September 19, 2012

REMEDIAL INVESTIGATION WORK PLAN

149 Kent Avenue

Prepared for

KENT & WYTHE OWNERS LLC
149 Kent Avenue
Williamsburg
Kings County, New York

ROUX ASSOCIATES, INC.

Environmental Consulting & Management

209 Shafter Street, Islandia, New York 11749 ♦ 631-232-2600

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1.0 INTRODUCTION

Roux Associates, Inc. (Roux Associates), on behalf of Kent & Wythe Owners LLC/149 Kent Avenue LLC/The Western Carpet and Linoleum Co. Inc. (collectively, Volunteer), has prepared this Remedial Investigation (RI) Work Plan for the property at 149 Kent Avenue, Brooklyn, New York. The Site location is shown on Figure 1. The anticipated plan for the Site is construction of a multi-level, mixed use development including parking, retail space and residential space.

1.1 Brownfields Cleanup Program Application and Environmental Work Plans

Due to the presence of contaminated groundwater, soil, and sub-slab soil vapor at the Site, the Volunteer plans to remediate the Site for restricted residential use under the New York State Brownfield Cleanup Program (BCP). The RI Work Plan is being submitted for New York State Department of Environmental Conservation (NYSDEC) review and approval. The RI has been developed in accordance with the draft BCP Guide (May 2004) and the DER-10 Technical Guidance for Site Investigation and Remediation (May 2010) issued by the NYSDEC. The purpose of the RI is to determine the nature and extent of contamination at the Site, characterize environmental media at the Site, qualitatively assess the potential exposure of receptors to Site contaminants, and develop any other additional data necessary to support the development of a Remedial Action Work Plan (RAWP).

The Site was accepted to the BCP, and the Brownfield Cleanup Agreement (BCA) was signed on August 21, 2012. Site Number C224159 has been assigned.

1.2 RI Work Plan Document Organization

This RI Work Plan contains a background section (Section 2) describing the Site, its history, and results of previous environmental investigations; a section defining the objectives and scope of the RI (Section 3); and Sections 4 and 5 that describe various project operations plans (e.g., Quality Assurance/Quality Control, Health and Safety). Reporting requirements and the project schedule are discussed in Section 6. Additionally, tables are provided that summarize all previously collected environmental quality data. Finally, maps are also provided to illustrate Site location, surrounding land use, and locations of proposed sampling efforts.

1.3 Project Team Contact Information

Roux Associates' Principal-In-Charge for this Site will be Joseph Duminuco, Principal Hydrogeologist and Vice President. Mr. Duminuco, is based in Roux Associates' Islandia, New York headquarters office and can be reached at (631) 232-2600. Josh Levine, P.E. will be the Project Manager and will be responsible for day-to-day management of the project, including preparation of work plans, and scoping and directing field activities. David Bligh, P.E., Project Engineer will act as Field Manager for the duration of the project, and will be responsible for implementing and directing field activities onsite.

The contact for the Volunteer is:

Tell Metzger
Kent & Wythe Owners LLC
1865 Palmer Avenue, Suite 203
Larchmont, New York 10538

At this time, the following subcontractors have been selected for this project:

- Drilling: Zebra Environmental Corp., Lynbrook, New York
- Analytical: Accutest Laboratories, Inc., Dayton, New Jersey

Waste disposal, and other subcontracted services have not yet been selected. This information will be provided to NYSDEC following contractor selection.

1.4 Certification

I, Joseph D. Duminuco, certify that I am currently a Qualified Environmental Professional as defined in 6 NYCRR Part 375 and that this Remedial Investigation 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).

Signature

September 19, 2012
Date

2.0 BACKGROUND

This section provides pertinent background information, including a description of the Site and its setting, the known history of the Site, and the results of preliminary environmental investigation work conducted at the Site.

2.1 Site Description and Setting

Property Location	
Property Name:	149 Kent Avenue
Property Description:	Vacant building formerly used for carpet and flooring storage
Property Address:	149 Kent Avenue
Property Town, County, State:	Kings County, New York 11211
Property Tax Identification:	Section 3, Block 2333, Lot 1
Property Topographic Quadrangle:	Brooklyn, New York
Nearest Intersection:	Kent Avenue and North 5th Street
Area Description:	Commercial and Industrial, with some Residential to the north, west and south

A Site location map is included as Figure 1.

Property Information	
Property Acreage:	0.92
Property Shape:	Rectangular
Property Use:	One vacant former warehouse building
Number of Buildings:	One
Number of Stories:	One
Date of Construction:	1988
Building Square Footage:	Approximately 40,000 square feet
Basement/Slab-on-Grade:	Slab-on-grade
Number of Units:	One

Property Information	
Ceiling Finishes:	Concrete and exposed structural elements
Floor Finishes:	Bare concrete
Wall Finishes:	Concrete and exposed structural elements
HVAC:	Electric Space Heaters
Renovation Date:	NA
Renovation Description:	Demolition of all structures is planned
Vehicular Access:	Via North 5th Street
Property Coverage:	Footprint of the subject building occupies the entire lot

2.1.1 Property Operations

The Site property is currently unoccupied. The building was formerly used as a storage warehouse for carpet and flooring. According to the previous owner/operator no industrial or manufacturing operations were performed at the Site. This is consistent with the activities observed at the Site at the time of the preliminary visit completed in May 30, 2009.

2.1.2 Utilities

The following companies and municipalities currently provide utility services to the Site:

Utility	Provider
Electricity	Con Edison
Sanitary Sewerage	New York City Department of Public Works
Potable Water	New York City Department of Environmental Protection
Solid Waste Removal	New York City Department of Sanitation

There is a manifolded series of stormwater retention rings located beneath the building. Site plans provided by the Site owner show three series of three retention rings, for a total of nine retention rings at the Site. Each retention ring is eight feet in diameter, five feet deep with eight-inch top and bottom slabs. The retention rings retain stormwater from the roof prior to discharge to a New York City Combined Sewer.

2.1.3 Topography/Hydrogeology

Review of the United States Geological Survey (USGS) 7.5-minute series topographic quadrangle map of Brooklyn, New York reveals that the elevation of the Site is approximately 20 feet above mean sea level. The topography of the Site is essentially flat with only a slight grade toward the southwest. According to water level data for Long Island (USGS 1989), the water table at the Site is in the Upper Glacial aquifer and the regional depth to groundwater ranges from 10 to 12 feet below land surface (bls) within ½ mile of the Site. The regional groundwater flow direction is southwest. Local groundwater is expected to flow toward the west-southwest based on water level information collected during previous investigations. A previous investigation near the Site indicated a depth to water ranging from 10 to 11 feet bls and a west-southwesterly flow direction, towards the East River.

Based on a review of the Hydrologic Framework of Long Island, New York (1989), the principal aquifer in the vicinity of the Site is the Upper Glacial Aquifer. The Upper Glacial Aquifer is known as an unconsolidated coastal plain aquifer and is one of the major aquifers of Brooklyn, New York.

2.1.4 Wetland Areas and Surface Water Bodies

There are no identified wetlands on or adjacent to the Site. The only mapped wetland within ½ mile of the Site is along the East River. This area will not be impacted by the proposed development plans.

There are no surface water bodies on or adjacent to the Site. The East River is 0.1 mile west of the Site.

2.1.5 Soils

Based on a review of the United States Department of Agriculture, Soil Conservation Service's soil maps, soils in the area of the Site are classified as Urban land (Ug).

Urban land consists of areas where at least 80-85 percent of the surface is covered by asphalt, concrete, or other impervious building materials.

2.1.6 Underlying Formation

According to the *Surficial Geologic Map of New York* (1989), glacial till underlies the Site. Glacial till consists of deposits of poorly sorted sand, gravel, cobbles, and boulders in a clay and silt matrix. The various components were deposited by glacial activity.

2.1.7 Neighboring Properties

Review of neighboring properties from the Site and from public thoroughfares, and research of available information regarding the neighboring properties, were performed to identify evidence of environmental concern that could adversely impact the Site. The Site is located in a mixed used commercial, industrial and residential area of Brooklyn, New York.

Direction	Operations
North	Commercial/Residential
South	Industrial/Commercial/Residential
East	Commercial
West	Commercial/Residential

The Site and the nearby properties are included in the M1-2/R6A mixed-use district and include a mixture of residential, commercial, and industrial properties. A mixed-use commercial/residential property (Edge Community Apartments LLC) occupies the entire block to the west across Kent Avenue. Immediately north of the Site are several commercial/ retail buildings including (listed from west to east) a coffee bar, CitiWindows, 48 N. 6th Deli, FreshKills Furniture, Meg Clothing, Built by Wendy, Jane's Closet, Music Hall of Williamsburg, Public Assembly, Cubana Social, and two vacant lots owned by Dan Kyle Realty IV, LLC. To the east, across Wythe Avenue, are two vacant industrial properties owned by Mancini Family Limited Partnership and a commercial property owned by ABA Realty Management. To the south, across North 5th Street, are a vacant mixed residential/ commercial property owned by SM Wythe LLC and an industrial property owned by 151 Kent Avenue LLC. East River State Park, a seven-acre recreational waterfront park located along the East River is approximately 500 feet from the Site. Additionally, the Bedford-Stuyvesant Branch of YMCA and the Chabad of North Brooklyn Hebrew School are located within 1,000 feet of 149 Kent Avenue.

There is no agricultural land use within ½ mile of the Site. The nearest park, East River State Park, is located approximately 1/10th of a mile north of the Site. The adjacent and nearby property usage is identified in Figure 2.

2.2 Site History

Roux Associates evaluated several information sources to determine historic uses of the property.

2.2.1 Fire Insurance Maps

Based on a review of Sanborn fire insurance maps that cover the Site for the years 1887, 1905, 1916, 1942, 1951, 1965, 1979, 1987, and 1995, the Site operated as a rail terminal for approximately 100 years prior to becoming a warehouse in 1988.

2.3 Results of Previous Environmental Investigations

The following sections provide an overview of the results of previous environmental investigations at the Site. Previous investigations have been performed by AKRF, Inc. (AKRF), Hydro Tech Corp. (Hydro Tech) and Roux Associates.

2.3.1 Groundwater

AKRF installed six monitoring wells (MW-1 to MW-6) at the Site during their investigation in 2007 and 2008. The locations of the observation wells are shown on Figure 3. As part of the AKRF investigation, groundwater samples were collected in December 2007. These samples were analyzed for select volatile organic compounds (VOCs) (USEPA Method 8260). A summary of the results are presented in Table 1, and are as follows:

- Groundwater samples from wells MW-1 through MW-4 had detections of chlorinated volatile organic compounds (CVOCs) above the NYSDEC Ambient Water Quality Standards and Guidance Values (AWQSGVs).
- Groundwater samples from wells MW-4 and MW-5 had detections of petroleum-related VOCs above the NYSDEC AWQSGVs.
- The groundwater sample from well MW-6 had no detections above the NYSDEC AWQSGVs.

The results indicate that the Site groundwater had levels of chlorinated solvents that exceeded AWQSGVs as of 2008. The groundwater in the western portion of the Site generally contained

concentrations of tetrachloroethene (PCE) exceeding the class GA groundwater quality standards. The groundwater in the southeastern portion of the Site generally contained the petroleum-related VOCs (benzene, ethylbenzene and xylenes) and CVOCs carbon tetrachloride, 1,1-dichloroethane, 1,1-dichloroethene, PCE, trichloroethene (TCE), 1,1,1-trichloroethane (1,1,1-TCA), and cis-1,2-dichloroethene exceeding the class GA groundwater quality standards.

2.3.2 Soil

AKRF performed a Site investigation in 2007 and 2008 which included soil borings, sub-slab soil vapor sampling, and the installation of monitoring wells. Soil analytical data is available for soil samples that were collected from boring locations B-1 through B-6 (B-1 is the corresponding soil boring for MW-1, B-2 corresponds to MW-2, etc.). The soil samples were analyzed for VOCs, semivolatile organic compounds (SVOCs), Target Analyte List (TAL) Metals, pesticides, and polychlorinated biphenyls (PCBs). The results are presented on Table 2 through Table 5.

The chlorinated solvent PCE was detected at high concentrations in both shallow [0-4 feet below land surface (feet bls)] and deep (14-15 feet bls) soil samples from the MW-2 soil boring B-2. Concentrations were 2,500 parts per million (ppm) and 4,200 ppm, respectively. Acetone and methylene chloride were also detected in the B-2 soil samples at elevated levels; however, these compounds were detected in the associated laboratory method blank and possibly due to laboratory contamination. None of the other soil samples exhibited VOC concentrations exceeding Part 375 Restricted Residential Soil Cleanup Objectives (SCOs). An additional six soil borings near well MW-2 were completed on December 27, 2007 with PCE soil concentrations ranging from below detection limits to 78,000 ppm. Laboratory analytical data from these additional six soil borings are not available.

Polycyclic aromatic hydrocarbons (PAHs) and metals were also detected in the majority of the soil samples, but at concentrations exceeding their respective SCOs only in three soil borings (B-2, B-5, and B-6). Concentrations were generally higher in the shallow soil samples collected from 0 to 10 ft bls, with the exception of B-5 which had a slight exceedance of indeno[1,2,3-cd]pyrene in the 14-15 ft bls interval. Lead was detected at 12,000 ppm in the shallow soil sample from the MW-1 boring B-1, located in the southwestern portion of the Site. Lead was detected in the 0-4 ft bls interval in B-2 at 556 ppm, only slightly exceeding the SCO of 400 ppm for this

compound. Mercury was also detected in boring B-2, at a concentration of 1.1 ppm, only slightly exceeding the SCO of 0.81 ppm for this compound. The only other metal to exceed the SCOs was an estimated detection of cadmium (4.6 ppm) in the 0-6 ft bls interval of B-3, which also only slightly exceeds the SCO of 4.3 ppm for this compound. These analytical results are consistent with field observations of urban fill material in the shallow Site subsurface.

The combined PCB concentration (Aroclors 1248, 1254, and 1260) in the shallow soil from the B-2 boring (13.5 ppm) exceeded the SCO of 1 ppm. All other detected PCB and pesticide concentrations were below their respective SCOs.

2.3.3 Indoor Air and Sub-slab Soil Vapor

AKRF collected six sub-slab soil vapor samples (SG-1 through SG-6) at the Site during their investigation in 2007 and 2008. Each AKRF sub-slab soil vapor sample was located next to its corresponding monitoring well (SG-1 located near MW-1, SG-2 located near MW-2, etc.). The locations of the observation wells are shown on Figure 3. A total of 25 compounds were detected in the sub-slab samples including, but not limited to:

- CVOCs: carbon tetrachloride, PCE (ranging from 22 to 440,000 micrograms per cubic meter [µg/m^3]), 1,1,1-TCA, and 1,2-dichloroethene, and
- Petroleum-related VOCs: benzene, toluene, ethylbenzene and xylenes, 2,2,4-trimethylpentane, n-hexane, n-heptane, and cyclohexane.

Roux Associates collected one ambient air, five indoor air and five sub-slab soil vapor samples as part of the 2009 Sub-Slab and Indoor Air Sampling Investigation. The sub-slab and indoor air sample results were similar to the AKRF results, with 23 detected compounds. TCE detections ranged from 16 to 5,100 µg/m^3 and PCE detections ranged from 140 to 95,000 µg/m^3.

Hydro Tech Environmental Corp. conducted an Indoor Air Quality Investigation at the Site in November 2011. Laboratory results indicated similar compounds to the Roux Associates 2009 study and similar concentrations were detected.

The sub-slab soil vapor results are included in Table 6 and the indoor/ ambient air results are included in Table 7.

2.4 Data Usability

Previous groundwater, sub-slab soil vapor, and soil analytical data developed by AKRF and Hydro Tech were evaluated by Roux Associates for data usability purposes. The laboratory data package deliverables were not produced in accordance with NYSDEC Analytical Services Protocol (ASP) Category B deliverables. Therefore, the data generated by AKRF and Hydro Tech should be considered qualitative and used only as "screening level" quality data to guide/support future RI sampling efforts.

Data from Roux Associates' previous investigations at the Site were produced in accordance with NYSDEC ASP Category B deliverables. This data and a data usability summary report (DUSR) will be included in the RI Report.

3.0 RI WORK PLAN OBJECTIVES, SCOPE, AND RATIONALE

3.1 Objectives and Relationship to RAWP

Previous investigations have documented the presence of the following areas of contamination (AOCs):

- SVOCs in soil across the Site;
- TCE, PCE and PCBs in soil on the western portion of the Site;
- CVOCs (TCE and PCE) in groundwater on the western portion of the Site;
- Petroleum related VOCs (benzene, ethylbenzene and xylenes) and CVOCs (carbon tetrachloride, 1,1-dichloroethane, 1,1-dichloroethene, PCE, TCE, 1,1,1-TCA, and cis-1,2-dichloroethene) in groundwater on the southeastern portion of the Site;
- TCE and PCE in soil vapor beneath the warehouse building; and
- Metals in soil in the southwest corner of the Site.

Based on the existing database for the Site and known data gaps, the following objectives have been identified for the RIWP:

- Evaluate soil quality associated with all AOCs;
- Complete the installation of a comprehensive onsite groundwater monitoring well network to determine groundwater flow direction and provide coverage for all potential AOCs; and
- Delineate the three dimensional extent of previously documented VOC impacts to groundwater.

Environmental data collected during the RI will be used to qualitatively assess the potential exposure of receptors to Site contaminants, and develop the information necessary to support the development of a RAWP.

Offsite groundwater monitoring wells are not proposed at this time. The installation of offsite monitoring wells (in the sidewalk adjacent to the Site) will be evaluated based on the RI Phase I data, which will guide the selection of appropriate well locations and depths.

Soil vapor sampling is not proposed at this time. Previous results have already confirmed the presence of CVOCs, primarily TCE and PCE in sub-slab soil gas beneath the warehouse floor slab. The need for and potential location of additional sub-slab soil vapor sampling will be evaluated based on the results of the RI VOC data. The redevelopment plans include demolition

of the existing building, an approximately 15 feet deep excavation across the entire Site and installation of a vapor barrier and a subsurface venting system, thereby making current sub-slab soil gas data not representative of future conditions.

3.2 RI Scope

The scope of the RI will entail the collection of supplemental Site characterization data so that, together with the historic data including groundwater, soil and soil vapor sampling, the entire Site will be sufficiently characterized to support the development of the Site-wide RAWP. To accomplish this, the RI will focus on the following:

- The collection of Site characterization data for potential impacted areas;
- The collection of groundwater data for the Site; and
- The performance of a qualitative exposure assessment to identify exposure pathways, and evaluate contaminant fate and transport.

The scope of each component of the RI is discussed in the following subsections. The proposed scope of work will be conducted in a phased approach as follows:

RI Phase I

- Survey, redevelop to the extent possible, collect water level measurements, and sample all existing groundwater monitoring wells;
- Install 14 shallow soil borings to confirm and delineate previous soil sample results and fill existing data gaps;
- Collect a Membrane Interface Probe (MIP) profile from a deep exploratory soil boring to determine the vertical extent of CVOC impacts, depth to bedrock and/or any confining unit and the appropriate depth to terminate the four proposed deep monitoring wells.

RI Phase II

- Install four deep monitoring wells, collect water level measurements and collect groundwater samples to vertically delineate CVOC impacts;
- Install three shallow monitoring wells (adjacent to three of the deep wells to form clusters), collect water level measurements and collect groundwater samples to delineate shallow VOC impacts; and
- Install offsite monitoring wells to determine on-site and/or off-site groundwater contaminant migration, as needed in the sidewalk adjacent to the Site;

Additional soil borings and soil samples to horizontally and/or vertically delineate detections above the NYSDEC restricted residential criteria are not proposed at this time. Current development plans include removal and offsite disposal of the top 15 feet of soil across the entire Site. If development plans are modified and soil will remain in place, additional soil borings will be installed and samples will be collected to delineate the extent of exceedances. If delineation borings are performed, the procedures outlined in the Field Sampling Plan (FSP) will be followed.

Detailed field sampling procedures are provided in the FSP, Appendix A. The proposed locations are shown on Figure 3 and sampling details are summarized in Table 8a, Table 8b and Table 8c. This RIWP is designed to be dynamic and the RI Phase II will be based on a review of the RI Phase I results in consultation with NYSDEC. The same drilling and sampling procedures will be followed during the RI Phase II ; therefore a supplemental RIWP will not be necessary.

3.2.1 Site Reconnaissance

Roux Associates has performed a preliminary Site reconnaissance and has not located any additional AOCs. An inspection of the existing Site building will be conducted to determine final locations of soil boring and monitoring wells based on actual field conditions.

3.2.2 Membrane Interface Probe/Exploratory Soil Boring

A Membrane Interface Probe (MIP) will be used to define the vertical extent of the CVOCs in groundwater near the suspected source area. The MIP is a screening technology that can identify the relative magnitude of contamination present within the formation. As the MIP is driven to depth, a permeable membrane on the side of the probe is heated, volatilizing VOCs that are present within the surrounding groundwater and sorbed to the soil. The VOCs permeate the membrane and are delivered via a vacuum to the surface using an internal carrier gas. The detector signals from the MIP probe are graphed versus depth in real time.

Based on the results of the MIP, Roux Associates will determine the appropriate interval(s) to collect groundwater and soil samples. The MIP exploratory soil boring will be advanced at boring location RA-9/MW-9D using a Geoprobe® direct-push unit to the top of bedrock, or a confining layer, whichever is encountered first. Roux Associates' field manager will review the data collected from the MIP boring during its completion to determine if the final depth of the boring is

sufficient to evaluate the potential for a source area to be present. Upon completion, a 'deep' monitoring well will be installed in this location at a depth to be determined based on the MIP results.

3.2.3 Soil Characterization at Potential Impact Areas

Twenty soil borings (13 soil borings and seven monitoring well pilot-boreholes) will be drilled at locations shown in Figure 3, actual locations may vary slightly based on field conditions (i.e., building constraints, and/or utilities). Soil samples will be collected using a Geoprobe®. Geoprobe® samples will be collected continuously using either a four foot or five foot macro core sampler, depending on the model used. Previous soil samples were collected by AKRF at depths ranging from zero to 15 feet below grade. Additional soil samples will be taken to delineate the vertical and horizontal extent of impacts detected during the historical sampling event.

Up to three soil samples will be collected from each borehole as outlined in the FSP. In Site-wide soil borings and shallow monitoring well borings, the three potential soil samples will be collected from 0-2 foot below the floor slab, the interval that exhibits the highest odor/visual evidence of contamination or highest elevated PID reading. and the next clean interval below the interval with the highest elevated PID reading or the 2-foot interval above the water table, whichever is encountered first. In deep monitoring well borings, the three potential soil samples will be collected from the 2-foot interval above the water table, the 2-foot interval above the termination depth of the borehole, and the interval that exhibits the highest odor/visual evidence of contamination or highest elevated PID reading. The proposed sampling locations can be found on Figure 3 and sampling criteria are summarized in Table 8a. During installation of the soil borings, the lithology will be recorded and soil will be visually inspected for evidence of contamination and field screened for VOCs using a PID, every two-feet to two and a half feet.

All samples will be analyzed for the following parameters.

- Target Compound List plus 30/ Target Analyte (TCL + 30/TAL) which includes:
  - TCL VOA + Tentatively identified compounds (ID TICS),
  - TCL Base neutral acids (BNA)/SVOCs + 20,
  - TCL Pesticides,

- TCL Herbicides,
- TCL PCBs, and
- TAL Metals (including hexavalent chromium).

Note: Soil samples collected below the water table in the deep monitoring well soil borings will only be analyzed for VOCs.

3.2.4 Groundwater Investigation

To characterize onsite groundwater flow and quality conditions, the existing network of monitoring wells will be gauged and sampled, to the extent possible. Seven new monitoring wells will also be installed at the Site (MW-7D, MW-8D, MW-9D, MW-10, MW-11, MW-12D, and MW-13) to evaluate groundwater quality in these areas and to vertically delineate previously identified CVOC detections. The wells will be installed as shallow/deep clusters, the deep wells are denoted with a 'D' designation. An additional shallow monitoring well may be installed at location RA-14 based on field observations (elevated PID readings, visual or olfactory evidence of contamination at or near the water table) during soil boring activities. The monitoring well locations are shown on Figure 3 and summarized in Table 8b.

Each well will be developed to ensure proper hydraulic connection with the aquifer and to reduce/eliminate turbidity of the water. The wells will be developed using a submersible pump, which will be surged periodically until well yield is consistent and has a turbidity below 50 nephelometric turbidity units (NTUs), if possible. Detailed procedures regarding well development are also found in the FSP (Appendix A). All monitoring wells will be surveyed by a licensed New York State surveyor to obtain horizontal and vertical survey coordinates, and water level elevations will be calculated for each well.

Following well development, one round of groundwater samples will be collected and analyzed for:

- TCL + 30/TAL, which includes:
  - TCL VOA + ID TICS,
  - TCL BNA/(SVOCs) + 20,
  - TCL Pesticides,

- TCL Herbicides,
- TCL PCBs,
- TAL Metals.

Note: Groundwater samples collected from the deep monitoring wells will only be analyzed for VOCs.

Field parameters will also be collected during well sampling using a water quality meter.

3.2.5 Qualitative Exposure Assessment

A qualitative exposure assessment (EA) will be performed following the collection of all initial and supplemental RI data. The EA will be performed in accordance with Section 3.3(c)4 of DER-10 and the New York State Department of Health (NYSDOH) guidance for performing a qualitative EA (NYSDEC DER-10; Technical Guidance for Site Investigation and Remediation; Appendix 3 B). The results of the qualitative EA will be provided in the RI report.

4.0 QUALITY ASSURANCE/ QUALITY CONTROL (QA/QC) PROTOCOLS

The goal of the QA/QC aspect of the RI is to ensure that suitable and verifiable data results from sampling and analysis performed. To accomplish this, a Quality Assurance Project Plan (QAPP) has been prepared and is provided as Appendix B.

5.0 HEALTH AND SAFETY

A site-specific Health and Safety Plan (HASP) has been prepared for the Site and is provided in Appendix C.

6.0 REPORTING AND SCHEDULE

The following will be provided to the NYSDEC during the course of the RI work.

Sampling Results Technical Memorandum

Following the completion of the initial RI sampling work, a technical memorandum summarizing the results of the work, including all data, and proposed additional sampling locations will be submitted to the NYSDEC for review.

Progress Reports

Progress report submittals to be provided to the NYSDEC include the following.

1) Periodic reports, no less than one per month, will be required during RI activities.

2) Identification of any previously unknown contaminated media identified during RI activities will be promptly communicated to NYSDEC's project manager.

3) A Site map will be provided to identify locations discussed in progress reports provided to NYSDEC.

RI Summary Report

Following the completion of the RI, a RI report will be prepared and will include a description of the procedures followed and the results, including data summary tables and maps showing the extent of contamination. Based on the RI report findings a RAWP will be prepared to address any remaining contamination at the Site.

The RI report will include all data developed during the RI, and will meet the technical requirements of NYSDEC's DER-10; Technical Guidance for Site Investigation and Remediation. All RI analyses (i.e., TCL + 30/TAL) will be performed in accordance with the NYSDEC Analytical Services Protocol (ASP), using USEPA SW-846 methods. The laboratory selected to analyze the field samples collected during the RI shall maintain a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) Contract Laboratory Protocol (CLP) certification for each of the analyses listed in Section 2.0.

All laboratory data are to be reported in NYSDEC ASP Category B deliverables and will be delivered to NYSDEC in electronic data deliverable (EDD) format as described on NYSDEC's website (http://www.dec.ny.gov/chemical/62440.html). A Data Usability Report will be prepared

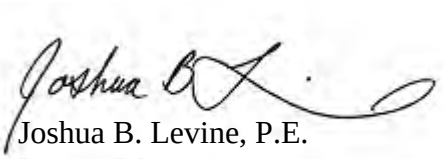
meeting the requirements in Section 2.2(a)1.ii and Appendix 2B of DER-10 for all data packages generated for the RI.

Schedule

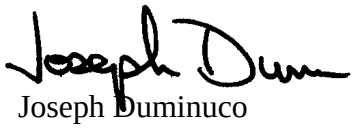
RIWP Submittal to NYSDEC	September 2012
NYSDEC Approval of RIWP	November 2012
Remedial Investigation	November 2012 to December 2012
Submit RI Report	March 2013
NYSDEC and NYSDOH RI Report Approval	May 2013
Remedial Action Plan	June 2013
NYSDEC and NYSDOH Approval	September 2013
Implement Remedial Action Plan	September 2013
Submit Remedial Action Report	To Be Determined

Respectfully submitted,

ROUX ASSOCIATES, INC.



Joshua B. Levine, P.E.
Project Manager



Joseph Duminuco
Principal Hydrogeologist/
Vice President

TABLES

Table 1. Summary of Volatile Organic Compounds in Groundwater Samples Collected by AKRF, 149 Kent Avenue, Brooklyn, New York

Parameter (Concentrations in µg/L)	NYSDEC AWQSGVs (µg/L)	**Sample Designation:** / **Sample Date:**	MW-1 12/28/2007	MW-2 12/28/2007	MW-3 12/28/2007	MW-4 12/28/2007	MW-5 12/28/2007	MW-6 12/28/2007	TRIP BLANK 12/28/2007
Acetone	50		**260 JMB**	**1600 UM**	5.5 JMB	34 JMB	11 B	1.6 UM	2.5 JMB
Benzene	1		23 U	230 U	0.46 U	4.6 U	**53**	0.23 U	0.23 U
Carbon tetrachloride	5		29 U	290 U	0.58 U	**69 J**	0.29 U	0.29 U	0.29 U
1,1-Dichloroethane	5		23 U	230 U	0.46 U	**100 M**	0.23 U	0.23 U	0.23 U
1,1-Dichloroethene	5		25 U	250 U	0.5 U	**490**	0.25 U	0.25 U	0.25 U
Ethylbenzene	5		28 U	280 U	0.56 U	5.6 U	**19**	0.28 U	0.28 U
Methylene Chloride	5		26 U M	260 U	1.3 J M	5.2 U	0.26 U	0.26 U	3.9 J B
Tetrachloroethene	5		**4800 B**	**72000 B**	**110 B**	**820 B**	1.1 J B	1.5 J M B	0.3 U
1,1,1-Trichloroethane	5		38 U	380 U	0.76 U	**1400**	0.38 U	0.38 U	0.38 U
Trichloroethene	5		26 U	260 U	**5.9 J**	**82 J**	0.26 U	0.26 U	0.26 U
Xylenes, Total	5		46 U	460 U	0.92 U	9.2 U	**16**	0.46 U	0.46 U
cis-1,2-Dichloroethene	5		33 U	330 U	4.6 J	**130**	0.33 U	0.33 U	0.33 U

NYSDEC - New York State Department of Environmental Conservation
AWQSGVs - Ambient Water-Quality Standards and Guidance Values
µg/L -Micrograms per liter
J - Estimated Value
U - Compound was analyzed for but not detected
B - The analyte was found in an associated blank as well as in the sample
M - Undefined laboratory qualifier from AKRF, Inc. report
- - No NYSDEC AWQSGV available
Bold data indicates that parameter was detected above the NYSDEC AWQSGVs

Table 2. Summary of Volatile Organic Compounds in Soil Samples Collected by AKRF, 149 Kent Avenue, Brooklyn, New York

Parameter (Concentrations in µg/kg)	NYSDEC Part 375 Restricted Residential	**Sample Designation:**	B-1	B-1	B-2	B-2	B-2	B-3	B-3	B-4
		Sample Date:	12/14/2007	12/14/2007	12/14/2007	12/14/2007	12/14/2007	12/15/2007	12/15/2007	12/15/2007
		Sample Depth (ft bls):	0-4	14-15	0-4	7-8	14-15	0-6	14-16	0-6
Acetone	100000		31 B *	25 J B *	**120000 J M**	23 * B	32000 U	27 B	15 J B	58 B
Methyl Ethyl Ketone	100000		3.4 U	4.3 U	28000 U	3.8 U	28000 U	6.3 J	3.9 U	9.4 J
Chloroform	49000		0.54 U	0.68 U	16000 U	0.6 U	16000 U	0.61 U	0.61 U	0.58 U
Methylene Chloride	100000		4.1 J B	4.7 J B	9400 U	3.6 J B	21000 J	2.9 J B	5.1 J B	3.3 J B
Tetrachloroethene	19000		7.3 B	5.6 J B	**2500000**	88	**4200000**	8.5	0.93 J	2 J
Toluene	100000		0.6 U	0.76 U	7000 U	0.67 U	7000 U	0.68 U	0.68 U	0.65 U
1,1,1-Trichloroethane	100000		0.74 U	0.94 U	9400 U	0.82 U	9300 U	0.84 U	0.84 U	0.8 U
Trichloroethene	21000		9.3	1.3 U	16000 U	1.1 U	16000 U	11	1.1 U	1.1 U
cis-1,2-Dichloroethene	100000		3.2 J	1.2 U	14000 U	1 U	14000 U	8.2	1.1 U	1 U

J - Estimated value
U - Indicates that the compound was analyzed for but not detected
B - The analyte was found in an associated blank as well as in the sample
E - Indicates value exceeded calibration range
M - Undefined laboratory qualifier from AKRF, Inc. report
µg/kg - Micrograms per kilogram
ft bls - Feet below land surface
NYSDEC - New York State Department of Environmental Conservation
-- No NYSDEC Part 375 Restricted Residential Standards available
Bold data indicates that parameter was detected above the NYSDEC Part 375 Restricted Residential Standards

Table 2. Summary of Volatile Organic Compounds in Soil Samples Collected by AKRF, 149 Kent Avenue, Brooklyn, New York

Parameter (Concentrations in µg/kg)	NYSDEC Part 375 Restricted Residential	**Sample Designation:**	B-4	B-5	B-5	B-6	B-6	B-7	B-7	FB-1
		Sample Date:	12/15/2007	12/17/2007	12/18/2007	12/18/2007	12/18/2007	12/19/2007	12/19/2007	12/14/2007
		Sample Depth (ft bls):	16-18	0-4	14-15	0-4	11-13	0-10	12-14	
Acetone	100000		17 J B	25 J B	38 B	47 B	25 J B	27 B	15 J B	1.6 U
Methyl Ethyl Ketone	100000		3.9 U	4.2 U	4.1 U	4.9 U	4.4 U	3.9 U	4 U	1.1 U
Chloroform	49000		0.62 U	0.67 U	0.65 U	0.77 U	0.69 U	0.62 U	0.62 U	0.27 U
Methylene Chloride	100000		6.5 J B	6.2 J B	8.8 J B	17 J B	5.6 J B	2.7 J B	4.4 J B	2.2 J
Tetrachloroethene	19000		0.87 U	0.93 U	0.91 U	1.1 U	0.96 U	0.86 U	0.87 U	29
Toluene	100000		0.69 U	0.74 U	0.72 U	0.85 U	0.76 U	0.69 U	0.69 U	0.09 U
1,1,1-Trichloroethane	100000		0.85 U	0.92 U	0.9 U	2.1 J	0.95 U	0.85 U	0.86 U	0.38 U
Trichloroethene	21000		1.2 U	1.2 U	1.2 U	1.4 U	1.3 U	1.2 U	1.2 U	0.26 U
cis-1,2-Dichloroethene	100000		1.1 U	1.2 U	1.1 U	1.3 U	1.2 U	1.1 U	1.1 U	0.33 U

J - Estimated value
U - Indicates that the compound was analyzed for but not detected
B - The analyte was found in an associated blank as well as in the samp
E - Indicates value exceeded calibration range
M - Undefined laboratory qualifier from AKRF, Inc. report
µg/kg - Micrograms per kilogram
ft bls - Feet below land surface
NYSDEC - New York State Department of Environmental Conservatio
-- No NYSDEC Part 375 Restricted Residential Standards available
Bold data indicates that parameter was detected above the NYSDEC Part 375 Restricted Residential Standards

Table 2. Summary of Volatile Organic Compounds in Soil Samples Collected by AKRF, 149 Kent Avenue, Brooklyn, New York

Parameter (Concentrations in µg/kg)	NYSDEC Part 375 Restricted Residential	**Sample Designation:**	FB-1	TRIP BLANK	FIELD BLANK	TRIP BLANK	FB	TB
		Sample Date:	12/14/2007	12/14/2007	12/15/2007	12/15/2007	12/19/2007	12/21/2007
		Sample Depth (ft bls):						
Acetone	100000		1.6 U	1.6 U	1.6 U	1.6 U	5.1 J	2.4 J
Methyl Ethyl Ketone	100000		1.1 U	1.1 U	1.1 U	1.1 U	4.3 J	1.1 U
Chloroform	49000		0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U
Methylene Chloride	100000		1.9 J	2 J	1.7 J	2.1 J	2.4 J B	2.3 J B
Tetrachloroethene	19000		220 E	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Toluene	100000		0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U
1,1,1-Trichloroethane	100000		0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U
Trichloroethene	21000		0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U
cis-1,2-Dichloroethene	100000		0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U

J - Estimated value
U - Indicates that the compound was analyzed for but not detected
B - The analyte was found in an associated blank as well as in the samp
E - Indicates value exceeded calibration range
M - Undefined laboratory qualifier from AKRF, Inc. report
µg/kg - Micrograms per kilogram
ft bls - Feet below land surface
NYSDEC - New York State Department of Environmental Conservatio
-- No NYSDEC Part 375 Restricted Residential Standards available
Bold data indicates that parameter was detected above the NYSDEC Part 375 Restricted Residential Standards

Table 3. Summary of Semivolatile Organic Compounds in Soil Samples Collected by AKRF, 149 Kent Avenue, Brooklyn, New York

Parameter (Concentrations in µg/kg)	NYSDEC Part 375 Restricted Residential	Sample Designation:	B-1	B-1	B-2	B-2	B-2	B-3	B-3	B-4	B-4
		Sample Date:	12/14/2007	12/14/2007	12/14/2007	12/14/2007	12/14/2007	12/15/2007	12/15/2007	12/15/2007	12/15/2007
		Sample Depth (ft bls):	0-4	14-15	0-4	7-8	14-15	0-6	14-16	0-6	16-18
Acenaphthene	100000		87 J	73 U	130 U	65 U	67 U	64 U	62 U	240 U	65 U
Acenaphthylene	100000		110 J	79 U	290 J	70 U	73 U	69 U	68 U	260 U	70 U
Anthracene	100000		240 J	67 U	630 J	59 U	62 J	90 J	57 U	220 U M	60 U
Benzo[a]anthracene	1000		470	60 U	2000	66 J	180 J	280 J	52 U	380 J	54 U
Benzo[a]pyrene	1000		480	53 U	930	47 U	70 J	240 J	46 U	350 J	47 U
Benzo[b]fluoranthene	1000		660	71 U	**2200**	75 J	210 J	300 J	61 U	480 J	63 U
Benzo[g,h,i]perylene	100000		330 J	81 U	1400	72 U	77 J	240 J	70 U	420 J	72 U
Benzo[k]fluoranthene	3900		250 J	68 U	840	60 U M	78 J	140 J M	58 U	230 U M	61 U
Bis(2-ethylhexyl) phthalate	--		200 J	53 U	1900	640	810	190 J	66 J	260 J	47 U
Butyl benzyl phthalate	--		47 U	58 U	110 U	52 U	54 U	51 U	50 U	200 U	52 U
Carbazole	--		77 J	71 U	440 J	63- U	65 U	62 U	61 U	240 U	63 U
Chrysene	3900		530	73 U	2900	95 J	210 J	340 J	63 U	380 J	65 U
Di-n-butyl phthalate	--		51 U	64 U	120 U	57 U	59 U	56 U	55 U	210 U	57 U
Dibenz(a,h)anthracene	330		98 J	63 U	330 J	56 U	58 U	55 U	54 U	210 U	56 U
Dibenzofuran	59000		65 J	73 U	800	65 U	86 J	64 U	62 U	240 U	65 U
1,2-Dichlorobenzene	100000		53 U	66 U	700 J	58 U	61 U	57 U	56 U	220 U	59 U
1,4-Dichlorobenzene	13000		52 U	65 U	380 J	58 U	60 U	57 U	56 U	220 U	58 U
Fluoranthene	100000		910	69 U	10000	330 J	630	600	59 U	640 J	61 U
Fluorene	100000		80 J	71 U	130 U	63 U	76 J	62 U	61 U	240 U	63 U
Indeno[1,2,3-cd]pyrene	500		400	74 U	**1600**	65 U	79 J	220 J	63 U	390 J	66 U
2-Methylnaphthalene	--		61 U	76 U	240 J	68 U	70 U	67 U	65 U	250 U	68 U
Naphthalene	100000		87 J	63 U	310 J	56 U	160 J	55 U	54 U	210 U	56 U
Phenanthrene	100000		610	68 U	3300	61 U	570	520	59 U	500 J	61 U
Pyrene	100000		650	61 U	6600	250 J	530	570	52 U	640 J	54 U
1,2,4-Trichlorobenzene	--		53 U	66 U	130 J	59 U	61 U	58 U	57 U	220 U	59 U
4-Methylphenol	100000		50 U	62 U	110 U	55 U	57 U	54 U	53 U	210 U	55 U
Pentachlorophenol	6700		24 U	29 U	54 U	26 U	27 U	26 U	25 U	98 U	26 U
Phenol	100000		40 U	50 U	91 U	44 U	46 U	43 U	43 U	170 U	44 U

J - Estimated value
U - Indicates that the compound was analyzed for but not detected
M - Undefined laboratory qualifier from AKRF, Inc. report
µg/kg - Micrograms per kilogram
ft bls - Feet below land surface
NYSDEC - New York State Department of Environmental Conservation
-- No NYSDEC Part 375 Restricted Residential Standards available
Bold data indicates that parameter was detected above the NYSDEC Part 375 Restricted Residential Standards

Table 3. Summary of Semivolatile Organic Compounds in Soil Samples Collected by AKRF, 149 Kent Avenue, Brooklyn, New York

Parameter (Concentrations in µg/kg)	NYSDEC Part 375 Restricted Residential	**Sample Designation:**	B-5	B-5	B-6	B-6
		Sample Date:	12/17/2007	12/18/2007	12/18/2007	12/18/2007
		Sample Depth (ft bls):	0-4	14-15	0-4	11-13
Acenaphthene	100000		1800 J	300 J	610 J	73 U
Acenaphthylene	100000		2200	140 J	760 J	80 U
Anthracene	100000		5700	440	4100	68 U
Benzo[a]anthracene	1000		9600	650	17000	61 U
Benzo[a]pyrene	1000		**7700**	540	**18000**	54 U
Benzo[b]fluoranthene	1000		**12000**	830	**19000**	72 U
Benzo[g,h,i]perylene	100000		7900	560	21000	82 U
Benzo[k]fluoranthene	3900		**4800**	310 J	**7500**	69 U
Bis(2-ethylhexyl) phthalate	--		760 J	3700	290 U	60 J
Butyl benzyl phthalate	--		270 U	130 J	320 U	59 U
Carbazole	--		2100	180 J	1300 J	71 U
Chrysene	3900		**13000**	750	**16000**	74 U
Di-n-butyl phthalate	--		300 U	62 U	350 U	65 U
Dibenz(a,h)anthracene	330		**2400**	120 J	**4300**	64 U
Dibenzofuran	59000		2800	240 J	550 J	74 U
1,2-Dichlorobenzene	100000		310 U	63 U	360 U	66 U
1,4-Dichlorobenzene	13000		310 U	63 U	350 U	66 U
Fluoranthene	100000		12000	1500	27000	70 U
Fluorene	100000		2700	320 J	700 J	71 U
Indeno[1,2,3-cd]pyrene	500		**8800**	**540**	**21000**	74 U
2-Methylnaphthalene	--		1700 J	150 J	410 U	77 U
Naphthalene	100000		3600	210 J	340 U	64 U
Phenanthrene	100000		12000	1500	15000	69 U
Pyrene	100000		14000	1200	28000	61 U
1,2,4-Trichlorobenzene	--		310 U	64 U	360 U	67 U
4-Methylphenol	100000		290 U	60 U	340 U	63 U
Pentachlorophenol	6700		140 U	28 U	160 U	30 U
Phenol	100000		230 U	48 U	270 U	50 U

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M - Undefined laboratory qualifier from AKRF, Inc. report
µg/kg - Micrograms per kilogram
ft bls - Feet below land surface
NYSDEC - New York State Department of Environmental Conservation
-- No NYSDEC Part 375 Restricted Residential Standards available
Bold data indicates that parameter was detected above the NYSDEC Part 375 Restricted Residential Standards

Table 4. Summary of Pesticides and Polychlorinated Biphenyls in Soil Samples Collected by AKRF, 149 Kent Avenue, Brooklyn, New York

