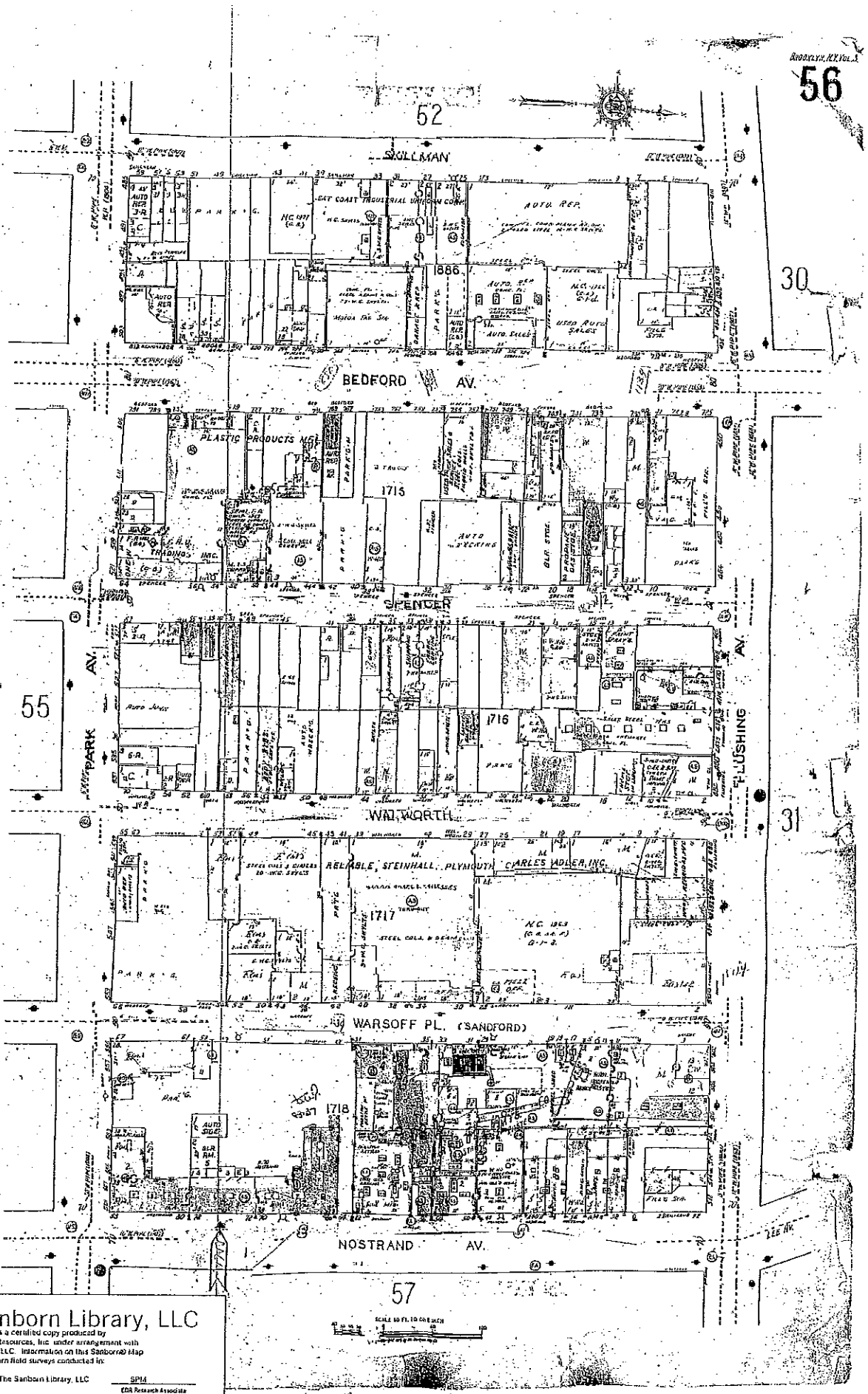
CLASSON AV.
TAAFFE PL.
KENT AV.
FRANKLIN
SKILLMAN
PARK AV.
NASSAU
LITTLE
FLUSHING AV.
GALLO ORIGINAL IRON WKS INC. 1881
DEPT. OF WATER SUPPLY, GAS & ELECTRICITY BOARD OF SERVICE
1882
1883
ST LUCY'S R.C. CHURCH
1884
MEADOW BROOK
N.Y. CLEANERS INC.
1885
PARKING
29
30
51
56
Scale 60 Ft. to One Inch



See Volume Two - Borough of Brooklyn

CLASSON AV.
TAAFFE PL.
KENT AV.
FRANKLIN AV.
SKILLMAN
PARK AV.
NASSAU
LITTLE
FLUSHING AV.
1881
1882
1883
1884
1885
KNITTING MILL INC.
ST LUCY'S R.C. CHURCH
CLERK OF WATER SUPPLY, GAS & ELECTRICITY
H. V. CLEANERS INC.
29
30
51
56

Scale 50 Ft. to One Inch



See Volume Two - Borough of Brooklyn

CLASSON AV.
AAEFE PL.
KENT AV.
FRANKLIN AV.
SKILLMAN
PARK AV.
NASS AV.
FLUSHING AV.
LITTLE
1881
1882
1883
1885
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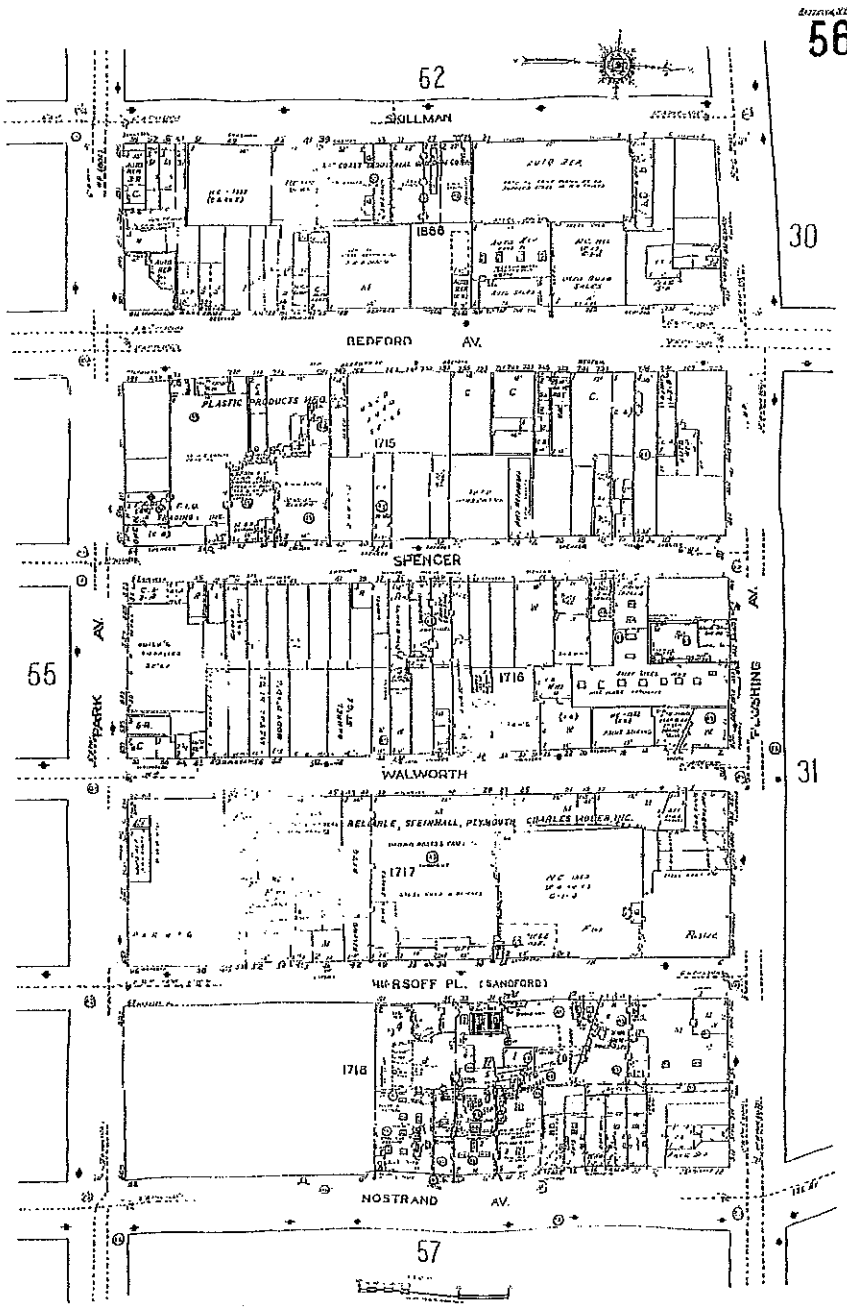
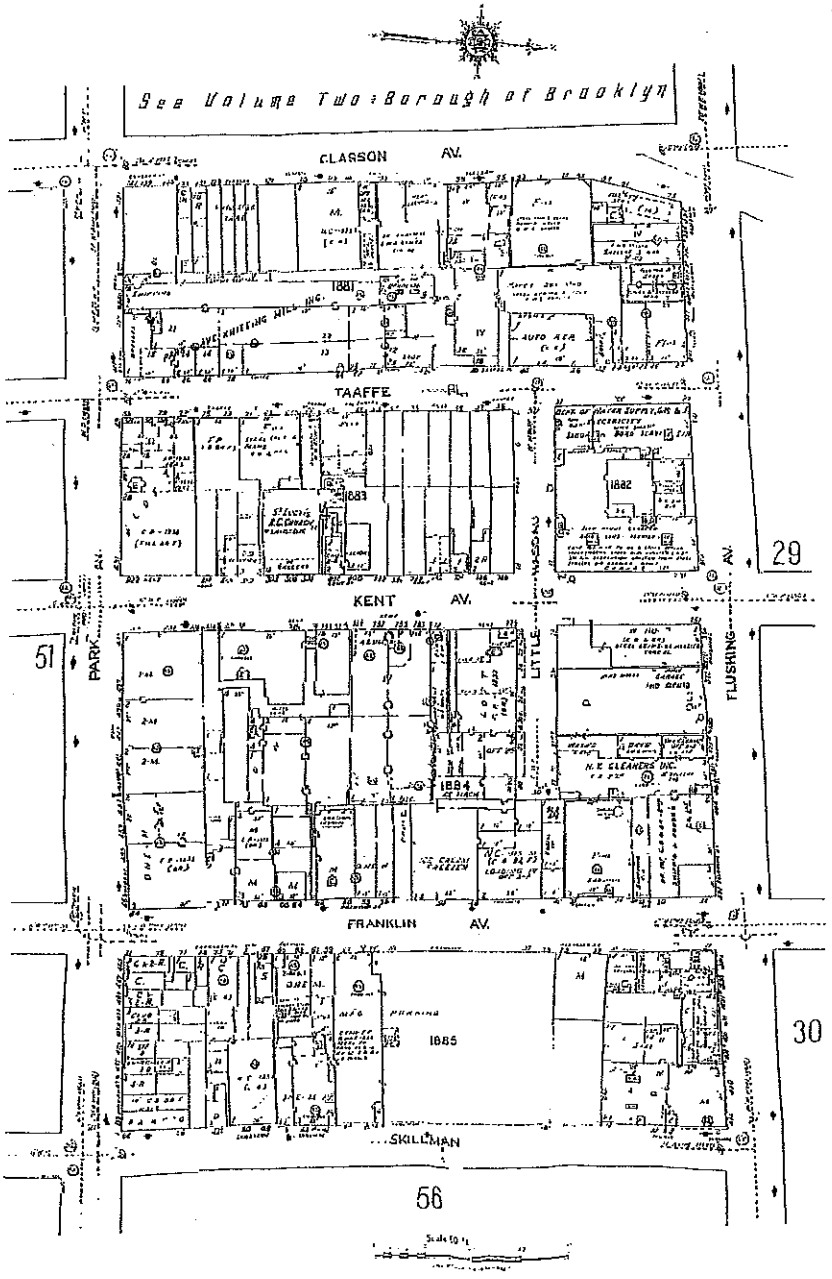
PARKING
ONE M.
Scale 60 Ft. to One Inch.
NEW AREA





ATTACHMENT C
Health and Safety Plan

FORMER EAST COAST INDUSTRIAL UNIFORMS SITE

39 SKILLMAN STREET
BROOKLYN, NEW YORK
Block 1886 Lot 10

CONSTRUCTION HEALTH AND SAFETY PLAN

March 2012

Prepared for:
39 Skillman Street LLC
331 Rutledge Street, Suite 209
Brooklyn, NY 11211

Prepared By:

EBC
ENVIRONMENTAL BUSINESS CONSULTANTS
1808 Middle Country Road
Ridge, NY 11961

HEALTH AND SAFETY PLAN

Site:	**Former East Coast Industrial Uniforms Site**
Location:	**39 Skillman Street, Brooklyn, New York**
Prepared By:	**ENVIRONMENTAL BUSINESS CONSULTANTS**
Date Prepared:	**March - 2012**
Version:	**1**
Revision:	**0**
Project Description:	**INTERIM REMEDIAL MEASURE**
Waste types:	Solid
Characteristics:	Volatile Organic Compounds - Gasoline related hydrocarbons, Chlorinated Solvents. Semi-Volatile Organic Compounds - Fuel oil related hydrocarbons
Overall Hazard:	Low to Moderate

ENVIRONMENTAL BUSINESS CONSULTANTS (EBC) AND EBC'S SUBCONTRACTORS DO NOT GUARANTEE THE HEALTH OR SAFETY OF ANY PERSON ENTERING THIS SITE. DUE TO THE NATURE OF THIS SITE AND THE ACTIVITY OCCURRING THEREON, IT IS NOT POSSIBLE TO DISCOVER, EVALUATE, AND PROVIDE PROTECTION FOR ALL POSSIBLE HAZARDS WHICH MAY BE ENCOUNTERED. STRICT ADHERENCE TO THE HEALTH AND SAFETY GUIDELINES SET FORTH HEREIN WILL REDUCE, BUT NOT ELIMINATE, THE POTENTIAL FOR INJURY AT THIS SITE. THE HEALTH AND SAFETY GUIDELINES IN THIS PLAN WERE PREPARED SPECIFICALLY FOR THIS SITE AND SHOULD NOT BE USED ON ANY OTHER SITE WITHOUT PRIOR RESEARCH AND EVALUATION.

CONSTRUCTION HEALTH AND SAFETY PLAN
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STATEMENT OF COMMITMENT

This Construction Health and Safety Plan (CHASP) has been prepared to ensure that workers are not exposed to risks from hazardous materials during the Interim Remedial Measure (IRM) activities planned for 39 Skillman Street Brooklyn, New York.

This CHASP, which applies to persons present at the site actually or potentially exposed to hazardous materials, describes emergency response procedures for actual and potential chemical hazards. This CHASP is also intended to inform and guide personnel entering the work area or exclusion zone. Persons are to acknowledge that they understand the potential hazards and the contents of this Health and Safety policy by signing off on receipt of their individual copy of the document. The Environmental Contractor and Excavation Contractor, its subcontractors and suppliers are retained as independent contractors and are responsible for ensuring the health and safety of their own employees. The Environmental Contractor and Excavation Contractor have the option of adopting this CHASP or providing its own for the planned scope of work under the IRMWP.

1.0 INTRODUCTION

This document describes the health and safety guidelines developed by Environmental Business Consultants (EBC) for implementation of a Remedial Investigation at the site located at 39 Skillman Street, Brooklyn NY, to protect on-site personnel, visitors, and the public from physical harm and exposure to hazardous materials or wastes during the investigative activities. In accordance with the Occupational Safety and Health Administration (OSHA) 29 CFR Part 1910.120 Hazardous Waste Operations and Emergency Response Final rule, this CHASP, including the attachments, addresses safety and health hazards related to Interim Remedial Measure activities and is based on the best information available. The CHASP may be revised by EBC at the request of 39 Skillman Street LLC, ("the owner") and/or the New York State Department of Environmental Conservation (NYSDEC) or the New York State Department of Health (NYSDOH) upon receipt of new information regarding site conditions. Changes will be documented by written amendments signed by EBC's Project Manager, Site Safety Officer and/or the EBC Health and Safety Consultant.

1.1 Scope

This CHASP addresses the potential hazards related to the site Interim Remedial Measure (IRM). The IRM activities include three distinct stages as described below:

1) Site mobilization of 40HR HAZWOPER trained Environmental Remediation Contractor (EnvRC).
    a) Expose, remove, clean and dispose of One 2,000 gallon above ground storage tank and one 2,000 gallon underground storage tank.
    b) Excavate, load and transport for disposal, soil contaminated with petroleum hydrocarbons or chlorinated solvents (if encountered) by EnvRCS.
    c) Collect verification (endpoint) soil samples.
    d) Demobilization of EnvRC
2) Site mobilization of 24HR HAZWOPER trained Excavation Contractor (ExC).
    a) Excavate, load and transport for disposal, historic fill soil and uncontaminated native soil (if encountered) by ExC.
    b) Collect verification (endpoint) soil samples.
    c) Demobilization of ExC

1.2 Application

The CHASP applies to all personnel involved in the above tasks who wish to gain access to active work areas, including but not limited to:

- IRM Remedial Contractor
- IRM Excavation Contractor
- EBC - AMC employees and subcontractors;
- Client representatives; and
- Federal, state or local representatives.

1.3 Site Safety Plan Acceptance, Acknowledgment and Amendments

The project superintendent and the site safety officer are responsible for informing personnel (EBC employees and/or owner or owners representatives) entering the work area of the contents of this plan and ensuring that each person signs the safety plan acknowledging the on-site

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hazards and procedures required to minimize exposure to adverse effects of these hazards. A copy of the Acknowledgement Form is included in **Appendix A**. Site conditions may warrant an amendment to the CHASP. Amendments to the CHASP are acknowledged by completing forms included in **Appendix B**.

1.4 Key Personnel - Roles and Responsibilities

Personnel responsible for implementing this Investigation Health and Safety Plan are:

Name	Title	Address	Contact Numbers
Mr. Charles B. Sosik	EBC Principal	1808 Middle Country Road Ridge, NY 11961	(631) 504-6000 Cell (631) 357-4927
Mr. Kevin Brussee	EBC Project Manager	1808 Middle Country Road Ridge, NY 11961	(631) 504-6000 Cell (631) 338-1749
Mr. Kevin Waters	EBC Site Safety Officer	1808 Middle Country Road Ridge, NY 11961	(631) 504-6000

The project manager is responsible for overall project administration and, with guidance from the site safety officer, for supervising the implementation of this CHASP. The site safety officer will conduct daily (tail gate or tool box) safety meetings at the project site and oversee daily safety issues. Each subcontractor and supplier (defined as an OSHA employer) is also responsible for the health and safety of its employees. If there is any dispute about health and safety or project activities, on-site personnel will attempt to resolve the issue. If the issue cannot be resolved at the site, then the project manager will be consulted.

The site safety officer is also responsible for coordinating health and safety activities related to hazardous material exposure on-site. The site safety officer is responsible for the following:

1. Educating personnel about information in this CHASP and other safety requirements to be observed during site operations, including, but not limited to, decontamination procedures, designation of work zones and levels of protection, air monitoring, fit testing, and emergency procedures dealing with fire and first aid.

2. Coordinating site safety decisions with the project manager.

3. Designating exclusion, decontamination and support zones on a daily basis.

4. Monitoring the condition and status of known on-site hazards and maintaining and implementing the air quality monitoring program specified in this CHASP.

5. Maintaining the work zone entry/exit log and site entry/exit log.

6. Maintaining records of safety problems, corrective measures and documentation of chemical exposures or physical injuries (the site safety officer will document these conditions in a bound notebook and maintain a copy of the notebook on-site).

The person who observes safety concerns and potential hazards that have not been addressed in the daily safety meetings should immediately report their observations/concerns to the site safety officer or appropriate key personnel.

2.0 SITE BACKGROUND AND SCOPE OF WORK

The address for the subject property is 39 Skillman Street, Brooklyn, New York 11205. The subject property is designated as Block 1886, Lot 10 by the New York City Department of Assessment. The subject property is located in the City of New York and Borough of Brooklyn (Kings County). The lot has 250 feet of frontage on Skillman Street and is 100 feet deep for a total lot area of 25,000 square feet.

The lot is developed with three attached buildings and a parking area formerly used by the East Coast Industrial Uniform laundry facility. All buildings are currently vacant. The parking area is located on the southern end of the lot and consists of an asphalt cover. A one-story brick building is located north of the parking area. The building contains an aboveground 2,000-gallon No. 2 fuel oil storage tank in the rear and a boiler room (empty) in the front of the building.

A second one-story brick building is located north of the first, and consists of open space with several concrete lined trenches cut through the southeast end of the building. The trenches were likely used to contain wash water from numerous washing machines prior to discharge through the small aboveground oil water separator located in the southeast corner and finally to public sewer. An area in the northeastern part of this building is labeled with signage as a "hazardous waste storage". An underground storage tank (abandoned-in-place) is located near the roll-up gate entrance to the building. The underground storage tank is believed to be the 3,000-gallon No. 2 fuel oil tank identified on the NYSDEC PBS database.

The environmental history of the subject lots was investigated through the review of Sanborn Fire Insurance maps, NYC Department of Building records and the NYC Department of Finance databases.

The environmental history of the Site was previously investigated through the review of Federal and State Environmental databases, Environmental Sanborn Fire Insurance maps, NYC Department of Building records and the NYC Department of Finance databases.

The Site was developed prior to 1887 with a Brooklyn Union Gas "Gasometer" in the northern third of the property and multiple residential homes and stores on the southern portion. By 1935, the Gasometer is gone and that area of the site is now vacant. The southern portion is unchanged. A small storage building is added to the northern lot in 1947. By 1965 the houses are gone from the southern portion of the property and the north lot is now labeled as a furniture/frame company.

By 1977 property is shown in its current configuration with two attached buildings in the northern area and a small parking lot in the southern portion of the lot. The property is labeled as East Coast Industrial Uniform Company.

An underground storage tank (abandoned-in-place) is located near the roll-up gate entrance to the south building. The property is registered under the NYSDEC Petroleum Bulk Storage (PBS) program as Facility No.2-055468. According to PBS records, a 3,000 gallon underground fuel oil tank and a 2,000 gallon aboveground fuel oil tank are registered to the property. The underground tank is listed as being closed-in-place on 6/1/98. The installation date is unknown.

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Petroleum contamination was observed in soil and groundwater during the installation of soil borings at the site in September 2011. The NYSDEC was notified of these conditions and Spill No. 11-08026 was assigned.

According to the NYSDEC spills database, there are two previous spills associated with the Site: Spill No. 87-07894 which was reported on December 12, 1987, and Spill No. 98-00638 which was reported on April 14, 1998. Both spills are listed as a tank test failure. The 1987 spill was closed on October 2, 1992. The 1998 Spill was closed on May 16, 2006, though there is no record of remedial activity being completed at the site.

The property is know to have elevated concentrations of petroleum VOCs in soil and groundwater and elevated levels of SVOCs and chlorinated VOCs in groundwater. Elevated levels of chlorinated VOCs and SVOCs in soil are suspected. In addition, historic fill at the site may contain elevated levels of heavy metals and pesticides.

2.1 Redevelopment Plans

Redevelopment plans for the Site include demolishing the existing 26,000 square foot (combined) buildings and replacing them with three new 6-story residential apartment buildings. Current plans call for each building to have 16 apartments with a mix of 3, 4 and 5 bedroom units to better serve the needs of the community. Each building will feature a full basement level with utility rooms, residential living space, and 8-9 parking spaces and outdoor recreation areas on the roof.

2.2 Description of Interim Remedial Measure

Site activities associated with the IRM that are included within the scope of this CHASP include the following:

1. Empty and Clean 2,000 gallon aboveground fuel oil tank
2. Excavate 3,000 gallon underground fuel oil tank
3. Cut tanks and ship off-site as scrap metal
4. Excavation, segregation and off-site disposal of any petroleum VOC or SVOC impacted soil encountered in the tank area following tank removal.
5. Excavation, segregation and off-site disposal of CVOC impacted soil from hot-spot areas, if encountered.
6. Excavation, segregation and off-site disposal of historic fill materials.
7. Screening for indications of contamination (by visual means, odor, and monitoring with PID) of all excavated soil during all intrusive Site work.
8. Site Monitoring of airborne VOCs and particulates in accordance with a NYSDEC and NYSDOH approved Community Air Monitoring Plan (CAMP) and Health and Safety Plan during all intrusive and soil handling activities.
9. Implementation of proper dust and odor suppression techniques during all intrusive and soil handling activities.
10. Collection of verification (end-point) soil samples from as required from excavations.

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3.0 HAZARD ASSESSMENT

This section identifies the hazards associated with the proposed scope of work, general physical hazards that can be expected at most sites; and presents a summary of documented or potential chemical hazards at the site. Every effort must be made to reduce or eliminate these hazards. Those that cannot be eliminated must be guarded against using engineering controls and/or personal protective equipment.

3.1 Physical Hazards

3.1.1 Tripping Hazards

An area of risk associated with on-site activities are presented by uneven ground, concrete, curbstones or equipment which may be present at the site thereby creating a potential tripping hazard. During intrusive work, care should be taken to mark or remove any obstacles within the exclusion zone.

3.1.2 Climbing Hazards

During site activities, workers may have to work on excavating equipment by climbing. The excavating contractor will conform with any applicable NIOSH and OSHA requirements or climbing activities.

3.1.3 Cuts and Lacerations

Field activities that involve excavating activities usually involve contact with various types of machinery. A first aid kit approved by the American Red Cross will be available during all intrusive activities.

3.1.4 Lifting Hazards

Improper lifting by workers is one of the leading causes of industrial injuries. Field workers in the excavation program may be required to lift heavy objects. Therefore, all members of the field crew should be trained in the proper methods of lifting heavy objects. All workers should be cautioned against lifting objects too heavy for one person.

3.1.5 Utility Hazards

Before conducting any excavation, the excavation contractor will be responsible for locating and verifying all existing utilities at each excavation.

3.1.6 Traffic Hazards

All traffic, vehicular and pedestrian, shall be maintained and protected at all times consistent with local, state and federal agency regulations regarding such traffic and in accordance with NYCDOT guidelines. The excavation contractor shall carry on his operations without undue interference or delays to traffic. The excavation contractor shall furnish all labor, materials, guards, barricades, signs, lights, and anything else necessary to maintain traffic and to protect his work and the public, during operations.

3.2 Work in Extreme Temperatures

Work under extremely hot or cold weather conditions requires special protocols to minimize the chance that employees will be affected by heat or cold stress.

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3.2.1 Heat Stress

The combination of high ambient temperature, high humidity, physical exertion, and personal protective apparel, which limits the dissipation of body heat and moisture, can cause heat stress.

The following prevention, recognition and treatment strategies will be implemented to protect personnel from heat stress. Personnel will be trained to recognize the symptoms of heat stress and to apply the appropriate treatment.

1. Prevention
    a. Provide plenty of fluids. Available in the support zone will be a 50% solution of fruit punch and water or plain water.
    b. Work in Pairs. Individuals should avoid undertaking any activity alone.
    c. Provide cooling devices. A spray hose and a source of water will be provided to reduce body temperature, cool protective clothing and/or act as a quick-drench shower in case of an exposure incident.
    d. Adjustment of the work schedule. As is practical, the most labor-intensive tasks should be carried out during the coolest part of the day.

2. Recognition and Treatment
    a Heat Rash (or prickly heat):
        Cause: Continuous exposure to hot and humid air, aggravated by chafing clothing.
        Symptoms: Eruption of red pimples around sweat ducts accompanied by intense itching and tingling.
        Treatment: Remove source or irritation and cool skin with water or wet cloths.

    b. Heat Cramps (or heat prostration)
        Cause: Profuse perspiration accompanied by inadequate replenishment of body water and electrolytes.
        Symptoms: Muscular weakness, staggering gait, nausea, dizziness, shallow breathing, pale and clammy skin, approximately normal body temperature.
        Treatment: Perform the following while making arrangement for transport to a medical facility. Remove the worker to a contamination reduction zone. Remove protective clothing. Lie worker down on back in a cool place and raise feet 6 to 12 inches. Keep warm, but loosen all clothing. If conscious, provide sips of salt-water solution, using one teaspoon of salt in 12 ounces of water. Transport to a medical facility.
    c. Heat Stroke
        Cause: Same as heat exhaustion. This is also an extremely serious condition.
        Symptoms: Dry hot skin, dry mouth, dizziness, nausea, headache, rapid pulse.
        Treatment: Cool worker immediately by immersing or spraying with cool water or sponge bare skin after removing protective clothing. Transport to hospital.

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3.2.2 Cold Exposure

Exposure to cold weather, wet conditions and extreme wind-chill factors may result in excessive loss of body heat (hypothermia) and /or frostbite. To guard against cold exposure and to prevent cold injuries, appropriate warm clothing should be worn, warm shelter must be readily available, rest periods should be adjusted as needed, and the physical conditions of on-site field personnel should be closely monitored. Personnel and supervisors working on-site will be made aware of the signs and symptoms of frost bite and hypothermia such as shivering, reduced blood pressure, reduced coordination, drowsiness, impaired judgment, fatigue, pupils dilated but reactive to light and numbing of the toes and fingers.

3.3 Chemical Hazards

Soil collected from the site as part of several subsurface investigations performed at the site have revealed significant concentrations of volatile organic compounds (VOCs) associated with gasoline or "Stoddard Solvent". Chlorinated VOCs and petroleum related volatile and semi-volatile organic compounds are also present in groundwater may be encountered in soil and or vapors excavation and intrusive activities. Elevated levels of metals may also be present in historic fill at the site.

Volatile organic compounds reported to be present at elevated concentrations in soil and /or groundwater include the following:

Ethylbenzene	Napthalene	sec-Butylbenzene	Tetrachloroethene
1,2,4-Trimethylbenzene	Xylenes		

Semi-volatile organic compounds which may be present in soil / historic fill and /or groundwater at the Site include the following:

Anthracene	Ancenaphthene	Benzo(b)fluoranthene	Phenanthrene
Benzo(a)anthracene	Pyrene	Indeno(1,2,3-cd)pyrene	Benzo(a)pyrene
Benzo(g,h,i)perylene	Chrysene	Dibenzo(a,h)anthracene	Fluorene
Benzo(k)fluoranthene	Fluoranthene		

Metals which have not been confirmed but which may be encountered in historic fill materials at the Site include the following:

Chromium	Copper	Lead	Nickel
Mercury	Zinc	Barium	Arsenic

The source of the VOCs and SVOCs detected within the soil and / or groundwater are unknown at this time.

The primary routes of exposure to identified contaminants in soil and groundwater to on-site excavation personnel is through inhalation, ingestion and absorption.

Appendix C includes information sheets for the known and suspected chemicals that may be encountered at the site.

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3.3.1 Respirable Dust

Dust may be generated from vehicular traffic and/or excavation activities. If visible observation detects elevated levels of dust, a program of wetting will be employed by the site safety officer. If elevated dust levels persist, the site safety office will employ dust monitoring using a particulate monitor (Miniram or equivalent). If monitoring detects concentrations greater than 150 µg/m3 over daily background, the site safety officer will take corrective actions as defined herein, including the use of water for dust suppression and if this is not effective, requiring workers to wear APRs with efficiency particulate air (HEPA) cartridges.

Absorption pathways for dust and direct contact with soils or groundwater will be mitigated with the implementation of latex gloves, hand washing and decontamination exercises when necessary.

