HARLEM PARK

1800 PARK AVENUE

NEW YORK COUNTY

NEW YORK, NEW YORK

SITE MANAGEMENT PLAN

NYSDEC Site Number: C231041

Prepared for:

Harlem Park Acquisition LLC
30 West 21st Street, 11th Floor
New York, New York 10010

Prepared by:

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Revisions to Final Approved Site Management Plan:

Revision No.	Date Submitted	Summary of Revision	NYSDEC Approval Date

SEPTEMBER 2016

CERTIFICATION STATEMENT

I, Arnold F. Fleming, PE, certify that I am currently a NYS registered professional engineer and that this Site Management 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).

050411 — NYS Professional Engineer #

9/13/16 — Date

Signature

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List of Acronyms

AS	Air Sparging
ASP	Analytical Services Protocol
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CAMP	Community Air Monitoring Plan
C/D	Construction and Demolition
CFR	Code of Federal Regulation
CLP	Contract Laboratory Program
COC	Certificate of Completion
CO2	Carbon Dioxide
CP	Commissioner Policy
DER	Division of Environmental Remediation
EC	Engineering Control
ECL	Environmental Conservation Law
ELAP	Environmental Laboratory Approval Program
ERP	Environmental Restoration Program
EWP	Excavation Work Plan
GHG	Green House Gas
GWE&T	Groundwater Extraction and Treatment
HASP	Health and Safety Plan
IC	Institutional Control
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYCRR	New York Codes, Rules and Regulations
O&M	Operation and Maintenance
OM&M	Operation, Maintenance and Monitoring
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
PID	Photoionization Detector
PRP	Potentially Responsible Party
PRR	Periodic Review Report
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RAO	Remedial Action Objective
RAWP	Remedial Action Work Plan
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RP	Remedial Party
RSO	Remedial System Optimization
SAC	State Assistance Contract
SCG	Standards, Criteria and Guidelines

SCO	Soil Cleanup Objective
SMP	Site Management Plan
SOP	Standard Operating Procedures
SOW	Statement of Work
SPDES	State Pollutant Discharge Elimination System
SSD	Sub-slab Depressurization
SVE	Soil Vapor Extraction
SVI	Soil Vapor Intrusion
TAL	Target Analyte List
TCL	Target Compound List
TCLP	Toxicity Characteristic Leachate Procedure
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VCA	Voluntary Cleanup Agreement
VCP	Voluntary Cleanup Program

ES EXECUTIVE SUMMARY

The following provides a brief summary of the controls implemented for the Site, as well as the inspections, monitoring, maintenance and reporting activities required by this Site Management Plan:

Site Identification: Harlem Park, 1800 Park Avenue, New York, NY
(BCP No. C231041)

Institutional Controls:	1. The property may be used for restricted residential, commercial and industrial use;	
	2. Environmental Easement	
	3. All ECs must be inspected at a frequency and in a manner defined in the SMP.	
	4. The potential for soil vapor intrusion for any buildings developed on the site must be evaluated, including provision for implementing actions recommended to address exposures related to soil vapor intrusion.	
Engineering Controls:	1. Cover system	
Inspections:		Frequency
Cover inspection		Annually
Monitoring:		
Soil Vapor Intrusion		Prior to occupancy of any buildings constructed on-site
Reporting:		
Periodic Review Report		Annually

Further descriptions of the above requirements are provided in detail in the latter sections of this Site Management Plan.

1.0 INTRODUCTION

1.1 General

This Site Management Plan (SMP) is a required element of the remedial program for the Harlem Park Site located in New York, New York (hereinafter referred to as the "Site"). See Figure 1. The Site is currently in the New York State (NYS) Brownfield Cleanup Program (BCP) Site No. C231041 which is administered by New York State Department of Environmental Conservation (NYSDEC).

On January 20, 2005, 1800 Park Avenue LLC entered into a Brownfield Cleanup Agreement (BCA) with the NYSDEC to remediate the site as a Volunteer. On June 23, 2006, the BCA was amended to add CV Harlem Park LLC as a Volunteer to the BCA. On June 6, 2013, the BCA was amended a second time to add Harlem Park Acquisition LLC as a Volunteer to the BCA. Harlem Park Acquisition LLC acquired the site by deed dated September 30, 2013. On July 8, 2015, the BCA was amended a third time to reflect the merger of the five tax lots that made up the property into a single lot. A figure showing the site location and boundaries of this site is provided in Figure 2. The boundaries of the site are more fully described in the metes and bounds site description that is part of the Environmental Easement provided in Appendix C.

After completion of the remedial work, some contamination was left at this site, which is hereafter referred to as "remaining contamination". Institutional and Engineering Controls (ICs and ECs) have been incorporated into the site remedy to control exposure to remaining contamination to ensure protection of public health and the environment. An Environmental Easement granted to the NYSDEC, and recorded with the New York City Register, requires compliance with this SMP and all ECs and ICs placed on the site.

This SMP was prepared to manage remaining contamination at the site until the Environmental Easement is extinguished in accordance with ECL Article 71, Title 36.

This plan has been approved by the NYSDEC, and compliance with this plan is required by the grantor of the Environmental Easement and the grantor's successors and assigns. This SMP may only be revised with the approval of the NYSDEC.

It is important to note that:

- This SMP details the site-specific implementation procedures that are required by the Environmental Easement. Failure to properly implement the SMP is a violation of the Environmental Easement, which is grounds for revocation of the Certificate of Completion (COC);

- Failure to comply with this SMP is also a violation of Environmental Conservation Law, 6NYCRR Part 375 and the BCA Index# W2-1037-04-12, Site # C231041 for the site, and thereby subject to applicable penalties.

All reports associated with the site can be viewed by contacting the NYSDEC or its successor agency managing environmental issues in New York State. A list of contacts for persons involved with the site is provided in Appendix A of this SMP.

This SMP was prepared by Arnold F. Fleming P.E., on behalf of Harlem Park Acquisition LLC, in accordance with the requirements of the NYSDEC's DER-10 ("Technical Guidance for Site Investigation and Remediation"), dated May 3, 2010, and the guidelines provided by the NYSDEC. This SMP addresses the means for implementing the ICs and/or ECs that are required by the Environmental Easement for the site.

1.2 Revisions

Revisions to this plan will be proposed in writing to the NYSDEC's project manager. Revisions will be necessary upon, but not limited to, the following occurring: a change in media monitoring requirements, upgrades to or shut-down of a remedial system, post-remedial removal of contaminated sediment or soil, or other significant change to the site conditions. In accordance with the Environmental Easement for the site, the NYSDEC will provide a notice of any approved changes to the SMP, and append these notices to the SMP that is retained in its files.

1.3 Notifications

Notifications will be submitted by the property owner to the NYSDEC, as needed, in accordance with NYSDEC's DER – 10 for the following reasons:

- 60-day advance notice of any proposed changes in site use that are required under the terms of the BCA, 6NYCRR Part 375 and/or Environmental Conservation Law.
- 7-day advance notice of any field activity associated with the remedial program.
- 15-day advance notice of any proposed ground-intrusive activity pursuant to the Excavation Work Plan.
- Notice within 48-hours of any damage or defect to the foundation, structures or EC that reduces or has the potential to reduce the effectiveness of an EC, and likewise, any action to be taken to mitigate the damage or defect.
- Verbal notice by noon of the following day of any emergency, such as a fire; flood; or earthquake that reduces or has the potential to reduce the effectiveness of ECs in place at the site, with written confirmation within 7 days that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.
- Follow-up status reports on actions taken to respond to any emergency event requiring ongoing responsive action submitted to the NYSDEC within 45 days describing and documenting actions taken to restore the effectiveness of the ECs.

Any change in the ownership of the site or the responsibility for implementing this SMP will include the following notifications:

- At least 60 days prior to the change, the NYSDEC will be notified in writing of the proposed change. This will include a certification that the prospective purchaser/Remedial Party has been provided with a copy of the BCA, and all approved work plans and reports, including this SMP.
- Within 15 days after the transfer of all or part of the site, the new owner's name, contact representative, and contact information will be confirmed in writing to the NYSDEC.

Table A below includes contact information for the above notification. The information on this table will be updated as necessary to provide accurate contact information. A full listing of site-related contact information is provided in Appendix A.

Table A: Notifications*

Name	**Contact Information**
NYSDEC Project Manager Shaun Bollers	(718) 482-4096 shaun.bollers@dec.ny.gov
NYSDEC Chief – Superfund and Brownfield Cleanup Section Region 2 Jane O'Connell	(718) 482-4599 Jane.oconnell@dec.ny.gov
NYSDEC Site Control Kelly Lewandowski	(518) 402-9553 kelly.lewandowski@dec.ny.gov

* Note: Notifications are subject to change and will be updated as necessary.

2.0 SUMMARY OF PREVIOUS INVESTIGATIONS AND REMEDIAL ACTIONS

2.1 Site Location and Description

The site is located in New York, New York County, New York and is identified as Block 1749 and Lot 33 (formerly lots 31, 33, 35, 40 and 43) on the New York City Tax Map (see Figure 2). The site is an approximately 0.83-acre area and is bounded by 125th Street to the north, Park Avenue to the east, 124th Street to the south, and mixed use properties to the west including New York College of Podiatric Medicine as seen in Figure 2. The boundaries of the site are more fully described in Appendix C – Environmental Easement. The owner of the site parcel at the time of issuance of this SMP is Harlem Park Acquisition, LLC.

2.2 Physical Setting

2.2.1 Land Use

The Site consists of an excavated lot with a 2-foot temporary site cover and a construction fence around it. The Site is zoned C4-7 for commercial use as a special purpose district and is currently vacant. It is contemplated that a building with basement will be constructed on the Site in the future.

The properties adjoining the Site and in the neighborhood surrounding the Site primarily include residential and commercial properties. The properties immediately south of the Site include residential properties; the properties immediately north of the Site include commercial properties; the properties immediately east of the Site include an elevated railroad and commercial properties; and the properties to the west of the Site include commercial properties.

2.2.2 Geology

The Site is underlain by man-made fill to a depth of approximately 20 feet below grade, glacial lake deposits and till, and bedrock. Published geologic data indicate that the bedrock consists of Ordovician/Cambrian age metamorphic rock. In the vicinity of the Site, bedrock consists of Manhattan Formation (schist) surrounded by a larger area underlain by the Inwood Formation (marble). The groundwater table is found at approximately 14 to 16 feet below grade and the gradient is toward the southwest.

A geologic cross section is shown in Figure 3. Site specific boring logs are provided in Appendix D.

2.2.3 Hydrogeology

Based on historical data, groundwater is generally encountered at a depth of 14 to 17 feet below grade. Based upon peizometric data collected by FLS, the groundwater gradient is to the southwest.

A groundwater contour map is shown in Figure 4. Groundwater monitoring wells installed during the RI were destroyed during construction.

2.3 Investigation and Remedial History

The following narrative provides a remedial history timeline and a brief summary of the available project records to document key investigative and remedial milestones for the Site. Full titles for each of the reports referenced below are provided in Section 8.0 - References.

Several RIs were performed to characterize the nature and extent of contamination at the Site. The following reports were completed prior to and subsequent to entry into the BCP and describe in detail the results of these previous investigations:

- *Phase I Environmental Site Assessment (Professional Services Industries, Inc. July 2003)*
- *Geotechnical Report Harlem Hotel (MRCE February 2004)*
- *Remedial Investigation Report (FLS August 2005)*
- *Cross Sections of Soil Waste Streams (FLS April 2009)*
- *Supplemental Remedial Investigation Report (FLS July 2011)*

2.3.1 Soil Analytical Results

The soil analytical results for samples collected during the RI were compared to the Track 4 Site-specific Soil Cleanup Objectives (SSSCOs) which are provided in Table 1. A summary of the soil analytical results and comparison to the Track 4 SSCOS and the 6 NYCRR Part 375 Protection of Groundwater (PGSCOs) is provided in Tables 2. Figure 5 shows the sampling plan and Figure 6 shows the locations of hotspots identified during the RIs.

Several petroleum related volatile organic compounds (VOCs) were detected in the soils during the RIs. The VOCs detected in soils include 1,2,4-trimethylbenzene, 1,3,5-trimethylebenzene, ethyl benzene, isopropylbenzene, xylenes, naphthalene, n-butylbenzene, n-propylbenzene, p-isopropyltoluene, sec-butylbenzene and toluene. In addition to the petroleum related VOCs detected in analytical results, evidence of petroleum contamination was identified during the in-field screening conducted during the RIs. Elevated organic vapors, strong petroleum odors and black staining were identified at the groundwater table interface in borings in several areas of the Site. GC-fingerprint analysis confirmed that the petroleum contamination was Number 6 fuel oil, however, a source could not be identified during the RIs. The concentration of VOCs exceeded the Track 4 SSCOs in Grid B2-I.

Several semi-volatile organic compounds (SVOCs) were detected in the soil at the Site, however, none were detected at concentrations exceeding the Track 4 SSCOs. A few SVOCs in soil are most likely related to the No. 6 fuel oil contamination including

naphthalene and 2-methylnaphthalene. The other SVOCs detected in soil consist of polycyclic aromatic hydrocarbons (PAHs) and are typically indicative of urban fill. These include benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, indeno(1,2,3-cd)pyrene, chrysene, fluoranthene, fluorene, phenanthrene and pyrene. The concentration of total SVOCs exceeded the Track 4 SSCOs in Grid D2-I.

Several metals were detected in the Site soils during the RIs which is indicative of urban fill material. Lead was detected in the shallow soil in the northeast corner of the Site (soil boring HH-5) and several other areas in the eastern portion of the Site (Grids A1-I, A2-III, A3-III and B2-I) at concentrations exceeding the Track 4 SSCOs. Mercury was detected in two areas in the western portion of the Site (Grids D-II and D-III). Since lead was also detected in groundwater at the Site at concentrations greater than TOGS standard, the PGSCOs are applied to lead detected in soil. The concentration of lead exceeded the PGSCOs in the shallow soil samples from soil borings HH3 and HH5.

No polychlorinated biphenyls (PCBs) or pesticides were detected at concentrations exceeding either the Track 4 SSCOS or the PGSCOs.

Soil samples were also analyzed for Toxicity Characteristic Leaching Procedure (TCLP) metals. The TCLP is an analytical method that simulates sanitary landfill contaminant leaching in waste samples. As contained in the Code of Federal Regulations (40 CFR 261.24), the Maximum Concentrations of Contaminants for the TCLP Limits are an appropriate comparison for determining if a material is a “toxicity characteristic” hazardous waste. Hazardous levels of lead were found in multiple areas throughout eastern portion of the Site (Grids A1-I, B1-I, B2-I and B4-I through B4-IV).

2.3.2 Groundwater Analytical Results

Groundwater analytical results were compared to the Division of Water Technical and Operational Guidance Series 1.1.1 Ambient Water Quality Standards and Guidance

Values and Groundwater Effluent Limitations – Class GA (TOGS). A summary of the groundwater analytical results and comparison to TOGS standards is provided in Tables 7 through 10.

The laboratory analytical results for the groundwater samples did not detect VOCs, SVOCs, pesticides or PCBs at concentrations exceeding TOGS. Several metals were detected in the groundwater samples at levels greater than TOGS standards. These include iron, manganese, lead and sodium.

2.4 Remedial Action Objectives

The Remedial Action Objectives (RAOs) for the Site as listed in the Decision Document dated May 2013 are as follows:

Groundwater

RAOs for Public Health Protection

- Prevent contact with, or inhalation of, volatiles from contaminated groundwater.

RAOs for Environmental Protection

- Remove the source of ground or surface water contamination.

Soil

RAOs for Public Health Protection

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

RAOs for Environmental Protection

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

2.5 Remaining Contamination

Remedial activities completed at the Site were conducted in accordance with the NYSDEC-approved RAWP for the Harlem Park site (May 2013).

The following sub-sections intent to summarize the contamination remaining at the Site after remedial actions were implemented so environmental conditions can be anticipated.

2.5.1 Soil

As part of the Site remediation, soils from all hotspot grids were excavated to 13 ft.-bgs, including the perimeter hotspot grids where soil were excavated to 13 ft.-bgs and backfilled with soil meeting re-use criteria from the Site to maintain the desired slope along the perimeter of the Site. In addition to the soil removed for remedial purposes, the remainder of the Site was excavated to approximately 13 ft.-bgs for redevelopment purposes, with the exception of the perimeter of the Site. Soil around the perimeter of the Site along the north, south and east property boundaries was left in place in order to achieve a 12-foot offset from the property boundary and a 1 to 1 slope to the bottom of excavation.

Remaining contamination is documented by the results of the endpoint samples collected at the bottom of the excavation, at a frequency of one per every 900 square feet, and soil samples collected during the RI below the excavation depth (13 ft.-bgs). Please note that sidewall samples were collected, from perimeter hotspot grids at a frequency of one per every 30 linear feet, to document conditions that will remain at the exterior boundary of the Site excavation.

No VOCs were detected above the Site Specific SCOs. Only four samples show one or a few VOCs concentrations (i.e. 1,2-dichloroethane, 2-butanone (MEK), acetone, methylene chloride and vinyl chloride) above Track 1, unrestrictive use, SCOs, but below SSSCOs.

No SVOCs were detected above the Site Specific SCOs. Only eight samples show one or a few SVOCs (i.e. benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene) detected at a concentrations above Track 1, unrestrictive use, SCOs, but below the SSSCOs.

Three samples [HH10-63, HH15-18 and EP-A1-I(SW-E-11)] show metals above the Site Specific SCOs (mercury: 3.01 mg/kg; selenium: 419 mg/kg, and lead: 2570 mg/kg, respectively). Samples HH10-63 and HH15-18 were collected in August 2004, below excavation depth, as part of the RI. Sample EP-A1-I(SW-E-11) is a sidewall sample and documents conditions at the exterior boundary of the Site excavation.

No pesticides were detected above the Site Specific SCOs. Six samples show one or few pesticides (i.e. dieldrin, 4,4'-DDD, 4,4'-DDE and 4,4'-DDT) detected at a concentrations above Track 1, unrestrictive use, SCOs, but below the SSSCOs.

All endpoint samples were analyzed by Accutest Laboratories, a NYSDOH Environmental Laboratory Accreditation Program, for VOCs by U. S. Environmental Protection Agency (EPA) Method 8260; SVOC by EPA Method 8270; metals by EPA Methods 6010, SW846 3060/7196 and SW846 7471A; pesticides by EPA Method 8081; and PCB by EPA Method 8082. Tables summarizing the results of endpoint and RI samples (collected below excavation depth) are included as Tables 3 through 6. Location of RI and endpoint soil samples that exceed the Unrestricted Use SCOs and the Site Specific SCOs after completion of remedial action are depicted in Figure 9.

The achieved cleanup objectives are consistent with the goals of the BCA and for the intended use of the Site.

2.5.2 Groundwater

The source for the metals identified in groundwater during the remedial investigation was removed by fully excavating soils in the hotspot grids. The achieved cleanup objectives are consistent with the goals of the BCA and for the intended use of the Site.

2.5.3 Soil Vapor Intrusion

No soil vapor samples were collected during the RI.

As part of this SMP, the potential for soil vapor intrusion (i.e. due to remaining VOC concentrations above Track 1 SCO) will be addressed. Soil vapor sampling will be conducted prior to occupancy of any future on-site buildings.

Because there is no on-site building, inhalation of site contaminants in indoor air due to soil vapor intrusion does not represent a concern for the site in its current condition. However, the potential exists for the inhalation of site contaminants due to soil vapor intrusion for any future on-site development.

3.0 INSTITUTIONAL AND ENGINEERING CONTROL PLAN

3.1 General

Since remaining contamination exists at the site, Institutional Controls (ICs) and Engineering Controls (ECs) are required to protect human health and the environment. This IC/EC Plan describes the procedures for the implementation and management of all IC/ECs at the site. The IC/EC Plan is one component of the SMP and is subject to revision by the NYSDEC.

This plan provides:

- A description of all IC/ECs on the site;
- The basic implementation and intended role of each IC/EC;
- A description of the key components of the ICs set forth in the Environmental Easement;
- A description of the controls to be evaluated during each required inspection and periodic review;
- A description of plans and procedures to be followed for implementation of IC/ECs, such as the implementation of the Excavation Work Plan (EWP) (as provided in Appendix B) for the proper handling of remaining contamination that may be disturbed during maintenance or redevelopment work on the site; and
- A provision for evaluation of the potential for soil vapor intrusion for any buildings developed on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
- Any other provisions necessary to identify or establish methods for implementing the IC/ECs required by the site remedy, as determined by the NYSDEC.

3.2 Institutional Controls

A series of ICs is required by the RAWP and Decision Document to: (1) implement, maintain and monitor Engineering Control systems; (2) prevent future exposure to remaining contamination; and, (3) limit the use and development of the site to restricted residential, commercial and industrial uses only. Adherence to these ICs on the site is required by the Environmental Easement and will be implemented under this SMP. ICs identified in the Environmental Easement may not be discontinued without an amendment to or extinguishment of the Environmental Easement. The IC boundaries are shown on Figure 2. These ICs are:

- The property may be used for: restricted residential, commercial and industrial uses;
- All ECs must be operated and maintained as specified in this SMP;
- All ECs must be inspected at a frequency and in a manner defined in the SMP.
- The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the New York City Department of Health and Mental Hygiene to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the Department.
- Soil vapor and other environmental or public health monitoring must be performed as defined in this SMP;
- Data and information pertinent to site management must be reported at the frequency and in a manner as defined in this SMP;
- All future activities that will disturb remaining contaminated material must be conducted in accordance with this SMP;
- Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in this SMP;
- Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical component of the remedy shall be performed as defined in this SMP;
- Access to the site must be provided to agents, employees or other representatives of the State of New York with reasonable prior notice to the

property owner to assure compliance with the restrictions identified by the Environmental Easement.

- The potential for vapor intrusion must be evaluated for any buildings developed in the area within the IC boundaries noted on Figure 10, and any potential impacts that are identified must be monitored or mitigated; and

- Vegetable gardens and farming on the site are prohibited.

3.3 Engineering Controls

3.3.1 Cover

Exposure to remaining contamination at the site is prevented by a cover system placed over the site. The components of the cover system will be comprised of a minimum of 24 inches of clean soil, asphalt pavement, concrete-covered sidewalks, and/or concrete building slabs. At the time of the publication of this SMP, this cover system is comprised of a minimum of 2 feet of recycled concrete aggregate (RCA). Figure 8 presents the location of the cover system and applicable demarcation layers. The Excavation Work Plan (EWP) provided in Appendix B outlines the procedures required to be implemented in the event the cover system is breached, penetrated or temporarily removed, and any underlying remaining contamination is disturbed. Procedures for the inspection of this cover are provided in the Monitoring and Sampling Plan included in Section 4.0 of this SMP. Any work conducted pursuant to the EWP must also be conducted in accordance with the procedures defined in the Health and Safety Plan (HASP) prepared for the site, provided in Appendix E, and associated Community Air Monitoring Plan (CAMP) prepared for the site and provided in Appendix F.

The site cover system is a permanent engineering control and the quality and integrity of this system will be inspected at defined, regular intervals.

It is contemplated that a building with basement will be constructed on the Site in the future. The construction of the building will result in a modification to the site cover

system, which will consist of the concrete building slab. When complete, this SMP will be revised to reflect the engineering controls as built.

4.0 MONITORING AND SAMPLING PLAN

4.1 General

This Monitoring Plan describes the measures for evaluating the overall performance and effectiveness of the remedy. This Monitoring Plan may only be revised with the approval of the NYSDEC.

This Monitoring and Sampling Plan describes the methods to be used for:

- Sampling and analysis of all appropriate media (e.g., groundwater, indoor air, soil vapor, soils);
- Assessing compliance with applicable NYSDEC standards, criteria and guidance (SCGs), particularly groundwater standards and Part 375 SCOs for soil; and
- Evaluating site information periodically to confirm that the remedy continues to be effective in protecting public health and the environment;

To adequately address these issues, this Monitoring and Sampling Plan provides information on:

- Sampling locations, protocol and frequency;
- Information on all designed monitoring systems;
- Analytical sampling program requirements;
- Annual inspection and periodic certification.

Reporting requirements are provided in Section 7.0 of this SMP.

4.2 Site-wide Inspection

Site-wide inspections will be performed at a minimum of once per year. Modification to the frequency or duration of the inspections will require approval from the NYSDEC. Site-wide inspections will also be performed after all severe weather conditions that may affect ECs or monitoring devices. During these inspections, an inspection form will be completed as provided in Appendix G – Site Management Forms. The form will compile sufficient information to assess the following:

- Compliance with all ICs, including site usage;
- An evaluation of the condition and continued effectiveness of ECs;
- General site conditions at the time of the inspection;
- The site management activities being conducted including, where appropriate, confirmation sampling and a health and safety inspection; and
- Confirm that site records are up to date.

Inspections of all remedial components installed at the site will be conducted. A comprehensive site-wide inspection will be conducted and documented according to the SMP schedule, regardless of the frequency of the Periodic Review Report. The inspections will determine and document the following:

- Whether ECs continue to perform as designed;
- If these controls continue to be protective of human health and the environment;
- Compliance with requirements of this SMP and the Environmental Easement;
- Achievement of remedial performance criteria; and
- If site records are complete and up to date; and

Reporting requirements are outlined in Section 7.0 of this plan.

Inspections will also be performed in the event of an emergency. If an emergency, such as a natural disaster or an unforeseen failure of any of the ECs occurs that reduces or has the potential to reduce the effectiveness of ECs in place at the site, verbal notice to the NYSDEC must be given by noon of the following day. In addition, an inspection of the site will be conducted within 5 days of the event to verify the effectiveness of the IC/ECs implemented at the site by a qualified environmental professional, as determined by the NYSDEC. Written confirmation must be provided to the NYSDEC within 7 days of the event that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.

4.3 Soil Vapor Intrusion Sampling

Soil vapor sampling will be performed prior to occupancy of any future on-site buildings to assess the performance of the remedy. Modification to the frequency or sampling requirements will require approval from the NYSDEC. Please note that at the time of the publication of this SMP, no buildings has been developed at the Site.

The proposed network of on-site soil vapor intrusion sample locations will be designed based on the following criteria:

- Existing environmental data (e.g., RI and endpoint soil data)
- Locations of potential surface features (e.g., Site building) and subsurface characteristics (e.g., soil stratigraphy, buried structures, utility corridors, or clay lenses)
- Purpose of the sampling
- Depth remaining impacts
- Depth to groundwater
- Access

The potential for soil vapor intrusion will be evaluated via collection of six sub-slab soil vapor samples from underneath the foundation slab, six indoor air samples at each sub-slab soil vapor sampling location and one outdoor ambient air sample for background comparison.

Temporary sub-slab soil vapor points will be installed using a handheld rotary hammer drill. Prior to vapor sample collection, the annulus around the sub-slab soil vapor point will be sealed with a clay seal to prevent the infiltration of ambient air into the sampling point.

All sub-slab soil vapor points will undergo a "tracer gas" test to verify the integrity of the soil vapor seals. One of the three tracer gas techniques described in the NYSDOH Soil Vapor Intrusion Guidance will be used. Once the sampling tube has been properly installed and sealed, the soil vapor in the tube and drill rod tip will be purged of three volumes of the sample probe and tubing using a PID attached to the end of the sampling tube. Both the vapor and indoor air samples will be collected using Summa Canisters over an 8-hour sampling period, which is consistent with the workplace conditions at the Norampac property. The Summa Canisters will have a regulator set to collect the sample at a rate not to exceed 0.2 liters per minute.

Samples will be analyzed by a NYSDOH-Environmental Laboratory Approval Program (ELAP) certified laboratory, for the complete list of USEPA TO-15 volatile organic compounds by methods that can achieve minimum reporting limits of 1 microgram per cubic meter (µg/m3) or less to allow comparison of the result to background levels. Note that, for indoor air (and ambient air) samples, an analytical reporting limit of 0.25 µg/m3 or less is required for trichloroethene (TCE) and carbon tetrachloride.

Table B summarizes the sample location and rational, analytical parameters, laboratory detection limits and minimum reporting limits to be achieved by the ELAP-certified laboratory. Figure 10 shows the locations of the proposed soil vapor sample locations. Of note, proposed sampling locations will not be finalized until design of the future building is completed.

Table B: Soil Vapor Sampling

Sampling Location	Sample Location Rationale	Analytical Parameters	Minimum Reporting Limits to be achieved by the ELAP-certified laboratory.
Grid E1	Former UST location	VOCs (EPA TO-15)	<1 µg/m3 <0.25 µg/m3 for TCE & carbon tetrachloride
Grid B-2I	Remedial hot spot	VOCs	<1 µg/m3

	excavation	(EPA TO-15)	<0.25 µg/m3 for TCE & carbon tetrachloride
Grid D-1IV	VOC sample (HH1-14) above UUSCOs	VOCs (EPA TO-15)	<1 µg/m3 <0.25 µg/m3 for TCE & carbon tetrachloride
Grid E-2II	VOC sample (HH2-15) above UUSCOs	VOCs (EPA TO-15)	<1 µg/m3 <0.25 µg/m3 for TCE & carbon tetrachloride
Grid C-2III	VOC sample (HH3-14.5) above UUSCOs	VOCs (EPA TO-15)	<1 µg/m3 <0.25 µg/m3 for TCE & carbon tetrachloride
Grid C-3I	VOC sample (HH6-14.5) above UUSCOs	VOCs (EPA TO-15)	<1 µg/m3 <0.25 µg/m3 for TCE & carbon tetrachloride
Outdoor	Background data	VOCs (EPA TO-15)	<1 µg/m3 <0.25 µg/m3 for TCE & carbon tetrachloride

The sampling frequency may only be modified with the approval of the NYSDEC. This SMP will be modified to reflect changes in sampling plans approved by the NYSDEC.

Deliverables for the soil vapor intrusion sampling program are specified in Section 7.0 – Reporting Requirements.

4.4 Monitoring and Sampling Protocol

All sampling activities will be recorded in a field book and associated sampling log as provided in Appendix [I] - Site Management Forms. Other observations (e.g., conditions of the concrete slab, etc.) will be noted on the sampling log. The sampling log will serve as the inspection form for the monitoring network. Additional detail regarding monitoring and sampling protocols are provided in the site-specific Field Sampling Plan provided as Appendix [J] of this document.

5.0 OPERATION AND MAINTENANCE PLAN

5.1 General

Because the Site does not have a building present, the site remedy does not rely on any mechanical systems, such as groundwater treatment systems, sub-slab depressurization systems or air sparge/soil vapor extraction systems to protect public health and the environment. Therefore, the operation and maintenance of such components is not included in this SMP.

Once a building is developed on the site under this SMP, the need for an O&M Plan will be evaluated and this SMP modified to reflect the presence of any mechanical systems such as an SSDS.

6.0 PERIODIC ASSESSMENTS/EVALUATIONS

6.1 Climate Change Vulnerability Assessment

Increases in both the severity and frequency of storms/weather events, an increase in sea level elevations along with accompanying flooding impacts, shifting precipitation patterns and wide temperature fluctuation, resulting from global climactic change and instability, have the potential to significantly impact the performance, effectiveness and protectiveness of a given site and associated remedial systems. Vulnerability assessments provide information so that the site and associated remedial systems are prepared for the impacts of the increasing frequency and intensity of severe storms/weather events and associated flooding.

This section provides a summary of vulnerability assessments that will be conducted for the site during periodic assessments, and briefly summarizes the vulnerability of the site and/or engineering controls to severe storms/weather events and associated flooding.

The Site is not identified in the FEMA flood zone maps as a potential risk for flooding. In case of severe rain events, rain will drain through the RCA and filter fabric into the subsurface. Due to the excavation of soils at the Site, storm water can collect without any runoff. The potential for erosion of soils remaining onsite was minimized by sloping the perimeter of the excavation at a 2 to 1 rate. Once the site is developed with impervious surfaces, this section of the SMP will be revised as necessary.

6.2 Green Remediation Evaluation

NYSDEC's DER-31 Green Remediation requires that green remediation concepts and techniques be considered during all stages of the remedial program including site management, with the goal of improving the sustainability of the cleanup and summarizing the net environmental benefit of any implemented green technology. This

section of the SMP provides a summary of any green remediation evaluations to be completed for the site during site management, and as reported in the Periodic Review Report (PRR).

No waste is expected to be generated at the Site until the redevelopment activities resume in the future. The Site is not expected to use electricity, water or produce any emissions until redevelopment activities resume in the future. As noted earlier a revised SMP will be prepared after redevelopment is complete.

7.0 REPORTING REQUIREMENTS

7.1 Site Management Reports

All site management inspection, maintenance and monitoring events will be recorded on the appropriate site management forms provided in Appendix G. These forms are subject to NYSDEC revision.

All applicable inspection forms and other records, including media sampling data and system maintenance reports, generated for the site during the reporting period will be provided in electronic format to the NYSDEC in accordance with the requirements of Table C and summarized in the Periodic Review Report.

Table C: Schedule of Inspection Reports

Task/Report	Reporting Frequency*
Periodic Review Report	Annually, or as otherwise determined by the Department

* The frequency of events will be conducted as specified until otherwise approved by the NYSDEC.

All interim monitoring/inspections reports will include, at a minimum:

- Date of event or reporting period;
- Name, company, and position of person(s) conducting monitoring/inspection activities;
- Description of the activities performed;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet);
- Type of samples collected (e.g., sub-slab vapor, indoor air, outdoor air, etc);
- Copies of all field forms completed (e.g., well sampling logs, chain-of-custody documentation, etc.);

- Sampling results in comparison to appropriate standards/criteria;
- A figure illustrating sample type and sampling locations;
- Copies of all laboratory data sheets and the required laboratory data deliverables required for all points sampled (to be submitted electronically in the NYSDEC-identified format);
- Any observations, conclusions, or recommendations; and
- A determination as to whether contaminant conditions have changed since the last reporting event.

Routine maintenance event reporting forms will include, at a minimum:

- Date of event;
- Name, company, and position of person(s) conducting maintenance activities;
- Description of maintenance activities performed;
- Any modifications to the system;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet); and,
- Other documentation such as copies of invoices for maintenance work, receipts for replacement equipment, etc., (attached to the checklist/form).

Non-routine maintenance event reporting forms will include, at a minimum:

- Date of event;
- Name, company, and position of person(s) conducting non-routine maintenance/repair activities;
- Description of non-routine activities performed;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents (included either on the form or on an attached sheet); and
- Other documentation such as copies of invoices for repair work, receipts for replacement equipment, etc. (attached to the checklist/form).

Data will be reported in digital format as determined by the NYSDEC. Currently, data is to be supplied electronically and submitted to the NYSDEC EQuIS^{TM} database in accordance with the requirements found at this link http://www.dec.ny.gov/chemical/62440.html.

7.2 Periodic Review Report

A Periodic Review Report (PRR) will be submitted to the Department beginning sixteen (16) months after the Certificate of Completion is issued. After submittal of the initial Periodic Review Report, the next PRR shall be submitted annually to the Department or at another frequency as may be required by the Department. In the event that the site is subdivided into separate parcels with different ownership, a single Periodic Review Report will be prepared that addresses the site described in Appendix C - Environmental Easement. The report will be prepared in accordance with NYSDEC's DER-10 and submitted within 30 days of the end of each certification period. Media sampling results will also be incorporated into the Periodic Review Report. The report will include:

- Identification, assessment and certification of all ECs/ICs required by the remedy for the site.
- Results of the required annual site inspections and severe condition inspections, if applicable.
- All applicable site management forms and other records generated for the site during the reporting period in the NYSDEC-approved electronic format, if not previously submitted.
- A summary of any discharge monitoring data and/or information generated during the reporting period, with comments and conclusions.
- Data summary tables and graphical representations of contaminants of concern by media (groundwater, soil vapor, etc.), which include a listing of all compounds analyzed, along with the applicable standards, with all exceedances highlighted (if such samples are collected during the reporting period). These will include a presentation of past data as part of an evaluation of contaminant concentration trends.

- Results of all analyses, copies of all laboratory data sheets, and the required laboratory data deliverables for all samples collected during the reporting period will be submitted in digital format as determined by the NYSDEC. Currently, data is supplied electronically and submitted to the NYSDEC EQuIS™ database in accordance with the requirements found at this link: http://www.dec.ny.gov/chemical/62440.html.

- A site evaluation, which includes the following:

  – The compliance of the remedy with the requirements of the site-specific RAWP, ROD or Decision Document;

  – Any new conclusions or observations regarding site contamination based on inspections or data generated by the Monitoring and Sampling Plan for the media being monitored;

  – Recommendations regarding any necessary changes to the remedy and/or Monitoring and Sampling Plan; and The overall performance and effectiveness of the remedy.

7.2.1 Certification of Institutional and Engineering Controls

Following the last inspection of the reporting period, a Professional Engineer licensed to practice in New York State will prepare, and include in the Periodic Review Report, the following certification as per the requirements of NYSDEC DER-10:

"*For each institutional or engineering control identified for the site, I certify that all of the following statements are true:*

- *The inspection of the site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under my direction;*

- *The institutional control and/or engineering control employed at this site is unchanged from the date the control was put in place, or last approved by the Department;*

- *Nothing has occurred that would impair the ability of the control to protect the public health and environment;*

- *Nothing has occurred that would constitute a violation or failure to comply with any site management plan for this control;*

- *Access to the site will continue to be provided to the Department to evaluate the remedy, including access to evaluate the continued maintenance of this control;*

- *If a financial assurance mechanism is required under the oversight document for the site, the mechanism remains valid and sufficient for the intended purpose under the document;*

- *Use of the site is compliant with the environmental easement;*

- *The engineering control systems are performing as designed and are effective;*

- *To the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program and generally accepted engineering practices; and*

- *The information presented in this report is accurate and complete.*

I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law. I, Arnold F. Fleming, P.E., am certifying as the Owner's/Remedial Party's Designated Site Representative for the site."

Every five years the following certification will be added:

- *The assumptions made in the qualitative exposure assessment remain valid.*

The signed certification will be included in the Periodic Review Report. The Periodic Review Report will be submitted, in electronic format, to the NYSDEC Central Office, Regional Office in which the site is located and the NYSDOH Bureau of Environmental Exposure Investigation. The Periodic Review Report may need to be submitted in hard-copy format, as requested by the NYSDEC project manager.

7.3 Corrective Measures Work Plan

If any component of the remedy is found to have failed, or if the periodic certification cannot be provided due to the failure of an institutional or engineering control, a Corrective Measures Work Plan will be submitted to the NYSDEC for approval. This plan will explain the failure and provide the details and schedule for performing work necessary to correct the failure. Unless an emergency condition exists, no work will be performed pursuant to the Corrective Measures Work Plan until it has been approved by the NYSDEC.

8.0 REFERENCES

Supplemental Remedial Investigation Report prepared by Fleming-Lee Shue, Inc., July 29, 2011.

Revised Remedial Action Work Plan prepared by Arnold F. Fleming & Fleming-Lee Shue, Inc., May 2013.

6NYCRR Part 375, Environmental Remediation Programs. December 14, 2006.

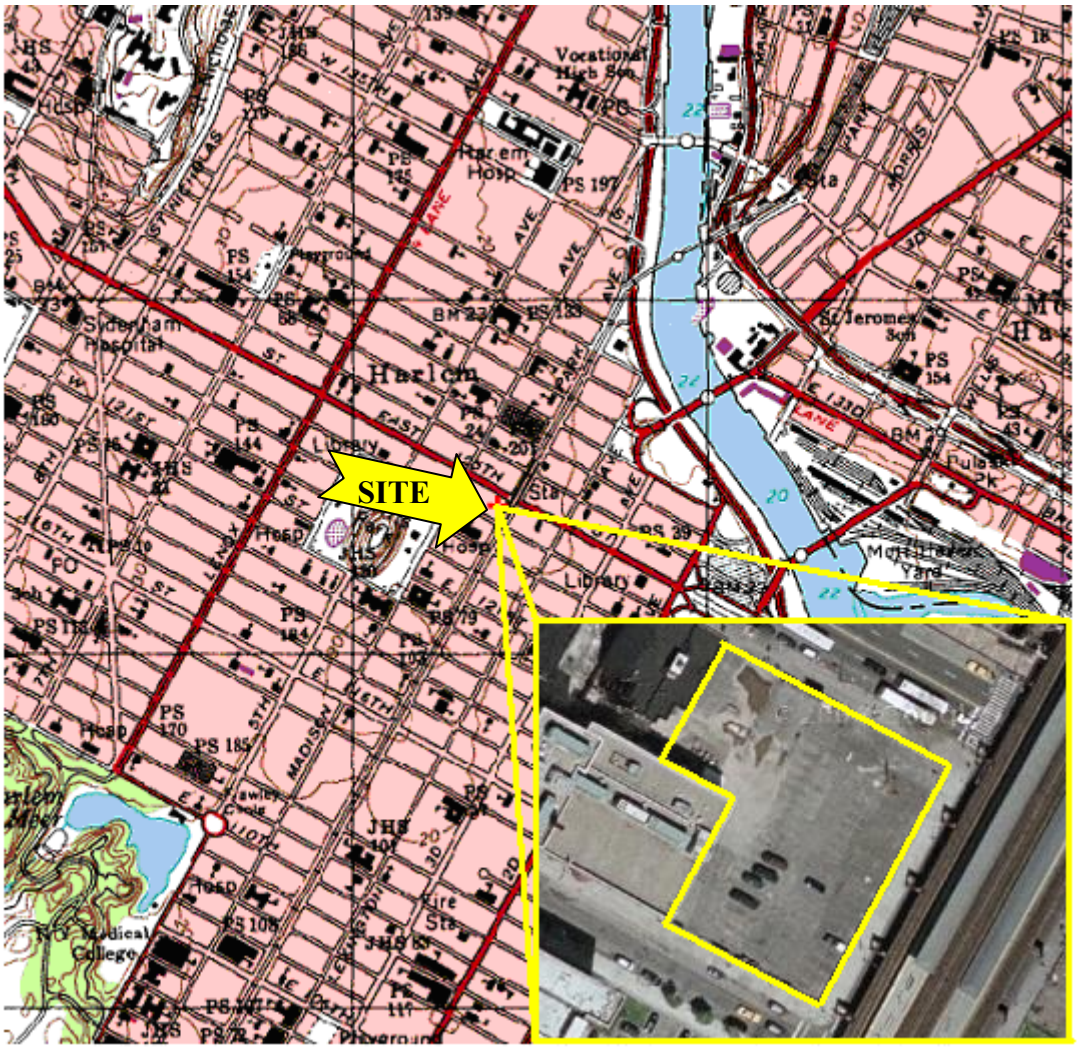
NYSDEC DER-10 – "Technical Guidance for Site Investigation and Remediation". May 2010.

NYSDEC, 1998. Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1. June 1998 (April 2000 addendum).

NYSDOH, 2006. Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York.

FIGURES

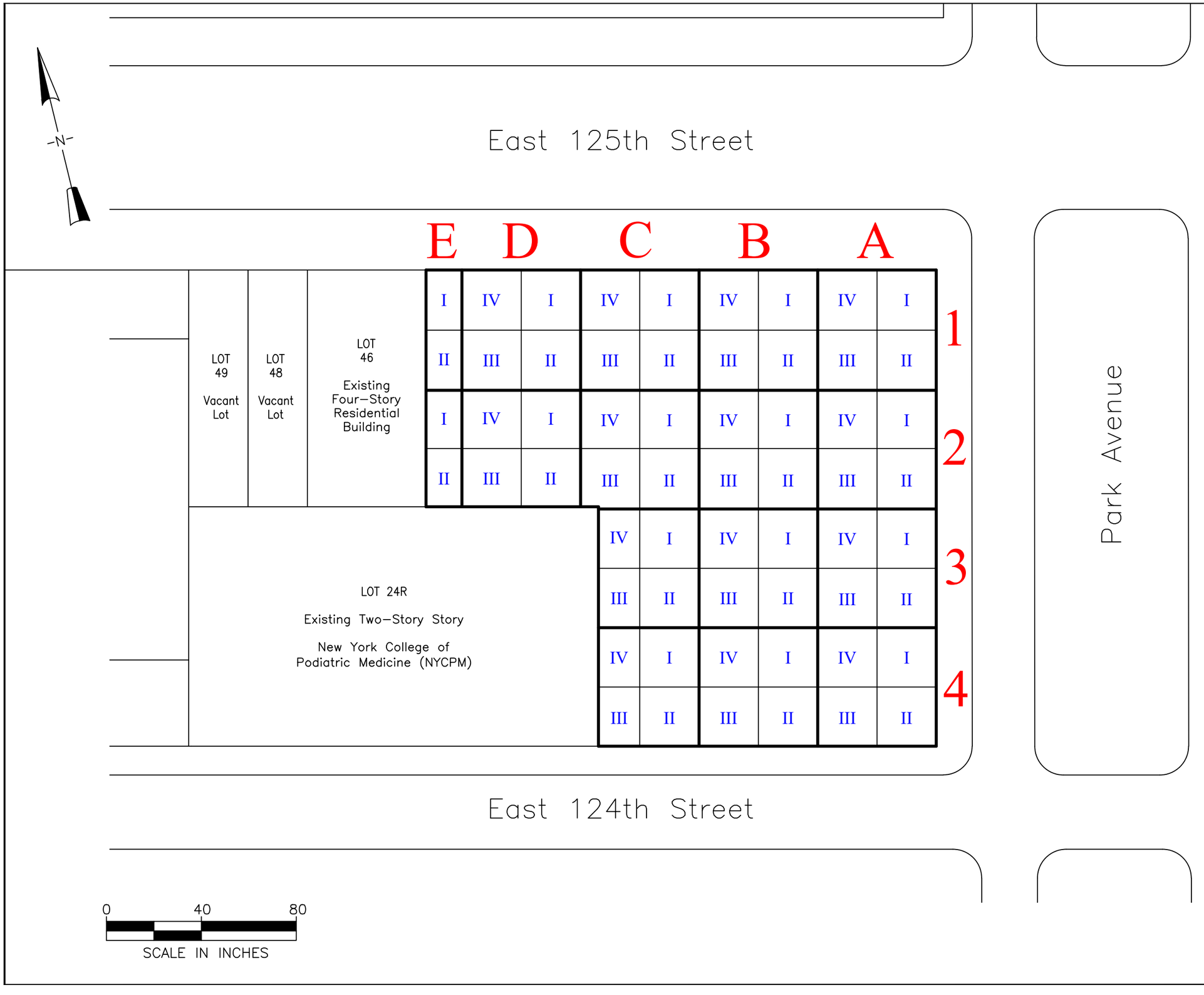
FIGURE 1: SITE LOCATION



Approximate Scale: 1" ≈ 24,000'
Source Map: USGS Central Park

Fleming Lee Shue

SITE: Harlem Park
1800 Park Avenue,
New York, New York
BCP Site # C231041



FILE: P:\10207 – Continuum Company LLC\Figures\SMP\FIG 2 – Site Plan.dwg DATE: 8/25/2016

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New York, NY 10001

FIGURE 2

Harlem Park
New York, NY

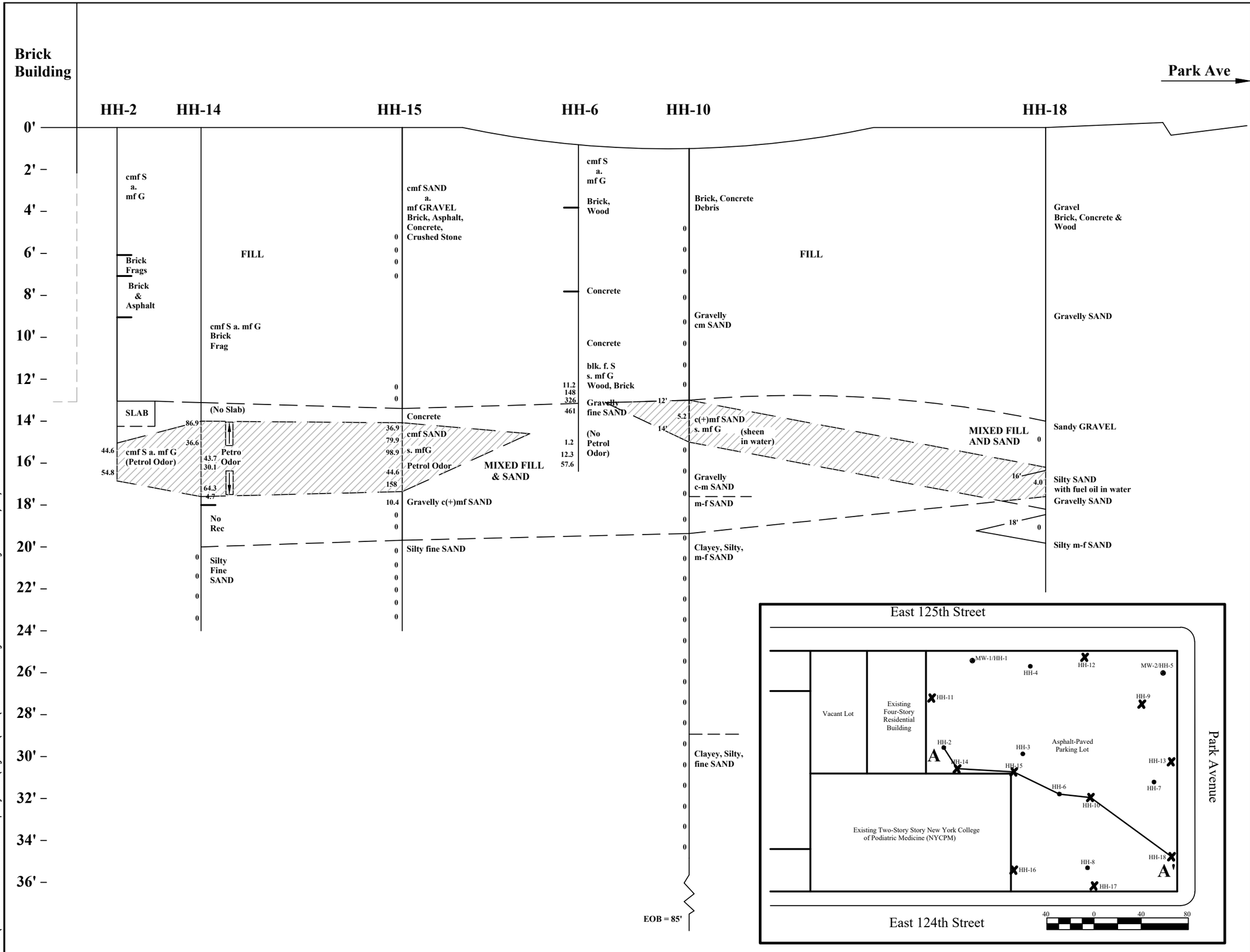
SITE PLAN

Date
August 2016

Project Number
10207-001

LEGEND

- SITE BOUNDARY (BLOCK 1749, LOT 33)
- A — GRID DESIGNATION
- IV — QUADRANT DESIGNATION



FILE: P:\10207 - Continuum Company LLC\Figures\SMP\FIG 3 - Geologic Cross-Section.dwg DATE: 8/25/2016

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FIGURE 3

Harlem Park
New York, NY

GEOLOGIC CROSS-SECTION

Date
August 2016

Project Number
10207-001

LEGEND

SOIL WITH EVIDENCE OF PETROLEUM CONTAMINATION

East 125th Street

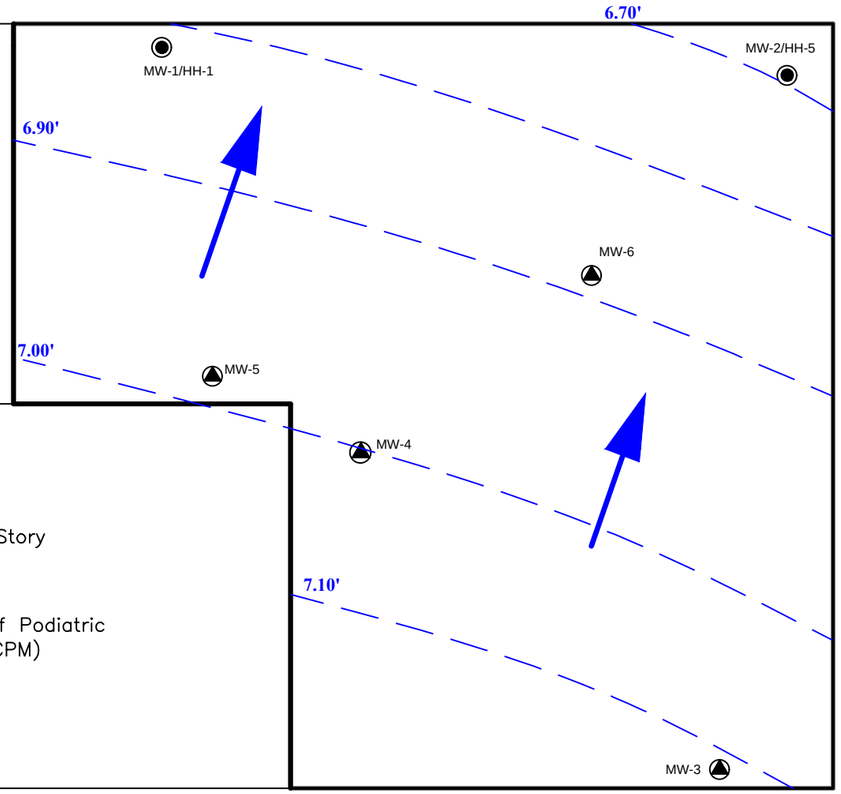
Vacant Lot

Existing Four–Story Residential Building

Existing Two–Story

New York College of Podiatric Medicine (NYCPM)

Park Avenue



East 124th Street

0 40 80

SCALE IN INCHES

-N-

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New York, NY 10001

Harlem Park
New York, NY

FIGURE 4

GROUNDWATER CONTOUR MAP

Date
August 2016

Project Number
10207-001

LEGEND

- MONITORING WELL LOCATION
- MONITORING WELL AND SOIL BORING LOCATION
- INFERRED GROUNDWATER FLOW DIRECTON
- INFERRED GROUNDWATER TABLE CONTOUR

FILE: P:\10207 – Continuum Company LLC\Figures\SMP\FIG 4 – Groundwater Contour.dwg DATE: 8/25/2016

East 125th Street

Vacant Lot

Existing Four–Story Residential Building

Existing Two–Story Story

New York College of Podiatric Medicine (NYCPM)

Park Avenue

East 124th Street

MW-1/HH-1
HH-4
HH-12
MW-2/HH-5
HH-11
HH-9
MW-6
HH-2
HH-3
HH-13
MW-5
HH-14
HH-15
MW-4
HH-6
HH-10
HH-7
HH-18
HH-16
HH-8
HH-17
MW-3

-N-

0 40 80

SCALE IN INCHES

FILE: P:\10207 – Continuum Company LLC\Figures\SMP\FIG 5 – RI Sampling Plan.dwg DATE: 8/26/2016

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New York, NY 10001

Harlem Park
New York, NY

FIGURE 5

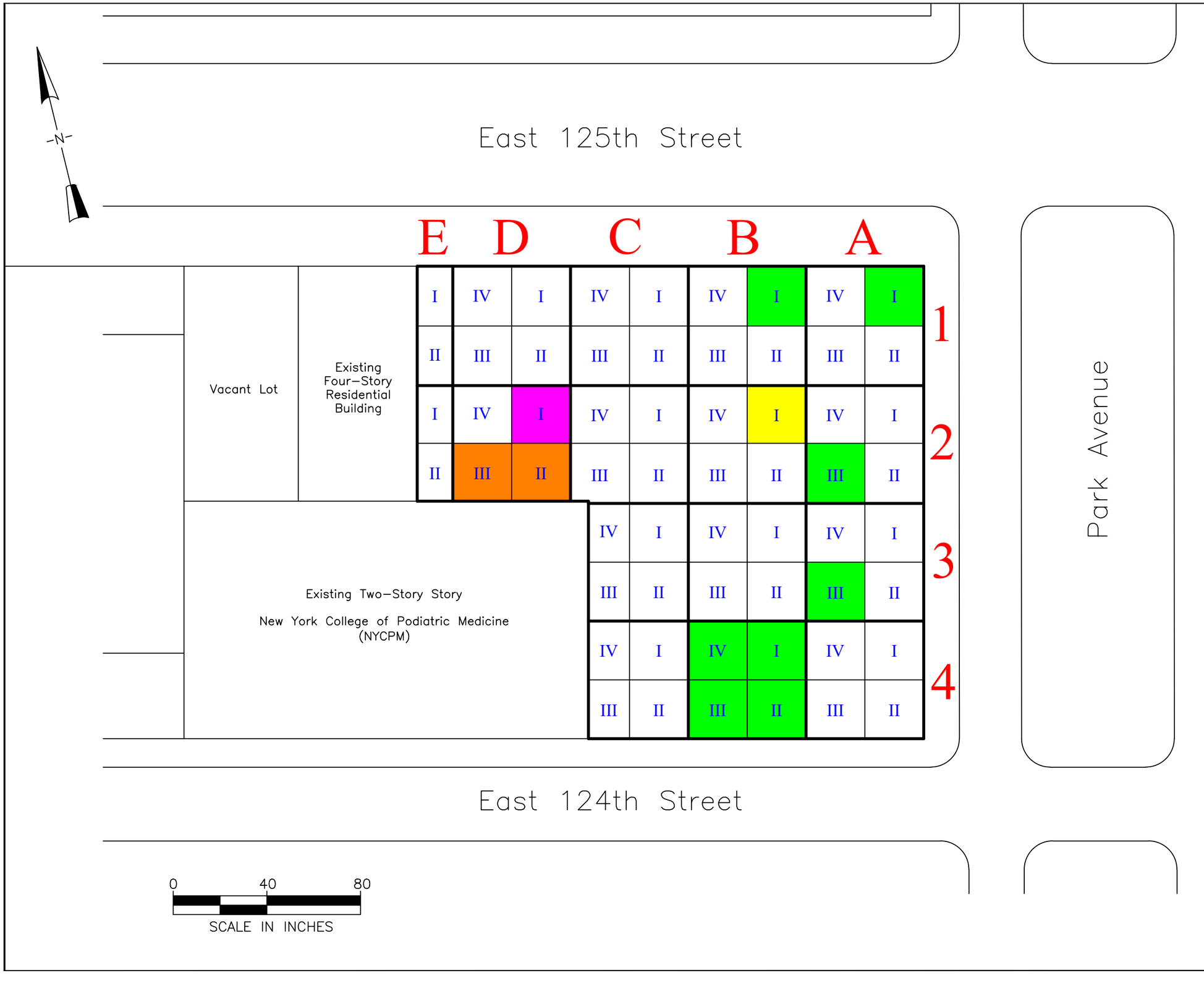
REMEDIAL INVESTIGATION SAMPLING PLAN

Date
August 2016

Project Number
10207-001

LEGEND

- MONITORING WELL LOCATION
- SOIL BORING LOCATION
- MONITORING WELL AND SOIL BORING LOCATION



FILE: P:\10207 - Continuum Company LLC\Figures\SMP\FIG 6 - Hot Spot Locations.dwg DATE: 8/26/2016

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New York, NY 10001

FIGURE 6

Harlem Park
New York, NY

HOT SPOT LOCATIONS

Date
August 2016

Project Number
10207-001

LEGEND

- A — GRID DESIGNATION
- IV — QUADRANT DESIGNATION
- LEAD/HAZARDOUS LEAD
- VOC / LEAD
- MERCURY >2.8 ppm
- SVOCs >500 ppm

FILE: P:\10207 - Continuum Company LLC\Figures\SMP\FIG 7 - Endpoint Sample Locations.dwg DATE: 8/26/2016

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New York, NY 10001

FIGURE 7

Harlem Park
New York, NY

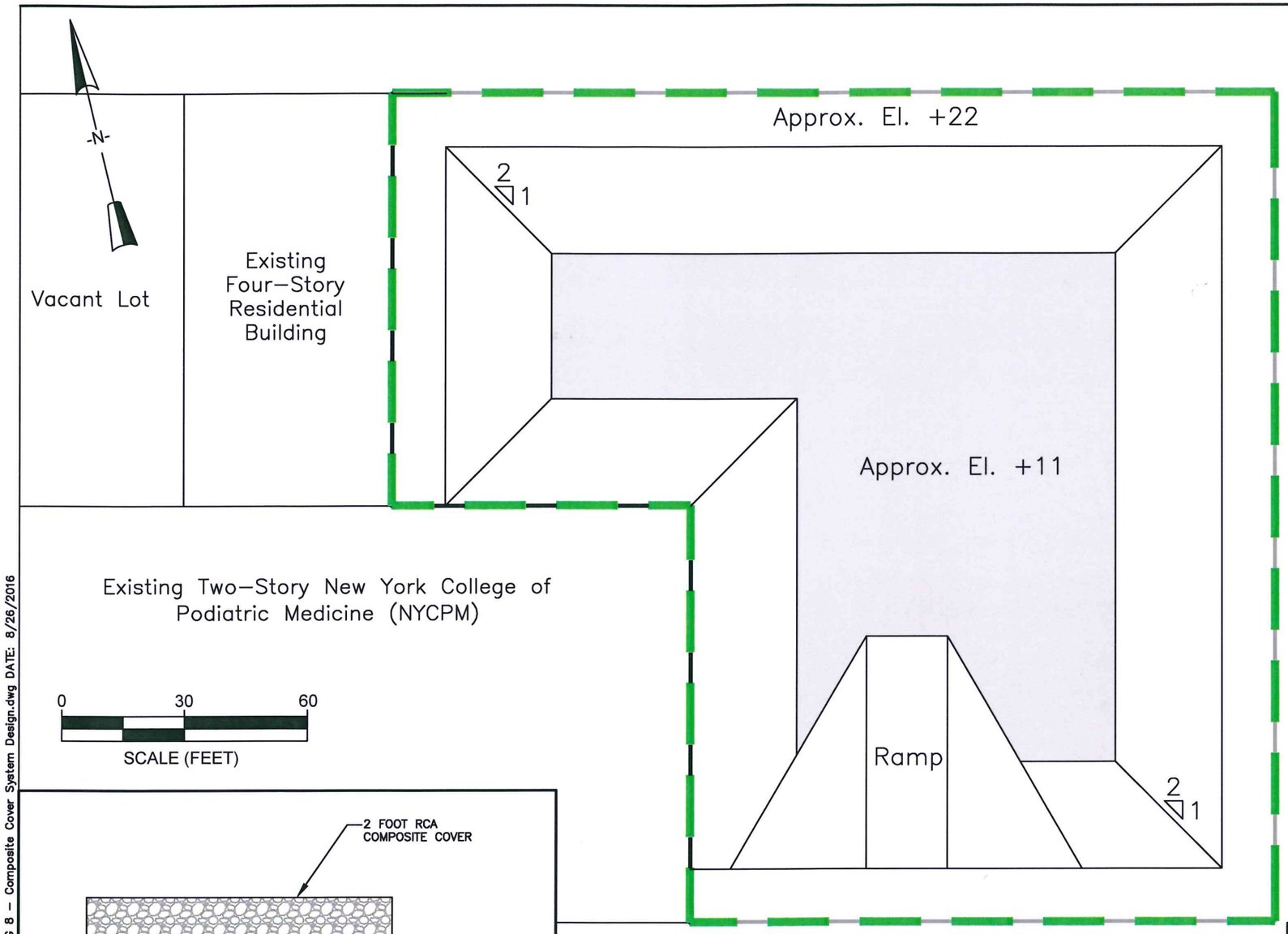
ENDPOINT SAMPLE LOCATIONS

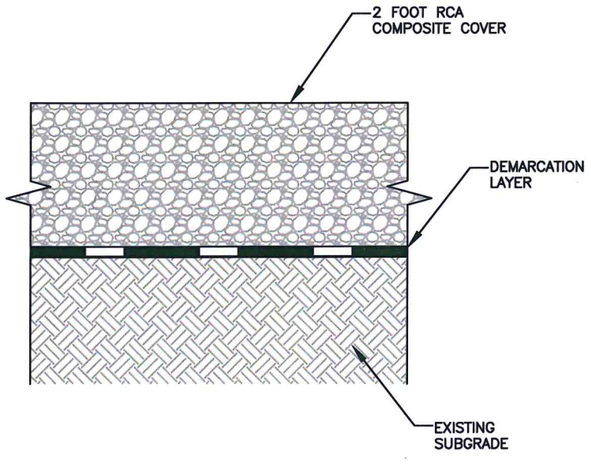
Date
August 2016

Project Number
10207-001

LEGEND

- EP ENDPOINT SAMPLE
- LEAD/HAZARDOUS LEAD
- VOCs/LEAD
- MERCURY > 2.8 ppm
- SVOCs > 500 ppm





DETAIL 1: TYPICAL COMPOSITE COVER

N.T.S.

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New York, NY 10001

Harlem Park
New York, NY

FIGURE 8

AS-BUILT COMPOSITE COVER SYSTEM DESIGN AND DETAILS

August 2016

Project Number
10207-001

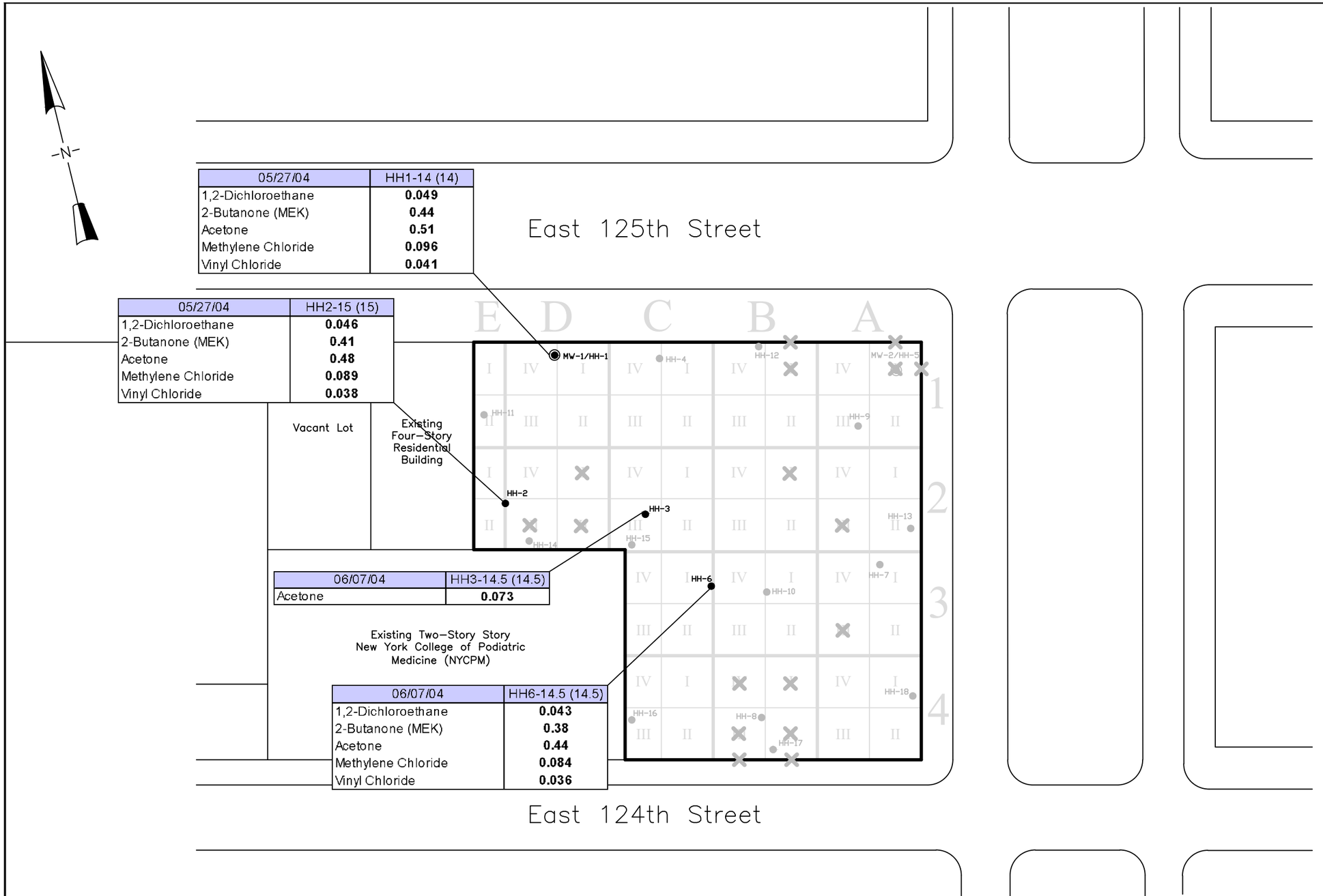
LEGEND

- BCP SITE
- 2 / 1 — 2:1 SLOPE AROUND THE PERIMETER OF THE SITE
- BOTTOM OF EXCAVATION
- 2 FT RCA COMPOSITE COVER (DETAIL 1)

ELEVATIONS LISTED IN NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)

STATE OF NEW YORK · ARNOLD F. FLEMING · 050411 · LICENSED PROFESSIONAL ENGINEER

FILE: P:\10207 – Continuum Company LLC\Figures\SMP\FIG 8 – Composite Cover System Design.dwg DATE: 8/26/2016



05/27/04	HH1-14 (14)
1,2-Dichloroethane	**0.049**
2-Butanone (MEK)	**0.44**
Acetone	**0.51**
Methylene Chloride	**0.096**
Vinyl Chloride	**0.041**

05/27/04	HH2-15 (15)
1,2-Dichloroethane	**0.046**
2-Butanone (MEK)	**0.41**
Acetone	**0.48**
Methylene Chloride	**0.089**
Vinyl Chloride	**0.038**

06/07/04	HH3-14.5 (14.5)
Acetone	**0.073**

06/07/04	HH6-14.5 (14.5)
1,2-Dichloroethane	**0.043**
2-Butanone (MEK)	**0.38**
Acetone	**0.44**
Methylene Chloride	**0.084**
Vinyl Chloride	**0.036**

Compound	Site Specific SCO	Unrestricted Use SCO
1,2-Dichloroethane	3.1	0.02
2-Butanone (MEK)	100	0.12
Acetone	100	0.05
Methylene Chloride	100	0.05
Vinyl Chloride	0.9	0.02

Notes:
Exccedances in UUSCOS bolded
No exceedances in SSSCOs
Concentrations measured in mg/kg

0 50 100
Scale (feet)

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FIGURE 9A

Harlem Park
New York, NY

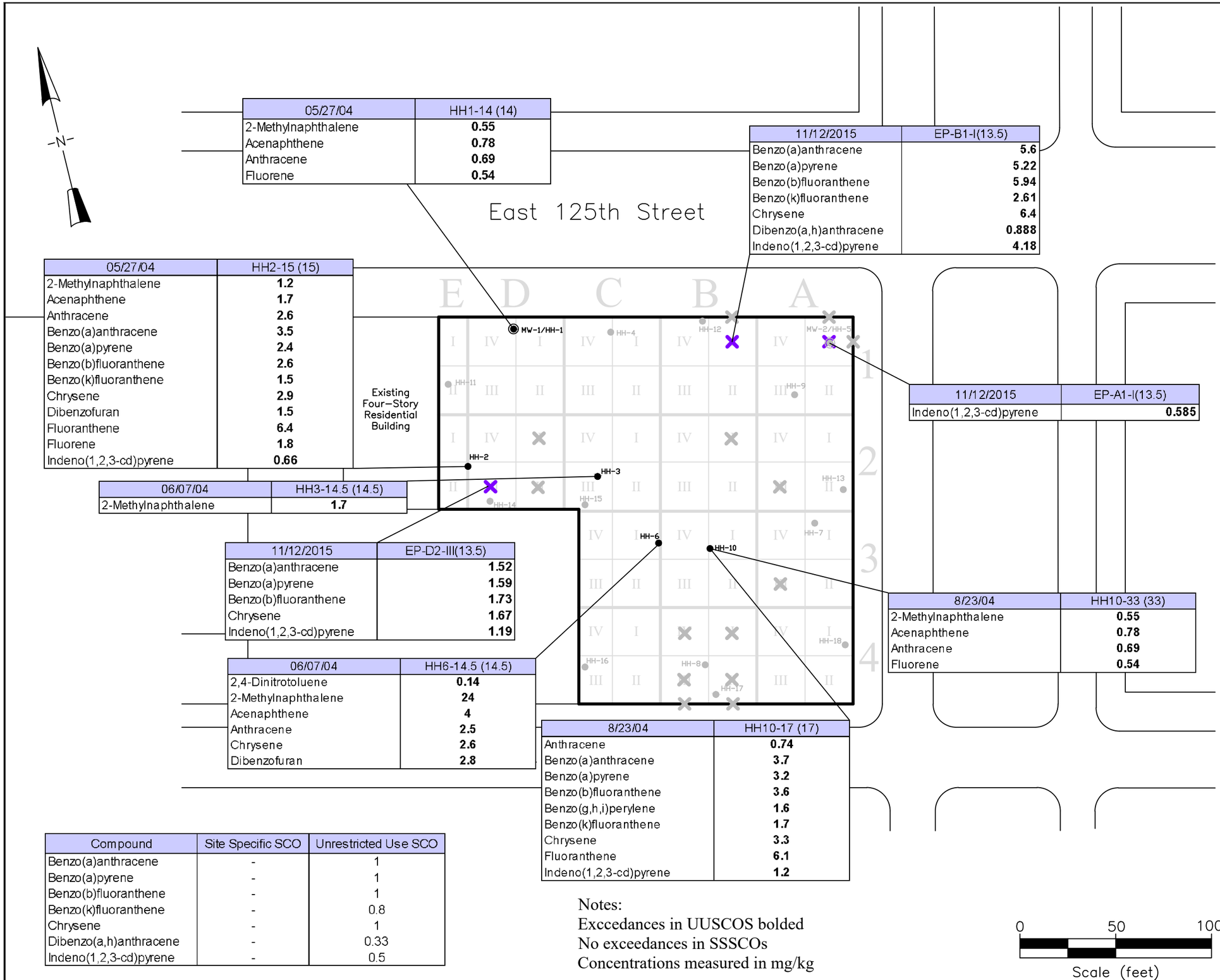
REMAINING VOC CONTAMINATION

August 2016

Project Number
10207-001

LEGEND

- ✕ ENDPOINT SAMPLE LOCATION (SAMPLE DEPTH, FEET BELOW GRADE)
- ● SOIL BORING
- ◉ CO-LOCATED MONITORING WELL AND SOIL BORING



05/27/04	HH1-14 (14)
2-Methylnaphthalene	**0.55**
Acenaphthene	**0.78**
Anthracene	**0.69**
Fluorene	**0.54**

11/12/2015	EP-B1-I(13.5)
Benzo(a)anthracene	**5.6**
Benzo(a)pyrene	**5.22**
Benzo(b)fluoranthene	**5.94**
Benzo(k)fluoranthene	**2.61**
Chrysene	**6.4**
Dibenzo(a,h)anthracene	**0.888**
Indeno(1,2,3-cd)pyrene	**4.18**

05/27/04	HH2-15 (15)
2-Methylnaphthalene	**1.2**
Acenaphthene	**1.7**
Anthracene	**2.6**
Benzo(a)anthracene	**3.5**
Benzo(a)pyrene	**2.4**
Benzo(b)fluoranthene	**2.6**
Benzo(k)fluoranthene	**1.5**
Chrysene	**2.9**
Dibenzofuran	**1.5**
Fluoranthene	**6.4**
Fluorene	**1.8**
Indeno(1,2,3-cd)pyrene	**0.66**

11/12/2015	EP-A1-I(13.5)
Indeno(1,2,3-cd)pyrene	**0.585**

06/07/04	HH3-14.5 (14.5)
2-Methylnaphthalene	**1.7**

11/12/2015	EP-D2-III(13.5)
Benzo(a)anthracene	**1.52**
Benzo(a)pyrene	**1.59**
Benzo(b)fluoranthene	**1.73**
Chrysene	**1.67**
Indeno(1,2,3-cd)pyrene	**1.19**

06/07/04	HH6-14.5 (14.5)
2,4-Dinitrotoluene	**0.14**
2-Methylnaphthalene	**24**
Acenaphthene	**4**
Anthracene	**2.5**
Chrysene	**2.6**
Dibenzofuran	**2.8**

8/23/04	HH10-33 (33)
2-Methylnaphthalene	**0.55**
Acenaphthene	**0.78**
Anthracene	**0.69**
Fluorene	**0.54**

8/23/04	HH10-17 (17)
Anthracene	**0.74**
Benzo(a)anthracene	**3.7**
Benzo(a)pyrene	**3.2**
Benzo(b)fluoranthene	**3.6**
Benzo(g,h,i)perylene	**1.6**
Benzo(k)fluoranthene	**1.7**
Chrysene	**3.3**
Fluoranthene	**6.1**
Indeno(1,2,3-cd)pyrene	**1.2**

Compound	Site Specific SCO	Unrestricted Use SCO
Benzo(a)anthracene	-	1
Benzo(a)pyrene	-	1
Benzo(b)fluoranthene	-	1
Benzo(k)fluoranthene	-	0.8
Chrysene	-	1
Dibenzo(a,h)anthracene	-	0.33
Indeno(1,2,3-cd)pyrene	-	0.5

Notes:
Exccedances in UUSCOS bolded
No exceedances in SSSCOs
Concentrations measured in mg/kg

0 50 100
Scale (feet)

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New York, NY 10001

FIGURE 9B

Harlem Park
New York, NY

REMAINING SVOC CONTAMINATION

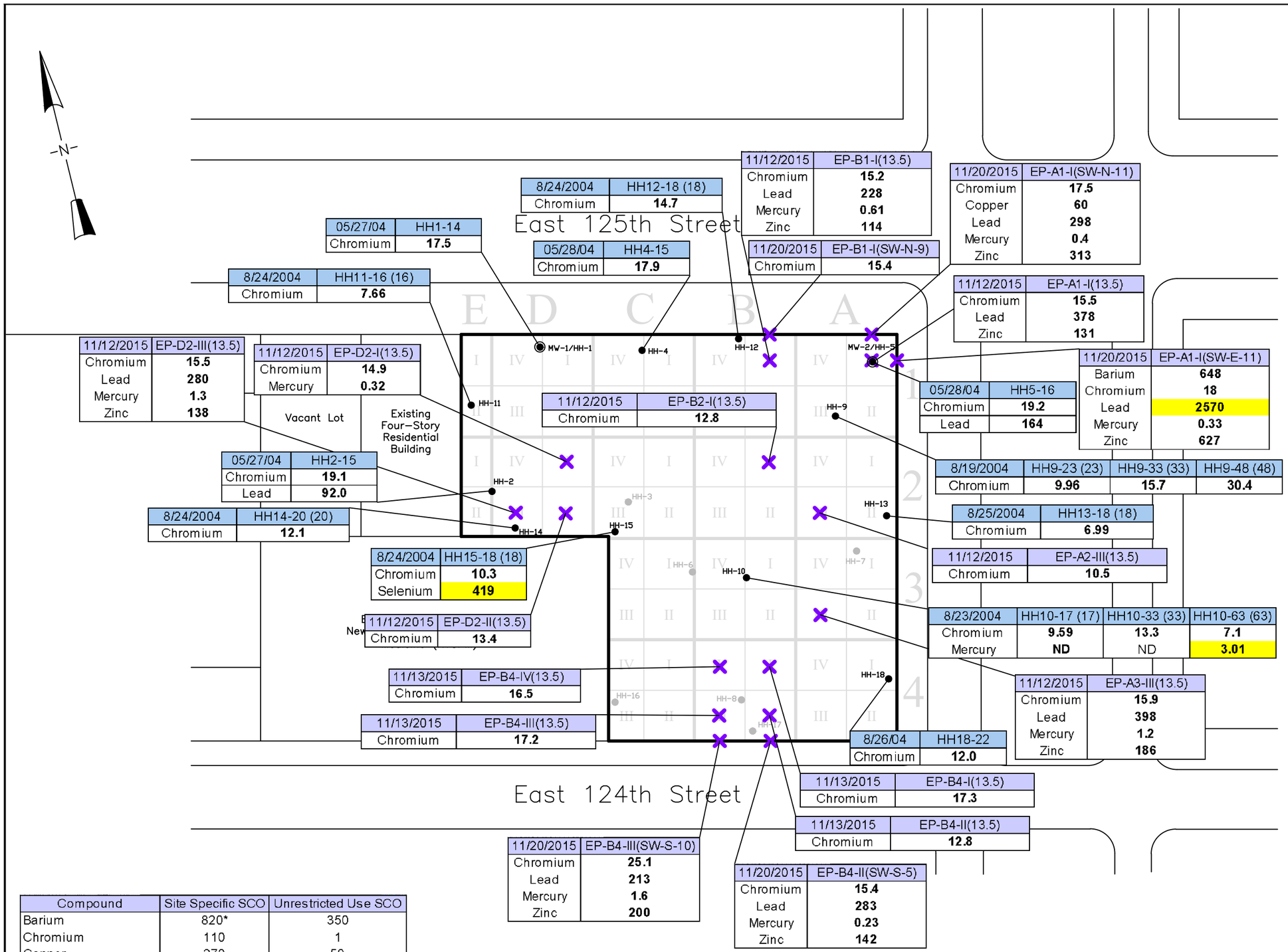
August 2016

Project Number
10207-001

LEGEND

- ✖ ENDPOINT SAMPLE LOCATION (SAMPLE DEPTH, FEET BELOW GRADE)
- ● SOIL BORING
- ◉ CO-LOCATED MONITORING WELL AND SOIL BORING

FILE: P:\10207 - Continuum Company LLC\Figures\SMP\FIG 9B - Remaining SVOC Contamination.dwg DATE: 8/30/2016



Compound	Site Specific SCO	Unrestricted Use SCO
Barium	820*	350
Chromium	110	1
Copper	270	50
Lead	1000*	63
Mercury	2.8*	0.18
Selenium	180	3.9
Zinc	10000	109

Notes:
Exccedances in UUSCOS bolded
Exceedances in SSSCOs are highlighted
Concentrations measured in mg/kg

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New York, NY 10001

FIGURE 9C

Harlem Park
New York, NY

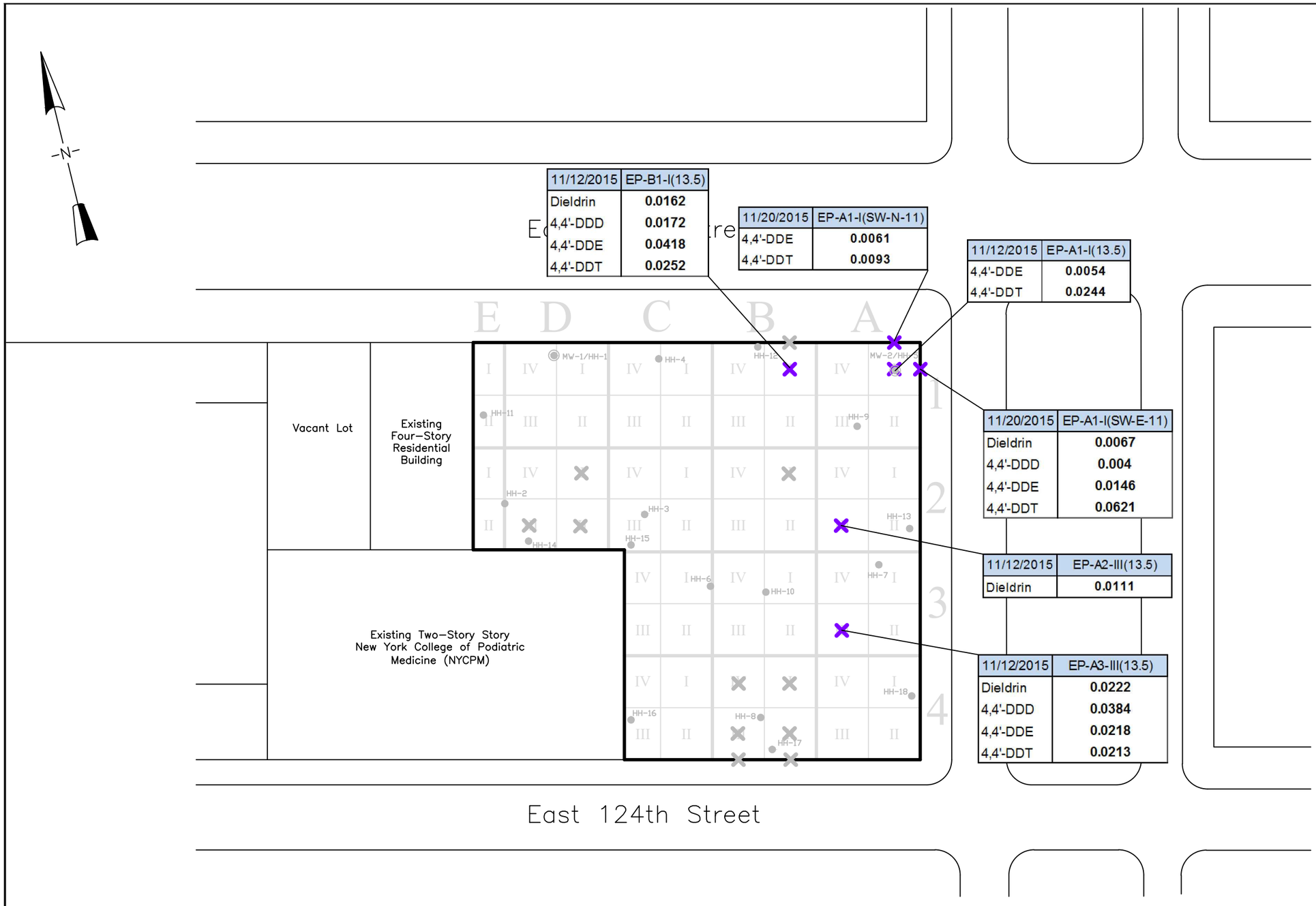
REMAINING METALS CONTAMINATION

August 2016

Project Number
10207-001

LEGEND

- ✖ ENDPOINT SAMPLE LOCATION (SAMPLE DEPTH, FEET BELOW GRADE)
- ● SOIL BORING
- ◉ CO-LOCATED MONITORING WELL AND SOIL BORING



Compound	Site Specific SCO	Unrestricted Use SCO
Dieldrin	-	0.005
4,4'-DDD	-	0.0033
4,4'-DDE	-	0.0033
4,4'-DDT	-	0.0033

Notes:
Exccedances in UUSCOS bolded
No exceedances in SSSCOs
Concentrations measured in mg/kg

0 50 100
Scale (feet)

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FIGURE 9D

Harlem Park
New York, NY

REMAINING PESTICIDE AND PCB CONTAMINATION

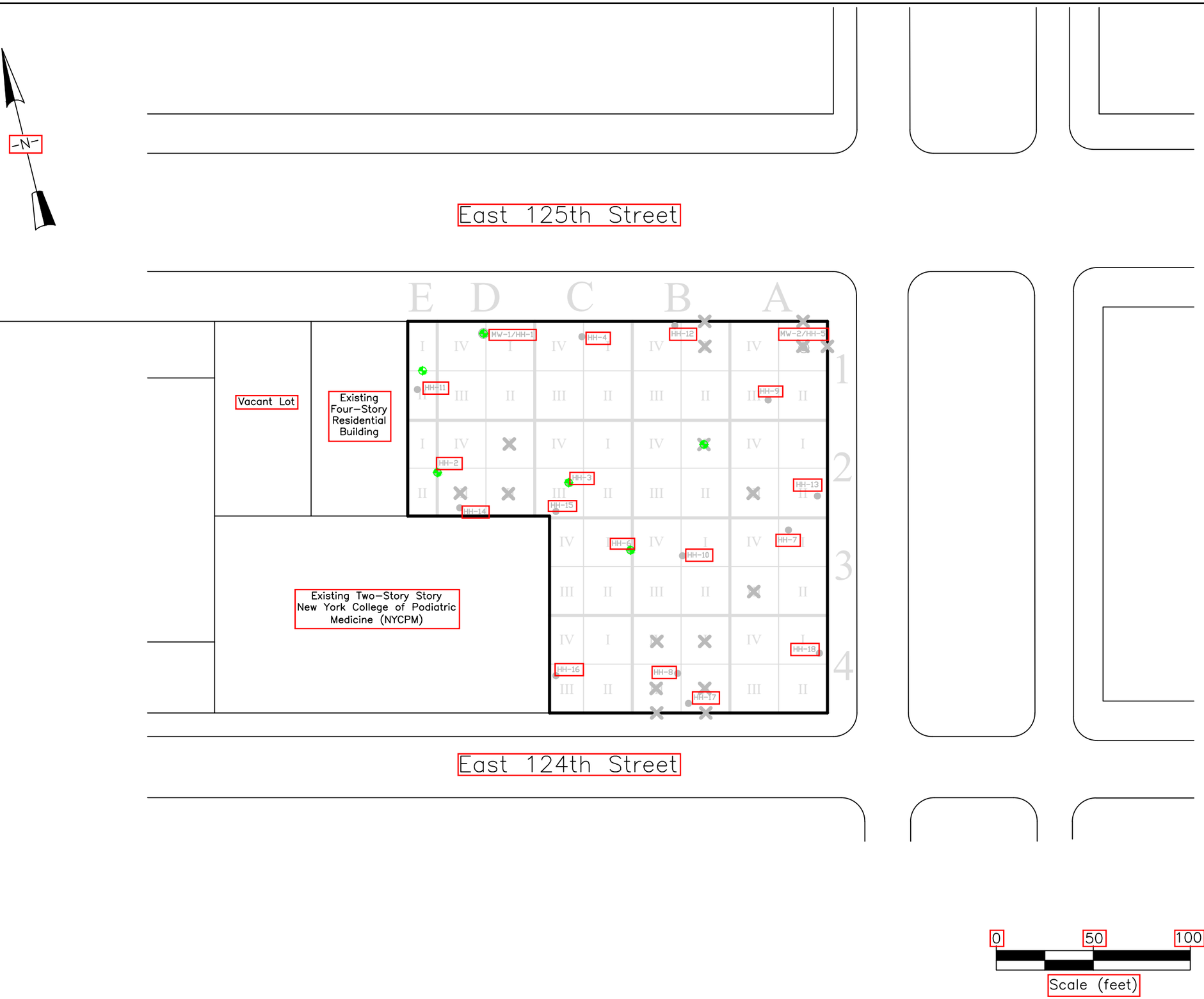
August 2016

Project Number
10207-001

LEGEND

- ✖ ENDPOINT SAMPLE LOCATION (SAMPLE DEPTH, FEET BELOW GRADE)
- ● SOIL BORING
- ◉ CO-LOCATED MONITORING WELL AND SOIL BORING

FILE: P:\10207 – Continuum Company LLC\Figures\SMP\FIG 9D – Remaining Pesticide and PCB Contamination.dwg DATE: 8/30/2016



FILE: P:\10207 - Continuum Company LLC\Figures\SMP\FIG10 - Proposed Soil Vapor Samples.dwg DATE: 8/29/2016

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Environmental Management & Consulting

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New York, NY 10001

FIGURE 10

Harlem Park
New York, NY

PROPOSED SOIL VAPOR SAMPLES

August 2016

Project Number
10207-001

LEGEND

- ENDPOINT SAMPLE LOCATION
- SOIL BORING
- CO-LOCATED MONITORING WELL AND SOIL BORING
- PROPOSED SOIL VAPOR SAMPLE

TABLES

Table 1 - Soil Remedial Goals and Soil Cleanup Objectives

Harlem Park, New York, NY

Analyte	Remedial Goal/SCO
VOCs	RRUSCOs (Restricted Residential SCOs)
Total SVOCs	< 500 ppm
Metals	RRUSCOs, with the following exceptions: SSSCOs (Site Specific SCOs) , ppm:
Barium	820 ppm (Protection of Groundwater SCO)
Cadmium	6.5
Lead	1,000*
Manganese	2,500*
Mercury	2.8
Hazardous Lead	Removal of all hazardous lead [<5 milligrams per liter (mg/L) TCLP]
Encountered Observed Gross Petroleum Contamination	Removal of Observed Gross Petroleum Contamination, if encountered, during proposed remedial excavations identified in Table 2, as determined either visually or with plastic bag shake test. Gross petroleum contamination will be removed in areas that are otherwise being excavated.

*As set forth in Section 3.5, FLS has recommended that these SSSCOs for lead and manganese based on the results of the 2011 Supplemental Remedial Investigation report.