Parameter (Concentrations in µg/kg)	NYSDEC Part 375 Restricted Residential	**Sample Designation:**	B-1	B-1	B-2	B-2	B-2	B-3	B-3	B-4
		Sample Date:	12/14/2007	12/14/2007	12/14/2007	12/14/2007	12/14/2007	12/15/2007	12/15/2007	12/15/2007
		Sample Depth (ft bls):	0-4	14-15	0-4	7-8	14-15	0-6	14-16	0-6
Pesticides										
4,4'-DDD	13000		44 M	0.49 U	100	13 J	64 M	11 M	0.43 U	7.7 J M
4,4'-DDE	8900		8 M	0.56 U	150	9.8 U	50 U	5.8 M	0.49 U	5 J M
4,4'-DDT	7900		31 M	0.4 U	520	350	1500	33 M	0.35 U	7.8 J M
alpha-BHC	480		0.28 U	0.35 U	6.5 U	6.2 U	32 U	0.31 U	0.31 U	1.2 U
beta-BHC	360		0.27 U	0.34 U	6.3 U	6.1 U	31 U	0.31 U	0.31 U	1.2 U
delta-BHC	100000		0.1 U	0.13 U	2.4 U	2.3 U	12 U	0.12 U	0.13 J	0.45 U
Dieldrin	200		2.4 J M	0.41 U	7.5 U	7.2 U	37 U	1.3 J M	0.36 U	2.1 J M
Endosulfan I	24000		0.22 J	0.19 U	3.4 U	3.3 U	17 U	0.17 U	0.17 U	0.64 U
Endosulfan II	24000		0.24 J M	0.22 U	4 U	3.8 U	20 U	5.6 M	0.19 U	0.74 U
Endosulfan sulfate	24000		0.18 U	0.22 U	4.1 U	3.9 U	20 U	0.2 U	0.2 U	0.75 U
Endrin	11000		0.9 U	1.1 U	21 U	20 U	100 U	1 U	1 U	3.9 U
Endrin aldehyde	--		3.4 M	0.41 U	7.6 U	7.3 U	37 U	0.37 U	0.37 U	1.4 U
Heptachlor	2100		0.54 J	0.19 U	3.5 U	3.4 U	17 U	0.17 U	0.17 U	0.65 U
Heptachlor epoxide	--		1.5 J M	0.15 U	6.3 J	2.6 U	13 U	0.79 J M	0.13 U	0.5 U
Methoxychlor	--		6.8 J M	2.7 U	50 U	48 U	250 U	2.4 U	2.4 U	9.2 U
alpha-Chlordane	4200		0.59 J	0.14 U	2.6 U	2.5 U	13 U	0.13 U	0.12 U	0.48 U
gamma-Chlordane	--		1.1 J M	0.12 U	16 J	13 J	12 J	0.1 U	0.1 U	2 J M
Polychlorinated Biphenyls (PCBs)										
PCB-1248	--		38 M	3.4 U	160 U	3 U	3.1 U	29 M	3.1 U	24 M
PCB-1254	--		55 M	1.6 U	12000 M	1.4 U	1.4 U	50 M	1.4 U	51 M
PCB-1260	--		44 M	5.1 U	1400 M	4.5 U	4.6 U	25 M	4.5 U	26 M
Total PCBs	1000		137	0	**13560**	0	0	104	0	101

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M - Undefined laboratory qualifier from AKRF, Inc. report
µg/kg - Micrograms per kilogram
ft bls - Feet below land surface
NYSDEC - New York State Department of Environmental Conservation
-- No NYSDEC Part 375 Restricted Residential Standards available
Bold data indicates that parameter was detected above the NYSDEC Part 375 Restricted Residential Standards

Table 4. Summary of Pesticides and Polychlorinated Biphenyls in Soil Samples Collected by AKRF, 149 Kent Avenue, Brooklyn, New York

Parameter (Concentrations in µg/kg)	NYSDEC Part 375 Restricted Residential	**Sample Designation:** / **Sample Date:** / **Sample Depth (ft bls):**	B-4 12/15/2007 16-18	B-5 12/17/2007 0-4	B-5 12/18/2007 14-15	B-6 12/18/2007 0-4	B-6 12/18/2007 11-13
Pesticides							
4,4'-DDD	13000		0.44 U	40 J M	3.1 J	5.4 U	0.48 U
4,4'-DDE	8900		0.51 U	5.3 U	1.5 J M	12 J	0.55 U
4,4'-DDT	7900		0.36 U	56 M	8.8	36 J M	0.39 U
alpha-BHC	480		0.32 U	17 J M	0.54 J M	3.9 U	0.35 U
beta-BHC	360		0.31 U	3.3 U	0.46 J M	3.8 U	0.34 U
delta-BHC	100000		0.12 U	2.6 J M	0.13 U	1.5 U	0.13 U
Dieldrin	200		0.37 U	7.4 J M	1.4 J M	4.6 U	0.41 U
Endosulfan I	24000		0.17 U	1.8 U	0.18 U	2.1 U	0.19 U
Endosulfan II	24000		0.2 U	2.1 U	0.21 U	2.4 U	0.22 U
Endosulfan sulfate	24000		0.2 U	2.1 U	2.3 J M	15 J M	0.22 U
Endrin	11000		1 U	11 U	1.1 U	13 U	1.1 U
Endrin aldehyde	--		0.38 U	24 J M	0.4 U	23 J M	0.41 U
Heptachlor	2100		0.17 U	1.8 U	0.18 U	2.1 U	0.19 U
Heptachlor epoxide	--		0.13 U	1.4 U	0.14 U	1.6 U	0.14 U
Methoxychlor	--		2.5 U	26 U	2.6 U	230 J M	2.7 U
alpha-Chlordane	4200		0.13 U	1.3 U	0.13 U	1.6 U	0.14 U
gamma-Chlordane	--		0.11 U	26 M	1.2 J M	15 J	0.12 U
Polychlorinated Biphenyls (PCBs)							
PCB-1248	--		3.1 U	43 M	20 J M	16 J M	3.4 U
PCB-1254	--		1.4 U	260 M	34 M	20 J M	1.5 U
PCB-1260	--		4.6 U	160 M	21 M	16 J	5.1 U
Total PCBs	1000		0	463	75	52	0

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M - Undefined laboratory qualifier from AKRF, Inc. report
µg/kg - Micrograms per kilogram
ft bls - Feet below land surface
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Bold data indicates that parameter was detected above the NYSDEC Part 375 Restricted Residential Standards

Table 5. Summary of Metals in Soil Samples Collected by AKRF, 149 Kent Avenue, Brooklyn, New York

Parameter (Concentrations in mg/kg)	NYSDEC Part 375 Restricted Residential	Sample Designation:	B-1	B-1	B-2	B-2	B-2	B-3	B-3
		Sample Date:	12/14/2007	12/14/2007	12/14/2007	12/14/2007	12/14/2007	12/15/2007	12/15/2007
		Sample Depth (ft bls):	0-4	14-15	0-4	7-8	14-15	0-6	14-16
Silver	180		1.2 J	0.42 U	0.33 U	0.33 U	0.35 U	0.42 U	0.38 U
Aluminum	--		7650	13200	4530	7370	6580	5080	4820
Arsenic	--		74	5.2 J	17.7	1.8 J	1.6 U	11.3	2.4 J
Barium	400		95.1	46.6	167	24.2	55.9	63.9	37.2
Beryllium	72		0.46 J	0.65 U	0.5 U	0.51 U	0.54 U	0.64 U	0.59 U
Calcium	--		5990	958	5950	535	1200	35700	732
Cadmium	4.3		1.3 J	1.3 U	3.1 J	1 U	1.1 U	**4.6 J**	1.2 U
Cobalt	--		5.7	4	7.6	6.2	18.4	6.6	6.6
Chromium	180		20.7	19.2	29.2	10.5	18.7	35.2	17.2
Copper	270		73.2	16.2	137	9.2	72.5	30.7	17
Iron	--		26100	13000	21200	13400	26200	16600	25400
Potassium	--		806	1050	445	639	1160	868	794
Magnesium	--		3360	3100	1380	2220	1850	10100	1480
Manganese	2000		255	141	286	138	798	250	449
Sodium	--		330	283	422	89.9 J	135 J	603	84.7 J
Nickel	310		17.1	12.4	24.3	13.2	12.9	27	8.9
Lead	400		**12000**	9.4	**556**	6.3	7.3	42.1	6.8
Antimony	--		7.4 J	1.9 U	4 J	1.5 U	1.6 U	2.3 J	1.8 U
Selenium	180		1.9 J	2.3 U	2.5 J	1.8 U	1.9 U	2.3 U	2.1 U
Thallium	--		2 U	3.1 U	2.4 U	2.4 U	2.6 U	3.1 U	2.8 U
Vanadium	--		24.4	24.9	30.6	16	39.1	18.9	33.1
Zinc	10000		236	35.5	964	33	33.5	172	29.6
Mercury	0.81		0.2	0.025 J	**1.1**	0.014 U	0.014 U	0.1	0.013 U

J - Estimated value
U - Indicates that the compound was analyzed for but not detected
mg/kg - Milligrams per kilogram
ft bls - Feet below land surface
NYSDEC - New York State Department of Environmental Conservation
-- No NYSDEC Part 375 Restricted Residential Standards available
Bold data indicates that parameter was detected above the NYSDEC Part 375 Restricted Residential Standards

Table 5. Summary of Metals in Soil Samples Collected by AKRF, 149 Kent Avenue, Brooklyn, New York

Parameter (Concentrations in mg/kg)	NYSDEC Part 375 Restricted Residential	**Sample Designation:**	B-4	B-4	B-5	B-5	B-6	B-6
		Sample Date:	12/15/2007	12/15/2007	12117/2007	12/18/2007	12/18/2007	12/18/2007
		Sample Depth (ft bls):	0-6	16-18	0-4	14-15	0-4	11-13
Silver	180		0.3 U	0.34 U	0.35 U	0.37 U	0.43 U	0.37 U
Aluminum	--		4910	5580	7170	9160	5760	23200
Arsenic	--		25.9	7.2 J	9.8	19.3	17.5	5.4 J
Barium	400		44.9	58.4	61.5	115	92.7	186
Beryllium	72		0.46 U	0.51 U	0.54 U	0.59 J	0.66 U	1.3 J
Calcium	--		17300	334	2630	15700	52900	3100
Cadmium	4.3		0.94 J	1 U	3 J	1.7 J	1.3 U	1.1 U
Cobalt	--		5.1	6.3	7	8.6	6.5	19.4
Chromium	180		34.6	31	25.4	36.7	69.1	83.9
Copper	270		31.6	23	83.1	89.5	102	43.3
Iron	--		12900	36400	25100	23200	20300	43800
Potassium	--		741	993	1020	1200	917	6430
Magnesium	--		2010	1590	2410	5360	4980	9720
Manganese	2000		178	349	263	301	331	592
Sodium	--		227	324	202 J	543	597	144 J
Nickel	310		18.4	14.9	23.7	26.6	29.5	44.6
Lead	400		44.9	7.2	139	123	181	16.1
Antimony	--		1.4 U	1.5 U	1.6 U	1.7 U	2 U	1.7 U
Selenium	180		1.6 U	2.1 J	1.9 U	2 U	2.3 U	2.3 J
Thallium	--		2.2 U	2.5 J	2.6 U	2.7 U	3.2 U	2.7 U
Vanadium	--		18.9	41	34.1	32.7	27.2	77.8
Zinc	10000		70.5	35	337	183	398	123
Mercury	0.81		0.14	0.014 U	0.3	0.08	0.16	0.02 J

J - Estimated value
U - Indicates that the compound was analyzed for but not detected
mg/kg - Milligrams per kilogram
ft bls - Feet below land surface
NYSDEC - New York State Department of Environmental Conservatio
-- No NYSDEC Part 375 Restricted Residential Standards available
Bold data indicates that parameter was detected above the NYSDEC Part 375 Restricted Residential Standards

Table 6. Summary of Volatile Organic Compounds in Sub-Slab Soil Vapor Samples, 149 Kent Avenue, Brooklyn, New York

Parameter (Concentrations in µg/m^3)	Air Guideline Values Derived by NYSDOH (µg/m^3)	**Sample Designation:** / **Sample Date:** / **Collected By:**	SS-1 06/20/09 Roux	SS-2 06/20/09 Roux	SS-3 06/20/09 Roux	SS-4 06/20/09 Roux	SS-5 06/20/09 Roux	SG-1 12/12/07 AKRF	SG-2 12/12/07 AKRF
1,1,1-Trichloroethane	100		600 U	5.1	7.6	21	**190**	44	3300 U
1,1,2,2-Tetrachloroethane	NS		760 U	1.4 U	3.4 U	3.4 U	1.4 U	NA	NA
1,1,2-Trichloroethane	NS		600 U	1.1 U	2.7 U	2.7 U	1.1 U	NA	NA
1,1-Dichloroethane	NS		450 U	0.81 U	2 U	2 U	11	1.6 U	2400 U
1,1-Dichloroethene	NS		440 U	0.79 U	2 U	2 U	0.79 U	NA	NA
1,2,4-Trichlorobenzene	NS		2000 U	3.7 U	9.6 U	9.6 U	3.7 U	NA	NA
1,2,4-Trimethylbenzene	NS		540 U	3.8	3.5	3	3.7	2.2	2900 U
1,2-Dibromoethane	NS		850 U	1.5 U	3.8 U	3.8 U	1.5 U	NA	NA
1,2-Dichlorobenzene	NS		660 U	1.2 U	3 U	3 U	1.2 U	NA	NA
1,2-Dichloroethane	NS		450 U	0.81 U	2 U	2 U	0.81 U	NA	NA
1,2-Dichloroethene (total)	NS		7500	0.79 U	3.8	2.2	0.79 U	3.7	2400 U
1,2-Dichloropropane	NS		510 U	0.92 U	2.3 U	2.3 U	0.92 U	NA	NA
1,2-Dichlorotetrafluoroethane	NS		770 U	1.4 U	3.5 U	3.5 U	1.4 U	NA	NA
1,3,5-Trimethylbenzene	NS		540 U	1.2	2.5 U	2.5 U	1.2	2 U	2900 U
1,3-Butadiene	NS		600 U	1.1 U	2.9 U	2.9 U	1.1 U	2.2U	3300 U
1,3-Dichlorobenzene	NS		660 U	1.2 U	3 U	3 U	1.2 U	NA	NA
1,4-Dichlorobenzene	NS		660 U	1.2 U	3 U	3 U	1.2 U	NA	NA
1,4-Dioxane	NS		9700 U	18 U	47 U	47 U	18 U	NA	NA
2,2,4-Trimethylpentane	NS		510 U	1.3	2.3 U	2.3 U	0.93 U	2.4	2800 U
2-Butanone (MEK)	NS		800 U	2.9	3.8 U	3.8 U	2.9	2.9 U	4400 U
2-Chlorotoluene	NS		570 U	1 U	2.6 U	2.6 U	1 U	NA	NA
2-Hexanone	NS		1100 U	2 U	5.3 U	5.3 U	2 U	NA	NA
3-Chloropropene	NS		850 U	1.6 U	4.1 U	4.1 U	1.6 U	NA	NA
4-Ethyltoluene	NS		540 U	0.98 U	2.5 U	2.5 U	0.98 U	3	2900 U
4-Methyl-2-pentanone (MIBK)	NS		1100 U	2	5.3 U	5.3 U	2 U	4.1 U	6100 U
Acetone	NS		6400 U	12 U	31 U	31 U	12 U	24 U	36000 U
Benzene	NS		350 U	1.2	1.6	1.6 U	0.67	4.5	1900 U
Benzyl chloride	NS		NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	NS		740 U	1.3 U	3.4 U	3.4 U	1.3 U	NA	NA
Bromoethene	NS		480 U	0.87 U	2.2 U	2.2 U	0.87 U	NA	NA
Bromoform	NS		1100 U	2.1 U	5.2 U	5.2 U	2.1 U	NA	NA
Bromomethane	NS		430 U	0.78 U	1.9 U	1.9 U	0.78 U	NA	NA
Carbon disulfide	NS		840 U	8.7	31	22	29	3.1 U	4700 U
Carbon tetrachloride	5		690 U	2.1	3.1 U	**25**	**10**	2.5 U	3800 U
Chlorobenzene	NS		510 U	0.92 U	2.3 U	2.3 U	0.92 U	NA	NA
Chloroethane	NS		710 U	1.3 U	3.4 U	3.4 U	1.3 U	NA	NA
Chloroform	NS		540 U	1.4	2.7	22	23	2 U	2900 U
Chloromethane	NS		560 U	1 U	2.7 U	2.7 U	1 U	NA	NA
cis-1,2-Dichloroethene	NS		7500	0.79 U	3.8	2.2	0.79 U	NA	NA
cis-1,3-Dichloropropene	NS		500 U	0.91 U	2.3 U	2.3 U	0.91 U	NA	NA

Table 6. Summary of Volatile Organic Compounds in Sub-Slab Soil Vapor Samples, 149 Kent Avenue, Brooklyn, New York

Parameter (Concentrations in µg/m^3)	Air Guideline Values Derived by NYSDOH (µg/m^3)	**Sample Designation:** / **Sample Date:** / **Collected By:**	SS-1 06/20/09 Roux	SS-2 06/20/09 Roux	SS-3 06/20/09 Roux	SS-4 06/20/09 Roux	SS-5 06/20/09 Roux	SG-1 12/12/07 AKRF	SG-2 12/12/07 AKRF
Cyclohexane	NS		380 U	0.69	1.7 U	1.7 U	0.69 U	2.2	2100 U
Dibromochloromethane	NS		940 U	1.7 U	4.3 U	4.3 U	1.7 U	NA	NA
Dichlorodifluoromethane	NS		1300 U	3	6.4 U	6.9	3.9	4.9 U	7400 U
Ethyl acetate	NS		NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	NS		480 U	4.8	5.6	5.2	4.8	8.7	2600 U
Freon TF	NS		840 U	1.5 U	3.8 U	3.8 U	1.5 U	NA	NA
Hexachlorobutadiene	NS		1200 U	2.1 U	5.3 U	5.3 U	2.1 U	NA	NA
Isopropyl Alcohol	NS		6600 U	12 U	32 U	32 U	12 U	NA	NA
m+p-Xylene	NS		1200 U	17	22	20	17	25	2600 U
Xylenes (m,p)	NS		NA	NA	NA	NA	NA	18	6500 U
Methylene chloride	60		940 U	1.7 U	4.5 U	4.5 U	1.7 U	NA	NA
MTBE	NS		970 U	1.8 U	4.7 U	4.7 U	1.8 U	NA	NA
n-Heptane	NS		450 U	1.1	2 U	2 U	1	5.7	2500 U
n-Hexane	NS		950 U	3	4.6 U	4.6 U	2.5	4.2	5300 U
o-Xylene	NS		480 U	4.8	6.1	5.2	4.8	6.1	2600 U
Propylene	NS		NA	NA	NA	NA	NA	NA	NA
Styrene	NS		470 U	1.1	2.1 U	2.1 U	0.94	NA	NA
t-Butyl Alcohol	NS		8200 U	15 U	39 U	39 U	15 U	NA	NA
Tetrachloroethene	100		**95000**	**150**	**450**	**430**	**140**	**350**	**440000**
Tetrahydrofuran	NS		8000 U	15 U	38 U	38 U	15 U	NA	NA
Toluene	NS		410 U	9	9.8	4.5	6.4	41	2300 U
trans-1,2-Dichloroethene	NS		440 U	0.79 U	2 U	2 U	0.79 U	3.7	2400 U
trans-1,3-Dichloropropene	NS		500 U	0.91 U	2.3 U	2.3 U	0.91 U	NA	NA
Trichloroethene	5		**5100**	**16**	**41**	**110**	**31**	**64**	3200 U
Trichlorofluoromethane	NS		620 U	30	31	29	34	11	3400 U
Vinyl acetate	NS		NA	NA	NA	NA	NA	NA	NA
Vinyl bromide	NS		NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	NS		280 U	0.51 U	1.3 U	1.3 U	0.51 U	NA	NA
Xylenes (total)	NS		480 U	23	29	26	23	NA	NA

NS - No standard available

µg/m^3 - Micrograms per cubic meter

U - Not detected

Bold - Value exceeds Air Guideline Values Derived by New York State Department of Health (NYSDOH)

NA - Compound was not analyzed for by laboratory

Table 6. Summary of Volatile Organic Compounds in Sub-Slab Soil Vapor Samples, 149 Kent Avenue, Brooklyn, New York

Parameter (Concentrations in µg/m^3)	Air Guideline Values Derived by NYSDOH (µg/m^3)	**Sample Designation:**	SG-3	SG-4	SG-5	SG-6
		Sample Date:	12/12/07	12/12/07	12/12/07	12/12/07
		Collected By:	AKRF	AKRF	AKRF	AKRF
1,1,1-Trichloroethane	100		9.8	3.5	28	87
1,1,2,2-Tetrachloroethane	NS		NA	NA	NA	NA
1,1,2-Trichloroethane	NS		NA	NA	NA	NA
1,1-Dichloroethane	NS		3.2 U	0.81 U	1.7	0.81 U
1,1-Dichloroethene	NS		NA	NA	NA	NA
1,2,4-Trichlorobenzene	NS		NA	NA	NA	NA
1,2,4-Trimethylbenzene	NS		59	3.4	26	2.2
1,2-Dibromoethane	NS		NA	NA	NA	NA
1,2-Dichlorobenzene	NS		NA	NA	NA	NA
1,2-Dichloroethane	NS		NA	NA	NA	NA
1,2-Dichloroethene (total)	NS		3.2 U	0.79 U	0.79 U	0.79 U
1,2-Dichloropropane	NS		NA	NA	NA	NA
1,2-Dichlorotetrafluoroethane	NS		NA	NA	NA	NA
1,3,5-Trimethylbenzene	NS		36	1.7	13	0.98 U
1,3-Butadiene	NS		4.4 U	1.1 U	1.1 U	1.1 U
1,3-Dichlorobenzene	NS		NA	NA	NA	NA
1,4-Dichlorobenzene	NS		NA	NA	NA	NA
1,4-Dioxane	NS		NA	NA	NA	NA
2,2,4-Trimethylpentane	NS		3.7 U	0.93 U	1.2	0.98
2-Butanone (MEK)	NS		7.7	3.8	9.7	2.1
2-Chlorotoluene	NS		NA	NA	NA	NA
2-Hexanone	NS		NA	NA	NA	NA
3-Chloropropene	NS		NA	NA	NA	NA
4-Ethyltoluene	NS		100	3.9	37	1.8
4-Methyl-2-pentanone (MIBK)	NS		8.2 U	2 U	2.6	2 U
Acetone	NS		81	29	67	15
Benzene	NS		14	1.9	8.9	2.7
Benzyl chloride	NS		NA	NA	NA	NA
Bromodichloromethane	NS		NA	NA	NA	NA
Bromoethene	NS		NA	NA	NA	NA
Bromoform	NS		NA	NA	NA	NA
Bromomethane	NS		NA	NA	NA	NA
Carbon disulfide	NS		6.2 U	1.6 U	3	1.6 U
Carbon tetrachloride	5		**10**	4.3	4.9	**9.4**
Chlorobenzene	NS		NA	NA	NA	NA
Chloroethane	NS		NA	NA	NA	NA
Chloroform	NS		33	2.8	1.5	10
Chloromethane	NS		NA	NA	NA	NA
cis-1,2-Dichloroethene	NS		NA	NA	NA	NA
cis-1,3-Dichloropropene	NS		NA	NA	NA	NA

Table 6. Summary of Volatile Organic Compounds in Sub-Slab Soil Vapor Samples, 149 Kent Avenue, Brooklyn, New York

Parameter (Concentrations in µg/m^3)	Air Guideline Values Derived by NYSDOH (µg/m^3)	**Sample Designation:**	SG-3	SG-4	SG-5	SG-6
		Sample Date:	12/12/07	12/12/07	12/12/07	12/12/07
		Collected By:	AKRF	AKRF	AKRF	AKRF
Cyclohexane	NS		2.8 U	0.69 U	1.9	2.2
Dibromochloromethane	NS		NA	NA	NA	NA
Dichlorodifluoromethane	NS		9.9 U	34	2.5 U	2.5 U
Ethyl acetate	NS		NA	NA	NA	NA
Ethylbenzene	NS		120	5.6	36	1.8
Freon TF	NS		NA	NA	NA	NA
Hexachlorobutadiene	NS		NA	NA	NA	NA
Isopropyl Alcohol	NS		NA	NA	NA	NA
m+p-Xylene	NS		480	19	150	5.6
Xylenes (m,p)	NS		360	13	110	3.9
Methylene chloride	60		NA	NA	NA	NA
MTBE	NS		NA	NA	NA	NA
n-Heptane	NS		5.7	1.3	4.9	2.5
n-Hexane	NS		7 U	1.8 U	4.9	1.8 U
o-Xylene	NS		110	5.2	33	1.5
Propylene	NS		NA	NA	NA	NA
Styrene	NS		NA	NA	NA	NA
t-Butyl Alcohol	NS		NA	NA	NA	NA
Tetrachloroethene	100		**360**	**160**	22	58
Tetrahydrofuran	NS		NA	NA	NA	NA
Toluene	NS		330	20	110	7.9
trans-1,2-Dichloroethene	NS		3.2 U	0.79 U	0.79 U	0.79 U
trans-1,3-Dichloropropene	NS		NA	NA	NA	NA
Trichloroethene	5		**86**	**12**	2.4	**59**
Trichlorofluoromethane	NS		11	13	8.4	8.4
Vinyl acetate	NS		NA	NA	NA	NA
Vinyl bromide	NS		NA	NA	NA	NA
Vinyl chloride	NS		NA	NA	NA	NA
Xylenes (total)	NS		NA	NA	NA	NA

NS - No standard available

µg/m^3 - Micrograms per cubic meter

U - Not detected

Bold - Value exceeds Air Guideline Values Derived by New York State Department of Health (N

NA - Compound was not analyzed for by laboratory

Table 7. Summary of Volatile Organic Compounds in Ambient and Indoor Air Samples, 149 Kent Avenue, Brooklyn, New York

Parameter (Concentrations in µg/m^3)	Air Guideline Values Derived by NYSDOH (µg/m^3)	**Sample Designation:**	AMB-062009	IA-1	IA-2	IA-3	IA-4	IA-5	IA-5 DUP
		Sample Date:	06/20/09	06/20/09	06/20/09	06/20/09	06/20/09	06/20/09	06/20/09
		Air Matrix:	Ambient Air	Indoor Air	Indoor Air	Indoor Air	Indoor Air	Indoor Air	Indoor Air
		Collected By:	Roux	Roux	Roux	Roux	Roux	Roux	Roux
1,1,1-Trichloroethane	100		1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
1,1,2,2-Tetrachloroethane	NS		1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
1,1,2-Trichloroethane	NS		1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
1,1-Dichloroethane	NS		0.81 U	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U
1,1-Dichloroethene	NS		0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U
1,2,4-Trichlorobenzene	NS		3.7 U	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U
1,2,4-Trimethylbenzene	NS		0.98 U	1.2	1.2	1.3	0.98 U	1.2	1.3
1,2-Dibromoethane	NS		1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U
1,2-Dichlorobenzene	NS		1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
1,2-Dichloroethane	NS		0.81 U	0.81 U	0.81 U	0.81 U	0.81 U	1.6	1.6
1,2-Dichloroethene (total)	NS		0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U
1,2-Dichloropropane	NS		0.92 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U
1,2-Dichlorotetrafluoroethane	NS		1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
1,3,5-Trimethylbenzene	NS		0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U
1,3-Butadiene	NS		1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
1,3-Dichlorobenzene	NS		1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
1,4-Dichlorobenzene	NS		1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
1,4-Dioxane	NS		18 U	18 U	18 U	18 U	18 U	18 U	18 U
2,2,4-Trimethylpentane	NS		2.2	2.1	1.9	1.9	1.7	1.7	1.8
2-Butanone (MEK)	NS		2.7	2.4	2.5	4.4	2.2	4.4	2.9
2-Chlorotoluene	NS		1 U	1 U	1 U	1 U	1 U	1 U	1 U
2-Hexanone	NS		2 U	2 U	2 U	2 U	2 U	2 U	2 U
3-Chloropropene	NS		1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U
4-Ethyltoluene	NS		0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U
4-Methyl-2-pentanone (MIBK)	NS		2 U	2 U	2 U	2 U	2 U	2 U	2 U
Acetone	NS		19	29	29	38	23	45	38
Benzene	NS		1.6	1.9	1.7	1.8	1.5	1.6	1.6
Benzyl chloride	NS		NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	NS		1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U
Bromoethene	NS		0.87 U	0.87 U	0.87 U	0.87 U	0.87 U	0.87 U	0.87 U
Bromoform	NS		2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U
Bromomethane	NS		0.78 U	0.78 U	0.78 U	0.78 U	0.78 U	0.78 U	0.78 U
Carbon disulfide	NS		1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U
Carbon tetrachloride	5		1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U
Chlorobenzene	NS		0.92 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U
Chloroethane	NS		1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U
Chloroform	NS		0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U
Chloromethane	NS		1.3	1.8	1.3	1.4	1.3	1.4	1.3
cis-1,2-Dichloroethene	NS		0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U
cis-1,3-Dichloropropene	NS		0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U
Cyclohexane	NS		0.69 U	0.69 U	0.69 U	1.5	0.69 U	0.69 U	0.69 U

Table 7. Summary of Volatile Organic Compounds in Ambient and Indoor Air Samples, 149 Kent Avenue, Brooklyn, New York

Parameter (Concentrations in µg/m^3)	Air Guideline Values Derived by NYSDOH (µg/m^3)	**Sample Designation:**	AMB-062009	IA-1	IA-2	IA-3	IA-4	IA-5	IA-5 DUP
		Sample Date:	06/20/09	06/20/09	06/20/09	06/20/09	06/20/09	06/20/09	06/20/09
		Air Matrix:	Ambient Air	Indoor Air	Indoor Air	Indoor Air	Indoor Air	Indoor Air	Indoor Air
		Collected By:	Roux	Roux	Roux	Roux	Roux	Roux	Roux
Dibromochloromethane	NS		1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Dichlorodifluoromethane	NS		3.2	3.1	2.8	3.2	2.9	2.9	3.2
Ethyl acetate	NS		NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	NS		1.2	1.5	1.4	1.8	1.1	1.9	2
Freon TF	NS		1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U
Hexachlorobutadiene	NS		2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U
Isopropyl Alcohol	NS		12 U	12 U	12 U	12 U	12 U	12 U	12 U
m+p-Xylene	NS		3.6	3.8	3.7	4.3	2.8	3.4	3.6
Xylenes (m,p)	NS		NA	NA	NA	NA	NA	NA	NA
Methylene chloride	60		5.6	1.7 U	1.7 U	1.7 U	1.7 U	1.9	2.1
MTBE	NS		1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
n-Heptane	NS		0.98	1.2	1.1	1.4	0.94	1.3	1.2
n-Hexane	NS		1.8 U	1.9	1.8	2.5	1.8 U	1.8 U	1.8 U
o-Xylene	NS		1.1	1.3	1.2	1.4	0.96	1.1	1.3
Propylene	NS		NA	NA	NA	NA	NA	NA	NA
Styrene	NS		0.85 U	1.6	1.4	1.7	1.2	1.7	1.7
t-Butyl Alcohol	NS		15 U	15 U	15 U	15 U	15 U	15 U	15 U
Tetrachloroethene	100		1.9	16	20	18	7.5	4	4.2
Tetrahydrofuran	NS		15 U	15 U	15 U	15 U	15 U	15 U	15 U
Toluene	NS		6	7.9	7.5	12	6.4	7.9	8.3
trans-1,2-Dichloroethene	NS		0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U
trans-1,3-Dichloropropene	NS		0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U
Trichloroethene	5		1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
Trichlorofluoromethane	NS		3	12	11	11	9	12	12
Vinyl acetate	NS		NA	NA	NA	NA	NA	NA	NA
Vinyl bromide	NS		NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	NS		0.51 U	0.51 U	0.51 U	0.51 U	0.51 U	0.51 U	0.51 U
Xylenes (total)	NS		4.8	5.2	5.2	5.6	3.8	4.8	5.2

NS - No standard available

µg/m^3 - Micrograms per cubic meter

U - Not detected

B - The analyte was found in an associated blank as well as in the sample

Bold - Value exceeds Air Guideline Values Derived by New York State Department of Health (NYSDOH)

NA - Compound was not analyzed for by laboratory

Table 7. Summary of Volatile Organic Compounds in Ambient and Indoor Air Samples, 149 Kent Avenue, Brooklyn, New York

Parameter (Concentrations in µg/m^3)	Air Guideline Values Derived by NYSDOH (µg/m^3)	**Sample Designation:**	21	68	Y-48	Y-80	Y-02
		Sample Date:	11/09/11	11/09/11	11/09/11	11/09/11	11/09/11
		Air Matrix:	Ambient Air	Indoor Air	Indoor Air	Indoor Air	Indoor Air
		Collected By:	Hyrdo Tech	Hyrdo Tech	Hyrdo Tech	Hyrdo Tech	Hyrdo Tech
1,1,1-Trichloroethane	100		1.3 U	2.2 U	2.4 U	1.4 U	1.7 U
1,1,2,2-Tetrachloroethane	NS		1.7 U	2.7 U	3.0 U	1.8 U	2.1 U
1,1,2-Trichloroethane	NS		1.3 U	2.2 U	2.4 U	1.4 U	1.7 U
1,1-Dichloroethane	NS		0.99 U	1.6 U	1.8 U	1.1 U	1.3 U
1,1-Dichloroethene	NS		0.97 U	1.6 U	1.8 U	1.1 U	1.2 U
1,2,4-Trichlorobenzene	NS		1.8 U	2.9 U	3.3 U	2.0 U	2.3 U
1,2,4-Trimethylbenzene	NS		6.0 U	9.7 U	11 U	6.5 U	7.7 U
1,2-Dibromoethane	NS		NA	NA	NA	NA	NA
1,2-Dichlorobenzene	NS		1.5 U	2.4 U	2.7 U	1.6 U	1.9 U
1,2-Dichloroethane	NS		0.99 U	1.6 U	1.8 U	1.1 U	1.3 U
1,2-Dichloroethene (total)	NS		NA	NA	NA	NA	NA
1,2-Dichloropropane	NS		1.1 U	1.8 U	2.0 U	1.2 U	1.4 U
1,2-Dichlorotetrafluoroethane	NS		1.7 U	2.8 U	3.1 U	1.9 U	2.2 U
1,3,5-Trimethylbenzene	NS		2.4 U	3.9 U	4.3 U	2.6 U	3.1 U
1,3-Butadiene	NS		1.1 U	1.7 U	1.9 U	1.2 U	1.4 U
1,3-Dichlorobenzene	NS		1.5 U	2.4 U	2.7 U	1.6 U	1.9 U
1,4-Dichlorobenzene	NS		1.5 U	2.4 U	2.7 U	1.6 U	1.9 U
1,4-Dioxane	NS		8.8 U	14 U	16 U	9.6 U	11 U
2,2,4-Trimethylpentane	NS		1.1 U	1.8 U	2.1 U	1.2 U	1.5 U
2-Butanone (MEK)	NS		2.7	3.1	6.0	2.7	3.5
2-Chlorotoluene	NS		NA	NA	NA	NA	NA
2-Hexanone	NS		2.0 U	3.2 U	3.6 U	2.2 U	2.6 U
3-Chloropropene	NS		7.6 U	12 U	14 U	8.3 U	9.8 U
4-Ethyltoluene	NS		6.0 U	9.7 U	11 U	6.5 U	7.7 U
4-Methyl-2-pentanone (MIBK)	NS		1.0 U	1.6 U	1.8 U	1.1 U	1.3 U
Acetone	NS		51	21	38	20	24
Benzene	NS		1.2	1.3 U	1.4 U	0.85 U	1.0 U
Benzyl chloride	NS		1.3 U	2.0 U	2.3 U	1.4 U	1.6 U
Bromodichloromethane	NS		1.5 U	2.4 U	2.7 U	1.6 U	1.9 U
Bromoethene	NS		NA	NA	NA	NA	NA
Bromoform	NS		2.5 U	4.1 U	4.6 U	2.7 U	3.2 U
Bromomethane	NS		0.95 U	1.5 U	1.7 U	1.0 U	1.2 U
Carbon disulfide	NS		6.9	8.6	9.8	5.6	6.4
Carbon tetrachloride	5		0.77 U	1.2 U	1.4 U	0.84 U	0.98 U
Chlorobenzene	NS		1.1 U	1.8 U	2.0 U	1.2 U	1.4 U
Chloroethane	NS		0.64 U	1.0 U	1.2 U	0.70 U	0.82 U
Chloroform	NS		1.2 U	1.9 U	2.2 U	1.3 U	1.5 U
Chloromethane	NS		1.3	0.81 U	0.91 U	0.55 U	0.65 U
cis-1,2-Dichloroethene	NS		0.97 U	1.6 U	1.8 U	1.1 U	1.2 U
cis-1,3-Dichloropropene	NS		1.1 U	1.8 U	2.0 U	1.2 U	1.4 U
Cyclohexane	NS		0.84 U	1.4 U	1.5 U	0.91 U	1.1 U

Table 7. Summary of Volatile Organic Compounds in Ambient and Indoor Air Samples, 149 Kent Avenue, Brooklyn, New York

Parameter (Concentrations in µg/m^3)	Air Guideline Values Derived by NYSDOH (µg/m^3)	**Sample Designation:**	21	68	Y-48	Y-80	Y-02
		Sample Date:	11/09/11	11/09/11	11/09/11	11/09/11	11/09/11
		Air Matrix:	Ambient Air	Indoor Air	Indoor Air	Indoor Air	Indoor Air
		Collected By:	Hyrdo Tech	Hyrdo Tech	Hyrdo Tech	Hyrdo Tech	Hyrdo Tech
Dibromochloromethane	NS		NA	NA	NA	NA	NA
Dichlorodifluoromethane	NS		2.7	1.9 U	2.2 U	1.3 U	1.5 U
Ethyl acetate	NS		0.88 U	1.4 U	1.6 U	0.96 U	1.1 U
Ethylbenzene	NS		1.1 U	1.7 U	1.9 U	1.2 U	1.4 U
Freon TF	NS		1.9 U	3.0 U	3.4 U	2.0 U	2.4 U
Hexachlorobutadiene	NS		2.6 U	4.2 U	4.7 U	2.8 U	3.3 U
Isopropyl Alcohol	NS		18	0.97 U	1.1 U	0.65 U	0.77 U
m+p-Xylene	NS		2.9	1.7 U	1.9 U	1.2 U	1.4 U
Xylenes (m,p)	NS		NA	NA	NA	NA	NA
Methylene chloride	60		**77 B**	28 B	36 B	11 B	7.6 B
MTBE	NS		0.88 U	1.4 U	1.6 U	0.96 U	1.1 U
n-Heptane	NS		1.0 U	1.6 U	1.8 U	1.1 U	1.3 U
n-Hexane	NS		16	3.9	7.2	2.2	1.1 U
o-Xylene	NS		1.2	1.7 U	1.9 U	1.2 U	1.4 U
Propylene	NS		0.42 U	0.68 U	0.76 U	0.46 U	0.54 U
Styrene	NS		1.0 U	1.7 U	1.9 U	1.1 U	1.3 U
t-Butyl Alcohol	NS		NA	NA	NA	NA	NA
Tetrachloroethene	100		1.7 U	2.7 U	3.0 U	3.4	2.1 U
Tetrahydrofuran	NS		0.72 U	1.2 U	1.3 U	0.78 U	0.92 U
Toluene	NS		4.6	5.5	6.0	5.7	5.1
trans-1,2-Dichloroethene	NS		0.97 U	1.6 U	1.8 U	1.1 U	1.2 U
trans-1,3-Dichloropropene	NS		1.1 U	1.8 U	2.0 U	1.2 U	1.4 U
Trichloroethene	5		0.66 U	1.1 U	1.2 U	0.71 U	0.84 U
Trichlorofluoromethane	NS		2.5	11	7.9	12	12
Vinyl acetate	NS		1.7 U	2.8 U	3.1 U	1.9 U	2.2 U
Vinyl bromide	NS		1.1 U	1.7 U	1.9 U	1.2 U	1.4 U
Vinyl chloride	NS		1.2 U	2.0 U	2.3 U	1.4 U	1.6 U
Xylenes (total)	NS		NA	NA	NA	NA	NA

NS - No standard available

µg/m^3 - Micrograms per cubic meter

U - Not detected

B - The analyte was found in an associated blank as well as in the sample

Bold - Value exceeds Air Guideline Values Derived by New York State Department of l

NA - Compound was not analyzed for by laboratory

Table 8a. Proposed Soil Sampling Locations, 149 Kent Avenue, Brooklyn, New York

Area of Concern (AOC)	Location	Matrix	Sample Depths*	Sample Parameters	Sampling Method**	Rationale
Sitewide and Confirmation Soil Borings						
	RA-1	Soil	Up to 3 samples: 0-2 foot below floor slab, interval with the highest elevated PID reading, and the next clean interval below the interval with the highest elevated PID reading or 2-foot interval above the water table, whichever is encountered first	TCL + 30/TAL	SW-846 8260B;SW-846 8270C;SW-846 8081A; SW-846 8151A;SW-846 8082;SW-846 6010/7471	To delineate the nature and extent of contamination identified during previous investigations
	RA-2	Soil		TCL + 30/TAL	SW-846 8260B;SW-846 8270C;SW-846 8081A; SW-846 8151A;SW-846 8082;SW-846 6010/7471	To delineate the nature and extent of contamination identified during previous investigations
	RA-3	Soil		TCL + 30/TAL	SW-846 8260B;SW-846 8270C;SW-846 8081A; SW-846 8151A;SW-846 8082;SW-846 6010/7471	To delineate the nature and extent of contamination identified during previous investigations
	RA-4	Soil		TCL + 30/TAL	SW-846 8260B;SW-846 8270C;SW-846 8081A; SW-846 8151A;SW-846 8082;SW-846 6010/7471	To delineate the nature and extent of contamination identified during previous investigations
	RA-5	Soil		TCL + 30/TAL	SW-846 8260B;SW-846 8270C;SW-846 8081A; SW-846 8151A;SW-846 8082;SW-846 6010/7471	To delineate the nature and extent of contamination identified during previous investigations
	RA-6	Soil		TCL + 30/TAL	SW-846 8260B;SW-846 8270C;SW-846 8081A; SW-846 8151A;SW-846 8082;SW-846 6010/7471	To delineate the nature and extent of contamination identified during previous investigations
	RA-14	Soil		TCL + 30/TAL	SW-846 8260B;SW-846 8270C;SW-846 8081A; SW-846 8151A;SW-846 8082;SW-846 6010/7471	To fill data gaps observed in previous investigations
	RA-15	Soil		TCL + 30/TAL	SW-846 8260B;SW-846 8270C;SW-846 8081A; SW-846 8151A;SW-846 8082;SW-846 6010/7471	To fill data gaps observed in previous investigations
	RA-16	Soil		TCL + 30/TAL	SW-846 8260B;SW-846 8270C;SW-846 8081A; SW-846 8151A;SW-846 8082;SW-846 6010/7471	To delineate the nature and extent of contamination identified during previous investigations
	RA-17	Soil		TCL + 30/TAL	SW-846 8260B;SW-846 8270C;SW-846 8081A; SW-846 8151A;SW-846 8082;SW-846 6010/7471	To delineate the nature and extent of contamination identified during previous investigations
	RA-18	Soil		TCL + 30/TAL	SW-846 8260B;SW-846 8270C;SW-846 8081A; SW-846 8151A;SW-846 8082;SW-846 6010/7471	To delineate the nature and extent of contamination identified during previous investigations
	RA-19	Soil		TCL + 30/TAL	SW-846 8260B;SW-846 8270C;SW-846 8081A; SW-846 8151A;SW-846 8082;SW-846 6010/7471	To delineate the nature and extent of contamination identified during previous investigations
	RA-20	Soil		TCL + 30/TAL	SW-846 8260B;SW-846 8270C;SW-846 8081A; SW-846 8151A;SW-846 8082;SW-846 6010/7471	To fill data gaps observed in previous investigations
Monitoring Well Soil Borings						
	RA-7/MW-7D	Soil	Up to 3 samples: 2-foot interval above the water table, 2-foot interval above the termination depth of the borehole, and interval that exhibits highest odor/visual evidence of contamination or highest elevated PID reading	TCL + 30/TAL	SW-846 8260B;SW-846 8270C;SW-846 8081A; SW-846 8151A;SW-846 8082;SW-846 6010/7471	To delineate the nature and extent of contamination identified during previous investigations
	RA-8/MW-8D	Soil		TCL + 30/TAL	SW-846 8260B;SW-846 8270C;SW-846 8081A; SW-846 8151A;SW-846 8082;SW-846 6010/7471	To delineate the nature and extent of contamination identified during previous investigations
	RA-9/MW-9D	Soil		TCL + 30/TAL	SW-846 8260B;SW-846 8270C;SW-846 8081A; SW-846 8151A;SW-846 8082;SW-846 6010/7471	To delineate the nature and extent of contamination identified during previous investigations
	RA-10/MW-10	Soil	Up to 3 samples: 0-2 foot below floor slab, interval with the highest elevated PID reading, and the next clean interval below the interval with the highest elevated PID reading or 2-foot interval above the water table, whichever is encountered first	TCL + 30/TAL	SW-846 8260B;SW-846 8270C;SW-846 8081A; SW-846 8151A;SW-846 8082;SW-846 6010/7471	To delineate the nature and extent of contamination identified during previous investigations
	RA-11/MW-11	Soil		TCL + 30/TAL	SW-846 8260B;SW-846 8270C;SW-846 8081A; SW-846 8151A;SW-846 8082;SW-846 6010/7471	To delineate the nature and extent of contamination identified during previous investigations
	RA-12/MW-12D	Soil	Up to3 samples: 2-foot interval above the water table, 2-foot interval above the termination depth of the borehole, and interval that exhibits highest odor/visual evidence of contamination or highest elevated PID reading	TCL + 30/TAL	SW-846 8260B;SW-846 8270C;SW-846 8081A; SW-846 8151A;SW-846 8082;SW-846 6010/7471	To delineate the nature and extent of contamination identified during previous investigations
	RA-13/MW-13	Soil	Up to 3 samples: 0-2 foot below floor slab, interval with highest elevated PID reading, and the next clean interval below any interval with an elevated PID reading or 2-foot interval above the water table, whichever is encountered first	TCL + 30/TAL	SW-846 8260B;SW-846 8270C;SW-846 8081A; SW-846 8151A;SW-846 8082;SW-846 6010/7471	To delineate the nature and extent of contamination identified during previous investigations