3.3.2 Dust Control and Monitoring During Excavation

Dust generated during excavation activities may contain contaminants identified in soils at the site or associated with historic fill material present at the site. Dust will be controlled by wetting the working surface with water. Calcium chloride may be used if the problem cannot be controlled with water. Air monitoring and dust control techniques are specified in a site specific Dust Control Plan (if applicable). Site workers will not be required to wear APR's unless dust concentrations are consistently over 150 µg/m3 over site-specific background in the breathing zone as measured by a dust monitor unless the site safety officer directs workers to wear APRs. The site safety officer will use visible dust as an indicator to implement the dust control plan.

3.3.3 Organic Vapors

Elevated levels of VOCs were detected in both soil and groundwater samples collected during previous investigations at the site. Therefore, excavation activities may cause the release of organic vapors to the atmosphere. The site safety officer will periodically monitor organic vapors with a Photoionization Detector (PID) during excavation and intrusive activities to determine whether organic vapor concentrations exceed action levels shown in Section 5 and/or the Community Air Monitoring Plan.

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4.0 PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment (PPE) shall be selected in accordance with the site air monitoring program, OSHA 29 CFR 1910.120(c), (g), and 1910.132. Protective equipment shall be NIOSH approved and respiratory protection shall conform to OSHA 29 CFR Part 1910.133 and 1910.134 specifications; head protection shall conform to 1910.135; eye and face protection shall conform to 1910.133; and foot protection shall conform to 1910.136. The only true difference among the levels of protection from D thru B is the addition of the type of respiratory protection. **It is anticipated that work will be performed in Level D PPE.**

4.1 Level D

Level D PPE shall be donned when the atmosphere contains no known hazards and work functions preclude splashes, immersion, or the potential for inhalation of, or contact with, hazardous concentrations of harmful chemicals. Level D PPE consists of:

- standard work clothes, coveralls, or tyvek, as needed;
- steel toe and steel shank work boots;
- hard hat;
- gloves, as needed;
- safety glasses;
- hearing protection;
- equipment replacements are available as needed.

4.2 Level C

Level C PPE shall be donned when sustained concentrations of measured total organic vapors in the breathing zone exceed background concentrations (using a portable OVA, or equivalent), by more than 5 ppm. The specifications on the APR filters used must be appropriate for contaminants identified or expected to be encountered. Level C PPE shall be donned when the identified contaminants have adequate warning properties and criteria for using APR have been met. Level C PPE consists of:

- chemical resistant or coated tyvek coveralls;
- steel-toe and steel-shank workboots;
- chemical resistant overboots or disposable boot covers;
- disposable inner gloves (surgical gloves);
- disposable outer gloves;
- full face APR fitted with organic vapor/dust and mist filters or filters appropriate for the identified or expected contaminants;
- hard hat;
- splash shield, as needed; and,
- ankles/wrists taped with duct tape.

The site safety officer will verify if Level C is appropriate by checking organic vapor concentrations using compound and/or class-specific detector tubes.

The exact PPE ensemble is decided on a site-by-site basis by the Site Safety Officer with the intent to provide the most protective and efficient worker PPE.

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4.3 Activity-Specific Levels of Personal Protection

The required level of PPE is activity-specific and is based on air monitoring results (Section 4.0) and properties of identified or expected contaminants. **It is expected that site work will be performed in Level D.** If air monitoring results indicate the necessity to upgrade the level of protection, engineering controls (i.e. Facing equipment away from the wind and placing site personnel upwind of excavations, active venting, etc.) will be implemented before requiring the use of respiratory protection.

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5.0 AIR MONITORING AND ACTION LEVELS

29 CFR 1910.120(h) specifies that monitoring shall be performed where there may be a question of employee exposure to hazardous concentrations of hazardous substances in order to assure proper selection of engineering controls, work practices and personal protective equipment so that employees are not exposed to levels which exceed permissible exposure limits, or published exposure levels if there are no permissible exposure limits, for hazardous substances.

5.1 Air Monitoring Requirements

Air will be monitored for VOCs with a portable ION Science 3000EX photoionization detector, or the equivalent. If necessary, Lower Explosive Limit (LEL) and oxygen will be monitored with a Combustible Gas Indicator (CGI). If appropriate, fugitive dust will be monitored using a MiniRam Model PDM-3 aerosol monitor. Air will be monitored when any of the following conditions apply:

- initial site entry;
- during any work where a potential IDLH condition or flammable atmosphere could develop;
- excavation work begins on another portion of the site;
- contaminants, other than those previously identified, have been discovered;
- each time a different task or activity is initiated;
- during trenching and/or excavation work.

The designated site safety officer will record air monitoring data and ensure that air monitoring instruments are calibrated and maintained in accordance with manufacturer's specifications. Instruments will be zeroed daily and checked for accuracy. Monitoring results will be recorded in a field notebook and will be transferred to instrument reading logs.

5.2 Work Stoppage Responses

The following responses will be initiated whenever one or more of the action levels necessitating a work stoppage are exceeded:

1 The SSO will be consulted immediately
2 All personnel (except as necessary for continued monitoring and contaminant migration, if applicable) will be cleared from the work area (eg from the exclusion zone).
3 Monitoring will be continued until intrusive work resumes.

5.3 Action Levels During Excavation and Intrusive Activities

Instrument readings will be taken in the breathing zone unless otherwise noted. Each action level is independent of all other action levels in determining responses.

Organic Vapors (PID)	LEL %	Responses
0-1 ppm above background	0%	• Continue excavation • Level D protection • Continue monitoring every 10 minutes
1-5 ppm Above Background, Sustained Reading	1-10%	• Continue excavation • Go to Level C protection or employ

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		engineering controls • Continue monitoring every 10 minutes
5-25 ppm Above Background, Sustained Reading	10-20%	• Discontinue excavation, unless PID is only action level exceeded. • Level C protection or employ engineering controls • Continue monitoring for organic vapors 200 ft downwind • Continuous monitoring for LEL at excavation pit
>25 ppm Above Background, Sustained Reading	>20%	• Discontinue excavation • Withdraw from area, shut off all engine ignition sources. • Allow pit to vent • Continuous monitoring for organic vapors 200 ft downwind.

Notes: Air monitoring will occur in the breathing zone 30 inches above the surface.

If action levels for any one of the monitoring parameters are exceeded, the appropriate responses listed in the right hand column should be taken. If instrument readings do not return to acceptable levels after the area has been vented for a period of greater than one-half hour, a decision will then be made whether or not to continue working.

If, during excavation activities, downwind monitoring PID readings are greater than 5 ppm above background for more than one-half hour, excavation will stop until sustained levels are less then 5 ppm (see Community Air Monitoring Plan).

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6.0 SITE CONTROL

6.1 Work Zones

The primary purpose of site controls is to establish the perimeter of a hazardous area, to reduce the migration of contaminants into clean areas, and to prevent access or exposure to hazardous materials by unauthorized persons. When operations are to take place involving hazardous materials, the site safety officer will establish an exclusion zone, a decontamination zone, and a support zone. These zones "float" (move around the site) depending on the tasks being performed on any given day. The site safety officer will outline these locations before work begins and when zones change. The site safety officer records this information in the site log book.

Due to the dimensions of the Site and the work area, it is expected that an exclusion zone, if needed, will be limited to the immediate area around the excavation area. A support zone if needed will be located outside of the excavation area. An environmental remediation contractor with appropriate hazardous material handling experience and training is required to perform the tank removal and excavation of petroleum and chlorinated solvent impacted soil during this IRM. All onsite workers must provide evidence of OSHA 40-hour Hazardous Waste Operations and Emergency Response Operations training to conduct work within the exclusion zone established by the site safety officer. Gross decontamination (as determined by the site Health and Safety Officer) is conducted in the exclusion zone; all other decontamination is performed in the decontamination zone or trailer, if provided. After the contaminated soil is removed and the remediation contractor has demobilized from the Site, an excavation contractor will remove historic fill and uncontaminated soil. The excavation contractor's on-site personnel will have a minimum of 24 hour Hazardous Waste Operations and Emergency Response Operations training.

Protective equipment is removed in the decontamination zone. Disposable protective equipment is stored in receptacles staged in the decontamination zone, and non-disposable equipment is decontaminated. All personnel and equipment exit the exclusion zone through the decontamination zone. If a decontamination trailer is provided the first aid equipment, an eye wash unit, and drinking water are kept in the decontamination trailer.

The support zone is used for vehicle parking, daily safety meetings, and supply storage. Eating, drinking, and smoking are permitted only in the support zone. When a decontamination trailer is not provided, the eye wash unit, first aid equipment, and drinking water are kept at a central location designated by the site safety officer.

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1808 Middle Country Road
Ridge, NY 11961
Phone 631.504.6000
Fax 631.924.2870

7.0 CONTINGENCY PLAN/EMERGENCY RESPONSE PLAN

Site personnel must be prepared in the event of an emergency. Emergencies can take many forms: illnesses, injuries, chemical exposure, fires, explosions, spills, leaks, releases of harmful contaminants, or sudden changes in the weather.

Emergency telephone numbers and a map to the hospital will be posted in the command post. Site personnel should be familiar with the emergency procedures, and the locations of site safety, first aid, and communication equipment.

7.1 Emergency Equipment On-site

Private telephones:	Site personnel.
Two-way radios:	Site personnel where necessary.
Emergency Alarms:	On-site vehicle horns*.
First aid kits:	On-site, in vehicles or office.
Fire extinguisher:	On-site, in office or on equipment.

* Horns: Air horns will be supplied to personnel at the discretion of the project superintendent or site safety officer.

7.2 Emergency Telephone Numbers

General Emergencies	911
Suffolk County Police	911
NYC Fire Department	911
Jamaica Hospital Medical Center	(718) 206-6000
NYSDEC Spills Hotline	1-800-457-7362
NYSDEC Project Manager	(718) 482-4010
NYC Department of Health	(212) 676-2400
National Response Center	1-800-424-8802
Poison Control	1-800-222-1222
Project Manager	1-631-504-6000
Site Safety Officer	1-631-504-6000

7.3 Personnel Responsibilities During an Emergency

The project manager is primarily responsible for responding to and correcting any emergency situations. However, in the absence of the project manager, the site safety officer shall act as the project manager's on-site designee and perform the following tasks:

- Take appropriate measures to protect personnel including: withdrawal from the exclusion zone, evacuate and secure the site, or upgrade/downgrade the level of protective clothing and respiratory protection;

- Ensure that appropriate federal, state, and local agencies are informed and emergency response plans are coordinated. In the event of fire or explosion, the local fire department should be summoned immediately. If toxic materials are released to the air, the local authorities should be informed in order to assess the need for evacuation;

- Ensure appropriate decontamination, treatment, or testing for exposed or injured

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personnel;

- Determine the cause of incidents and make recommendations to prevent recurrence; and,

- Ensure that all required reports have been prepared.

The following key personnel are planned for this project:

- Project Manager — Mr. Kevin Brussee (631) 504-6000
- Site Safety Officer — Mr. Kevin Waters (631) 504-6000

7.4 Medical Emergencies

A person who becomes ill or injured in the exclusion zone will be decontaminated to the maximum extent possible. If the injury or illness is minor, full decontamination will be completed and first aid administered prior to transport. First aid will be administered while waiting for an ambulance or paramedics. A Field Accident Report (**Appendix D**) must be filled out for any injury.

A person transporting an injured/exposed person to a clinic or hospital for treatment will take the directions to the hospital (**Appendix D**).and information on the chemical(s) to which they may have been exposed (**Appendix C**).

7.5 Fire or Explosion

In the event of a fire or explosion, the local fire department will be summoned immediately. The site safety officer or his designated alternate will advise the fire commander of the location, nature and identification of the hazardous materials on-site. If it is safe to do so, site personnel may:

- use fire fighting equipment available on site; or,
- remove or isolate flammable or other hazardous materials that may contribute to the fire.

7.6 Evacuation Routes

Evacuation routes established by work area locations for each site will be reviewed prior to commencing site operations. As the work areas change, the evacuation routes will be altered accordingly, and the new route will be reviewed.

Under extreme emergency conditions, evacuation is to be immediate without regard for equipment. The evacuation signal will be a continuous blast of a vehicle horn, if possible, and/or by verbal/radio communication. When evacuating the site, personnel will follow these instructions:

- Keep upwind of smoke, vapors, or spill location.

- Exit through the decontamination corridor if possible.
- If evacuation through the decontamination corridor is not possible, personnel should remove contaminated clothing once they are in a safe location and leave it near the exclusion zone or in a safe place.

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- The site safety officer will conduct a head count to ensure that all personnel have been evacuated safely. The head count will be correlated to the site and/or exclusion zone entry/exit log.

- If emergency site evacuation is necessary, all personnel are to escape the emergency situation and decontaminate to the maximum extent practical.

7.7 Spill Control Procedures

Spills associated with site activities may be attributed to project equipment and include gasoline, diesel and hydraulic oil. In the event of a leak or a release, site personnel will inform their supervisor immediately, locate the source of spillage and stop the flow if it can be done safely. A spill containment kit including absorbent pads, booms and/or granulated speedy dry absorbent material will be available to site personnel to facilitate the immediate recovery of the spilled material. Daily inspections of site equipment components including hydraulic lines, fuel tanks, etc. will be performed by their respective operators as a preventative measure for equipment leaks and to ensure equipment soundness. In the event of a spill, site personnel will immediately notify the NYSDEC (1-800-457-7362), and a spill number will be generated.

7.8 Vapor Release Plan

If work zone organic vapor (excluding methane) exceeds 5 ppm, then a downwind reading will be made either 200 feet from the work zone or at the property line, whichever is closer. If readings at this location exceed 5 ppm over background, the work will be stopped.

If 5 ppm of VOCs are recorded over background on a PID at the property line, then an off-site reading will be taken within 20 feet of the nearest residential or commercial property, whichever is closer. If efforts to mitigate the emission source are unsuccessful for 30 minutes, then the designated site safety officer will:

- contact the local police;
- continue to monitor air every 30 minutes, 20 feet from the closest off-site property. If two successive readings are below 5 ppm (non-methane), off-site air monitoring will be halted.
- All property line and off site air monitoring locations and results associated with vapor releases will be recorded in the site safety log book.

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APPENDIX A

SITE SAFETY ACKNOWLEDGEMENT FORM

DAILY BREIFING SIGN-IN SHEET

Date:_____ Person Conducting Briefing:_____

Project Name and Location:_____

1. AWARENESS (topics discussed, special safety concerns, recent incidents, etc…):

_____

_____

_____

_____

2. OTHER ISSUES (HASP changes, attendee comments, etc…):

_____

_____

_____

3. ATTENDEES (Print Name):

1.	11.
2.	12.
3.	13.
4.	14.
5.	15.
6.	16.
7.	17.
8.	18.
9.	19.
10.	20.

APPENDIX B

SITE SAFETY PLAN AMENDMENTS

SITE SAFETY PLAN AMENDMENT FORM

Site Safety Plan Amendment #: _____

Site Name: _____

Reason for Amendment: _____

_____

_____

_____

Alternative Procedures: _____

_____

_____

_____

Required Changes in PPE: _____

_____

_____

_____

_____ _____

Project Superintendent (signature) **Date**

_____ _____

Health and Safety Consultant (signature) **Date**

_____ _____

Site Safety Officer (signature) **Date**

APPENDIX C

CHEMICAL HAZARDS

CHEMICAL HAZARDS

The attached International Chemical Safety Cards are provided for contaminants of concern that have been identified in soils and/or groundwater at the site.

International Chemical Safety Cards

ETHYLBENZENE

ICSC: 0268

Ethylbenzol
Phenylethane
EB
C_8H_{10} / $C_6H_5C_2H_5$
Molecular mass: 106.2

ICSC # 0268
CAS # 100-41-4
RTECS # DA0700000
UN # 1175
EC # 601-023-00-4
March 13, 1995 Validated

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Highly flammable.	NO open flames, NO sparks, and NO smoking.	Powder, AFFF, foam, carbon dioxide.
EXPLOSION	Vapour/air mixtures are explosive.	Closed system, ventilation, explosion-proof electrical equipment and lighting. Do NOT use compressed air for filling, discharging, or handling.	In case of fire: keep drums, etc., cool by spraying with water.
EXPOSURE		PREVENT GENERATION OF MISTS!	
•INHALATION	Cough. Dizziness. Drowsiness. Headache.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Refer for medical attention.
•SKIN	Dry skin. Redness.	Protective gloves.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES	Redness. Pain. Blurred vision.	Face shield or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION	(Further see Inhalation).	Do not eat, drink, or smoke during work.	Rinse mouth. Give a slurry of activated charcoal in water to drink. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Ventilation. Collect leaking liquid in covered containers. Absorb remaining liquid in sand or inert absorbent and remove to safe place. Do NOT wash away into sewer. Personal protection: A filter respirator for organic gases and vapours.	Fireproof. Separated from strong oxidants.	F symbol Xn symbol R: 11-20 S: 2-16-24/25-29 UN Hazard Class: 3 UN Packing Group: II

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0268

International Chemical Safety Cards

ETHYLBENZENE

ICSC: 0268

IMPORTANT DATA	**PHYSICAL STATE; APPEARANCE:** COLOURLESS LIQUID , WITH AROMATIC ODOUR. **PHYSICAL DANGERS:** The vapour mixes well with air, explosive mixtures are easily formed. **CHEMICAL DANGERS:** Reacts with strong oxidants. Attacks plastic and rubber. **OCCUPATIONAL EXPOSURE LIMITS:** TLV: 100 ppm as TWA 125 ppm as STEL A3 (confirmed animal carcinogen with unknown relevance to humans); BEI issued (ACGIH 2005). MAK: skin absorption (H); Carcinogen category: 3A; (DFG 2004). OSHA PEL†: TWA 100 ppm (435 mg/m^3) NIOSH REL: TWA 100 ppm (435 mg/m^3) ST 125 ppm (545 mg/m^3) NIOSH IDLH: 800 ppm 10%LEL See: 100414	**ROUTES OF EXPOSURE:** The substance can be absorbed into the body by inhalation of its vapour, through the skin and by ingestion. **INHALATION RISK:** A harmful contamination of the air will be reached rather slowly on evaporation of this substance at 20°C. **EFFECTS OF SHORT-TERM EXPOSURE:** The substance is irritating to the eyes the skin and the respiratory tract Swallowing the liquid may cause aspiration into the lungs with the risk of chemical pneumonitis. The substance may cause effects on the central nervous system Exposure far above the OEL could cause lowering of consciousness. **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** Repeated or prolonged contact with skin may cause dermatitis.
PHYSICAL PROPERTIES	Boiling point: 136°C Melting point: -95°C Relative density (water = 1): 0.9 Solubility in water, g/100 ml at 20°C: 0.015 Vapour pressure, kPa at 20°C: 0.9 Relative vapour density (air = 1): 3.7	Relative density of the vapour/air-mixture at 20°C (air = 1): 1.02 Flash point: 18°C c.c. Auto-ignition temperature: 432°C Explosive limits, vol% in air: 1.0-6.7 Octanol/water partition coefficient as log Pow: 3.2
ENVIRONMENTAL DATA	The substance is harmful to aquatic organisms. 	

N O T E S

The odour warning when the exposure limit value is exceeded is insufficient.

Transport Emergency Card: TEC (R)-30S1175 or 30GF1-I+II
NFPA Code: H2; F3; R0

ADDITIONAL INFORMATION

IMPORTANT LEGAL NOTICE:	Neither NIOSH, the CEC or the IPCS nor any person acting on behalf of NIOSH, the CEC or the IPCS is responsible for the use which might be made of this information. This card contains the collective views of the IPCS Peer Review Committee and may not reflect in all cases all the detailed requirements included in national legislation on the subject. The user should verify compliance of the cards with the relevant legislation in the country of use. The only modifications made to produce the U.S. version is inclusion of the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

1,2,4-TRIMETHYLBENZENE

ICSC: 1433

Pseudocumene

C_9H_{12}

Molecular mass: 120,2

ICSC # 1433
CAS # 95-63-6
RTECS # DC3325000
UN # 1993
EC # 601-043-00-3
March 06, 2002 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Flammable.	NO open flames, NO sparks, and NO smoking.	Alcohol-resistant foam, dry powder, carbon dioxide.
EXPLOSION	Above 44°C explosive vapour/air mixtures may be formed.	Above 44°C use a closed system, ventilation, and explosion-proof electrical equipment. Prevent build-up of electrostatic charges (e.g., by grounding).	In case of fire: keep drums, etc., cool by spraying with water.
EXPOSURE		PREVENT GENERATION OF MISTS!	
•INHALATION	Confusion. Cough. Dizziness. Drowsiness. Headache. Sore throat. Vomiting.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Refer for medical attention.
•SKIN	Redness. Dry skin.	Protective gloves.	Rinse skin with plenty of water or shower.
•EYES	Redness. Pain.	Safety spectacles.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION	(See Inhalation).	Do not eat, drink, or smoke during work.	Rinse mouth. Do NOT induce vomiting. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent and remove to safe place. Do NOT wash away into sewer. Do NOT let this chemical enter the environment. Personal protection: filter respirator for organic gases and vapours.	Fireproof. Separated from strong oxidants. Well closed. Keep in a well-ventilated room.	Xn symbol N symbol R: 10-20-36/37/38-51/53 S: 2-26-61 UN Hazard Class: 3 UN Packing Group: III

SEE IMPORTANT INFORMATION ON BACK

ICSC: 1433

International Chemical Safety Cards

1,2,4-TRIMETHYLBENZENE

ICSC: 1433

IMPORTANT DATA	**PHYSICAL STATE; APPEARANCE:** COLOURLESS LIQUID , WITH CHARACTERISTIC ODOUR. **PHYSICAL DANGERS:** **CHEMICAL DANGERS:** The substance decomposes on burning producing toxic and irritating fumes Reacts violently with strong oxidants causing fire and explosion hazard. **OCCUPATIONAL EXPOSURE LIMITS:** TLV: (as mixed isomers) 25 ppm as TWA (ACGIH 2004). MAK: (as mixed isomers) 20 ppm 100 mg/m³ Peak limitation category: II(2) Pregnancy risk group: C (DFG 2004). OSHA PEL†: none NIOSH REL: TWA 25 ppm (125 mg/m^3) NIOSH IDLH: N.D. See: IDLH INDEX	**ROUTES OF EXPOSURE:** The substance can be absorbed into the body by inhalation. **INHALATION RISK:** A harmful contamination of the air will be reached rather slowly on evaporation of this substance at 20°C; on spraying or dispersing, however, much faster. **EFFECTS OF SHORT-TERM EXPOSURE:** The substance is irritating to the eyes the skin and the respiratory tract If this liquid is swallowed, aspiration into the lungs may result in chemical pneumonitis. The substance may cause effects on the central nervous system **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** The liquid defats the skin. Lungs may be affected by repeated or prolonged exposure , resulting in chronic bronchitis The substance may have effects on the central nervous system blood See Notes.
PHYSICAL PROPERTIES	Boiling point: 169°C Melting point: -44°C Relative density (water = 1): 0.88 Solubility in water: very poor Relative vapour density (air = 1): 4.1	Relative density of the vapour/air-mixture at 20°C (air = 1): 1.01 Flash point: 44°C c.c. Auto-ignition temperature: 500°C Explosive limits, vol% in air: 0.9-6.4 Octanol/water partition coefficient as log Pow: 3.8
ENVIRONMENTAL DATA	The substance is toxic to aquatic organisms. Bioaccumulation of this chemical may occur in fish. 	

N O T E S

Use of alcoholic beverages enhances the harmful effect. Depending on the degree of exposure, periodic medical examination is suggested. See also ICSC 1155 1,3,5-Trimethylbenzene (Mesitylene), ICSC 1362 1,2,3-Trimethylbenzene (Hemimellitene), ICSC 1389 Trimethyl benzene (mixed isomers). 1,3,5-Trimethylbenzene (Mesitylene) is classified as a marine pollutant.

Transport Emergency Card: TEC (R)-30GF1-III
NFPA Code: H0; F2; R0;

ADDITIONAL INFORMATION

International Chemical Safety Cards

TETRACHLOROETHYLENE

ICSC: 0076

1,1,2,2-Tetrachloroethylene
Perchloroethylene
Tetrachloroethene
C_2Cl_4 / $Cl_2C=CCl_2$
Molecular mass: 165.8

ICSC # 0076
CAS # 127-18-4
RTECS # KX3850000
UN # 1897
EC # 602-028-00-4
April 13, 2000 Validated

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Not combustible. Gives off irritating or toxic fumes (or gases) in a fire.		In case of fire in the surroundings: use appropriate extinguishing media.
EXPLOSION			
EXPOSURE		STRICT HYGIENE! PREVENT GENERATION OF MISTS!	
•INHALATION	Dizziness. Drowsiness. Headache. Nausea. Weakness. Unconsciousness.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Artificial respiration may be needed. Refer for medical attention.
•SKIN	Dry skin. Redness.	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES	Redness. Pain.	Safety goggles , face shield .	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION	Abdominal pain. (Further see Inhalation).	Do not eat, drink, or smoke during work.	Rinse mouth. Do NOT induce vomiting. Give plenty of water to drink. Rest.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Ventilation. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent and remove to safe place. Do NOT let this chemical enter the environment. Personal protection: filter respirator for organic gases and vapours.	Separated from metals ,(see Chemical Dangers), food and feedstuffs . Keep in the dark. Ventilation along the floor.	Do not transport with food and feedstuffs. Marine pollutant. Xn symbol N symbol R: 40-51/53 S: (2-)23-36/37-61 UN Hazard Class: 6.1 UN Packing Group: III

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0076

International Chemical Safety Cards

TETRACHLOROETHYLENE

ICSC: 0076

I M P O R T A N T D A T A

PHYSICAL STATE; APPEARANCE:
COLOURLESS LIQUID , WITH CHARACTERISTIC ODOUR.

PHYSICAL DANGERS:
The vapour is heavier than air.

CHEMICAL DANGERS:
On contact with hot surfaces or flames this substance decomposes forming toxic and corrosive fumes (hydrogen chloride, phosgene, chlorine). The substance decomposes slowly on contact with moisture producing trichloroacetic acid and hydrochloric acid. Reacts with metals such as aluminium, lithium, barium, beryllium.

OCCUPATIONAL EXPOSURE LIMITS:
TLV: 25 ppm as TWA, 100 ppm as STEL; A3 (confirmed animal carcinogen with unknown relevance to humans); BEI issued; (ACGIH 2004).
MAK: skin absorption (H);
Carcinogen category: 3B;
(DFG 2004).
OSHA PEL†: TWA 100 ppm C 200 ppm 300 ppm (5-minute maximum peak in any 3-hours)
NIOSH REL: Ca Minimize workplace exposure concentrations. See Appendix A
NIOSH IDLH: Ca 150 ppm See: 127184

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation and by ingestion.

INHALATION RISK:
A harmful contamination of the air will be reached rather slowly on evaporation of this substance at 20°C.

EFFECTS OF SHORT-TERM EXPOSURE:
The substance is irritating to the eyes , the skin and the respiratory tract . If this liquid is swallowed, aspiration into the lungs may result in chemical pneumonitis. The substance may cause effects on the central nervous system. Exposure at high levels may result in unconsciousness.

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
Repeated or prolonged contact with skin may cause dermatitis. The substance may have effects on the liver and kidneys. This substance is probably carcinogenic to humans.

PHYSICAL PROPERTIES

Boiling point: 121°C
Melting point: -22°C
Relative density (water = 1): 1.6
Solubility in water, g/100 ml at 20°C: 0.015

Vapour pressure, kPa at 20°C: 1.9
Relative vapour density (air = 1): 5.8
Relative density of the vapour/air-mixture at 20°C (air = 1): 1.09
Octanol/water partition coefficient as log Pow: 2.9

ENVIRONMENTAL DATA

The substance is toxic to aquatic organisms. The substance may cause long-term effects in the aquatic environment.

N O T E S

Depending on the degree of exposure, periodic medical examination is suggested. The odour warning when the exposure limit value is exceeded is insufficient. Do NOT use in the vicinity of a fire or a hot surface, or during welding. An added stabilizer or inhibitor can influence the toxicological properties of this substance, consult an expert. Card has been partly updated in April 2005. See section Occupational Exposure Limits.

Transport Emergency Card: TEC (R)-61S1897

NFPA Code: H2; F0; R0;

ADDITIONAL INFORMATION

International Chemical Safety Cards

p-XYLENE

ICSC: 0086

para-Xylene
1,4-Dimethylbenzene
p-Xylol
$C_6H_4(CH_3)_2$ / C_8H_{10}
Molecular mass: 106.2

ICSC # 0086
CAS # 106-42-3
RTECS # ZE2625000
UN # 1307
EC # 601-022-00-9
August 03, 2002 Validated

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Flammable.	NO open flames, NO sparks, and NO smoking.	Powder, water spray, foam, carbon dioxide.
EXPLOSION	Above 27°C explosive vapour/air mixtures may be formed.	Above 27°C use a closed system, ventilation, and explosion-proof electrical equipment. Prevent build-up of electrostatic charges (e.g., by grounding).	In case of fire: keep drums, etc., cool by spraying with water.
EXPOSURE		STRICT HYGIENE! AVOID EXPOSURE OF (PREGNANT) WOMEN!	
•INHALATION	Dizziness. Drowsiness. Headache. Nausea.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Refer for medical attention.
•SKIN	Dry skin. Redness.	Protective gloves.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES	Redness. Pain.	Safety spectacles.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION	Burning sensation. Abdominal pain. (Further see Inhalation).	Do not eat, drink, or smoke during work.	Rinse mouth. Do NOT induce vomiting. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Ventilation. Remove all ignition sources. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent and remove to safe place. Do NOT let this chemical enter the environment. (Extra personal protection: filter respirator for organic gases and vapours.)	Fireproof. Separated from strong oxidants, strong acids	Note: C Xn symbol R: 10-20/21-38 S: 2-25 UN Hazard Class: 3 UN Packing Group: III

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0086

International Chemical Safety Cards

p-XYLENE

ICSC: 0086

I M P O R T A N T D A T A

PHYSICAL STATE; APPEARANCE:
COLOURLESS LIQUID , WITH CHARACTERISTIC ODOUR.

PHYSICAL DANGERS:
As a result of flow, agitation, etc., electrostatic charges can be generated.

CHEMICAL DANGERS:
Reacts with strong acids strong oxidants

OCCUPATIONAL EXPOSURE LIMITS:
TLV: 100 ppm as TWA 150 ppm as STEL A4 (ACGIH 2001). BEI (ACGIH 2001).
MAK: 100 ppm 440 mg/m³
Peak limitation category: II(2)
skin absorption (H);
Pregnancy risk group: D
(DFG 2005).
EU OEL: 50 ppm as TWA 100 ppm as STEL (skin) (EU 2000).
OSHA PEL†: TWA 100 ppm (435 mg/m^3)
NIOSH REL: TWA 100 ppm (435 mg/m^3) ST 150 ppm (655 mg/m^3)
NIOSH IDLH: 900 ppm See: 95476

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation, through the skin and by ingestion.

INHALATION RISK:
A harmful contamination of the air will be reached rather slowly on evaporation of this substance at 20°C.

EFFECTS OF SHORT-TERM EXPOSURE:
The substance is irritating to the eyes and the skin The substance may cause effects on the central nervous system If this liquid is swallowed, aspiration into the lungs may result in chemical pneumonitis.

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
The liquid defats the skin. The substance may have effects on the central nervous system. Animal tests show that this substance possibly causes toxicity to human reproduction or development.