Table 2A - RI - Volatile Organic Compounds in Soil

Harlem Park -1800 Park Avenue, New York, NY

Sample ID	NY SCO - Restricted Residential w/ Track 4 Site Specific SCOs	NY SCO - Protection of Groundwater w/CP-51	HH1-1	HH1-14	HH2-1	HH2-15	HH3-1	HH5-1	HH5-16	HH4-1	HH4-15	HH6-1	HH6-13	HH3-14.5	HH6-14.5	HH7-1	HH7-15	HH8-1	HH8-14.5	HH9-7	HH9-23	HH9-33	HH9-48	HH10-7	HH10-17
Sampling Date			05/27/04	05/27/04	05/27/04	05/27/04	05/27/04	05/28/04	05/28/04	05/28/04	05/28/04	05/28/04	05/28/04	06/07/04	06/07/04	06/07/04	06/07/04	06/07/04	06/07/04	8/19/04	8/19/04	8/19/04	8/19/04	8/23/04	8/23/04
Units			mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
1,1,1,2-Tetrachloroethane	-	-	0.0002 U	0.066 U	0.0002 U	0.062 U	0.00019 U	0.00019 U	0.00025 U	0.00019 U	0.0011 U	0.00021 U	0.00094 U	0.00021 U	0.058 U	0.0002 U	0.00021 U	0.0002 U	0.00021 U	NR	NR	NR	NR	NR	NR
1,1,1-Trichloroethane	100	0.68	0.0003 U	0.063 U	0.0003 U	0.059 U	0.00029 U	0.00029 U	0.00038 U	0.00029 U	0.0016 U	0.00032 U	0.0014 U	0.00032 U	0.055 U	0.00031 U	0.00032 U	0.00031 U	0.00032 U	0.00031 U	0.00035 U	0.00034 U	0.00035 U	0.00031 U	0.0003 U
1,1,2,2-Tetrachloroethane	-	0.6	0.00059 U	0.076 U	0.00059 U	0.071 U	0.00056 U	0.00057 U	0.00075 U	0.00056 U	0.0031 U	0.00062 U	0.0028 U	0.00062 U	0.067 U	0.00061 U	0.00062 U	0.0006 U	0.00062 U	0.0006 U	0.00069 U	0.00066 U	0.00069 U	0.0006 U	0.00059 U
1,1,2-Trichloroethane	-	-	0.00056 U	0.08 U	0.00057 U	0.074 U	0.00053 U	0.00055 U	0.00071 U	0.00054 U	0.003 U	0.0006 U	0.0027 U	0.0006 U	0.069 U	0.00058 U	0.00059 U	0.00057 U	0.00059 U	NR	NR	NR	NR	NR	NR
1,1-Dichloroethane	26	0.27	0.00039 U	0.033 U	0.0004 U	0.031 U	0.00037 U	0.00038 U	0.0005 U	0.00038 U	0.0021 U	0.00042 U	0.0019 U	0.00042 U	0.029 U	0.00041 U	0.00041 U	0.0004 U	0.00041 U	0.0004 U	0.00046 U	0.00044 U	0.00044 U	0.0004 U	0.0004 U
1,1-Dichloroethene	100	0.33	0.00024 U	0.05 U	0.00024 U	0.046 U	0.00023 U	0.00023 U	0.0003 U	0.00023 U	0.0013 U	0.00025 U	0.0011 U	0.00025 U	0.043 U	0.00025 U	0.00025 U	0.00024 U	0.00025 U	0.00024 U	0.00028 U	0.00027 U	0.00028 U	0.00024 U	0.00024 U
1,1-Dichloropropene	-	-	0.00046 U	0.058 U	0.00047 U	0.054 U	0.00044 U	0.00045 U	0.00059 U	0.00044 U	0.0025 U	0.00049 U	0.0022 U	0.00049 U	0.05 U	0.00048 U	0.00048 U	0.00047 U	0.00048 U	NR	NR	NR	NR	NR	NR
1,2,3-Trichlorobenzene	-	-	0.00049 U	0.038 U	0.00049 U	0.035 U	0.00046 U	0.00048 U	0.00062 U	0.00047 U	0.0026 U	0.00052 U	0.0023 U	0.00052 U	0.033 U	0.00051 U	0.00051 U	0.0005 U	0.00051 U	NR	NR	NR	NR	NR	NR
1,2,3-Trichloropropane	-	-	0.00045 U	0.07 U	0.00046 U	0.065 U	0.00043 U	0.00044 U	0.00057 U	0.00043 U	0.0024 U	0.00048 U	0.0021 U	0.00048 U	0.061 U	0.00047 U	0.00047 U	0.00046 U	0.00047 U	0.00046 U	0.00053 U	0.00051 U	0.00053 U	0.00046 U	0.00046 U
1,2,4-Trichlorobenzene	-	3.4	0.00028 U	0.044 U	0.00028 U	0.041 U	0.00026 U	0.00027 U	0.00035 U	0.00027 U	0.0015 U	0.00029 U	0.0013 U	0.00029 U	0.039 U	0.00029 U	0.00029 U	0.00028 U	0.00029 U	0.00028 U	0.00032 U	0.00031 U	0.00032 U	0.00028 U	0.00028 U
1,2,4-Trimethylbenzene	52	3.6	0.00045 U	0.057 U	0.00046 U	0.053 U	0.00043 U	0.00044 U	0.00057 U	0.00043 U	0.0024 U	0.00048 U	2.4 E	0.032	0.05 U	0.00047 U	0.00047 U	0.00046 U	0.00047 U	NR	NR	NR	NR	NR	NR
1,2-Dibromo-3-Chloropropane	-	-	0.00075 U	0.14 U	0.00076 U	0.13 U	0.00071 U	0.00074 U	0.00095 U	0.00072 U	0.004 U	0.0008 U	0.0036 U	0.0008 U	0.13 U	0.00078 U	0.00079 U	0.00077 U	0.00079 U	0.00075 U	0.00088 U	0.0034 J	0.00088 J	NR	NR
1,2-Dibromoethane	-	-	0.00046 U	0.098 U	0.00047 U	0.091 U	0.00044 U	0.00045 U	0.00059 U	0.00044 U	0.0025 U	0.00049 U	0.0022 U	0.00049 U	0.085 U	0.00048 U	0.00048 U	0.00047 U	0.00048 U	NR	NR	NR	NR	NR	NR
1,2-Dichlorobenzene	100	1.1	0.00045 U	0.056 U	0.00046 U	0.053 U	0.00043 U	0.00044 U	0.00058 U	0.00044 U	0.0024 U	0.00048 U	0.0022 U	0.00048 U	0.049 U	0.00047 U	0.00048 U	0.00046 U	0.00048 U	0.00046 U	0.00053 U	0.00051 U	0.00053 U	0.00046 U	0.00046 U
1,2-Dichloroethane	3.1	0.02	0.0034 U	0.049 U	0.0035 U	0.046 U	0.0032 U	0.0033 U	0.0043 U	0.0033 U	0.018 U	0.0036 U	0.016 U	0.0036 U	0.043 U	0.0035 U	0.0036 U	0.0035 U	0.0036 U	0.0035 U	0.004 U	0.0038 U	0.004 U	0.0035 U	0.0035 U
1,2-Dichloropropane	-	-	0.00037 U	0.049 U	0.00038 U	0.046 U	0.00035 U	0.00036 U	0.00047 U	0.00036 U	0.002 U	0.00039 U	0.0018 U	0.00039 U	0.043 U	0.00039 U	0.00039 U	0.00038 U	0.00039 U	NR	NR	NR	NR	NR	NR
1,3,5-Trimethylbenzene	52	8.4	0.00032 U	0.057 U	0.00032 U	0.053 U	0.0003 U	0.00031 U	0.0004 U	0.0003 U	0.0017 U	0.00034 U	2.9 E	0.01	0.049 U	0.00033 U	0.00033 U	0.00032 U	0.00033 U	NR	NR	NR	NR	NR	NR
1,3-Dichlorobenzene	49	2.4	0.00023 U	0.057 U	0.00024 U	0.053 U	0.00022 U	0.00023 U	0.0003 U	0.00022 U	0.0013 U	0.00025 U	0.0011 U	0.00025 U	0.05 U	0.00024 U	0.00025 U	0.00024 U	0.00025 U	0.00024 U	0.00027 U	0.00026 U	0.00027 U	0.00024 U	0.00024 U
1,3-Dichloropropane	-	-	0.00051 U	0.06 U	0.00052 U	0.056 U	0.00048 U	0.0005 U	0.00065 U	0.00049 U	0.0027 U	0.00054 U	0.0024 U	0.00054 U	0.052 U	0.00053 U	0.00053 U	0.00052 U	0.00053 U	0.00052 U	0.0006 U	0.00057 U	0.0006 U	0.00052 U	0.00052 U
1,4-Dichlorobenzene	13	1.8	0.00039 U	0.06 U	0.00039 U	0.056 U	0.00037 U	0.00038 U	0.00049 U	0.00037 U	0.0021 U	0.00041 U	0.0018 U	0.00041 U	0.052 U	0.0004 U	0.00041 U	0.0004 U	0.00041 U	0.0004 U	0.00046 U	0.00044 U	0.00046 U	0.0004 U	0.00039 U
2,2-Dichloropropane	-	-	0.0011 U	0.047 U	0.0011 U	0.044 U	0.0011 U	0.0011 U	0.0014 U	0.0011 U	0.0061 U	0.0012 U	0.0054 U	0.0012 U	0.041 U	0.0012 U	0.0012 U	0.0012 U	0.0012 U	NR	NR	NR	NR	NR	NR
2-Butanone	100	0.3	0.0025 U	0.44 U	0.0026 U	0.41 U	0.0024 U	0.0025 U	0.0032 U	0.0024 U	0.014 U	0.0082 J	0.012 U	0.0027 U	0.38 U	0.0026 U	0.0026 U	0.0026 U	0.0026 U	0.0026 U	0.003 U	0.0028 U	0.003 U	0.0026 U	0.0026 U
2-Chloroethyl Vinyl ether	-	-	0.0013 U	0.29 U	0.0013 U	0.27 U	0.0012 U	0.0012 U	0.0016 U	0.0012 U	0.0067 U	0.0013 U	0.0059 U	0.0013 U	0.25 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	NR	NR	NR	NR	NR	NR
2-Chlorotoluene	-	-	0.0003 U	0.047 U	0.0003 U	0.044 U	0.00029 U	0.00029 U	0.00038 U	0.00029 U	0.0016 U	0.00032 U	0.0014 U	0.00032 U	0.041 U	0.00031 U	0.00032 U	0.00031 U	0.00032 U	NR	NR	NR	NR	NR	NR
2-Hexanone	-	-	0.0036 U	0.1 U	0.0036 U	0.095 U	0.0034 U	0.0035 U	0.0045 U	0.0034 U	0.019 U	0.0038 U	0.017 U	0.0038 U	0.089 U	0.0037 U	0.0037 U	0.0036 U	0.0037 U	NR	NR	NR	NR	NR	NR
4-Chlorotoluene	-	-	0.00032 U	0.11 U	0.00033 U	0.11 U	0.00031 U	0.00032 U	0.00041 U	0.00031 U	0.0017 U	0.00034 U	0.0015 U	0.00034 U	0.099 U	0.00034 U	0.00034 U	0.00033 U	0.00034 U	NR	NR	NR	NR	NR	NR
4-Methyl-2-Pentanone	-	1	0.0027 U	0.2 U	0.0027 U	0.19 U	0.0025 U	0.0026 U	0.0034 U	0.0026 U	0.014 U	0.0028 U	0.013 U	0.0028 U	0.18 U	0.0028 U	0.0028 U	0.0027 U	0.0028 U	0.0027 U	0.0031 U	0.00032 U	0.0031 U	0.0027 U	0.0027 U
Acetone	100	0.05	0.017 J	0.51 U	0.021 J	0.48 U	0.018 J	0.035	0.023 J	0.015 J	0.044 U	0.059	0.14	0.073	0.44 U	0.019 J	0.02 J	0.034	0.035	0.0085 U	0.0097 U	0.0093 U	0.0097 U	0.041 0	0.0084 U
Acrolein	-	-	0.0026 U	0.28 U	0.0026 U	0.26 U	0.0025 U	0.0025 U	0.0033 U	0.0025 U	0.014 U	0.0027 U	0.012 U	0.0027 U	0.24 U	0.0027 U	0.0027 U	0.0027 U	0.0027 U	NR	NR	NR	NR	NR	NR
Acrylonitrile	-	-	0.0095 U	0.49 U	0.0096 U	0.46 U	0.009 U	0.0093 U	0.012 U	0.0091 U	0.051 U	0.01 U	0.045 U	0.01 U	0.43 U	0.0099 U	0.01 U	0.0097 U	0.01 U	NR	NR	NR	NR	NR	NR
Benzene	4.8	0.06	0.00022 U	0.037 U	0.00023 U	0.035 U	0.00021 U	0.0012 J	0.00028 U	0.00021 U	0.0012 U	0.00024 U	0.0011 U	0.0017 J	0.032 U	0.00023 U	0.00023 U	0.00023 U	0.00023 U	0.00023 U	0.00026 U	0.00025 U	0.00026 U	0.00023 U	0.00023 U
Bromobenzene	-	-	0.00045 U	0.036 U	0.00045 U	0.034 U	0.00042 U	0.00044 U	0.00057 U	0.00043 U	0.0024 U	0.00047 U	0.0021 U	0.00047 U	0.032 U	0.00046 U	0.00047 U	0.00046 U	0.00047 U	NR	NR	NR	NR	NR	NR
Bromochloromethane	-	-	0.00049 U	0.082 U	0.00049 U	0.076 U	0.00046 U	0.00048 U	0.00062 U	0.00047 U	0.0026 U	0.00052 U	0.0023 U	0.00052 U	0.072 U	0.0005 U	0.00051 U	0.0005 U	0.00051 U	NR	NR	NR	NR	NR	NR
Bromodichloromethane	-	-	0.00037 U	0.054 U	0.00037 U	0.05 U	0.00035 U	0.00036 U	0.00047 U	0.00035 U	0.002 U	0.00039 U	0.0018 U	0.00039 U	0.047 U	0.00038 U	0.00039 U	0.00038 U	0.00039 U	NR	NR	NR	NR	NR	NR
Bromoform	-	-	0.00033 U	0.039 U	0.00034 U	0.036 U	0.00031 U	0.00032 U	0.00042 U	0.00032 U	0.0018 U	0.00035 U	0.0016 U	0.00035 U	0.034 U	0.00034 U	0.00035 U	0.00034 U	0.00035 U	NR	NR	NR	NR	NR	NR
Bromomethane	-	-	0.00079 U	0.12 U	0.0008 U	0.11 U	0.00075 U	0.00077 U	0.001 U	0.00075 U	0.0042 U	0.00083 U	0.0037 U	0.00083 U	0.11 U	0.00081 U	0.00082 U	0.0008 U	0.00082 U	NR	NR	NR	NR	NR	NR
Carbon Disulfide	-	2.7	0.00011 U	0.06 U	0.00011 U	0.056 U	0.00011 U	0.00011 U	0.0031 J	0.00011 U	0.0006 U	0.0034 J	0.021 J	0.024	0.052 U	0.00012 U	0.00012 U	0.00011 U	0.012	0.00011 U	0.00013 U	0.00013 U	0.00013 U	0.0025 J	0.00011 U
Carbon Tetrachloride	2.4	0.76	0.00033 U	0.073 U	0.00033 U	0.068 U	0.00031 U	0.00032 U	0.00042 U	0.00032 U	0.0018 U	0.00035 U	0.0016 U	0.00035 U	0.063 U	0.00034 U	0.00035 U	0.00034 U	0.00035 U	0.00034 U	0.00039 U	0.00037 U	0.00039 U	0.00034 U	0.00033 U
Chlorobenzene	100	1.1	0.00039 U	0.057 U	0.0004 U	0.053 U	0.00037 U	0.00038 U	0.0005 U	0.00037 U	0.0021 U	0.00041 U	0.0019 U	0.00041 U	0.049 U	0.0004 U	0.00041 U	0.0004 U	0.00041 U	0.0004 U	0.00046 U	0.00044 U	0.00046 U	0.0004 U	0.0004 U
Chloroethane	-	1.9	0.00058 U	0.14 U	0.00059 U	0.13 U	0.00055 U	0.00057 U	0.00074 U	0.00056 U	0.0031 U	0.00062 U	0.0028 U	0.00062 U	0.12 U	0.0006 U	0.00061 U	0.0006 U	0.00061 U	0.0006 U	0.00068 U	0.00066 U	0.00068 U	0.0006 U	0.00059 U
Chloroform	49	0.37	0.00026 U	0.089 U	0.00027 U	0.083 U	0.00025 U	0.00026 U	0.00033 U	0.00025 U	0.0014 U	0.00028 U	0.0012 U	0.00028 U	0.077 U	0.00027 U	0.00028 U	0.00027 U	0.00028 U	0.00027 U	0.00031 U	0.0003 U	0.00031 U	0.00027 U	0.00027 U
Chloromethane	-	-	0.00037 U	0.11 U	0.00037 U	0.098 U	0.00035 U	0.00036 U	0.00047 U	0.00035 U	0.002 U	0.00039 U	0.0017 U	0.00039 U	0.092 U	0.00038 U	0.00038 U	0.00038 U	0.00038 U	NR	NR	NR	NR	NR	NR
cis-1,2-Dichloroethene	100	0.25	0.00039 U	0.12 U	0.0004 U	0.11 U	0.00037 U	0.00038 U	0.0005 U	0.00037 U	0.0021 U	0.00041 U	0.0019 U	0.00041 U	0.1 U	0.0004 U	0.00041 U	0.0004 U	0.00041 U	NR	NR	NR	NR	NR	NR
cis-1,3-Dichloropropene	-	-	0.00022 U	0.023 U	0.00022 U	0.022 U	0.0002 U	0.00021 U	0.00027 U	0.00021 U	0.0012 U	0.00023 U	0.001 U	0.00023 U	0.02 U	0.00022 U	0.00023 U	0.00022 U	0.00023 U	NR	NR	NR	NR	NR	NR
Dibromochloromethane	-	-	0.00032 U	0.058 U	0.00033 U	0.054 U	0.00031 U	0.00032 U	0.00041 U	0.00031 U	0.0017 U	0.00034 U	0.0015 U	0.00034 U	0.051 U	0.00033 U	0.00034 U	0.00033 U	0.00034 U	0.00033 U	0.00038 U	0.00036 U	0.00038 U	0.00033 U	0.00033 U
Dibromomethane	-	-	0.0003 U	0.093 U	0.0003 U	0.087 U	0.00028 U	0.00029 U	0.00037 U	0.00028 U	0.0016 U	0.00031 U	0.0014 U	0.00031 U	0.081 U	0.00031 U	0.00031 U	0.0003 U	0.00031 U	NR	NR	NR	NR	NR	NR
Dichlorodifluoromethane	-	-	0.0014 U	0.052 U	0.0014 U	0.048 U	0.0013 U	0.0013 U	0.0017 U	0.0013 U	0.0074 U	0.0015 U	0.0065 U	0.0015 U	0.045 U	0.0014 U	0.0014 U	0.0014 U	0.0014 U	NR	NR	NR	NR	NR	NR
Ethyl Benzene	41	1	0.00028 U	0.063 U	0.00028 U	0.059 U	0.00026 U	0.00027 U	0.00035 U	0.00026 U	0.0015 U	0.00029 U	0.38	0.0029 J	0.055 U	0.00029 U	0.00029 U	0.00028 U	0.00029 U	0.00028 U	0.00032 U	0.00031 U	0.00032 U	0.00028 U	0.00028 U
Hexachlorobutadiene	-	-	0.00051 U	0.04 U	0.00051 U	0.037 U	0.00048 U	0.0005 U	0.00064 U	0.00049 U	0.0027 U	0.00054 U	0.0024 U	0.00054 U	0.034 U	0.00053 U	0.00053 U	0.00052 U	0.00053 U	NR	NR	NR	NR	NR	NR
Isopropylbenzene	-	2.3	0.00041 U	0.051 U	0.00042 U	0.048 U	0.00039 U	0.0004 U	0.00052 U	0.00039 U	0.0022 U	0.00044 U	0.15	0.13	0.3 J	0.00043 U	0.00043 U	0.00042 U	0.00043 U	NR	NR	NR	NR	NR	NR
m/p-Xylenes	100	1.6	0.00057 U	0.15 U	0.00058 U	0.14 U	0.00054 U	0.00056 U	0.00072 U	0.00055 U	0.0031 U	0.0015 J	1.5	0.0072	0.13 U	0.00059 U	0.0006 U	0.00058 U	0.0006 U	0.00058 U	0.00067 U	0.00064 U	0.00067 U	0.00058 U	0.00058 U
Methyl tert-butyl Ether	100	0.93	0.00025 U	0.055 U	0.00026 U	0.052 U	0.00024 U	0.00025 U	0.00032 U	0.00024 U	0.0014 U	0.00027 U	0.0012 U	0.00027 U	0.048 U	0.00026 U	0.00027 U	0.00026 U	0.00027 U	0.00026 U	0.0003 U	0.00029 U	0.0003 U	NR	NR
Methylene Chloride	100	0.05	0.00076 U	0.096 U	0.0023 JB	0.089 U	0.0018 JB	0.0031 JB	0.00096 U	0.00072 U	0.004 U	0.0034 JB	0.0036 U	0.0008 U	0.084 U	0.0014 J	0.00079 U	0.00077 U	0.00079 U	0.00077 U	0.00088 UB	0.00085 UB	0.0026 JB	0.0023 JB	0.00076 U
Naphthalene	100	12	0.0089	1.1	0.091	3	0.016	0.0045 J	0.0043 J	0.059	0.077	0.005 J	0.32	0.00035	4.6	0.00034 U	0.00035 U	0.00034 U	0.00035 U	0.00034 U	0.00039 U	0.00037 U	0.00039 U	NR	NR
n-Butylbenzene	-	-	0.00046 U	0.072 U	0.00046 U	0.19 J	0.00043 U	0.00045 U	0.00058 U	0.00044 U	0.0024 U	0.00048 U	0.16	0.15	0.92	0.00047 U	0.00048 U	0.00047 U	0.00048 U	NR	NR	NR	NR	NR	NR
n-propylbenzene	100	3.9	0.00046 U	0.058 U	0.00047 U	0.054 U	0.00044 U	0.00045 U	0.00058 U	0.00044 U	0.0025 U	0.00049 U	0.62	0.31 E	0.58 J	0.00048 U	0.00048 U	0.00047 U	0.00048 U	0.00047 U	0.00054 U	0.00052 U	0.00054 U	NR	NR
o-Xylene	100	1.6	0.00048 U	0.057 U	0.00049 U	0.053 U	0.00045 U	0.00047 U	0.00061 U	0.00046 U	0.0026 U	0.00051 U	0.38	0.015	0.049 U	0.0005 U	0.0005 U	0.00049 U	0.0005 U	0.00049 U	0.00056 U	0.00054 U	0.00056 U	0.00049 U	0.00049 U
p-Isopropyltoluene	-	-	0.00065 U	0.056 U	0.00066 U	0.052 U	0.00062 U	0.00064 U	0.00083 U	0.00062 U	0.0035 U	0.00069 U	0.14	0.00069 U	0.049 U	0.00067 U	0.00068 U	0.00067 U	0.00068 U	NR	NR	NR	NR	NR	NR
sec-Butylbenzene	100	11	0.00027 U	0.066 U	0.00027 U	0.061 U	0.00025 U	0.00026 U	0.00034 U	0.00026 U	0.0014 U	0.00028 U	0.061	0.13	0.68	0.00028 U	0.0018 J	0.00027 U	0.00028 U	NR	NR	NR	NR	NR	NR
Styrene	-	-	0.00035 U	0.053 U	0.00035 U	0.049 U	0.00033 U	0.00034 U	0.00044 U	0.00033 U	0.0019 U	0.00037 U	0.0016 U	0.00037 U	0.046 U	0.00036 U	0.00036 U	0.00036 U	0.00036 U	NR	NR	NR	NR	NR	NR
t-1,3-Dichloropropene	-	-	0.00028 U	0.066 U	0.00029 U	0.061 U	0.00027 U	0.00028 U	0.00036 U	0.00027 U	0.0015 U	0.0003 U	0.0013 U	0.0003 U	0.057 U	0.00029 U	0.0003 U	0.00029 U	0.0003 U	NR	NR	NR	NR	NR	NR
Tert butyl alcohol	-	-	0.016 U	0.67 U	0.016 U	0.63 U	0.015 U	0.016 U	0.021 U	0.016 U	0.087 U	0.017 U	0.077 U	0.017 U	0.59 U	0.017 U	0.017 U	0.017 U	0.017 U	NR	NR	NR	NR	NR	NR
tert-Butylbenzene	-	-	0.00031 U	0.056 U	0.00031 U	0.052 U	0.00029 U	0.0003 U	0.00039 U	0.00029 U	0.0016 U	0.00032 U	0.0015 U	0.00032 U	0.049 U	0.00032 U	0.00032 U	0.00031 U	0.00032 U	NR	NR	NR	NR	NR	NR
Tetrachloroethene	19	1.3	0.00071 U	0.051 U	0.00071 U	0.047 U	0.00067 U	0.00069 U	0.00089 U	0.00068 U	0.0038 U	0.00075 U	0.0033 U	0.00075 U	0.044 U	0.00073 U	0.00074 U	0.00072 U	0.005 J	0.00072 U	0.00082 U	0.00079 U	0.00082 U	0.00072 U	0.00071 U
Toluene	100	0.7	0.00029 U	0.06 U	0.00029 U	0.056 U	0.00027 U	0.0017 J	0.00036 U	0.00028 U	0.0015 U	0.0031 J	0.0014 U	0.0058 J	0.052 U	0.0003 U	0.0003 U	0.00029 U	0.0003 U	0.00029 U	0.00034 U	0.00032 U	0.00034 U	0.00029 U	0.00029 U
trans-1,2-Dichloroethene	100	0.19	0.00041 U	0.079 U	0.00042 U	0.074 U	0.00039 U	0.0004 U	0.00052 U	0.00039 U	0.0022 U	0.00044 U	0.002 U	0.00044 U	0.069 U	0.00043 U	0.00043 U	0.00042 U	0.00043 U	0.00042 U	0.00048 U	0.00046 U	0.00048 U	0.00042 U	0.00042 U
Trichloroethene	21	0.47	0.00036 U	0.1 U	0.00036 U	0.096 U	0.00034 U	0.00035 U	0.00045 U	0.00034 U	0.0019 U	0.00038 U	0.0017 U	0.00038 U	0.09 U	0.00037 U	0.00037 U	0.00036 U	0.00037 U	0.00036 U	0.00042 U	0.0004 U	0.00042 U	0.00036 U	0.00036 U
Trichlorofluoromethane	-	-	0.0027 U	0.089 U	0.0028 U	0.083 U	0.0026 U	0.0027 U	0.0035 U	0.0026 U	0.015 U	0.0029 U	0.013 U	0.0029 U	0.077 U	0.0028 U	0.0029 U	0.0028 U	0.0029 U	NR	NR	NR	NR	NR	NR
Vinyl Acetate	-	-	0.006 U	0.36 U	0.0061 U	0.34 U	0.0057 U	0.0059 U	0.0076 U	0.0057 U	0.032 U	0.0064 U	0.028 U	0.0064 U	0.32 U	0.0062 U	0.0063 U	0.0061 U	0.0063 U	NR	NR	NR	NR	NR	NR
Vinyl Chloride	0.9	0.02	0.00026 U	0.041 U	0.00026 U	0.038 U	0.00025 U	0.00026 U	0.00033 U	0.00025 U	0.0014 U	0.00028 U	0.0012 U	0.00028 U	0.036 U	0.00027 U	0.00027 U	0.00027 U	0.00027 U	0.00027 U	0.00031 U	0.00029 U	0.00031 U	0.00027 U	0.00026 U

U = The compound was not detected at the indicated concentration.

J = The result is less than the quantitation limit but greater so result is an approximate value.

B = The analyte was found in the laboratory blank as well as the sample

NR = Not analyzed

- = No standard

Table 2A - RIR - Volatile Organic Compounds in Soil
Harlem Park - 1800 Park Avenue, New York, NY

Sample ID Sampling Date Units	NY SCO - Restricted Residential w/ Track 4 Site Specific SCOs	NY SCO - Protection of Groundwater w/CP-51	HH10-33 8/23/04 mg/Kg	HH10-63 8/23/04 mg/Kg	HH11-16 8/24/04 mg/Kg	HH12-18 8/24/04 mg/Kg	HH13-5 8/23/04 mg/Kg	HH13-18 8/24/04 mg/Kg	HH14-20 8/24/04 mg/Kg	HH15-18 8/24/04 mg/Kg	HH16-18 8/25/04 mg/Kg	HH17-20 8/26/04 mg/Kg	HH18-22 8/26/04 mg/Kg
1,1,1,2-Tetrachloroethane	-	-	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,1,1-Trichloroethane	100	0.68	0.00028 U	0.00031 U	0.00029 U	0.00035 U	0.00032 U	0.00033 U	0.00036 U	0.0003 U	0.00035 U	0.00034 U	0.00032 U
1,1,2,2-Tetrachloroethane	-	0.6	0.00054 U	0.0006 U	0.00057 U	0.00069 U	0.00062 U	0.00065 U	0.0007 U	0.00059 U	0.00068 U	0.00066 U	0.00062 U
1,1,2-Trichloroethane	-	-	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,1-Dichloroethane	26	0.27	0.00036 U	0.0004 U	0.00038 U	0.00046 U	0.00042 U	0.00043 U	0.00046 U	0.00039 U	0.00045 U	0.00044 U	0.00042 U
1,1-Dichloroethene	100	0.33	0.00022 U	0.00024 U	0.00023 U	0.00028 U	0.00025 U	0.00026 U	0.00028 U	0.00024 U	0.00028 U	0.00027 U	0.00025 U
1,1-Dichloropropene	-	-	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,2,3-Trichlorobenzene	-	-	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,2,3-Trichloropropane	-	-	0.00042 U	0.00046 U	0.00044 U	0.00053 U	0.00048 U	0.0005 U	0.00054 U	0.00045 U	0.00052 U	0.00051 U	0.00048 U
1,2,4-Trichlorobenzene	-	3.4	0.00026 U	0.00028 U	0.00027 U	0.00032 U	0.00029 U	0.0003 U	0.00033 U	0.00028 U	0.00032 U	0.00031 U	0.00029 U
1,2,4-Trimethylbenzene	52	3.6	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,2-Dibromo-3-Chloropropane	-	-	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,2-Dibromoethane	-	-	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,2-Dichlorobenzene	100	1.1	0.00042 U	0.00046 U	0.00044 U	0.00053 U	0.00048 U	0.0005 U	0.00054 U	0.00045 U	0.00052 U	0.00051 U	0.00048 U
1,2-Dichloroethane	3.1	0.02	0.0031 U	0.0035 U	0.0033 U	0.004 U	0.0036 U	0.0038 U	0.0041 U	0.0034 U	0.0039 U	0.0038 U	0.0036 U
1,2-Dichloropropane	-	-	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,3,5-Trimethylbenzene	52	8.4	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,3-Dichlorobenzene	49	2.4	0.00022 U	0.00024 U	0.00023 U	0.00027 U	0.00025 U	0.00026 U	0.00028 U	0.00023 U	0.00027 U	0.00026 U	0.00025 U
1,3-Dichloropropane	-	-	0.00047 U	0.00052 U	0.0005 U	0.0006 U	0.00054 U	0.00056 U	0.00061 U	0.00051 U	0.00059 U	0.00057 U	0.00054 U
1,4-Dichlorobenzene	13	1.8	0.00036 U	0.0004 U	0.00038 U	0.00046 U	0.00041 U	0.00043 U	0.00046 U	0.00039 U	0.00045 U	0.00044 U	0.00041 U
2,2-Dichloropropane	-	-	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
2-Butanone	100	0.3	0.0023 U	0.0026 U	0.0025 U	0.003 U	0.0027 U	0.0028 U	0.003 U	0.0025 U	0.0029 U	0.0028 U	0.0027 U
2-Chloroethyl Vinyl ether	-	-	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
2-Chlorotoluene	-	-	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
2-Hexanone	-	-	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
4-Chlorotoluene	-	-	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
4-Methyl-2-Pentanone	-	1	0.0025 U	0.0027 U	0.0026 U	0.0031 U	0.0028 U	0.0029 U	0.0032 U	0.0027 U	0.0031 U	0.003 U	0.0028 U
Acetone	100	0.05	0.0076 U	0.0085 U	0.0081 U	0.0097 U	0.0088 U	0.027 J	0.0098 U	0.0083 U	0.0096 U	0.0093 U	0.0088 U
Acrolein	-	-	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Acrylonitrile	-	-	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Benzene	4.8	0.06	0.00021 U	0.00023 U	0.00022 U	0.00026 U	0.00024 U	0.00025 U	0.00027 U	0.00022 U	0.00026 U	0.00025 U	0.00024 U
Bromobenzene	-	-	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Bromochloromethane	-	-	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Bromodichloromethane	-	-	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Bromoform	-	-	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Bromomethane	-	-	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Carbon Disulfide	-	2.7	0.0001 U	0.00011 U	0.00011 U	0.00013 U	0.00012 U	0.00012 U	0.00013 U	0.00011 U	0.00013 U	0.00013 U	0.00012 U
Carbon Tetrachloride	2.4	0.76	0.0003 U	0.00034 U	0.00032 U	0.00036 U	0.00035 U	0.00036 U	0.00039 U	0.00033 U	0.00038 U	0.00037 U	0.00035 U
Chlorobenzene	100	1.1	0.00036 U	0.0004 U	0.00038 U	0.00046 U	0.00041 U	0.00043 U	0.00046 U	0.00039 U	0.00045 U	0.00044 U	0.00041 U
Chloroethane	-	1.9	0.00054 U	0.0006 U	0.00057 U	0.00068 U	0.00062 U	0.00064 U	0.00069 U	0.00058 U	0.00067 U	0.00066 U	0.00062 U
Chloroform	49	0.37	0.00024 U	0.00027 U	0.00026 U	0.00031 U	0.00028 U	0.00029 U	0.00031 U	0.00026 U	0.0003 U	0.0003 U	0.00028 U
Chloromethane	-	-	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
cis-1,2-Dichloroethene	100	0.25	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
cis-1,3-Dichloropropene	-	-	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Dibromochloromethane	-	-	0.0003 U	0.00033 U	0.00032 U	0.00038 U	0.00034 U	0.00035 U	0.00038 U	0.00032 U	0.00037 U	0.00036 U	0.00034 U
Dibromomethane	-	-	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Dichlorodifluoromethane	-	-	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Ethyl Benzene	41	1	0.00025 U	0.00028 U	0.00027 U	0.00032 U	0.00029 U	0.0003 U	0.00033 U	0.00028 U	0.00032 U	0.00031 U	0.00029 U
Hexachlorobutadiene	-	-	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Isopropylbenzene	-	2.3	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
m/p-Xylenes	100	1.6	0.00052 U	0.00058 U	0.00056 U	0.00067 U	0.0006 U	0.00063 U	0.00068 U	0.00057 U	0.00066 U	0.00064 U	0.0006 U
Methyl tert-butyl Ether	100	0.93	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Methylene Chloride	100	0.05	0.00069 U	0.0024 J	0.0036 J	0.016 0	0.0035 J	0.0037 J	0.0038 J	0.0045 J	0.0067 0	0.0082 0	0.0078 0
Naphthalene	100	12	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
n-Butylbenzene	-	-	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
n-propylbenzene	100	3.9	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
o-Xylene	100	1.6	0.00044 U	0.00049 U	0.00047 U	0.00056 U	0.00051 U	0.00053 U	0.00057 U	0.00048 U	0.00055 U	0.00054 U	0.00051 U
p-Isopropyltoluene	-	-	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
sec-Butylbenzene	100	11	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Styrene	-	-	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
t-1,3-Dichloropropene	-	-	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Tert butyl alcohol	-	-	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
tert-Butylbenzene	-	-	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Tetrachloroethene	19	1.3	0.00065 U	0.00072 U	0.00069 U	0.00082 U	0.00075 U	0.00077 U	0.00084 U	0.00071 U	0.00081 U	0.00079 U	0.00075 U
Toluene	100	0.7	0.00026 U	0.00029 U	0.00028 U	0.00034 U	0.0003 U	0.00032 U	0.00034 U	0.00029 U	0.00033 U	0.00032 U	0.0003 U
trans-1,2-Dichloroethene	100	0.19	0.00038 U	0.00042 U	0.0004 U	0.00048 U	0.00044 U	0.00045 U	0.00049 U	0.00041 U	0.00048 U	0.00046 U	0.00044 U
Trichloroethene	21	0.47	0.00033 U	0.00036 U	0.00035 U	0.00042 U	0.00038 U	0.00039 U	0.00042 U	0.00036 U	0.00041 U	0.0004 U	0.00038 U
Trichlorofluoromethane	-	-	NR	NR	NR	0.0006 U	0.00054 U	0.00056 U	0.0006 U	0.00051 U	0.00059 U	0.00057 U	0.00054 U
Vinyl Acetate	-	-	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Vinyl Chloride	0.9	0.02	0.00024 U	0.00027 U	0.00026 U	0.00031 U	0.00028 U	0.00029 U	0.00031 U	0.00026 U	0.0003 U	0.00029 U	0.00028 U

U = The compound was not detected at the indicated concentration.

J = The result is less than the quantitation limit but greater so result is an approximate value.

B = The analyte was found in the laboratory blank as well as the sample

NR = Not analyzed

- = No standard

Table 2B - RI -Semi Volatile Organic Compounds in Soil

Harlem Park - 1800 Park Avenue, New York, NY

Sample ID	NY SCO - Restricted Residential w/ Track 4 Site Specific SCOs	NY SCO - Protection of Groundwater w/CP-51	HH1-1	HH1-14	HH2-1	HH2-15	HH3-1	HH5-1	HH5-16	HH4-1	HH4-15	HH6-1	HH6-13	HH3-14.5	HH6-14.5	HH7-1	HH7-15	HH8-1	HH8-1RE
Sampling Date			05/27/04	05/27/04	05/27/04	05/27/04	05/27/04	05/28/04	05/28/04	05/28/04	05/28/04	05/28/04	05/28/04	06/07/04	06/07/04	06/07/04	06/07/04	06/07/04	06/07/04
Units			mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
1,2,4-Trichlorobenzene	-	-	0.1 U	0.012 U	0.53 U	0.054 U	0.5 U	1 U	0.013 U	0.0099 U	0.011 U	1.1 U	0.5 U	0.011 U	0.2 U	0.11 U	0.011 U	0.11 U	0.11 U
1,2-Dichlorobenzene	-	-	0.2 U	0.022 U	1 U	0.1 U	0.94 U	1.9 U	0.025 U	0.019 U	0.021 U	2.1 U	0.94 U	0.021 U	0.38 U	0.2 U	0.021 U	0.2 U	0.2 U
1,3-Dichlorobenzene	-	-	0.13 U	0.015 U	0.68 U	0.07 U	0.64 U	1.3 U	0.017 U	0.013 U	0.014 U	1.4 U	0.64 U	0.014 U	0.26 U	0.14 U	0.014 U	0.14 U	0.14 U
1,4-Dichlorobenzene	-	-	0.15 U	0.017 U	0.76 U	0.079 U	0.72 U	1.5 U	0.019 U	0.014 U	0.016 U	1.6 U	0.72 U	0.016 U	0.29 U	0.16 U	0.016 U	0.15 U	0.15 U
2,2-oxybis(1-Chloropropane)	-	-	0.2 U	0.022 U	0.99 U	0.1 U	0.94 U	1.9 U	0.025 U	0.019 U	0.021 U	2.1 U	0.94 U	0.021 U	0.38 U	0.2 U	0.021 U	0.2 U	0.2 U
2,4-Dinitrotoluene	-	-	0.073 U	0.0081 U	0.37 U	0.038 U	0.34 U	0.71 U	0.0093 U	0.0069 U	0.0078 U	0.77 U	0.35 U	0.0077 U	0.14 U	0.074 U	0.0076 U	0.074 U	0.074 U
2,6-Dinitrotoluene	-	1	0.16 U	0.017 U	0.78 U	0.081 U	0.74 U	1.5 U	0.02 U	0.015 U	0.017 U	1.6 U	0.74 U	0.017 U	0.3 U	0.16 U	0.016 U	0.16 U	0.16 U
2-Chloronaphthalene	-	-	0.076 U	0.0085 U	0.38 U	0.039 U	0.36 U	0.74 U	0.0097 U	0.0072 U	0.0081 U	0.8 U	0.36 U	0.0081 U	0.15 U	0.078 U	0.0079 U	0.077 U	0.077 U
2-Methylnaphthalene	-	36.4	0.063 U	0.55	0.32 U	1.2 J	0.3 U	0.61 U	0.008 U	0.035 J	0.0067 U	0.66 U	0.3 U	1.7	24	0.064 U	0.0065 U	0.064 U	0.064 U
2-Nitroaniline	-	0.4	0.13 U	0.015 U	0.66 U	0.069 U	0.63 U	1.3 U	0.017 U	0.013 U	0.014 U	1.4 U	0.63 U	0.014 U	0.25 U	0.14 U	0.014 U	0.13 U	0.13 U
3,3-Dichlorobenzidine	-	-	0.58 U	0.065 U	2.9 U	0.3 U	2.8 U	5.7 U	0.075 U	0.056 U	0.062 U	6.2 U	2.8 U	0.062 U	1.1 U	0.6 U	0.061 U	0.59 U	0.59 U
3-Nitroaniline	-	0.5	0.59 U	0.065 U	3 U	0.31 U	2.8 U	5.7 U	0.075 U	0.056 U	0.063 U	6.2 U	2.8 U	0.063 U	1.1 U	0.6 U	0.061 U	0.6 U	0.6 U
4-Bromophenyl-phenylether	-	-	0.096 U	0.011 U	0.48 U	0.05 U	0.45 U	0.93 U	0.012 U	0.0091 U	0.01 U	1 U	0.46 U	0.01 U	0.18 U	0.098 U	0.01 U	0.097 U	0.097 U
4-Chloroaniline	0	0.22	1.3 U	0.15 U	6.8 U	0.7 U	6.4 U	13 U	0.17 U	0.13 U	0.14 U	14 U	6.4 U	0.14 U	2.6 U	1.4 U	0.14 U	1.4 U	1.4 U
4-Chlorophenyl-phenylether	-	-	0.09 U	0.01 U	0.45 U	0.047 U	0.43 U	0.88 U	0.012 U	0.0086 U	0.0096 U	0.95 U	0.43 U	0.0096 U	0.17 U	0.093 U	0.0094 U	0.092 U	0.092 U
4-Nitroaniline	-	-	0.29 U	0.032 U	1.4 U	0.15 U	1.4 U	2.8 U	0.036 U	0.027 U	0.03 U	3 U	1.4 U	0.03 U	0.55 U	0.29 U	0.03 U	0.29 U	0.29 U
Acenaphthene	100	98	0.08 U	0.78	0.4 U	1.7 J	0.38 U	0.78 U	0.01 U	0.094 J	0.04 J	0.85 U	0.38 U	0.19 J	4 J	0.082 U	0.075 J	0.082 U	0.082 U
Acenaphthylene	100	107	0.11 U	0.16 J	0.55 U	0.41 J	0.52 U	1.1 U	0.014 U	0.01 U	0.012 U	1.2 U	0.52 U	0.012 U	0.21 U	0.11 U	0.011 U	0.11 U	0.11 U
Anthracene	100	1000	0.74 J	0.69	0.44 U	2.6	0.41 U	0.85 U	0.076 J	0.11 J	0.05 J	0.92 U	0.41 U	0.21 J	2.5 J	0.089 U	0.11 J	0.45 J	0.49 J
Azobenzene	0	0	0.1 U	0.012 U	0.52 U	0.054 U	0.49 U	1 U	0.013 U	0.0098 U	0.011 U	1.1 U	0.49 U	0.011 U	0.2 U	0.11 U	0.011 U	0.11 U	0.11 U
Benzo(a)anthracene	49.1*	1	3.7	0.36 J	2.4 J	3.5	0.26 U	0.54 U	0.15 J	0.22 J	0.053 J	0.58 U	0.26 U	0.071 J	1.2 J	0.056 U	0.1 J	1.4 J	1.4 J
Benzo(a)pyrene	50*	22	3.2 J	0.26 J	2.3 J	2.4	0.3 U	0.61 U	0.13 J	0.19 J	0.04 J	0.66 U	0.3 U	0.0067 U	0.12 U	0.064 U	0.061 J	1.5 J	1.6 J
Benzo(b)fluoranthene	44.9*	1.7	3.6	0.23 J	2.3 J	2.6	0.92 U	1.9 U	0.17 J	0.28 J	0.045 J	2 U	0.92 U	0.021 U	0.37 U	0.49 J	0.069 J	2.2 J	2.4 J
Benzo(g,h,i)perylene	100	1000	1.6 J	0.069 J	0.8 U	0.74 J	0.75 U	1.5 U	0.02 U	0.047 J	0.017 U	1.7 U	0.75 U	0.017 U	0.31 U	0.16 U	0.017 U	0.46 J	0.16 U
Benzo(k)fluoranthene	30*	1.7	1.7 J	0.086 J	0.63 U	1.5 J	0.59 U	1.2 U	0.064 J	0.13 J	0.013 U	1.3 U	0.59 U	0.013 U	0.24 U	0.13 U	0.013 U	1.1 J	0.71 J
bis(2-Chloroethoxy)methane	-	-	0.17 U	0.019 U	0.84 U	0.086 U	0.79 U	1.6 U	0.021 U	0.016 U	0.018 U	1.8 U	0.79 U	0.018 U	0.32 U	0.17 U	0.017 U	0.17 U	0.17 U
bis(2-Chloroethyl)ether	-	-	0.18 U	0.02 U	0.9 U	0.093 U	0.85 U	1.8 U	0.023 U	0.017 U	0.019 U	1.9 U	0.85 U	0.019 U	0.35 U	0.18 U	0.019 U	0.18 U	0.18 U
bis(2-Ethylhexyl)phthalate	-	435	0.084 U	0.0093 U	0.42 U	0.043 U	680 E	0.82 U	0.066 J	0.057 J	0.37 J	0.88 U	10 J	0.0089 U	0.16 U	0.086 U	0.0087 U	0.085 U	0.085 U
Butylbenzylphthalate	-	122	0.12 U	0.014 U	0.61 U	0.063 U	0.58 U	1.2 U	0.016 U	0.012 U	0.16 J	1.3 U	0.58 U	0.013 U	0.24 U	0.13 U	0.013 U	0.12 U	0.12 U
Chrysene	51*	1	3.3 J	0.45	2.4 J	2.9	0.55 U	1.1 U	0.19 J	0.23 J	0.066 J	1.2 U	0.55 U	0.14 J	2.6 J	0.12 U	0.17 J	1.8 J	1.7 J
Dibenz(a,h)anthracene	87.9*	1000	0.11 U	0.012 U	0.54 U	0.055 U	0.51 U	1 U	0.014 U	0.01 U	0.011 U	1.1 U	0.51 U	0.011 U	0.21 U	0.11 U	0.011 U	0.11 U	0.11 U
Dibenzofuran	59	6.2	0.12 U	0.18 J	0.6 U	1.5 J	0.57 U	1.2 U	0.015 U	0.085 J	0.013 U	1.3 U	0.57 U	0.13 J	2.8 J	0.12 U	0.012 U	0.12 U	0.12 U
Diethylphthalate	-	7.1	0.11 U	0.013 U	0.58 U	0.059 U	0.54 U	1.1 U	0.015 U	0.011 U	0.012 U	1.2 U	0.54 U	0.012 U	0.22 U	0.12 U	0.012 U	0.12 U	0.12 U
Dimethylphthalate	-	27	0.087 U	0.0097 U	0.44 U	0.045 U	0.41 U	0.85 U	0.011 U	0.0083 U	0.0093 U	0.92 U	0.41 U	0.0093 U	0.17 U	0.089 U	0.0091 U	0.088 U	0.088 U
Di-n-butylphthalate	-	8.1	0.048 U	0.0054 U	0.24 U	0.025 U	0.23 U	0.47 U	0.07 J	0.061 J	0.0052 U	0.51 U	0.23 U	0.0052 U	0.093 U	0.05 U	0.092 J	0.049 U	0.049 U
Di-n-octyl phthalate	-	120	0.087 U	0.0097 U	0.44 U	0.045 U	0.41 U	0.85 U	0.011 U	0.0083 U	0.0093 U	0.92 U	0.41 U	0.0093 U	0.17 U	0.089 U	0.0091 U	0.088 U	0.088 U
Fluoranthene	16.7*	1000	6.1	0.61	4.4 J	6.4	0.24 U	0.49 U	0.32 J	0.61	0.13 J	3.2 J	2.9 J	0.079 J	1.1 J	0.5 J	0.13 J	3 J	3.2 J
Fluorene	100	386	0.1 U	0.54	0.52 U	1.8 J	0.49 U	1 U	0.013 U	0.11 J	0.011 U	1.1 U	0.49 U	0.37 J	0.2 U	0.11 U	0.15 J	0.11 U	0.11 U
Hexachlorobenzene	1.2	1.4	0.068 U	0.0076 U	0.34 U	0.035 U	0.32 U	0.67 U	0.0087 U	0.0065 U	0.0073 U	0.72 U	0.32 U	0.0073 U	0.13 U	0.07 U	0.0071 U	0.069 U	0.069 U
Hexachlorobutadiene	-	-	0.13 U	0.014 U	0.64 U	0.066 U	0.61 U	1.2 U	0.016 U	0.012 U	0.014 U	1.3 U	0.61 U	0.014 U	0.25 U	0.13 U	0.013 U	0.13 U	0.13 U
Hexachlorocyclopentadiene	-	-	0.091 U	0.01 U	0.46 U	0.047 U	0.43 U	0.89 U	0.012 U	0.0087 U	0.0098 U	0.96 U	0.43 U	0.0097 U	0.18 U	0.094 U	0.0095 U	0.093 U	0.093 U
Hexachloroethane	-	-	0.17 U	0.019 U	0.87 U	0.09 U	0.83 U	1.7 U	0.022 U	0.017 U	0.019 U	1.8 U	0.83 U	0.019 U	0.33 U	0.18 U	0.018 U	0.18 U	0.18 U
Indeno(1,2,3-cd)pyrene	26.2*	8.2	1.2 J	0.05 J	0.44 U	0.66 J	0.42 U	0.86 U	0.011 U	0.0084 U	0.0094 U	0.93 U	0.42 U	0.0094 U	0.17 U	0.09 U	0.0092 U	0.089 U	0.089 U
Isophorone	-	4.4	0.14 U	0.015 U	0.68 U	0.07 U	0.64 U	1.3 U	0.017 U	0.013 U	0.014 U	1.4 U	0.64 U	0.014 U	0.26 U	0.14 U	0.014 U	0.14 U	0.14 U
Naphthalene	100	12	0.079 U	0.43	0.4 U	2.4	0.38 U	0.77 U	0.01 U	0.079 J	0.0085 U	0.84 U	0.38 U	0.0084 U	0.15 U	0.081 U	0.0083 U	0.08 U	0.08 U
Nitrobenzene	15	0.17	0.19 U	0.021 U	0.93 U	0.096 U	0.88 U	1.8 U	0.024 U	0.018 U	0.02 U	2 U	0.88 U	0.02 U	0.36 U	0.19 U	0.019 U	0.19 U	0.19 U
N-Nitroso-di-n-propylamine	-	-	0.16 U	0.018 U	0.81 U	0.083 U	0.76 U	1.6 U	0.02 U	0.015 U	0.017 U	1.7 U	0.76 U	0.017 U	0.31 U	0.16 U	0.017 U	0.16 U	0.16 U
N-Nitrosodiphenylamine	-	-	0.093 U	0.01 U	0.46 U	0.048 U	0.44 U	0.9 U	0.012 U	0.0088 U	0.0099 U	0.98 U	0.44 U	0.0098 U	0.18 U	0.095 U	0.0096 U	0.094 U	0.094 U
Phenanthrene	11.3*	1000	3.5 J	1.9	3.7 J	9.2	0.39 U	0.79 U	0.27 J	0.81	0.17 J	0.86 U	3.5 J	1.1	4.4 J	0.083 U	0.26 J	2.8 J	2.9 J
Pyrene	11.3*	1000	6.4	1.1	4.7 J	5.9	2.2 J	4.4 J	0.37 J	0.55	0.14 J	0.69 U	3.1 J	0.22 J	4.1 J	0.71 J	0.33 J	3.9	3.8

* = Site Specific Soil Cleanup Objective

U = The compound was not detected at the indicated concentration.

J = The result is less than the quantitation limit but greater so result is an approximate value.

B = The analyte was found in the laboratory blank as well as the sample

NR = Not analyzed

- = No standard

Table 2B - RI - Semi Volatile Organic Compounds in Soil
Harlem Park - 1800 Park Avenue, New York, NY

Sample ID	NY SCO - Restricted Residential w/ Track 4 Site Specific SCOs	NY SCO - Protection of Groundwater w/CP-51	HH8-14.5	HH9-7	HH9-23	HH9-33	HH9-48	HH10-7	HH10-17	HH10-33	HH10-63	HH11-16	HH12-18	HH13-5	HH13-18	HH14-20	HH15-18	HH16-18	HH17-20	HH18-22
Sampling Date			06/07/04	8/19/04	8/19/04	8/19/04	8/19/04	8/23/04	8/23/04	8/23/04	8/23/04	8/24/04	8/25/04	8/26/04	8/26/04	8/26/04	8/26/04	8/26/04	8/26/04	8/26/04
Units			mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
1,2,4-Trichlorobenzene	-	-	0.043 U	0.11 U	0.012 U	0.012 U	0.012 U	0.099 U	0.1 U	0.012 U	0.53 U	0.01 U	0.012 U	0.022 U	0.012 U	0.012 U	0.01 U	0.012 U	0.012 U	0.011 U
1,2-Dichlorobenzene	-	-	0.082 U	0.2 U	0.023 U	0.022 U	0.023 U	0.199 U	0.2 U	0.022 U	1 U	0.019 U	0.023 U	0.042 U	0.022 U	0.024 U	0.02 U	0.022 U	0.022 U	0.021 U
1,3-Dichlorobenzene	-	-	0.056 U	0.14 U	0.016 U	0.015 U	0.016 U	0.129 U	0.13 U	0.015 U	0.68 U	0.013 U	0.016 U	0.028 U	0.015 U	0.016 U	0.013 U	0.015 U	0.015 U	0.014 U
1,4-Dichlorobenzene	-	-	0.063 U	0.16 U	0.018 U	0.017 U	0.021 U	0.149 U	0.15 U	0.017 U	0.76 U	0.015 U	0.018 U	0.032 U	0.017 U	0.018 U	0.015 U	0.017 U	0.017 U	0.016 U
2,2-oxybis(1-Chloropropane)	-	-	0.082 U	0.2 U	0.023 U	0.022 U	0.023 U	0.199 U	0.2 U	0.022 U	0.99 U	0.019 U	0.023 U	0.042 U	0.022 U	0.023 U	0.02 U	0.022 U	0.022 U	0.021 U
2,4-Dinitrotoluene	-	-	0.03 U	0.074 U	0.0085 U	0.0082 U	0.0084 U	0.072 U	0.073 U	0.0081 U	0.37 U	0.0071 U	0.0084 U	0.015 U	0.008 U	0.019 U	0.016 U	0.018 U	0.0082 U	0.017 U
2,6-Dinitrotoluene	-	1	0.064 U	0.16 U	0.018 U	0.017 U	0.018 U	0.159 U	0.16 U	0.017 U	0.78 U	0.015 U	0.018 U	0.033 U	0.017 U	0.018 U	0.015 U	0.018 U	0.017 U	0.016 U
2-Chloronaphthalene	-	-	0.032 U	0.078 U	0.0088 U	0.0085 U	0.0088 U	0.075 U	0.076 U	0.0085 U	0.38 U	0.0074 U	0.0088 U	0.016 U	0.0084 U	0.009 U	0.0076 U	0.0086 U	0.0086 U	0.008 U
2-Methylnaphthalene	-	36.4	0.026 U	0.064 U	0.0073 U	0.007 U	0.0073 U	0.062 U	0.063 U	0.55	0.32 U	NR 0	NR 0	NR 0	NR 0	NR 0	NR 0	NR 0	NR 0	NR 0
2-Nitroaniline	-	0.4	0.055 U	0.14 U	0.015 U	0.015 U	0.015 U	0.129 U	0.13 U	0.015 U	0.66 U	NR 0	NR 0	NR 0	NR 0	NR 0	NR 0	NR 0	NR 0	NR 0
3,3-Dichlorobenzidine	-	-	0.24 U	0.6 U	0.068 U	0.066 U	0.068 U	0.579 U	0.58 U	0.065 U	2.9 U	0.057 U	0.068 U	0.12 U	0.065 U	0.069 U	0.058 U	0.066 U	0.066 U	0.062 U
3-Nitroaniline	-	0.5	0.24 U	0.6 U	0.068 U	0.066 U	0.068 U	0.589 U	0.59 U	0.065 U	3 U	NR 0	NR 0	NR 0	NR 0	NR 0	NR 0	NR 0	NR 0	NR 0
4-Bromophenyl-phenylether	-	-	0.04 U	0.098 U	0.011 U	0.011 U	0.011 U	0.095 U	0.096 U	0.011 U	0.48 U	0.0093 U	0.011 U	0.02 U	0.011 U	0.011 U	0.0096 U	0.011 U	0.011 U	0.01 U
4-Chloroaniline	0	0.22	0.56 U	1.4 U	0.16 U	0.15 U	0.16 U	1.299 U	1.3 U	0.15 U	6.8 U	0.13 U	0.16 U	0.28 U	0.15 U	0.16 U	0.13 U	0.15 U	0.15 U	0.14 U
4-Chlorophenyl-phenylether	-	-	0.037 U	0.092 U	0.01 U	0.01 U	0.01 U	0.089 U	0.09 U	0.01 U	0.45 U	0.0088 U	0.01 U	0.019 U	0.01 U	0.011 U	0.009 U	0.01 U	0.01 U	0.01 U
4-Nitroaniline	-	-	0.12 U	0.29 U	0.032 U	0.032 U	0.033 U	0.289 U	0.29 U	0.032 U	1.4 U	NR 0	NR 0	NR 0	NR 0	NR 0	NR 0	NR 0	NR 0	NR 0
Acenaphthene	100	98	0.033 U	0.082 U	0.0094 U	0.009 U	0.0093 U	0.079 U	0.08 U	0.78	0.4 U	0.1 J	0.0093 U	0.017 U	0.0089 U	0.0095 U	0.008 U	0.0091 U	0.009 U	0.009 U
Acenaphthylene	100	107	0.045 U	0.11 U	0.013 U	0.012 U	0.013 U	0.109 U	0.11 U	0.16 J	0.55 U	0.011 U	0.013 U	0.23 J	0.012 U	0.013 U	0.011 U	0.012 U	0.012 U	0.012 U
Anthracene	100	1000	0.036 U	0.39 J	0.01 U	0.0098 U	0.01 U	0.739 J	0.74 J	0.69	0.44 U	0.23 J	0.01 U	0.34 J	0.0096 U	0.01 U	0.0087 U	0.0098 U	0.0098 U	0.009 U
Azobenzene	0	0	0.043 U	0.11 U	0.012 U	0.012 U	0.012 U	0.099 U	0.1 U	0.012 U	0.52 U	0.01 U	0.012 U	0.022 U	0.011 U	0.012 U	0.01 U	0.012 U	0.012 U	0.011 U
Benzo(a)anthracene	49.1*	1	0.023 U	2 J	0.0064 U	0.0062 U	0.0064 U	3.699	3.7	0.36 J	2.4 J	0.37 0	0.0064 J	1.4 0	0.0061 U	0.0065 U	0.0055 U	0.0062 U	0.0062 U	0.006 U
Benzo(a)pyrene	50*	22	0.026 U	1.5 J	0.0073 J	0.007 J	0.0073 U	3.199 J	3.2 J	0.26 J	2.3 J	0.28 J	0.0073 J	1.1 0	0.0069 U	0.0074 U	0.0063 U	0.0071 U	0.0071 U	0.007 U
Benzo(b)fluoranthene	44.9*	1.7	0.08 U	2.4 J	0.023 J	0.022 J	0.022 U	3.599	3.6	0.23 J	2.3 J	0.34 J	0.022 J	1.6 0	0.021 U	0.023 U	0.019 U	0.022 U	0.022 U	0.02 U
Benzo(g,h,i)perylene	100	1000	0.066 U	0.49 J	0.018 J	0.018 J	0.018 J	1.599 J	1.6 J	0.069 J	0.8 U	0.11 J	0.018 U	0.32 J	0.018 U	0.019 U	0.016 U	0.018 U	0.018 U	0.017 U
Benzo(k)fluoranthene	30*	1.7	0.052 U	1.1 J	0.014 J	0.014 J	0.014 J	1.699 J	1.7 J	0.086 J	0.63 U	0.15 J	0.014 U	0.76 J	0.014 U	0.015 U	0.012 U	0.014 U	0.014 U	0.013 U
bis(2-Chloroethoxy)methane	-	-	0.069 U	0.17 U	0.019 U	0.019 U	0.019 U	0.169 U	0.17 U	0.019 U	0.84 U	0.016 U	0.019 U	0.035 U	0.018 U	0.02 U	0.017 U	0.019 U	0.019 U	0.018 U
bis(2-Chloroethyl)ether	-	-	0.075 U	0.18 U	0.021 U	0.02 U	0.021 U	0.018 U	0.18 U	0.02 U	0.9 U	0.017 U	0.021 U	0.038 U	0.02 U	0.028 U	0.018 U	0.02 U	0.026 U	0.019 U
bis(2-Ethylhexyl)phthalate	-	435	0.035 U	0.74 J	0.14 J	0.29 J	0.06 U	0.083 U	0.084 U	0.0093 U	0.42 U	0.087 J	0.049 J	0.018 U	0.055 J	0.0099 U	0.052 J	0.0095 U	0.046 J	0.009 U
Butylbenzylphthalate	-	122	0.051 U	0.12 U	0.014 U	0.014 U	0.014 U	0.119 U	0.12 U	0.014 U	0.61 U	0.012 U	0.014 U	0.026 U	0.014 U	0.014 U	0.012 U	0.014 U	0.014 U	0.013 U
Chrysene	51*	1	0.32 J	2.1 J	0.013 U	0.013 U	0.013 U	3.299 J	3.3 J	0.45	2.4 J	0.33 J	0.013 J	1.3 0	0.013 U	0.014 U	0.012 U	0.013 U	0.013 U	0.012 U
Dibenz(a,h)anthracene	87.9*	1000	0.044 U	0.11 U	0.012 U	0.012 U	0.012 J	0.109 U	0.11 U	0.012 U	0.54 U	0.01 U	0.012 U	0.023 U	0.012 U	0.013 U	0.011 U	0.012 U	0.012 U	0.011 U
Dibenzofuran	59	6.2	0.05 U	0.12 U	0.014 U	0.013 U	0.014 U	0.119 U	0.12 U	0.18 J	0.6 U	NR 0	NR 0	NR 0	NR 0	NR 0	NR 0	NR 0	NR 0	NR 0
Diethylphthalate	-	7.1	0.048 U	0.12 U	0.013 U	0.013 U	0.013 U	0.109 U	0.11 U	0.013 U	0.58 U	0.011 U	0.013 U	0.024 U	0.013 U	0.014 U	0.011 U	0.013 U	0.013 U	0.012 U
Dimethylphthalate	-	27	0.036 U	0.089 U	0.01 U	0.0098 U	0.01 U	0.086 U	0.087 U	0.0097 U	0.44 U	0.0085 U	0.01 U	0.018 U	0.0096 U	0.01 U	0.0087 U	0.0098 U	0.0098 U	0.009 U
Di-n-butylphthalate	-	8.1	0.02 U	0.05 U	0.0056 U	0.0054 U	0.0056 U	0.047 U	0.048 U	0.0054 U	0.24 U	0.0047 U	0.0056 U	0.01 U	0.0054 U	0.0057 U	0.0048 U	0.0055 U	0.0055 U	0.005 U
Di-n-octyl phthalate	-	120	0.036 U	0.089 U	0.01 U	0.0098 U	0.01 U	0.086 U	0.087 U	0.0097 U	0.44 U	0.0085 U	0.01 U	0.018 U	0.0096 U	0.01 U	0.0087 U	0.0098 U	0.0098 U	0.009 U
Fluoranthene	16.7*	1000	0.021 U	4.3	0.0059 U	0.0057 U	0.0059 U	6.099	6.1	0.61	4.4 J	0.89 0	0.0059 U	3.1 0	0.0056 U	0.006 U	0.0051 U	0.0057 U	0.0057 U	0.005 U
Fluorene	100	386	0.043 U	0.11 U	0.011 U	0.012 U	0.012 U	0.099 U	0.1 U	0.54	0.52 U	0.13 U	0.012 U	0.098 J	0.011 U	0.012 U	0.01 U	0.012 U	0.012 U	0.011 U
Hexachlorobenzene	1.2	1.4	0.028 U	0.07 U	0.008 U	0.0077 U	0.0079 U	0.067 U	0.068 U	0.0076 U	0.34 U	0.0066 U	0.0079 U	0.014 U	0.0075 U	0.0081 U	0.0068 U	0.0077 U	0.0077 U	0.007 U
Hexachlorobutadiene	-	-	0.053 U	0.13 U	0.015 U	0.014 U	0.015 U	0.129 U	0.13 U	0.014 U	0.64 U	0.012 U	0.015 U	0.027 U	0.014 U	0.015 U	0.013 U	0.014 U	0.014 U	0.014 U
Hexachlorocyclopentadiene	-	-	0.038 U	0.093 U	0.011 U	0.01 U	0.011 U	0.09 U	0.091 U	0.01 U	0.46 U	0.0089 U	0.011 U	0.019 U	0.01 U	0.011 U	0.0091 U	0.01 U	0.01 U	0.01 U
Hexachloroethane	-	-	0.072 U	0.18 U	0.02 U	0.02 U	0.02 U	0.169 U	0.17 U	0.019 U	0.87 U	0.017 U	0.02 U	0.037 U	0.019 U	0.021 U	0.017 U	0.02 U	0.02 U	0.018 U
Indeno(1,2,3-cd)pyrene	26.2*	8.2	0.037 U	0.09 U	0.01 J	0.0099 J	0.01 J	1.199 J	1.2 J	0.05 J	0.44 U	0.091 J	0.01 U	0.19 J	0.0097 U	0.01 U	0.0088 U	0.01 U	0.0099 U	0.009 U
Isophorone	-	4.4	0.056 U	0.14 U	0.016 U	0.015 U	0.016 U	0.139 U	0.14 U	0.015 U	0.68 U	0.013 U	0.016 U	0.029 U	0.015 U	0.016 U	0.014 U	0.015 U	0.015 U	0.014 U
Naphthalene	100	12	0.033 U	0.081 U	0.0092 U	0.0089 U	0.0092 U	0.078 U	0.079 U	0.43	0.4 U	0.13 U	0.0092 U	0.08 J	0.0088 U	0.0094 U	0.0079 U	0.009 U	0.0089 U	0.008 U
Nitrobenzene	15	0.17	0.077 U	0.19 U	0.022 U	0.021 U	0.021 U	0.189 U	0.19 U	0.021 U	0.93 U	0.018 U	0.021 U	0.039 U	0.02 U	0.022 U	0.018 U	0.021 U	0.021 U	0.02 U
N-Nitroso-di-n-propylamine	-	-	0.067 U	0.16 U	0.019 U	0.018 U	0.019 U	0.159 U	0.16 U	0.018 U	0.81 U	0.016 U	0.019 U	0.034 U	0.018 U	0.019 U	0.016 U	0.018 U	0.018 U	0.017 U
N-Nitrosodiphenylamine	-	-	0.038 U	0.095 U	0.011 U	0.01 U	0.011 U	0.092 U	0.093 U	0.01 U	0.46 U	0.009 U	0.011 U	0.02 U	0.01 U	0.011 U	0.0092 U	0.01 U	0.01 U	0.01 U
Phenanthrene	11.3*	1000	0.034 U	4 0	0.0095 U	0.0091 U	0.0094 U	3.499 J	3.5 J	1.9	3.7 J	1 0	0.0095 U	2.8 0	0.009 U	0.0097 U	0.0081 U	0.0092 U	0.0092 U	0.009 U
Pyrene	11.3*	1000	0.47 J	4.9	0.0076 U	0.0073 U	0.0075 U	6.399	6.4	1.1	4.7 J	0.78 0	0.0075 U	2.8 0	0.0072 U	0.0077 U	0.0065 U	0.0074 U	0.0073 U	0.007 U

* = Site Specific Soil Cleanup Objective

U = The compound was not detected at the indicated concentration.

J = The result is less than the quantitation limit but greater so result is an approximate value.

B = The analyte was found in the laboratory blank as well as the sample

NR = Not analyzed

- = No standard

Table 2C - RI -Metals in Soil

Harlem Park - 1800 Park Avenue, New York, NY

Sample ID Sampling Date Units	NY SCO - Restricted Residential w/ Track 4 Site Specific SCOs	NY SCO - Protection of Groundwater w/CP-51	HH9-7 8/19/04 mg/Kg	HH9-23 8/19/04 mg/Kg	HH9-33 8/19/04 mg/Kg	HH9-48 8/19/04 mg/Kg	HH10-7 8/23/04 mg/Kg	HH10-17 8/23/04 mg/Kg	HH10-33 8/23/04 mg/Kg	HH10-63 8/23/04 mg/Kg	HH11-16 8/24/04 mg/Kg	HH12-18 8/24/04 mg/Kg	HH13-5 8/25/04 mg/Kg	HH13-18 8/25/04 mg/Kg	HH14-20 8/24/04 mg/Kg	HH15-18 8/24/04 mg/Kg
Aluminum	-	-	11,700	4,330	8,300	14,300	5,550	4,440	7,160	3,370	2,690	4,730	3,570	1,990	5,250	2,670
Antimony	-	-	0.639 U N	0.728 U N	0.689 U N	0.727 U N	0.641 U N	0.633 U N	0.576 U N	0.637 U N	0.615 U N	0.735	0.661 U N	0.686 U N	0.737 U N	0.629 U N
Arsenic	16	16	2.71	0.495 J	2.33	1.72	1.71	0.649 J	0.242 U	0.268 U	0.259 U	0.309	0.278 U N	0.289 U	0.645 J	0.265 U
Barium	820*	820	129	174	123	123	39.6	55.8	56.7	29.2	20.9 J	56.8	103	13.3 J	78.7	27.5
Beryllium	72	47	0.666	0.567 J	0.723	0.991	0.495 J N	0.513 J N	0.459 J N	0.338 J N	0.699 N	0.306	0.228 J N	0.078 J N	0.372 J N	0.172 J N
Cadmium	6.5*	7.5	0.639	0.06 U	0.323 J	0.961	0.192 J	0.052 U	0.306 J N	0.097 J	0.118 J	0.539	0.356 J N	0.056 U	0.548 J	0.051 U
Calcium	-	-	3,470	11,700 N	20,100 N	26,400 N	18,000	1,400	30,400	21,100	1,350 N	15,500	12,700 N	950 N	2,300 N	663 N
Chromium	184*	-	26.7	9.96	15.7	30.4	21.2	9.59	13.3	7.1	7.66	14.7	12.8	6.99	12.1	10.3
Cobalt	-	-	11.6	4.37 J	8.05	13.9	4.74 J N	5.1 J N	6.49	4.12 J N	2.99 J	6.04	3.74	1.62 J	6.59	3.41 J
Copper	270	1720	24.5	7.93	18.2	27.3	22.5	8.99	19.2	10.0	12.2	15.5	13.2	6.11	14.2	9.97
Cyanide	-	-	0.568 U	0.647 U	0.624 U	0.652 U	0.569 U	0.562 U	0.511 U	0.566 U	0.546 U	0.653 U	0.587 U	0.609 U	0.654 U	0.559 U
Iron	-	-	17,700	7,640	13,200	20,900	8,690	8,280	9,010	5,220	4,130	8,710	5,200	3,110	10,000	4,980
Lead	1000*	450	59.1	7.15	12.0	15.5	62.1	6.03	6.08	3.47	5.89	6.79	131	2.3	7.28	3.07
Magnesium	-	-	3,910	4,530	7,950	17,200	8,010	1,780	17,900	11,400	1,270	5,720	1,530	979	2,380	1,230
Manganese	2500*	2000	1670	398	403	510	244	258	200	113	98.7	298	298	26.6	369	68.6
Mercury	2.8*	0.73	0.04	0.01 U	0.01 U	0.01 U	0.07 U	0.01 U	0.01 U	3.01 U	0.02	0.01 U	0.02	0.01 U	0.01 U	0.01 U
Nickel	310	130	28.7	9.55	17.7	27.6	9.97	8.83	12.1	7.62	6.46	20.9	7.29	4.62 J	19.1	7.64
Potassium	-	-	1290	2,100	3,480	6,730	743	1,370	3,500	1,310	578 N	1,890	683 N	345 J N	1,720 N	429 J N
Selenium	180	4	0.355 U	0.405 U	0.383 U	0.404 U	0.946 J N	0.987 J N	0.81 J N	1.18 N	0.764 J N	0.531	0.367 U N	0.381 U N	0.887 J N	419 J N
Silver	180	8.3	0.119 U	0.136 U	0.129 U	0.136 U	0.12 U	0.118 U	0.107 U	0.119 U	0.115 U	0.137	0.123 U	0.128 U	0.315 J	0.117 U
Sodium	-	-	108 J N	242 J N	276 J N	370	362 J	87.7 J	379 J	213 J	147 J	208	106 J	46.6 J	212 J	43.4 J
Thallium	-	-	0.375 U	0.427 U	0.404 U	0.426 U	0.376 U	0.371 U	0.337 U	0.373 U	0.36 U	0.431	0.387 U	0.402 U	0.432 U	0.369 U
Vanadium	-	-	35.9	13.6	20.1	38.7	22.3 N	14.6 N	19.5 N	9.51 N	9.36 N	14.2	12.4 N	4.69 J N	18.0 N	8.08 N
Zinc	10000	2480	45.0	18.6	42.3	84.8	41.0 N	18.3 N	37.8 N	18.4 N	22.1 N	27.8	117 N	13.2 N	30.0 N	15.8 N

* = Site Specific Soil Cleanup Objective

U = The compound was not detected at the indicated concentration.

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B = The analyte was found in the laboratory blank as well as the sample

NR = Not analyzed

- = No standard

Red shading indicates exceedance of PWGSCOs for compound which was detected in groundwater over TOGS standards

Yellow shading indicates exceedance of RRSCO or Track 4 Site Specific SCO and PWGSCOs

Table 2C - RI - Metals in Soil

Harlem Park - 1800 Park Avenue, New York, NY

Sample ID Sampling Date Units	NY SCO - Restricted Residential w/ Track 4 Site Specific SCOs	NY SCO - Protection of Groundwater w/CP-51	HH16-18 8/25/04 mg/Kg	HH17-20 8/26/04 mg/Kg	HH18-22 8/26/04 mg/Kg	HH1-1 05/27/04 mg/Kg	HH1-14 05/27/04 mg/Kg	HH2-1 05/27/04 mg/Kg	HH2-15 05/27/04 mg/Kg	HH3-1 05/27/04 mg/Kg	HH5-1 05/28/04 mg/Kg	HH5-16 05/28/04 mg/Kg	HH4-1 05/28/04 mg/Kg	HH4-15 05/28/04 mg/Kg	HH6-1 05/28/04 mg/Kg	HH6-13 05/28/04 mg/Kg
Aluminum	-	-	6,530	5,780	6,070	5470	4820	7600	6,500	4,560	6,960	6,290	5,150	4,650	5,330	5,780
Antimony	-	-	0.717 U N	0.702 U	0.665 U	3.5 J	0.68 U	3.7 J	0.65 U	2.7 J	2.7 J	0.77 U	0.60 U	0.67 U	2.0 J	1.4 J
Arsenic	16	16	0.302 U	2.21	1.08 J	2.5	0.37 J	2.5	1.9	4.2	3.9	0.43 J	0.48 J	0.28 U	3.8	3.9
Barium	820*	820	54.2	73.8	35.5	341	39.6	531	165	166	656	177	53.7	38.9	168	160
Beryllium	72	47	0.376 J N	0.352 J	0.334 J	0.24 J	0.37 J	0.30 J	0.32 J	0.28 J	0.19 J	0.30 J	0.30 J	0.27 J	0.28 J	0.32 J
Cadmium	6.5*	7.5	0.378 U	0.057 U	0.054 U	0.71	0.20 J	1.0	0.49 J	0.48 J	2.4	0.40 J	0.37 J	0.24 J	0.76	1.0
Calcium	-	-	1,810 N	2,070	18,600	45,500	1,620	29,100	10,300	89,700	36,200	8,000	7,050	3,020	38,200	22,500
Chromium	184*	-	14.2	11.6	12.0	13.5	17.5	17.8	19.1	10.0	41.1	19.2	12.5	17.9	13.8	28.2
Cobalt	-	-	6.85	6.52	6.7	5.1 J	5.6 J	7.6	6.0	3.6 J	9.2	5.1 J	5.4	4.7 J	4.3 J	6.2
Copper	270	1720	13.8	9.89	14.6	14.5	24.7	33.8	34.9	16.2	73.3	27.7	14.8	15.9	24.4	46.3
Cyanide	-	-	0.637 U	0.623 U	0.590 U	0.116	0.129	0.118	0.121	0.111	0.114	0.147	0.112	0.125	0.771	0.111
Iron	-	-	10,900	11,700	11,100	8,840	8,640	14,200	10,600	7,090	34,100	9,980	10,400	7,990	13,000	18,200
Lead	1000*	450	7.49	5.2	5.73	76.6	6.9	301	92.0	540	1,050	164	27.5	6.9	418	290
Magnesium	-	-	2,370	2,510	7,870	5070	2300	5360	3230	51,600	8,660	3,570	5,500	2,590	18,600	12500
Manganese	2500*	2000	358	540	341	190	190	250	310	178	306	127	313	93.6	186	408
Mercury	2.8*	0.73	0.01 U	0.01 U	0.01 U	0.13	0.05	0.30	0.05	0.21	0.06	0.14	0.33	0.03	0.31	0.47
Nickel	310	130	12.5	13.7	14.6	12.4	14.1	16.5	11.8	7.5	24.0	13.8	11.1	12.6	10.0	14.7
Potassium	-	-	1,880 N	1,530	2,220	1920	592 J	2560	1,010	941	1280	841	1320	782	744	977
Selenium	180	4	0.445 J N	1.54	0.944 J	0.35 U	0.38 U	0.35 U	0.36 U	0.33 U	0.34 U	0.43 U	0.33 U	0.37 U	0.36 U	0.33 U
Silver	180	8.3	0.134 U	0.131 U	0.124 U	0.12 U	0.13 U	0.12 U	0.12 U	0.11 U	0.11 U	0.14 U	0.11 U	0.12 U	0.12 U	0.11 U
Sodium	-	-	130 J	235 J	273 J	662	60.1 J	512 J	359 J	746	1490	51.1 U	144 J	144 J	506 J	342 J
Thallium	-	-	0.42 U	0.814 J	0.39 U	0.37 U	0.40 U	0.37 U	0.38 U	0.35 U	0.35 U	0.45 U	0.35 U	0.39 U	0.38 U	0.35 U
Vanadium	-	-	19.6 N	18.6	16.1	20.3	19.0	30.7	21.2	18.3	41.2	22.9	17.6	19.5	28.6	26.0
Zinc	10000	2480	32.8 N	19.4	29.6	208	17.8	277	138	140	591	137	39.1	18.3	151	137

* = Site Specific Soil Cleanup Objective

U = The compound was not detected at the indicated concentration.

J = The result is less than the quantitation limit but greater so result is an approximate value.

B = The analyte was found in the laboratory blank as well as the sample

NR = Not analyzed

- = No standard

Red shading indicates exceedance of PWGSCOs for compound which was detected in groundwater over TOGS standards

Yellow shading indicates exceedance of RRSCO or Track 4 Site Specific SCO and PWGSCOs

Table 2D - RI - Pesticides and PCBs in Soil
Harlem Park - 1800 Park Avenue, New York, NY

Sample ID Sampling Date Units	NY SCO - Restricted Residential w/ Track 4 Site Specific SCOs	NY SCO - Protection of Groundwater w/CP-51	HH9-7 8/19/04 mg/Kg	HH9-23 8/19/04 mg/Kg	HH9-33 8/19/04 mg/Kg	HH9-48 8/19/04 mg/Kg	HH11-16 8/24/04 mg/Kg	HH12-18 8/25/04 mg/Kg	HH13-5 8/26/04 mg/Kg	HH13-18 8/26/04 mg/Kg	HH14-20 8/26/04 mg/Kg	HH15-18 8/26/04 mg/Kg	HH16-18 8/26/04 mg/Kg	HH17-20 8/26/04 mg/Kg	HH18-22 8/26/04 mg/Kg
PESTICIDES															
4,4-DDD	13	14	0.097 E P	0.0013 U	0.0013 U	0.0013 U	0.0011 U	0.0013 U	0.0012 U	0.0012 U	0.0013 U	0.0011 U	0.0013 U	0.0013 U	0.0012 U
4,4-DDE	8.9	17	0.071 E	0.0017 U	0.0016 U	0.0017 U	0.0014 U	0.0017 U	0.0015 U	0.0015 U	0.0017 U	0.0014 U	0.0016 U	0.0016 U	0.0015 U
4,4-DDT	7.9	136	0.55 E P	0.0024 U	0.0023 U	0.0024 U	0.002 U	0.0024 U	0.0021 U	0.0022 U	0.0024 U	0.002 U	0.0023 U	0.0023 U	0.0022 U
Aldrin	0.097	0.19	0.0012 U	0.0014 U	0.0013 U	0.0014 U	0.0011 U	0.0014 U	0.0012 U	0.0013 U	0.0014 U	0.0012 U	0.0013 U	0.0013 U	0.0012 U
alpha-BHC	0.48	0.02	0.0013 U	0.0014 U	0.0014 U	0.0014 U	0.0012 U	0.0014 U	0.0013 U	0.0013 U	0.0015 U	0.0012 U	0.0014 U	0.0014 U	0.0013 U
alpha-Chlordane	4.2	2.9	0.0017 U	0.0019 U	0.0018 U	0.0019 U	0.0016 U	0.0019 U	0.0017 U	0.0018 U	0.0019 U	0.0016 U	0.0019 U	0.0018 U	0.0017 U
beta-BHC	0.36	0.09	0.0013 U	0.0015 U	0.0014 U	0.0015 U	0.0012 U	0.0015 U	0.0013 U	0.0014 U	0.0015 U	0.0013 U	0.0014 U	0.0014 U	0.0013 U
delta-BHC	100	0.25	0.001 U	0.0011 U	0.0011 U	0.0011 U	0.00095 U	0.0011 U	0.001 U	0.0011 U	0.0012 U	0.00098 U	0.0011 U	0.0011 U	0.001 U
Dieldrin	0.2	0.1	0.0011 U	0.0013 U	0.0013 U	0.0013 U	0.0011 U	0.0013 U	0.0012 U	0.0012 U	0.0013 U	0.0011 U	0.0013 U	0.0013 U	0.0012 U
Endosulfan I	24	102	0.0016 U	0.0019 U	0.0018 U	0.0019 U	0.0016 U	0.0019 U	0.0017 U	0.0018 U	0.0019 U	0.0016 U	0.0018 U	0.0018 U	0.0017 U
Endosulfan II	24	102	0.0015 U	0.0019 U	0.0016 U	0.0017 U	0.0014 U	0.0017 U	0.0015 U	0.0016 U	0.0017 U	0.0015 U	0.0017 U	0.0017 U	0.0015 U
Endosulfan Sulfate	24	1000	0.0017 U	0.0019 U	0.0018 U	0.0019 U	0.0016 U	0.0019 U	0.0017 U	0.0018 U	0.0019 U	0.0016 U	0.0019 U	0.0018 U	0.0017 U
Endrin	11	0.06	0.0021 U	0.0013 U	0.0023 U	0.0024 U	0.002 U	0.0024 U	0.0021 U	0.0022 U	0.0024 U	0.002 U	0.0023 U	0.0023 U	0.0021 U
Endrin aldehyde	-	-	0.0017 U	0.002 U	0.0019 U	0.002 U	0.0016 U	0.002 U	0.0018 U	0.0018 U	0.002 U	0.0017 U	0.0019 U	0.0019 U	0.0018 U
Endrin ketone	-	-	0.0015 U	0.0017 U	0.0016 U	0.0017 U	0.0014 U	0.0017 U	0.0015 U	0.0016 U	0.0017 U	0.0014 U	0.0016 U	0.0016 U	0.0015 U
gamma-BHC	1.3	0.1	0.0014 U	0.0016 U	0.0015 U	0.0016 U	0.0013 U	0.0016 U	0.0014 U	0.0015 U	0.0016 U	0.0013 U	0.0015 U	0.0015 U	0.0014 U
gamma-Chlordane	-	14	0.0017 U	0.0019 U	0.0018 U	0.0019 U	0.0016 U	0.0019 U	0.0017 U	0.0018 U	0.0019 U	0.0016 U	0.0019 U	0.0019 U	0.0017 U
Heptachlor	2.1	0.38	0.0015 U	0.0017 U	0.0016 U	0.0017 U	0.0014 U	0.0017 U	0.0015 U	0.0016 U	0.0017 U	0.0015 U	0.0017 U	0.0016 U	0.0015 U
Heptachlor epoxide	-	0.02	0.0014 U	0.0016 U	0.0016 U	0.0016 U	0.0014 U	0.0016 U	0.0015 U	0.0015 U	0.0017 U	0.0014 U	0.0016 U	0.0016 U	0.0015 U
Methoxychlor	-	900	0.0014 U	0.0016 U	0.0016 U	0.0016 U	0.0014 U	0.0016 U	0.0015 U	0.0015 U	0.0016 U	0.0014 U	0.0016 U	0.0016 U	0.0015 U
Toxaphene	-	-	0.0034 U	0.0039 U	0.0037 U	0.0039 U	0.0032 U	0.0039 U	0.0035 U	0.0036 U	0.0039 U	0.0033 U	0.0038 U	0.0037 U	0.0035 U
PCBs															
Aroclor-1016	1	3.2	0.0058 U	0.0066 U	0.0064 U	0.0067 U	0.0056 U	0.0067 U	0.0061 U	0.0063 U	0.0067 U	0.0057 U	0.0065 U	0.0064 U	6 U
Aroclor-1221	1	3.2	0.004 U	0.0045 U	0.0044 U	0.0046 U	0.0038 U	0.0046 U	0.0041 U	0.0043 U	0.0046 U	0.0039 U	0.0044 U	0.0044 U	4.1 U
Aroclor-1232	1	3.2	0.0027 U	0.0031 U	0.003 U	0.0031 U	0.0026 U	0.0031 U	0.0028 U	0.0029 U	0.0031 U	0.0026 U	0.003 U	0.003 U	2.8 U
Aroclor-1242	1	3.2	0.0035 U	0.0039 U	0.0038 U	0.004 U	0.0033 U	0.004 U	0.0036 U	0.0037 U	0.004 U	0.0034 U	0.0039 U	0.0038 U	3.6 U
Aroclor-1248	1	3.2	0.0041 U	0.0047 U	0.0045 U	0.0047 U	0.0039 U	0.0047 U	0.0043 U	0.0044 U	0.0047 U	0.004 U	0.0046 U	0.0045 U	4.2 U
Aroclor-1254	1	3.2	0.0015 U	0.0017 U	0.0017 U	0.0017 U	0.0014 U	0.0017 U	0.0016 U	0.0016 U	0.0017 U	0.0015 U	0.0017 U	0.0017 U	1.6 U
Aroclor-1260	1	3.2	0.0033 U	0.0038 U	0.0036 U	0.0038 U	0.0032 U	0.0038 U	0.0034 U	0.0035 U	0.0038 U	0.0032 U	0.0037 U	0.0036 U	3.4 U

U = The compound was not detected at the indicated concentration.

J = The result is less than the quantitation limit but greater so result is an approximate value.

B = The analyte was found in the laboratory blank as well as the sample

NR = Not analyzed

- = No standard

Table 3A - Volatile Organic Compounds in Soil - RI Data*
Harlem Park
1800 Park Avenue, New York, NY

Sample ID	Site Specific SCO	NY SCO - Unrestricted Use (6 NYCRR 375-6 12/06)	HH1-14	HH2-15	HH5-16	HH4-15	HH3-14.5	HH6-14.5	HH7-15	HH8-14.5	HH9-23	HH9-33	HH9-48	HH10-17	HH10-33	HH10-63	HH11-16	HH12-18	HH13-18	HH14-20	HH15-18	HH16-18	HH17-20	HH18-22
Sample Depth (ft.-bgs)			14	15	16	15	14.5	14.5	15	14.5	23	33	48	17	33	63	16	18	18	20	18	18	20	22
Sampling Date			05/27/04	05/27/04	05/28/04	05/28/04	06/07/04	06/07/04	06/07/04	06/07/04	8/19/04	8/19/04	8/19/04	8/23/04	8/23/04	8/23/04	8/24/04	8/24/04	8/24/04	8/24/04	8/24/04	8/25/04	8/26/04	8/26/04
Units			mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
1,1,1,2-Tetrachloroethane	-	-	0.066 U	0.062 U	0.00025 U	0.0011 U	0.00021 U	0.058 U	0.00021 U	0.00021 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,1,1-Trichloroethane	100	0.68	0.063 U	0.059 U	0.00038 U	0.0016 U	0.00032 U	0.055 U	0.00032 U	0.00032 U	0.00035 U	0.00034 U	0.00035 U	0.0003 U	0.00028 U	0.00031 U	0.00029 U	0.00035 U	0.00033 U	0.00036 U	0.0003 U	0.00035 U	0.00034 U	0.00032 U
1,1,2,2-Tetrachloroethane	-	-	0.076 U	0.071 U	0.00075 U	0.0031 U	0.00062 U	0.067 U	0.00062 U	0.00062 U	0.00069 U	0.00066 U	0.00069 U	0.00059 U	0.00054 U	0.0006 U	0.00057 U	0.00069 U	0.00065 U	0.0007 U	0.00059 U	0.00068 U	0.00066 U	0.00062 U
1,1,2-Trichloroethane	-	-	0.08 U	0.074 U	0.00071 U	0.003 U	0.0006 U	0.069 U	0.00059 U	0.00059 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,1-Dichloroethane	26	0.27	0.033 U	0.031 U	0.0005 U	0.0021 U	0.00042 U	0.029 U	0.00041 U	0.00041 U	0.00046 U	0.00044 U	0.00044 U	0.0004 U	0.00036 U	0.0004 U	0.00038 U	0.00046 U	0.00043 U	0.00046 U	0.00039 U	0.00045 U	0.00044 U	0.00042 U
1,1-Dichloroethene	100	0.33	0.05 U	0.046 U	0.0003 U	0.0013 U	0.00025 U	0.043 U	0.00025 U	0.00025 U	0.00028 U	0.00027 U	0.00028 U	0.00024 U	0.00022 U	0.00024 U	0.00023 U	0.00028 U	0.00026 U	0.00028 U	0.00024 U	0.00028 U	0.00027 U	0.00025 U
1,1-Dichloropropene	-	-	0.058 U	0.054 U	0.00059 U	0.0025 U	0.00049 U	0.05 U	0.00048 U	0.00048 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,2,3-Trichlorobenzene	-	-	0.038 U	0.035 U	0.00062 U	0.0026 U	0.00052 U	0.033 U	0.00051 U	0.00051 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,2,3-Trichloropropane	-	-	0.07 U	0.065 U	0.00057 U	0.0024 U	0.00048 U	0.061 U	0.00047 U	0.00047 U	0.00053 U	0.00051 U	0.00053 U	0.00046 U	0.00042 U	0.00046 U	0.00044 U	0.00053 U	0.0005 U	0.00054 U	0.00045 U	0.00052 U	0.00051 U	0.00048 U
1,2,4-Trichlorobenzene	-	-	0.044 U	0.041 U	0.00035 U	0.0015 U	0.00029 U	0.039 U	0.00029 U	0.00029 U	0.00032 U	0.00031 U	0.00032 U	0.00028 U	0.00026 U	0.00028 U	0.00027 U	0.00032 U	0.0003 U	0.00033 U	0.00028 U	0.00032 U	0.00031 U	0.00029 U
1,2,4-Trimethylbenzene	52	3.6	0.057 U	0.053 U	0.00057 U	0.0024 U	0.032	0.05 U	0.00047 U	0.00047 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,2-Dibromo-3-Chloropropane	-	-	0.14 U	0.13 U	0.00095 U	0.004 U	0.0008 U	0.13 U	0.00079 U	0.00079 U	0.00088 U	0.0034 J	0.00088 J	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,2-Dibromoethane	-	-	0.098 U	0.091 U	0.00059 U	0.0025 U	0.00049 U	0.085 U	0.00048 U	0.00048 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,2-Dichlorobenzene	100	1.1	0.056 U	0.053 U	0.00058 U	0.0024 U	0.00048 U	0.049 U	0.00048 U	0.00048 U	0.00053 U	0.00051 U	0.00053 U	0.00046 U	0.00042 U	0.00046 U	0.00044 U	0.00053 U	0.0005 U	0.00054 U	0.00045 U	0.00052 U	0.00051 U	0.00048 U
1,2-Dichloroethane	3.1	0.02	**0.049** U	**0.046** U	0.0043 U	0.018 U	0.0036 U	**0.043** U	0.0036 U	0.0036 U	0.004 U	0.0038 U	0.004 U	0.0035 U	0.0031 U	0.0035 U	0.0033 U	0.004 U	0.0038 U	0.0041 U	0.0034 U	0.0039 U	0.0038 U	0.0036 U
1,2-Dichloropropane	-	-	0.049 U	0.046 U	0.00047 U	0.002 U	0.00039 U	0.043 U	0.00039 U	0.00039 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,3,5-Trimethylbenzene	52	8.4	0.057 U	0.053 U	0.0004 U	0.0017 U	0.01	0.049 U	0.00033 U	0.00033 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,3-Dichlorobenzene	49	2.4	0.057 U	0.053 U	0.0003 U	0.0013 U	0.00025 U	0.05 U	0.00025 U	0.00025 U	0.00027 U	0.00026 U	0.00027 U	0.00024 U	0.00022 U	0.00024 U	0.00023 U	0.00027 U	0.00026 U	0.00028 U	0.00023 U	0.00027 U	0.00026 U	0.00025 U
1,3-Dichloropropane	-	-	0.06 U	0.056 U	0.00065 U	0.0027 U	0.00054 U	0.052 U	0.00053 U	0.00053 U	0.0006 U	0.00057 U	0.0006 U	0.00052 U	0.00047 U	0.00052 U	0.0005 U	0.0006 U	0.00056 U	0.00061 U	0.00051 U	0.00059 U	0.00057 U	0.00054 U
1,4-Dichlorobenzene	13	1.8	0.06 U	0.056 U	0.00049 U	0.0021 U	0.00041 U	0.052 U	0.00041 U	0.00041 U	0.00046 U	0.00044 U	0.00046 U	0.00039 U	0.00036 U	0.0004 U	0.00038 U	0.00046 U	0.00043 U	0.00046 U	0.00039 U	0.00045 U	0.00044 U	0.00041 U
2,2-Dichloropropane	-	-	0.047 U	0.044 U	0.0014 U	0.0061 U	0.0012 U	0.041 U	0.0012 U	0.0012 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
2-Butanone (MEK)	100	0.12	**0.44** U	**0.41** U	0.0032 U	0.014 U	0.0027 U	**0.38** U	0.0026 U	0.0026 U	0.003 U	0.0028 U	0.003 U	0.0026 U	0.0023 U	0.0026 U	0.0025 U	0.003 U	0.0028 U	0.003 U	0.0025 U	0.0029 U	0.0028 U	0.0027 U
2-Chloroethyl Vinyl ether	-	-	0.29 U	0.27 U	0.0016 U	0.0067 U	0.0013 U	0.25 U	0.0013 U	0.0013 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
2-Chlorotoluene	-	-	0.047 U	0.044 U	0.00038 U	0.0016 U	0.00032 U	0.041 U	0.00032 U	0.00032 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
2-Hexanone	-	-	0.1 U	0.095 U	0.0045 U	0.019 U	0.0038 U	0.089 U	0.0037 U	0.0037 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
4-Chlorotoluene	-	-	0.11 U	0.11 U	0.00041 U	0.0017 U	0.00034 U	0.099 U	0.00034 U	0.00034 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
4-Methyl-2-pentanone(MIBK)	-	-	0.2 U	0.19 U	0.0034 U	0.014 U	0.0028 U	0.18 U	0.0028 U	0.0028 U	0.0031 U	0.00032 U	0.0031 U	0.0027 U	0.0025 U	0.0027 U	0.0026 U	0.0031 U	0.0029 U	0.0032 U	0.0027 U	0.0031 U	0.003 U	0.0028 U
Acetone	100	0.05	**0.51** U	**0.48** U	0.023 J	0.044 U	**0.073**	**0.44** U	0.02 J	0.035	0.0097 U	0.0093 U	0.0097 U	0.0084 U	0.0076 U	0.0085 U	0.0081 U	0.0097 U	0.027 J	0.0098 U	0.0083 U	0.0096 U	0.0093 U	0.0088 U
Acrolein	-	-	0.28 U	0.26 U	0.0033 U	0.014 U	0.0027 U	0.24 U	0.0027 U	0.0027 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Acrylonitrile	-	-	0.49 U	0.46 U	0.012 U	0.051 U	0.01 U	0.43 U	0.01 U	0.01 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Benzene	4.8	0.06	0.037 U	0.035 U	0.00028 U	0.0012 U	0.0017 J	0.032 U	0.00023 U	0.00023 U	0.00026 U	0.00025 U	0.00026 U	0.00023 U	0.00021 U	0.00023 U	0.00022 U	0.00026 U	0.00025 U	0.00027 U	0.00022 U	0.00026 U	0.00025 U	0.00024 U
Bromobenzene	-	-	0.036 U	0.034 U	0.00057 U	0.0024 U	0.00047 U	0.032 U	0.00047 U	0.00047 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Bromochloromethane	-	-	0.082 U	0.076 U	0.00062 U	0.0026 U	0.00052 U	0.072 U	0.00051 U	0.00051 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Bromodichloromethane	-	-	0.054 U	0.05 U	0.00047 U	0.002 U	0.00039 U	0.047 U	0.00039 U	0.00039 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Bromoform	-	-	0.039 U	0.036 U	0.00042 U	0.0018 U	0.00035 U	0.034 U	0.00035 U	0.00035 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Bromomethane	-	-	0.12 U	0.11 U	0.001 U	0.0042 U	0.00083 U	0.11 U	0.00082 U	0.00082 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Carbon Disulfide	-	-	0.06 U	0.056 U	0.0031 J	0.0006 U	0.024	0.052 U	0.00012 U	0.012	0.00013 U	0.00013 U	0.00013 U	0.00011 U	0.0001 U	0.00011 U	0.00011 U	0.00013 U	0.00012 U	0.00013 U	0.00011 U	0.00013 U	0.00013 U	0.00012 U
Carbon Tetrachloride	2.4	0.76	0.073 U	0.068 U	0.00042 U	0.0018 U	0.00035 U	0.063 U	0.00035 U	0.00035 U	0.00039 U	0.00037 U	0.00039 U	0.00033 U	0.0003 U	0.00034 U	0.00032 U	0.00036 U	0.00036 U	0.00039 U	0.00033 U	0.00038 U	0.00037 U	0.00035 U
Chlorobenzene	100	1.1	0.057 U	0.053 U	0.0005 U	0.0021 U	0.00041 U	0.049 U	0.00041 U	0.00041 U	0.00046 U	0.00044 U	0.00046 U	0.0004 U	0.00036 U	0.0004 U	0.00038 U	0.00046 U	0.00043 U	0.00046 U	0.00039 U	0.00045 U	0.00044 U	0.00041 U
Chloroethane	-	-	0.14 U	0.13 U	0.00074 U	0.0031 U	0.00062 U	0.12 U	0.00061 U	0.00061 U	0.00068 U	0.00066 U	0.00068 U	0.00059 U	0.00054 U	0.0006 U	0.00057 U	0.00068 U	0.00064 U	0.00069 U	0.00058 U	0.00067 U	0.00066 U	0.00062 U
Chloroform	49	0.37	0.089 U	0.083 U	0.00033 U	0.0014 U	0.00028 U	0.077 U	0.00028 U	0.00028 U	0.00031 U	0.0003 U	0.00031 U	0.00027 U	0.00024 U	0.00027 U	0.00026 U	0.00031 U	0.00029 U	0.00031 U	0.00026 U	0.0003 U	0.0003 U	0.00028 U
Chloromethane	-	-	0.11 U	0.098 U	0.00047 U	0.002 U	0.00039 U	0.092 U	0.00038 U	0.00038 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
cis-1,2-Dichloroethene	100	0.25	0.12 U	0.11 U	0.0005 U	0.0021 U	0.00041 U	0.1 U	0.00041 U	0.00041 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
cis-1,3-Dichloropropene	-	-	0.023 U	0.022 U	0.00027 U	0.0012 U	0.00023 U	0.02 U	0.00023 U	0.00023 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Dibromochloromethane	-	-	0.058 U	0.054 U	0.00041 U	0.0017 U	0.00034 U	0.051 U	0.00034 U	0.00034 U	0.00038 U	0.00036 U	0.00038 U	0.00033 U	0.0003 U	0.00033 U	0.00032 U	0.00038 U	0.00035 U	0.00038 U	0.00032 U	0.00037 U	0.00036 U	0.00034 U
Dibromomethane	-	-	0.093 U	0.087 U	0.00037 U	0.0016 U	0.00031 U	0.081 U	0.00031 U	0.00031 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Dichlorodifluoromethane	-	-	0.052 U	0.048 U	0.0017 U	0.0074 U	0.0015 U	0.045 U	0.0014 U	0.0014 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Ethylbenzene	41	1	0.063 U	0.059 U	0.00035 U	0.0015 U	0.0029 J	0.055 U	0.00029 U	0.00029 U	0.00032 U	0.00031 U	0.00032 U	0.00028 U	0.00025 U	0.00028 U	0.00027 U	0.00032 U	0.0003 U	0.00033 U	0.00028 U	0.00032 U	0.00031 U	0.00029 U
Hexachlorobutadiene	-	-	0.04 U	0.037 U	0.00064 U	0.0027 U	0.00054 U	0.034 U	0.00053 U	0.00053 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Isopropylbenzene	-	-	0.051 U	0.048 U	0.00052 U	0.0022 U	0.13	0.3 J	0.00043 U	0.00043 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
m,p-Xylene	100	1.6	0.15 U	0.14 U	0.00072 U	0.0031 U	0.0072	0.13 U	0.0006 U	0.0006 U	0.00067 U	0.00064 U	0.00067 U	0.00058 U	0.00052 U	0.00058 U	0.00056 U	0.00067 U	0.00063 U	0.00068 U	0.00057 U	0.00066 U	0.00064 U	0.0006 U
Methyl Tert Butyl Ether	100	0.93	0.055 U	0.052 U	0.00032 U	0.0014 U	0.00027 U	0.048 U	0.00027 U	0.00027 U	0.0003 U	0.00029 U	0.0003 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Methylene Chloride	100	0.05	**0.096** U	**0.089** U	0.00096 U	0.004 U	0.0008 U	**0.084** U	0.00079 U	0.00079 U	0.00088 UB	0.00085 UB	0.0026 JB	0.00076 U	0.00069 U	0.0024 J	0.0036 J	0.016 0	0.0037 J	0.0038 J	0.0045 J	0.0067 0	0.0082 0	0.0078 0
Naphthalene	100	12	1.1	3	0.0043 J	0.077	0.00035	4.6	0.00035 U	0.00035 U	0.00039 U	0.00037 U	0.00039 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
n-Butylbenzene	-	-	0.072 U	0.19 J	0.00058 U	0.0024 U	0.15	0.92	0.00048 U	0.00048 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
n-propylbenzene	100	3.9	0.058 U	0.054 U	0.00058 U	0.0025 U	0.31 E	0.58 J	0.00048 U	0.00048 U	0.00054 U	0.00052 U	0.00054 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
o-Xylene	100	0.26	0.057 U	0.053 U	0.00061 U	0.0026 U	0.015	0.049 U	0.0005 U	0.0005 U	0.00056 U	0.00054 U	0.00056 U	0.00049 U	0.00044 U	0.00049 U	0.00047 U	0.00056 U	0.00053 U	0.00057 U	0.00048 U	0.00055 U	0.00054 U	0.00051 U
p-Isopropyltoluene	-	-	0.056 U	0.052 U	0.00083 U	0.0035 U	0.00069 U	0.049 U	0.00068 U	0.00068 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
sec-Butylbenzene	100	11	0.066 U	0.061 U	0.00034 U	0.0014 U	0.13	0.68	0.0018 J	0.00028 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Styrene	-	-	0.053 U	0.049 U	0.00044 U	0.0019 U	0.00037 U	0.046 U	0.00036 U	0.00036 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
t-1,3-Dichloropropene	-	-	0.066 U	0.061 U	0.00036 U	0.0015 U	0.0003 U	0.057 U	0.0003 U	0.0003 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Tert butyl alcohol	-	-	0.67 U	0.63 U	0.021 U	0.087 U	0.017 U	0.59 U	0.017 U	0.017 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
tert-Butylbenzene	-	-	0.056 U	0.052 U	0.00039 U	0.0016 U	0.00032 U	0.049 U	0.00032 U	0.00032 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Tetrachloroethene	19	1.3	0.051 U	0.047 U	0.00089 U	0.0038 U	0.00075 U	0.044 U	0.00074 U	0.005 J	0.00082 U	0.00079 U	0.00082 U	0.00071 U	0.00065 U	0.00072 U	0.00069 U	0.00082 U	0.00077 U	0.00084 U	0.00071 U	0.00081 U	0.00079 U	0.00075 U
Toluene	100	0.7	0.06 U	0.056 U	0.00036 U	0.0015 U	0.0058 J	0.052 U	0.0003 U	0.0003 U	0.00034 U	0.00032 U	0.00034 U	0.00029 U	0.00026 U	0.00029 U	0.00028 U	0.00034 U	0.00032 U	0.00034 U	0.00029 U	0.00033 U	0.00032 U	0.0003 U
trans-1,2-Dichloroethene	100	0.19	0.079 U	0.074 U	0.00052 U	0.0022 U	0.00044 U	0.069 U	0.00043 U	0.00043 U	0.00048 U	0.00046 U	0.00048 U	0.00042 U	0.00038 U	0.00042 U	0.0004 U	0.00048 U	0.00045 U	0.00049 U	0.00041 U	0.00048 U	0.00046 U	0.00044 U
Trichloroethene	21	0.47	0.1 U	0.096 U	0.00045 U	0.0019 U	0.00038 U	0.09 U	0.00037 U	0.00037 U	0.00042 U	0.0004 U	0.00042 U	0.00036 U	0.00033 U	0.00036 U	0.00035 U	0.00042 U	0.00039 U	0.00042 U	0.00036 U	0.00041 U	0.0004 U	0.00038 U
Trichlorofluoromethane	-	-	0.089 U	0.083 U	0.0035 U	0.015 U	0.0029 U	0.077 U	0.0029 U	0.0029 U	NR	NR	NR	NR	NR	NR	NR	0.0006 U	0.00056 U	0.0006 U	0.00051 U	0.00059 U	0.00057 U	0.00054 U
Vinyl Acetate	-	-	0.36 U	0.34 U	0.0076 U	0.032 U	0.0064 U	0.32 U	0.0063 U	0.0063 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Vinyl Chloride	0.9	0.02	**0.041** U	**0.038** U	0.00033 U	0.0014 U	0.00028 U	**0.036** U	0.00027 U	0.00027 U	0.00031 U	0.00029 U	0.00031 U	0.00026 U	0.00024 U	0.00027 U	0.00026 U	0.00031 U	0.00029 U	0.00031 U	0.00026 U	0.0003 U	0.00029 U	0.00028 U

* This table includes data results for samples collected during the RI below remedial excavation depth (13ft. Bgs)

U = The compound was not detected at the indicated concentration.