* Depths are in feet from grade; Additional intervals may be added based on field observations
** Laboratory will report to their minimum possible standards for each method (QAPP Table 2)
TCL + 30/TAL - includes TCL VOCs + 10 TICs, TCL BNA (SVOCs) + 20 TICs, TCL Pest/Herb/PCBs, TAL Metals
TCL - USEPA Contract Laboratory Program Target Compound List
TAL - USEPA Contract Laboratory Program Target Analyte List
VOCs - Volatile Organic Compounds
SVOCs - Semivolatile Organic Compounds
PCBs - Polychlorinated Biphenyls
TICs - Tentatively Identified Compounds
TBD - To Be Determined
QA/QC samples will be collected as described in the QAPP (Appendix B)

Table 8b. Proposed Groundwater Sampling Locations, 149 Kent Avenue, Brooklyn, New York

Area of Concern (AOC)	Monitoring Wells	Matrix	Sample Depth*	Sample Parameters	Sampling Method**	Rationale
Site-wide Groundwater	MW-1 through MW-6, MW-10, MW-11, MW-13	Groundwater	± 10-20	TCL + 30/TAL	SW-846 8260B;SW-846 8270C;SW-846 8081A; SW-846 8151A;SW-846 8082;SW-846 6010/7471	To evaluate the nature and extent of groundwater impacts as indicated by previous investigations
Northwestern Deep Groundwater	MW-7D, MW-8D, MW-9D, MW-12D	Groundwater	TBD	TCL + 30/TAL	SW-846 8260B;SW-846 8270C;SW-846 8081A; SW-846 8151A;SW-846 8082;SW-846 6010/7471	To evaluate the vertical extent of groundwater impacts as indicated by previous investigations

* Feet below grade, screened interval of well
** Laboratory will report to their minimum possible standards for each method (QAPP Table 2)
TCL + 30/TAL - includes TCL VOCs + 10 TICs, TCL BNA (SVOCs) + 20 TICs, TCL Pest/PCBs, TAL Metals
TCL - USEPA Contract Laboratory Program Target Compound List
TAL - USEPA Contract Laboratory Program Target Analyte List
VOCs - Volatile Organic Compounds
SVOCs - Semivolatile Organic Compounds
TICs - Tentatively Identified Compounds
PCBs - Polychlorinated Biphenyls
TBD - To Be Determined
QA/QC samples will be collected as described in the QAPP (Appendix B)

Table 8c. Proposed Sub-Slab Soil Vapor Sampling Locations, 149 Kent Avenue, Brooklyn, New York

Area of Concern (AOC)	Location	Matrix	Sample Depth*	Sample Parameters	Sampling Method**	Rationale
Sub-Slab Soil Vapor Samples	TBD	Soil Vapor	Sub-Slab	VOCs	TO-15	To evaluate the nature and extent of sub-slab soil vapor impacts as indicated by the initial investigation

* Feet below grade

** Laboratory will report to their minimum possible standards for each method (QAPP Table 2)

VOCs - Volatile Organic Compounds

QA/QC samples will be collected as described in the QAPP (Appendix B)

FIGURES

1. Site Location Map
2. Land Use
3. Proposed Sampling Locations

QUADRANGLE LOCATION

SOURCE:
USGS; 1995, BROOKLYN, NY
7.5 Minute Topographic Quadrangle

N

0 1000'

Title:

SITE LOCATION MAP

149 KENT AVENUE
BROOKLYN, NEW YORK

Prepared for:

KENT & WYTHE OWNERS LLC

ROUX
ROUX ASSOCIATES, INC.
Environmental Consulting & Management

Compiled by: D.T.B.	Date: 07SEP12	FIGURE
Prepared by: J.A.D.	Scale: AS SHOWN	1
Project Mgr.: J.D.	Project No.: 2158.0001Y000	
File: 2158.0001Y103.01.CDR		

V:\CAD\PROJECTS\2158\Y0001Y\1103\2158.0001Y103.01.CDR

LEGEND

- MIXED RESIDENTIAL COMMERCIAL
- COMMERCIAL
- INDUSTRIAL

0 80'

Title:

LAND USE MAP

149 KENT AVENUE
BROOKLYN, NEW YORK

Prepared for:

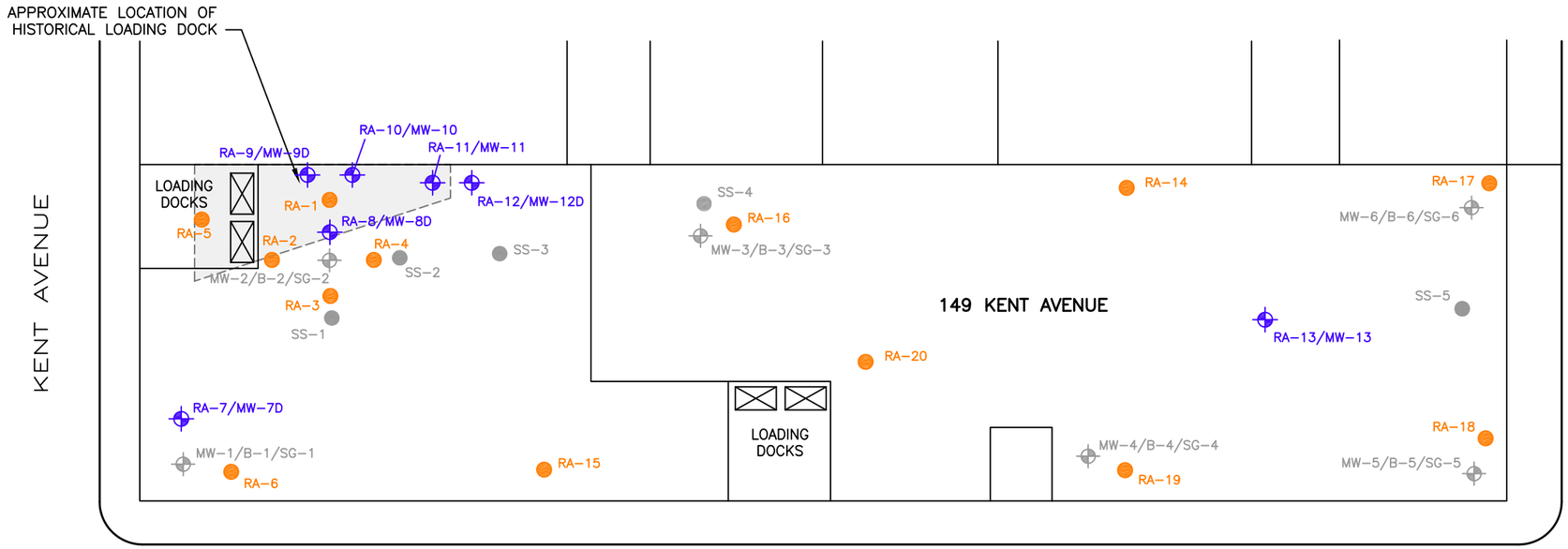
KENT & WYTHE OWNERS LLC

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

Compiled by: D.T.B.	Date: 06SEP12
Prepared by: J.A.D.	Scale: AS SHOWN
Project Mgr.: D.T.B.	Project No.: 2158.0001Y000
File: 2158.0001Y103.02.CDR	

FIGURE 2

V:\CAD\PROJECTS\2158Y0001Y\103\2158.0001Y103.02.CDR



LEGEND

MW-1/B-1/SG-1	EXISTING GROUND WATER MONITORING WELL/ SOIL BORING/SUBSLAB SOIL VAPOR SAMPLING POINT INSTALLED BY AKRF ENVIRONMENTAL CONSULTANTS
SS-1	APPROXIMATE LOCATION OF EXISTING SUBSLAB VAPOR SAMPLING POINT INSTALLED BY ROUX ASSOCIATES, INC.
RA-13/MW-13	LOCATION OF PROPOSED SOIL BORING AND MONITORING WELL
RA-1	LOCATION OF PROPOSED SOIL BORING

NOTE

BASE MAP PROVIDED BY AKRF ENVIRONMENTAL CONSULTANTS FIGURE 2, TITLED "SITE PLAN DETAIL", DATED 01/10/07

40' 0 40'

Title:

PROPOSED SAMPLE LOCATIONS

149 KENT AVENUE
BROOKLYN, NEW YORK

Prepared For:

KENT & WYTHE OWNERS LLC

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

Compiled by: D.T.B.	Date: 18SEP12	FIGURE
Prepared by: J.A.D.	Scale: AS SHOWN	
Project Mgr: J.D.	Project: 2158.0001Y000	3
File: 2158.0001Y103.03.DWG		

V:\CAD\PROJECTS\2158Y\0001Y\103\2158.0001Y103.03.DWG

APPENDICES

A. Field Sampling Plan
B. Quality Assurance Project Plan
C. Site Health and Safety Plan

APPENDIX A

Field Sampling Plan

September 19, 2012

FIELD SAMPLING PLAN

149 Kent Avenue

Prepared for

KENT & WYTHE OWNERS LLC
149 Kent Avenue
Williamsburg
Kings County, New York

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

209 Shafter Street, Islandia, New York 11749 ♦ 631-232-2600

TABLE OF CONTENTS

TABLES

ATTACHMENTS

1.0 INTRODUCTION

Roux Associates has developed this Field Sampling Plan (FSP) to describe in detail the field sampling methods to be used during performance of the Remedial Investigation (RI) at 149 Kent Avenue, Brooklyn, New York (Site).

The FSP was prepared in accordance with directives provided in the DER-10 Technical Guidance for Site Investigation and Remediation (May 2010) issued by the New York State Department of Environmental Conservation (NYSDEC), as well as relevant NYSDEC Technical and Administrative Guidance Memoranda (TAGMs), and provides guidelines and procedures to be followed by field personnel during performance of the RI. Information contained in this FSP relates to sampling objectives, sampling locations, sampling frequencies, sample designations, sampling equipment, sample handling, sample analysis, and decontamination.

2.0 SAMPLING OBJECTIVES

Prior Site characterization work was conducted on the Site over the course of several years by various entities.

The objective of the proposed sampling is to determine the nature and extent of the known contamination on Site, to evaluate any additional areas of contamination (AOCs) and potential associated contamination and to obtain a current representation of the environmental conditions at the Site. Roux Associates has performed a preliminary Site reconnaissance and has not located any additional AOCs.

The sampling procedures associated with characterization of soil, groundwater, and soil vapors are discussed in detail in Section 4 of this FSP. A discussion of the data quality objectives (DQOs) is provided in the Quality Assurance Project Plan (QAPP) located in Appendix B of the RI Work Plan.

3.0 SAMPLE MEDIA, LOCATIONS, ANALYTICAL SUITES, AND FREQUENCY

The media to be sampled during the RI include soil and groundwater. Soil vapor sampling is not proposed at this time, but may be undertaken if indicated by the RI Phase I. Discussions regarding soil vapor sampling are included for reference in the event the soil vapor sampling is conducted. Sampling locations, analytical suites, and frequency vary by medium. A discussion of the sampling schedule for each medium is provided below, while the assumed number of field samples to be collected for each medium, including quality control (QC) samples, is shown in Table A-1. Specifics regarding the collection of samples at each location and for each task are provided in Section 4 of this FSP.

3.1 Membrane Interface Probe/Exploratory Soil Boring

A Membrane Interface Probe (MIP) will be used to define the vertical extent of the chlorinated CVOCs in groundwater near the suspected source area in one exploratory soil boring. The MIP is a screening technology that can identify the relative magnitude of contamination present within the formation. As the MIP is driven to depth, a permeable membrane on the side of the probe is heated, volatilizing VOCs that are present within the surrounding groundwater and sorbed to the soil. The VOCs permeate the membrane and are delivered via a vacuum to the surface using an internal carrier gas. The detector signals from the MIP probe are graphed versus depth in real time.

The MIP probe will be used to conduct the exploratory soil boring at RA-9/MW-9D. Data from this borehole will be used to determine the approximate depth to bedrock for the Site (depth to bedrock may vary beneath the Site), or any confining unit, and to determine the appropriate depth to collect analytical samples and set the proposed deep monitoring wells.

3.2 Soil Sampling

Soil samples underlying the Site will be collected at 20 locations as shown in Figure 3 of the RI Work Plan. At each soil boring location, up to three soil samples will be collected:

- one from the 0-2 foot interval directly beneath the floor slab;
- one from the interval exhibiting the highest photo-ionization detector (PID) reading and/or odor/visual evidence of contamination (staining): and

- one from the next 'clean' interval as evidenced by a reduction or absence of PID detections or odor/visual evidence of contamination, or the two-foot interval directly above the water table, whichever is encountered first.

In the four 'deep' monitoring well borings (MW-7D, MW-8D, MW-9, MW-12D) up to three soil samples will be collected based on field observations:

- one soil sample will be collected at the two-foot interval immediately above the water table;
- one soil sample from the termination depth of the borehole; and
- one additional sample may be collected from any interval that exhibits PID detections or odor/visual evidence of contamination.

Note: No soil samples will be collected in the exploratory MIP soil boring RA-9/MW-9, since the instrument is a direct push probe. A soil sample will be collected from a new borehole adjacent to the MIP soil boring.

All samples will be analyzed for Target Compound List (TCL) plus 30/ Target Analyte List (TCL + 30/TAL) (which includes TCL VOCs, TCL Base neutral acids [BNA], semivolatile organic compounds [SVOCs] + 20, TCL Pesticides, TCL Herbicides, TCL polychlorinated biphenyls [PCBs], and TAL Metals, including hexavalent chromium), with the exception of soil samples collected below the water table in the monitoring well borings. These samples will only be analyzed for VOCs to determine the presence or absence of CVOCs.

Continuous soil samples will be collected using the direct-push method via a Geoprobe® with either a four or five-foot macrocore sampler, depending on the model used. During soil boring activities, lithology will be recorded and soil will be visually inspected and field screened every two feet to two and a half feet for VOCs using a PID.

Soil borings may be added to the scope of work to investigate any additional areas of concern identified during field activities.

3.3 Groundwater Sampling

Groundwater samples will be collected from all six existing monitoring wells located at the Site and the seven additional monitoring wells that will be installed during the investigation. After gauging for potential separate-phase petroleum product using an oil/water interface probe,

each shallow well will be sampled for TCL + 30/TAL. Deep wells (MW-7D, MW-8D, MW-9D, and MW-12D) will only be sampled for VOCs to determine the presence or absence of CVOCs at depth. A groundwater profile sample will also be collected from a soil boring adjacent to the MIP exploratory boring in RA-9/MW-9D and analyzed for VOCs. Field parameters including pH and conductivity will also be measured prior to sampling.

3.4 Sub-slab Soil Vapor

Sub-slab soil vapor sampling is not proposed at this time. Previous results have already confirmed the presence of CVOCs, primarily TCE and PCE in sub-slab soil gas beneath the warehouse floor slab. The need for and potential location of additional sub-slab soil vapor sampling will be evaluated based on the results of the RI Phase I VOC data. If performed, sub-slab soil vapor samples collected in Summa canisters will be used to quantitatively verify the extent of sub-slab soil vapor impacts indicated by RI Phase I sample results.

If deemed necessary at a future date, sample locations for sub-slab soil vapor samples will be selected based on areas of known or suspected historical activities, where previous sampling has indicated contamination and based on the results of the RI Phase I as described in Section 3.2.2 of the RI work plan. All samples will be analyzed for VOCs using USEPA method TO-15.

4.0 FIELD SAMPLING PROCEDURES

This section provides a detailed discussion of the field procedures to be used during sampling of the various media being evaluated as part of the RI (i.e., soil, groundwater, and sub-slab soil vapor). The locations are shown on Figure 3 of the RI work plan and additional information including intervals to be sampled and sample rationale is provided in Tables 8a, 8b and 8c of the RI work plan.

4.1 Soil Sampling and Monitoring Well Installation

Details for the collection of soil samples and the installation of monitoring wells are provided below.

4.1.1 Membrane Interface Probe/Exploratory Soil Boring

The MIP exploratory soil boring will be advanced at boring location RA-9/MW-9D using a Geoprobe® direct-push unit to the top of bedrock, or a confining layer, whichever is encountered first. Roux Associates' field manager will review the data collected from the MIP boring during its completion to determine if the final depth of the boring is sufficient to evaluate the potential for a source area to be present. Upon completion, a 'deep' monitoring well will be installed in this location at a depth to be determined based on the MIP results.

4.1.1 Soil Sampling

Borings will be advanced using a Geoprobe® truck or track-mounted direct-push drill rig. Samples of the soil profile will be collected in continuous four or five-foot increments using a 2-inch-diameter macrocore sampler to a maximum depth of approximately 15-17 feet below land surface, in soil borings RA-1 through RA-6, RA-10, RA-11, and RA-13 through RA-20. Maximum depth for soil borings RA-7, RA-8, and RA-12 will be determined following the completion of the exploratory MIP soil boring (RA-9) discussed in Section 3.1 and above, which will proceed to bedrock or a confining unit, whichever is encountered first.

The soil from each four or five-foot interval will be observed for lithology and evidence of contamination (e.g., staining, odors, and/or visible free product) and placed immediately thereafter into large Zip-loc™ bags for recording headspace. After a minimum of 15 minutes for equilibration with the headspace in the Zip-loc™ bag, each sample will be screened for organic

vapors using a PID. Samples for possible VOC analysis will be placed in a laboratory-supplied jar prior to screening, due to the potential for loss of VOCs through volatilization. Soil samples will be collected according to Table 8a. In site-wide soil borings and shallow monitoring well borings (RA-1 through RA-6, RA-10, RA-11, RA-13 through RA-20), up to three soil samples will be collected: from the 0-2 foot below the floor slab, the interval the exhibits the highest elevated PID reading, and the next clean interval below the interval with the highest elevated PID reading or the 2-foot interval above the water table, whichever is encountered first. In deep monitoring well soil borings (MW-7D, MW-8D, MW-9D and MW-12D), up to three soil samples will be collected: from the two-foot interval immediately above the water table, the two-foot interval above the termination depth of the borehole, and the interval that exhibits the highest odor/visual evidence of contamination or highest elevated PID reading. These samples will be placed in the laboratory-supplied containers and shipped to the laboratory under chain of custody procedures in accordance with Roux Associates standard operating procedures. Upon completion, each boring will be allowed to collapse. Surface completion will consist of placing a bentonite seal at the surface so that boreholes may be returned to for further delineation, if necessary.

Additional soil borings and soil samples to horizontally and/or vertically delineate detections above the NYSDEC restricted residential criteria are not proposed at this time. Current development plans include removal and offsite disposal of the top 15 feet of soil across the entire Site. If development plans are modified and soil will remain in place, additional soil borings will be installed and samples will be collected to delineate the extent of exceedances. If delineation borings are performed, the following procedures will apply.

If delineation is required, up to four additional delineation borings will be advanced around the location (based on building constraints and proximity to other sample locations). The additional borings will be evenly spaced around the location(s), within a five-foot radius, and sampled in the same manner as described above. Soil samples from delineation borings will be sent to the laboratory for analysis of the compound(s) detected in exceedance in the initial sample location.

Additional details regarding soil-sampling protocols are described in Roux Associates' Standard Operating Procedure for the Collection of Soil Samples for Laboratory Analysis, which is provided in Attachment 1.

4.1.2 Monitoring Well Installation

Following soil sampling activities, monitoring wells will be installed in shallow/deep pairs at soil boring locations RA-10/MW-10, RA-11/MW-11, and RA-13/MW-13 bridging the water table to a depth of approximately 20 feet bls, and at RA-7/MW-7D, RA-8/MW-8D, RA-9/MW-9D and RA-12/MW-12D to a depth to be determined by a pilot borehole during the RI Phase I Investigation. An additional shallow monitoring well may be installed at location RA-14 based on field observations (elevated PID readings, visual or olfactory evidence of contamination at or near the water table) during soil boring activities. Monitoring wells will be installed using the hollow stem auger drilling method and constructed of 2-inch-inside-diameter, Schedule 40 polyvinyl chloride (PVC) casing and, 0.020-inch slot, machined screen. Well screens will be 10 feet long, and will be installed with three feet above and seven feet below the water table in MW-10, MW-11, and MW-13, and at a depth to be determined in MW-7D, MW-8D, MW-9D and MW-12D. A sand pack will be placed around the well screen, extending two feet above the top of the screened zone. Once the driller confirms the depth of the sand pack, a minimum two-foot-thick bentonite pellet seal will be placed above the sand pack. Once the pellets have been allowed to hydrate, a cement-bentonite grout will be pumped into the remaining annular space from the bottom up using a tremie pipe lowered to just above the bentonite seal. The wells will be completed using locking well plugs, and flush mounted, bolt down, watertight, manhole covers cemented into place. Following installation, all site monitoring wells will be surveyed in order to construct groundwater contour maps.

4.2 Groundwater Sampling

Each monitoring well, including existing wells, will be developed to remove any fine-grained material in the vicinity of the well screen and to promote hydraulic connection with the aquifer. The wells will be developed using a submersible pump, which will be surged periodically until well yield is consistent and has a turbidity below 50 nephelometric turbidity units (NTUs), if possible.

Groundwater samples will be collected no sooner than one week following development of the wells. Prior to sampling, depth to water will be measured at each well using an electronic oil/water level meter with an accuracy of +/-0.01 feet. All wells will then be purged and sampled using a peristaltic pump, or an alternative method, depending on the observed depth to

groundwater and logistical issues. Samples will be analyzed for TCL + 30/TAL. Additional details for the collection of groundwater samples are included in the Roux Associates SOPs (Attachment 1).

All groundwater samples will be placed in the laboratory-supplied containers and shipped to the laboratory under chain of custody procedures in accordance with Roux Associates' SOPs.

4.3 Sub-slab Soil Vapor Sampling

Sub-slab Soil vapor sampling is not proposed at this time. Previous results have already confirmed the presence of CVOCs, primarily TCE and PCE in soil gas beneath the warehouse. The need for and potential location of sub-slab soil vapor sampling will be evaluated based on the results of the RI VOC data. However, should additional sub-slab soil vapor sampling be added to the scope of work, the procedures described below will be followed.

All sub-slab vapor samples will be analyzed using USEPA Method TO-15 for VOCs. The detection limits for all Matrix 1 compounds will be less than 0.25 $\mu g/m^3$, as required in the New York State Department of Health Guidance.

4.3.1 Sub-Slab Soil Vapor Samples

If deemed appropriate, sample locations for sub-slab soil vapor samples will be selected based on areas of known or suspected historical activities and the results of the RI Phase I . Sub-slab vapor samples will be collected directly below the slab, by penetrating the floor slab using a hammer drill to create a 1-inch diameter hole in the concrete down to 6–inches below the slab. The sample tubing will be placed through this hole and will be held in place and sealed with a clay or bentonite seal.

The sample tubing will be connected to a pre-evacuated SUMMA canister with a laboratory calibrated regulator set to collect a sample over a one-hour interval (approximately 10 milliliters per minute). Prior to sample collection, the Teflon®-lined tubing will be purged of approximately two volumes of the tubing using a vacuum pump set at a rate of 0.2 liters per minute. A tracer gas (i.e., helium) will be used to enrich the atmosphere in the immediate vicinity of the sampling location in order to test the borehole seal and verify that ambient air is not being drawn into the

sample. Following purging and verification with the tracer gas, the tubing will be connected to the laboratory supplied six-liter SUMMA canister. Soil vapor samples and will be submitted to for laboratory analysis under chain of custody procedures for analysis using USEPA Method TO-15 for VOCs. The detection limits for all Matrix 1 compounds will be less than 0.25 $\mu g/m^3$, as required in the New York State Department of Health Guidance.

When sub-slab vapor samples are collected, the following actions/conditions will be documented to aid in the interpretation of the sampling results:

a. floor plan sketches that include the floor layout with sample locations, doorways, stairways, location of sumps or subsurface drains and utility perforations through building foundations, compass orientation (north), and any other pertinent information should be noted;

b. if possible, photographs will accompany floor plan sketches;

c. weather conditions (e.g., precipitation, indoor and outdoor temperature, and barometric pressure) and ventilation conditions (e.g., windows/doors closed) will be reported; and

d. any pertinent observations, such as spills, floor stains, and odors will be recorded.

5.0 SAMPLE HANDLING AND ANALYSIS

To ensure quality data acquisition and collection of representative samples, there are selective procedures to minimize sample degradation or contamination. These include procedures for preservation of the samples as well as sample packaging and shipping procedures.

5.1 Field Sample Handling

A detailed discussion of the number and types of samples to be collected during each task, as well as the analyses to be performed can be found in Section 3.0 of this FSP. The types of containers, volumes needed, and preservation techniques for the aforementioned testing parameters are presented in Table A-2.

5.2 Sample Custody Documentation

The purpose of documenting sample custody is to confirm that the integrity and handling of the samples is not subject to question. Sample custody will be maintained from the point of sampling through the analysis. Specific procedures regarding sample tracking from the field to the laboratory are described in Roux Associates' SOP for Sample Handling (Attachment 1).

Each individual collecting samples is personally responsible for the care and custody of the samples. All sample labels should be pre-printed or filled out using waterproof ink. The technical staff will review all field activities with the Field Team Leader to determine whether proper custody procedures were followed during the fieldwork and to decide if additional samples are required.

All samples being shipped off-site for analysis must be accompanied by a properly completed chain of custody form (Attachment 2). The sample numbers will be listed on the chain of custody form. When transferring the possession of samples, individuals relinquishing and receiving will sign, date, and note the time on the record. This record documents transfer of custody of samples from the sampler to another person, to/from a secure storage area, and to the laboratory.

Samples will be packaged for laboratory pick up and/or shipment with a separate signed custody record enclosed in each sample box or cooler. Shipping containers will be locked and/or secured with strapping tape in at least two locations for shipment to the laboratory.

5.3 Sample Shipment

Laboratory courier services may be used for sample transport on this project. However, in the event that samples are shipped to the laboratory the following procedures will apply. Sample packaging and shipping procedures are based upon USEPA specifications, as well as U.S. Department of Transportation (DOT) regulations. The procedures vary according to potential sample analytes, concentration, and matrix, and are designed to provide optimum protection for the samples and the public. Sample packaging and shipment must be performed using the general outline described below. Additional information regarding sample handling is provided in Roux Associates' SOP for Sample Handling (Attachment 1).

All samples will be shipped within 12 hours of collection (when possible) and will be preserved appropriately from the time of sample collection. A description of the sample packing and shipping procedures is presented below:

1. Prepare cooler(s) for shipment.
   - tape drain(s) of cooler shut;
   - affix "this side up" arrow labels and "fragile" labels on each cooler; and
   - place mailing label with laboratory address on top of cooler(s).
2. Arrange sample containers in groups by sample number or analyte.
3. Ensure that all bottle labels are completed correctly. Place clear tape over bottle labels to prevent moisture accumulation from causing the label to peel off.
4. Arrange containers in front of assigned coolers.
5. Place packaging material at the bottom of the cooler to act as a cushion for the sample containers.
6. Arrange containers in the cooler so that they are not in contact with the cooler or other samples.
7. Fill remaining spaces with packaging material.
8. Ensure all containers are firmly packed with packaging material.
9. If ice is required to preserve the samples, ice cubes should be repackaged in double Zip-Lock™ bags, and placed on top of the packaging material.
10. Sign chain of custody form (or obtain signature) and indicate the time and date it was relinquished to Federal Express or other carrier, as appropriate.

11. Separate chain of custody forms. Seal proper copies within a large Zip-Lock™ bag and tape to cooler. Retain copies of all forms.

12. Close lid and latch.

13. Secure each cooler using custody seals.

14. Tape cooler shut on both ends.

15. Relinquish to Federal Express or other courier service as appropriate. Retain airbill receipt for project records. (Note: All samples will be shipped for "NEXT A.M." delivery).

16. Telephone laboratory contact and provide him/her with the following shipment information:

    - sampler's name;
    - project name;
    - number of samples sent according to matrix and concentration; and
    - airbill number.

6.0 SITE CONTROL PROCEDURES

Site control procedures, including decontamination and waste handling and disposal, are discussed below.

6.1 Decontamination

In an attempt to avoid the spread of contamination, all drilling and sampling equipment must be decontaminated at a reasonable frequency in a properly designed and located decontamination area. Detailed procedures for the decontamination of field and sampling equipment are included in Roux Associates' SOPs for the Decontamination of Field Equipment, which is provided in Attachment 1. The location of the decontamination area will be determined prior to the start of field operations. The decontamination area will be constructed to ensure that all wash water generated during decontamination can be collected and containerized for proper disposal.

6.2 Waste Handling and Disposal

All waste materials (drill cuttings, decontamination water, etc.) generated during the RI will be consolidated, and stored in appropriate labeled bulk containers (drums, etc.), and temporarily staged at an investigation-derived-waste storage area onsite. Roux Associates will then coordinate waste characterization and disposal by appropriate means.

TABLES

1. Remedial Investigation Field and Quality Control Sampling Summary
2. Preservation, Holding Times, and Sample Containers

Table 1. Remedial Investigation Field and Quality Control Sampling Summary

Sample Medium	Target Analytes	Field Samples	Replicates[1]	Trip Blanks[2]	Field Blanks[3]	Matrix Spikes[1]	Spike Duplicates[1]	Total No. of Samples
Soil	TCL VOCs +10	60	3	5	5	3	3	79
	TCL SVOCs +20	56	3	0	5	3	3	70
	TCL Pesticides	56	3	0	5	3	3	70
	TCL Herbicides	56	3	0	5	3	3	70
	TCL PCBs	56	3	0	5	3	3	70
	TAL Metals	56	3	0	5	3	3	70
	Hexavalent Chromium	56	3	0	5	3	3	70
Groundwater	TCL VOCs +10	14	1	2	2	1	1	21
	TCL SVOCs +20	9	1	0	2	1	1	14
	TCL Pesticides	9	1	0	2	1	1	14
	TCL Herbicides	9	1	0	2	1	1	14
	TCL PCBs	9	1	0	2	1	1	14
	TAL Metals	9	1	0	2	1	1	14
	Hexavalent Chromium	9	1	0	2	1	1	14
Soil Vapor	TO-15 VOCs	TBD	TBD	0	0	0	0	TBD

Totals are estimated based on scope of work as written, actual sample quantities may vary based on field conditions. QA/QC sample quantities will be adjusted accordingly.

[1] Based on 1 per 20 samples or 1 per Sample Delivery Group (3 days max)

[2] Based on 1 cooler per day

[3] Based on 1 per day

TCL - USEPA Contract Laboratory Program Target Compound List

VOCs - Volatile Organic Compounds

SVOCs - Semivolatile Organic Compounds

PCBs - Polychlorinated Biphenyls

TAL - USEPA Contract Laboratory Program Target Analyte List

TBD - To Be Determined

Table 2. Preservation, Holding Times and Sample Containers

Analysis	Matrix	Bottle Type	Preservation(a)	Holding Time(b)
TAL Metals (total) SW-846 6010/7471	Soil Water	8 oz wide mouth glass, teflon lined cap 250 mL plastic, teflon lined cap	Cool to 4°C Nitric acid	180 days, Hg 28 days
Hexavalent Chromium SW-846 7196A	Soil Water	2 oz wide mouth glass, teflon lined cap 500 mL Plastic	None	180 days 24 hours from sample collection
TO-15	Air	6 liter Summa Canister	None	14 days from sample collection
Target Compound List (TCL)				
TCL Volatile Organic Compounds (VOCs) SW-846 8260B	Soil Water	2 oz wide mouth glass, teflon lined cap 40mL voa vial, teflon lined cap	Cool to 4°C Hydrochloric Acid	14 days from sample collection
TCL Semivolatile Organic Compounds (SVOCs) SW-846 8270C	Soil Water	8 oz wide mouth glass, teflon lined cap 1 liter amber glass, teflon lined cap	Cool to 4°C	14 days to extract, 40 days to analysis 7 days to extract, 40 days to analysis
TCL Pesticides SW-846 8081A	Soil Water	8 oz wide mouth glass, teflon lined cap 1 liter amber glass, teflon lined cap	Cool to 4°C	14 days to extract, 40 days to analysis 7 days to extract, 40 days to analysis
TCL Herbicides SW-846 8051A	Soil Water	8 oz wide mouth glass, teflon lined cap 1 liter amber glass, teflon lined cap	Cool to 4°C	14 days to extract, 40 days to analysis 7 days to extract, 40 days to analysis
TCL Polychlorinated biphenyls (PCBs) SW-846 8082	Soil Water	8 oz wide mouth glass, teflon lined cap 1 liter amber glass, teflon lined cap	Cool to 4°C	14 days to extract, 40 days to analysis 7 days to extract, 40 days to analysis

(a) All soil and groundwater samples to be preserved in ice during collection and transport

(b) Days from date of sample collection.

TAL - Target Analyte List

TCL - USEPA Contract Laboratory Program Target Compound List

ATTACHMENTS

1. Roux Associates' Standard Operating Procedure for Tasks Described in this Field Sampling Plan
2. Chain of Custody Form

ATTACHMENT 1

Roux Associates' Standard Operating Procedure for
Tasks Described in this Field Sampling Plan

Date: May 5, 2000

1.0 PURPOSE

The purpose for this standard operating procedure (SOP) is to establish the guidelines for decontamination of all field equipment potentially exposed to contamination during drilling, and soil and water sampling. The objective of decontamination is to ensure that all drilling, and soil-sampling and water-sampling equipment is decontaminated (free of potential contaminants): 1) prior to being brought onsite to avoid the introduction of potential contaminants to the site; 2) between drilling and sampling events/activities onsite to eliminate the potential for cross-contamination between boreholes and/or wells; and 3) prior to the removal of equipment from the site to prevent the transportation of potentially contaminated equipment offsite.

In considering decontamination procedures, state and federal regulatory agency requirements must be considered because of potential variability between state and federal requirements and because of variability in the requirements of individual states. Decontamination procedures must be in compliance with state and/or federal protocols in order that regulatory agency(ies) scrutiny of the procedures and data collected do not result in non acceptance (invalidation) of the work undertaken and data collected.

2.0 PROCEDURE FOR DRILLING EQUIPMENT

The following is a minimum decontamination procedure for drilling equipment. Drilling equipment decontamination procedures, especially any variation from the method itemized below, will be documented on an appropriate field form or in the field notebook.

2.1 The rig and all associated equipment should be properly decontaminated by the contractor before arriving at the test site.

2.2 The augers, drilling casings, rods, samplers, tools, rig, and any piece of equipment that can come in contact (directly or indirectly) with the soil, will be steam cleaned onsite prior to set up for drilling to ensure proper decontamination.

2.3 The same steam cleaning procedures will be followed between boreholes (at a fixed on-site location[s], if appropriate) and before leaving the site at the end of the study.

2.4 All on-site steam cleaning (decontamination) activities will be monitored and documented by a member(s) of the staff of Roux Associates, Inc.

2.5 If drilling activities are conducted in the presence of thick, sticky oils (e.g., PCBs) which coat drilling equipment, then special decontamination procedures may have to be utilized before steam cleaning (e.g., hexane scrub and wash).

2.6 Containment of decontamination fluids may be necessary (e.g., rinseate from steam cleaning) or will be required (e.g., hexane), and disposal must be in accordance with state and/or federal procedures.

3.0 PROCEDURE FOR SOIL-SAMPLING EQUIPMENT

The following is a minimum decontamination procedure for soil-sampling equipment (e.g., split spoons, stainless-steel spatulas). Soil-sampling equipment decontamination procedures, especially any variation from the method itemized below, will be documented on an appropriate field form or in the field notebook.

3.1 Wear disposable gloves while cleaning equipment to avoid cross-contamination and change gloves as needed.

3.2 Steam clean the sampler or rinse with potable water. If soil-sampling activities are conducted in the presence of thick, sticky oils (e.g., PCBs) which coat sampling equipment, then special decontamination procedures may have to be utilized before steam cleaning and washing in detergent solution (e.g., hexane scrub and wash).

3.3 Prepare a non-phosphate, laboratory-grade detergent solution and distilled or potable water in a clean bucket.

3.4 Disassemble the sampler, as necessary and immerse all parts and other sampling equipment in the solution.

3.5 Scrub all equipment in the bucket with a brush to remove any adhering particles.

3.6 Rinse all equipment with copious amounts of potable water followed by distilled or deionized water.

3.7 Place clean equipment on a clean plastic sheet (e.g., polyethylene)

3.8 Reassemble the cleaned sampler, as necessary.

3.9 Transfer the sampler to the driller (or helper) making sure that this individual is also wearing clean gloves, or wrap the equipment with a suitable material (e.g., plastic bag, aluminum foil.

As part of the decontamination procedure for soil-sampling equipment, state and/or federal protocols must be considered. These may require procedures above those specified as minimum for Roux Associates, Inc., such as the use of nitric acid, acetone, etc. Furthermore, the containment and proper disposal of decontamination fluids must be considered with respect to regulatory agency(ies) requirements.

4.0 PROCEDURE FOR WATER-SAMPLING EQUIPMENT

The following is a decontamination procedure for water-sampling equipment (e.g., bailers, pumps). Water-sampling equipment decontamination procedures, especially any variation from the method itemized below, will be documented on an appropriate field form or in the field notebook.

4.1 Decontamination procedures for bailers follow:

a. Wear disposable gloves while cleaning bailer to avoid cross-contamination and change gloves as needed.

b. Prepare a non-phosphate, laboratory-grade detergent solution and potable water in a bucket.

c. Disassemble bailer (if applicable) and discard cord in an appropriate manner, and scrub each part of the bailer with a brush and solution.

d. Rinse with potable water and reassemble bailer.

e. Rinse with copious amounts of distilled or deionized water.

f. Air dry.

g. Wrap equipment with a suitable material (e.g., clean plastic bag, aluminum foil).

h. Rinse bailer at least three times with distilled or deionized water before use.

4.2 Decontamination procedures for pumps follow:

a. Wear disposable gloves while cleaning pump to avoid cross-contamination and change gloves as needed.

b. Prepare a non-phosphate, laboratory-grade detergent solution and potable water in a clean bucket, clean garbage can, or clean 55-gallon drum.

c. Flush the pump and discharge hose (if not disposable) with the detergent solution, and discard disposable tubing and/or cord in an appropriate manner.

d. Flush the pump and discharge hose (if not disposable) with potable water.

e. Place the pump on clear plastic sheeting.

f. Wipe any pump-related equipment (e.g., electrical lines, cables, discharge hose) that entered the well with a clean cloth and detergent solution, and rinse or wipe with a clean cloth and potable water.

g. Air dry.

h. Wrap equipment with a suitable material (e.g., clean plastic bag).

As part of the decontamination procedure for water-sampling equipment, state and/or federal protocols must be considered. These may require procedures above those specified as minimum for Roux Associates, Inc., such as the use of nitric acid, acetone, etc. Furthermore, the containment and proper disposal of decontamination fluids must be considered with respect to regulatory agency(ies) requirements.

Date: May 5, 2000

1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to establish guidelines for the collection of soil samples for laboratory analysis. This SOP is applicable to soil samples collected from split-spoon samplers during drilling, hand auger samples, grab samples from stockpiled soils, surface samples, test pit samples, etc.

2.0 CONSIDERATIONS

Soil samples may be collected in either a random or biased manner. Random samples can be based on a grid system or statistical methodology. Biased samples can be collected in areas of visible impact or suspected source areas. Soil samples can be collected at the surface, shallow subsurface, or at depth. When samples are collected at depth the water content should be noted, since generally "soil sampling" is restricted to the unsaturated zone. Equipment selection will be determined by the depth of the sample to be collected. A thorough description of the sampling locations and proposed methods of sample collection should be included in the work plan.

Commonly, surface sampling refers to the collection of samples at a 0 to 6 inch depth interval. Certain regulatory agencies may define the depth interval of a surface sample differently, and this must be defined in the work plan. Collection of surface soil samples is most efficiently accomplished with the use of a stainless steel trowel or scoop. For samples at greater depths a decontaminated bucket auger or power auger may be needed to advance the hole to the point of sample collection. Another clean bucket auger should then be used to collect the sample. To collect samples at depths of greater than approximately six feet the use of a drill rig and split spoon samples will usually be necessary. In some situations, sample locations are accessed with the use of a backhoe.

3.0 MATERIALS/EQUIPMENT

a. A work plan which outlines soil sampling requirements.

b. Field notebook, field form(s), maps, chain-of-custody forms, and custody seals.

c. Decontamination supplies (including: non-phosphate, laboratory grade detergent, buckets, brushes, potable water, distilled water, regulatory-required reagents, aluminum foil, plastic sheeting, etc.).

d. Sampling device (split-spoon sampler, stainless steel hand auger, stainless steel trowel, etc.).

e. Stainless steel spoons or spatulas.

f. Disposable sampling gloves.

g. Laboratory-supplied sample containers with labels.

h. Cooler with blue or wet ice.

i. Plastic sheeting.

j. Black pen and indelible marker.

k. Zip-lock bags and packing material.

l. Tape measure.

m. Paper towels or clean rags.

n. Masking and packing tape.

o. Overnight (express) mail forms.

4.0 DECONTAMINATION

All reusable sampling equipment will be thoroughly cleaned according to the decontamination SOP. Where possible, thoroughly pre-cleaned and wrapped sampling equipment should be used and dedicated to individual sampling locations. Disposable items such as sampling gloves, aluminum foil, and plastic sheeting will be changed after each use and discarded in an appropriate manner.

5.0 PROCEDURE

5.1 Prior to collecting soil samples, ensure that all sampling equipment has been thoroughly cleaned according to the decontamination SOP. If samples are to be collected at depth, then the boring must be advanced with thoroughly cleaned equipment to the desired sampling horizon and a different thoroughly cleaned sampler must be used to collect the sample.

5.2 Using disposable gloves and a pre-cleaned, stainless steel spatula or spoon, extract the soil sample from the sampler, measure the recovery, and separate the wash from the true sample. Where allowed by regulatory agency(ies), disposable plastic spoons may be used.

5.3 Place the sample in a laboratory-supplied, pre-cleaned sample container. This should be done as quickly as possible and this is especially important when sampling for volatile organic compounds (VOCs). Samples to be analyzed for VOCs must be collected prior to other constituents.

5.4 The sample container will be labeled with appropriate information such as, client name, site location, sample identification (location, depth, etc.), date and time of collection, and sampler's initials.

5.5 Using the remaining portion of soil from the sampler, log the sample in detail and record sediment characteristics (color, odor, moisture, texture, density, consistency, organic content, layering, grain size, etc.).

5.6 If soil samples are to be composited in the field, then equal portions from selected locations will be placed on a clean plastic sheet and homogenized. Alternately, several samples may be submitted to the laboratory for compositing by weight. The method used is dependent upon regulatory requirements. Specific compositing procedures shall be approved by the appropriate regulatory agency and described in the work plan. Samples to be analyzed for VOCs will not be composited unless required by a regulatory agency.

5.7 After the sample has been collected, labeled, and logged in detail, it is placed in a zip-lock bag and stored in a cooler at 4°C.

5.8 A chain-of-custody form is completed for all samples collected. One copy is retained and two are sent with the samples in a zip-lock bag to the laboratory. A custody seal is placed on the cooler prior to shipment.

5.9 Samples collected from Monday to Friday are to be delivered to the laboratory within 24 hours of collection. If Saturday delivery is unavailable, samples collected on Friday must be delivered by Monday morning. Check the work plan to determine if any analytes require a shorter delivery time.

5.10 The field notebook and appropriate forms should include, but not be limited to the following: client name, site location, sample location, sample depth, sample identification, date and time collected, sampler's name, method of sample collection, number and type of containers, geologic description of material, description of decontamination procedures, etc. A site map should be prepared with exact measurements to each sample location in case follow-up sampling is necessary.

5.11 All reusable sampling equipment must be thoroughly cleaned in accordance with the decontamination SOP. Following the final decontamination (after all samples are collected) the sampling equipment is wrapped in aluminum foil. Discard any gloves, foil, plastic, etc. in an appropriate manner that is consistent with site conditions.

END OF PROCEDURE

Date: May 5, 2000

1.0 PURPOSE

The purpose of this standard operating procedure (SOP) is to establish guidelines for the sampling of ground-water monitoring wells for dissolved constituents. As part of the SOP for the sampling of ground-water monitoring wells, sample collection equipment and devices must be considered, and equipment decontamination and pre-sampling procedures (e.g., measuring water levels, sounding wells, and purging wells) must be implemented. Sampling objectives must be firmly established in the work plan before considering the above.

Valid water-chemistry data are integral to a hydrogeologic investigation that characterizes ground-water quality conditions. Water-quality data are used to evaluate both current and historic aquifer chemistry conditions, as well as to estimate future conditions (e.g., trends, migration pathways). Water-quality data can be used to construct ground-water quality maps to illustrate chemical conditions within the flow system, to generate water-quality plots to depict conditions with time and trends, and to perform statistical analyses to quantify data variability, trends, and cleanup levels.