PHYSICAL PROPERTIES

Boiling point: 138°C
Melting point: 13°C
Relative density (water = 1): 0.86
Solubility in water:
none
Vapour pressure, kPa at 20°C: 0.9

Relative vapour density (air = 1): 3.7
Relative density of the vapour/air-mixture at 20°C (air = 1): 1.02
Flash point: 27°C c.c.
Auto-ignition temperature: 528°C
Explosive limits, vol% in air: 1.1-7.0
Octanol/water partition coefficient as log Pow: 3.15

ENVIRONMENTAL DATA

The substance is toxic to aquatic organisms.

N O T E S

Depending on the degree of exposure, periodic medical examination is indicated. The recommendations on this Card also apply to technical xylene. See ICSC 0084 o-Xylene and 0085 m-Xylene.

Transport Emergency Card: TEC (R)-30S1307-III
NFPA Code: H 2; F 3; R 0;

ADDITIONAL INFORMATION

ICSC: 0086 **p-XYLENE**

International Chemical Safety Cards

ANTHRACENE

ICSC: 0825

Anthracin
Paranaphthalene
$C_{14}H_{10}$ / $(C_6H_4CH)_2$
Molecular mass: 178.2

ICSC # 0825
CAS # 120-12-7
RTECS # CA9350000
March 24, 1999 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible.	NO open flames.	Powder, water spray, foam, carbon dioxide.
EXPLOSION	Finely dispersed particles form explosive mixtures in air.	Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	In case of fire: keep drums, etc., cool by spraying with water.
EXPOSURE		PREVENT DISPERSION OF DUST!	
•INHALATION	Cough. Sore throat.	Ventilation (not if powder), local exhaust, or breathing protection.	Fresh air, rest. Refer for medical attention.
•SKIN	Redness.	Protective gloves.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES	Redness. Pain.	Safety spectacles, face shield, or eye protection in combination with breathing protection if powder.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION	Abdominal pain.	Do not eat, drink, or smoke during work.	Rinse mouth. Rest. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Sweep spilled substance into containers. Carefully collect remainder, then remove to safe place Do NOT let this chemical enter the environment. (Extra personal protection: P2 filter respirator for harmful particles).	Separated from strong oxidants. Well closed.	R: S:

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0825

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

ANTHRACENE

ICSC: 0825

I **M**	**PHYSICAL STATE; APPEARANCE:** WHITE CRYSTALS OR FLAKES.	**ROUTES OF EXPOSURE:** The substance can be absorbed into the body by

P O R T A N T D A T A	**PHYSICAL DANGERS:** Dust explosion possible if in powder or granular form, mixed with air. **CHEMICAL DANGERS:** The substance decomposes on heating, under influence of strong oxidants producing acrid, toxic fume , causing fire and explosion hazard. **OCCUPATIONAL EXPOSURE LIMITS:** TLV not established. inhalation. **INHALATION RISK:** Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly. **EFFECTS OF SHORT-TERM EXPOSURE:** The substance slightly irritates the skin and the respiratory tract. **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** Repeated or prolonged contact with skin may cause dermatitis under the influence of UV light.
PHYSICAL PROPERTIES	Boiling point: 342°C Melting point: 218°C Density: 1.25-1.28 g/cm3 Solubility in water, g/100 ml at 20 °C: 0.00013 Vapour pressure, Pa at 25°C: 0.08 Relative vapour density (air = 1): 6.15 Flash point: 121°C Auto-ignition temperature: 538°C Explosive limits, vol% in air: 0.6-? Octanol/water partition coefficient as log Pow: 4.5 (calculated)
ENVIRONMENTAL DATA	The substance is very toxic to aquatic organisms. The substance may cause long-term effects in the aquatic environment. 

N O T E S

Green oil, Tetra-olive N2G are trade names.

NFPA Code: H0; F1; R;

ADDITIONAL INFORMATION

ICSC: 0825 **ANTHRACENE**

International Chemical Safety Cards

BENZ(a)ANTHRACENE

ICSC: 0385

1,2-Benzoanthracene
Benzo(a)anthracene
2,3-Benzphenanthrene
Naphthanthracene
$C_{18}H_{12}$
Molecular mass: 228.3

ICSC # 0385
CAS # 56-55-3
RTECS # CV9275000
EC # 601-033-00-9
October 23, 1995 Validated

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible.		Water spray, powder. In case of fire in the surroundings: use appropriate extinguishing media.
EXPLOSION	Finely dispersed particles form explosive mixtures in air.	Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	
EXPOSURE		AVOID ALL CONTACT!	
•INHALATION		Local exhaust or breathing protection.	Fresh air, rest.
•SKIN		Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES		Safety goggles face shield or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION		Do not eat, drink, or smoke during work. Wash hands before eating.	Rinse mouth.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Sweep spilled substance into sealable containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place. Personal protection: complete protective clothing including self-contained breathing apparatus.	Well closed.	T symbol N symbol R: 45-50/53 S: 53-45-60-61

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0385

International Chemical Safety Cards

BENZ(a)ANTHRACENE

I M P O R T A N T D A T A

PHYSICAL STATE; APPEARANCE:
COLOURLESS TO YELLOW BROWN FLUORESCENT FLAKES OR POWDER.

PHYSICAL DANGERS:
Dust explosion possible if in powder or granular form, mixed with air.

CHEMICAL DANGERS:

OCCUPATIONAL EXPOSURE LIMITS:
TLV: A2 (suspected human carcinogen); (ACGIH 2004).
MAK:
Carcinogen category: 2 (as pyrolysis product of organic materials)
(DFG 2005).

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation, through the skin and by ingestion.

INHALATION RISK:
Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly.

EFFECTS OF SHORT-TERM EXPOSURE:

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
This substance is probably carcinogenic to humans.

PHYSICAL PROPERTIES

Sublimation point: 435°C
Melting point: 162°C
Relative density (water = 1): 1.274
Solubility in water:
none

Vapour pressure, Pa at 20°C: 292
Octanol/water partition coefficient as log Pow: 5.61

ENVIRONMENTAL DATA

Bioaccumulation of this chemical may occur in seafood.

N O T E S

This substance is one of many polycyclic aromatic hydrocarbons - standards are usually established for them as mixtures, e.g., coal tar pitch volatiles. However, it may be encountered as a laboratory chemical in its pure form. Insufficient data are available on the effect of this substance on human health, therefore utmost care must be taken. Do NOT take working clothes home. Tetraphene is a common name. Card has been partly updated in October 2005 and August 2006: see sections Occupational Exposure Limits, EU classification.

ADDITIONAL INFORMATION

ICSC: 0385 **BENZ(a)ANTHRACENE**

International Chemical Safety Cards

BENZO(b)FLUORANTHENE

ICSC: 0720

Benz(e)acephenanthrylene
2,3-Benzofluoroanthene
Benzo(e)fluoranthene
3,4-Benzofluoranthene
$C_{20}H_{12}$
Molecular mass: 252.3

ICSC # 0720
CAS # 205-99-2
RTECS # CU1400000
EC # 601-034-00-4
March 25, 1999 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE			In case of fire in the surroundings: use appropriate extinguishing media.
EXPLOSION			
EXPOSURE		AVOID ALL CONTACT!	
•INHALATION		Local exhaust or breathing protection.	Fresh air, rest.
•SKIN		Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES		Safety spectacles or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION		Do not eat, drink, or smoke during work.	Rinse mouth. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Sweep spilled substance into covered containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place. Do NOT let this chemical enter the environment.	Provision to contain effluent from fire extinguishing. Well closed.	T symbol N symbol R: 45-50/53 S: 53-45-60-61

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0720

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

BENZO(b)FLUORANTHENE

ICSC: 0720

I	**PHYSICAL STATE; APPEARANCE:** COLOURLESS CRYSTALS	**ROUTES OF EXPOSURE:** The substance can be absorbed into the body by inhalation

IMPORTANT DATA	**PHYSICAL DANGERS:** **CHEMICAL DANGERS:** Upon heating, toxic fumes are formed. **OCCUPATIONAL EXPOSURE LIMITS:** TLV: A2 (suspected human carcinogen); (ACGIH 2004). MAK: Carcinogen category: 2; (DFG 2004).	of its aerosol and through the skin. **INHALATION RISK:** Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly. **EFFECTS OF SHORT-TERM EXPOSURE:** **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** This substance is possibly carcinogenic to humans. May cause genetic damage in humans.
PHYSICAL PROPERTIES	Boiling point: 481°C Melting point: 168°C Solubility in water: none	Octanol/water partition coefficient as log Pow: 6.12
ENVIRONMENTAL DATA	This substance may be hazardous to the environment; special attention should be given to air quality and water quality. 	

N O T E S

Benzo(b)fluoranthene is present as a component of polycyclic aromatic hydrocarbons (PAH) content in the environment usually resulting from the incomplete combustion or pyrolysis of organic matters, especially fossil fuels and tobacco.ACGIH recommends environment containing benzo(b)fluoranthene should be evaluated in terms of the TLV-TWA for coal tar pitch volatile, as benzene soluble 0.2 mg/m^3. Insufficient data are available on the effect of this substance on human health, therefore utmost care must be taken.

ADDITIONAL INFORMATION

ICSC: 0720 **BENZO(b)FLUORANTHENE**

International Chemical Safety Cards

BENZO(g,h,i)FLUORANTHENE

ICSC: 0527

2,13-Benzofluoranthene
Benzo(mno)fluoranthene
$C_{18}H_{10}$
Molecular mass: 226.3

ICSC # 0527
CAS # 203-12-3
RTECS # DF6140000
March 25, 1998 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible.	NO open flames.	Water spray, powder.
EXPLOSION			
EXPOSURE		PREVENT DISPERSION OF DUST!	
•INHALATION		Local exhaust or breathing protection.	
•SKIN	MAY BE ABSORBED!	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap. Refer for medical attention. Wear protective gloves when administering first aid.
•EYES		Safety goggles, face shield, or eye protection in combination with breathing protection if powder.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION		Do not eat, drink, or smoke during work.	

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Sweep spilled substance into containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place. Do NOT let this chemical enter the environment.	Well closed.	R: S:

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0527

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

BENZO(g,h,i)FLUORANTHENE

ICSC: 0527

I

M

P

PHYSICAL STATE; APPEARANCE:
YELLOW CRYSTALS

PHYSICAL DANGERS:

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation of its aerosol and through the skin.

O R T A N T D A T A	**CHEMICAL DANGERS:** The substance decomposes on heating producing toxic fumes. **OCCUPATIONAL EXPOSURE LIMITS:** TLV not established.	**INHALATION RISK:** **EFFECTS OF SHORT-TERM EXPOSURE:** **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** See Notes.
PHYSICAL PROPERTIES	Melting point: 149°C Solubility in water: none Vapour pressure, Pa at 20°C: <10	Relative vapour density (air = 1): 7.8 Relative density of the vapour/air-mixture at 20°C (air = 1): 1.0 Octanol/water partition coefficient as log Pow: 7.23
ENVIRONMENTAL DATA	This substance may be hazardous to the environment; special attention should be given to the total environment. In the food chain important to humans, bioaccumulation takes place, specifically in oils and fats. 	

N O T E S

Insufficient data are available on the effect of this substance on human health, therefore utmost care must be taken. Also consult ICSC #0720 and 0721.

ADDITIONAL INFORMATION

ICSC: 0527 **BENZO(g,h,i)FLUORANTHENE**

International Chemical Safety Cards

BENZO(k)FLUORANTHENE

ICSC: 0721

Dibenzo(b,jk)fluorene
8,9-Benzofluoranthene
11,12-Benzofluoranthene
$C_{20}H_{12}$
Molecular mass: 252.3

ICSC # 0721
CAS # 207-08-9
RTECS # DF6350000
EC # 601-036-00-5
March 25, 1999 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE			In case of fire in the surroundings: use appropriate extinguishing media.
EXPLOSION			
EXPOSURE		AVOID ALL CONTACT!	
•INHALATION		Local exhaust or breathing protection.	Fresh air, rest.
•SKIN		Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES		Safety spectacles or eye protection in combination with breathing protection if powder.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION		Do not eat, drink, or smoke during work.	Rinse mouth. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Sweep spilled substance into covered containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place. Do NOT let this chemical enter the environment.	Provision to contain effluent from fire extinguishing. Well closed.	T symbol N symbol R: 45-50/53 S: 53-45-60-61

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0721

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

BENZO(k)FLUORANTHENE

ICSC: 0721

I **M**	**PHYSICAL STATE; APPEARANCE:** YELLOW CRYSTALS	**ROUTES OF EXPOSURE:** The substance can be absorbed into the body by inhalation of its aerosol and through the skin.

P O R T A N T D A T A	**PHYSICAL DANGERS:** **CHEMICAL DANGERS:** Upon heating, toxic fumes are formed. **OCCUPATIONAL EXPOSURE LIMITS:** TLV not established. MAK: Carcinogen category: 2; (DFG 2004). **INHALATION RISK:** Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly. **EFFECTS OF SHORT-TERM EXPOSURE:** **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** This substance is possibly carcinogenic to humans.
PHYSICAL PROPERTIES	Boiling point: 480°C Melting point: 217°C Solubility in water: none Octanol/water partition coefficient as log Pow: 6.84
ENVIRONMENTAL DATA	This substance may be hazardous to the environment; special attention should be given to air quality and water quality. Bioaccumulation of this chemical may occur in crustacea and in fish. 

N O T E S

Benzo(k)fluoranthene is present as a component of polycyclic aromatic hydrocarbons (PAH) content in the environment usually resulting from the incomplete combustion or pyrolysis of organic matters, especially fossil fuels and tobacco.ACGIH recommends environment containing benzo(k)fluoranthene should be evaluated in terms of the TLV-TWA for coal tar pitch volatile, as benzene soluble 0.2 mg/m^3. Insufficient data are available on the effect of this substance on human health, therefore utmost care must be taken.

ADDITIONAL INFORMATION

ICSC: 0721 **BENZO(k)FLUORANTHENE**

International Chemical Safety Cards

COAL-TAR PITCH

ICSC: 1415

Pitch

ICSC # 1415
CAS # 65996-93-2
RTECS # GF8655000
EC # 648-055-00-5
March 07, 2002 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible.	NO open flames.	Foam, dry powder, carbon dioxide.
EXPLOSION			
EXPOSURE		AVOID ALL CONTACT! PREVENT DISPERSION OF DUST!	
•INHALATION	Sneezing. Cough. See EFFECTS OF LONG-TERM OR REPEATED EXPOSURE.	Closed system and ventilation.	Fresh air, rest.
•SKIN	MAY BE ABSORBED! Redness. Burning sensation.	Protective gloves. Protective clothing.	Rinse and then wash skin with water and soap.
•EYES	Redness. Pain.	Safety goggles, or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION	See EFFECTS OF LONG-TERM OR REPEATED EXPOSURE.	Do not eat, drink, or smoke during work. Wash hands before eating.	Give plenty of water to drink. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Sweep spilled substance into sealable containers. Carefully collect remainder, then remove to safe place. Do NOT let this chemical enter the environment. (Extra personal protection: A/P2 filter respirator for organic vapour and harmful dust.)	Separated from strong oxidants. Separated from food and feedstuffs	Do not transport with food and feedstuffs. Note: H T symbol R: 45 S: 53-45

SEE IMPORTANT INFORMATION ON BACK

ICSC: 1415

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

COAL-TAR PITCH

ICSC: 1415

I

M

P

PHYSICAL STATE; APPEARANCE:
BLACK TO BROWN PASTE

PHYSICAL DANGERS:

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation and through the skin and by ingestion.

INHALATION RISK:
Evaporation at 20°C is negligible; a harmful concentration

O R T A N T D A T A	**CHEMICAL DANGERS:** The substance decomposes on heating above 400°C producing toxic fumes Reacts with strong oxidants **OCCUPATIONAL EXPOSURE LIMITS:** TLV: (as benzene soluble aerosol for coal tar pitch volatiles) 0.2 mg/m³ as TWA A1 (ACGIH 2001). OSHA PEL: TWA 0.2 mg/m^3 (benzene-soluble fraction) 1910.1002 See Appendix C NIOSH REL: Ca TWA 0.1 mg/m^3 (cyclohexane-extractable fraction) See Appendix A See Appendix C NIOSH IDLH: Ca 80 mg/m^3 See: 65996932 of airborne particles can, however, be reached quickly when dispersed and when heated. **EFFECTS OF SHORT-TERM EXPOSURE:** The substance is irritating to the eyes the skin and the respiratory tract **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** Repeated or prolonged contact with skin may cause dermatitis and hyperpigmentation of skin. This substance is carcinogenic to humans.
PHYSICAL PROPERTIES	Boiling point: >250°C Melting point: 30-180°C Density: >1 g/cm3 Solubility in water: at 20°C none Vapour pressure, kPa at 20°C: <0.01 Flash point: >200°C o.c. Auto-ignition temperature: >500°C Octanol/water partition coefficient as log Pow: 6.04
ENVIRONMENTAL DATA	This substance may be hazardous to the environment; special attention should be given to soil contamination and aquatic organisms. The substance may cause long-term effects in the aquatic environment. 

N O T E S

Depending on the degree of exposure, periodic medical examination is suggested.

NFPA Code: H0; F1; R0;

ADDITIONAL INFORMATION

ICSC: 1415 **COAL-TAR PITCH**

International Chemical Safety Cards

INDENO(1,2,3-cd)PYRENE

ICSC: 0730

o-Phenylenepyrene
2,3-Phenylenepyrene
$C_{22}H_{12}$
Molecular mass: 276.3

ICSC # 0730
CAS # 193-39-5
RTECS # NK9300000
March 25, 1999 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE			In case of fire in the surroundings: use appropriate extinguishing media.
EXPLOSION			
EXPOSURE		AVOID ALL CONTACT!	
•INHALATION		Local exhaust or breathing protection.	Fresh air, rest.
•SKIN		Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES		Safety spectacles or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION		Do not eat, drink, or smoke during work.	Rinse mouth. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Sweep spilled substance into covered containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place. Do NOT let this chemical enter the environment.	Provision to contain effluent from fire extinguishing. Well closed.	R: S:

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0730

International Chemical Safety Cards

INDENO(1,2,3-cd)PYRENE

ICSC: 0730

I **M** **P**	**PHYSICAL STATE; APPEARANCE:** YELLOW CRYSTALS **PHYSICAL DANGERS:**	**ROUTES OF EXPOSURE:** The substance can be absorbed into the body by inhalation of its aerosol and through the skin. **INHALATION RISK:**

IMPORTANT DATA	**PHYSICAL DANGERS:** **CHEMICAL DANGERS:** Upon heating, toxic fumes are formed. **OCCUPATIONAL EXPOSURE LIMITS:** TLV: A2 (suspected human carcinogen); (ACGIH 2004). MAK: Carcinogen category: 2; (DFG 2004). of its aerosol and through the skin. **INHALATION RISK:** Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly. **EFFECTS OF SHORT-TERM EXPOSURE:** **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** This substance is possibly carcinogenic to humans. May cause genetic damage in humans.
PHYSICAL PROPERTIES	Boiling point: 481°C Melting point: 168°C Solubility in water: none Octanol/water partition coefficient as log Pow: 6.12
ENVIRONMENTAL DATA	This substance may be hazardous to the environment; special attention should be given to air quality and water quality. 

N O T E S

Benzo(b)fluoranthene is present as a component of polycyclic aromatic hydrocarbons (PAH) content in the environment usually resulting from the incomplete combustion or pyrolysis of organic matters, especially fossil fuels and tobacco.ACGIH recommends environment containing benzo(b)fluoranthene should be evaluated in terms of the TLV-TWA for coal tar pitch volatile, as benzene soluble 0.2 mg/m^3. Insufficient data are available on the effect of this substance on human health, therefore utmost care must be taken.

ADDITIONAL INFORMATION

ICSC: 0720 **BENZO(b)FLUORANTHENE**

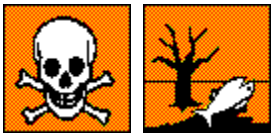
International Chemical Safety Cards

BENZO(b)FLUORANTHENE

ICSC: 0720

Benz(e)acephenanthrylene
2,3-Benzofluoroanthene
Benzo(e)fluoranthene
3,4-Benzofluoranthene
$C_{20}H_{12}$
Molecular mass: 252.3

ICSC # 0720
CAS # 205-99-2
RTECS # CU1400000
EC # 601-034-00-4
March 25, 1999 Peer reviewed



TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE			In case of fire in the surroundings: use appropriate extinguishing media.
EXPLOSION			
EXPOSURE		AVOID ALL CONTACT!	
•INHALATION		Local exhaust or breathing protection.	Fresh air, rest.
•SKIN		Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES		Safety spectacles or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION		Do not eat, drink, or smoke during work.	Rinse mouth. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Sweep spilled substance into covered containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place. Do NOT let this chemical enter the environment.	Provision to contain effluent from fire extinguishing. Well closed.	T symbol N symbol R: 45-50/53 S: 53-45-60-61

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0720

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

BENZO(b)FLUORANTHENE

ICSC: 0720

I	**PHYSICAL STATE; APPEARANCE:** COLOURLESS CRYSTALS	**ROUTES OF EXPOSURE:** The substance can be absorbed into the body by inhalation

IMPORTANT DATA	**PHYSICAL DANGERS:** **CHEMICAL DANGERS:** Upon heating, toxic fumes are formed. **OCCUPATIONAL EXPOSURE LIMITS:** TLV: A2 (suspected human carcinogen); (ACGIH 2004). MAK: Carcinogen category: 2; (DFG 2004). of its aerosol and through the skin. **INHALATION RISK:** Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly. **EFFECTS OF SHORT-TERM EXPOSURE:** **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** This substance is possibly carcinogenic to humans. May cause genetic damage in humans.
PHYSICAL PROPERTIES	Boiling point: 481°C Melting point: 168°C Solubility in water: none Octanol/water partition coefficient as log Pow: 6.12
ENVIRONMENTAL DATA	This substance may be hazardous to the environment; special attention should be given to air quality and water quality. 

N O T E S

Benzo(b)fluoranthene is present as a component of polycyclic aromatic hydrocarbons (PAH) content in the environment usually resulting from the incomplete combustion or pyrolysis of organic matters, especially fossil fuels and tobacco.ACGIH recommends environment containing benzo(b)fluoranthene should be evaluated in terms of the TLV-TWA for coal tar pitch volatile, as benzene soluble 0.2 mg/m^3. Insufficient data are available on the effect of this substance on human health, therefore utmost care must be taken.

ADDITIONAL INFORMATION

ICSC: 0720 **BENZO(b)FLUORANTHENE**

International Chemical Safety Cards

CHRYSENE

ICSC: 1672

Benzoaphenanthrene
1,2-Benzophenanthrene
1,2,5,6-Dibenzonaphthalene
$C_{18}H_{12}$
Molecular mass: 228.3

ICSC # 1672
CAS # 218-01-9
RTECS # GC0700000
UN # 3077
EC # 601-048-00-0
October 12, 2006 Validated

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible.	NO open flames.	Water spray. Dry powder. Foam. Carbon dioxide.
EXPLOSION	Finely dispersed particles form explosive mixtures in air.	Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	
EXPOSURE	See EFFECTS OF LONG-TERM OR REPEATED EXPOSURE.	AVOID ALL CONTACT!	
•INHALATION		Local exhaust or breathing protection.	Fresh air, rest.
•SKIN		Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES		Safety goggles	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION		Do not eat, drink, or smoke during work.	Rinse mouth.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Personal protection: P3 filter respirator for toxic particles. Do NOT let this chemical enter the environment. Sweep spilled substance into sealable containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place.	Separated from strong oxidants, Provision to contain effluent from fire extinguishing. Store in an area without drain or sewer access.	T symbol N symbol R: 45-68-50/53 S: 53-45-60-61 UN Hazard Class: 9 UN Packing Group: III Signal: Warning Aqua-Cancer Suspected of causing cancer Very toxic to aquatic life with long lasting effects Very toxic to aquatic life

SEE IMPORTANT INFORMATION ON BACK

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European

International Chemical Safety Cards

CHRYSENE

ICSC: 1672

IMPORTANT DATA

PHYSICAL STATE; APPEARANCE:
COLOURLESS TO BEIGE CRYSTALS OR POWDER

PHYSICAL DANGERS:
Dust explosion possible if in powder or granular form, mixed with air.

CHEMICAL DANGERS:
The substance decomposes on burning producing toxic fumes Reacts violently with strong oxidants

OCCUPATIONAL EXPOSURE LIMITS:
TLV: A3 (confirmed animal carcinogen with unknown relevance to humans); (ACGIH 2006).
MAK not established.

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation of its aerosol, through the skin and by ingestion.

INHALATION RISK:
A harmful concentration of airborne particles can be reached quickly when dispersed

EFFECTS OF SHORT-TERM EXPOSURE:

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
This substance is possibly carcinogenic to humans.

PHYSICAL PROPERTIES

Boiling point: 448°C
Melting point: 254 - 256°C
Density: 1.3 g/cm³

Solubility in water:
very poor
Octanol/water partition coefficient as log Pow: 5.9

ENVIRONMENTAL DATA

The substance is very toxic to aquatic organisms. Bioaccumulation of this chemical may occur in seafood. It is strongly advised that this substance does not enter the environment.

NOTES

Depending on the degree of exposure, periodic medical examination is suggested. Do NOT take working clothes home. This substance does not usually occur as a pure substance but as a component of polyaromatic hydrocarbon (PAH) mixtures. Human population studies have associated PAH's exposure with cancer and cardiovascular diseases.

Transport Emergency Card: TEC (R)-90GM7-III

ADDITIONAL INFORMATION

International Chemical Safety Cards

COAL-TAR PITCH

ICSC: 1415

Pitch

ICSC # 1415
CAS # 65996-93-2
RTECS # GF8655000
EC # 648-055-00-5
March 07, 2002 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible.	NO open flames.	Foam, dry powder, carbon dioxide.
EXPLOSION			
EXPOSURE		AVOID ALL CONTACT! PREVENT DISPERSION OF DUST!	
•INHALATION	Sneezing. Cough. See EFFECTS OF LONG-TERM OR REPEATED EXPOSURE.	Closed system and ventilation.	Fresh air, rest.
•SKIN	MAY BE ABSORBED! Redness. Burning sensation.	Protective gloves. Protective clothing.	Rinse and then wash skin with water and soap.
•EYES	Redness. Pain.	Safety goggles, or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION	See EFFECTS OF LONG-TERM OR REPEATED EXPOSURE.	Do not eat, drink, or smoke during work. Wash hands before eating.	Give plenty of water to drink. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Sweep spilled substance into sealable containers. Carefully collect remainder, then remove to safe place. Do NOT let this chemical enter the environment. (Extra personal protection: A/P2 filter respirator for organic vapour and harmful dust.)	Separated from strong oxidants. Separated from food and feedstuffs	Do not transport with food and feedstuffs. Note: H T symbol R: 45 S: 53-45

SEE IMPORTANT INFORMATION ON BACK

ICSC: 1415

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

COAL-TAR PITCH

ICSC: 1415

I

M

P

PHYSICAL STATE; APPEARANCE:
BLACK TO BROWN PASTE

PHYSICAL DANGERS:

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation and through the skin and by ingestion.

INHALATION RISK:
Evaporation at 20°C is negligible; a harmful concentration

O R T A N T D A T A	**CHEMICAL DANGERS:** The substance decomposes on heating above 400°C producing toxic fumes Reacts with strong oxidants **OCCUPATIONAL EXPOSURE LIMITS:** TLV: (as benzene soluble aerosol for coal tar pitch volatiles) 0.2 mg/m³ as TWA A1 (ACGIH 2001). OSHA PEL: TWA 0.2 mg/m^3 (benzene-soluble fraction) 1910.1002 See Appendix C NIOSH REL: Ca TWA 0.1 mg/m^3 (cyclohexane-extractable fraction) See Appendix A See Appendix C NIOSH IDLH: Ca 80 mg/m^3 See: 65996932 of airborne particles can, however, be reached quickly when dispersed and when heated. **EFFECTS OF SHORT-TERM EXPOSURE:** The substance is irritating to the eyes the skin and the respiratory tract **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** Repeated or prolonged contact with skin may cause dermatitis and hyperpigmentation of skin. This substance is carcinogenic to humans.
PHYSICAL PROPERTIES	Boiling point: >250°C Melting point: 30-180°C Density: >1 g/cm3 Solubility in water: at 20°C none Vapour pressure, kPa at 20°C: <0.01 Flash point: >200°C o.c. Auto-ignition temperature: >500°C Octanol/water partition coefficient as log Pow: 6.04
ENVIRONMENTAL DATA	This substance may be hazardous to the environment; special attention should be given to soil contamination and aquatic organisms. The substance may cause long-term effects in the aquatic environment. 

N O T E S

Depending on the degree of exposure, periodic medical examination is suggested.

NFPA Code: H0; F1; R0;

ADDITIONAL INFORMATION

ICSC: 1415 **COAL-TAR PITCH**

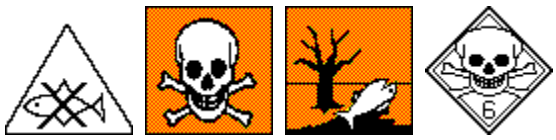
International Chemical Safety Cards

ARSENIC

ICSC: 0013

Grey arsenic
As
Atomic mass: 74.9

ICSC # 0013
CAS # 7440-38-2
RTECS # CG0525000
UN # 1558
EC # 033-001-00-X
October 18, 1999 Peer reviewed



TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible. Gives off irritating or toxic fumes (or gases) in a fire.	NO open flames. NO contact with strong oxidizers. NO contact with hot surfaces.	Powder, water spray, foam, carbon dioxide.
EXPLOSION	Risk of fire and explosion is slight when exposed to hot surfaces or flames in the form of fine powder or dust.	Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	
EXPOSURE		PREVENT DISPERSION OF DUST! AVOID ALL CONTACT! AVOID EXPOSURE OF (PREGNANT) WOMEN!	IN ALL CASES CONSULT A DOCTOR!
•INHALATION	Cough. Sore throat. Shortness of breath. Weakness. See Ingestion.	Closed system and ventilation.	Fresh air, rest. Artificial respiration may be needed. Refer for medical attention.
•SKIN	Redness.	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse skin with plenty of water or shower.
•EYES	Redness.	Face shield or eye protection in combination with breathing protection if powder.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION	Abdominal pain. Diarrhoea. Nausea. Vomiting. Burning sensation in the throat and chest. Shock or collapse. Unconsciousness.	Do not eat, drink, or smoke during work. Wash hands before eating.	Rinse mouth. Induce vomiting (ONLY IN CONSCIOUS PERSONS!). Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Evacuate danger area! Sweep spilled substance into sealable containers. Carefully collect remainder, then remove to safe place. Chemical protection suit including self-contained breathing apparatus. Do NOT let this chemical enter the environment.	Separated from strong oxidants, acids, halogens, food and feedstuffs. Well closed.	Do not transport with food and feedstuffs. Marine pollutant. T symbol N symbol R: 23/25-50/53 S: 1/2-20/21-28-45-60-61 UN Hazard Class: 6.1 UN Packing Group: II

SEE IMPORTANT INFORMATION ON BACK

International Chemical Safety Cards

ARSENIC

ICSC: 0013

I M P O R T A N T D A T A

PHYSICAL STATE; APPEARANCE:
ODOURLESS, BRITTLE, GREY, METALLIC-LOOKING CRYSTALS.