J = The result is less than the quantitation limit but greater so result is an approximate value.

B = The analyte was found in the laboratory blank as well as the sample

NR = Not analyzed

- = No standard

Exceedances of UUSCO are **bolded**

Exceedances of UUSCO and SSSCO are **bolded** and highlighted yellow

Table 3B - Volatile Organic Compounds in Soil - Endpoint Samples
Harlem Park
1800 Park Avenue, New York, NY

Sample ID	Site Specific SCO mg/kg	NY SCO - Unrestricted Use (6 NYCRR 375-6 12/06) mg/kg	EP-A1-I(13.5)	EP-A1-I(SW-E-11)	EP-A1-I(SW-N-11)	EP-A2-III(13.5)	EP-A3-III(13.5)	EP-B1-I(13.5)	EP-B1-I(SW-N-9)	EP-B2-I(13.5)	EP-B4-I(13.5)	EP-B4-II(13.5)	EP-B4-II(SW-S-5)	EP-B4-III(13.5)	EP-B4-III(SW-S-10)	EP-B4-IV(13.5)	EP-D2-I(13.5)	EP-D2-II(13.5)	EP-D2-III(13.5)
Sampling Date			11/12/2015	11/20/2015	11/20/2015	11/12/2015	11/12/2015	11/12/2015	11/20/2015	11/12/2015	11/13/2015	11/13/2015	11/20/2015	11/13/2015	11/20/2015	11/13/2015	11/12/2015	11/12/2015	11/12/2015
Units			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Lab ID			JC8567	JC9086	JC9086	JC8567	JC8567	JC8567	JC9086	JC8567	JC8567	JC8567	JC9086	JC8567	JC9086	JC8567	JC8567	JC8567	JC8567
Acetone	100	0.05	0.0096 J	0.0109 J	0.0023 U	0.0026 U	0.0067 J	0.0023 U	0.0023 U	0.0117	0.0159	0.0027 U	0.0024 U	0.0028 U	0.0032 U	0.0098 J	0.0109 J	0.0233	0.0096 J
Benzene	4.8	0.06	0.00015 U	0.00021 U	0.00014 U	0.00016 U	0.00015 U	0.00014 U	0.00014 U	0.00015 U	0.00017 U	0.00016 U	0.00014 U	0.00016 U	0.00019 U	0.00016 U	0.00014 U	0.00015 U	0.00014 U
Bromochloromethane	-	-	0.00035 U	0.00048 U	0.00032 U	0.00036 U	0.00036 U	0.00032 U	0.00032 U	0.00034 U	0.00041 U	0.00037 U	0.00032 U	0.00038 U	0.00044 U	0.00036 U	0.00033 U	0.00034 U	0.00032 U
Bromodichloromethane	-	-	0.00018 U	0.00024 U	0.00016 U	0.00018 U	0.00018 U	0.00016 U	0.00016 U	0.00017 U	0.00021 U	0.00019 U	0.00016 U	0.00019 U	0.00022 U	0.00018 U	0.00017 U	0.00017 U	0.00016 U
Bromoform	-	-	0.00027 U	0.00036 U	0.00025 U	0.00028 U	0.00027 U	0.00024 U	0.00025 U	0.00026 U	0.00031 U	0.00028 U	0.00025 U	0.00029 U	0.00034 U	0.00028 U	0.00025 U	0.00026 U	0.00025 U
Bromomethane	-	-	0.00041 U	0.00056 U	0.00038 U	0.00043 U	0.00042 U	0.00037 U	0.00038 U	0.00040 U	0.00048 U	0.00043 U	0.00038 U	0.00045 U	0.00052 U	0.00043 U	0.00039 U	0.00040 U	0.00038 U
2-Butanone (MEK)	100	0.12	0.0021 U	0.0029 U	0.0020 U	0.0022 U	0.0022 U	0.0020 U	0.0020 U	0.0021 U	0.0025 U	0.0023 U	0.0020 U	0.0024 U	0.0027 U	0.0022 U	0.0020 U	0.0021 U	0.0020 U
Carbon disulfide	-	-	0.00026 U	0.00035 U	0.0013 J	0.00027 U	0.00026 U	0.00023 U	0.00071 J	0.00025 U	0.00030 U	0.00027 U	0.00024 U	0.00028 U	0.00033 U	0.00027 U	0.00024 U	0.00025 U	0.00024 U
Carbon tetrachloride	2.4	0.76	0.00026 U	0.00035 U	0.00024 U	0.00027 U	0.00027 U	0.00024 U	0.00024 U	0.00025 U	0.00030 U	0.00027 U	0.00024 U	0.00028 U	0.00033 U	0.00027 U	0.00024 U	0.00025 U	0.00024 U
Chlorobenzene	100	1.1	0.00017 U	0.00024 U	0.00016 U	0.00018 U	0.00018 U	0.00016 U	0.00016 U	0.00017 U	0.00020 U	0.00019 U	0.00016 U	0.00019 U	0.00022 U	0.00018 U	0.00016 U	0.00017 U	0.00016 U
Chloroethane		-	0.00054 U	0.00074 U	0.00050 U	0.00056 U	0.00056 U	0.00049 U	0.00050 U	0.00053 U	0.00063 U	0.00057 U	0.00051 U	0.00059 U	0.00069 U	0.00056 U	0.00051 U	0.00053 U	0.00050 U
Chloroform	49	0.37	0.00017 U	0.00023 U	0.00016 U	0.00017 U	0.00017 U	0.00015 U	0.00016 U	0.00016 U	0.0081	0.00018 U	0.00016 U	0.00018 U	0.00021 U	0.00055 J	0.00016 U	0.00016 U	0.00016 U
Chloromethane	-	-	0.00029 U	0.00040 U	0.00027 U	0.00031 U	0.00030 U	0.00027 U	0.00027 U	0.00029 U	0.00034 U	0.00031 U	0.00028 U	0.00032 U	0.00038 U	0.00031 U	0.00028 U	0.00029 U	0.00027 U
Cyclohexane	-	-	0.00036 U	0.00049 U	0.00033 U	0.00037 U	0.00037 U	0.00032 U	0.00033 U	0.00035 U	0.00042 U	0.00038 U	0.00033 U	0.00039 U	0.00045 U	0.00037 U	0.00034 U	0.00035 U	0.00033 U
1,2-Dibromo-3-chloropropane	-	-	0.00061 U	0.00084 U	0.00057 U	0.00064 U	0.00063 U	0.00056 U	0.00057 U	0.00059 U	0.00071 U	0.00065 U	0.00057 U	0.00067 U	0.00078 U	0.00064 U	0.00058 U	0.00060 U	0.00057 U
Dibromochloromethane	-	-	0.00023 U	0.00032 U	0.00021 U	0.00024 U	0.00024 U	0.00021 U	0.00021 U	0.00022 U	0.00027 U	0.00024 U	0.00022 U	0.00025 U	0.00029 U	0.00024 U	0.00022 U	0.00023 U	0.00021 U
1,2-Dibromoethane	-	-	0.00015 U	0.00020 U	0.00014 U	0.00015 U	0.00015 U	0.00013 U	0.00014 U	0.00014 U	0.00017 U	0.00016 U	0.00014 U	0.00016 U	0.00019 U	0.00015 U	0.00014 U	0.00014 U	0.00014 U
1,2-Dichlorobenzene	100	1.1	0.00014 U	0.00019 U	0.00013 U	0.00014 U	0.00014 U	0.00012 U	0.00013 U	0.00013 U	0.00016 U	0.00015 U	0.00013 U	0.00015 U	0.00018 U	0.00014 U	0.00013 U	0.00013 U	0.00013 U
1,3-Dichlorobenzene	49	2.4	0.00018 U	0.00024 U	0.00016 U	0.00018 U	0.00018 U	0.00016 U	0.00016 U	0.00017 U	0.00021 U	0.00019 U	0.00016 U	0.00019 U	0.00023 U	0.00018 U	0.00017 U	0.00017 U	0.00016 U
1,4-Dichlorobenzene	13	1.8	0.00025 U	0.00035 U	0.00024 U	0.00026 U	0.00026 U	0.00023 U	0.00024 U	0.00025 U	0.00030 U	0.00027 U	0.00024 U	0.00028 U	0.00032 U	0.00026 U	0.00024 U	0.00025 U	0.00024 U
Dichlorodifluoromethane	-	-	0.00041 U	0.00056 U	0.00038 U	0.00042 U	0.00042 U	0.00037 U	0.00038 U	0.00039 U	0.00047 U	0.00043 U	0.00038 U	0.00045 U	0.00052 U	0.00042 U	0.00038 U	0.00040 U	0.00038 U
1,1-Dichloroethane	26	0.27	0.00016 U	0.00022 U	0.00015 U	0.00017 U	0.00016 U	0.00014 U	0.00015 U	0.00015 U	0.00019 U	0.00017 U	0.00015 U	0.00017 U	0.00020 U	0.00017 U	0.00015 U	0.00016 U	0.00015 U
1,2-Dichloroethane	3.1	0.02	0.00015 U	0.00021 U	0.00014 U	0.00016 U	0.00016 U	0.00014 U	0.00014 U	0.00015 U	0.00018 U	0.00016 U	0.00014 U	0.00017 U	0.00019 U	0.00016 U	0.00014 U	0.00015 U	0.00014 U
1,1-Dichloroethene	100	0.33	0.00067 U	0.00091 U	0.00062 U	0.00069 U	0.00069 U	0.00061 U	0.00062 U	0.00065 U	0.00078 U	0.00071 U	0.00062 U	0.00073 U	0.00085 U	0.00070 U	0.00063 U	0.00065 U	0.00062 U
cis-1,2-Dichloroethene	100	0.25	0.00088 U	0.0012 U	0.00082 U	0.00091 U	0.00090 U	0.00080 U	0.00082 U	0.00085 U	0.0010 U	0.00093 U	0.00082 U	0.00096 U	0.0011 U	0.00091 U	0.00083 U	0.00086 U	0.00081 U
trans-1,2-Dichloroethene	100	0.19	0.00067 U	0.00092 U	0.00062 U	0.00070 U	0.00069 U	0.00061 U	0.00062 U	0.00065 U	0.00078 U	0.00071 U	0.00062 U	0.00073 U	0.00085 U	0.00070 U	0.00063 U	0.00065 U	0.00062 U
1,2-Dichloropropane	-	-	0.00027 U	0.00037 U	0.00025 U	0.00028 U	0.00028 U	0.00024 U	0.00025 U	0.00026 U	0.00031 U	0.00028 U	0.00025 U	0.00029 U	0.00034 U	0.00028 U	0.00025 U	0.00026 U	0.00025 U
cis-1,3-Dichloropropene	-	-	0.00013 U	0.00018 U	0.00012 U	0.00014 U	0.00014 U	0.00012 U	0.00012 U	0.00013 U	0.00016 U	0.00014 U	0.00012 U	0.00015 U	0.00017 U	0.00014 U	0.00013 U	0.00013 U	0.00012 U
trans-1,3-Dichloropropene	-	-	0.00020 U	0.00027 U	0.00019 U	0.00021 U	0.00020 U	0.00018 U	0.00019 U	0.00019 U	0.00023 U	0.00021 U	0.00019 U	0.00022 U	0.00025 U	0.00021 U	0.00019 U	0.00019 U	0.00019 U
1,4-Dioxane	13	0.1	0.018 U	0.024 U	0.016 U	0.018 U	0.018 U	0.016 U	0.016 U	0.017 U	0.021 U	0.019 U	0.016 U	0.019 U	0.023 U	0.018 U	0.017 U	0.017 U	0.016 U
Ethylbenzene	41	1	0.00018 U	0.00025 U	0.00017 U	0.00019 U	0.00019 U	0.00017 U	0.00017 U	0.00018 U	0.00021 U	0.00019 U	0.00017 U	0.00020 U	0.00023 U	0.00019 U	0.00017 U	0.00018 U	0.00017 U
Freon 113	-	-	0.00050 U	0.00069 U	0.00047 U	0.00052 U	0.00052 U	0.00046 U	0.00047 U	0.00049 U	0.00059 U	0.00054 U	0.00047 U	0.00055 U	0.00064 U	0.00053 U	0.00048 U	0.00049 U	0.00047 U
2-Hexanone	-	-	0.0015 U	0.0021 U	0.0014 U	0.0016 U	0.0016 U	0.0014 U	0.0014 U	0.0015 U	0.0018 U	0.0016 U	0.0014 U	0.0017 U	0.0019 U	0.0016 U	0.0014 U	0.0015 U	0.0014 U
Isopropylbenzene	-	-	0.00012 U	0.00016 U	0.00011 U	0.00012 U	0.00012 U	0.00011 U	0.00011 U	0.00012 U	0.00014 U	0.00013 U	0.00011 U	0.00013 U	0.00015 U	0.00012 U	0.00011 U	0.00012 U	0.00011 U
Methyl Acetate	-	-	0.00097 U	0.0013 U	0.00090 U	0.0010 U	0.0010 U	0.00088 U	0.00090 U	0.00094 U	0.0011 U	0.0010 U	0.00090 U	0.0011 U	0.0012 U	0.0010 U	0.00091 U	0.00095 U	0.00090 U
Methylcyclohexane	-	-	0.00026 U	0.00035 U	0.00024 U	0.00027 U	0.00026 U	0.00023 U	0.00024 U	0.00025 U	0.00030 U	0.00027 U	0.00024 U	0.00028 U	0.00033 U	0.00027 U	0.00024 U	0.00025 U	0.00024 U
Methyl Tert Butyl Ether	100	0.93	0.00017 U	0.00024 U	0.00016 U	0.00018 U	0.00018 U	0.00016 U	0.00016 U	0.00017 U	0.00020 U	0.00018 U	0.00016 U	0.00019 U	0.00022 U	0.00018 U	0.00016 U	0.00017 U	0.00016 U
4-Methyl-2-pentanone(MIBK)	-	-	0.00052 U	0.00071 U	0.00048 U	0.00054 U	0.00053 U	0.00047 U	0.00048 U	0.00050 U	0.00060 U	0.00055 U	0.00048 U	0.00057 U	0.00066 U	0.00054 U	0.00049 U	0.00050 U	0.00048 U
Methylene chloride	100	0.05	0.0011 U	0.0015 U	0.0010 U	0.0012 U	0.0011 U	0.0010 U	0.0010 U	0.0011 U	0.0013 U	0.0012 U	0.0010 U	0.0012 U	0.0014 U	0.0012 U	0.0010 U	0.0011 U	0.0010 U
Styrene	-	-	0.00020 U	0.00027 U	0.00019 U	0.00021 U	0.00021 U	0.00018 U	0.00019 U	0.00019 U	0.00023 U	0.00021 U	0.00019 U	0.00022 U	0.00026 U	0.00021 U	0.00019 U	0.00020 U	0.00019 U
1,1,2,2-Tetrachloroethane	-	-	0.00020 U	0.00027 U	0.00018 U	0.00021 U	0.00020 U	0.00018 U	0.00018 U	0.00019 U	0.00023 U	0.00021 U	0.00018 U	0.00022 U	0.00025 U	0.00021 U	0.00019 U	0.00019 U	0.00018 U
Tetrachloroethene	19	1.3	0.00034 U	0.00046 U	0.00074 J	0.00035 U	0.00035 U	0.00031 U	0.00032 U	0.00033 U	0.00040 U	0.00036 U	0.00032 U	0.00037 U	0.00043 U	0.00035 U	0.00032 U	0.00033 U	0.00031 U
Toluene	100	0.7	0.00025 J	0.00032 U	0.00022 U	0.00024 U	0.00024 U	0.00021 U	0.00022 U	0.00031 J	0.00027 U	0.00025 U	0.00022 U	0.00026 U	0.00030 U	0.00024 U	0.00028 J	0.00023 U	0.00022 U
1,2,3-Trichlorobenzene	-	-	0.00020 U	0.00027 U	0.00018 U	0.00021 U	0.00020 U	0.00018 U	0.00018 U	0.00019 U	0.00023 U	0.00021 U	0.00018 U	0.00022 U	0.00025 U	0.00021 U	0.00019 U	0.00019 U	0.00018 U
1,2,4-Trichlorobenzene	-	-	0.00019 U	0.00026 U	0.00018 U	0.00020 U	0.00020 U	0.00017 U	0.00018 U	0.00018 U	0.00022 U	0.00020 U	0.00018 U	0.00021 U	0.00024 U	0.00020 U	0.00018 U	0.00019 U	0.00018 U
1,1,1-Trichloroethane	100	0.68	0.00017 U	0.00023 U	0.00016 U	0.00017 U	0.00017 U	0.00015 U	0.00016 U	0.00016 U	0.00020 U	0.00018 U	0.00016 U	0.00018 U	0.00021 U	0.00018 U	0.00016 U	0.00016 U	0.00016 U
1,1,2-Trichloroethane	-	-	0.00017 U	0.00023 U	0.00015 U	0.00017 U	0.00017 U	0.00015 U	0.00015 U	0.00016 U	0.00019 U	0.00018 U	0.00015 U	0.00018 U	0.00021 U	0.00017 U	0.00016 U	0.00016 U	0.00015 U
Trichloroethene	21	0.47	0.00017 U	0.00023 U	0.00015 U	0.00017 U	0.00017 U	0.00015 U	0.00015 U	0.00016 U	0.00019 U	0.00018 U	0.00015 U	0.00018 U	0.00021 U	0.00017 U	0.00016 U	0.00016 U	0.00015 U
Trichlorofluoromethane	-	-	0.00028 U	0.00038 U	0.00026 U	0.00029 U	0.00029 U	0.00025 U	0.00026 U	0.00027 U	0.00033 U	0.00030 U	0.00026 U	0.00031 U	0.00036 U	0.00029 U	0.00026 U	0.00027 U	0.00026 U
Vinyl chloride	0.9	0.02	0.00022 U	0.00030 U	0.00021 U	0.00023 U	0.00023 U	0.00020 U	0.00021 U	0.00022 U	0.00026 U	0.00024 U	0.00021 U	0.00024 U	0.00028 U	0.00023 U	0.00021 U	0.00022 U	0.00021 U
m,p-Xylene	100	0.26	0.00040 U	0.00054 U	0.00037 U	0.00041 U	0.00041 U	0.00036 U	0.00037 U	0.00038 U	0.00046 U	0.00042 U	0.00037 U	0.00043 U	0.00051 U	0.00041 U	0.00037 U	0.00039 U	0.00037 U
o-Xylene	100	0.26	0.00031 U	0.00042 U	0.00029 U	0.00032 U	0.00032 U	0.00028 U	0.00029 U	0.00030 U	0.00036 U	0.00033 U	0.00029 U	0.00034 U	0.00039 U	0.00032 U	0.00029 U	0.00030 U	0.00029 U
Xylene (total)	100	0.26	0.00031 U	0.00042 U	0.00029 U	0.00032 U	0.00032 U	0.00028 U	0.00029 U	0.00030 U	0.00036 U	0.00033 U	0.00029 U	0.00034 U	0.00039 U	0.00032 U	0.00029 U	0.00030 U	0.00029 U

No exceedances detected

U = The compound was not detected at the indicated concentration.

J = The result is less than the quantitation limit but greater so result is an approximate value.

B = The analyte was found in the laboratory blank as well as the sample

- = No standard

Table 4A - Semi-Volatile Organic Compounds in Soil - RI Data*
Harlem Park
1800 Park Avenue, New York, NY

Sample ID	Site Specific SCO	NY SCO - Unrestricted Use (6 NYCRR 375-6 12/06)	HH1-14	HH2-15	HH5-16	HH4-15	HH3-14.5	HH6-14.5	HH7-15	HH8-14.5	HH9-23	HH9-33	HH9-48	HH10-17	HH10-33	HH10-63	HH11-16	HH12-18	HH13-18	HH14-20	HH15-18	HH16-18	HH17-20	HH18-22
Sample Depth (ft.-bgs)			14	15	16	15	14.5	14.5	15	14.5	23	33	48	17	33	63	16	18	18	20	18	18	20	22
Sampling Date			05/27/04	05/27/04	05/28/04	05/28/04	06/07/04	06/07/04	06/07/04	06/07/04	8/19/04	8/19/04	8/19/04	8/23/04	8/23/04	8/23/04	8/24/04	8/25/04	8/26/04	8/26/04	8/26/04	8/26/04	8/26/04	8/26/04
Units			mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
1,2,4-Trichlorobenzene	-	-	0.012 U	0.054 U	0.013 U	0.011 U	0.011 U	0.2 U	0.011 U	0.043 U	0.012 U	0.012 U	0.012 U	0.1 U	0.012 U	0.53 U	0.01 U	0.012 U	0.012 U	0.012 U	0.01 U	0.012 U	0.012 U	0.011 U
1,2-Dichlorobenzene	-	-	0.022 U	0.1 U	0.025 U	0.021 U	0.021 U	0.38 U	0.021 U	0.082 U	0.023 U	0.022 U	0.023 U	0.2 U	0.022 U	1 U	0.019 U	0.023 U	0.022 U	0.024 U	0.02 U	0.022 U	0.022 U	0.021 U
1,3-Dichlorobenzene	-	-	0.015 U	0.07 U	0.017 U	0.014 U	0.014 U	0.26 U	0.014 U	0.056 U	0.016 U	0.015 U	0.016 U	0.13 U	0.015 U	0.68 U	0.013 U	0.016 U	0.015 U	0.016 U	0.013 U	0.015 U	0.015 U	0.014 U
1,4-Dichlorobenzene	-	-	0.017 U	0.079 U	0.019 U	0.016 U	0.016 U	0.29 U	0.016 U	0.063 U	0.018 U	0.017 U	0.021 U	0.15 U	0.017 U	0.76 U	0.015 U	0.018 U	0.017 U	0.018 U	0.015 U	0.017 U	0.017 U	0.016 U
2,2-oxybis(1-Chloropropane)	-	-	0.022 U	0.1 U	0.025 U	0.021 U	0.021 U	0.38 U	0.021 U	0.082 U	0.023 U	0.022 U	0.023 U	0.2 U	0.022 U	0.99 U	0.019 U	0.023 U	0.022 U	0.023 U	0.02 U	0.022 U	0.022 U	0.021 U
2,4-Dinitrotoluene	-	0.37	0.0081 U	0.038 U	0.0093 U	0.0078 U	0.0077 U	**0.14** U	0.0076 U	0.03 U	0.0085 U	0.0082 U	0.0084 U	0.073 U	0.0081 U	0.37 U	0.0071 U	0.0084 U	0.008 U	0.019 U	0.016 U	0.018 U	0.0082 U	0.017 U
2,6-Dinitrotoluene	-	0.78	0.017 U	0.081 U	0.02 U	0.017 U	0.017 U	0.3 U	0.016 U	0.064 U	0.018 U	0.017 U	0.018 U	0.16 U	0.017 U	0.78 U	0.015 U	0.018 U	0.017 U	0.018 U	0.015 U	0.018 U	0.017 U	0.016 U
2-Chloronaphthalene	-	0.38	0.0085 U	0.039 U	0.0097 U	0.0081 U	0.0081 U	0.15 U	0.0079 U	0.032 U	0.0088 U	0.0085 U	0.0088 U	0.076 U	0.0085 U	0.38 U	0.0074 U	0.0088 U	0.0084 U	0.009 U	0.0076 U	0.0086 U	0.0086 U	0.008 U
2-Methylnaphthalene	-	0.32	**0.55**	**1.2** J	0.008 U	0.0067 U	**1.7**	**24**	0.0065 U	0.026 U	0.0073 U	0.007 U	0.0073 U	0.063 U	**0.55**	0.32 U	NR 0	NR 0	NR 0	NR 0	NR 0	NR 0	NR 0	NR 0
2-Nitroaniline	-	0.66	0.015 U	0.069 U	0.017 U	0.014 U	0.014 U	0.25 U	0.014 U	0.055 U	0.015 U	0.015 U	0.015 U	0.13 U	0.015 U	0.66 U	NR 0	NR 0	NR 0	NR 0	NR 0	NR 0	NR 0	NR 0
3,3-Dichlorobenzidine	-	-	0.065 U	0.3 U	0.075 U	0.062 U	0.062 U	1.1 U	0.061 U	0.24 U	0.068 U	0.066 U	0.068 U	0.58 U	0.065 U	2.9 U	0.057 U	0.068 U	0.065 U	0.069 U	0.058 U	0.066 U	0.066 U	0.062 U
3-Nitroaniline	-	3	0.065 U	0.31 U	0.075 U	0.063 U	0.063 U	1.1 U	0.061 U	0.24 U	0.068 U	0.066 U	0.068 U	0.59 U	0.065 U	3 U	NR 0	NR 0	NR 0	NR 0	NR 0	NR 0	NR 0	NR 0
4-Bromophenyl phenyl ether	-	0.48	0.011 U	0.05 U	0.012 U	0.01 U	0.01 U	0.18 U	0.01 U	0.04 U	0.011 U	0.011 U	0.011 U	0.096 U	0.011 U	0.48 U	0.0093 U	0.011 U	0.011 U	0.011 U	0.0096 U	0.011 U	0.011 U	0.01 U
4-Chloroaniline	-	6.8	0.15 U	0.7 U	0.17 U	0.14 U	0.14 U	2.6 U	0.14 U	0.56 U	0.16 U	0.15 U	0.16 U	1.3 U	0.15 U	6.8 U	0.13 U	0.16 U	0.15 U	0.16 U	0.13 U	0.15 U	0.15 U	0.14 U
4-Chlorophenyl-phenylether	-	-	0.01 U	0.047 U	0.012 U	0.0096 U	0.0096 U	0.17 U	0.0094 U	0.037 U	0.01 U	0.01 U	0.01 U	0.09 U	0.01 U	0.45 U	0.0088 U	0.01 U	0.01 U	0.011 U	0.009 U	0.01 U	0.01 U	0.0095 U
4-Nitroaniline	-	1.4	0.032 U	0.15 U	0.036 U	0.03 U	0.03 U	0.55 U	0.03 U	0.12 U	0.032 U	0.032 U	0.033 U	0.29 U	0.032 U	1.4 U	NR 0	NR 0	NR 0	NR 0	NR 0	NR 0	NR 0	NR 0
Acenaphthene	-	0.4	**0.78**	**1.7** J	0.01 U	0.04 J	0.19 J	**4** J	0.075 J	0.033 U	0.0094 U	0.009 U	0.0093 U	0.08 U	**0.78**	0.4 U	0.1 J	0.0093 U	0.0089 U	0.0095 U	0.008 U	0.0091 U	0.009 U	0.0085 U
Acenaphthylene	-	0.55	0.16 J	0.41 J	0.014 U	0.012 U	0.012 U	0.21 U	0.011 U	0.045 U	0.013 U	0.012 U	0.013 U	0.11 U	0.16 J	0.55 U	0.011 U	0.013 U	0.012 U	0.013 U	0.011 U	0.012 U	0.012 U	0.012 U
Anthracene	-	0.44	**0.69**	**2.6**	0.076 J	0.05 J	0.21 J	**2.5** J	0.11 J	0.036 U	0.01 U	0.0098 U	0.01 U	**0.74** J	**0.69**	0.44 U	0.23 J	0.01 U	0.0096 U	0.01 U	0.0087 U	0.0098 U	0.0098 U	0.0092 U
Azobenzene	-	-	0.012 U	0.054 U	0.013 U	0.011 U	0.011 U	0.2 U	0.011 U	0.043 U	0.012 U	0.012 U	0.012 U	0.1 U	0.012 U	0.52 U	0.01 U	0.012 U	0.011 U	0.012 U	0.01 U	0.012 U	0.012 U	0.011 U
Benzo(a)anthracene	-	2.4	0.36 J	**3.5**	0.15 J	0.053 J	0.071 J	1.2 J	0.1 J	0.023 U	0.0064 U	0.0062 U	0.0064 U	**3.7**	0.36 J	2.4 J	0.37 0	0.0064 J	0.0061 U	0.0065 U	0.0055 U	0.0062 U	0.0062 U	0.0058 U
Benzo(a)pyrene	-	2.3	0.26 J	**2.4**	0.13 J	0.04 J	0.0067 U	0.12 U	0.061 J	0.026 U	0.0073 J	0.007 J	0.0073 U	**3.2** J	0.26 J	2.3 J	0.28 J	0.0073 J	0.0069 U	0.0074 U	0.0063 U	0.0071 U	0.0071 U	0.0066 U
Benzo(b)fluoranthene	-	2.3	0.23 J	**2.6**	0.17 J	0.045 J	0.021 U	0.37 U	0.069 J	0.08 U	0.023 J	0.022 J	0.022 U	**3.6**	0.23 J	2.3 J	0.34 J	0.022 J	0.021 U	0.023 U	0.019 U	0.022 U	0.022 U	0.02 U
Benzo(g,h,i)perylene	-	0.8	0.069 J	0.74 J	0.02 U	0.017 U	0.017 U	0.31 U	0.017 U	0.066 U	0.018 J	0.018 J	0.018 J	**1.6** J	0.069 J	0.8 U	0.11 J	0.018 U	0.018 U	0.019 U	0.016 U	0.018 U	0.018 U	0.017 U
Benzo(k)fluoranthene	-	0.63	0.086 J	**1.5** J	0.064 J	0.013 U	0.013 U	0.24 U	0.013 U	0.052 U	0.014 J	0.014 J	0.014 J	**1.7** J	0.086 J	0.63 U	0.15 J	0.014 U	0.014 U	0.015 U	0.012 U	0.014 U	0.014 U	0.013 U
bis(2-Chloroethoxy)methane	-	0.84	0.019 U	0.086 U	0.021 U	0.018 U	0.018 U	0.32 U	0.017 U	0.069 U	0.019 U	0.019 U	0.019 U	0.17 U	0.019 U	0.84 U	0.016 U	0.019 U	0.018 U	0.02 U	0.017 U	0.019 U	0.019 U	0.018 U
bis(2-Chloroethyl)ether	-	0.9	0.02 U	0.093 U	0.023 U	0.019 U	0.019 U	0.35 U	0.019 U	0.075 U	0.021 U	0.02 U	0.021 U	0.18 U	0.02 U	0.9 U	0.017 U	0.021 U	0.02 U	0.028 U	0.018 U	0.02 U	0.026 U	0.019 U
bis(2-Ethylhexyl)phthalate	-	0.42	0.0093 U	0.043 U	0.066 J	0.37 J	0.0089 U	0.16 U	0.0087 U	0.035 U	0.14 J	0.29 J	0.06 U	0.084 U	0.0093 U	0.42 U	0.087 J	0.049 J	0.055 J	0.0099 U	0.052 J	0.0095 U	0.046 J	0.0088 U
Butylbenzylphthalate	-	0.61	0.014 U	0.063 U	0.016 U	0.16 J	0.013 U	0.24 U	0.013 U	0.051 U	0.014 U	0.014 U	0.014 U	0.12 U	0.014 U	0.61 U	0.012 U	0.014 U	0.014 U	0.014 U	0.012 U	0.014 U	0.014 U	0.013 U
Chrysene	-	2.4	0.45	**2.9**	0.19 J	0.066 J	0.14 J	**2.6** J	0.17 J	0.32 J	0.013 U	0.013 U	0.013 U	**3.3** J	0.45	2.4 J	0.33 J	0.013 J	0.013 U	0.014 U	0.012 U	0.013 U	0.013 U	0.012 U
Dibenz(a,h)anthracene	-	0.54	0.012 U	0.055 U	0.014 U	0.011 U	0.011 U	0.21 U	0.011 U	0.044 U	0.012 U	0.012 U	0.012 J	0.11 U	0.012 U	0.54 U	0.01 U	0.012 U	0.012 U	0.013 U	0.011 U	0.012 U	0.012 U	0.011 U
Dibenzofuran	-	0.6	0.18 J	**1.5** J	0.015 U	0.013 U	0.13 J	**2.8** J	0.012 U	0.05 U	0.014 U	0.013 U	0.014 U	0.12 U	0.18 J	0.6 U	NR 0	NR 0	NR 0	NR 0	NR 0	NR 0	NR 0	NR 0
Diethylphthalate	-	0.58	0.013 U	0.059 U	0.015 U	0.012 U	0.012 U	0.22 U	0.012 U	0.048 U	0.013 U	0.013 U	0.013 U	0.11 U	0.013 U	0.58 U	0.011 U	0.013 U	0.013 U	0.014 U	0.011 U	0.013 U	0.013 U	0.012 U
Dimethylphthalate	-	0.44	0.0097 U	0.045 U	0.011 U	0.0093 U	0.0093 U	0.17 U	0.0091 U	0.036 U	0.01 U	0.0098 U	0.01 U	0.087 U	0.0097 U	0.44 U	0.0085 U	0.01 U	0.0096 U	0.01 U	0.0087 U	0.0098 U	0.0098 U	0.0092 U
Di-n-butylphthalate	-	0.24	0.0054 U	0.025 U	0.07 J	0.0052 U	0.0052 U	0.093 U	0.092 J	0.02 U	0.0056 U	0.0054 U	0.0056 U	0.048 U	0.0054 U	0.24 U	0.0047 U	0.0056 U	0.0054 U	0.0057 U	0.0048 U	0.0055 U	0.0055 U	0.0051 U
Di-n-octyl phthalate	-	0.44	0.0097 U	0.045 U	0.011 U	0.0093 U	0.0093 U	0.17 U	0.0091 U	0.036 U	0.01 U	0.0098 U	0.01 U	0.087 U	0.0097 U	0.44 U	0.0085 U	0.01 U	0.0096 U	0.01 U	0.0087 U	0.0098 U	0.0098 U	0.0092 U
Fluoranthene	-	4.4	0.61	**6.4**	0.32 J	0.13 J	0.079 J	1.1 J	0.13 J	0.021 U	0.0059 U	0.0057 U	0.0059 U	**6.1**	0.61	4.4 J	0.89 0	0.0059 U	0.0056 U	0.006 U	0.0051 U	0.0057 U	0.0057 U	0.0054 U
Fluorene	-	0.52	**0.54**	**1.8** J	0.013 U	0.011 U	0.37 J	0.2 U	0.15 J	0.043 U	0.011 U	0.012 U	0.012 U	0.1 U	**0.54**	0.52 U	0.13 U	0.012 U	0.011 U	0.012 U	0.01 U	0.012 U	0.012 U	0.011 U
Hexachlorobenzene	-	0.34	0.0076 U	0.035 U	0.0087 U	0.0073 U	0.0073 U	0.13 U	0.0071 U	0.028 U	0.008 U	0.0077 U	0.0079 U	0.068 U	0.0076 U	0.34 U	0.0066 U	0.0079 U	0.0075 U	0.0081 U	0.0068 U	0.0077 U	0.0077 U	0.0072 U
Hexachlorobutadiene	-	0.64	0.014 U	0.066 U	0.016 U	0.014 U	0.014 U	0.25 U	0.013 U	0.053 U	0.015 U	0.014 U	0.015 U	0.13 U	0.014 U	0.64 U	0.012 U	0.015 U	0.014 U	0.015 U	0.013 U	0.014 U	0.014 U	0.014 U
Hexachlorocyclopentadiene	-	0.46	0.01 U	0.047 U	0.012 U	0.0098 U	0.0097 U	0.18 U	0.0095 U	0.038 U	0.011 U	0.01 U	0.011 U	0.091 U	0.01 U	0.46 U	0.0089 U	0.011 U	0.01 U	0.011 U	0.0091 U	0.01 U	0.01 U	0.0097 U
Hexachloroethane	-	0.87	0.019 U	0.09 U	0.022 U	0.019 U	0.019 U	0.33 U	0.018 U	0.072 U	0.02 U	0.02 U	0.02 U	0.17 U	0.019 U	0.87 U	0.017 U	0.02 U	0.019 U	0.021 U	0.017 U	0.02 U	0.02 U	0.018 U
Indeno(1,2,3-cd)pyrene	-	0.44	0.05 J	**0.66** J	0.011 U	0.0094 U	0.0094 U	0.17 U	0.0092 U	0.037 U	0.01 J	0.0099 J	0.01 J	**1.2** J	0.05 J	0.44 U	0.091 J	0.01 U	0.0097 U	0.01 U	0.0088 U	0.01 U	0.0099 U	0.0093 U
Isophorone	-	0.68	0.015 U	0.07 U	0.017 U	0.014 U	0.014 U	0.26 U	0.014 U	0.056 U	0.016 U	0.015 U	0.016 U	0.14 U	0.015 U	0.68 U	0.013 U	0.016 U	0.015 U	0.016 U	0.014 U	0.015 U	0.015 U	0.014 U
Naphthalene	-	0.4	0.43	2.4	0.01 U	0.0085 U	0.0084 U	0.15 U	0.0083 U	0.033 U	0.0092 U	0.0089 U	0.0092 U	0.079 U	0.43	0.4 U	0.13 U	0.0092 U	0.0088 U	0.0094 U	0.0079 U	0.009 U	0.0089 U	0.0084 U
Nitrobenzene	-	0.93	0.021 U	0.096 U	0.024 U	0.02 U	0.02 U	0.36 U	0.019 U	0.077 U	0.022 U	0.021 U	0.021 U	0.19 U	0.021 U	0.93 U	0.018 U	0.021 U	0.02 U	0.022 U	0.018 U	0.021 U	0.021 U	0.02 U
N-Nitroso-di-n-propylamine	-	0.81	0.018 U	0.083 U	0.02 U	0.017 U	0.017 U	0.31 U	0.017 U	0.067 U	0.019 U	0.018 U	0.019 U	0.16 U	0.018 U	0.81 U	0.016 U	0.019 U	0.018 U	0.019 U	0.016 U	0.018 U	0.018 U	0.017 U
N-Nitrosodiphenylamine	-	0.46	0.01 U	0.048 U	0.012 U	0.0099 U	0.0098 U	0.18 U	0.0096 U	0.038 U	0.011 U	0.01 U	0.011 U	0.093 U	0.01 U	0.46 U	0.009 U	0.011 U	0.01 U	0.011 U	0.0092 U	0.01 U	0.01 U	0.0098 U
Phenanthrene	-	1000	1.9	9.2	0.27 J	0.17 J	1.1	4.4 J	0.26 J	0.034 U	0.0095 U	0.0091 U	0.0094 U	3.5 J	1.9	3.7 J	1 0	0.0095 U	0.009 U	0.0097 U	0.0081 U	0.0092 U	0.0092 U	0.0086 U
Pyrene	-	100	1.1	5.9	0.37 J	0.14 J	0.22 J	4.1 J	0.33 J	0.47 J	0.0076 U	0.0073 U	0.0075 U	6.4	1.1	4.7 J	0.78 0	0.0075 U	0.0072 U	0.0077 U	0.0065 U	0.0074 U	0.0073 U	0.0069 U
Total SVOCs	< 500	-	9.1533	50.7	2.7677	2.0049	4.9694	60.653	2.281	4.025	1.0585	1.1763	0.981	41.895	9.1533	59.2	5.5378	0.8298	0.7993	0.8219	0.7244	0.7744	0.8057	0.7252

* This table includes data results for samples collected during the RI below remedial excavation depth (13ft. Bgs)

* = Site Specific Soil Cleanup Objective

U = The compound was not detected at the indicated concentration.

J = The result is less than the quantitation limit but greater so result is an approximate value.

B = The analyte was found in the laboratory blank as well as the sample

NR = Not analyzed

- = No standard

Exceedances of UUSCO are **bolded**

Exceedances of UUSCO and SSSCO are **bolded** and highlighted yellow

Table 4B - Semi Volatile Organic Compounds in Soil - Endpoint Samples
Harlem Park
1800 Park Avenue, New York, NY

Sample ID	Site Specific SCO mg/kg	NY SCO - Unrestricted Use (6 NYCRR 375-6 12/06) mg/kg	EP-A1-I(13.5)	EP-A1-I(SW-E-11)	EP-A1-I(SW-N-11)	EP-A2-III(13.5)	EP-A3-III(13.5)	EP-B1-I(13.5)	EP-D2-III(13.5)
Sampling Date			11/12/2015	11/20/2015	11/20/2015	11/12/2015	11/12/2015	11/12/2015	11/12/2015
Units			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Lab ID			JC8567	JC9086	JC9086	JC8567	JC8567	JC8567	JC8567
2-Chlorophenol	-	-	0.026 U	0.030 U	0.026 U	0.025 U	0.026 U	0.026 U	0.027 U
4-Chloro-3-methyl phenol	-	-	0.031 U	0.037 U	0.032 U	0.031 U	0.033 U	0.032 U	0.033 U
2,4-Dichlorophenol	-	-	0.028 U	0.033 U	0.028 U	0.027 U	0.029 U	0.028 U	0.029 U
2,4-Dimethylphenol	-	-	0.064 U	0.075 U	0.064 U	0.062 U	0.066 U	0.065 U	0.067 U
2,4-Dinitrophenol	-	-	0.15 U	0.18 U	0.15 U	0.15 U	0.16 U	0.16 U	0.16 U
4,6-Dinitro-o-cresol	-	-	0.066 U	0.078 U	0.066 U	0.065 U	0.068 U	0.067 U	0.070 U
2-Methylphenol	-	0.33	0.050 U	0.209	0.051 U	0.049 U	0.052 U	0.051 U	0.053 U
3&4-Methylphenol	-	-	0.033 U	1.11	0.033 U	0.033 U	0.034 U	0.0697 J	0.035 U
2-Nitrophenol	-	-	0.032 U	0.038 U	0.032 U	0.031 U	0.033 U	0.033 U	0.034 U
4-Nitrophenol	-	-	0.059 U	0.070 U	0.059 U	0.058 U	0.061 U	0.060 U	0.062 U
Pentachlorophenol	-	0.8	0.085 U	0.10 U	0.085 U	0.083 U	0.088 U	0.086 U	0.089 U
Phenol	-	0.33	0.026 U	0.031 U	0.026 U	0.026 U	0.027 U	0.027 U	0.027 U
2,3,4,6-Tetrachlorophenol	-	-	0.033 U	0.039 U	0.033 U	0.032 U	0.034 U	0.033 U	0.034 U
2,4,5-Trichlorophenol	-	-	0.031 U	0.037 U	0.031 U	0.031 U	0.032 U	0.032 U	0.033 U
2,4,6-Trichlorophenol	-	-	0.028 U	0.033 U	0.028 U	0.027 U	0.029 U	0.029 U	0.030 U
Acenaphthene	-	20	0.0392	0.039 U	0.033 U	0.032 U	0.034 U	0.366	0.176
Acenaphthylene	-	100	0.107	0.0606	0.0187 J	0.0036 U	0.126	1.38	0.216
Acetophenone	-	-	0.0059 U	0.177 J	0.0059 U	0.0058 U	0.0061 U	0.0060 U	0.0062 U
Anthracene	-	100	0.169	0.0692	0.0235 J	0.0029 U	0.114	1.87	0.586
Atrazine	-	-	0.014 U	0.017 U	0.014 U	0.014 U	0.015 U	0.015 U	0.015 U
Benzo(a)anthracene	-	1	0.668	0.233	0.0735	0.0234 J	0.373	**5.6**	**1.52**
Benzo(a)pyrene	-	1	0.726	0.212	0.0758	0.0249 J	0.496	**5.22**	**1.59**
Benzo(b)fluoranthene	-	1	0.881	0.277	0.0918	0.0277 J	0.574	**5.94**	**1.73**
Benzo(g,h,i)perylene	-	100	0.55	0.198	0.0611	0.0225 J	0.405	3.28	1.11
Benzo(k)fluoranthene	-	0.8	0.317	0.109	0.0310 J	0.0076 U	0.217	**2.61**	0.711
4-Bromophenyl phenyl ether	-	-	0.0079 U	0.0094 U	0.0080 U	0.0078 U	0.0082 U	0.0081 U	0.0084 U
Butyl benzyl phthalate	-	-	0.019 U	3.69	0.019 U	0.018 U	0.019 U	0.019 U	0.020 U
1,1'-Biphenyl	-	-	0.0064 U	0.0076 U	0.0065 U	0.0063 U	0.0067 U	0.131	0.0221 J
Benzaldehyde	-	-	0.0307 J	0.25	0.0087 U	0.0085 U	0.0462 J	0.0089 U	0.0318 J
2-Chloronaphthalene	-	-	0.0050 U	0.0059 U	0.0050 U	0.0049 U	0.0051 U	0.0051 U	0.0052 U
4-Chloroaniline	-	-	0.0092 U	0.011 U	0.0093 U	0.0090 U	0.0095 U	0.0094 U	0.0097 U
Carbazole	-	-	0.124	0.0543 J	0.0171 J	0.0038 U	0.0602 J	1.17	0.3
Caprolactam	-	-	0.022 U	0.026 U	0.022 U	0.022 U	0.023 U	0.023 U	0.024 U
Chrysene	-	1	0.831	0.284	0.0867	0.0246 J	0.497	**6.4**	**1.67**
bis(2-Chloroethoxy)methane	-	-	0.0079 U	0.0093 U	0.0079 U	0.0077 U	0.0082 U	0.0080 U	0.0083 U
bis(2-Chloroethyl)ether	-	-	0.014 U	0.017 U	0.015 U	0.014 U	0.015 U	0.015 U	0.015 U
bis(2-Chloroisopropyl)ether	-	-	0.0079 U	0.0094 U	0.0080 U	0.0078 U	0.0082 U	0.0081 U	0.0084 U
4-Chlorophenyl phenyl ether	-	-	0.0065 U	0.0077 U	0.0066 U	0.0064 U	0.0068 U	0.0067 U	0.0069 U
2,4-Dinitrotoluene	-	-	0.0065 U	0.0077 U	0.0066 U	0.0064 U	0.0068 U	0.0067 U	0.0069 U
2,6-Dinitrotoluene	-	-	0.0090 U	0.011 U	0.0090 U	0.0088 U	0.0093 U	0.0091 U	0.0095 U
3,3'-Dichlorobenzidine	-	-	0.023 U	0.027 U	0.023 U	0.022 U	0.024 U	0.023 U	0.024 U
Dibenzo(a,h)anthracene	-	0.33	0.152	0.0447	0.0143 J	0.012 U	0.112	**0.888**	0.303
Dibenzofuran	-	7	0.0509 J	0.0394 J	0.0049 U	0.0047 U	0.0269 J	0.958	0.159
Di-n-butyl phthalate	-	-	0.0041 U	0.122	0.0041 U	0.0040 U	0.0042 U	0.0042 U	0.0043 U
Di-n-octyl phthalate	-	-	0.0047 U	0.0056 U	0.0047 U	0.0046 U	0.0049 U	0.0048 U	0.0049 U
Diethyl phthalate	-	-	0.0044 U	0.0052 U	0.0044 U	0.0043 U	0.0046 U	0.0045 U	0.0047 U
Dimethyl phthalate	-	-	0.0050 U	0.0059 U	0.0050 U	0.0049 U	0.0051 U	0.0051 U	0.0052 U
bis(2-Ethylhexyl)phthalate	-	-	0.0489 J	14.7	0.551	0.012 U	0.163	0.012 U	0.0450 J
Fluoranthene	-	100	1.56	0.559	0.165	0.0407	0.716	18.3	3.47
Fluorene	-	30	0.0421	0.0202 J	0.0042 U	0.0041 U	0.0271 J	0.584	0.154
Hexachlorobenzene	-	0.33	0.0068 U	0.0081 U	0.0069 U	0.0067 U	0.0071 U	0.0070 U	0.0072 U
Hexachlorobutadiene	-	-	0.0092 U	0.011 U	0.0093 U	0.0090 U	0.0095 U	0.0094 U	0.0097 U
Hexachlorocyclopentadiene	-	-	0.055 U	0.065 U	0.056 U	0.054 U	0.057 U	0.056 U	0.058 U
Hexachloroethane	-	-	0.011 U	0.013 U	0.011 U	0.011 U	0.012 U	0.011 U	0.012 U
Indeno(1,2,3-cd)pyrene	-	0.5	**0.585**	0.202	0.0649	0.0212 J	0.423	**4.18**	**1.19**
Isophorone	-	-	0.0065 U	0.0077 U	0.0065 U	0.0064 U	0.0067 U	0.0066 U	0.0069 U
2-Methylnaphthalene	-	-	0.0247 J	0.0389 J	0.0065 U	0.0064 U	0.0218 J	0.205	0.0754
2-Nitroaniline	-	-	0.0079 U	0.0093 U	0.0079 U	0.0077 U	0.0082 U	0.0080 U	0.0083 U
3-Nitroaniline	-	-	0.0099 U	0.012 U	0.0099 U	0.0097 U	0.010 U	0.010 U	0.010 U
4-Nitroaniline	-	-	0.012 U	0.014 U	0.012 U	0.011 U	0.012 U	0.012 U	0.012 U
Naphthalene	-	12	0.0408	0.0671	0.0056 U	0.0055 U	0.0204 J	0.184	0.122
Nitrobenzene	-	-	0.011 U	0.013 U	0.011 U	0.011 U	0.011 U	0.011 U	0.012 U
N-Nitroso-di-n-propylamine	-	-	0.010 U	0.012 U	0.010 U	0.010 U	0.011 U	0.011 U	0.011 U
N-Nitrosodiphenylamine	-	-	0.018 U	0.022 U	0.018 U	0.018 U	0.019 U	0.019 U	0.019 U
Phenanthrene	-	100	1.04	0.474	0.145	0.0213 J	0.36	15.9	2.7
Pyrene	-	100	1.46	0.525	0.174	0.0444	0.778	12.4	3.45
1,2,4,5-Tetrachlorobenzene	-	-	0.0083 U	0.0099 U	0.0084 U	0.0082 U	0.0086 U	0.0085 U	0.0088 U
Total SVOCs	< 500	-	9.2921	23.3956	1.4888	0.0851	5.3540	87.5660	21.2324

Exceedances of UUSCO are **bolded**

Exceedances of UUSCO and SSSCO are **bolded** and highlighted yellow

U = The compound was not detected at the indicated concentration.

J = The result is less than the quantitation limit but greater so result is an approximate value.

B = The analyte was found in the laboratory blank as well as the sample

- = No standard

Table 5A - Metals in Soil - RI Data*
Harlem Park
1800 Park Avenue, New York, NY

Sample ID	Site Specific SCO	NY SCO - Unrestricted Use (6 NYCRR 375-6 12/06)	HH9-23	HH9-33	HH9-48	HH10-17	HH10-33	HH10-63	HH11-16	HH12-18	HH13-18	HH14-20	HH15-18	HH16-18	HH17-20	HH18-22	HH1-14	HH2-15	HH5-16	HH4-15
Sample Depth (ft.-bgs)			23	33	48	17	33	63	16	18	18	20	18	18	20	22	14	15	16	15
Sampling Date			8/19/04	8/19/04	8/19/04	8/23/04	8/23/04	8/23/04	8/24/04	8/24/04	8/25/04	8/24/04	8/24/04	8/25/04	8/26/04	8/26/04	05/27/04	05/27/04	05/28/04	05/28/04
Units	mg/kg	mg/kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Aluminum	-	-	4,330	8,300	14,300	4,440	7,160	3,370	2,690	4,730	1,990	5,250	2,670	6,530	5,780	6,070	4820	6,500	6,290	4,650
Antimony	-	-	0.728 U N	0.689 U N	0.727 U N	0.633 U N	0.576 U N	0.637 U N	0.615 U N	0.735	0.686 U N	0.737 U N	0.629 U N	0.717 U N	0.702 U	0.665 U	0.68 U	0.65 U	0.77 U	0.67 U
Arsenic	16	13	0.495 J	2.33	1.72	0.649 J	0.242 U	0.268 U	0.259 U	0.309	0.289 U	0.645 J	0.265 U	0.302 U	2.21	1.08 J	0.37 J	1.9	0.43 J	0.28 U
Barium	820*	350	174	123	123	55.8	56.7	29.2	20.9 J	56.8	13.3 J	78.7	27.5	54.2	73.8	35.5	39.6	165	177	38.9
Beryllium	72	7.2	0.567 J	0.723	0.991	0.513 J N	0.459 J N	0.338 J N	0.699 N	0.306	0.078 J N	0.372 J N	0.172 J N	0.376 J N	0.352 J	0.334 J	0.37 J	0.32 J	0.30 J	0.27 J
Cadmium	6.5*	2.5	0.06 U	0.323 J	0.961	0.052 U	0.306 J N	0.097 J	0.118 J	0.539	0.056 U	0.548 J	0.051 U	0.378 U	0.057 U	0.054 U	0.20 J	0.49 J	0.40 J	0.24 J
Calcium	-	-	11,700 N	20,100 N	26,400 N	1,400	30,400	21,100	1,350 N	15,500	950 N	2,300 N	663 N	1,810 N	2,070	18,600	1,620	10,300	8,000	3,020
Chromium	110	1	**9.96**	**15.7**	**30.4**	**9.59**	**13.3**	**7.1**	**7.66**	**14.7**	**6.99**	**12.1**	**10.3**	**14.2**	**11.6**	**12.0**	**17.5**	**19.1**	**19.2**	**17.9**
Cobalt	-	-	4.37 J	8.05	13.9	5.1 J N	6.49	4.12 J N	2.99 J	6.04	1.62 J	6.59	3.41 J	6.85	6.52	6.7	5.6 J	6.0	5.1 J	4.7 J
Copper	270	50	7.93	18.2	27.3	8.99	19.2	10.0	12.2	15.5	6.11	14.2	9.97	13.8	9.89	14.6	24.7	34.9	27.7	15.9
Cyanide	-	-	0.647 U	0.624 U	0.652 U	0.562 U	0.511 U	0.566 U	0.546 U	0.653 U	0.609 U	0.654 U	0.559 U	0.637 U	0.623 U	0.590 U	0.129	0.121	0.147	0.125
Iron	-	-	7,640	13,200	20,900	8,280	9,010	5,220	4,130	8,710	3,110	10,000	4,980	10,900	11,700	11,100	8,640	10,600	9,980	7,990
Lead	1000*	63	7.15	12.0	15.5	6.03	6.08	3.47	5.89	6.79	2.3	7.28	3.07	7.49	5.2	5.73	6.9	**92.0**	**164**	6.9
Magnesium	-	-	4,530	7,950	17,200	1,780	17,900	11,400	1,270	5,720	979	2,380	1,230	2,370	2,510	7,870	2300	3230	3,570	2,590
Manganese	2500*	1600	398	403	510	258	200	113	98.7	298	26.6	369	68.6	358	540	341	190	310	127	93.6
Mercury	2.8*	0.18	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	**3.01** U	0.02	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.05	0.05	0.14	0.03
Nickel	310	30	9.55	17.7	27.6	8.83	12.1	7.62	6.46	20.9	4.62 J	19.1	7.64	12.5	13.7	14.6	14.1	11.8	13.8	12.6
Potassium	-	-	2,100	3,480	6,730	1,370	3,500	1,310	578 N	1,890	345 J N	1,720 N	429 J N	1,880 N	1,530	2,220	592 J	1,010	841	782
Selenium	180	3.9	0.405 U	0.383 U	0.404 U	0.987 J N	0.81 J N	1.18 N	0.764 J N	0.531	0.381 U N	0.887 J N	**419** J N	0.445 J N	1.54	0.944 J	0.38 U	0.36 U	0.43 U	0.37 U
Silver	180	2	0.136 U	0.129 U	0.136 U	0.118 U	0.107 U	0.119 U	0.115 U	0.137	0.128 U	0.315 J	0.117 U	0.134 U	0.131 U	0.124 U	0.13 U	0.12 U	0.14 U	0.12 U
Sodium	-	-	242 J N	276 J N	370	87.7 J	379 J	213 J	147 J	208	46.6 J	212 J	43.4 J	130 J	235 J	273 J	60.1 J	359 J	51.1 U	144 J
Thallium	-	-	0.427 U	0.404 U	0.426 U	0.371 U	0.337 U	0.373 U	0.36 U	0.431	0.402 U	0.432 U	0.369 U	0.42 U	0.814 J	0.39 U	0.40 U	0.38 U	0.45 U	0.39 U
Vanadium	-	-	13.6	20.1	38.7	14.6 N	19.5 N	9.51 N	9.36 N	14.2	4.69 J N	18.0 N	8.08 N	19.6 N	18.6	16.1	19.0	21.2	22.9	19.5
Zinc	10000	109	18.6	42.3	84.8	18.3 N	37.8 N	18.4 N	22.1 N	27.8	13.2 N	30.0 N	15.8 N	32.8 N	19.4	29.6	17.8	138	137	18.3

* This table includes data results for samples collected during the RI below remedial excavation depth (13ft. Bgs)

* Specific Site SCOs that difers from Restricted Residential SCOs

U = The compound was not detected at the indicated concentration.

J = The result is less than the quantitation limit but greater so result is an approximate value.

B = The analyte was found in the laboratory blank as well as the sample

NR = Not analyzed

- = No standard

Exceedances of UUSCO are **bolded**

Exceedances of UUSCO and SSSCO are **bolded** and highlighted yellow

Table 5B- Metals in Soil - Endpoint Samples
Harlem Park
1800 Park Avenue, New York, NY

Sample ID	Site Specific SCO mg/kg	NY SCO - Unrestricted Use (6 NYCRR 375-6 12/06) mg/kg	EP-A1-I(13.5)	EP-A1-I(SW-E-11)	EP-A1-I(SW-N-11)	EP-A2-III(13.5)	EP-A3-III(13.5)	EP-B1-I(13.5)	EP-B1-I(SW-N-9)	EP-B2-I(13.5)	EP-B4-I(13.5)	EP-B4-II(13.5)	EP-B4-II(SW-S-5)	EP-B4-III(13.5)	EP-B4-III(SW-S-10)	EP-B4-IV(13.5)	EP-D2-I(13.5)	EP-D2-II(13.5)	EP-D2-III(13.5)
Sampling Date			11/12/2015	11/20/2015	11/20/2015	11/12/2015	11/12/2015	11/12/2015	11/20/2015	11/12/2015	11/13/2015	11/13/2015	11/20/2015	11/13/2015	11/20/2015	11/13/2015	11/12/2015	11/12/2015	11/12/2015
Units			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Lab ID			JC8567	JC9086	JC9086	JC8567	JC8567	JC8567	JC9086	JC8567	JC8567	JC8567	JC9086	JC8567	JC9086	JC8567	JC8567	JC8567	JC8567
Aluminum	-	-	7090	8200	9300	5920	7560	6630	12600	6130	7700	5780	7260	6820	12300	7100	7080	6460	7520
Antimony	-	-	2.1 U	2.4 U	2.1 U	2.0 U	2.2 U	2.1 U	2.1 U	2.0 U	2.1 U	2.0 U	2.2 U	2.1 U	2.0 U	2.1 U	2.2 U	2.2 U	2.1 U
Arsenic	16	13	2.8	4.5	7.1	2.0 U	4.1	3.1	2.2	2.0 U	2.1	2.4	3.4	3.4	8	2.2	3.1	2.2 U	3.4
Barium	820*	350	162	**648**	164	83.6	172	117	68.8	54.4	84.4	75	164	123	92.7	48.7	93.7	68.7	228
Beryllium	72	7.2	0.38	0.38	0.43	0.36	0.4	0.32	0.5	0.39	0.45	0.38	0.39	0.49	0.56	0.42	0.41	0.42	0.39
Cadmium	6.5*	2.5	0.52 U	0.79	0.51 U	0.51 U	0.54 U	0.52 U	0.52 U	0.51 U	0.52 U	0.50 U	0.56 U	0.52 U	0.51 U	0.52 U	0.54 U	0.54 U	0.53 U
Calcium	-	-	22400	85100	16900	3380	36600	29700	60400	7030	6230	3430	14900	1190	21400	3310	29200	7440	10800
Chromium	110	1	**15.5**	**18**	**17.5**	**10.5**	**15.9**	**15.2**	**15.4**	**12.8**	**17.3**	**12.8**	**15.4**	**17.2**	**25.1**	**16.5**	**14.9**	**13.4**	**15.5**
Cobalt	-	-	5.8	6.1 U	6.1	5.2	5.8	5.2 U	6.3	6.7	6.9	5.0 U	5.6 U	6.1	8	7.1	6.9	6.2	6.7
Copper	270	50	26.8	26.8	**60**	23.7	38.8	21.7	14.3	27.3	31	19.9	21.4	24.3	36.1	22.7	25.5	28.1	32
Iron	-	-	9410	13200	14600	9360	11200	9640	12400	7850	10500	9810	12400	11800	18900	10200	9690	9190	12900
Lead	1000*	63	**378**	**2570**	**298**	27.4	**398**	**228**	27.9	15.2	24.6	4.7	**283**	4.4	**213**	8.5	53.1	11.5	**280**
Magnesium	-	-	5110	6110	5980	2010	9410	6410	7020	2330	2820	2100	3250	2190	5010	2780	7210	2780	3220
Manganese	2500*	1600	315	285	323	623	299	306	278	265	621	823	352	1230	278	313	613	553	456
Mercury	2.8*	0.18	0.15	**0.33**	**0.4**	0.030 U	**1.2**	**0.61**	0.037	0.032 U	0.036	0.032 U	**0.23**	0.032 U	**1.6**	0.032 U	**0.32**	0.033 U	**1.3**
Nickel	310	30	16.3	11.9	15.3	13.7	13.2	13.6	13.4	16.2	15.5	13.7	13.1	17.5	16.9	16	17.1	17.4	18.7
Potassium	-	-	1000 U	1200 U	1410	1120	1210	1050	3250	1000 U	1140	1000 U	1350	1000 U	2210	1000 U	1320	1100 U	1100 U
Selenium	180	3.9	2.1 U	2.4 U	2.1 U	2.0 U	2.2 U	2.1 U	2.1 U	2.0 U	2.1 U	2.0 U	2.2 U	2.1 U	2.0 U	2.1 U	2.2 U	2.2 U	2.1 U
Silver	180	2	0.52 U	0.61 U	0.51 U	0.54	0.54 U	0.52 U	0.52 U	0.51 U	0.54	0.50 U	0.56 U	0.52 U	0.51 U	0.52 U	0.54 U	0.54 U	0.94
Sodium	-	-	1000 U	1200 U	1000 U	1000 U	1100 U	1000 U	1000 U	1000 U	1000 U	1000 U	1100 U	1000 U	1000 U	1000 U	1100 U	1100 U	1100 U
Thallium	-	-	1.0 U	1.2 U	1.0 U	1.0 U	1.1 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.1 U	2.1 U [b]	1.0 U	1.0 U	1.1 U	1.1 U	1.1 U
Vanadium	-	-	21.7	20	19.5	14	26.7	17.6	23.9	21.6	20.5	23.3	19.9	19.7	30.3	19.5	17.5	19.7	19.7
Zinc	10000	109	**131**	**627**	313	26.6	**186**	**114**	34.9	24.4	41.1	21.1	**142**	19.8	**200**	21.8	59.6	23.5	**138**

* Specific Site SCOs that difers from Restricted Residential SCOs
Exceedances of UUSCO are **bolded**
Exceedances of UUSCO and SSSCO are **bolded** and highlighted yellow
U = The compound was not detected at the indicated concentration.
J = The result is less than the quantitation limit but greater so result is an approximate value.
B = The analyte was found in the laboratory blank as well as the sample
- = No standard

Table 6A - Pesticides and PCBs in Soil - RI Data*
Harlem Park
1800 Park Avenue, New York, NY

Sample ID	Site Specific SCO	NY SCO - Unrestricted Use (6 NYCRR 375-6 12/06)	HH9-23	HH9-33	HH9-48	HH11-16	HH12-18	HH13-18	HH14-20	HH15-18	HH16-18	HH17-20	HH18-22
Sample Depth (ft.-bgs)			23	33	48	16	18	18	20	18	18	20	22
Sampling Date			8/19/04	8/19/04	8/19/04	8/24/04	8/25/04	8/26/04	8/26/04	8/26/04	8/26/04	8/26/04	8/26/04
Units	mg/kg	mg/kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
PESTICIDES													
4,4'-DDD	-	0.0033	0.0013 U	0.0013 U	0.0013 U	0.0011 U	0.0013 U	0.0012 U	0.0013 U	0.0011 U	0.0013 U	0.0013 U	0.0012 U
4,4'-DDE	-	0.0033	0.0017 U	0.0016 U	0.0017 U	0.0014 U	0.0017 U	0.0015 U	0.0017 U	0.0014 U	0.0016 U	0.0016 U	0.0015 U
4,4'-DDT	-	0.0033	0.0024 U	0.0023 U	0.0024 U	0.002 U	0.0024 U	0.0022 U	0.0024 U	0.002 U	0.0023 U	0.0023 U	0.0022 U
Aldrin	-	0.005	0.0014 U	0.0013 U	0.0014 U	0.0011 U	0.0014 U	0.0013 U	0.0014 U	0.0012 U	0.0013 U	0.0013 U	0.0012 U
alpha-BHC	-	0.02	0.0014 U	0.0014 U	0.0014 U	0.0012 U	0.0014 U	0.0013 U	0.0015 U	0.0012 U	0.0014 U	0.0014 U	0.0013 U
alpha-Chlordane	-	0.094	0.0019 U	0.0018 U	0.0019 U	0.0016 U	0.0019 U	0.0018 U	0.0019 U	0.0016 U	0.0019 U	0.0018 U	0.0017 U
beta-BHC	-	0.036	0.0015 U	0.0014 U	0.0015 U	0.0012 U	0.0015 U	0.0014 U	0.0015 U	0.0013 U	0.0014 U	0.0014 U	0.0013 U
delta-BHC	-	0.04	0.0011 U	0.0011 U	0.0011 U	0.00095 U	0.0011 U	0.0011 U	0.0012 U	0.00098 U	0.0011 U	0.0011 U	0.001 U
Dieldrin	-	0.005	0.0013 U	0.0013 U	0.0013 U	0.0011 U	0.0013 U	0.0012 U	0.0013 U	0.0011 U	0.0013 U	0.0013 U	0.0012 U
Endosulfan-I	-	2.4	0.0019 U	0.0018 U	0.0019 U	0.0016 U	0.0019 U	0.0018 U	0.0019 U	0.0016 U	0.0018 U	0.0018 U	0.0017 U
Endosulfan-II	-	2.4	0.0019 U	0.0016 U	0.0017 U	0.0014 U	0.0017 U	0.0016 U	0.0017 U	0.0015 U	0.0017 U	0.0017 U	0.0015 U
Endosulfan sulfate	-	2.4	0.0019 U	0.0018 U	0.0019 U	0.0016 U	0.0019 U	0.0018 U	0.0019 U	0.0016 U	0.0019 U	0.0018 U	0.0017 U
Endrin	-	0.014	0.0013 U	0.0023 U	0.0024 U	0.002 U	0.0024 U	0.0022 U	0.0024 U	0.002 U	0.0023 U	0.0023 U	0.0021 U
Endrin aldehyde	-	-	0.002 U	0.0019 U	0.002 U	0.0016 U	0.002 U	0.0018 U	0.002 U	0.0017 U	0.0019 U	0.0019 U	0.0018 U
Endrin ketone	-	-	0.0017 U	0.0016 U	0.0017 U	0.0014 U	0.0017 U	0.0016 U	0.0017 U	0.0014 U	0.0016 U	0.0016 U	0.0015 U
gamma-BHC (Lindane)	-	100	0.0016 U	0.0015 U	0.0016 U	0.0013 U	0.0016 U	0.0015 U	0.0016 U	0.0013 U	0.0015 U	0.0015 U	0.0014 U
gamma-Chlordane	-	-	0.0019 U	0.0018 U	0.0019 U	0.0016 U	0.0019 U	0.0018 U	0.0019 U	0.0016 U	0.0019 U	0.0019 U	0.0017 U
Heptachlor	-	0.042	0.0017 U	0.0016 U	0.0017 U	0.0014 U	0.0017 U	0.0016 U	0.0017 U	0.0015 U	0.0017 U	0.0016 U	0.0015 U
Heptachlor epoxide	-	-	0.0016 U	0.0016 U	0.0016 U	0.0014 U	0.0016 U	0.0015 U	0.0017 U	0.0014 U	0.0016 U	0.0016 U	0.0015 U
Methoxychlor	-	-	0.0016 U	0.0016 U	0.0016 U	0.0014 U	0.0016 U	0.0015 U	0.0016 U	0.0014 U	0.0016 U	0.0016 U	0.0015 U
Toxaphene	-	-	0.0039 U	0.0037 U	0.0039 U	0.0032 U	0.0039 U	0.0036 U	0.0039 U	0.0033 U	0.0038 U	0.0037 U	0.0035 U
PCBs													
Aroclor 1016	-	100	0.0066 U	0.0064 U	0.0067 U	0.0056 U	0.0067 U	0.0063 U	0.0067 U	0.0057 U	0.0065 U	0.0064 U	6 U
Aroclor 1221	-	100	0.0045 U	0.0044 U	0.0046 U	0.0038 U	0.0046 U	0.0043 U	0.0046 U	0.0039 U	0.0044 U	0.0044 U	4.1 U
Aroclor 1232	-	100	0.0031 U	0.003 U	0.0031 U	0.0026 U	0.0031 U	0.0029 U	0.0031 U	0.0026 U	0.003 U	0.003 U	2.8 U
Aroclor 1242	-	100	0.0039 U	0.0038 U	0.004 U	0.0033 U	0.004 U	0.0037 U	0.004 U	0.0034 U	0.0039 U	0.0038 U	3.6 U
Aroclor 1248	-	100	0.0047 U	0.0045 U	0.0047 U	0.0039 U	0.0047 U	0.0044 U	0.0047 U	0.004 U	0.0046 U	0.0045 U	4.2 U
Aroclor 1254	-	100	0.0017 U	0.0017 U	0.0017 U	0.0014 U	0.0017 U	0.0016 U	0.0017 U	0.0015 U	0.0017 U	0.0017 U	1.6 U
Aroclor 1260	-	100	0.0038 U	0.0036 U	0.0038 U	0.0032 U	0.0038 U	0.0035 U	0.0038 U	0.0032 U	0.0037 U	0.0036 U	3.4 U

* This table includes data results for samples collected during the RI below remedial excavation depth (13ft. Bgs)

U = The compound was not detected at the indicated concentration.

J = The result is less than the quantitation limit but greater so result is an approximate value.

B = The analyte was found in the laboratory blank as well as the sample

NR = Not analyzed

- = No standard

Exceedances of UUSCO are **bolded**

Exceedances of UUSCO and SSSCO are **bolded** and highlighted yellow

Table 6B- Pesticides and PCBs in Soil - Endpoint Samples
Harlem Park
1800 Park Avenue, New York, NY

Sample ID	Site Specific SCO mg/kg	NY SCO - Unrestricted Use (6 NYCRR 375-6 12/06) mg/kg	EP-A1-I(13.5)	EP-A1-I(SW-E-11)	EP-A1-I(SW-N-11)	EP-A2-III(13.5)	EP-A3-III(13.5)	EP-B1-I(13.5)	EP-B1-I(SW-N-9)	EP-B2-I(13.5)	EP-B4-I(13.5)	EP-B4-II(13.5)	EP-B4-II(SW-S-5)	EP-B4-III(13.5)	EP-B4-III(SW-S-10)	EP-B4-IV(13.5)	EP-D2-I(13.5)	EP-D2-II(13.5)	EP-D2-III(13.5)
Sampling Date			11/12/2015	11/20/2015	11/20/2015	11/12/2015	11/12/2015	11/12/2015	11/20/2015	11/12/2015	11/13/2015	11/13/2015	11/20/2015	11/13/2015	11/20/2015	11/13/2015	11/12/2015	11/12/2015	11/12/2015
Units			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Lab ID			JC8567	JC9086	JC9086	JC8567	JC8567	JC8567	JC9086	JC8567	JC8567	JC8567	JC9086	JC8567	JC9086	JC8567	JC8567	JC8567	JC8567
PESTICIDES																			
Aldrin	-	0.005	0.00059 U	0.00072 U	0.00061 U	0.0027	0.0014 [a]	0.00060 U	0.00057 U	0.00060 U	0.00060 U	0.00056 U	0.00061 U	0.00060 U	0.00077 U	0.00056 U	0.00063 U	0.00063 U	0.00063 U
alpha-BHC	-	0.02	0.00044 U	0.00054 U	0.00046 U	0.00043 U	0.00044 U	0.00045 U	0.00042 U	0.00045 U	0.00045 U	0.00042 U	0.00045 U	0.00045 U	0.00058 U	0.00042 U	0.00047 U	0.00047 U	0.00047 U
beta-BHC	-	0.036	0.00041 U	0.00050 U	0.00042 U	0.00040 U	0.00041 U	0.00042 U	0.00039 U	0.00042 U	0.00042 U	0.00039 U	0.00042 U	0.00041 U	0.00054 U	0.00039 U	0.00044 U	0.00044 U	0.00044 U
delta-BHC	-	0.04	0.00026 U	0.00032 U	0.00027 U	0.00025 U	0.00026 U	0.00027 U	0.00025 U	0.00026 U	0.00026 U	0.00025 U	0.00027 U	0.00026 U	0.00034 U	0.00025 U	0.00028 U	0.00028 U	0.00028 U
gamma-BHC (Lindane)	-	100	0.00030 U	0.00037 U	0.00031 U	0.00029 U	0.0021	0.0014 [a]	0.00029 U	0.00031 U	0.00031 U	0.00028 U	0.00031 U	0.00031 U	0.00039 U	0.00029 U	0.00032 U	0.00032 U	0.00032 U
alpha-Chlordane	-	0.094	0.0064 [a]	0.0162 [a]	0.0129 [a]	0.00099 [a]	0.0263 [a]	0.0148 [a]	0.00034 U	0.0011 [a]	0.00036 U	0.00033 U	0.0052	0.00036 U	0.00046 U	0.00034 U	0.0017	0.0014 [a]	0.0044
gamma-Chlordane	-	-	0.0061	0.0077 [a]	0.0131	0.00069 [a]	0.0236	0.0153	0.00048 U	0.0012	0.00051 U	0.00048 U	0.003	0.00051 U	0.00066 U	0.00048 U	0.0015	0.0011	0.0034
Dieldrin	-	0.005	0.0033 [a]	**0.0067**	0.0036	**0.0111**	**0.0222**	**0.0162**	0.00050 U	0.0018	0.00053 U	0.00068	0.0053	0.00053 U	0.00068 U	0.00049 U	0.0025	0.0011	0.0038 [a]
4,4'-DDD	-	0.0033	0.0027 [a]	**0.0040** [a]	0.00025 U	0.00024 U	**0.0384**	**0.0172**	0.00023 U	0.00025 U	0.00025 U	0.00023 U	0.00025 U	0.00025 U	0.00032 U	0.00023 U	0.00026 U	0.00026 U	0.0043 [a]
4,4'-DDE	-	0.0033	**0.0054**	**0.0146**	**0.0061**	0.00021 U	**0.0218**	**0.0418**	0.00021 U	0.00075 [a]	0.00022 U	0.00021 U	0.0023	0.00022 U	0.00029 U	0.00021 U	0.0011 [a]	0.0061	0.0133
4,4'-DDT	-	0.0033	**0.0244**	**0.0621**	**0.0093**	0.0016	**0.0213**	**0.0252**	0.00024 U	0.0014	0.00026 U	0.00024 U	0.0095	0.00026 U	0.00033 U	0.00024 U	0.0047	0.00095	0.0588
Endrin	-	0.014	0.00079 [a]	0.00029 U	0.00024 U	0.00023 U	0.0012 [a]	0.00024 U	0.00022 U	0.00024 U	0.00024 U	0.00022 U	0.00024 U	0.00024 U	0.00031 U	0.00022 U	0.00025 U	0.00025 U	0.0106 [a]
Endosulfan sulfate	-	2.4	0.00037 U	0.00046 U	0.00039 U	0.00036 U	0.00037 U	0.00039 U	0.00036 U	0.00038 U	0.00038 U	0.00036 U	0.00039 U	0.00038 U	0.00049 U	0.00036 U	0.00040 U	0.00040 U	0.00040 U
Endrin aldehyde	-	-	0.00049 U	0.00060 U	0.00051 U	0.00048 U	0.00049 U	0.00050 U	0.00047 U	0.00050 U	0.00050 U	0.00047 U	0.00050 U	0.00050 U	0.00064 U	0.00047 U	0.00053 U	0.00053 U	0.00053 U
Endosulfan-I	-	2.4	0.00022 U	0.00027 U	0.00023 U	0.00021 U	0.00022 U	0.00022 U	0.00021 U	0.00022 U	0.00022 U	0.00021 U	0.00022 U	0.00022 U	0.00029 U	0.00021 U	0.00023 U	0.00023 U	0.00023 U
Endosulfan-II	-	2.4	0.00062 U	0.00077 U	0.00065 U	0.00061 U	0.00062 U	0.00064 U	0.00060 U	0.00064 U	0.00064 U	0.00059 U	0.00064 U	0.00063 U	0.00082 U	0.00060 U	0.00067 U	0.00067 U	0.00067 U
Heptachlor	-	0.042	0.00054 U	0.00067 U	0.00056 U	0.00053 U	0.00054 U	0.00056 U	0.00052 U	0.00055 U	0.00055 U	0.00051 U	0.00056 U	0.00055 U	0.00071 U	0.00052 U	0.00058 U	0.00058 U	0.00058 U
Heptachlor epoxide	-	-	0.00027 U	0.00034 U	0.00028 U	0.00026 U	0.00027 U	0.00028 U	0.00026 U	0.00028 U	0.00028 U	0.00026 U	0.00028 U	0.00028 U	0.00036 U	0.00026 U	0.00029 U	0.00029 U	0.00029 U
Methoxychlor	-	-	0.00037 U	0.0261 [a]	0.00038 U	0.00036 U	0.00037 U	0.0103 [a]	0.00035 U	0.00037 U	0.00037 U	0.00035 U	0.00038 U	0.00037 U	0.00048 U	0.00035 U	0.00039 U	0.00039 U	0.00040 U
Endrin ketone	-	-	0.00035 U	0.00043 U	0.00036 U	0.00034 U	0.00035 U	0.00036 U	0.00033 U	0.00035 U	0.00035 U	0.00033 U	0.00036 U	0.00035 U	0.00046 U	0.00033 U	0.00037 U	0.00037 U	0.00037 U
Toxaphene	-	-	0.011 U	0.014 U	0.012 U	0.011 U	0.011 U	0.012 U	0.011 U	0.012 U	0.012 U	0.011 U	0.012 U	0.012 U	0.015 U	0.011 U	0.012 U	0.012 U	0.012 U
PCBs																			
Aroclor 1016	-	100	0.011 U	0.013 U	0.011 U	0.011 U	0.011 U	0.010 U	0.010 U	0.011 U	0.011 U	0.011 U	0.011 U	0.010 U	0.014 U	0.010 U	0.011 U	0.011 U	0.012 U
Aroclor 1221	-	100	0.020 U	0.024 U	0.020 U	0.020 U	0.021 U	0.019 U	0.019 U	0.020 U	0.020 U	0.020 U	0.020 U	0.019 U	0.026 U	0.019 U	0.021 U	0.020 U	0.022 U
Aroclor 1232	-	100	0.011 U	0.013 U	0.011 U	0.011 U	0.012 U	0.011 U	0.010 U	0.011 U	0.011 U	0.011 U	0.011 U	0.010 U	0.014 U	0.011 U	0.012 U	0.011 U	0.012 U
Aroclor 1242	-	100	0.016 U	0.018 U	0.015 U	0.015 U	0.016 U	0.015 U	0.014 U	0.016 U	0.015 U	0.015 U	0.015 U	0.014 U	0.020 U	0.014 U	0.016 U	0.016 U	0.017 U
Aroclor 1248	-	100	0.011 U	0.012 U	0.010 U	0.010 U	0.011 U	0.0099 U	0.0097 U	0.011 U	0.010 U	0.010 U	0.010 U	0.0097 U	0.013 U	0.0097 U	0.011 U	0.011 U	0.011 U
Aroclor 1254	-	100	0.015 U	0.018 U	0.015 U	0.015 U	0.016 U	0.014 U	0.014 U	0.015 U	0.015 U	0.015 U	0.015 U	0.014 U	0.019 U	0.014 U	0.016 U	0.015 U	0.016 U
Aroclor 1260	-	100	0.015 U	0.017 U	0.014 U	0.014 U	0.015 U	0.014 U	0.013 U	0.015 U	0.014 U	0.014 U	0.014 U	0.013 U	0.018 U	0.013 U	0.015 U	0.015 U	0.015 U
Aroclor 1268	-	100	0.011 U	0.013 U	0.011 U	0.010 U	0.011 U	0.010 U	0.0098 U	0.011 U	0.010 U	0.010 U	0.010 U	0.0098 U	0.013 U	0.0098 U	0.011 U	0.011 U	0.011 U
Aroclor 1262	-	100	0.0098 U	0.011 U	0.0097 U	0.0094 U	0.010 U	0.0091 U	0.0089 U	0.0097 U	0.0094 U	0.0094 U	0.0096 U	0.0090 U	0.012 U	0.0090 U	0.010 U	0.0098 U	0.010 U

Exceedances of UUSCO are **bolded**
a - More than 40 % RPD for detected concentrations between the two GC columns.
U = The compound was not detected at the indicated concentration.
J = The result is less than the quantitation limit but greater so result is an approximate value.
B = The analyte was found in the laboratory blank as well as the sample
- = No standard

Table 7 - Volatile Organic Compounds in Groundwater
Harlem Park - 1800 Park Avenue, New York, NY

Sample ID: Sampling Date Matrix: Units:	NY TOGS Class GA GW Standards ug/L	HHMW-1 06/17/04 WATER ug/L	HHMW-2 06/17/04 WATER ug/L	HHMW-3 06/17/04 WATER ug/L	HHTB 06/16/04 WATER ug/L	MW-1 5/13/11 WATER ug/L	MW-2 5/13/11 WATER ug/L	MW-3 5/13/11 WATER ug/L	MW-5 5/13/11 WATER ug/L	MW-6 5/13/11 WATER ug/L
Acetone	50.0	3.3 U	3.3 U	3.3 U	3.3 U	ND (4.4)	ND (4.4)	ND (4.4)	ND (4.4)	ND (4.4)
Benzene	1.0	0.24 U	0.24 U	0.24 U	0.24 U	ND (0.26)	ND (0.26)	ND (0.26)	ND (0.26)	ND (0.26)
Bromochloromethane	5.0	NR	NR	NR	NR	ND (0.79)	ND (0.79)	ND (0.79)	ND (0.79)	ND (0.79)
Bromodichloromethane	50.0	0.35 U	0.35 U	0.35 U	0.35 U	ND (0.18)	ND (0.18)	ND (0.18)	ND (0.18)	ND (0.18)
Bromoform	50.0	0.25 U	0.25 U	0.25 U	0.25 U	ND (0.42)	ND (0.42)	ND (0.42)	ND (0.42)	ND (0.42)
Bromomethane	5.0	0.25 U	0.25 U	0.25 U	0.25 U	ND (0.24)	ND (0.24)	ND (0.24)	ND (0.24)	ND (0.24)
2-Butanone (MEK)	50.0	2.8 U	2.8 U	2.8 U	2.8 U	ND (1.7)	ND (1.7)	ND (1.7)	ND (1.7)	ND (1.7)
Carbon disulfide	NS	0.39 U	0.39 U	0.39 U	0.39 U	ND (0.13)	ND (0.13)	ND (0.13)	ND (0.13)	ND (0.13)
Carbon tetrachloride	5.0	0.47 U	0.47 U	0.47 U	0.47 U	ND (0.35)	ND (0.35)	ND (0.35)	ND (0.35)	ND (0.35)
Chlorobenzene	5.0	0.37 U	0.37 U	0.37 U	0.37 U	ND (0.15)	ND (0.15)	ND (0.15)	ND (0.15)	ND (0.15)
Chloroethane	5.0	0.88 U	0.88 U	0.88 U	0.88 U	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)
Chloroform	7.0	0.58 U	0.58 U	6	0.58 U	ND (0.14)	ND (0.14)	ND (0.14)	1.7	0.91 J
Chloromethane	NS	0.68 U	0.68 U	0.68 U	0.68 U	ND (0.34)	ND (0.34)	ND (0.34)	ND (0.34)	ND (0.34)
Cyclohexane	NS	0.37 U	0.37 U	0.37 U	0.37 U	ND (0.43)	ND (0.43)	ND (0.43)	ND (0.43)	ND (0.43)
1,2-Dibromo-3-chloropropane	0.04	0.94 U	0.94 U	0.94 U	0.94 U	ND (1.2)	ND (1.2)	ND (1.2)	ND (1.2)	ND (1.2)
Dibromochloromethane	50.0	0.38 U	0.38 U	0.38 U	0.38 U	ND (0.16)	ND (0.16)	ND (0.16)	ND (0.16)	ND (0.16)
1,2-Dibromoethane	NS	0.63 U	0.63 U	0.63 U	0.63 U	ND (0.39)	ND (0.39)	ND (0.39)	ND (0.39)	ND (0.39)
1,2-Dichlorobenzene	3.0	0.37 U	0.37 U	0.37 U	0.37 U	ND (0.15)	ND (0.15)	ND (0.15)	ND (0.15)	ND (0.15)
1,3-Dichlorobenzene	3.0	0.37 U	0.37 U	0.37 U	0.37 U	ND (0.19)	ND (0.19)	ND (0.19)	ND (0.19)	ND (0.19)
1,4-Dichlorobenzene	3.0	0.39 U	0.39 U	0.39 U	0.39 U	ND (0.22)	ND (0.22)	ND (0.22)	ND (0.22)	ND (0.22)
Dichlorodifluoromethane	5.0	0.33 U	0.33 U	0.33 U	0.33 U	ND (0.39)	ND (0.39)	ND (0.39)	ND (0.39)	ND (0.39)
1,1-Dichloroethane	5.0	0.22 U	0.22 U	0.22 U	0.22 U	ND (0.16)	ND (0.16)	ND (0.16)	ND (0.16)	ND (0.16)
1,2-Dichloroethane	0.6	0.32 U	0.32 U	0.32 U	0.32 U	ND (0.31)	ND (0.31)	ND (0.31)	ND (0.31)	ND (0.31)
1,1-Dichloroethene	5.0	0.32 U	0.32 U	0.32 U	0.32 U	ND (0.24)	ND (0.24)	ND (0.24)	ND (0.24)	ND (0.24)
cis-1,2-Dichloroethene	5.0	0.77 U	0.77 U	0.77 U	0.77 U	ND (0.24)	ND (0.24)	ND (0.24)	ND (0.24)	ND (0.24)
trans-1,2-Dichloroethene	5.0	0.51 U	0.51 U	0.51 U	0.51 U	ND (0.30)	ND (0.30)	ND (0.30)	ND (0.30)	ND (0.30)
1,2-Dichloropropane	1.0	0.63 U	0.63 U	0.63 U	0.63 U	ND (0.23)	ND (0.23)	ND (0.23)	ND (0.23)	ND (0.23)
cis-1,3-Dichloropropene	NS	0.15 U	0.15 U	0.15 U	0.15 U	ND (0.16)	ND (0.16)	ND (0.16)	ND (0.16)	ND (0.16)
trans-1,3-Dichloropropene	NS	0.42 U	0.42 U	0.42 U	0.42 U	ND (0.22)	ND (0.22)	ND (0.22)	ND (0.22)	ND (0.22)
1,4-Dioxane	NS	NR	NR	NR	NR	ND (39)	ND (39)	ND (39)	ND (39)	ND (39)
Ethylbenzene	5.0	0.41 U	0.41 U	0.41 U	0.41 U	ND (0.31)	ND (0.31)	ND (0.31)	ND (0.31)	ND (0.31)
Freon 113	NS	NR	NR	NR	NR	ND (0.66)	ND (0.66)	ND (0.66)	ND (0.66)	ND (0.66)
2-Hexanone	50.0	0.66 U	0.66 U	0.66 U	0.66 U	ND (1.9)	ND (1.9)	ND (1.9)	ND (1.9)	ND (1.9)
Isopropylbenzene	5.0	0.33 U	0.33 U	0.33 U	0.33 U	ND (0.31)	ND (0.31)	ND (0.31)	1.1 J	0.87 J
Methyl Acetate	NS	0.83 U	0.83 U	0.83 U	0.83 U	ND (1.3)	ND (1.3)	ND (1.3)	ND (1.3)	ND (1.3)
Methylcyclohexane	NS	0.58 U	0.58 U	0.58 U	0.58 U	ND (0.16)	ND (0.16)	ND (0.16)	0.50 J	1.2 J
Methyl Tert Butyl Ether	10.0	0.36 U	0.36 U	0.36 U	0.36 U	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)
4-Methyl-2-pentanone(MIBK)	NS	1.3 U	1.3 U	1.3 U	1.3 U	ND (0.74)	ND (0.74)	ND (0.74)	ND (0.74)	ND (0.74)
Methylene chloride	5.0	0.62 U	0.62 U	0.62 U	0.62 U	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)
Styrene	5.0	0.34 U	0.34 U	0.34 U	0.34 U	ND (0.48)	ND (0.48)	ND (0.48)	ND (0.48)	ND (0.48)
1,1,2,2-Tetrachloroethane	5.0	0.5 U	0.5 U	0.5 U	0.5 U	ND (0.12)	ND (0.12)	ND (0.12)	ND (0.12)	ND (0.12)
Tetrachloroethene	5.0	0.33 U	0.33 U	0.33 U	0.33 U	0.45 J	ND (0.24)	ND (0.24)	ND (0.24)	ND (0.24)
Toluene	5.0	0.39 U	0.39 U	0.39 U	0.39 U	ND (0.27)	ND (0.27)	ND (0.27)	ND (0.27)	ND (0.27)
1,2,3-Trichlorobenzene	NS	NR	NR	NR	NR	ND (0.29)	ND (0.29)	ND (0.29)	ND (0.29)	ND (0.29)
1,2,4-Trichlorobenzene	NS	0.29 U	0.29 U	0.29 U	0.29 U	ND (0.16)	ND (0.16)	ND (0.16)	ND (0.16)	ND (0.16)
1,1,1-Trichloroethane	5.0	0.41 U	0.41 U	0.41 U	0.41 U	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)
1,1,2-Trichloroethane	1.0	0.52 U	0.52 U	0.52 U	0.52 U	ND (0.13)	ND (0.13)	ND (0.13)	ND (0.13)	ND (0.13)
Trichloroethene	5.0	0.67 U	0.67 U	0.67 U	0.67 U	ND (0.22)	ND (0.22)	ND (0.22)	ND (0.22)	ND (0.22)
Trichlorofluoromethane	5.0	0.58 U	0.58 U	0.58 U	0.58 U	ND (0.23)	ND (0.23)	ND (0.23)	ND (0.23)	ND (0.23)
Vinyl chloride	2.0	0.27 U	0.27 U	0.27 U	0.27 U	ND (0.22)	ND (0.22)	ND (0.22)	ND (0.22)	ND (0.22)
m,p-Xylene	NS	0.96 U	0.96 U	0.96 U	0.96 U	ND (0.39)	ND (0.39)	ND (0.39)	ND (0.39)	ND (0.39)
o-Xylene	NS	0.37 U	0.37 U	0.37 U	0.37 U	ND (0.28)	ND (0.28)	ND (0.28)	ND (0.28)	ND (0.28)
Xylene (total)	5.0	NR	NR	NR	NR	ND (0.28)	ND (0.28)	ND (0.28)	ND (0.28)	ND (0.28)

U or ND = The compound was not detected at the indicated concentration.

J = Data indicates the presence of a compound that meets the identification criteria. The concentration given is an approximate value.

B = The analyte was found in the laboratory blank as well as the sample.