2.0 EQUIPMENT AND MATERIALS

2.1 In order to sample ground water from monitoring wells, specific equipment and materials are required. The equipment and materials list may include, but not necessarily be limited to, the following:

a. Bailers (Teflon™ or stainless steel).

b. Pumps (centrifugal, peristaltic, bladder, electric submersible, bilge, hand-operated diaphragm, etc.).

c. Gas-displacement device(s).

d. Air-lift device(s).

e. Teflon™ tape, electrical tape.

f. Appropriate discharge hose.

g. Appropriate discharge tubing (e.g., polypropylene, teflon, etc.) if using a peristaltic pump.

h. Appropriate compressed gas if using bladder-type or gas-displacement device.

i. Portable generator and gasoline or alternate power supply if using an electric submersible pump.

j. Non-absorbent cord (e.g., polypropylene, etc.).

k. Plastic sheeting.

l. Tape measure (stainless steel, steel, fiberglass) with 0.01-foot measurement increments and chalk (blue carpenter's).

m. Electronic water-level indicators (e.g., m-scope, etc.) or electric water-level/product level indicators.

n. Non-phosphate, laboratory-grade detergent.

o. Distilled/Deionized water.

p. Potable water.

q. Paper towels, clean rags.

r. Roux Associates' field forms (e.g., daily log, well inspection checklist, sampling, etc.) and field notebook.

s. Well location and site map.

t. Well keys.

u. Stop watch, digital watch with second increments, or watch with a second hand.

v. Water Well Handbook.

w. Calculator.

x. Black pen and water-proof marker.

y. Tools (e.g., pipe wrenches, screwdrivers, hammer, pliers, flashlight, pen knife, etc.).

z. Appropriate health and safety equipment, as specified in the site health and safety plan (HASP).

aa. pH meter(s) and buffers.

bb. Conductivity meter(s) and standards.

cc. Thermometer(s).

dd. Extra batteries (meters, thermometers, flashlight).

ee. Filtration apparatus, filters, pre-filters.

ff. Plasticware (e.g., premeasured buckets, beakers, flasks, funnels).

gg. Disposable gloves.

hh. Water jugs.

ii. Laboratory-supplied sample containers with labels.

jj. Cooler(s).

kk. Ice (wet, blue packs).

ll. Masking, duct, and packing tape.

mm. Chain-of-custody form(s) and custody seal(s).

nn. Site sampling and analysis plan (SAP).

oo. Site health and safety plan (HASP).

pp. Packing material (e.g., bubble wrap)

qq. "Zip-lock" plastic bags.

rr. Overnight (express) mail forms.

3.0 DECONTAMINATION

3.1 Make sure all equipment is decontaminated and cleaned before use (refer to the SOP for Decontamination of Field Equipment for detailed decontamination methods, summaries for bailers and pumps are provided below). Use new, clean materials when decontamination is not appropriate (e.g., non-absorbent cord, disposable gloves). Document, and initial and date the decontamination procedures on the appropriate field form and in the field notebook.

a. Decontaminate a bailer by: 1) wearing disposable gloves, 2) disassembling (if appropriate) and scrubbing in a non-phosphate, laboratory-grade detergent and distilled/deionized water solution, and 3) rinsing first with potable water and then distilled/deionized water.

b. Decontaminate a pump by: 1) wearing disposable gloves, 2) flushing the pump and discharge hose (if not disposable) first with a non-phosphate, laboratory-grade detergent and potable water solution in an appropriate

container (clean bucket, garbage can, or 55-gallon drum) and then with distilled/deionized water or potable water, and 3) wiping pump-related equipment (e.g., electrical lines, cables, discharge hose) first with a clean cloth and detergent solution and then rinsing or wiping with a clean cloth and distilled/deionized water or potable water.

3.2 Note that the decontamination procedures for bailers and pumps are the minimum that must be performed. Check the work plan to determine if chemicals specified by individual state regulatory agencies must also be used for decontamination procedures (e.g., hexane, nitric acid, acetone, isopropanol, etc.).

4.0 CALIBRATION OF FIELD ANALYSIS EQUIPMENT

Calibrate field analysis equipment before use (e.g., thermometers, pH and conductivity meters, etc.). Refer to the specific SOP for field analysis for each respective piece of equipment. Document, and initial and date the calibration procedures on the appropriate field form, in the field notebook, and in the calibration log book.

5.0 PROCEDURE

5.1 Document, and initial and date well identification, pre-sampling information, and problems encountered on the appropriate field form and in the field notebook as needed.

5.2 Inspect the protective casing of the well and the well casing, and note any items of concern such as a missing lock, or bent or damaged casing(s).

5.3 Place plastic sheeting around the well to protect sampling equipment from potential cross contamination.

5.4 Remove the well cap or plug and, if necessary, clean the top of the well off with a clean rag. Place the cap or plug on the plastic sheeting. If the well is not vented, allow several minutes for the water level in the well to equilibrate. If fumes or gases are present, then diagnose these with the proper safety equipment. Never inhale the vapors.

5.5 Measure the depth to water (DTW) from the measuring point (MP) on the well using a steel tape and chalk or an electronic sounding device (m-scope). Refer to the specific SOPs for details regarding the use of a steel tape or a m-scope for measuring water levels. Calculate the water-level elevation. Document, and initial and date the information on the appropriate field form and in the field notebook.

5.6 Measuring the total depth of the well from the MP with a weighted steel tape. Calculate and record the volume of standing water in the well casing on the appropriate field form and in the field notebook.

5.7 Decontaminate the equipment used to measure the water level and sound the well with a non-phosphate, laboratory-grade detergent solution followed by a distilled/deionized water rinse.

5.8 Purge the well prior to sampling (refer to the SOP for Purging a Well). The well should be pumped or bailed to remove the volume of water specified in the work plan. Usually three to five casing volumes are removed if the recharge rate is adequate to accomplish this within a reasonable amount of time.

If the formation cannot produce enough water to sustain purging, then one of two options must be followed. These include: 1) pumping or bailing the well dry, or 2) pumping or bailing the well to "near-dry" conditions (i.e., leaving some water in the well). The option employed must be specified in the work plan and be in accordance with regulatory requirements.

If the well is purged dry, then all the standing water has been removed and upon recovery the well is ready for sampling. However, depending on the rate of recovery and the time needed to complete the sampling round, one of the following procedures may have to be implemented: 1) the well may have to be sampled over a period of more than one day; 2) the well may not yield enough water to collect a complete suite of samples and only select (most important) samples will be collected; or 3) the well may not recover which will preclude sampling. Regardless of the option that must be followed, the sampling procedure must be fully documented. When preparing to conduct a sampling round, review drilling, development and previous sampling information (if available) to identify low-yielding wells in order to purge them first, and potentially allow time for the well to recover for sampling.

5.9 Record the physical appearance of the water (i.e., color, turbidity, odor, etc.) on the appropriate field form and in the field notebook, as it is purged. Note any changes that occur during purging.

5.10 If a bailer is used to collect the sample, then:

a. Flush the decontaminated bailer three times with distilled/deionized water.

b. Tie the non-absorbent cord (polypropylene) to the bailer with a secure knot and then tie the free end of the bailer cord to the protective casing or, if possible, some nearby structure to prevent losing the bailer and cord down the well.

c. Lower the bailer slowly down the well and into the water column to minimize disturbance of the water surface. If a bottom-filling bailer is used, then do not submerge the top of the bailer; however, if a top-filling bailer is used, then submerge the bailer several feet below the water surface.

d. Remove and properly discard one bailer volume from the well to rinse the bailer with well water before sampling. Again, lower the bailer slowly down the well to the appropriate depth depending on the bailer type (as discussed above in 5.11 c). When removing the bailer from the well, do not allow the bailer cord to rest on the ground but coil it on the protective plastic sheeting placed around the well. Certain regulatory agencies require that the first bailer volume collected be utilized for the samples.

5.11 If a pump is used to collect the sample, then use the same pump used to purge the well and, if need be, reduce the discharge rate to facilitate filling sample containers and to avoid problems that can occur while filling sample containers (as listed in Number 5.14, below). Alternately, the purge pump may be removed and a thoroughly decontaminated bailer can be used to collect the sample.

5.12 Remove each appropriate container's cap only when ready to fill each with the water sample, and then replace and secure the cap immediately.

5.13 Fill each appropriate, pre-labeled sample container carefully and cautiously to prevent: 1) agitating or creating turbulence; 2) breaking the container; 3) entry of, or contact with, any other medium; and 4) spilling/splashing the sample and exposing the sampling team to contaminated water. Immediately place the filled sample container in a ice-filled (wet ice or blue pack) cooler for storage. If wet ice is used it is recommended that it be repackaged in zip-lock bags to help keep the cooler dry and the sample labels secure. Check the work plan as to whether wet ice or blue packs are specified for cooling the samples because certain regulatory agencies may specify the use of one and not the other.

5.14 "Top-off" containers for volatile organic compounds (VOCs) and tightly seal with Teflon™-lined septums held in place by open-top screw caps to prevent volatilization. Ensure that there are no bubbles by turning the container upside down and tapping it gently.

5.15 Filter water samples (Procedure 4.6) collected for dissolved metals analysis prior to preservation to remove the suspended sediment from the sample. If water samples are to be collected for total metals analysis, then collect a second set of samples without field filtering.

In the event that the regulatory agency(ies) want unfiltered samples for metals analysis, a second set of filtered samples should also be collected. Because unfiltered samples are indications of total metals (dissolved and suspended) they are not representative of aquifer conditions because ground water does not transport sediment (except in some rare cases). Thus, the results for dissolved metals in ground water should be based on filtered samples even if both filtered and unfiltered sets are presented in a report.

5.16 Add any necessary preservative(s) to the appropriate container(s) prior to, or after (preferred), the collection of the sample, unless the appropriate preservative(s) have already been added by the laboratory before shipment.

5.17 Collect quality control (QC) samples as required in the work plan to monitor sampling and laboratory performance. Refer to the SOP for Collection of Quality Control Samples.

5.18 Conduct field analyses after sample collection is complete by measuring and recording the temperature, conductivity, pH, etc. (as called for in the work plan). Note and record the "final" physical appearance of the water (after purging and sampling) on an appropriate field form and in the field notebook.

5.19 Wipe the well cap with a clean rag, replace the well cap and protective cover (if present). Lock the protective cover.

5.20 Verify that each sample is placed in an individual "zip-lock" bag, wrapped with "bubble wrap," placed in the cooler, and that the cooler has sufficient ice (wet ice or blue packs) to preserve the samples for transportation to the analytical laboratory.

5.21 Decontaminate bailers, hoses, and pumps as discussed in the decontamination SOP. Wrap decontaminated equipment with a suitable material (e.g., clean plastic bag or aluminum foil). Discard cords, rags, gloves, etc. in a manner consistent with site conditions.

5.22 Complete all necessary field forms, field notebook entries, and the chain-of-custody forms. Retain one copy of each chain-of-custody form. Secure the cooler with sufficient packing tape and a custody seal.

5.23 Samples collected from Monday through Friday will be delivered within 24 hours of collection. If Saturday delivery is not available, samples collected on Friday must be delivered by Monday morning. Consult the work plan to determine if any of the analytes require a shorter delivery time.

END OF PROCUDURE

Date: May 5, 2000

1.0 PURPOSE

The purpose of this standard operating procedure (SOP) is to establish guidelines for sample handling which will allow consistent and accurate results. Valid chemistry data are integral to investigations that characterize media-quality conditions. Thus, this SOP is designed to ensure that once samples are collected, they are preserved, packed and delivered in a manner which will maintain sample integrity to as great an extent as possible. The procedures outlined are applicable to most sampling events and any required modifications must be clearly described in the work plan.

2.0 CONSIDERATIONS

Sample containers, sampling equipment decontamination, quality assurance/quality control (QA/QC), sample preservation, and sample handling are all components of this SOP.

2.1 Sample Containers

Prior to collection of a sample, considerations must be given to the type of container that will be used to store and transport the sample. The type and number of containers selected is usually based on factors such as sample matrix, potential contaminants to be encountered, analytical methods requested, and the laboratory's internal quality assurance requirements. In most cases, the overriding considerations will be the analytical methodology, or the state or federal regulatory requirements because these regulations generally encompass the other factors. The sample container selected is usually based on some combination of the following criteria:

a. Reactivity of Container Material with Sample

Choosing the proper composition of sample containers will help to ensure that the chemical and physical integrity of the sample is maintained. For sampling potentially hazardous material, glass is the recommended container type because it is chemically inert to most substances. Plastic containers are not recommended for most hazardous wastes because the potential exists for contaminants to adsorb to the surface of the plastic or for the plasticizer to leach into the sample.

In some instances, however, the sample characteristics or analytes of interest may dictate that plastic containers be used instead of glass. Because some metals species will adhere to the sides of the glass containers in an aqueous matrix, plastic bottles (e.g., nalgene) must be used for samples collected for metals analysis. A separate, plastic

container should accompany glass containers if metals analysis is to be performed along with other analyses. Likewise, other sample characteristics may dictate that glass cannot be used. For example, in the case of a strong alkali waste or hydrofluoric solution, plastic containers may be more suitable because glass containers may be etched by these compounds and create adsorptive sites on the container's surface.

b. Volume of the Container

The volume of sample to be collected will be dictated by the analysis being performed and the sample matrix. The laboratory must supply bottles of sufficient volume to perform the required analysis. In most cases, the methodology dictates the volume of sample material required to complete the analysis. However, individual laboratories may provide larger volume containers for various analytes to ensure sufficient quantities for duplicates or other QC checks.

To facilitate transfer of the sample from the sampler into the container and to minimize spillage and sample disturbance, wide-mouth containers are recommended. Aqueous volatile organic samples must be placed into 40-milliliter (ml) glass vials with polytetrafluoroethylene (PTFE) (e.g., TeflonTM) septums. Non-aqueous volatile organic samples should be collected in the same type of vials or in 4-ounce (oz) wide-mouth jars provided by the laboratory. These jars should have PTFE-lined screw caps.

c. Color of Container

Whenever possible, amber glass containers should be used to prevent photodegradation of the sample, except when samples are being collected for metals analysis. If amber containers are not available, then containers holding samples should be protected from light (i.e., place in cooler with ice immediately after filling).

d. Container Closures

Container closures must screw on and off the containers and form a leak-proof seal. Container caps must not be removed until the container is ready to be filled with the sample, and the container cap must be replaced (securely) immediately after filling it. Closures should be constructed of a material which is inert with respect to the sampled material, such as PTFE (e.g., TeflonTM). Alternately, the closure may be separated from the sample by a closure liner that is inert to the sample material such as PTFE sheeting. If soil or sediment samples are being collected, the threads of the container must be wiped clean with a dedicated paper towel or cloth so the cap can be threaded properly.

e. Decontamination of Sample Containers

Sample containers must be laboratory cleaned by the laboratory performing the analysis. The cleaning procedure is dictated by the specific analysis to be performed on the sample. Sample containers must be carefully examined to ensure that all containers appear clean. Do not mistake the preservative as unwanted residue. The bottles should not be field cleaned. If there is any question regarding the integrity of the bottle, then the laboratory must be contacted immediately and the bottle(s) replaced.

f. Sample Bottle Storage and Transport

No matter where the sample bottles are, whether at the laboratory waiting to be packed for shipment or in the field waiting to be filled with sample, care must be taken to avoid contamination. Sample shuttles or coolers, and sample bottles must be stored and transported in clean environments. Sample bottles and clean sampling equipment must never be stored near solvents, gasoline, or other equipment that is a potential source of cross-contamination. When under chain of custody, sample bottles must be secured in locked vehicles, and custody sealed in shuttles or in the presence of authorized personnel. Information which documents that proper storage and transport procedures have been followed must be included in the field notebook and on appropriate field forms.

2.2 Decontamination of Sampling Equipment

Proper decontamination of all re-usable sampling equipment is critical for all sampling episodes. The SOP for Decontamination of Field Equipment and SOPs for method-specific or instrument-specific tasks must also be referred to for guidance for decontamination of various types of equipment.

2.3 Quality Assurance/Quality Control Samples

QA/QC samples are intended to provide control over the proper collection and tracking of environmental measurements, and subsequent review, interpretation and validation of generated analytical data. The SOPs for Collection of Quality Control Samples, for Evaluation and Validation of Data, and for Field Record Keeping and Quality Assurance/Quality Control must be referred to for detailed guidance regarding these respective procedures. SOPs for method-specific or instrument-specific tasks must also be referred to for guidance for QA/QC procedures.

2.4 Sample Preservation Requirements

Certain analytical methodologies for specific analytes require chemical additives in order to stabilize and maintain sample integrity. Generally, this is accomplished under the following two scenarios:

a. Sample bottles are preserved at the laboratory prior to shipment into the field.

b. Preservatives are added in the field immediately after the samples are collected.

Many laboratories provide pre-preserved bottles as a matter of convenience and to help ensure that samples will be preserved immediately upon collection. A problem associated with this method arises if not enough sample could be collected, resulting in too much preservative in the sample. More commonly encountered problems with this method include the possibility of insufficient preservative provided to achieve the desired pH level or the need for additional preservation due to chemical reactions caused by the addition of sample liquids to pre-preserved bottles. The use of pre-preserved bottles is acceptable; however, field sampling teams must always be prepared to add additional preservatives to samples if the aforementioned situations occur. Furthermore, care must be exercised not to overfill sample bottles containing preservatives to prevent the sample and preservative from spilling and therefore diluting the preservative (i.e., not having enough preservative for the volume of sample).

When samples are preserved after collection, special care must be taken. The transportation and handling of concentrated acids in the field requires additional preparation and adherence to appropriate preservation procedures. All preservation acids used in the field should be trace-metal or higher-grade.

2.5 Sample Handling

After the proper sample bottles have been received under chain-of-custody, properly decontaminated equipment has been used to collect the sample, and appropriate preservatives have been added to maintain sample integrity, the final step for the field personnel is checking the sample bottles prior to proper packing and delivery of the samples to the laboratory.

All samples should be organized and the labels checked for accuracy. The caps should be checked for tightness and any 40-ml volatile organic compound (VOC) bottles must be checked for bubbles. Each sample bottle must be placed in an individual "zip-lock" bag to protect the label, and placed on ice. The bottles must be carefully packed to prevent breakage during transport. When several bottles have been collected for an individual sample, they should not be placed adjacent to each other in the cooler to prevent possible breakage of all bottles for a given sample. If there are any samples which are known or suspected to be highly

contaminated, these should be placed in an individual cooler under separate chain-of-custody to prevent possible cross contamination. Sufficient ice (wet or blue packs) should be placed in the cooler to maintain the temperature at 4 degrees Celsius (°C) until delivery at the laboratory. Consult the work plan to determine if a particular ice is specified as the preservation for transportation (e.g., the United States Environmental Protection Agency does not like the use of blue packs because they claim that the samples will not hold at 4°C). If additional coolers are required, then they should be purchased. The chain-of-custody form should be properly completed, placed in a "zip-lock" bag, and placed in the cooler. One copy must be maintained for the project files. The cooler should be sealed with packing tape and a custody seal. The custody seal number should be noted in the field book. Samples collected from Monday through Friday will be delivered to the laboratory within 24 hours of collection. If Saturday delivery is not available, samples collected on Friday must be delivered by Monday morning. Check the work plan to determine if certain analytes require a shorter delivery time. If overnight mail is utilized, then the shipping bill must be maintained for the files and the laboratory must be called the following day to confirm receipt.

3.0 EQUIPMENT AND MATERIALS

3.1 General equipment and materials may include, but not necessarily be limited to, the following:

a. Sample bottles of proper size and type with labels.

b. Cooler with ice (wet or blue pack).

c. Field notebook, appropriate field form(s), chain-of-custody form(s), custody seals.

d. Black pen and indelible marker.

e. Packing tape, "bubble wrap," and "zip-lock" bags.

f. Overnight (express) mail forms and laboratory address.

g. Health and safety plan (HASP).

h. Work plan/scope of work.

i. Pertinent SOPs for specified tasks and their respective equipment and materials.

3.2 Preservatives for specific samples/analytes as specified by the laboratory. Preservatives must be stored in secure, spillproof glass containers with their content, concentration, and date of preparation and expiration clearly labeled.

3.3 Miscellaneous equipment and materials including, but not necessarily limited to, the following:

a. Graduated pipettes.

b. Pipette bulbs.

c. Litmus paper.

d. Glass stirring rods.

e. Protective goggles.

f. Disposable gloves.

g. Lab apron.

h. First aid kit.

i. Portable eye wash station.

j. Water supply for immediate flushing of spillage, if appropriate.

k. Shovel and container for immediate containerization of spillage-impacted soils, if appropriate.

4.0 PROCEDURE

4.1 Examine all bottles and verify that they are clean and of the proper type, number, and volume for the sampling to be conducted.

4.2 Label bottles carefully and clearly with project name and number, site location, sample identification, date, time, and the sampler's initials using an indelible marker.

4.3 Collect samples in the proper manner (refer to specific sampling SOPs).

4.4 Conduct preservation activities as required after each sample has been collected. Field preservation must be done immediately and must not be done later than 30 minutes after sample collection.

4.5 Conduct QC sampling, as required.

4.6 Seal each container carefully and place in an individual "zip lock" bag.

4.7 Organize and carefully pack all samples in the cooler immediately after collection (e.g., bubble wrap). Insulate samples so that breakage will not occur.

4.8 Complete and place the chain-of-custody form in the cooler after all samples have been collected. Maintain one copy for the project file. If the cooler is to be transferred several times prior to shipment or delivery to the laboratory, it may be easier to tape the chain-of-custody to the exterior of the sealed cooler. When exceptionally hazardous samples are known or suspected to be present, this should be identified on the chain-of-custody as a courtesy to the laboratory personnel.

4.9 Add additional ice as necessary to ensure that it will last until receipt by the laboratory.

4.10 Seal the cooler with packing tape and a custody seal. Record the number of the custody seal in the field notebook and on the field form. If there are any exceptionally hazardous samples, then shipping regulations should be examined to ensure that the sample containers and coolers are in compliance and properly labeled.

4.11 Samples collected from Monday through Friday will be delivered to the laboratory within 24 hours of collection. If Saturday delivery is not available, samples collected on Friday must be delivered by Monday morning. Check the work plan to determine if certain analytes require a shorter delivery time.

4.12 Maintain the shipping bill for the project files if overnight mail is utilized and call the laboratory the following day to confirm receipt.

END OF PROCEDURE

ATTACHMENT 2

Chain of Custody Form

ROUX CHAIN OF CUSTODY

№ 11332 Y

ROUX ASSOCIATES, INC.
Environmental Consulting & Management
209 SHAFTER STREET
ISLANDIA, NEW YORK 11749-5074
(631) 232-2600 FAX: (631) 232-9898

ANALYSES

PAGE OF

PROJECT NAME	PROJECT NUMBER
PROJECT LOCATION	
PROJECT MANAGER	SAMPLER(S)

SAMPLE DESIGNATION / LOCATION	DATE COLLECTED	TIME COLLECTED	SAMPLE MATRIX						TOTAL BOTTLES	NOTES

RELINQUISHED BY: (SIGNATURE)	FOR	DATE	TIME	SEAL INTACT Y OR N	RECEIVED BY: (SIGNATURE)	FOR	DATE	TIME	SEAL INTACT Y OR N
RELINQUISHED BY: (SIGNATURE)	FOR	DATE	TIME	SEAL INTACT Y OR N	RECEIVED BY: (SIGNATURE)	FOR	DATE	TIME	SEAL INTACT Y OR N

DELIVERY METHOD	COMMENTS
ANALYTICAL LABORATORY	

CHAINOF CDR 12AUG98

APPENDIX B

Quality Assurance Project Plan

September 19, 2012

QUALITY ASSURANCE PROJECT PLAN

149 Kent Avenue

Prepared for

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ROUX ASSOCIATES, INC.

Environmental Consulting & Management

ROUX

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TABLES

1.0 INTRODUCTION

This Quality Assurance Project Plan (QAPP) has been prepared to describe the measures that will be taken to ensure that the data generated during performance of the Remedial Investigation (RI) at 149 Kent Avenue, Brooklyn, New York (Site) are of quality sufficient to meet project-specific data quality objectives (DQOs). The QAPP was prepared in accordance with the guidance provided in New York State Department of Environmental Conservation (NYSDEC) Technical Guidance DER-10 (Technical Guidance for Site Investigation and Remediation), the Brownfield Cleanup Program Guide and the United States Environmental Protection Agency's (USEPA's) Guidance for the Data Quality Objectives Process (EPA QA/G-4).

2.0 BACKGROUND, OBJECTIVES, AND SCOPE

In order to achieve project objectives, Roux Associates has developed a scope of work that includes sampling of soil and groundwater. Soil vapor sampling is not proposed at this time, but may be undertaken if indicated by initial investigation results. A brief overview of each element of the RI scope of work is provided below. RI sampling locations are shown in Figure 3 of the RI Work Plan.

2.1 Soil

Samples of soil will be collected and analyzed at a minimum of 20 locations for the following analytes:

- Target Compound List (TCL) plus 30/ Target Analyte List (TCL + 30/TAL), which includes:
  - TCL VOA + Tentatively Identified Compounds (ID TICS)
  - TCL Base Neutral Acids (BNA)/Semivolatile Organic Compounds (SVOCs) + 20
  - TCL Pesticides
  - TCL Herbicides
  - TCL Polychlorinated Biphenyls (PCBs)
  - TAL Metals (including hexavalent chromium)

2.2 Groundwater

Groundwater samples will be collected from six (6) existing monitoring wells installed around the perimeter of the Site and a minimum of seven (7) new monitoring wells installed by Roux Associates during the investigation. After gauging for potential separate-phase petroleum product, each well will be sampled for the following analytes:

- TCL + 30/TAL, which includes:
  - TCL VOA + ID TICS
  - TCL BNA/(SVOCs) + 20
  - TCL Pesticides
  - TCL Herbicides
  - TCL PCBs,

– TAL Metals (including hexavalent chromium)

Field parameters, including temperature, pH, conductivity, redox potential, dissolved oxygen, and turbidity will also be measured.

2.3 Sub-Slab Soil Vapor Samples

As discussed above, sub-slab soil vapor sampling is not proposed at this time. Previous results have already confirmed the presence of chlorinated volatile organic compounds (CVOCs), primarily TCE and PCE in sub-slab soil gas beneath the warehouse floor slab. The need for and potential location of soil vapor sampling will be evaluated based on the results of the RI VOC data. Should soil vapor sampling be conducted at the Site, sampling depths and analytical methods will be selected in consultation with the NYSDEC and NYSDOH protocols.

3.0 PROJECT ORGANIZATION

The overall management structure and a general summary of the responsibilities of project team members are presented below.

Project Principal

Joseph Duminuco, of Roux Associates/Remedial Engineering will serve as Project Principal. The Project Principal is responsible for defining project objectives and bears ultimate responsibility for the successful completion of the investigation.

Project Manager

Joshua Levine, P.E. of Roux Associates/Remedial Engineering will serve as Project Manager. This individual will provide overall management for the implementation of the scope of work and will coordinate all field activities. The Project Manager is also responsible for data review/interpretation and report preparation. Activities of the Project Manager are supported by the Project Quality Assurance Coordinator.

Field Team Leader

David Bligh, P.E. of Roux Associates/Remedial Engineering will serve as the Field Team Leader. The Field Team Leader bears the responsibility for the successful execution of the field program, as scoped in the RI Work Plan and the Field Sampling Plan (FSP). The Field Team Leader will direct the activities of all technical staff in the field as well all subcontractors. The Field Team Leader will also assist in the interpretation of data and in report preparation. The Field Team Leader reports to the Project Manager.

Laboratory Project Manager

Accutest Laboratories, Inc. (Accutest) of Dayton, New Jersey, has been selected to analyze the field samples for this project and will be responsible for sample container preparation, sample custody in the laboratory, and completion of the required analysis through oversight of the laboratory staff. The Laboratory Project Manager will ensure that quality assurance procedures are followed and that an acceptable laboratory report is prepared and submitted. The Laboratory Project Manager reports to the Field Team Leader.

Quality Assurance Officer

Wai Kwan, Ph.D. of Roux Associates will serve as the Quality Assurance Officer (QAO) for this project. The QAO is responsible for conducting reviews, inspections, and audits to ensure that the data collection is conducted in accordance with the FSP and QAPP. The QAO's responsibilities range from ensuring effective field equipment decontamination procedures and proper sample collection to the review of all laboratory analytical data for completeness and usefulness. The QAO reports to the Project Manager and makes independent recommendations to the Field Team Leader.

4.0 SAMPLING PROCEDURES

Detailed discussions of sampling, decontamination, and sample handling procedures are provided in the FSP (Appendix A of the RI Work Plan).

5.0 QUALITY ASSURANCE/QUALITY CONTROL

The primary intended use for the RI data is to characterize Site conditions and determine if remediation needs to be undertaken at the Site. The primary DQO of the soil, groundwater, and sub-slab soil vapor sampling programs, therefore, is that data be accurate and precise, and hence representative of the actual Site conditions. Accuracy refers to the ability of the laboratory to obtain a true value (i.e., compared to a standard) and is assessed through the use of laboratory quality control (QC) samples, including laboratory control samples and matrix spike samples, as well as through the use of surrogates, which are compounds not typically found in the environment that are injected into the samples prior to analysis. Precision refers to the ability to replicate a value, and is assessed through both field and laboratory duplicate samples.

Sensitivity is also a critical issue in generating representative data. Laboratory equipment must be of sufficient sensitivity to detect target compounds and analytes at levels below NYSDEC standards and guidelines whenever possible. Equipment sensitivity can be decreased by field or laboratory contamination of samples, and by sample matrix effects. Assessment of instrument sensitivity is performed through the analysis of reagent blanks, near-detection-limit standards, and response factors. Potential field and/or laboratory contamination is assessed through use of trip blanks, method blanks, and equipment rinse blanks (also called “field blanks”).

Table 1 lists the field and laboratory QC samples that will be analyzed to assess data accuracy and precision, as well as to determine if equipment sensitivity has been compromised. Table 2 shows the reporting limits and minimum detection limits achievable by the laboratory.

All RI “assessment” analyses (i.e., TCL + 30/TAL) will be performed in accordance with the NYSDEC Analytical Services Protocol (ASP), using USEPA SW-846 methods. The laboratory selected to analyze the field samples collected during the RI shall maintain a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) Contract Laboratory Protocol (CLP) certification for each of the “assessment” analyses listed in Section 2.0.

All laboratory data are to be reported in NYSDEC ASP Category B deliverables and will be delivered to NYSDEC in electronic data deliverable (EDD) format as described on NYSDEC’s

website (http://www.dec.ny.gov/chemical/62440.html). A Data Usability Report will be prepared meeting the requirements in Section 2.2(a)1.ii and Appendix 2B of DER-10 for all data packages generated for the RI.

Table 1. Field and Laboratory QC Summary

QC Check Type	Minimum Frequency	Use
Field QC		
Duplicate	1 per matrix per 20 samples or SDG*	Precision
Trip Blank	1 per VOC cooler	Sensitivity
Equipment Rinse Blank	1 per day	Sensitivity
Laboratory QC		
Laboratory Control Sample	1 per matrix per SDG	Accuracy
Matrix Spike/Matrix Spike Duplicate/Matrix Duplicate*	1 per matrix per SDG	Accuracy/Precision
Surrogate Spike	All organics samples	Accuracy
Laboratory Duplicate	1 per matrix per SDG	Precision
Method Blank	1 per matrix per SDG	Sensitivity

Notes:

* SDG - Sample Delivery Group - Assumes a single extraction or preparation

** Provided to lab by field sampling personnel

Compound List Report

Product: V8260TCL11 TCL Volatile Organics
Matrix: SO Solid

Sep 10, 2012 04:53 pm

Method List:	VAIX8260 SO	**Method Ref:** SW846 8260B	LJ40841
Report List:	VTCL11 ALL	VOA TCL List (SOM0 1.1)	LJ24480
RL/MDL Factor:	1		

Compound	CAS No.	RL	MDL	Units
Acetone	67-64-1	10	1.7	ug/kg
Benzene	71-43-2	1.0	0.12	ug/kg
Bromochloromethane	74-97-5	5.0	0.27	ug/kg
Bromodichloromethane	75-27-4	5.0	0.11	ug/kg
Bromoform	75-25-2	5.0	0.15	ug/kg
Bromomethane	74-83-9	5.0	0.27	ug/kg
2-Butanone (MEK)	78-93-3	10	2.4	ug/kg
Carbon disulfide	75-15-0	5.0	0.12	ug/kg
Carbon tetrachloride	56-23-5	5.0	0.13	ug/kg
Chlorobenzene	108-90-7	5.0	0.11	ug/kg
Chloroethane	75-00-3	5.0	0.23	ug/kg
Chloroform	67-66-3	5.0	0.083	ug/kg
Chloromethane	74-87-3	5.0	0.19	ug/kg
Cyclohexane	110-82-7	5.0	0.12	ug/kg
1,2-Dibromo-3-chloropropane	96-12-8	10	0.89	ug/kg
Dibromochloromethane	124-48-1	5.0	0.16	ug/kg
1,2-Dibromoethane	106-93-4	1.0	0.13	ug/kg
1,2-Dichlorobenzene	95-50-1	5.0	0.19	ug/kg
1,3-Dichlorobenzene	541-73-1	5.0	0.19	ug/kg
1,4-Dichlorobenzene	106-46-7	5.0	0.18	ug/kg
Dichlorodifluoromethane	75-71-8	5.0	0.23	ug/kg
1,1-Dichloroethane	75-34-3	5.0	0.14	ug/kg
1,2-Dichloroethane	107-06-2	1.0	0.14	ug/kg
1,1-Dichloroethene	75-35-4	5.0	0.26	ug/kg
cis-1,2-Dichloroethene	156-59-2	5.0	0.18	ug/kg
trans-1,2-Dichloroethene	156-60-5	5.0	0.24	ug/kg
1,2-Dichloropropane	78-87-5	5.0	0.15	ug/kg
cis-1,3-Dichloropropene	10061-01-5	5.0	0.14	ug/kg
trans-1,3-Dichloropropene	10061-02-6	5.0	0.16	ug/kg
1,4-Dioxane	123-91-1	130	60	ug/kg
Ethylbenzene	100-41-4	1.0	0.26	ug/kg
Freon 113	76-13-1	5.0	0.43	ug/kg
2-Hexanone	591-78-6	5.0	0.62	ug/kg
Isopropylbenzene	98-82-8	5.0	0.074	ug/kg
Methyl Acetate	79-20-9	5.0	2.6	ug/kg
Methylcyclohexane	108-87-2	5.0	0.17	ug/kg
Methyl Tert Butyl Ether	1634-04-4	1.0	0.24	ug/kg
4-Methyl-2-pentanone(MIBK)	108-10-1	5.0	0.75	ug/kg
Methylene chloride	75-09-2	5.0	1.3	ug/kg
Styrene	100-42-5	5.0	0.092	ug/kg
1,1,2,2-Tetrachloroethane	79-34-5	5.0	0.13	ug/kg
Tetrachloroethene	127-18-4	5.0	0.17	ug/kg
Toluene	108-88-3	1.0	0.11	ug/kg
1,2,3-Trichlorobenzene	87-61-6	5.0	0.16	ug/kg

Compound List Report

Product: V8260TCL11 TCL Volatile Organics
Matrix: SO Solid

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Method List:	VAIX8260 SO	**Method Ref:** SW846 8260B	LJ40841
Report List:	VTCL11 ALL	VOA TCL List (SOM0 1.1)	LJ24480
RL/MDL Factor:	1		

Compound	CAS No.	RL	MDL	Units
1,2,4-Trichlorobenzene	120-82-1	5.0	0.14	ug/kg
1,1,1-Trichloroethane	71-55-6	5.0	0.11	ug/kg
1,1,2-Trichloroethane	79-00-5	5.0	0.17	ug/kg
Trichloroethene	79-01-6	5.0	0.17	ug/kg
Trichlorofluoromethane	75-69-4	5.0	0.30	ug/kg
Vinyl chloride	75-01-4	5.0	0.14	ug/kg
m,p-Xylene		1.0	0.17	ug/kg
o-Xylene	95-47-6	1.0	0.14	ug/kg
Xylene (total)	1330-20-7	1.0	0.14	ug/kg

53 compounds reported in list VTCL11

Compound List Report

Product: V8260TCL11 TCL Volatile Organics
Matrix: SO Solid

Sep 10, 2012 04:53 pm

Method List:	VAIX8260 SO	**Method Ref:** SW846 8260B	LJ40841
Report List:	VTCL11 ALL	VOA TCL List (SOM0 1.1)	LJ24480
RL/MDL Factor:	100		

Compound	CAS No.	RL	MDL	Units
Acetone	67-64-1	1000	170	ug/kg
Benzene	71-43-2	100	12	ug/kg
Bromochloromethane	74-97-5	500	27	ug/kg
Bromodichloromethane	75-27-4	500	11	ug/kg
Bromoform	75-25-2	500	15	ug/kg
Bromomethane	74-83-9	500	27	ug/kg
2-Butanone (MEK)	78-93-3	1000	240	ug/kg
Carbon disulfide	75-15-0	500	12	ug/kg
Carbon tetrachloride	56-23-5	500	13	ug/kg
Chlorobenzene	108-90-7	500	11	ug/kg
Chloroethane	75-00-3	500	23	ug/kg
Chloroform	67-66-3	500	8.3	ug/kg
Chloromethane	74-87-3	500	19	ug/kg
Cyclohexane	110-82-7	500	12	ug/kg
1,2-Dibromo-3-chloropropane	96-12-8	1000	89	ug/kg
Dibromochloromethane	124-48-1	500	16	ug/kg
1,2-Dibromoethane	106-93-4	100	13	ug/kg
1,2-Dichlorobenzene	95-50-1	500	19	ug/kg
1,3-Dichlorobenzene	541-73-1	500	19	ug/kg
1,4-Dichlorobenzene	106-46-7	500	18	ug/kg
Dichlorodifluoromethane	75-71-8	500	23	ug/kg
1,1-Dichloroethane	75-34-3	500	14	ug/kg
1,2-Dichloroethane	107-06-2	100	14	ug/kg
1,1-Dichloroethene	75-35-4	500	26	ug/kg
cis-1,2-Dichloroethene	156-59-2	500	18	ug/kg
trans-1,2-Dichloroethene	156-60-5	500	24	ug/kg
1,2-Dichloropropane	78-87-5	500	15	ug/kg
cis-1,3-Dichloropropene	10061-01-5	500	14	ug/kg
trans-1,3-Dichloropropene	10061-02-6	500	16	ug/kg
1,4-Dioxane	123-91-1	13000	6000	ug/kg
Ethylbenzene	100-41-4	100	26	ug/kg
Freon 113	76-13-1	500	43	ug/kg
2-Hexanone	591-78-6	500	62	ug/kg
Isopropylbenzene	98-82-8	500	7.4	ug/kg
Methyl Acetate	79-20-9	500	260	ug/kg
Methylcyclohexane	108-87-2	500	17	ug/kg
Methyl Tert Butyl Ether	1634-04-4	100	24	ug/kg
4-Methyl-2-pentanone(MIBK)	108-10-1	500	75	ug/kg
Methylene chloride	75-09-2	500	130	ug/kg
Styrene	100-42-5	500	9.2	ug/kg
1,1,2,2-Tetrachloroethane	79-34-5	500	13	ug/kg
Tetrachloroethene	127-18-4	500	17	ug/kg
Toluene	108-88-3	100	11	ug/kg
1,2,3-Trichlorobenzene	87-61-6	500	16	ug/kg

Compound List Report

Product: V8260TCL11 TCL Volatile Organics
Matrix: SO Solid

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Method List:	VAIX8260 SO	**Method Ref:** SW846 8260B	LJ40841
Report List:	VTCL11 ALL	VOA TCL List (SOM0 1.1)	LJ24480
RL/MDL Factor:	100		

Compound	CAS No.	RL	MDL	Units
1,2,4-Trichlorobenzene	120-82-1	500	14	ug/kg
1,1,1-Trichloroethane	71-55-6	500	11	ug/kg
1,1,2-Trichloroethane	79-00-5	500	17	ug/kg
Trichloroethene	79-01-6	500	17	ug/kg
Trichlorofluoromethane	75-69-4	500	30	ug/kg
Vinyl chloride	75-01-4	500	14	ug/kg
m,p-Xylene		100	17	ug/kg
o-Xylene	95-47-6	100	14	ug/kg
Xylene (total)	1330-20-7	100	14	ug/kg

53 compounds reported in list VTCL11

Compound List Report

Product: AB8270TCL11 TCL Semivolatiles
Matrix: SO Solid

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Method List:	AB8270 SO	**Method Ref:** SW846 8270D	LJ40837
Report List:	ABTCL11 ALL	ABN TCL List (SOM0 1.1)	LJ24481
RL/MDL Factor:	33.3		

Compound	CAS No.	RL	MDL	Units
2-Chlorophenol	95-57-8	170	34	ug/kg
4-Chloro-3-methyl phenol	59-50-7	170	33	ug/kg
2,4-Dichlorophenol	120-83-2	170	54	ug/kg
2,4-Dimethylphenol	105-67-9	170	56	ug/kg
2,4-Dinitrophenol	51-28-5	670	41	ug/kg
4,6-Dinitro-o-cresol	534-52-1	670	41	ug/kg
2-Methylphenol	95-48-7	67	38	ug/kg
3&4-Methylphenol		67	42	ug/kg
2-Nitrophenol	88-75-5	170	35	ug/kg
4-Nitrophenol	100-02-7	330	56	ug/kg
Pentachlorophenol	87-86-5	330	57	ug/kg
Phenol	108-95-2	67	35	ug/kg
2,3,4,6-Tetrachlorophenol	58-90-2	170	34	ug/kg
2,4,5-Trichlorophenol	95-95-4	170	39	ug/kg
2,4,6-Trichlorophenol	88-06-2	170	31	ug/kg
Acenaphthene	83-32-9	33	9.7	ug/kg
Acenaphthylene	208-96-8	33	11	ug/kg
Acetophenone	98-86-2	170	5.9	ug/kg
Anthracene	120-12-7	33	12	ug/kg
Atrazine	1912-24-9	170	6.6	ug/kg
Benzo(a)anthracene	56-55-3	33	11	ug/kg
Benzo(a)pyrene	50-32-8	33	10	ug/kg
Benzo(b)fluoranthene	205-99-2	33	11	ug/kg
Benzo(g,h,i)perylene	191-24-2	33	12	ug/kg
Benzo(k)fluoranthene	207-08-9	33	13	ug/kg
4-Bromophenyl phenyl ether	101-55-3	67	12	ug/kg
Butyl benzyl phthalate	85-68-7	67	19	ug/kg
1,1'-Biphenyl	92-52-4	67	3.9	ug/kg
Benzaldehyde	100-52-7	170	7.7	ug/kg
2-Chloronaphthalene	91-58-7	67	10	ug/kg
4-Chloroaniline	106-47-8	170	11	ug/kg
Carbazole	86-74-8	67	15	ug/kg
Caprolactam	105-60-2	67	10	ug/kg
Chrysene	218-01-9	33	11	ug/kg
bis(2-Chloroethoxy)methane	111-91-1	67	13	ug/kg
bis(2-Chloroethyl)ether	111-44-4	67	10	ug/kg
bis(2-Chloroisopropyl)ether	108-60-1	67	9.9	ug/kg
4-Chlorophenyl phenyl ether	7005-72-3	67	10	ug/kg
2,4-Dinitrotoluene	121-14-2	67	15	ug/kg
2,6-Dinitrotoluene	606-20-2	67	13	ug/kg
3,3'-Dichlorobenzidine	91-94-1	170	8.5	ug/kg
Dibenzo(a,h)anthracene	53-70-3	33	11	ug/kg
Dibenzofuran	132-64-9	67	9.9	ug/kg
Di-n-butyl phthalate	84-74-2	67	7.4	ug/kg

Compound List Report

Product: AB8270TCL11 TCL Semivolatiles
Matrix: SO Solid

Sep 10, 2012 04:53 pm

Method List:	AB8270 SO	**Method Ref:**	SW846 8270D	LJ40837
Report List:	ABTCL11 ALL	ABN TCL List (SOM0 1.1)		LJ24481
RL/MDL Factor:	33.3			

Compound	CAS No.	RL	MDL	Units
Di-n-octyl phthalate	117-84-0	67	16	ug/kg
Diethyl phthalate	84-66-2	67	11	ug/kg
Dimethyl phthalate	131-11-3	67	12	ug/kg
bis(2-Ethylhexyl)phthalate	117-81-7	67	29	ug/kg
Fluoranthene	206-44-0	33	15	ug/kg
Fluorene	86-73-7	33	11	ug/kg
Hexachlorobenzene	118-74-1	67	11	ug/kg
Hexachlorobutadiene	87-68-3	33	9.3	ug/kg
Hexachlorocyclopentadiene	77-47-4	330	34	ug/kg
Hexachloroethane	67-72-1	170	9.3	ug/kg
Indeno(1,2,3-cd)pyrene	193-39-5	33	12	ug/kg
Isophorone	78-59-1	67	9.0	ug/kg
2-Methylnaphthalene	91-57-6	67	19	ug/kg
2-Nitroaniline	88-74-4	170	15	ug/kg
3-Nitroaniline	99-09-2	170	13	ug/kg
4-Nitroaniline	100-01-6	170	13	ug/kg
Naphthalene	91-20-3	33	9.1	ug/kg
Nitrobenzene	98-95-3	67	9.6	ug/kg
N-Nitroso-di-n-propylamine	621-64-7	67	8.1	ug/kg
N-Nitrosodiphenylamine	86-30-6	170	20	ug/kg
Phenanthrene	85-01-8	33	15	ug/kg
Pyrene	129-00-0	33	13	ug/kg
1,2,4,5-Tetrachlorobenzene	95-94-3	170	10	ug/kg