PHYSICAL DANGERS:

CHEMICAL DANGERS:
Upon heating, toxic fumes are formed. Reacts violently with strong oxidants and halogens, causing fire and explosion hazard. Reacts with acids to produce

OCCUPATIONAL EXPOSURE LIMITS:
TLV: 0.01 mg/m³ as TWA A1 (confirmed human carcinogen); BEI issued (ACGIH 2004).
MAK:
Carcinogen category: 1; Germ cell mutagen group: 3A; (DFG 2004).
OSHA PEL: 1910.1018 TWA 0.010 mg/m^3
NIOSH REL: Ca C 0.002 mg/m^3 15-minute See Appendix A
NIOSH IDLH: Ca 5 mg/m^3 (as As) See: 7440382

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation of its aerosol and by ingestion.

INHALATION RISK:
Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly, when dispersed.

EFFECTS OF SHORT-TERM EXPOSURE:
The substance is irritating to the eyes the skin and the respiratory tract. The substance may cause effects on the gastrointestinal tract cardiovascular system central nervous system kidneys , resulting in severe gastroenteritis, loss of fluid, and electrolytes, cardiac disorders shock convulsions and kidney impairment Exposure above the OEL may result in death. The effects may be delayed. Medical observation is indicated.

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
Repeated or prolonged contact with skin may cause dermatitis. The substance may have effects on the mucous membranes, skin, peripheral nervous system liver bone marrow , resulting in pigmentation disorders, hyperkeratosis, perforation of nasal septum, neuropathy, liver impairment anaemia This substance is carcinogenic to humans. Animal tests show that this substance possibly causes toxicity to human reproduction or development.

PHYSICAL PROPERTIES

Sublimation point: 613°C
Density: 5.7 g/cm^3

Solubility in water:
none

ENVIRONMENTAL DATA

The substance is toxic to aquatic organisms. It is strongly advised that this substance does not enter the environment.

N O T E S

The substance is combustible but no flash point is available in literature. Depending on the degree of exposure, periodic medical examination is suggested. Do NOT take working clothes home. Refer also to cards for specific arsenic compounds, e.g., Arsenic pentoxide (ICSC 0377), Arsenic trichloride (ICSC 0221), Arsenic trioxide (ICSC 0378), Arsine (ICSC 0222).

Transport Emergency Card: TEC (R)-61GT5-II

ADDITIONAL INFORMATION

IMPORTANT LEGAL NOTICE:

International Chemical Safety Cards

BARIUM SULFATE

ICSC: 0827

Barium sulphate
Blanc fixe
Artificial barite
$BaSO_4$
Molecular mass: 233.43

ICSC # 0827
CAS # 7727-43-7
RTECS # CR0600000
October 20, 1999 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Not combustible. Gives off irritating or toxic fumes (or gases) in a fire.		In case of fire in the surroundings: use appropriate extinguishing media.
EXPLOSION			
EXPOSURE		PREVENT DISPERSION OF DUST!	
•INHALATION		Local exhaust or breathing protection.	Fresh air, rest.
•SKIN		Protective gloves.	Remove contaminated clothes. Rinse skin with plenty of water or shower.
•EYES		Safety spectacles.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION		Do not eat, drink, or smoke during work.	Rinse mouth.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Sweep spilled substance into containers; if appropriate, moisten first to prevent dusting. Personal protection: P1 filter respirator for inert particles.		R: S:

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0827

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

BARIUM SULFATE

ICSC: 0827

IMPORTANT DATA	**PHYSICAL STATE; APPEARANCE:** ODOURLESS TASTELESS, WHITE OR YELLOWISH CRYSTALS OR POWDER. **PHYSICAL DANGERS:** **CHEMICAL DANGERS:** Reacts violently with aluminium powder. **OCCUPATIONAL EXPOSURE LIMITS:** TLV: 10 mg/m³ as TWA; (ACGIH 2004). MAK: (Inhalable fraction) 4 mg/m³; (Respirable fraction) 1.5 mg/m³; (DFG 2004). OSHA PEL†: TWA 15 mg/m^3 (total) TWA 5 mg/m^3 (resp) NIOSH REL: TWA 10 mg/m^3 (total) TWA 5 mg/m^3 (resp) NIOSH IDLH: N.D. See: IDLH INDEX **ROUTES OF EXPOSURE:** The substance can be absorbed into the body by inhalation of its aerosol. **INHALATION RISK:** Evaporation at 20°C is negligible; a nuisance-causing concentration of airborne particles can, however, be reached quickly. **EFFECTS OF SHORT-TERM EXPOSURE:** **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** Lungs may be affected by repeated or prolonged exposure to dust particles , resulting in baritosis (a form of benign pneumoconiosis).
PHYSICAL PROPERTIES	Melting point (decomposes): 1600°C Density: 4.5 g/cm³ Solubility in water: none
ENVIRONMENTAL DATA	

NOTES

Occurs in nature as the mineral barite; also as barytes, heavy spar. Card has been partly updated in October 2005. See section Occupational Exposure Limits.

ADDITIONAL INFORMATION

International Chemical Safety Cards

COPPER

ICSC: 0240

Cu
(powder)

ICSC # 0240
CAS # 7440-50-8
RTECS # GL5325000
September 24, 1993 Validated

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible.	NO open flames.	Special powder, dry sand, NO other agents.
EXPLOSION			
EXPOSURE		PREVENT DISPERSION OF DUST!	
•INHALATION	Cough. Headache. Shortness of breath. Sore throat.	Local exhaust or breathing protection.	Fresh air, rest. Refer for medical attention.
•SKIN	Redness.	Protective gloves.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES	Redness. Pain.	Safety goggles.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION	Abdominal pain. Nausea. Vomiting.	Do not eat, drink, or smoke during work.	Rinse mouth. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Sweep spilled substance into containers. Carefully collect remainder. Then remove to safe place. (Extra personal protection: P2 filter respirator for harmful particles).	Separated from - See Chemical Dangers.	R: S:

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0240

International Chemical Safety Cards

COPPER

ICSC: 0240

I

M

P

PHYSICAL STATE; APPEARANCE:
RED POWDER, TURNS GREEN ON EXPOSURE TO MOIST AIR.

PHYSICAL DANGERS:

CHEMICAL DANGERS:

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation and by ingestion.

INHALATION RISK:
Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly when dispersed.

O **R** **T** **A** **N** **T** **D** **A** **T** **A**	Shock-sensitive compounds are formed with acetylenic compounds, ethylene oxides and azides. Reacts with strong oxidants like chlorates, bromates and iodates, causing explosion hazard. **OCCUPATIONAL EXPOSURE LIMITS:** TLV: 0.2 mg/m³ fume (ACGIH 1992-1993). TLV (as Cu, dusts & mists): 1 mg/m³ (ACGIH 1992-1993). Intended change 0.1 mg/m³ Inhal., A4 (not classifiable as a human carcinogen); MAK: 0.1 mg/m³ (Inhalable fraction) Peak limitation category: II(2) Pregnancy risk group: D (DFG 2005). OSHA PEL*: TWA 1 mg/m^3 *Note: The PEL also applies to other copper compounds (as Cu) except copper fume. NIOSH REL*: TWA 1 mg/m^3 *Note: The REL also applies to other copper compounds (as Cu) except Copper fume. NIOSH IDLH: 100 mg/m^3 (as Cu) See: 7440508	**EFFECTS OF SHORT-TERM EXPOSURE:** Inhalation of fumes may cause metal fume fever. See Notes. **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** Repeated or prolonged contact may cause skin sensitization.
PHYSICAL PROPERTIES	Boiling point: 2595°C Melting point: 1083°C Relative density (water = 1): 8.9	Solubility in water: none
ENVIRONMENTAL DATA		

N O T E S

The symptoms of metal fume fever do not become manifest until several hours.

ADDITIONAL INFORMATION

ICSC: 0240 **COPPER**

IMPORTANT LEGAL NOTICE:	Neither NIOSH, the CEC or the IPCS nor any person acting on behalf of NIOSH, the CEC or the IPCS is responsible for the use which might be made of this information. This card contains the collective views of the IPCS Peer Review Committee and may not reflect in all cases all the detailed requirements included in national legislation on the subject. The user should verify compliance of the cards with the relevant legislation in the country of use. The only modifications made to produce the U.S. version is inclusion of the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

CHROMIUM

ICSC: 0029

Chrome
Cr
Atomic mass: 52.0
(powder)

ICSC # 0029
CAS # 7440-47-3
RTECS # GB4200000
October 27, 2004 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible under specific conditions.	No open flames if in powder form.	In case of fire in the surroundings: use appropriate extinguishing media.
EXPLOSION		Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	
EXPOSURE		PREVENT DISPERSION OF DUST!	
•INHALATION	Cough.	Local exhaust or breathing protection.	Fresh air, rest.
•SKIN		Protective gloves.	Remove contaminated clothes. Rinse skin with plenty of water or shower.
•EYES	Redness.	Safety goggles.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION		Do not eat, drink, or smoke during work.	Rinse mouth.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Sweep spilled substance into containers; if appropriate, moisten first to prevent dusting. Personal protection: P2 filter respirator for harmful particles.		R: S:

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0029

International Chemical Safety Cards

CHROMIUM

ICSC: 0029

I

M

P

PHYSICAL STATE; APPEARANCE:
GREY POWDER

PHYSICAL DANGERS:
Dust explosion possible if in powder or granular form, mixed with air.

ROUTES OF EXPOSURE:

INHALATION RISK:
A harmful concentration of airborne particles can be reached quickly when dispersed.

O R T A N T D A T A	**CHEMICAL DANGERS:** Chromium is a catalytic substance and may cause reaction in contact with many organic and inorganic substances , causing fire and explosion hazard. **OCCUPATIONAL EXPOSURE LIMITS:** TLV: (as Cr metal, Cr(III) compounds) 0.5 mg/m³ as TWA A4 (ACGIH 2004). MAK not established. OSHA PEL*: TWA 1 mg/m^3 See Appendix C *Note: The PEL also applies to insoluble chromium salts. NIOSH REL: TWA 0.5 mg/m^3 See Appendix C NIOSH IDLH: 250 mg/m^3 (as Cr) See: 7440473 **EFFECTS OF SHORT-TERM EXPOSURE:** May cause mechanical irritation tothe eyesandthe respiratory tract. **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:**
PHYSICAL PROPERTIES	Boiling point: 2642°C Melting point: 1900°C Density: 7.15 g/cm³ Solubility in water: none
ENVIRONMENTAL DATA	

N O T E S

The surface of the chromium particles is oxidized to chromium(III)oxide in air. See ICSC 1531 Chromium(III) oxide.

ADDITIONAL INFORMATION

ICSC: 0029 **CHROMIUM**

IMPORTANT LEGAL NOTICE:	Neither NIOSH, the CEC or the IPCS nor any person acting on behalf of NIOSH, the CEC or the IPCS is responsible for the use which might be made of this information. This card contains the collective views of the IPCS Peer Review Committee and may not reflect in all cases all the detailed requirements included in national legislation on the subject. The user should verify compliance of the cards with the relevant legislation in the country of use. The only modifications made to produce the U.S. version is inclusion of the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

LEAD

ICSC: 0052

Lead metal
Plumbum
Pb
Atomic mass: 207.2
(powder)

ICSC # 0052
CAS # 7439-92-1
RTECS # OF7525000
October 08, 2002 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Not combustible. Gives off irritating or toxic fumes (or gases) in a fire.		In case of fire in the surroundings: use appropriate extinguishing media.
EXPLOSION	Finely dispersed particles form explosive mixtures in air.	Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	
EXPOSURE	See EFFECTS OF LONG-TERM OR REPEATED EXPOSURE.	PREVENT DISPERSION OF DUST! AVOID EXPOSURE OF (PREGNANT) WOMEN!	
•INHALATION		Local exhaust or breathing protection.	Fresh air, rest.
•SKIN		Protective gloves.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES		Safety spectacles.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION	Abdominal pain. Nausea. Vomiting.	Do not eat, drink, or smoke during work. Wash hands before eating.	Rinse mouth. Give plenty of water to drink. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Sweep spilled substance into containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place. Do NOT let this chemical enter the environment. Personal protection: P3 filter respirator for toxic particles.	Separated from food and feedstuffs incompatible materials See Chemical Dangers.	R: S:

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0052

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

LEAD

ICSC: 0052

I M P O R T A N T D A T A

PHYSICAL STATE; APPEARANCE:
BLUISH-WHITE OR SILVERY-GREY SOLID IN VARIOUS FORMS. TURNS TARNISHED ON EXPOSURE TO AIR.

PHYSICAL DANGERS:
Dust explosion possible if in powder or granular form, mixed with air.

CHEMICAL DANGERS:
On heating, toxic fumes are formed. Reacts with oxidants. Reacts with hot concentrated nitric acid, boiling concentrated hydrochloric acid and sulfuric acid. Attacked by pure water and by weak organic acids in the presence of oxygen.

OCCUPATIONAL EXPOSURE LIMITS:
TLV: 0.05 mg/m³ A3 (confirmed animal carcinogen with unknown relevance to humans); BEI issued (ACGIH 2004).
MAK:
Carcinogen category: 3B; Germ cell mutagen group: 3A; (DFG 2004).
EU OEL: as TWA 0.15 mg/m³ (EU 2002).
OSHA PEL*: 1910.1025 TWA 0.050 mg/m^3 See Appendix C *Note: The PEL also applies to other lead compounds (as Pb) -- see Appendix C.
NIOSH REL*: TWA 0.050 mg/m^3 See Appendix C
*Note: The REL also applies to other lead compounds (as Pb) -- see Appendix C.
NIOSH IDLH: 100 mg/m^3 (as Pb) See: 7439921

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation and by ingestion.

INHALATION RISK:
A harmful concentration of airborne particles can be reached quickly when dispersed, especially if powdered.

EFFECTS OF SHORT-TERM EXPOSURE:

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
The substance may have effects on the blood bone marrow central nervous system peripheral nervous system kidneys , resulting in anaemia, encephalopathy (e.g., convulsions), peripheral nerve disease, abdominal cramps and kidney impairment. Causes toxicity to human reproduction or development.

PHYSICAL PROPERTIES		
	Boiling point: 1740°C	Density: 11.34 g/cm3
	Melting point: 327.5°C	Solubility in water: none

ENVIRONMENTAL DATA	
	Bioaccumulation of this chemical may occur in plants and in mammals. It is strongly advised that this substance does not enter the environment. 

N O T E S

Depending on the degree of exposure, periodic medical examination is suggested. Do NOT take working clothes home.

Transport Emergency Card: TEC (R)-51S1872

ADDITIONAL INFORMATION

ICSC: 0052 **LEAD**

International Chemical Safety Cards

MERCURY

ICSC: 0056

Quicksilver
Liquid silver
Hg
Atomic mass: 200.6

ICSC # 0056
CAS # 7439-97-6
RTECS # OV4550000
UN # 2809
EC # 080-001-00-0
April 22, 2004 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Not combustible. Gives off irritating or toxic fumes (or gases) in a fire.		In case of fire in the surroundings: use appropriate extinguishing media.
EXPLOSION	Risk of fire and explosion.		In case of fire: keep drums, etc., cool by spraying with water.
EXPOSURE		STRICT HYGIENE! AVOID EXPOSURE OF (PREGNANT) WOMEN! AVOID EXPOSURE OF ADOLESCENTS AND CHILDREN!	IN ALL CASES CONSULT A DOCTOR!
•INHALATION	Abdominal pain. Cough. Diarrhoea. Shortness of breath. Vomiting. Fever or elevated body temperature.	Local exhaust or breathing protection.	Fresh air, rest. Artificial respiration if indicated. Refer for medical attention.
•SKIN	MAY BE ABSORBED! Redness.	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap. Refer for medical attention.
•EYES		Face shield, or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION		Do not eat, drink, or smoke during work. Wash hands before eating.	Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Evacuate danger area in case of a large spill! Consult an expert! Ventilation. Collect leaking and spilled liquid in sealable non-metallic containers as far as possible. Do NOT wash away into sewer. Do NOT let this chemical enter the environment. Chemical protection suit including self-contained breathing apparatus.	Provision to contain effluent from fire extinguishing. Separated from food and feedstuffs Well closed.	Special material. Do not transport with food and feedstuffs. T symbol N symbol R: 23-33-50/53 S: 1/2-7-45-60-61 UN Hazard Class: 8 UN Packing Group: III

SEE IMPORTANT INFORMATION ON BACK

International Chemical Safety Cards

MERCURY

ICSC: 0056

IMPORTANT DATA

PHYSICAL STATE; APPEARANCE:
ODOURLESS, HEAVY AND MOBILE SILVERY LIQUID METAL.

PHYSICAL DANGERS:

CHEMICAL DANGERS:
Upon heating, toxic fumes are formed. Reacts violently with ammonia and halogens causing fire and explosion hazard. Attacks aluminium and many other metals forming amalgams.

OCCUPATIONAL EXPOSURE LIMITS:
TLV: 0.025 mg/m³ as TWA (skin) A4 BEI issued (ACGIH 2004).
MAK: 0.1 mg/m³ Sh
Peak limitation category: II(8) Carcinogen category: 3B (DFG 2003).
OSHA PEL†: C 0.1 mg/m^3
NIOSH REL: Hg Vapor: TWA 0.05 mg/m^3 skin
Other: C 0.1 mg/m^3 skin
NIOSH IDLH: 10 mg/m^3 (as Hg) See: 7439976

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation of its vapour and through the skin , also as a vapour!

INHALATION RISK:
A harmful contamination of the air can be reached very quickly on evaporation of this substance at 20°C.

EFFECTS OF SHORT-TERM EXPOSURE:
The substance is irritating to the skin. Inhalation of the vapours may cause pneumonitis. The substance may cause effects on the central nervous systemandkidneys. The effects may be delayed. Medical observation is indicated.

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
The substance may have effects on the central nervous system kidneys , resulting in irritability, emotional instability, tremor, mental and memory disturbances, speech disorders. Danger of cumulative effects. Animal tests show that this substance possibly causes toxic effects upon human reproduction.

PHYSICAL PROPERTIES

Boiling point: 357°C
Melting point: -39°C
Relative density (water = 1): 13.5
Solubility in water:
none

Vapour pressure, Pa at 20°C: 0.26
Relative vapour density (air = 1): 6.93
Relative density of the vapour/air-mixture at 20°C (air = 1): 1.009

ENVIRONMENTAL DATA

The substance is very toxic to aquatic organisms. In the food chain important to humans, bioaccumulation takes place, specifically in fish.

N O T E S

Depending on the degree of exposure, periodic medical examination is indicated. No odour warning if toxic concentrations are present. Do NOT take working clothes home.

Transport Emergency Card: TEC (R)-80GC9-II+III

ADDITIONAL INFORMATION

ICSC: 0056 **MERCURY**

International Chemical Safety Cards

NICKEL

ICSC: 0062

Ni
Atomic mass: 58.7
(powder)

ICSC # 0062
CAS # 7440-02-0
RTECS # QR5950000
EC # 028-002-00-7
October 17, 2001 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Flammable as dust. Toxic fumes may be released in a fire.		Dry sand. NO carbon dioxide. NO water.
EXPLOSION	Finely dispersed particles form explosive mixtures in air.	Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	
EXPOSURE		PREVENT DISPERSION OF DUST! AVOID ALL CONTACT!	
•**INHALATION**	Cough. Shortness of breath.	Local exhaust or breathing protection.	Fresh air, rest.
•**SKIN**		Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•**EYES**		Safety spectacles, or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•**INGESTION**		Do not eat, drink, or smoke during work.	Rinse mouth.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Vacuum spilled material. Carefully collect remainder, then remove to safe place. Personal protection: P2 filter respirator for harmful particles.	Separated from strong acids.	Xn symbol R: 40-43 S: 2-22-36

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0062

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

NICKEL

ICSC: 0062

I	**PHYSICAL STATE; APPEARANCE:** SILVERY METALLIC SOLID IN VARIOUS FORMS. **PHYSICAL DANGERS:**
	ROUTES OF EXPOSURE: The substance can be absorbed into the body by inhalation of the dust.

IMPORTANT DATA	Dust explosion possible if in powder or granular form, mixed with air. **CHEMICAL DANGERS:** Reacts violently, in powder form, with titanium powder and potassium perchlorate, and oxidants such as ammonium nitrate, causing fire and explosion hazard. Reacts slowly with non-oxidizing acids and more rapidly with oxidizing acids. Toxic gases and vapours (such as nickel carbonyl) may be released in a fire involving nickel. **OCCUPATIONAL EXPOSURE LIMITS:** TLV: (Inhalable fraction) 1.5 mg/m³ as TWA A5 (not suspected as a human carcinogen); (ACGIH 2004). MAK: (Inhalable fraction) sensitization of respiratory tract and skin (Sah); Carcinogen category: 1; (DFG 2004). OSHA PEL*†: TWA 1 mg/m^3 *Note: The PEL does not apply to Nickel carbonyl. NIOSH REL*: Ca TWA 0.015 mg/m^3 See Appendix A *Note: The REL does not apply to Nickel carbonyl. NIOSH IDLH: Ca 10 mg/m^3 (as Ni) See: 7440020	**INHALATION RISK:** Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly when dispersed. **EFFECTS OF SHORT-TERM EXPOSURE:** May cause mechanical irritation. Inhalation of fumes may cause pneumonitis. **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** Repeated or prolonged contact may cause skin sensitization. Repeated or prolonged inhalation exposure may cause asthma. Lungs may be affected by repeated or prolonged exposure. This substance is possibly carcinogenic to humans.
PHYSICAL PROPERTIES	Boiling point: 2730°C Melting point: 1455°C Density: 8.9 g/cm3	Solubility in water: none
ENVIRONMENTAL DATA		

N O T E S

At high temperatures, nickel oxide fumes will be formed. Depending on the degree of exposure, periodic medical examination is suggested. The symptoms of asthma often do not become manifest until a few hours have passed and they are aggravated by physical effort. Rest and medical observation are therefore essential. Anyone who has shown symptoms of asthma due to this substance should avoid all further contact with this substance.

ADDITIONAL INFORMATION

ICSC: 0062 **NICKEL**

International Chemical Safety Cards

ZINC POWDER

ICSC: 1205

Blue powder
Merrillite
Zn
Atomic mass: 65.4
(powder)

ICSC # 1205
CAS # 7440-66-6
RTECS # ZG8600000
UN # 1436 (zinc powder or dust)
EC # 030-001-00-1
October 24, 1994 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Highly flammable. Many reactions may cause fire or explosion. Gives off irritating or toxic fumes (or gases) in a fire.	NO open flames, NO sparks, and NO smoking. NO contact with acid(s), base (s) and incompatible substances (see Chemical Dangers).	Special powder, dry sand, NO other agents. NO water.
EXPLOSION	Risk of fire and explosion on contact with acid(s), base(s), water and incompatible substances.	Closed system, ventilation, explosion-proof electrical equipment and lighting. Prevent build-up of electrostatic charges (e.g., by grounding). Prevent deposition of dust.	In case of fire: cool drums, etc., by spraying with water but avoid contact of the substance with water.
EXPOSURE		PREVENT DISPERSION OF DUST! STRICT HYGIENE!	
•**INHALATION**	Metallic taste and metal fume fever. Symptoms may be delayed (see Notes).	Local exhaust.	Fresh air, rest. Refer for medical attention.
•**SKIN**	Dry skin.	Protective gloves.	Rinse and then wash skin with water and soap.
•**EYES**		Safety spectacles.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•**INGESTION**	Abdominal pain. Nausea. Vomiting.	Do not eat, drink, or smoke during work. Wash hands before eating.	Rinse mouth. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Extinguish or remove all ignition sources. Do NOT wash away into sewer. Sweep spilled substance into containers. then remove to safe place. Personal protection: self-contained breathing apparatus.	Fireproof. Separated from acids, bases oxidants Dry.	Airtight. F symbol N symbol R: 15-17-50/53 S: 2-7/8-43-46-60-61 UN Hazard Class: 4.3 UN Subsidiary Risks: 4.2

SEE IMPORTANT INFORMATION ON BACK

International Chemical Safety Cards

ZINC POWDER

ICSC: 1205

I M P O R T A N T D A T A

PHYSICAL STATE; APPEARANCE:
ODOURLESS GREY TO BLUE POWDER.

PHYSICAL DANGERS:
Dust explosion possible if in powder or granular form, mixed with air. If dry, it can be charged electrostatically by swirling, pneumatic transport, pouring, etc.

CHEMICAL DANGERS:
Upon heating, toxic fumes are formed. The substance is a strong reducing agent and reacts violently with oxidants. Reacts with water and reacts violently with acids and bases forming flammable/explosive gas (hydrogen - see ICSC0001) Reacts violently with sulfur, halogenated hydrocarbons and many other substances causing fire and explosion hazard.

OCCUPATIONAL EXPOSURE LIMITS:
TLV not established.

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation and by ingestion.

INHALATION RISK:
Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly when dispersed.

EFFECTS OF SHORT-TERM EXPOSURE:
Inhalation of fumes may cause metal fume fever. The effects may be delayed.

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
Repeated or prolonged contact with skin may cause dermatitis.

PHYSICAL PROPERTIES

Boiling point: 907°C
Melting point: 419°C
Relative density (water = 1): 7.14
Solubility in water: reaction
Vapour pressure, kPa at 487°C: 0.1
Auto-ignition temperature: 460°C

ENVIRONMENTAL DATA

N O T E S

Zinc may contain trace amounts of arsenic, when forming hydrogen, may also form toxic gas arsine (see ICSC 0001 and ICSC 0222). Reacts violently with fire extinguishing agents such as water, halons, foam and carbon dioxide. The symptoms of metal fume fever do not become manifest until several hours later. Rinse contaminated clothes (fire hazard) with plenty of water.

Transport Emergency Card: TEC (R)-43GWS-II+III
NFPA Code: H0; F1; R1;

ADDITIONAL INFORMATION

ICSC: 1205 **ZINC POWDER**

IMPORTANT LEGAL NOTICE:

APPENDIX D

HOSPITAL INFORMATION AND MAP

FIELD ACCIDENT REPORT

FIELD ACCIDENT REPORT

This report is to be filled out by the designated Site Safety Officer after EVERY accident.

PROJECT NAME _____ PROJECT. NO._____

Date of Accident _____ Time _____ Report By _____

Type of Accident (Check One):

( ) Vehicular ( ) Personal ( ) Property

Name of Injured _____ DOB or Age _____

How Long Employed _____

Names of Witnesses _____

_____

Description of Accident _____

_____

_____

Action Taken _____

_____

_____

Did the Injured Lose Any Time? _____ How Much (Days/Hrs.)? _____

Was Safety Equipment in Use at the Time of the Accident (Hard Hat, Safety Glasses, Gloves, Safety Shoes, etc.)? _____

_____

(If not, it is the EMPLOYEE'S sole responsibility to process his/her claim through his/her Health and Welfare Fund.)

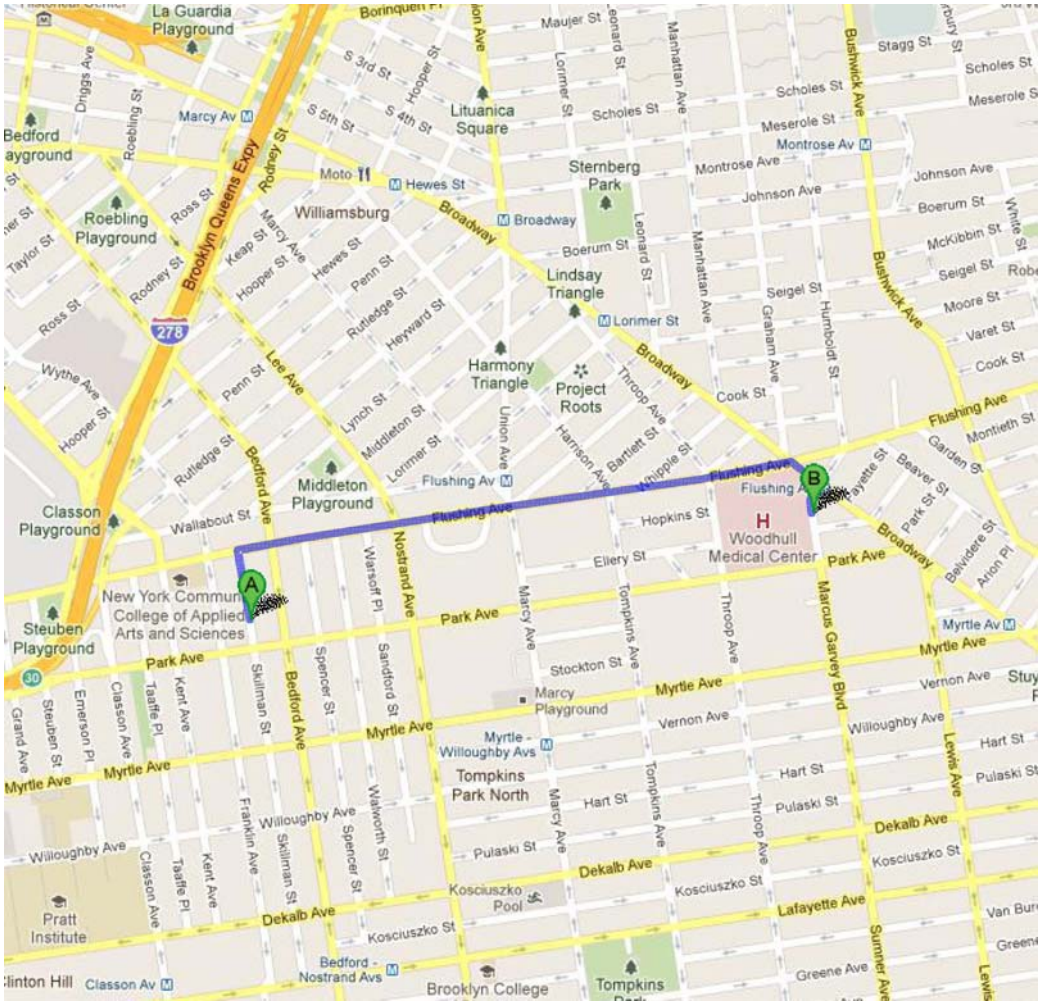
INDICATE STREET NAMES, DESCRIPTION OF VEHICLES, AND NORTH ARROW

HOSPITAL INFORMATION AND MAP

The hospital nearest the site is:

Woodhull Hospital

760 Broadway Brooklyn, New York 11206
0.9 Miles – About 3 Minutes



A 39 Skillman St, Brooklyn, NY 11205

1.	Head **north** on **Skillman St** toward **Flushing Ave**	go 0.1 mi total 0.1 mi
2.	Turn right onto **Flushing Ave** About 3 mins	go 0.8 mi total 1.0 mi
3.	Turn right onto **Broadway**	go 292 ft total 1.0 mi
4.	Take the 1st right onto **Marcus Garvey Blvd/Sumner Ave**	go 253 ft total 1.1 mi

B **Woodhull Medical Center**
760 Broadway Brooklyn, New York 11206 - (718) 963-8000

ATTACHMENT D
Quality Assurance Project Plan

QUALITY ASSURANCE PROJECT PLAN
Former East Coast Industrial Uniforms Site
39 Skillman Street, Brooklyn, NY
BCP No. 224156

Prepared on behalf of:

39 Skillman Street LLC
331 Rutledge Street, Suite 209
Brooklyn, NY 11211

Prepared by:

EBC
ENVIRONMENTAL BUSINESS CONSULTANTS
1808 MIDDLE COUNTRY ROAD
RIDGE, NY 11961

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QUALITY ASSURANCE PROJECT PLAN

Former East Coast Industrial Uniforms Site
39 Skillman Street, Brooklyn, NY

TABLES

1.0 INTRODUCTION

This Quality Assurance Project Plan (QAPP) has been prepared in accordance with DER-10 to detail procedures to be followed during the course of the sampling and analytical portion of the project, as required by the approved work plan.