NR = Not analyzed

NS = No standard

Table 8 - Semi Volatile Organic Compounds in Groundwater
Harlem Park - 1800 Park Avenue, New York, NY

Sample ID Sampling Date Matrix Units	NY TOGS Class GA GW Standards ug/L	HHMW-1 06/17/04 WATER ug/L	HHMW-2 06/17/04 WATER ug/L	HHMW-3 06/17/04 WATER ug/L	MW-1 5/13/2011 Water ug/l	MW-2 5/13/2011 Water ug/l	MW-3 5/13/2011 Water ug/l	MW-5 5/13/2011 Water ug/l	MW-6 5/13/2011 Water ug/l
1,1-Biphenyl	5	0.27 U	0.27 U	0.27 U	ND (0.42)	ND (0.42)	ND (0.42)	ND (0.42)	ND (0.42)
1,2,4,5-Tetrachlorobenzene	5	NR	NR	NR	ND (0.48)	ND (0.48)	ND (0.48)	ND (0.48)	ND (0.48)
2,3,4,6-Tetrachlorophenol	NS	NR	NR	NR	ND (0.81)	ND (0.81)	ND (0.81)	ND (0.81)	ND (0.81)
2,4,5-Trichlorophenol	1	0.59 U	0.59 U	0.58 U	ND (1.3)	ND (1.3)	ND (1.3)	ND (1.3)	ND (1.3)
2,4,6-Trichlorophenol	NS	0.29 U	0.29 U	0.28 U	ND (1.2)	ND (1.2)	ND (1.2)	ND (1.2)	ND (1.2)
2,4-Dichlorophenol	1	0.29 U	0.29 U	0.29 U	ND (1.2)	ND (1.2)	ND (1.2)	ND (1.2)	ND (1.2)
2,4-Dimethylphenol	NS	0.47 U	0.47 U	0.46 U	ND (1.7)	ND (1.7)	ND (1.7)	ND (1.7)	ND (1.7)
2,4-Dinitrophenol	5	0.19 U	0.19 U	0.19 U	ND (0.74)	ND (0.74)	ND (0.74)	ND (0.74)	ND (0.74)
2,4-Dinitrotoluene	NS	0.34 U	0.34 U	0.34 U	ND (0.22)	ND (0.22)	ND (0.22)	ND (0.22)	ND (0.22)
2,6-Dinitrotoluene	5	0.42 U	0.42 U	0.41 U	ND (0.33)	ND (0.33)	ND (0.33)	ND (0.33)	ND (0.33)
2-Chloronaphthalene	NS	0.39 U	0.39 U	0.39 U	ND (0.42)	ND (0.42)	ND (0.42)	ND (0.42)	ND (0.42)
2-Chlorophenol	50	0.73 U	0.73 U	0.73 U	ND (1.1)	ND (1.1)	ND (1.1)	ND (1.1)	ND (1.1)
2-Methylnaphthalene	50	13	2.3 J	0.5 U	ND (0.66)	ND (0.66)	ND (0.66)	ND (0.66)	ND (0.66)
2-Methylphenol	5	1.1 U	1.1 U	1.1 U	ND (1.1)	ND (1.1)	ND (1.1)	ND (1.1)	ND (1.1)
2-Nitroaniline	5	0.3 U	0.3 U	0.3 U	ND (0.24)	ND (0.24)	ND (0.24)	ND (0.24)	ND (0.24)
2-Nitrophenol	5	0.27 U	0.27 U	0.27 U	ND (1.2)	ND (1.2)	ND (1.2)	ND (1.2)	ND (1.2)
3,3-Dichlorobenzidine	NS	1.6 U	1.6 U	1.6 U	ND (0.30)	ND (0.30)	ND (0.30)	ND (0.30)	ND (0.30)
3+4-Methylphenols	NS	1.1 U	1.1 U	1.1 U	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
3-Nitroaniline	5	1.1 U	1.1 U	1 U	ND (0.29)	ND (0.29)	ND (0.29)	ND (0.29)	ND (0.29)
4,6-Dinitro-2-methylphenol	NS	1.5 U	1.5 U	1.4 U	ND (0.51)	ND (0.51)	ND (0.51)	ND (0.51)	ND (0.51)
4-Bromophenyl-phenylether	NS	0.17 U	0.17 U	0.17 U	ND (0.35)	ND (0.35)	ND (0.35)	ND (0.35)	ND (0.35)
4-Chloro-3-methylphenol	5	0.3 U	0.3 U	0.3 U	ND (1.1)	ND (1.1)	ND (1.1)	ND (1.1)	ND (1.1)
4-Chloroaniline	5	4.1 U	4.1 U	4.1 U	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)
4-Chlorophenyl-phenylether	NS	0.37 U	0.37 U	0.36 U	ND (0.35)	ND (0.35)	ND (0.35)	ND (0.35)	ND (0.35)
4-Nitroaniline	NS	0.84 U	0.84 U	0.83 U	ND (0.18)	ND (0.18)	ND (0.18)	ND (0.18)	ND (0.18)
4-Nitrophenol	5	0.95 U	0.95 U	0.94 U	ND (0.83)	ND (0.83)	ND (0.83)	ND (0.83)	ND (0.83)
Acenaphthene	20	2.8 J	1.7 J	1.1 J	ND (0.37)	1.9	ND (0.37)	2.4	2.1
Acenaphthylene	20	0.44 U	0.44 U	0.43 U	ND (0.27)	ND (0.27)	ND (0.27)	ND (0.27)	ND (0.27)
Acetophenone	NS	0.56 U	0.56 U	0.55 U	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)
Anthracene	50	0.16 U	0.16 U	0.16 U	ND (0.16)	ND (0.16)	ND (0.16)	ND (0.16)	ND (0.16)
Atrazine	7.5	0.48 U	0.48 U	0.48 U	ND (0.39)	ND (0.39)	ND (0.39)	ND (0.39)	ND (0.39)
Benzaldehyde	NS	1.7 U	1.7 U	1.7 U	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)
Benzo(a)anthracene	0.002	0.23 U	0.23 U	0.22 U	ND (0.12)	ND (0.12)	ND (0.12)	ND (0.12)	ND (0.12)
Benzo(a)pyrene	0.002	0.45 U	0.45 U	0.45 U	ND (0.095)	ND (0.095)	ND (0.095)	ND (0.095)	ND (0.095)
Benzo(b)fluoranthene	0.002	0.23 U	0.23 U	0.23 U	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)
Benzo(g,h,i)perylene	5	0.43 U	0.43 U	0.42 U	ND (0.12)	ND (0.12)	ND (0.12)	ND (0.12)	ND (0.12)
Benzo(k)fluoranthene	0.002	0.39 U	0.39 U	0.38 U	ND (0.38)	ND (0.38)	ND (0.38)	ND (0.38)	ND (0.38)
bis(2-Chloroethoxy)methane	NS	0.45 U	0.45 U	0.44 U	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)
bis(2-Chloroethyl)ether	NS	0.33 U	0.33 U	0.33 U	ND (0.31)	ND (0.31)	ND (0.31)	ND (0.31)	ND (0.31)
bis(2-Chloroisopropyl) ether	NS	0.84 U	0.84 U	0.83 U	ND (0.39)	ND (0.39)	ND (0.39)	ND (0.39)	ND (0.39)
bis(2-Ethylhexyl)phthalate	50	3.4 J	4 J	3.7 J	ND (0.33)	ND (0.33)	ND (0.33)	ND (0.33)	ND (0.33)
Butylbenzylphthalate	50	0.3 U	0.3 U	0.3 U	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)
Caprolactam	NS	0.51 U	0.51 U	0.51 U	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)
Carbazole	NS	0.31 U	0.31 U	0.31 U	ND (0.17)	ND (0.17)	ND (0.17)	ND (0.17)	ND (0.17)
Chrysene	0.002	0.39 U	0.39 U	0.38 U	ND (0.11)	ND (0.11)	ND (0.11)	ND (0.11)	ND (0.11)
Dibenz(a,h)anthracene	50	0.29 U	0.29 U	0.29 U	ND (0.15)	ND (0.15)	ND (0.15)	ND (0.15)	ND (0.15)
Dibenzofuran	5	0.32 U	0.32 U	0.31 U	ND (0.30)	ND (0.30)	ND (0.30)	0.73 J	0.58 J
Diethylphthalate	50	0.34 U	0.34 U	0.34 U	ND (0.17)	ND (0.17)	ND (0.17)	ND (0.17)	ND (0.17)
Dimethylphthalate	50	0.26 U	0.26 U	0.26 U	ND (0.23)	ND (0.23)	ND (0.23)	ND (0.23)	ND (0.23)
Di-n-butylphthalate	50	0.099 U	0.099 U	0.098 U	ND (0.19)	ND (0.19)	ND (0.19)	ND (0.19)	ND (0.19)
Di-n-octyl phthalate	50	0.17 U	0.17 U	0.17 U	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)
Fluoranthene	50	0.21 U	0.21 U	0.21 U	ND (0.17)	ND (0.17)	ND (0.17)	ND (0.17)	ND (0.17)
Fluorene	50	0.17 U	0.17 U	0.17 U	ND (0.27)	0.40 J	ND (0.27)	1.7	1.2
Hexachlorobenzene	0.35	0.23 U	0.23 U	0.23 U	ND (0.27)	ND (0.27)	ND (0.27)	ND (0.27)	ND (0.27)
Hexachlorobutadiene	NS	0.38 U	0.38 U	0.38 U	ND (0.13)	ND (0.13)	ND (0.13)	ND (0.13)	ND (0.13)
Hexachlorocyclopentadiene	NS	0.46 U	0.46 U	0.45 U	ND (0.24)	ND (0.24)	ND (0.24)	ND (0.24)	ND (0.24)
Hexachloroethane	NS	0.92 U	0.92 U	0.91 U	ND (0.21)	ND (0.21)	ND (0.21)	ND (0.21)	ND (0.21)
Indeno(1,2,3-cd)pyrene	0.002	0.29 U	0.29 U	0.29 U	ND (0.13)	ND (0.13)	ND (0.13)	ND (0.13)	ND (0.13)
Isophorone	50	0.48 U	0.48 U	0.48 U	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)
Naphthalene	10	1.2 J	0.27 U	0.27 U	ND (0.43)	ND (0.43)	ND (0.43)	0.49 J	ND (0.43)
Nitrobenzene	5	0.38 U	0.38 U	0.38 U	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)
N-Nitroso-di-n-propylamine	NS	0.77 U	0.77 U	0.77 U	ND (0.44)	ND (0.44)	ND (0.44)	ND (0.44)	ND (0.44)
N-Nitrosodiphenylamine	NS	0.28 U	0.28 U	0.28 U	ND (0.22)	ND (0.22)	ND (0.22)	ND (0.22)	ND (0.22)
Pentachlorophenol	1	0.39 U	0.39 U	0.39 U	ND (0.80)	ND (0.80)	ND (0.80)	ND (0.80)	ND (0.80)
Phenanthrene	50	0.28 U	0.28 U	0.27 U	ND (0.21)	ND (0.21)	ND (0.21)	ND (0.21)	1.2
Phenol	1	0.43 U	0.43 U	0.43 U	ND (0.58)	ND (0.58)	ND (0.58)	ND (0.58)	ND (0.58)
Pyrene	50	0.25 U	0.25 U	0.25 U	ND (0.16)	ND (0.16)	ND (0.16)	ND (0.16)	ND (0.16)

U or ND = The compound was not detected at the indicated concentration.

J = Data indicates the presence of a compound that meets the identification criteria. The concentration given is an approximate value.

B = The analyte was found in the laboratory blank as well as the sample.

NR = Not analyzed

NS = No standard

Table 9 - Metals in Groundwater
Harlem Park - 1800 Park Avenue, New York, NY

Sample ID Sampling Date Matrix Units	NY TOGS Class GA GW Standards ug/L	HHMW-1 06/17/04 WATER Unfiltered ug/L	HHMW-2 06/17/04 WATER Unfiltered ug/L	HHMW-3 06/17/04 WATER Unfiltered ug/L	HHMW-1 06/17/04 WATER Lab Filtered ug/L	HHMW-2 06/17/04 WATER Lab Filtered ug/L	HHMW-3 06/17/04 WATER Lab Filtered ug/L	MW-1 5/13/2011 Water Unfiltered ug/l	MW-1 5/13/2011 Water Lab Filtered ug/l	MW-1 5/13/2011 Water Field Filtered ug/l	MW-2 5/13/2011 Water Unfiltered ug/l	MW-2 5/13/2011 Water Lab Filtered ug/l	MW-2 5/13/2011 Water Field Filtered ug/l	MW-3 5/13/2011 Water Unfiltered ug/l	MW-3 5/13/2011 Water Lab Filtered ug/l	MW-3 5/13/2011 Water Field Filtered ug/l	MW-5 5/13/2011 Water Unfiltered ug/l	MW-5 5/13/2011 Water Lab Filtered ug/l	MW-5 5/13/2011 Water Field Filtered ug/l	MW-6 5/13/2011 Water Unfiltered ug/l	MW-6 5/13/2011 Water Lab Filtered ug/l	MW-6 5/13/2011 Water Field Filtered ug/l
Aluminum	-	1980	6130	180 U	643	1360	180 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Antimony	3	6.6 U	6.6 U	6.6 U	6.6 U	6.6 U	6.6 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Arsenic	25	4.84 U	4.84 U	4.84 U	4.84 U	4.84 U	4.84 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Barium	1000	84.9 J	167 J	42.6 J	83.4 J	130 J	37.8 J	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Beryllium	-	1.06 U	1.06 J	1.06 U	1.06 U	1.06 U	1.06 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Cadmium	5	0.994 U	0.994 U	0.994 U	0.994 U	0.994 U	0.994 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Calcium	-	45100	47000	40000	49500	48100	37100	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Chromium	50	4.9 J	13.3	1.22 U	1.9 J	3.48 J	1.22 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Cobalt	-	2.46 J	5.67 J	2.38 U	2.38 U	3.62 J	2.38 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Copper	200	16 J	35.5	2.28 J	14.7 J	20.9 J	2.12 J	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Iron	300	3020	10100	1150	1010	3300	916	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Lead	25	17.5	95.2	6.54	17.4	73	3.46 J	<3.0	<3.0	<3.0	4.5	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	90.5	<3.0	<3.0
Magnesium	-	14200	15100	17200	15000	14300	15800	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Manganese	300	1530	1470	100	1650	1490	92	1270	1270	1380	312	336	309	185	259	198	504	496	475	1830	614	665
Mercury	0.7	0.04 J	0.61	0.03 U	0.03 U	0.04 J	0.03 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Nickel	100	6.28 J	12.4 J	5.55 U	5.55 U	6.08 J	5.55 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Potassium	-	5980	4840 J	5920	6030	4500 J	5360	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Selenium	10	5.24 U	5.24 U	5.24 U	5.24 U	5.24 U	5.24 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Silver	50	3.38 U	3.38 U	3.38 U	3.38 U	3.38 U	3.38 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Sodium	20000	28800	32700	41000	31600	32200	37200	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Thallium	-	5.78 U	5.78 U	5.78 U	5.78 U	5.78 U	5.78 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Vanadium	-	5.9 J	14.5 J	1.86 U	2.46 J	5.32 J	1.86 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Zinc	-	43.3	79.2	25.5	43.4	54.3	36.8	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR

U or ND = The compound was not detected at the indicated concentration.

J = Data indicates the presence of a compound that meets the identification criteria. The concentration given is an approximate value.

B = The analyte was found in the laboratory blank as well as the sample.

NR = Not analyzed

- = No standard

Yellow shading indicates exceedance of TOGS

Table 10 - Pesticides and PCBs in Groundwater
Harlem Park - 1800 Park Avenue, New York, NY

Sample ID Sampling Date Matrix Units	NY TOGS Class GA GW Standards ug/L	HHMW-1 06/17/04 WATER ug/L	HHMW-2 06/17/04 WATER ug/L	HHMW-3 06/17/04 WATER ug/L
PCBs				
Aroclor-1016	0.09	0.13 U	0.13 U	0.13 U
Aroclor-1221	0.09	0.05 U	0.05 U	0.05 U
Aroclor-1232	0.09	0.05 U	0.05 U	0.05 U
Aroclor-1242	0.09	0.14 U	0.14 U	0.14 U
Aroclor-1248	0.09	0.06 U	0.06 U	0.06 U
Aroclor-1254	0.09	0.03 U	0.03 U	0.03 U
Aroclor-1260	0.09	0.063 U	0.062 U	0.062 U
Pesticides and PCBs				
4,4-DDD	0.3	0.03 U	0.03 U	0.03 U
4,4-DDE	0.2	0.04 U	0.04 U	0.04 U
4,4-DDT	0.2	0.06 U	0.06 U	0.06 U
Aldrin	ND	0.03 U	0.03 U	0.03 U
alpha-BHC	0.01	0.02 U	0.02 U	0.02 U
alpha-Chlordane	-	0.04 U	0.04 U	0.04 U
beta-BHC	0.04	0.11 U	0.11 U	0.11 U
Chlordane		0.01 U	0.01 U	0.01 U
delta-BHC	0.04	0.02 U	0.02 U	0.02 U
Dieldrin	0.004	0.04 U	0.04 U	0.04 U
Endosulfan I	-	0.04 U	0.04 U	0.04 U
Endosulfan II	-	0.02 U	0.02 U	0.02 U
Endosulfan Sulfate	-	0.04 U	0.04 U	0.04 U
Endrin	ND	0.05 U	0.05 U	0.05 U
Endrin aldehyde	5	0.04 U	0.04 U	0.04 U
Endrin ketone	5	0.03 U	0.03 U	0.03 U
gamma-BHC	0.05	0.03 U	0.03 U	0.03 U
gamma-Chlordane	-	0.04 U	0.04 U	0.04 U
Heptachlor	0.04	0.04 U	0.04 U	0.04 U
Heptachlor epoxide	0.03	0.03 U	0.03 U	0.03 U
Methoxychlor	35	0.04 U	0.04 U	0.04 U
Toxaphene	0.06	0.11 U	0.11 U	0.11 U

U = The compound was not detected at the indicated concentration.

J = Data indicates the presence of a compound that meets the identification criteria. The concentration given is an approximate value.

B = The analyte was found in the laboratory blank as well as the sample.

NR = Not analyzed

- = No standard

APPENDIX A

List of Site Contacts

APPENDIX A – LIST OF SITE CONTACTS

AGENCY OR CONTACT	PHONE NUMBER
Medical, Fire, and Police	911
One Call Center	(800) 272-4480 (3 day notice required for utility markout)
Poison Control Center	(800) 222-1222
National Response Center Pollution Toxic Chemical Oil Spills	(800) 424-8802
New York State Department of Environmental Conservation (NYSDEC) Spills Hotline	(800) 457-7362
Applicant and Property Owner: Harlem Park Acquisition LLC, Ian Bruce Eichner	(212) 554-3700
Primary Remedial Consultant: Fleming-Lee Shue, Inc., Arnold Fleming	(212) 675-3225
NYSDEC Case Manager: Shaun Bollers	(718) 482-4096
NYSDEC Chief – Superfund and Brownfield Cleanup Section Region 2: Jane O'Connell	(718) 482-4599
NYSDEC Site Control: Kelly Lewandowski	(518) 402-9553
* Note: Contact numbers subject to change and should be updated as necessary.	

APPENDIX B

Excavation Work Plan

APPENDIX B – EXCAVATION WORK PLAN (EWP)

B-1 NOTIFICATION

At least 15 days prior to the start of any activity that is anticipated to encounter remaining contamination, the site owner or their representative will notify the NYSDEC. Table A includes contact information for the above notification. The information on this table will be updated as necessary to provide accurate contact information. A full listing of site-related contact information is provided in Appendix A of the SMP.

Table A: Notifications*

Name	Contact Information
NYSDEC Project Manager Shaun Bollers	(718) 482-4096 shaun.bollers@dec.ny.gov
NYSDEC Chief – Superfund and Brownfield Cleanup Section Region 2 Jane O'Connell	(718) 482-4599 Jane.oconnell@dec.ny.gov
NYSDEC Site Control Kelly Lewandowski	(518) 402-9553 kelly.lewandowski@dec.ny.gov

* Note: Notifications are subject to change and will be updated as necessary.

This notification will include:

- A detailed description of the work to be performed, including the location and areal extent of excavation, plans/drawings for site re-grading, intrusive elements or utilities to be installed below the soil cover, estimated volumes of contaminated soil to be excavated and any work that may impact an engineering control;

- A summary of environmental conditions anticipated to be encountered in the work areas, including the nature and concentration levels of contaminants of concern, potential presence of grossly contaminated media, and plans for any pre-construction sampling;

- A schedule for the work, detailing the start and completion of all intrusive work;
- A summary of the applicable components of this EWP;
- A statement that the work will be performed in compliance with this EWP and 29 CFR 1910.120;
- A copy of the contractor's health and safety plan (HASP), in electronic format, if it differs from the HASP provided in Appendix E of this SMP;
- Identification of disposal facilities for potential waste streams; and
- Identification of sources of any anticipated backfill, along with all required chemical testing results.

B-2 SOIL SCREENING METHODS

Visual, olfactory and instrument-based (e.g. photoionization detector) soil screening will be performed by a qualified environmental professional during all excavations into known or potentially contaminated material (remaining contamination). Soil screening will be performed when invasive work is done and will include all excavation and invasive work performed during development, such as excavations for foundations and utility work, after issuance of the COC.

Soils will be segregated based on previous environmental data and screening results into material that requires off-site disposal and material that requires testing to determine if the material can be reused on-site as soil beneath a cover or if the material can be used as cover soil. Further discussion of off-site disposal of materials and on-site reuse is provided in Section B-4 of this Appendix.

B-3 SOIL STAGING METHODS

Soil stockpiles will be continuously encircled with a berm and/or silt fence. Hay bales will be used as needed near catch basins, surface waters and other discharge points.

Stockpiles will be kept covered at all times with appropriately anchored tarps. Stockpiles will be routinely inspected and damaged tarp covers will be promptly replaced.

Stockpiles will be inspected at a minimum once each week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the site and available for inspection by the NYSDEC.

B-4 MATERIALS EXCAVATION AND LOAD-OUT

A qualified environmental professional or person under their supervision will oversee all invasive work and the excavation and load-out of all excavated material.

The owner of the property and remedial party (if applicable) and its contractors are responsible for safe execution of all invasive and other work performed under this Plan.

The presence of utilities and easements on the site will be investigated by the qualified environmental professional. It will be determined whether a risk or impediment to the planned work under this SMP is posed by utilities or easements on the site.

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

A truck wash will be operated on-site, as appropriate. The qualified environmental professional will be responsible for ensuring that all outbound trucks will be washed at the truck wash before leaving the site until the activities performed under this section are complete Truck wash waters will be collected and disposed of off-site in an appropriate manner.

Locations where vehicles enter or exit the site shall be inspected daily for evidence of off-site soil tracking.

The qualified environmental professional will be responsible for ensuring that all egress points for truck and equipment transport from the site are clean of dirt and other materials derived from the site during intrusive excavation activities. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to site-derived materials.

B-5 MATERIALS TRANSPORT OFF-SITE

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

Material transported by trucks exiting the site will be secured with tight-fitting covers. Loose-fitting canvas-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used.

Waste facilities for potential future disposal of on-site soils have not been identified at this time and truck routes cannot be determined. When facilities are selected, the truck transport routes will take into account: (a) limiting transport through residential areas and past sensitive sites; (b) use of city mapped truck routes; (c) prohibiting off-site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport; (g) community input (where necessary).

Trucks will be prohibited from stopping and idling in the neighborhood outside the project site.

Egress points for truck and equipment transport from the site will be kept clean of dirt and other materials during site remediation and development.

Queuing of trucks will be performed on-site in order to minimize off-site disturbance. Off-site queuing will be prohibited.

B-6 MATERIALS DISPOSAL OFF-SITE

All material excavated and removed from the site will be treated as contaminated and regulated material and will be transported and disposed in accordance with all local, State (including 6NYCRR Part 360) and Federal regulations. If disposal of material from this site is proposed for unregulated off-site disposal (i.e. clean soil removed for development purposes), a formal request with an associated plan will be made to the NYSDEC. Unregulated off-site management of materials from this site will not occur without formal NYSDEC approval.

Off-site disposal locations for excavated soils will be identified in the pre-excavation notification. This will include estimated quantities and a breakdown by class of disposal facility if appropriate, i.e. hazardous waste disposal facility, solid waste landfill, petroleum treatment facility, C/D recycling facility, etc. Actual disposal quantities and associated documentation will be reported to the NYSDEC in the Periodic Review Report. This documentation will include: waste profiles, test results, facility acceptance letters, manifests, bills of lading and facility receipts.

Non-hazardous historic fill and contaminated soils taken off-site will be handled, at minimum, as a Municipal Solid Waste per 6NYCRR Part 360-1.2. Material that does not meet Unrestricted SCOs is prohibited from being taken to a New York State recycling facility (6NYCRR Part 360-16 Registration Facility).

B-7 MATERIALS REUSE ON-SITE

The qualified environmental professional will ensure that procedures defined for materials reuse in this SMP are followed and that unacceptable material does not remain on-site. Contaminated on-site material, including historic fill and contaminated soil, that is acceptable for reuse on-site will be placed below the demarcation layer or impervious surface, and will not be reused within a cover soil layer, within landscaping berms, or as backfill for subsurface utility lines.

If soil reuse is desired, then the soil in question will be stockpiled and sampled according to the imported backfill requirements. Soils will be required to meet the restricted residential SCOs for the site before being acceptable for reuse.

Any demolition material proposed for reuse on-site will be sampled for asbestos and the results will be reported to the NYSDEC for acceptance. Concrete crushing or processing on-site will not be performed without prior NYSDEC approval. Organic matter (wood, roots, stumps, etc.) or other solid waste derived from clearing and grubbing of the site will not be reused on-site.

B-8 FLUIDS MANAGEMENT

All liquids to be removed from the site, including but not limited to, excavation dewatering, decontamination waters and groundwater monitoring well purge and development waters, will be handled, transported and disposed in accordance with applicable local, State, and Federal regulations. Dewatering, purge and development fluids will not be recharged back to the land surface or subsurface of the site, and will be managed off-site, unless prior approval is obtained from NYSDEC.

Discharge of water generated during large-scale construction activities to surface waters (i.e. a local pond, stream or river) will be performed under a SPDES permit.

B-9 COVER SYSTEM RESTORATION

After the completion of soil removal and any other invasive activities the cover system will be restored in a manner that complies with the RAWP and/or decision document. The existing temporary cover system is comprised of a minimum of 24 inches of Recycled Concrete Aggregate (RCA). The demarcation layer, consisting of geotextile filter fabric will be replaced to provide a visual reference to the top of the remaining contamination zone, the zone that requires adherence to special conditions for disturbance of remaining contaminated soils defined in this SMP. If the type of cover system changes from that which exists prior to the excavation (i.e., a soil cover is replaced by asphalt), this will constitute a modification of the cover element of the remedy and the upper surface of the remaining contamination. A figure showing the modified surface will be included in the subsequent Periodic Review Report and in an updated SMP.

B-10 BACKFILL FROM OFF-SITE SOURCES

All materials proposed for import onto the site will be approved by the qualified environmental professional and will be in compliance with provisions in this SMP prior to receipt at the site. A Request to Import/Reuse Fill or Soil form, which can be found at http://www.dec.ny.gov/regulations/67386.html, will be prepared and submitted to the NYSDEC project manager allowing a minimum of 5 business days for review.

Import of materials to be used for backfill and cover will be in compliance with (1) chemical limits and other specifications and (2) all Federal, State and local rules and regulations for handling and transport of material. Off-site material brought in as backfill must be certified that it is free of contamination as virgin source material with written documentation from the supplier certifying that the soil is from a source not known to have been contaminated or have received hazardous materials, petroleum or other hydrocarbon-derived, toxic, or radioactive materials. If the material is not virgin, then the material will be tested at the frequency outlined in DER-10 table 5.4(e)10 for full scan TAL and TCL analyses plus pesticides/PCBs from each source area. The tested material

will be considered acceptable for import to the Site if it meets the lower of the protection of groundwater SCO or the protection of public health for restricted residential use SCO.

All imported soils will meet the backfill and cover soil quality standards established in 6NYCRR 375-6.7(d). Based on an evaluation of the land use, protection of groundwater and protection of ecological resources criteria, the resulting soil quality standards are listed in Table 1 of this SMP. Soils that meet 'exempt' fill requirements under 6 NYCRR Part 360, but do not meet backfill or cover soil objectives for this site, will not be imported onto the site without prior approval by NYSDEC. Solid waste will not be imported onto the site. Material from industrial sites, spill sites, or other environmental remediation sites or potentially contaminated sites will not be imported to the site. Commercial products such as recycled concrete aggregate from a NYS registered facility approved by the Department may also be imported to the site without testing in accordance with DER-10 5.4(e)5

If more than 1,000 yd^3 are imported from a given off-site non-virgin source, and each of the initial samples for the first 1,000 yd^3 meet the stated reuse criteria, then the sample frequency will reduce to two grab VOC and one composite sample/2,500 yd^3 for additional soil from the same source up to 5,000 yd^3. For volumes greater than 5,000 yd^3, the sampling frequency will be reduced to two grab VOC and one composite sample/5,000 yd^3, provided that all previous samples met the established limits.

Fill material will be placed in designated excavated areas when able. Stockpiles of additional fill material will be placed upon, and covered with, plastic sheeting at the end of each day. Trucks entering the site with imported soils will be securely covered with tight fitting covers. Imported soils will be stockpiled separately from excavated materials and covered to prevent dust releases.

B-11 STORMWATER POLLUTION PREVENTION

The site is currently excavated to 13 feet below grade and therefore there is minimal potential for stormwater pollution. The contractor shall prepare and maintain a

Stormwater Pollution Prevention Plan (SWPPP) for the site in accordance with the evolving work areas, topography and drainage patterns if necessary. The SWPPP will be submitted to NYSDEC for review prior to initiating any future development work on the site; and will be appended to, and enforceable under, this SMP.

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

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

B-12 EXCAVATION CONTINGENCY PLAN

If underground tanks or other previously unidentified contaminant sources are found during post-remedial subsurface excavations or development related construction, excavation activities will be suspended until sufficient equipment is mobilized to address the condition.

Sampling will be performed on product, sediment and surrounding soils, etc. as necessary to determine the nature of the material and proper disposal method. Chemical analysis will be performed for a full list of analytes (TAL metals; TCL volatiles and semi-volatiles, TCL pesticides and PCBs), unless the site history and previous sampling results provide a sufficient justification to limit the list of analytes. In this case, a reduced list of analytes will be proposed to the NYSDEC for approval prior to sampling.

Identification of unknown or unexpected contaminated media identified by screening during invasive site work will be promptly communicated by phone to NYSDEC’s Project Manager. Reportable quantities of petroleum product will also be

reported to the NYSDEC spills hotline. These findings will be also included in the Periodic Review Report.

B-13 COMMUNITY AIR MONITORING PLAN

A Community Air Monitoring Plan (CAMP) has been developed as part of this SMP and is included in Appendix F of the SMP. The CAMP will be implemented whenever soil disturbance activities occur. As per the CAMP, exceedances of action levels listed in the CAMP will be reported to NYSDEC and NYSDOH Project Managers.

B-14 ODOR CONTROL PLAN

This odor control plan is capable of controlling emissions of nuisance odors off-site. Specific odor control methods to be used on a routine basis will include foams to cover the exposed soil. If nuisance odors are identified at the site boundary, or if odor complaints are received, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. NYSDEC and NYSDOH will be notified of all odor events and of any other complaints about the project. Implementation of all odor controls, including the halt of work, is the responsibility of the remedial party's Remediation Engineer, and any measures that are implemented will be discussed in the Periodic Review Report.

All necessary means will be employed to prevent on- and off-site nuisances. At a minimum, these measures will include: (a) limiting the area of open excavations and size of soil stockpiles; (b) shrouding open excavations with tarps and other covers; and (c) using foams to cover exposed odorous soils. If odors develop and cannot be otherwise controlled, additional means to eliminate odor nuisances will include: (d) direct load-out of soils to trucks for off-site disposal; (e) use of chemical odorants in spray or misting systems; and, (f) use of staff to monitor odors in surrounding neighborhoods.

If nuisance odors develop during intrusive work that cannot be corrected, or where the control of nuisance odors cannot otherwise be achieved due to on-site conditions or close proximity to sensitive receptors, odor control will be achieved by sheltering the excavation and handling areas in a temporary containment structure equipped with appropriate air venting/filtering systems.

B-15 DUST CONTROL PLAN

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

- Dust suppression will be achieved through the use of a dedicated on-site water truck for road wetting. The truck will be equipped with a water cannon capable of spraying water directly onto off-road areas including excavations and stockpiles.
- Clearing and grubbing of larger sites will be done in stages to limit the area of exposed, unvegetated soils vulnerable to dust production.
- Gravel will be used on roadways to provide a clean and dust-free road surface.
- On-site roads will be limited in total area to minimize the area required for water truck sprinkling.

B-16 OTHER NUISANCES

A plan for rodent control will be developed and utilized by the contractor prior to and during site clearing and site grubbing, and during all remedial work, if needed.

A plan will be developed and utilized by the contractor for all remedial work to ensure compliance with local noise control ordinances, as needed.

APPENDIX C

Environmental Easement

NYC DEPARTMENT OF FINANCE
OFFICE OF THE CITY REGISTER

This page is part of the instrument. The City Register will rely on the information provided by you on this page for purposes of indexing this instrument.The information on this page will control for indexing purposes in the event of any conflict with the rest of the document.

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RECORDING AND ENDORSEMENT COVER PAGE **PAGE 1 OF 10**

Document ID: 2016040100343001 Document Date: 03-23-2016 Preparation Date: 04-01-2016
Document Type: EASEMENT
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PRESENTER:
FIRST AMERICAN TITLE INSURANCE (FIRSTAM PICKUP)
666 THIRD AVENUE-5TH FLOOR
TITLE# 3020-785789-CQ
NEW YORK, NY 10017
212-850-0670

RETURN TO:
SIVE PAGET & RIESEL, P.C.
460 PARK AVENUE
10TH FLOOR
NEW YORK, NY 10022
KARY TORRES

PROPERTY DATA

Borough	Block	Lot	Unit	Address
MANHATTAN	1749	33	Entire Lot	1800 PARK AVENUE

Property Type: OTHER

CROSS REFERENCE DATA

CRFN_____ *or* DocumentID_____ *or* _____ Year_____ Reel____ Page_____ *or* File Number_____

PARTIES

GRANTOR/SELLER:
HARLEM PARK ACQUISITION, LLC
C/O THE CONTINUUM COMPANY,, 30 WEST 21ST STREET, 11TH FLOOR
NEW YORK , NY 10010

GRANTEE/BUYER:
THE PEOPLE OF THE STATE OF NEW YORK BY COMMISSONER
DEPT. OF ENVIRONMENTAL CONSERVATION, , 625 BROADWAY
ALBANY, NY 12233

FEES AND TAXES

Mortgage :

Mortgage Amount:	$	0.00
Taxable Mortgage Amount:	$	0.00
Exemption:		
TAXES: County (Basic):	$	0.00
City (Additional):	$	0.00
Spec (Additional):	$	0.00
TASF:	$	0.00
MTA:	$	0.00
NYCTA:	$	0.00
Additional MRT:	$	0.00
TOTAL:	$	0.00
Recording Fee:	$	82.00
Affidavit Fee:	$	0.00

Filing Fee: $ 100.00
NYC Real Property Transfer Tax: $ 0.00
NYS Real Estate Transfer Tax: $ 0.00

RECORDED OR FILED IN THE OFFICE OF THE CITY REGISTER OF THE CITY OF NEW YORK
Recorded/Filed 04-04-2016 11:23
City Register File No.(CRFN): **2016000116800**

City Register Official Signature

ENVIRONMENTAL EASEMENT GRANTED PURSUANT TO ARTICLE 71, TITLE 36 OF THE NEW YORK STATE ENVIRONMENTAL CONSERVATION LAW

THIS INDENTURE made this 23RD day of MARCH, 2016, between Owner(s) Harlem Park Acquisition LLC, having an office at c/o Continuum Company, LLC 30 West 21st Street, 11th Floor, New York, New York 10010, County of New York, State of New York (the "Grantor"), and The People of the State of New York (the "Grantee."), acting through their Commissioner of the Department of Environmental Conservation (the "Commissioner", or "NYSDEC" or "Department" as the context requires) with its headquarters located at 625 Broadway, Albany, New York 12233,

WHEREAS, the Legislature of the State of New York has declared that it is in the public interest to encourage the remediation of abandoned and likely contaminated properties ("sites") that threaten the health and vitality of the communities they burden while at the same time ensuring the protection of public health and the environment; and

WHEREAS, the Legislature of the State of New York has declared that it is in the public interest to establish within the Department a statutory environmental remediation program that includes the use of Environmental Easements as an enforceable means of ensuring the performance of operation, maintenance, and/or monitoring requirements and the restriction of future uses of the land, when an environmental remediation project leaves residual contamination at levels that have been determined to be safe for a specific use, but not all uses, or which includes engineered structures that must be maintained or protected against damage to perform properly and be effective, or which requires groundwater use or soil management restrictions; and

WHEREAS, the Legislature of the State of New York has declared that Environmental Easement shall mean an interest in real property, created under and subject to the provisions of Article 71, Title 36 of the New York State Environmental Conservation Law ("ECL") which contains a use restriction and/or a prohibition on the use of land in a manner inconsistent with engineering controls which are intended to ensure the long term effectiveness of a site remedial program or eliminate potential exposure pathways to hazardous waste or petroleum; and

WHEREAS, Grantor, is the owner of real property located at the address of 1800 Park Avenue in the City of New York, County of New York and State of New York, known and designated on the tax map of the New York City Department of Finance as tax map parcel number: Block 1749 Lot 33 (formerly Lots 31, 33, 35, 40, 43, being the same as that property conveyed to Grantor by deed dated September 30, 2013 and recorded in the City Register of the City of New York as CRFN # 2013000430535. The property subject to this Environmental Easement (the "Controlled Property") comprises approximately 0.83 +/- acres, and is hereinafter more fully described in the Land Title Survey dated August 20, 2013 and last revised January 18, 2016 prepared by David H. Dippel, LLS of WSP | Parsons Brinckerhoff, which will be attached to the Site Management Plan. The Controlled Property description is set forth in and attached hereto as Schedule A; and

WHEREAS, the Department accepts this Environmental Easement in order to ensure the protection of public health and the environment and to achieve the requirements for remediation established for the Controlled Property until such time as this Environmental Easement is extinguished pursuant to ECL Article 71, Title 36; and

NOW THEREFORE, in consideration of the mutual covenants contained herein and the terms and conditions of Brownfield Cleanup Agreement Index Number: W2-1037-04-12 as amended July 8, 2015, Grantor conveys to Grantee a permanent Environmental Easement pursuant to ECL Article 71, Title 36 in, on, over, under, and upon the Controlled Property as more fully described herein ("Environmental Easement")

1. Purposes. Grantor and Grantee acknowledge that the Purposes of this Environmental Easement are: to convey to Grantee real property rights and interests that will run with the land in perpetuity in order to provide an effective and enforceable means of encouraging the reuse and redevelopment of this Controlled Property at a level that has been determined to be safe for a specific use while ensuring the performance of operation, maintenance, and/or monitoring requirements; and to ensure the restriction of future uses of the land that are inconsistent with the above-stated purpose.

2. Institutional and Engineering Controls. The controls and requirements listed in the Department approved Site Management Plan ("SMP") including any and all Department approved amendments to the SMP are incorporated into and made part of this Environmental Easement. These controls and requirements apply to the use of the Controlled Property, run with the land, are binding on the Grantor and the Grantor's successors and assigns, and are enforceable in law or equity against any owner of the Controlled Property, any lessees and any person using the Controlled Property.

A. (1) The Controlled Property may be used for:

Restricted Residential as described in 6 NYCRR Part 375-1.8(g)(2)(ii), Commercial as described in 6 NYCRR Part 375-1.8(g)(2)(iii) and Industrial as described in 6 NYCRR Part 375-1.8(g)(2)(iv)

(2) All Engineering Controls must be operated and maintained as specified in the Site Management Plan (SMP);

(3) All Engineering Controls must be inspected at a frequency and in a manner defined in the SMP;

(4) The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the New York City Department of Health and Mental Hygiene to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the Department;

(5) Groundwater and other environmental or public health monitoring must be performed as defined in the SMP;

(6) Data and information pertinent to Site Management of the Controlled Property must be reported at the frequency and in a manner defined in the SMP;

(7) All future activities on the property that will disturb remaining contaminated material must be conducted in accordance with the SMP;

(8) Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in the SMP;

(9) Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical components of the remedy shall be performed as defined in the SMP;

(10) Access to the site must be provided to agents, employees or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified by this Environmental Easement.

B. The Controlled Property shall not be used for Residential purposes as defined in 6NYCRR 375-1.8(g)(2)(i), and the above-stated engineering controls may not be discontinued without an amendment or extinguishment of this Environmental Easement.

C. The SMP describes obligations that the Grantor assumes on behalf of Grantor, its successors and assigns. The Grantor's assumption of the obligations contained in the SMP which may include sampling, monitoring, and/or operating a treatment system, and providing certified reports to the NYSDEC, is and remains a fundamental element of the Department's determination that the Controlled Property is safe for a specific use, but not all uses. The SMP may be modified in accordance with the Department's statutory and regulatory authority. The Grantor and all successors and assigns, assume the burden of complying with the SMP and obtaining an up-to-date version of the SMP from:

Site Control Section
Division of Environmental Remediation
NYSDEC
625 Broadway
Albany, New York 12233
Phone: (518) 402-9553

D. Grantor must provide all persons who acquire any interest in the Controlled Property a true and complete copy of the SMP that the Department approves for the Controlled Property and all Department-approved amendments to that SMP.

E. Grantor covenants and agrees that until such time as the Environmental Easement is extinguished in accordance with the requirements of ECL Article 71, Title 36 of the ECL, the property deed and all subsequent instruments of conveyance relating to the Controlled Property shall state in at least fifteen-point bold-faced type:

This property is subject to an Environmental Easement held by the New York State Department of Environmental Conservation pursuant to Title 36 of Article 71 of the Environmental Conservation Law.

F. Grantor covenants and agrees that this Environmental Easement shall be incorporated in full or by reference in any leases, licenses, or other instruments granting a right to use the Controlled Property.

G. Grantor covenants and agrees that it shall, at such time as NYSDEC may require, submit to NYSDEC a written statement by an expert the NYSDEC may find acceptable certifying under penalty of perjury, in such form and manner as the Department may require, that:

(1) the inspection of the site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under the direction of the individual set forth at 6 NYCRR Part 375-1.8(h)(3).

(2) the institutional controls and/or engineering controls employed at such site:

(i) are in-place;

(ii) are unchanged from the previous certification, or that any identified changes to the controls employed were approved b the NYSDEC and that all controls are in the Department-approved format; and

(iii) that nothing has occurred that would impair the ability of such control to protect the public health and environment;

(3) the owner will continue to allow access to such real property to evaluate the continued maintenance of such controls;

(4) nothing has occurred that would constitute a violation or failure to comply with any site management plan for such controls;

(5) the report and all attachments were prepared under the direction of, and reviewed by, the party making the certification;

(6) to the best of his/her knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program, and generally accepted engineering practices; and

(7) the information presented is accurate and complete.

3. Right to Enter and Inspect. Grantee, its agents, employees, or other representatives of the State may enter and inspect the Controlled Property in a reasonable manner and at reasonable times to assure compliance with the above-stated restrictions.

4. Reserved Grantor's Rights. Grantor reserves for itself, its assigns, representatives, and successors in interest with respect to the Property, all rights as fee owner of the Property, including:

A. Use of the Controlled Property for all purposes not inconsistent with, or limited by the terms of this Environmental Easement;

B. The right to give, sell, assign, or otherwise transfer part or all of the underlying fee interest to the Controlled Property, subject and subordinate to this Environmental Easement;

5. Enforcement

A. This Environmental Easement is enforceable in law or equity in perpetuity by Grantor, Grantee, or any affected local government, as defined in ECL Section 71-3603, against the owner of the Property, any lessees, and any person using the land. Enforcement shall not be defeated because of any subsequent adverse possession, laches, estoppel, or waiver. It is not a defense in any action to enforce this Environmental Easement that: it is not appurtenant to an interest in real property; it is not of a character that has been recognized traditionally at common law; it imposes a negative burden; it imposes affirmative obligations upon the owner of any interest in the burdened property; the benefit does not touch or concern real property; there is no privity of estate or of contract; or it imposes an unreasonable restraint on alienation.

B. If any person violates this Environmental Easement, the Grantee may revoke the Certificate of Completion with respect to the Controlled Property.

C. Grantee shall notify Grantor of a breach or suspected breach of any of the terms of this Environmental Easement. Such notice shall set forth how Grantor can cure such breach or suspected breach and give Grantor a reasonable amount of time from the date of receipt of notice in which to cure. At the expiration of such period of time to cure, or any extensions granted by Grantee, the Grantee shall notify Grantor of any failure to adequately cure the breach or suspected breach, and Grantee may take any other appropriate action reasonably necessary to remedy any breach of this Environmental Easement, including the commencement of any proceedings in accordance with applicable law.

D. The failure of Grantee to enforce any of the terms contained herein shall not be deemed a waiver of any such term nor bar any enforcement rights.

6. Notice. Whenever notice to the Grantee (other than the annual certification) or approval from the Grantee is required, the Party providing such notice or seeking such approval shall identify the Controlled Property by referencing the following information:

County, NYSDEC Site Number, NYSDEC Brownfield Cleanup Agreement, State Assistance Contract or Order Number, and the County tax map number or the Liber and Page or computerized system identification number.

Parties shall address correspondence to:

Site Number: C231041
Office of General Counsel
NYSDEC
625 Broadway
Albany New York 12233-5500

With a copy to:

Site Control Section
Division of Environmental Remediation
NYSDEC

625 Broadway
Albany, NY 12233

All notices and correspondence shall be delivered by hand, by registered mail or by Certified mail and return receipt requested. The Parties may provide for other means of receiving and communicating notices and responses to requests for approval.

7. Recordation. Grantor shall record this instrument, within thirty (30) days of execution of this instrument by the Commissioner or her/his authorized representative in the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

8. Amendment. Any amendment to this Environmental Easement may only be executed by the Commissioner of the New York State Department of Environmental Conservation or the Commissioner's Designee, and filed with the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

9. Extinguishment. This Environmental Easement may be extinguished only by a release by the Commissioner of the New York State Department of Environmental Conservation, or the Commissioner's Designee, and filed with the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

10. Joint Obligation. If there are two or more parties identified as Grantor herein, the obligations imposed by this instrument upon them shall be joint and several.

Remainder of Page Intentionally Left Blank

IN WITNESS WHEREOF, Grantor has caused this instrument to be signed in its name.

Harlem Park Acquisition LLC:

By Harlem Park Holdings LLC, its Sole Member

By: _____

Ian Bruce Eichner
President and CEO

Date: 2/19/2016

Grantor's Acknowledgment

STATE OF NEW YORK)
) ss:
COUNTY OF)

On the 19 day of February, in the year 2016, before me, the undersigned, personally appeared Ian Bruce Eichner, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

_____
Notary Public - State of New York

Sharon H. McCulloch
Notary Public, State of New York
No. 01MC6224121
Qualified in New York County
Commission Expires 6/28/2018

THIS ENVIRONMENTAL EASEMENT IS HEREBY ACCEPTED BY THE PEOPLE OF THE STATE OF NEW YORK, Acting By and Through the Department of Environmental Conservation as Designee of the Commissioner,

By: _____
Robert W. Schick, Director
Division of Environmental Remediation

Grantee's Acknowledgment

STATE OF NEW YORK)
) ss:
COUNTY OF ALBANY)

On the 23rd day of March, in the year 2016, before me, the undersigned, personally appeared Robert W. Schick, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/ executed the same in his/her/ capacity as Designee of the Commissioner of the State of New York Department of Environmental Conservation, and that by his/her/ signature on the instrument, the individual, or the person upon behalf of which the individual acted, executed the instrument.

_____
Notary Public - State of New York

David J. Chiusano
Notary Public, State of New York
No. 01CH5032146
Qualified in Schenectady County
Commission Expires August 22, 2016

SCHEDULE "A" PROPERTY DESCRIPTION

Legal Description of Environmental Easement – 1800 Park Avenue, New York, NY, BCP Site No. C231041, Manhattan Block 1794, Lot 33 (formerly lots 31, 33, 35, 40, 43)

GPS Coordinates of Starting Point: 40° 48' 16.41
73° 56' 22.95"

ALL that certain plot, piece or parcel of land, situate, lying and being in the Borough of Manhattan, City, County and State of New York, bounded and described as follows:

BEGINNING at a point formed by the intersection of the northerly side of East 124th Street with the westerly side of Park Avenue (formerly Fourth Avenue);

RUNNING THENCE westerly along the northerly side of East 124th Street 142 feet 6 inches;

THENCE northerly parallel with the westerly side of Park Avenue, 100 feet 11 inches to the center line of the block between East 124th and East 125th Streets;

THENCE westerly along said center line of the block 72 feet 6 inches;

THENCE northerly parallel with the westerly side of Park Avenue, 100 feet 11 inches to the southerly side of East 125th Street;

THENCE easterly along the southerly side of East 125th Street, 215 feet to the westerly side of Park Avenue;

THENCE southerly along the westerly side of Park Avenue 201 feet 10 inches to the point and place of BEGINNING.

CONTAINING 0.83 acres more or less.

TOGETHER WITH the rights, obligations and benefits accruing to the owner of the above land pursuant to the Zoning Lot Development and Easement Agreement dated as of May 10, 2007, by and between New York College of Podiatric Medicine and CV Harlem Park LLC, and recorded in the Office of the New York City Register on May 23, 2007, under CRFN 2007000269640.

APPENDIX D

Soil Boring Logs

Fleming-Lee Shue	Environmental Management & Consulting 226 West 26th Street New York, N.Y. 10001 212-675-3225	CLIENT: 1800 Park Avenue LLC Project No.: 10052-001 Site Location: Harlem Hotel Site 1800 Park Ave., East Harlem	Boring No. HH1
Driller: Aquifer Drilling & Testing Geologist: Curt Schmidt, P.G.		Equipment:	Date: 5/27/2004

Depth (feet)	Sample No.	Sample Type	Blow Counts (per 6 inches)	Density/ Moisture	PID (ppm)	Field Identification of Soil	Remarks
12			39	very moist	0.0	brown - reddish brown c-m f SAND, little m-f gravel, tr silt	7"
			50/5	loose	0.0		
14							
			9		572	Same	3" rec. Will try second spoon petrol. odor in 2nd spoon
			9				
					8		
16			12 17		61.7		
						Drill to 25' Set .010" slot (2" pvc) 10-25 2" PVC 10-0.5 Sand to 8' bentonite to 4' concrete to surf	
18							
20							
22							
24							

Legend: MC = macrocore; SS = Split Spoon; HA = hand auger; HSA = hollow-stem auger;
tr. = trace = 0-10%; l. = little = 10-20%; s. = some = 20-35%; and = 35-50%;
(+) = upper end; (-) = lower end of limit
c = coarse; m = medium; f = fine

Fleming-Lee Shue	Environmental Management & Consulting 226 West 26th Street New York, N.Y. 10001 212-675-3225	CLIENT: 1800 Park Avenue LLC Project No.: 10052-001 Site Location: Harlem Hotel Site 1800 Park Ave., East Harlem	Boring No. HH-1 Date: 5/27/2004
Driller: Aquifer Drilling & Testing Geologist: Curt Schmidt, P.G.		Equipment: Davey Kent Rig 6" Hollow Stem Augers	

Depth (feet)	Sample No.	Sample Type	Blow Counts (per 6 inches)	Density/ Moisture	PID (ppm)	Field Identification of Soil	Remarks
0			7		0	Asphalt brn-gray brown cmf SAND, some cmf gravel, tr. silt	2.5" rec.
			12	Moist	↓		
			8	loose			
2			7	↓	↓		
			9		0	red-brown-cmf SAND, some cmf gravel brick, glass	3" Fill
			7				
4			2 2	↓			
			4		0	Same	3"
			3				
			2				
6			2		↓		
			4 6		5.0	Same	Pine/wax odor
			3/3		0.0	w black charcoal & wood frags in tip	5" Rec
8							
			4 6		0.0	Same	6"
			11 3		↓	brown cmf	
10							
			22	Wet	0.0	brown to dark brownish gray cmf SAND and mf gravel tr. silt concrete in tip	Odor of Moth Balls
			50/2	Moist	0.5		
12							

Legend: MC = macrocore; SS = Split Spoon; HA = hand auger; HSA = hollow-stem auger;
tr. = trace = 0-10%; l. = little = 10-20%; s. = some = 20-35%; and = 35-50%;
(+) = upper end; (-) = lower end of limit
c = coarse; m = medium; f = fine

Fleming-Lee Shue

Environmental Management & Consulting

226 West 26th Street
New York, N.Y. 10001
212-675-3225

CLIENT: 1800 Park Avenue LLC

Project No.: 10052-001

Site Location: Harlem Hotel Site
1800 Park Ave., East Harlem

Boring No. HH2

Date: 5/27/2004

Driller: Aquifer Drilling & Testing

Geologist: Curt Schmidt, P.G.

Equipment: see HH1

Depth (feet) 0	Sample No.	Sample Type	Blow Counts (per 6 inches)	Density/ Moisture	PID (ppm)	Field Identification of Soil	Remarks
			Augered	Moist			/
			Pavement	loose			
	HH2-1	Soil	7		0.8	brown-black c/m/f SAND little m/f g; trace silt	Rec = 4"
2			11		0	asphalt break	
			8		0		
			8		0		
			10		0	Same	Rec 3"
4			10		0		
			10		0		
			10				
			6	Moist	0	Same	Rec = 6"
6			6	loose			
			20		0	brick frags	
			7				
			3	Moist	0	brick frags	Rec. 7"
8			4	loose		and asphalt	
			3	V. Moist	0		
			6	loose	0		
			5	Moist	0	brown-red brn c/m/f(+) SAND	Rec 12"
10			7	Sl. firm		little m/f gravel, tr. silt	
			7		0	= Asphalt	
			22		0	concrete in tip	
			11		0		5"
12			50/3"		0	Same	
						Asphalt	

Legend: MC = macrocore; SS = Split Spoon; HA = hand auger; HSA = hollow-stem auger;
tr. = trace = 0-10%; l. = little = 10-20%; s. = some = 20-35%; and = 35-50%;
(+) = upper end; (-) = lower end of limit
c = coarse; m = medium; f = fine

Fleming-Lee Shue

Environmental Management & Consulting

226 West 26th Street
New York, N.Y. 10001
212-675-3225

CLIENT: 1800 Park Avenue LLC

Project No.: 10052-001

Site Location: Harlem Hotel Site
1800 Park Ave., East Harlem

Boring No. HH2

Date: 5/27/2004

Driler: Aquifer Drilling & Testing

Geologist: *Curt Schmidt, P.G.*

Equipment:

Depth (feet) 12	Sample No.	Sample Type	Blow Counts (per 6 inches)	Density/ Moisture	PID (ppm)	Field Identification of Soil	Remarks
							drilled through sampled 13-15'
14			48 38		0	Same - brn - red brn cmf(+) SAND little mf(+) gravel, tr. silt	
			50/2		0		drilled thru [illegible]
16			38 42	V. Moist	44.6	brown - black cmf SAND and mf GRAVEL	Petro! Odor
			56 34	Wet	54.8		
18							
20							
22							
24							

Legend: MC = macrocore; SS = Split Spoon; HA = hand auger; HSA = hollow-stem auger;
tr. = trace = 0-10%; l. = little = 10-20%; s. = some = 20-35%; and = 35-50%;
(+) = upper end; (-) = lower end of limit
c = coarse; m = medium; f = fine

Fleming-Lee Shue	Environmental Management & Consulting 226 West 26th Street New York, N.Y. 10001 212-675-3225	CLIENT: 1800 Park Avenue LLC Project No.: 10052-001 Site Location: Harlem Hotel Site 1800 Park Ave., East Harlem	Boring No. HH3 Date: 5/27/2004
Driller: Aquifer Drilling & Testing Geologist: Curt Schmidt, P.G.		Equipment: see HH1	

Depth (feet) 0	Sample No.	Sample Type	Blow Counts (per 6 inches)	Density/ Moisture	PID (ppm)	Field Identification of Soil	Remarks
						Asphalt	5"
2			17 15	loose sl moist	0	brick and sand	
			50/1	-dry	0		
4			14 20		0	gray - dk gray c,m,f SAND, some m,f + G, + - silt brick concrete stone	4"
			3 1		0		
6			2 3	Moist firm	0	dark grey brown - m,f SAND, little - fine gravel, trace(-) silt	8" Rec
			3 1	very moist sl. firm	0	strong brown fine SAND, little(-) silt	
8			3 7	loose	0	collapsed(?) gray c,m,f SAND and m,f G concrete frags brick frags	9"
			5 5	Moist	0	brown c,m,f + SAND, trace silt	
10			30 50/4				
							refusal return ... w/air ...
12			50/4				

Legend: MC = macrocore; SS = Split Spoon; HA = hand auger; HSA = hollow-stem auger;
tr. = trace = 0-10%; l. = little = 10-20%; s. = some = 20-35%; and = 35-50%;
(+) = upper end; (-) = lower end of limit
c = coarse; m = medium; f = fine

Fleming-Lee Shue	*Environmental Management & Consulting* 226 West 26th Street New York, N.Y. 10001 212-675-3225	CLIENT: 1800 Park Avenue LLC Proiect No.: 10052-001 Site Location: Harlem Hotel Site 1800 Park Ave., East Harlem	**Boring No.** HH3 Date: 6/7/2004
		Driller: Aquifer Drilling & Testing Geologist: *Curt Schmidt, P.G.*	Equipment:

Depth (feet) 12	Sample No.	Sample Type	Blow Counts (per 6 inches)	Density/ Moisture	PID (ppm)	Field Identification of Soil	Remarks
							drilled thru slab 6/7/04
				firm	0.0	red. gray cmf(+) SAND, little mf gravel, (+) silt	rec. = 12"
14				sl. moist	2.5		
					20.5	grey - black cmf SAND, little mf gravel, trace silt	
				wet	42.5		rec = 24"
				wet	30.6	Same	rec = 3"
16					22.3		
18							
20							
22							
24							

Legend: MC = macrocore; SS = Split Spoon; HA = hand auger; HSA = hollow-stem auger;
tr. = trace = 0-10%; l. = little = 10-20%; s. = some = 20-35%; and = 35-50%;
(+) = upper end; (-) = lower end of limit
c = coarse; m = medium; f = fine

Fleming-Lee Shue

Environmental Management & Consulting

226 West 26th Street
New York, N.Y. 10001
212-675-3225

CLIENT: 1800 Park Avenue LLC

Project No.: 1652-001

Site Location: Harlem Hotel Site
1800 Park Ave., East Harlem

Boring No. HH4

Date: 5/28/2004

Driller: Aquifer Drilling & Testing

Geologist: *Curt Schmidt, P.G.*

Equipment: CME 75
Hollow Stem Auger

Depth (feet) 0	Sample No.	Sample Type	Blow Counts (per 6 inches)	Density/ Moisture	PID (ppm)	Field Identification of Soil	Remarks
			Auger			Asphalt	Started SS Sample @ 5'
2			7 5	sl moist sl. firm	0	d reddish brown c-m SAND, little m-f gravel asphalt	10"
			6 4		0		
4			6 2		0	dk gray-brown c-m SAND little(+) m-f gravel stone, asphalt	11"
			2 2		0	reddish brn c-m(+) SAND, little m-f gravel, trace silt, brick, concrete asphalt backfill	
6			6 2		0	Same as above	3"
			2 5		0		
8			7 3		0	brown - red very pale brown c-m SAND, little m-f gravel, tr(+) silt	7"
			1 1		0	glass frags	
10			1 7	very moist	0	brown c-m SAND l. m-f G, tr silt	8"
			12 25	firm	0	Pink Sandstone frags	
12			50/6	firm moist	0	brown c(-) m-f(+) SAND, little m-f(+) gravel, trace(+) silt	6"
					0	drilling thru concrete	

Legend: MC = macrocore; SS = Split Spoon; HA = hand auger; HSA = hollow-stem auger;
tr. = trace = 0-10%; l. = little = 10-20%; s. = some = 20-35%; and = 35-50%;
(+) = upper end; (-) = lower end of limit
c = coarse; m = medium; f = fine

Fleming-Lee Shue
Environmental Management & Consulting
226 West 26th Street
New York, N.Y. 10001
212-675-3225

CLIENT: 1800 Park Avenue LLC

Project No.: 10052-001

Site Location: Harlem Hotel Site 1800 Park Ave., East Harlem

Equipment:

Boring No. HH 4

Date: 5/5/2004

Driller: Aquifer Drilling & Testing

Geologist: Curt Schmidt, P.G.

Depth (feet) 12	Sample No.	Sample Type	Blow Counts (per 6 inches)	Density/ Moisture	PID (ppm)	Field Identification of Soil	Remarks
			Augered			Concrete	
			8	Moist	0	Same as 11-12'	3"
14			50/6	firm-stiff	0		
			65	Moist. ~~V. Moist~~	96.3	yelbrn-brown c-m-f SAND l. m-f G tr. silt	Petrol
16			28				Odor
			17		37.3	black c-m-f SAND, some m-f G	
			10	Wet	21.9		
			12	~~Wet~~	91.2	brown-dk grey c(+)m-f SAND, l. m-f G, tr silt	
18			10	loose	25.2		
			12		4.1	reddish brown fine SAND, some-silt	
			8		0.0		
20							
22							
24							

Legend: MC = macrocore; SS = Split Spoon; HA = hand auger; HSA = hollow-stem auger;
tr. = trace = 0-10%; l. = little = 10-20%; s. = some = 20-35%; and = 35-50%;
(+) = upper end; (-) = lower end of limit
c = coarse; m = medium; f = fine

Fleming-Lee Shue

Environmental Management & Consulting

226 West 26th Street
New York, N.Y. 10001
212-675-3225

CLIENT: 1800 Park Avenue LLC

Project No.: 10052-001

Site Location: Harlem Hotel Site
1800 Park Ave., East Harlem

Boring No. HH5 /MW2

Date: 5/25/2004

Driller: Aquifer Drilling & Testing Tony & Chris

Geologist: *Curt Schmidt, P.G.*

Equipment: CME 75 HSA

Depth (feet) 0	Sample No.	Sample Type	Blow Counts (per 6 inches)	Density/ Moisture	PID (ppm)	Field Identification of Soil	Remarks
			Augered			Asphalt	
			WOR	loose	0	gray-black m/f GRAVEL and c/m/f SAND;	2"
2				moist		asphalt concrete frags	
	HH4-1	Soil	1 2		0		
			2 4		0	gray-black-red c/m/f SAND and m/f gravel	4"
4						asphalt, brick frags.	
			4 3		0		
			2 4	loose	0	brick frags o/g	2"
6				moist		(red c/m/f GRAVEL)	
			4 3		0		
			2 2		0	White to brown c/m/f(+) SAND, some m/f gravel	2"
8						det. concrete, brick and stone	
			2 2		0		
			1 2		0	lgl gry brown - white c/m/f SAND, little f gravel/trace silt	2"
10							
			2 1		0	det concrete & sand, red fukuie (coffee)	
			2 4	loose		same as above	
12				moist			
			3 4				

Legend: MC = macrocore; SS = Split Spoon; HA = hand auger; HSA = hollow-stem auger;
tr. = trace = 0-10%; l. = little = 10-20%; s. = some = 20-35%; and = 35-50%;
(+) = upper end; (-) = lower end of limit
c = coarse; m = medium; f = fine

Fleming-Lee Shue

Environmental Management & Consulting

226 West 26th Street
New York, N.Y. 10001
212-675-3225

CLIENT: 1800 Park Avenue LLC

Project No.: 10052-001

Site Location: Harlem Hotel Site
1800 Park Ave., East Harlem

Boring No. HHS / MW2

Date: 5/28/2004

Driller: Aquifer Drilling & Testing

Geologist: *Curt Schmidt, P.G.*

Equipment:

Depth (feet)	Sample No.	Sample Type	Blow Counts (per 6 inches)	Density/ Moisture	PID (ppm)	Field Identification of Soil	Remarks
12			3	Moist	0		
			4	loose			
			2		0	Strong brown - gray c m f SAND, some c m f gravel, tr f	5"
14			4				
			3	very moist		silt	slight odor in 6"
			4	tr f	4.9		
			2	v. Moist		Same	
16			7		15.3		
			12	wet	12.2	dk gray m f GRAVEL and c m f SAND	slight petrol odor
			14	loose			
			4		q.f	brn c(f) m f SAND, l. m f gravel, tr(-) s. f	8"
18			6				
			7		4.3	Wood, fabric	
			6				
			10		5.2	brn - pinkish brn, c m f SAND, some f) c m f gravel trace silt	7"
20			10				
			15		8.8	yellow c m f GRAVEL, l. c m f sand	
			14				
22							
24							

Legend: MC = macrocore; SS = Split Spoon; HA = hand auger; HSA = hollow-stem auger;
tr. = trace = 0-10%; l. = little = 10-20%; s. = some = 20-35%; and = 35-50%;
(+) = upper end; (-) = lower end of limit
c = coarse; m = medium; f = fine

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Fleming-Lee Shue	*Environmental Management & Consulting* 226 West 26th Street New York, N.Y. 10001 212-675-3225	CLIENT: 1800 Park Avenue LLC Project No.: 10052-001 Site Location: Harlem Hotel Site 1800 Park Ave., East Harlem	Boring No. HA5 Date: 5/ /2004
Driller: Aquifer Drilling & Testing Geologist: *Curt Schmidt, P.G.*		Equipment:	

Depth (feet) ~~26~~	Sample No.	Sample Type	Blow Counts (per 6 inches)	Density/ Moisture	PID (ppm)	Field Identification of Soil	Remarks
25							
			17		1.8	reddish gray	18"
28			13		7.5	C+MF SAND, some m-f(+) gravel, trace(-) silt	very
			13		5.8		slight petrol
			6		4.6		odor
30							
32							
34							
36							
38							

Legend: MC = macrocore; SS = Split Spoon; HA = hand auger; HSA = hollow-stem auger;
tr. = trace = 0-10%; l. = little = 10-20%; s. = some = 20-35%; and = 35-50%;
(+) = upper end; (-) = lower end of limit
c = coarse; m = medium; f = fine

Fleming-Lee Shue

Environmental Management & Consulting

226 West 26th Street
New York, N.Y. 10001
212-675-3225

CLIENT: 1800 Park Avenue LLC

Project No.: 10052-001

Site Location: Harlem Hotel Site
1800 Park Ave., East Harlem

Equipment: CME 75

Boring No. HH6

Date: 5/25/2004

Driller: Aquifer Drilling & Testing
Geologist: *Curt Schmidt, P.G.*

Depth (feet)	Sample No.	Sample Type	Blow Counts (per 6 inches)	Density/ Moisture	PID (ppm)	Field Identification of Soil	Remarks
0			Auger			Asphalt	
			4	Moist	3.0	very dk gy cmf SAND and cmf GRAVEL	12"
2			6	loose	1.5		
			7	dry	0.4	red cmf GRAVEL and cmf SAND	
			50/6	loose	0.0	brick & brick frags, wood in tip	1st Refusal of auger @ 3' Move East
4							
			8		0.9	V. dk gray cmf-f SAND, some m-f(+) G & trace silt brick, stone, concrete	
6			8		0.4		
			5		3.4	Wood	
			6	Moist Firm	2.1	yellowish brown cmf SAND, trace silt	2nd refusal 7' on concrete Move 5' West
8							
10							
			12	Firm, Moist	5.4	brown-gray brown cmf SAND, some mf gravel, trace silt concrete	No Odor
			18		1.8		
			16		0	black fine SAND, little (+) silt little m-f(+) gravel wood brick	
12			50/6"		0		

Legend: MC = macrocore; SS = Split Spoon; HA = hand auger; HSA = hollow-stem auger;
tr. = trace = 0-10%; l. = little = 10-20%; s. = some = 20-35%; and = 35-50%;
(+) = upper end; (-) = lower end of limit
c = coarse; m = medium; f = fine

Fleming-Lee Shue

Environmental Management & Consulting

226 West 26th Street
New York, N.Y. 10001
212-675-3225

CLIENT: 1800 Park Avenue LLC

Project No.: 10052-001

Site Location: Harlem Hotel Site
1800 Park Ave., East Harlem

Equipment:

Boring No. 4HE

Date: 5/ /2004

Driller: Aquifer Drilling & Testing

Geologist: Curt Schmidt, P.G.

Depth (feet) 12	Sample No.	Sample Type	Blow Counts (per 6 inches)	Density/ Moisture	PID (ppm)	Field Identification of Soil	Remarks
			22		11.2	v. dk gray m-f(+) SAND, some(-) m-f gravel, little(-) clay.	No Petrol. Odor
			35	very	148		
			15	firm Moist	326		Sample is hot due to heavy blow counts
14			50/6		46.1		
					1.2		Re ... Sample 14-16 6-7-04 Rec = 4"
			20 [illegible]		12.3		
16			50	Wet	57.6		
18							
20							
22							
24							

Legend: MC = macrocore; SS = Split Spoon; HA = hand auger; HSA = hollow-stem auger;
tr. = trace = 0-10%; l. = little = 10-20%; s. = some = 20-35%; and = 35-50%;
(+) = upper end; (-) = lower end of limit
c = coarse; m = medium; f = fine

Fleming-Lee Shue

Environmental Management & Consulting

226 West 26th Street
New York, N.Y. 10001
212-675-3225

CLIENT: 1800 Park Avenue LLC

Project No.: 10052-001

Site Location: Harlem Hotel Site
1800 Park Ave., East Harlem

Boring No. HH7

Date: 6/7/2004

Driller: Aquifer Drilling & Testing

Geologist: *Curt Schmidt, P.G.*

Equipment: Davey Kent Hollow Stem Auger

Depth (feet) 0	Sample No.	Sample Type	Blow Counts (per 6 inches)	Density/ Moisture	PID (ppm)	Field Identification of Soil	Remarks
			Augered			Asphalt	
			11		0.	brown c-m-f SAND, l. m-f gravel, f. silt; brk	Rec = 6"
2			8		0		
			4		0		
			3		1.5	Weed in top	
			7		0	Same w/ 50% soft wood frags	Rec = 3"
4			4		.		
			7		0		
			5				
			3		0	brown-red c-m-f(t) SAND, l. f-c gravel, tr. silt; wood, brick	3" Rec
6			5				
			6		0		
			3				
			25		0	red-gray c-m-f SAND, some m-f gravel, tr. silt; brick, concrete	6" Rec
8			50/4		0		
			50/3		0	Same, w/ wood & l. c-cs. gravel	6" Rec.
10					0		
			27		0		8" Rec
12			50/1		0.0 0		

Legend: MC = macrocore; SS = Split Spoon; HA = hand auger; HSA = hollow-stem auger;
tr. = trace = 0-10%; l. = little = 10-20%; s. = some = 20-35%; and = 35-50%;
(+) = upper end; (-) = lower end of limit
c = coarse; m = medium; f = fine

Fleming-Lee Shue

Environmental Management & Consulting

226 West 26th Street
New York, N.Y. 10001
212-675-3225

CLIENT: 1800 Park Avenue LLC

Project No.: 10052-001

Site Location: Harlem Hotel Site
1800 Park Ave., East Harlem

Boring No. HH7

Date: 5/7/2004

Driller: Aquifer Drilling & Testing

Geologist: *Curt Schmidt, P.G.*

Equipment:

Depth (feet)	Sample No.	Sample Type	Blow Counts (per 6 inches)	Density/ Moisture	PID (ppm)	Field Identification of Soil	Remarks
12							
			21		0	Same	
14			41		0	brick, wood	
			23		0		
			18		5.5	Wet w/oil on very tip	Slight odor
			15		33.7		4" Rec. Fuel Oil odor
16			13		46.8		
18							
20							
22							
24							

Legend: MC = macrocore; SS = Split Spoon; HA = hand auger; HSA = hollow-stem auger;
tr. = trace = 0-10%; l. = little = 10-20%; s. = some = 20-35%; and = 35-50%;
(+) = upper end; (-) = lower end of limit
c = coarse; m = medium; f = fine

Fleming-Lee Shue

Environmental Management & Consulting

226 West 26th Street
New York, N.Y. 10001
212-675-3225

CLIENT: 1800 Park Avenue LLC

Project No.: 10052-001

Site Location: Harlem Hotel Site
1800 Park Ave., East Harlem

Boring No. HH 8

Date: 6/7/2004

Driller: Aquifer Drilling & Testing
Geologist: *Curt Schmidt, P.G.*

Equipment: Davey Kent Drill Rig
Hollow Stem Auger & 2" ϕ SS

Depth (feet) 0	Sample No.	Sample Type	Blow Counts (per 6 inches)	Density/ Moisture	PID (ppm)	Field Identification of Soil	Remarks
			Auger				
			20	Firm	2.9	brown-gray c(-)m+f SAND, some m+f gravel, tr. silt	Rec = 18" No Odor
2			20	sl moist	2.3		
			18		1.9	=wood	Slight wood odor
			15		3.3	red brick, asphalt	
			3		0.7	Same	Rec = 8"
4			17		0		
			20		0		
			12		0	=wood asphalt	
			10		0.0	red-brown c+m+f SAND, some c+m+f gravel, tr. silt,	Rec = 14"
6			20		0.0	asphalt, brick, wood	
			25		0.1		
			16		1.8		
			5	Moist	0	dark brown-red c+m SAND, some c+m+f gravel, tr. silt brick & glass	Rec = 2"
8			3	loose			
			2		0		
			2			Same	
			2	loose moist	0	~~Same~~ brownish gray-brown c+m+f SAND and m+f GRAVEL, trace silt, brick, concrete, glass	Rec = 6" Perched Water
10			3	wet			
			50/2		0		
			18	wet soft	0	Same	
12			27		0		
			22-25	Moist firm	0		

Legend: MC = macrocore; SS = Split Spoon; HA = hand auger; HSA = hollow-stem auger;
tr. = trace = 0-10%; l. = little = 10-20%; s. = some = 20-35%; and = 35-50%;
(+) = upper end; (-) = lower end of limit
c = coarse; m = medium; f = fine

Fleming-Lee Shue	*Environmental Management & Consulting* 226 West 26th Street New York, N.Y. 10001 212-675-3225	CLIENT: 1800 Park Avenue LLC Project No.: 10052-001 Site Location: Harlem Hotel Site 1800 Park Ave., East Harlem	**Boring No.** HH8 Date: 5/3/2004
Driller: Aquifer Drilling & Testing Geologist: *Curt Schmidt, P.G.*		Equipment: Davey Kent Rig HSA & S.S. 2' x 2" Dia.	

Depth (feet)	Sample No.	Sample Type	Blow Counts (per 6 inches)	Density/ Moisture	PID (ppm)	Field Identification of Soil	Remarks
			33	Very Moist	0.7	brown - v.dk.gray crs SAND, some m& grave/, trace silt; concrete frags	rec=5'
			14	Wet	0.1		
			13	Wet	238		Petrol. Odor
15			11	loose	61.7		
				↓	23.6	Same, less odor	grab additional sample for volatiles
				↓	10.7		
17							
19							

Legend: MC = macrocore; SS = Split Spoon; HA = hand auger; HSA = hollow-stem auger;
tr. = trace = 0-10%; l. = little = 10-20%; s. = some = 20-35%; and = 35-50%;
(+) = upper end; (-) = lower end of limit
c = coarse; m = medium; f = fine

Fleming-Lee Shue

Environmental Management & Consulting

226 West 26th Street
New York, N.Y. 10001
212-675-3225

CLIENT: 1800 Park Avenue LLC

Project No.: 10052-001

Site Location: Harlem Hotel Site
1800 Park Ave., East Harlem

Boring No. H.H. 9

Date: 8/19/2004 started 0900
ended 8/20/2004 @ 1215

Driller: Aquifer Drilling & Testing

Geologist: ~~Curt Schmidt, P.G.~~ Joel Reigert

Equipment: PID

Depth (feet)	Sample No.	Sample Type	Blow Counts (per 6 inches)	Density/ Moisture	PID (ppm)	Field Identification of Soil	Remarks
1-4	—	—	NONE	—	0	GENERAL CONSTRUCTION DEBRIS, FILL MATERIAL	DRY
5				/DRY	0		
6	1	G	9-7	/DRY	0	RED, BROWN, BLACK C-F SANDS SOME CMF; GRAVEL; TRACE SILTS; CONCRETE LENS @ 5'-6'	DRY
7			3-2	/DRY	0		
8	2	G	16-8	/DRY	0	BROWN to BLACK C-F SANDS TRACE SILTS, SOME ARKOSE	DRY
9			32-45	/DRY	0		
10	3	G	46-43	/DRY	0	RED to BROWN C-F SANDS Lt. RED to PINK to Lt. PURPLE COARSE SANDS	
11			50/4"	/DRY	0		
12	4	G	42-17	/DRY	0	DARK RED to BROWN C-M SANDS TRACE F tan to LIGHT BROWN SANDS	DRY
13			30-43	/DRY	0		
14	5	G	22-23	/WET	0	MED to DARK BROWN C-M SANDS LITTLE to SOME Lt. to MED BR M SANDS	WET
15			38-25	/WET	0		
18	6	G	17-12	/wet	0	no sample - spoon was empty	wet
20			9-11	/wet	0		
23	7	G	12-11	/wet	0	mod red to brown medium to fine SAND, some silts	wet
25			11-12	/wet	0		
28	8	G	7-5	/wet	0	mod red to brown medium to fine sands; some silts; to clay	plastic
30			11-14	/wet	0		
33	9	G	12-10	/wet	0	mod grayish brown m to f SAND some SILTS, LITTLE CLAY	
35			8-7	/wet	0		
38	10	G	5-5	/wet	0	mod gray to brown fine Sand some silt, some clay	plastic
40			5-5	/wet	0		
43	11	G	6-4	/wet	0	mod grayish brown fine sands some silt, some clay	plastic
45			6-3	/wet	0		
48	12	G	10-7	/wet	0		

Legend: MC = macrocore; SS = Split Spoon; HA = hand auger; HSA = hollow-stem auger;
tr. = trace = 0-10%; l. = little = 10-20%; s. = some = 20-35%; and = 35-50%;
(+) = upper end; (-) = lower end of limit
c = coarse; m = medium; f = fine

Fleming-Lee Shue

Environmental Management & Consulting

226 West 26th Street
New York, N.Y. 10001
212-675-3225

CLIENT: 1800 Park Avenue LLC

Project No.: 10052-001

Site Location: Harlem Hotel Site
1800 Park Ave., East Harlem

Boring No. H.H. #9

Date: 8/20/2004

Driller: Aquifer Drilling & Testing

Geologist: *Curt Schmidt, P.G.*

Equipment: PID

Depth (feet)	Sample No.	Sample Type	Blow Counts (per 6 inches)	Density/ Moisture	PID (ppm)	Field Identification of Soil	Remarks
50	12	G	50/5"	wet	0		
53	13	G	9-14	wet	0	med to dark reddish brown fine to coarse sands, some gravel, little silt.	tough augering
55		G	17-24	wet	0		
58	14	G	10 50/5	wet	0		
60		G		wet	0	dark grayish brown med to coarse sands, some gravel, little silt	tough augering
end of boring @ 60'							

Legend: MC = macrocore; SS = Split Spoon; HA = hand auger; HSA = hollow-stem auger;
tr. = trace = 0-10%; l. = little = 10-20%; s. = some = 20-35%; and = 35-50%;
(+) = upper end; (-) = lower end of unit
c = coarse; m = medium; f = fine

Fleming-Lee Shue	*Environmental Management & Consulting* 226 West 26th Street New York, N.Y. 10001 212-675-3225	CLIENT: 1800 Park Avenue LLC Project No.: 10052-001 Site Location: Harlem Hotel Site 1800 Park Ave., East Harlem	Boring No. H.H. #10
Driller: Aquifer Drilling & Testing Geologist: ~~Clark Schmidt, P.G.~~ Joel Reigart		Equipment: PID	Date: 8/23/2004 Started 0745 Finished 1515

Depth (feet) 0	Sample No.	Sample Type	Blow Counts (per 6 inches)	Density/ Moisture	PID (ppm)	Field Identification of Soil	Remarks
1					0	6" BLACKTOP ASPHALT PAVEMENT 6" CRUSHED STONE	
2							
3						ASSORTED CONSTRUCTION DEBRIS	
4							
5	1	G	2-11	firm/dry	0	dark reddish brown coarse sands some gravel, some medium sands	60% recovery
6			14-18				
7	2	G	15-34	firm/dry	0	med. to dark reddish, brown, black coarse to med sands, little gravel trace med sands	60% recovery
8			35-41				
9	3	G	36-50/4"	/dry	0	med to dark brown gravel to coarse sands, trace mdl. sands.	V. little recovery
10							
11	4	G	36-37	tight/wet	0	med to dark, med to coarse sands	100% recovery
12			44-50/3"			some gravel, brown, little fine sands	
13	5	G	29-32	tight/wet	5.2	med reddish-brown coarse sands	100% recovery
14			23-21			some gravel, little med sands oil sheen on gravel	
15	6	G	30-18	/wet	0	med to dak brown, black, gray coarse sands, some gravel, little med sands	60% recovery
16			15-16				
17	7	G	2-5-	/wet	0	med reddish brown, med to fine sands, some silts, trace clay	75% recovery
18			8-7				
19	8	G	4-11-	/wet	0	med to dark reddish brown, med. to fine sands, some silt, trace clay	50% recovery
20			14-14				
21	9	G	5-7-		0	as above	75% recovery
22			11-17				
23	10	G	3-9		0	as above, more reddish color	100% recovery
24			13-20				
25							

~~oil~~ case goes to 20'

Legend: MC = macrocore; SS = Split Spoon; HA = hand auger; HSA = hollow-stem auger;
tr. = trace = 0-10%; l. = little = 10-20%; s. = some = 20-35%; and = 35-50%;
(+) = upper end; (-) = lower end of limit
c = coarse; m = medium; f = fine

Fleming-Lee Shue	*Environmental Management & Consulting* 226 West 26th Street New York, N.Y. 10001 212-675-3225	CLIENT: 1800 Park Avenue LLC Project No.: 10052-001 Site Location: Harlem Hotel Site 1800 Park Ave., East Harlem	Boring No. H.H. #10 Date: 8/23/2004 finished @ 1515
Driller: Aquifer Drilling & Testing Geologist: *Curt Schmidt, P.G.*		Equipment: PID	

Depth (feet)	Sample No.	Sample Type	Blow Counts (per 6 inches)	Density/ Moisture	PID (ppm)	Field Identification of Soil	Remarks
26	11	G	7-11	firm/wet	0	dark reddish brown med to fine sands, some silts, trace clay	100% recovery
28			13-14				
30	12	G	6-9	tight/wet	0	med. reddish brown fine sands some silt, little clay	100% recovery
32			10-14				
0939 33-35	13	G	4-4	firm/wet	0	med. reddish brown fine sands some silts, some clay	100% recovery
35			5-8				
37	14	G	9-50/5"	firm/wet	0	as above	20% recovery
37							
38	15	G	12-30/2"	firm/wet	0	as above	20% recovery
1110 39							
40	16	G	8-40/4"	tight/wet	0	dark reddish brown med to fine sands, some silt, some clay	10% recovery
1125 41							
43	17	G	6-50/5"	tight/wet	0	light to med gray med. to fine sands, some silt, little clay	20% recovery
45							
48	18	G	10-13	tight/wet	0	med gray to white & buff coarse sands, little gravel, trace med sands	20% recovery
1145 50			17-17				
53	19	G	12-16	tight/wet	0	AS ABOVE	10% recovery
55			16-37				
334 58-60	20	G	14-18-	firm/wet	0	MED GRAYISH BROWN COARSE SANDS, SOME MED SANDS, TRACE GRAVEL, TRACE FINE SANDS	30% RECOVERY
60			23-24-				
1349 63	21	G	9-12	loose/wet	0	lt to med. grayish brown med sands some coarse, little silts	25% recovery
65			14-18				
1410 68	22	G	11-15-	loose/wet	0	lt grayish brown med to coarse sands, some gravel, little fine sands	20% recovery
70			17-19				
1430 73-75	23	G	20-40/2"	loose/wet	0	AS ABOVE end of hole @ 80'	10% recovery

Legend: MC = macrocore; SS = Split Spoon; HA = hand auger; HSA = hollow-stem auger;
tr. = trace = 0-10%; l. = little = 10-20%; s. = some = 20-35%; and = 35-50%;
(+) = upper end; (-) = lower end of limit
c = coarse; m = medium; f = fine

Fleming-Lee Shue	Environmental Management & Consulting 226 West 26th Street New York, N.Y. 10001 212-675-3225	CLIENT: 1800 Park Avenue LLC Project No.: 10052-001 Site Location: Harlem Hotel Site 1800 Park Ave., East Harlem	Boring No. HH-13 Date: 8/25/2004
Driller: Aquifer Drilling & Testing Geologist: Curt Schmidt, P.G.		Equipment: CME Rotary	

Depth (feet)	Sample No.	Sample Type	Blow Counts (per 6 inches)	Density/ Moisture	PID (ppm)	Field Identification of Soil	Remarks
1							
2							
3							
4							
5			3-3	v. moist ~~firm~~	0.0	gray - pale brown cmf SAND, some mf gravel, trace silt, brick concrete	7" Rec
6			10-50/3"		0.0		
7							
8							
9							~~8" Rec~~
10							
11			8-7	wet	0.0	reddish brown cm+f SAND, trace fine gravel tr. silt.	8" Rec
12			9-11	firm	0.0		
13			11-19	wet	0.0 0.1	grayish brown ~ brownish gray c(+)mf SAND, some(-) mf(+) gravel, concrete v. dk gray gravel frags in tip brick	18" Rec No Odor
14			30-43	firm	0.1 0.0		
15			6-13	wet	3.2 2.4	~~same~~ dk gray mf GRAVEL and c(+)mf SAND	12" Petrol Odor
16			13-14	firm	0.9 20.9		
17			11-11	wet	51.5	grayish brown c(+)mf SAND, some mf(+) gravel tr.(-) silt	12" Rec Slight petrol. odor
18			13-20	loose	15.4		
19			21-13	wet	0.0	Same	12" Rec.
20			11-9	sl. firm	0.0	red silty fine SAND in tip	No Odor
21			7-6	wet	0.1 0.0	reddish brown to brown mf SAND, little silt, occ. mf gravel (rounded)	15" Rec No Odor
22			6-8	firm	0.0 0.0		
23			14-15	wet	0.0	Same as 20-22	9" Rec No Odor
24			19-11	firm	0.0		

Legend: MC = macrocore; SS = Split Spoon; HA = hand auger; HSA = hollow-stem auger;
tr. = trace = 0-10%; l. = little = 10-20%; s. = some = 20-35%; and = 35-50%;
(+) = upper end; (-) = lower end of limit
c = coarse; m = medium; f = fine

Fleming-Lee Shue	*Environmental Management & Consulting* 226 West 26th Street New York, N.Y. 10001 212-675-3225	CLIENT: 1800 Park Avenue LLC	Boring No. HH-14
		Project No.: 10052-001	
		Site Location: Harlem Hotel Site 1800 Park Ave., East Harlem	Date: 8/25/2004
Driller: Aquifer Drilling & Testing Geologist: *Curt Schmidt, P.G.*		Equipment:	

Depth (feet) 0	Sample No.	Sample Type	Blow Counts (per 6 inches)	Density/ Moisture	PID (ppm)	Field Identification of Soil	Remarks
1							
2							
3							
4							
5							
6			18 21			No Recovery	
7			21 17				
8							
9							
10							
11			7-7	Moist	0.0	brown crs SAND and mf GRAVEL	12" Rec
12			8-11	firm	0.0	brick fragments	
13			13-19	firm	0	dk greyish brown - gy w/ yellow mottling	15" Rec
14			15-20	v moist - wet	0	crs GRAVEL and crs (+) SAND, tr. silt	Odor
15			18-16	firm	56.9	dk gray to black crs SAND	Petrol.
16			19-10	wet	36.6	and crs GRAVEL	Odor 11" Rec
17			12 15	"	43.7	dk brownish gray - black	14" Rec
18			19 23	slightly moist	30.1 @ 4.5 ft	crs SAND and (+) mf (+) GRAVEL tr silt	
19			7-6				No Rec
20			6-6				
21			8-10	firm	0.0	brown fine SAND, little (+) silt	14" Rec
22			11-10	wet	0.0	occ mf gravel	
23			12-16		0.0	same as 20-22	12" Rec
24			17-22	↓	0.0		
25							

Legend: MC = macrocore; SS = Split Spoon; HA = hand auger; HSA = hollow-stem auger;
tr. = trace = 0-10%; l. = little = 10-20%; s. = some = 20-35%; and = 35-50%;
(+) = upper end; (-) = lower end of limit
c = coarse; m = medium; f = fine

Fleming-Lee Shue	Environmental Management & Consulting 226 West 26th Street New York, N.Y. 10001 212-675-3225	CLIENT: 1800 Park Avenue LLC Project No.: 10052-001 Site Location: Harlem Hotel Site 1800 Park Ave., East Harlem	Boring No. HH-15 Date: 8/25/2004 Staff 8/26/2004 F. Lee
		Driller: Aquifer Drilling & Testing Geologist: Curt Schmidt, P.G.	Equipment: CME 75 HSA

Depth (feet)	Sample No.	Sample Type	Blow Counts (per 6 inches)	Density/ Moisture	PID (ppm)	Field Identification of Soil	Remarks
1							
2							
3							
4							
5							
6			7-6	Moist	0 0	red, brown - black c(f)m SAND and m GRAVEL, brick	6" Rec
7			11-10	firm	0 0	concrete, asphalt, crushed stone	Rubble
8							
9							
10							
11			5-6	v. moist - wet	0 0	Same as 5'-7'	5" Rec
12			6-12	firm	0 0		
13			21-30	firm	0 0	dark reddish brown c(f)m SAND, some(-) m gravel, trace silt	11" Rec No Odor
14			25-24	v. Moist - Moist	0 0	Concrete brick fragments	
15			9-9-	v. Moist Wet	30.9	v. dk gray - dark gray c(m) SAND, some(-) c(m) gravel (+/-) silt	10" Rec Petrol Odor
16			7-8	Sl. firm	74.9		
17			9-12	Wet	[illegible]	Same	Petrol Odor
18			10 10	firm	158 20.4		
19			7-8	Wet	0 0	brown - dk gray c(f)m SAND, some fine gravel, (+/-) silt	4" No Odor
20			10-6	Sl. firm	0 0		
21			7-7	v. moist - wet	0 0	reddish brown fine SAND some silt, occ. fine gravel.	14"
22			4-8	firm	0 0		
23			6-15	x	0 0	some m coarse sand - probably dragged down	
24			21-20	↓	0 0		

Legend: MC = macrocore; SS = Split Spoon; HA = hand auger; HSA = hollow-stem auger;
tr. = trace = 0-10%; l. = little = 10-20%; s. = some = 20-35%; and = 35-50%;
(+) = upper end; (-) = lower end of limit
c = coarse; m = medium; f = fine

Fleming-Lee Shue

Environmental Management & Consulting

226 West 26th Street
New York, N.Y. 10001
212-675-3225

CLIENT: 1800 Park Avenue LLC

Project No.: 10052-001

Site Location: Harlem Hotel Site
1800 Park Ave., East Harlem

Boring No. U.U. #16

Date: 2/20/2004
Started 0900
Finished 10:50

Driller: Aquifer Drilling & Testing

Geologist: ~~Curt Schmidt, P.G.~~ Joel Reigart

Equipment: PID

Depth (feet)	Sample No.	Sample Type	Blow Counts (per 6 inches)	Density/ Moisture	PID (ppm)	Field Identification of Soil	Remarks
0			/	Dry	0	asphalt pavement and stone	
2							
2			/	Dry	0	Bldg debris, wood, brick, concrete soil	
8							
8	1	G	5-5	loose Dry	0	med. reddish brown coarse sands and gravel, some med sands	loose 16% rec
10			8-7				
11	2	G	7-5	loose wet	0	as above with increasing med brown med sands	15% rec
12			7-5				
13	3	G	8-7	loose wet	0	as above little gravel and 250% med to coarse sands, trace silts	20% rec
14			8-7				
15	4	G	11-16	wet			
16			24-11				
17	5	G	11-12	empty/wet	0	no sample collected in spoon (14-16)	0% rec.
18			16-15			Dark brown, black coarse sands and gravel, some med brown med sands slight odor present	100% rec.
19	6	G	5-7	firm/wet	0	dark med brown med to fine sands, some silts. no odor	50% rec
20			8-9				100% rec
21	7	G	6-5	firm/wet	0	as above, clean, no odor	100% rec
22			5-3				
23	8	G	10-12	firm/wet	0	as above, clean no odors end of boring @ 25'	100% rec
24			13-15				

Legend: MC = macrocore; SS = Split Spoon; HA = hand auger; HSA = hollow-stem auger;
tr. = trace = 0-10%; l. = little = 10-20%; s. = some = 20-35%; and = 35-50%;
(+) = upper end; (-) = lower end of limit
c = coarse; m = medium; f = fine

Fleming-Lee Shue

Environmental Management & Consulting

226 West 26th Street
New York, N.Y. 10001
212-675-3225

CLIENT: 1800 Park Avenue LLC

Project No.: 10052-001

Site Location: Harlem Hotel Site
1800 Park Ave., East Harlem

Boring No. H.H. #17

Date: 8/26/2004
Started 1115
Finished 1315

Driller: Aquifer Drilling & Testing
Geologist: Curt Schmidt, P.G.

Equipment: PID

Depth (feet)	Sample No.	Sample Type	Blow Counts (per 6 inches)	Density/ Moisture	PID (ppm)	Field Identification of Soil	Remarks
0				Dry	–	asphalt pavement and crushed stone	casing shelled @ 5' to 25'
115 2							
3				Dry	–	construction debris, brick, stone concrete, wood pieces, etc	
8							
30 9	1	G	4-2-	wet/Dry	0	med to dark reddish brown gravel and coarse sands, some med. sands, trace silts and fine sands	25% rec
10			3-2				
11	2	G	5-7	loose/wet	0	as above	25% rec
12			7-6				
140 13	3	G	9-10	light/wet	2	dark reddish brown coarse sands, some gravel, some med sands to fine sands (oil stench)	25% rec
14			10-11				
15	4	G	6-13	firm/wet	10	coarse sands, some gravel, dark brown, black, oil presence little silt	50% recovery
155 16			23-46				
17	5	G	18-8	firm/wet	5	as above, less oil smell no gravel, more silt and m-f sands.	50% rec.
18			7-10				
19	6	G	10-8	firm/wet	0	med to dark reddish brown coarse to med sands, some m-f sands to silts no odors	100% rec.
245 20			7-9				
300 21	7	G	9-12	firm/wet	0	as above with increasing silts and fine sands no odors.	100%
22			13-14				
23	8	G	13-16	firm/wet	0	as above, no odors.	120%
315 24			17-20				

Legend: MC = macrocore; SS = Split Spoon; HA = hand auger; HSA = hollow-stem auger;
tr. = trace = 0-10%; l. = little = 10-20%; s. = some = 20-35%; and = 35-50%;
(+) = upper end; (-) = lower end of limit
c = coarse; m = medium; f = fine

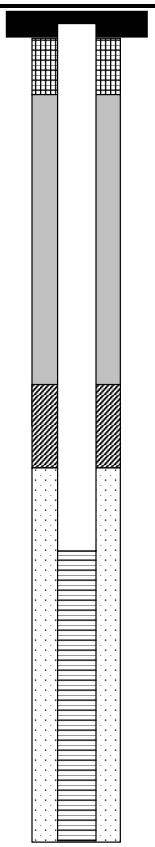
Fleming-Lee Shue	*Environmental Management & Consulting* 226 West 26th Street New York, N.Y. 10001 212-675-3225	CLIENT: 1800 Park Avenue LLC	Boring No. H.H. #78
		Project No.: 10052-001	
		Site Location: Harlem Hotel Site 1800 Park Ave., East Harlem	
Driller: Aquifer Drilling & Testing Geologist: Curt Schmidt, P.G.		Equipment: PID	Date: 8/27/2004 STARTED @ 730 FINISHED

	Depth (feet)	Sample No.	Sample Type	Blow Counts (per 6 inches)	Density/ Moisture	PID (ppm)	Field Identification of Soil	Remarks
0800	0	—	—	—	—	—	ASPHALT PAVEMENT AND CRUSHED STONE	
	2	—	—		—	—		
	3	—	—	—	—	—	ASSORTED CONSTRUCTION DEBRIS GRAVEL, STONE, BRICK, WOOD AND CONCRETE PIECES	CASING STARTED @ 5'
	8	—	—		—	—		
0830	9	1	G	3-8	loose WET	0	med brown med to coarse sands some gravel, tr. m-f brown sands	25% rec
	10			6-8				
	11	2	G	12-13	loose WET	0	med brown coarse sands, some m-f brown sands, little silt tr brick and gravel	25% rec.
	12			18-27				
0840	13	3	G	21-14	loose WET	0	as above	10% rec.
	14			11-11				
	15	4	G	11-13	loose WET	0	med to dark gray, black, brown gravel to coarse sands, little m-f sands, trace silts	2" recovery
	16			15-13				
0910	17	5	G	15-12	firm WET	4	dark brown, gray coarse sands little to med sand, some fine sand, silts free oil present	50% rec
	18			14-10				
0925	19	6	G	13-10	firm WET	0	mod reddish brown med to fine sands, some coarse sands, little silt no oil present	75% rec
	20			9-8				
	21	7	G	10-10	WET	0	coarse sands dark gray, brown gravel, some mod silts no oil present	50% rec
	22			9-10				
	23	8	G	18-21	WET	0	med reddish brown med to fine sands, some silt, little clay no oil present	100% rec.
	24			37-47				
	25	9	G		WET	0	END OF BORING AS ABOVE	100% rec.

Legend: MC = macrocore; SS = Split Spoon; HA = hand auger; HSA = hollow-stem auger;
tr. = trace = 0-10%; l. = little = 10-20%; s. = some = 20-35%; and = 35-50%;
(+) = upper end; (-) = lower end of limit
c = coarse; m = medium; f = fine

MONITORING WELL: MW-4

PROJECT ID:	**Harlem Park Site**	DATE WELL INSTALLED:	4/27/2011
LOCATION:	**1800 Park Avenue (East Harlem)**	FLS FIELD SUPERVISOR:	D. Grunat
FLS PROJECT NO.:	**10052-001**	TOTAL DEPTH:	20 ft bgs
CLIENT:	Vornado Realty Trust	WELL DIAMETER:	2-inch
SITE LOCATION:	New York, New York	SLOT SIZE:	0.020-inch
DRILLER:	ADT	SCREEN INTERVAL:	13-20 ft bgs
DRILLING METHOD:	Roto-Sonic	WELL COMPLETION:	6" Flush Mount Well Box
SOIL SAMPLING METHOD:	N/A	TOC Elevation:	20.91

DEPTH (FT) BELOW SURFACE					WELL CONSTRUCTION
0					
2					
4					
6					
8					
10					
12					
14					
16					
18					
				Bottom of Boring at 20 ft bgs	
20					

Legend:

- 2" diameter SCH 40 PVC Riser
- 2" diameter 0.010-inch slotted SCH 40 PVC well screen
- #2 Morie Silica Sand
- 3/8-inch Bentonite Chips
- Portland Cement
- Expanding Concrete

Notes:

TOC = top-of-casing
SCH = Schedule
ft bgs = feet below ground surface
PVC = polyvinyl chloride

Well completion:

Well screen 20 to 13 ft bgs, well riser 13 ft bgs to surface, sand from 20 ft bgs to 11 ft bgs, bentonite plug from 11 to 9 ft bgs, grout from 9 to 2 ft bgs, expanding concrete apron from 2 ft bgs to surface.

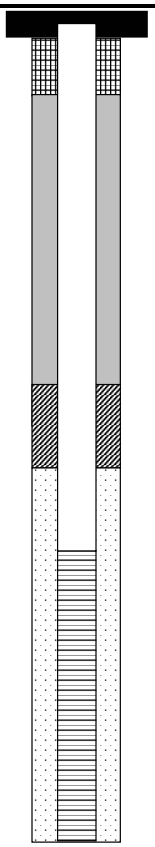
MONITORING WELL LOG

DATE: 7/25/2011 DRAWN BY: DG
SCALE: NTS REV. BY: JM

Fleming-Lee Shue, Inc.
158 W. 29th Street, 9th Floor
New York, New York 10001
(212) 675-3225

MONITORING WELL: MW-5

PROJECT ID:	**Harlem Park Site**	DATE WELL INSTALLED:	4/27/2011
LOCATION:	**1800 Park Avenue (East Harlem)**	FLS FIELD SUPERVISOR:	D. Grunat
FLS PROJECT NO.:	**10118**	TOTAL DEPTH:	20 ft bgs
CLIENT:	Vornado Realty Trust	WELL DIAMETER:	2-inch
SITE LOCATION:	New York, New York	SLOT SIZE:	0.020-inch
DRILLER:	ADT	SCREEN INTERVAL:	13-20 ft bgs
DRILLING METHOD:	Roto-Sonic	WELL COMPLETION:	6" Flush Mount Well Box
SOIL SAMPLING METHOD:	N/A	TOC Elevation:	21.19

DEPTH (FT) BELOW SURFACE					WELL CONSTRUCTION
0					
2					
4					
6					
8					
10					
12					
14					
16					
18					
				Bottom of Boring at 20 ft bgs	
20					

Legend:

- 2" diameter SCH 40 PVC Riser
- 2" diameter 0.010-inch slotted SCH 40 PVC well screen
- #2 Morie Silica Sand
- 3/8-inch Bentonite Chips
- Portland Cement
- Expanding Concrete

Notes:

TOC = top-of-casing
SCH = Schedule
ft bgs = feet below ground surface
PVC = polyvinyl chloride

Well completion:

Well screen 20 to 13 ft bgs, well riser 13 ft bgs to surface, sand from 20 ft bgs to 11 ft bgs, bentonite plug from 11 to 9 ft bgs, grout from 9 to 2 ft bgs, expanding concrete apron from 2 ft bgs to surface.