67 compounds reported in list ABTCL11

Compound List Report

Product: P8081PESTTCL TCL Pesticides
Matrix: SO Solid

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Method List:	P8081 SO	**Method Ref:** SW846 8081B	LJ36014
Report List:	PTCL ALL	Pesticide TCL List	LJ1046
RL/MDL Factor:	.67		

Compound	CAS No.	RL	MDL	Units
Aldrin	309-00-2	0.67	0.33	ug/kg
alpha-BHC	319-84-6	0.67	0.50	ug/kg
beta-BHC	319-85-7	0.67	0.47	ug/kg
delta-BHC	319-86-8	0.67	0.39	ug/kg
gamma-BHC (Lindane)	58-89-9	0.67	0.31	ug/kg
alpha-Chlordane	5103-71-9	0.67	0.44	ug/kg
gamma-Chlordane	5103-74-2	0.67	0.34	ug/kg
Dieldrin	60-57-1	0.67	0.52	ug/kg
4,4'-DDD	72-54-8	0.67	0.34	ug/kg
4,4'-DDE	72-55-9	0.67	0.40	ug/kg
4,4'-DDT	50-29-3	0.67	0.49	ug/kg
Endrin	72-20-8	0.67	0.34	ug/kg
Endosulfan sulfate	1031-07-8	0.67	0.61	ug/kg
Endrin aldehyde	7421-93-4	0.67	0.64	ug/kg
Endosulfan-I	959-98-8	0.67	0.32	ug/kg
Endosulfan-II	33213-65-9	0.67	0.44	ug/kg
Heptachlor	76-44-8	0.67	0.41	ug/kg
Heptachlor epoxide	1024-57-3	0.67	0.33	ug/kg
Methoxychlor	72-43-5	1.3	0.47	ug/kg
Endrin ketone	53494-70-5	0.67	0.44	ug/kg
Toxaphene	8001-35-2	17	8.4	ug/kg

21 compounds reported in list PTCL

Compound List Report

Product: P8082PCB11 PCBs w 1262 & 1268
Matrix: SO Solid

Sep 10, 2012 04:53 pm

Method List:	P8082 SO	**Method Ref:**	SW846 8082A	LJ35975
Report List:	PCB11 ALL		PCB List	LJ31661
RL/MDL Factor:	.67			

Compound	CAS No.	RL	MDL	Units
Aroclor 1016	12674-11-2	34	8.7	ug/kg
Aroclor 1221	11104-28-2	34	20	ug/kg
Aroclor 1232	11141-16-5	34	17	ug/kg
Aroclor 1242	53469-21-9	34	11	ug/kg
Aroclor 1248	12672-29-6	34	10	ug/kg
Aroclor 1254	11097-69-1	34	16	ug/kg
Aroclor 1260	11096-82-5	34	11	ug/kg
Aroclor 1268	11100-14-4	34	9.8	ug/kg
Aroclor 1262	37324-23-5	34	11	ug/kg

9 compounds reported in list PCB11

Compound List Report

Product: H8151STD Herbicides
Matrix: SO Solid

Sep 10, 2012 04:54 pm

Method List:	H8151 SO	**Method Ref:**	SW846 8151	LJ33544
Report List:	HERB3 ALL	Herbicide List		LJ925
RL/MDL Factor:	.67			

Compound	CAS No.	RL	MDL	Units
2,4-D	94-75-7	34	9.7	ug/kg
2,4,5-TP (Silvex)	93-72-1	6.7	1.2	ug/kg
2,4,5-T	93-76-5	6.7	2.9	ug/kg

3 compounds reported in list HERB3

Compound List Report

Product: V8260TCL11 TCL Volatile Organics
Matrix: AQ Aqueous

Sep 10, 2012 04:45 pm

Method List:	VAIX8260 AQ	**Method Ref:** SW846 8260B	LJ40839
Report List:	VTCL11 ALL	VOA TCL List (SOM0 1.1)	LJ24480
RL/MDL Factor:	1		

Compound	CAS No.	RL	MDL	Units
Acetone	67-64-1	10	3.3	ug/l
Benzene	71-43-2	1.0	0.24	ug/l
Bromochloromethane	74-97-5	5.0	0.30	ug/l
Bromodichloromethane	75-27-4	1.0	0.21	ug/l
Bromoform	75-25-2	4.0	0.21	ug/l
Bromomethane	74-83-9	2.0	0.22	ug/l
2-Butanone (MEK)	78-93-3	10	2.4	ug/l
Carbon disulfide	75-15-0	2.0	0.19	ug/l
Carbon tetrachloride	56-23-5	1.0	0.22	ug/l
Chlorobenzene	108-90-7	1.0	0.23	ug/l
Chloroethane	75-00-3	1.0	0.26	ug/l
Chloroform	67-66-3	1.0	0.20	ug/l
Chloromethane	74-87-3	1.0	0.21	ug/l
Cyclohexane	110-82-7	5.0	0.35	ug/l
1,2-Dibromo-3-chloropropane	96-12-8	10	0.54	ug/l
Dibromochloromethane	124-48-1	1.0	0.14	ug/l
1,2-Dibromoethane	106-93-4	2.0	0.20	ug/l
1,2-Dichlorobenzene	95-50-1	1.0	0.22	ug/l
1,3-Dichlorobenzene	541-73-1	1.0	0.22	ug/l
1,4-Dichlorobenzene	106-46-7	1.0	0.30	ug/l
Dichlorodifluoromethane	75-71-8	5.0	0.27	ug/l
1,1-Dichloroethane	75-34-3	1.0	0.11	ug/l
1,2-Dichloroethane	107-06-2	1.0	0.26	ug/l
1,1-Dichloroethene	75-35-4	1.0	0.19	ug/l
cis-1,2-Dichloroethene	156-59-2	1.0	0.19	ug/l
trans-1,2-Dichloroethene	156-60-5	1.0	0.21	ug/l
1,2-Dichloropropane	78-87-5	1.0	0.48	ug/l
cis-1,3-Dichloropropene	10061-01-5	1.0	0.21	ug/l
trans-1,3-Dichloropropene	10061-02-6	1.0	0.19	ug/l
1,4-Dioxane	123-91-1	130	75	ug/l
Ethylbenzene	100-41-4	1.0	0.23	ug/l
Freon 113	76-13-1	5.0	0.53	ug/l
2-Hexanone	591-78-6	5.0	1.1	ug/l
Isopropylbenzene	98-82-8	2.0	0.45	ug/l
Methyl Acetate	79-20-9	5.0	1.2	ug/l
Methylcyclohexane	108-87-2	5.0	0.26	ug/l
Methyl Tert Butyl Ether	1634-04-4	1.0	0.16	ug/l
4-Methyl-2-pentanone(MIBK)	108-10-1	5.0	0.83	ug/l
Methylene chloride	75-09-2	2.0	0.70	ug/l
Styrene	100-42-5	5.0	0.21	ug/l
1,1,2,2-Tetrachloroethane	79-34-5	1.0	0.21	ug/l
Tetrachloroethene	127-18-4	1.0	0.28	ug/l
Toluene	108-88-3	1.0	0.23	ug/l
1,2,3-Trichlorobenzene	87-61-6	5.0	0.28	ug/l

Compound List Report

Product: V8260TCL11 TCL Volatile Organics
Matrix: AQ Aqueous

Sep 10, 2012 04:45 pm

Method List:	VAIX8260 AQ	**Method Ref:**	SW846 8260B	LJ40839
Report List:	VTCL11 ALL	VOA TCL List (SOM0 1.1)		LJ24480
RL/MDL Factor:	1			

Compound	CAS No.	RL	MDL	Units
1,2,4-Trichlorobenzene	120-82-1	5.0	0.20	ug/l
1,1,1-Trichloroethane	71-55-6	1.0	0.24	ug/l
1,1,2-Trichloroethane	79-00-5	1.0	0.29	ug/l
Trichloroethene	79-01-6	1.0	0.22	ug/l
Trichlorofluoromethane	75-69-4	5.0	0.27	ug/l
Vinyl chloride	75-01-4	1.0	0.21	ug/l
m,p-Xylene		1.0	0.42	ug/l
o-Xylene	95-47-6	1.0	0.24	ug/l
Xylene (total)	1330-20-7	1.0	0.24	ug/l

53 compounds reported in list VTCL11

Compound List Report

Product: AB8270TCL11 TCL Semivolatiles
Matrix: AQ Aqueous

Sep 10, 2012 04:45 pm

Method List:	AB8270 AQ	**Method Ref:** SW846 8270D	LJ40836
Report List:	ABTCL11 ALL	ABN TCL List (SOM0 1.1)	LJ24481
RL/MDL Factor:	1		

Compound	CAS No.	RL	MDL	Units
2-Chlorophenol	95-57-8	5.0	0.97	ug/l
4-Chloro-3-methyl phenol	59-50-7	5.0	1.8	ug/l
2,4-Dichlorophenol	120-83-2	5.0	1.2	ug/l
2,4-Dimethylphenol	105-67-9	5.0	1.5	ug/l
2,4-Dinitrophenol	51-28-5	20	17	ug/l
4,6-Dinitro-o-cresol	534-52-1	20	0.99	ug/l
2-Methylphenol	95-48-7	2.0	1.0	ug/l
3&4-Methylphenol		2.0	0.93	ug/l
2-Nitrophenol	88-75-5	5.0	1.5	ug/l
4-Nitrophenol	100-02-7	10	5.2	ug/l
Pentachlorophenol	87-86-5	10	1.4	ug/l
Phenol	108-95-2	2.0	1.3	ug/l
2,3,4,6-Tetrachlorophenol	58-90-2	5.0	0.94	ug/l
2,4,5-Trichlorophenol	95-95-4	5.0	1.6	ug/l
2,4,6-Trichlorophenol	88-06-2	5.0	1.3	ug/l
Acenaphthene	83-32-9	1.0	0.26	ug/l
Acenaphthylene	208-96-8	1.0	0.23	ug/l
Acetophenone	98-86-2	2.0	0.29	ug/l
Anthracene	120-12-7	1.0	0.29	ug/l
Atrazine	1912-24-9	5.0	0.49	ug/l
Benzaldehyde	100-52-7	5.0	3.3	ug/l
Benzo(a)anthracene	56-55-3	1.0	0.23	ug/l
Benzo(a)pyrene	50-32-8	1.0	0.23	ug/l
Benzo(b)fluoranthene	205-99-2	1.0	0.46	ug/l
Benzo(g,h,i)perylene	191-24-2	1.0	0.32	ug/l
Benzo(k)fluoranthene	207-08-9	1.0	0.51	ug/l
4-Bromophenyl phenyl ether	101-55-3	2.0	0.36	ug/l
Butyl benzyl phthalate	85-68-7	2.0	0.29	ug/l
1,1'-Biphenyl	92-52-4	1.0	0.30	ug/l
2-Chloronaphthalene	91-58-7	2.0	0.30	ug/l
4-Chloroaniline	106-47-8	5.0	0.53	ug/l
Carbazole	86-74-8	1.0	0.36	ug/l
Caprolactam	105-60-2	2.0	0.69	ug/l
Chrysene	218-01-9	1.0	0.29	ug/l
bis(2-Chloroethoxy)methane	111-91-1	2.0	0.31	ug/l
bis(2-Chloroethyl)ether	111-44-4	2.0	0.31	ug/l
bis(2-Chloroisopropyl)ether	108-60-1	2.0	0.45	ug/l
4-Chlorophenyl phenyl ether	7005-72-3	2.0	0.31	ug/l
2,4-Dinitrotoluene	121-14-2	2.0	0.43	ug/l
2,6-Dinitrotoluene	606-20-2	2.0	0.46	ug/l
3,3'-Dichlorobenzidine	91-94-1	5.0	0.36	ug/l
Dibenzo(a,h)anthracene	53-70-3	1.0	0.38	ug/l
Dibenzofuran	132-64-9	5.0	0.27	ug/l
Di-n-butyl phthalate	84-74-2	2.0	0.56	ug/l

Compound List Report

Product: AB8270TCL11 TCL Semivolatiles
Matrix: AQ Aqueous

Sep 10, 2012 04:45 pm

Method List:	AB8270 AQ	**Method Ref:** SW846 8270D	LJ40836
Report List:	ABTCL11 ALL	ABN TCL List (SOM0 1.1)	LJ24481
RL/MDL Factor:	1		

Compound	CAS No.	RL	MDL	Units
Di-n-octyl phthalate	117-84-0	2.0	0.31	ug/l
Diethyl phthalate	84-66-2	2.0	0.33	ug/l
Dimethyl phthalate	131-11-3	2.0	0.28	ug/l
bis(2-Ethylhexyl)phthalate	117-81-7	2.0	0.59	ug/l
Fluoranthene	206-44-0	1.0	0.32	ug/l
Fluorene	86-73-7	1.0	0.28	ug/l
Hexachlorobenzene	118-74-1	1.0	0.34	ug/l
Hexachlorobutadiene	87-68-3	1.0	0.51	ug/l
Hexachlorocyclopentadiene	77-47-4	10	7.1	ug/l
Hexachloroethane	67-72-1	2.0	0.55	ug/l
Indeno(1,2,3-cd)pyrene	193-39-5	1.0	0.37	ug/l
Isophorone	78-59-1	2.0	0.27	ug/l
2-Methylnaphthalene	91-57-6	1.0	0.38	ug/l
2-Nitroaniline	88-74-4	5.0	1.1	ug/l
3-Nitroaniline	99-09-2	5.0	1.3	ug/l
4-Nitroaniline	100-01-6	5.0	1.7	ug/l
Naphthalene	91-20-3	1.0	0.26	ug/l
Nitrobenzene	98-95-3	2.0	0.42	ug/l
N-Nitroso-di-n-propylamine	621-64-7	2.0	0.30	ug/l
N-Nitrosodiphenylamine	86-30-6	5.0	0.31	ug/l
Phenanthrene	85-01-8	1.0	0.29	ug/l
Pyrene	129-00-0	1.0	0.27	ug/l
1,2,4,5-Tetrachlorobenzene	95-94-3	2.0	0.31	ug/l

67 compounds reported in list ABTCL11

Compound List Report

Product: P8082PCB11 PCBs w 1262 & 1268
Matrix: AQ Aqueous

Sep 10, 2012 04:45 pm

Method List:	P8082 AQ	**Method Ref:**	SW846 8082A	LJ35825
Report List:	PCB11 ALL		PCB List	LJ31661
RL/MDL Factor:	1			

Compound	CAS No.	RL	MDL	Units
Aroclor 1016	12674-11-2	50	13	ug/l
Aroclor 1221	11104-28-2	50	27	ug/l
Aroclor 1232	11141-16-5	50	39	ug/l
Aroclor 1242	53469-21-9	50	8.6	ug/l
Aroclor 1248	12672-29-6	50	15	ug/l
Aroclor 1254	11097-69-1	50	14	ug/l
Aroclor 1260	11096-82-5	50	21	ug/l
Aroclor 1268	11100-14-4	50	13	ug/l
Aroclor 1262	37324-23-5	50	6.0	ug/l

9 compounds reported in list PCB11

Compound List Report

Product: P8081PESTTCL TCL Pesticides
Matrix: AQ Aqueous

Sep 10, 2012 04:45 pm

Method List:	P8081 AQ	**Method Ref:**	SW846 8081B	LJ36015
Report List:	PTCL ALL	Pesticide TCL List		LJ1046
RL/MDL Factor:	1			

Compound	CAS No.	RL	MDL	Units
Aldrin	309-00-2	1.0	0.95	ug/l
alpha-BHC	319-84-6	1.0	0.40	ug/l
beta-BHC	319-85-7	1.0	0.38	ug/l
delta-BHC	319-86-8	1.0	0.62	ug/l
gamma-BHC (Lindane)	58-89-9	1.0	0.41	ug/l
alpha-Chlordane	5103-71-9	1.0	0.50	ug/l
gamma-Chlordane	5103-74-2	1.0	0.23	ug/l
Dieldrin	60-57-1	1.0	0.33	ug/l
4,4'-DDD	72-54-8	1.0	0.36	ug/l
4,4'-DDE	72-55-9	1.0	0.30	ug/l
4,4'-DDT	50-29-3	1.0	0.60	ug/l
Endrin	72-20-8	1.0	0.64	ug/l
Endosulfan sulfate	1031-07-8	1.0	0.64	ug/l
Endrin aldehyde	7421-93-4	1.0	0.29	ug/l
Endrin ketone	53494-70-5	1.0	0.41	ug/l
Endosulfan-I	959-98-8	1.0	0.30	ug/l
Endosulfan-II	33213-65-9	1.0	0.28	ug/l
Heptachlor	76-44-8	1.0	0.84	ug/l
Heptachlor epoxide	1024-57-3	1.0	0.38	ug/l
Methoxychlor	72-43-5	2.0	0.82	ug/l
Toxaphene	8001-35-2	25	15	ug/l

21 compounds reported in list PTCL

Compound List Report

Product: H8151STD Herbicides
Matrix: AQ Aqueous

Sep 10, 2012 04:45 pm

Method List:	H8151 AQ	**Method Ref:**	SW846 8151	LJ32664
Report List:	HERB3 ALL		Herbicide List	LJ925
RL/MDL Factor:	1			

Compound	CAS No.	RL	MDL	Units
2,4-D	94-75-7	50	16	ug/l
2,4,5-TP (Silvex)	93-72-1	10	2.6	ug/l
2,4,5-T	93-76-5	10	2.0	ug/l

3 compounds reported in list HERB3

Accutest NJ Normal Reporting Limits for Soil and Non-potable Water Matrices for 2011

(Soil values will be adjusted up for percent solids.)

TEST	Method 200.7/6010 waters - normal RL in ug/l - ICP	Method 6010 soils - normal RL in mg/kg - ICP	TEST
Al	200.0	50.0	Al
Sb	6.0	2.0	Sb
As	8.0	2.0	As
Ba	200.0	20.0	Ba
Be	1.0	0.2	Be
Cd	3.0	0.5	Cd
Ca	5000.0	500.0	Ca
Cr	10.0	1.0	Cr
Co	50.0	5.0	Co
Cu	10.0	2.5	Cu
Fe	100.0	50.0	Fe
Pb	3.0	2.0	Pb
Mg	5000.0	500.0	Mg
Mn	15.0	1.5	Mn
Ni	10.0	4.0	Ni
K	10000.0	1000.0	K
Se	10.0	2.0	Se
Ag	10.0	0.5	Ag
Na	10000.0	1000.0	Na
Tl	10.0	1.0	Tl
V	50.0	5.0	V
Zn	20.0	2.0	Zn
B	100.0	10.0	B
Bi	20.0	2.0	Bi
Mo	20.0	2.0	Mo
Li	20.0	2.0	Li
Pd	50.0	5.0	Pd
SICP	50.0	5.0	SICP
Si	200.0	NA	Si
Sr	10.0	1.0	Sr
Sn	10.0	5.0	Sn
Ti	10.0	1.0	Ti
W	50.0	5.0	W
Zr	10.0	2.0	Zr

	EPA 245.1/SW846 7470A waters- normal RL in ug/l	SW846 7470A leachates- normal MDL in mg/l
CR6	.01 mg/l	.2 ug/kg
Hg -CV	0.200	0.000075

Compound List Report

Product: VTO15STD Volatile Organics
Matrix: AIR Air

Oct 13, 2008 11:31 am

Method List:	VTO14/15 AIR	**Method Ref:**	TO-15	LJ26877
Report List:	VTO15 AIR			LJ17455
RL/MDL Factor:	1			

Compound	CAS No.	RL	MDL	Units
Acetone	67-64-1	0.20	0.044	ppbv
1,3-Butadiene	106-99-0	0.20	0.054	ppbv
Benzene	71-43-2	0.20	0.017	ppbv
Bromodichloromethane	75-27-4	0.20	0.023	ppbv
Bromoform	75-25-2	0.20	0.029	ppbv
Bromomethane	74-83-9	0.20	0.031	ppbv
Bromoethene	593-60-2	0.20	0.032	ppbv
Benzyl Chloride	100-44-7	0.20	0.037	ppbv
Carbon disulfide	75-15-0	0.20	0.018	ppbv
Chlorobenzene	108-90-7	0.20	0.028	ppbv
Chloroethane	75-00-3	0.20	0.026	ppbv
Chloroform	67-66-3	0.20	0.021	ppbv
Chloromethane	74-87-3	0.20	0.039	ppbv
3-Chloropropene	107-05-1	0.20	0.029	ppbv
2-Chlorotoluene	95-49-8	0.20	0.022	ppbv
Carbon tetrachloride	56-23-5	0.20	0.027	ppbv
Cyclohexane	110-82-7	0.20	0.034	ppbv
1,1-Dichloroethane	75-34-3	0.20	0.021	ppbv
1,1-Dichloroethylene	75-35-4	0.20	0.040	ppbv
1,2-Dibromoethane	106-93-4	0.20	0.030	ppbv
1,2-Dichloroethane	107-06-2	0.20	0.038	ppbv
1,2-Dichloropropane	78-87-5	0.20	0.029	ppbv
1,4-Dioxane	123-91-1	0.20	0.046	ppbv
Dichlorodifluoromethane	75-71-8	0.20	0.030	ppbv
Dibromochloromethane	124-48-1	0.20	0.019	ppbv
trans-1,2-Dichloroethylene	156-60-5	0.20	0.023	ppbv
cis-1,2-Dichloroethylene	156-59-2	0.20	0.028	ppbv
cis-1,3-Dichloropropene	10061-01-5	0.20	0.027	ppbv
m-Dichlorobenzene	541-73-1	0.20	0.044	ppbv
o-Dichlorobenzene	95-50-1	0.20	0.040	ppbv
p-Dichlorobenzene	106-46-7	0.20	0.044	ppbv
trans-1,3-Dichloropropene	10061-02-6	0.20	0.032	ppbv
Ethanol	64-17-5	0.50	0.047	ppbv
Ethylbenzene	100-41-4	0.20	0.018	ppbv
Ethyl Acetate	141-78-6	0.20	0.046	ppbv
4-Ethyltoluene	622-96-8	0.20	0.036	ppbv
Freon 113	76-13-1	0.20	0.020	ppbv
Freon 114	76-14-2	0.20	0.027	ppbv
Heptane	142-82-5	0.20	0.021	ppbv
Hexachlorobutadiene	87-68-3	0.20	0.084	ppbv
Hexane	110-54-3	0.20	0.054	ppbv
2-Hexanone	591-78-6	0.20	0.025	ppbv
Isopropyl Alcohol	67-63-0	0.20	0.036	ppbv
Methylene chloride	75-09-2	0.20	0.040	ppbv

Compound List Report

Product: VTO15STD Volatile Organics
Matrix: AIR Air

Oct 13, 2008 11:31 am

Method List:	VTO14/15 AIR	**Method Ref:**	TO-15	LJ26877
Report List:	VTO15 AIR			LJ17455
RL/MDL Factor:	1			

Compound	CAS No.	RL	MDL	Units
Methyl ethyl ketone	78-93-3	0.20	0.039	ppbv
Methyl Isobutyl Ketone	108-10-1	0.20	0.022	ppbv
Methyl Tert Butyl Ether	1634-04-4	0.20	0.018	ppbv
Propylene	115-07-1	0.50	0.053	ppbv
Styrene	100-42-5	0.20	0.023	ppbv
1,1,1-Trichloroethane	71-55-6	0.20	0.026	ppbv
1,1,2,2-Tetrachloroethane	79-34-5	0.20	0.024	ppbv
1,1,2-Trichloroethane	79-00-5	0.20	0.020	ppbv
1,2,4-Trichlorobenzene	120-82-1	0.20	0.066	ppbv
1,2,4-Trimethylbenzene	95-63-6	0.20	0.024	ppbv
1,3,5-Trimethylbenzene	108-67-8	0.20	0.021	ppbv
2,2,4-Trimethylpentane	540-84-1	0.20	0.026	ppbv
Tertiary Butyl Alcohol	75-65-0	0.20	0.027	ppbv
Tetrachloroethylene	127-18-4	0.20	0.027	ppbv
Tetrahydrofuran	109-99-9	0.20	0.027	ppbv
Toluene	108-88-3	0.20	0.020	ppbv
Trichloroethylene	79-01-6	0.20	0.029	ppbv
Trichlorofluoromethane	75-69-4	0.20	0.029	ppbv
Vinyl chloride	75-01-4	0.20	0.031	ppbv
Vinyl Acetate	108-05-4	0.20	0.088	ppbv
m,p-Xylene		0.20	0.10	ppbv
o-Xylene	95-47-6	0.20	0.026	ppbv
Xylenes (total)	1330-20-7	0.20	0.026	ppbv

67 compounds reported in list VTO15

Compound List Report

Product: VTO15STD Volatile Organics
Matrix: AIR Air

Sep 17, 2009 06:14 pm

Method List:	VTO14/15 AIR	**Method Ref:**	TO-15	LJ29994
Report List:	VTO15 AIR			LJ17455
RL/MDL Factor:	4			

Compound	CAS No.	RL	MDL	Units
Acetone	67-64-1	1.9	0.37	ug/m3
1,3-Butadiene	106-99-0	1.8	0.32	ug/m3
Benzene	71-43-2	2.6	0.27	ug/m3
Bromodichloromethane	75-27-4	5.2	0.76	ug/m3
Bromoform	75-25-2	8.4	0.92	ug/m3
Bromomethane	74-83-9	3.1	0.38	ug/m3
Bromoethene	593-60-2	3.5	0.32	ug/m3
Benzyl Chloride	100-44-7	4.0	0.68	ug/m3
Carbon disulfide	75-15-0	2.5	0.40	ug/m3
Chlorobenzene	108-90-7	3.7	0.48	ug/m3
Chloroethane	75-00-3	2.1	0.44	ug/m3
Chloroform	67-66-3	3.9	0.56	ug/m3
Chloromethane	74-87-3	1.6	0.39	ug/m3
3-Chloropropene	107-05-1	2.5	0.38	ug/m3
2-Chlorotoluene	95-49-8	4.0	0.44	ug/m3
Carbon tetrachloride	56-23-5	5.2	0.56	ug/m3
Cyclohexane	110-82-7	2.8	0.84	ug/m3
1,1-Dichloroethane	75-34-3	3.2	0.52	ug/m3
1,1-Dichloroethylene	75-35-4	3.2	0.68	ug/m3
1,2-Dibromoethane	106-93-4	6.0	0.64	ug/m3
1,2-Dichloroethane	107-06-2	3.2	0.60	ug/m3
1,2-Dichloropropane	78-87-5	3.7	0.52	ug/m3
1,4-Dioxane	123-91-1	2.9	0.92	ug/m3
Dichlorodifluoromethane	75-71-8	4.0	0.48	ug/m3
Dibromochloromethane	124-48-1	6.8	1.2	ug/m3
trans-1,2-Dichloroethylene	156-60-5	3.2	0.56	ug/m3
cis-1,2-Dichloroethylene	156-59-2	3.2	0.44	ug/m3
cis-1,3-Dichloropropene	10061-01-5	3.6	0.35	ug/m3
m-Dichlorobenzene	541-73-1	4.8	0.76	ug/m3
o-Dichlorobenzene	95-50-1	4.8	0.88	ug/m3
p-Dichlorobenzene	106-46-7	4.8	0.76	ug/m3
trans-1,3-Dichloropropene	10061-02-6	3.6	0.29	ug/m3
Ethanol	64-17-5	3.8	0.56	ug/m3
Ethylbenzene	100-41-4	3.5	0.34	ug/m3
Ethyl Acetate	141-78-6	2.9	0.72	ug/m3
4-Ethyltoluene	622-96-8	3.9	0.84	ug/m3
Freon 113	76-13-1	6.0	0.68	ug/m3
Freon 114	76-14-2	5.6	0.60	ug/m3
Heptane	142-82-5	3.3	0.40	ug/m3
Hexachlorobutadiene	87-68-3	8.4	1.8	ug/m3
Hexane	110-54-3	2.8	0.27	ug/m3
2-Hexanone	591-78-6	3.3	0.48	ug/m3
Isopropyl Alcohol	67-63-0	2.0	0.34	ug/m3
Methylene chloride	75-09-2	2.8	0.35	ug/m3

Compound List Report

Product: VTO15STD Volatile Organics
Matrix: AIR Air

Sep 17, 2009 06:14 pm

Method List:	VTO14/15 AIR	**Method Ref:**	TO-15	LJ29994
Report List:	VTO15 AIR			LJ17455
RL/MDL Factor:	4			

Compound	CAS No.	RL	MDL	Units
Methyl ethyl ketone	78-93-3	2.4	0.48	ug/m3
Methyl Isobutyl Ketone	108-10-1	3.3	0.72	ug/m3
Methyl Tert Butyl Ether	1634-04-4	2.9	0.32	ug/m3
Propylene	115-07-1	3.4	0.44	ug/m3
Styrene	100-42-5	3.4	0.31	ug/m3
1,1,1-Trichloroethane	71-55-6	4.4	0.52	ug/m3
1,1,2,2-Tetrachloroethane	79-34-5	5.6	0.64	ug/m3
1,1,2-Trichloroethane	79-00-5	4.4	0.48	ug/m3
1,2,4-Trichlorobenzene	120-82-1	6.0	2.0	ug/m3
1,2,4-Trimethylbenzene	95-63-6	3.9	0.44	ug/m3
1,3,5-Trimethylbenzene	108-67-8	3.9	0.52	ug/m3
2,2,4-Trimethylpentane	540-84-1	3.7	0.38	ug/m3
Tertiary Butyl Alcohol	75-65-0	2.4	0.28	ug/m3
Tetrachloroethylene	127-18-4	1.1	0.56	ug/m3
Tetrahydrofuran	109-99-9	2.4	0.38	ug/m3
Toluene	108-88-3	3.0	0.27	ug/m3
Trichloroethylene	79-01-6	0.84	0.40	ug/m3
Trichlorofluoromethane	75-69-4	4.4	0.48	ug/m3
Vinyl chloride	75-01-4	2.0	0.24	ug/m3
Vinyl Acetate	108-05-4	2.8	0.64	ug/m3
m,p-Xylene		3.5	0.80	ug/m3
o-Xylene	95-47-6	3.5	0.40	ug/m3
Xylenes (total)	1330-20-7	3.5	0.40	ug/m3

67 compounds reported in list VTO15

APPENDIX C

Site Health and Safety Plan

September 19, 2012

HEALTH AND SAFETY PLAN

149 Kent Avenue

Prepared for

KENT & WYTHE OWNERS LLC
149 Kent Avenue
Williamsburg
Kings County, New York

ROUX ASSOCIATES, INC.

Environmental Consulting & Management

209 Shafter Street, Islandia, New York 11749 ♦ 631-232-2600

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APPROVALS

By their signature, the undersigned certify that this Health and Safety Plan (HASP) is approved and will be utilized at the project site located at 149 Kent Avenue, Brooklyn, New York.

Joseph Gentile Corporate Health and Safety Manager Roux Associates, Inc.	Date
David Bligh, P.E. Site Health and Safety Officer Roux Associates, Inc.	Date
Joseph Duminuco Project Principal Roux Associates, Inc.	Date

1.0 INTRODUCTION

This Site-specific and Safety Plan (HASP) has been prepared in accordance with 29 CFR 1910.120 Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations and Emergency Response (HAZWOPER) and Roux Associates, Inc. (Roux Associates) Standard Operating Procedures (SOPs). It addresses all activities to be performed during the implementation of Remedial Investigation (RI) activities at 149 Kent Avenue, Brooklyn, New York (Site) (Figure 1). The HASP will be implemented by the designated Site Health and Safety Officer (SSO) during RI work at the Site. The HASP attempts to identify all potential hazards at the Site; however, Site conditions are dynamic and new hazards may appear constantly. Personnel must remain alert to existing and potential hazards as Site conditions change and protect themselves accordingly.

Compliance with this HASP is required of all persons and subcontractors who perform RI fieldwork or enter the Site. The contents of this HASP may change or undergo revision based upon additional information made available to health and safety personnel, monitoring results, or changes in the technical scope of work. Any changes proposed must be reviewed and approved by the Corporate Health and Safety Manager (CHSM), with the SSO implementing the changes to the HASP.

Upon entering the Site, all visitors are required to sign in. All visitors entering the Contamination Reduction Zone (CRZ) (defined in Section 8.1.2), the Contamination Reduction Corridor (CRC) (defined in Section 8.1.2), or the Exclusion Zone (EZ) (defined in Section 8.1.3) will be required to read and comply with the provisions of this HASP. Visitors will be required to comply with applicable OSHA requirements such as training, medical monitoring, and respiratory protection.

In the event that a visitor does not adhere to the provisions of this HASP, he or she will be required to leave the Site. Mobilization activities not requiring intrusive activities (e.g., survey, equipment staging, etc.) or exposure to potentially impacted areas may only be performed if supervised by a competent Roux Associates employee.

1.1 Scope of Work

The Scope of Work activities will include the implementation of RI activities.

The Scope of Work activities are as follows:

1. Obtain necessary permits and approvals.
2. Preparation and implementation of an approved Health and Safety Plan (HASP).
3. Implementation of RI activities, consisting of site inspection/reconnaissance, drilling, soil boring and sampling, groundwater sampling, and soil vapor sampling.
4. Implementation of the approved Field Sampling Plan (FSP).
5. Mobilization and demobilization.
6. Maintain good site housekeeping procedures at all times.
7. Identification, protection, and/or relocation of any utilities within the work area.
8. Construct a decontamination pad with proper containment and collection system, if necessary.

1.2 Emergency Numbers

1.2.1 Emergency Phone Numbers

Emergency Medical Service 911

Police: New York City Police Department (NYPD).....911

Fire: 911

Hospital: Woodhull Medical Center 718-963-8101

National Response Center.....800-424-8802

Poison Control Center.....800-222-1222

Chemtrec.....800-262-8200

Fire: 911

Center for Disease Control.....800-311-3435

USEPA (Region II).....212-637-5000

NYSDEC Emergency Spill Response 800-457-7362

1.2.2 Project Management/Health and Safety Personnel

Title	Contact	Telephone/Cell
Roux Associates		
Project Director	Joseph Duminuco	631-232-2600 Cell – 631-921-6279
Site Health and Safety Officer	David Bligh	631-232-2600 Cell – 631-379-2281
Corporate Health and Safety Manager	Joseph Gentile	856-423-8800 Cell – 610-844-6911

1.2.3 Directions to Woodhull Medical Center

760 Broadway
Brooklyn, New York 11206

See Figure 2 for street map.

- Start at 149 Kent Avenue, Brooklyn, New York
- Head northeast on Kent Avenue toward North 6th Street
- Turn Right onto North 7th Street
- Turn Right onto Wythe Avenue
- Turn Left onto Metropolitan Avenue
- Turn Right onto Union Avenue
- Turn Left onto Broadway
- Arrive at Woodhull Medical Center on your right.

2.0 HEALTH AND SAFETY STAFF

This section briefly describes all site personnel and their health and safety responsibilities for the RI work to be implemented at the Site. All personnel are responsible for ensuring compliance with the HASP.

2.1 Project Principal (PP) – Joseph Duminuco – Roux Associates

- Has the overall responsibility for the health and safety of Site personnel.
- Ensures that adequate resources are provided to the field health and safety staff to carry out their responsibilities as outlined below.

2.2 Corporate Health and Safety Manager (CHSM) – Joe Gentile – Roux Associates

- Implements the HASP.
- Performs or oversees site-specific training and approves revised or new safety protocols or field operations.
- Coordinates revisions of this HASP with Project Principal.
- Responsible for the development of new task safety protocols and procedures and resolution of any outstanding safety issues which may arise during the conduction of site work.
- Review and approve all health and safety training and medical surveillance records for personnel and subcontractors.

2.3 Site Safety and Health Officer (SSO) – David Bligh – Roux Associates

- Directs and coordinates health and safety monitoring activities.
- Ensures that field teams utilize proper personal protective equipment.
- Conducts initial onsite specific training prior to personnel and/or subcontractors commencing work.
- Conducts and documents periodic safety briefings.
- Ensures that field team members comply with this HASP.
- Completes and maintains Accident Report and Investigation Forms.
- Notifies PP and CHSM of all accident/incidents.

- Notifies PP of daily field operations and work progress, who will then communicate at the end of the day to the designated representative the following:

    1. End of day tasks completed

    2. Next day's planned activities

    3. Third party issues

    4. Change of Plans – approvals

- Change in level of personal protective equipment (PPE).

- Maintains contact with Contractors.

- Determines upgrade or downgrade of personal protective equipment (PPE) based on Site conditions and/or real time monitoring results.

- Ensures that monitoring instruments are calibrated daily or as manufacturer's suggested instructions determine.

- Submits and maintains health and safety field log books, daily safety logs, training logs, air monitoring result reports, weekly safety report.

2.4 Field Personnel and Subcontractors

- Report any unsafe or potentially hazardous conditions to the SSO.

- Maintain knowledge of the information, instructions, and emergency response actions contained in the HASP.

- Comply with rules, regulations, and procedures as set forth in this HASP and any revisions, which are instituted.

- Prevent admittance to work Site by unauthorized personnel.

3.0 SITE LOCATION, DESCRIPTION, AND HISTORY

Descriptions of the Site and surrounding property usage are included in the following sections. The location of the Site is presented in Figure 1.

3.1 Property Location and Description

The Site is located at 149 Kent Avenue, Brooklyn, New York. The Site is comprised of a 0.92-acre parcel located on the north side of North 5th Street, between Wythe Avenue and Kent Avenue. The entire site is occupied by a one story former carpet warehouse building. The building is constructed with concrete block and brick walls, steel frame, and roof on a concrete slab. Two loading and unloading bays are located along the building, one on the west side of the building and one along the south side of the building. The building is surrounded by concrete public sidewalks along Kent Avenue, North 5th Street and Wythe Avenue. To the north the building is bordered by several businesses including a coffee bar, a deli, several clothing stress and several vacant buildings.

The Site is currently owned by Kent & Wythe Owners LLC.

4.0 WASTE DESCRIPTION/CHARACTERIZATION

4.1 General

The following information is presented in order to identify the types of materials that may be encountered at the Site. The detailed information on these materials was obtained from:

- SAX's Dangerous Properties of Industrial Materials – Lewis Eight Edition
- Chemical Hazards of the Workplace – Proctor/Hughes
- Condensed Chemical Dictionary – Hawley
- Rapid Guide to Hazardous Chemical in the Workplace – Lewis 1990
- NIOSH Pocket Guide to Chemical Hazards – 2005
- ACGIH TLV Values and Biological Exposure Indices
- OSHA 29 CFR 1910.1000

4.2 Chemical Data Sheets

Several chemicals that may potentially be present in soils and groundwater at the Site, based on previous soil, soil vapor and groundwater sampling results and historic operations conducted at the Site that have been identified. The Summary of Toxicological Data is found in Table 1 and is provided for review of chemicals that may be encountered. The Summary of Toxicological Data Sheets provides information such as the chemicals characteristics, health hazards, protection, and exposure limits.

4.2.1 Contaminants of Concern

Soil and groundwater contaminants that may be encountered during drilling and sampling activities include both organic and inorganic compounds. Prior investigations at the site have indicated detection of Volatile Organic Compounds (VOCs), Semi-volatile Organic Compounds (SVOCs), metals, and polychlorinated biphenyls (PCBs).

The toxicological, physical, and chemical properties of potential contaminants are presented in Table 1.

5.0 HAZARD ASSESSMENT

The potential to encounter chemical hazards is dependent upon the work activity performed (intrusive versus non-intrusive), and the duration and location of the work activity. Such hazards could include inhalation and/or skin contact with chemicals/gases that could cause: dermatitis, skin burns, being overcome by vapors or asphyxiation.

Physical hazards that may be encountered during Site work include; heat and cold stress, exposure to excessive noise, loss of limbs, being crushed, head injuries, punctures, cuts, falls, electrocution, and bruises, structural integrity of buildings, asbestos and lead paint exposure, and other physical hazards due to motor vehicle operation, heavy equipment and power tools.

Biological hazards may exist during Site activities. These hazards include exposure to insect bites/stings, animals and animal wastes, mold and bloodborne pathogens.

Prior to the beginning of each new phase of RI work, an activity hazard analysis will be prepared by the SSO with assistance from the CHSM. The analysis will address the hazards for each activity performed in the phase and will present the procedures and safeguards necessary to eliminate the hazards or reduce the risk. The Activity Hazard Analysis Sheets are located in Appendix A.

5.1 Chemical Hazards

The potential for personnel and subcontractors to come in contact with chemical hazards may occur during the following tasks:

- Drilling Activities
- Sampling activities
- Decontamination Activities

For chronic and acute toxicity data, refer to Summary of Toxicological Data Sheets in Table 1 for further details on compound characteristics.

5.1.1 Exposure Pathways

Exposure to these compounds during ongoing activities may occur through inhalation of contaminated dust particles, inhalation of VOCs and SVOCs, dermal absorption, and accidental ingestion of the contaminant by either direct or indirect cross-contamination activities.

Inhalation of contaminated dust particles (VOCs, SVOCs, and inorganics) can occur during adverse weather conditions (high or changing wind directions) or during operations that may generate airborne dust such as excavation and loading of contaminated soils. Dust control measures such as applying water to roadways and excavations will be implemented where visible dust is generated. Where dust control measures are not feasible or effective, respiratory protection will be used when necessary (see Section 9.2.2 for monitoring procedures and action levels).

5.1.2 Operational Action Levels

A decision-making protocol for an upgrade in levels of protection and/or withdrawal of personnel from an area based on atmospheric hazards is outlined in Table 2.

5.1.3 Additional Precautions

Dermal absorption or skin contact with chemical compounds is possible during intrusive activities at the Site. The use of PPE in accordance with Section 8.2 and strict adherence to proper decontamination procedures should significantly reduce the risk of skin contact.

The potential for accidental ingestion of potentially hazardous chemicals is expected to be remote, when good hygiene practices are used.

5.2 Physical Hazards

A variety of physical hazards may be present during Site activities. These hazards include typical construction activities: operation of motor vehicles and heavy equipment operation, the use of power and hand tools, roping and rigging of steel sheeting, walking on objects, tripping over objects, working on surfaces which have the potential to promote falling, skin burns, crushing of fingers, toes, limbs, head injuries caused by falling objects, temporary loss of one's hearing and/or eyesight. The referenced hazards are not unique and are generally familiar to most hazardous waste site workers at construction sites. Task specific safety requirements for each phase will be

covered during safety briefings. Activity Hazard Analysis summaries are contained in Appendix A.

5.2.1 Noise

Noise is a potential hazard associated with operation of heavy equipment, power tools, pumps, and generators. High noise equipment operators will be evaluated at the discretion of the SSO. Employees with an 8-hour time weighted average exposure exceeding 85 dBA will be included in the hearing conservation program in accordance with 29 CFR 1910.95 and 1926.52.

It is mandated that employees working around heavy equipment or using power tools that produce noise levels exceeding 90 dBA are to wear hearing protection that shall consist of earplugs or protective earmuffs.

5.2.2 Heat Stress

Heat stress is a significant potential hazard, associated with the use of protective equipment in a hot weather environment. The human body is designed to function at a certain internal temperature. When metabolism or external sources (fire or hot summer day) cause the body temperature to rise, the body seeks to protect itself by triggering cooling mechanisms. The SSO will monitor the air temperature (as described later in this section) to determine potential adverse affects the weather can cause onsite personnel. Excess heat is dissipated by two means:

- Changes in blood flow to dissipate heat by convection, which can be seen as "flushing" or reddening of the skin in extreme cases.
- Perspiration is the release of water through skin and sweat glands. While working in hot environments, evaporation of perspiration is the primary cooling mechanism.

Protective clothing worn to guard against chemical contact effectively stops the evaporation of perspiration. Thus the use of protective clothing increases heat stress problems.

The major disorders due to heat stress are heat cramps, heat exhaustion, and heat stroke. Heat cramps are painful spasms, which occur in the skeletal muscles of workers who sweat profusely in the heat and drink large quantities of water, but fail to replace the bodies lost salts or electrolytes. Drinking water while continuing to lose salt tends to dilute the body's extracellular fluids.

Soon water seeps by osmosis into active muscles and causes pain. Muscles fatigued from work are usually most susceptible to cramps.

Extreme weakness or fatigue, dizziness, nausea, and headache characterize heat exhaustion. In serious cases, a person may vomit or lose consciousness. The skin is clammy and moist, complexion pale or flushed, and body temperature normal or slightly higher than normal. Treatment is rest in a cool place and replacement of body water lost by perspiration. Mild cases may recover spontaneously with this treatment; severe cases may require care for several days. There are no permanent effects.

Heat stroke is a very serious condition caused by the breakdown of the body's regulating mechanisms. The skin is very dry and hot with red mottled or bluish appearance. Unconsciousness, mental confusion, or convulsions may occur. Without quick and adequate treatment, the result can be death or permanent brain damage. As first aid treatment, the person should be moved to a cool place. Body heat should be reduced artificially, but not too rapidly, by soaking the person's clothes in water and fanning them.