To ensure the successful completion of the project each individual responsible for a given component of the project must be aware of the quality assurance objectives of his / her particular work and of the overall project. The EBC Project Director, Charles Sosik will be directly responsible to the client for the overall project conduct and quality assurance/quality control (QA/QC) for the project. The Project Director will be responsible for overseeing all technical and administrative aspects of the project and for directing QA/QC activities. As Project Director Mr. Sosik will also serve as the Quality Assurance Officer (QAO) and in this role may conduct:

- conduct periodic field and sampling audits;
- interface with the analytical laboratory to resolve problems; and
- interface with the data validator and/or the preparer of the DUSR to resolve problems.

Kevin Brussee will serve as the Project Manager and will be responsible for implementation of the Remedial Action and coordination with field sampling crews and subcontractors. Reporting directly to the Project Manager will be the Field Operations Officer, Kevin Waters; who will serve as the on-Site qualified environmental professional who will record observations, direct the sampling team and be responsible for the collection and handling of all samples.

1.1 Organization

Project QA will be maintained under the direction of the Project Manager, in accordance with this QAPP. QC for specific tasks will be the responsibility of the individuals and organizations listed below, under the direction and coordination of the Project Manager

.

GENERAL RESPONSIBILITY	SCOPE OF WORK	RESPONSIBILITY OF QUALITY CONTROL
Field Operations	Supervision of Field Crew, sample collection and handling	K. Waters, EBC
Project Manager	Implementation of the IRM according to the IRMWP.	Kevin Brussee, EBC
Laboratory Analysis	Analysis of soil samples by NYSDEC ASP methods Laboratory	NYSDOH-Certified Laboratory
Data review	Review for completeness and compliance	3rd party validation

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2.0 QUALITY ASSURANCE PROJECT PLAN OBJECTIVES

2.1 Overview

Overall project goals are defined through the development of Data Quality Objectives (DQOs), which are qualitative and quantitative Statements that specify the quality of the data required to support decisions; DQOs, as described in this section, are based on the end uses of the data as described in the work plan.

In this plan, Quality Assurance and Quality Control are defined as follows:

- Quality Assurance - The overall integrated program for assuring reliability of monitoring and measurement data.

- Quality Control - The routine application of procedures for obtaining prescribed standards of performance in the monitoring and measurement process.

2.2 QA / QC Requirements for Analytical Laboratory

Samples will be analyzed by a New York State Department of Health (NYSDOH) ELAP certified laboratory. Data generated from the laboratory will be used primarily to evaluate the success of the remedial program VOC components in soil, groundwater and air at the Site. The QA requirements for all subcontracted analytical laboratory work performed on this project are described below. QA elements to be evaluated include accuracy, precision, sensitivity, representativeness, and completeness. The data generated by the analytical laboratory for this project are required to be sensitive enough to achieve detection levels low enough to meet required quantification limits as specified in NYSDEC Analytical Services Protocol (NYSDEC ASP, 07/2005. The analytical results meeting the required quantification limits will provide data sensitive enough to meet the data quality objectives of this remedial program as described in the work plan. Reporting of the data must be clear, concise, and comprehensive. The QC elements that are important to this project are completeness of field data, sample custody, sample holding times, sample preservation, sample storage, instrument calibration and blank contamination.

2.2.1 Instrument Calibration

Calibration curves will be developed for each of the compounds to be analyzed. Standard concentrations and a blank will be used to produce the initial curves. The development of calibration curves and initial calibration response factors must be consistent with method requirements presented in the most recent version of NYSDEC ASP 07/2005).

2.2.2 Continuing Instrument Calibration

The initial calibration curve will be verified every 12 hrs by analyzing one calibration standard. The standard concentration will be the midpoint concentration of the initial calibration curve. The calibration check compound must come within 25% relative percent difference (RPD) of the average response factor obtained during initial calibration. If the RPD is greater than 25%, then corrective action must be taken as provided in the specific methodology.

2.2.3 Method Blanks

Method blank or preparation blank is prepared from an analyte·free matrix which includes the same reagents, internal standards and surrogate standards as me related samples. II is carried through the

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entire sample preparation and analytical procedure. A method blank analysis will be performed once for each 12 hr period during the analysis of samples for volatiles. An acceptable method blank will contain less than two (2) times the CRQL of methylene chloride, acetone and 2-butanone. For all other target compounds, the method blank must contain less than or equal to the CRQL of any single target compound. For non-target peaks in the method blank, the peak area must be less than 10 percent of the nearest internal standard. The method blank will be used to demonstrate the level of laboratory background and reagent contamination that might result from the analytical process itself.

2.2.4 Trip Blanks.
Trip blanks consist of a single set of sample containers filled at the laboratory with deionized. laboratory-grade water. The water used will be from the same source as that used for the laboratory method blank. The containers will be carried into the field and handled and transported in the same way as the samples collected that day. Analysis of the trip blank for VOCs is used to identify contamination from the air, shipping containers, or from other items coming in contact with the sample bottles. (The bottles holding the trip blanks will be not opened during this procedure.) A complete set of trip blanks will be provided with each shipment of samples to the certified laboratory.

2.2.5 Surrogate Spike Analysis
For organic analyses, all samples and blanks will be spiked with surrogate compounds before purging or extraction in order to monitor preparation and analyses of samples. Surrogate spike recoveries shall fall within the advisory limits in accordance with the NY5DEC ASP protocols for samples falling within the quantification limits without dilution.

2.2.6 Matrix Spike / Matrix Spike Duplicate / Matrix Spike Blank (MS/MSDIMSB) Analysis
MS, MSD and MSB analyses will be performed to evaluate the matrix effect of the sample upon the analytical methodology along with the precision of the instrument by measuring recoveries. The MS / MSD / MSB samples will be analyzed for each group of samples of a similar matrix at a rate of one for every 20 field samples. The RPD will be calculated from the difference between the MS and MSD. Matrix spike blank analysis will be performed to indicate the appropriateness of the spiking solution(s) used for the MS/MSD.

2.3 Accuracy
Accuracy is defined as the nearness of a real or the mean (x) of a set of results to the true value. Accuracy is assessed by means of reference samples and percent recoveries. Accuracy includes both precision and recovery and is expressed as percent recovery (% REC). The MS sample is used to determine the percent recovery. The matrix spike percent recovery (% REC) is calculated by the following equation:

$$\%REC = \frac{SSR - SR}{SA} \times 100$$

Where:
SSR = spike sample results
SR = sample results
SA = spike added from spiking mix

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2.4 Precision

Precision is defined as the measurement of agreement of a set of replicate results among themselves without a Precision is defined as the measurement of agreement of a set of replicate results among themselves without assumption of any prior information as to the true result. Precision is assessed by means of duplicate/replicate sample analyses.

Analytical precision is expressed in terms of RPD. The RPD is calculated using the following formula:

$$RPD = \frac{D^1 - D^2}{(D^1 - D^2)/2} \times 100$$

Where:
RPD = relative percent difference
D^1 = first sample value
D^2 = second sample value (duplicate)

2.5 Sensitivity

The sensitivity objectives for this plan require that data generated by the analytical laboratory achieve quantification levels low enough to meet the required detection limits specified by NYSDEC ASP and to meet all site-specific standards, criteria and guidance values (SGCs) established for this project.

2.6 Representativeness

Representativeness is a measure of the relationship of an individual sample taken from a particular site to the remainder of that site and the relationship of a small aliquot of the sample (i.e., the one used in the actual analysis) to the sample remaining on site. The representativeness of samples is assured by adherence to sampling procedures described in the IRM Work Plan.

2.7 Completeness

Completeness is a measure of the quantity of data obtained from a measurement system as compared to the amount of data expected from the measurement system. Completeness is defined as the percentage of all results that are not affected by failing QC qualifiers, and should be between 70 and 100% of all analyses performed. The objective of completeness in laboratory reporting is to provide a thorough data support package. The laboratory data package provides documentation of sample analysis and results in the form of summaries, QC data, and raw analytical data. The laboratory will be required to submit data packages that follow NYSDEC ASP reporting format which, at a minimum, will include the following components:

1. All sample chain-of-custody forms.
2. The case narrative(s) presenting a discussion of any problems and/or procedural changes required during analyses. Also presented in the case narrative are sample summary forms.
3. Documentation demonstrating the laboratory's ability to attain the contract specified detection limits for all target analytes in all required matrices.
4. Tabulated target compound results and tentatively identified compounds.
5. Surrogate spike analysis results (organics).
6. Matrix spike/matrix spike duplicate/matrix spike blank results.
7. QC check sample and standard recovery results
8. Blank results (field, trip, and method).
9. Internal standard area and RT summary.

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2.8 Laboratory Custody Procedures

The following elements are important for maintaining the field custody of samples:

- Sample identification
- Sample labels
- Custody records
- Shipping records
- Packaging procedures

Sample labels will be attached to all sampling bottles before field activities begin; each label will contain an identifying number. Each number will have a suffix that identifies the site and where the sample was taken. Approximate sampling locations will be marked on a map with a description of the sample location. The number, type of sample, and sample identification will be entered into the field logbook. A chain-of-custody form, initiated at the analytical laboratory will accompany the sample bottles from the laboratory into the field. Upon receipt of the bottles and cooler, the sampler will sign and date the first received blank space. After each sample is collected and appropriately identified, entries will be made on the chain-of-custody form that will include:

- Site name and address
- Samplers' names and signatures

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3.0 ANALYTICAL PROCEDURES

3.1 Laboratory Analysis

Samples will be analyzed by the NYSDEC ELAP laboratory for one or more of the following parameters: VOCs in soil and groundwater by USEPA Method 8260, and VOCs in air by USEPA Method TO15. If any modifications or additions to the standard procedures are anticipated, and if any nonstandard sample preparation or analytical protocol is to be used, the modifications and the nonstandard protocol will be explicitly defined and documented. Prior approval by EBC's PM will be necessary for any nonstandard analytical or sample preparation protocol used by the laboratory, i.e., dilution of samples or extracts by greater than a factor of five (5).

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4.0 DATA REDUCTION, REVIEW, AND REPORTING

4.1 Overview

The process of data reduction, review, and reporting ensures the assessments or a conclusion based on the final data accurately reflects actual site conditions. This plan presents the specific procedures, methods, and format that will be employed for data reduction, review and reporting of each measurement parameter determined in the laboratory and field. Also described in this section is the process by which all data, reports, and work plans are proofed and checked for technical and numerical errors prior to final submission.

4.2 Data Reduction

Standard methods and references will be used as guidelines for data handling, reduction, validation, and reporting. All data for the project will be compiled and summarized with an independent verification at each step in the process to prevent transcription/typographical errors. Any computerized entry of data will also undergo verification review.

Sample analysis will be provided by a New York State ELAP certified laboratory. Laboratory reports will include ASP category B deliverables for use in the preparation of a data usability summary report (DUSR). All results will be provided in accordance with the NYSDEC Environmental Information Management System (EIMS) electronic data deliverable (EDD) format. Analytical results shall be presented on standard NYSDEC ASP-B forms or equivalents, and include the dates the samples were received and analyzed, and the actual methodology used. Note that waste characterization samples will be in results only format and will not be evaluated in the DUSR.

Laboratory QA/QC information required by the method protocols will be compiled, including the application of data QA/QC qualifiers as appropriate. In addition, laboratory worksheets, laboratory notebooks, chains-of-custody, instrument logs, standards records, calibration records, and maintenance records, as applicable, will be provided in the laboratory data packages to determine the validity of data. Specifics on internal laboratory data reduction protocols are identified in the laboratory's SOPs.

Following receipt of the laboratory analytical results by EBC, the data results will be compiled and presented in an appropriate tabular form. Where appropriate, the impacts of QA/QC qualifiers resulting from laboratory or external validation reviews will be assessed in terms of data usability.

4.3 Laboratory Data Reporting

All sample data packages submitted by the analytical laboratory will be required to be reported in conformance to the NYSDEC ASP (7/2005), Category B data deliverable requirements as applicable to the method utilized. All results will be provided in accordance with the NYSDEC Environmental Information Management System (EIMS) electronic data deliverable (EDD) format. Note that waste characterization samples will be in results only format and will not be evaluated in the DUSR.

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5.0 CORRECTIVE ACTION

Review and implementation of systems and procedures may result in recommendations for corrective action. Any deviations from the specified procedures within approved project plans due to unexpected site-specific conditions shall warrant corrective action. All errors, deficiencies, or other problems shall be brought to the immediate attention of the EBC PM, who in turn shall contact the Quality Assurance/Data Quality Manager or his designee (if applicable).

Procedures have been established to ensure that conditions adverse to data quality are promptly investigated, evaluated and corrected. These procedures for review and implementation of a change are as follows:

- Define the problem.
- Investigate the cause of the problem.
- Develop a corrective action to eliminate the problem, in consultation with the personnel who defined the problem and who will implement the change.
- Complete the required form describing the change and its rationale (see below for form requirements).
- Obtain all required written approvals.
- Implement the corrective action.
- Verify that the change has eliminated the problem.

During the field investigation, all changes to the sampling program will be documented in field logs/sheets and the EBC PM advised.

If any problems occur with the laboratory or analyses, the laboratory must immediately notify the PM, who will consult with other project staff. All approved corrective actions shall be controlled and documented.

All corrective action documentation shall include an explanation of the problem and a proposed solution which will be maintained in the project file or associated logs. Each report must be approved by the necessary personnel (e.g., the PM) before implementation of the change occurs. The PM shall be responsible for controlling, tracking, implementing and distributing identified changes.

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TABLE 1
SUMMARY OF
SAMPLING PROGRAM RATIONALE AND ANALYSIS

Matrix	Location	Approximate Number of Samples	Frequency	Rationale for Sampling	Laboratory Analysis	Matrix Spikes	Spike Duplicates	Trip Blanks
Groundwater	10 Monitoring Wells	10	Quarterly	Performance monitoring	VOCs by 8260C	1 per 20 samples	1 per 20 samples	1 per trip
Air	Subslab and Exterior Ambient	10	1 time or as needed to confirm conditions	Performance monitoring	VOCs by TO15	0	0	0

TABLE 2
SAMPLE COLLECTION AND ANALYSIS PROTOCOLS

Sample Type	Matrix	Sampling Device	Parameter	Sample Container	Sample Preservation	Analytical Method#	CRQL / MDLH	Holding Time
Grab	Groundwater	Dedicated tubing	VOCs	(3) 40 ml Vial	Cool to 4^{o} C HCL	EPA Method 8260C	Compound specific (1-5 ug/L)	14 days
2 hr Average	Air	Vacuum Canister	VOCs	6 Liter Summa Can	Ambient	EPA Method TO15	Compound specific (1- ug/m3)	30 day

Notes:
All holding times listed are from Verified Time of Sample Receipt (VTSR) unless noted otherwise. *Holding time listed is from time of sample collection.
The number in parentheses in the "Sample Container" column denotes the number of containers needed.
Triple volume required when collecting MS/MSD samples
The number of trip blanks are estimated.
CRQL / MDL = Contract Required Quantification Limit / Method Detection Limit.
MCAWW = Methods for Chemical Analysis of Water and Wastes.
NA = Not available or not applicable.

ATTACHMENT E
Community Air Monitoring Plan

NEW YORK STATE BROWNFIELDS CLEANUP PROGRAM

COMMUNITY AIR MONITORING PLAN

FORMER EAST COAST INDUSTRIAL UNIFORMS SITE
39 SKILLMAN STREET
BROOKLYN, NY

JUNE - 2012

FORMER EAST COAST INDUSTRIAL UNIFORMS SITE

COMMUNITY AIR MONITORING PLAN
TABLE OF CONTENTS

APPENDICES

1.0 INTRODUCTION

This Community Air Monitoring Plan (CAMP) has been prepared for the excavation activities to be performed under an Interim Remedial Measure Work Plan (IRMWP) at the Former East Coast Industrial Uniform Site. The CAMP provides measures for protection for the downwind community (i.e., off-site receptors including residences, businesses, and on-site workers, not directly involved in the remedial work, from potential airborne contaminant releases resulting from excavation and soil loading activities at the site.

Compliance with this CAMP is required during all activities associated with soil excavation that have the potential to generate airborne particulate matter and volatile organic compounds (VOCs). These activities include excavation of soils, stockpiling, loading, and backfilling. This CAMP has been prepared to ensure that remediation activities do not adversely affect passersby, residents, or workers in the area immediately surrounding the Site and to preclude or minimize airborne migration of construction-related contaminants to offsite areas.

1.1 Regulatory Requirements

This CAMP was established in accordance with the following requirements:

- New York State Department of Health's (NYSDOH) Generic Community Air Monitoring Plan as presented in DER-10 Technical Guidance for Site Investigation and Remediation (NYSDEC May 3, 2010). This guidance specifies that a community air-monitoring program shall be implemented to protect the surrounding community and to confirm that the work does not spread contamination off-site through the air;

- New York State Department of Environmental Conservation (NYSDEC) Technical and Guidance Memorandum (TAGM) #4031 - Fugitive Dust Suppression and Particulate Monitoring Program at Inactive Hazardous Waste Sites: This guidance provides a basis for developing and implementing a fugitive dust suppression and particulate monitoring program as an element of a hazardous waste site's health and safety program.

2.0 AIR MONITORING

VOCs and metals are the constituents of concern at the Site. The appropriate method to monitor air for these constituents during remediation activities is through real-time VOC and air particulate (dust) monitoring.

2.1 Meteorological Data

At a minimum, wind direction will be evaluated at the start of each workday, noon of each workday, and the end of each workday. These readings will be utilized to position the monitoring equipment in appropriate upwind and downwind locations.

2.2 Community Air Monitoring Requirements

To establish ambient air background concentrations, air will be monitored at several locations around the site perimeter before activities begin. These points will be monitored periodically in series during the site work. When the excavation area is within 20 feet of potentially exposed populations or occupied structures, the perimeter monitoring points will be located to represent the nearest potentially exposed individuals at the downwind location.

Fugitive respirable dust will be monitored using a MiniRam Model PDM-3 aerosol monitor (or equivalent). Air will be monitored for VOCs with a portable Ionscience 3000 photoionization detector (PID), or equivalent. All air monitoring data will be documented in a site log book by the designated site safety officer. The site safety officer or delegate must ensure that air monitoring instruments are calibrated and maintained in accordance with manufacturer's specifications. All instruments will be zeroed daily and checked for accuracy. A daily log will be kept. If additional monitoring is required, the protocols will be developed and appended to this plan

3.0 VOC MONITORING, RESPONSE LEVELS, AND ACTIONS

Volatile organic compounds (VOCs) will be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions. 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.

- 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.

- 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.

- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown. All 15-minute readings must be recorded and be available for State (DEC and DOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

All readings will be recorded and made available for NYSDEC and NYSDOH personnel to review. If an exceedance of the Action Limits occurs, an Action Limit Report, as shown in Appendix A, will be completed.

3.1 Potential Corrective Measures and VOC Suppression Techniques

If the 15-minute integrated VOC level at the downwind location persists at a concentration that exceeds the upwind level by more than 5 ppm but less than 25 ppm during remedial activities, then vapor suppression techniques will be employed. The following techniques, or others, may be employed to mitigate the generation and migration of fugitive organic vapors:

- limiting the excavation size;
- backfilling the excavation;
- spraying water onto the excavation faces and equipment;
- covering soil stockpiles with 6-mil plastic sheeting;
- hauling waste materials in properly tarped containers; and/or
- applying vapor suppressant foam.

4.0 PARTICULATE MONITORING

Air monitoring for particulates (i.e., dust) will be performed continuously during excavation and loading activities using both air monitoring equipment and visual observation at upwind and downwind locations. Monitoring equipment capable of measuring particulate matter smaller than 10 microns (PM_{10}) and capable of integrating (averaging) over periods of 15 minutes or less will be set up at upwind (i.e., background) and downwind locations, at heights approximately four to five feet above land surface (i.e., the breathing zone). Monitoring equipment will be MIE Data Ram monitors, or equivalent. The audible alarm on the particulate monitoring device will be set at 90 micrograms per cubic meter ($\mu g/m_3$). This setting will allow proactive evaluation of worksite conditions prior to reaching the action level of 100 $\mu g/m^3$ above background. The monitors will be calibrated at least once per day prior to work activities and recalibrated as needed thereafter. In addition, fugitive dust migration will be visually assessed during all intrusive work activities.

The following summarizes particulate action levels and the appropriate responses:

- If the downwind PM-10 particulate level is 100 $\mu g/m^3$ 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 $\mu g/m^3$ above the upwind level and provided that no visible dust is migrating from the work area.

- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 $\mu g/m^3$ above the upwind level, work must be stopped and an evaluation of activities initiated. Work can resume provided that dust suppression measures (as described in Section 2.3.1 below) and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 $\mu g/m^3$ of the upwind level and in preventing visible dust migration.

All readings will be recorded and be available for NYSDEC and NYSDOH personnel to review. If an exceedance of the Action Limits occurs, an Action Limit Report as shown in **Appendix A** will be completed.

4.1 Potential Particulate Suppression Techniques

If the integrated particulate level at the downwind location exceeds the upwind level by more than 100 $\mu g/m_3$ at any time during remediation activities, then dust suppression techniques will be employed. The following techniques, or others, may be employed to mitigate the generation and migration of fugitive dusts:

- limiting the excavation size;
- backfilling the excavation;
- spraying water onto the excavation faces and equipment;
- covering soil stockpiles with 8-mil plastic sheeting;
- hauling waste materials in properly tarped containers; and/or
- limiting vehicle speeds onsite.

Work may continue with dust suppression techniques provided that downwind PM_{10} levels are not more than 150 $\mu g/m^3$ greater than the upwind levels.

There may also be situations where the dust is generated by remediation activities and migrates to downwind locations, but is not detected by the monitoring equipment at or above the action level. Therefore, if dust is observed leaving the working area, dust suppression techniques such as those listed above will be employed.

If dust suppression techniques do not lower particulates to below 150 $\mu g/m^3$, or visible dust persists, work will be suspended until appropriate corrective measures are identified and implemented to remedy the situation.

All air monitoring readings will be recorded in the field logbook and will be available for the NYSDEC and NYSDOH personnel to review.

5.0 DATA QUALITY ASSURANCE

5.1 Calibration

Instrument calibration shall be documented on instrument calibration and maintenance sheets or in the designated field logbook. All instruments shall be calibrated as required by the manufacturer. Calibration checks may be used during the day to confirm instrument accuracy. Duplicate readings may be taken to confirm individual instrument response.

5.2 Operations

All instruments shall be operated in accordance with the manufacturer's specifications. Manufacturers' literature, including an operations manual for each piece of monitoring equipment will be maintained on-site by the SSO for reference.

5.3 Data Review

The SSO will interpret all monitoring data based the established criteria and his/her professional judgment. The SSO shall review the data with the PM to evaluate the potential for worker exposure, upgrades/downgrades in level of protection, comparison to direct reading instrumentation and changes in the integrated monitoring strategy.

Monitoring and sampling data, along with all sample documentation will be periodically reviewed by the PM.

6.0 RECORDS AND REPORTING

All air readings must be recorded on daily air monitoring log sheets and made available for review by personnel from NYSDEC and NYSDOH.

ATTACHMENT F
Citizen Participation Plan

New York State Department of Environmental Conservation

Brownfield Cleanup Program

Citizen Participation Plan

for

FORMER EAST COAST INDUSTRIAL UNIFORMS SITE

39 SKILLMAN STREET
Brooklyn, New York 11211

April 2012

Contents

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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: **39 Skillman Street LLC**
Site Name: **Former East Coast Industrial Uniforms ("Site")**
Site Address: **39 Skillman Street, Brooklyn**
Site County: **Kings**
Site Number: **C224156**

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 web site. 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.

- **Document repositories** allow the public to access and review project documents including investigation and cleanup work plans and final reports.

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.

To make Citizen Participation Plans (CPPs) as consistent as possible with DER's CP Handbook, Region 2 Public Affairs asks that the Handbook's "Scoping Sheet for Major Issues of Public Concern" be used by applicants/responsible parties to inform their completion of this section of the plan. Because of the high percentage of Environmental Justice Areas in New York City, the Scoping Sheet is a particularly valuable tool in this region. The information that is included in the Scoping Sheet will help to determine if future fact sheets need to be translated into other languages. This particular site is located in Brooklyn Community Board # 3, which is predominantly Black American.

The major issues of concern to the public will be potential impacts of nuisance odors and dust during the removal of affected soil at the Site. Another example of a major issue of public concern would be the impact of increased truck traffic on the surrounding neighborhood. In addition, this site may be located in a potential environmental justice area. Furthermore, it may be determined that translation services may be necessary for fact sheets and public meetings. This work will be performed in accordance with procedures which will be specified under a detailed Remedial Program which considers and takes preventive measures for exposures to future residents of the property and those on adjacent properties during construction. Detailed plans to monitor the potential for exposure including a Health and Safety Plan (HASP) and a Community Air Monitoring Plan (CAMP) are required components of the remedial program. Implementation of these plans will be under the direct oversight of the NYSDEC and the New York State Department of Health (NYSDOH).

These plans will specify the following worker and community health and safety activities during remedial activity at the Site:

- On-site air monitoring for worker protection;
- Perimeter air monitoring for community protection;
- The use of odor, vapor, and dust controls, such as water or foam sprays, as needed;
- Monitoring and control of soil, sediments, and water generated during remediation;and
- Truck routes which avoid residential streets.

The HASP and the CAMP will be prepared as part of the Remedial Action Work Plan (RAWP) and will be available for public review at the document repository as identified in Appendix A (page 11).

4. Site Information

Appendix C contains a map identifying the location of the Site.

Site Description

The Site to be remediated and redeveloped is located in the Williamsburg section of Brooklyn (Kings County) and is comprised of a single tax parcel totaling 25,000 square feet (0.57 acres). The subject property is located in the City of New York and Borough of Brooklyn (Kings County). The lot has 250 feet of frontage on Skillman Street and is 100 feet deep.

The lot is developed with three attached buildings and a parking area formerly used by the East Coast Industrial Uniform laundry facility. All buildings are currently vacant. The parking area is located on the southern end of the lot and consists of an asphalt cover. A one-story brick building is located north of the parking area. The building contains an aboveground 2,000-gallon No. 2 fuel oil storage tank in the rear and a boiler room (empty) in the front of the building.

A second one-story brick building is located north of the first, and consists of open space with several concrete lined trenches cut through the southeast end of the building. The trenches were likely used to contain wash water from numerous washing machines prior to discharge through the small aboveground oil water separator located in the southeast corner and finally to public sewer. An area in the northeastern part of this building is labeled with signage as a "hazardous waste storage". An underground storage tank (abandoned-in-place) is located near the roll-up gate entrance to the building.

The northern most building is a vacant two-story brick building which was used for sorting, ironing, folding and storage of clothing/uniforms, etc.

The area surrounding the Site consists includes three new multi-family residential buildings across Skillman Avenue to the east, four new multi-family residential buildings and a vacant commercial building to the west, older multi-family walk up style buildings to the south and a community/office building to the north.

In general the area was historically characterized by commercial-industrial properties with older walk-up style residential buildings surrounding, and, in some cases, interspersed with the industrial-commercial properties. The area has been changing in response to the upzoning and many of the industrial/commercial buildings are being converted to, or replaced by, new residential buildings and schools.

History of Site Use, Investigation, and Cleanup

The Site was developed prior to 1887 with a Brooklyn Union Gas "Gasometer" in the northern third of the property and multiple residential homes and stores on the southern portion. By 1935, the Gasometer is gone and that area of the site is now vacant. The southern portion is unchanged. A small storage building is added to the northern lot in 1947. By 1965 the houses are gone from the southern portion of the property and the north lot is now labeled as a furniture/frame company.

By 1977 property is shown in its current configuration with two attached buildings in the northern area and a small parking lot in the southern portion of the lot. The property is labeled as East Coast Industrial Uniform Company.

A variety of environmental issues associated with the past use of the property as a commercial laundry facility were identified during a limited subsurface investigation performed in October 2011. The investigation identified petroleum contaminants typically associated with fuel oil and gasoline including volatile organic compounds (VOCs) in soil and groundwater and semi-volatile organic compounds (SVOCs) in groundwater above standards. Chlorinated volatile organic compounds (CVOCs) typically associated with dry cleaning solvents were also reported in groundwater above standards.

Finally, the fill material used to backfill the Brooklyn Union Gas gas storage tank and some of the remainder of the property is suspected to contain elevated levels of metals including arsenic, lead, copper, chromium, mercury and zinc.

5. Investigation and Cleanup Process

Application

The Applicant in has applied for and been accepted into New York's Brownfield Cleanup Program (BCP) 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 on-site, 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 the BCP proposes that the Site will be used for restricted residential 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 (BCA) executed by NYSDEC and the Applicant sets forth the responsibilities of each party in conducting these activities at the Site.

Investigation

The Applicant has completed a partial site investigation before it entered into the BCP. For the partial investigation, NYSDEC will determine if the data are useable. 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 Asignificant 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 (COC) (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 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 (SMP).