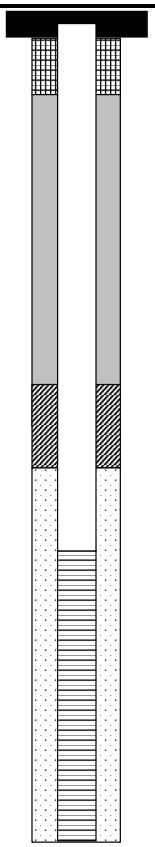
MONITORING WELL LOG

DATE: 7/25/2011 DRAWN BY: DG
SCALE: NTS REV. BY: JM

Fleming-Lee Shue, Inc.
158 W. 29th Street, 9th Floor
New York, New York 10001
(212) 675-3225

MONITORING WELL: MW-6

PROJECT ID:	**Harlem Park Site**	DATE WELL INSTALLED:	4/27/2011
LOCATION:	**1800 Park Avenue (East Harlem)**	FLS FIELD SUPERVISOR:	D. Grunat
FLS PROJECT NO.:	**10118**	TOTAL DEPTH:	20 ft bgs
CLIENT:	Vornado Realty Trust	WELL DIAMETER:	2-inch
SITE LOCATION:	New York, New York	SLOT SIZE:	0.020-inch
DRILLER:	ADT	SCREEN INTERVAL:	13-20 ft bgs
DRILLING METHOD:	Roto-Sonic	WELL COMPLETION:	6" Flush Mount Well Box
SOIL SAMPLING METHOD:	N/A	TOC Elevation:	20.79

DEPTH (FT) BELOW SURFACE					WELL CONSTRUCTION
0					
2					
4					
6					
8					
10					
12					
14					
16					
18					
				Bottom of Boring at 20 ft bgs	
20					

Legend:

- 2" diameter SCH 40 PVC Riser
- 2" diameter 0.010-inch slotted SCH 40 PVC well screen
- #2 Morie Silica Sand
- 3/8-inch Bentonite Chips
- Portland Cement
- Expanding Concrete

Notes:

TOC = top-of-casing
SCH = Schedule
ft bgs = feet below ground surface
PVC = polyvinyl chloride

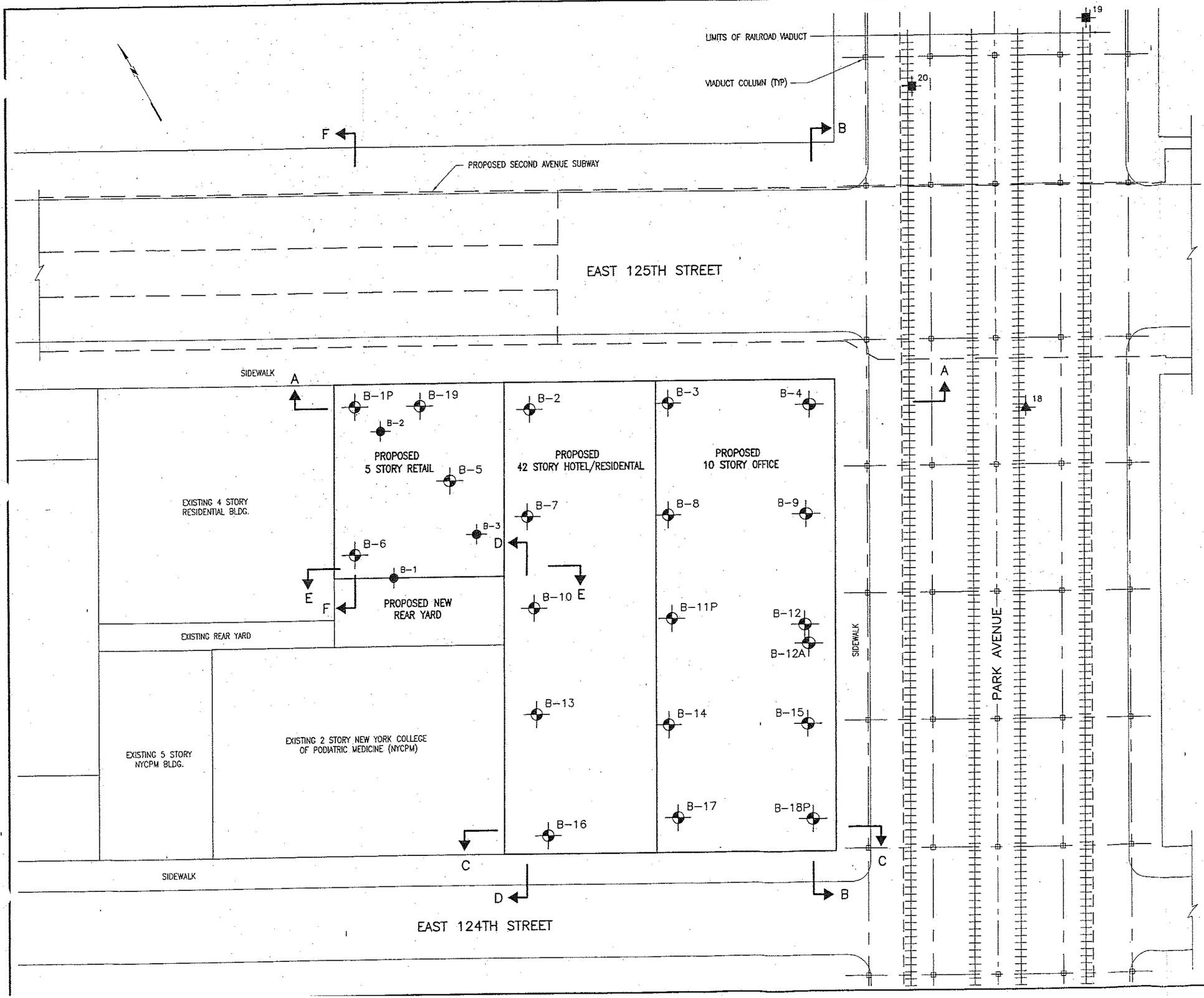
Well completion:

Well screen 20 to 13 ft bgs, well riser 13 ft bgs to surface, sand from 20 to 11 ft bgs, bentonite plug from 11 to 9 ft bgs, grout from 9 to 2 ft bgs, expanding concrete apron from 2 ft bgs to surface.

MONITORING WELL LOG

DATE: 7/25/2011 DRAWN BY: DG
SCALE: NTS REV. BY: JM

Fleming-Lee Shue, Inc.
158 W. 29th Street, 9th Floor
New York, New York 10001
(212) 675-3225



NOTES:

1. BASE PLAN FOR THIS DRAWING IS DRAWING NO. Z-1 "PLAN AND GENERAL INFORMATION SCHEME 'C'", ELECTRONIC FILE PROVIDED BY SCR DESIGN ORGANIZATION, DATED JANUARY 9, 2003.
2. AS-DRILLED LOCATIONS AND GROUND SURFACE ELEVATIONS FOR BORINGS NOS. B-1P THROUGH B-18P WERE TAKEN FROM SURVEY BY ANGELO J. FIORENZA SURVEYING, P.C., DATED 9-6-03. LOCATION AND ELEVATION OF BORING NO. B-19 WAS MEASURED BY MRCE.
3. BORINGS NOS. B-1P THROUGH B-19 WERE MADE BY CMI SUBSURFACE INVESTIGATIONS, INC. UNDER CONTINUOUS INSPECTION BY MRCE.
4. FOR GEOLOGIC SECTIONS A-A THROUGH F-F, SEE DRAWINGS NOS. GS-1 THROUGH GS-4.
5. RAILROAD VIADUCT LOCATION OBTAINED FROM TOPOGRAPHICAL AND STREET SURVEY, SHEET 11 OF 27, BY N. MASSAND, P.C., DATED 3/25/92.

LEGEND:

B-1P — BORING MADE IN SEPTEMBER, 2003.
"P" INDICATES PIEZOMETER INSTALLATION.

B-1 — BORING MADE IN 1994.

19 — BORING MADE IN 1992.

18 — BORING SHOWN ON MANHATTAN ROCK DATA MAP.

GRAPHIC SCALE

20' 10' 0 20' 40'

REV.	DATE	MADE BY	DESCRIPTION
1	10/21/03	R.T.W.	ADDED AS-DRILLED BORING LOCATIONS & SECTION MARKS, REVISED NOTES & LEGEND.

HARLEM HOTEL
NEW YORK NEW YORK

1800 PARK AVENUE, LLC
NEW YORK NEW YORK

MUESER RUTLEDGE CONSULTING ENGINEERS
14 PENN PLAZA – 225 W. 34TH STREET, NY, NY 10122

SCALE	MADE BY	DATE	FILE NO.
GRAPHIC	H.B.	8-19-03	10064
	CH'KD BY R.T.W.	8-19-03	DRAWING NO.

BORING LOCATION PLAN — B-1

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. B-1P
SHEET 1 OF 7
FILE NO. 10064
SURFACE ELEV. 21.8
RES. ENGR. RANDY NUNEZ

PROJECT: HARLEM HOTEL
LOCATION: NEW YORK, NEW YORK

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
09:30	1D	0.5	15	Brown fine to coarse sand, some silt, trace				6" Asphalt at surface.
09-08-03		2.0	13-12	gravel, brick, glass, mica, conc (Fill) (SM)				
Monday	2D	2.0	20-29	Brown to gray fine to medium sand, some				
Sunny		4.0	14-5	silt, trace gravel, cinders, brick (Fill) (SM)				
70°F	3D	4.0	9-4	Brown fine to coarse sand, some silt, trace		5		
		6.0	2-5	gravel, brick (Fill) (SM)				
	4D	6.0	6-4	Red brick and gravel, trace fine to medium				
		8.0	3-9	sand, silt (Fill) (GP)				
	5NR	8.0	75/0"	No recovery	F			Spoon bouncing.
						10		
	6D	10.0	2-5	Brown coarse to fine sand, trace silt, brick,				
		12.0	5-12	gravel (Fill) (SP-SM)				
								Wood in wash.
						15		
	7D	15.0	26-24	Black to brown fine to coarse sand, some				7D: petroleum odor.
		17.0	34-36	gravel, silt, mica (Fill) (SM)				Petroleum present
								in sample.
						18.5		
					S1	20		
	8D	20.0	6-4	Brown micaceous silty fine sand (SM)				
		22.0	4-7					
						25		
	9D	25.0	6-13	Do 8D (SM)				
		27.0	16-17					
						30		
	10D	30.0	6-6	Gray brown fine sand, some silt, trace mica				
		32.0	5-5	(SM)				
						35		
	11D	35.0	4-5	Gray brown fine sand, some silt, trace mica				
		37.0	6-8	(SM)				
						38.5		
						40		
	12D	40.0	1-4	Gray brown silt, some fine sand, trace clay,				
		42.0	6-8	mica, varved with med cl silt, tr cl sms (ML)				
	13U	42.0	PUSH=24"	Brown silt, trace fine sand, mica, varved with				WC=28, pp=1.0, 1.5
		44.0	REC=22"	trace silty clay (ML)	V			TV=0.3
						45		
	14D	45.0	5-4	Medium brn clayey silt, tr f sand, mica, vvd/w				
		47.0	5-5	silty clay, trace silt seams (ML&CL)				
	15U	47.0	PUSH=18"	Stiff brown clayey silt, varved with some silty				WC=32, pp=1.5, 2.0
		49.0	REC=12"	clay, silt (ML&CL)				TV=0.3, 0.6
						50		
	16D	50.0	2-5	Brown silt, some fine sand, trace mica, vvd/w				
		52.0	5-7	some stiff clayey silt, trace, clay seams (ML)				

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. B-1P
SHEET 2 OF 7
FILE NO. 10064
SURFACE ELEV. 21.8
RES. ENGR. RANDY NUNEZ

PROJECT: HARLEM HOTEL
LOCATION: NEW YORK, NEW YORK

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
09-08-03								
						55		
	17D	55.0	2-5	Brown silt, some fine sand, trace mica (ML)				
		57.0	11-14					
						60		
	18D	60.0	3-4	Brown silt, trace fine sand, vvd/w stiff clayey				
		62.0	5-4	silt, trace gray clay layers (ML)				
						65		
	19D	65.0	3-7	Brown silt, trace fine sand, varved with clayey				
		67.0	8-11	silt, trace clay seams (ML)				
						70		
	20D	70.0	3-3	Gray brown silt, trace fine sand, clay, varved	V			
		72.0	4-4	with stiff silty clay (ML&CL)				
14:30						75		
06:00 09-09-03 Tuesday	21D	75.0	2-5	Gray brown silt, trace fine sand, clay, varved				pp=1.0 tsf
		77.0	6-10	with stiff clayey silt, trace clay layers (ML)				
						80		
	22D	80.0	3-3	Gray brown silt, trace micaceous fine sand,				pp=0.5 tsf
		82.0	7-10	varved with medium clayey silt, trace				
				clay layers (ML)				Hard drilling at 84'.
						85		
	23D	85.0	8-7	Top 7": Do 22D, trace coarse sand (ML)				
		87.0	25-50	Bot 7": Gray fine to medium sand, some		86.4		
				gravel, silt, trace mica (SM)				
					T	90		
	24D	90.0	50-79	Brown silty fine to coarse sand, some gravel,				
		91.5	100/6"	clay, trace mica (SM)				Rods chattering at 92'.
						95		
	25D	95.0	32-27	Brown fine to medium sand, trace gravel, silt,				
		97.0	23-39	mica (SP-SM)				
						100		
	26D	100.0	100/4"	Brown fine to coarse sand, some silt, gravel,				
		100.3		trace mica, clay pockets (SM)				

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. B-1P
SHEET 3 OF 7
FILE NO. 10064
SURFACE ELEV. 21.8
RES. ENGR. RANDY NUNEZ

PROJECT: HARLEM HOTEL
LOCATION: NEW YORK, NEW YORK

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
09-09-03 Tuesday								
								Core barrel plugged.
	1C	102.5	REC=80%	Gray cobbles and gray brown coarse to fine sand, some silt, gravel, trace mica (SM)				
		107.5			T	105		
						110		
	27NR	110.0	100/0"	No recovery	R		8*	*Coring time in minutes per foot.
							10*	
	2C	110.0	REC=93%	Medium hard, slightly weathered, white marble and schistose gneiss, jointed			5*	
		115.0	RQD=82%"				6*	
						115	6*	
							4*	
	3C	115.0	REC=100%	Hard, slightly weathered, white schistose marble, moderately jointed			6*	3C: Rec 59", including 5 in. from run 2C
		119.5	RQD=98%				7*	
							9*	
14:00						119.5	20*	Core barrel blocked at 119.5'.
								End of boring at 119.5'.
						125		
								WC=Water Content in percent of dry weight.
						130		pp=Pocket Penetrometer Unconfined Compressive Strength in tsf.
						135		TV=Torvane Shear Strength in tsf.
						140		
						145		
						150		

SHEET 5 OF 7
FILE NO. 10064
SUBCODE

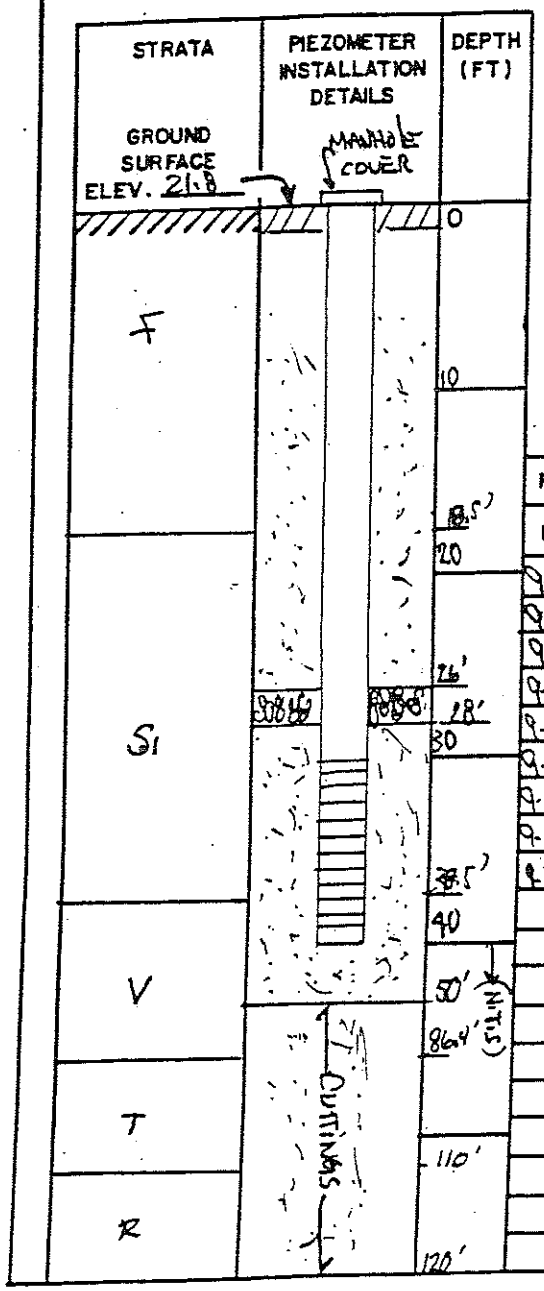
MUESER RUTLEDGE CONSULTING ENGINEERS

PIEZOMETER RECORD

PROJECT Harlem Hotel
LOCATION New York, NY
PIEZOMETER LOCATION See Plan
☐ SEE SKETCH ON BACK

PIEZOMETER NO. B-1P
DATE OF INSTALLATION 9-10-03
RES. ENG. J.C. Nunez

PIEZOMETER TYPE Slotted PVC



INTAKE POINT

depth to bottom, ft = 50
depth to top, ft = 28
length, ft = 22 = L
diameter, in = 4, ft = 0.33 = 2R

STANDPIPE/RISER

elevation of rim, ft = 21.8
diameter, in = 2, ft = 0.16 = 2r

READING TIME		DEPTH - RIM TO WATER (FT.)	ELEVATION OF WATER	REMARKS
DATE	CLOCK (hrs)			
9-10-03	1005	11.0	+10.8	
9-11-03	0638	14.8	+7.0	
9-11-03	0945	14.8	+7.0	
9-12-03	0840	14.7	+7.1	
9-15-03	0846	14.65	+7.1	
9-16-03	1422	14.6	+7.2	
9-18-03	1135	14.7	+7.1	
9-24-03	0835	14.6	+7.2	
9-29-03	0759	14.7	+7.1	

Sand Bentonite
Gravel Grout

GROUND SURFACE ELEV. 21.8

PIEZOMETER NO. B-1P

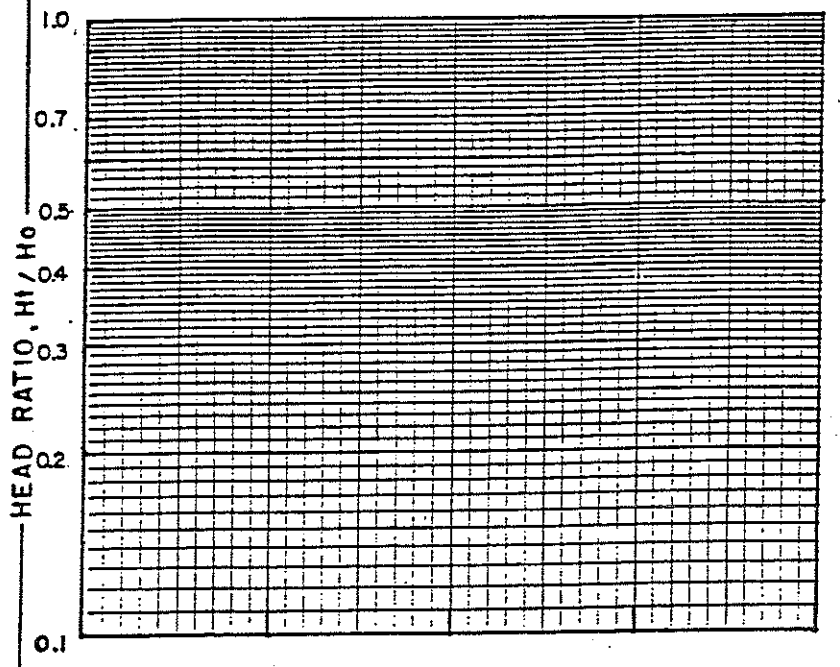
SHEET 6 OF 7
FILE NO. 10016
SUBCODE

MUESER RUTLEDGE CONSULTING ENGINEERS

VARIABLE HEAD PERMEABILITY TEST

☐ BOREHOLE OR ☒ PIEZOMETER NO. B-1P
TEST NO. 1

PROJECT Harlem Hotel — RES.ENG. T. NUNEZ
LOCATION NEW YORK, NY — CALC.BY ___ DATE ___
PIEZOMETER LOCATION see plan — CH'KD BY ___ DATE ___



ELAPSED TIME, Δt, MIN.

INTAKE POINT

depth to bottom, ft = 50
depth to top, ft = 28
length, ft = 22 = L
diameter, in = 4, ft = 0.33 = 2R

STANDPIPE/RISER

diameter, in = 2, ft = 0.16 = 2r

depth of casing, ft = 30

depth to which standpipe was bailed, ft = — = Z

READING TIME DATE	CLOCK	Δt MIN.	TEST DEPTH-RIM TO WATER ft.	DEPTH-RIM TO TIDE OR GWL ft.	UNBALANCED HEAD H ft.	HEAD RATIO H1/Ho	REMARKS Rim is 0.5" below grade.
9-16-03	1430 hrs			14.6	0		STATIC WATER LEVEL
							① Falling Head Test.
							filled w/ water to top of
							Rim. Water level down to
							14.6 ft (depth) in less than
							30 seconds.

PIEZOMETER NO. B-1P

MUESER RUTLEDGE CONSULTING ENGINEERS

		BORING NO.	B-1P
		SHEET	7 OF 7
PROJECT	HARLEM HOTEL	FILE NO.	10064
LOCATION	NEW YORK, NEW YORK	SURFACE ELEV.	21.8
BORING LOCATION	SEE BORING LOCATION PLAN	DATUM	BOROUGH PRESIDENT OF MANHATTAN

BORING EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG		TYPE OF FEED DURING CORING		CASING USED		[X] YES	[ ] NO		
TRUCK	CME-75	MECHANICAL		DIA., IN.	4	DEPTH, FT. FROM	0	TO	40
SKID		HYDRAULIC	X	DIA., IN.		DEPTH, FT. FROM		TO	
BARGE		OTHER		DIA., IN.		DEPTH, FT. FROM		TO	
OTHER									

TYPE AND SIZE OF:

D-SAMPLER	2" O.D. SPLIT SPOON
U-SAMPLER	FIXED PISTON
S-SAMPLER	
CORE BARREL	NX DOUBLE TUBE
CORE BIT	DIAMOND
DRILL RODS	NW

DRILLING MUD USED	[X] YES	[ ] NO	
DIAMETER OF ROTARY BIT, IN.	3-7/8, 5-7/8		
TYPE OF DRILLING MUD	REVERT		
AUGER USED	[ ] YES	[, X] NO	
TYPE AND DIAMETER, IN.			
CASING HAMMER, LBS.	300	AVERAGE FALL, IN.	24
SAMPLER HAMMER, LBS.	140	AVERAGE FALL, IN.	30

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION
					FOR PIEZOMETER READINGS SEE SHEET 5.

PIEZOMETER INSTALLED [X] YES [ ] NO SKETCH SHOWN ON SHEET 5

STANDPIPE:	TYPE	SCHEDULE 40 PVC	ID, IN.	2	LENGTH, FT.	30	TOP ELEV.	+21.8
INTAKE ELEMENT:	TYPE	SLOTTED PVC	OD, IN.	2-1/4	LENGTH, FT.	10	TIP ELEV.	-18.2
FILTER:	MATERIAL	SAND	OD, IN.	4	LENGTH, FT.	12	BOT. ELEV.	-18.2

PAY QUANTITIES

3.5" DIA. DRY SAMPLE BORING	LIN. FT.	108	NO. OF 3" SHELBY TUBE SAMPLES	
3.5" DIA. U-SAMPLE BORING	LIN. FT.		NO. OF 3" UNDISTURBED SAMPLES	2
CORE DRILLING IN ROCK	LIN. FT.	9.5	OTHER:	2 FEET BOULDER CORE

BORING CONTRACTOR	CMI SUBSURFACE INVESTIGATIONS, INC.		
DRILLER	JOHN IMPARATO	HELPERS	ROBERT TRANCHIRA
REMARKS			
RESIDENT ENGINEER	RANDY NUNEZ	DATE	09-10-03
		BORING NO.	B-1P

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. B-2
SHEET 1 OF 4
FILE NO. 10064
SURFACE ELEV. 21.3
RES. ENGR. RANDY NUNEZ

PROJECT: HARLEM HOTEL
LOCATION: NEW YORK, NEW YORK

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	CASING DEPTH	CASING BLOWS	REMARKS
11:00	1D	0.5	15-14	Brown fine to medium sand, some silt, gravel,				6" Asphalt at surface.
09-17-03		2.0	15	trace brick (Fill) (SM)				
Wednesday	2D	2.0	21-18	Do 1D, trace clay (Fill) (SM)				
Sunny		4.0	11-14					
70°F	3NR	4.0	12-6	No recovery		5		3D: 2 attempts.
		6.0	7-3					
	4D	6.0	7-6	Brown gravel , some fine to coarse sand,				
		8.0	4-15	trace silt (GP-GM)				
	5D	8.0	27-7	Brown fine to coarse sand, some brick, trace	F			
		10.0	9-10	silt, gravel (Fill) (SP-SM)		10		
	6D	10.0	4-10	Brown fine to coarse sand, trace silt, brick,				
		12.0	10-28	gravel (Fill) (SP-SM)				
						15		
	7D	15.0	16-8	Brown fine to coarse sand, trace silt, gravel				7D: Petroleum odor.
		17.0	9-15	(Fill) (SP-SM)				Petroleum present in
								sample.
						18.5		
						20		
	8D	20.0	6-8	Brown silt, some fine sand, trace fine sand	M			
		22.0	21-21	seams, mica (ML)				
						23.5		
						25		
	9D	25.0	16-14	Brown fine sand, trace silt, mica (SP-SM)	S1			
		27.0	13-9					
						28.5		
						30		
	10D	30.0	3-5	Stiff brown clayey silt, varved with silt, some				
		32.0	7-7	fine sand, trace mica, clay seams (ML)				
						35		
	11D	35.0	3-4	Brown silt, some fine sand, trace mica, clay,				
		37.0	8-12	clayey silt seams (ML)				
					V			
						40		
	12D	40.0	4-3	Brown silt, trace fine sand, mica, clay; varved				
		42.0	6-7	with medium clayey silt (ML)				
						45		
	13D	45.0	3-4	Medium brown clayey silt, varved with silt,				
		47.0	4-5	trace mica, clay layers (ML)				
						50		
	14D	50.0	3-4	Do 13D (ML)				
		52.0	4-6					

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. B-2
SHEET 2 OF 4
FILE NO. 10064
SURFACE ELEV. 21.3
RES. ENGR. RANDY NUNEZ

PROJECT: HARLEM HOTEL
LOCATION: NEW YORK, NEW YORK

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
09-17-03								
						55		
	15D	55.0	4-4	Brown silt, trace fine sand, varved with				
14:00		57.0	4-6	medium clayey silt, trace clay seams (ML)	V			
06:00	16U	57.0	PUSH=24"	Brown silt, some fine sand varved with some				WC=23
09-18-03		59.0	REC=22"	silt (ML)				pp=1.5, 2.0
Thursday						60		TV=0.3
Cloudy	17D	60.0	3-4	Brown silt, some fine sand, trace clay				
60°F		62.0	8-6	seams (ML)				
						65		
	18D	65.0	2-8	Brown silt, trace fine sand, varved with stiff				WC=33
		67.0	17-18	clayey silt, trace fine sand layers (ML)				
						69		
						70		Rods chattering at
	19D	70.0	40-59	Gray brown fine to medium sand, some silt,				69'.
		72.0	31-40	gravel, trace coarse sand (SM)	T			
						75		
	20D	75.0	100/5"	Gray rock fragments, trace fine to medium		75.4		Hard drilling from 75.4'
		75.4		sand, silt (GP-GM)				to 77'.
	1C	77.0	REC=83%	Medium hard, slightly weathered to highly			1.5*	
		82.0	RQD=63%	weathered, white gray calcareous gneissic			1.5*	
				schist, blocky to broken, weathered joints		80	1*	Lost water at 78.5'±;
							2.5*	water returned at 82'.
					R		3.5*	
	2C	82.0	REC=90%	Hard, slightly weathered, white gray calcareous			1.5*	*Coring time in
		87.0	RQD=82%	gneissic schist, moderately jointed			2*	minutes per foot.
						85	5*	
							7*	
11:00						87	6*	End of boring at 87'.
						90		
								WC=Water Content
								in percent of dry
								weight.
						95		pp=Pocket
								Penetrometer
								Unconfined Compres-
								sive Strength in tsf.
						100		TV=Torvane Shear
								Strength in tsf.

MUESER RUTLEDGE CONSULTING ENGINEERS
ROCK CORE SKETCH

BORING NO. B-2
SHEET 3 OF 4
FILE NO. 10064
SURFACE ELEV. 21.3
RES. ENGR. TC. Nunez

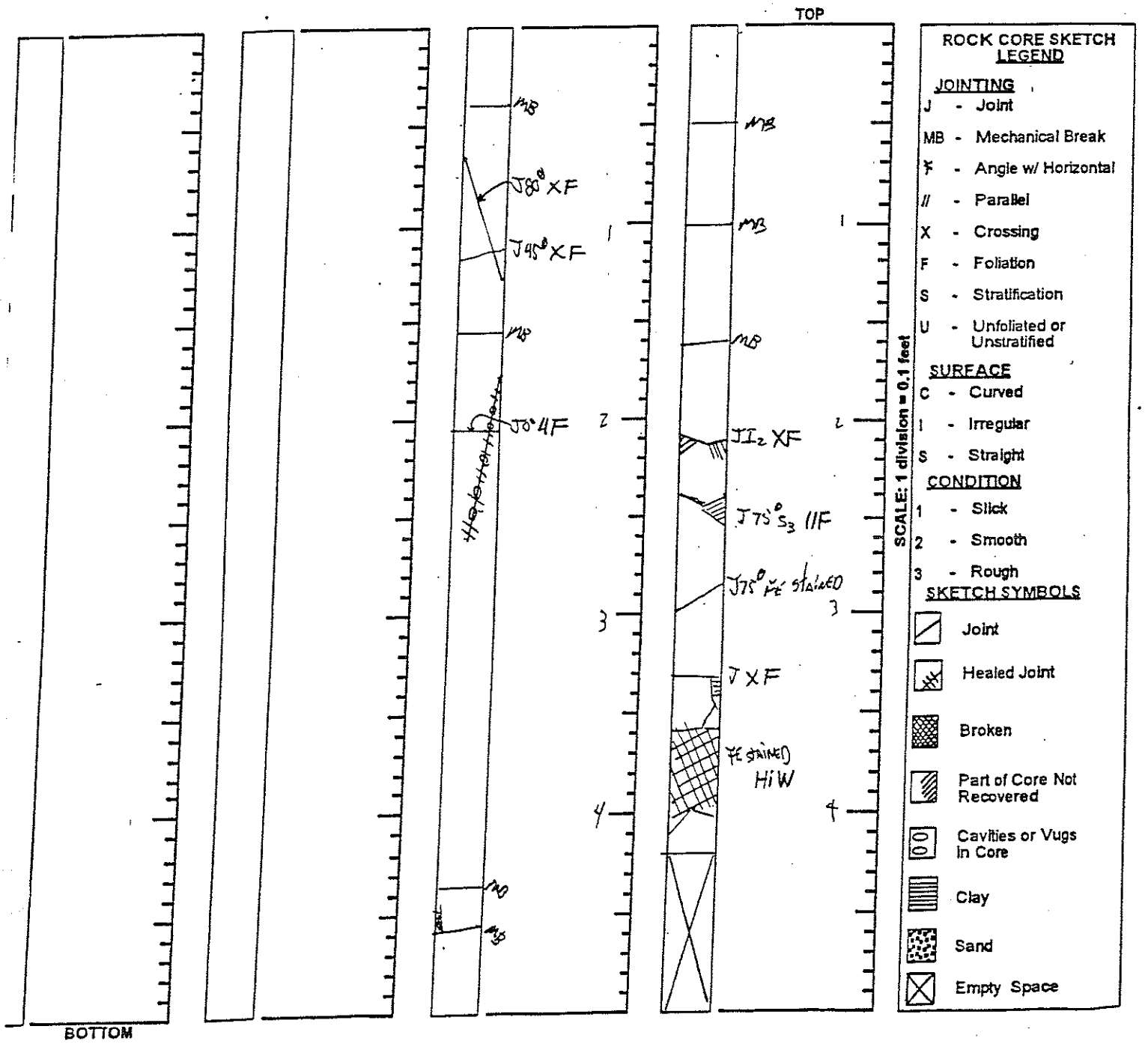
PROJECT Harlem Hotel
LOCATION NEW YORK, NY

Run No.	REC / RQD

Run No.	REC / RQD

Run No.	REC / RQD
2C	90 / 82%

Run No.	REC / RQD
1C	83 / 63%



MUESER RUTLEDGE CONSULTING ENGINEERS

		BORING NO.	B-2
		SHEET	4 OF 4
PROJECT	HARLEM HOTEL	FILE NO.	10064
LOCATION	NEW YORK, NEW YORK	SURFACE ELEV.	21.3
BORING LOCATION	SEE BORING LOCATION PLAN	DATUM	BOROUGH PRESIDENT OF MANHATTAN

BORING EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

		TYPE OF FEED DURING CORING		CASING USED		[X] YES [ ] NO		
TYPE OF BORING RIG								
TRUCK	CME-75	MECHANICAL		DIA., IN.	4	DEPTH, FT. FROM	0	TO 25
SKID		HYDRAULIC	X	DIA., IN.		DEPTH, FT. FROM		TO
BARGE		OTHER		DIA., IN.		DEPTH, FT. FROM		TO
OTHER								

TYPE AND SIZE OF:		DRILLING MUD USED	[X] YES [ ] NO
D-SAMPLER	2" O.D. SPLIT SPOON	DIAMETER OF ROTARY BIT, IN.	3-7/8, 5-7/8
U-SAMPLER	FIXED PISTON	TYPE OF DRILLING MUD	QUIK GEL
S-SAMPLER			
CORE BARREL	NX DOUBLE TUBE	AUGER USED	[ ] YES [X] NO
CORE BIT	DIAMOND	TYPE AND DIAMETER, IN.	
DRILL RODS	N		

CASING HAMMER, LBS.	300	AVERAGE FALL, IN.	24
SAMPLER HAMMER, LBS.	140	AVERAGE FALL, IN.	30

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION
					NO OBSERVATIONS MADE.

PIEZOMETER INSTALLED [ ] YES [X] NO SKETCH SHOWN ON

STANDPIPE:	TYPE	ID, IN.	LENGTH, FT.	TOP ELEV.	
INTAKE ELEMENT:	TYPE	OD, IN.	LENGTH, FT.	TIP ELEV.	
FILTER:	MATERIAL	OD, IN.	LENGTH, FT.	BOT. ELEV.	

PAY QUANTITIES

3.5" DIA. DRY SAMPLE BORING	LIN. FT.	77	NO. OF 3" SHELBY TUBE SAMPLES	
3.5" DIA. U-SAMPLE BORING	LIN. FT.		NO. OF 3" UNDISTURBED SAMPLES	1
CORE DRILLING IN ROCK	LIN. FT.	10	OTHER:	

BORING CONTRACTOR	CMI SUBSURFACE INVESTIGATIONS, INC.		
DRILLER	JOHN IMPARATO	HELPERS	CARLOS MALDONADO
REMARKS	GROUTED BOREHOLE UPON COMPLETION.		
RESIDENT ENGINEER	RANDY NUNEZ	DATE	09-18-03

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. B-3
SHEET 1 OF 4
FILE NO. 10064
SURFACE ELEV. 20.8
RES. ENGR. RANDY NUNEZ

PROJECT: HARLEM HOTEL
LOCATION: NEW YORK, NEW YORK

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	CASING DEPTH	CASING BLOWS	REMARKS
06:00	1D	0.5	99-100/6"	Brown coarse to fine sand, asphalt, trace				6" Asphalt at surface.
09-12-03		1.5		brick, silt (Fill) (SP-SM)				
Friday	2D	2.0	16-3	Do 1D (Fill) (SP-SM)				
Partly		4.0	7-6					
Cloudy	3D	4.0	100/5"	Wood (Fill)		5		Spoon bouncing.
60°F		4.4						
	4D	6.0	3-5	Brown coarse to fine sand, some silt, trace				
		8.0	4-4	brick (Fill) (SM)				
	5D	8.0	10-100/5"	Brown coarse to fine sand, some brick, silt,				
		8.9		trace gravel, wood (Fill) (SM)	F	10		
	6D	10.0	24-21	Brown coarse to fine sand and gravel, trace				
		12.0	9-14	brick, silt (Fill) (SP&GP)				
						15		
	7D	15.0	24-26	Brown coarse to fine sand, some silt, gravel,				7D: Petroleum odor.
		17.0	29-25	trace brick (Fill) (SM)				
						18.5		
						20		
	8D	20.0	20-25	Brown fine sandy silt, trace mica, gravel (ML)				
		22.0	20-17					
						25		
	9D	25.0	15-16	Brown fine sandy silt, trace mica (ML)				
		27.0	21-23		M			
						30		
	10D	30.0	6-8	Brown silt, trace fine sand, clay, mica, clayey				
		32.0	12-13	silt seams (ML)				
						35		
	11D	35.0	9-14	Brown silt, some fine sand, trace clay, clayey				
		37.0	14-13	silt seams, mica (ML)				
						38.5		
						40		
	12D	40.0	4-5	Brown medium clayey silt, varved with silt, tr				pp=1.0 tsf
		42.0	6-7	clay seams (ML)				
	13U	42.0	PUSH=24"	Brown silt, varved with some silt, some fine				WC=27, PP=2.0, 2.5
		44.0	REC=19"	sand (ML)				TV=0.3
						45		
	14D	45.0	4-5	Brown silt, trace fine sand, varved with	V			pp=1.0 tsf
		47.0	5-6	medium stiff clayey silt, trace clay seams (ML)				
						50		
	15D	50.0	5-5	Medium brown clayey silt, varved with silty				pp=1.0 tsf
		52.0	4-6	clay, trace silt seams (ML&CL)				

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. B-3
SHEET 2 OF 4
FILE NO. 10064
SURFACE ELEV. 20.8
RES. ENGR. RANDY NUNEZ

PROJECT: HARLEM HOTEL
LOCATION: NEW YORK, NEW YORK

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
09-12-03 Friday								
					V	55		
	16D	55.0	3-5	Top 16": Brown silt, sm fine sand, tr mica,		56		
		57.0	26-37	varved with some clayey silt (ML)				
				Bot 3": Lt gray f-c sand, sm silt, tr gravel (SM)	T			
						59	3*	Hard drilling.
	1C	59.0	REC=100%	Hard, slightly weathered, white gray schistose		60	2.5*	
		64.0	RQD=100%	marble, blocky, iron stained joints			2.5*	*Coring time in
							2*	minutes per foot.
							2.5*	
					R			
	2C	64.0	REC=83%	Medium hard, slightly weathered, gry calcareous		65		
		69.0	RQD=67%	schistose gneiss, moderately jointed to				
				jointed, iron stained joints to weathered joints				
12:45						69		End of boring at 69'
						70		
								WC=Water Content in percent of dry weight.
						75		pp=Pocket Penetrometer Unconfined Compressive Strength in tsf.
						80		TV=Torvane Shear Strength in tsf.
						85		
						90		
						95		
						100		

MUESER RUTLEDGE CONSULTING ENGINEERS
ROCK CORE SKETCH

BORING NO. B-3
SHEET 3 OF 4
FILE NO. 10164
SURFACE ELEV. 20.8
RES. ENGR. TC NUNN

PROJECT HARLEM HOTEL
LOCATION NEW YORK, NY

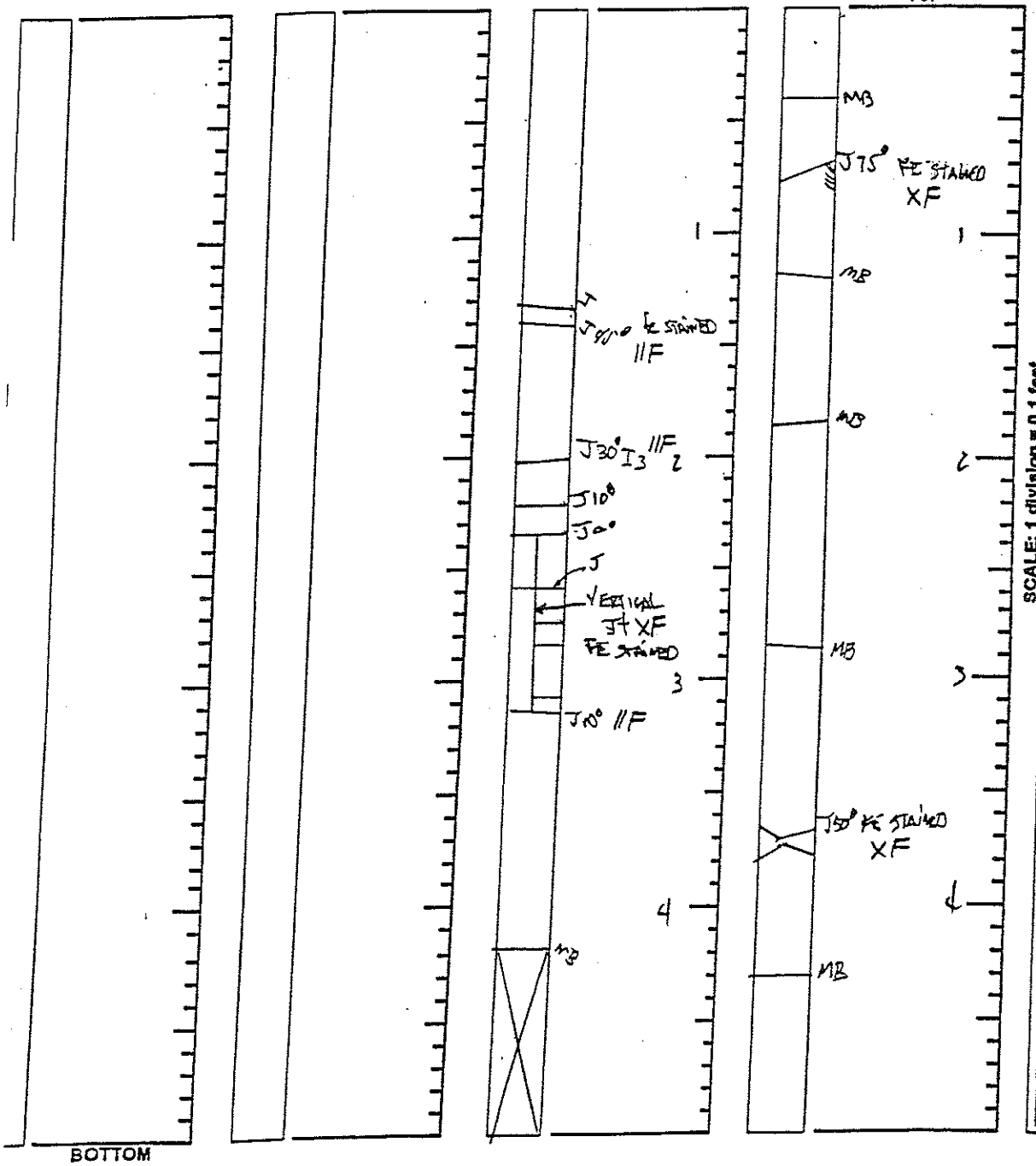
Run No.	REC / RQD

Run No.	REC / RQD

Run No.	REC / RQD
2C	83/67%

Run No.	REC / RQD
1C	100/100%

TOP



SCALE: 1 division = 0.1 feet

ROCK CORE SKETCH LEGEND

JOINTING
- J - Joint
- MB - Mechanical Break
- ∠ - Angle w/ Horizontal
- // - Parallel
- X - Crossing
- F - Foliation
- S - Stratification
- U - Unfoliated or Unstratified

SURFACE
- C - Curved
- I - Irregular
- S - Straight

CONDITION
- 1 - Slick
- 2 - Smooth
- 3 - Rough

SKETCH SYMBOLS
- Joint
- Healed Joint
- Broken
- Part of Core Not Recovered
- Cavities or Vugs in Core
- Clay
- Sand
- Empty Space

MUESER RUTLEDGE CONSULTING ENGINEERS

		BORING NO.	B-3
		SHEET	4 OF 4
PROJECT	HARLEM HOTEL	FILE NO.	10064
LOCATION	NEW YORK, NEW YORK	SURFACE ELEV.	20.8
BORING LOCATION	SEE BORING LOCATION PLAN	DATUM	BOROUGH PRESIDENT OF MANHATTAN

BORING EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG		TYPE OF FEED DURING CORING		CASING USED					
TRUCK	CME 75	MECHANICAL		DIA., IN.	4	DEPTH, FT. FROM	0	TO	25
SKID		HYDRAULIC	X	DIA., IN.		DEPTH, FT. FROM		TO	
BARGE		OTHER		DIA., IN.		DEPTH, FT. FROM		TO	
OTHER									

TYPE AND SIZE OF:					
D-SAMPLER	2" O.D. SPLIT SPOON	DRILLING MUD USED	X YES		NO
U-SAMPLER	FIXED-PISTON	DIAMETER OF ROTARY BIT, IN.	3-7/8, 5-7/8		
S-SAMPLER		TYPE OF DRILLING MUD	QUIK-GEL		
CORE BARREL	NX DOUBLE TUBE	AUGER USED		YES	X NO
CORE BIT	DIAMOND	TYPE AND DIAMETER, IN.			
DRILL RODS	N				

CASING HAMMER, LBS.	300	AVERAGE FALL, IN.	24
SAMPLER HAMMER, LBS.	140	AVERAGE FALL, IN.	30

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION
					NO OBSERVATIONS MADE.

PIEZOMETER INSTALLED ☐ YES ☒ NO SKETCH SHOWN ON

STANDPIPE:	TYPE		ID, IN.		LENGTH, FT.		TOP ELEV.		
INTAKE ELEMENT:	TYPE		OD, IN.		LENGTH, FT.		TIP ELEV.		
FILTER:	MATERIAL		OD, IN.		LENGTH, FT.		BOT. ELEV.		

PAY QUANTITIES

3.5" DIA. DRY SAMPLE BORING	LIN. FT.	59	NO. OF 3" SHELBY TUBE SAMPLES		
3.5" DIA. U-SAMPLE BORING	LIN. FT.		NO. OF 3" UNDISTURBED SAMPLES		1
CORE DRILLING IN ROCK	LIN. FT.	10	OTHER:		

BORING CONTRACTOR	CMI SUBSURFACE INVESTIGATIONS, INC.		
DRILLER	JOHN IMPARATO	HELPERS	ROBERT TRANCHIDA
REMARKS	GROUTED BOREHOLE UPON COMPLETION.		
RESIDENT ENGINEER	RANDY NUNEZ	DATE	09-12-03

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. B-4
SHEET 1 OF 4
FILE NO. 10064
SURFACE ELEV. 21.3
RES. ENGR. RANDY NUNEZ

PROJECT: HARLEM HOTEL
LOCATION: NEW YORK, NEW YORK

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
12:15	1D	1.0	22-9	Brown coarse to fine sand, some gravel,				6" Asphalt at surface.
09-10-03		3.0	14-12	trace brick, silt (Fill) (SP-SM)				
Wednesday	2D	3.0	5-6	Brown fine to coarse sand, some silt, brick,				
Sunny		5.0	6-4	gravel (Fill) (SM)				
70°F	3D	5.0	5-2	Brown fine to coarse sand, some silt, trace		5		
		7.0	1-1	brick, wood (Fill) (SM)				
	4D	7.0	4-4	Brown fine to coarse sand, some silt, brick,				
		9.0	5-5	mortar, trace wood (Fill) (SM)				
						10		
	5D	10.0	40-33	Brown fine to medium sand, some silt, trace	F			
14:30		12.0	18-7	gravel, coarse sand, cinders (Fill) (SM)				
06:00								
09-11-03								
Thursday						15		
70°F	6D	15.0	27-27	Gray gravel, trace fine sand, silt, concrete				
		17.0	21-29	(Fill) (GP-GM)				
						20		
	7D	20.0	14-12	Brown coarse to fine sand, some gravel,				
		22.0	13-14	trace silt, brick (Fill) (SP-SM)				
						23.5		
						25		
	8D	25.0	14-15	Red brown silt, some fine sand, trace clay,				
		27.0	15-17	mica (ML)				
						30		
	9D	30.0	14-15	Red brown silt, trace fine sand, clay, clayey	M			pp=1.25 tsf
		32.0	15-19	silt seams (ML)				
						35		
	10D	35.0	7-9	Do 9D (ML)				
		37.0	8-10					
						38.5		
						40		
	11D	40.0	7-8	Gray brown silt, trace fine sand, clay, varved				
		42.0	9-11	with stiff clayey silt, trace clay seams (ML)				
					V			
						45		
	12D	45.0	7-14	Brown silt, some fine sand, trace clay,				
		47.0	19-31	mica, varved with some stiff clayey silt (ML)		46.5		
					T	50		
	13D	50.0	100/5"	Brown fine to medium sand, some silt, trace				
		50.4		gravel, mica (SM)				

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. B-4
SHEET 2 OF 4
FILE NO. 10064
SURFACE ELEV. 21.3
RES. ENGR. RANDY NUNEZ

PROJECT: HARLEM HOTEL
LOCATION: NEW YORK, NEW YORK

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
09-11-03								
					T	55		
	14D	55.0	57-100/2"	Brown silty fine to medium sand, sm gravel,				
		55.7		trace mica (SM)				
								Hard drilling
						60		
	15NR	60.0	100/0"	No recovery				
	1C	62.0	REC=98%	Hard, slightly weathered, gray calcareous				
		67.0	RQD=98%	schistose gneiss, blocky				
						65		
					R			
							4*	*Coring time in
	2C	67.0	REC=100%	Do 1C			3*	minutes per foot.
		72.0	RQD=100%				3*	
						70	3*	
							4*	
						72		End of boring at 72'.
						75		
						80		pp=Pocket
								Penetrometer
								Unconfined Compres-
								sive Strengt in tsf.
						85		
						90		
						95		
						100		

MUESER RUTLEDGE CONSULTING ENGINEERS
ROCK CORE SKETCH

BORING NO. B-4
SHEET 3 OF 4
FILE NO. 10004
SURFACE ELEV. 21.3
RES. ENGR. T. NUNEZ

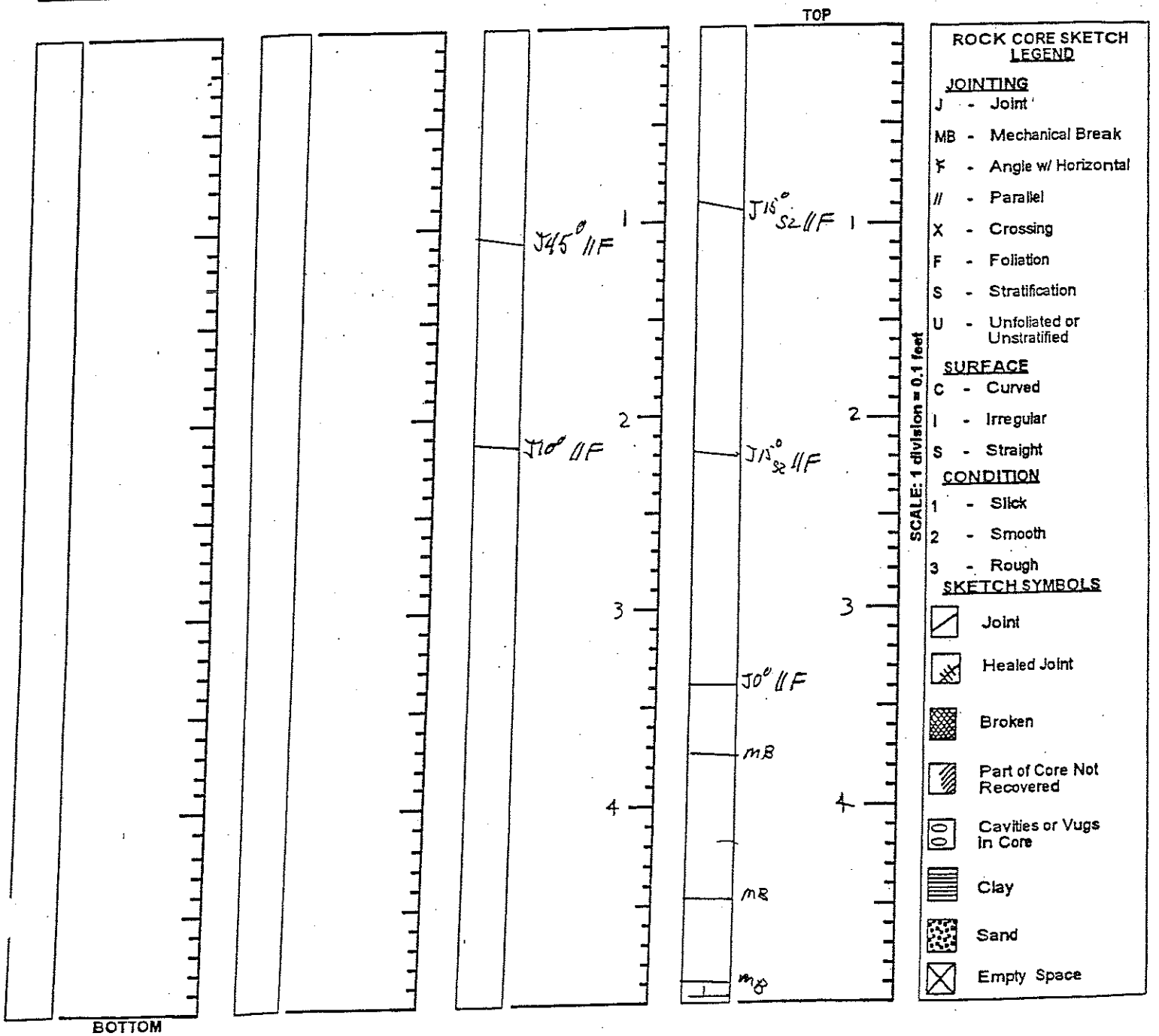
PROJECT Harlem Hotel
LOCATION NEW YORK, NY

Run No.	REC / RQD

Run No.	REC / RQD

Run No.	REC / RQD
2C	100/100

Run No.	REC / RQD
1C	98/98%



ROCK CORE SKETCH
LEGEND

JOINTING
J - Joint
MB - Mechanical Break
∠ - Angle w/ Horizontal
// - Parallel
X - Crossing
F - Foliation
S - Stratification
U - Unfoliated or Unstratified

SURFACE
C - Curved
I - Irregular
S - Straight

CONDITION
1 - Slick
2 - Smooth
3 - Rough

SKETCH SYMBOLS
Joint
Healed Joint
Broken
Part of Core Not Recovered
Cavities or Vugs In Core
Clay
Sand
Empty Space

NOTES

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING NO. B-4
SHEET 4 OF 4
FILE NO. 10064
SURFACE ELEV. 21.3
DATUM BOROUGH PRESIDENT OF MANHATTAN

PROJECT HARLEM HOTEL
LOCATION NEW YORK, NEW YORK
BORING LOCATION SEE BORING LOCATION PLAN

BORING EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG		TYPE OF FEED DURING CORING		CASING USED		X YES		NO		
TRUCK	MOBILE B-61	MECHANICAL		DIA., IN.	4	DEPTH, FT. FROM	0	TO	25
SKID		HYDRAULIC	X	DIA., IN.		DEPTH, FT. FROM		TO	
BARGE		OTHER		DIA., IN.		DEPTH, FT. FROM		TO	
OTHER									

TYPE AND SIZE OF:

D-SAMPLER	2" O.D. SPLIT SPOON
U-SAMPLER	
S-SAMPLER	
CORE BARREL	NX-DOUBLE TUBE
CORE BIT	DIAMOND
DRILL RODS	N

DRILLING MUD USED X YES NO
DIAMETER OF ROTARY BIT, IN. 3-7/8, 5-7/8
TYPE OF DRILLING MUD QUIK- GEL

AUGER USED YES X NO
TYPE AND DIAMETER, IN.

CASING HAMMER, LBS. 300 AVERAGE FALL, IN. 24
SAMPLER HAMMER, LBS. 140 AVERAGE FALL, IN. 30

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION
					NO OBSERVATIONS MADE.

PIEZOMETER INSTALLED YES X NO SKETCH SHOWN ON

STANDPIPE:	TYPE		ID, IN.		LENGTH, FT.		TOP ELEV.	
INTAKE ELEMENT:	TYPE		OD, IN.		LENGTH, FT.		TIP ELEV.	
FILTER:	MATERIAL		OD, IN.		LENGTH, FT.		BOT. ELEV.	

PAY QUANTITIES

3.5" DIA. DRY SAMPLE BORING	LIN. FT.	62	NO. OF 3" SHELBY TUBE SAMPLES	
3.5" DIA. U-SAMPLE BORING	LIN. FT.		NO. OF 3" UNDISTURBED SAMPLES	
CORE DRILLING IN ROCK	LIN. FT.	10	OTHER:	

BORING CONTRACTOR CMI SUBSURFACE INVESTIGATIONS, INC.
DRILLER MIKE MCERLEAN HELPERS BERT MOLZAHN
REMARKS GROUTED BOREHOLE UPON COMPLETION.
RESIDENT ENGINEER RANDY NUNEZ DATE 09-11-03

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. B-5
SHEET 1 OF 5
FILE NO. 10064
SURFACE ELEV. 21.1
RES. ENGR. RANDY NUNEZ

PROJECT: HARLEM HOTEL
LOCATION: NEW YORK, NEW YORK

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
	1D	0.5	33-35	Brown fine to coarse sand, some gravel, silt,				6" Asphalt at surface.
09-18-03		2.0	22	trace brick (Fill) (SM)				
Thursday	2D	2.0	12-16	Red brick (Fill)				
Cloudy		4.0	13-26					
75°F	3D	4.0	8-7	Red brick and cinders, trace gravel (Fill)		5		
		6.0	5-3					
	4D	6.0	2-2	Brown fine to coarse sand, some brick, trace				
		8.0	2-2	silt, cinders (Fill) (SP-SM)	F			Lost water at 8'.
						10		
	5D	10.0	3-2	Brown fine to coarse sand, some brick, trace				
		12.0	3-25	silt, gravel (Fill) (SP-SM)				
						15		
	6D	15.0	19-54	Brown black fine to coarse sand, some gravel,				7D: Petroleum odor.
		17.0	24-8	silt (Fill) (SM)				Petroleum present in
								sample.
						18.5		
						20		
	7D	20.0	9-8	Brown silty fine sand, trace mica (SM)				Low recovery.
14:00		22.0	11-10					
06:00					S1			
09-22-03								
Monday						25		
Cloudy	8D	25.0	14-19	Brown fine sand, some silt, trace mica (SM)				
70°F		27.0	17-15					
						28.5		
						30		
	9D	30.0	16-17	Brown silt, trace clay, mica with some clayey				
		32.0	11-11	silt seams (ML)				
						35		
	10D	35.0	4-4	Brown silt, some fine sand, trace clay, clayey				
		37.0	6-12	silt seams, fine sand layers, mica (ML)	M			
						40		
	11D	40.0	5-8	Brown silt, some fine sand, trace clay, clayey				
		42.0	9-8	silt seams, mica (ML)				
						43.5		
						45		
	12D	45.0	3-3	Medium brown clayey silt, varved with gray				WC=40, pp=0.5 tsf
		47.0	5-6	silty clay, trace silt seams (ML&CL)				
	13U	48.0	PUSH=24"	Stiff brown silt, varved with trace silty clay (ML)	V			WC=32, pp=1.0
		50.0	REC=21"					TV=0.4, 0.6
						50		
	14D	50.0	4-6	Brown silt, trace fine sand, clay, varved with				WC=26
		52.0	7-10	medium clayey silt, trace clay seams (ML)				

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. B-5
SHEET 2 OF 5
FILE NO. 10064
SURFACE ELEV. 21.1
RES. ENGR. RANDY NUNEZ

PROJECT: HARLEM HOTEL
LOCATION: NEW YORK, NEW YORK

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
09-22-03								
	15U	53.0	PUSH=21"	Brown silt, varved with some silt, some fine				WC=32, pp=1.0
		55.0	REC=17"	sand, trace silty clay (ML)		55		TV=0.2
	16D	55.0	6-6	Top 12": Brown silt, trace fine sand, clay, mica,				
		57.0	8-8	clayey silt seams (ML)				
				Bot 12": Brown fine sandy silt, trace clay, mica				
				(ML)		60		
	17D	60.0	3-3	Brown silt, trace fine sand, varved with medium				WC=34
		62.0	5-5	red brown clayey silt, trace clay seams (ML)				
	18U	62.0	PUSH=24"	Do 17D (ML)				WC=28, pp=1.0, 1.5
		64.0	REC=21"					TV=0.3, 0.4
						65		
	19D	65.0	2-3	Do 17D (ML)				WC=27
		67.0	4-5					
	20U	67.0	PUSH=24"	Do 17D (ML)				WC=25, pp=1.0, 2.0
		69.0	REC=22"					TV=0.3
						70		
	21D	70.0	3-4	Do 17D (ML)	V			WC=40
		72.0	6-6					
	22U	72.0	PUSH=18"	Brown silt, varved with some silty clay, trace				WC=36, pp=2.0
		74.0	REC=17"	micaceous coarse to fine sand (ML+CL)				TV=0.4. 0.6
						75		
	23D	75.0	4-6	Do 17D, trace gravel (ML)				WC=27
		77.0	7-11					
								Sand in wash; drilled
						80		to 80'.
	24D	80.0	3-4	Brown silt, trace clay, fine to medium				
		82.0	5-5	sand seams (ML)				
	25U	82.0	PUSH=24"	No recovery				Sample fell out,
		84.0	REC=0"					pushed split spoon
						84.5		at 82', REC=0"
	26D	85.0	29-20	Gray brown fine to coarse sand, some silt,				
		87.0	23-16	gravel, trace mica (SM)				Rods chattering at
								84.5'.
14:00						90		
06:00	27D	90.0	100/3"	Gray gravel, trace fine sand, silt (GP-GM)				Boulder 90.2' to 91.7'.
09-24-03		90.3						
Wednesday					T			
Clear								*Coring time in
60°F						95		minutes per foot.
	28D	95.0	85-91	Gray rock fragments, some fine to coarse sand,				
		96.4	100/5"	trace silt, clay (GP-GM)		97		Lost water.
	1C	97.0	REC=100%	Medium hard, slightly weathered to moderately			4.5*	Hard drilling to 97'.
		102.0	RQD=68%	weathered, gray schistose gneiss, jointed to			5*	
				closely jointed, weathered joints	R	100	7*	Core barrel getting
							6*	blocked.
							7*	

MRCE Form BL-1

BORING NO. B-5

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. B-5
SHEET 3 OF 5
FILE NO. 10064
SURFACE ELEV. 21.1
RES. ENGR. RANDY NUNEZ

PROJECT: HARLEM HOTEL
LOCATION: NEW YORK, NEW YORK

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
09-24-03	2C	102.0	REC=87%	Medium hard, slightly weathered, white gray schistose gneiss and pegmatite, jointed to closely jointed, weathered joints	R	105		2C: Average drilling rate 9 minutes per foot.
		107.0	RQD=68%					
10:45						107		End of boring at 107'.
						110		WC=Water Content in percent of dry weight. pp=Pocket Penetrometer Unconfined Compressive Strength in tsf.
						115		TV=Torvane Shear Strenght in tsf.
						120		
						125		
						130		
						135		
						140		
						145		
						150		

MUESER RUTLEDGE CONSULTING ENGINEERS
ROCK CORE SKETCH

BORING NO. B-5
SHEET 4 OF 5
FILE NO. 10064
SURFACE ELEV. 21.1
RES. ENGR. K. NUNEZ

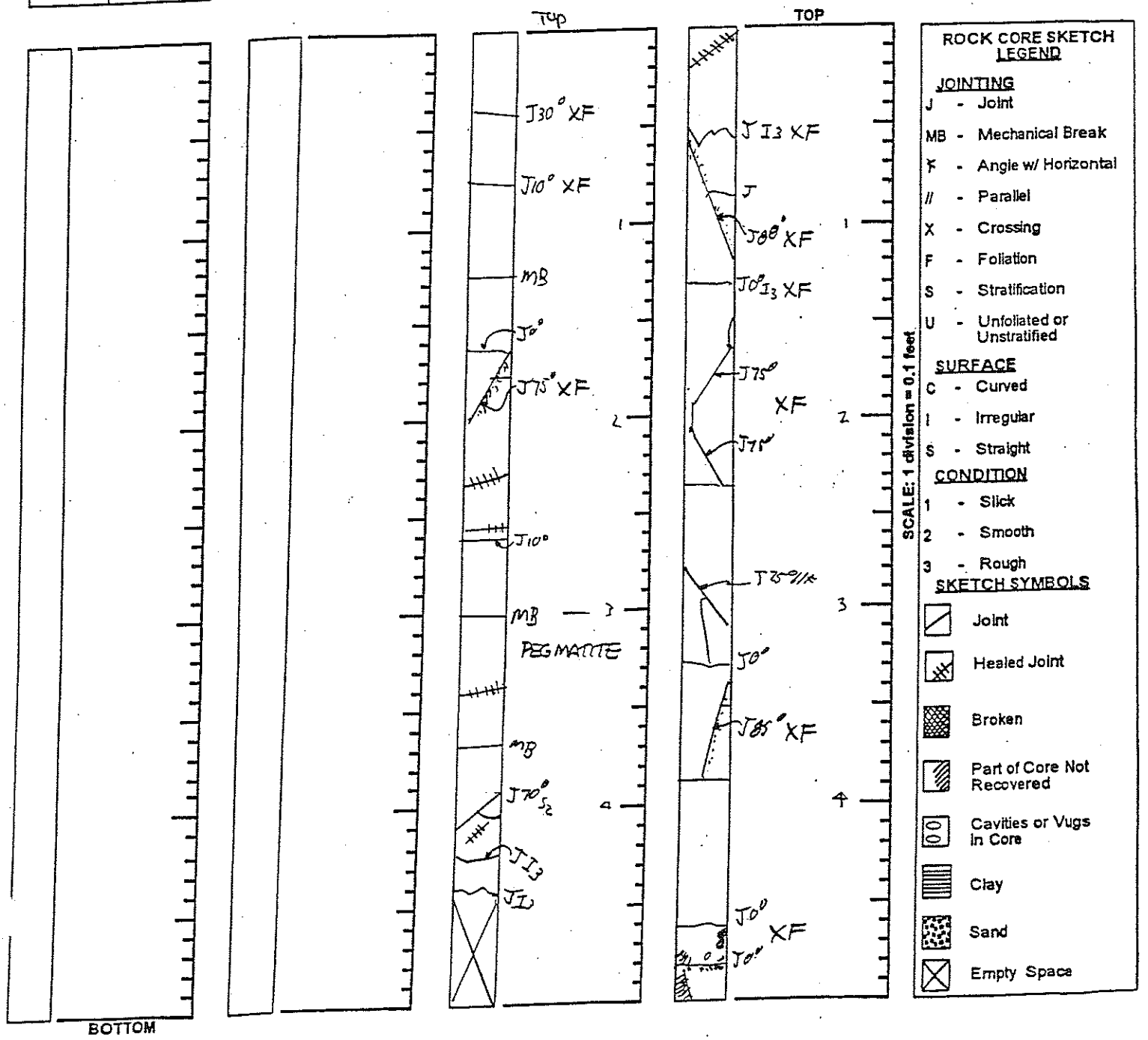
PROJECT HARLEM HOTEL
LOCATION NEW YORK, NY

Run No.	REC / RQD

Run No.	REC / RQD

Run No.	REC / RQD
2C	87/68%

Run No.	REC / RQD
1C	100/68%



ROCK CORE SKETCH LEGEND

JOINTING
- J - Joint
- MB - Mechanical Break
- ∠ - Angle w/ Horizontal
- // - Parallel
- X - Crossing
- F - Foliation
- S - Stratification
- U - Unfoliated or Unstratified

SURFACE
- C - Curved
- I - Irregular
- S - Straight

CONDITION
- 1 - Slick
- 2 - Smooth
- 3 - Rough

SKETCH SYMBOLS
- Joint
- Healed Joint
- Broken
- Part of Core Not Recovered
- Cavities or Vugs in Core
- Clay
- Sand
- Empty Space

NOTES

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING NO. B-5
SHEET 5 OF 5
FILE NO. 10064
SURFACE ELEV. 21.1
DATUM BOROUGH PRESIDENT OF MANHATTAN

PROJECT HARLEM HOTEL
LOCATION NEW YORK, NEW YORK
BORING LOCATION SEE BORING LOCATION PLAN

BORING EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG		TYPE OF FEED DURING CORING		CASING USED		[X] YES	[ ] NO		
TRUCK	CME-75	MECHANICAL		DIA., IN.	4	DEPTH, FT. FROM	0	TO	20
SKID		HYDRAULIC	X	DIA., IN.		DEPTH, FT. FROM		TO	
BARGE		OTHER		DIA., IN.		DEPTH, FT. FROM		TO	
OTHER									

TYPE AND SIZE OF:

D-SAMPLER	2" O.D. SPLIT SPOON
U-SAMPLER	FIXED PISTON
S-SAMPLER	
CORE BARREL	NX DOUBLE TUBE
CORE BIT	DIAMOND
DRILL RODS	N

DRILLING MUD USED [X] YES [ ] NO
DIAMETER OF ROTARY BIT, IN. 3-7/8, 5-7/8
TYPE OF DRILLING MUD QUIK GEL

AUGER USED [ ] YES [X] NO
TYPE AND DIAMETER, IN.

CASING HAMMER, LBS. 300 AVERAGE FALL, IN. 24
SAMPLER HAMMER, LBS. 140 AVERAGE FALL, IN. 30

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION
					NO OBSERVATIONS MADE.

PIEZOMETER INSTALLED [ ] YES [X] NO SKETCH SHOWN ON

STANDPIPE:	TYPE		ID, IN.		LENGTH, FT.	TOP ELEV.	
INTAKE ELEMENT:	TYPE		OD, IN.		LENGTH, FT.	TIP ELEV.	
FILTER:	MATERIAL		OD, IN.		LENGTH, FT.	BOT. ELEV.	

PAY QUANTITIES

3.5" DIA. DRY SAMPLE BORING	LIN. FT.	97	NO. OF 3" SHELBY TUBE SAMPLES	
3.5" DIA. U-SAMPLE BORING	LIN. FT.		NO. OF 3" UNDISTURBED SAMPLES	5
CORE DRILLING IN ROCK	LIN. FT.	10	OTHER:	

BORING CONTRACTOR CMI SUBSURFACE INVESTIGATIONS INC.
DRILLER JOHN IMPARATO HELPERS CARLOS MALDONADO
REMARKS GROUTED BOREHOLE UPON COMPLETION.
RESIDENT ENGINEER RANDY NUNEZ DATE 09-24-03

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. B-6
SHEET 1 OF 5
FILE NO. 10064
SURFACE ELEV. 21.5
RES. ENGR. RANDY NUNEZ

PROJECT: HARLEM HOTEL
LOCATION: NEW YORK, NEW YORK

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	CASING DEPTH	CASING BLOWS	REMARKS
10:00	1D	0.5	10-7	Brown fine to medium sand, some silt, trace				6" Asphalt at surface.
09-10-03		2.0	5	gravel, brick (Fill) (SM)				
Wednesday	2D	2.0	8-9	Brown silty fine to medium sand, trace gravel,				
Sunny		4.0	9-6	brick, clay (Fill) (SM)				
70°F	3D	4.0	3-5	Brown fine to coarse sand, some brick, silt,		5		
		5.5	100/6"	gravel (Fill) (SM)				
	4D	6.0	3-4	Red brick and asphalt, trace fine to medium				
		8.0	2-12	sand, silt (Fill)				
	5D	8.0	3-8	Do 4D, trace wood (Fill)	F			
		10.0	11-8			10		
	6D	10.0	5-6	Brown fine to coarse sand, some silt, brick,				
		12.0	6-16	trace gravel (Fill) (SM)				
						15		
	7D	15.0	4-10	Gray gravel, trace brick, metal, silt (Fill)				7D: Possible wash
		17.0	13-60	(GP-GM)				sample.
						19		
						20		
	8D	20.0	6-8	Red brown silt, trace fine sand, mica, clay (ML)				Rods chattering.
		22.0	9-9					
						25		
	9D	25.0	6-5	Red brown silt, some fine sand, trace clay,				
		27.0	6-12	mica, clayey silt seams (ML)	M			
						30		
	10D	30.0	5-9	Brown silt, some fine sand, trace mica (ML)				
		32.0	14-16					
						33.5		
						35		
	11D	35.0	8-9	Brown silty fine sand, trace mica (SM)	S1			
		37.0	11-11					
						38.5		
						40		
	12D	40.0	4-6	Brown silt, trace fine sand, trace clay, clayey				pp=0.75 tsf
		42.0	8-10	silt seams, mica (ML)	M			
						43.5		
						45		
	13D	45.0	4-5	Medium brown clayey silt, varved with brown				
		47.0	6-7	silt, trace fine sand, clay, mica (ML)				
					V			
						50		
	14D	50.0	3-4	Brown silt, trace fine sand, mica, varved with				
		52.0	4-5	medium clayey silt, trace clay seams (ML)				

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. B-6
SHEET 2 OF 5
FILE NO. 10064
SURFACE ELEV. 21.5
RES. ENGR. RANDY NUNEZ

PROJECT: HARLEM HOTEL
LOCATION: NEW YORK, NEW YORK

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
09-10-03								
14:30						55		
06:00	15D	55.0	4-5	Do 14D (ML)				
09-11-03		57.0	5-4					
Thursday								
60°F								
						60		
	16D	60.0	3-5	Brown silt, trace fine sand, mica, varved with				pp=1.5 tsf
		62.0	6-8	medium clayey silt, trace clay seams (ML)				
						65		
	17D	65.0	4-4	Do 16D (ML)				
		67.0	4-5					
						70		
	18D	70.0	3-3	Medium stiff brown silty clay, varved with	V			
		72.0	5-4	clayey silt, trace silt seams (CL&ML)				
						75		
	19D	75.0	3-4	Medium stiff brown clayey silt, varved with				
		77.0	5-7	some silty clay (ML)				
						80		
	20D	80.0	5-7	Brown silt, trace fine sand, clay, varved with				
		82.0	9-8	medium clayey silt, trace clay seams (ML)				
						85		
	21D	85.0	5-7	Stiff gray brown clayey silt, varved with				
		87.0	10-14	silty clay, trace silt seams (ML&CL)				
						90		
	22D	90.0	8-11	Do 21D, trace gravel, mica (ML&CL)				
		92.0	13-13					
						95		
	23D	95.0	11-10	Gray silt, some micaceous fine sand, varved				
		97.0	18-18	with some clayey silt, trace gravel (ML)				
						98.5		
					T	100		
	24D	100.0	30-20	Brown fine to coarse sand, some silt, trace				
		102.0	20-22	gravel, mica (SM)				

MUESER RUTLEDGE CONSULTING ENGINEERS
ROCK CORE SKETCH

BORING NO. B-6
SHEET 4 OF 5
FILE NO. 10064
SURFACE ELEV. 21.5
RES. ENGR. J. NUNEZ

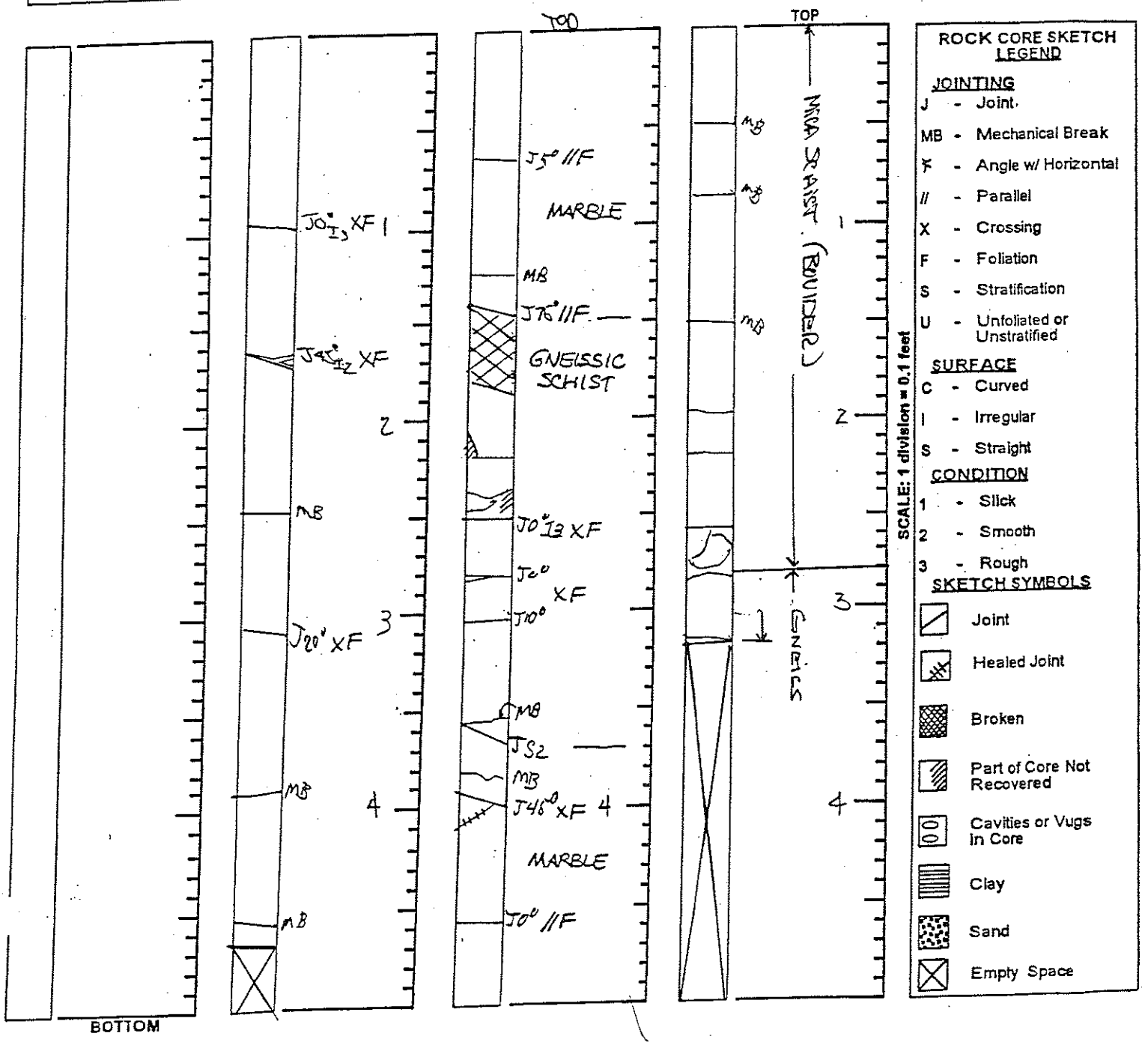
PROJECT HARLEM HOTEL
LOCATION NEW YORK, NY

Run No.	REC / RQD

Run No.	REC / RQD
3C	93/92

Run No.	REC / RQD
2C	100%/65%

Run No.	REC / RQD
1C	62%/NA



ROCK CORE SKETCH LEGEND

JOINTING
- J - Joint
- MB - Mechanical Break
- ∠ - Angle w/ Horizontal
- // - Parallel
- X - Crossing
- F - Foliation
- S - Stratification
- U - Unfoliated or Unstratified

SURFACE
- C - Curved
- I - Irregular
- S - Straight

CONDITION
- 1 - Slick
- 2 - Smooth
- 3 - Rough

SKETCH SYMBOLS
- Joint
- Healed Joint
- Broken
- Part of Core Not Recovered
- Cavities or Vugs In Core
- Clay
- Sand
- Empty Space

NOTES

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING NO. B-6
SHEET 5 OF 5
FILE NO. 10064
SURFACE ELEV. 21.5
DATUM BOROUGH PRESIDENT OF MANHATTAN

PROJECT HARLEM HOTEL
LOCATION NEW YORK, NEW YORK
BORING LOCATION SEE BORING LOCATION PLAN

BORING EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG
TRUCK CME
SKID
BARGE
OTHER

TYPE OF FEED DURING CORING
MECHANICAL
HYDRAULIC
OTHER

CASING USED [X] YES [ ] NO
DIA., IN. 4 DEPTH, FT. FROM 0 TO 25
DIA., IN. DEPTH, FT. FROM TO
DIA., IN. DEPTH, FT. FROM TO

TYPE AND SIZE OF:
D-SAMPLER 2" O.D. SPLIT SPOON
U-SAMPLER
S-SAMPLER
CORE BARREL NX DOUBLE TUBE
CORE BIT DIAMON
DRILL RODS N

DRILLING MUD USED [X] YES [ ] NO
DIAMETER OF ROTARY BIT, IN. 3-7/8, 5-7/8
TYPE OF DRILLING MUD QUIK GEL

AUGER USED [ ] YES [X] NO
TYPE AND DIAMETER, IN.

CASING HAMMER, LBS. 300 AVERAGE FALL, IN. 24
SAMPLER HAMMER, LBS. 140 AVERAGE FALL, IN. 30

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION
					NO OBSERVATIONS MADE.

PIEZOMETER INSTALLED [ ] YES [X] NO SKETCH SHOWN ON

STANDPIPE: TYPE ID, IN. LENGTH, FT. TOP ELEV.
INTAKE ELEMENT: TYPE OD, IN. LENGTH, FT. TIP ELEV.
FILTER: MATERIAL OD, IN. LENGTH, FT. BOT. ELEV.

PAY QUANTITIES

3.5" DIA. DRY SAMPLE BORING LIN. FT. 108
3.5" DIA. U-SAMPLE BORING LIN. FT.
CORE DRILLING IN ROCK LIN. FT. 10

NO. OF 3" SHELBY TUBE SAMPLES
NO. OF 3" UNDISTURBED SAMPLES
OTHER: 2 FT. BOULDER

BORING CONTRACTOR CMI SUBSURFACE INVESTIGATIONS, INC.
DRILLER JOHN IMPERATO HELPERS ROBERT TRAVCHIRA
REMARKS GROUTED BOREHOLE UPON COMPLETION.
RESIDENT ENGINEER RANDY NUNEZ DATE 9/11/2003

MRCE Form BS-1

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. B-7
SHEET 1 OF 4
FILE NO. 10064
SURFACE ELEV. 20.5
RES. ENGR. RANDY NUNEZ

PROJECT: HARLEM HOTEL
LOCATION: NEW YORK, NEW YORK

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
12:15	1D	0.5	55-49	Brown fine to medium sand, some silt, gravel,				6" Asphalt at surface.
09-25-03		2.0	11	asphalt (Fill) (SM)				
Thursday	2D	2.0	4-4	Brown fine to medium sand, some silt, trace				
Cloudy		4.0	3-3	gravel, brick (Fill) (SM)				
70°F	3D	4.0	4-4	Brown fine to coarse sand, some silt, trace		5		
		6.0	8-7	brick, gravel, concrete, wood (Fill) (SM)				
	4D	6.0	4-2	Do 3D (Fill) (SM)				
		8.0	5-3					
	5D	8.0	3-5	Brown fine to medium sand, some silt, trace	F			
		10.0	6-4	brick, gravel (Fill) (SM)		10		
	6D	10.0	100/6"	Brown gravelly fine to medium sand, some				
		10.5		silt, trace brick (Fill) (SM)				
						15		
	7D	15.0	25-14	Brown fine to coarse sand, some gravel, trace				
		17.0	7-10	silt (Fill) (SP-SM)				
						18.5		
					M	20		
	8D	20.0	4-6	Brown fine sandy silt, trace clay, mica (ML)				
		22.0	11-13					
						25		
14:00								
06:00	9D	25.0	10-13	Interlayered brown fine sandy silt, trace mica				
09-26-03		27.0	15-14	and silty fine sand, trace mica (ML&SM)				
Friday								
						30		
	10D	30.0	14-24	Brown silt, trace fine sand, clay, mica, clayey				
		32.0	15-17	silt layers (ML)				
						33.5		
						35		
	11D	35.0	5-6	Brown silt, trace fine sand, mica, clay, varved				WC=31
		37.0	9-9	with stiff clayey silt (ML)				
						40		
	12D	40.0	3-8	Brown silt, trace fine sand, mica, varved with	V			
		42.0	5-8	some medium clayey silt, trace micaceous				
				fine sand seams (ML)				
						45		
	13D	45.0	2-4	Brown silt, trace fine sand, mica, clay, varved				WC=36
		47.0	5-7	with medium clayey silt, trace gray clay seams				
				(ML)				
						50		
	14D	50.0	2-4	Do 13D (ML)				WC=32
		52.0	4-6					

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. B-7
SHEET 2 OF 4
FILE NO. 10064
SURFACE ELEV. 20.5
RES. ENGR. RANDY NUNEZ

PROJECT: HARLEM HOTEL
LOCATION: NEW YORK, NEW YORK

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
09-26-03								
					V	55		
	15D	55.0	5-4	Medium brown clayey silt, varved with silty				WC=33
		57.0	3-5	clay, trace silt seams (ML&CL)				
						58.5		
					M	60		
	16D	60.0	6-8	Brown sandy silt, trace clay, mica, clayey silt				
		62.0	9-9	seams (ML)				
						65		
	17D	65.0	10-11	No recovery				
		67.0	12-18					
						68.5		
					T	70		
	18D	70.0	5-26	Gray brown fine to coarse sand, some silt,				
		72.0	32-50	gravel, trace clay (SM)				
						75		
	19D	75.0	45-39	Gray brown fine to medium sand, some silt,				
		76.3	100/3"	trace gravel, decomposed rock, clay pockets				
				(SM)		77.5		Hard drilling 77' to 78'.
	1C	78.0	REC=95%	Hard, slightly weathered, gray calcareous	R			
		83.0	RQD=95%	schistose gneiss, massive		80		
						85		
	2C	83.0	REC=87%	Hard, slightly weathered, gray schistose				
		88.0	RQD=87%	gneiss, blocky, weathered joints				
						88		End of boring at 88'.
						90		
								WC=Water Content in percent of dry weight.
						95		
						100		

MUESER RUTLEDGE CONSULTING ENGINEERS
ROCK CORE SKETCH

BORING NO. B-7
SHEET 3 OF 4
FILE NO. 10064
SURFACE ELEV. 20.5
RES. ENGR. E. MUNOZ

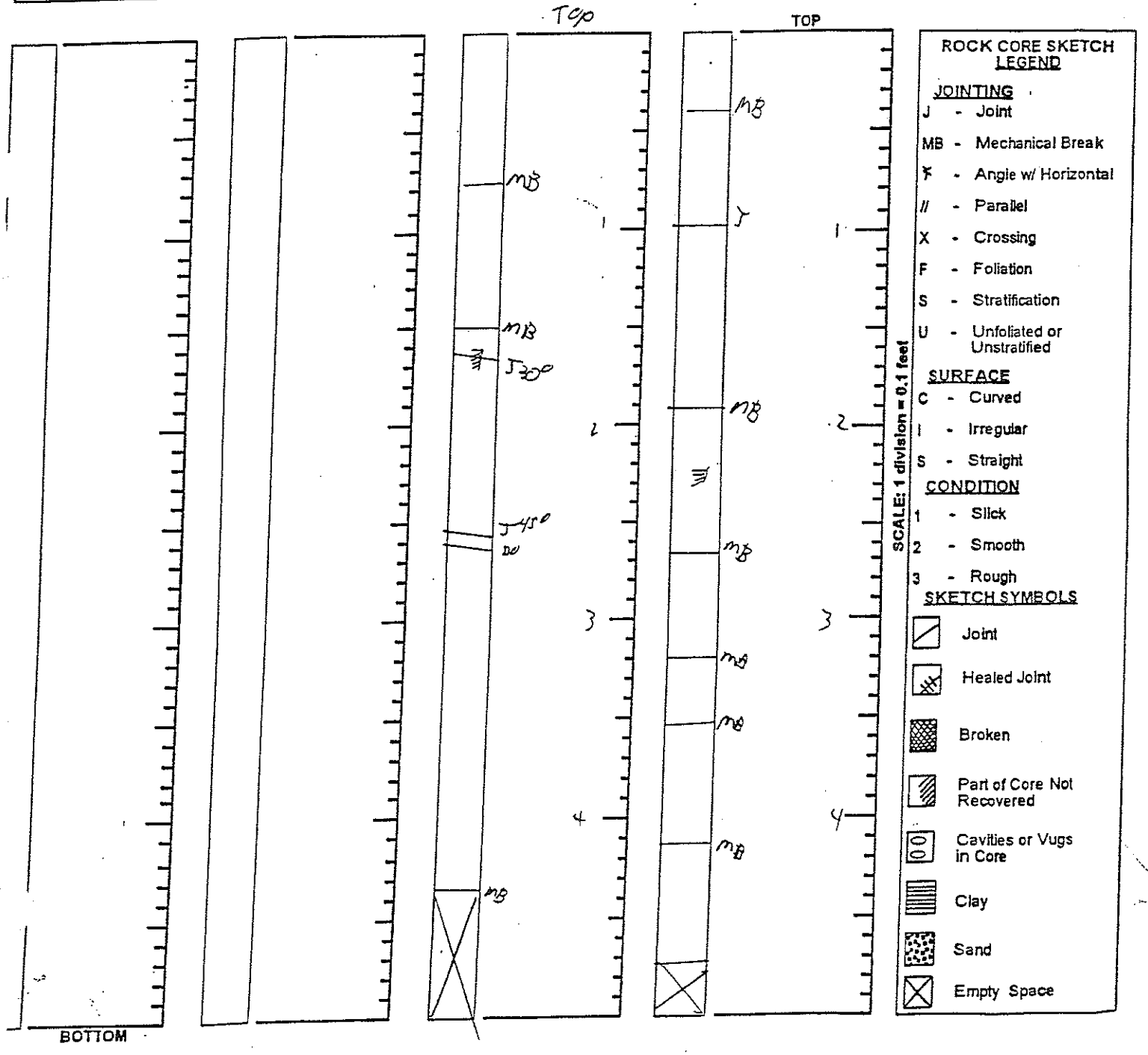
PROJECT HARLEM HOTEL
LOCATION NEW YORK, NY

Run No.	REC / RQD

Run No.	REC / RQD

Run No.	REC / RQD
2C	87/87%

Run No.	REC / RQD
1C	95/95%



ROCK CORE SKETCH
LEGEND

JOINTING
- J - Joint
- MB - Mechanical Break
- ∢ - Angle w/ Horizontal
- // - Parallel
- X - Crossing
- F - Foliation
- S - Stratification
- U - Unfoliated or Unstratified

SURFACE
- C - Curved
- I - Irregular
- S - Straight

CONDITION
- 1 - Slick
- 2 - Smooth
- 3 - Rough

SKETCH SYMBOLS
- Joint
- Healed Joint
- Broken
- Part of Core Not Recovered
- Cavities or Vugs in Core
- Clay
- Sand
- Empty Space

MUESER RUTLEDGE CONSULTING ENGINEERS

		BORING NO.	B-7
		SHEET	4 OF 4
PROJECT	HARLEM HOTEL	FILE NO.	10064
LOCATION	NEW YORK, NEW YORK	SURFACE ELEV.	20.5
BORING LOCATION	SEE BORING LOCATION PLAN	DATUM	BOROUGH PRESIDENT OF MANHATTAN

BORING EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG		TYPE OF FEED DURING CORING		CASING USED		[X] YES [ ] NO			
TRUCK	CME-75	MECHANICAL		DIA., IN.	4	DEPTH, FT. FROM	0	TO	20
SKID		HYDRAULIC	X	DIA., IN.		DEPTH, FT. FROM		TO	
BARGE		OTHER		DIA., IN.		DEPTH, FT. FROM		TO	
OTHER									

TYPE AND SIZE OF:

D-SAMPLER	2" O.D. SPLIT SPOON
U-SAMPLER	
S-SAMPLER	
CORE BARREL	NX-DOUBLE TUBE
CORE BIT	DIAMOND
DRILL RODS	N

DRILLING MUD USED	[X] YES	[ ] NO	
DIAMETER OF ROTARY BIT, IN.	5-7/8, 3-7/8		
TYPE OF DRILLING MUD	QUIK GEL		
AUGER USED	[ ] YES	[X] NO	
TYPE AND DIAMETER, IN.			
CASING HAMMER, LBS.	300	AVERAGE FALL, IN.	24
SAMPLER HAMMER, LBS.	140	AVERAGE FALL, IN.	30

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION
					NO OBSERVATIONS MADE.

PIEZOMETER INSTALLED [ ] YES [X] NO SKETCH SHOWN ON

STANDPIPE:	TYPE		ID, IN.		LENGTH, FT.		TOP ELEV.		
INTAKE ELEMENT:	TYPE		OD, IN.		LENGTH, FT.		TIP ELEV.		
FILTER:	MATERIAL		OD, IN.		LENGTH, FT.		BOT. ELEV.		

PAY QUANTITIES

3.5" DIA. DRY SAMPLE BORING	LIN. FT.	78	NO. OF 3" SHELBY TUBE SAMPLES	
3.5" DIA. U-SAMPLE BORING	LIN. FT.		NO. OF 3" UNDISTURBED SAMPLES	
CORE DRILLING IN ROCK	LIN. FT.	10	OTHER:	

BORING CONTRACTOR CMI SUBSURFACE INVESTIGATIONS INC.

DRILLER JOHN IMPARATO HELPERS CARLOS MALDONADO

REMARKS GROUTED BOREHOLE UPON COMPLETION.

RESIDENT ENGINEER RANDY NUNEZ DATE 09-26-03

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. B-8
SHEET 1 OF 4
FILE NO. 10064
SURFACE ELEV. 21.0
RES. ENGR. RANDY NUNEZ

PROJECT: HARLEM HOTEL
LOCATION: NEW YORK, NEW YORK

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
12:00	1D	0.5	12	Brown black fine to medium sand, some silt,				6" Asphalt at surface.
09-16-03		2.0	21-26	trace brick, gravel, cinders (Fill) (SM)				
Tuesday	2D	2.0	19-17	Brown fine sand, some silt, trace brick, gravel,				
70°F		4.0	16-20	(Fill) (SM)				
	3D	4.0	13-9	Brown fine to medium sand, some silt, trace		5		
		6.0	12-23	brick, gravel (Fill) (SM)				
	4D	6.0	50-55	Brown fine to coarse sand, trace silt, gravel,				
		8.0	50-70	brick (Fill) (SP-SM)				
	5D	8.0	100/6"	Brown fine sand, some gravel, trace silt (Fill)	F			
		8.5		(SP-SM)		10		
	6D	10.0	40-78	Do 5D (Fill) (SP-SM)				
		11.3	100/4"					
						15		
	7D	15.0	64-21	Gray coarse to fine sand, some gravel, trace				7D: Petroleum odor.
		17.0	14-13	silt (Fill) (SP-SM)				
						17.5		
					M			
						20		
	8D	20.0	11-14	Brown fine sandy silt, trace mica (ML)				
14:00		22.0	17-21					
06:00								
09-17-03						23.5		
Wednesday						25		
Clear	9D	25.0	7-15	Brown fine sand, some silt, trace mica (SM)	S1			
70°F		27.0	24-20					
						28.5		
						30		
	10D	30.0	4-6	Brown silt, some fine sand, trace mica, clay,	M			
		32.0	8-13	clayey silt seams (ML)				
						33.5		
						35		
	11D	35.0	9-10	Brown silt, trace fine sand, clay, varved with				
		37.0	11-12	medium clayey silt (ML)				
						40		
	12D	40.0	4-6	Brown silt, trace fine sand, clay, varved with				pp=1.0 tsf
		42.0	6-10	medium clayey silt (ML)	V			
						45		
	13D	45.0	12-8	Stiff brown clayey silt, varved with silty clay,				
		47.0	11-15	trace fine sand seams (ML&CL)				
						50		
	14D	50.0	7-18	Brown silt, varved with stiff clayey silt (ML)				
		52.0	17-42					

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. B-8
SHEET 2 OF 4
FILE NO. 10064
SURFACE ELEV. 21.0
RES. ENGR. RANDY NUNEZ

PROJECT: HARLEM HOTEL
LOCATION: NEW YORK, NEW YORK

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	CASING DEPTH	CASING BLOWS	REMARKS
09-17-03								
					V			
						53.5		
						55		
	15D	55.0	53-60	White gray coarse to fine sand, some silt,				
		57.0	60-62	gravel (SM)				
					T			
						60		
	16D	60.0	70-100/4"	Brown gravelly fine to medium sand, some				
		60.8		silt, mica (SM)		62	3*	*Coring time in
	1C	62.0	REC=93%	Hard, slightly weathered, white gray calcareous			3.5*	minutes per foot.
		67.0	RQD=87%	gneissic schist, blockly			2.5*	
						65	2*	
							2*	
					R			
	2C	67.0	REC=68%	Medium hard, slightly weathered, white gray				
		72.0	RQD=57%	calcareous gneissic schist, jointed to closely				Run 2C: Soft drilling
				jointed, weathered joints		70		69'± to 71'±.
10:30						72		End of boring at 72'.
								pp=Pocket
						75		Penetrometer
								Unconfined Compres-
								sive Strenght in tsf.
						80		
						85		
						90		
						95		
						100		

MUESER RUTLEDGE CONSULTING ENGINEERS
ROCK CORE SKETCH

BORING NO. B-8
SHEET 3 OF 4
FILE NO. 10064
SURFACE ELEV. 21.0
RES. ENGR. YC NUNEZ

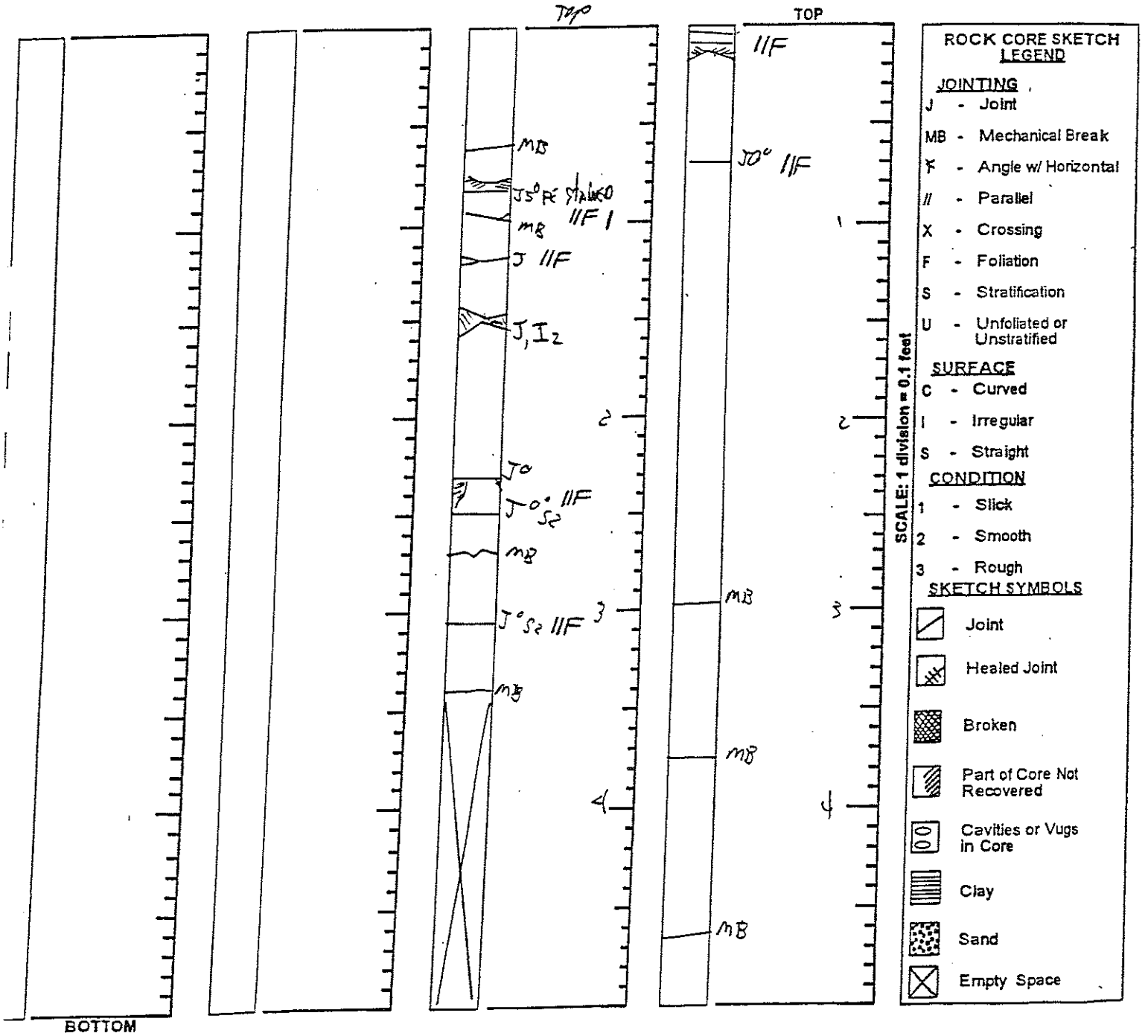
PROJECT HARLEM HOTEL
LOCATION NEW YORK, NY

Run No.	REC / RQD

Run No.	REC / RQD

Run No.	REC / RQD
2C	68/57%

Run No.	REC / RQD
1C	93/87%



ROCK CORE SKETCH LEGEND

JOINTING
- J - Joint
- MB - Mechanical Break
- ∠ - Angle w/ Horizontal
- // - Parallel
- X - Crossing
- F - Foliation
- S - Stratification
- U - Unfoliated or Unstratified

SURFACE
- C - Curved
- I - Irregular
- S - Straight

CONDITION
- 1 - Slick
- 2 - Smooth
- 3 - Rough

SKETCH SYMBOLS
- Joint
- Healed Joint
- Broken
- Part of Core Not Recovered
- Cavities or Vugs in Core
- Clay
- Sand
- Empty Space

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING NO. B-8
SHEET 4 OF 4
FILE NO. 10064
SURFACE ELEV. 21.0
DATUM BOROUGH PRESIDENT OF MANHATTAN

PROJECT HARLEM HOTEL
LOCATION NEW YORK, NEW YORK
BORING LOCATION SEE BORING LOCATION PLAN

BORING EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG		TYPE OF FEED DURING CORING		CASING USED		X YES		NO		
TRUCK	CME 75	MECHANICAL		DIA., IN.	4	DEPTH, FT. FROM	0	TO	25	
SKID		HYDRAULIC	X	DIA., IN.		DEPTH, FT. FROM		TO		
BARGE		OTHER		DIA., IN.		DEPTH, FT. FROM		TO		
OTHER										

TYPE AND SIZE OF:

D-SAMPLER	2" O.D. SPLIT SPOON
U-SAMPLER	
S-SAMPLER	
CORE BARREL	NX-DOUBLE TUBE
CORE BIT	DIAMOND
DRILL RODS	N

DRILLING MUD USED X YES NO
DIAMETER OF ROTARY BIT, IN. 3-7/8", 5-7/8"
TYPE OF DRILLING MUD QUIK GEL

AUGER USED YES , X NO
TYPE AND DIAMETER, IN.