Steps that can be taken to reduce heat stress are:

- Acclimate the body. Allow a period of adjustment to make further heat exposure endurable.
- Drink more liquids to replace the body water lost during sweating.
- Rest is necessary and should be conducted under the direction of the SSO.
- Wear personal cooling devices. These are two basic designs; units with pockets for holding frozen packets and units that circulate fluid from a reservoir through tubes to different parts of the body. Both designs can be in the form of a vest, jacket, or coverall. Some circulating units also have a cap for cooling the head.
- Wear long cotton underwear under chemical protective clothing. The cotton will absorb perspiration and will hold it close to the skin. This will provide the body with the maximum cooling available from the limited evaporation that takes place beneath chemical resistant clothing. It also allows for rapid cooling of the body when the protective clothing is removed.

Heat stress is a significant hazard associated with using protective equipment in hot weather environments. Local weather conditions may produce conditions, which will require restricted work schedules in order to protect employees.

Appendix B contains procedures for heat stress; these will be used as a guideline and to provide additional information.

5.2.3 Cold Stress

Cold temperatures are a significant potential hazard. Examples of cold temperature hazards are frostbite and hypothermia.

Frostbite is the most common injury resulting from exposure to cold. The extremities of the body are most often affected. The signs of frostbite are:

- The skin turns white or grayish-yellow.
- Pain is sometimes felt early but subsides later. Often there is no pain.
- The affected parts feel intensely cold and numb.

Hypothermia is characterized by shivering, numbness, drowsiness, muscular weakness, and a low internal body temperature when the body feels extremely warm. This can lead to unconsciousness and death. With both frostbite and hypothermia, the affected areas need to be warmed quickly. Immersion in warm water is an effective means of warming the affected areas quickly. In such cases, medical assistance will be sought.

To prevent these effects from occurring, persons working in the cold should wear adequate clothing and reduce the time spent in the cold area. The field SSO is responsible for determining appropriate time personnel should spend in adverse weather conditions and will monitor this.

Appendix B, which contains the Heat and Cold Stress Guidelines, provides additional information.

5.2.4 Asbestos

Asbestos is a widely used, mineral-based material that is resistant to heat and corrosive chemicals. Depending on the chemical composition, fibers may range from course to silky. The properties

that make asbestos fibers to valuable to industry are its high-tensile strength, flexibility, heat and chemical resistance, and good frictional properties. Asbestos is a common naturally occurring group of fibrous minerals. Asbestos fibers have been used in a variety of building materials; generally, most asbestos is found in pipe insulation, doors, textures paints and plasters, structural fireproofing, and floor tiles. Friable asbestos (that is, material that contains more than 0.1% asbestos by weight and can be crumbled by hand) is a potential hazard because it can release fibers into the air if damaged. Roux Associates' personnel will not disturb any suspected asbestos material.

5.2.5 Structural Integrity

The structural integrity of a building and the safety of the individuals inside depend on meeting and maintaining national and local building codes. Structural integrity can range from minor defects such as loose floorboards and roof leaks to major defects such as floors and walls sagging and collapsed roofs. Numerous other structural defects can exist with or without consequence to the occupants. If Roux Associates personnel detect a problem, they should notify their supervisor, who in turn, should seek the opinion of a qualified structural engineer to offer and opinion regarding the integrity of the building. If in the opinion of the qualified engineer it is unsafe, no work can proceed until a solution to rectify the situation has been performed.

5.2.6 Lockout/Tagout

Roux Associates and all Site contractors will develop a lockout/tagout plan in the event of the repair of electrical, pneumatic, hydraulic, mechanical systems, per OSHA requirements under 29 CFR 1910.147.

5.3 Biological Hazards

The biological hazards, which have the potential to cause adverse health effects, are from exposure to domestic flies, mosquitoes, insects, animals and animal wastes, mold and bloodborne pathogens. The Activity Hazard Analysis (Appendix A) suggests controls for various hazards to be potentially encountered onsite.

5.3.1 Insect Stings

Stings from insects are often painful, cause swelling and can be fatal if a severe allergic reaction such as anaphylactic shock occurs. If a sting occurs, the stinger should be scraped out of the skin, opposite of the sting direction. The area should be washed with soap and water followed by application of an ice pack.

If the victim has a history of allergic reaction, he should be taken to the nearest medical facility. If the victim has medication to reverse the effects of the sting, it should be taken immediately.

If the victim experiences a severe reaction, a constricting band should be placed between the sting and the heart. The bitten area should be kept below the heart if possible. A physician should be contacted immediately for further instructions.

5.3.2 Animals and Animal Wastes

Due to most of the onsite structures being abandoned for several years, there lies the potential for various wildlife to reside within the structures, including, but not limited to, pigeons, bats, mice, rats, squirrels, raccoons, and feral cats. Certain animals can represent significant sources (vectors) of disease transmission. Precautions to avoid or minimize potential contact with (biting) animals (such as some of the above listed) or animal waste and/or deceased animals should be considered prior to all field activities. Rats, squirrels, raccoons, feral cats, and other wild animals can inflict painful bites which can also cause disease (as in the case of rabid animals). Site personnel should avoid contact with any of the above.

If contact occurs, be sure to clean the area thoroughly with soap and water as soon as possible. If a bite occurs, the area should be cleaned thoroughly immediately with soap and water and medical attention should be sought.

5.3.3 Mold

Although mold affects individuals differently and to different degrees, the following are some of the most common adverse health effects:

- Respiratory problems – wheezing, difficulty breathing;
- Nasal and sinus congestion;

- Eyes – burning, watery, reddened, blurry vision, light sensitivity;
- Dry, hacking cough;
- Sore throat;
- Nose and throat irritation;
- Shortness of breath and lung disease;
- Chronic fatigue;
- Skin irritation;
- Central nervous system (headaches, loss of memory, and mood changes);
- Aches and pains;
- Fever;
- Headaches;
- Diarrhea; and
- Immune suppression.

Decisions about removing individuals from an affected area must be based on the results of a medical evaluation, and be made on a case-by-case basis.

Workers that discover the visible presence of mold in excess of 10 sq. feet need to notify the SSO for consultation. If a worker smells mold and feels that he/she is experiencing symptoms of exposure, he/she should retreat and report the symptoms to the SSO.

5.3.4 Bloodborne Pathogens

The majority of the occupational tasks onsite will not involve a significant risk of exposure to blood, blood components, or body fluids. The highest risk of acquiring any bloodborne pathogen for employees onsite will be following an injury. When administering first aid care, there are potential hazards associated with bloodborne pathogens that cause diseases such as Human Immunodeficiency Virus (HIV), Hepatitis B (HBV), Hepatitis A (HAV), Hepatitis C (HCV), or the Herpes Simplex Virus (HSV). An employee who has not received the appropriate certification should never execute first aid and/or CPR.

In order to minimize any potential pathogen exposure, all employees should use the hand washing facilities on a regular basis. Additionally, the following universal precautions should be followed to prevent further potential risk:

- Direct skin or mucous membrane contact with blood should be avoided.
- Open skin cuts or sores should be covered to prevent contamination from infectious agents.
- Body parts should be washed immediately after contact with blood or body fluids that might contain blood, even when gloves or other barriers have been used.
- Gloves and disposable materials used to clean spilled blood shall be properly disposed of in an approved hazardous waste container.
- First aid responders shall wear latex or thin mil nitrile gloves when performing any procedure risking contact with blood or body substances.
- Safety glasses will be worn to protect the eyes from splashing or aerosolization of body fluids.
- A CPR mask will be worn when performing CPR to avoid mouth-to-mouth contact.
- Work gloves will be worn to minimize the risk of injury to the hands and fingers when working on all equipment with sharp or rough edges.
- Never pick up broken glass or possible contaminated material with your unprotected hands.
- Never handle wildlife (living or deceased) encountered onsite.

5.4 Hazard Assessment

Task	Hazards	Risk of Exposure
Decontamination	Inhalation/Skin Contact	Moderate
	Heat Stress/Cold Stress	Moderate
	Physical Injury	Moderate
	Noise	Low
Drilling/Sampling	Inhalation/Skin Contact	Moderate
	Heat Stress/Cold Stress	Moderate
	Noise	Moderate/High
	Physical Injury	Moderate

6.0 TRAINING

6.1 General Health and Safety Training

In accordance with Roux Associates' corporate policies, and pursuant to 29 CFR 1910.120, during RI work, hazardous waste site workers shall, at the time of the job assignment, have received a minimum of 40 hours of initial health and safety training for hazardous waste site operations. As a minimum, the training shall have consisted of instruction in the topics outlined in the above reference. Personnel who have not met the requirements for initial training will not be allowed to work in any Site activities in which they may be exposed to hazards (chemical or physical).

Completion of a 40-hour Health and Safety Training Course for Hazardous Waste Operations or an approved equivalent will fulfill the requirements of this section.

In addition to the required initial training, each employee shall have received 3 days of directly supervised on-the-job training. This training will address the duties the employees are expected to perform.

Roux Associates' SSO has the responsibility of ensuring that personnel assigned to this project comply with these requirements.

6.2 Annual Eight-Hour Refresher Training

Annual 8-hour refresher training will be required of all hazardous waste site field personnel in order to maintain their qualifications for fieldwork. The following topics will be reviewed; toxicology, respiratory protection, including air purifying devices and self-contained breathing apparatus (SCBA), medical surveillance, decontamination procedures, and personal protective clothing. In addition, topics deemed necessary by Roux Associates' Health and Safety Director may be added to the above list.

6.3 Site-Specific Training

Site personnel will receive training that will specifically address the activities, procedures, monitoring, and equipment for Site operations. It will include Site and facility layout, hazards, first aid equipment locations and emergency services at the Site, and will highlight all provisions contained within this HASP. This training will also allow field workers to clarify anything they do

not understand and to reinforce their responsibilities regarding safety and operations for their particular activity.

6.4 Onsite Safety Meetings

Daily safety meetings will be presented each morning to discuss potential safety concerns for the upcoming activities.

The briefings will also provide a forum to facilitate conformance with safety requirements and to identify performance deficiencies related to safety during daily activities or as a result of safety audits by Roux Associates or other involved parties.

6.5 First Aid and CPR

The SSO will identify those individuals having first aid and CPR training in order to ensure that emergency medical treatment is available during field activities. The training will be consistent with the requirements of the American Red Cross Association. Certification and appropriate training documentation will be kept with the Site personnel records.

6.6 Additional Training

The CHSM may require additional or specialized training throughout the project. Such training shall be in the safe operation of heavy or power tool equipment or hazard communication training or other topic deemed Site appropriate.

6.7 Subcontractor Training

All subcontractor personnel working on the Site shall have completed the 40-hour training requirement and meet the medical surveillance requirements found in Section 7.1. Subcontractor training shall be performed in accordance with 29 CFR 1910.120 and HASP specifications. In certain unique situations (e.g., mechanical failure of equipment), the non-trained individual performing emergency repairs may be allowed, at the discretion of the SSO, to perform repairs when no intrusive activities are being performed, and provisions have been made to mitigate potential exposure.

7.0 MEDICAL SURVEILLANCE PROCEDURES

7.1 General

A Medical Surveillance Program has been established as part of this plan and is included in Appendix C. Roux Associates and subcontractor personnel performing field work at the Site are required to have passed a complete medical surveillance examination in accordance with 29 CFR 1910.120(f). A physician's medical release for work will be confirmed by the SSO before an employee can begin Site activities. Such examinations shall include a statement as to the worker's present health status, the ability to work in a hazardous environment (including any required PPE, which may be used during temperature extremes), and the worker's ability to wear respiratory protection.

Appendix C, "Medical Data Sheet," will be completed by all permanent, onsite personnel and will be kept in Roux Associates offices during the conduct of Site operations. Completion is required in addition to compliance with Roux Associates' Health and Safety Program. This data sheet will be available through the Roux Associates Human Resources Department if medical assistance is needed or if transport to hospital facilities is required.

8.0 SITE CONTROL, PERSONAL PROTECTIVE EQUIPMENT, AND COMMUNICATIONS

A modified Site control approach may be utilized since activities will be limited to site inspection/geophysical survey, drilling and sampling only during this phase of work. If remedial work is necessary, the following four-zone approach will be used.

8.1 Site Control

Based on the Site history and operations, a potential for the presence of hazardous material does exist. During drilling and sampling, work areas will be delineated with high visibility cones and/or caution tape. A dedicated decontamination area will be established to decontaminate all equipment used for sampling.

If remedial activities are necessary, a four-zone approach will be employed in order to prevent the spread of contamination from the disturbed areas onsite. The four zones include: the Exclusion Zone (EZ), the Contamination Reduction Zone (CRZ), Contamination Reduction Corridor (CRC) and the Support Zone (SZ). A stepped remedial approach will be managed, and the zones modified as the work progresses. Each of the areas will be defined through the use of control barricades and/or construction/hazard fencing. A clearly marked delineation between the SZ and the remaining three zones, the CRZ and CRC and the EZ will be maintained. The preferred method will utilize high visibility orange fencing and hand driven metal posts, or orange cones. Signage will be posted to further identify and delineate these areas.

8.1.1 Support Zone

The Support Zone (SZ) is an uncontaminated area that will be the field support area for the Site operations. The SZ will contain the temporary project trailers and provides for field team communications and staging for emergency response. Appropriate sanitary facilities and safety equipment will be located in this zone. Potentially contaminated personnel or materials are not allowed in this zone. The only exception will be appropriately packaged/decontaminated and labeled samples. Meteorological conditions will be observed and noted from this zone, as well as those factors pertinent to heat and cold stress.

8.1.2 Contamination Reduction Zone

A Contamination Reduction Zone (CRZ) is established between the exclusion zone and the support zone. The CRZ contains the Contamination Reduction Corridor (CRC) and provides an area for decontamination of personnel and equipment. The CRZ will be used for general Site entry and egress in addition to access for heavy equipment and emergency support services. Personnel are not allowed in the CRZ without:

- A buddy (co-worker);
- Appropriate PPE;
- Medical authorization;
- Training certification; and
- A need to be in the zone.

8.1.3 Exclusion Zone

The area where contamination exists is considered to be the Exclusion Zone (EZ). All areas where excavation and handling of contaminated materials take place are considered the EZ. This zone will be clearly delineated by orange high visibility fencing. Safety tape may be used as a secondary delineation within the EZ. The zone delineation markings may be opened in areas for varying lengths of time to accommodate equipment operation or specific construction activities. The SSO may establish more than one EZ where different levels of protection may be employed or where different hazards exist. Personnel are not allowed in the EZ without:

- A buddy (co-worker);
- Appropriate PPE;
- Medical authorization;
- Training certification; and
- A need to be in the zone.

8.2 Personal Protective Equipment

8.2.1 General

The level of protection worn by field personnel will be enforced by the SSO. Levels of protection for general operations are provided below and are defined in this section. Levels of protection

may be upgraded at the discretion of the SSO. All decisions on the level of protection will be based upon a conservative interpretation by the SSO of the information provided by air monitoring results, environmental results and other appropriate information. Any changes in the level of protection shall be recorded in the health and safety field logbook.

8.2.2 Personal Protective Equipment Specifications

The initial level of personal protective equipment is Level D. It is not anticipated that either Level B or Level C protection will be necessary.

Although not anticipated, any tasks requiring Level B personal protective equipment (PPE) will utilize the following equipment:

- Positive pressure, full facepiece, self-contained breathing apparatus (SCBA) or positive pressure, supplied air respirator with escape SCBA (NIOSH approved)
- Disposable coveralls (Tyvek, Poly-coated Tyvek, or Saranex)
- Gloves, inner: latex or nitrile
- Gloves, outer: nitrile or neoprene
- Chemical resistant boots over the work boots
- Steel toe work boots
- Hard hat
- Hearing protection (as needed)
- Boot cover (as needed)

For tasks requiring Level C PPE, the following equipment may be used in any combination:

- Full-face, air purifying, canister-equipped respirators (NIOSH approved) utilizing Organic Vapor/Acid Gas and P-100 filters (half-face if approved by SSO)
- Disposable coveralls (Tyvek, Poly-coated Tyvek, or Saranex) as required
- Gloves, inner: latex or nitrile as required
- Gloves, outer: nitrile or neoprene as required
- Chemical resistant boots over the work boots as required

- Steel toe work boots
- Hard hat
- Hearing protection (as needed)
- Safety glasses (if half-mask is utilized)
- Boot covers (as needed)

The Minimum level of PPE for entry onto the Site is Level D PPE. The following equipment shall be used:

- Work uniform (long pants, sleeved shirt)
- Hard hat
- Steel toe work boots
- Safety glasses
- Boot covers (as needed)
- Hearing protection (as needed)
- Reflective safety vest (as needed)

Modified Level D PPE consists of the following:

- Regular Tyvek coveralls (Poly-coated Tyvek as required)
- Outer gloves: leather, cotton, neoprene or nitrile (as required)
- Inner gloves: latex or nitrile (doubled) as required
- Chemical resistant boots over work boots (as required)
- Steel toe work boots
- Hard hat
- Safety glasses
- Hearing protection as needed
- Reflective safety vest

8.2.3 Initial Levels of Protection

Levels of protection for the proposed scope of work may be upgraded or downgraded depending on direct-reading instruments or personnel monitoring. The following are the initial levels of protection that shall be used for each planned RI field activity:

Activity	Initial level of PPE
Mobilization/Demobilization	D
Site Inspection/Geophysical Survey	D
Decontamination	D
Drilling	D
Groundwater Sampling	D

8.3 Communications

If working in level C/B respiratory protection is required, personnel may find that communication becomes a more difficult task and process to accomplish. Distance and space further complicate this. In order to address this problem, electronic instruments, mechanical devices, or hand signals will be used as follows:

Telephones – Mobile telephones will be carried by designated personnel for communication with emergency support services/facilities.

Radios – Two-way radios will be utilized onsite for communications between field personnel in areas where visual contact cannot be maintained and where hand signals cannot be employed.

Air Horn – Available as posted in the Site trailer or support zone to alert field personnel to an emergency situation. The emergency signal will be the sharp blasts of the air horn.

Hand Signals – This communication method will be employed by members of the field team along with use of the buddy system. Signals become especially important when in the vicinity of heavy moving equipment and when using Level B respiratory equipment. The signals shall become familiar to the entire field team before Site operations commence, and will be reinforced and reviewed during site-specific training.

Signal	Meaning
Hand gripping throat	Out of air; can't breathe
Grip partner's wrist	Leave area immediately; no debate
Hands on top of head	Need assistance
Thumbs up	OK; I'm all right; I understand
Thumbs down	No; Unable to understand you, I'm not all right

9.0 MONITORING PROCEDURES

9.1 General

A Community Air Monitoring Plan ("CAMP") will be implemented onsite, in which VOCs will be monitored in the work area during ground intrusive activities. VOCs will be monitored as a precautionary measure. The design of the CAMP is intended to provide a measure of protection for the onsite workers not directly involved with the subject work activities from potential airborne contaminant releases as a direct result of remedial work activities. Monitoring will be performed to verify the adequacy of the Level D respiratory protection, to aid in Site layout, and to document monitoring results. If air monitoring in the work areas indicates the presence of potentially hazardous materials, control measures will be implemented. All monitoring instruments shall be operated by qualified personnel only and will be calibrated prior to use daily or more often, as necessary. The SHSO is responsible for ensuring that appropriate monitoring, levels of protection, and safety procedures are followed.

9.2 Exclusion Zone Monitoring

9.2.1 Instrumentation

The following monitoring instruments will be available for use during field operations as necessary:

- Photoionization Detector (PID) with 10.6 EV probe or Flame Ionization Detector (FID) or equivalent.

A PID organic vapor meter shall be used to monitor VOCs in active work areas during the soil intrusive activities.

Calibration records shall be documented and recorded daily and included in the daily Health and Safety Briefing Form (Appendix D) or Site designated field notebook.

9.2.2 Action Levels

Action levels for the upgrading of PPE requirements in the HASP will apply to all Site work during investigation and remediation activities at the Site. Action levels are for known contaminants using direct reading instruments in the Breathing Zone (BZ) for VOCs and particulates, and at the source for combustible gases. The BZ will be determined by the SSO, but

is typically 4 to 5 feet above the work area surface or elevation. The action levels to be utilized for the Site are found in Table 2.

9.2.3 Monitoring During Field Activities

Intrusive Operations – Continuous Personnel Breathing Zone Air Monitoring will be performed by the SSO during drilling activities. Real-time monitoring for all onsite activities will be accomplished as follows:

- Monitoring of VOCs in the work zones.

The frequency of monitoring may be modified by the SSO, after consultation with the Project Manager. The rationale for any modification must be documented in the HASP.

10.0 SAFETY CONSIDERATIONS

10.1 General

In addition to the specific requirements of this HASP, common sense should be used at all times.

The following general safety rules and practices will be in effect at the site.

- All open holes, trenches, and obstacles will be properly barricaded in accordance with local Site needs and requirements. Proximity to traffic ways, both pedestrian and vehicular, and location of the open hole, trench, or obstacle will determine these needs.

- All excavation and other Site work will be planned and performed with consideration for underground lines.

- Smoking and ignition sources in the vicinity of potentially flammable or contaminated material are strictly prohibited.

- Drilling, boring, and use of cranes and drilling rigs, erection of towers, movement of vehicles and equipment, and other activities will be planned and performed with consideration for the location, height, and relative position of aboveground utilities and fixtures, including signs; lights; canopies; buildings and other structures and construction; and natural features such as trees, boulders, bodies of water, and terrain.

- When working in areas where flammable vapors may be present, particular care shall be exercised with tools and equipment that may be sources of ignition. All tools and equipment provided must be properly bonded and/or grounded.

- Approved and appropriate safety equipment (as specified in this HASP), such as eye protection, hard hats, hand protection (nitrile, leather and/or cut resistant gloves as necessary), foot protection, and respirators, must be worn in areas where required. In addition, eye protection must be worn when sampling soil or water that may be contaminated.

- All site personnel may be called upon to use respirator protection in some situations. Fit testing will be necessary for all persons using respirators. The criteria for facial hair will be determined by the SSO. In general, the guideline is that facial hair cannot impede the fit of the respirator.

- No smoking, eating, chewing tobacco, gum chewing or drinking will be allowed outside the SZ.

- Contaminated tools and hands must be kept away from the face.

- Personnel must use personal hygiene safe guards (washing up) at the end of the shift.

- Each sample must be treated and handled as though it were contaminated.

- Persons with long hair and/or loose-fitting clothing that could become entangled in power equipment must take adequate precautions.

- Horseplay is prohibited in the work area.
- Work while under the influence of intoxicants, narcotics, or controlled substances is strictly prohibited.

10.2 Traffic Control

Traffic control methods and barricades will be used as needed when working in areas of vehicular traffic. Since the entire site is covered by the existing warehouse building, outside vehicular and pedestrian traffic is not considered to be an issue at this time. If offsite drilling occurs vehicular and or pedestrian traffic may be an issue and this plan will be amended accordingly.

10.3 Sample Handling

Personnel responsible for handling of samples will wear the prescribed level of protection. Samples are to be identified as to their hazard and packaged as to prevent spillage or breakage. Any unusual sample conditions shall be noted. Laboratory personnel and all field personnel shall be advised of sample hazard levels and the potential contaminants present. This can be accomplished by a phone call to the lab coordinator and/or including a written statement with the samples reviewing lab safety procedures in handling in order to assure that the practices are appropriate for the suspected contaminants in the sample.

11.0 DECONTAMINATION AND DISPOSAL PROCEDURES

11.1 Contamination Prevention

Contamination prevention should minimize worker exposure and help ensure valid sample results by precluding cross-contamination. Procedures for contamination avoidance include:

Personnel

- Do not walk through areas of obvious or known contamination.
- Do not directly handle or touch contaminated materials.
- Make sure that there are no cuts or tears on PPE.
- Fasten all closures in suits; cover with tape, if necessary.
- Particular care should be taken to protect any skin injuries.
- Stay upwind of airborne contaminants.
- Do not carry cigarettes, cosmetics, gum, etc., into contaminated areas.

Sampling/Monitoring

- When required by the SSO, cover instruments with clear plastic, leaving openings for sampling ports.
- Bag sample containers prior to emplacement of sample material.

Heavy Equipment

- Care should be taken to limit the amount of contamination that comes in contact with heavy equipment (tires, contaminated augers).
- If contaminated tools are to be placed on non-contaminated equipment for transport to a decontamination area, plastic should be used to keep the equipment clean.
- Dust control measures including water misting will be used on roads inside the Site boundaries.

11.2 Personnel Decontamination

A field wash for equipment and PPE shall be set up and maintained for all persons exiting the EZ. The system will include a gross wash and rinse for all disposable clothing and boots worn in the EZ. As necessary, equipment and facilities will be available for personnel to wash their hands, arms, neck, and face.

11.3 Equipment Decontamination

All potentially contaminated equipment used at the Site will be decontaminated to prevent contaminants from leaving the Site. The decontamination area will provide for the containment of all wastewater from the decontamination process. Respirators and any other PPE that comes in contact with contaminated materials shall pass through a field wash in the decontamination area, and a thorough decontamination at the end of the day. All decontamination rinse water will be collected and managed in accordance with all applicable regulations.

11.4 Decontamination during Medical Emergencies

If emergency life-saving first aid and/or medical treatment are required, normal decontamination procedures may need to be abbreviated or omitted. The Site SSO or designee will accompany contaminated victims to the medical facility to advise on matters involving decontamination, when necessary. The outer garments can be removed if they do not cause delays, interfere with treatment, or aggravate the problem. Respiratory equipment must always be removed. Protective clothing can be cut away. If the outer contaminated garments cannot be safely removed, a plastic barrier between the individual and clean surfaces should be used to help prevent contaminating the inside of ambulances and/or medical personnel. Outer garments are then removed at the medical facility. No attempt will be made to wash or rinse the victim, unless it is known that the individual has been contaminated with an extremely toxic or corrosive material, which could also cause severe injury or loss of life to emergency response personnel. For minor medical problems (ambulatory) or injuries, the normal decontamination procedures will be followed. Note that heat stroke requires prompt treatment to prevent irreversible damage or death. Protective clothing must be promptly removed. Less serious forms of heat stress also require prompt attention and removal of protective clothing immediately. Unless the victim is obviously contaminated, decontamination should be omitted or minimized, and treatment begun immediately.

11.5 Disposal Procedures

A system of segregating all waste will be developed by the SSO.

All discarded materials, waste materials, or other objects shall be handled in such a way as to preclude the potential for spreading contamination, creating a sanitary hazard, or causing litter to

be left onsite. All potentially contaminated materials (e.g., clothing, gloves, etc.,) will be bagged or drummed as necessary, labeled and segregated for disposal. All non-contaminated materials shall be collected and bagged for appropriate disposal as domestic waste.

12.0 EMERGENCY PLAN

Should an emergency situation occur, the emergency plan, outlined in this section, shall be known by Roux Associates and all Subcontractors prior to the start of work. The emergency plan will be available for use at all times during Site work. The plan provides the phone numbers for the fire, police, ambulance, hospital, poison control centers, and directions to the hospital from the Site. This information is to be found in Section 1.2 of the HASP.

Various individual Site characteristics will determine preliminary actions taken to assure that this emergency plan is successfully implemented in the event of a Site emergency. Careful consideration must be given to the proximity of neighborhood housing or places of employment, and to the relative possibility of Site release of vapors, which could affect the surrounding community.

The emergency coordinator shall implement the contingency plan whenever conditions at the Site warrant such action. The coordinator will be responsible for coordination of the evacuation, emergency treatment and transport of Site personnel as necessary, and notification of emergency response units and the appropriate management staff.

In cases where the project manager is not available, the SSO shall serve as the alternate emergency coordinator.

The SSO during an emergency will perform air monitoring as needed, as well as lend assistance and provide health and safety information to responding emergency personnel.

Site Personnel will endeavor to keep non-essential personnel away from the incident until the appropriate emergency resources arrive. At that time, the responders will take control of the Site. Site personnel may be asked to lend assistance to emergency personnel such as during evacuations, help with the injured, etc.

12.1 Evacuation

Evacuation procedures will be discussed prior to the start of work and periodically during safety meetings. In the event of an emergency situation, such as fire, or explosion, an air horn,

automobile horn, or other appropriate device will be sounded for three (3) sharp blasts indicating the initiation of evacuation procedures. The emergency evacuation route shall be known by all site workers. Under no circumstances will incoming personnel or visitors be allowed to proceed into the area once the emergency signal has been given. The SSO or project manager must ensure that access for emergency equipment is provided and that all combustion apparatuses have been shut down once the alarm has been sounded. All Site personnel will assemble in the designated nearest safe location. Once the safety of all personnel is established, the fire department and other emergency response groups will be notified by telephone of the emergency.

12.2 Personnel Injury

Emergency first aid shall be applied onsite as appropriate. If necessary, the individual shall be decontaminated and transported to the nearest hospital. The SSO will supply medical data sheets to medical personnel and complete the accident/incident reports in accordance with Section 13.4 of the HASP.

The ambulance/rescue squad shall be contacted for transport as necessary in an emergency. However, since some situations may require transport of an injured party by other means, the injured person shall be escorted to the hospital. A map to this facility is shown in Figure 2.

12.3 Accident/Incident Reporting

As soon as first aid and/or emergency response needs have been met, the following parties are to be contacted by telephone: (Direct contact, no phone messages).

		Office:	**Cell:**
1. Project Director:	Joseph Duminuco	631-232-2600	631-921-6279
2. Office Health and Safety Manager:	Joe Gentile	856-423-8800	610-844-6911
3. Site Health and Safety Officer:	David Bligh	631-232-2600	631-379-2281

4. The employer of any injured worker, if not a Roux Associates employee.

Written confirmation of verbal reports are to be submitted within 24 hours. The report form entitled "Accident Report and Investigation Form" (Appendix E) is to be used for this purpose.

All representatives contacted by telephone are to receive a copy of this report. If the employee involved is not a Roux Associates employee, his employer shall receive a copy of the report. In addition to filling out the Accident Report and Investigation Form, if a Roux employee is involved in a vehicle accident, the employee must also complete the Acord form (Appendix F).

For reporting purposes, the term accident refers to fatalities, lost time injuries, spill or exposure to hazardous materials (radioactive materials, toxic materials, explosive or flammable materials), fire, explosion, property damage, or potential occurrence (i.e., near miss) of the above.

Any information released from the health care provider, which is not deemed confidential patient information, is to be attached to the appropriate form. Any medical information, which is released by patient consent, is to be filed in the individual's medical record and treated as confidential.

12.4 Personnel Exposure

Skin Contact:	Use copious amounts of soap and water. Wash/rinse affected area thoroughly, then provide appropriate medical attention. Eyes should be rinsed for 15 minutes upon chemical contamination.
Inhalation:	Move to fresh air and/or, if necessary, decontaminate/transport to hospital.
Ingestion:	Decontamination and transport to emergency medical facility.
Puncture Wound or Laceration:	Decontamination and transport to emergency medical facility.

12.5 Adverse Weather Conditions

In the event of adverse weather conditions, the SSO or project manager will determine if work can continue without sacrificing the health and safety of all field workers. Some of the items to be considered prior to determining if work should continue are:

- Potential for heat stress and heat-related injuries.
- Potential for cold stress and cold-related injuries.
- Treacherous weather-related conditions.
- Limited visibility.
- Electrical storm potential.

Site activities will be limited to daylight hours and acceptable weather conditions. Inclement working conditions include heavy rain, fog, high winds, and lightning. Observe daily weather reports and evacuate if necessary in case of inclement weather conditions.

13.0 LOGS, REPORTS AND RECORD KEEPING

The following is a summary of required health and safety logs, reports, and record keeping for this project.

13.1 Medical and Training Records

The employer keeps medical and training records. The subcontractor employer must provide verification of training and medical qualifications to the SSO. The SSO will keep a log of personnel meeting appropriate training and medical qualifications for Site work. The log will be kept in the project file. Roux Associates will maintain medical records in accordance with 29 CFR 1910.20.

13.2 Onsite Log

The SSO or project manager will keep a log of onsite personnel daily in the designated field book.

13.3 Exposure Records

Any personal monitoring results, laboratory reports, calculations, and air sampling data sheets are part of an employee exposure record. These records will be kept by Roux Associates in accordance with 29 CFR 1910.20.

13.4 Accident/Incident Reports

An accident/incident report must be completed following procedures given in Appendix E. The originals will be sent to Roux Associates for maintenance. Copies will be distributed as stated. A copy of the forms will be kept in the project file.

13.5 OSHA Form 300

An OSHA Form 300 (Log of Occupational Injuries and Illnesses) (Appendix G) will be kept at the Site. All reportable injuries or illnesses will be recorded on this form. At the end of the project, the original will be sent to Roux Associates for maintenance. Subcontractor employers must also meet the requirements of maintaining an OSHA 300 form.

13.6 Daily Safety Logs

The Daily Safety Log form in Appendix D will be completed daily by the SSO and submitted to the project manager.

14.0 FIELD TEAM REVIEW

Each Roux Associates employee or subcontractor shall sign this section after site-specific training is completed and before being permitted to work at the Site.

I have read and reviewed the Site Health and Safety Plan prepared for this Site. I understand and will comply with the provisions contained therein.

Site/Project: Kent & Wythe Owners LLC
149 Kent Avenue
Brooklyn, New York

Date	Name	Signature	Company

SSO CERTIFICATION OF HOSPITAL DIRECTIONS

Name of Roux Associates SSO:

Date:_____

This is to certify that on _____, I personally drove the route to Woodhull Medical Center as listed in the HASP. The Map Routing and Directions were/were not as listed in the plan. Listed below were conditions that resulted in different directions.

_____
Roux Associates Site Health and Safety Officer

TABLES

1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at the Site
2. Action Levels for Worker Breathing Zone

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 149 Kent Avenue, Brooklyn, New York

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
1,1,1-Trichloroethane	71-55-6	TWA 350 ppm STEL 440 ppm C 440 ppm	C 350 ppm (1900 mg/m^3) [15-minute]	TWA 350 ppm (1900 mg/m^3)	700 ppm	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin; headache, lassitude (weakness, exhaustion), central nervous system depression, poor equilibrium; dermatitis; cardiac arrhythmias;	Eyes, skin, central nervous system, cardiovascular system, liver	Colorless liquid with a mild, chloroform-like odor. BP: 165°F UEL: 12.5% LEL: 7.5%
1,1,2-Trichloroethane	79-00-5	TWA 10 ppm	Ca TWA 10 ppm (45 mg/m^3) [skin]	TWA 10 ppm (45 mg/m^3) [skin]	Ca [100 ppm]	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, nose; central nervous system depression; liver, kidney damage; dermatitis; [potential occupational carcinogen]	Eyes, respiratory system, central nervous system, liver, kidneys	Colorless liquid with a sweet, chloroform-like odor. BP: 237°F UEL: 15.5% LEL: 6%
1,1-Dichloroethane	75-34-3	TWA 100 ppm	TWA 100 ppm (400 mg/m^3)	TWA 100 ppm (400 mg/m^3)	3000 ppm	inhalation, ingestion, skin and/or eye contact	Irritation skin; central nervous system depression; liver, kidney, lung damage	Skin, liver, kidneys, lungs, central nervous system	Colorless, oily liquid with a chloroform-like odor. BP: 135°F Fl.P: 2°F UEL: 11.4% LEL: 5.4%
1,1-Dichloroethene	75-35-4	TWA 5 ppm	Ca (lowest feasible concentration)	TWA 1ppm	Ca [N.D.]	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin, throat; dizziness, headache, nausea, dyspnea (breathing difficulty); liver, kidney disturbance; pneumonitis; [potential occupational carcinogen]	Eyes, skin, respiratory system, central nervous system, liver, kidneys	Colorless liquid or gas (above 89°F) with a mild, sweet, chloroform-like odor. BP: 89°F Fl.P: -2°F UEL: 15.5% LEL: 6.5% Class IA Flammable Liquid
1,2,4-Trimethylbenzene	95-63-6	None established	TWA 25 ppm (125mg/m^3)	None established	N.D.	Inhalation; ingestion; skin and/or eye contact	Eye, skin, nose, and throat, resp syst irritation; bronchitis; hypochromic anemia; headache, drowsiness, weakness, dizziness, nausea, incoordination, vomit, confusion; chemical pneumonitis	Eyes, skin, resp sys, CNS, blood	Clear, colorless liquid with a distinctive, aromatic odor BP: 337°F FL.P: 112°F UEL: 6.4% LEL: 0.9% Class II Flammable liquid
1,2,4-Trimethylbenzene	95-63-6	TWA 25 ppm (125 mg	TWA 25 ppm (125 mg/m^3)	None established	N.D.	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, nose, throat, respiratory system; bronchitis; hypochromic anemia; headache, drowsiness, fatigue, dizziness, nausea, incoordination; vomiting, confusion; chemical pneumonitis (aspiration liquid)	Eyes, skin, respiratory system, central nervous system, blood	Clear, colorless liquid with a distinctive, aromatic odor. BP: 337°F Fl.P: 112°F UEL: 6.4% LEL: 0.9% Class II Flammable Liquid
1,2-Dichlorobenzene	95-50-1	TWA 25 ppm STEL 50 ppm	C 50 ppm (300 mg/m^3)	C 50 ppm (300 mg/m^3)	200 ppm	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, nose; liver, kidney damage; skin blisters	Eyes, skin, respiratory system, liver, kidneys	Colorless to pale-yellow liquid with a pleasant, aromatic odor. [herbicide] BP: 357°F Fl.P: 151°F UEL: 9.2% LEL: 2.2% Class IIIA Combustible Liquid

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 149 Kent Avenue, Brooklyn, New York

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
1,2-Dichloroethane	107-06-2	TWA 10 ppm	Ca TWA 1 ppm (4 mg/m^3) STEL 2 ppm (8 mg/m^3)	TWA 50 ppm C 100 ppm 200 ppm [5-minute maximum peak in any 3 hours]	Ca [50 ppm]	inhalation, ingestion, skin absorption, skin and/or eye contact	Irritation eyes, corneal opacity; central nervous system depression; nausea, vomiting; dermatitis; liver, kidney, cardiovascular system damage; [potential occupational carcinogen]	Eyes, skin, kidneys, liver, central nervous system, cardiovascular system	Colorless liquid with a pleasant, chloroform-like odor. [Note: Decomposes slowly, becomes acidic & darkens in color.] BP: 182°F Fl.P: 56°F UEL: 16% LEL: 6.2% Class IB Flammable Liquid
1,2-Dichloroethene (total)	540-59-0	TWA 200 ppm (790 m	TWA 200 ppm (790 mg/m^3)	TWA 200 ppm (790 mg/m^3)	1000 ppm	inhalation, ingestion, skin and/or eye contact	Irritation eyes, respiratory system; central nervous system depression	Eyes, respiratory system, central nervous system	Colorless liquid (usually a mixture of the cis & trans isomers) with a slightly acrid, chloroform-like odor BP: 118-140°F Fl.P: 36-39°F UEL: 12.8% LEL: 5.6% Class IB Flammable Liquid
1,3,5-Trimethylbenzene	108-67-8	None established	TWA 25 ppm (125mg/m^3)	None established	N.D.	Inhalation; ingestion; skin and/or eye contact	Eye, skin, nose, and throat, resp syst irritation; bronchitis; hypochromic anemia; headache, drowsiness, weakness, dizziness, nausea, incoordination, vomit, confusion; chemical pneumonitis	Eyes, skin, resp sys, CNS, blood	Clear, colorless liquid with a distinctive, aromatic odor BP: 329°F FL.P: 122°F Class II Flammable liquid
1,3,5-Trimethylbenzene	108-67-8	TWA 25 ppm (125 mg	TWA 25 ppm (125 mg/m^3)	None established	N.D	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, nose, throat, respiratory system; bronchitis; hypochromic anemia; headache, drowsiness, lassitude (weakness, exhaustion), dizziness, nausea, incoordination; vomiting, confusion; chemical pneumonitis (aspiration liquid)	Eyes, skin, respiratory system, central nervous system, blood	Clear, colorless liquid with a distinctive, aromatic odor. BP: 329°F Fl.P: 122°F Class II Flammable Liquid
1,4-Dichlorobenzene	106-46-7	TWA 10 ppm	Ca	TWA 75 ppm (450 mg/m^3)	Ca [150 ppm]	inhalation, skin absorption, ingestion, skin and/or eye contact	Eye irritation, swelling periorbital (situated around the eye); profuse rhinitis; headache, anorexia, nausea, vomiting; weight loss, jaundice, cirrhosis; in animals: liver, kidney injury; [potential occupational carcinogen]	Liver, respiratory system, eyes, kidneys, skin	Colorless or white crystalline solid with a mothball-like odor. [insecticide] BP: 345°F Fl.P: 150°F LEL: 2.5% Combustible Solid
2,4-Dimethylphenol	105-67-9	None established	None established	None established	None established	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin, respiratory system, mouth, throat, stomach; dizziness, weakness, fatigue, nausea, headache; systemic damage; moderate to severe eye injury.	Skin, CVS, eyes, CNS	Clear, colorless liquid with a faint ether or chloroform-like odor BP: 178°F

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 149 Kent Avenue, Brooklyn, New York

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
2-Butanone (MEK)	78-93-3	TWA 200 ppm (590 mg/m^3) STEL 300 ppm (885 mg/m^3)	TWA 200 ppm (590 mg/m^3) STEL 300 ppm (885 mg/m^3)	TWA 200 ppm (590 mg/m^3)	3000 ppm	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, nose; headache; dizziness; vomiting; dermatitis	Eyes, skin, respiratory system, central nervous system	Colorless liquid with a moderately sharp, fragrant, mint- or acetone-like odor. BP: 175°F Fl.P: 16°F UEL(200°F): 11.4% LEL(200°F): 1.4% Class IB Flammable Liquid
Acenaphthene	83-32-9	None established	None established	None established	None established	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, respiratory system	Eyes, skin, respiratory system	Brown solid
Acetone	67-64-1	TWA 200 ppm STEL 500 ppm	TWA 250 ppm (590 mg/m^3)	TWA 1000 ppm (2400 mg/m^3)	2500 ppm [10%LEL]	inhalation, ingestion, skin and/or eye contact	Irritation eyes, nose, throat; headache, dizziness, central nervous system depression; dermatitis	Eyes, skin, respiratory system, central nervous system	Colorless liquid with a fragrant, mint-like odor BP: 133°F Fl.P: 0°F UEL: 12.8% LEL: 2.5% Class IB Flammable Liquid
Anthracene	65996-93-2	TWA 0.2 mg/m^3	Ca TWA 0.1 mg/m^3 (cyclohexane-extractable fraction)	TWA 0.2 mg/m^3 (benzene-soluble fraction)	Ca [80 mg/m^3]	inhalation, skin and/or eye contact	Dermatitis, bronchitis, [potential occupational carcinogen]	respiratory system, skin, bladder, kidneys	Black or dark-brown amorphous residue. Combustible Solids
Antimony	7440-36-0	TWA 0.5 mg/m^3	TWA 0.5 mg/m^3	TWA 0.5 mg/m^3	50 mg/m^3 (as Sb	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, nose, throat, mouth; cough; dizziness; headache; nausea, vomiting, diarrhea; stomach cramps; insomnia; anorexia; unable to smell properly	Eyes, skin, respiratory system, cardiovascular system	Silver-white, lustrous, hard, brittle solid; scale-like crystals; or a dark-gray, lustrous powder. BP: 2975°F
Arsenic (inorganic)	7440-38-2 (metal)	TWA 0.01 mg/m3	Ca C 0.002 mg/m3 [15-min]	TWA 0.010 mg/m3	Ca [5 mg/m3 (as As)]	Inhalation; ingestion; skin absorption; skin and/or eye contact	Ulceration of nasal septum, dermatitis, GI disturbances, peripheral neuropathy, resp irritation, hyperpigmentation of skin, [potential occupational carcinogen]	Liver, kidneys, skin, lungs, lymphatic sys	Metal: sliver-gray or tin-white brittle, odorless solid BP: sublimes
Asbestos	1332-21-4	TWA 0.1 f/cc	Ca 100,000 fibers/m3	TWA 0.1 fiber/cm3	Ca [IDLH value has not been determined]	Inhalation; ingestion; skin and/or eye contact	Asbestosis (chronic exposure), dyspnea, interstitial fibrosis, restricted pulmonary function, finger clubbing, irritation eyes, [potential occupational carcinogen]	Respiratory system, eyes,	White or greenish (chrysotile), blue (crocidolite), or gray-green (amosite), fibrous, odorless solids. BP: decomposes
Asphalt fumes	8052-42-4	TWA 0.5 mg/m^3(fumes)	Ca C 5 mg/m3 [15 min]	None established	Ca [IDLH value has not been determined]	Skin absorption; inhalation; skin and/or eye contact	Irritation eyes, resp sys	Eyes, respiratory system	Black or dark brown cement-like substance Combustible solid
Barium	7440-39-3	TWA 0.5 mg/m3	None established	TWA 0.5 mg/m3	None established	Inhalation, ingestion, skin contact	Irritation skin, respiratory system,	Skin, eyes, respiratory system	Yellow white powder BP: 1640 C
Benzene	71-43-2	TWA 0.5 ppm STEL 2.5 ppm	Ca TWA 0.1 ppm STEL 1 ppm	TWA 1 ppm STEL 5 ppm	Ca [500 ppm]	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin, nose, respiratory system; dizziness; headache, nausea, staggered gait; anorexia, lassitude (weakness, exhaustion); dermatitis; bone marrow depression; [potential occupational carcinogen]	Eyes, skin, respiratory system, blood, central nervous system, bone marrow	Colorless to light yellow liquid with an aromatic odor [Note: Solid below 42 °F] BP: 176°F Fl.Pt = 12°F LEL: 1.2% UEL: 7.8% Class B Flammable liquid