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):

MandyYau
Project Manager
NYSDEC Region 2
Division of Environmental Remediation
One Hunters Point Plaza 47-4021st Street
Long Island City, NY 11101
(718) 482-4897
mxyau@gw.dec.state.ny.us

Thomas Panzone
Regional Citizen Participation Specialist
NYSDEC Region 2
Division of Environmental Remediation
47-40 21st Street
Long Island City, NY 11101
(718) 482-4953

New York State Department of Health (NYSDOH):

Krista Anders
New York State Department of Health
Bureau of Environmental Exposure Investigation
Flanigan Square -547 River Street
Troy, New York 12180-2216
(518) 402-7860
beei@health.state.ny.us

Locations of Reports and Information

The facilities identified below are being used to provide the public with convenient access to important project documents:

Marcy Library
617 DeKalb Ave. at Nostrand Ave.
Brooklyn, NY 11216
718-935-0032

Hours:
Saturday: Closed
Sunday: Closed
Monday: 10am- 6pm
Tuesday: 1pm- 8pm
Wednesday, Thursday & Friday: 10am- 6pm

Appendix B - Site Contact List

Local Government Contacts:

City of New York
Michael Bloomberg
Mayor of New York City
City Hall
New York, NY 10007

Marty Markowitz
Brooklyn Borough President
209 Joralemon Street
Brooklyn, NY 11201

Henry Butler
Chair Brooklyn Community Board 3
1360 Fulton Street
Brooklyn, NY, 11216

Charlene Phillips
District Manager, Brooklyn Community Board # 3
Brooklyn, NY 11216

Hon. Letitia James
NYC Council Member
35th[4th] District
67 Hanson Place
Brooklyn, NY 1121

Amanda M. Burden
Commissioner, NYC Dept. of City Planning
22 Reade St.
Third Floor
New York, NY 10007

New York City Department of Transportation
Brooklyn Borough Commissioner
Attn: Joseph Palmieri
16 Court Street
Brooklyn, NY 11241

Kings County Clerk's Office
Nancy T. Sunshine, County Clerk
360 Adams Street, Room 189
Brooklyn, NY 11201

Hon. Bill de Blasio
Public Advocate
1 Centre Street, 15th Floor
New York, NY 10007
Email: kjfoy@pubadvocate.nyc.gov

Hon. John Liu
Office of the Comptroller
1 Centre Street
New York, NY 10007
Email: **intergov@comptroller.nyc.gov**

Hon. Martin Malave Dilan
NYS Senator
786 Knickerbocker Avenue
Brooklyn, NY 11207

Hon. Joseph Lentol
NYS Assembly Member
619 Lorimer Street
Brooklyn , NY 11211

Hon. Charles Schumer
U.S. Senator
757 Third Avenue, Suite 17-02
New York, NY 10017
Email: senator@schumer.senate.gov

Hon. Kirsten Gillibrand
U.S. Senator
780 Third Avenue, Suite 2601
New York, NY 10017
Email: contact@gillibrand.senate.gov

Hon. Edolphus Towns
U.S. House of Representatives
186 Joralemon Street, Suite 1101
Brooklyn, NY 11201

John Wuthenow
Office of Environmental Planning & Assessment
NYC Dept. of Environmental Protection
96-05 Horace Harding Expressway
Flushing, NY 11373

Daniel Walsh
Director
NYC Office of Environmental Remediation
253 Broadway – 14th Floor
New York, NY 10007

Dr. Robert Kulikowski
Director
NYC Office of Environmental Coordination
253 Broadway – 14th Floor
New York, NY 10007

Local News Media:

New York 1 News
75 Ninth Avenue
New York, NY 10011

Brooklyn Daily Eagle
30 Henry Street
Brooklyn, NY 11201

Courier-Life Publications
1 Metro-Tech Center North - 10th Floor
Brooklyn, NY 11201

News 12 Brooklyn
164 20th Street, 4th Floor
Brooklyn, NY 11232

The Brooklyn Paper
One Metrotech Center, Suite 1001
Brooklyn, NY 11201
(718) 260-4504

New York Times
620 Eighth Ave.
New York, NY 10018

New York Daily News
450 W. 33 Street
New York, NY 10001

New York Post
1211 Avenue of the Americas
New York, NY 10036-8790

Public Water Supplier:
New York City Department of Environmental Protection
Attn: Hon. Caswell Holloway Commissioner
59-17 Junction Boulevard
Flushing, NY 11373

Schools and Daycare Facilities:

Hychel Hatorah of Williamsburg
70 Franklin Avenue
Brooklyn, NY 11205-1504
718-250-9982

Yeshiva Dinov
68 Franklin Avenue
Brooklyn, NY 11205-1504
718-855-5567

Mosdos Krula
795 Kent Avenue
Brooklyn, NY 11205-1517
718-254-8005

Public School 157
850 Kent Avenue
Brooklyn, New York 11205

Talmud Torah Tashbar
857 Kent Avenue
Brooklyn, NY 11205-2656
718-636-1380

Ohel Elozer
263 Classon Avenue
New York, NY 11205
718-797-2888

Pratt Institute
Brooklyn, New York
718-636-3514

Tiferes Bnos
Skillman Street
Brooklyn, NY 11205-1551
718-855-1888

Yeshivas Ahavas Israel
Franklin Avenue
Brooklyn, NY 11211-7802
718-330-0222

Beth Chana School
712 Bedford Avenue
Brooklyn, NY 11206-5406
718-858-5267

Yeshiva Bnos Spinka
Brooklyn, New York
718-596-7657

Yeshiva Mesivta Arugath Habosem
Brooklyn, New York
718-237-4500

Mosdos Chasidei Square
105 Heyward Street
Brooklyn, NY 11206-5408
718-852-0502

Beth Jacob School
Brooklyn, New York

United Talmudical Academy
128 Rutledge Street
Brooklyn, NY 11211-8005
718-596-6532

Central UTA Inc
76 Rutledge Street
Brooklyn, NY 11211-7814
718-422-0375

Bnos Chayil
712 Wythe Avenue
Brooklyn, NY 11211-7534
718-403-0185

Talmud Torah Dnitra
Brooklyn, New York
718-797-2900

Talmud Torah Toldos Hillel-Krasna
35 Hewes Street
Brooklyn, New York
718-802-9567

United Talmudical Academy
45 Williamsburg Street West
Brooklyn, NY 11211-7981
718-935-9848

Yeshiva Kehilath Yakov Inc
638 Bedford Avenue
Brooklyn, NY 11211-8007
718-923-9234

Beth Chana School for Girls
624 Bedford Avenue
Brooklyn, New York
718-522-7422

United Talmudical Academy
590 Bedford Avenue
Brooklyn, NY 11211
718-486-0879

Congregation Ahavas Shulem
237 Lee Avenue
Brooklyn, NY 11206-5459
718-599-0660

PS 380 School
370 Marcy Avenue
Brooklyn, NY 11206-4814
718-388-4800

Kolel Erev Kehilath Yakov
213 Lee Avenue
Brooklyn, NY 11206-5411
718-782-1916

Yeshiva Kehilath Yakou Inc
158 Lee Avenue
Brooklyn, NY 11211-8048
718-855-9020

Yeshiva Gedoah Ohr Yisr
222 Penn Street
Brooklyn, NY 11211-8167
718-302-4687

P141 k IS 71 School
215 Heyward Street
Brooklyn, NY 11206-2966
718-782-3121

Bnei Shimon Yisroel of Sopron
18 Warsoff Place
Brooklyn, New York
718-855-4092

Tiferes Bnos
114 Walworth Street
Brooklyn, NY 11205-2808
718-596-4848

Public School 54
195 Sanford Street
Brooklyn, NY 11205-4525
718-237-2255

E & T Arbor
585 Dekalb Avenue
Brooklyn, NY 11205-4902
718-789-7789

Tiferres Bnos
585 Marcy Avenue
Brooklyn, NY 11206-6687
718-676-2235

Public School 297
700 Park Avenue
Brooklyn, New York 11206
718-388-4581

Yeled V'Yalda Headstart
12 Franklin Avenue
Brooklyn, NY 11211

Central United Talmudical Academy
2 Skillman Street
Brooklyn, NY 11205

Child Development Support Corporation
802 Kent Avenue
Brooklyn, NY 11205

David T. Bradley Day Care Center
172 Frankin Avenue
Brooklyn, NY 11205

Marcy Children's Center
494 Marcy Avenue
Brooklyn, NY 11206

Marcy Houses
NYC Housing Authority
C/o Management Office
648 Park Avenue
Brooklyn, NY 11206

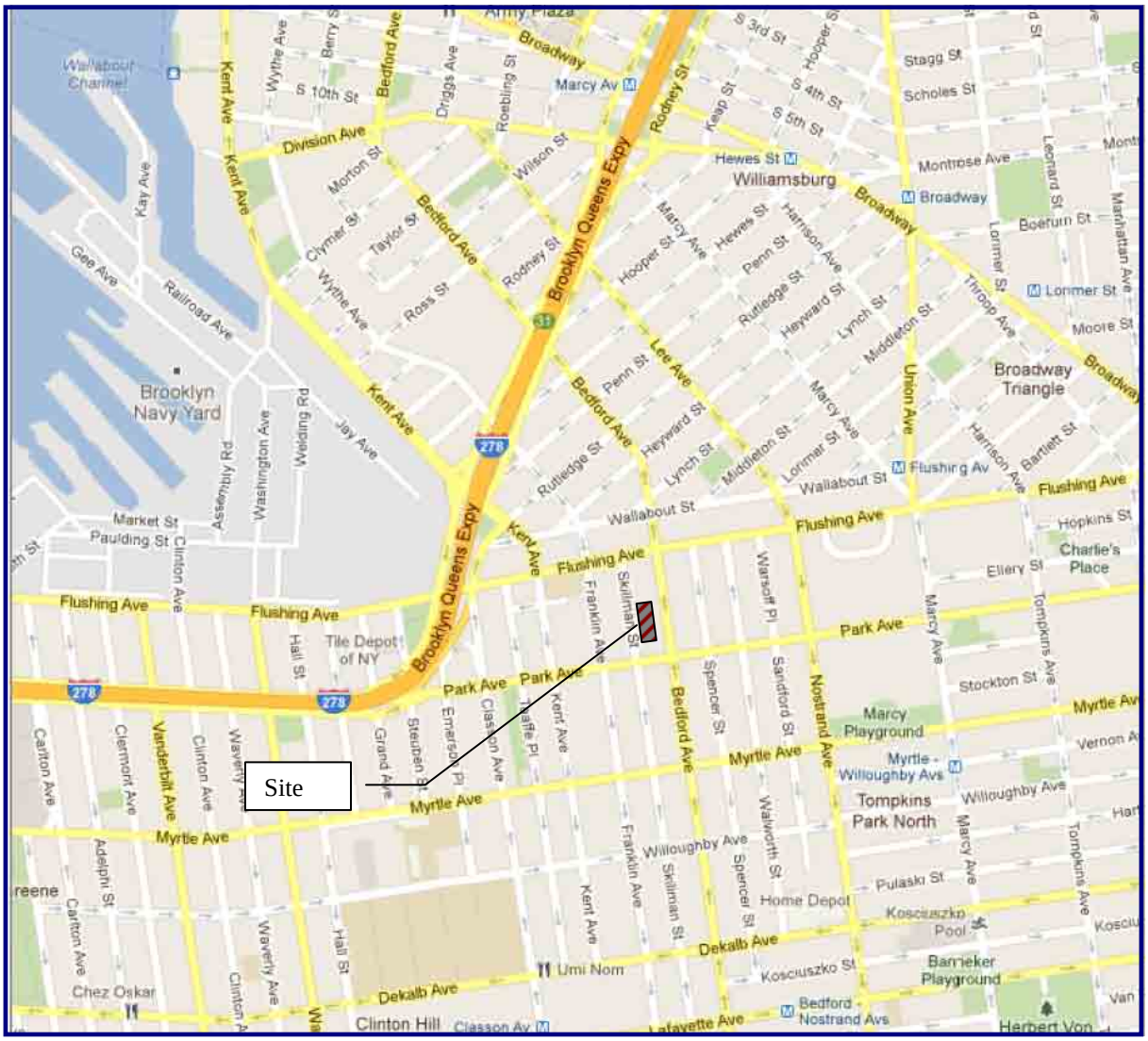
Marcy Houses
NYC Housing Authority
C/o President, Resident's Association
648 Park Avenue
Brooklyn, NY 11206

Clinton Hill CSA
P.O. Box 050377
Brooklyn, NY 11205

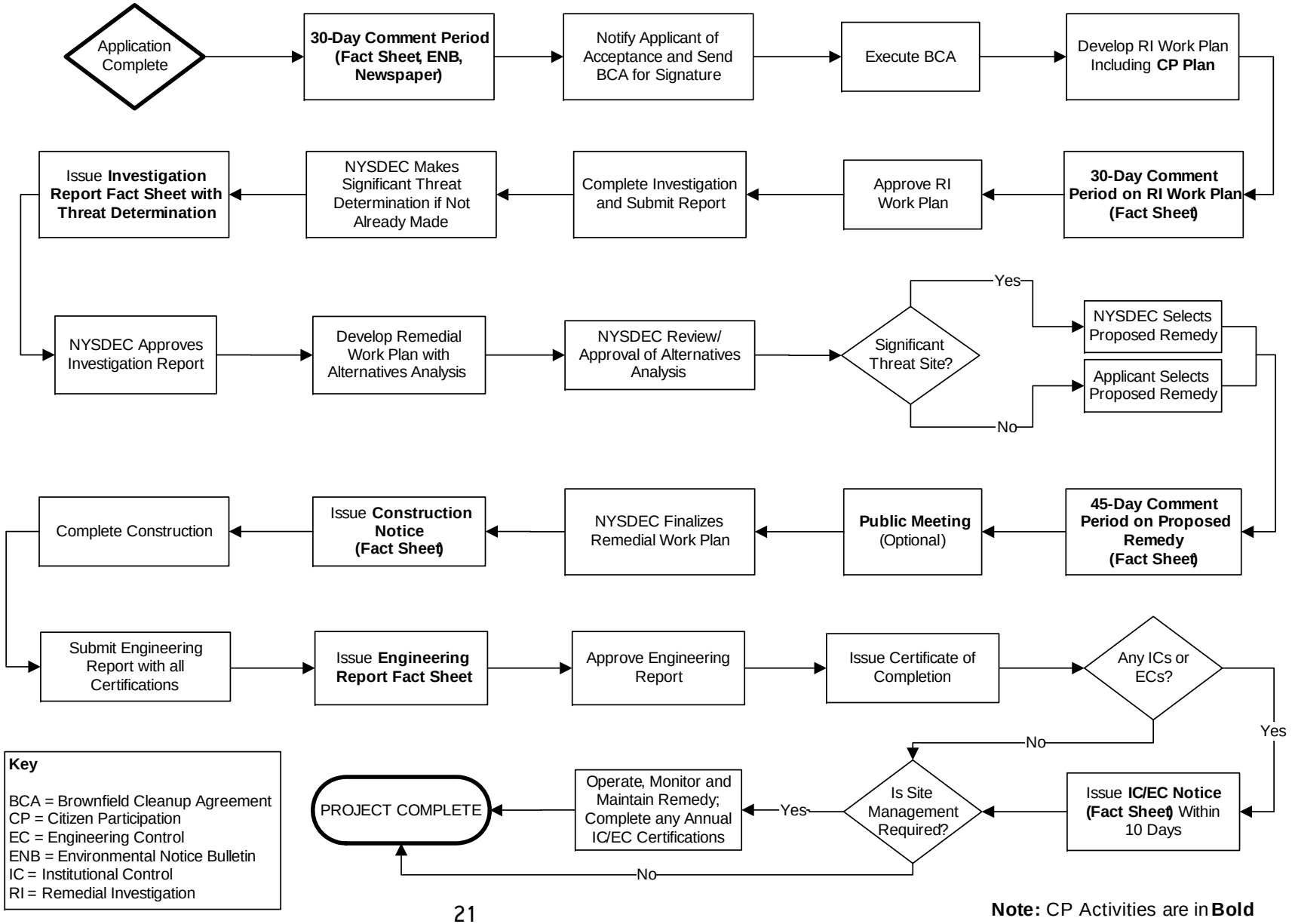
Brooklyn Chamber of Commerce
25 Elm Place, Suite 200 2nd Floor
Brooklyn, NY 11201

Open Space Alliance for North Brooklyn
79 North 11th Street
Brooklyn, NY 11211

Appendix C - Site Location Map



Appendix D– Brownfield Cleanup Program Process



Note: CP Activities are in **Bold**

ATTACHMENT G
Resumes

EBC

ENVIRONMENTAL BUSINESS CONSULTANTS

ARIEL CZEMERINSKI, P.E.

Mr. Czemerinski is a New York State Professional Engineer and CEO of AMC Engineering PLLC an EBC affiliate. Mr. Czemerinski has with 16 years of experience in the chemical and environmental areas. Areas of expertise include environmental compliance, permitting, remedial system design, process and plant safety, and management of a production facility. Mr. Czemerinski is a Registered Professional Engineer in NY, IN, IL, and MI.

Professional Experience
EBC: January 2007
Prior: 11 years

Education
Master of Science in Chemical Engineering, Columbia University, New York, NY, Feb. 1990. Bachelor of Science in Chemical Engineering, University Of Buenos Aires, Buenos Aires, Argentina, May 1987

Areas of Expertise

- Vapor Intrusion - Barrier and Sub Slab Venting System Design
- Environmental Assessment Statements and Environmental Impact Assessments under CEQR, ULURP
- Remedial Program Design and Management
- Environmental Compliance, Clean Water Act, Clean Air Act, Hazardous Materials
- Transfer Station Permitting and Compliance
- Chemical Process Design and Optimization
- Wastewater Treatment Systems and Permitting, SPEDES, Air
- Zoning Regulations and Permitting
- Safety and environmental training

Professional Certification

- OSHA 40-hr HAZWOPER
- OSHA 8-hr HAZWOPER Supervisor

supplemental plan to meet the requirements of an RI under the BCP program. By performing this limited amount of field work "up-front" he was able to complete an RI Report and Remedial Plan and submit both with the BCP application package. The NYSDEC and NYSDOH approved the RI Report and the Remedial Plan with minor changes. This cut 120 days from the review process and allowed the client to arrange financing and move his project forward knowing what the clean-up costs would be at the outset.

Metro Management, Bronx, NY

Brownfield Project – The site of a former gas station, the developer had planned to construct a 12-story affordable housing apartment complex with first floor retail space. Since the site was located in an Environmental zone, potential tax credits of 22% for site development, remediation and tangible property could be realized under the BCP. In a pre-application meeting with the NYSDEC, Mr. Sosik realized that the department did not believe the site was eligible for the BCP, since it had been previously investigated and closed under the spills program.

Mr. Sosik assisted the developer in securing financing, and due to the demands of an aggressive construction schedule developed an Interim Remedial Measure (IRM), based on chemical oxidation treatment. Working closely with the clients environmental counsel, Mr. Sosik was able to get the IRM approved without a public comment period. Implementation of the IRM is currently underway.

The project was awarded the 2009 NYC Brownfield Award for Innovation.

Brandt Airflex, NY

Technical Consulting Services - Mr. Sosik provided senior level technical advice and strategic planning in developing an off-site RI/FS for the site, in negotiating a tax reduction for the property due to the environmental condition and in preparing a cost to cure estimate for settlement between business partners. After achieving a favorable tax consideration and settlement agreement for his client

Allied Aviation Services, Dallas, Fort Worth, Airport, Dallas, TX

Jet Fuel Investigation - Mr. Sosik developed and managed an investigative plan to quickly identify the extent and source of jet fuel which was discharging from the Airport's storm drain system to a creek a mile away. Through the use of a refined conceptual model, accelerated investigative techniques and a flexible work plan, he was able to identify the source of the fuel and the migration route within a single week. He then identifled remedial options and successfully negotiated a risk based plan with the Texas regulatory agency that had issued a notice of enforcement action against the facility.

KeySpan – Former LILCO Facilities, Various NY Locations

Pesticide Impact Evaluation - Mr. Sosik developed, negotiated and implemented a site screening procedure to evaluate impact to public health and the environment as the result of past herbicide use at 211 utility sites. Using an unsaturated zone leaching model (PRZM) on a small subset of the sites, he was able to establish mass loading schedules for the remaining sites. This was combined with public well data in a GIS environment to perform queries with respect to mass loading, time transport and proximity to vunerable public supply wells. Using this approach Mr. Sosik was able to show that there were no concerns for future impact. This effort satisfied the public health and resource concerns of the state environmental agency and county health department in a reasonable amount of time and at a fraction of the cost of a full scale investigation.

Former Computer Circuits (Superfund) Site, Hauppauge, NY

CERCLA RI/FS - As Senior Project Manager for the site, he played a major role in regaining control of the investigation activites for the PRP. This action prevented the USEPA from initiating an extensive investigation at the site using a RAC II contractor allowing the client to perform a more efficient investigation. He was involved in all negotiations with EPA and was the project lead in developing a revised site characterization plan (work plan, field sampling plan, quality assurance plan, etc.). By carefully managing all phases of the investigation and continued interaction with each of the three regulatory agencies involved, Mr. Sosik was able to keep the project focused and incrementally reinforce the clients position. The estimated cost of the revised investigation is expected to save the client 1.5 to 2 million dollars.

Sun Oil, Seaford, NY

Remediation Consuliting Services & Project Management - Under an atmosphere of regulatory distrust, political pressure and mounting public hostility toward the client, Mr. Sosik conducted an off-site 3-D investigation to define the extent of contamination and the potential impact on public health. By designing and implementing an aggressive source area remediation program and personal interaction with the public and regulatory agencies, he was able to successfully negotiate a limited off-site remediation favorable to the client. Source area remediation was completed within 6 months and the project successfully closed without damage to the client's public image or working relationship with the regulatory agencies.

Con Edison, Various Locations, NY

Hydrogeologic Consulting Services - Under a general consulting contract, Mr. Sosik conducted detailed subsurface hydrogeologic investigations at five locations to assist in the development of groundwater contingency planning. He also developed and implemented work plans to investigate and remediate existing petroleum, cable fluid, and PCB releases at many of the generating facilities and substations. An important aspect of his role was in assisting the client in strategic planning and negotiations with the regulatory agency.

Keyspan - Tuthill Substation, Aqueboque, NY

Accelerated Site Characterization - Using accelerated site characterization techniques, Mr. Sosik presented the project as a case study in establishing the transport of an herbacide and its metobolites aplied at utility sites in the 1980's The results were then used to establish a screening method for evaluating 211 similar sites controlled by the client in a reasonable and eficient manner.

NYSDEC Spill, East Moriches, NY

Spill Release Analysis - With recognized expertise in the area of gasoline plume development on Long Island, Mr. Sosik was asked by

Charles B. Sosik, PG, PHG, Principal

the State to establish the release date (and principal responsible party) of an extensive petroleum spill, which impacted a residential neighborhood. He used multiple lines of evidence, and a new EPA model (HSSM), which he has helped to refine, to reconstruct the release scenario and spill date, in support of the State Attorney General's cost recovery effort from the PRP.

Minmilt Realty, Farmingdale, NY

Fate & Transport Modeling - He completed an RI/FS at this location for a PCE plume that had been in transit for over 30 years. Mr. Sosik applied a conservative model to evaluate time/concentration impacts under a variety of transport scenarios to a municipal wellfield located 13,000 feet away. Through the use of the model and careful interpretation of an extensive data set compiled from several sources, Mr. Sosik was able to propose a plan which was both acceptable to the regulator and favorable to the client.

Sebonack Golf Course Project, Town of Southampton, NY

IPM Pesticide Study - Provided professional hydrogeologic services in support of the EIS prepared for the development of the site. The proposed development included an 18-hole golf course, clubhouse, dormitory facility, cottages, associated structures, and a 6,000 square foot research station for Southampton College. Mr. Sosik performed an extensive evaluation (using a pesticide-leaching model) on the effects of pesticide and nitrogen loading to groundwater as part of the projects commitment to an Integrated Pest Management (IPM) approach.

NYSDEC, Spills Division, Regions 1 – 4

Petroleum Spills Investigation & Remediation - As a prime contractor/consultant for the NYSDEC in Regions 1-4, Mr. Sosik has managed the investigation and remediation of numerous petroleum spills throughout the State. Many of these projects required the development of innovative investigation and remediation techniques to achieve project goals. He was also involved in many pilot projects and research studies to evaluate innovative investigation techniques such as accelerated site characterization, and alternative approaches to remediation such as monitored natural attenuation and risk based corrective action.

Sun Oil, E. Meadow, NY

Exposure Assessment - Performed to seek closure of the spill file, despite the presence of contaminants above standards, Mr. Sosik determined after the extended assessment that the level of remaining contamination would not pose a future threat to human health or the environment. He used multiple lines of evidence, and a fate and transport model to show that degradation processes would achieve standards within a reasonable time.

Sand & Gravel Mine, NY

Property Development - As part of the development of a sand and gravel mine, Mr. Sosik provided environmental consulting services to assist in obtaining a mining permit, which would result in the construction of a 150-acre lake. Specifically, Mr. Sosik investigated if the proposed lake would reduce groundwater quantity to domestic and public well fields, and/or accelerate the migration of potential surface contaminants to the lower part of the aquifer. After assuming the lead role in negotiations with the regulatory agency, Mr. Sosik was able to obtain a permit for the client by adequately addressing water quality and quantity issues, and by preparing a monitoring plan and spill response plan, acceptable to all parties.

NYSDEC, Mamaroneck, NY

Site Characterization / Source Identification - In a complex hydrogeologic setting consisting of contaminant transport through fractured metomorphic bedrock and variable overburden materials, Mr. Sosik was able to develop and implement a sub-surface investigation to differentiate and separate the impact associated with each of two sources. The results of this investigation were successful in encouraging the spiller to accept responsibility for the release.

Riverhead Municipal Water District, NY

Site Characterization / Remedial Planning - Using accelerated characterization techniques, he implemented a 3-D site investigation to identify two service stations 4,000 ft. away as the source of contamination impacting a municipal wellfield. In accordance with the strict time table imposed by the need to return the wellfield to production by early spring, he designed and implemented a multi-point (9 RW, 6 IW) recovery and injection well system using a 3-d numerical flow model, and completed the project on time. Using a contaminant transport model, Mr. Sosik developed clean-up goals which were achieved in 9 months of operation, well below the projected 3 to 5 year project duration.

Montauk Fire Department, NY

Site Assessment - Mr. Sosik performed a limited investigation and used a 2-D flow model to demonstrate that the property could not have been the source of contamination which had impacted an adjacent wellfield as per the results of a previous investigation. This small focused effort successfully reversed a $500,000, and rising, claim against the department by the water district and the NYSDEC.

PREVIOUS EXPERIENCE

P.W. Grosser Consulting, Bohemia, NY
Senior Project Manager, 1999-2006

Environmental Assessment & Remediation, Patchogue, NY
Senior Project Manager, 1994-1999

Miller Environmental Group, Calverton, NY
Project Manager, 1989-1994

DuPont Biosystems, Aston, PA
Hydrogeologist, 1988-1989

EBC

ENVIRONMENTAL BUSINESS CONSULTANTS

Charles B. Sosik, PG, PHG, Principal

EXPERT WITNESS TESTIMONY AND DEPOSITIONS

Fact Witness -Testimony on relative age of petroleum spill based on nature and extent of residual and dissolved components at the Delta Service Station in Uniondale, NY Fall/1999

Expert Witness / Expert Report for defendant in cost recovery case by NYS Attorney General regarding a Class II Inactive Hazardous Waste (State Superfund) project by the NYSDEC (October 2004 – present, Report: March 2005, Deposition: April 2005)

Expert Witness / Fact Witness for plaintiff seeking compensation for partial expenses incurred during the investigation and remediation of a USEPA CERCLA site due to the release and migration of contaminants from an "upgradient" industrial property. (Deposition May 2005, case settled April 2007).

Expert Witness / Fact Witness for NYS Attorney General with respect to cost recovery for a NYSDEC petroleum spill site in Holtzville, NY (Deposition April 2005 - case settled).

Expert Witness – Statement of opinion and expert testimony at trial for plaintiff seeking damages from a major oil corporation for contamination under a prior leasing agreement in Rego Park, NY. Case decided in favor of plaintiff. Trial July 2007, in favor of Plaintiff. Qualified as Expert Witness.

Expert Witness / Fact Witness for NYS Attorney General with respect to cost recovery for a NYSDEC petroleum spill site in Lindenhurst, NY (Trial date December 2009, in favor of plaintiff. Qualified as Expert Witness.

Expert Witness / Fact Witness for defendant with respect to cost recovery and third party responsibility for a NYSDEC petroleum spill site. (Expert Statement of Fact – October 2005).

Expert Witness for plaintiff seeking damages related to a petroleum spill from the previous owner/operator of a gas station in College Point, NY. Case settled 2009.

Expert Witness for plaintiff (municipal water supply purveyor) seeking damages from major oil companies and manufacturer of MTBE at various locations in Suffolk County, NY. Expert reports July 2007, August 2007 and October 2007, Case settled August, 2008.

Expert Witness - Deposition for NYS Attorney General regarding NYSDEC cost recovery for a petroleum spill site at Sag Harbor, NY. August 2002

Expert Witness - for NYS Attorney General regarding NYSDEC cost recovery for a petroleum spill site at Riverhead, NY. Case settled July 2008.

Expert Witness for defendant responding to a claim from adjacent commercial property owner on the origin of chlorinated solvents on plaintiff's property located in Cedarhurst, NY. Expert opinion submitted to lead counsel on March 6, 2009, case settled April 2009.

Expert Report - for Attorney General on modeling performed to determine the spill release scenario at a NYSDEC petroleum spill site in East Moriches, NY. June 2000.

MODELING EXPERIENCE (PARTIAL LISTING)

PROJECT	MODEL	APPLICATION
Riverhead Water District, Riverhead, NY	MODFLOW, MODPATH	Remediation system design to intercept MTBE plume and prevent continued impact to municipal well field.
NYSDEC - Region 1, Holbrook, NY	MODFLOW, MODPATH	Simulate transport of MTBE plume to predict future impact.
NYSDEC - Region 1, East Moriches, NY	HSSM	Evaluate release scenario and start date of petroleum spill in support of cost recovery by NYS AG office.
AMOCO, Deer Park, NY	HSSM	Estimate release amount, start date and spill scenario to evaluate the potential for mass unaccounted for
Keyspan Energy, Nassau/Suffolk Counties Substations	PRZM	Estimate mass load of simazine used at 211 electric substations and screen sites according to potential for human health and ecological impacts.
Saboneck Golf Club, Southampton NY	PRZM	Estimate mass load of proposed pesticides on new golf course to evaluate acceptability under an IPM program.
Suffolk County Department of Public Works (SCDPW) Scavenger Waste Treatment Plant, Yaphank, NY	DYNFLOW, DYNTRAC	Evaluate time-transport and nitrogen impact on local river system.
SCDPW SUNY Waste Water Treatment Plant, Stony Brook, NY	DYNFLOW, DYNTRAC	Determine outfall location and time-transport of nitrogen from proposed upgrades to an existing wastewater treatment plant
Water Authority of Great Neck North Great Neck, NY	MODFLOW, MODPATH, MT3D	Review of modeling study performed by EPA to evaluate potential future impact to Well field from PCE plume. Identified serious flaws in model construction and implementation, which invalidated conclusions

PUBLICATIONS / PROFESSIONAL PAPERS

Smart Pump & Treat Strategy for MTBE Impacting a Public Water Supply (14th Annual Conference on Contaminated Soils Proceedings, 1998)

Transport & Transformation of BTEX & MTBE in a Sand Aquifer (Groundwater Monitoring & Remediation 05/1998)

Characteristics of Gasoline Releases in the Water Table Aquifer of Long Island (Petroleum Hydrocarbons Conference Proceedings, 1999)

Field Applications of the Hydrocarbon Spill Screening Model (HSSM) (USEPA Interactive Modeling Web Course www.epa.gov/athens/software/training/webcourse Authored module on model application and applied use of calculators, 02/2000)

Comparative Evaluation of MTBE Sites on Long Island, US EPA Workshop on MTBE Bioremediation (Cincinnati, 02/2000)

Comparison of Four MTBE Plumes in the Upper Glacial Aquifer of Long Island (American Geophysical Union, San Francisco, 12/1996)

Analysis and Simulation of the Gasoline Spill at East Patchogue, New York (American Geophysical Union, San Francisco, 12/1998)

EBC

ENVIRONMENTAL BUSINESS CONSULTANTS

Kevin R. Brussee, Project Manager

Professional Experience
EBC: January 2008
Prior: 6 years

Education
Bachelor of Science, Environmental Science, Plattsburgh State University, NY
Master of Science, Environmental Studies, University of Massachusetts, Lowell

Areas of Expertise
- Site Investigations NYC "E" Designations
- NYSDEC Spill Closure
- Gasoline/Fuel Oil Tank Removals
- NYC "E" Designations

Professional Certification
- OSHA 40-hr HAZWOPER
- OSHA 8-hr HAZWOPER Supervisor

PROFILE

Mr. Brussee has 10 years experience as an environmental consultant/contractor and has worked on and managed a wide range of environmental projects. Mr. Brussee has conducted Phase I, II and III Environmental Site Assessments for commercial, industrial, and residential properties in New York, New Jersey, Maryland and Delaware.

Mr. Brussee's field experience includes tank removal and installations, spill management and closure, soil and groundwater sampling, and both the oversight and operation of soil boring and well installation equipment. In addition, Mr. Brussee has performed project research, data reduction and evaluation, and has prepared reports for both regulatory and client use.