CASING HAMMER, LBS. 300 AVERAGE FALL, IN. 24
SAMPLER HAMMER, LBS. 140 AVERAGE FALL, IN. 30

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION
					NO OBSERVATIONS MADE.

PIEZOMETER INSTALLED YES X NO SKETCH SHOWN ON

STANDPIPE:	TYPE		ID, IN.		LENGTH, FT.		TOP ELEV.		
INTAKE ELEMENT:	TYPE		OD, IN.		LENGTH, FT.		TIP ELEV.		
FILTER:	MATERIAL		OD, IN.		LENGTH, FT.		BOT. ELEV.		

PAY QUANTITIES

3.5" DIA. DRY SAMPLE BORING	LIN. FT.	62	NO. OF 3" SHELBY TUBE SAMPLES	
3.5" DIA. U-SAMPLE BORING	LIN. FT.		NO. OF 3" UNDISTURBED SAMPLES	
CORE DRILLING IN ROCK	LIN. FT.	10	OTHER:	

BORING CONTRACTOR CMI SUBSURFACE INVESTIGATIONS, INC.
DRILLER JOHN IMPARATO HELPERS CARLOS MALDONADO
REMARKS GROUTED BOREHOLE UPON COMPLETION.
RESIDENT ENGINEER RANDY NUNEZ DATE 09-17-03

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. B-9
SHEET 1 OF 4
FILE NO. 10064
SURFACE ELEV. 21.8
RES. ENGR. RANDY NUNEZ

PROJECT: HARLEM HOTEL
LOCATION: NEW YORK, NEW YORK

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	CASING DEPTH	CASING BLOWS	REMARKS
13:00	1D	0.5	15-23	Brown fine to coarse sand, some silt, brick, tr				6" Asphalt at surface.
09-12-03		2.0	14	wood, concrete (Fill) (SM)				
Friday	2D	2.0	9-13	Red brick and wood, trace fine to coarse				
Partly		4.0	9-4	sand (Fill)				
Cloudy	3NR	4.0	3-3	No recovery		5		
70°F		6.0	2-1					
	4D	6.0	WR/12"	Brown fine to coarse sand, some concrete,				
		8.0	2-26	trace silt, brick (Fill) (SP-SM)				
	5D	8.0	6-11	Brown silt, some fine sand, trace clay, mica,	F			
14:00		10.0	15-19	silty fine sand layers (Fill) (ML)		10		
06:00	6D	10.0	21-29	Brown fine to medium sand, some silt, trace				
09-15-03		12.0	49-60	gravel, clay (Fill) (SM)				
Monday								
Cloudy								Rods chattering.
						15		
	7D	15.0	11-23	Black brown fine to medium sand, some				7D: Petroleum odor.
		17.0	26-31	gravel, silt, trace cinders (Fill) (SM)				
								Rods chattering.
						20		
	8D	20.0	19-20	Brown fine to coarse sand, some gravel, silt				8D: Slight petroleum
		22.0	31-26	(SM)				odor.
						22.5		
						25		
	9D	25.0	19-23	Brown silty fine sand, trace mica (SM)				
		27.0	20-20		S1			
								Hole caved in to 20'
						30		with casing at 10'.
	10D	30.0	13-21	Brown fine sand, some silt, trace mica (SM)				
		32.0	16-14					
						32.5		
						35		
	11D	35.0	7-11	Brown silt, trace fine sand, clayey silt	M			
		37.0	14-11	and clay seams (ML)				
						38.5		
						40		
	12D	40.0	6-11	Brown silt, trace fine to medium sand pockets,				
		42.0	14-13	clay, varved with stiff clayey silt (ML)	V			
						45		
	13D	45.0	8-10	Top 15": Gray brown silt, varved with stiff				
		46.8	12-100/4"	clayey silt, sm mic silty f sand layers (ML)		46.5		
				Bot 2": Gray white f-c sand, some silt, trace				
				gravel, rock fragments (SM)	T			
						50		
	14D	50.0	22-32	Brown fine to coarse sand, some gravel, trace				
		52.0	32-32	silt (SP-SM)				

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. B-9
SHEET 2 OF 4
FILE NO. 10064
SURFACE ELEV. 21.8
RES. ENGR. RANDY NUNEZ

PROJECT: HARLEM HOTEL
LOCATION: NEW YORK, NEW YORK

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	CASING DEPTH	CASING BLOWS	REMARKS
09-15-03 Monday								
								Rods chattering.
						55		
	15D	55.0	100/5"	Gray gravel, some fine to medium sand, tr silt (GP)	T			REC=1" Gravel in the tip of the spoon.
		55.4						Hard drilling 56'± to 59'±.
	1C	59.0	REC=54%	Top 10": Gray mica schist (Boulder)			25*	
		63.0		Bot 17": Medium hard, slightly weathered, white gray schistose marble, closely jointed, weathered joints		60	2*	Boulders 56' to 61.5'.
							6*	Core barrel blocked,
						61.5	2*	stopped at 63'.
14:00								
09-16-03 Tuesday Clear Sunny 60°F	2C	63.0	REC=98%	Hard, slightly weathered, white gray schistose				
		68.0	RQD=87%	marble, moderately jointed, weathered joints		65		*Coring time in minutes per foot.
							5*	
					R		4*	Drilled 3" casing to 60'.
							4*	
	3C	68.0	REC=98%	Hard, unweathered, white gray calcareous			3*	
		73.0	RQD=98%	gneissic schist, massive		70	3*	
							3*	Losing water at 65'±.
							3*	
11:45						73	4.5*	End of boring at 73'.
						75		
						80		
						85		
						90		
						95		
						100		

MUESER RUTLEDGE CONSULTING ENGINEERS
ROCK CORE SKETCH

BORING NO. B-9
SHEET 3 OF 4
FILE NO. 10064
SURFACE ELEV. 21.8
RES. ENGR. K NUNEZ

PROJECT Harlem Hotel

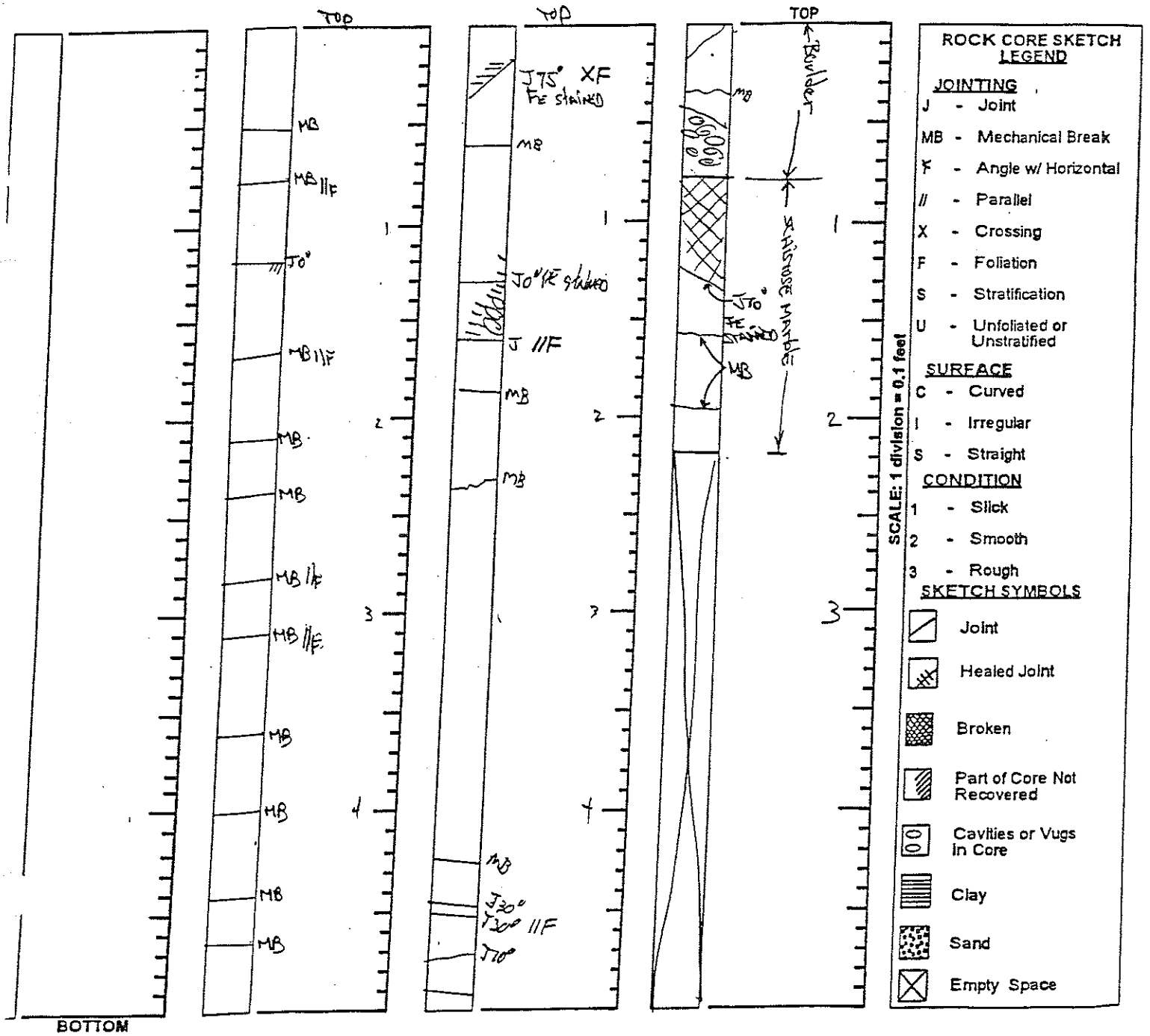
LOCATION NEW YORK, NY

Run No.	REC / RQD

Run No.	REC / RQD
3C	98/98%

Run No.	REC / RQD
2C	98/87%

Run No.	REC / RQD
1C	54%/N/A



MUESER RUTLEDGE CONSULTING ENGINEERS

		BORING NO.	B-9
		SHEET	4 OF 4
PROJECT	HARLEM HOTEL	FILE NO.	10064
LOCATION	NEW YORK, NEW YORK	SURFACE ELEV.	21.8
BORING LOCATION	SEE BORING LOCATION PLAN	DATUM	BOROUGH PRESIDENT OF MANHATTAN

BORING EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG		TYPE OF FEED DURING CORING		CASING USED		[X] YES [ ] NO			
TRUCK	CME 75	MECHANICAL		DIA., IN.	3	DEPTH, FT. FROM	0	TO	60
SKID		HYDRAULIC	X	DIA., IN.	4	DEPTH, FT. FROM	0	TO	10
BARGE		OTHER		DIA., IN.		DEPTH, FT. FROM		TO	
OTHER									

TYPE AND SIZE OF:			
D-SAMPLER	2" O.D. SPLIT SPOON	DRILLING MUD USED	[X] YES [ ] NO
U-SAMPLER		DIAMETER OF ROTARY BIT, IN.	3-7/8, 5-7/8, 2-15/16
S-SAMPLER		TYPE OF DRILLING MUD	QUIK GEL
CORE BARREL	NX-DOUBLE TUBE	AUGER USED	[ ] YES [ ] NO
CORE BIT	DIAMOND	TYPE AND DIAMETER, IN.	
DRILL RODS	N		

CASING HAMMER, LBS.	300	AVERAGE FALL, IN.	30
SAMPLER HAMMER, LBS.	140	AVERAGE FALL, IN.	24

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION
					NO OBSERVATIONS MADE.

PIEZOMETER INSTALLED [ ] YES [X] NO SKETCH SHOWN ON

STANDPIPE:	TYPE	ID, IN.	LENGTH, FT.	TOP ELEV.			
INTAKE ELEMENT:	TYPE	OD, IN.	LENGTH, FT.	TIP ELEV.			
FILTER:	MATERIAL	OD, IN.	LENGTH, FT.	BOT. ELEV.			

PAY QUANTITIES

3.5" DIA. DRY SAMPLE BORING	LIN. FT.	61.5	NO. OF 3" SHELBY TUBE SAMPLES		
3.5" DIA. U-SAMPLE BORING	LIN. FT.		NO. OF 3" UNDISTURBED SAMPLES		
CORE DRILLING IN ROCK	LIN. FT.	10	OTHER:	1.5' BOULDER	

BORING CONTRACTOR CMI SUBSURFACE INVESTIGATIONS, INC.

DRILLER JOHN IMPARATO HELPERS ROBERT TRAVCHIRA

REMARKS GROUTED BOREHOLE UPON COMPLETION.

RESIDENT ENGINEER RANDY NUNEZ DATE 09-16-03

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. B-10
SHEET 1 OF 4
FILE NO. 10064
SURFACE ELEV. 21.3
RES. ENGR. RANDY NUNEZ

PROJECT: HARLEM HOTEL
LOCATION: NEW YORK, NEW YORK

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
11:10	1D	0.5	6-9	Brown fine to coarse sand, some silt, gravel,				6" Asphalt at surface.
09-24-03		2.0	6	trace brick (Fill) (SM)				
Wednesday	2D	2.0	9-28	Brown fine sandy, silt, trace clay, mica (Fill)				
Sunny		4.0	7-7	(ML)				
70°F	3D	4.0	7-7	Brown fine to medium sand, some silt, trace		5		
		6.0	12-30	gravel, clay pockets, wire (Fill) (SM)				
	4D	6.0	27-47	Brown fine to coarse sand, some gravel, trace				
		8.0	23-16	silt (Fill) (SP-SM)				
	5D	8.0	21-26	Brown medium to fine sand, trace silt, gravel	F			
		10.0	46-39	(Fill) (SP-SM)		10		
	6D	10.0	44-55	Brown fine to coarse sand, some gravel, trace				
		12.0	49-60	silt (Fill) (SP-SM)				
						15		
	7D	15.0	13-21	Brown fine to coarse sand, some gravel, trace				7D: Petroleum odor.
		17.0	16-16	silt (Fill) (SP-SM)				Oil present in sample.
						18.5		
						20		
	8D	20.0	11-9	Brown fine sandy silt, trace mica, clay (ML)				
		22.0	11-16					
						25		
	9D	25.0	16-17	Brown fine sandy silt, trace clay, fine sand				
		27.0	17-14	layers, mica (ML)				
14:00						30		
09-25-03	10D	30.0	10-11	Brown silt, trace fine sand, clay, mica, clayey				
Thursday		32.0	14-19	silt layers, micaceous fine sand seams (ML)	M			
Clear								
60°F								
						35		
	11D	35.0	8-8	Do 10D, trace clay seams (ML)				WC=30
		37.0	13-11					
						40		
	12D	40.0	4-8	Do 10D (ML)				
		42.0	7-9					
						43.5		
						45		
	13D	45.0	6-6	Brown silt, trace fine sand, clay, varved with				WC=34
		47.0	8-6	medium clayey silt, trace gray clay seams (ML)				
					V			
						50		
	14D	50.0	6-6	Do 13D (ML)				WC=36
		52.0	7-9					

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. B-10
SHEET 2 OF 4
FILE NO. 10064
SURFACE ELEV. 21.3
RES. ENGR. RANDY NUNEZ

PROJECT: HARLEM HOTEL
LOCATION: NEW YORK, NEW YORK

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	CASING DEPTH	CASING BLOWS	REMARKS
09-25-03								
						55		
	15D	55.0	3-4	Brown silt, some fine sand, varved with some				
		57.0	5-7	medium clayey silt (ML)	V			
						60		
	16D	60.0	3-8	Brown silt, trace fine sand, varved with stiff				WC=27
		62.0	10-13	clayey silt (ML)				
						63.5		
						65		
	17D	65.0	7-46	Brown light gray fine to medium sand, trace				
		67.0	40-42	silt, rock fragments, mica (SP-SM)				
					S2			
						70		
	18D	70.0	22-12	Brown medium to fine sand, trace silt, gravel,				
		72.0	19-25	mica, silt pockets (SP-SM)				
						73.5		
						75		
	19D	75.0	50-74	Brown fine to medium sand, some silt, trace				19D: Rock fragments
		76.5	100	gravel, clay pockets (SM)	T			in the tip of the spoon.
						79		Hard drilling to 80'.
						80		
	1C	80.0	REC=100%	Hard, unweathered, gray calcareous schistose			4*	
		85.0	RQD=100%	gneiss, massive			2*	*Coring time in
							2*	minutes per foot.
							3*	
					R	85	2*	
	2C	85.0	REC=95%	Do 1C				
		90.0	RQD=95%				2*	
							2.5*	
							3*	
11:30						90	2.5*	End of boring at 90'.
						95		
								WC=Water Content
								in percent of dry
								weight.
						100		

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. B-11P
SHEET 1 OF 6
FILE NO. 10064
SURFACE ELEV. 21.1
RES. ENGR. RANDY NUNEZ

PROJECT: HARLEM HOTEL
LOCATION: NEW YORK, NEW YORK

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
11:00								6" Asphalt at surface.
09-11-03	1D	1.0	15-38	Brown silty fine to coarse sand, trace brick,				
Thursday		3.0	35-24	gravel, wood (Fill) (SM)				
Sunny	2D	3.0	4-2	Light brown fine sandy silt, trace clay (Fill)				
70°F		5.0	2-2	(ML)		5		
	3D	5.0	3-18	Brown silty fine to caorse sand, trace gravel				
		7.0	34-37	(Fill) (SM)				
	4D	7.0	51-100/5"	Brown coarse to fine sand, some gravel, silt,				
		7.9		trace brick (Fill) (SM)	F			
						10		
	5D	10.0	20-22	Brown coarse to fine sand, some gravel, trace				
		11.2	100/3"	brick, silt (Fill) (SP-SM)				
						15		
	6D	15.0	17-17	Brown coarse to fine sand, some gravel, trace				6D: Petroleum odor.
		17.0	18-21	brick, silt (Fill) (SP-SM)				Presence of
								petroleum.
						18.5		
					M	20		
	7D	20.0	24-13	Red brown fine sandy silt, trace clay, mica				
		22.0	13-13	(ML)				
						23.5		
					S1	25		
	8D	25.0	24-20	Red brown silty fine sand, some gravel, trace				1st attempt no REC.
		27.0	29-38	mica (SM)				2nd attempt 11" REC.
						28.5		
					M	30		
	9D	30.0	10-12	Brown silt, some fine sand, trace mica				
		32.0	12-13	(ML)				
						33.5		
					V	35		
	10D	35.0	7-9	Brown silt, trace fine sand, mica, varved with				
14:30		37.0	11-13	some stiff clayey silt, trace clay seams (ML)				
07:00								
09-12-03								
Friday						40		
Partly	11D	40.0	5-13	Gray brown silt, trace fine sand, gravel, clay,				pp=1.5 tsf
Cloudy		42.0	12-81	varved with trace clayey silt (ML)		42		Hard drilling at 42'.
60°F								
						45		
	12D	45.0	12-30	Brown coarse to fine sand, trace gravel, trace	S2			Losing water.
		47.0	39-48	silt (SP-SM)				
						48.5		
						50		
	13NR	50.0	100/5"	No recovery	T			Use 300lb hammer,
		50.4						no recovery.

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. B-11P
SHEET 2 OF 6
FILE NO. 10064
SURFACE ELEV. 21.1
RES. ENGR. RANDY NUNEZ

PROJECT: HARLEM HOTEL
LOCATION: NEW YORK, NEW YORK

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
09-18-03					T	55		
	14D	55.0	36-57	Brown fine to coarse sand, some gravel, silt,				
		57.0	46-41	trace clay pockets, mica (SM)				
						58.5		
					S1	60		
	15D	60.0	25-31	Brown silty fine sand, trace clay, mica (SM)				
		62.0	50-66					
						63.5		
					S2	65		
	16D	65.0	29-34	Brown medium to fine sand, trace silt, trace				
		67.0	41-54	red brown clayey silt pockets, mica (SP-SM)				
						68.5		
					T	70		
	17D	70.0	100/3"	Brown silty fine to medium sand, some rock				
		70.2		fragments, trace gravel, mica (SM)				
						73		Hard drilling at 73'.
	1C	73.0	REC=92%	Hard, slightly weathered, white gray schistose				
		78.0	RQD=92%	marble, blocky		75		
								*Coring time in minutes per foot.
					R			Placed barrel for run
	2C	78.0	REC=95%	Hard, unweathered, white gray schistose			3*	2C, borehole caved
		83.0	RQD=95%	marble, massive		80	2*	in.
							4*	
							4*	
14:00						83	4*	End of boring at 83'.
						85		pp=Pocket Penetrometer Unconfined Compressive Strength in tsf.
						90		
						95		
						100		

MUESER RUTLEDGE CONSULTING ENGINEERS
ROCK CORE SKETCH

BORING NO. B-11P
SHEET 3 OF 6
FILE NO. 10864
SURFACE ELEV. 21.1
RES. ENGR. T. NUNER

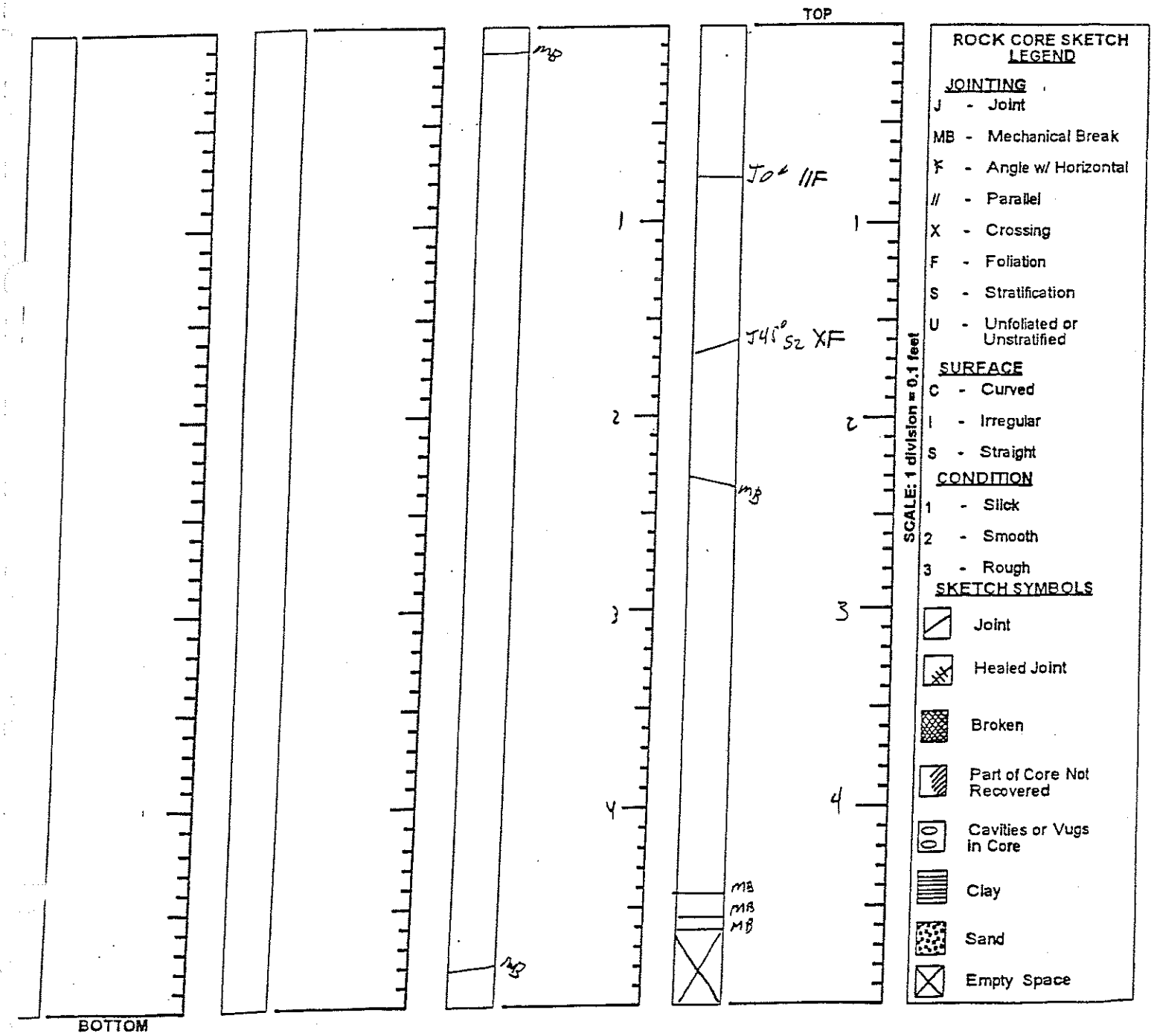
PROJECT HARLEM HOTEL
LOCATION NEW YORK, NY

Run No.	REC / RQD

Run No.	REC / RQD

Run No.	REC / RQD
2C	95/95

Run No.	REC / RQD
1C	92/92%



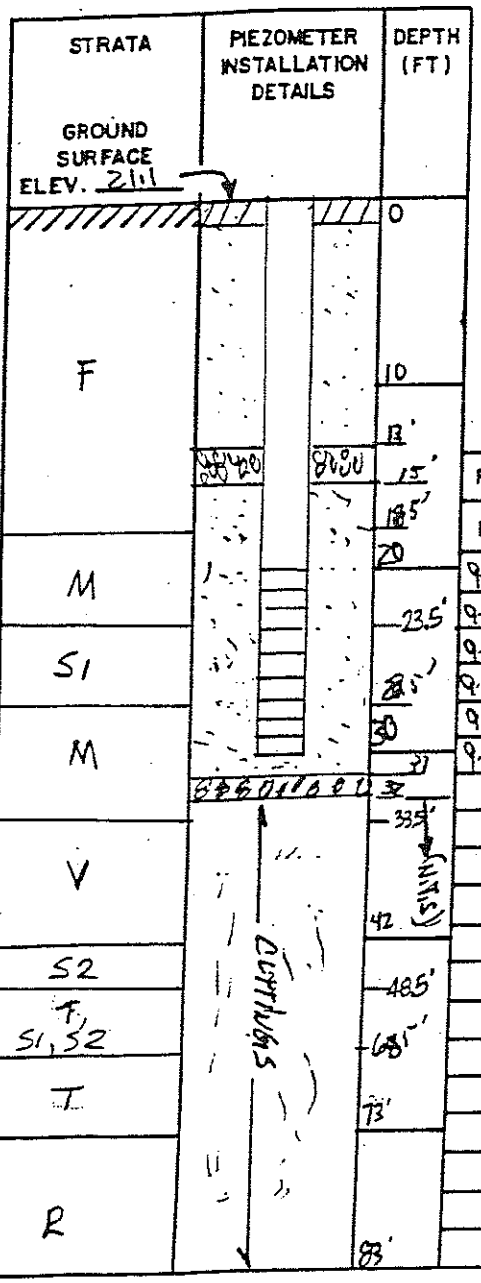
SHEET 4 OF 6
FILE NO. 10014
SUBCODE

MUESER RUTLEDGE CONSULTING ENGINEERS

PIEZOMETER RECORD

PROJECT HARLEM HOTEL — PIEZOMETER NO. B-11P
LOCATION NEW YORK, NY
PIEZOMETER LOCATION SEE PLAN — DATE OF INSTALLATION 9-15-03
☐ SEE SKETCH ON BACK — RES. ENG. R NUNEZ

PIEZOMETER TYPE slotted PVC



INTAKE POINT

depth to bottom, ft = 31
depth to top, ft = 15
length, ft = 16 = L
diameter, in = 4, ft = 0.33 = 2R

STANDPIPE/RISER

elevation of rim, ft = 21.1
diameter, in = 2, ft = 0.16 = 2r

READING TIME		DEPTH - RIM TO WATER (FT.)	ELEVATION OF WATER	REMARKS
DATE	CLOCK (HRS)			
9.15.03	0840	13.7	+7.4	
9.16.03	0740	13.9	+7.2	
9.16.03	1202	13.8	+7.3	
9.18.03	1130	13.9	+7.2	
9.24.03	0840	13.8	+7.3	
9.29.03	0757	13.8	+7.3	

Sand Bentonite
Gravel Grout

GROUND SURFACE ELEV. 21.1

PIEZOMETER NO. B-11P

SHEET 5 OF 6
FILE NO. 1006(4
SUBCODE

MUESER RUTLEDGE CONSULTING ENGINEERS

VARIABLE HEAD PERMEABILITY TEST

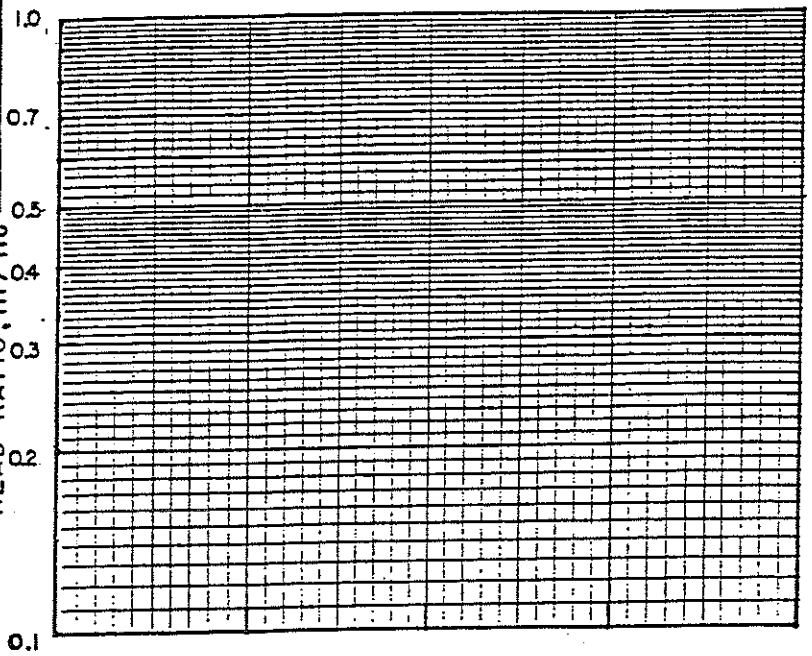
☐ BOREHOLE OR ☒ PIEZOMETER NO. B-11P

TEST NO. 1

PROJECT Harlem Hotel — RES.ENG. TC NUNEZ

LOCATION New York, NY — CALC.BY ___ DATE ___

PIEZOMETER LOCATION Seeplan — CH'KD BY ___ DATE ___



ELAPSED TIME, Δt, MIN.

INTAKE POINT

depth to bottom, ft = 31
depth to top, ft = 15
length, ft = 16 = L
diameter, in = 4, ft = 0.33 = 2R

STANDPIPE/RISER

diameter, in = 2, ft = 0.16 = 2r

depth of casing, ft = 20

depth to which standpipe was bailed, ft = - = Z

READING TIME			TEST DEPTH-RIM TO WATER ft.	DEPTH-RIM TO TIDE OR GWL ft.	UNBALANCED HEAD H ft.	HEAD RATIO Ht/Ho	REMARKS
DATE	CLOCK	Δt MIN.					Rim is 0.5" below grade.
9-16-03	0720hr			13.9	0		STATIC WATER LEVEL
							(1) Falling Head Test.
							Filled w/ water to top of
							Rim. Water level down to
							13.9 ft. in less than 20 sec.

PIEZOMETER NO. B-11P

MUESER RUTLEDGE CONSULTING ENGINEERS

		BORING NO.	B-11P
		SHEET	6 OF 6
PROJECT	HARLEM HOTEL	FILE NO.	10064
LOCATION	NEW YORK, NEW YORK	SURFACE ELEV.	21.1
BORING LOCATION	SEE BORING LOCATION PLAN	DATUM	BOROUGH PRESIDENT OF MANHATTAN

BORING EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG		TYPE OF FEED DURING CORING		CASING USED		[X] YES [ ] NO			
TRUCK	MOBILE B-61	MECHANICAL		DIA., IN.	4	DEPTH, FT. FROM	0	TO	53
SKID		HYDRAULIC	X	DIA., IN.		DEPTH, FT. FROM		TO	
BARGE		OTHER		DIA., IN.		DEPTH, FT. FROM		TO	
OTHER									

TYPE AND SIZE OF:			
D-SAMPLER	2" O.D. SPLIT SPOON	DRILLING MUD USED	[X] YES [ ] NO
U-SAMPLER		DIAMETER OF ROTARY BIT, IN.	3-7/8, 5-7/8
S-SAMPLER		TYPE OF DRILLING MUD	EZ-MUD
CORE BARREL	NX-DOUBLE TUBE	AUGER USED	[ ] YES [X] NO
CORE BIT	DIAMOND	TYPE AND DIAMETER, IN.	
DRILL RODS	N		

CASING HAMMER, LBS.	300	AVERAGE FALL, IN.	24
SAMPLER HAMMER, LBS.	140	AVERAGE FALL, IN.	30

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION
09-16-03	07:20			13.9	FOR PIEZOMETER READINGS SEE SHEET 4.

PIEZOMETER INSTALLED [X] YES [ ] NO SKETCH SHOWN ON SHEET 4

STANDPIPE:	TYPE	SCHEDULE 40 PVC	ID, IN.	2	LENGTH, FT.	20	TOP ELEV.	+21.1
INTAKE ELEMENT:	TYPE	SLOTTED PVC	OD, IN.	2-1/4	LENGTH, FT.	10	TIP ELEV.	-8.9
FILTER:	MATERIAL	SAND	OD, IN.	4	LENGTH, FT.	15	BOT. ELEV.	-8.9

PAY QUANTITIES

3.5" DIA. DRY SAMPLE BORING	LIN. FT.	73	NO. OF 3" SHELBY TUBE SAMPLES	
3.5" DIA. U-SAMPLE BORING	LIN. FT.		NO. OF 3" UNDISTURBED SAMPLES	
CORE DRILLING IN ROCK	LIN. FT.	10	OTHER:	

BORING CONTRACTOR: CMI SUBSURFACE INVESTIGATIONS, INC.

DRILLER: MIKE MCERLEAN HELPERS: BERT MOLZAHN

REMARKS:

RESIDENT ENGINEER: RANDY NUNEZ DATE: 09-12-03

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. B-12
SHEET 1 OF 2
FILE NO. 10064
SURFACE ELEV. 21.9
RES. ENGR. RANDY NUNEZ

PROJECT: HARLEM HOTEL
LOCATION: NEW YORK, NEW YORK

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
09-18-03								6" Asphalt at surface.
Thursday	1D	1.0	5-11	Brown fine to coarse sand, some silt, trace				
Cloudy		2.0	100/0"	brick, gravel (Fill) (SM)				
	2D	3.0	100/2"	Brown coarse to fine sand, trace silt, brick,	F			
		3.2		gravel (Fill) (SP-SM)		5		
	3D	5.0	3-4	Red brick, some brown coarse to fine sand,				
		7.0	5-5	trace silt, wood (Fill)				
	4D	7.0	100/2"	Brown coarse to fine sand, trace silt, gravel,				
08:15		7.2		brick (Fill) (SP-SM)		9		Unable to advance
06:30						10		beyond obstruction at
09-22-03								9'. Hard drilling, roller
Monday								bit wore out.
								Abandoned boring at
						15		9'. Offset to No. B-12A.
						20		
						25		
						30		
						35		
						40		
						45		
						50		

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING NO. B-12
SHEET 2 OF 2
FILE NO. 10064
SURFACE ELEV. 21.9
DATUM BOROUGH PRESIDENT OF MANHATTAN

PROJECT HARLEM HOTEL
LOCATION NEW YORK, NEW YORK
BORING LOCATION SEE BORING LOCATION PLAN

BORING EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG: TRUCK MOBILE B-61; SKID; BARGE; OTHER

TYPE OF FEED DURING CORING: MECHANICAL; HYDRAULIC; OTHER

CASING USED: [X] YES [ ] NO

	DIA., IN.	DEPTH, FT. FROM	TO
	4	0	5

TYPE AND SIZE OF:
D-SAMPLER 2" O.D. SPLIT SPOON
U-SAMPLER
S-SAMPLER
CORE BARREL
CORE BIT
DRILL RODS N

DRILLING MUD USED [X] YES [ ] NO
DIAMETER OF ROTARY BIT, IN. 5-7/8, 3-7/8
TYPE OF DRILLING MUD QUIK GEL

AUGER USED [ ] YES [X] NO
TYPE AND DIAMETER, IN.

CASING HAMMER, LBS. AVERAGE FALL, IN.
SAMPLER HAMMER, LBS. 140 AVERAGE FALL, IN. 30

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION
					NO OBSERVATIONS MADE.

PIEZOMETER INSTALLED [ ] YES [X] NO SKETCH SHOWN ON

STANDPIPE:	TYPE	ID, IN.	LENGTH, FT.	TOP ELEV.	
INTAKE ELEMENT:	TYPE	OD, IN.	LENGTH, FT.	TIP ELEV.	
FILTER:	MATERIAL	OD, IN.	LENGTH, FT.	BOT. ELEV.	

PAY QUANTITIES

3.5" DIA. DRY SAMPLE BORING	LIN. FT.	9	NO. OF 3" SHELBY TUBE SAMPLES	
3.5" DIA. U-SAMPLE BORING	LIN. FT.		NO. OF 3" UNDISTURBED SAMPLES	
CORE DRILLING IN ROCK	LIN. FT.		OTHER:	

BORING CONTRACTOR CMI SUBSURFACE INVESTIGATIONS, INC.
DRILLER MIKE MCERLEAN HELPERS BERT MOLZAHN
REMARKS ABANDONED AT 9 FEET, GROUTED BOREHOLE UPON COMPLETION, OFFSET TO B-12A.
RESIDENT ENGINEER RANDY NUNEZ DATE 09-22-03

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. B-12A
SHEET 1 OF 4
FILE NO. 10064
SURFACE ELEV. 21.9
RES. ENGR. RANDY NUNEZ

PROJECT: HARLEM HOTEL
LOCATION: NEW YORK, NEW YORK

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
06:50								6" Asphalt at surface.
09-22-03								Offset from B-12.
Monday								
Cloudy								
78°F						5		Drilled without sampling to 10'. See Boring No. B-12 for samples above 10'.
					F			
						10		
	1D	10.0	32-42	Brown fine to coarse sand, some gravel, trace brick, silt (Fill) (SP-SM)				
		11.4	100/5"					
						15		
	2D	15.0	11-12	Brown fine to coarse sand and gravel, trace silt (Fill) (SP&GP)				2D: Petroleum odor.
		17.0	14-11					
						18.5		
					S1	20		
	3D	20.0	19-18	Interlayered brown fine sand, some silt, trace mica and fine sandy silt, trace clay, clayey silt seams (SM&ML)				
		22.0	12-12					
						23.5		
						25		
	4NR	25.0	100/1"	No recovery				Hard drilling and rock chips in wash from 25.1' to 27.9'.
		25.1						
						30		
	5D	30.0	13-29	Brown fine to medium sand, some silt, trace coarse sand, gravel with some clayey silt pockets (SM)	S2			
		32.0	28-31					
						35		
	6D	35.0	43-32	Brown coarse to fine sand, some gravel, trace silt (SP-SM)				
		37.0	32-35					
						38.5		
						40		
	7D	40.0	17-22	Brown micaceous fine sand, some silt (SM)				
		42.0	42-53					
					S1			
						45		
	8D	45.0	22-31	Do 7D, trace white medium sand (SM)				Rock fragments in tip of spoon.
		47.0	45-100					
						48.5		
					T	50		
	9D	50.0	21-43	Brown fine to medium sand, some silt, trace gravel, mica (SM)				
		52.0	58-71					

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. B-12A
SHEET 2 OF 4
FILE NO. 10064
SURFACE ELEV. 21.9
RES. ENGR. RANDY NUNEZ

PROJECT: HARLEM HOTEL
LOCATION: NEW YORK, NEW YORK

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
09-22-03								
						55		
	10D	55.0	76-100/3"	Brown fine to coarse sand, some silt, trace gravel, clay pockets, mica (SM)				
		55.8						
					T	60		
	11D	60.0	33-59	Brown fine to coarse sand, some gravel,				
		61.8	85-100/3"	silt (SM)				
						65		
	12D	65.0	48-44	Gray brown gravelly fine to coarse sand, some				
		66.3	100/3"	silt, trace mica (SM)				
						67.5		Hard drilling from 67.5' to 69'.
	1C	69.0	REC=80%	Medium hard, slightly weathered, white gray		70		
		74.0	RQD=72%	schistose marble, jointed to moderately jointed, weathered joints	R			
	2C	74.0	REC=97%	Hard, slightly weathered, white gray schistose		75		
		79.0	RQD=97%	marble, jointed, weathered joints				
14:00						79		End of boring at 79'.
						80		
						85		
						90		
						95		
						100		

MUESER RUTLEDGE CONSULTING ENGINEERS
ROCK CORE SKETCH

BORING NO. B-12A
SHEET 3 OF 4
FILE NO. 10064
SURFACE ELEV. 21.9
RES. ENGR. TO NUNEZ

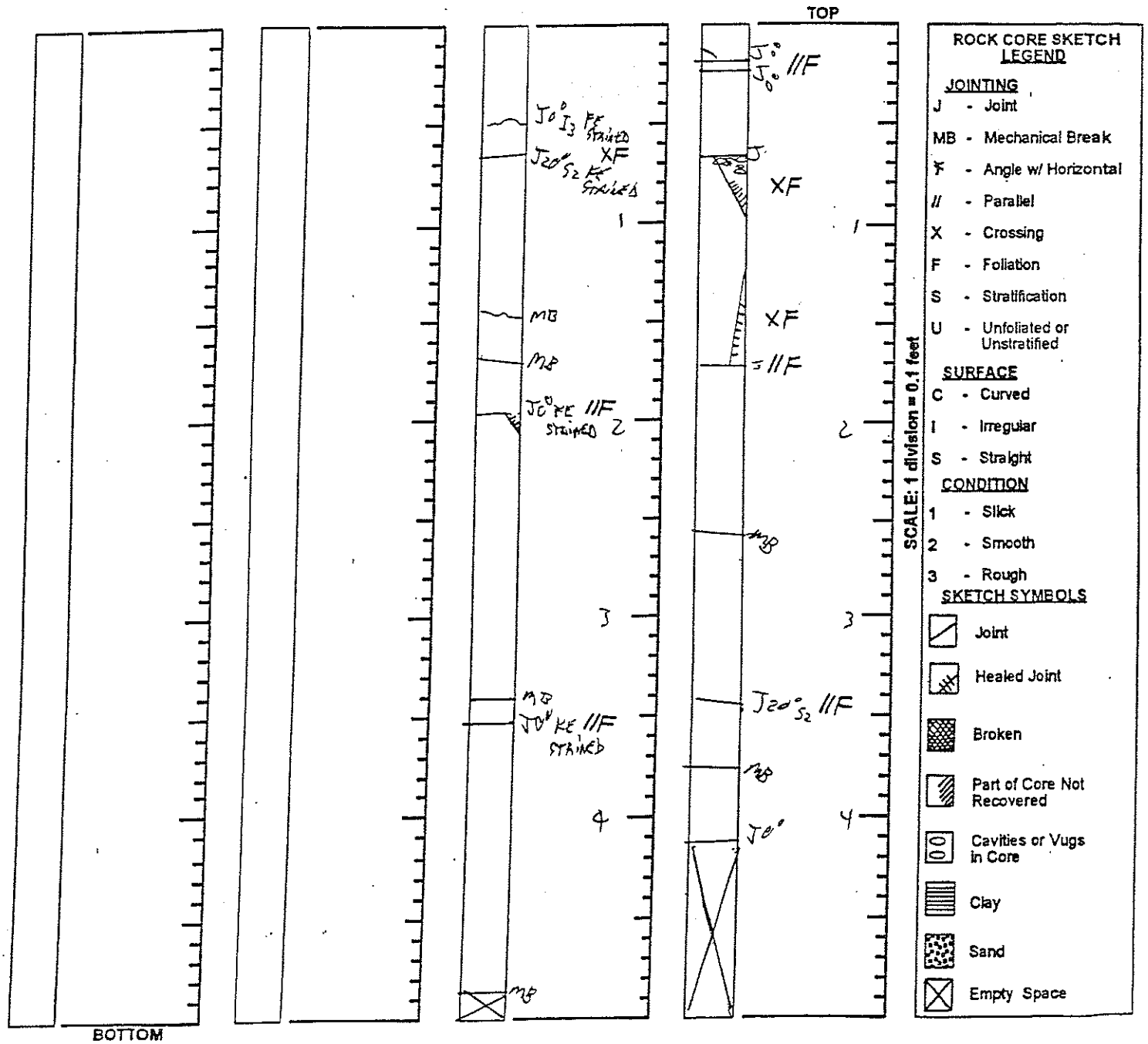
PROJECT HARLEM HOTEL
LOCATION NEW YORK, NY

Run No.	REC / RQD

Run No.	REC / RQD

Run No.	REC / RQD
2C	97/97%

Run No.	REC / RQD
1C	80/72%



NOTES

MUESER RUTLEDGE CONSULTING ENGINEERS

		BORING NO.	B-12A
		SHEET	4 OF 4
PROJECT	HARLEM HOTEL	FILE NO.	10064
LOCATION	NEW YORK, NEW YORK	SURFACE ELEV.	21.9
BORING LOCATION	SEE BORING LOCATION PLAN	DATUM	BOROUGH PRESIDENT OF MANHATTAN

BORING EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG		TYPE OF FEED DURING CORING		CASING USED						
				[X] YES	[ ] NO					
TRUCK	MOBILE B-61	MECHANICAL		DIA., IN.	4	DEPTH, FT. FROM	0	TO	20
SKID		HYDRAULIC	X	DIA., IN.	3	DEPTH, FT. FROM	0	TO	55
BARGE		OTHER		DIA., IN.		DEPTH, FT. FROM		TO	
OTHER									

TYPE AND SIZE OF:

D-SAMPLER	2" O.D. SPLIT SPOON
U-SAMPLER	
S-SAMPLER	
CORE BARREL	NX - DOUBLE TUBE
CORE BIT	DIAMOND
DRILL RODS	N

DRILLING MUD USED [X] YES [ ] NO

DIAMETER OF ROTARY BIT, IN. 2-15/16, 3-7/8, 5-7/8

TYPE OF DRILLING MUD

AUGER USED [ ] YES [X] NO

TYPE AND DIAMETER, IN.

CASING HAMMER, LBS. 300 AVERAGE FALL, IN. 24

SAMPLER HAMMER, LBS. 140 AVERAGE FALL, IN. 30

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION
					NO OBSERVATIONS MADE.

PIEZOMETER INSTALLED [ ] YES [X] NO SKETCH SHOWN ON

STANDPIPE:	TYPE		ID, IN.		LENGTH, FT.		TOP ELEV.		
INTAKE ELEMENT:	TYPE		OD, IN.		LENGTH, FT.		TIP ELEV.		
FILTER:	MATERIAL		OD, IN.		LENGTH, FT.		BOT. ELEV.		

PAY QUANTITIES

3.5" DIA. DRY SAMPLE BORING	LIN. FT.	69	NO. OF 3" SHELBY TUBE SAMPLES	
3.5" DIA. U-SAMPLE BORING	LIN. FT.		NO. OF 3" UNDISTURBED SAMPLES	
CORE DRILLING IN ROCK	LIN. FT.	10	OTHER:	

BORING CONTRACTOR CMI SUBSURFACE INVESTIGATIONS, INC.

DRILLER MIKE MCERLEAN HELPERS BERT MOLZAHN

REMARKS GROUTED BOREHOLE UPON COMPLETION.

RESIDENT ENGINEER RANDY NUNEZ DATE 09-22-03

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. B-13
SHEET 1 OF 4
FILE NO. 10064
SURFACE ELEV. 21.8
RES. ENGR. RANDY NUNEZ

PROJECT: HARLEM HOTEL
LOCATION: NEW YORK, NEW YORK

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	CASING DEPTH	CASING BLOWS	REMARKS
09-26-03								6" Asphalt at surface.
Friday	1D	1.0	15-38	Brown fine to medium sand, some silt, gravel,				
		3.0	26-14	trace brick (Fill) (SM)				
	2D	3.0	10-6	Brown fine to medium sand and gravel, some				
		5.0	5-5	silt, trace brick (Fill) (SM&GM)		5		
	3D	5.0	3-6	Gray gravel (Fill) (GP)				Gravel in tip of spoon.
		7.0	9-11					
	4D	7.0	10-33	Brown fine to medium sand, some silt, gravel,				
		9.0	48-80	(Fill) (SM)	F			
						10		
	5D	10.0	43-100/5"	Brown fine to coarse sand, some gravel, trace				
		10.9		silt (Fill) (SP-SM)				
						15		
	6D	15.0	17-38	Brown fine to coarse, some gravel, trace silt,				6D: Petroleum odor.
		17.0	19-22	brick (Fill) (SP-SM)				Petroleum present in
								sample.
						18.5		
					S1	20		
	7D	20.0	14-14	Brown silty fine sand, trace fine sandy silt				
		22.0	11-12	layers, mica, clay (SM)				
						23.5		
						25		
14:00								
06:00	8D	25.0	6-6	Brown silt, some fine sand, trace clay, mica,				
09-29-03		27.0	8-9	varved with trace red brown clayey silt (ML)				
Monday								
Cloudy								
60°F						30		
	9D	30.0	6-7	Brown silt, some fine sand, trace clay, mica,	M			
		32.0	8-13	clayey silt seams (ML)				
						35		
	10D	35.0	4-8	Brown silt, trace fine sand, clay, mica, clayey				WC=25
		37.0	8-12	silt seams (ML)				
						38.5		
						40		
	11D	40.0	5-7	Brown silt, trace fine sand, clay, mica, varved				WC=33
		42.0	6-7	with stiff clayey silt (ML)				
						45		
	12D	45.0	3-5	Do 11D (ML)	V			
		47.0	7-4					
						48.5		
						50		
	13D	50.0	3-7	Brown silt, trace fine sand, clay, mica, clayey	M			WC=25
		52.0	7-8	silt seams (ML)				

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. B-13
SHEET 2 OF 4
FILE NO. 10064
SURFACE ELEV. 21.8
RES. ENGR. RANDY NUNEZ

PROJECT: HARLEM HOTEL
LOCATION: NEW YORK, NEW YORK

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
09-29-03 Monday								
								Hard drilling at 53' probably due to gravel layer.
						55		
	14D	55.0	17-18	Red brown silt, trace fine sand, clay, mica,	M			
		57.0	10-19	clay layers, with trace layers of brown fine to coarse sand, some silt, gravel (ML)				
						60		
	15D	60.0	8-16	Gray brown fine sandy silt, trace mica, clay				
		62.0	17-19	seams (ML)				
						63.5		
						65		
	16D	65.0	72-49	Brown fine to coarse sand, trace silt, gravel,				
		67.0	52-33	white fine to coarse sand (SP-SM)				
						70		
	17D	70.0	17-19	Brown fine to medium sand, trace silt, gravel	S2			
		72.0	19-22	(SP-SM)				
						75		
	18D	75.0	15-15	Brown fine to coarse sand, trace silt, gravel,				
		77.0	16-18	mica (SP)				
						80		
	19D	80.0	12-16	Brown fine to medium sand, trace silt, mica,				
		82.0	21-23	red brown clayey silt layers (SP-SM)				
								Hard drilling at 87.5',
						83.5		silt/clay in wash,
						85		decomposed rock.
	20D	85.0	100/3"	Brown fine to coarse sand, some silt, trace	T			
		85.3		gravel, clay pockets, mica (SM)				
						87.5		
					DR			
						90		
	21NR	90.0	100/0"	No recovery			3*	*Coring time in
	1C	90.0	REC=97%	Hard, slightly weathered, gray calcareous			2*	minutes per foot.
		95.0	RQD=93%	schistose gneiss, moderately jointed,			3*	
				weathered joints			2*	WC=Water Content
						95	3*	in percent of dry
	2C	95.0	REC=97%	Hard, slightly weathered, gray schistose	R			weight.
		100.0	RQD=88%	gneiss, jointed, weathered joints				
						100		End of boring at 100'.

MUESER RUTLEDGE CONSULTING ENGINEERS
ROCK CORE SKETCH

BORING NO. B-13
SHEET 3 OF 4
FILE NO. 10064
SURFACE ELEV. 21.8
RES. ENGR. JC. NUNEZ

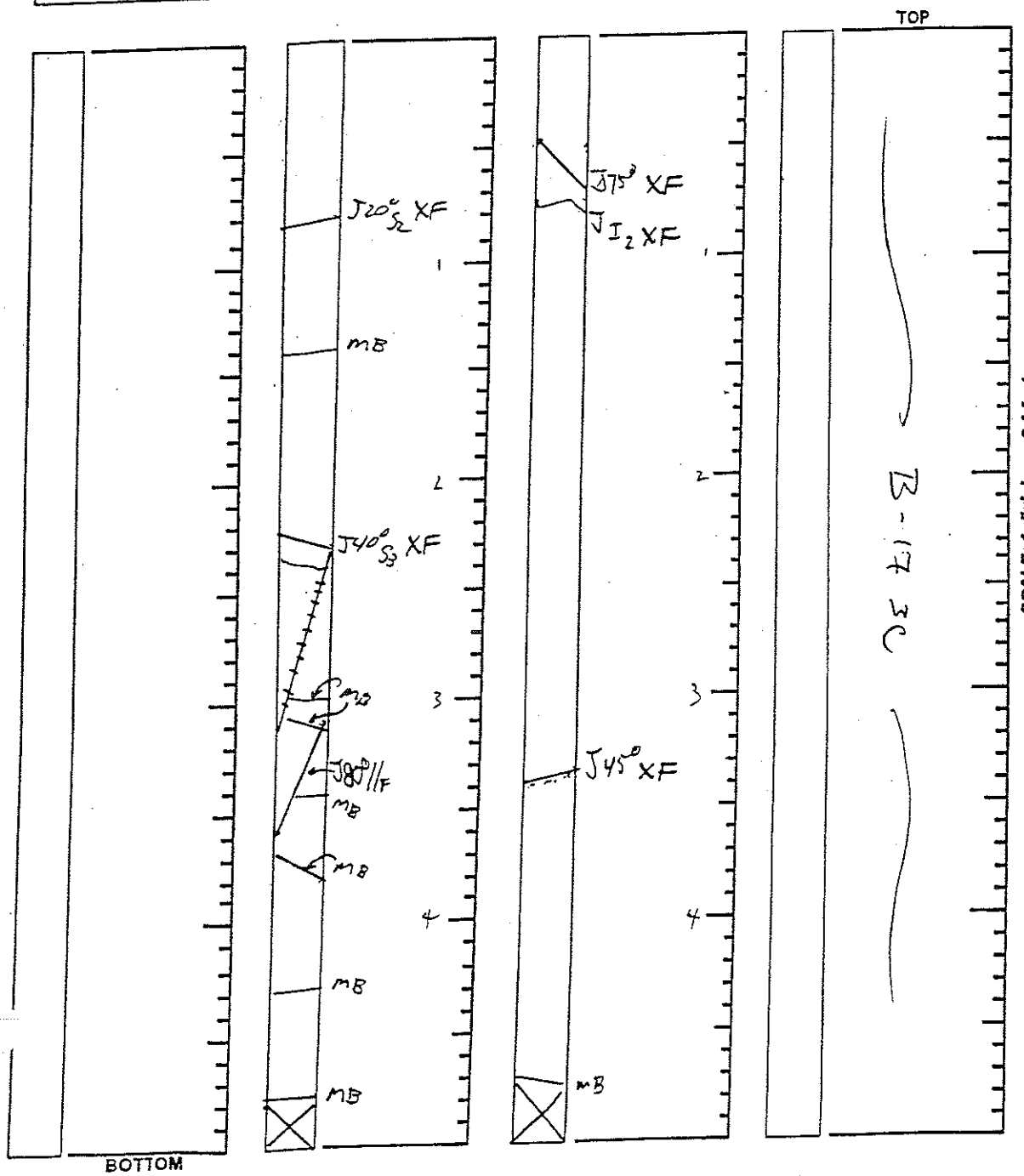
PROJECT Harlem Hotel
LOCATION NEW YORK, NY

Run No.	REC / RQD

Run No.	REC / RQD
2C	97/88%

Run No.	REC / RQD
1C	97/93%

Run No.	REC / RQD



SCALE: 1 division = 0.1 feet

ROCK CORE SKETCH LEGEND

JOINTING
- J - Joint
- MB - Mechanical Break
- F - Angle w/ Horizontal
- // - Parallel
- X - Crossing
- F - Foliation
- S - Stratification
- U - Unfoliated or Unstratified

SURFACE
- C - Curved
- I - Irregular
- S - Straight

CONDITION
- 1 - Slick
- 2 - Smooth
- 3 - Rough

SKETCH SYMBOLS
- Joint
- Healed Joint
- Broken
- Part of Core Not Recovered
- Cavities or Vugs in Core
- Clay
- Sand
- Empty Space

NOTES

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING NO. B-13
SHEET 4 OF 4
FILE NO. 10064
SURFACE ELEV. 21.8
DATUM BOROUGH PRESIDENT OF MANHATTAN

PROJECT HARLEM HOTEL
LOCATION NEW YORK, NEW YORK
BORING LOCATION SEE BORING LOCATION PLAN

BORING EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG: TRUCK MOBILE B-61; SKID; BARGE; OTHER
TYPE OF FEED DURING CORING: MECHANICAL; HYDRAULIC X; OTHER

CASING USED: [X] YES [ ] NO
DIA., IN. 4 DEPTH, FT. FROM 0 TO 25
DIA., IN. DEPTH, FT. FROM TO
DIA., IN. DEPTH, FT. FROM TO

TYPE AND SIZE OF:
D-SAMPLER 2" O.D. SPLIT SPOON
U-SAMPLER
S-SAMPLER
CORE BARREL NX - DOUBLE TUBE
CORE BIT DIAMOND
DRILL RODS N

DRILLING MUD USED: [X] YES [ ] NO
DIAMETER OF ROTARY BIT, IN. 3-7/8, 5-7/8
TYPE OF DRILLING MUD REVERT

AUGER USED: [ ] YES [X] NO
TYPE AND DIAMETER, IN.

CASING HAMMER, LBS. 300 AVERAGE FALL, IN. 24
SAMPLER HAMMER, LBS. 140 AVERAGE FALL, IN. 30

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION
					NO OBSERVATIONS MADE.

PIEZOMETER INSTALLED [ ] YES [X] NO SKETCH SHOWN ON

STANDPIPE: TYPE ID, IN. LENGTH, FT. TOP ELEV.
INTAKE ELEMENT: TYPE OD, IN. LENGTH, FT. TIP ELEV.
FILTER: MATERIAL OD, IN. LENGTH, FT. BOT. ELEV.

PAY QUANTITIES

3.5" DIA. DRY SAMPLE BORING LIN. FT. 90
3.5" DIA. U-SAMPLE BORING LIN. FT.
CORE DRILLING IN ROCK LIN. FT. 10
NO. OF 3" SHELBY TUBE SAMPLES
NO. OF 3" UNDISTURBED SAMPLES
OTHER:

BORING CONTRACTOR CMI SUBSURFACE INVESTIGATIONS, INC.
DRILLER MIKE MCERLEAN HELPERS BERT MOLZAHN
REMARKS GROUTED BOREHOLE UPON COMPLETION.
RESIDENT ENGINEER RANDY NUNEZ DATE 09-29-03

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. B-14
SHEET 1 OF 4
FILE NO. 10064
SURFACE ELEV. 20.7
RES. ENGR. RANDY NUNEZ

PROJECT: HARLEM HOTEL
LOCATION: NEW YORK, NEW YORK

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	CASING DEPTH	CASING BLOWS	REMARKS
06:00	1D	1.0	11-22	Brown silty fine to medium sand, trace brick,				6" Asphalt at surface.
09-24-03		3.0	19-23	gravel, roots (Fill) (SM)				
Wednesday	2D	3.0	15-14	Brown fine to medium sand, some silt, trace				
Clear		4.6	38-100/1"	brick, gravel (Fill) (SM)				
50°F	3D	5.0	71-100/5"	Brown fine to medium sand, some gravel, silt,		5		
		5.9		trace brick (Fill) (SM)				Hard drilling at 5.9'.
	4NR	7.0	100/1"	No recovery				
		7.1						
	5D	10.0	37-100/1"	Brown fine to medium sand, some silt, trace				
		10.6		gravel (Fill) (SM)		10		
					F			
						15		
	6D	15.0	24-50	Brown fine to coarse sand, some gravel, silt,				
		17.0	63-75	trace cinders, brick (Fill) (SM)				
						20		
	7D	20.0	23-20	Brown fine to medium sand, trace silt, gravel,				
		22.0	13-9	mica, brick (Fill) (SP-SM)				
						25		
	8D	25.0	20-35	Brown fine to coarse sand, trace gravel, silt,				
		27.0	48-37	silt pockets (Fill) (SP-SM)				
						28.5		
						30		
	9D	30.0	12-15	Brown silt, trace fine sand, clay, varved with	V			WC=29
		32.0	18-21	stiff clayey silt (ML)				
						33		Hard drilling at 33'.
						35		
	10NR	35.0	100/0"	No recovery				Hard drilling to 36.5'. Boulder from 33' ± to 36.5'±.
						40		
	11D	40.0	31-44	Brown fine to coarse sand, some gravel, silt				
		42.0	32-23	(SM)				
					S2			
						45		
	12NR	45.0	42-48	No recovery				Gravel in tip of spoon.
		47.0	36-25					
						50		
	13D	50.0	23-24	Brown fine to coarse sand, some gravel, silt,				
		52.0	27-33	trace mica (SM)				

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. B-14
SHEET 2 OF 4
FILE NO. 10064
SURFACE ELEV. 20.7
RES. ENGR. RANDY NUNEZ

PROJECT: HARLEM HOTEL
LOCATION: NEW YORK, NEW YORK

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
09-24-03					S2			
						55		
	14D	55.0	22-24	Brown fine sand, some silt, trace gravel, mica,	S1			Gravel in tip of spoon.
		57.0	28-29	clay (SM)				
						60		
	15D	60.0	22-23	Brown fine sand, some silt, trace clayey silt				
		62.0	29-24	pockets, mica (SM)				
						63.5		
					S2	65		
	16D	65.0	13-15	Brown fine to coarse sand, trace gravel, silt				
		67.0	15-14	(SP)				
						70		
	17D	70.0	9-12	Brown medium to fine sand, trace silt, mica				
		72.0	10-10	(SP)				
						74		Hard drilling.
						75		
	18D	75.0	100/3"	Brown fine to coarse sand, some gravel, silt,	T			
		75.3		trace mica (SM)				
								Hard drilling 79' to
						80		80.5', possible boulder.
	19NR	81.0	100/0"	No recovery		80.5		19NR: Spoon bouncing.
							3.5*	*Coring time in
	1C	82.5	REC=100%	Hard, unweathered, white gray schistose			2.5*	minutes per foot.
		87.7	RQD=100%	marble, jointed		85	2.5*	
					R		3*	
							2.5*	
	2C	87.7	REC=100%	Hard, unweathered, gray calcareous schistose				2C: Average drilling
		92.7	RQD=95%	gneiss, jointed				rate 2 minutes per foot.
						90		
14:00						92.7		End of boring at 92.7'.
						95		WC=Water Content
								in percent of dry
								weight.
						100		

MUESER RUTLEDGE CONSULTING ENGINEERS
ROCK CORE SKETCH

BORING NO. B-14
SHEET 3 OF 4
FILE NO. 10064
SURFACE ELEV. 20.7
RES. ENGR. TC. NUNEZ

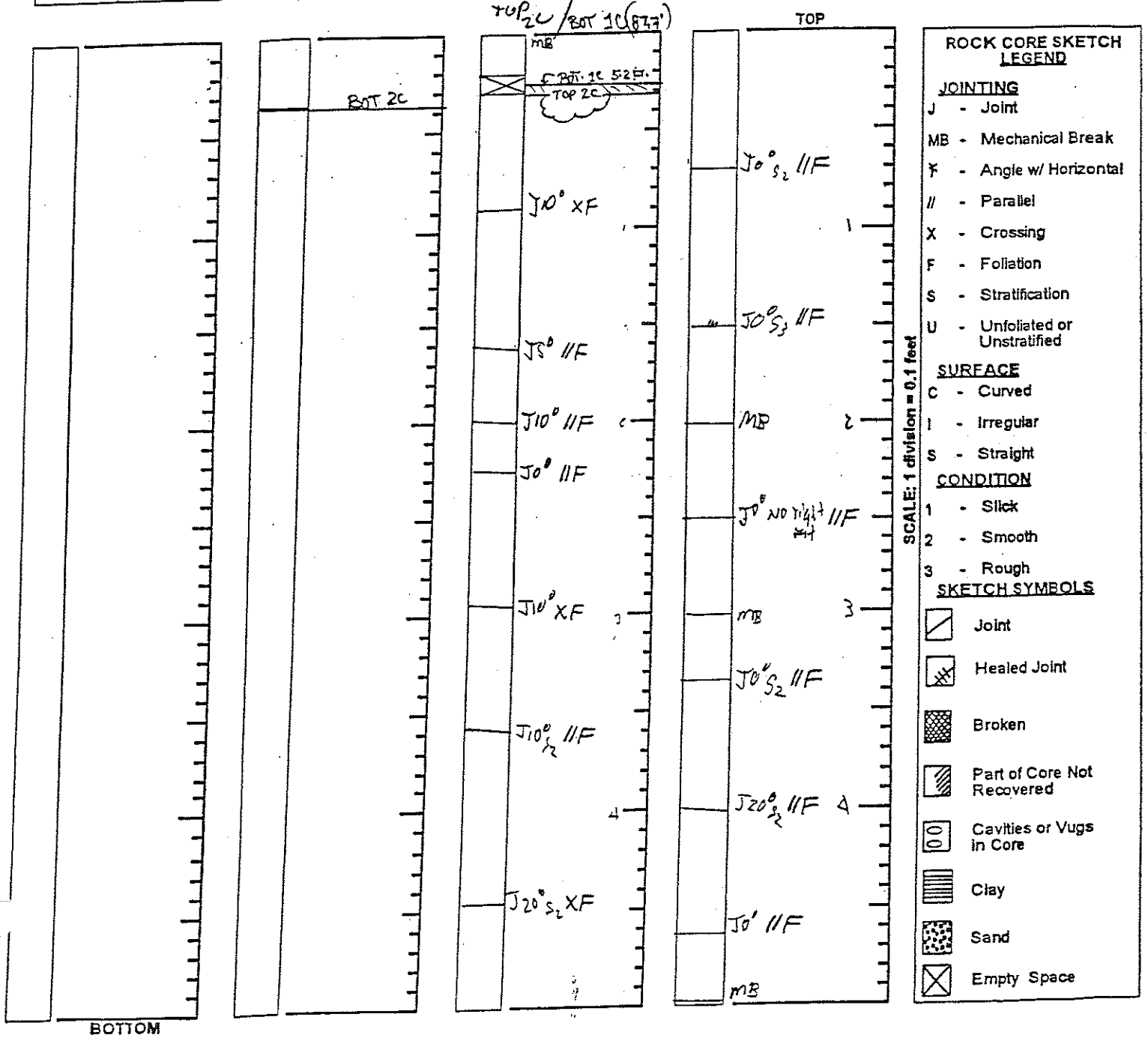
PROJECT Harlem Hotel
LOCATION NEW YORK, NY

Run No.	REC / RQD

Run No.	REC / RQD

Run No.	REC / RQD
2C	100/95%

Run No.	REC / RQD
1C	103/103%



ROCK CORE SKETCH LEGEND

JOINTING
- J - Joint
- MB - Mechanical Break
- ∢ - Angle w/ Horizontal
- // - Parallel
- X - Crossing
- F - Foliation
- S - Stratification
- U - Unfoliated or Unstratified

SURFACE
- C - Curved
- I - Irregular
- S - Straight

CONDITION
- 1 - Slick
- 2 - Smooth
- 3 - Rough

SKETCH SYMBOLS
- Joint
- Healed Joint
- Broken
- Part of Core Not Recovered
- Cavities or Vugs in Core
- Clay
- Sand
- Empty Space

NOTES

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING NO. B-14
SHEET 4 OF 4
FILE NO. 10064
SURFACE ELEV. 20.7
DATUM BOROUGH PRESIDENT OF MANHATTAN

PROJECT HARLEM HOTEL
LOCATION NEW YORK, NEW YORK
BORING LOCATION SEE BORING LOCATION PLAN

BORING EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG		TYPE OF FEED DURING CORING		CASING USED		[X] YES	[ ] NO		
TRUCK	MOBILE B-61	MECHANICAL		DIA., IN.	4	DEPTH, FT. FROM	0	TO	20
SKID		HYDRAULIC	X	DIA., IN.		DEPTH, FT. FROM		TO	
BARGE		OTHER		DIA., IN.		DEPTH, FT. FROM		TO	
OTHER									

TYPE AND SIZE OF:

D-SAMPLER	2" O.D. SPLIT SPOON
U-SAMPLER	
S-SAMPLER	
CORE BARREL	NX-DOUBLE TUBE
CORE BIT	DIAMOND
DRILL RODS	N

DRILLING MUD USED [X] YES [ ] NO
DIAMETER OF ROTARY BIT, IN. 3-7/8, 5-7/8
TYPE OF DRILLING MUD QUIK GEL

AUGER USED [ ] YES [X] NO
TYPE AND DIAMETER, IN.

CASING HAMMER, LBS. 300 AVERAGE FALL, IN. 24
SAMPLER HAMMER, LBS. 140 AVERAGE FALL, IN. 30

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION
					NO OBSERVATIONS MADE.

PIEZOMETER INSTALLED [ ] YES [X] NO SKETCH SHOWN ON

STANDPIPE:	TYPE		ID, IN.		LENGTH, FT.		TOP ELEV.	
INTAKE ELEMENT:	TYPE		OD, IN.		LENGTH, FT.		TIP ELEV.	
FILTER:	MATERIAL		OD, IN.		LENGTH, FT.		BOT. ELEV.	

PAY QUANTITIES

3.5" DIA. DRY SAMPLE BORING	LIN. FT.	82.5	NO. OF 3" SHELBY TUBE SAMPLES	
3.5" DIA. U-SAMPLE BORING	LIN. FT.		NO. OF 3" UNDISTURBED SAMPLES	
CORE DRILLING IN ROCK	LIN. FT.	10.2	OTHER:	

BORING CONTRACTOR CMI SUBSURFACE INVESTIGATIONS, INC.
DRILLER MIKE MCERLEAN HELPERS BERT MOLZAHN
REMARKS GROUTED BOREHOLE UPON COMPLETION.
RESIDENT ENGINEER RANDY NUNEZ DATE 09-24-03

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. B-15
SHEET 1 OF 4
FILE NO. 10064
SURFACE ELEV. 21.6
RES. ENGR. RANDY NUNEZ

PROJECT: HARLEM HOTEL
LOCATION: NEW YORK, NEW YORK

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	CASING DEPTH	CASING BLOWS	REMARKS
12:00								6" Asphalt at surface.
09-09-03	1D	1.0	12-20	Brown fine to coarse sand, some silt, brick,				
Tuesday		3.0	40-45	gravel, trace wood (Fill) (SM)				
Sunny	2D	3.0	14-17	Brown fine to medium sand, some silt, brick,				
70°F		5.0	11-17	trace gravel (Fill) (SM)		5		
	3D	5.0	10-7	Brown fine to meidum sand, some silt, wood,				
		7.0	10-6	trace brick (Fill) (SM)				
	4D	7.0	55-14	Brown fine to coarse sand, some gravel, trace				Wood in wash.
		9.0	32-51	brick, silt (Fill) (SP-SM)	F			
						10		
	5D	10.0	36-36	Brown fine to coarse sand, some gravel, silt,				
		12.0	38-42	trace brick (Fill) (SM)				
						15		6D: Petroleum odor.
	6D	15.0	40-45	Brown black fine to coarse sand, some silt,				
		15.8	100/4"	gravel, trace brick (Fill) (SM)				
						18.5		
						20		
	7D	20.0	13-19	Red brown silty fine sand, trace gravel, mica	S1			
14:00		22.0	14-11	(SM)				
06:00								
09-10-03						23.5		
Wednesday						25		
Sunny	8D	25.0	12-28	Top 8": Red brown silt, some fine sand, trace	M			
65°F		27.0	47-57	gravel, clayey silt layers (ML)		26.8		
				Bot 3": Brown fine to medium sand, some				
				gravel, trace silt, mica (SP-SM)				
						30		
	9D	30.0	24-28	Brown medium to fine sand, trace silt,	S2			
		32.0	49-60	gravel (SP-SM)				
						33.5		
						35		
	10D	35.0	31-33	Brown micaceous fine sand, some silt, trace				
		37.0	28-24	gravel (SM)				
						40		
	11D	40.0	25-25	Brown fine sand, some silt, mica (SM)	S1			
		42.0	30-26					
						45		
	12D	45.0	18-27	Brown fine sand, trace silt, mica (SP-SM)				
		47.0	35-41					
						50		
	13D	50.0	21-27	Brown fine sand, some silt, trace mica (SM)				
		52.0	42-35					

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. B-15
SHEET 2 OF 4
FILE NO. 10064
SURFACE ELEV. 21.6
RES. ENGR. RANDY NUNEZ

PROJECT: HARLEM HOTEL
LOCATION: NEW YORK, NEW YORK

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
09-10-03					S1			
						53.5		
					T	55		Spoon bouncing.
	14NR	56.0	100/0"	No recovery				Hard drilling at 55'
								white rock in wash.
								Roller bit to 60'.
						60		
	15D	60.0	100/6"	Brown silty fine to medium sand, some				
		60.5		gravel, trace mica (SM)				
						65		
	16NR	65.0	100/0"	No recovery				
						70		
	17D	70.0	100/3"	Brown silty fine to medium sand, trace		71		
		70.3		coarse sand, gravel, red brown silt pockets,				
				mica (SM)				
					DR			
						75		
	18D	75.0	89-100/1"	Gray fine to coarse sand, trace rock				Possible
		75.6		fragments, silt (Decomposed Rock)		77		decomposed rock.
				(SP-SM)				Hard drilling at 77'.
					R	80		*Coring time in
	19NR	80.0	100/1"	No recovery			5*	minutes per foot.
		80.1					3*	Lost water at 82'.
	1C	80.1	REC=88%	Medium hard, slightly weathered, gray			2*	
		85.1	RQD=76%	calcareous gneissic schist, jointed to closely			3*	
				jointed		85.1	3*	End of boring at 85.1'.
						90		
						95		
						100		

MUESER RUTLEDGE CONSULTING ENGINEERS
ROCK CORE SKETCH

BORING NO. B-15
SHEET 3 OF 4
FILE NO. 10064
SURFACE ELEV. 21.6
RES. ENGR. JL NUNEZ

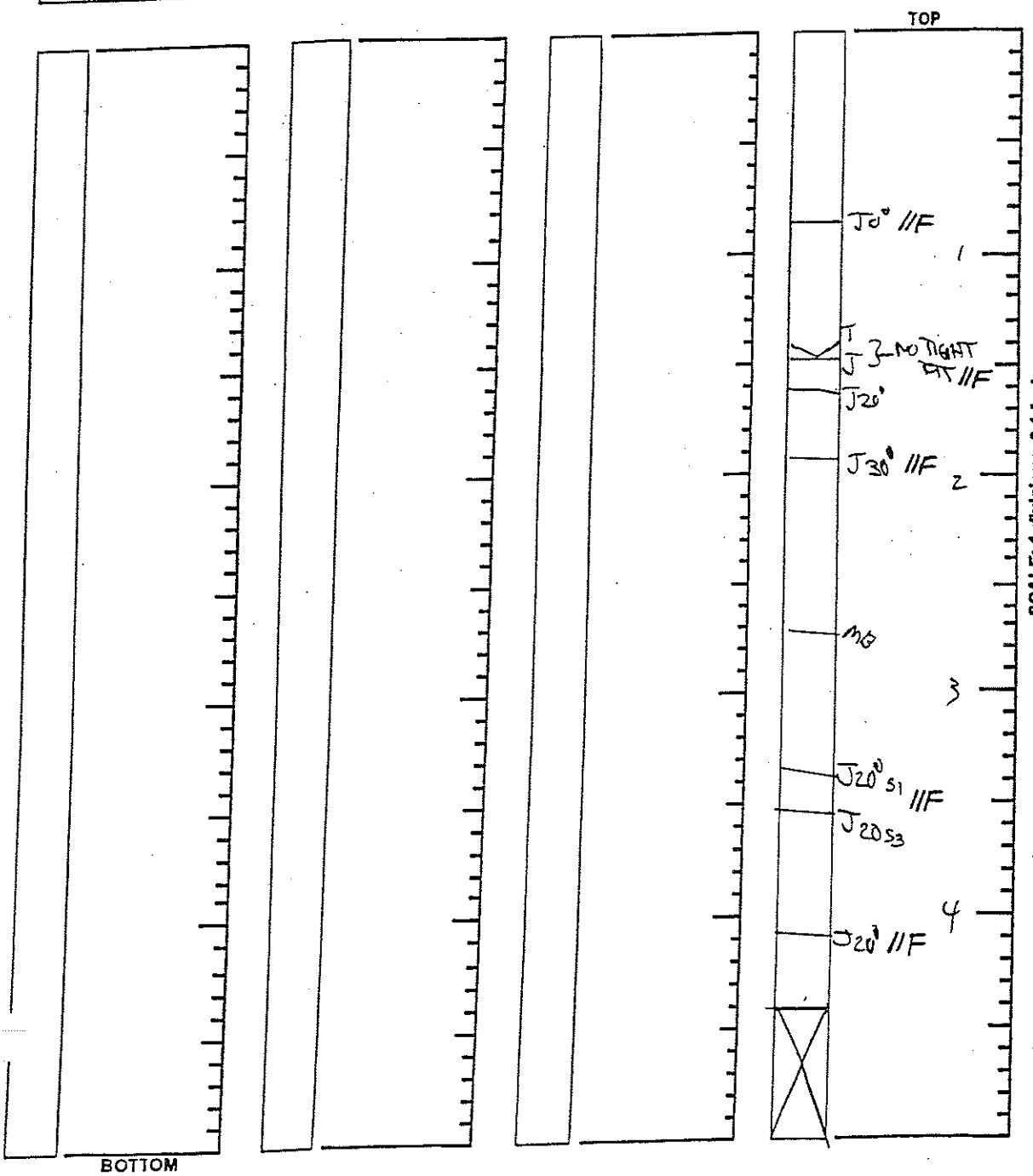
PROJECT HARLEM HOTEL
LOCATION NEW YORK NY

Run No.	REC / RQD

Run No.	REC / RQD

Run No.	REC / RQD

Run No.	REC / RQD
1C	88/76%



ROCK CORE SKETCH LEGEND

JOINTING
J - Joint
MB - Mechanical Break
∠ - Angle w/ Horizontal
// - Parallel
X - Crossing
F - Foliation
S - Stratification
U - Unfoliated or Unstratified

SURFACE
C - Curved
I - Irregular
S - Straight

CONDITION
1 - Slick
2 - Smooth
3 - Rough

SCALE: 1 division = 0.1 feet

SKETCH SYMBOLS
Joint
Healed Joint
Broken
Part of Core Not Recovered
Cavities or Vugs in Core
Clay
Sand
Empty Space

NOTES

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING NO. B-15
SHEET 4 OF 4
FILE NO. 10064
SURFACE ELEV. 21.6
DATUM BOROUGH PRESIDENT OF MANHATTAN

PROJECT HARLEM HOTEL
LOCATION NEW YORK, NEW YORK
BORING LOCATION SEE BORING LOCATION PLAN

BORING EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG		TYPE OF FEED DURING CORING		CASING USED	[X] YES [ ] NO			
TRUCK	MOBILE B-61	MECHANICAL		DIA., IN.	4	DEPTH, FT. FROM	0	TO 20
SKID		HYDRAULIC	X	DIA., IN.		DEPTH, FT. FROM		TO
BARGE		OTHER		DIA., IN.		DEPTH, FT. FROM		TO
OTHER								

TYPE AND SIZE OF:

D-SAMPLER	2" O.D. SPLIT SPOON
U-SAMPLER	
S-SAMPLER	
CORE BARREL	NX-DOUBLE TUBE
CORE BIT	DIAMOND
DRILL RODS	N

DRILLING MUD USED [X] YES [ ] NO
DIAMETER OF ROTARY BIT, IN. 3-7/8, 5-7/8
TYPE OF DRILLING MUD QUIK GEL

AUGER USED [ ] YES [X] NO
TYPE AND DIAMETER, IN.

CASING HAMMER, LBS. 300 AVERAGE FALL, IN. 24
SAMPLER HAMMER, LBS. 140 AVERAGE FALL, IN. 30

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION
					NO OBSERVATIONS MADE.

PIEZOMETER INSTALLED [ ] YES [X] NO SKETCH SHOWN ON

STANDPIPE:	TYPE		ID, IN.		LENGTH, FT.		TOP ELEV.
INTAKE ELEMENT:	TYPE		OD, IN.		LENGTH, FT.		TIP ELEV.
FILTER:	MATERIAL		OD, IN.		LENGTH, FT.		BOT. ELEV.

PAY QUANTITIES

3.5" DIA. DRY SAMPLE BORING	LIN. FT.	80.1	NO. OF 3" SHELBY TUBE SAMPLES	
3.5" DIA. U-SAMPLE BORING	LIN. FT.		NO. OF 3" UNDISTURBED SAMPLES	
CORE DRILLING IN ROCK	LIN. FT.	5	OTHER:	

BORING CONTRACTOR CMI SUBSURFACE INVESTIGATIONS, INC.
DRILLER MIKE MCERLEAN HELPERS BERT MOLZAHN
REMARKS GROUTED BOREHOLE UPON COMPLETION.
RESIDENT ENGINEER RANDY NUNEZ DATE 09-10-03

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. B-16
SHEET 1 OF 5
FILE NO. 10064
SURFACE ELEV. 22.3
RES. ENGR. RANDY NUNEZ

PROJECT: HARLEM HOTEL
LOCATION: NEW YORK, NEW YORK

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	CASING DEPTH	CASING BLOWS	REMARKS
09:00	1D	1.0	23-19	Brown fine to medium sand, some gravel,				6" Asphalt at surface.
09-15-03		3.0	11-7	silt, trace brick (Fill) (SM)				
Monday	2D	3.0	6-4	Red brick (Fill)				
Cloudy		5.0	7-12					
	3D	5.0	13-5	Brown fine to medium sand, some silt, trace		5		
		7.0	5-4	gravel, brick, wood (Fill) (SM)				
	4D	7.0	8-7	Brown fine to coarse sand, some silt, trace				
		9.0	5-4	gravel, cinders, clay pockets (Fill) (SM)				
						10		
	5D	10.0	9-17	Brown fine to coarse sand, some gravel, trace	F			
		12.0	15-10	silt (Fill) (SP-SM)				
						15		
	6D	15.0	47-100/5"	Brown fine to coarse sand, some gravel, trace				6D: Petroleum odor.
		15.9		silt (Fill) (SP-SM)				
	7D	20.0	21-23	Brown fine to coarse sand, some gravel, trace		20		7D: Petroleum odor.
		22.0	25-24	silt (SP-SM)				
						23.5		Lost water at 24'.
						25		
	8D	25.0	5-6	Brown fine sandy silt, trace clay, mica (ML)				
		27.0	5-5		M			
						30		
	9D	30.0	6-6	Do 8D (ML)				
		32.0	11-14					
						33.5		
						35		
	10D	35.0	11-11	Brown silt, trace fine sand, clay, varved with	V			
		37.0	14-14	stiff clayey silt (ML)				
						38.5		
						40		
	11D	40.0	14-23	Brown fine to coarse sand, some gravel,	S2			
		42.0	26-42	trace silt (SP-SM)				
						43.5		
						45		
	12D	45.0	48-22	Brown silt, trace fine sand, clay, fine sand	M			
13:10		47.0	31-42	layers, clayey silt layers (ML)				
06:00						48.5		
09-16-03								
Tuesday					S2	50		
Sunny	13D	50.0	16-17	Brown fine to coarse sand, trace silt (SP-SM)				
70°F		52.0	16-18					

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. B-16
SHEET 2 OF 5
FILE NO. 10064
SURFACE ELEV. 22.3
RES. ENGR. RANDY NUNEZ

PROJECT: HARLEM HOTEL
LOCATION: NEW YORK, NEW YORK

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
09-16-03 Tuesday					S2			
						53.5		
					S1	55		
	14D	55.0	11-12	Brown fine sand, some silt, trace mica (SM)				
		57.0	15-21					
						58.5		
						60		
	15D	60.0	11-13	Brown fine to medium sand, trace silt, mica				
		62.0	35-46	(SP-SM)				
						65		
	16D	65.0	23-25	Do 15D (SP-SM)				
		67.0	27-31					
						70		
	17D	70.0	47-35	Brown coarse to fine sand, some gravel, trace				
		72.0	32-33	silt (SP-SM)	S2			
						75		
	18D	75.0	36-32	Brown medium to fine sand, trace silt, gravel				
		77.0	39-52	(SP)				
						80		
	19D	80.0	40-100/3"	Brown fine to medium sand, trace silt, gravel,				
		80.7		mica (SP-SM)				
						83.5		
						85		
	20D	85.0	100/5"	Gray brown fine to medium sand, some silt,				
		85.4		gravel (SM)	T			
						90		
	21D	90.0	13-16	Top 10": Brown clayey fine to coarse sand,		91		
		92.0	27-31	trace gravel, mica (SC)				
				Bot 9": Gray micaceous silty fine to medium				
				sand, trace clay, rock fragments				
				(Decomposed Rock) (SM)		95		
	22NR	95.0	100/0"	No recovery	DR			Hard drilling at 95'. Attempted coring. Possible rock boulder. No recovery.
15:00						100		Drilled ahead to 100'.
06:00 09-17-03								

MRCE Form BL-1

BORING NO. B-16

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. B-16
SHEET 3 OF 5
FILE NO. 10064
SURFACE ELEV. 22.3
RES. ENGR. RANDY NUNEZ

PROJECT: HARLEM HOTEL
LOCATION: NEW YORK, NEW YORK

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	CASING DEPTH	CASING BLOWS	REMARKS
09-17-03 Wednesday								
	23D	102.5	32-42	Brown fine to medium sand, trace silt, coarse				
		104.5	38-45	sand, clay layers, mica (Decomposed Rock)	DR			
				(SP-SM)		105		
	24D	105.0	30-100/4"	Brown slightly micaceous fine to medium		106		Hard drilling at 106'
		105.8		sand, trace rock fragments, clay				to 109'.
				(Decomposed Rock) (SP-SM)				
	1C	109.0	REC=95%	Hard, slightly weathered, white-gray schistose		110		Hole caved in after
		114.0	RQD=95%	marble, blocky				run 1C. Reamed out.
					R		7*	*Coring time in
							9*	minutes per foot.
	2C	114.0	REC=90%	Hard, unweathered, white-gray schistose		115		
		119.0	RQD=90%	marble, blocky				
13:00						119		End of boring at 119'.
						120		
						125		
						130		
						135		
						140		
						145		
						150		

MUESER RUTLEDGE CONSULTING ENGINEERS
ROCK CORE SKETCH

BORING NO. B-16
SHEET 4 OF 5
FILE NO. 10064
SURFACE ELEV. 22.3
RES. ENGR. T. Nunez

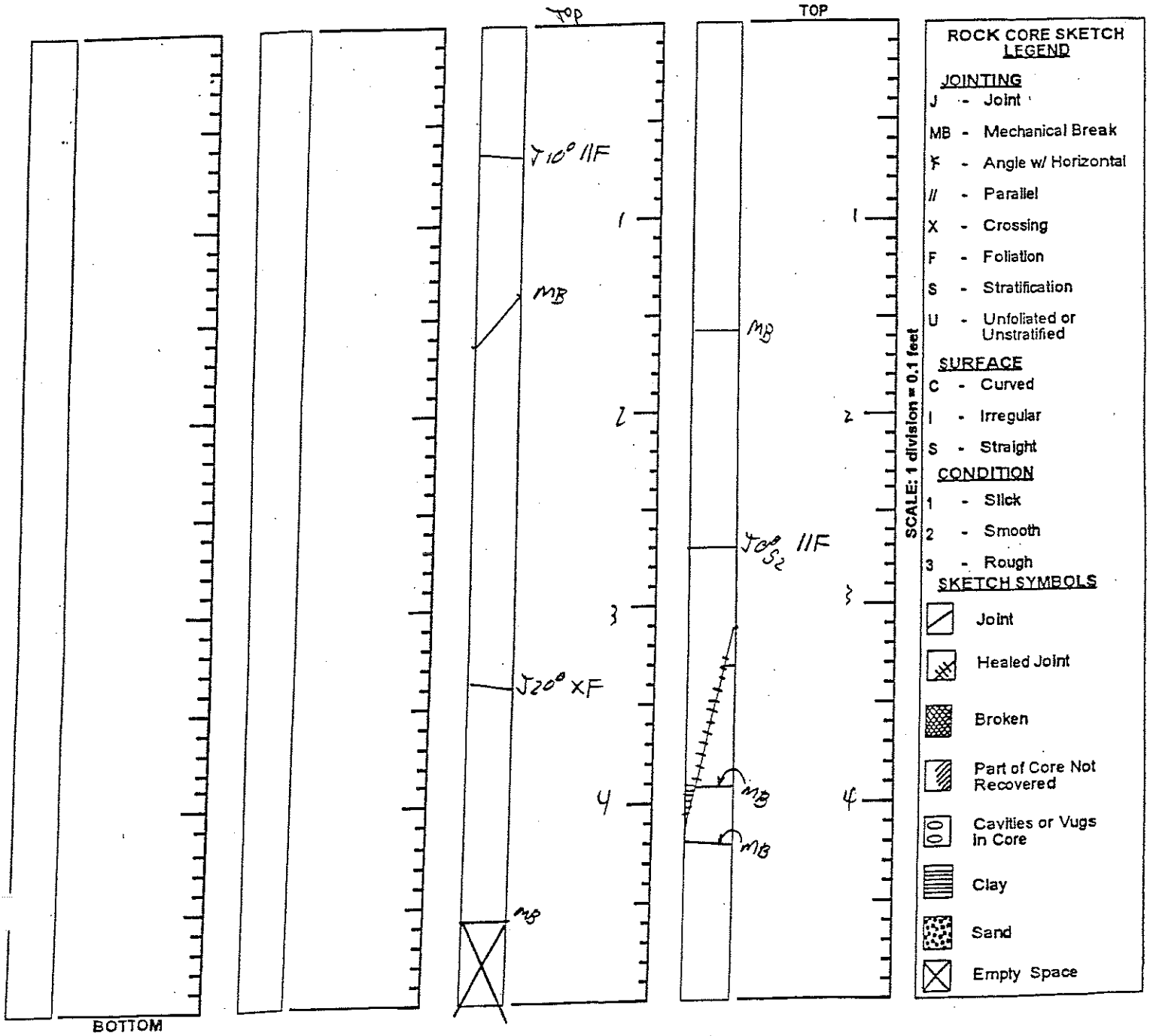
PROJECT Harlem Hotel
LOCATION NEW YORK, NY

Run No.	REC / RQD

Run No.	REC / RQD

Run No.	REC / RQD
2C	90/90%

Run No.	REC / RQD
1C	95/95%



NOTES

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING NO. B-16
SHEET 5 OF 5
FILE NO. 10064
SURFACE ELEV. 22.3
DATUM BOROUGH PRESIDENT OF MANHATTAN

PROJECT HARLEM HOTEL
LOCATION NEW YORK, NEW YORK
BORING LOCATION SEE BORING LOCATION PLAN

BORING EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG		TYPE OF FEED DURING CORING		CASING USED		X YES		NO		
TRUCK	MOBILE B-61	MECHANICAL		DIA., IN.	4	DEPTH, FT. FROM	0	TO	30
SKID		HYDRAULIC	X	DIA., IN.		DEPTH, FT. FROM		TO	
BARGE		OTHER		DIA., IN.		DEPTH, FT. FROM		TO	
OTHER									

TYPE AND SIZE OF:

D-SAMPLER	2" O.D. SPLIT SPOON
U-SAMPLER	
S-SAMPLER	
CORE BARREL	NX-DOUBLE TUBE
CORE BIT	DIAMOND
DRILL RODS	N

DRILLING MUD USED X YES NO
DIAMETER OF ROTARY BIT, IN. 3-7/8, 5-7/8
TYPE OF DRILLING MUD REVERT

AUGER USED YES X NO
TYPE AND DIAMETER, IN.

CASING HAMMER, LBS. 300 AVERAGE FALL, IN. 24
SAMPLER HAMMER, LBS. 140 AVERAGE FALL, IN. 30

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION
					NO OBSERVATIONS MADE.

PIEZOMETER INSTALLED YES X NO SKETCH SHOWN ON

STANDPIPE:	TYPE		ID, IN.		LENGTH, FT.		TOP ELEV.		
INTAKE ELEMENT:	TYPE		OD, IN.		LENGTH, FT.		TIP ELEV.		
FILTER:	MATERIAL		OD, IN.		LENGTH, FT.		BOT. ELEV.		