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 149 Kent Avenue, Brooklyn, New York

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
Benzo[a]anthracene	56-55-3	None established	None established	None established	None established	Inhalation; ingestion; skin absorption; skin and/or eye contact	Irritation eyes, skin, respiratory system, CNS	Skin	Pale Yellow crystal, solid BP: 438 C
Benzo[a]pyrene	50-32-8	None established	TWA 0.1 mg/m3	TWA 0.2 mg/m3	None established	Inhalation; ingestion; skin absorption; skin and/or eye contact	POISON. This material is an experimental carcinogen, mutagen, tumorigen, neoplastigen and teratogen. It is a probable carcinogen in humans and a known human mutagen. IARC Group 2A carcinogen. It is believed to cause bladder, skin and lung cancer. Exposure to it may damage the developing foetus. May cause reproductive damage. Skin, respiratory and eye irritant or burns.	Skin, eye, bladder, lung, reproductive	Yellow crystals or powder [found in cigarette smoke, coal tar, fuel exhaust gas and in many other sources] BP: 495 C
Benzo[b]fluoranthene	205-99-2	None established	TWA 0.1 mg/m3	TWA 0.2 mg/m3	None established	Inhalation; ingestion; skin and/or eye contact	No data were identified on the toxicity of benzo[b]fluoranthene to humans. Based on results of studies in animals, IARC concluded that benzo[b]fluoranthene is possibly carcinogenic to humans	Respiratory system, skin, bladder, kidneys	Off-white to tan powder
Benzo[k]fluoranthene	207-08-9	None established	None established	None established	None established	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin, respiratory tract, gastrointestinal; fatal if swallowed, inhaled, absorbed through the skin; vomiting, nausea, diarrhea	Lungs, respiratory system	Yellow crystals BP: 480 C
Beryllium	7440-41-7 (metal)	TWA 0.002 mg/m^3	Ca C 0.0005 mg/m^3	TWA 0.002 mg/m^3 C 0.005 mg/m^3 (30 minutes) with a maximum peak of 0.025 mg/m^3	Ca [4 mg/m^3 (as Be)]	inhalation, skin and/or eye contact	Berylliosis (chronic exposure): anorexia, weight loss, lassitude (weakness, exhaustion), chest pain, cough, clubbing of fingers, cyanosis, pulmonary insufficiency; irritation eyes; dermatitis; [potential occupational carcinogen]	Eyes, skin, respiratory system	Metal: A hard, brittle, gray-white solid. BP: 4532°F
Bis(2-ethylhexyl) phthalate	117-81-7	TWA 5 mg/m^3	TWA 5 mg/m^3 STEL 10 mg/m^3 (do not exceed during andy 15-minute work period)	TWA 5 mg/m^3	None established	inhalation, skin and/or eye contact	Irritation eyes, skin, nose, throat; affect the nervous system and liver; damage to male reproductive glands	Eyes, skin, nose, respiratory system, nervous system, reproductive system, liver	Colorless to light colored, thick liquid with slight odor
Butane	106-97-8	TWA 1000 ppm	TWA 800 ppm (1900 mg/m^3)	None established	None established	inhalation, skin and/or eye contact (liquid)	Drowsiness, narcosis, asphyxia; liquid: frostbite	central nervous system	Colorless gas with a gasoline-like or natural gas odor. BP: 31°F UEL: 8.4% LEL: 1.6% Flammable Gas

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 149 Kent Avenue, Brooklyn, New York

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
Cadmium	7440-43-9 (metal)	TWA 0.01 mg/m^3	Ca	TWA 0.005 mg/m^3	Ca [9 mg/m^3 (as Cd)]	inhalation, ingestion	Pulmonary edema, dyspnea (breathing difficulty), cough, chest tightness, substernal (occurring beneath the sternum) pain; headache; chills, muscle aches; nausea, vomiting, diarrhea; anosmia (loss of the sense of smell), emphysema, proteinuria, mild anemia; [potential occupational carcinogen]	respiratory system, kidneys, prostate, blood	Metal: Silver-white, blue-tinged lustrous, odorless solid. BP: 1409°F
Carbon Disulfide	75-15-0	TWA 1 ppm	TWA 1 ppm (3 mg/m^3) STEL 10 ppm (30 mg/m^3) [skin]	TWA 20 ppm C 30 ppm 100 ppm (30-minute maximum peak)	500 ppm	inhalation, skin absorption, ingestion, skin and/or eye contact	Dizziness, headache, poor sleep, lassitude (weakness, exhaustion), anxiety, anorexia, weight loss; psychosis; polyneuropathy; Parkinson-like syndrome; ocular changes; coronary heart disease; gastritis; kidney, liver injury; eye, skin burns; dermatitis; reproductive effects	central nervous system, peripheral nervous system, cardiovascular system, eyes, kidneys, liver, skin, reproductive system	Colorless to faint-yellow liquid with a sweet ether-like odor. BP: 116°F Fl.P: -22°F UEL: 50.0% LEL: 1.3% Class IB Flammable Liquid
Chlorobenzene	108-90-7	TWA 10 ppm	None established	TWA 75 ppm (350 mg/m^3)	1000 ppm	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, nose; drowsiness, incoordination; central nervous system depression; in animals: liver, lung, kidney injury	Eyes, skin, respiratory system, central nervous system, liver	Colorless liquid with an almond-like odor BP: 270°F Fl.P: 82°F UEL: 9.6% LEL: 1.3%
Chloroethane	75-00-3	TWA 100ppm	Handle with caution in the workplace	TWA 1000 ppm (2600 mg/m^3)	3800 ppm [10%LEL]	inhalation, skin absorption (liquid), ingestion (liquid), skin and/or eye contact	Incoordination, inebriation; abdominal cramps; cardiac arrhythmias, cardiac arrest; liver, kidney damage	Liver, kidneys, respiratory system, cardiovascular system, central nervous system	Colorless gas or liquid (below 54°F) with a pungent, ether-like odor. BP: 54°F Fl.P: NA (Gas) -58°F (Liquid) UEL: 15.4% LEL: 3.8%
Chloroform	67-66-3	TWA 10 ppm	Ca STEL 2 ppm (9.78 mg/m^3) [60-minute]	C 50 ppm (240 mg/m^3)	Ca [500 ppm]	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; dizziness, mental dullness, nausea, confusion; headache, lassitude (weakness, exhaustion); anesthesia; enlarged liver; [potential occupational carcinogen]	Liver, kidneys, heart, eyes, skin, central nervous system	Colorless liquid with a pleasant odor BP: 143°F
Chromium	7440-47-3	TWA 0.5 mg/m^3 (metal and Cr III compounds) TWA 0.05 mg/m^3 (water-soluble Cr IV compounds) TWA 0.01 mg/m^3 (insoluble Cr IV compounds)	TWA 0.5 mg/m^3	TWA 1 mg/m^3	250 mg/m^3 (as Cr)	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin; lung fibrosis (histologic)	Eyes, skin, respiratory system	Blue-white to steel-gray, lustrous, brittle, hard, odorless solid. BP: 4788°F
Chrysene; Phenanthrene; Pyrene; Coal tar pitch volatiles	65996-93-2	TWA 0.2 mg/m3	Ca TWA 0.1 mg/m^3 (cyclohexane-extractable fraction)	TWA 0.2 mg/m^3 (benzene-soluble fraction)	Ca [80 mg/m^3]	Inhalation, skin and/or eye contact	Dermatitis, bronchitis, [potential occupational carcinogen]	Respiratory system, skin, bladder, kidneys	Black or dark-brown amorphous residue. Combustible Solids

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 149 Kent Avenue, Brooklyn, New York

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
cis-1,2-Dichloroethene	158-59-2	TWA 200 ppm	TWA 200 ppm	TWA 200 ppm	None established	inhalation, skin absorption, ingestion	Harmful if swallowed, inhaled, or absorbed through skin. Irritant. Narcotic. Suspected carcinogen	Skin	Colorless liquid BP: 60 C Fl.P: 4 C UEL: 12.8% LEL: 9.7 %
Copper	7440-50-8	TWA 0.2mg/m^3 (fume) 1 mg/m^3 (dusts and mists)	TWA 1 mg/m^3	TWA 1 mg/m^3	100 mg/m^3 (as Cu)	Inhalation, ingestion, skin and/or eye contact	Irritation eyes, respiratory system; cough, dyspnea (breathing difficulty), wheezing	Eyes, skin, respiratory system, liver, kidneys (increase(d) risk with Wilson's disease)	Noncombustible Solid in bulk form, but powdered form may ignite. BP: 4703°F
Dibenzo[a,h]anthracene	53-70-3	None established	None established	None established	None established	Inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin	Eyes, skin; skin photosensitization.	Colorless crystalline powder BP: 524°C
Diesel Fuel #2	68476-34-6	None established	None established	Designated as an OSHA Select Carcinogen	None established	ingestion, skin and/or eye contact	Kidney damage; potential lung damage; suspected carcinogen; irritation of eyes, skin, respiratory tract; dizziness, headache, nausea; chemical pneumonitis (from aspiration of liquid); dry, red skin; irritant contact dermatitis; eye redness, pain.	Eyes, skin, kidneys	Clear yellow brown combustible liquid; floats on water; distinct diesel petroleum hydrocarbon odor. BP: 356-716°F Fl.P: 154.4-165.2°F LEL: 0.6% UEL: 7.0%
Ethylbenzene	100-41-4	TWA 100 ppm STEL 125 ppm	TWA 100 ppm (435 mg/m^3) STEL 125 ppm (545 mg/m^3)	TWA 100 ppm (435 mg/m^3)	800 ppm [10%LEL]	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, mucous membrane; headache; dermatitis; narcosis, coma	Eyes, skin, respiratory system, central nervous system	Colorless liquid with an aromatic odor. BP: 277°F Fl.P: 55°F UEL: 6.7% LEL: 0.8% Class IB Flammable Liquid
Fluoranthene	206-44-0	None established	None established	None established	None established	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; possible burns; heart and liver injury, pulmonary edema, respiratory arrest, gastrointestinal disturbances.	Heart, liver, lungs.	Yellow needles.
Fluorene	86-73-7	None established	None established	None established	None established	inhalation, ingestion, skin and/or eye contact	Irritation skin, digestive tract	Skin	White crystals BP: 563°F
Fuel Oil #2	68476-30-2	TWA 100mg/m^3 (aerosol and vapor, as total hydrocarbons)	None established	None established	None established	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; CNS effects; nausea, vomiting, headache, cramping, dizziness, weakness, loss of coordination,, drowsiness; kidney, liver damage	Eyes, skin, CNS	Clear or yellow to red oily liquid, kerosene-like odor BP: 347 - 689 °F UEL:5-6% LEL: 0.7-1.0%
Gasoline	8006-61-9	TWA 300 ppm STEL 500 ppm	Carcinogen	None established	Ca [IDLH value has not been determined]	Skin absorption; inhalation; ingestion; skin and/or eye contact	Eyes and skin irritation, mucous membrane; dermatitis; headache; listlessness, blurred vision, dizziness, slurred speech, confusion, convulsions; chemical pneumonitis; possible liver, kidney damage [Potential occupational carcinogen]	Eyes, skin, respiratory system, CNS, Liver, Kidneys	Clear liquid with a characteristic odor, aromatic Fl.Pt = -45°F LEL = 1.4% UEL = 7.6% Classs 1B Flammable Liquid

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 149 Kent Avenue, Brooklyn, New York

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
Hexachlorobutadiene	87-68-3	TWA 0.02 ppm	Ca TWA 0.02 ppm (0.24 mg/m^3) [skin]	None established	Ca [N.D.]	inhalation, skin absorption, ingestion, skin and/or eye contact	In animals: irritation eyes, skin, respiratory system; kidney damage; [potential occupational carcinogen]	Eyes, skin, respiratory system, kidneys	Clear, colorless liquid with a mild, turpentine-like odor. BP: 419°F
Hydrogen Sulfide	7783-06-4	TWA (10 ppm) STEL (15 ppm) (adopted values for which changes are proposed in the NIC)	C 10 ppm (15 mg/m^3) [10-minute]	C 20 ppm 50 ppm [10-minute maximum peak]	100 ppm	inhalation, skin and/or eye contact	Irritation eyes, respiratory system; apnea, coma, convulsions; conjunctivitis, eye pain, lacrimation (discharge of tears), photophobia (abnormal visual intolerance to light), corneal vesiculation; dizziness, headache, lassitude (weakness, exhaustion), irritability, insomnia; gastrointestinal disturbance; liquid: frostbite	Eyes, respiratory system, central nervous system	Colorless gas with a strong odor of rotten eggs. BP: -77°F UEL: 44.0% LEL: 4.0% Flammable Gas
Indeno[1,2,3-cd]pyrene	193-39-5	None established	None established	None established	None established	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; possible human carcinogen (skin); weakness; affect liver, lung tissue, renal tissue; impariment of blood forming tissue	Skin	Fluorescent green-yellow crystalline solid BP: 536 C
Indeno[1,2,3-cd]pyrene	193-39-5	None established	None established	None established	None established	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; possible human carcinogen (skin); weakness; affect liver, lung tissue, renal tissue; impariment of blood forming tissue	Skin	Yellowish crystal solid BP: 536 C
Isopropylbenzene	98-82-8	TWA 50 ppm	TWA 50 ppm (245 mg/m^3) [skin]	TWA 50 ppm (245 mg/m^3) [skin]	900 ppm [10%LEL]	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin, mucous membrane; dermatitis; headache, narcosis, coma	Eyes, skin, respiratory system, central nervous system	Colorless liquid with a sharp, penetrating, aromatic odor. BP: 306°F Fl.P: 96°F UEL: 6.5% LEL: 0.9%
Kerosene	8008-20-6	TWA 200 mg/m^3	TWA 100 mg/m^3	None established	IDLH value has not been determined	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, nose, throat; burning sensation in chest; headache, nausea, lassitude (weakness, exhaustion), restlessness, incoordination, confusion, drowsiness; vomiting, diarrhea; dermatitis; chemical pneumonitis (aspiration liquid)	Eyes, skin, respiratory system, central nervous system	Colorless to yellowish, oily liquid with a strong, characteristic odor. BP: 347-617°F Fl.P: 100-162°F UEL: 5% LEL: 0.7% Class II Combustible Liquid
Lead	7439-92-1	TWA 0.05 mg/m^3	TWA (8-hour) 0.050 mg/m^3	TWA 0.050 mg/m^3	100 mg/m^3 (as Pb)	inhalation, ingestion, skin and/or eye contact	Lassitude (weakness, exhaustion), insomnia; facial pallor; anorexia, weight loss, malnutrition; constipation, abdominal pain, colic; anemia; gingival lead line; tremor; paralysis wrist, ankles; encephalopathy; kidney disease; irritation eyes; hypertension	Eyes, gastrointestinal tract, central nervous system, kidneys, blood, gingival tissue	A heavy, ductile, soft, gray solid. BP: 3164°F Noncombustible Solid in bulk form

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 149 Kent Avenue, Brooklyn, New York

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
Manganese	7439-96-5 (metal)	TWA 0.2 mg/m^3	TWA 1 mg/m^3 STEL 3 mg/m^3	C 5 mg/m^3	500 mg/m^3 (as Mn)	inhalation, ingestion	Manganism; asthenia, insomnia, mental confusion; metal fume fever: dry throat, cough, chest tightness, dyspnea (breathing difficulty), rales, flu-like fever; low-back pain; vomiting; malaise (vague feeling of discomfort); lassitude (weakness, exhaustion); kidney damage	respiratory system, central nervous system, blood, kidneys	A lustrous, brittle, silvery solid. BP: 3564°F
Mercury (organo) alkyl compounds (as Hg)	7439-97-6	TWA 0.01 mg/m^3 STEL 0.03 mg/m^3 [skin]	TWA 0.01 mg/m^3 STEL 0.03 mg/m^3 [skin]	TWA 0.01 mg/m^3 C 0.04 mg/m^3	2 mg/m^3 (as Hg)	inhalation, skin absorption, ingestion, skin and/or eye contact	Paresthesia; ataxia, dysarthria; vision, hearing disturbance; spasticity, jerking limbs; dizziness; salivation; lacrimation (discharge of tears); nausea, vomiting, diarrhea, constipation; skin burns; emotional disturbance; kidney injury; possible teratogenic effects	Eyes, skin, central nervous system, peripheral nervous system, kidneys	Appearance and odor vary depending upon the specific (organo) alkyl mercury compound
Mercury compounds [except (organo) alkyls] (as Hg) Mercury	7439-97-6	TWA 0.025 mg/m^3 (elemental and inorganic forms)	Hg Vapor: TWA 0.05 mg/m^3 [skin] Other: C 0.1 mg/m3 [skin]	TWA 0.1 mg/m^3	10 mg/m^3 (as Hg)	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; cough, chest pain, dyspnea (breathing difficulty), bronchitis, pneumonitis; tremor, insomnia, irritability, indecision, headache, lassitude (weakness, exhaustion); stomatitis, salivation; gastrointestinal disturbance, anorexia, weight loss; proteinuria	Eyes, skin, respiratory system, central nervous system, kidneys	Metal: Silver-white, heavy, odorless liquid. [Note: "Other" Hg compounds include all inorganic & aryl Hg compounds except (organo) alkyls.] BP: 674°F
Methyl tert-butyl ether (MTBE)	1634-04-4	TWA 50 ppm	No established REL	None established	None established	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, mucous membrane, respiratory; dizziness, nausea, headache, intoxication	Eyes, skin, mucous membrane, respiratory system, central nervous system	Colorless liquid BP: 55.2 C
Methylene Chloride	75-09-2	TWA 50 ppm, A3 - suspected human carcinogen	Ca	TWA 25 ppm STEL 125 ppm	Ca [2300 ppm]	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; lassitude (weakness, exhaustion), drowsiness, dizziness; numbness, tingle limbs; nausea; [potential occupational carcinogen]	Eyes, skin, cardiovascular system, central nervous system	Colorless liquid with a chloroform-like odor BP: 104°F UEL: 23% LEL: 13%
Metals Remediation Compound (MRC): Glycerol Tripolylactate Sorbitol Cysteinate Lactic Acid Glycerol	201167-72-8 444618-64-8 50-21-5 56-81-5	None established	None established	None established	None established	inhalation, ingestion, skin absorption, skin and/or eye contact	Irritation eyes, skin, respiratory tract	Behavioral (headache), gastrointestinal tract, reproductive system	Viscous amber gel/liquid; strong amine/sulfur odor
Naphtha (coal tar)	8030-30-6	None established	TWA 100 ppm (400 mg/m^3)	TWA 100 ppm (400 mg/m^3)	1000 ppm [10%LEL]	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, nose; dizziness, drowsiness; dermatitis; in animals: liver, kidney damage	Eyes, skin, respiratory system, central nervous system, liver, kidneys	Reddish-brown, mobile liquid with an aromatic odor BP: 320-428°F Fl.P: 100-109°F Class II Combustible Liquid

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 149 Kent Avenue, Brooklyn, New York

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
Naphthalene	91-20-3	TWA 2 ppm STEL 15 ppm	TWA 10 ppm (50 mg/m^3) STEL 15 ppm (75 mg/m^3)	TWA 10 ppm (50 mg/m^3)	250 ppm	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes; headache, confusion, excitement, malaise (vague feeling of discomfort); nausea, vomiting, abdominal pain; irritation bladder; profuse sweating; jaundice; hematuria (blood in the urine), renal shutdown; dermatitis, optical neuritis, corneal damage	Eyes, skin, blood, liver, kidneys, central nervous system	Colorless to brown solid with an odor of mothballs. BP: 424°F Fl.P: 174°F UEL: 5.9% LEL: 0.9%
n-Butylbenzene	104-51-8	None established	None established	None established	None established	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; CNS depression, lung damage; nausea, vomiting, headache, dizziness, weakness, loss of coordination, blured vision, drowsiness, confusion, disorientation	Eyes, skin,repiratory system, central nervous system	Colorless liquid with a sweet odor BP: 183 C Fl.P: 59 C UEL: 5.8% LEL: 0.8%
Nickel	7440-02-0 (Metal)	TWA 1.5 mg/m^3 (elemental) TWA 0.1 mg/m^3 (soluble inorganic compounds) TWA 0.2 mg/m^3 (insoluble inorganic compounds) TWA 0.1 mg/m^3 (Nickle subsulfide)	Ca TWA 0.015 mg/m^3	TWA 1 mg/m^3	Ca [10 mg/m^3 (as Ni)]	inhalation, ingestion, skin and/or eye contact	Sensitization dermatitis, allergic asthma, pneumonitis; [potential occupational carcinogen]	Nasal cavities, lungs, skin	Metal: Lustrous, silvery, odorless solid. BP: 5139°F
Nitrobenzene	98-95-3	TWA 1 ppm	TWA 1 ppm (5 mg/m^3) [skin]	TWA 1 ppm (5 mg/m^3) [skin]	200 ppm	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; anoxia; dermatitis; anemia; methemoglobinemia; in animals: liver, kidney damage; testicular effects	Eyes, skin, blood, liver, kidneys, cardiovascular system, reproductive system	Yellow, oily liquid with a pungent odor like paste shoe polish. BP: 411°F Fl.P: 190°F LEL(200°F): 1.8%
n-Propylbenzene	103-65-1	None established	None established	None established	None established	inhalation, ingestion, skin and/or eye contact	Harmful if swallowed, Irritation eyes, skin, digestive tract, respiratory tract, central nervous system	Eyes, skin, central nervous system, respiratory system	colorless or light yellow liquid BP: 159 C Fl.P: 47 C UEL: 6% LEL: 0.8%
Petroleum hydrocarbons(Petroleum distillates)	8002-05-9	None established	TWA 350 mg/m^3 C 1800 mg/m^3 [15 min]	TWA 500 ppm (2000 mg/m^3)	1,100 [10% LEL]	Inhalation; ingestion; skin and/or eye contact	Irritation eyes, skin, nose, throat; dizziness, drowsiness, headache, nausea; dried/cracked skin; chemical pneumonitis	CNS, eyes, respiratory system, skin	Colorless liquid with a gasoline or kerosene-like odor BP: 86-460°F Fl. Pt = -40 to -86°F UEL: 5.9% LEL: 1.1% Flammable liquid

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 149 Kent Avenue, Brooklyn, New York

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
Phenol	108-95-2	TWA 5 ppm	TWA 5 ppm (19 mg/m^3) C 15.6 ppm (60 mg/m^3) [15-minute] [skin]	TWA 5 ppm (19 mg/m^3) [skin]	250 ppm	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, nose, throat; anorexia, weight loss; lassitude (weakness, exhaustion), muscle ache, pain; dark urine; cyanosis; liver, kidney damage; skin burns; dermatitis; ochronosis; tremor, convulsions, twitching	Eyes, skin, respiratory system, liver, kidneys	Colorless to light-pink, crystalline solid with a sweet, acrid odor. BP: 359°F UEL: 8.6% LEL: 1.8%
p-Isopropyltoluene	99-87-6	None established	None established	None established	None established	inhalation, skin absorption, eye contact	Irritation skin	CNS, skin	Colorless, clear liquid, sweetish aromatic odor BP: 350.8°F Class III Flammable liquid
Regenox Part A: Sodium Percarbonate Sodium Carbonate Monohydrate Silicic Acid Silica Gel	15630-89-4 5968-11-6 7699-11-6 63231-67-4	None established	None established	None established	None established	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation respiratory tract, mucous membranes, nose, throat, eyes, skin; gastrointestinal disturbance	Respiratory system, eyes, skin	Odorless, white, powder [Note: Self-accelerating decomposition with oxygen release starts at 50° C]
Regenox Part B: Silicic Acid, Sodium Salt, Sodium Silicate; Silica Gel; Ferrous Sulfate; Water	1344-09-8 63231-67-4 7720-78-7 7732-18-5	None established	None established	None established	None established	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation respiratory tract, mucous membranes, nose, throat, eyes, skin, mouth, esophagus and stomach	Respiratory system, eyes, skin, gastrointestinal tract	Odorless, Blue/Green, liquid [Note: Oxides of carbon and silicon may be formed when heated to decomposition]
sec-Butylbenzene	135-98-8	None established	None established	None established	None established	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin, upper airway; central nervous system, headache, dizziness; gastrointestinal disturbance	Respiratory system, central nervous system, eyes, skin;	Colorless liquid BP: 344°F Fl.P: 126 °F UEL: 6.9% LEL: 0.8% Combustible liquid
Selenium	7782-49-2	TWA 0.2 mg/m^3	TWA 0.2 mg/m^3	TWA 0.2 mg/m^3	1 mg/m^3 (as Se)	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, nose, throat; visual disturbance; headache; chills, fever; dyspnea (breathing difficulty), bronchitis; metallic taste, garlic breath, gastrointestinal disturbance; dermatitis; eye, skin burns; in animals: anemia; liver necrosis, cirrhosis; kidney, spleen damage	Eyes, skin, respiratory system, liver, kidneys, blood, spleen	Amorphous or crystalline, red to gray solid. [Note: Occurs as an impurity in most sulfide ores.] BP: 1265°F
Silver	7440-22-4 (metal)	TWA 0.1 mg/m^3 (metal, dust, fumes) TWA 0.01 mg/m^3 (Soluble compounds, as Ag)	TWA 0.01 mg/m^3	TWA 0.01 mg/m^3	10 mg/m^3 (as Ag)	inhalation, ingestion, skin and/or eye contact	Blue-gray eyes, nasal septum, throat, skin; irritation, ulceration skin; gastrointestinal disturbance	Nasal septum, skin, eyes	Metal: White, lustrous solid BP: 3632°F
Slop Oil	69029-75-0	None established	None established	None established	None established	Inhalation; ingestion	Irritation eyes, skin, gastrointestinal tract	Eyes, skin, gastrointestinal tract	Clear light to dark amber liquid, with mild hydrocarbon odor. BP: >500°F Fl.P : 250°F

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 149 Kent Avenue, Brooklyn, New York

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
Sulfuric Acid	7664-93-9	TWA 0.2 mg/m^3	TWA 1 mg/m^3	TWA 1 mg/m^3	15 mg/m^3	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, nose, throat; pulmonary edema, bronchitis; emphysema; conjunctivitis; stomatis; dental erosion; eye, skin burns; dermatitis	Eyes, skin, respiratory system, teeth	Colorless to dark-brown, oily, odorless liquid. BP: 554°F Noncombustible Liquid
tert-Butylbenzene	98-06-6	None established	None established	None established	None established	inhalation, skin absorption, ingestion,	Eye and respiratory irritant; CNS depression; liver or kidney damage	Respiratory system, central nervous system, eyes, liver, kidney	Colorless liquid with an aromatic odor BP: 168 - 169 C Fl.P: 34 C UEL:5.6 % LEL: 0.8 %
Tetrachloroethene	127-18-4	TWA 25 ppm STEL 100 ppm (STEL) listed as A3, animal carcinogen	Ca Minimize workplace exposure concentrations	TWA 100 ppm C 200 ppm (for 5 minutes in any 3-hour period), with a maximum peak of 300 ppm	Ca [150 ppm]	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin, nose, throat, respiratory system; nausea; flush face, neck; dizziness, incoordination; headache, drowsiness; skin erythema (skin redness); liver damage; [potential occupational carcinogen]	Eyes, skin, respiratory system, liver, kidneys, central nervous system	Colorless liquid with a mild, chloroform-like odor. BP: 250°F Noncombustible Liquid
Toluene	108-88-3	TWA 20 ppm	TWA 100 ppm (375 mg/m^3) STEL 150 ppm (560 mg/m^3)	TWA 200 ppm C 300 ppm 500 ppm (10-minute maximum peak)	500 ppm	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, nose; lassitude (weakness, exhaustion), confusion, euphoria, dizziness, headache; dilated pupils, lacrimation (discharge of tears); anxiety, muscle fatigue, insomnia; paresthesia; dermatitis; liver, kidney damage	Eyes, skin, respiratory system, central nervous system, liver, kidneys	Colorless liquid with a sweet, pungent, benzene-like odor. BP: 232°F Fl.P: 40°F UEL: 7.1% LEL: 1.1% Class IB Flammable Liquid
trans-1,2-Dichloroethene	156-60-5	TWA 200 ppm	None established	TWA 200 ppm STEL 250 ppm (skin)	None established	inhalation, skin absorption, ingestion, skin and/or eye contact	Narcotic. Irritation eyes, skin, respiratory tract, mucous membrane; CNS depression.	Respiratory tract, mucous membrane, eyes, skin, CNS	Colorless liquid with a fruity pleasant odor BP: 48°C Fl.P 6C UEL: 12.8% LEL: 9.7%
Trichloroethene	79-01-6	TWA 10 ppm STEL 25 ppm	Ca	TWA 100 ppm C 200 ppm 300 ppm (5-minute maximum peak in any 2 hours)	Ca [1000 ppm]	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; headache, visual disturbance, lassitude (weakness, exhaustion), dizziness, tremor, drowsiness, nausea, vomiting; dermatitis; cardiac arrhythmias, paresthesia; liver injury; [potential occupational carcinogen]	Eyes, skin, respiratory system, heart, liver, kidneys, central nervous system	Colorless liquid (unless dyed blue) with a chloroform-like odor. BP: 189°F UEL(77°F): 10.5% LEL(77°F): 8%
Vinyl Chloride	75-01-4	TWA 1 ppm	Carcinogen	TWA 1 ppm C 5 ppm [15-minute]	Ca [IDLH value has not been determined]	inhalation, skin, and/or eye contact (liquid)	Lassitude (weakness, exhaustion); abdominal pain, gastrointestinal bleeding; enlarged liver; pallor or cyanosis of extremities; liquid: frostbite; [potential occupational carcinogen]	Liver, central nervous system, blood, respiratory system, lymphatic system	Colorless gas or liquid (below 7°F) with a pleasant odor at high concentrations. BP: 7°F UEL: 33.0% LEL: 3.6% Flammable Gas

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 149 Kent Avenue, Brooklyn, New York

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
Xylene (m, o & p isomers)	108-38-3, 95-47-6, 106-42-3	TWA 100 ppm (435 mg/m^3) STEL 150 ppm	TWA 100 ppm (435 mg/m^3)	TWA 100 ppm (435 mg/m^3)	900 ppm	Skin absorption, inhalation, ingestion, skin, and/or eye contact	Irritation eyes, skin, nose, throat; dizziness, excitement, drowsiness, incoordination, staggering gait; corneal vacuolization; anorexia, nausea, vomiting, abdominal pain; dermatitis	Eyes, skin, respiratory system, central nervous system, gastrointestinal tract, blood, liver, kidneys	Colorless liquid with an aromatic odor BP: 282°F, 292°F, 281°F Fl. Pt. 82°F, 90°F, 81°F LEL: 1.1%, 0.9%, 1.1% UEL: 7.0%, 6.7%, 7.0% Classs C Flammable Liquid
Zinc	7440-66-6	TWA 10 mg/m3 (Inhalable fraction)	None established	TWA 10 mg/m3 (for zinc oxide fume)	None established	skin and/or eye contact, inhalation, ingestion	Irritation eyes, skin, respiratory tract; gastrointestinal disturbances	Eyes, skin, respiratory system	Bluish gray solid BP: 1664.6°F Flammable

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 900 Old Country Road, Garden City, New York

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Guide to Occupational Exposure Values. 2008. American Conference of Governmental Industrial Hygienists (ACGIH).
NIOSH Pocket Guide to Chemical Hazards. 2005. Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health

Abbreviations:
ACGIH – American Conference of Governmental Industrial Hygienists.
BP – boiling point at 1 atmosphere, °F
C – Ceiling, is a concentration that should not be exceeded during and part of the working exposure.
Ca - considered by NIOSH to be a potential occupational carcinogen
CAS# Chemical Abstracts Service registry number which is unique for each chemical.
Fl. Pt. – Flash point
IDLH - Immediately Dangerous to Life and Health concentrations represent the maximum concentration from which, in the event of respirator failure, one could escape within 30 minutes without a respirator and without experiencing any escape-impairing or irreversible health effects.
LEL – Lower explosive (flammable) limit in air, % by volume (at room temperature)
mg/m^3 – Milligrams of substance per cubic meter of air
NIOSH -National Institute for Occupational Safety and Health.
OSHA – Occupational Safety and Health Administration
PEL - OSHA Permissible Exposure Limit (usually) a time weighted average concentration that must not be exceeded during any 8 hour work shift of a 40 hr work week.
ppm – parts per million
REL – NIOSH Recommended Limit indicated a time weighted average concentration that must not be exceeded during any 10 hour work shift of a 40 hr work week
STEL – Short-term exposure limit
TLV -ACGIH Threshold Limit Values (usually 8 hour time weighted average concentrations).
TWA – 8-hour, time-weighted average
UEL – Upper explosive (flammable) limit in air, % by volume (at room temperature)

TABLE 2

ACTION LEVELS FOR WORKER BREATHING ZONE

Instrument	Action Level *	Level of Respiratory Protection/Action
PID	0 to <5 ppm (one minute sustained)	Level D *
PID	>5 to <50 ppm (one minute sustained)	Utilize APR (Level C)
PID	>50 to <100 ppm (one minute sustained)	Level B
PID	>100ppm	Stop work** (ventilate, apply foam)
CGI/H_2S Meter	<5%	Level D
CGI/H_2S Meter	>5% to <25%	Level B
CGI/H_2S Meter	>25%	Stop work**
CGI/CO Meter	>25%	Level B
CGI/CO Meter	>50%	Stop work** (ventilate area)
CGI/O_2 Meter	<10% LEL, in excavation	Level D
	19.5% oxygen – 23.5%	Level D
CGI/O_2 Meter	>10% LEL, in excavation	Allow to vent, apply foam**
	>23.5% oxygen	Stop work, Oxygen Enriched ATM**
Dust Monitor	0 – 1.0 mg/m^3, 5-minutes average	Level D
Dust Monitor	>1.0 to 5.0 mg/m^3, 5-minutes average	Level D – Institute dust suppression measures
Dust Monitor	5.0 to >50 mg/m^3, 5-minute average	Level C – Institute dust suppression measures

Note: Action levels are based on above background levels.

* Instrument readings will be taken in the breathing zone (BZ) of the workers, unless otherwise indicated.

** Suspend work in immediate area. Conduct air monitoring periodically to determine when work can continue. Implement mitigative measures.

FIGURES

1. Site Location Map
2. Hospital Route Map

QUADRANGLE LOCATION

SOURCE:
USGS; 1995, BROOKLYN, NY
7.5 Minute Topographic Quadrangle

N

0 1000'

Title:

SITE LOCATION MAP

149 KENT AVENUE
BROOKLYN, NEW YORK

Prepared for:

KENT & WYTHE OWNERS LLC

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

Compiled by: D.T.B.	Date: 07SEP12	FIGURE
Prepared by: J.A.D.	Scale: AS SHOWN	1
Project Mgr.: J.D.	Project No.: 2158.0001Y000	
File: 2158.0001Y103.01.CDR		

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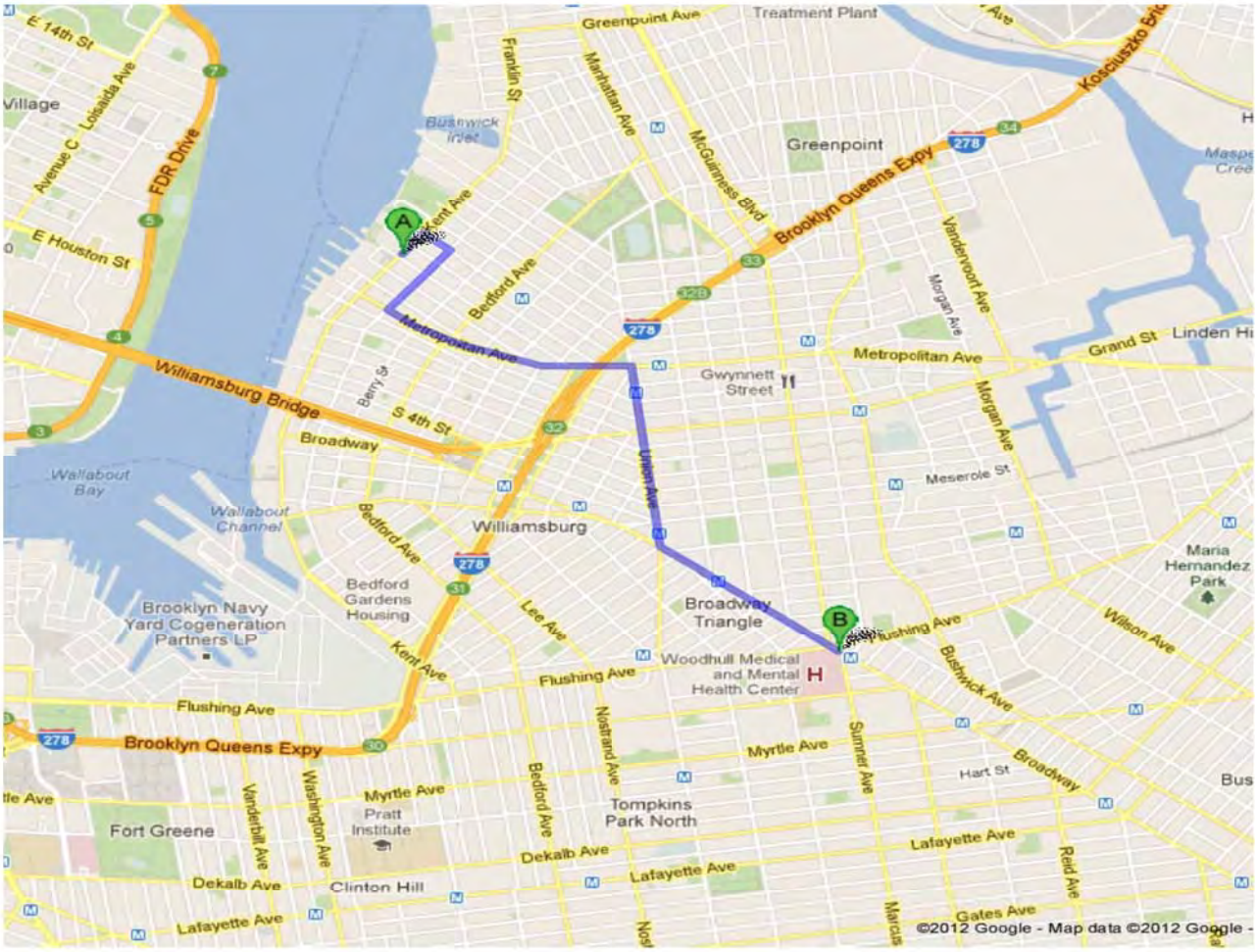

Figure 2. Directions to Woodhull Medical Center

760 Broadway
Brooklyn, New York 11206

- Start at 149 Kent Avenue, Brooklyn, New York
- Head northeast on Kent Avenue toward North 6th Street
- Turn Right onto North 7th Street
- Turn Right onto Wythe Avenue
- Turn Left onto Metropolitan Avenue
- Turn Right onto Union Avenue
- Turn Left onto Broadway
- Arrive at Woodhull Medical Center on your right.

APPENDICES

A. Activity Hazard Analysis
B. Heat and Cold Stress Guidelines
C. Medical Data Form
D. Health and Safety Briefing/Tailgate Meeting Form
E. Accident Report and Investigation Form
F. Acord Form
G. OSHA 300
H. Job Safety and Health Protection Poster

APPENDIX A

Activity Hazard Analysis

JOB SAFETY ANALYSIS	Ctrl. No. 563	DATE 9/10/12	☒ NEW ☐ REVISED	PAGE 1 of 2

JSA TYPE CATEGORY:	WORK TYPE:	WORK ACTIVITY (Description):	
KENT & WYTHE OWNERS LLC	**Drilling**	**Hollow Stem Auger Soil Borings /Well Installation**	
DEVELOPMENT TEAM	**POSITION / TITLE**	**REVIEWED BY:**	**POSITION / TITLE**
Wendy Monterosso	Senior Hydrogeologist	Joseph Gentile	CHSM
David Bligh	Project Engineer		

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST ☒ HARD HAT ☐ LIFELINE / BODY HARNESS ☒ SAFETY GLASSES	☐ GOGGLES ☐ FACE SHIELD ☒ HEARING PROTECTION: (as needed) ☒ SAFETY SHOES: Composite-toe or steel toe boots/shoes	☐ AIR PURIFYING RESPIRATOR ☐ SUPPLIED RESPIRATOR ☒ PPE CLOTHING: Fluorescent reflective vest or high visibility clothing	☒ GLOVES: Leather, Nitrile and cut resistant ☒ OTHER: Insect Repellant, sunscreen (as needed)

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Truck-Mounted Drilling Rig, saw, Hand Tools, Photoionization Detector, MultiGas meter (or equivalent),Interface Probe, 20 lb. fire extinguisher, Safety Cones & Flags, "Work Area" Signs (if needed)

COMMITMENT TO SAFETY - All personnel onsite will actively participate in SPSA performance by verbalizing SPSAs throughout the day.

"SHOW ME YOUR HANDS"
Driller and helper should show that hands are clear from controls and moving parts

[1]JOB STEPS	[2]POTENTIAL HAZARDS	[3]CRITICAL ACTIONS
1. Mobilization of drilling rig	1a. Contact: equipment/property damage	1a. The drill rig's tower/derrick will be lowered and secured prior to mobilization. 1a. If personnel moves into the path of the drilling rig, the drilling rig will be stopped until the path is again clear. 1a. Use a spotter. 1a. Use caution while advancing the drilling rig. 1a. Inspect the driving path for uneven terrain.
	1b. Fall: slip/trip/fall hazards	1b Inspect walking path for uneven terrain, weather-related hazards (i.e., ice, puddles, snow, etc.), and obstructions prior to mobilizing equipment. 1b. Do not climb over stored materials/equipment; walk around. Practice good housekeeping. 1b. Use established pathways and walk on stable, secure ground.
2. Setting up drilling rig/work area	2a. Fall: slip/trip/fall hazards associated with drilling equipment and tools	2a. See 1b. 2a. Equipment and tools will be staged in a convenient, stable, and orderly manner. 2a. Equipment and tools will be stored at the lowest point of potential energy and out of the walkway and immediate work area (i.e. tools should not be propped against walls or nearby equipment or vehicles). 2a. Equipment and tools that are not anticipated to be used will be returned to an appropriate storage area that is out of the immediate work area. 2a. Ensure power cords and water lines are grouped when used within the work area.
	2b. Exertion: lifting	2b. Use proper body positioning and lifting techniques; keep back straight, lift with legs, keep load close to body, and never reach with a load. 2b. Ensure that loads are balanced to reduce the potential for muscle strain. 2b. Two people or a mechanical lifting aid are required when lifting objects over 50 lbs or when the shape makes the object difficult to lift.
3. Raising tower/derrick of drilling rig	3. Contact: overhead hazards	3. Prior to raising the tower/derrick, the area above the drilling rig will be inspected for wires, tree limbs, piping, or other structures, that could come in contact with the rig's tower and/or drilling rods or tools. 3. The tower/derrick must not be raised beneath overhead power lines unless approved by the Roux PM. 3. Maintain a safe distance from overhead structures. 3. Do not move the rig while the tower/derrick is raised.

[1] Each Job or Operation consists of a set of tasks / steps. Be sure to list all the steps needed to perform job.

[2] A hazard is a potential danger. Break hazards into five types: Contact - victim is struck by or strikes an object; Caught - victim is caught on, caught in or caught between objects; Fall - victim falls to ground or lower level (includes slips and trips); Exertion - excessive strain or stress / ergonomics / lifting techniques; Exposure - inhalation/skin hazards.

[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift". Avoid general statements such as, "be careful".

[1]JOB STEPS	[2]POTENTIAL HAZARDS	[3]CRITICAL ACTIONS
4. Drilling activity	4a. Contact: flying debris	4a. Use the proper PPE (especially hand, eye, ear and respiratory protection). 4a. Be aware of and avoid potential lines of fire.
	4b. Exposure: noise and dust	4b. Wet borehole area with sprayer to minimize dust. 4b. Stand upwind and keep body away from rig. 4b. No open flames/heat sources.
	4c. Caught: limb/extremity pinching; abrasion/crushing	4c. Use proper PPE. 4c. Always wear leather gloves when making connections and using hand tools; wear cut-resistant (i.e., Kevlar) gloves when handling cutting tools. 4c. Inspect the equipment prior to use for potential pinch points. 4c. Test all emergency shutdown devices prior to drilling to ensure proper working condition. 4c. Inspect drill head for worn surface or missing teeth; replace if damaged or blunt. 4c. Ensure all jewelry is removed, loose clothing is secured, and PPE is secured close to the body. 4c. All non-essential personnel should stay away from the immediate work area; position body out of the line-of-fire of equipment. 4c. Drillers and helpers will understand and use the "Show Me Your Hands" Policy.
	4d. Contact: equipment imbalance during advancement drill equipment	4d. Drillers will advance the borehole with caution to avoid causing the rig to become imbalanced and/or tip. 4d. The blocking and leveling devices used to secure the rig will be inspected by drillers and Roux personnel regularly to see if shifting has occurred. 4d. In addition, personnel and equipment that are non-essential to the advancement of the borehole will be positioned away from the rig at a distance that is at least as far as the boom is high. For example, if the boom is ten feet high, non-essential personnel and equipment will be positioned at least ten feet away from the rig in case the rig tips over.
	4e. Exposure: inhalation of contamination	4e. Air monitoring using a calibrated photoionization detector (PID) will be used to periodically monitor the breathing zone of the work area. 4e. The Action Level for breathing zone air is five parts per million (sustained) as detected by the PID. 4e. If a reading of >5ppm is recorded, the Roux field personnel must temporarily cease work, instruct all Site personnel to step away from the area of elevated readings and inform the Roux PM of the condition. The Roux PM will then recommend additional appropriate precautions in accordance with the site specific health and safety plan.
	4f. Fall: slip/trip/fall hazards	4f. See 2a.
5. Decontaminate equipment	5a. Exposure to contamination (e.g., Separate Phase Hydrocarbons (SPH), contaminated groundwater, vapors)	5a. Wear chemical-resistant disposable gloves and safety glasses. 5a. Use an absorbent pad to clean spills.
	5b. Exposure to chemicals in cleaning solution including ammonia	5b. See 5a.