PREVIOUS EXPERIENCE

Eastern Environmental Solutions, Inc., Manorville, NY
Project Manager, 2006-2008

EA Engineering, Science & Technology
Hydrogeologist, 2005-2006

P.W. Grosser Consulting, Bohemia, NY
Field Hydrogeologist, 2002-2003

PUBLICATIONS

Chemical Stress Induced by Copper, Examination of a Biofilm System;
(Water Science Technology, 2006; 54(9): 191-199.)

EBC

ENVIRONMENTAL BUSINESS CONSULTANTS

Kevin Waters, Hydrogeologist

Professional Experience
EBC: October 2010
Prior: 5 years

Education
Bachelor of Science, Geology, SUNY Stony Brook

Areas of Expertise
- Soil and Groundwater Sampling
- NYSDEC Spill Closure
- Gasoline/Fuel Oil Tank Removals
- NYC "E" Designations

Professional Certification
- OSHA 40-hr HAZWOPER
- OSHA 8-hr HAZWOPER Supervisor

PROFILE

Mr. Waters has 7 years experience as an environmental consultant and has worked on a wide range of environmental projects. Mr. Waters has conducted Phase II and III Environmental Site Assessments for commercial, industrial, and residential properties in New York.

Mr. Waters' field experience includes soil, air and groundwater sampling, operations and maintenance of groundwater remediation systems, tank removals, spill management and closure, and oversight of monitoring well installations. In addition, Mr. Waters has prepared reports for both regulatory and client use.

PREVIOUS EXPERIENCE

P.W. Grosser Consulting, Bohemia, NY
Field/Project Hydrogeologist, 2003-2008

ATTACHMENT H
Estimated Remedial Costs

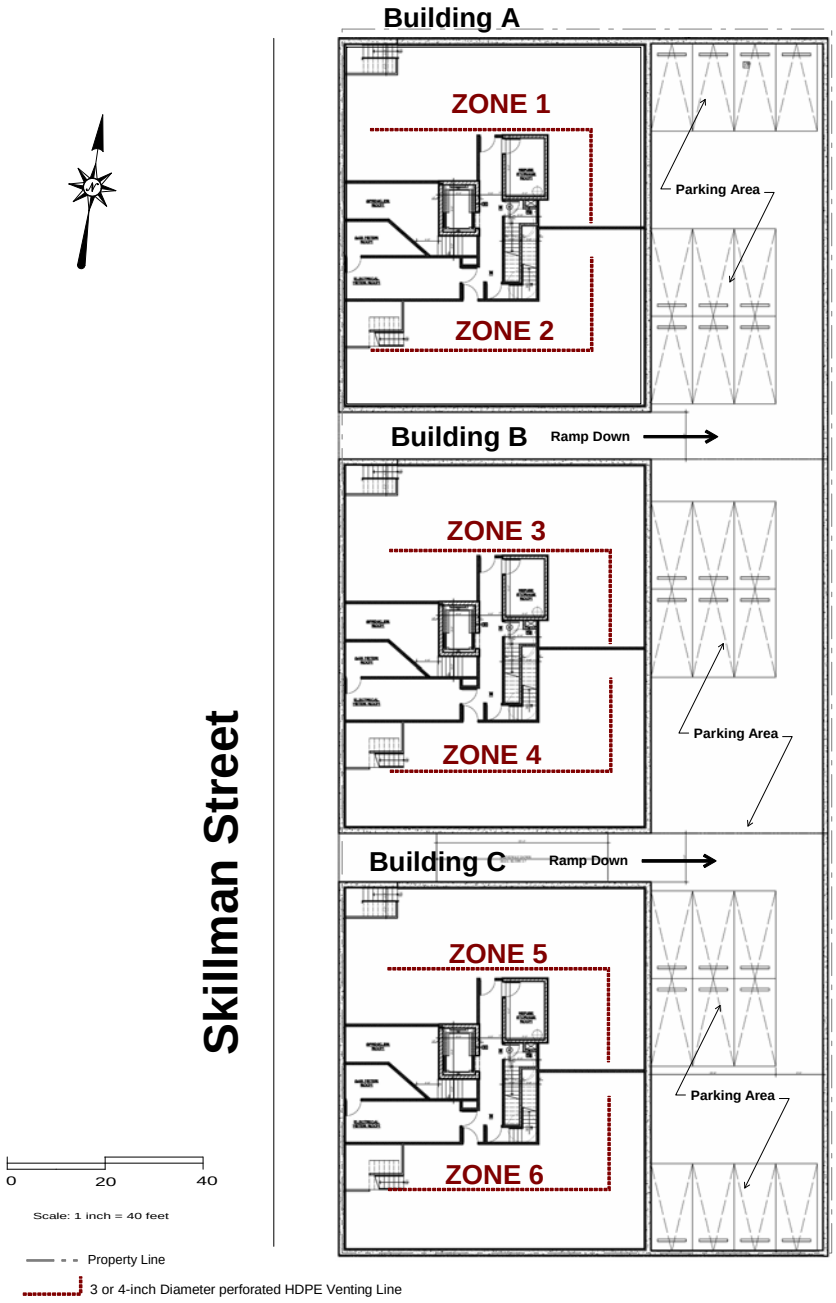
TABLE 1
FORMER EAST COAST INDUSTRIAL UNIFORMS SITE
39 Skillman Street
Brooklyn, NY

Summary of Project Costs

NYS Brownfields Cleanup Program
Costs by Task

TASK	Alternative 1	Alternative 2	Alternative 3
BCP Entry Documents	$ 33,100.00	$ 33,100.00	$ 33,100.00
Supplemental Investigation And RI Report	$ 95,500.00	$ 95,500.00	$ 95,500.00
Remedial Work Plan, Remedy Scoping & Coordination	$ 30,250.00	$ 30,250.00	$ 30,250.00
Remedial Program Implementation	$ 1,556,697.00	$ 1,060,047.00	$ 1,060,047.00
Final Engineering Report, Site Management Plan & IC/ECs	$ 108,500.00	$ 108,500.00	$ 108,500.00
Site Management - Operation and Maintenance Program	$ 91,550.00	$ 91,550.00	$ 91,550.00
Subtotal	$ 1,915,597.00	$ 1,418,947.00	$ 1,418,947.00
15% Contingency	$ 287,339.55	$ 212,842.05	$ 212,842.05
Total	**$ 2,202,936.55**	**$ 1,631,789.05**	**$ 1,631,789.05**

ATTACHMENT I
SSDS Specifications



EBC
Environmental Business Consultants
Phone 631.504.6000
Fax 631. 924 .2870

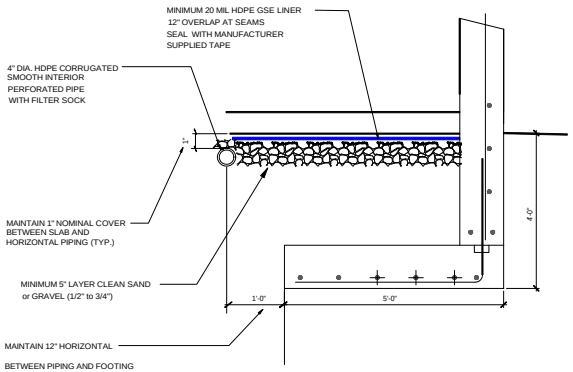
Former East Coast Industrial Uniform Site
39 Skillman Street, Brooklyn, NY

Subslab Depressurization System Layout

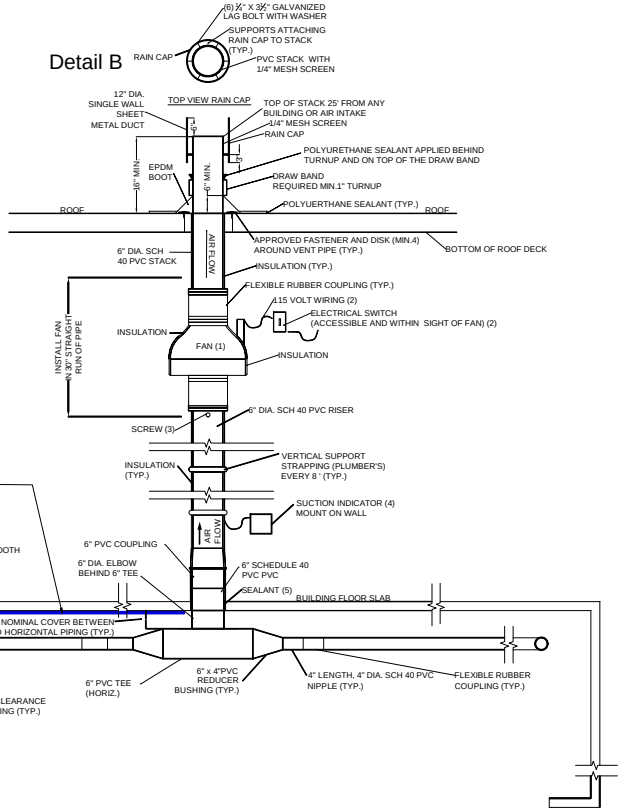
NOTES:

1. FAN TO BE RADONAWAY HIGH-FLOW IN-LINE FAN, MODEL RP 265, OR APPROVED EQUAL.
2. FAN AND ON/OFF SWITCH TO BE HARD-WIRED TOGETHER TO 115 VOLT CIRCUIT.
3. SECURE RUBBER COUPLING WITH SCREW TO PREVENT FAN ASSEMBLY FROM SLIPPING DOWN VERTICAL PIPE.
4. DWYER MAGNAHELIC DIAL TYPE VACUUM GAUGE MODEL 2002-M OR APPROVED EQUAL.
5. SEAL OPENING WITH ELASTOMERIC JOINT SEALANT AS DEFINED IN ASTM C920.
6. HIGH DENSITY POLYETHYLENE CORRUGATED PERFORATED PIPE WITH SMOOTH INTERIOR WATERWAY. ADS N-12 OR APPROVED EQUAL.
7. WRAP 4" HDPE PIPE WITH GEOTEXTILE FABRIC, GSE NW4 OR APPROVED EQUAL.
8. EBC MUST PRE-APPROVE ALL FILLMATERIAL BEFORE DELIVERY TO SITE.

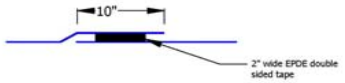
Detail A



Detail B

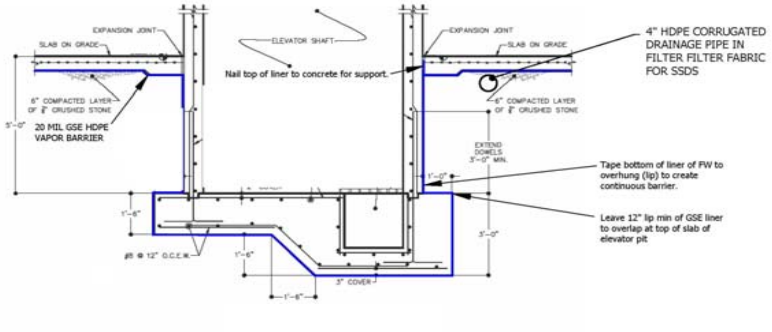


Detail C



20 mil HDPE liner Overlap Detail

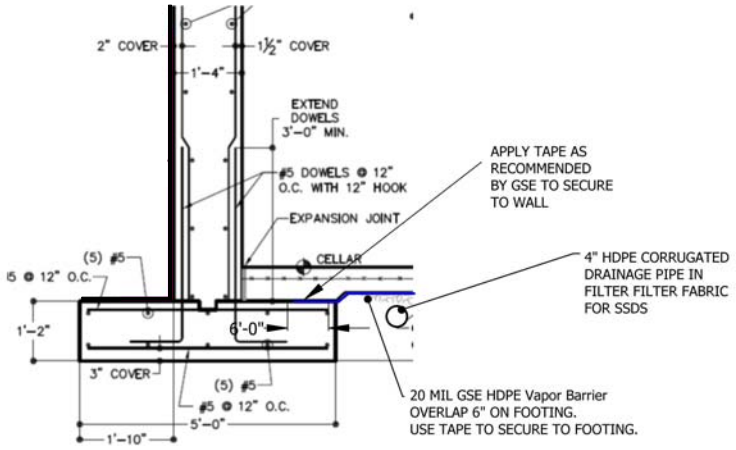
N.T.S.



EVEVATOR PIT DETAIL

Detail D

Detail E



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FORMER EAST COAST INDUSTRIAL UNIFORMS SITE
39 SKILLMAN STREET, BROOKLYN, NY

SUB SLAB DEPRESSURIZATION SYSTEM DETAILS

Vapor Barrier Design and Installation

A vapor barrier is being recommended for this project as a preventative measure. This section includes the specifications and guidelines for installing a below concrete slab sheet vapor barrier. The vapor barrier will extend throughout the area to be occupied by the new multi-use building to be constructed on the site. Vapor barrier seams, penetrations, and repairs will be sealed either by the tape method or weld method, according to the manufacturer's recommendations and instructions.

A vapor retarder or barrier, by definition, is a material or assembly of materials that resists vapor diffusion through it. For this project the sheet material will consist of a black high-density polyethylene (HDPE) film, 20 mil thick.

ASTM references for vapor barriers include the following:

1. ASTM E 1745-97 "Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs."

2. ASTM E 1643-98 "Standard Practice for Vapor Barriers."

Materials
The minimum values for the HDPE film will meet the following:

Property	Test Method	Minimum Values
Thickness, mil (mm)	ASTM D 5199	20
Density, g/cm3	ASTM D 1505	0.94
Carbon Black Content, %	ASTM D 1603, mod.	2.0
Tensile Properties (each direction)	ASTM D 6693	
Strength at Yield, lb/in. (kN/m)		22
Strength at Break, lb/in. (kN/m)		44
Elongation at Yield, %	(1.3" gauge length)	10
Elongation at Break, %	(2.0" gauge length)	500
Tear Resistance, lb (N)	ASTM D 1004	5
Puncture Resistance, lb (N)	ASTM D 4833	26
Notched Constant Tensile Load, hours	ASTM D 5397, app.	400
Oxidative Induction Time, min.	ASTM D 3895	100

The manufacturer of the specified liner is: GSE LINING TECHNOLOGY, INC.

1. All joints in the HDPE sheeting will be sealed with either a tape seal or a weld seal. The tape seal consists of a butyl mastic self-adhering tape, 2 inch (50 mm) wide, compatible with the sheet material.
2. The weld seal consists of an extrudate rod or bead, compatible with sheet material.

Preparation for the installation of the vapor barrier membrane is as follows:

3. Do not install vapor retarder/barrier until items penetrating it are in place.
4. Rake, trim, and tamp surfaces over which membrane is to be installed.
5. Substrates must be regular and smooth with no gaps or voids greater than 0.5 inches (12 mm).
6. The substrate must be free of loose aggregate and sharp protrusions.
7. The substrate does not need to be dry, but standing water must be removed.

Membrane Installation

Place the membrane HDPE film side to the substrate with printed coating side up facing towards the concrete pour. Lay membrane with seams perpendicular to and lapped in direction of concrete pour.

End laps should be staggered to avoid a build-up of layers. Accurately position succeeding sheets to overlap the previous sheet 3 inches (75 mm). Ensure that the underside of the succeeding sheet is clean, dry, and free from contamination before attempting to overlap.

If manufacturer recommends sealing overlaps with tape, proceed with the following steps:

8. Secure overlaps to the bottom sheet with tape.

9. Ensure a continuous bond is achieved without creases and roll firmly with a heavy roller. During cold or damp conditions, the tape adhesive can be gently warmed using a hot air gun or similar to remove moisture or condensation and improve initial adhesion.

10. If manufacturer recommends sealing overlaps by welding, weld overlap seams according to manufacturer's instructions.

11. Penetrations through the membrane such as utility conduits, can be sealed either using the tape and liquid membrane method or the extrusion weld method.

Procedures for sealing penetrations using the tape and seal method include the following:

12. Scribe membrane tight to the penetration.
13. If the membrane is not within 0.5 inches (12 mm) of the penetration, apply tape to cover the gap.
14. Wrap the penetration with tape by positioning the tape 0.5 inches (12 mm) above the membrane.
15. Mix and apply Liquid Membrane around the penetrations using a fillet to provide a watertight seal between the membrane and tape.

Procedures for sealing penetrations using the extrusion weld method include the following:

Scribe membrane tight to the penetration.

16. Perform extrusion weld techniques according to manufacturer's instructions.

Protection

Protect membrane from damage until permanent covering is in place.

Membrane Repair
The membrane can be repaired using either the tape method or the weld method.

The procedure to repair the membrane using the tape method is as follows:

- Repair punctures and tears in membrane using patches of the material and overlapping the puncture or tear a minimum of 12 inches.

- Seal with tape.

The procedure to repair the membrane using the weld method is as follows:

- Repair punctures and tears in membrane using patches of the material and overlapping the puncture or tear a minimum of 6 inches. Seal with extrusion weld.

Inspection
Upon completion of the installation of the membrane, the Contractor shall coordinate an inspection with the Engineer or its designated representative. The membrane shall not be covered until the Contractor receives written approval from the Engineer.

Pouring of Concrete
It is recommended that concrete be poured within 56 days of application of the membrane. Concrete must be placed and compacted carefully to avoid damage to the membrane. Never use a sharp object to consolidate the concrete.

Technical Note

Permeability For GSE Geomembranes

Due to its chemical structure, polyethylene is an (essentially) impermeable substance. The material is made up of very long molecules. There does exist, however, molecular voids (sometimes referred to as "free space") among the individual polyethylene chains. The existence of these spaces is recognized when we say polyethylene is essentially impermeable. Permeation may exist when, for instance, the pressure behind the permeant is very high or the permeant's molecular size is very small. However, the degree of permeation exhibited is difficult to determine using currently available test procedures. As a result, test results frequently reflect the inaccuracy of the procedure rather than the permeation of the material. Testing of GSE HDPE performed by an independent laboratory produced the following results.

Test	ASTM Method	Results
Methane Permeability	D 1434	2.0 x 10-6 mL/cm²·s
Water Vapor Permeability	E 96	1.7 x 10-9 mL/cm²·s

It must be emphasized that different chemicals will permeate at different rates due to differences in molecular shape, polarity and phase (gas or liquid). For example, the relatively small water molecule (atomic weight 18) will more easily permeate the polyethylene matrix as compared to a large molecule such as cyclohexanol (atomic weight 94).

The molecules' polarity must also be considered (recall the adage "like dissolves like"). Polyethylene is a non-polar molecule, therefore other non-polar molecules will permeate the matrix better. Examples of these molecules are hydrocarbons - especially those such as octane, pentane and hexene. The permeation of these are therefore greater than for polar molecules such as water.

A sometimes overlooked factor when reviewing permeation data is that most permeameters apply pressure to encourage permeation. In geotechnical and environmental applications, geomembranes are not subjected to the high pressures of potential permeants as they are in a permeation laboratory test. The lack of a driving force greatly diminishes actual permeation since the gaseous molecules find an easier path to follow than through the polyethylene liner. Also, because of the high pressures required to force permeants through polyethylene, failure of the permeameter is common. This is commonly in the form of a test apparatus leak. Such leaks can result in erroneous results.

TN006 PermeabilityGeomem R03/17/06

North America	GSE Lining Technology, Inc.	Houston, Texas	800 435 2008	281 443 8564	Fax: 281 230 8650
South America	GSE Lining Technology Chile S.A.	Santiago, Chile		56 2 595 4200	Fax: 56 2 595 4290
Asia Pacific	GSE Lining Technology Company Limited	Bangkok, Thailand		66 2 937 0091	Fax: 66 2 937 0097
Europe & Africa	GSE Lining Technology GmbH	Hamburg, Germany		49 40 767420	Fax: 49 40 7674234
Middle East	GSE Lining Technology-Egypt	The 6th of October City, Egypt		202 2 828 8888	Fax: 202 2 828 8889

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Technical Note

Chemical Resistance For GSE Geomembranes

GSE geomembranes are made of high quality, virgin polyethylene which demonstrates excellent chemical resistance. GSE polyethylene geomembranes are resistant to a great number and combinations of chemicals. It is this property of (HDPE) high density polyethylene geomembranes that makes it the lining material of choice.

In order to gauge the durability of a material in contact with a chemical mixture, testing is required in which the material is exposed to the chemical environment in question. Chemical resistance testing is a very large and complex topic because of two factors. First, the number of specific media is virtually endless and second, there are many criteria such as tensile strength, hardness, etc. that may be used to assess a material's resistance to degradation.

The chemical resistance of polyethylene has been investigated by many people over the past few decades. We are able to draw from that work when making statements about the chemical resistance of today's polyethylene geomembranes. In addition to that, many tests have been performed that specifically use geomembranes and certain chemical mixtures. Naturally, however, every mixture of chemicals cannot be tested for. As a result of these factors, GSE published a chemical resistance chart, demonstrating general guidelines.

Polyethylene is, for practical purposes, considered impermeable. Be aware, however, that all materials are permeable to some extent. Permeability varies with concentration, temperature, pressure and type of permeant. The rates of permeation are usually so low, however, that they are insignificant. As a point of reference, polyethylene is commonly used for packaging of several types of materials. These include gasoline, motor oil, household cleaners (i.e. bleach), muratic acid, pesticides, insecticides, fungicides, and other highly concentrated chemicals. Also, you should be aware that there are some chemicals which may be absorbed by the material but only when present at very high concentrations. These include halogenated and/or aromatic hydrocarbons at greater than 50%; their absorption results in swelling and slight changes in physical properties such as increased tensile elongations. This includes many types of fuels and oils. Recognize that this action, however, does not affect the liner's ability to act as a barrier for the material it is containing.

Since polyethylene is a petroleum product, it can absorb other petroleum products. Like a sponge, the material becomes slightly thicker and more flexible but does not produce a hole or void. However, unlike a sponge, this absorption is not immediate. It takes a much longer time for a polyethylene liner to swell than it does for a sponge. The exact time it takes for swelling to occur depends on the particular constituents and concentrations of the contained media. However, a hole would not be produced. Also, this absorption is reversible and the material will essentially return to it's original state when the chemical is no longer in contact with the liner.

With regard to typical municipal landfills in the United States, legally allowable levels of chemicals have been demonstrated to have no adverse affect on polyethylene geomembrane performance. The very low levels of salts, metals and organic compounds do not damage polyethylene. A double-lined containment with a leachate (leak detection) removal system effectively prevents any significant, continuous exposure of the secondary membrane to these materials and for practical purposes makes the total liner system even more impermeable.

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South America	GSE Lining Technology Chile S.A.	Santiago, Chile		56 2 595 4200	Fax: 56 2 595 4290
Asia Pacific	GSE Lining Technology Company Limited	Bangkok, Thailand		66 2 937 0091	Fax: 66 2 937 0097
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Technical Note

Chemical Resistance Chart

GSE is the world's leading supplier of high quality, polyethylene geomembranes. GSE polyethylene geomembranes are resistant to a great number and combinations of chemicals. Note that the effect of chemicals on any material is influenced by a number of variable factors such as temperature, concentration, exposed area and duration. Many tests have been performed that use geomembranes and certain specific chemical mixtures. Naturally, however, every mixture of chemicals cannot be tested for, and various criteria may be used to judge performance. Reported performance ratings may not apply to all applications of a given material in the same chemical. Therefore, these ratings are offered as a guide only. This information is provided for reference purposes only and is not intended as a warranty or guarantee. GSE assumes no liability in connection with the use of this information.

Medium	Concentration	Resistance at: 20 °C (68 °F)	60 °C (140 °F)
A			
Acetic acid	100%	S	L
Acetic acid	10%	S	S
Acetic acid anhydride	100%	S	L
Acetone	100%	L	L
Adipic acid	sat. sol.	S	S
Allyl alcohol	96%	S	S
Aluminum chloride	sat. sol.	S	S
Aluminum fluoride	sat. sol.	S	S
Aluminum sulfate	sat. sol.	S	S
Alum	sol.	S	S
Ammonia, aqueous	dil. sol.	S	S
Ammonia, gaseous dry	100%	S	S
Ammonia, liquid	100%	S	S
Ammonium chloride	sat. sol.	S	S
Ammonium fluoride	sol.	S	S
Ammonium nitrate	sat. sol.	S	S
Ammonium sulfate	sat. sol.	S	S
Ammonium sulfide	sol.	S	S
Amyl acetate	100%	S	L
Amyl alcohol	100%	S	L
Aniline	100%	S	L
Antimony trichloride	90%	S	S
Arsenic acid	sat. sol.	S	S
Aqua regia	HCI-HNO3	U	U
B			
Barium carbonate	sat. sol.	S	S
Barium chloride	sat. sol.	S	S
Barium hydroxide	sat. sol.	S	S
Barium sulfate	sat. sol.	S	S
Barium sulfide	sol.	S	S
Benzaldehyde	100%	S	L
Benzene	—	L	L
Benzoic acid	sat. sol.	S	S
Beer	—	S	S
Borax (sodium tetraborate)	sat. sol.	S	S
Boric acid	sat. sol.	S	S
Bromine, gaseous dry	100%	U	U
Bromine, liquid	100%	U	U
Butane, gaseous	100%	S	S
1-Butanol	100%	S	S
Butyric acid	100%	S	L
C			
Calcium carbonate	sat. sol.	S	S
Calcium chlorate	sat. sol.	S	S
Calcium chloride	sat. sol.	S	S
Calcium nitrate	sat. sol.	S	S
Calcium sulfate	sat. sol.	S	S
Calcium sulfide	dil. sol.	L	L
Carbon dioxide, gaseous dry	100%	S	S
Carbon disulfide	100%	L	U
Carbon monoxide	100%	S	S
Chloracetic acid	sol.	S	S
Carbon tetrachloride	100%	L	U
Chlorine, aqueous solution	sat. sol.	L	U
Chlorine, gaseous dry	100%	L	U
Chloroform	100%	U	U
Chromic acid	20%	S	L
Chromic acid	50%	S	L
Citric acid	sat. sol.	S	S

Medium	Concentration	Resistance at: 20 °C (68 °F)	60 °C (140 °F)
Copper chloride	sat. sol.	S	S
Copper nitrate	sat. sol.	S	S
Copper sulfate	sat. sol.	S	S
Cresylic acid	sat. sol.	L	—
Cyclohexanol	100%	S	S
Cyclohexanone	100%	S	L
D			
Decahydronaphthalene	100%	S	L
Dextrine	sol.	S	S
Diethyl ether	100%	L	—
Dioctylphthalate	100%	S	L
Dioxane	100%	S	S
E			
Ethanediol	100%	S	S
Ethanol	40%	S	L
Ethyl acetate	100%	S	U
Ethylene trichloride	100%	U	U
F			
Ferric chloride	sat. sol.	S	S
Ferric nitrate	sol.	S	S
Ferric sulfate	sat. sol.	S	S
Ferrous chloride	sat. sol.	S	S
Ferrous sulfate	sat. sol.	S	S
Fluorine, gaseous	100%	U	U
Fluorosilicic acid	40%	S	S
Formaldehyde	40%	S	S
Formic acid	50%	S	S
Formic acid	98-100%	S	S
Furfuryl alcohol	100%	S	L
G			
Gasoline	—	S	L
Glacial acetic acid	96%	S	L
Glucose	sat. sol.	S	S
Glycerine	100%	S	S
Glycol	sol.	S	S
H			
Heptane	100%	S	U
Hydrobromic acid	50%	S	S
Hydrobromic acid	100%	S	S
Hydrochloric acid	10%	S	S
Hydrochloric acid	35%	S	S
Hydrocyanic acid	10%	S	S
Hydrofluoric acid	4%	S	S
Hydrofluoric acid	60%	S	L
Hydrogen	100%	S	S
Hydrogen peroxide	30%	S	L
Hydrogen peroxide	90%	S	U
Hydrogen sulfide, gaseous	100%	S	S
L			
Lactic acid	100%	S	S
Lead acetate	sat. sol.	S	—
M			
Magnesium carbonate	sat. sol.	S	S
Magnesium chloride	sat. sol.	S	S
Magnesium hydroxide	sat. sol.	S	S
Magnesium nitrate	sat. sol.	S	S
Maleic acid	sat. sol.	S	S
Mercuric chloride	sat. sol.	S	S

- Continued -

Medium	Concentration	Resistance at: 20 °C (68 °F)	60 °C (140 °F)
Mercuric cyanide	sat. sol.	S	S
Mercuric nitrate	sol.	S	S
Mercury	100%	S	S
Methanol	100%	S	S
Methylene chloride	100%	L	—
Milk	—	S	S
Molasses	—	S	S
N			
Nickel chloride	sat. sol.	S	S
Nickel nitrate	sat. sol.	S	S
Nickel sulfate	sat. sol.	S	S
Nicotinic acid	dil. sol.	S	—
Nitric acid	25%	S	S
Nitric acid	50%	S	U
Nitric acid	75%	U	U
Nitric acid	100%	U	U
O			
Oils and Grease	—	S	L
Oleic acid	100%	S	L
Orthophosphoric acid	50%	S	S
Orthophosphoric acid	95%	S	L
Oxalic acid	sat. sol.	S	S
Oxygen	100%	S	L
Ozone	100%	L	U
P			
Petroleum (kerosene)	—	S	L
Phenol	sol.	S	S
Phosphorus trichloride	100%	S	L
Photographic developer	cust. conc.	S	S
Picric acid	sat. sol.	S	—
Potassium bicarbonate	sat. sol.	S	S
Potassium bisulfide	sol.	S	S
Potassium bromate	sat. sol.	S	S
Potassium bromide	sat. sol.	S	S
Potassium carbonate	sat. sol.	S	S
Potassium chlorate	sat. sol.	S	S
Potassium chloride	sat. sol.	S	S
Potassium chromate	sat. sol.	S	S
Potassium cyanide	sol.	S	S
Potassium dichromate	sat. sol.	S	S
Potassium ferricyanide	sat. sol.	S	S
Potassium ferrocyanide	sat. sol.	S	S
Potassium fluoride	sat. sol.	S	S
Potassium hydroxide	10%	S	S
Potassium hydroxide	sol.	S	S
Potassium hypochlorite	sol.	S	L
Potassium nitrate	sat. sol.	S	S
Potassium orthophosphate	sat. sol.	S	S
Potassium perchlorate	sat. sol.	S	S
Potassium permanganate	20%	S	S
Potassium persulfate	sat. sol.	S	S
Potassium sulfate	sat. sol.	S	S
Potassium sulfite	sol.	S	S
Propionic acid	50%	S	S
Propionic acid	100%	S	L
Pyridine	100%	S	L
Q			
Quinol (Hydroquinone)	sat. sol.	S	S
S			
Salicylic acid	sat. sol.	S	S
Silver acetate	sat. sol.	S	S
Silver cyanide	sat. sol.	S	S
Silver nitrate	sat. sol.	S	S
Sodium benzoate	sat. sol.	S	S
Sodium bicarbonate	sat. sol.	S	S
Sodium biphosphate	sat. sol.	S	S
Sodium bisulfite	sol.	S	S
Sodium bromide	sat. sol.	S	S
Sodium carbonate	sat. sol.	S	S
Sodium chlorate	sat. sol.	S	S
Sodium chloride	sat. sol.	S	S
Sodium cyanide	sat. sol.	S	S
Sodium ferricyanide	sat. sol.	S	S
Sodium ferrocyanide	sat. sol.	S	S
Sodium fluoride	sat. sol.	S	S
Sodium hydroxide	40%	S	S
Sodium hydroxide	sat. sol.	S	S
Sodium hypochlorite	15% active chlorine	S	S
Sodium nitrate	sat. sol.	S	S
Sodium nitrite	sat. sol.	S	S
Sodium orthophosphate	sat. sol.	S	S
Sodium sulfate	sat. sol.	S	S
Sodium sulfide	sat. sol.	S	S
Sulfur dioxide, dry	100%	S	S
Sulfur trioxide	100%	U	U
Sulfuric acid	10%	S	S
Sulfuric acid	50%	S	S
Sulfuric acid	98%	S	U
Sulfuric acid	fuming	U	U
Sulfurous acid	30%	S	S
T			
Tannic acid	sol.	S	S
Tartaric acid	sol.	S	S
Thionyl chloride	100%	L	U
Toluene	100%	L	U
Triethylamine	sol.	S	L
U			
Urea	sol.	S	S
Urine	—	S	S
W			
Water	—	S	S
Wine vinegar	—	S	S
Wines and liquors	—	S	S
X			
Xylenes	100%	L	U
Y			
Yeast	sol.	S	S
Z			
Zinc carbonate	sat. sol.	S	S
Zinc chloride	sat. sol.	S	S
Zinc (II) chloride	sat. sol.	S	S
Zinc (IV) chloride	sat. sol.	S	S
Zinc oxide	sat. sol.	S	S
Zinc sulfate	sat. sol.	S	S

Specific immersion testing should be undertaken to ascertain the suitability of chemicals not listed above with reference to special requirements.