PAY QUANTITIES

3.5" DIA. DRY SAMPLE BORING	LIN. FT.	109	NO. OF 3" SHELBY TUBE SAMPLES	
3.5" DIA. U-SAMPLE BORING	LIN. FT.		NO. OF 3" UNDISTURBED SAMPLES	
CORE DRILLING IN ROCK	LIN. FT.	10	OTHER:	

BORING CONTRACTOR CMI SUBSURFACE INVESTIGATIONS, INC.
DRILLER MIKE MCERLEAN HELPERS BERT MOLZAHN
REMARKS GROUTED BOREHOLE UPON COMPLETION.
RESIDENT ENGINEER RANDY NUNEZ DATE 09-17-03

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. B-17
SHEET 1 OF 5
FILE NO. 10064
SURFACE ELEV. 21.6
RES. ENGR. RANDY NUNEZ

PROJECT: HARLEM HOTEL
LOCATION: NEW YORK, NEW YORK

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
06:00								6" Asphalt at surface.
09-25-03	1D	1.0	33-39	Brown fine to coarse sand, some silt, brick,				
Thursday		2.2	100/2"	concrete, trace gravel (Fill) (SM)				
Clear	2D	3.0	34-34	Brown fine to medium sand, some silt, trace				
60°F		5.0	49-53	brick, gravel (Fill) (SM)		5		
	3D	5.0	100/5"	Do 2D (Fill) (SM)				
		5.4						
	4D	7.0	100/2"	Brown fine to medium sand, some silt, trace				4D: Possible wash.
		7.2		brick (Fill) (SM)	F			
						10		
	5NR	10.0	100/5"	No recovery				
		10.4						
						15		
	6D	15.0	53-50	Light gray gravel, trace fine to coarse sand,				
		17.0	47-40	silt (Fill) (GP-GM)				
						18.5		
					S1	20		
	7D	20.0	20-25	Brown fine sand, some silt, fine sandy silt				
		22.0	31-38	layers, trace mica (SM)				
						23.5		
					M	25		
	8D	25.0	23-35	Brown silt, some fine sand, trace mica, clayey				
		27.0	25-27	silt seams, gravel (ML)				
						28.5		
					S2	30		
	9D	30.0	33-27	Brown medium to fine sand, some gravel,				
		32.0	29-31	trace silt, silt pockets, mica (SP-SM)				
						35		
	10NR	35.0	100/1"	No recovery				
		35.1						
						40		
	11D	40.0	14-16	Brown fine to medium sand, trace silt, coarse				
		42.0	25-26	sand, mica (SP)				
						45		
	12D	45.0	15-17	Brown fine to medium sand, trace silt, mica,				
		47.0	19-18	coarse sand (SP)				
						48.5		
					S1	50		
	13D	50.0	15-15	Brown slightly micaceous fine sand, some				
		52.0	17-19	silt, trace mica (SM)				

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. B-17
SHEET 2 OF 5
FILE NO. 10064
SURFACE ELEV. 21.6
RES. ENGR. RANDY NUNEZ

PROJECT: HARLEM HOTEL
LOCATION: NEW YORK, NEW YORK

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
09-25-03								
					S1	55		
	18D	55.0	20-21	Brown fine sand, trace silt, mica (SP-SM)				
		57.0	27-34					
						58.5		
						60		
	19D	60.0	39-51	Brown fine to coarse sand, some gravel, silt				
		62.0	53-39	(SM)	T			
						65		
	20D	65.0	16-20	Brown gravelly fine to coarse sand, some silt				
		67.0	20-20	(SM)				
						68.5		
						70		
	21D	70.0	9-7	Brown medium to fine sand, trace silt, mica	S2			
		72.0	9-9	(SP)				
						73.5		
						75		
	22D	75.0	10-21	Brown fine to coarse sand, trace silt, gravel,				
		77.0	28-15	with some layers of micaceous fine to				
				medium sand (SP-SM)				
								Hard drilling to 79.5'.
14:00	1C	79.5	REC=37%	Gray gneiss (boulder and cobbles)	T	80		
06:00		84.5						
09-26-03								
Friday								
						85		
	23D	85.0	11-15	Yellow brown micaceous clayey fine sand,				WC=34
		87.0	19-24	trace rock fragments (Decomposed Rock)				
				(SC)	DR			
						90		
	24NR	90.0	100/2"	No recovery				
		90.2						
	2C	90.2	REC=100%	Hard, slightly weathered, white gray gneissic				
		95.3	RQD=100%	marble, moderately jointed, weathered joints				
					R	95		WC=Water Content
								in percent of dry
	3C	95.3	REC=98%	Hard, slightly weathered, gray calcareous				weight.
		100.3	RQD=98%	schistose gneiss, blocky, weathered joints				
						100		
						100.3		End of boring at
								100.3'.

MUESER RUTLEDGE CONSULTING ENGINEERS
ROCK CORE SKETCH

BORING NO. B-17
SHEET 3 OF 5
FILE NO. 10064
SURFACE ELEV. 21.6
RES. ENGR. TC. MUHER

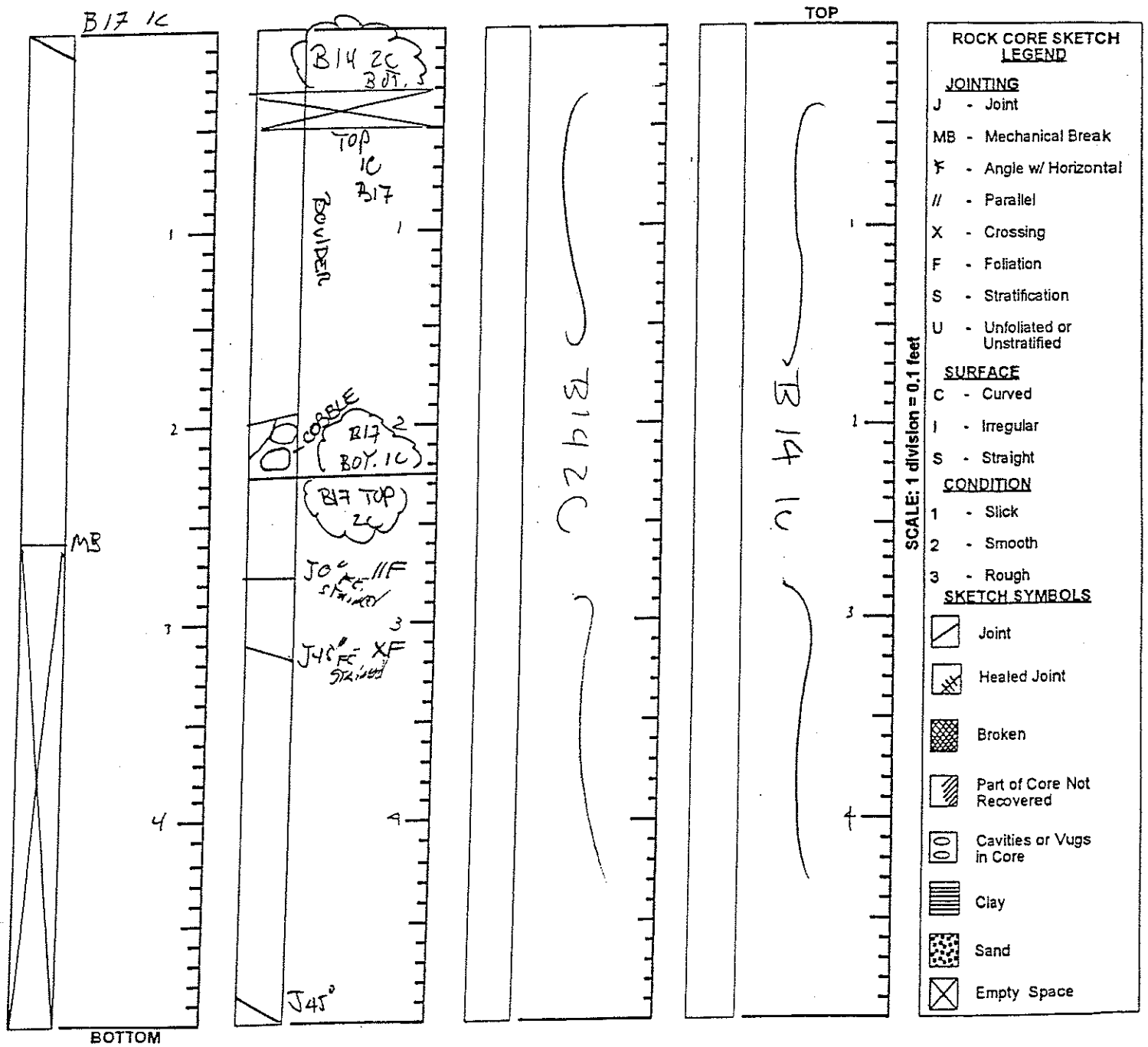
PROJECT HARLEM HOTEL
LOCATION NEW YORK, NY

Run No.	REC / RQD
2C	100/100

Run No.	REC / RQD
1C B17	37/N/A

Run No.	REC / RQD

Run No.	REC / RQD



ROCK CORE SKETCH LEGEND

JOINTING
- J - Joint
- MB - Mechanical Break
- ∠ - Angle w/ Horizontal
- // - Parallel
- X - Crossing
- F - Foliation
- S - Stratification
- U - Unfoliated or Unstratified

SURFACE
- C - Curved
- I - Irregular
- S - Straight

CONDITION
- 1 - Slick
- 2 - Smooth
- 3 - Rough

SKETCH SYMBOLS
- Joint
- Healed Joint
- Broken
- Part of Core Not Recovered
- Cavities or Vugs in Core
- Clay
- Sand
- Empty Space

NOTES

MUESER RUTLEDGE CONSULTING ENGINEERS
ROCK CORE SKETCH

BORING NO. B-17
SHEET 4 OF 5
FILE NO. 10060
SURFACE ELEV. 21.6
RES. ENGR. TC, NJ-22

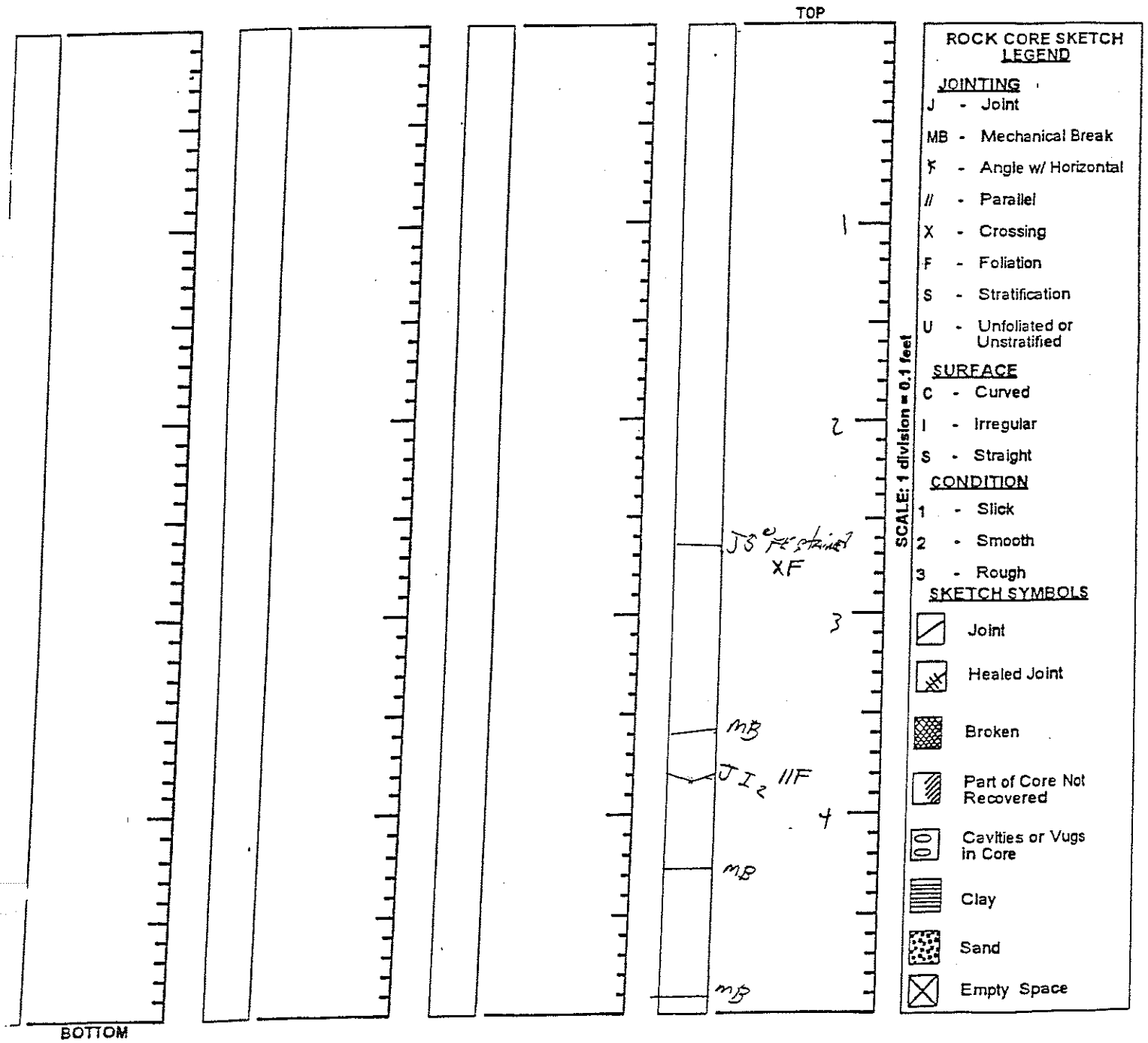
PROJECT HARLEM Hotel
LOCATION NEW YORK, NY

Run No.	REC / RQD

Run No.	REC / RQD

Run No.	REC / RQD

Run No.	REC / RQD
3C	98/98%



MUESER RUTLEDGE CONSULTING ENGINEERS

		BORING NO.	B-17
		SHEET	5 OF 5
PROJECT	HARLEM HOTEL	FILE NO.	10064
LOCATION	NEW YORK, NEW YORK	SURFACE ELEV.	21.6
BORING LOCATION	SEE BORING LOCATION PLAN	DATUM	BOROUGH PRESIDENT OF MANHATTAN

BORING EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG		TYPE OF FEED DURING CORING		CASING USED					
				[X] YES	[ ] NO				
TRUCK	MOBILE B-61	MECHANICAL		DIA., IN.	4	DEPTH, FT. FROM	0	TO	40
SKID		HYDRAULIC	X	DIA., IN.		DEPTH, FT. FROM		TO	
BARGE		OTHER		DIA., IN.		DEPTH, FT. FROM		TO	
OTHER									

TYPE AND SIZE OF:					
D-SAMPLER	2" O.D. SPLIT SPOON	DRILLING MUD USED	[X] YES	[ ] NO	
U-SAMPLER		DIAMETER OF ROTARY BIT, IN.	5-7/8, 3-7/8		
S-SAMPLER		TYPE OF DRILLING MUD	QUIK GEL, REVERT		
CORE BARREL	NX-DOUBLE TUBE	AUGER USED	[ ] YES	[X] NO	
CORE BIT	DIAMOND	TYPE AND DIAMETER, IN.			
DRILL RODS	N				
		CASING HAMMER, LBS.	300	AVERAGE FALL, IN.	24
		SAMPLER HAMMER, LBS.	140	AVERAGE FALL, IN.	30

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION
					NO OBSERVATIONS MADE.

PIEZOMETER INSTALLED [ ] YES [X] NO SKETCH SHOWN ON

STANDPIPE:	TYPE		ID, IN.		LENGTH, FT.		TOP ELEV.		
INTAKE ELEMENT:	TYPE		OD, IN.		LENGTH, FT.		TIP ELEV.		
FILTER:	MATERIAL		OD, IN.		LENGTH, FT.		BOT. ELEV.		

PAY QUANTITIES

3.5" DIA. DRY SAMPLE BORING	LIN. FT.	87.8	NO. OF 3" SHELBY TUBE SAMPLES	
3.5" DIA. U-SAMPLE BORING	LIN. FT.		NO. OF 3" UNDISTURBED SAMPLES	
CORE DRILLING IN ROCK	LIN. FT.	10	OTHER:	2.5 FT (BOULDER)

BORING CONTRACTOR: CMI SUBSURFACE INVESTIGATIONS, INC.

DRILLER: MIKE MCERLEAN HELPERS: BERT MOLZAHN

REMARKS: GROUTED BOREHOLE UPON COMPLETION.

RESIDENT ENGINEER: RANDY NUNEZ DATE: 09-26-03

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. B-18P
SHEET 1 OF 6
FILE NO. 10064
SURFACE ELEV. 22.1
RES. ENGR. RANDY NUNEZ

PROJECT: HARLEM HOTEL
LOCATION: NEW YORK, NEW YORK

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
09:45	1D	1.0	18-28	Brown fine to coarse sand, some gravel, silt,				6" Asphalt at surface.
09-08-03		3.0	14-14	brick, trace cinders, mica (Fill) (SM)				
Monday	2D	3.0	7-16	Brown fine to medium sand and brick, some				
Sunny		5.0	9-7	silt, trace gravel, ceramic tile (Fill) (SM)				
70°F	3D	5.0	3-4	Brown fine to medium sand, some silt, brick,		5		
		6.5	38-40/0"	trace gravel, mica (Fill) (SM)				Spoon bouncing.
	4D	7.0	8-31	Brown fine to coarse sand, some silt, trace				
		9.0	36-41	brick, gravel (Fill) (SM)				
						10		
	5D	10.0	29-34	Brown coarse to fine sand, trace gravel, silt,				
		12.0	25-23	rock fragments, brick, metal (Fill) (SP-SM)				
						15		
	6D	15.0	30-73	Brown fine to medium sand, some silt, brick,				6D: Petroleum odor.
		17.0	45-21	gravel (Fill) (SM)				
						20		
	7D	20.0	23-13	Top 5": Brown coarse to fine sand and gravel,	F			
		22.0	11-11	trace silt, brick (Fill) (SP&GP)				
				Bot 2": Brown silt, trace fine to medium sand,				
				clay, gravel, mica (Fill) (ML)		25		
	8D	25.0	40-100/3"	Gray rock fragments, some silt pockets, trace				
		25.7		fine to medium sand (Fill) (GP&ML)				
						30		
	9D	30.0	33-100/4"	Gray gneiss, boulder fragments (Fill) (GP)				
		30.8						
						33.5		
						35		
	10D	35.0	7-9	Brown medium to fine sand, trace silt, gravel,				
		37.0	10-11	coarse sand (SP-SM)	S2			
						40		
	11D	40.0	5-5	Brown medium to fine sand, trace coarse				
		42.0	7-15	sand, silt (SP-SM)				
						43.5		
						45		
	12D	45.0	25-28	Brown fine sand, some silt, trace mica (SM)	S1			
		47.0	45-49					
						48.5		
					T	50		
	13D	50.0	45-50	Brown fine to coarse sand, some gravel, trace				
		52.0	33-40	silt, mica (SP-SM)				

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. B-18P
SHEET 2 OF 6
FILE NO. 10064
SURFACE ELEV. 22.1
RES. ENGR. RANDY NUNEZ

PROJECT: HARLEM HOTEL
LOCATION: NEW YORK, NEW YORK

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
09-08-03 Monday								
						55		
	14D	55.0	41-34	Brown fine to coarse sand, some gravel,	T			
		57.0	42-43	trace silt, mica (SP-SM)				
14:30						60		
06:00	15D	60.0	97-55	Brown coarse to fine sand, some gravel,				
09-09-03		62.0	58-44	trace silt, trace red brown silt pockets (SP-SM)				
Tuesday								
						63.5		
						65		Hole caved in, drove
	16D	65.0	96-62	Light brown fine to coarse sand, some silt,				3" casing to 65'.
		67.0	37-60	trace rock fragments (Decomposed Rock) (SM)				Lost water.
					DR			
						70		
	17NR	70.0	100/0"	No recovery				Spoon bouncing.
						72		Drilled 1' (70'-71').
	1C	72.0	REC=99%	Hard, slightly weathered, gray calcareous				Hard drilling to 72'.
		77.0	RQD=98%	gneissic schist, blocky			3*	*Coring time in
						75	3*	minutes per foot.
							3*	
							3*	
	2C	77.0	REC=100%	Do 1C	R		3*	
		82.0	RQD=92%				3*	
						80	5*	
							4*	
11:45						82	3*	End of boring at 82'.
						85		
						90		
						95		
						100		

MUESER RUTLEDGE CONSULTING ENGINEERS
ROCK CORE SKETCH

BORING NO. B-18P
SHEET 3 OF 6
FILE NO. 10064
SURFACE ELEV. 22.1
RES. ENGR. TC · NUMEZ

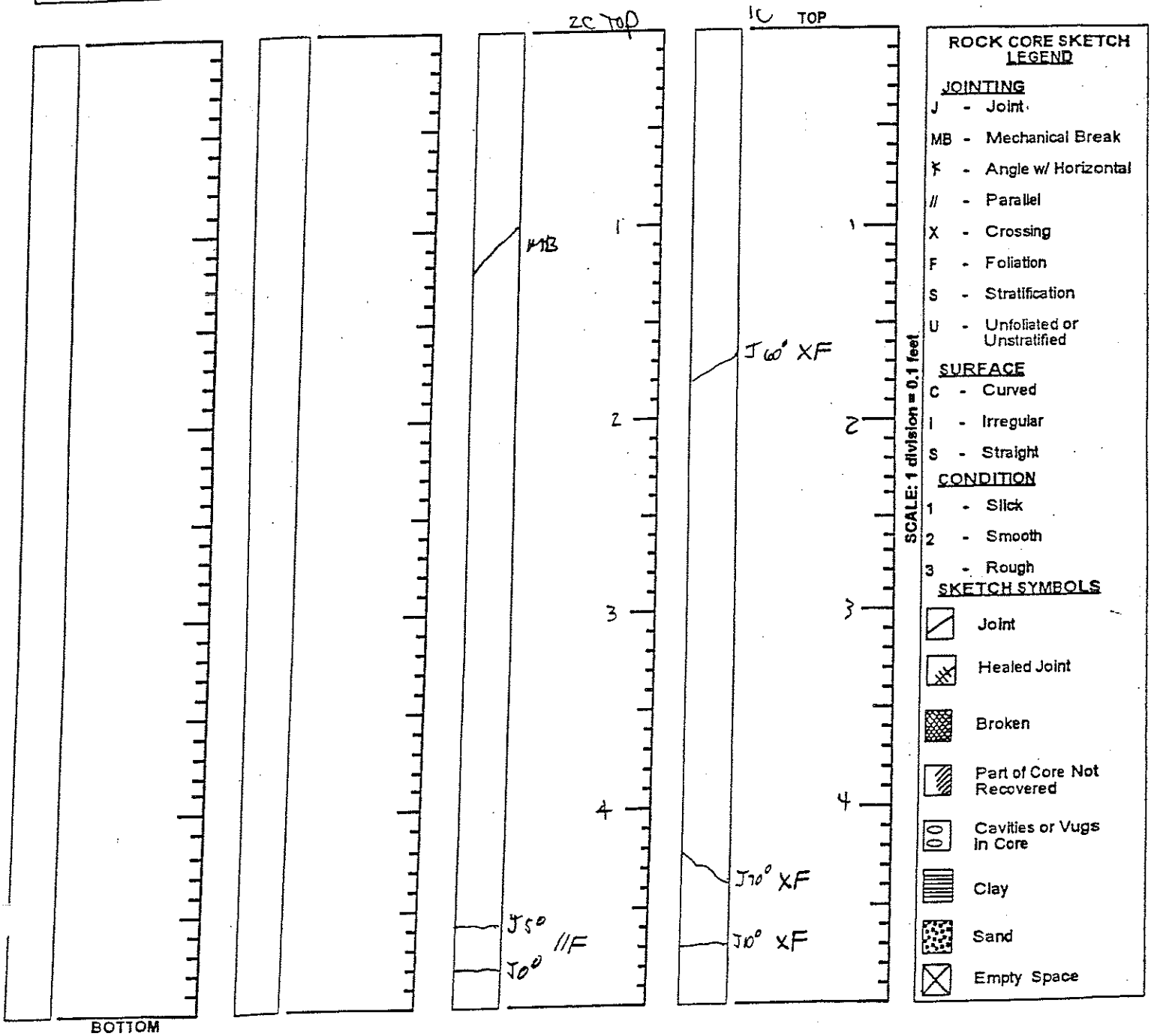
PROJECT HARLEM HOTEL
LOCATION NEW YORK, NY

Run No.	REC / RQD

Run No.	REC / RQD

Run No.	REC / RQD
2C	100/92%

Run No.	REC / RQD
1C	99/98%



NOTES

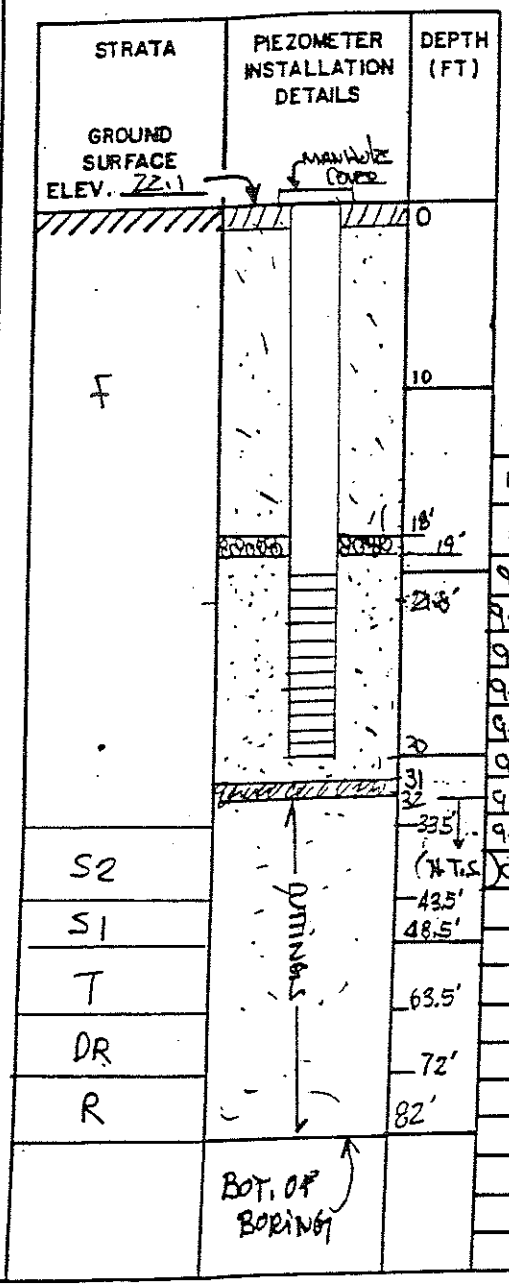
SHEET 4 OF 6
FILE NO. 10064
SUBCODE

MUESER RUTLEDGE CONSULTING ENGINEERS

PIEZOMETER RECORD

PROJECT Harlem Hotel — PIEZOMETER NO. B-18P
LOCATION N.Y., N.Y.
PIEZOMETER LOCATION See Plan — DATE OF INSTALLATION 9-9-03
☐ SEE SKETCH ON BACK — RES. ENG. J.C. Nunez

PIEZOMETER TYPE Slotted PVC



INTAKE POINT

depth to bottom, ft = 31
depth to top, ft = 19
length, ft = 12 = L
diameter, in = 4, ft = 0.33 = 2R

STANDPIPE/RISER

elevation of rim, ft = 21.85
diameter, in = 2, ft = 0.16 = 2r

READING TIME		DEPTH - RIM TO WATER (FT)	ELEVATION OF WATER	REMARKS
DATE	CLOCK			
9-10-03	0700	14.6	+7.3	Rim 3" below grade
9-10-03	0730	14.6	+7.3	
9-11-03	0642	14.6	+7.3	
9-12-03	0837	14.6	+7.3	
9-15-03	0845	14.7	+7.2	
9-16-03	1422	14.6	+7.3	
9-18-03	1132	14.8	+7.1	
9-24-03	0843	14.5	+7.4	
9-29-03	0755	14.55	+7.4	

Sand Bentonite
Gravel Grout

GROUND SURFACE ELEV. 22.1

PIEZOMETER NO. B-18P

SHEET 5 OF 6

MUESER RUTLEDGE CONSULTING ENGINEERS FILE NO. 10064

SUBCODE

VARIABLE HEAD PERMEABILITY TEST

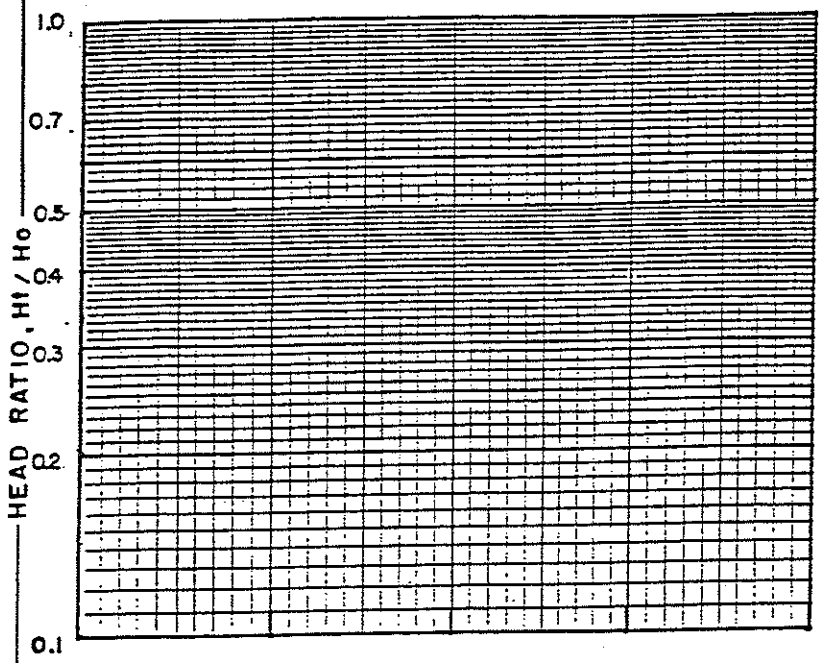
☐ BOREHOLE OR ☒ PIEZOMETER NO. B-18P

TEST NO. 1

PROJECT Harlem Hotel RES.ENG. JR. NUNEZ

LOCATION NEW YORK, NY CALC.BY ___ DATE ___

PIEZOMETER LOCATION see plan CH'KD BY ___ DATE ___



ELAPSED TIME, Δt, MIN.

INTAKE POINT

depth to bottom, ft = 31

depth to top, ft = 19

length, ft = 12 = L

diameter, in = 4, ft = 0.33 = 2R

STANDPIPE/RISER

diameter, in = 2, ft = 0.16 = 2r

depth of casing, ft = 20

depth to which standpipe was bailed, ft = — = Z

READING TIME			TEST DEPTH-RIM TO WATER ft.	DEPTH-RIM TO TIDE OR GWL ft.	UNBALANCED HEAD H ft.	HEAD RATIO Ht/Ho	REMARKS
DATE	CLOCK	Δt MIN.					Rim 3" below grade.
9-10-93	0700			14.6	0		STATIC WATER LEVEL
							(1) Rising Head Test.
							unable to bail out. Made
							3 attempts. Water level @
							14.6ft.
							(2) Falling Head Test.
							Filled w/water to top of
							Rim. Water level down to
							14.6ft in less than 15 sec.
							Made 2 attempts.

MUESER RUTLEDGE CONSULTING ENGINEERS

		BORING NO.	B-18P
		SHEET	6 OF 6
PROJECT	HARLEM HOTEL	FILE NO.	10064
LOCATION	NEW YORK, NEW YORK	SURFACE ELEV.	22.1
BORING LOCATION	SEE BORING LOCATION PLAN	DATUM	BOROUGH PRESIDENT OF MANHATTAN

BORING EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG		TYPE OF FEED DURING CORING		CASING USED		[X] YES	[ ] NO		
TRUCK	MOBILE	MECHANICAL		DIA., IN.	3	DEPTH, FT. FROM	0	TO	72
SKID		HYDRAULIC	X	DIA., IN.	4	DEPTH, FT. FROM	0	TO	30
BARGE		OTHER		DIA., IN.		DEPTH, FT. FROM		TO	
OTHER									

TYPE AND SIZE OF:			
D-SAMPLER	2" O.D. SPLIT SPOON	DRILLING MUD USED	[X] YES [ ] NO
U-SAMPLER		DIAMETER OF ROTARY BIT, IN.	2-15/16, 3-7/8, 5-7/8
S-SAMPLER		TYPE OF DRILLING MUD	EZ-MUD
CORE BARREL	NX-DOUBLE TUBE	AUGER USED	[ ] YES [X] NO
CORE BIT	DIAMOND	TYPE AND DIAMETER, IN.	
DRILL RODS	NW		

CASING HAMMER, LBS.	300	AVERAGE FALL, IN.	24
SAMPLER HAMMER, LBS.	140	AVERAGE FALL, IN.	30

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION
09-10-03	07:00			14.6	FOR PIEZOMETER READINGS SEE SHEET 4.
09-10-03	07:30			14.6	

PIEZOMETER INSTALLED [X] YES [ ] NO SKETCH SHOWN ON SHEET 4

STANDPIPE:	TYPE	PVC SCHEDULE 40	ID, IN.	2	LENGTH, FT.	20	TOP ELEV.	+22.1
INTAKE ELEMENT:	TYPE	SLOTTED PVC	OD, IN.	2-1/4	LENGTH, FT.	10	TIP ELEV.	-7.9
FILTER:	MATERIAL	SAND	OD, IN.	4	LENGTH, FT.	11	BOT. ELEV.	-7.9

PAY QUANTITIES

3.5" DIA. DRY SAMPLE BORING	LIN. FT.	72	NO. OF 3" SHELBY TUBE SAMPLES	
3.5" DIA. U-SAMPLE BORING	LIN. FT.		NO. OF 3" UNDISTURBED SAMPLES	
CORE DRILLING IN ROCK	LIN. FT.	10	OTHER:	

BORING CONTRACTOR: CMI SUBSURFACE INVESTIGATIONS, INC.

DRILLER: MIKE MCERLEAN HELPERS: BERT MOLZAHN

REMARKS:

RESIDENT ENGINEER: RANDY NUNEZ DATE: 09-09-03

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. B-19
SHEET 1 OF 5
FILE NO. 10064
SURFACE ELEV. 21.6±
RES. ENGR. RANDY NUNEZ

PROJECT: HARLEM HOTEL
LOCATION: NEW YORK, NEW YORK

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
09-26-03	1D	0.5	24-18	Brown fine to medium sand, some silt, trace				6" Asphalt at surface.
Friday		2.0	16	gravel, brick (Fill) (SM)				
	2D	2.0	36-8	Brown fine to coarse sand, some silt, gravel,				
		4.0	6-5	trace brick (Fill) (SM)				
	3D	4.0	3-4	Brown fine to coarse sand, some brick, trace		5		
		6.0	4-2	gravel, silt (Fill) (SP-SM)				
	4D	6.0	5-4	Brown fine to coarse sand, some brick, trace				
		8.0	3-3	silt, gravel, cement (Fill) (SP-SM)				
	5D	8.0	11-8	Brown fine to coarse sand and brick, trace				
		10.0	9-9	gravel, silt (Fill)		10		
	6D	10.0	6-12	Red brick and mortar (Fill)	F			
		12.0	19-17					
						15		
	7D	15.0	15-25	Brown black coarse to fine sand, trace gravel,				7D: Petroleum odor.
		17.0	18-20	silt (Fill) (SP)				
						20		
	8D	20.0	12-9	Do 7D (Fill) (SP-SM)				
		22.0	10-11					
						23.5		
						25		
	9D	25.0	13-15	Brown silt, some fine sand, trace clay, mica				
		27.0	13-14	(ML)				
14:00						30		
06:00	10D	30.0	5-4	Do 9D (ML)				WC=23
09-29-03		32.0	4-3		M			
Monday								
Cloudy								
60°F						35		
	11D	35.0	6-6	Brown fine sandy silt, trace clay, mica (ML)				
		37.0	6-7					
						38.5		
						40		
	12D	40.0	4-6	Brown silt, trace fine sand, clay, mica, varved				WC=28
		42.0	6-7	with medium clayey silt, trace clay seams (ML)				
					V	45		
	13D	45.0	3-4	Medium brown clayey silt, varved with silty				WC=33
		47.0	4-5	clay, trace silt layers (ML&CL)				
						50		
	14D	50.0	3-5	Brown silt, trace fine sand, clay, mica, varved				
		52.0	5-6	with sm medium clayey silt, tr clay seams (ML)				

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. B-19
SHEET 2 OF 5
FILE NO. 10064
SURFACE ELEV. 21.6±
RES. ENGR. RANDY NUNEZ

PROJECT: HARLEM HOTEL
LOCATION: NEW YORK, NEW YORK

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	CASING DEPTH	CASING BLOWS	REMARKS
09-29-03 Monday								
						55		
	15D	55.0	3-6	Do 14D (ML)				
		57.0	7-8					
						60		
	16D	60.0	2-3	Medium brown clayey silt, varved with silty clay,				WC=36
		62.0	5-6	trace silt layers (ML&CL)				
						65		
	17D	65.0	4-6	Brown silt, trace fine sand, mica, clay, varved				
		67.0	5-5	with medium clayey silt, trace clay seams (ML)				
						70		
	18D	70.0	3-3	Do 17D (ML)	V			
		72.0	3-4					
						75		
	19D	75.0	2-3	Do 17D (ML)				WC=32
		77.0	7-6					
						80		
	20D	80.0	2-4	Do 17D, trace micaceous fine sand seams				WC=31
		82.0	6-8	(ML)				
						85		
	21D	85.0	7-5	Gray brown silty fine sand, trace mica, gravel,				
		87.0	13-19	varved with some medium clayey silt				
				(SM&ML)		88		Rods chattering at 88'.
						90		
	22D	90.0	100/4"	Gray gravel (GP)	T			Hard drilling (Boulder 90.3' to 91.8'±)
		90.3						
						95		
	23D	95.0	40-41	Gray fine to coarse sand, some gravel, silt				
		96.7	65-100/3	(SM)				
						98		Hard drilling at 98' to 99'.
							3*	
	1C	99.0	REC=98%	Hard, slightly weathered, white gray schistose		100	3*	*Coring time in minutes per foot.
		104.0	RQD=95%	marble, jointed	R		2*	
							2*	

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. B-19
SHEET 3 OF 5
FILE NO. 10064
SURFACE ELEV. 21.6±
RES. ENGR. RANDY NUNEZ

PROJECT: HARLEM HOTEL
LOCATION: NEW YORK, NEW YORK

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
09-29-03 Monday								
	2C	104.0	REC=97%	Hard, white gray schistose marble, moderately jointed	R	105		
		109.0	RQD=87%			109		End of boring at 109'.
						110		
								WC=Water Content in percent of dry weight.
						115		
						120		
						125		
						130		
						135		
						140		
						145		
						150		

MUESER RUTLEDGE CONSULTING ENGINEERS
ROCK CORE SKETCH

BORING NO. B-19
SHEET 4 OF 5
FILE NO. 10064
SURFACE ELEV. 21.6 ±
RES. ENGR. K NUNEZ

PROJECT Harlem River

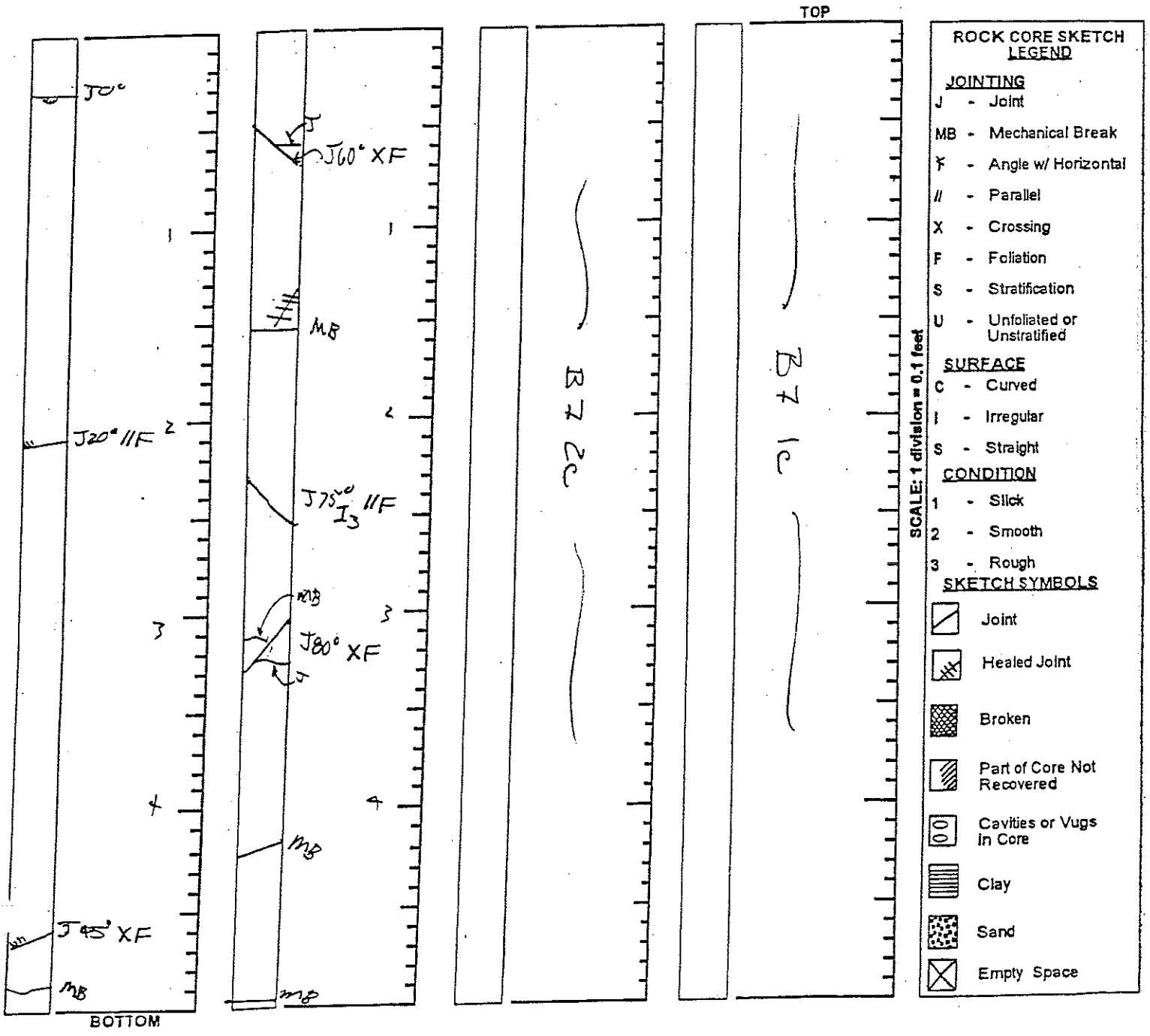
LOCATION NEW YORK, NY

Run No.	REC / RQD
2C	97/87%

Run No.	REC / RQD
1C	98/95%

Run No.	REC / RQD

Run No.	REC / RQD



ROCK CORE SKETCH LEGEND

JOINTING
- J - Joint
- MB - Mechanical Break
- ∢ - Angle w/ Horizontal
- // - Parallel
- X - Crossing
- F - Foliation
- S - Stratification
- U - Unfoliated or Unstratified

SURFACE
- C - Curved
- I - Irregular
- S - Straight

CONDITION
- 1 - Slick
- 2 - Smooth
- 3 - Rough

SKETCH SYMBOLS
- Joint
- Healed Joint
- Broken
- Part of Core Not Recovered
- Cavities or Vugs In Core
- Clay
- Sand
- Empty Space

NOTES

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING NO. B-19
SHEET 5 OF 5
FILE NO. 10064
SURFACE ELEV. 21.6±
DATUM BOROUGH PRESIDENT OF MANHATTAN

PROJECT HARLEM HOTEL
LOCATION NEW YORK, NEW YORK
BORING LOCATION SEE BORING LOCATION PLAN

BORING EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG
TRUCK CME-75
SKID
BARGE
OTHER

TYPE OF FEED DURING CORING
MECHANICAL
HYDRAULIC X
OTHER

CASING USED [X] YES [ ] NO
DIA., IN. 4 DEPTH, FT. FROM 0 TO 30
DIA., IN. 3 DEPTH, FT. FROM 0 TO 97
DIA., IN. DEPTH, FT. FROM TO

TYPE AND SIZE OF:
D-SAMPLER 2" O.D. SPLIT SPOON
U-SAMPLER
S-SAMPLER
CORE BARREL NX DOUBLE TUBE
CORE BIT DIAMOND
DRILL RODS N

DRILLING MUD USED [X] YES [ ] NO
DIAMETER OF ROTARY BIT, IN. 2-15/16, 3-7/8, 5-7/8
TYPE OF DRILLING MUD QUIK GEL

AUGER USED [ ] YES [X] NO
TYPE AND DIAMETER, IN.

CASING HAMMER, LBS. 300 AVERAGE FALL, IN. 24
SAMPLER HAMMER, LBS. 140 AVERAGE FALL, IN. 30

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION
					NO OBSERVATIONS MADE.

PIEZOMETER INSTALLED [ ] YES [X] NO SKETCH SHOWN ON

STANDPIPE: TYPE ID, IN. LENGTH, FT. TOP ELEV.
INTAKE ELEMENT: TYPE OD, IN. LENGTH, FT. TIP ELEV.
FILTER: MATERIAL OD, IN. LENGTH, FT. BOT. ELEV.

PAY QUANTITIES

3.5" DIA. DRY SAMPLE BORING LIN. FT. 99
3.5" DIA. U-SAMPLE BORING LIN. FT.
CORE DRILLING IN ROCK LIN. FT. 10

NO. OF 3" SHELBY TUBE SAMPLES
NO. OF 3" UNDISTURBED SAMPLES
OTHER:

BORING CONTRACTOR CMI SUBSURFACE INVESTIGATIONS, INC.
DRILLER JOHN IMPARATO HELPERS CARLOS MALDONADO
REMARKS GROUTED BOREHOLE UPON COMPLETION.
RESIDENT ENGINEER RANDY NUNEZ DATE 09-29-03

APPENDIX E

Health and Safety Plan

1800 PARK AVENUE
NEW YORK, NEW YORK

HEALTH AND SAFETY PLAN

NYSDEC BCP Number: C231041

Prepared for:
Harlem Park Acquisition LLC
30 West 21st Street, 11th Floor
New York, New York 10010

Prepared by:
Arnold F. Fleming, P.E. &
Fleming-Lee Shue Inc.
158 West 29th Street, 9th Floor
New York, NY 10001
(212) 675-3225

DECEMBER 2015

TABLE OF CONTENTS

FIGURES

TABLES

ATTACHMENTS

1.0 INTRODUCTION

1.1 Purpose

Fleming-Lee Shue, Inc. (FLS) and Arnold F. Fleming P.E. (AFF) prepared this site-specific Health and Safety Plan (HASP) for use by FLS employees and representatives of AFF and FLS during activities performed under the Site Management Plan (SMP) at the 1800 Park Avenue, Brownfield Cleanup Program (BCP) site # C231041, located on Block 1749, Lots 33 in New York, New York (hereafter referred to as the "Site").

The purpose of this HASP is to identify the real and potential hazards associated with environmental field activities and to stipulate appropriate health and safety procedures. The procedures and guidelines contained in this document are intended to minimize exposure to chemical, physical, and biological hazards that may be present in the soil, groundwater, or air, and to reduce the potential for accidents and injuries.

The SMP includes health and safety requirements for the operation, maintenance and monitoring of the composite cover. Routine health and safety issues common to general construction/excavation are included in Attachment V.

All subcontractors working with FLS/AFF will be provided with a copy of this HASP for review. Based on their means and methods of executing the work activities, the subcontractors will either accept the safety procedures outlined in this HASP and by FLS/AFF Health and Safety Officer's (HSO) supervision or the subcontractor can provide a HASP addendum, for FLS/AFF review and acceptance, stating any additional procedures that they wish to be incorporated. Other parties (contractors, subcontractors, and their employees) performing their own scope of work not covered by this HASP can review this HASP but must prepare their own HASP that meets Occupational Safety and Health Administration (OSHA) requirements.

This HASP will be kept onsite during field activities and shall be accessible at all times. This HASP will be reviewed as necessary and amended or revised as conditions change and

additional activities arise. All FLS/AFF site personnel and subcontractors will receive site specific HASP training and will be required to sign the Acknowledgement Form (Attachment I). All visitors, who visit the site for the purposes of observing our work activities will also receive a health and safety briefing, sign the Acknowledgement Form, and be escorted at all times.

The general provisions of this HASP were developed in accordance with the provisions of OSHA Hazardous Waste Operations and Emergency Response (HAZWOPER) Standard, 29 CFR 1910.120 or 29 CFR 1926.65.

The Occupational Safety and Health Act (1970) requires the following:

- Employers shall furnish each employee with a place of employment free from recognized hazards that are causing or likely to cause death or serious physical harm.
- Employers must comply with occupational health and safety standards and rules, regulations and orders pursuant to the Occupational Safety and Health Act, that are applicable to company business and operations.
- All employees must comply with occupational health and safety standards and regulations under the Act, which are applicable to their actions and situations.
- Employees are encouraged to contact their immediate superior for information that will help them understand their responsibilities under the Act.

1.2 Site Description

The Site is located in the Harlem, New York County, New York and is identified as Block 1749 and Lot 33 (formerly lots 31, 33, 35, 40 and 43) on the current New York City Tax Map. The Site is an approximately 0.83-acre area bounded by 125th Street to the north, Park Avenue to the east, 124th Street to the south, and mixed use properties to the west including New York College of Podiatric Medicine as seen in Figure 2.

1.3 Site Background

The Site is located in a mixed-use commercial area of the Borough of Manhattan, New York. Historical maps indicate that the Site was meadow land at the time of the European discovery

of Manhattan. Land books dating back to 1895 indicate that the Site was occupied by 3 and 4-story buildings, some with basements.

Based upon a 2003 Phase I Environmental Site Assessment, from approximately 1896 through 1979, a hotel and several four-story dwellings occupied the Site. By 1979, those buildings had been demolished. Thereafter, the Site was used as a parking lot.

2.0 SCOPE OF WORK

This HASP addresses the general activities associated with the planned environmental management of the Site. These activities include, but are not limited to, the following:

- Mobilization/demobilization
  - Mobilization and demobilization of equipment and supplies
  - Establishment of Site access procedures, site security and work zones
- Inspection Activities
  - Inspection of the composite cover
- Operation and Maintenance Activities
  - Operation, routine and non-routine maintenance of engineering controls

The planned environmental activities are detailed in the succeeding sections.

2.1 Site Management Inspections

Site-wide inspections will be performed annually by a Professional Engineer. Site-wide inspections will also be performed after all severe weather conditions and emergencies that may affect ECs or monitoring devices.

2.2 Operation and Maintenance of Engineering Controls

All remedial components installed at the Site will remain operational and be maintained as necessary. Monitoring of the composite cover will be performed on a routine basis. Unscheduled inspections and/or sampling may take place when a suspected failure in the composite cover occurs that is deemed likely to affect its intended operation.

3.0 POTENTIAL CHEMICAL, PHYSICAL AND BIOLOGICAL HAZARDS AND CONTROLS

This section discusses the potential chemical, physical, and biological hazards and controls associated with the Site management tasks above. A summary of potential Site management tasks, safety hazards, and safety requirements is presented in Table 1.

3.1 Site–Specific Potential Chemical Hazards/Controls

Based on data collected during previous investigations, the potential chemical hazards are petroleum hydrocarbons, lead, mercury and VOCs.

Attachment II lists the recognized and suspected health hazards, exposure limits, physical and chemical properties, recommended protection levels and symptoms of exposure for the chemicals known or suspected. Any chemical hazards will be minimized by limiting exposure of personnel to soil and groundwater, engineering controls, and PPE. Material Safety Data Sheets (MSDS) are provided as Attachment III.

3.2 Physical Hazards/Controls

Physical hazards potentially present at the Site include, but are not limited to, the following:

Hazard	Control
Slip, trip and fall (uneven terrain and slippery surfaces)	Avoid uneven terrain, walk slowly, wear sturdy/supportive shoes
Environmental (heat/cold) stress	A discussion of heat stress and cold stress and related illnesses and controls is provided in Attachment IV.
Dust/Particulate Inhalation Hazard	Dust suppression and monitoring will be employed as necessary. The air monitoring requirements are discussed in Section 6.0, and requirements are listed in Table 1. Actions levels are listed in Table 2.
Vehicular Traffic	Avoid working in high traffic areas. If necessary, use cones, reflective vests, and consider use of a flagman/additional protection.
Fire	Ensure class ABC fire extinguisher is nearby to work area when using equipment that can provide an ignition source (heavy machinery, generators, power tools)
Noise hazards	Use ear plugs and/or ear muffs during demolition and excavation activities.
Use of heavy equipment	Stay clear of heavy equipment during operation. Maintain eye contact with operator when approaching equipment.

Anticipated Site operations do not include the need for specific operations such as lockout/tag-out, scaffolds or confined spaces; therefore these items are not addressed in this HASP. If Site activities require these operations, the HASP will be amended and personnel properly trained, experienced and competent personnel shall be utilized.

3.3 Biological Hazards

General biological hazards present at the Site include, but not limited to, the following:

- Bites or stings from insects (particularly ticks) resulting in skin inflammation, disease, or allergic reaction
- Allergens and toxins from plants and animals, producing dermatitis, rhinitis, or asthma

4.0 HEALTH AND SAFETY PROTOCOLS

4.1 Training

Knowledge of the safety rules, supplemented by compliance, is essential to safety. New employees will be provided orientation training by qualified personnel having at a minimum the 40-hour OSHA HAZWOPPER training and will be furnished information and literature covering the company health and safety policies, rules, and procedures. This orientation training must be provided prior to the employee's visit to the Site. Employees must read the HASP and project-specific Work Plan, which contains the applicable regulations/standards for their job.

4.2 Project Team Organization and Responsibilities

All personnel who participate in invasive field activities will be required to attend a Health and Safety meeting prior to the commencement of field activities, as needed. The Health and Safety meeting will include all personnel and members of the Site management project team that would be at risk to exposure. Field personnel at risk to direct exposure will sign the acknowledgment form (Attachment I) maintained by the HSO. The key Site management project team organization and roles are described below.

Health and Safety Officer

- Administers all aspects of the occupational health and safety program to FLS and AFF personnel and our subcontractors
- Develops programs and technical guidance to identify and remove physical, chemical, and biological hazards from facilities, operations, and sites
- Assists management and supervisors in the health and safety training of employees
- Conducts inspections to identify unhealthy or unsafe conditions or work practices
- Takes immediate corrective action
- Investigates all accidents and takes action to eliminate accident causes
- Monitors to determine the degree of hazard

- Determines the protection levels and equipment required to ensure the safety of personnel
- Evaluates on-site conditions (i.e., weather and chemical hazard information) and recommending to the project manager and/or the field coordinator, modifications to the work plan and personnel protection levels
- Monitors performance of all personnel to ensure compliance with the required safety procedures
- Ensures that all personnel have been trained in proper site-safety procedures including the use of Personal Protective Equipment (PPE), and have read and signed the Acknowledgment Form (Attachment I)
- Conducts daily health and safety briefings as necessary
- Halts work if necessary
- Ensures strict adherence to the Site HASP
- Reviews personnel medical monitoring participation to ensure compliance
- Records safety infractions and corrective actions in field log
- Notifies subcontractors of unsafe conditions
- Ensure overall project objectives are being met
- Ensures that safety equipment is available
- Requires all subcontractors and subcontractor personnel to comply with health and safety regulations

Project Manager

- Ensure overall project objectives are being met
- Supports HSO

All FLS and AFF Employees

The minimum personal qualifications for each individual participating in field activities are as follows:

- Has had all OSHA-specific medical examinations including, but not limited to, audiometric testing under the hearing conservation program and medical approval for the use of respirators
- Participation in the FLS Occupational Health Monitoring Program

- Successful completion of the 40-hour OSHA health and safety training for hazardous material sites (29 CFR 1910.120[e][3][i]) and valid/up-to-date 8-hour refresher training (29 CFR 1910.120[e][4])
- Be familiar with and comply with proper health and safety practices
- Use the required safety devices and proper personal protective safety equipment
- Notify HSO/supervisor immediately of unsafe conditions/acts, accidents, and injuries
- Be alert on Site and communicate unsafe conditions and safety infractions immediately

4.3 Subcontractor Compliance

All FLS and AFF contracts and subcontracts require that state laws concerning health and safety will be observed by the subcontractor. The provisions of these health and safety responsibilities apply to subcontractors and their employees working for FLS. Failure to fulfill this requirement is a failure to meet the conditions of the contract.

4.4 Levels of Personal Protective Equipment

All PPE must be worn as required for each job in all operations where there is an exposure to hazardous conditions. Upon review of contaminant levels, physical and biological hazards, exposure routes and the nature of the management tasks, it has been determined that PPE requirements will vary depending on the tasks/activities. For visual inspections and soil vapor sampling of the SSDS the minimal PPE should include work clothes or coveralls, safety boots with steel toe and additional PPE as required. For groundwater monitoring PPE should include at a minimum work clothes or coveralls, safety boots with steel toe, safety glasses, disposable nitrile gloves additional PPE as required. If any of these activities are performed in vehicle trafficed areas or an active construction area, additional PPE will be must be worn as appropriate including reflective vests and hard hat.

If there is an future excavation into residual contaminated soil left at the Site, Level D protection will be used during these field activities with a contingency to upgrade to Level C protection if total organic compound concentrations in the breathing zone consistently reach or exceed 5 parts per million (ppm) as measured with a photoionization detector (PID). If

PID readings in the breathing zone consistently reach or exceed 25 ppm, work will be stopped and the Site HSO and Project Manager contacted. Air monitoring is further discussed in Section 6.

4.5 General Hazard Controls

4.5.1 General Workplace Safety Rules

- Report unsafe conditions, accidents, injuries, or incidents to the HSO and Project Manager—immediately
- Use eye and/or face protection where there is danger from flying objects or particles, (such as when grinding, chipping, burning and welding, etc.) or from hazardous chemical splashes
- Dress properly - Loose clothing and jewelry shall not be worn
- Keep all equipment in safe working condition - Never use defective tools or equipment
- Report any defective tools or equipment to immediate supervisor
- Properly care for and be responsible for all PPE
- Do not leave materials in aisles, walkways, stairways, work areas, roadways, or other points of egress
- Practice good housekeeping at all times
- Training on equipment is required prior to unsupervised operation
- During work, pause every few minutes and assess surrounding conditions—be alert!
- For personal safety, be cognizant of your surroundings and ensure that equipment is properly secured

General construction health and safety guidelines are provided in Attachment V. These will only apply if any management activities must be performed in an active construction area.

4.5.2 Housekeeping

- Proper housekeeping is the foundation for a safe work environment. It definitely helps prevent accidents and fires, as well as creating a professional appearance in the work area
- Material will be piled or stored in a stable manner so that it will not be subject to falling
- Combustible scrap, debris, and garbage shall be removed from the work area at frequent and regular intervals
- Stairways, walkways, exit doors, in front of electrical panels, or access to firefighting equipment will be kept clear of materials, supplies, trash, and debris

4.5.3 Fire Prevention

- All firefighting equipment shall be conspicuously located, accessible, and inspected periodically, and maintained in operating condition
- All employees must know the location of firefighting equipment in the work area and have knowledge of its use and application

4.5.4 Personal Hygiene

Eating, drinking and the use of tobacco products in the immediate work area are prohibited. Field personnel taking prescription or non-prescription medication that could impair function or cause drowsiness should alert the HSO before work begins. Beards or facial hair that could interfere with the use of a respirator are not permitted if a respirator is being used. Dermal contact with groundwater or soil should be avoided. This includes avoiding walking through puddles, pools, and mud, sitting or leaning on or against drums, equipment, or on the ground. Field personnel should wash their hands before eating, smoking, using the toilet, etc. Field personnel should wash their hands and face and shower (daily) as soon as possible after leaving the site.

4.6 Spill Containment Program

The cleanup of a chemical spill should only be done by knowledgeable and experienced personnel. Spill kits, consisting of absorbents and protective equipment should be available

to clean up minor spills. A minor chemical spill is one that the FLS and AFF staff is capable of handling safely without the assistance of emergency personnel. All other chemical spills are considered major. For a major spill, contact the HSO.

Procedure for Responding to a Minor Chemical Spill

- Contact HSO to obtain guidance
- Alert people in immediate area of spill
- Wear PPE, minimum level D—**First assess the spill to determine whether you have sufficient protection to continue**
- Upgrade to level C to avoid breathing vapors from spill, if needed
- Confine spill to small area using absorbent, debris, soil etc.
- Absorb spill with vermiculite, dry sand, or oil-sorbent pads
- Collect residues, place in DOT-approved containers (labeled) and dispose as chemical waste
- Clean spill area

5.0 INDIVIDUAL HEALTH AND SAFETY PROGRAMS LISTING

The OSHA standards specify various individual programs that may be applicable to work performed on construction sites. Highlights of these programs are provided below, and specific written programs or procedures may be included into this written program, attached, or developed separately.

5.1 Hazard Communication Program

If employees are exposed to or work with hazardous chemicals at the job site, this program is required. Important elements of the written program are required to include a master listing of chemicals, maintaining material safety data sheets on each chemical, and training of employees on the program, the chemicals exposed to, and safety data sheets.

5.2 Occupational Noise Exposure/Hearing Conservation Program

If employees are exposed to noise levels above 85 decibels on the A scale (85 dBA), protection against the effects of noise and an effective hearing conservation program are required. Such a program would include elements such as written program, noise monitoring, hearing evaluations and follow-on testing, personal protective equipment (hearing protection), and maintenance of medical records.

5.3 Assured Equipment Grounding Conductor Program

If the employer uses assured equipment grounding verses ground fault circuit interrupters to provide employee electrical grounding protection, this program is required. Program elements include the inclusion of all cord sets, receptacles and cord/plug connected equipment and tools; a written program; quarterly testing; recording of each test by logging, color coding, or other equally effective means; and designation of a competent person to run the program.

5.4 Emergency Response Plan

If employees are engaged in emergency response to a hazardous substance/chemical release, an emergency response plan must be developed and implemented to handle anticipated emergencies. Program elements include a written response plan, identification and training of responding employees, medical surveillance and consultation, and post response operations.

6.0 AIR QUALITY MONITORING AND ACTION LEVELS

Air monitoring requirements by field activity is specified in Table 1. As shown in Table 1, air monitoring will not be required for most activities unless it involves disturbance of the residual contaminated soil left at the Site. If remaining contaminated soil is to be disturbed the following air monitoring protocol shall be followed accordingly. The monitoring instruments will be calibrated daily or as necessary due to field conditions and the results noted in the project field book. A background level will be established, at a minimum, on a daily basis, and recorded in the field book. The action levels and required responses are listed in the Table 2.

6.1 Total Organic Vapor Action Levels

Periodic readings above 5 ppm require caution. A sustained PID measurement greater than 5 ppm or objectionable nuisance odors, detected over a 15-minute period in the breathing zone, will require upgrading to Level C protection. A sustained PID measurement 25 ppm or greater, detected over a 15-minute period in the breathing zone, will require suspension of work activities. The source will be identified and corrective action taken to abate the VOC emissions so that VOC levels are less than 25 ppm.

6.2 Particulate Monitoring Action Levels

Particulate monitoring will be performed as necessary using a real-time particulate monitor that will monitor particulate matter less than ten microns (PM10) in size with the following minimum performance standards:

Object to be measured: Dust, Mists, Aerosols

Size range: <0.1 to 10 microns

Sensitivity: 0.001 mg/m3

Range: 0.001 to 10 mg/m3

Overall Accuracy: ±10% as compared to gravimetric analysis of stearic acid or reference dust.

Particulate levels will be monitored immediately downwind at the working site and integrated over a period not to exceed 15 minutes. The action level will be established at 150 ug/m3 over the integrated period not to exceed 15 minutes.

7.0 DECONTAMINATION

7.1 Site/Work Area Organization

The work area and appropriate organization will be defined prior to startup of the management tasks/activities. A typical site work area will consist of an exclusion zone where the actual field activity will take place; a decontamination zone; and a command post located outside the decontamination area and exclusion zones. Levels of personal protection in the exclusion zone will vary depending on the task being performed and air monitoring data, and will be specified by the HSO.

7.2 Personnel Decontamination

Decontamination (decon) of personnel consists of physically removing soil or contaminants using the correct procedures for washing and removal of PPE. Decon will take place in the designated decontamination zone using the following steps, if applicable:

- Soap and potable water wash and potable water rinse of gloves
- Glove removal
- Field wash of hands and face

7.3 Equipment Decontamination

The following decontamination procedure will be implemented in the field after field equipment has come in contact with contaminated material.

- Rinse equipment in tap water
- Scrub equipment with non-phosphate detergent and tap water
- Rinse equipment with distilled water
- Allow equipment to air dry

8.0 EMERGENCY AND CONTINGENCY PLAN

Emergency communications will be maintained during all on-site field activities. The emergency route to the hospital is depicted on Figure 3 and emergency contacts and their phone numbers are presented in Table 3.

A first aid kit will be available on-site at all times for any minor on-site injuries. Emergency medical assistance or ambulance can be reached by calling 911 for more severe injuries.

All OSHA recordable injuries and illnesses will be reported using OSHA Form 301 (Attachment VI).

General Emergency Response Procedures:

Any employee discovering a fire, explosion, or release of hazardous materials, which could potentially harm human health, or the environment, must immediately notify 911 to activate appropriate emergency procedures.

The following steps will be taken to expeditiously secure the appropriate assistance:

- Ascertain pertinent information (location, type of emergency condition, presence of possible victims which may be hurt or trapped nearby to the condition) and immediately contact and provide this information to 911 emergency personnel.
- Identify yourself and give the exact location first, then the type of emergency, and the presence of possible victims which may be hurt or trapped nearby to the condition. Then await the arrival of emergency response police officers, staying a safe distance from the emergency condition if warranted.
- Contact the FLS HSO and Project Manager and notify them of situation while waiting for emergency personnel.
- If possible, have a responsible person nearby to help flag down responding emergency services personnel as they respond.

- Emergency response personnel will assess the reported emergency and advise what appropriate action needs to be taken (i.e., evacuate an area).

Unless specifically trained to handle an emergency of the type you may be reporting, please do not attempt to render assistance in handling the emergency unless ordered to do so by competent authority or emergency services personnel.

Emergency Medical Services

In the event of an injury or illness that requires medical treatment, the HSO will contact emergency services by dialing 911 (ambulance) for the transportation of the individual. In the event ambulance service is not available or the response time is not suitable, the following are driving directions to the hospital:

HOSPITAL

Harlem Hospital Center: (212) 939-1000

506 Malcolm X Blvd

New York, NY 10037

- Head southwest on Park Ave toward E 124th St.
- Turn right at the 2nd cross street onto E 123rd St.
- Turn right onto Madison Ave.
- Turn left onto E 135th St.
- Turn right onto Lenox Ave./Malcolm X Blvd.
- Destination will be on the right

Figure 3 provides a map and route to the hospital.

TABLES

Table 1 – Tasks, Safety Hazards & Safety Requirements

Task/Activity	Hazards	Preventative Measures	Air Monitoring Requirements
Inspections	Trips and falls	PPE as required.	None.
Post-remediation soil vapor and groundwater sampling and monitoring	Trips, falls, materials handling, VOCs, SVOCs, metals, LNAPL, and DNAPL	PPE as required and use of normal sampling procedures.	None.
Soil Sampling, Test Pits, or Soil Borings	Subsurface utilities, vehicle hazards, trips, falls, materials handling, VOCs, SVOCs, and metals.	Clear utilities beforehand, use normal sampling procedures, exercise caution around equipment and excavations, wet area if necessary to control dust and odors. PPE as required.	PID measurements for VOCs, colorimetric tubes for benzene, particulate monitoring for SVOCs and metals, and Jerome measurements for Mercury (test pits only).
Excavation - Outside	Subsurface utilities, vehicle hazards, trips, falls, materials handling, VOCs, SVOCs, and metals. Falling objects, LNAPL, DNAPL, LEL, noise, vibration	Clear utilities beforehand, exercise caution around equipment and excavations, wet area if necessary to control dust and odors. PPE as required. Check for accumulation of vapors after period of inactivity.	PID measurements for VOCs, colorimetric tubes for benzene, particulate monitoring for SVOCs and metals, Jerome measurements for Mercury, and LEL measurements.
Excavation – Inside	Subsurface utilities, vehicle hazards, trips, falls, materials handling, VOCs, SVOCs, and metals. Falling objects, LNAPL, DNAPL, CO, CO_2, LEL, noise, vibration	Clear utilities beforehand, exercise caution around equipment and excavations, wet area if necessary to control dust and odors. PPE as required. Check for accumulation of vapors each morning and after period of inactivity.	PID measurements for VOCs, colorimetric tubes for benzene, particulate monitoring for SVOCs and metals, Jerome measurements for Mercury, and CO, CO_2, LEL measurements.

LEL - Lower Explosive Limit
PID - Photoionization detector
VOCs - Volatile organic compounds
SVOCs - Semi-volatile organic compounds
LNAPL - Light non-aqueous phase liquid
DNAPL - Dense non-aqueous phase liquid

Table 2 Air Monitoring, Action Levels, PPE

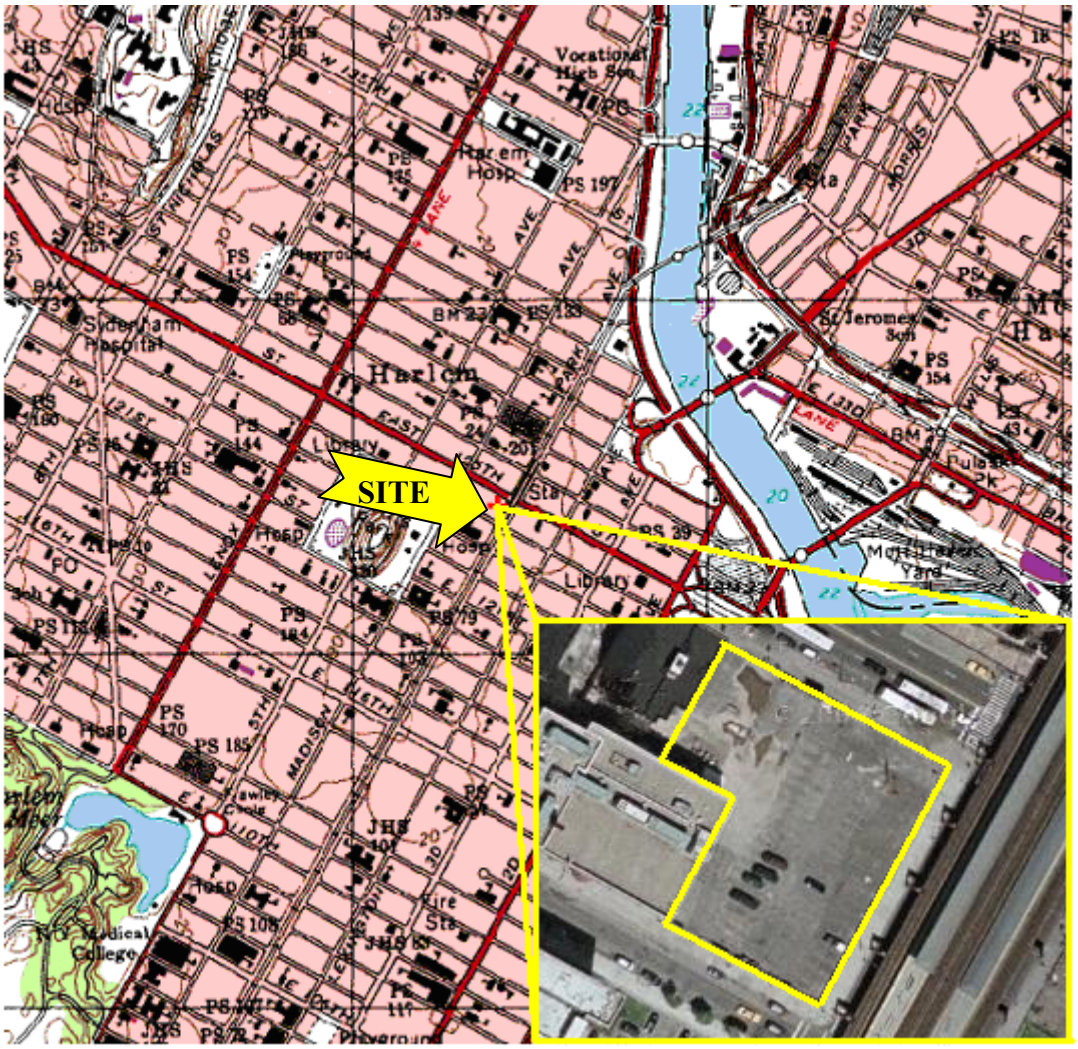
Instrument	Action Level	Response Action
Gas/Vapor		
PID	<0.5 ppm total VOCs in the workers' breathing zone (WBZ)	Continue work in Level D
PID	>0.5 ppm for a sustained period of 5 minutes in the WBZ	Use detector tube to measure benzene concentration
Colorimetric detector tube	> 0.5 ppm for benzene in the WBZ	Discontinue work and allow the work area to vent. Use mechanical ventilation as necessary. If after 15 minutes the benzene concentration is still greater than 0.5 ppm, upgrade to Level C, notify HSO
PID	1 to 10 ppm in the WBZ (no benzene)	Continue work in Level D
	> 10 ppm for a sustained period of 5 minutes in the WBZ (confirmed absence of benzene)	Discontinue work and allow the work area to vent. Use mechanical ventilation as necessary. If after 15 minutes the PID reading is still greater than 10 ppm, upgrade to Level C, notify HSO
	> 100 ppm for a sustained period of 5 minutes in the WBZ	Stop work. Resume work when readings are less than 100 ppm
Combustible Gas Indicator	Less than 20% LEL	Continue work
	Greater than 20% LEL	Stop work. Resume work when less than 20% LEL
Oxygen Monitor	Above 19.5% and less than 23.5%	Continue work
	Outside of this range	Stop work. Resume work when concentration is back in this acceptable range
Carbon Monoxide Monitor	Less than 25 ppm	Continue work
	Above 25 ppm	Stop work. Use mechanical ventilation as necessary. Resume work when less than 25 ppm.
Carbon Dioxide Monitor	<1000 ppm	Continue work
	>1000 ppm	Stop work. Use mechanical ventilation as necessary. Resume work when less than 1000 ppm.
Particulates		
Particulate Monitor	<100 µg/m^3 above background (upwind location)	Continue work, Level D
	> 100 µg/m3 above background for a period of 5 minutes in the WBZ	Stop work. Apply dust suppression measures. Resume work using Level D only if <100 µg/m^3 above background.
	>150 µg/m^3 above background for a sustained period of 5 minutes.	Stop work. Re-evaluate work. Collect air samples for As, Pb, Cd, and PAHs.
Mercury		
Jerome Monitor	<0.025 mg/m^3	Continue work, Level D
	> 0.025 mg/m3 for a period of 5 minutes in the WBZ	Stop work. Allow the work area to vent. Use mechanical ventilation as necessary. Resume work using Level D only if <0.025 mg/$m^{3.}$
	** Should Level C be necessary, contact the CIH as special coveralls and respirator cartridges are required.	

Table 3 – Key Personnel Emergency Phone Numbers

New York City Police Department	911
New York City Fire Department	911
Harlem Hospital Center 506 Malcolm X Blvd. New York, NY 10037	(212) 939-1000
Emergency Medical Service (ambulance)	911
Arnold F. Fleming, P. E., Project Director	(212) 675-3225
Daniel DiRocco, FLS Project Manager	(212) 675-3225
Raul Ramirez, Site Health and Safety Officer	(212) 675-3225
National Response Center	(800) 424-8802
NYSDEC Spill Hotline	(800) 457-7362

FIGURES

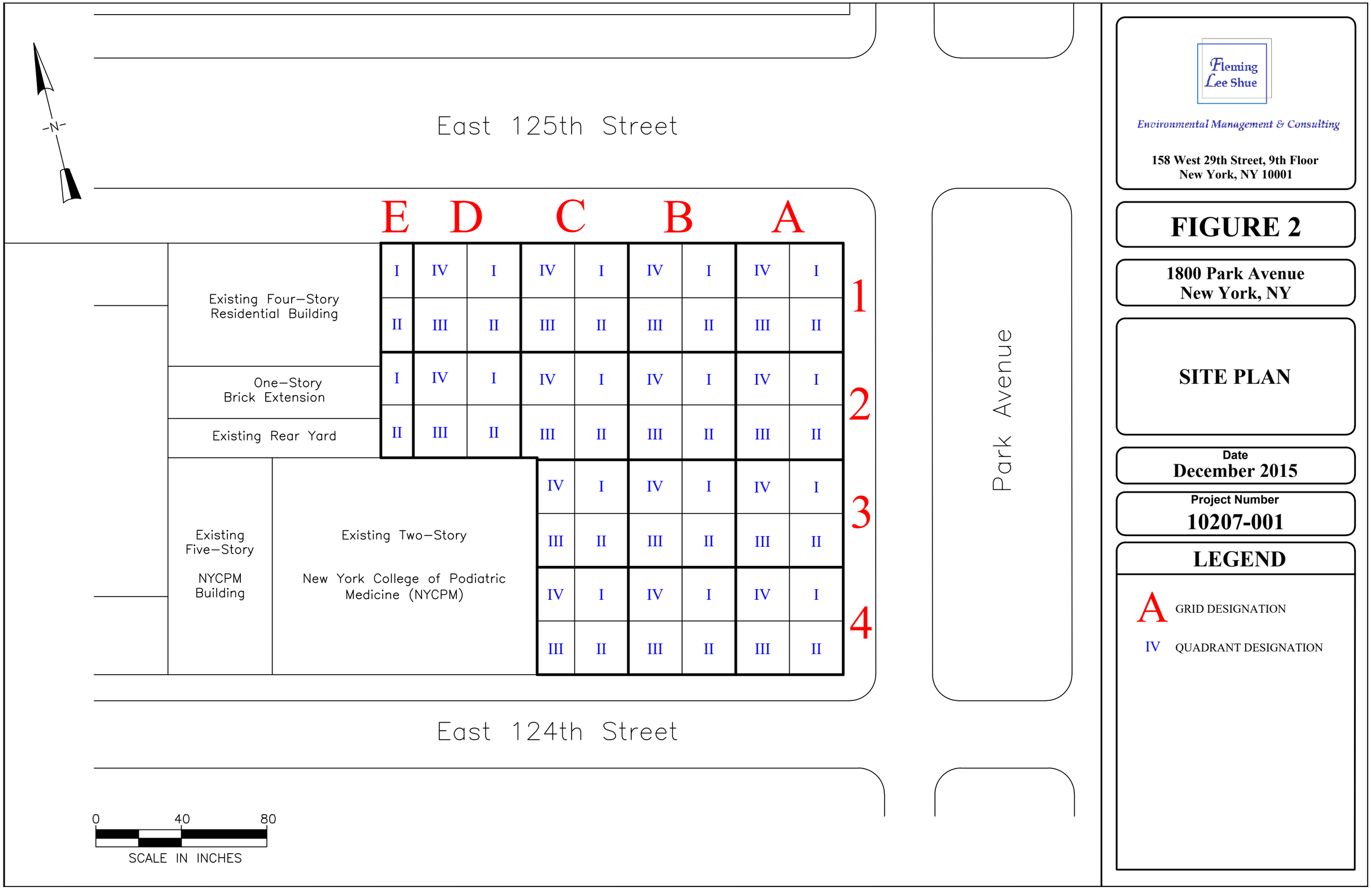
FIGURE 1: SITE LOCATION



Approximate Scale: 1" ≈ 24,000'
Source Map: USGS Central Park

Fleming Lee Shue

SITE: Harlem Park
1800 Park Avenue,
New York, New York
BCP Site # C231041



FILE: P:\10207 – Continuum Company LLC\Figures\SMP\FIG 2 – Site Plan.dwg DATE: 12/2/2015

Fleming Lee Shue

Environmental Management & Consulting

158 West 29th Street, 9th Floor
New York, NY 10001

FIGURE 2

1800 Park Avenue
New York, NY

SITE PLAN

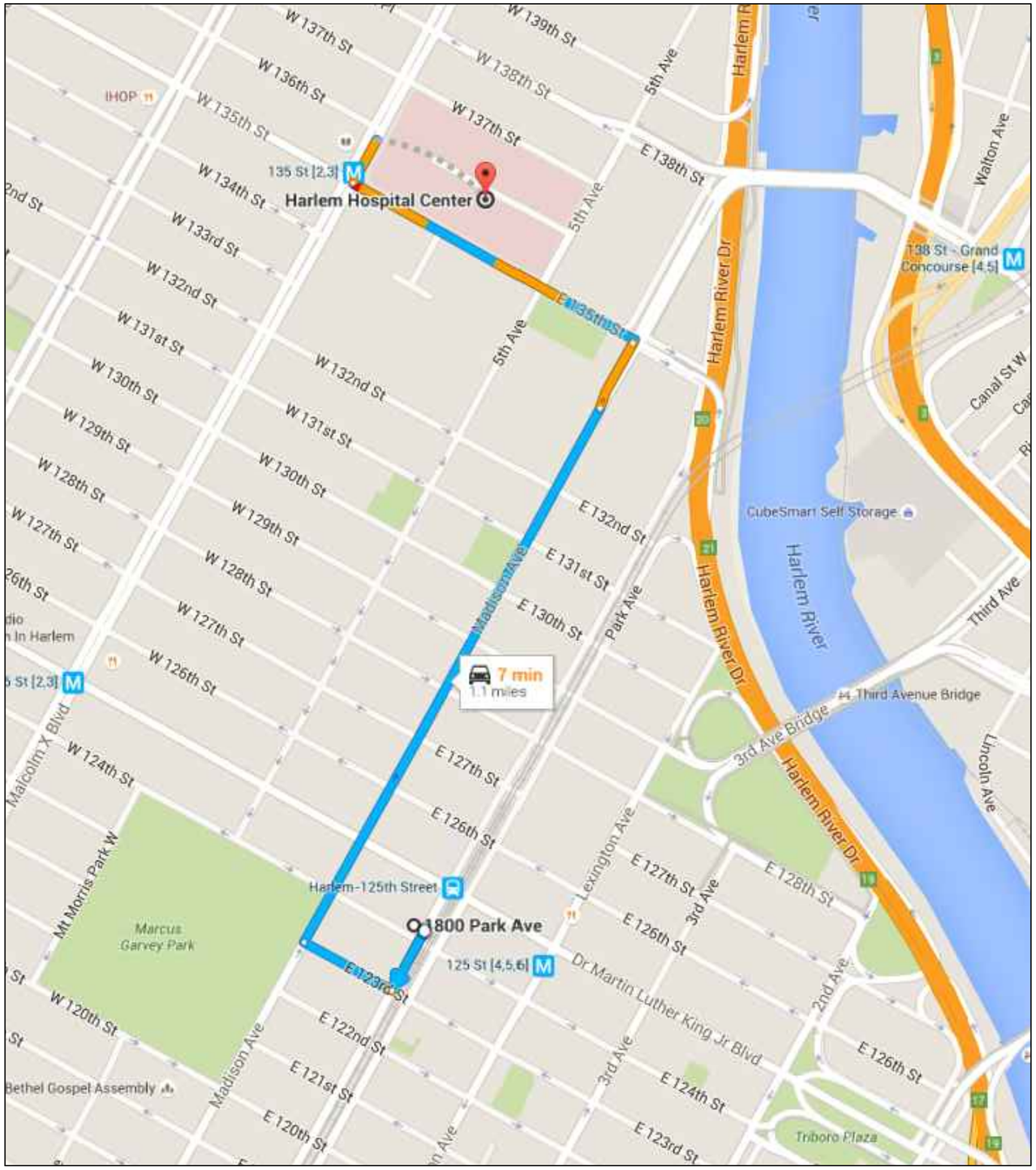
Date
December 2015

Project Number
10207-001

LEGEND

A GRID DESIGNATION

IV QUADRANT DESIGNATION



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FILE: P:\10207 - Continuum Company LLC\Figures\SMP\HASP\FIG 3 - Hospital Route.dwg DATE: 12/2/2015

Fleming Lee Shue

Environmental Management & Consulting

158 West 29th Street, 9th Fl.
New York, NY 10001

1800 Park Avenue
New York, NY

FIGURE 3

HOSPITAL ROUTE

Date
December 2015

Project Number
10207-001

LEGEND

ATTACHMENT I

HASP ACKNOWLEDGMENT FORM

The following personnel have read the site-specific HASP and are familiar with its provisions.

Print Name	*Signature*	*Company*	*Function*	*Date*

ATTACHMENT II

Attachment II - Health Hazards for Contaminants of Concern

Contaminant	Recognized and Suspected Health Hazards
Volatile Organic Compounds (VOCs) Including BTEX Benzene, Toulene, Ethylbenzene and Xylene	**Suspected** carcinogen; cardiovascular or blood toxicant; gastrointestinal or liver toxicant; reproductive toxicant; respiratory toxicant; skin or sense organ toxicant
Semi- Volatile Organic Compounds (SVOCs) Including Poly Aromatic Hydrocarbons (PAHs)	**Suspected** carcinogen; cardiovascular or blood toxicant; gastrointestinal or liver toxicant; reproductive toxicant; respiratory toxicant; skin or sense organ toxicant
Arsenic	**Recognized** carcinogen; developmental toxicant
	Suspected cardiovascular or blood toxicant; endocrine toxicant; gastrointestinal or liver toxicant; immunotoxicant; kidney toxicant; neurotoxicant; respiratory toxicant; skin or sense organ toxicant
Beryllium	**Recognized** carcinogen; developmental toxicant
	Suspected cardiovascular or blood toxicant; endocrine toxicant; gastrointestinal or liver toxicant; immunotoxicant; kidney toxicant; neurotoxicant; respiratory toxicant; skin or sense organ toxicant
Copper	**Suspected** cardiovascular or blood toxicant; developmental toxicant; gastrointestinal or liver toxicant; kidney toxicant; reproductive toxicant; respiratory toxicant
Chromium	**Suspected** cardiovascular or blood toxicant; endocrine toxicant; gastrointestinal or liver toxicant; immunotoxicant; kidney toxicant; neurotoxicant; respiratory toxicant; skin or sense organ toxicant
Cyanide	**Suspected** cardiovascular or blood toxicant; endocrine toxicant; neurotoxicant; respiratory toxicant; skin or sense organ toxicant
Iron	**Suspected** cardiovascular or blood toxicant; developmental toxicant; gastrointestinal or liver toxicant; kidney toxicant; reproductive toxicant; respiratory toxicant

Contaminant	Recognized and Suspected Health Hazards
Lead	**Recognized** carcinogen; developmental toxicant; reproductive toxicant
	Suspected cardiovascular or blood toxicant; endocrine toxicant; gastrointestinal or liver toxicant; immunotoxicant; kidney toxicant; neurotoxicant; respiratory toxicant; skin or sense organ toxicant
Mercury	**Recognized** developmental toxicant
	Suspected cardiovascular or blood toxicant; endocrine toxicant; gastrointestinal or liver toxicant; immunotoxicant; kidney toxicant; neurotoxicant; reproductive toxicant; respiratory toxicant; skin or sense organ toxicant
Nickel	**Recognized** skin or sense organ toxicant and respiratory toxicant
Pesticides	**Recognized** developmental toxicant
	Suspected cardiovascular or blood toxicant; endocrine toxicant; gastrointestinal or liver toxicant; immunotoxicant; kidney toxicant; neurotoxicant; reproductive toxicant; respiratory toxicant; skin or sense organ toxicant
Polychlorinated Biphenyls	**Recognized** carcinogen, developmental toxicant
	Suspected endocrine toxicant; gastrointestinal or liver toxicant; immunotoxicant; neurotoxicant; reproductive toxicant; respiratory toxicant; skin or sense organ toxicant
Tetrachloroethylene	**Recognized** carcinogen; developmental toxicant; reproductive toxicant
	Suspected cardiovascular or blood toxicant; developmental toxicant; endocrine toxicant; gastrointestinal or liver toxicant; immunotoxicant; kidney toxicant; neurotoxicant; reproductive toxicant; respiratory toxicant; skin or sense organ toxicant
Zinc	**Suspected** cardiovascular or blood toxicant; developmental toxicant; immunotoxicant; reproductive toxicant; respiratory toxicant; skin or sense organ toxicant

ATTACHMENT III

International Chemical Safety Cards

BENZENE

ICSC: 0015

Cyclohexatriene
Benzol
C_6H_6
Molecular mass: 78.1

ICSC # 0015
CAS # 71-43-2
RTECS # CY1400000
UN # 1114
EC # 601-020-00-8

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Highly flammable.	NO open flames, NO sparks, and NO smoking.	Powder, AFFF, foam, carbon dioxide.
EXPLOSION	Vapour/air mixtures are explosive. Risk of fire and explosion: see chemical dangers.	Closed system, ventilation, explosion-proof electrical equipment and lighting. Do NOT use compressed air for filling, discharging, or handling. Use non-sparking handtools.	In case of fire: keep drums, etc., cool by spraying with water.
EXPOSURE		AVOID ALL CONTACT!	
•INHALATION	Dizziness. Drowsiness. Headache. Nausea. Shortness of breath. Convulsions. Unconsciousness.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Refer for medical attention.
•SKIN	MAY BE ABSORBED! Dry skin (further see Inhalation).	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse skin with plenty of water or shower. Refer for medical attention.
•EYES		face shield, or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION	Abdominal pain. Sore throat. Vomiting (further see Inhalation).	Do not eat, drink, or smoke during work.	Rinse mouth. Do NOT induce vomiting. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent and remove to safe place. Do NOT wash away into sewer (extra personal protection: complete protective clothing including self-contained breathing apparatus).	Fireproof. Separated from food and feedstuffs, oxidants and halogens.	Do not transport with food and feedstuffs. F symbol T symbol R: 45-11-48/23/24/25 S: 53-45 UN Hazard Class: 3 UN Packing Group: II

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0015

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1999. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

BENZENE

ICSC: 0015

IMPORTANT DATA

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

PHYSICAL DANGERS:
The vapour is heavier than air and may travel along the ground; distant ignition possible.

CHEMICAL DANGERS:
Reacts violently with oxidants and halogens causing fire and explosion hazard.

OCCUPATIONAL EXPOSURE LIMITS:
TLV: 10 ppm; 32 mg/m^3 (as TWA) A2 (ACGIH 1991-1992).
OSHA PEL: 1910.1028 TWA 1 ppm ST 5 ppm See Appendix F
NIOSH REL: Ca TWA 0.1 ppm ST 1 ppm See Appendix A
NIOSH IDLH: Potential occupational carcinogen 500 ppm

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

INHALATION RISK:
A harmful contamination of the air can be reached rather quickly on evaporation of this substance at 20°C; on spraying or dispersion, however, much faster.

EFFECTS OF SHORT-TERM EXPOSURE:
The substance irritates the skin and the respiratory tract. Swallowing the liquid may cause aspiration into the lungs with the risk of chemical pneumonitis. The substance may cause effects on the central nervous system. Exposure far above the occupational exposure limit may result in unconsciousness.

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
The liquid defats the skin. The substance may have effects on the blood forming organs, liver and immune system. This substance is carcinogenic to humans.

PHYSICAL PROPERTIES	Boiling point: 80°C Melting point: 6°C Relative density (water = 1): 0.9 Solubility in water, g/100 ml at 25°C: 0.18 Vapour pressure, kPa at 20°C: 10 Relative vapour density (air = 1): 2.7	Relative density of the vapour/air-mixture at 20°C (air = 1): 1.2 Flash point: (c.c.) -11°C Auto-ignition temperature: about 500°C Explosive limits, vol% in air: 1.2-8.0 Octanol/water partition coefficient as log Pow: 2.13
ENVIRONMENTAL DATA		

NOTES

Use of alcoholic beverages enhances the harmful effect. Depending on the degree of exposure, periodic medical examination is indicated. The odour warning when the exposure limit value is exceeded is insufficient.

Transport Emergency Card: TEC (R)-7
NFPA Code: H2; F3; R0;

ADDITIONAL INFORMATION

ICSC: 0015 **BENZENE**

Material Safety Data Sheet

Beryllium, powder, -325 mesh, 99+%

ACC# 99072

Section 1 - Chemical Product and Company Identification

MSDS Name: Beryllium, powder, -325 mesh, 99+%
Catalog Numbers: AC317870000, AC317870050
Synonyms: None.
Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01
For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7440-41-7	Beryllium	>99	231-150-7

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: gray-white flakes.
Warning! Cancer hazard. Can be explosive when exposed to heat or flames. Causes eye, skin, and respiratory tract irritation. Inhalation of fumes may cause metal-fume fever.
Target Organs: Lungs.

Potential Health Effects

Eye: Causes eye irritation. May cause conjunctivitis and corneal inflammation.
Skin: Causes skin irritation. May cause contact dermatitis.
Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea.
Inhalation: Causes respiratory tract irritation. Inhalation of fumes may cause metal fume fever, which is characterized by flu-like symptoms with metallic taste, fever, chills, cough, weakness, chest pain, muscle pain and increased white blood cell count. If heated, dust or fume may cause respiratory tract irritation.
Chronic: Chronic beryllium disease, an immunologically mediated response occurring after a latent period ranging from a few weeks to many years, causes difficult breathing on exertion, weight loss, nonproductive cough, fatigue, chest pain, anorexia, and weakness.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid immediately. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.
Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.
Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.
Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dust can be an explosion hazard when exposed to heat or flame. Flammable solid.
Extinguishing Media: Do NOT use carbon dioxide. Do NOT use halogenated agents. Use approved class D extinguishing agents or smother with dry sand, clay, or sodium bicarbonate. DO NOT USE WATER!
Flash Point: Not applicable.
Autoignition Temperature: Not applicable.
Explosion Limits, Lower: Not available.
Upper: Not available.
NFPA Rating: (estimated) Health: 3; Flammability: 2; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Remove all sources of ignition. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Do not breathe dust. Keep away from heat, sparks and flame. Use only with adequate ventilation or respiratory protection.
Storage: Keep away from sources of ignition. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs

Beryllium	0.002 mg/m3 TWA; 0.01 mg/m3 STEL	4 mg/m3 IDLH	2 ug/m3 TWA; 5 æg/m3 Ceiling

OSHA Vacated PELs: Beryllium: 2 ug/m3 TWA
Personal Protective Equipment
Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.
Skin: Wear appropriate protective gloves to prevent skin exposure.
Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Flakes
Appearance: gray-white
Odor: odorless
pH: Not available.
Vapor Pressure: 1.85 mm Hg
Vapor Density: Not available.
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: 2970 deg C
Freezing/Melting Point:1287 deg C
Decomposition Temperature: Not available.
Solubility: Not available.
Specific Gravity/Density:1.85 @ 20C
Molecular Formula: Be
Molecular Weight:9.01

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.
Conditions to Avoid: Ignition sources, dust generation, excess heat, exposure to flame.
Incompatibilities with Other Materials: Oxidizing agents, phosphorus, lithium, caustics (e.g. ammonia, ammonium hydroxide, calcium hydroxide, potassium hydroxide, sodium hydroxide), carbontetrachloride, chlorinated hydrocarbons, Contact with acids causes evolution of flammable hydrogen gas..
Hazardous Decomposition Products: Hydrogen gas.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 7440-41-7: DS1750000
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 7440-41-7:

- **ACGIH:**
  A1 - Confirmed Human Carcinogen
- **California:**
  carcinogen, initial date 10/1/87
- **NTP:**
  Known carcinogen
- **IARC:**
  Group 1 carcinogen

Epidemiology: Epidemiologic studies have demonstrated a statistically significant increase in lung cancer mortality in beryllium-exposed workers.
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: No information found
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: CAS# 7440-41-7: waste number P015.
RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	DOT regulated - small quantity provisions apply (see 49CFR173.4)	BERYLLIUM POWDER
Hazard Class:		6.1
UN Number:		UN1567
Packing Group:		II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7440-41-7 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 7440-41-7: 10 lb final RQ (no reporting of releases of this hazardous substance is required

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7440-41-7: immediate, delayed, fire.

Section 313

This material contains Beryllium (CAS# 7440-41-7, >99%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 7440-41-7 (listed as Beryllium compounds, n.o.s.) is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

CAS# 7440-41-7 is listed as a Priority Pollutant under the Clean Water Act. CAS# 7440-41-7 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7440-41-7 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains Beryllium, a chemical known to the state of California to cause cancer.

California No Significant Risk Level: CAS# 7440-41-7: 0.1 æg/day NSRL

European / International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T+

Risk Phrases:

R 25 Toxic if swallowed.
R 26 Very toxic by inhalation.
R 36/37/38 Irritating to eyes, respiratory system and skin.
R 43 May cause sensitization by skin contact.
R 49 May cause cancer by inhalation.
R 48/23 Toxic : danger of serious damage to health by prolonged exposure through inhalation.

Safety Phrases:

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S 53 Avoid exposure - obtain special instructions before use.

WGK (Water Danger/Protection)

CAS# 7440-41-7: No information available.

Canada - DSL/NDSL

CAS# 7440-41-7 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B4, D2A, D1A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7440-41-7 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 1/21/1998
Revision #5 Date: 8/23/2004

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

Material Safety Data Sheet
Chloroform

ACC# 04770

Section 1 - Chemical Product and Company Identification

MSDS Name: Chloroform
Catalog Numbers: AC95232184, S79960, S79960-1, S79960HPLC-2, S79960SPEC-1, S79960SPEC-2, C2974LC, C297POP19, C297POP200, C297POP50, C297RS115, C297RS200, C297RS28, C297RS50, C297SS115, C297SS19, C297SS200, C297SS28, C297SS50, C29820LC, C298FB115, C298FB19, C298FB200, C298FB50, C298J1, C298POP19, C298POP200, C298POP50, C298POPB19, C298POPB200, C298POPB50, C298RB115, C298RB19, C298RB200, C298RB50, C298RB500, C298RS115, C298RS19, C298RS200, C298RS28, C298RS50, C298SS-11, C298SS19, C298SS28, C605-1, C605-4, C606POP19, C606POP200, C606POP50, C606RS115, C606RS200, C606RS28, C606RS50, C606SS115, C606SS19, C606SS200, C606SS28, C606SS50
Synonyms: Formyl Trichloride; Methane Trichloride; Methenyl Trichloride; Methyl Trichloride; Trichlormethan; Trichloroform; Trichloromethane.
Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100
Emergency Number: 201-796-7100
For CHEMTREC assistance, call: 800-424-9300
For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
67-66-3	Chloroform	100	200-663-8
25377-72-4	Amylene	<1.0	246-916-6

Hazard Symbols: XN
Risk Phrases: 22 38 40 48/20/22

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear, colorless liquid. May cause central nervous system depression. May cause cardiac disturbances. May cause cancer based on animal studies. This substance has caused adverse reproductive and fetal effects in animals. May be harmful if swallowed. **Caution!** Causes eye and skin irritation. Causes digestive and respiratory tract irritation. Light sensitive.
Target Organs: Blood, kidneys, heart, central nervous system, liver, cardiovascular system, excretory system, reproductive system.