[1] Each Job or Operation consists of a set of tasks / steps. Be sure to list all the steps needed to perform job.

[2] A hazard is a potential danger. Break hazards into five types: Contact - victim is struck by or strikes an object; Caught - victim is caught on, caught in or caught between objects; Fall - victim falls to ground or lower level (includes slips and trips); Exertion - excessive strain or stress / ergonomics / lifting techniques; Exposure - inhalation/skin hazards.

[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift". Avoid general statements such as, "be careful".

JOB SAFETY ANALYSIS	Ctrl. No. 564	DATE 9/10/12	☐ NEW ☒ REVISED	PAGE 1 of 2

JSA TYPE CATEGORY:	WORK TYPE:	WORK ACTIVITY (Description):
KENT & WYTHE OWNERS LLC	**Monitoring Well Gauging/Sampling**	**Groundwater Gauging and Sampling**

DEVELOPMENT TEAM	POSITION / TITLE	REVIEWED BY:	POSITION / TITLE
Wendy Monterosso	Senior Hydrogeologist	Joseph Gentile	CHSM
David Bligh	Project Engineer		

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST	☐ GOGGLES	☐ AIR PURIFYING RESPIRATOR	☒ GLOVES: Leather, Nitrile and cut resistant
☒ HARD HAT	☐ FACE SHIELD	☐ SUPPLIED RESPIRATOR	☒ OTHER: Insect Repellant, sunscreen (as needed)
☐ LIFELINE / BODY HARNESS	☐ HEARING PROTECTION	☒ PPE CLOTHING: Fluorescent reflective vest or high visibility clothing	
☒ SAFETY GLASSES	☒ SAFETY SHOES: Composite-toe or steel toe boots/shoes		

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Required Equipment: Safety cones, caution tape, Interface probe and/or Water level meter, scissors, tubing cutter, 20 lb. fire extinguisher
Equipment as needed: Peristaltic pump, appropriate power sources, tubing, master flex, bailers, poly rope, 55-gallon drums; buckets
Tools as needed: socket wrench, screw driver, crow bar, mallet

COMMITMENT TO SAFETY - All personnel onsite will actively participate in SPSA performance by verbalizing SPSAs throughout the day.

[1]JOB STEPS	[2]POTENTIAL HAZARDS	[3]CRITICAL ACTIONS
1. Open/close well	1a. Exertion: muscle strain	1a. Use proper lifting techniques; keep back straight, lift with legs, keep load close to body, and never reach with a load. 1a. Ensure that loads are balanced to reduce the potential for muscle strain. 1a. Two people are required when lifting objects over 50 lbs or when the shape makes the object difficult to lift.
	1b. Caught: pinch points associated with removing/replacing manholes and working with hand tools	1b. Wear leather gloves when working with well cover and hand tools. 1b. Use proper tools (ratchet and pry bar for well cover) and inspect before use. 1b. Do not put fingers under well cover.
	1c. Exposure: potential hazardous vapors	1c. No open flames/heat sources. 1c. Allow well to vent after opening it and before sampling activities begin to minimize exposure to vapors. 1c. Work on the upwind side of well.
	1d. Contact with traffic	1d. Identify potential traffic sources. 1d. Wear appropriate PPE including high visibility clothing or reflective vest. 1d. Delineate work area with 42 inch safety cones and/or other barriers. Position vehicle to protect against oncoming traffic. Use caution tape to provide a more visible delineation of the work area. 1d. Face traffic, maintain eye contact with oncoming vehicles, and establish a safe exit route.
2. Gauge well	2a. Contact with contamination (e.g., Separate Phase Hydrocarbons (SPH), contaminated groundwater, vapors)	2a. See 1c. 2a. Wear chemical-resistant disposable gloves and safety glasses when gauging well. 2a. Use an absorbent pad to clean probe.
	2b. Contact with traffic	2b. See 1d.
3. Purge and sample well using most appropriate method	3a. Exposure: contamination (e.g., SPH, contaminated groundwater, vapors)	3a. Wear chemical-resistant disposable gloves and safety glasses when gauging well. 3a. Insert and remove tubing or bailers slowly to avoid splashing. 3a. Use an absorbent pad to clean spills (see 1c).
	3b. Exertion: muscle strain while carrying equipment	3b. Use proper lifting techniques when handling/moving equipment. 3b. Use mechanical assistance or make multiple trips to carry equipment (see 1a).
	3c. Exposure: exposure to preservatives and contaminated liquids	3c. Wear chemical-resistant disposable gloves, cut-resistant gloves and safety glasses when handling samples. 3c. Open and fill sample jars slowly to avoid splashing and contact with preservatives.
	3d. Contact: cuts by glass or sharp objects	3d. Wear cut-resistant (i.e., Kevlar) gloves under chemical-resistant gloves when handling VOA vials or when using cutting tools.
	3e. Contact with traffic	3e. See 1d.
	3f. Electrical hazards	3f. Use caution when attaching equipment to power sources. 3f. Avoid touching battery terminals. 3f. Position batteries away from water source.

[1] Each Job or Operation consists of a set of tasks / steps. Be sure to list all the steps needed to perform job.
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[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift". Avoid general statements such as, "be careful".

[1]JOB STEPS	[2]POTENTIAL HAZARDS	[3]CRITICAL ACTIONS
4. Transfer purge water from 5-gallon buckets to 55-gallon drums (if necessary); move drums to storage area- **See waste disposal/storage JSA**	4a. Exposure to contamination (e.g., Separate Phase Hydrocarbons (SPH), contaminated groundwater)	4a. Do not overfill buckets or drums and pour liquids in such a manner that they do not splash. 4a. Properly dispose of used materials/PPE in provided drums in designated drum storage area (see 3a).
	4b. Exertion: muscle strain from lifting/carrying 5-gallon buckets	4b. Use proper lifting techniques when carrying buckets. Do not overfill buckets (see 3b).
	4c. Caught: pinch points associated with handling drum lid	4c. Ensure that fingers are not placed under the lid of the drum. Wear leather gloves and use proper tools (ratchet) while sealing drum lid.
	4d. Fall: spilled purge water	4d. Clean up any spills using absorbent pads.
5. Decontaminate interface probe	5a. Exposure to contamination (e.g., SPH, contaminated groundwater, vapors)	5a. See 3a.
	5b. Exposure to chemicals in cleaning solution including ammonia	5b. See 3a.

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[2] A hazard is a potential danger. Break hazards into five types: Contact - victim is struck by or strikes an object; Caught - victim is caught on, caught in or caught between objects; Fall - victim falls to ground or lower level (includes slips and trips); Exertion - excessive strain or stress / ergonomics / lifting techniques; Exposure - inhalation/skin hazards.

[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift". Avoid general statements such as, "be careful".

JOB SAFETY ANALYSIS	Ctrl. No. 565	DATE 9/10/12	☐ NEW ☒ REVISED	PAGE 1 of 1
JSA TYPE CATEGORY: **KENT & WYTHE OWNERS LLC**	WORK TYPE: **Waste Disposal Oversight**	WORK ACTIVITY (Description): **Movement of 55-gallon Drums**		
DEVELOPMENT TEAM	**POSITION / TITLE**	**REVIEWED BY:**	**POSITION / TITLE**	
Wendy Monterosso	Senior Hydrogeologist	Joseph Gentile	CHSM	
David Bligh	Project Engineer			

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST ☒ HARD HAT ☐ LIFELINE / BODY HARNESS ☒ SAFETY GLASSES	☐ GOGGLES ☐ FACE SHIELD ☒ HEARING PROTECTION (as needed) ☒ SAFETY SHOES: Composite-toe or steel toe boots/shoes	☐ AIR PURIFYING RESPIRATOR ☐ SUPPLIED RESPIRATOR ☒ PPE CLOTHING: Fluorescent reflective vest or high visibility clothing	☒ GLOVES: Leather, Nitrile ☒ OTHER: Insect Repellant, sunscreen (as needed)

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Drum Cart

COMMITMENT TO SAFETY - All personnel onsite will actively participate in SPSA performance by verbalizing SPSAs throughout the day.

[1]JOB STEPS	[2]POTENTIAL HAZARDS	[3]CRITICAL ACTIONS
1. Inspect 55-gal drums for proper condition, labeling	1a. Exposure: if drum contains hazardous material, if the drum is damaged; or if the drum has hazardous materials stuck on the outside of the drum	1a. If drum is not properly labeled, do not open and cease all drum transport activities. Immediately contact Project Manager and inform him/her of drum situation. Do not continue drum transport activities until further actions are determined by the project manager. 1a. If drum is properly labeled, but leaking, improperly sealed or in a poor condition, place drum in an over-pack drum.
	1b. Caught: drum could potentially be damaged	1b. Use proper PPE (leather gloves). 1b. If damaged, see 1a.
2. If 55-gal drum is properly labeled and in adequate condition, transfer onto a drum cart	2a. Exertion: muscle strain (handling drums)	2a Use proper body positioning and lifting techniques; keep back straight, lift with legs, keep load close to body, and never reach with a load. 2a. Ensure that loads are balanced to reduce the potential for muscle strain. 2a. Two people or a mechanical lifting aid are required when lifting objects over 50 lbs or when the shape makes the object difficult to lift. 2a. Never move drum by picking it up. If movement is necessary, slightly lean the drum over and roll it on its edge.
	2b. Caught: pinch points associated with handling the drum	2b. Use proper PPE (leather gloves and steel-toed boots). 2b. Never put hand or foot in a position between the drum and the drum cart or ground.
3. Push drum cart with 55-gal drum to appropriate pre-determined drum storage area	3a. Exertion: muscle strain (pushing drum cart)	3a. See 2a. 3a. Inspect the wheels of the cart and ensure that the load is evenly distributed.
	3b. Caught: dropping of the drum	3b. Determine transport route before actually moving the drum. 3b. Remove all obstructions from transport route prior to transport. 3b. Maintain a straight route on solid, level ground. 3b. Ensure that the drum is properly secured before transport.
4. Place 55-gal drum in drum storage area or on lift gate of disposal truck	4a. Exertion: muscle strain (handling drums)	4a. See 2a.
	4b. Caught: pinch points associated with handling the drum	4b. See 2b.

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[2] A hazard is a potential danger. Break hazards into five types: Contact - victim is struck by or strikes an object; Caught - victim is caught on, caught in or caught between objects; Fall - victim falls to ground or lower level (includes slips and trips); Exertion - excessive strain or stress / ergonomics / lifting techniques; Exposure - inhalation/skin hazards.

[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift". Avoid general statements such as, "be careful".

JOB SAFETY ANALYSIS	Ctrl. No. 566	DATE 9/10/12	☒ NEW ☐ REVISED	PAGE 1 of 2
JSA TYPE CATEGORY: **KENT & WYTHE OWNERS LLC**	WORK TYPE: **Drilling**	WORK ACTIVITY (Description): **Geoprobe Soil Borings / Well Installation**		
DEVELOPMENT TEAM	**POSITION / TITLE**	**REVIEWED BY:**	**POSITION / TITLE**	
Wendy Monterosso	Senior Hydrogeologist	Joseph Gentile	CHSM	
David Bligh	Project Engineer			

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST ☒ HARD HAT ☐ LIFELINE / BODY HARNESS ☒ SAFETY GLASSES	☐ GOGGLES ☐ FACE SHIELD ☒ HEARING PROTECTION: (as needed) ☒ SAFETY SHOES: Composite-toe or steel toe boots/shoes	☐ AIR PURIFYING RESPIRATOR ☐ SUPPLIED RESPIRATOR ☒ PPE CLOTHING: Fluorescent reflective vest or high visibility clothing	☒ GLOVES: Leather, Nitrile and cut resistant ☒ OTHER: Insect Repellant, sunscreen (as needed)

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Truck-Mounted Drilling Rig, saw, Hand Tools, Photoionization Detector, MultiGas meter (or equivalent),Interface Probe, 20 lb. fire extinguisher, Safety Cones & Flags, "Work Area" Signs

COMMITMENT TO SAFETY - All personnel onsite will actively participate in SPSA performance by verbalizing SPSAs throughout the day.

"SHOW ME YOUR HANDS"
Driller and helper should show that hands are clear from controls and moving parts

[1]JOB STEPS	[2]POTENTIAL HAZARDS	[3]CRITICAL ACTIONS
1. Mobilization of drilling rig	1a. Contact: equipment/property damage	1a. The drill rig's tower/derrick will be lowered and secured prior to mobilization. 1a. If personnel moves into the path of the drilling rig, the drilling rig will be stopped until the path is again clear. 1a. Use a spotter. 1a. Use caution while advancing the drilling rig. 1a. Inspect the driving path for uneven terrain.
	1b. Fall: slip/trip/fall hazards	1b Inspect walking path for uneven terrain, weather-related hazards (i.e., ice, puddles, snow, etc.), and obstructions prior to mobilizing equipment. 1b. Do not climb over stored materials/equipment; walk around. Practice good housekeeping. 1b. Use established pathways and walk on stable, secure ground.
2. Setting up drilling rig/work area	2a. Fall: slip/trip/fall hazards associated with drilling equipment and tools	2a. See 1b. 2a. Equipment and tools will be staged in a convenient, stable, and orderly manner. 2a. Equipment and tools will be stored at the lowest point of potential energy and out of the walkway and immediate work area (i.e. tools should not be propped against walls or nearby equipment or vehicles). 2a. Equipment and tools that are not anticipated to be used will be returned to an appropriate storage area that is out of the immediate work area. 2a. Ensure power cords and water lines are grouped when used within the work area.
	2b. Exertion: lifting	2b. Use proper body positioning and lifting techniques; keep back straight, lift with legs, keep load close to body, and never reach with a load. 2b. Ensure that loads are balanced to reduce the potential for muscle strain. 2b. Two people or a mechanical lifting aid are required when lifting objects over 50 lbs or when the shape makes the object difficult to lift.
3. Raising tower/derrick of drilling rig	3. Contact: overhead hazards	3. Prior to raising the tower/derrick, the area above the drilling rig will be inspected for wires, tree limbs, piping, or other structures, that could come in contact with the rig's tower and/or drilling rods or tools. 3. The tower/derrick must not be raised beneath overhead power lines unless approved by the Roux PM. 3. Maintain a safe distance from overhead structures. 3. Do not move the rig while the tower/derrick is raised.

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[2] A hazard is a potential danger. Break hazards into five types: Contact - victim is struck by or strikes an object; Caught - victim is caught on, caught in or caught between objects; Fall - victim falls to ground or lower level (includes slips and trips); Exertion - excessive strain or stress / ergonomics / lifting techniques; Exposure - inhalation/skin hazards.

[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift". Avoid general statements such as, "be careful".

[1]JOB STEPS	[2]POTENTIAL HAZARDS	[3]CRITICAL ACTIONS
4. Drilling activity	4a. Contact: flying debris	4a. Use the proper PPE (especially hand, eye, ear and respiratory protection). 4a. Be aware of and avoid potential lines of fire.
	4b. Exposure: noise and dust	4b. Wet borehole area with sprayer to minimize dust. 4b. Stand upwind and keep body away from rig. 4b. No open flames/heat sources.
	4c. Caught: limb/extremity pinching; abrasion/crushing	4c. Use proper PPE. 4c. Always wear leather gloves when making connections and using hand tools; wear cut-resistant (i.e., Kevlar) gloves when handling cutting tools. 4c. Inspect the equipment prior to use for potential pinch points. 4c. Test all emergency shutdown devices prior to drilling. 4c. Inspect drill head for worn surface or missing teeth; replace if damaged or blunt. 4c. Ensure all jewelry is removed, loose clothing is secured, and PPE is secured close to the body. 4c. All non-essential personnel should stay away from the immediate work area; position body out of the line-of-fire of equipment. 4c. The emergency stop switches on the rig should be tested to ensure proper working condition. 4c. Drillers and helpers will understand and use the "Show Me Your Hands" Policy.
	4d. Contact: equipment imbalance during advancement drill equipment	4d. Drillers will advance the borehole with caution to avoid causing the rig to become imbalanced and/or tip. 4d. The blocking and leveling devices used to secure the rig will be inspected by drillers and Roux personnel regularly to see if shifting has occurred. 4d. In addition, personnel and equipment that are non-essential to the advancement of the borehole will be positioned away from the rig at a distance that is at least as far as the boom is high. For example, if the boom is ten feet high, non-essential personnel and equipment will be positioned at least ten feet away from the rig in case the rig tips over.
	4e. Exposure: inhalation of contamination	4e. Air monitoring using a calibrated photoionization detector (PID) will be used to periodically monitor the breathing zone of the work area. 4e. The Action Level for breathing zone air is five parts per million (sustained) as detected by the PID. 4e. If a reading of >5ppm is recorded, the Roux field personnel must temporarily cease work, instruct all Site personnel to step away from the area of elevated readings and inform the Roux PM of the condition. The Roux PM will then recommend additional appropriate precautions in accordance with the site specific health and safety plan.
	4f. Fall: slip/trip/fall hazards	4f. See 2a.
5. Decontaminate equipment	5a. Exposure to contamination (e.g., Separate Phase Hydrocarbons (SPH), contaminated groundwater, vapors)	5a. Wear chemical-resistant disposable gloves and safety glasses. 5a. Use an absorbent pad to clean spills.
	5b. Exposure to chemicals in cleaning solution including ammonia	5b. See 5a.

[1] Each Job or Operation consists of a set of tasks / steps. Be sure to list all the steps needed to perform job.

[2] A hazard is a potential danger. Break hazards into five types: Contact - victim is struck by or strikes an object; Caught - victim is caught on, caught in or caught between objects; Fall - victim falls to ground or lower level (includes slips and trips); Exertion - excessive strain or stress / ergonomics / lifting techniques; Exposure - inhalation/skin hazards.

[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift". Avoid general statements such as, "be careful".

JOB SAFETY ANALYSIS	Ctrl. No. 567	DATE 09/10/12	☐ NEW ☒ REVISED	PAGE 1 of 1
JSA TYPE CATEGORY: **KENT & WYTHE OWNERS LLC**	WORK TYPE: **General**	WORK ACTIVITY (Description): **Site Mobilization/Demobilization**		

DEVELOPMENT TEAM	POSITION / TITLE	REVIEWED BY:	POSITION / TITLE
Wendy Monterosso	Senior Hydrogeologist	Joseph Gentile	CHSM
David Bligh	Project Engineer		

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST ☒ HARD HAT ☐ LIFELINE / BODY HARNESS ☒ SAFETY GLASSES	☐ GOGGLES ☐ FACE SHIELD ☒ HEARING PROTECTION: (as needed) ☒ SAFETY SHOES: Composite-toe or steel toe boots/shoes	☐ AIR PURIFYING RESPIRATOR ☐ SUPPLIED RESPIRATOR ☒ PPE CLOTHING: Fluorescent reflective vest or high visibility clothing	☒ GLOVES: Leather, Nitrile and cut resistant ☒ OTHER: Insect Repellant, sunscreen (as needed)

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Safety cones and flags, 20 lb. fire extinguisher, "Work Area" signs (if needed based on task), vehicle tire chocks, caution tape, HASP

COMMITMENT TO SAFETY - All personnel onsite will actively participate in SPSA performance by verbalizing SPSAs throughout the day.

[1]JOB STEPS	[2]POTENTIAL HAZARDS	[3]CRITICAL ACTIONS
1. Mobilize/demobilize and establish work area	1a . Fall: tripping/falling due to uneven terrain, weather conditions, and materials/equipment stored at the Site	1a. Inspect walking path for uneven terrain, weather-related hazards (i.e., ice, puddles, snow, etc.), and obstructions prior to mobilizing equipment. 1a. Do not climb over stored materials/equipment; walk around. Practice good housekeeping. 1a . Use established pathways and walk on stable, secure ground.
	1b. Contact: with traffic (including any unintended movement of the work truck), Contact / Interference with Other Site Activities	1b. When first arriving onsite park vehicles in designated parking space and/or out of the way locations. Use parking brake on all vehicles and tire chocks on work trucks and trailers. 1b. Check in with with Site Manager/Supervisor to ensure proper coordination with other site activities. 1b. Identify potential traffic sources. 1b. Wear appropriate PPE including high visibility clothing or reflective vest. 1b. Use a spotter while moving work vehicles; plan ahead to avoid backing when unnecessary. 1b. Delineate work area with cones, flags, caution tape, and/or other barriers. 1b. Position "Work Area" signs at site entrances. 1b. Position largest vehicle to protect against oncoming traffic. 1b. Face traffic, maintain eye contact with oncoming vehicles, use a spotter, and establish a safe exit route. 1b. Chock wheels of work truck and other support equipment on wheels and engage parking brake if possible.
	1c. Exertion: during moving of equipment(cones and signage) into work area	1c. Use proper body positioning and lifting techniques; keep back straight, lift with legs, keep load close to body, and never reach with a load. 1c. Ensure that loads are balanced to reduce the potential for muscle strain.
	1d. Exposure: to biological hazards: ticks, bees/wasps, poison ivy, insects, dogs, etc. (ticks are most active any time the temperature is above freezing from March to November)	1d. Inspect area to avoid contact with biological hazards. 1d. Be aware of pedestrians walking pet dogs and keep distance. 1d. Wear long sleeved clothing to protect skin and apply insect repellant containing DEET when working in overgrown areas of the Site. 1d. Personnel shall examine themselves for ticks. 1d. If skin comes in contact with poison ivy, wash skin thoroughly with soap and water as soon as possible.
	1e. Exposure: to sun, possibly causing sunburn	1e. Wear sunscreen with an SPF of at least 15 whenever 30 minutes or more of exposure is expected.
	1f. Noise hazards (active auto repair facility, impact hammers and compressor noise)	1f. Wear hearing protection if necessary.

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APPENDIX B

Heat and Cold Stress Guidelines

Heat Stress

Heat stress is a significant potential hazard and can be associated with heavy physical activity and/or the use of personal protective equipment (PPE) in hot weather environments.

Heat cramps are brought on by prolonged exposure to heat. As an individual sweats, water and salts are lost by the body resulting in painful muscle cramps. The signs and symptoms of heat cramps are as follows:

- severe muscle cramps, usually in the legs and abdomen;
- exhaustion, often to the point of collapse; and
- dizziness or periods of faintness.

First aid treatment includes moving to a shaded area, rest, and fluid intake. Normally, the individual should recover within one-half hour. If the individual has not recovered within 30 minutes and the temperature has not decreased, the individual should be transported to a hospital for medical attention.

Heat exhaustion may occur in a healthy individual who has been exposed to excessive heat. The circulatory system of the individual fails as blood collects near the skin in an effort to rid the body of excess heat. The signs and symptoms of heat exhaustion are as follows:

- rapid and shallow breathing;
- weak pulse;
- cold and clammy skin with heavy perspiration;
- skin appears pale;
- fatigue and weakness;
- dizziness; and
- elevated body temperature.

First aid treatment includes cooling the victim, elevating the feet, and replacing fluids and electrolytes. If the individual has not recovered within 30 minutes and the temperature has not decreased, the individual should be transported to the hospital for medical attention.

Heat stroke occurs when an individual is exposed to excessive heat and stops sweating. This condition is classified as a **MEDICAL EMERGENCY**, requiring immediate cooling of the victim and transport to a medical facility. The signs and symptoms of heat stroke are as follows:

- dry, hot, red skin;
- body temperature approaching or above 105°F;
- large (dilated) pupils; and
- loss of consciousness - the individual may go into a coma.

First aid treatment requires immediate cooling and transportation to a medical facility.

Heat stress (heat cramps, heat exhaustion, and heat stroke) is a significant hazard if any type of protective equipment (semi-permeable or impermeable) which prevents evaporative cooling is worn in hot weather environments. Local weather conditions may require restricted work schedules in order to adequately protect personnel. The use of work/rest cycles (including working in the cooler periods of the day or evening) and training on the signs and symptoms of heat stress should help prevent heat-related illnesses from occurring. Work/rest cycles will depend on the work load required to perform each task, type of protective equipment, temperature, and humidity. In general, when the temperature exceeds 88°F, a 15 minute rest cycle will be initiated once every two hours. In addition, potable water and fluids containing electrolytes (e.g., Gatorade) will be available to replace lost body fluids.

Cold Stress

Cold stress is a danger at low temperatures and when the wind-chill factor is low. Prevention of cold-related illnesses is a function of whole-body protection. Adequate insulating clothing must be used when the air temperature is below 40°F. In addition, reduced work periods followed by rest in a warm area may be necessary in extreme conditions. Training on the signs and symptoms of cold stress should prevent cold-related illnesses from occurring. The signs and symptoms of cold stress include the following:

- severe shivering;
- abnormal behavior;

- slowing of body movement;
- confusion;
- weakness;
- stumbling or repeated falling;
- inability to walk;
- collapse; and/or
- unconsciousness.

First aid requires removing the victim from the cold environment and seeking medical attention immediately. Also, prevent further body heat loss by covering the victim lightly with blankets. Do not cover the victim's face. If the victim is still conscious, administer hot drinks, and encourage activity, such as walking wrapped in a blanket.

APPENDIX C

Medical Data Form

MEDICAL DATA SHEET

This form must be completed by all onsite personnel prior to the commencement of activities, and shall be kept by the Site Health and Safety Officer during site activities. This form must be delivered to any attending physician when medical assistance is needed.

(This form should be typed or printed legibly.)

Site: _____

Name: _____ Home Telephone: _____
(Area Code/Telephone Number)

Address: _____

Date of Birth: _____ Height: _____ Weight: _____

Emergency Contact: _____ Telephone: _____
(Area Code/Telephone Number)

Drug Allergies or Other Allergies: _____

_____

Previous Illnesses or Exposures to Hazardous Substances: _____

_____

_____

Current Medication (Prescription and Non-Prescription): _____

_____

_____

Medical Restrictions: _____

_____

Name, Address and Telephone Number of Person Physician: _____

_____

APPENDIX D

Health and Safety Briefing/ Tailgate Meeting Form

HEALTH & SAFETY BRIEFING / TAILGATE MEETING FORM

Site Name / Location _____

Date: _____ Weather Forecast: _____

Names of Personnel Attending Briefing

_____ _____ _____

_____ _____ _____

_____ _____ _____

Planned Work

_____

_____

_____

Instrument Calibration: Instrument/Time/Cal. Gas/Cal. Concentration/Actual Concentration

_____

_____

_____

Items Discussed

_____

_____

_____

_____

_____

Work Permit Type and Applicable Restrictions

_____

_____

_____

Signatures of Attending Personnel

_____ _____ _____

_____ _____ _____

_____ _____ _____

APPENDIX E

Accident Report and Investigation Form

☐ Roux Associates, Inc. ☐ Remedial Engineering, P.C.
(Check applicable company name)

ACCIDENT REPORT

Joe Gentile, Corporate Health and Safety Manager
Cell: (610) 844-6911; Office: (856) 423-8800; Office FAX: (856) 423-3220; Home: (484) 373-0953

PART 1: ADMINISTRATIVE INFORMATION

Project #: 1575.0002y
Project Name: Kristal Auto Mall
Project Location (street address/city/state):
5200 Kings Highway, Brooklyn, New York

Client Corporate Name / Contact / Address / Phone #:

Immediate Verbal Notifications Given To:

Corporate Health & Safety	☐Yes	☐No
Office Health & Safety	☐Yes	☐No
Office Manager	☐Yes	☐No
Project Principal	☐Yes	☐No
Project Manager	☐Yes	☐No
Client Contact	☐Yes	☐No

REPORT STATUS (time due):
☐ Initial (24 hr) Date: _____
☐ Final (5-10 days) Date: _____

Accident Report Delivered To:

Corporate Health & Safety	☐Yes	☐No
Office Health & Safety	☐Yes	☐No
Office Manager	☐Yes	☐No
Project Principal	☐Yes	☐No
Project Manager	☐Yes	☐No

REPORT TYPE: ☐ Loss ☐ Near Loss Estimated Costs: $ _____

OSHA CASE # Assigned by Corporate Health & Safety if Applicable: _____

Corporate Health & Safety Confirmed Final Accident Report
☐Yes ☐No

DATE OF INCIDENT: _____

TIME INCIDENT OCCURRED: _____ ☐AM ☐PM

INCIDENT LOCATION – City, State, and Country (If outside U.S.A.)

INCIDENT TYPES: (Select most appropriate if Loss occurred.)
From lists below, please select the option that best categories the incident. When selecting an injury or illness, also indicate the severity level.

☐**INJURY** ☐**ILLNESS**

----------**Severity Level**----------

☐Fatality ☐First Aid ☐Medical
☐Restricted Work ☐Lost Time Treatment

OTHER INCIDENT TYPES

☐Spill / Release
Material involved: _____
Quantity (U.S. Gallons): _____

☐Misdirected Waste ☐Consent Order ☐NOV
☐Property Damage ☐Exceedance
☐Motor Vehicle ☐Fine / Penalty

ACTIVITY TYPE (Check most appropriate one.)

☐Decommissioning	☐Geoprobe	☐Sampling
☐Demolition	☐Motor Vehicle	☐System Start-up
☐Dewatering	☐Operations/	☐Trenching
☐Drilling	Maintenance	☐AST/UST Removal
☐Excavation	☐Pump/Pilot Test	☐Other_____
☐Gauging	☐Rigging/Lifting	

INJURY TYPE (Check all applicable.)

☐Abrasion	☐Occupational Illness
☐Amputation	☐Puncture
☐Burn	☐Rash
☐Cold/Heat Stress	☐Repetitive Motion
☐Inflammation	☐Sprain/Strain
☐Laceration	☐Other_____

BODY PART AFFECTED (Check all applicable.)

☐Respiratory	☐Shoulder	☐Face
☐Neck	☐Arm	☐Leg
☐Chest	☐Wrist	☐Knee
☐Abdomen	☐Hand/Fingers	☐Ankle
☐Groin	☐Eye	☐Foot/Toes
☐Back	☐Head	☐Other_____

I. PERSON(S) DIRECTLY / INDIRECTLY INVOLVED IN INCIDENT (Attach additional information as necessary/applicable.)

Name/Phone # of Each Person Directly/Indirectly Involved in Incident:	Designate: Roux/Remedial Employee; Roux/Remedial Subcontractor; Client Employee; Client Contractor; Third Party	As applicable, Current Occupation; Yrs in Current Occupation; Current Position; and Yrs in Current Position:	As applicable, Employer Name; Address; and Phone #:	As applicable, Supervisor Name; and Phone #:
1)				
2)				

II. PERSONS INJURED IN INCIDENT (Attach additional information as necessary/applicable.)

Name/Phone # of Each Person Injured in Incident:	Designate: Roux/Remedial Employee; Roux/Remedial Subcontractor; Client Employee; Client Contractor; Third Party	As applicable, Current Occupation; Yrs in Current Occupation; Current Position; and Yrs in Current Position:	As applicable, Employer Name; Address; and Phone #:	As applicable, Supervisor Name; and Phone #:	Description of Injury:
1)					
2)					

III. PROPERTY DAMAGED IN INCIDENT (Attach additional information as necessary/applicable.)

Property Damaged:	Property Location:	Owner Name, Address & Phone #:	Description of Damage:	Estimated Cost:
1)				$

2)				$

IV. WITNESSES TO INCIDENT (Attach additional information as necessary/applicable.)

Witness Name:	Address:	Phone #:
1)		
2)		

PART 2: WHAT HAPPENED AND INCIDENT DETAILS

PROVIDE FACTUAL DESCRIPTION OF INCIDENT (e.g., describe loss/near loss, injury, response / treatment).

I. AUTHORITIES/GOVERNMENTAL AGENCIES NOTIFIED (Attach additional information as necessary/applicable.)

Authority/Agency Notified:	Name/Phone #/Fax # of Person Notified:	Address of Person Notified:	Date & Time of Notification:	Exact Information Reported/Provided:

II. PUBLIC RESPONSES TO INCIDENT (if applicable)

Response/Inquiry By: (check one)	Entity Name:	Name/Phone # of Respondent/ Inquirer:	Address of Entity/Person:	Date & Time of Response/Inquiry:
☐Newspaper ☐Television ☐Community Group ☐Neighbors ☐Other _____				

Describe Response/Inquiry:

Roux/Remedial Response:

(Check all that apply.) (Attach photos, drawings, etc. to help illustrate the incident.)
ATTACHED INFORMATION: ☐Photo ☐Sketches ☐Vehicle Acord Form ☐Police Report ☐Other

Name(s) of person(s) who prepared Initial and Final Report:	**Title(s):**	**Phone number(s):**

PART 3: INVESTIGATION TEAM ANALYSIS

CONCLUSION: WHY IT HAPPENED (LIST CAUSAL FACTORS AND CORRESPONDING ROOT CAUSES)

(Root Causes: Lack of knowledge or skill, Doing the task according to procedures or acceptable practices takes more time or effort, Short-cuts or not following acceptable practices is reinforced or tolerated, Not following procedures or acceptable practices did not result in an accident, Lack of or inadequate procedures, Inadequate communications of expectations regarding procedures or acceptable practices, Inadequate tools or equipment, External Factors)

ROOT CAUSE(S) AND SOLUTION(S): HOW TO PREVENT INCIDENT FROM RECURRING

CAUSAL FACTOR	ROOT CAUSE		SOLUTION(S) [Must Match Root Cause(s)] #	SOLUTION(S) [Must Match Root Cause(s)] Solution(s)	PERSON RESPONSIBLE	AGREED DUE DATE	ACTUAL COMPLETION DATE
			1				
			2				
			3				

INVESTIGATION TEAM:

PRINT NAME	JOB POSITION	DATE	SIGNATURE

No One Gets Hurt!

APPENDIX F

Acord Form

ACORD™ AUTOMOBILE LOSS NOTICE

DATE

PRODUCER	COMPANY	MISCELLANEOUS INFO (Site & location code)
The Treiber Group, AJ Gallagher Risk Mgt. Svc. 377 Oak Street Garden City, NY 11530	Great Divide Insurance Company NAIC CODE: 25224	
	POLICY NUMBER: BAP1549799-10	REFERENCE NUMBER / CAT #

CODE: | SUB CODE: | AGENCY CUSTOMER ID:

EFFECTIVE DATE: 06/01/12 | EXPIRATION DATE: 06/01/13 | DATE OF ACCIDENT AND TIME | AM / PM | PREVIOUSLY REPORTED: YES / NO

INSURED

NAME AND ADDRESS

Roux Associates, Inc.
209 Shafter Street
Islandia, NY 11749

SOC SEC # OR FEIN: 11-2579482

RESIDENCE PHONE (A/C, No): NA

BUSINESS PHONE (A/C, No, Ext): 631-232-2600

CONTACT

CONTACT INSURED

NAME AND ADDRESS

Susan Sullivan, General Counsel
Roux Associates, Inc.
209 Shafter Street
Islandia, NY 11749

RESIDENCE PHONE (A/C, No):

BUSINESS PHONE (A/C, No, Ext): 631-232-2600

WHERE TO CONTACT: Fax Notice: 631-232-1525

WHEN TO CONTACT:

LOSS

LOCATION OF ACCIDENT (Include city & state)

AUTHORITY CONTACTED:

REPORT #:

VIOLATIONS/CITATIONS

DESCRIPTION OF ACCIDENT (Use separate sheet, if necessary)

POLICY INFORMATION

BODILY INJURY (Per Person)	BODILY INJURY (Per Accident)	PROPERTY DAMAGE	SINGLE LIMIT	MEDICAL PAYMENT	OTC DEDUCTIBLE	OTHER COVERAGE & DEDUCTIBLES (UM, no-fault, towing, etc)
					COLLISION DED	

UMBRELLA/EXCESS | UMBRELLA | EXCESS | CARRIER: | LIMITS: | AGGR | PER CLAIM/OCC | SIR/DED

INSURED VEHICLE

VEH #	YEAR	MAKE:	BODY TYPE:	PLATE NUMBER	STATE
		MODEL:	V.I.N.:		

OWNER'S NAME & ADDRESS | RESIDENCE PHONE (A/C, No): | BUSINESS PHONE (A/C, No, Ext):

DRIVER'S NAME & ADDRESS (Check if same as owner) | RESIDENCE PHONE (A/C, No): | BUSINESS PHONE (A/C, No, Ext):

RELATION TO INSURED (Employee, family, etc.)	DATE OF BIRTH	DRIVER'S LICENSE NUMBER	STATE	PURPOSE OF USE	USED WITH PERMISSION? YES / NO
Employee					

DESCRIBE DAMAGE	ESTIMATE AMOUNT	WHERE CAN VEHICLE BE SEEN?	WHEN CAN VEH BE SEEN?	OTHER INSURANCE ON VEHICLE

PROPERTY DAMAGED

DESCRIBE PROPERTY (If auto, year, make, model, plate #)

OTHER VEH/PROP INS? YES / NO

COMPANY OR AGENCY NAME:

POLICY #:

OWNER'S NAME & ADDRESS | RESIDENCE PHONE (A/C, No): | BUSINESS PHONE (A/C, No, Ext):

OTHER DRIVER'S NAME & ADDRESS (Check if same as owner) | RESIDENCE PHONE (A/C, No): | BUSINESS PHONE (A/C, No, Ext):

DESCRIBE DAMAGE	ESTIMATE AMOUNT	WHERE CAN DAMAGE BE SEEN?

INJURED

NAME & ADDRESS	PHONE (A/C, No)	PED	INS VEH	OTH VEH	AGE	EXTENT OF INJURY

WITNESSES OR PASSENGERS

NAME & ADDRESS	PHONE (A/C, No)	INS VEH	OTH VEH	OTHER (Specify)

REMARKS (Include adjuster assigned)

REPORTED BY	REPORTED TO	SIGNATURE OF INSURED	SIGNATURE OF PRODUCER

Applicable in Arizona

For your protection, Arizona law requires the following statement to appear on this form. Any person who knowingly presents a false or fraudulent claim for payment of a loss is subject to criminal and civil penalties.

Applicable in Arkansas, District of Columbia, Kentucky, Louisiana, Maine, Michigan, New Jersey, New Mexico, Pennsylvania and Virginia

Any person who knowingly and with intent to defraud any insurance company or another person, files a statement of claim containing any materially false information, or conceals for the purpose of misleading, information concerning any fact, material thereto, commits a fraudulent insurance act, which is a crime, subject to criminal prosecution and civil penalties. In D.C., LA, ME and VA insurance benefits may also be denied.

Applicable in California

Any person who knowingly files a statement of claim containing any false or misleading information is subject to criminal and civil penalties.

Applicable in Colorado

It is unlawful to knowingly provide false, incomplete, or misleading facts or information to an insurance company for the purpose of defrauding or attempting to defraud the company. Penalties may include imprisonment, fines, denial of insurance, and civil damages. Any insurance company or agent of an insurance company who knowingly provides false, incomplete, or misleading facts or information to a policy holder or claimant for the purpose of defrauding or attempting to defraud the policy holder or claimant with regard to a settlement or award payable from insurance proceeds shall be reported to the Colorado Division of Insurance within the Department of Regulatory Agencies.

Applicable in Florida and Idaho

Any person who knowingly and with the intent to injure, Defraud, or Deceive any Insurance Company Files a Statement of Claim Containing any False, Incomplete or Misleading information is Guilty of a Felony.*

* In Florida - Third Degree Felony

Applicable in Hawaii

For your protection, Hawaii law requires you to be informed that presenting a fraudulanet claim for payment of a loss or benefit is a crime punishable by fines or imprisonment , or both.

Applicable in Indiana

A person who knowingly and with intent to defraud an insurer files a statement of claim containing any false, incomplete, or misleading information commits a felony.

Applicable in Minnesota

A person who files a claim with intent to defraud or helps commit a fraud against an insurer is guilty of a crime.

Applicable in Nevada

Pursuant to NRS 686A.291, any person who knowingly and willfully files a statement of claim that contains any false, incomplete or misleading information concerning a material fact is guilty of a felony.

Applicable in New Hampshire

Any person who, with purpose to injure, defraud or deceive any insurance company, files a statement of claim containing any false, incomplete or misleading information is subject to prosecution and punishment for insurance fraud, as provided in RSA 638:20.

Applicable in New York

Any person who knowingly makes or knowingly assists, abets, solicits or conspires with another to make a false report of the theft, destruction, damage or conversion of any motor vehicle to a law enforcement agency, the Department of Motor Vehicles or an insurance company, commits a fraudulent insurance act, which is a crime, and shall also be subject to a civil penalty not to exceed five thousand dollars and the value of the subject motor vehicle or stated claim for each violation.

Applicable in Ohio

Any person who, with intent to defraud or knowing that he/she is facilitating a fraud against an insurer, submits an application or files a claim containing a false or deceptive statement is guilty of insurance fraud.

Applicable in Oklahoma

WARNING: Any person who knowingly and with intent to injure, defraud or deceive any insurer, makes any claim for the proceeds of an insurance policy containing any false, incomplete or misleading information is guilty of a felony.

APPENDIX G

OSHA 300

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

Log of Work-Related Injuries and Illnesses

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

Year _____

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

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

Form approved OMB no. 1218-0176

Establishment name _____

City _____ State _____

Identify the person			Describe the case			Classify the case											
						CHECK ONLY ONE box for each case based on the most serious outcome for that case:				Enter the number of days the injured or ill worker was:		Check the "injury" column or choose one type of illness:					
(A) Case No.	(B) Employee's Name	(C) Job Title (e.g., Welder)	(D) Date of injury or onset of illness (mo./day)	(E) Where the event occurred (e.g. Loading dock north end)	(F) Describe injury or illness, parts of body affected, and object/substance that directly injured or made person ill (e.g. Second degree burns on right forearm from acetylene torch)	Death	Days away from work	Remained at work		Away From Work (days)	On job transfer or restriction (days)	(M) Injury	Skin Disorder	Respiratory Condition	Poisoning	Hearing Loss	All other illnesses
								Job transfer or restriction	Other record-able cases								
						(G)	(H)	(I)	(J)	(K)	(L)	(1)	(2)	(3)	(4)	(5)	(6)
					Page totals	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*

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

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

Injury (1) | Skin Disorder (2) | Respiratory Condition (3) | Poisoning (4) | Hearing Loss (5) | All other illnesses (6)

KTW2158.0001Y.104/HSP-APG

APPENDIX H

Job Safety and
Health Protection Poster

You Have a Right to a Safe and Healthful Workplace.

IT'S THE LAW!

- You have the right to notify your employer or OSHA about workplace hazards. You may ask OSHA to keep your name confidential.
- You have the right to request an OSHA inspection if you believe that there are unsafe and unhealthful conditions in your workplace. You or your representative may participate in the inspection.
- You can file a complaint with OSHA within 30 days of discrimination by your employer for making safety and health complaints or for exercising your rights under the *OSH Act*.
- You have a right to see OSHA citations issued to your employer. Your employer must post the citations at or near the place of the alleged violation.
- Your employer must correct workplace hazards by the date indicated on the citation and must certify that these hazards have been reduced or eliminated.
- You have the right to copies of your medical records or records of your exposure to toxic and harmful substances or conditions.
- Your employer must post this notice in your workplace.

The *Occupational Safety and Health Act of 1970 (OSH Act)*, P.L. 91-596, assures safe and healthful working conditions for working men and women throughout the Nation. The Occupational Safety and Health Administration, in the U.S. Department of Labor, has the primary responsibility for administering the *OSH Act*. The rights listed here may vary depending on the particular circumstances. To file a complaint, report an emergency, or seek OSHA advice, assistance, or products, call 1-800-321-OSHA or your nearest OSHA office: • Atlanta (404) 562-2300 • Boston (617) 565-9860 • Chicago (312) 353-2220 • Dallas (214) 767-4731 • Denver (303) 844-1600 • Kansas City (816) 426-5861 • New York (212) 337-2378 • Philadelphia (215) 861-4900 • San Francisco (415) 975-4310 • Seattle (206) 553-5930. Teletypewriter (TTY) number is 1-877-889-5627. To file a complaint online or obtain more information on OSHA federal and state programs, visit OSHA's website at **www.osha.gov**. If your workplace is in a state operating under an OSHA-approved plan, your employer must post the required state equivalent of this poster.

1-800-321-OSHA

www.osha.gov

U.S. Department of Labor • Occupational Safety and Health Administration • OSHA 3165