NOTES:

(S) Satisfactory: *Liner material is resistant to the given reagent at the given concentration and temperature. No mechanical or chemical degradation is observed.*

(L) Limited Application Possible: *Liner material may reflect some attack. Factors such as concentration, pressure and temperature directly affect liner performance against the given media. Application, however, is possible under less severe conditions, e.g. lower concentration, secondary containment, additional liner protections, etc.*

(U) Unsatisfactory: ***Liner material is not resistant to the given reagent at the given concentration and temperature. Mechanical and/or chemical degradation is observed.***

(–) Not tested

sat. sol. = *Saturated aqueous solution, prepared at 20°C (68°F)*

sol. = *aqueous solution with concentration above 10% but below saturation level*

dil. sol. = *diluted aqueous solution with concentration below 10%*

cust. conc. = *customary service concentration*

TN032 ResistChart R03/17/06

North America	GSE Lining Technology, Inc.	Houston, Texas	800 435 2008	281 443 8564	Fax: 281 230 8650
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Asia Pacific	GSE Lining Technology Company Limited	Bangkok, Thailand		66 2 937 0091	Fax: 66 2 937 0097
Europe & Africa	GSE Lining Technology GmbH	Hamburg, Germany		49 40 767420	Fax: 49 40 7674234
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- Ultra-quiet operation
- Meets all electrical code requirements
- Water-hardened motorized impeller
- Seams sealed to inhibit radon leakage (RP140 & RP145 double snap sealed)
- RP140 and RP260 Energy Star® Rated
- ETL Listed - for indoor or outdoor use
- Thermally protected motor
- Rated for commercial and residential use

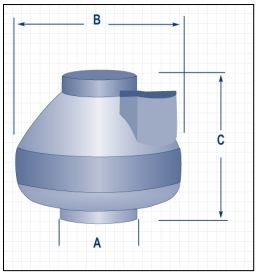
MODEL	P/N	FAN DUCT DIAMETER	WATTS	MAX. PRESSURE"WC	TYPICAL CFM vs. STATIC PRESSURE WC				
					0"	.5"	1.0"	1.5"	2.0"
RP140*	23029-1	4"	15-21	0.8	135	70	-	-	-
RP145	23030-1	4"	41-72	2.1	166	126	82	41	3
RP260*	23032-1	6"	50-75	1.6	272	176	89	13	-
RP265	23033-1	6"	91-129	2.3	334	247	176	116	52
RP380*	28208	8"	95-152	2.3	497	353	220	130	38

*Energy Star® Rated

Made in USA with US and imported parts

ETL Listed

All RadonAway inline radon fans are covered by our 5-year, hassle-free warranty



Model	A	B	C
RP140	4.5"	9.7"	8.5"
RP145	4.5"	9.7"	8.5"
RP260	6"	11.75"	8.6"
RP265	6"	11.75"	8.6"
RP380	8"	13.41"	10.53"

For Further Information Contact

9/12
P/N 02008

RadonAway™

The World's Leading
Radon Fan Manufaturer



RP Series
Installation Instructions

RadonAway
3 Saber Way | Ward Hill, MA 01835
www.radonaway.com

P/N IN020-REV K 4/11

Series Fan Installation Instructions

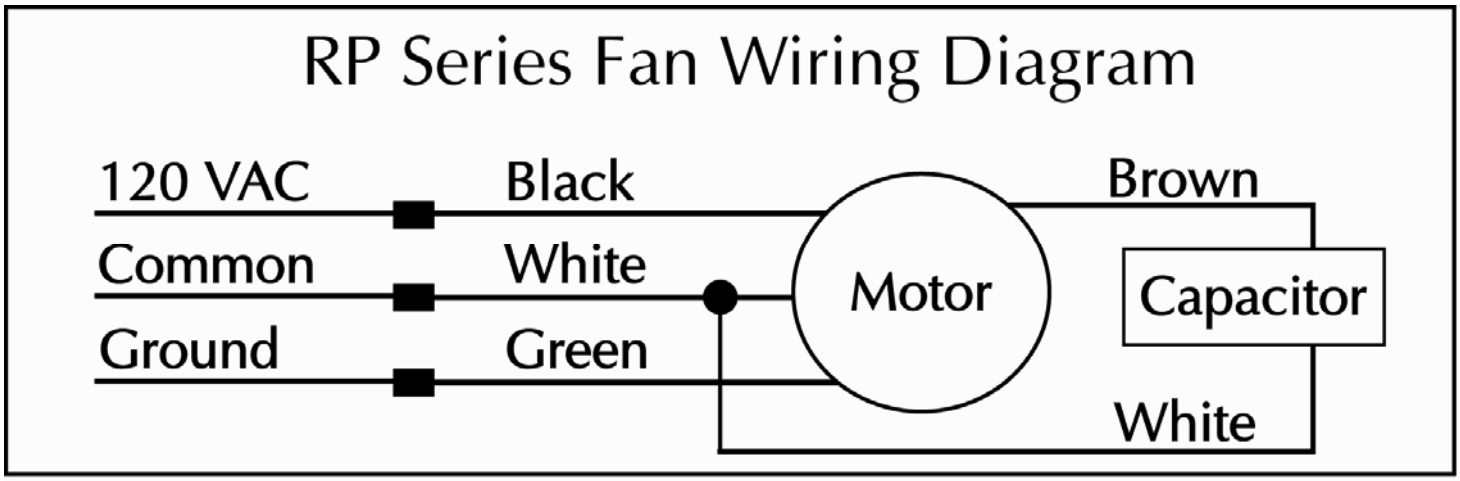
Please Read and Save These Instructions.

DO NOT CONNECT POWER SUPPLY UNTIL FAN IS COMPLETELY INSTALLED.
MAKE SURE ELECTRICAL SERVICE TO FAN IS LOCKED IN "OFF" POSITION.
DISCONNECT POWER BEFORE SERVICING FAN.

1. **WARNING!** Do not use fan in hazardous environments where fan electrical system could provide ignition to combustible or flammable materials.
2. **WARNING!** Do not use fan to pump explosive or corrosive gases.
3. **WARNING!** Check voltage at the fan to insure it corresponds with nameplate.
4. **WARNING!** Normal operation of this device may affect the combustion airflow needed for safe operation of fuel burning equipment. Check for possible backdraft conditions on all combustion devices after installation.
5. **NOTICE!** There are no user serviceable parts located inside the fan unit.
   Do NOT attempt to open. Return unit to the factory for service.
6. All wiring must be performed in accordance with the National Fire Protection Association's (NFPA)"National Electrical Code, Standard #70"-current edition for all commercial and industrial work, and state and local building codes. All wiring must be performed by a qualified and licensed electrician
7. **WARNING!** Do not leave fan unit installed on system piping without electrical power for more than 48 hours. Fan failure could result from this non-operational storage.
8. **WARNING!** TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS, OBSERVE THE FOLLOWING:

   a) Use this unit only in the manner intended by the manufacturer. If you have questions, contact the manufacturer.

   b) Before servicing or cleaning unit, switch power off at service panel and lock the service disconnecting means to prevent power from being switched on accidentally. When the service disconnecting means cannot be locked, securely fasten a prominent warning device, such as a tag, to the service panel.



1.0 SYSTEM DESIGN CONSIDERATIONS

1.1 INTRODUCTION

The RP Series Radon Fans are intended for use by trained, professional Radon mitigators. The purpose of this instruction is to provide additional guidance for the most effective use of an RP Series Fan. This instruction should be considered as a supplement to EPA standard practices, state and local building codes and state regulations. In the event of a conflict, those codes, practices and regulations take precedence over this instruction.

1.2 ENVIRONMENTALS

The RP Series Fans are designed to perform year-round in all but the harshest climates without additional concern for temperature or weather. For installations in an area of severe cold weather, please contact RadonAway for assistance. When not in operation, the fan should be stored in an area where the temperature is never less than 32 degrees F. or more than 100 degrees F.

1.3 ACOUSTICS

The RP Series Fan, when installed properly, operates with little or no noticeable noise to the building occupants. The velocity of the outgoing air should be considered in the overall system design. In some cases the "rushing" sound of the outlet air may be disturbing. In these instances, the use of a RadonAway Exhaust Muffler is recommended.

(To ensure quiet operation of ENERGY STAR qualified in-line and remote fans, each fan shall be installed using sound attenuation techniques appropriate for the installation. For bathroom and general ventilation applications, at least 8 feet of insulated flexible duct shall be installed between the exhaust or supply grille(s) and the fan).

1.4 GROUND WATER

In the event that a temporary high water table results in water at or above slab level, water may be drawn into the riser pipes thus blocking air flow to the RP Series Fan. The lack of cooling air may result in the fan cycling on and off as the internal temperature rises above the thermal cutoff and falls upon shutoff. Should this condition arise, it is recommended that the fan be turned off until the water recedes allowing for return to normal operation.

1.5 SLAB COVERAGE

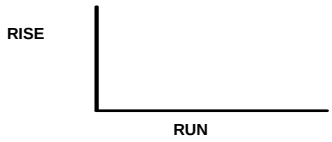
The RP Series Fan can provide coverage up to 2000+ sq. ft. per slab penetration. This will primarily depend on the sub-slab material in any particular installation. In general, the tighter the material, the smaller the area covered per penetration. Appropriate selection of the RP Series Fan best suited for the sub-slab material can improve the slab coverage. The RP140/145/155 are best suited for general purpose use. The RP260 can be used where additional airflow is required and the RP265/380 is best suited for large slab, high airflow applications. Additional suction points can be added as required. It is recommended that a small pit (5 to 10 gallons in size) be created below the slab at each suction hole.

1.6 CONDENSATION & DRAINAGE

Condensation is formed in the piping of a mitigation system when the air in the piping is chilled below its dew point. This can occur at points where the system piping goes through unheated space such as an attic, garage or outside. The system design must provide a means for water to drain back to a slab hole to remove the condensation. The RP Series Fan **MUST** be mounted vertically plumb and level, with the outlet pointing up for proper drainage through the fan. Avoid mounting the fan in any orientation that will allow water to accumulate inside the fan housing. The RP Series Fans are **NOT** suitable for underground burial.

For RP Series Fan piping, the following table provides the minimum recommended pipe diameter and pitch under several system conditions.

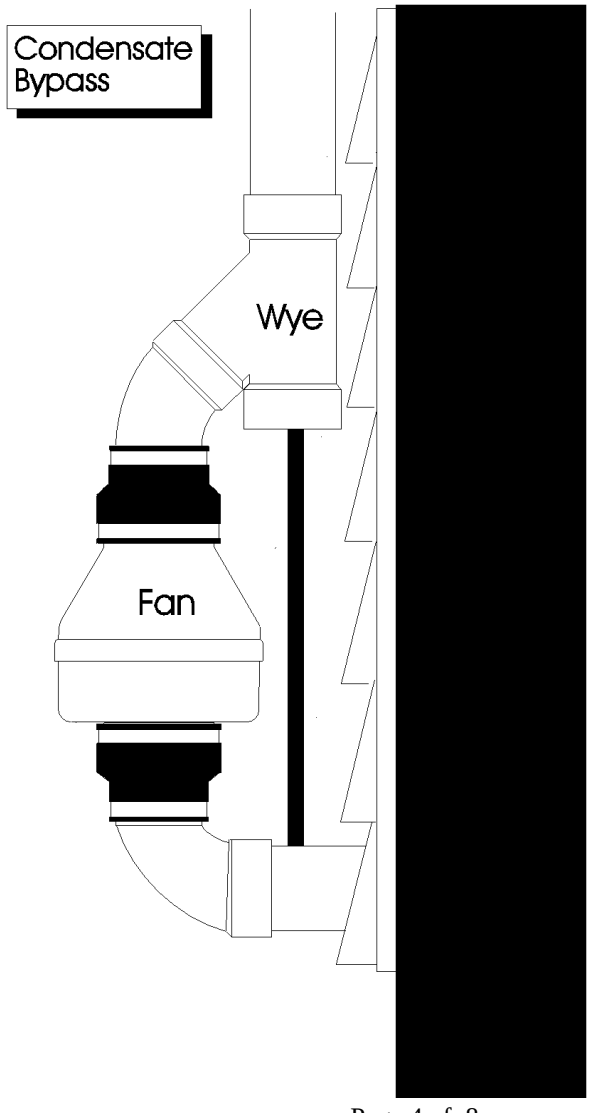
Pipe Dia.	Minimum Rise per Ft of Run*				
	@25 CFM	@50 CFM	@100 CFM	@200 CFM	@300 CFM
6"	-	3/16	1/4	3/8	3/4
4"	1/8	1/4	3/8	2 3/8	-
3"	1/4	3/8	1 1/2	-	-



*Typical RP1xx/2xx Series Fan operational flow rate is 25 - 90 CFM 0n 3" and 4" pipe. (For more precision, determine flow rate by measuring Static Pressure, in WC, and correlate pressure to flow in the performance chart in the addendum.)

Under some circumstances in an outdoor installation a condensate bypass should be installed in the outlet ducting as shown. This may be particularly true in cold climate installations which require long lengths of outlet ducting or where the outlet ducting is likely to produce large amounts of condensation because of high soil moisture or outlet duct material. Schedule 20 piping and other thin-walled plastic ducting and Aluminum downspout will normally produce much more condensation than Schedule 40 piping.

The bypass is constructed with a 45 degree Wye fitting at the bottom of the outlet stack. The bottom of the Wye is capped and fitted with a tube that connects to the inlet piping or other drain. The condensation produced in the outlet stack is collected in the Wye fitting and drained through the bypass tube. The bypass tubing may be insulated to prevent freezing.



1.7 "SYSTEM ON" INDICATOR

A properly designed system should incorporate a "System On" Indicator for affirmation of system operation. A manometer, such as a U-Tube, or a vacuum alarm is recommended for this purpose.

1.8 ELECTRICAL WIRING

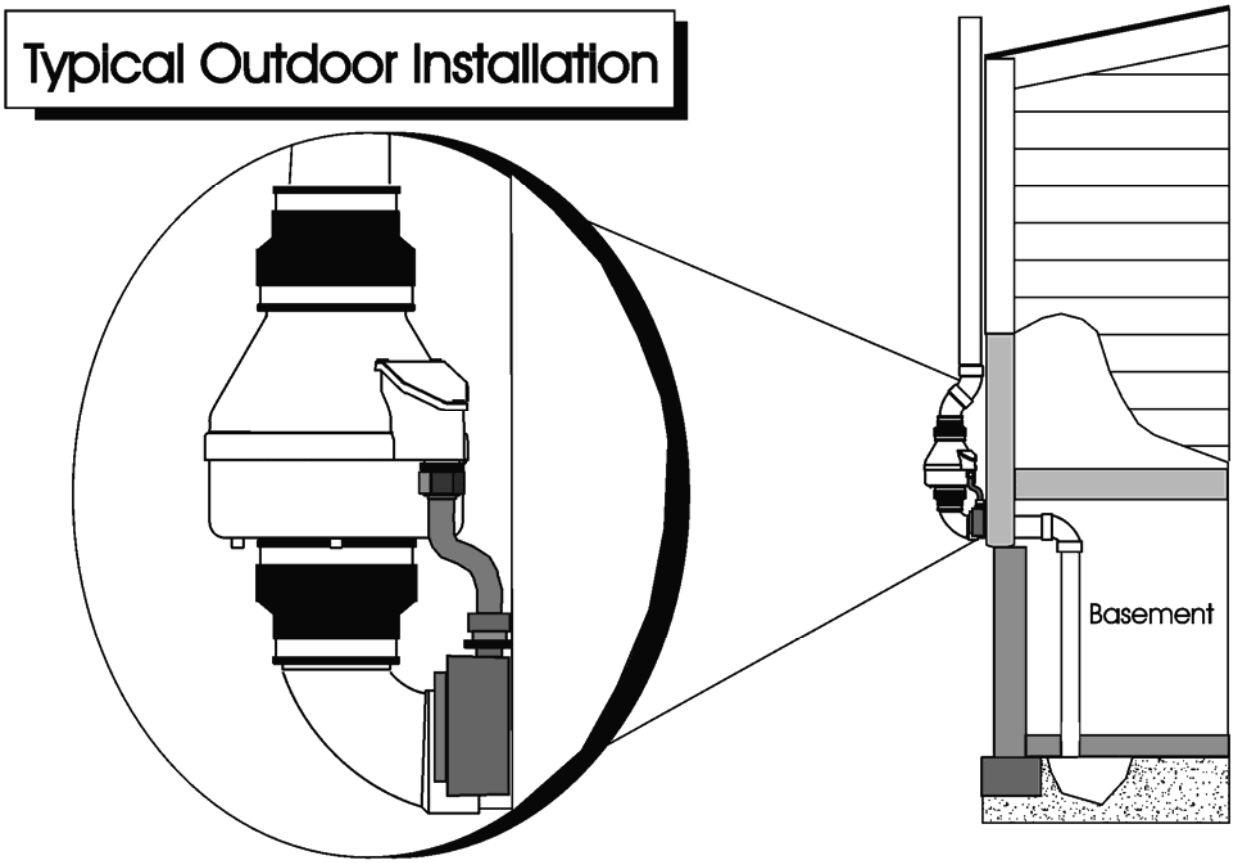
The RP Series Fans operate on standard 120V 60 Hz. AC. All wiring must be performed in accordance with the National Fire Protection Association's (NFPA)"National Electrical Code, Standard #70"-current edition for all commercial and industrial work, and state and local building codes. All wiring must be performed by a qualified and licensed electrician. Outdoor installations require the use of a U.L. listed watertight conduit. Ensure that all exterior electrical boxes are outdoor rated and properly sealed to prevent water penetration into the box. A means, such as a weep hole, is recommended to drain the box.

1.9 SPEED CONTROLS

The RP Series Fans are rated for use with electronic speed controls, however, they are generally not recommended. If used, the recommended speed control is Pass & Seymour Solid State Speed Control Cat. No. 94601-I.

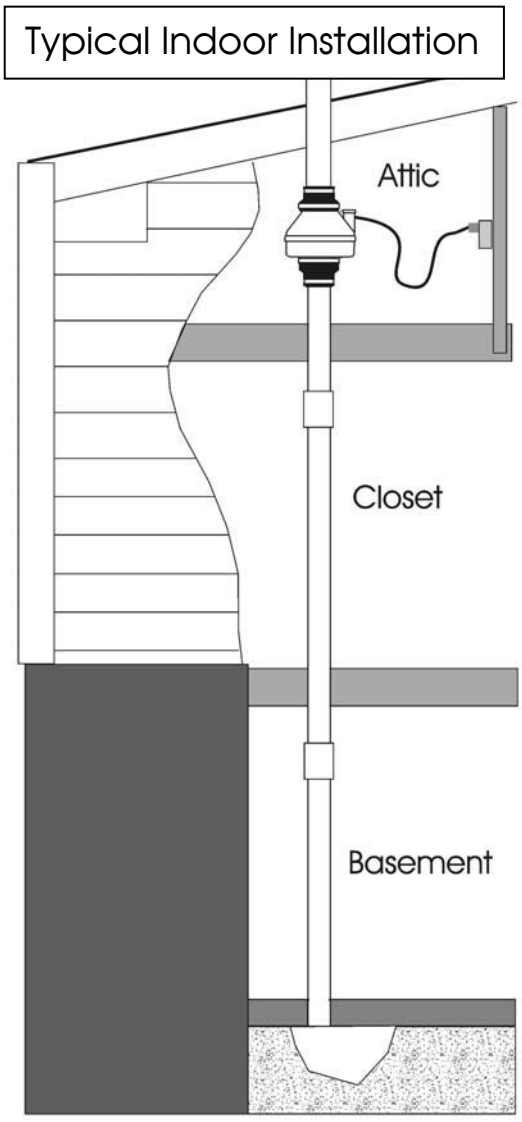
2.0 INSTALLATION

The RP Series Fan can be mounted indoors or outdoors. (It is suggested that EPA recommendations be followed in choosing the fan location.) The RP Series Fan may be mounted directly on the system piping or fastened to a supporting structure by means of optional mounting bracket.



2.1 MOUNTING

Mount the RP Series Fan vertically with outlet up. Insure the unit is plumb and level. When mounting directly on the system piping assure that the fan does not contact any building surface to avoid vibration noise.



2.2 MOUNTING BRACKET (optional)

The RP Series Fan may be optionally secured with the RadonAway P/N 25007-2 (25033 for RP385) mounting bracket. Foam or rubber grommets may also be used between the bracket and mounting surface for vibration isolation.

2.3 SYSTEM PIPING

Complete piping run, using flexible couplings as means of disconnect for servicing the unit and vibration isolation.

2.4 ELECTRICAL CONNECTION

Connect wiring with wire nuts provided, observing proper connections (See Section 1.8):

Fan Wire	Connection
Green	Ground
Black	AC Hot
White	AC Common

2.5 VENT MUFFLER (optional)

Install the muffler assembly in the selected location in the outlet ducting. Solvent weld all connections. The muffler is normally installed at the end of the vent pipe.

2.6 OPERATION CHECKS

_____ **Verify** all connections are tight and **leak-free**.

_____ **Insure** the RP Series Fan and all ducting is secure and vibration-free.

_____ **Verify** system vacuum pressure with manometer. **Insure** vacuum pressure is **less than** maximum recommended operating pressure

(Based on sea-level operation, at higher altitudes reduce by about 4% per 1000 Feet.)
(Further reduce Maximum Operating Pressure by 10% for High Temperature environments)
See Product Specifications. If this is exceeded, increase the number of suction points.

_____ **Verify Radon levels by testing to EPA protocol.**

RP SERIES PRODUCT SPECIFICATIONS

The following chart shows fan performance for the RP Series Fan:

Typical CFM Vs Static Pressure "WC									
	0"	.25"	.5"	.75"	1.0"	1.25"	1.5"	1.75"	2.0"
RP140	135	103	70	14	-	-	-	-	-
RP145	166	146	126	104	82	61	41	21	3
RP260	272	220	176	138	103	57	13	-	-
RP265	334	291	247	210	176	142	116	87	52
RP380*	497	401	353	281	220	176	130	80	38

* Tested with 6" inlet and discharge pipe.

Power Consumption 120 VAC, 60Hz 1.5 Amp Maximum		Maximum Recommended Operating Pressure* (Sea Level Operation)**	
RP140	17 - 21 watts	RP140	0.8" W.C.
RP145	41 - 72 watts	RP145	1.7" W.C.
RP260	52 - 72 watts	RP260	1.5" W.C.
RP265	91 - 129 watts	RP265	2.2" W.C.
RP380	95 - 152 watts	RP380	2.0" W.C.

**Reduce by 10% for High Temperature Operation*
***Reduce by 4% per 1000 feet of altitude*

	Size	Weight	Inlet/Outlet
RP140	8.5H" x 9.7" Dia.	5.5 lbs.	4.5" OD (4.0" PVC Sched 40 size compatible)
RP145	8.5H" x 9.7" Dia.	5.5 lbs.	4.5" OD (4.0" PVC Sched 40 size compatible)
RP260	8.6H" x 11.75" Dia.	5.5 lbs.	6.0" OD
RP265	8.6H" x 11.75" Dia.	6.5 lbs.	6.0" OD
RP380	10.53H" x 13.41" Dia.	11.5 lbs.	8.0" OD

Recommended ducting: 3" or 4" RP1xx/2xx, 6" RP380, Schedule 20/40 PVC Pipe

Mounting: Mount on the duct pipe or with optional mounting bracket.

Storage temperature range: 32 - 100 degrees F.

Normal operating temperature range: -20 - 120 degrees F.

Maximum inlet air temperature: 80 degrees F.

Continuous Duty

Class B Insulation

Thermally Protected

3000 RPM

Rated for Indoor or Outdoor Use

LISTED Electric Fan ETL® 77728 Tested to UL Std. 507

ENERGY STAR **RP140 and RP260 Only.**

TESTED/CERTIFIED HOME VENTILATING INSTITUTE® DIVISION OF AMCA

IMPORTANT INSTRUCTIONS TO INSTALLER

Inspect the GP/XP/XR/RP Series Fan for shipping damage within 15 days of receipt. Notify **RadonAway of any damages immediately**. Radonaway is not responsible for damages incurred during shipping. However, for your benefit, Radonaway does insure shipments.

There are no user serviceable parts inside the fan. **Do not attempt to open.** Return unit to factory for service.

Install the GP/XP/XR/RP Series Fan in accordance with all EPA standard practices, and state and local building codes and state regulations.

WARRANTY

Subject to any applicable consumer protection legislation, RadonAway warrants that the GPX01/XP/XR/RP Series Fan (the "Fan") will be free from defects in materials and workmanship for a period of 90 days from the date of purchase (the "Warranty Term").

RadonAway will replace any Fan which fails due to defects in materials or workmanship. The Fan must be returned (at Owner's cost) to the RadonAway factory. Any Fan returned to the factory will be discarded unless the Owner provides specific instructions along with the Fan when it is returned regardless of whether or not the Fan is actually replaced under this warranty. Proof of purchase must be supplied upon request for service under this Warranty.

This Warranty is contingent on installation of the Fan in accordance with the instructions provided. This Warranty does not apply where any repairs or alterations have been made or attempted by others, or if the unit has been abused or misused. Warranty does not cover damage in shipment unless the damage is due to the negligence of RadonAway.

5 YEAR EXTENDED WARRANTY WITH PROFESSIONAL INSTALLATION.

RadonAway will extend the Warranty Term of the fan to 5 years from date of manufacture if the Fan is installed in a professionally designed and professionally installed radon system or installed as a replacement fan in a professionally designed and professionally installed radon system. Proof of purchase and/or proof of professional installation may be required for service under this warranty. Outside the Continental United States and Canada the extended Warranty Term is limited to one (1) year from the date of manufacture.

RadonAway is not responsible for installation, removal or delivery costs associated with this Warranty.

EXCEPT AS STATED ABOVE, THE GPx01/XP/XR/RP SERIES FANS ARE PROVIDED WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

IN NO EVENT SHALL RADONAWAY BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR RELATING TO, THE FAN OR THE PERFORMANCE THEREOF. RADONAWAY'S AGGREGATE LIABILITY HEREUNDER SHALL NOT IN ANY EVENT EXCEED THE AMOUNT OF THE PURCHASE PRICE OF SAID PRODUCT. THE SOLE AND EXCLUSIVE REMEDY UNDER THIS WARRANTY SHALL BE THE REPAIR OR REPLACEMENT OF THE PRODUCT, TO THE EXTENT THE SAME DOES NOT MEET WITH RADONAWAY'S WARRANTY AS PROVIDED ABOVE.

For service under this Warranty, contact RadonAway for a Return Material Authorization (RMA) number and shipping information. No returns can be accepted without an RMA. If factory return is required, the customer assumes all shipping cost to and from factory.

RadonAway
3 Saber Way
Ward Hill, MA 01835
TEL. (978) 521-3703
FAX (978) 521-3964

Record the following information for your records:

Serial No._____
Purchase Date_____

INSTALLATION & OPERATING INSTRUCTIONS
Instruction P/N IN015 Rev E
FOR *CHECKPOINT IIa*™ P/N 28001-2 & 28001-3
RADON SYSTEM ALARM

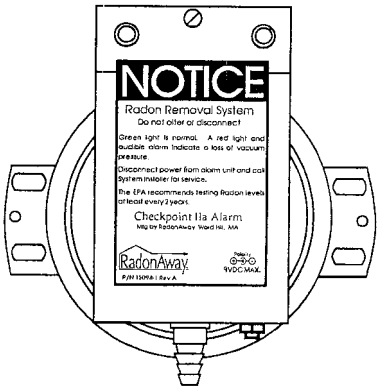
INSTALLATION INSTRUCTIONS
(WALL MOUNTING)

Select a suitable wall location near a vertical section of the suction pipe. The unit should be mounted about four or five feet above the floor and as close to the suction pipe as possible. Keep in mind that with the plug-in transformer provided, the unit must also be within six feet of a 120V receptacle. **NOTE: The Checkpoint IIa is calibrated for vertical mounting, horizontal mounting will affect switchpoint calibration.**

Drill two ¼" holes 4" apart horizontally where the unit is to be mounted.

Install the two ¼" wall anchors provided.

Hang the CHECKPOINT IIa from the two mouting holes located on the mounting bracket. Tighten the mounting screws so the unit fits snugly and securely against the wall.



Drill a 5/16" hole into the side of the vent pipe about 6" higher than the top of the unit.

Insert the vinyl tubing provided about 1" inside the suction pipe.

Cut a suitable length of vinyl tubing and attach it to the pressure switch connector on the CHECKPOINT IIa.

CALIBRATION AND OPERATION.

The CHECKPOINT IIa units are calibrated and sealed at the factory to alarm when the vacuum pressure falls below the factory setting and should not normally require field calibration. Factory Settings are:
28001-2 -.25" WC Vacuum
28001-3 -.10" WC Vacuum

To Verify Operation:

With the exhaust fan off or the pressure tubing disconnected and the CHECKPOINT IIa plugged in, both the red indicator light and the audible alarm should be on.

Turn the fan system on or connect the pressure tubing to the fan piping. The red light and the audible alarm should go off. The green light should come on.

Now turn the fan off. The red light and audible alarm should come on in about two or three seconds and the green light should go out.

WARRANTY INFORMATION

Subject to applicable consumer protection legislation, RadonAway warrants that the CHECKPOINT IIa will be free from defective material and workmanship for a period of (1) year from the date of purchase. Warranty is contingent on installation in accordance with the instructions provided. This warranty does not apply where repairs or alterations have been made or attempted by others; or the unit has been abused or misused. Warranty does not include damage in shipment unless the damage is due to the negligence of RadonAway. All other warranties, expressed or written, are not valid. To make a claim under these limited warranties, you must return the defective item to RadonAway with a copy of the purchase receipt. RadonAway is not responsible for installation or removal cost associated with this warranty. In no case is RadonAway liable beyond the repair or replacement of the defective product FOB RadonAway.

THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF. THERE IS NO WARRANTY OF MERCHANTIBILITY. ALL OTHER WARRANTIES, EXPRESSED OR WRITTEN, ARE NOT VALID.

For service under these warranties, contact RadonAway for a Return Material Authorization (RMA) number and shipping information. **No returns can be accepted without an RMA.** If factory return is required, the customer assumes all shipping costs to and from factory.

Manufactured by:
RadonAway
Ward Hill, MA
(978)-521-3703