Potential Health Effects

Eye: Causes moderate eye irritation. Contact with liquid causes immediate burning pain, tearing, and

reddening of the conjunctiva.
Skin: Causes mild skin irritation. Prolonged or repeated contact may dry/defat the skin and cause irritation. Absorption of liquid through intact skin is possible and may cause sys temic poisoning if contact with liquid is prolonged.
Ingestion: Causes gastrointestinal irritation with nausea, vomiting and diarrhea. May cause liver damage. May cause cardiac disturbances. Aspiration of material into the lungs may cause chemical pneumonitis, which may be fatal. Possible aspiration hazard. May cause hallucinations and distorted perceptions.
Inhalation: Inhalation of high concentrations may cause central nervous system effects characterized by nausea, headache, dizziness, unconsciousness and coma. May cause cardiac sensitization and possible failure. Inhalation of large amounts may cause respiratory stimulation, followed by respiratory depression, convulsions and possible death due to respiratory paralysis. May be absorbed through the lungs. Causes irritation of the mucous membrane and upper respiratory tract.
Chronic: Possible cancer hazard based on tests with laboratory animals. Prolonged or repeated skin contact may cause dermatitis. May cause reproductive and fetal effects. Effects may be delayed. Laboratory experiments have resulted in mutagenic effects. Toxicity may be increased by exposure to alcohol, steroids, and ketones. Prolonged exposure may cause liver, kidney, and heart damage.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.
Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.
Ingestion: Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.
Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.
Notes to Physician: Causes cardiac sensitization to endogenous catelcholamines which may lead to cardiac arrhythmias. Do NOT use adrenergic agents such as epinephrine or pseudoepinephrine. Persons with liver, kidney, or central nervous system diseases may be at increased risk from exposure to this product. Alcoholic beverage consumption may enhance the toxic effects of this substance. Effects may be delayed.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool. Substance is nonflammable. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas. Containers may explode when heated.
Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire. Do NOT get water inside containers. Do NOT use straight streams of water. For small fires, use dry chemical, carbon dioxide, or water spray. For large fires, use water spray, fog or regular foam. Cool containers with flooding quantities of water until well after fire is out.
Flash Point: Not available.
Autoignition Temperature: Not available.
Explosion Limits, Lower: Not available.
Upper: Not available.
NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Provide ventilation. Approach spill from upwind.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use only in a well-ventilated area. Avoid contact with eyes, skin, and clothing. Do not breathe dust, vapor, mist, or gas. Do not ingest or inhale. Store protected from light.
Storage: Do not store in direct sunlight. Store in a cool, dry, well-ventilated area away from incompatible substances. Do not store near alkaline substances. Separate from strong mineral acids.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Chloroform	10 ppm TWA	500 ppm IDLH	50 ppm Ceiling; 240 mg/m3 Ceiling
Amylene	none listed	none listed	none listed

OSHA Vacated PELs: Chloroform: 2 ppm TWA; 9.78 mg/m3 TWA Amylene: No OSHA Vacated PELs are listed for this chemical.
Personal Protective Equipment
Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.
Skin: Wear appropriate protective gloves to prevent skin exposure.
Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

Section 9 - Physical and Chemical Properties

Physical State: Liquid
Appearance: clear, colorless
Odor: sweet, fruity odor - ethereal odor
pH: Not available.
Vapor Pressure: 160 mm Hg @ 20 deg C
Vapor Density: 4.12 (Air=1)
Evaporation Rate:11.6 (Butyl acetate=1)

Viscosity: 0.58 cps @ 20 deg C
Boiling Point: 60.5-61.5 deg C
Freezing/Melting Point:-63 deg C
Decomposition Temperature: Not available.
Solubility: Slightly soluble.
Specific Gravity/Density:1.492 (Water=1)
Molecular Formula:CHCl3
Molecular Weight:119.366

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions. Light sensitive.
Conditions to Avoid: High temperatures, incompatible materials, light.
Incompatibilities with Other Materials: Strong oxidizing agents, aluminum, fluorine, magnesium, sodium potassium, lithium, caustics (e.g. ammonia, ammonium hydroxide, calcium hydroxide, potassium hydroxide, sodium hydroxide), dinitrogen tetraoxide, sodium + methanol, potassium-tert-butoxide, chemically active metals, Attacks some forms of plastics, rubbers, and coatings., nitrogen tetroxide, acetone + alkali, disilane, perchloric acid + phosphorus pentoxide, sodium methylate, triisopropylphosphine, sodium methoxide + methanol.
Hazardous Decomposition Products: Hydrogen chloride, carbon monoxide, carbon dioxide, chlorine, phosgene gas.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 67-66-3: FS9100000
CAS# 25377-72-4 unlisted.
LD50/LC50:
CAS# 67-66-3:
Draize test, rabbit, eye: 148 mg;
Draize test, rabbit, eye: 20 mg/24H Moderate;
Draize test, rabbit, skin: 500 mg/24H Mild;
Inhalation, rat: LC50 = 47702 mg/m3/4H;
Oral, mouse: LD50 = 36 mg/kg;
Oral, rat: LD50 = 695 mg/kg;
Skin, rabbit: LD50 = >20 gm/kg;

CAS# 25377-72-4:

Carcinogenicity:
CAS# 67-66-3:
ACGIH: A3 - Animal Carcinogen
California: carcinogen; initial date 10/1/87
NIOSH: potential occupational carcinogen
NTP: Suspect carcinogen
OSHA: Possible Select carcinogen
IARC: Group 2B carcinogen CAS# 25377-72-4: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.
Epidemiology: Oral, rat: TDLo = 13832 mg/kg/2Y-C (Tumorigenic - Carcinogen ic by RTECS criteria - Blood - leukemia).; Oral, mouse: TDLo = 127 gm/kg/92W-I (Tumorigenic - Carcinogenic by RTECS criteria - Liver - tumors).; Oral, rat: TD = 98 gm/kg/78W-I (Tumorigenic - neoplastic by RTECS

criteria - Kidney, Ureter, Bladder - Kidney tumors and Endocrine - thyroid tumors).; Oral, mouse: TD = 18 gm/kg/17W-I (Tumorigenic - neoplastic by RTECS criteria - Liver - tumor s).;
Teratogenicity: Oral, rat: TDL0 = 1260 mg/kg (female 6-15 day(s) after conception) Effects on Embryo or Fetus - fetotoxicity (except death, e.g., stunted fetus) Specific Developmental Abnormalities - musculoskeletal system.; Inhalation, rat: TCLo = 100 ppm/7H (female 6-15 day(s) after conception) Specific Developmental Abnormalities - gastrointestinal system and homeostasis.; Inhalation, mouse: TCLo = 100 ppm/7H (female 8-15 day(s) after conception) Specific Developmental Abnormalities - craniofacial (including nose and tongue).
Reproductive Effects: Inhalation, rat: TCLo = 30 ppm/7H (female 6-15 day(s) after conception) Fertility - other measures of fertility.; Inhalation, rat: TCLo = 300 ppm/7H (female 6-15 day(s) after conception) Fertility - female fertility index (e.g. # females pregnant per # sperm positive females; # females pregnant per # females mated) and post-implantation mortality (e.g. dead and/or resorbed implants per total number of implants).
Neurotoxicity: No information available.
Mutagenicity: DNA Inhibition: Human, HeLa cell = 19 mmol/L.; Sister Chromatid Exchange: Human, Lymphocyte = 10 mmol/L.; Micronucleus Test: Oral, rat = 4 mmol/kg.; Unscheduled DNA Synthesis: Oral, rat = 1 gm/kg.; Sister Chromatid Exchange: Hamster, Embryo = 100 umol/L.
Other Studies: Open irritation test: Administration onto the skin (rabbit) 10 mg/24H (Mild). Standard Draize Test: Administratio n onto the skin (rabbit) = 500 mg/24H (Mild). Standard D raize Test: Administration into the eye (rabbit) = 20 mg /24H (Moderate).

Section 12 - Ecological Information

Ecotoxicity: Fish: Channel catfish: LC50 = 75 ppm; 96 Hr; Unspecified Rainbow trout: LC50 = 43.8 mg/L; 96 Hr; Static bioassay Fathead Minnow: LC50 = 129.0 mg/L; 96 Hr; Static bioassay (pH = 7.6-8.3) Bluegill/Sunfish: LC50 = 100.0 mg/L; 96 Hr; Static bioassay flea Daphnia: EC50 = 28.9 mg/L; 48 Hr; Static bioassay The majority of the environmental releases from industrial uses are to the atmosphere; releases to water and land will be primarily lost by evaporation and will end up in the atmosphere. Release to the atmosphere may be transported long distances and will photodegrade with a half-life of a few months. Spills and other releases on land will also leach into the groundwater where it will reside for long periods of time.
Environmental: Chloroform will not be expected to bioconcentrate into the food chain but contamination of food is likely due to its use as an extractant and its presence in drinking water.
Physical: No information available.
Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series: CAS# 67-66-3: waste number U044.

Section 14 - Transport Information

	US DOT	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	CHLOROFORM				CHLOROFORM
Hazard Class:	6.1				6.1(9.2)
UN Number:	UN1888				UN1888

Packing Group:	III				II

Section 15 - Regulatory Information

US FEDERAL

TSCA
CAS# 67-66-3 is listed on the TSCA inventory.
CAS# 25377-72-4 is listed on the TSCA inventory.
Health & Safety Reporting List
CAS# 67-66-3: Effective Date: 6/1/87; Sunset Date: 6/1/97
Chemical Test Rules
None of the chemicals in this product are under a Chemical Test Rule.
Section 12b
None of the chemicals are listed under TSCA Section 12b.
TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.
SARA

CERCLA Hazardous Substances and corresponding RQs
CAS# 67-66-3: 10 lb final RQ; 4.54 kg final RQ
SARA Section 302 Extremely Hazardous Substances
CAS# 67-66-3: 10,000 lb TPQ
SARA Codes
CAS # 67-66-3: acute, chronic. CAS # 25377-72-4: acute, flammable.
Section 313
This material contains Chloroform (CAS# 67-66-3, 100%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.
Clean Air Act:
CAS# 67-66-3 is listed as a hazardous air pollutant (HAP). This material does not contain any Class 1 Ozone depletors. This material does not contain any Class 2 Ozone depletors.
Clean Water Act:
CAS# 67-66-3 is listed as a Hazardous Substance under the CWA. CAS# 67-66-3 is listed as a Priority Pollutant under the Clean Water Act. CAS# 67-66-3 is listed as a Toxic Pollutant under the Clean Water Act.
OSHA:
None of the chemicals in this product are considered highly hazardous by OSHA.
STATE
CAS# 67-66-3 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.
CAS# 25377-72-4 can be found on the following state right to know lists: New Jersey.
The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act: WARNING: This product contains Chloroform, a chemical known to the state of California to cause cancer. California No Significant Risk Level: CAS# 67-66-3: 20 ug/day NSRL (oral); 40 ug/day NSRL (inhalation)

European/International Regulations

European Labeling in Accordance with EC Directives
Hazard Symbols:
XN
Risk Phrases:
R 22 Harmful if swallowed.
R 38 Irritating to skin.
R 40 Limited evidence of a carcinogenic effect.

R 48/20/22 Harmful : danger of serious damage to health by prolonged exposure through inhalation and if swallowed.

Safety Phrases:
S 36/37 Wear suitable protective clothing and gloves.

WGK (Water Danger/Protection)
CAS# 67-66-3: 3
CAS# 25377-72-4: No information available.
Canada - DSL/NDSL
CAS# 67-66-3 is listed on Canada's DSL List.
CAS# 25377-72-4 is listed on Canada's DSL List.
Canada - WHMIS
This product has a WHMIS classification of D2A, D1B.
Canadian Ingredient Disclosure List
CAS# 67-66-3 is listed on the Canadian Ingredient Disclosure List.
Exposure Limits
CAS# 67-66-3: OEL-ARAB Republic of Egypt:TWA 10 ppm (50 mg/m3) OEL-AUSTRALIA:TWA 10 ppm (50 mg/m3);Carcinogen OEL-AUSTRIA:TWA 10 ppm (50 mg/m3) OEL-BELGIUM:TWA 10 ppm (49 mg/m3);Carcinogen JAN9 OEL-CZECHO SLOVAKIA:TWA 10 mg/m3;STEL 20 mg/m3 OEL-DENMARK:TWA 2 ppm (10 mg/m3); Carcinogen OEL-FINLAND:TWA 10 ppm (50 mg/m3);STEL 20 ppm;Skin;CAR OE L-FRANCE:TWA 5 ppm (25 mg/m3);STEL 50 ppm (250 mg/m3);CAR OEL-GERMANY :TWA 10 ppm (50 mg/m3);Carcinogen JAN9 OEL-HUNGARY:STEL 10 mg/m3 OEL -INDIA:TWA 10 ppm (50 mg/m3);Carcinogen OEL-JAPAN:TWA 50 ppm (240 mg/ m3);Carcinogen OEL-THE NETHERLANDS:TWA 10 ppm (50 mg/m3) OEL-THE PHI LIPPINES:TWA 50 ppm (240 mg/m3) OEL-POLAND:TWA 50 mg/m3 OEL-RUSSIA:T WA 50 ppm OEL-SWEDEN:TWA 2 ppm (10 mg/m3);STEL 5 ppm (25 mg/m3);CAR OEL-SWITZERLAND:TWA 10 ppm (50 mg/m3);STEL 20 ppm (100 mg/m3) OEL-THA ILAND:TWA 50 ppm (240 mg/m3) OEL-TURKEY:TWA 50 ppm (240 mg/m3) OEL-U NITED KINGDOM:TWA 2 ppm (9.9 mg/m3);Skin OEL IN BULGARIA, COLOMBIA, J ORDAN, KOREA check ACGIH TLV OEL IN NEW ZEALAND, SINGAPORE, VIETNAM c heck ACGIH TLV

Section 16 - Additional Information

MSDS Creation Date: 6/09/1999
Revision #7 Date: 9/11/2002

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

International Chemical Safety Cards

CHROMIUM

ICSC: 0029

Chrome
Cr (metal)
Atomic mass: 52.0

ICSC # 0029
CAS # 7440-47-3
RTECS # GB4200000

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible if in very fine powder. Gives off irritating or toxic fumes (or gases) in a fire.	No open flames if in powder form.	In case of fire in the surroundings: all extinguishing agents allowed.
EXPLOSION	Finely dispersed particles form explosive mixtures in air.	Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	
EXPOSURE		PREVENT DISPERSION OF DUST! STRICT HYGIENE!	
•INHALATION	Cough.	Local exhaust or breathing protection.	Fresh air, rest.
•SKIN	Redness.	Protective gloves.	Remove contaminated clothes. Rinse skin with plenty of water or shower. Refer for medical attention.
•EYES	Redness.	Face shield.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION		Do not eat, drink, or smoke during work.	Rinse mouth.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Vacuum spilled material. Carefully collect remainder, then remove to safe place (extra personal protection: P2 filter respirator for harmful	Fireproof. Separated from strong oxidants.	R: S:

particles).

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0029

International Chemical Safety Cards

CHROMIUM

ICSC: 0029

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

PHYSICAL STATE; APPEARANCE:
STEEL GREY LUTROUS METAL.

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

CHEMICAL DANGERS:
Reacts violently with strong oxidants such as hydrogen peroxide, causing fire and explosion hazard. Reacts with diluted hydrochloric and sulfuric acids. Incompatible with alkalis and alkali carbonates.

OCCUPATIONAL EXPOSURE LIMITS:
TLV: ppm; 0.5 mg/m^3 (as TWA) (ACGIH 1994-1995).
OSHA PEL*: TWA 1 mg/m^3 See Appendix C *Note: The PEL also applies to insoluble chromium salts.
NIOSH REL: TWA 0.5 mg/m^3 See Appendix C
NIOSH IDLH: 250 mg/m^3 (as Cr)

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

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

EFFECTS OF SHORT-TERM EXPOSURE:

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
Repeated or prolonged contact may cause skin sensitization.

PHYSICAL PROPERTIES	Boiling point: 2642°C Melting point: 1900°C	Relative density (water = 1): 7.14 Solubility in water: none
ENVIRONMENTAL DATA		

NOTES

Explosive limits are unknown in literature. Depending on the degree of exposure, periodic medical examination is indicated.

ADDITIONAL INFORMATION

ICSC: 0029	**CHROMIUM**

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

ALDRICH CHEMICAL CO -- DIELDRIN, TECH., CA. 90%, 29121-8 -- 6810-00N037359

========== Product Identification ==========

Product ID:DIELDRIN, TECH., CA. 90%, 29121-8
MSDS Date:01/07/1992
FSC:6810
NIIN:00N037359
MSDS Number: BQRWJ
=== Responsible Party ===
Company Name:ALDRICH CHEMICAL CO
Box:355
City:MILWAUKEE
State:WI
ZIP:53201
Country:US
Info Phone Num:414-273-3850
Emergency Phone Num:414-273-3850
CAGE:60928
=== Contractor Identification ===
Company Name:ALDRICH CHEMICAL CO INC
Address:1001 WEST ST PAUL AVE
Box:355
City:MILWAUKEE
State:WI
ZIP:53233
Country:US
Phone:414-273-3850
CAGE:60928

========== Composition/Information on Ingredients ==========

Ingred Name:1,4:5,8-DIMETHANONAPHTHALENE, 1,2,3,4,10,10-HEXACHLORO-6,
7-EPOXY- 1,4,4A,5,6,7,8,8A-OCTAHYDRO, ENDO, EXO-; (ING 2)
CAS:60-57-1
RTECS #:IO1750000
Fraction by Wt: 90%
OSHA PEL:0.25 MG/M3, S
ACGIH TLV:0.25 MG/M3, S
EPA Rpt Qty:1 LB
DOT Rpt Qty:1 LB

Ingred Name:ING 1: (DIELDRIN) (SARA III)
RTECS #:9999999ZZ

========== Hazards Identification ==========

LD50 LC50 Mixture:LD50 (ORAL,RAT): 38300 UG/KG.
Routes of Entry: Inhalation:YES Skin:YES Ingestion:NO
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:ACUTE:MAY BE FATAL IF INHALED,
SWALLOWED, OR ABSORBED THROUGH SKIN. MAY CAUSE IRRITATION. CHRONIC:
CARCINOGEN. MAY ALTER GENETIC MATERIAL. OVEREXPOSURE MAY CAUSE
REPRODUCTIVE DISORDER(S) BASED ON TEST S WITH LABORATORY ANIMALS.
TARGET ORGANS: CENTRAL NERVOUS SYSTEM, LIVER, BLOOD. OVEREXPOSURE
CAN CAUSE (EFTS OF OVEREXP)
Explanation of Carcinogenicity:NOT RELEVANT.
Effects of Overexposure:HLTH HAZ: MALAISE, HEADACHE, NAUSEA, VOMITING,
DIZZINESS, TREMORS, CLONIC AND TONIC CONVULSIONS, COMA, RESPIRATORY
FAILURE.
Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

========== First Aid Measures ==========

First Aid:EYES: IMMEDIATELY FLUSH WITH COPIOUS AMOUNTS OF WATER FOR AT
LEAST 15 MINUTES. SKIN: IMMEDIATELY FLUSH WITH COPIOUS AMOUNTS OF

WATER FOR AT LEAST 15 MINUTES WHILE REMOVING CONTAMINATED CLOTHING AND SH OES. INHALATION: REMOVE TO FRESH AIR. IF NOT BREATHING GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. INGESTION: WASH OUT MOUTH W/WATER PROVIDED PERSON IS CONSCIOUS. CALL PHYS.

========== Fire Fighting Measures ==========

Extinguishing Media:WATER SPRAY, CARBON DIOXIDE, DRY CHEMICAL POWDER OR APPROPRIATE FOAM.
Fire Fighting Procedures:WEAR NIOSH/MSHA APPROVED SCBA AND FULL PROTECTIVE EQUIPMENT .
Unusual Fire/Explosion Hazard:EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

========== Accidental Release Measures ==========

Spill Release Procedures:EVACUATE AREA. WEAR NIOSH/MSHA APPROVED SCBA, RUBBER BOOTS AND HEAVY RUBBER GLOVES. SWEEP UP, PLACE IN BAG AND HOLD FOR WASTE DISPOSAL. AVOID RAISING DUST. VENTILATE AREA AND WASH SPILL SITE AFTER MAT ERIAL PICKUP IS COMPLETE.
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

========== Handling and Storage ==========

Handling and Storage Precautions:KEEP TIGHTLY CLOSED. STORE IN A COOL DRY PLACE.
Other Precautions:HIGHLY TOX.CARCIN. MUTAGEN. REPROD HAZ.MAY CAUSE CANCER.MAY CAUSE INHERITABLE GENETIC DMG. READILY ABSORB THRU SKIN. AVOID PRLNGD/RPTD EXPOS. DO NOT BRTH DUST. DO NOT GET IN EYES,ON SKIN,ON CLTHG.VERY TOX BY INHAL,IN CONT W/SKIN & (SUPDAT)

========== Exposure Controls/Personal Protection ==========

Respiratory Protection:WEAR APPROPRIATE NIOSH/MSHA APPROVED RESPIRATOR.
Ventilation:USE ONLY IN A CHEMICAL FUME HOOD.
Protective Gloves:CHEMICAL-RESISTANT GLOVES.
Eye Protection:CHEM WORK GOG W/FULL LNGTH FCSHLD
Other Protective Equipment:OTHER PROTECTIVE CLOTHING. SAFETY SHOWER AND EYE BATH.
Work Hygienic Practices:WASH THOROUGHLY AFTER HANDLING.
Supplemental Safety and Health
OTHER PRECAUTIONS: IF SWALLOWED. IF YOU FEEL UNWELL, SEEK MEDICAL ADVICE (SHOW THE LABEL WHERE POSSIBLE).

========== Physical/Chemical Properties ==========

Melt/Freeze Pt:M.P/F.P Text:>289F,>143C
Vapor Density:13.2
Appearance and Odor:ORANGE-TAN POWDER.

========== Stability and Reactivity Data ==========

Stability Indicator/Materials to Avoid:YES
STRONG OXIDIZING AGENTS.
Stability Condition to Avoid:NONE SPECIFIED BY MANUFACTURER.
Hazardous Decomposition Products:TOXIC FUMES OF CARBON MONOXIDE, CARBON DIOXIDE, HYDROGEN CHLORIDE GAS.

========== Disposal Considerations ==========

Waste Disposal Methods:DISSOLVE OR MIX MATERIAL WITH COMBUSTIBLE SOLVENT AND BURN IN A CHEMICAL INCINERATOR EQUIPPED WITH AN AFTERBURNER AND SCURBBER. DISPOSE OF IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS (FP N).

Disclaimer (provided with this information by the compiling agencies):
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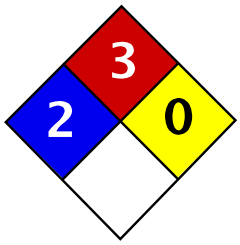

Health	2
Fire	3
Reactivity	0
Personal Protection	H

Material Safety Data Sheet
Ethylbenzene MSDS

Section 1: Chemical Product and Company Identification

Product Name: Ethylbenzene

Catalog Codes: SLE2044

CAS#: 100-41-4

RTECS: DA0700000

TSCA: TSCA 8(b) inventory: Ethylbenzene

CI#: Not available.

Synonym: Ethyl Benzene; Ethylbenzol; Phenylethane

Chemical Name: Ethylbenzene

Chemical Formula: C8H10

Contact Information:

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

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

Order Online: ScienceLab.com

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

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

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

Section 2: Composition and Information on Ingredients

Composition:

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

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

Section 3: Hazards Identification

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

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

Section 4: First Aid Measures

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

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

Serious Skin Contact: Not available.

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

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

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

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Flammable.

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

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

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

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

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

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

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

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

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

Section 6: Accidental Release Measures

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

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

Section 7: Handling and Storage

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

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

Section 8: Exposure Controls/Personal Protection

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

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

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

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

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Sweetish. Gasoline-like. Aromatic.

Taste: Not available.

Molecular Weight: 106.16 g/mole

Color: Colorless.

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

Boiling Point: 136°C (276.8°F)

Melting Point: -94.9 (-138.8°F)

Critical Temperature: 617.15°C (1142.9°F)

Specific Gravity: 0.867 (Water = 1)

Vapor Pressure: 0.9 kPa (@ 20°C)

Vapor Density: 3.66 (Air = 1)

Volatility: 100% (v/v).

Odor Threshold: 140 ppm

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

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, diethyl ether.

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

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

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

Incompatibility with various substances: Reactive with oxidizing agents.

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

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

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Inhalation.

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

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

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

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

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

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects:
Skin: Can cause mild skin irritation. It can be absorbed through intact skin.
Eyes: Contact with vapor or liquid can cause severe eye irritation depending on concentration. It may also cause conjunctivitis. At a vapor exposure level of 85 - 200 ppm , it is mildly and transiently irritating to the eyes; 1000 ppm causes further irritation and tearing; 2000 ppm results in immediate and severe irritation and tearing; 5,000 ppm is intolerable (ACGIH, 1991; Clayton and Clayton, 1994). Standard draize test for eye irritation using 500 mg resulted in severe irritation (RTECS)
Inhalation: Exposure to high concentrations can cause nasal, mucous membrane and respiratory tract irritation and can also result in chest constriction and, trouble breathing, respiratory failure, and even death. It can also affect behavior/Central Nervous System. The effective dose for CNS depression in experimental animals was 10,000 ppm (ACGIH, 1991). Symptoms of CNS depression include headache, nausea, weakness, dizziness, vertigo, irritability, fatigue, lightheadedness, sleepiness, tremor, loss of coordination, judgement and conciousness, coma, and death. It can also cause pulmonary edema. Inhalation of 85 ppm can produce fatigue, insomnia, headache, and mild irritation of the respiratory tract (Haley & Berndt, 1987).
Ingestion: Do not drink, pipet or siphon by mouth. May cause gastroinestinal/digestive tract irritation with Abdominal pain, nausea, vomiting. Ethylbenzene is a pulmonary aspiration hazard. Pulmonary aspiration of even small amounts of the liquid may cause fatal pneumonitis. It may also affect behavior/central nervous system with

Section 12: Ecological Information

Ecotoxicity:
Ecotoxicity in water (LC50): 14 mg/l 96 hours [Fish (Trout)] (static). 12.1 mg/l 96 hours [Fish (Fathead Minnow)] (flow-through)]. 150 mg/l 96 hours [Fish (Blue Gill/Sunfish)] (static). 275 mg/l 96 hours [Fish (Sheepshead Minnow)]. 42.3 mg/l 96 hours [Fish (Fathead Minnow)](soft water). 87.6mg/l 96 hours [Shrimp].

BOD5 and COD: Not available.

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

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: CLASS 3: Flammable liquid.

Identification: : Ethylbenzene UNNA: 1175 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
Connecticut hazardous material survey.: Ethylbenzene
Illinois toxic substances disclosure to employee act: Ethylbenzene
Illinois chemical safety act: Ethylbenzene
New York release reporting list: Ethylbenzene
Rhode Island RTK hazardous substances: Ethylbenzene
Pennsylvania RTK: Ethylbenzene
Minnesota: Ethylbenzene
Massachusetts RTK: Ethylbenzene
Massachusetts spill list: Ethylbenzene
New Jersey: Ethylbenzene
New Jersey spill list: Ethylbenzene
Louisiana spill reporting: Ethylbenzene
California Director's List of Hazardous Substances: Ethylbenzene
TSCA 8(b) inventory: Ethylbenzene
TSCA 4(a) proposed test rules: Ethylbenzene
TSCA 8(d) H and S data reporting: Ethylbenzene: Effective Date: 6/19/87; Sunset Date: 6/19/97
SARA 313 toxic chemical notification and release reporting: Ethylbenzene

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

Other Classifications:

WHMIS (Canada):
CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F).
CLASS D-2A: Material causing other toxic effects (VERY TOXIC).
CLASSE D-2B: Material causing other toxic effects (TOXIC).

DSCL (EEC):
R11- Highly flammable.
R20- Harmful by inhalation.
S16- Keep away from sources of ignition - No smoking.
S24/25- Avoid contact with skin and eyes.
S29- Do not empty into drains.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 3

Reactivity: 0

Personal Protection: h

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

Health: 2

Flammability: 3

Reactivity: 0

Specific hazard:

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

Section 16: Other Information

References:
-Manufacturer's Material Safety Data Sheet.
-Fire Protection Guide to Hazardous Materials, 13th ed., National Fire Protection Association (NFPA)
-Registry of Toxic Effects of Chemical Substances (RTECS)
-Chemical Hazard Response Information System (CHRIS)
-Hazardous Substance Data Bank (HSDB)
-New Jersey Hazardous Substance Fact Sheet
-Ariel Global View
-Reprotext System

Other Special Considerations: Not available.

Created: 10/09/2005 05:28 PM

Last Updated: 10/09/2005 05:28 PM

METAL

MATERIAL SAFETY DATA SHEET

ALDON CORPORATION
221 Rochester Street
Avon, New York 14414-9409
(585) 226-6177

MSDS No.: LL0070 LL0079 LL0080 LL0081 LL0082 LL0085 LL0086
Effective Date: March 29, 2005

SECTION I NAME

Product	Lead Metal
Chemical Synonyms	N/A
Formula	Pb
Unit Size	up to 2.5 Kg.
C.A.S. No.	7439-92-1

24 HOUR EMERGENCY ASSISTANCE

CHEMTREC 800-424-9300
Day 585-226-6177

NFPA

Health	3
Fire	0
Reactivity	0

HMIS *

HAZARD RATING

MINIMAL	SLIGHT	MODERATE	SERIOUS	SEVERE
0	1	2	3	4

SECTION II INGREDIENTS OF MIXTURES

Principal Component(s)	%	TLV Units
Lead metal, shot, granular, sheet, foil	99+%	See Section V.
CAUTION! MAY BE HARMFUL OR FATAL IF SWALLOWED		
OR INHALED AS FUMES OR DUST.		

SECTION III PHYSICAL DATA

Melting Point (°F)	Approx. 327.4°C (621°F)	Specific Gravity (H_2O = 1)	11.34 (20/4°C)
Boiling Point (°F)	1753°C (3187°F)	Percent Volatile by Volume (%)	0% at ambient temp.
Vapor Pressure (mm Hg)	N/A	Evaporation Rate (=1)	Non-volatile (N/A).
Vapor Density (Air=1)	N/A		
Solubility in Water	Insoluble.		
Appearance & Odor	Bluish, silvery, gray soft metal, granular, shot, sheet, foil; no odor.		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

			Lower	Upper
Flash Point (Method Used)	Non-flammable (N/A).	Flammable Limits in Air % by Volume N/A	--------	--------
Extinguisher Media	Dry chemical or carbon dioxide should be used on surrounding fire. Do not use water on fires where molten metal is present.			

SPECIAL FIREFIGHTING PROCEDURES

In fire conditions, wear a NIOSH/MSHA-approved self-contained breathing apparatus and full protective clothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS

When heated emits toxic fumes of lead which can react vigorously with oxidizing materials.

D.O.T. Non Regulated.

Approved by U.S. Department of Labor "essentially similar" to form OSHA-20

SECTION V HEALTH HAZARD DATA LL0070

Threshold Limited Value
Lead as inorganic compounds, as Pb:
TWA 0.05 mg/m^3 (ACGIH 2001).

Effects of Overexposure
SKIN: Not absorbed through skin. **EYES:** No specific hazard known. Contact may cause transient irritation. **INGESTION:** May produce anorexia, vomiting, malaise, convulsions due to increased intracranial pressure. **INHALATION:** Of dust or fumes can cause lead poisoning. Target organs: Lungs, kidneys.

Emergency and First Aid Procedures
INGESTION: Call physician or Poison Control Center immediately. Induce vomiting only if advised by appropriate medical personnel. Never give anything by mouth to an unconscious person. **EYES:** Check for and remove contact lenses. Flush thoroughly with water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get immediate medical attention. **SKIN:** Remove contaminated clothing. Flush thoroughly with mild soap and water. If irritation occurs, get medical attention. **INHALATION:** Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

SECTION VI REACTIVITY DATA

Stability	Unstable		**Conditions to Avoid**
	Stable	X	High temperatures to produce fumes.

Incompatibility (Materials to Avoid) Strong oxidizing materials.

Hazardous Decomposition Products When heated, emits toxic fumes of lead.

Hazardous Polymerization		Conditions to Avoid
May Occur	Will Not Occur	Not applicable.
	X	

SECTION VII SPILL OR LEAK PROCEDURES

Steps to be taken in case material is released or spilled
Carefully sweep up without producing dust and recycle for use or place in a suitable container for disposal.

Waste Disposal Method
Discharge, treatment, or disposal may be subject to Federal, State or Local laws. These disposal guidelines are intended for the disposal of catalog-size quantities only.
Dispose of in an approved chemical landfill or contract with a licensed waste disposal service.

SECTION VIII SPECIAL PROTECTION INFORMATION

Respiration Protection (Specify Type) None should be needed in normal laboratory use at room temperature. If dusty conditions prevail, work in ventilation hood or wear a NIOSH/MSHA-approved dust mask or respirator.

Ventilation	Local Exhaust	None needed.	Special	No.
	Mechanical (General)	None needed.	Other	No.

Protective Gloves Recommended - leather. **Eye Protection** Chemical safety glasses.

Other Protective Equipment Smock, apron, eye wash station, lab coat, ventilation hood.

SECTION IX SPECIAL PRECAUTIONS

Precautions to be Taken in Handling & Storing
Keep container tightly closed when not in use.
Store in a cool, dry place away from fire hazards. Wash thoroughly after handling. Remove and wash contaminated clothing.

Other Precautions Read label on container before using. Do not wear contact lenses when working with chemicals. For laboratory use only. Not for drug, food or household use. Keep out of reach of children.

Lead can react violently with oxidizing materials. Water may become trapped within surface cracks which may cause an explosion when the metal is molten.

Revision No. 9	Date 03/29/05	Approved Michael Raszeja	Chemical Safety Coordinator MR

METAL

10 M

Material Safety Data Sheet
Mercury

ACC# 14020

Section 1 - Chemical Product and Company Identification

MSDS Name: Mercury
Catalog Numbers: S40672B, S41542, S41599, S41599B, S41599E, S41599G, S41599J, S41599K, S41599M, S41600P, S41600S, S41600W, S41630A, S41630B, S41630C, S41631, S41631A, S41631B, S41631C, S41645, S45245, S46981, S50443, S71966, S71967, S71968, S78777, 13501, M139-1LB, M139-5LB, M140-14LB, M140-1LB, M140-5LB, M141-1LB, M141-6LB, NC9534278
Synonyms: Colloidal mercury; Hydrargyrum; Metallic mercury; Quick silver; Liquid silver.
Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100
Emergency Number: 201-796-7100
For CHEMTREC assistance, call: 800-424-9300
For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7439-97-6	Mercury	100	231-106-7

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: silver liquid.
Danger! Corrosive. Harmful if inhaled. May be absorbed through intact skin. Causes eye and skin irritation and possible burns. May cause severe respiratory tract irritation with possible burns. May cause severe digestive tract irritation with possible burns. May cause central nervous system effects. Inhalation of fumes may cause metal-fume fever. May cause liver and kidney damage. Possible sensitizer. This substance has caused adverse reproductive and fetal effects in animals.
Target Organs: Blood, kidneys, central nervous system, liver, brain.

Potential Health Effects
Eye: Exposure to mercury or mercury compounds can cause discoloration on the front surface of the lens, which does not interfere with vision. Causes eye irritation and possible burns. Contact with mercury or mercury compounds can cause ulceration of the conjunctiva and cornea.
Skin: May be absorbed through the skin in harmful amounts. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. Causes skin irritation and possible burns. May cause skin rash (in milder cases), and cold and clammy skin with cyanosis or pale color.
Ingestion: May cause severe and permanent damage to the digestive tract. May cause perforation

of the digestive tract. May cause effects similar to those for inhalation exposure. May cause systemic effects.
Inhalation: Causes chemical burns to the respiratory tract. Inhalation of fumes may cause metal fume fever, which is characterized by flu-like symptoms with metallic taste, fever, chills, cough, weakness, chest pain, muscle pain and increased white blood cell count. May cause central nervous system effects including vertigo, anxiety, depression, muscle incoordination, and emotional instability. Aspiration may lead to pulmonary edema. May cause systemic effects. May cause respiratory sensitization.
Chronic: May cause liver and kidney damage. May cause reproductive and fetal effects. Effects may be delayed. Chronic exposure to mercury may cause permanent central nervous system damage, fatigue, weight loss, tremors, personality changes. Chronic ingestion may cause accumulation of mercury in body tissues. Prolonged or repeated exposure may cause inflammation of the mouth and gums, excessive salivation, and loosening of the teeth.

Section 4 - First Aid Measures

Eyes: Get medical aid immediately. Do NOT allow victim to rub eyes or keep eyes closed. Extensive irrigation with water is required (at least 30 minutes).
Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Destroy contaminated shoes.
Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately. Wash mouth out with water.
Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.
Notes to Physician: The concentration of mercury in whole blood is a reasonable measure of the body-burden of mercury and thus is used for monitoring purposes. Treat symptomatically and supportively. Persons with kidney disease, chronic respiratory disease, liver disease, or skin disease may be at increased risk from exposure to this substance.
Antidote: The use of d-Penicillamine as a chelating agent should be determined by qualified medical personnel. The use of Dimercaprol or BAL (British Anti-Lewisite) as a chelating agent should be determined by qualified medical personnel.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Water runoff can cause environmental damage. Dike and collect water used to fight fire. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.
Extinguishing Media: Substance is nonflammable; use agent most appropriate to extinguish surrounding fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.
Flash Point: Not applicable.
Autoignition Temperature: Not applicable.
Explosion Limits, Lower: Not available.
Upper: Not available.
NFPA Rating: (estimated) Health: 3; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Minimize dust generation and accumulation. Keep container tightly closed. Do not get on skin or in eyes. Do not ingest or inhale. Use only in a chemical fume hood. Discard contaminated shoes. Do not breathe vapor.
Storage: Keep container closed when not in use. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from metals. Store protected from azides.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use only under a chemical fume hood.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Mercury	0.025 mg/m3 TWA; Skin - potential significant contribution to overall exposure by the cutaneous r oute	0.05 mg/m3 TWA (vapor) 10 mg/m3 IDLH	0.1 mg/m3 Ceiling (vapor)

OSHA Vacated PELs: Mercury: 0.05 mg/m3 TWA (vapor)
Personal Protective Equipment
Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.
Skin: Wear appropriate protective gloves to prevent skin exposure.
Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Liquid
Appearance: silver
Odor: odorless
pH: Not available.

Vapor Pressure: 0.002 mm Hg @ 25C
Vapor Density: 7.0
Evaporation Rate: Not available.
Viscosity: 15.5 mP @ 25 deg C
Boiling Point: 356.72 deg C
Freezing/Melting Point:-38.87 deg C
Decomposition Temperature: Not available.
Solubility: Insoluble.
Specific Gravity/Density:13.59 (water=1)
Molecular Formula: Hg
Molecular Weight:200.59

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: High temperatures, incompatible materials.
Incompatibilities with Other Materials: Oxygen, sulfur, acetylene, ammonia, chlorine dioxide, azides, chlorates, nitrates, sulfuric acid, halogens, rubidium, calcium, 3-bromopropyne, ethylene oxide, lithium, methylsilane + oxygen, peroxyformic acid, tetracarbonylnickel + oxygen, copper, copper alloys, boron diiodophosphide, metals, nitromethane, sodium carbide, aluminum, lead, iron, metal oxides.
Hazardous Decomposition Products: Mercury/mercury oxides.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 7439-97-6: OV4550000
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 7439-97-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: Intraperitoneal, rat: TDLo = 400 mg/kg/14D-I (Tumorigenic - equivocal tumorigenic agent by RTECS criteria - tumors at site of application).
Teratogenicity: Inhalation, rat: TCLo = 1 mg/m3/24H (female 1-20 day(s) after conception) Effects on Embryo or Fetus - fetotoxicity (except death, e.g., stunted fetus).
Reproductive Effects: Inhalation, rat: TCLo = 890 ng/m3/24H (male 16 week(s) pre-mating) Paternal Effects - spermatogenesis (incl. genetic material, sperm morphology, motility, and count).; Inhalation, rat: TCLo = 7440 ng/m3/24H (male 16 week(s) pre-mating) Fertility - post-implantation mortality (e.g. dead and/or resorbed implants per total number of implants).
Mutagenicity: Cytogenetic Analysis: Unreported, man = 150 ug/m3.
Neurotoxicity: The brain is the critical organ in humans for chronic vapor exposure; in severe cases, spontaneous degeneration of the brain cortex can occur as a late sequela to past exposure.
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Rainbow trout: LC50 = 0.16-0.90 mg/L; 96 Hr; UnspecifiedFish: Bluegill/Sunfish: LC50 = 0.16-0.90 mg/L; 96 Hr; UnspecifiedFish: Channel catfish: LC50 = 0.35 mg/L; 96 Hr; UnspecifiedWater flea Daphnia: EC50 = 0.01 mg/L; 48 Hr; Unspecified In aquatic systems, mercury appears to bind to dissolved matter or fine particulates, while the transport of mercury bound to dust particles in the atmosphere or bed sediment particles in rivers and lakes is generally less substantial. The conversion, in aquatic environments, of inorganic mercury cmpd to methyl mercury implies that recycling of mercury from sediment to water to air and back could be a rapid process.
Environmental: Mercury bioaccumulates and concentrates in food chain (concentration may be as much as 10,000 times that of water). Bioconcentration factors of 63,000 for freshwater fish and 10,000 for salt water fish have been found. Much of the mercury deposited on land, appears to revaporize within a day or two, at least in areas substantially heated by sunlight.
Physical: All forms of mercury (Hg) (metal, vapor, inorganic, or organic) are converted to methyl mercury. Inorganic forms are converted by microbial action in the atmosphere to methyl mercury.
Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series:
CAS# 7439-97-6: waste number U151.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	MERCURY	MERCURY
Hazard Class:	8	8
UN Number:	UN2809	UN2809
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA
CAS# 7439-97-6 is listed on the TSCA inventory.
Health & Safety Reporting List
None of the chemicals are on the Health & Safety Reporting List.
Chemical Test Rules
None of the chemicals in this product are under a Chemical Test Rule.
Section 12b
None of the chemicals are listed under TSCA Section 12b.
TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.
CERCLA Hazardous Substances and corresponding RQs

CAS# 7439-97-6: 1 lb final RQ; 0.454 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7439-97-6: acute, chronic.

Section 313

This material contains Mercury (CAS# 7439-97-6, 100%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 7439-97-6 (listed as Mercury compounds) is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

CAS# 7439-97-6 is listed as a Priority Pollutant under the Clean Water Act. CAS# 7439-97-6 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7439-97-6 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

WARNING: This product contains Mercury, a chemical known to the state of California to cause developmental reproductive toxicity.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T N

Risk Phrases:

R 23 Toxic by inhalation.

R 33 Danger of cumulative effects.

R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 1/2 Keep locked up and out of reach of children.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 7 Keep container tightly closed.

S 60 This material and its container must be disposed of as hazardous waste.

S 61 Avoid release to the environment. Refer to special instructions/safety data sheets.

WGK (Water Danger/Protection)

CAS# 7439-97-6: 3

Canada - DSL/NDSL

CAS# 7439-97-6 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2A, E.

Canadian Ingredient Disclosure List

CAS# 7439-97-6 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 6/15/1999
Revision #7 Date: 1/20/2005

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

International Chemical Safety Cards

NICKEL

ICSC: 0062

NICKEL
(powder)
Ni
Molecular mass: 58.7

CAS # 7440-02-0
RTECS # QR5950000
ICSC # 0062
EC # 028-002-00-7

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Flammable as dust. Toxic fumes may be released in a fire.		Water in large amounts, foam, dry sand, NO carbon dioxide.
EXPLOSION	Finely dispersed particles form explosive mixtures in air.	Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	
EXPOSURE		PREVENT DISPERSION OF DUST! STRICT HYGIENE!	
• **INHALATION**		Local exhaust or breathing protection.	Fresh air, rest.
• **SKIN**		Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
• **EYES**		Safety spectacles or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
• **INGESTION**		Do not eat, drink, or smoke during work.	

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Vacuum spilled material. Carefully collect remainder, then remove to safe place (extra personal protection: P2 filter respirator for harmful particles).	Separated from strong acids.	Xn symbol R: 40-43 S: (2-)22-36

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0062

International Chemical Safety Cards

NICKEL

ICSC: 0062

I M P O R T A N T D A T A	**PHYSICAL STATE; APPEARANCE:** ODOURLESS SILVERY METALLIC SOLID IN VARIOUS FORMS. **PHYSICAL DANGERS:** Dust explosion possible if in powder or granular form, mixed with air. **CHEMICAL DANGERS:** Reacts violently, in powder form, with titanium powder and potassium perchlorate, and oxidants such as ammonium nitrate, causing fire and explosion hazard. Reacts slowly with non-oxidizing acids and more rapidly with oxidizing acids. Toxic gases and vapours (such as nickel carbonyl) may be released in a fire involving nickel. **OCCUPATIONAL EXPOSURE LIMITS (OELs):** TLV: ppm; 1 mg/m^3 (as TWA) (ACGIH 1993-1994).	**ROUTES OF EXPOSURE:** The substance can be absorbed into the body by inhalation of the dust and by ingestion. **INHALATION RISK:** Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly when dispersed. **EFFECTS OF SHORT-TERM EXPOSURE:** Inhalation of the fumes may cause pneumonitis. **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** Repeated or prolonged contact with skin may cause dermatitis. Repeated or prolonged contact may cause skin sensitization. Repeated or prolonged inhalation exposure may cause asthma. Lungs may be affected by repeated or prolonged exposure. The substance may have effects on the nasal sinuses , resulting in inflammation and ulceration.
PHYSICAL PROPERTIES	Boiling point: 2730°C Melting point: 1455°C	Relative density (water = 1): 8.9 Solubility in water: none
ENVIRONMENTAL DATA		

NOTES

Depending on the degree of exposure, periodic medical examination is indicated. The symptoms of asthma often do not become manifest until a few hours have passed and they are aggravated by physical effort. Rest and medical observation are therefore essential. Anyone who has shown symptoms of asthma due to this substance should avoid all further contact with this substance.

ADDITIONAL INFORMATION

ICSC: 0062 **NICKEL**

IMPORTANT LEGAL NOTICE:	Neither the CEC or the IPCS nor any person acting on behalf of the CEC or the IPCS is responsible for the use which might be made of this information. This card contains the collective views of the IPCS Peer Review Committee and may not reflect in all cases all the detailed requirements included in national legislation on the subject. The user should verify compliance of the cards with the relevant legislation in the country of use.

Material Safety Data Sheet

PAH Contaminated Soil

ACC# 17974

Section 1 - Chemical Product and Company Identification

MSDS Name: PAH Contaminated Soil
Catalog Numbers: SRS103100
Synonyms: API separator sludge
Company Identification:
Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410
For information, call: 201-796-7100
Emergency Number: 201-796-7100
For CHEMTREC assistance, call: 800-424-9300
For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
Not available	Soil	78-99	unlisted
120-12-7	Anthracene	0-2	204-371-1
129-00-0	Pyrene	0-2	204-927-3
132-64-9	Dibenzofuran	0-2	205-071-3
205-99-2	Benzo(b)fluoranthene	0-2	205-911-9
206-44-0	Fluoranthene	0-2	205-912-4
208-96-8	Acenaphthylene	0-2	205-917-1
218-01-9	1,2-benzphenanthrene	0-2	205-923-4
50-32-8	Benzo(a)pyrene	0-2	200-028-5
56-55-3	1,2-Benzanthracene	0-2	200-280-6
83-32-9	Acenaphthene	0-2	201-469-6
85-01-8	Phenanthrene	0-2	201-581-5
86-73-7	Fluorene	0-2	201-695-5
87-86-5	Pentachlorophenol	0-2	201-778-6
91-20-3	Naphthalene	0-2	202-049-5
91-57-6	2-methylnaphthalene	0-2	202-078-3

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: not available solid.
Warning! May cause allergic skin reaction. Causes eye and skin irritation. May cause cancer based on animal studies.
Target Organs: Eyes, skin.

Potential Health Effects
Eye: May cause eye irritation.
Skin: May cause skin irritation. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material.
Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. Naphthalene can cause cataracts, optical neuritis, and cornea injuries. Ingestion of large quantities may cause severe hemolytic anemia and
Inhalation: Causes respiratory tract irritation. May cause effects similar to those described for ingestion.
Chronic: May cause cancer according to animal studies. Prolonged exposure to respirable crystalline quartz may cause delayed lung injury/fibrosis (silicosis).

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.
Skin: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.
Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.
Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.
Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.
Extinguishing Media: For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam.
Flash Point: Not applicable.
Autoignition Temperature: Not applicable.
Explosion Limits, Lower: Not available.
Upper: Not available.
NFPA Rating: Not published.

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions.

Section 7 - Handling and Storage

Handling: Wash hands before eating. Use with adequate ventilation. Avoid contact with skin and eyes. Keep container tightly closed. Avoid ingestion and inhalation.
Storage: Store in a cool, dry place.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Soil	none listed	none listed	none listed
Anthracene	0.2 mg/m3 TWA (as benzene soluble aerosol) (listed under Coal tar pitches).	0.1 mg/m3 TWA (cyclohexane-extractable fraction) (listed under Coal tar pitches).80 mg/m3 IDLH (listed under Coal tar pitches).	0.2 mg/m3 TWA (as benzene soluble fraction) (listed under Coal tar pitches).
Pyrene	0.2 mg/m3 TWA (as benzene soluble aerosol) (listed under Coal tar pitches).	0.1 mg/m3 TWA (cyclohexane-extractable fraction) (listed under Coal tar pitches).80 mg/m3 IDLH (listed under Coal tar pitches).	0.2 mg/m3 TWA (as benzene soluble fraction) (listed under Coal tar pitches).
Dibenzofuran	none listed	none listed	none listed
Benzo(b)fluoranthene	none listed	none listed	none listed
Fluoranthene	none listed	none listed	none listed
Acenaphthylene	none listed	none listed	none listed
1,2-benzphenanthrene	0.2 mg/m3 TWA (as benzene soluble aerosol) (listed under Coal tar pitches).	0.1 mg/m3 TWA (cyclohexane-extractable fraction) (listed under Coal tar pitches).80 mg/m3 IDLH (listed under Coal tar pitches).	0.2 mg/m3 TWA (as benzene soluble fraction) (listed under Coal tar pitches).

Benzo(a)pyrene	0.2 mg/m3 TWA (as benzene soluble aerosol) (listed under Coal tar pitches).	0.1 mg/m3 TWA (cyclohexane-extractable fraction) (listed under Coal tar pitches).80 mg/m3 IDLH (listed under Coal tar pitches).	0.2 mg/m3 TWA (as benzene soluble fraction) (listed under Coal tar pitches).
1,2-Benzanthracene	none listed	none listed	none listed
Acenaphthene	none listed	none listed	none listed
Phenanthrene	0.2 mg/m3 TWA (as benzene soluble aerosol) (listed under Coal tar pitches).	0.1 mg/m3 TWA (cyclohexane-extractable fraction) (listed under Coal tar pitches).80 mg/m3 IDLH (listed under Coal tar pitches).	0.2 mg/m3 TWA (as benzene soluble fraction) (listed under Coal tar pitches).
Fluorene	none listed	none listed	none listed
Pentachlorophenol	0.5 mg/m3 TWA; Skin - potential significant contribution to overall exposure by the cutaneous r oute	0.5 mg/m3 TWA 2.5 mg/m3 IDLH	0.5 mg/m3 TWA
Naphthalene	10 ppm TWA; 15 ppm STEL; Skin - potential significant contribution to overall exposure by the cutaneous r oute	10 ppm TWA; 50 mg/m3 TWA 250 ppm IDLH	10 ppm TWA; 50 mg/m3 TWA
2-methylnaphthalene	none listed	none listed	none listed

OSHA Vacated PELs: Soil: No OSHA Vacated PELs are listed for this chemical. Anthracene: No OSHA Vacated PELs are listed for this chemical. Pyrene: No OSHA Vacated PELs are listed for this chemical. Dibenzofuran: No OSHA Vacated PELs are listed for this chemical. Benzo(b)fluoranthene: No OSHA Vacated PELs are listed for this chemical. Fluoranthene: No OSHA Vacated PELs are listed for this chemical. Acenaphthylene: No OSHA Vacated PELs are listed for this chemical. 1,2-benzphenanthrene: No OSHA Vacated PELs are listed for this chemical. Benzo(a)pyrene: No OSHA Vacated PELs are listed for this chemical. 1,2-Benzanthracene: No OSHA Vacated PELs are listed for this chemical. Acenaphthene: No OSHA Vacated PELs are listed for this chemical. Phenanthrene: No OSHA Vacated PELs are listed for this chemical. Fluorene: No OSHA Vacated PELs are listed for this chemical. Pentachlorophenol: 0.5 mg/m3 TWA Naphthalene: 10 ppm TWA; 50 mg/m3 TWA 2-methylnaphthalene: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid
Appearance: not available
Odor: none reported
pH: Not available.
Vapor Pressure: Not applicable.
Vapor Density: Not available.
Evaporation Rate: Not applicable.
Viscosity: Not applicable.
Boiling Point: Not available.
Freezing/Melting Point: Not available.
Decomposition Temperature: Not available.
Solubility: Insoluble in water.
Specific Gravity/Density: Not available.
Molecular Formula: Mixture
Molecular Weight: Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: High temperatures.
Incompatibilities with Other Materials: None reported.
Hazardous Decomposition Products: No data available.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 120-12-7: CA9350000
CAS# 129-00-0: UR2450000; UR2450100
CAS# 132-64-9: HP4430000
CAS# 205-99-2: CU1400000
CAS# 206-44-0: LL4025000
CAS# 208-96-8: AB1254000; AB1254200
CAS# 218-01-9: GC0700000
CAS# 50-32-8: DJ3675000
CAS# 56-55-3: CV9275000
CAS# 83-32-9: AB1000000
CAS# 85-01-8: SF7175000
CAS# 86-73-7: LL5670000
CAS# 87-86-5: SM6300000; SM6314000; SM6321000
CAS# 91-20-3: QJ0525000
CAS# 91-57-6: QJ9635000
LD50/LC50:
CAS# 120-12-7:

Oral, mouse: LD50 = 4900 mg/kg;

CAS# 129-00-0:
Draize test, rabbit, skin: 500 mg/24H Mild;
Inhalation, rat: LC50 = 170 mg/m3;
Inhalation, rat: LC50 = 170 mg/m3;
Oral, mouse: LD50 = 800 mg/kg;
Oral, rat: LD50 = 2700 mg/kg;

CAS# 132-64-9:

CAS# 205-99-2:

CAS# 206-44-0:
Oral, rat: LD50 = 2 gm/kg;
Skin, rabbit: LD50 = 3180 mg/kg;

CAS# 208-96-8:
Oral, mouse: LD50 = 1760 mg/kg;

CAS# 218-01-9:

CAS# 50-32-8:

CAS# 56-55-3:

CAS# 83-32-9:

CAS# 85-01-8:
Oral, mouse: LD50 = 700 mg/kg;
Oral, rat: LD50 = 1.8 gm/kg;

CAS# 86-73-7:

CAS# 87-86-5:
Draize test, rabbit, eye: 100 uL/24H Mild;
Inhalation, mouse: LC50 = 225 mg/m3;
Inhalation, mouse: LC50 = 225 mg/m3;
Inhalation, rat: LC50 = 355 mg/m3;
Inhalation, rat: LC50 = 200 mg/m3;
Inhalation, rat: LC50 = 335 mg/m3;
Oral, mouse: LD50 = 36 mg/kg;
Oral, mouse: LD50 = 117 mg/kg;
Oral, mouse: LD50 = 30 mg/kg;
Oral, rabbit: LD50 = 200 mg/kg;
Oral, rat: LD50 = 27 mg/kg;
Oral, rat: LD50 = 27 mg/kg;
Oral, rat: LD50 = 50 mg/kg;
Skin, rat: LD50 = 96

CAS# 91-20-3:
Draize test, rabbit, eye: 100 mg Mild;
Inhalation, rat: LC50 = >340 mg/m3/1H;
Oral, mouse: LD50 = 316 mg/kg;
Oral, rat: LD50 = 490 mg/kg;
Skin, rabbit: LD50 = >20 gm/kg;
Skin, rat: LD50 = >2500 mg/kg;

CAS# 91-57-6:
Oral, rat: LD50 = 1630 mg/kg;

Carcinogenicity:
CAS# 120-12-7:

- **ACGIH:** A1 - Confirmed Human Carcinogen (as benzene soluble aerosol) (listed as 'Coal tar pitches').
- **California:** Not listed.
- **NTP:** Known carcinogen (listed as Coal tar pitches).
- **IARC:** Group 1 carcinogen (listed as Coal tar pitches).

CAS# 129-00-0:

- **ACGIH:** A1 - Confirmed Human Carcinogen (as benzene soluble aerosol) (listed as 'Coal tar pitches').
- **California:** Not listed.
- **NTP:** Known carcinogen (listed as Coal tar pitches).
- **IARC:** Group 1 carcinogen (listed as Coal tar pitches).

CAS# 132-64-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 205-99-2:

- **ACGIH:** A2 - Suspected Human Carcinogen
- **California:** carcinogen, initial date 7/1/87
- **NTP:** Suspect carcinogen
- **IARC:** Group 2B carcinogen

CAS# 206-44-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 208-96-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 218-01-9:

- **ACGIH:** A3 - Confirmed animal carcinogen with unknown relevance to humans
- **California:** carcinogen, initial date 1/1/90
- **NTP:** Known carcinogen (listed as Coal tar pitches).
- **IARC:** Group 1 carcinogen (listed as Coal tar pitches).

CAS# 50-32-8:

- **ACGIH:** A2 - Suspected Human Carcinogen
- **California:** carcinogen, initial date 7/1/87
- **NTP:** Suspect carcinogen
- **IARC:** Group 1 carcinogen (listed as Coal tar pitches).

CAS# 56-55-3:

- **ACGIH:** A2 - Suspected Human Carcinogen
- **California:** carcinogen, initial date 7/1/87
- **NTP:** Suspect carcinogen
- **IARC:** Group 2A carcinogen

CAS# 83-32-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 85-01-8:

- **ACGIH:** A1 - Confirmed Human Carcinogen (as benzene soluble aerosol) (listed as 'Coal tar pitches').

- **California:** Not listed.
- **NTP:** Known carcinogen (listed as Coal tar pitches).
- **IARC:** Group 1 carcinogen (listed as Coal tar pitches).

CAS# 86-73-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 87-86-5:

- **ACGIH:** A3 - Confirmed animal carcinogen with unknown relevance to humans
- **California:** carcinogen, initial date 1/1/90
- **NTP:** Not listed.
- **IARC:** Not listed.

CAS# 91-20-3:

- **ACGIH:** Not listed.
- **California:** carcinogen, initial date 4/19/02
- **NTP:** Suspect carcinogen
- **IARC:** Group 2B carcinogen

CAS# 91-57-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.
Teratogenicity: No information available.
Reproductive Effects: No information available.
Mutagenicity: No information available.
Neurotoxicity: No information available.
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series:
CAS# 206-44-0: waste number U120.
CAS# 218-01-9: waste number U050.
CAS# 50-32-8: waste number U022.
CAS# 56-55-3: waste number U018.
CAS# 91-20-3: waste

Section 14 - Transport Information

US DOT	Canada TDG

Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

Soil is not listed on the TSCA inventory. It is for research and development use only.
CAS# 120-12-7 is listed on the TSCA inventory.
CAS# 129-00-0 is listed on the TSCA inventory.
CAS# 132-64-9 is listed on the TSCA inventory.
CAS# 205-99-2 is not listed on the TSCA inventory. It is for research and development use only.
CAS# 206-44-0 is listed on the TSCA inventory.
CAS# 208-96-8 is listed on the TSCA inventory.
CAS# 218-01-9 is listed on the TSCA inventory.
CAS# 50-32-8 is listed on the TSCA inventory.
CAS# 56-55-3 is listed on the TSCA inventory.
CAS# 83-32-9 is listed on the TSCA inventory.
CAS# 85-01-8 is listed on the TSCA inventory.
CAS# 86-73-7 is listed on the TSCA inventory.
CAS# 87-86-5 is listed on the TSCA inventory.
CAS# 91-20-3 is listed on the TSCA inventory.
CAS# 91-57-6 is listed on the TSCA inventory.

Health & Safety Reporting List

CAS# 129-00-0: Effective 6/1/87, Sunset 6/1/97 CAS# 91-20-3: Effective 6/1/87, Sunset 6/1/97

Chemical Test Rules

CAS# 91-20-3: Testing required by manufacturers, processors

Section 12b

CAS# 91-20-3: Section 4

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 120-12-7: 5000 lb final RQ; 2270 kg final RQ CAS# 129-00-0: 5000 lb final RQ; 2270 kg final RQ CAS# 132-64-9: 100 lb final RQ; 45.4 kg final RQ CAS# 205-99-2: 1 lb final RQ; 0.454 kg final RQ CAS# 206-44-0: 100 lb final RQ; 45.4 kg final RQ CAS# 208-96-8: 5000 lb final RQ; 2270 kg final RQ CAS# 218-01-9: 100 lb final RQ; 45.4 kg final RQ CAS# 50-32-8: 1 lb final RQ; 0.454 kg final RQ CAS# 56-55-3: 10 lb final RQ; 4.54 kg final RQ CAS# 83-32-9: 100 lb final RQ; 45.4 kg final RQ CAS# 85-01-8: 5000 lb final RQ; 2270 kg final RQ CAS# 86-73-7: 5000 lb final RQ; 2270 kg final RQ CAS# 87-86-5: 10 lb final RQ; 4.54 kg final RQ CAS# 91-20-3: 100 lb final RQ; 45.4 kg final RQ

SARA Section 302 Extremely Hazardous Substances

CAS# 129-00-0: 1000 lb TPQ (lower threshold); 10000 lb TPQ (upper thre shold)

SARA Codes

CAS # 120-12-7: acute.
CAS # 129-00-0: acute, chronic.
CAS # 206-44-0: acute.

CAS # 50-32-8: acute, chronic.
CAS # 56-55-3: chronic.
CAS # 83-32-9: acute.
CAS # 85-01-8: acute.
CAS # 91-20-3: acute, chronic, flammable.
CAS # 91-57-6: acute.

Section 313

This material contains Anthracene (CAS# 120-12-7, 0-2%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

This material contains Dibenzofuran (CAS# 132-64-9, 0-2%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

This material contains Benzo(b)fluoranthene (CAS# 205-99-2, 0-2%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR

This material contains Fluoranthene (CAS# 206-44-0, 0-2%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

This material contains 1,2-benzphenanthrene (CAS# 218-01-9, 0-2%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR

This material contains Benzo(a)pyrene (CAS# 50-32-8, 0-2%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR

This material contains 1,2-Benzanthracene (CAS# 56-55-3, 0-2%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR

This material contains Phenanthrene (CAS# 85-01-8, 0-2%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

This material contains Pentachlorophenol (CAS# 87-86-5, 0-2%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR

This material contains Naphthalene (CAS# 91-20-3, 0-2%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 132-64-9 is listed as a hazardous air pollutant (HAP).

CAS# 87-86-5 is listed as a hazardous air pollutant (HAP).
CAS# 91-20-3 is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 87-86-5 is listed as a Hazardous Substance under the CWA. CAS# 91-20-3 is listed as a Hazardous Substance under the CWA. CAS# 120-12-7 is listed as a Priority Pollutant under the Clean Water Act. CAS# 129-00-0 is listed as a Priority Pollutant under the Clean Water Act. CAS# 205-99-2 is listed as a Priority Pollutant under the Clean Water Act.

CAS# 206-44-0 is listed as a Priority Pollutant under the Clean Water Act. CAS# 208-96-8 is listed as a Priority Pollutant under the Clean Water Act. CAS# 218-01-9 is listed as a Priority Pollutant under the Clean Water Act. CAS# 50-32-8 is listed as a Priority Pollutant under the Clean Water Act. CAS# 56-55-3 is listed as a Priority Pollutant under the Clean Water Act. CAS# 83-32-9 is listed as a Priority Pollutant under the Clean Water Act. CAS# 85-01-8 is listed as a Priority Pollutant under the Clean Water Act.

CAS# 86-73-7 is listed as a Priority Pollutant under the Clean Water Act. CAS# 87-86-5 is listed as a Priority Pollutant under the Clean Water Act. CAS# 91-20-3 is listed

as a Priority Pollutant under the Clean Water Act. CAS# 206-44-0 is listed as a Toxic Pollutant under the Clean Water Act. CAS# 83-32-9 is listed as a Toxic Pollutant under the Clean Water Act. CAS# 87-86-5 is listed as a Toxic Pollutant under the Clean Water Act. CAS# 91-20-3 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 120-12-7 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, (listed as Coal tar pitches), Massachusetts.

CAS# 129-00-0 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, (listed as Coal tar pitches), Massachusetts.

CAS# 132-64-9 can be found on the following state right to know lists: New Jersey, Pennsylvania, Massachusetts.

CAS# 205-99-2 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

CAS# 206-44-0 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

CAS# 208-96-8 can be found on the following state right to know lists: New Jersey, Pennsylvania, Massachusetts.

CAS# 218-01-9 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

CAS# 50-32-8 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

CAS# 56-55-3 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

CAS# 83-32-9 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

CAS# 85-01-8 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, (listed as Coal tar pitches), Massachusetts.

CAS# 86-73-7 can be found on the following state right to know lists: New Jersey, Pennsylvania, Massachusetts.

CAS# 87-86-5 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

CAS# 91-20-3 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

CAS# 91-57-6 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

WARNING: This product contains Benzo(b)fluoranthene, a chemical known to the state of California to cause cancer. WARNING: This product contains 1,2-benzphenanthrene, a chemical known to the state of California to cause cancer. WARNING: This product contains Benzo(a)pyrene, a chemical known to the state of California to cause cancer. WARNING: This product contains 1,2-Benzanthracene, a chemical known to the state of California to cause cancer. WARNING: This product contains Pentachlorophenol, a chemical known to the state of California to cause cancer. WARNING: This product contains Naphthalene, a chemical known to the state of California to cause cancer.

California No Significant Risk Level: CAS# 205-99-2: 0.096 æg/day NSRL (oral) CAS# 218-01-9: 0.35 æg/day NSRL (oral) CAS# 50-32-8: 0.06 æg/day NSRL CAS# 56-55-3: 0.033 æg/day NSRL (oral) CAS# 87-86-5: 40 æg/day NSRL

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 120-12-7: 2
CAS# 129-00-0: No information available.
CAS# 132-64-9: No information available.
CAS# 205-99-2: No information available.
CAS# 206-44-0: No information available.
CAS# 208-96-8: No information available.
CAS# 218-01-9: No information available.
CAS# 50-32-8: No information available.
CAS# 56-55-3: No information available.
CAS# 83-32-9: No information available.
CAS# 85-01-8: No information available.
CAS# 86-73-7: No information available.
CAS# 87-86-5: 3
CAS# 91-20-3: 2
CAS# 91-57-6: No information available.

Canada - DSL/NDSL

CAS# 120-12-7 is listed on Canada's DSL List.
CAS# 129-00-0 is listed on Canada's DSL List.
CAS# 132-64-9 is listed on Canada's DSL List.
CAS# 218-01-9 is listed on Canada's DSL List.
CAS# 50-32-8 is listed on Canada's DSL List.
CAS# 83-32-9 is listed on Canada's DSL List.
CAS# 85-01-8 is listed on Canada's DSL List.
CAS# 86-73-7 is listed on Canada's DSL List.
CAS# 87-86-5 is listed on Canada's DSL List.
CAS# 91-20-3 is listed on Canada's DSL List.
CAS# 91-57-6 is listed on Canada's DSL List.
CAS# 206-44-0 is listed on Canada's NDSL List.
CAS# 208-96-8 is listed on Canada's NDSL List.
CAS# 56-55-3 is listed on Canada's NDSL List.

Canada - WHMIS

This product has a WHMIS classification of D2A.

Canadian Ingredient Disclosure List

CAS# 120-12-7 is listed on the Canadian Ingredient Disclosure List.
CAS# 129-00-0 is listed on the Canadian Ingredient Disclosure List.
CAS# 205-99-2 is listed on the Canadian Ingredient Disclosure List.
CAS# 206-44-0 is listed on the Canadian Ingredient Disclosure List.
CAS# 208-96-8 is not listed on the Canadian Ingredient Disclosure List.
CAS# 218-01-9 is listed on the Canadian Ingredient Disclosure List.
CAS# 50-32-8 is listed on the Canadian Ingredient Disclosure List.
CAS# 56-55-3 is listed on the Canadian Ingredient Disclosure List.
CAS# 83-32-9 is listed on the Canadian Ingredient Disclosure List.
CAS# 85-01-8 is listed on the Canadian Ingredient Disclosure List.
CAS# 86-73-7 is not listed on the Canadian Ingredient Disclosure List.
CAS# 87-86-5 is not listed on the Canadian Ingredient Disclosure List.
CAS# 91-20-3 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 9/02/1997
Revision #3 Date: 3/18/2003

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

3 PCB

International Chemical Safety Cards

POLYCHLORINATED BIPHENYL (AROCLOR 1254)

ICSC: 0939

Chlorobiphenyl (54% chlorine)
Chlorodiphenyl (54% chlorine)
PCB
Molecular mass: 327 (average)

ICSC # 0939
CAS # 11097-69-1
RTECS # TQ1360000
UN # 2315
EC # 602-039-00-4

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Not combustible. Gives off irritating or toxic fumes (or gases) in a fire.		Powder, carbon dioxide.
EXPLOSION			
EXPOSURE		PREVENT GENERATION OF MISTS! STRICT HYGIENE!	
•INHALATION		Ventilation.	Fresh air, rest. Refer for medical attention.
•SKIN	MAY BE ABSORBED! Dry skin. Redness.	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap. Refer for medical attention.
•EYES		Safety goggles, face shield.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION	Headache. Numbness.	Do not eat, drink, or smoke during work.	Rest. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING

Consult an expert! Collect leaking liquid in sealable containers. Absorb remaining liquid in sand or inert absorbent and remove to safe place. Do NOT let this chemical enter the environment. (Extra personal protection: complete protective clothing including self-contained breathing apparatus).	Separated from food and feedstuffs. Cool. Dry. Keep in a well-ventilated room.	Unbreakable packaging; put breakable packaging into closed unbreakable container. Do not transport with food and feedstuffs. Severe marine pollutant. Note: C Xn symbol R: 33-50/53 S: 2-35-60-61 UN Hazard Class: 9 UN Packing Group: II

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0939

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 2000. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

POLYCHLORINATED BIPHENYL (AROCLOR 1254)

ICSC: 0939

IMPORTANT DATA	**PHYSICAL STATE; APPEARANCE:** LIGHT YELLOW VISCOUS LIQUID. **PHYSICAL DANGERS:** **CHEMICAL DANGERS:** The substance decomposes in a fire producing irritating and toxic gases. **OCCUPATIONAL EXPOSURE LIMITS:** TLV: ppm; 0.5 mg/m^3 A3 (skin) (ACGIH 1999). OSHA PEL: TWA 0.5 mg/m^3 skin NIOSH REL: Ca TWA 0.001 mg/m^3 See Appendix A *Note: The REL also applies to other PCBs. NIOSH IDLH: Potential occupational carcinogen 5 mg/m^3	**ROUTES OF EXPOSURE:** The substance can be absorbed into the body by inhalation of its aerosol, through the skin and by ingestion. **INHALATION RISK:** A harmful contamination of the air will be reached rather slowly on evaporation of this substance at 20°C. **EFFECTS OF SHORT-TERM EXPOSURE:** **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** Repeated or prolonged contact with skin may cause dermatitis. The substance may have effects on the liver. Animal tests show that this substance possibly causes toxic effects upon human reproduction.
PHYSICAL PROPERTIES	Relative density (water = 1): 1.5 Solubility in water: none	Vapour pressure, Pa at 25°C: 0.01 Octanol/water partition coefficient as log

	Pow: 6.30 (estimated)
ENVIRONMENTAL DATA	In the food chain important to humans, bioaccumulation takes place, specifically in water organisms. It is strongly advised not to let the chemical enter into the environment. 

NOTES

Changes into a resinous state (pour point) at 10°C. Distillation range: 365°-390°C.

Transport Emergency Card: TEC (R)-914

ADDITIONAL INFORMATION

ICSC: 0939 **POLYCHLORINATED BIPHENYL (AROCLOR 1254)**

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

21 VOC

Material Safety Data Sheet
Tetrachloroethylene

ACC# 22900

Section 1 - Chemical Product and Company Identification

MSDS Name: Tetrachloroethylene
Catalog Numbers: C182 20, C182 4, C182-20, C182-4, C18220, C1824, O4586 4, O4586-4, O45864
Synonyms: Ethylene tetrachloride; Tetrachlorethylene; Perchloroethylene; Perchlorethylene
Company Identification:
Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410
For information, call: 201-796-7100
Emergency Number: 201-796-7100
For CHEMTREC assistance, call: 800-424-9300
For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
127-18-4	Tetrachloroethylene	99.0+	204-825-9

Hazard Symbols: XN N
Risk Phrases: 40 51/53

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear, colorless liquid. Irritant. May cause severe eye and skin irritation with possible burns. May cause central nervous system depression. May cause liver and kidney damage. May cause reproductive and fetal effects. May cause cancer based on animal studies. **Caution!** May cause respiratory tract irritation.
Target Organs: Kidneys, central nervous system, liver.

Potential Health Effects
Eye: Contact with eyes may cause severe irritation, and possible eye burns.
Skin: May cause severe irritation and possible burns.
Ingestion: May cause central nervous system depression, kidney damage, and liver damage. Symptoms may include: headache, excitement, fatigue, nausea, vomiting, stupor, and coma. May cause gastrointestinal irritation with nausea, vomiting and diarrhea.
Inhalation: Inhalation of vapor may cause respiratory tract irritation. May cause central nervous system effects including vertigo, anxiety, depression, muscle incoordination, and emotional instability.
Chronic: Possible cancer hazard based on tests with laboratory animals. Prolonged or repeated skin contact may cause defatting and dermatitis. May cause respiratory tract cancer. May cause

adverse nervous system effects including muscle tremors and incoordination. May cause liver and kidney damage. May cause reproductive and fetal effects.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.
Skin: Get medical aid if irritation develops or persists. Wash clothing before reuse. Flush skin with plenty of soap and water.
Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.
Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.
Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Containers may explode in the heat of a fire. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas.
Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire. For small fires, use dry chemical, carbon dioxide, or water spray. For large fires, use dry chemical, carbon dioxide, alcohol-resistant foam, or water spray. Cool containers with flooding quantities of water until well after fire is out.
Flash Point: Not applicable.
Autoignition Temperature: Not applicable.
Explosion Limits, Lower: Not available.
Upper: Not available.
NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Flush down the spill with a large amount of water. Remove all sources of ignition. Use a spark-proof tool. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Do not reuse this container. Avoid breathing vapors from heated material. Avoid contact with skin and eyes. Keep container tightly closed. Keep away from flames

and other sources of high temperatures that may cause material to form vapors or mists.
Storage: Keep away from heat and flame. Store in a cool, dry place. Keep containers tightly closed.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Tetrachloroethylene	25 ppm TWA; 100 ppm STEL	150 ppm IDLH	100 ppm TWA; 200 ppm Ceiling

OSHA Vacated PELs: Tetrachloroethylene: 25 ppm TWA; 170 mg/m3 TWA
Personal Protective Equipment
Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.
Skin: Wear appropriate protective gloves to prevent skin exposure.
Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

Section 9 - Physical and Chemical Properties

Physical State: Liquid
Appearance: clear, colorless
Odor: sweetish odor
pH: Not available.
Vapor Pressure: 15.8 mm Hg
Vapor Density: 5.2
Evaporation Rate:9 (ether=100)
Viscosity: 0.89 mPa s 20 deg C
Boiling Point: 121 deg C
Freezing/Melting Point:-22.3 deg C
Decomposition Temperature:150 deg C
Solubility: Nearly insoluble in water.
Specific Gravity/Density:1.623
Molecular Formula:C2Cl4
Molecular Weight:165.812

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, excess heat.
Incompatibilities with Other Materials: Strong bases, metals, liquid oxygen, dinitrogen tetroxide.

Hazardous Decomposition Products: Hydrogen chloride, phosgene, carbon monoxide, carbon dioxide.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 127-18-4: KX3850000
LD50/LC50:
CAS# 127-18-4:
Draize test, rabbit, eye: 162 mg Mild;
Draize test, rabbit, eye: 500 mg/24H Mild;
Draize test, rabbit, skin: 810 mg/24H Severe;
Draize test, rabbit, skin: 500 mg/24H Mild;
Inhalation, mouse: LC50 = 5200 ppm/4H;
Inhalation, rat: LC50 = 34200 mg/m3/8H;
Oral, mouse: LD50 = 8100 mg/kg;
Oral, rat: LD50 = 2629 mg/kg;
Carcinogenicity:
CAS# 127-18-4:
ACGIH: A3 - Animal Carcinogen
California: carcinogen; initial date 4/1/88
NIOSH: potential occupational carcinogen
NTP: Suspect carcinogen
OSHA: Possible Select carcinogen
IARC: Group 2A carcinogen
Epidemiology: Epidemiologic studies have given inconsistent results. Studi es have shown that tetrachloroethylene has not caused canc er in exposed workers. The studies have serious weakne sses such as mixed exposures. In tests with rats and mice, i t appeared that tissue destruction or peroxisome prolifera tion rather than genetic mechanisms were the cause of the observed increases in normally occurring cancers. The oral mouse TDLo that was tumorigenic was 195 gm/kg/50W-I.
Teratogenicity: Has caused musculoskeletal abnormalities. Has caused morphological transformation at a dose of 97mol/L in a study using rat embryos.
Reproductive Effects: Has caused behavioral, biochemical, and metabolic effects on newborn rats when the mother was exposed to the TCLo of 900 ppm/7H at 7-13 days after conception. A dose of 300 ppm/7H 6-15 days after conception caused post-implantation mortality.
Neurotoxicity: No information available.
Mutagenicity: Not mutagenic in Escherichia coli. No mutagenic effects were seen in rat liver after exposure at 200 ppm for 10 weeks. No chromosome changes were seen in the bone marrow cells of exposed mice.
Other Studies: A case of 'obstructive jaundice' in a 6-week old infant has been attributed to tetrachloroethylene in breast milk.

Section 12 - Ecological Information

Ecotoxicity: Fish: Rainbow trout: LC50 = 5.28 mg/L; 96 Hr.; Static Condition, 12 degrees C Fathead Minnow: LC50 = 18.4 mg/L; 96 Hr.; Flow-through condition Bluegill/Sunfish: LC50 = 12.9 mg/L; 96 Hr.; Static Condition ria: Phytobacterium phosphoreum: EC50 = 120.0 mg/L; 30 minutes; Microtox test No data available.

Environmental: In soil, substance will rapidly evaporate. In water, it will evaporate. In air, it can be expected to exist in the vapor phase.
Physical: No information available.
Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series: CAS# 127-18-4: waste number U210.

Section 14 - Transport Information

	US DOT	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	TETRACHLOROETHYLENE				TETRACHLOROETHYLENE
Hazard Class:	6.1				6.1
UN Number:	UN1897				UN1897
Packing Group:	III				III

Section 15 - Regulatory Information

US FEDERAL

TSCA
CAS# 127-18-4 is listed on the TSCA inventory.
Health & Safety Reporting List
CAS# 127-18-4: Effective Date: 6/1/87; Sunset Date: 6/1/97
Chemical Test Rules
None of the chemicals in this product are under a Chemical Test Rule.
Section 12b
None of the chemicals are listed under TSCA Section 12b.
TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.
SARA

CERCLA Hazardous Substances and corresponding RQs
CAS# 127-18-4: 100 lb final RQ; 45.4 kg final RQ
SARA Section 302 Extremely Hazardous Substances
None of the chemicals in this product have a TPQ.
SARA Codes
CAS # 127-18-4: acute.
Section 313
This material contains Tetrachloroethylene (CAS# 127-18-4, 99 0%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:
CAS# 127-18-4 is listed as a hazardous air pollutant (HAP). This material does not contain any Class 1 Ozone depletors. This material does not contain any Class 2 Ozone depletors.
Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA. CAS# 127-18-4 is listed as a Priority Pollutant under the Clean Water Act. CAS# 127-18-4 is listed as a Toxic Pollutant under the Clean Water Act.
OSHA:
None of the chemicals in this product are considered highly hazardous by OSHA.
STATE
CAS# 127-18-4 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.
The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act: WARNING: This product contains Tetrachloroethylene, a chemical known to the state of California to cause cancer. California No Significant Risk Level: CAS# 127-18-4: 14 ug/day NSRL

European/International Regulations

European Labeling in Accordance with EC Directives
Hazard Symbols:
XN N
Risk Phrases:
R 40 Limited evidence of a carcinogenic effect.
R 51/53 Toxic to aquatic organisms; may cause long-term adverse effects in the aquatic environment.

Safety Phrases:
S 23 Do not inhale gas/fumes/vapour/spray.
S 36/37 Wear suitable protective clothing and gloves.
S 61 Avoid release to the environment. Refer to special instructions/Safety data sheets.

WGK (Water Danger/Protection)
CAS# 127-18-4: 3
Canada - DSL/NDSL
CAS# 127-18-4 is listed on Canada's DSL List.
Canada - WHMIS
This product has a WHMIS classification of D1B, D2A.
Canadian Ingredient Disclosure List
CAS# 127-18-4 is listed on the Canadian Ingredient Disclosure List.
Exposure Limits
CAS# 127-18-4: OEL-ARAB Republic of Egypt:TWA 5 ppm (35 mg/m3);Skin OEL-AUSTRALIA:TWA 50 ppm (335 mg/m3);STEL 150 ppm;CAR OEL-BELGIUM:TWA 50 ppm (339 mg/m3);STEL 200 ppm (1368 mg/m3) OEL-CZECHOSLOVAKIA:TWA 250 mg/m3;STEL 1250 mg/m3 OEL-DENMARK:TWA 30 ppm (200 mg/m3);Skin OEL-FINLAND:TWA 50 ppm (335 mg/m3);STEL 75 ppm (520 mg/m3);Skin OEL-FRANCE:TWA 50 ppm (335 mg/m3) OEL-GERMANY:TWA 50 ppm (345 mg/m3);Carcinogen OEL-HUNGARY:STEL 50 mg/m3;Skin;Carcinogen OEL-JAPAN:TWA 50 ppm (340 mg/m3) OEL-THE NETHERLANDS:TWA 35 ppm (240 mg/m3);Skin OEL-THE PHILIPPINES:TWA 100 ppm (670 mg/m3) OEL-POLAND:TWA 60 mg/m3 OEL-RUSSIA:TWA 50 ppm;STEL 10 mg/m3 OEL-SWEDEN:TWA 10 ppm (70 mg/m3);STEL 25 ppm (170 mg/m3) OEL-SWITZERLAND:TWA 50 ppm (345 mg/m3);STEL 100 ppm;Skin OEL-THAILAND:TWA 100 ppm;STEL 200 ppm OEL-UNITED KINGDOM:TWA 50 ppm (335 mg/m3);STEL 15 ppm OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA

check ACGIH TLV OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV

Section 16 - Additional Information

MSDS Creation Date: 6/17/1999
Revision #3 Date: 3/18/2003

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

MSDS Number: **T3913** * * * * * *Effective Date:* ***10/05/06*** * * * * * *Supercedes:* ***08/03/04***

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS | J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

TOLUENE

1. Product Identification

Synonyms: Methylbenzene; Toluol; Phenylmethane
CAS No.: 108-88-3
Molecular Weight: 92.14
Chemical Formula: C6H5-CH3
Product Codes:
J.T. Baker: 5375, 5812, 9336, 9351, 9364, 9456, 9457, 9459, 9460, 9462, 9466, 9472, 9476
Mallinckrodt: 4483, 8092, 8604, 8608, 8610, 8611, V560

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Toluene	108-88-3	100%	Yes

3. Hazards Identification

Emergency Overview

POISON! DANGER! HARMFUL OR FATAL IF SWALLOWED. HARMFUL IF INHALED OR ABSORBED THROUGH SKIN. VAPOR HARMFUL. FLAMMABLE LIQUID AND VAPOR. MAY AFFECT LIVER, KIDNEYS, BLOOD SYSTEM, OR CENTRAL NERVOUS SYSTEM. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT.

SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 2 - Moderate (Life)
Flammability Rating: 3 - Severe (Flammable)
Reactivity Rating: 1 - Slight
Contact Rating: 3 - Severe (Life)
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES; CLASS B EXTINGUISHER
Storage Color Code: Red (Flammable)

Potential Health Effects

Inhalation:
Inhalation may cause irritation of the upper respiratory tract. Symptoms of overexposure may include fatigue, confusion, headache, dizziness and drowsiness. Peculiar skin sensations (e. g. pins and needles) or numbness may be produced. Very high concentrations may cause unconsciousness and death.
Ingestion:
Swallowing may cause abdominal spasms and other symptoms that parallel over-exposure from inhalation. Aspiration of material into the lungs can cause chemical pneumonitis, which may be fatal.
Skin Contact:
Causes irritation. May be absorbed through skin.
Eye Contact:
Causes severe eye irritation with redness and pain.
Chronic Exposure:
Reports of chronic poisoning describe anemia, decreased blood cell count and bone marrow hypoplasia. Liver and kidney damage may occur. Repeated or prolonged contact has a defatting action, causing drying, redness, dermatitis. Exposure to toluene may affect the developing fetus.
Aggravation of Pre-existing Conditions:
Persons with pre-existing skin disorders or impaired liver or kidney function may be more susceptible to the effects of this substance. Alcoholic beverage consumption can enhance the toxic effects of this substance.

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4. First Aid Measures

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. CALL A PHYSICIAN IMMEDIATELY.
Ingestion:
Aspiration hazard. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Get medical attention immediately. If vomiting occurs, keep head below hips to prevent aspiration into lungs.
Skin Contact:
In case of contact, immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Call a physician immediately.
Eye Contact:
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

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5. Fire Fighting Measures

Fire:
Flash point: 7C (45F) CC
Autoignition temperature: 422C (792F)
Flammable limits in air % by volume:
lel: 1.1; uel: 7.1
Flammable liquid and vapor!
Dangerous fire hazard when exposed to heat or flame. Vapors can flow along surfaces to distant ignition source and flash back.
Explosion:
Above flash point, vapor-air mixtures are explosive within flammable limits noted above. Contact with strong oxidizers may cause fire or explosion. Sensitive to static discharge.
Fire Extinguishing Media:
Dry chemical, foam or carbon dioxide. Water may be used to flush spills away from exposures and to dilute spills to non-flammable mixtures.
Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full

facepiece operated in the pressure demand or other positive pressure mode. Water spray may be used to keep fire exposed containers cool.

6. Accidental Release Measures

Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! If a leak or spill has not ignited, use water spray to disperse the vapors, to protect personnel attempting to stop leak, and to flush spills away from exposures. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

J. T. Baker SOLUSORB® solvent adsorbent is recommended for spills of this product.

7. Handling and Storage

Protect against physical damage. Store in a cool, dry well-ventilated location, away from any area where the fire hazard may be acute. Outside or detached storage is preferred. Separate from incompatibles. Containers should be bonded and grounded for transfers to avoid static sparks. Storage and use areas should be No Smoking areas. Use non-sparking type tools and equipment, including explosion proof ventilation. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
Toluene:
- OSHA Permissible Exposure Limit (PEL):
200 ppm (TWA); 300 ppm (acceptable ceiling conc.); 500 ppm (maximum conc.).
- ACGIH Threshold Limit Value (TLV):
50 ppm (TWA) skin, A4 - Not Classifiable as a Human Carcinogen.

Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded and engineering controls are not feasible, a half-face organic vapor respirator may be worn for up to ten times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece organic vapor respirator may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-face piece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection:
Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:
Clear, colorless liquid.
Odor:
Aromatic benzene-like.
Solubility:
0.05 gm/100gm water @ 20C (68F).
Specific Gravity:
0.86 @ 20C / 4 C
pH:
No information found.
% Volatiles by volume @ 21C (70F):
100
Boiling Point:
111C (232F)
Melting Point:
-95C (-139F)
Vapor Density (Air=1):
3.14
Vapor Pressure (mm Hg):
22 @ 20C (68F)
Evaporation Rate (BuAc=1):
2.24

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10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage. Containers may burst when heated.
Hazardous Decomposition Products:
Carbon dioxide and carbon monoxide may form when heated to decomposition.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
Heat, flame, strong oxidizers, nitric and sulfuric acids, chlorine, nitrogen tetraoxide; will attack some forms of plastics, rubber, coatings.
Conditions to Avoid:
Heat, flames, ignition sources and incompatibles.

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11. Toxicological Information

Toxicological Data:
Oral rat LD50: 636 mg/kg; skin rabbit LD50: 14100 uL/kg; inhalation rat LC50: 49 gm/m3/4H; Irritation data: skin rabbit, 500 mg, Moderate; eye rabbit, 2 mg/24H, Severe. Investigated as a tumorigen, mutagen, reproductive effector.
Reproductive Toxicity:
Has shown some evidence of reproductive effects in laboratory animals.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Toluene (108-88-3)	No	No	3

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12. Ecological Information

Environmental Fate:
When released into the soil, this material may evaporate to a moderate extent. When released into the soil, this material is expected to leach into groundwater. When released into the soil, this material may biodegrade to a moderate extent. When released into water, this material may evaporate to a moderate extent. When released into water, this material may biodegrade to a moderate extent. When released into the air, this material may be moderately degraded by reaction

with photochemically produced hydroxyl radicals. When released into the air, this material is expected to have a half-life of less than 1 day. This material is not expected to significantly bioaccumulate. This material has a log octanol-water partition coefficient of less than 3.0. Bioconcentration factor = 13.2 (eels).
Environmental Toxicity:
This material is expected to be toxic to aquatic life. The LC50/96-hour values for fish are between 10 and 100 mg/l.

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13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved incinerator or disposed in a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

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14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: TOLUENE
Hazard Class: 3
UN/NA: UN1294
Packing Group: II
Information reported for product/size: 390LB

International (Water, I.M.O.)

Proper Shipping Name: TOLUENE
Hazard Class: 3
UN/NA: UN1294
Packing Group: II
Information reported for product/size: 390LB

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15. Regulatory Information

--------\Chemical Inventory Status - Part 1\----------

Ingredient	TSCA	EC	Japan	Australia
Toluene (108-88-3)	Yes	Yes	Yes	Yes

--------\Chemical Inventory Status - Part 2\----------

Ingredient	Korea	--Canada-- DSL	NDSL	Phil.
Toluene (108-88-3)	Yes	Yes	No	Yes

--------\Federal, State & International Regulations - Part 1\----------

Ingredient	-SARA 302- RQ	TPQ	------SARA 313------ List	Chemical Catg.
Toluene (108-88-3)	No	No	Yes	No

--------\Federal, State & International Regulations - Part 2\----------

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Toluene (108-88-3)	1000	U220	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: Yes
SARA 311/312: Acute: Yes Chronic: Yes Fire: Yes Pressure: No
Reactivity: No (Pure / Liquid)

WARNING:

THIS PRODUCT CONTAINS A CHEMICAL(S) KNOWN TO THE STATE OF CALIFORNIA TO CAUSE BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM.

Australian Hazchem Code: 3[Y]E
Poison Schedule: S6
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

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16. Other Information

NFPA Ratings: Health: **2** Flammability: **3** Reactivity: **0**
Label Hazard Warning:
POISON! DANGER! HARMFUL OR FATAL IF SWALLOWED. HARMFUL IF INHALED OR ABSORBED THROUGH SKIN. VAPOR HARMFUL. FLAMMABLE LIQUID AND VAPOR. MAY AFFECT LIVER, KIDNEYS, BLOOD SYSTEM, OR CENTRAL NERVOUS SYSTEM. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT.
Label Precautions:
Keep away from heat, sparks and flame.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.
Avoid breathing vapor.
Avoid contact with eyes, skin and clothing.
Label First Aid:
Aspiration hazard. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. If vomiting occurs, keep head below hips to prevent aspiration into lungs. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. In all cases call a physician immediately.
Product Use:
Laboratory Reagent.
Revision Information:
MSDS Section(s) changed since last revision of document include: 5.
Disclaimer:
****

Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.
****

Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

MSDS Number: **X2000** * * * * * *Effective Date:* ***02/16/06*** * * * * * *Supercedes:* ***04/01/03***

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS | J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

XYLENES

1. Product Identification

Synonyms: Dimethyl benzene, xylol, methyltoluene
CAS No.: 1330-20-7
Molecular Weight: 106.17
Chemical Formula: C6H4(CH3)2
Product Codes:
J.T. Baker: 5377, 5813, 9483, 9489, 9490, 9493, 9494, 9499, 9516, X516
Mallinckrodt: 8664, 8668, 8671, 8672, 8802, V052

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
m-Xylene	108-38-3	40 - 65%	Yes
o-Xylene	95-47-6	15 - 20%	Yes
p-Xylene	106-42-3	< 20%	Yes
Ethyl Benzene	100-41-4	15 - 25%	Yes

3. Hazards Identification

Emergency Overview

DANGER! HARMFUL OR FATAL IF SWALLOWED. VAPOR HARMFUL. AFFECTS CENTRAL NERVOUS SYSTEM. CAUSES SEVERE EYE IRRITATION. CAUSES IRRITATION TO SKIN AND RESPIRATORY TRACT. MAY BE HARMFUL IF ABSORBED THROUGH SKIN. CHRONIC EXPOSURE CAN CAUSE ADVERSE LIVER, KIDNEY, AND BLOOD EFFECTS. FLAMMABLE LIQUID AND VAPOR.

SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 2 - Moderate (Life)

Flammability Rating: 2 - Moderate
Reactivity Rating: 1 - Slight
Contact Rating: 3 - Severe
Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES; CLASS B EXTINGUISHER
Storage Color Code: Red (Flammable)

Potential Health Effects

Inhalation:
Inhalation of vapors may be irritating to the nose and throat. Inhalation of high concentrations may result in nausea, vomiting, headache, ringing in the ears, and severe breathing difficulties which may be delayed in onset. Substernal pain, cough, and hoarseness are also reported. High vapor concentrations are anesthetic and central nervous system depressants.
Ingestion:
Ingestion causes burning sensation in mouth and stomach, nausea, vomiting and salivation. Minute amounts aspirated into the lungs can produce a severe hemorrhagic pneumonitis with severe pulmonary injury or death.
Skin Contact:
Skin contact results in loss of natural oils and often results in a characteristic dermatitis. May be absorbed through the skin.
Eye Contact:
Vapors cause eye irritation. Splashes cause severe irritation, possible corneal burns and eye damage.
Chronic Exposure:
Chronic inhalation can cause headache, loss of appetite, nervousness and pale skin. Repeated or prolonged skin contact may cause a skin rash. Repeated exposure of the eyes to high concentrations of vapor may cause reversible eye damage. Repeated exposure can damage bone marrow, causing low blood cell count. May damage the liver and kidneys.
Aggravation of Pre-existing Conditions:
Persons with pre-existing skin disorders or eye problems, or impaired liver, kidney, blood, or respiratory function may be more susceptible to the effects of the substance.

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4. First Aid Measures

Inhalation:
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician immediately.
Ingestion:
Aspiration hazard. If swallowed, vomiting may occur spontaneously, but DO NOT INDUCE. If vomiting occurs, keep head below hips to prevent aspiration into lungs. Never give anything by mouth to an unconscious person. Call a physician immediately.
Skin Contact:
Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.
Eye Contact:
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

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5. Fire Fighting Measures

Fire:
Flash point: 29C (84F) CC
Autoignition temperature: 464C (867F)
Flammable limits in air % by volume:

lel: 1.0; uel: 7.0
Explosion:
Above flash point, vapor-air mixtures are explosive within flammable limits noted above. Contact with strong oxidizers may cause fire. Sealed containers may rupture when heated. Sensitive to static discharge.
Fire Extinguishing Media:
Dry chemical, foam or carbon dioxide. Water spray may be used to keep fire exposed containers cool, dilute spills to nonflammable mixtures, protect personnel attempting to stop leak and disperse vapors.
Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Vapors can flow along surfaces to distant ignition source and flash back.

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6. Accidental Release Measures

Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! If a leak or spill has not ignited, use water spray to disperse the vapors, to protect personnel attempting to stop leak, and to flush spills away from exposures. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

J. T. Baker SOLUSORB® solvent adsorbent is recommended for spills of this product.

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7. Handling and Storage

Protect against physical damage. Store in a cool, dry well-ventilated location, away from any area where the fire hazard may be acute. Outside or detached storage is preferred. Separate from incompatibles. Containers should be bonded and grounded for transfers to avoid static sparks. Storage and use areas should be No Smoking areas. Use non-sparking type tools and equipment, including explosion proof ventilation. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product. Do Not attempt to clean empty containers since residue is difficult to remove. Do not pressurize, cut, weld, braze, solder, drill, grind or expose such containers to heat, sparks, flame, static electricity or other sources of ignition: they may explode and cause injury or death.

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8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
-OSHA Permissible Exposure Limit (PEL):
100 ppm (TWA) xylene
100 ppm (TWA) ethylbenzene
-ACGIH Threshold Limit Value (TLV):
xylene: 100 ppm (TWA) 150 ppm (STEL), A4 - Not classifiable as a human carcinogen.
ethyl benzene: 100 ppm (TWA) 125 ppm (STEL), A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans.
Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details. Use explosion-proof equipment.

Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded and engineering controls are not feasible, a half-face organic vapor respirator may be worn for up to ten times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece organic vapor respirator may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-face piece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres. Where respirators are required, you must have a written program covering the basic requirements in the OSHA respirator standard. These include training, fit testing, medical approval, cleaning, maintenance, cartridge change schedules, etc. See 29CFR1910.134 for details.
Skin Protection:
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.
Eye Protection:
Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

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9. Physical and Chemical Properties

The following physical data is for xylene.
Appearance:
Clear, colorless liquid.
Odor:
Characteristic odor.
Solubility:
Insoluble in water.
Specific Gravity:
0.86 @ 20C/4C
pH:
Not applicable.
% Volatiles by volume @ 21C (70F):
100
Boiling Point:
137 - 140C (279 - 284F)
Melting Point:
-25C (-13F)
Vapor Density (Air=1):
3.7
Vapor Pressure (mm Hg):
8 @ 20C (68F)
Evaporation Rate (BuAc=1):
0.7

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10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage.
Hazardous Decomposition Products:
Involvement in a fire causes formation of carbon monoxide and unidentified organic components.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
Strong oxidizing agents and strong acids.
Conditions to Avoid:

Heat, flames, ignition sources and incompatibles.

11. Toxicological Information

Toxicological Data:
Xylene: oral rat LD50: 4300 mg/kg; inhalation rat LC50: 5000 ppm/4H; skin rabbit LD50: > 1700 mg/kg; Irritation eye rabbit: 87 mg mild (Std. Draize); irritation skin rabbit 500 mg/24 moderate (Std. Draize); investigated as a tumorigen, mutagen, reproductive effector.
Ethyl benzene: oral rat LD50: 3500 mg/kg; skin rabbit LD50: 17800 uL/kg; investigated as a tumorigen, mutagen, reproductive effector.
Reproductive Toxicity:
May cause teratogenic effects.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
m-Xylene (108-38-3)	No	No	3
o-Xylene (95-47-6)	No	No	3
p-Xylene (106-42-3)	No	No	3
Ethyl Benzene (100-41-4)	No	No	2B

12. Ecological Information

Environmental Fate:
Following data for xylene: When released into the soil, this material may evaporate to a moderate extent. When released into the soil, this material is expected to leach into groundwater. When released into the soil, this material may biodegrade to a moderate extent. When released into water, this material may evaporate to a moderate extent. When released into water, this material may biodegrade to a moderate extent. When released into the air, this material may be moderately degraded by reaction with photochemically produced hydroxyl radicals. When released into the air, this material is expected to have a half-life of less than 1 day. This material is not expected to significantly bioaccumulate. (mixed xylenes: octanol / water partition coefficient 3.1 - 3.2; bioconcentration factor = 1.3, eels)
Environmental Toxicity:
For xylene: This material is expected to be slightly toxic to aquatic life. The LC50/96-hour values for fish are between 10 and 100 mg/l.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved incinerator or disposed in a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: RQ, XYLENES
Hazard Class: 3
UN/NA: UN1307
Packing Group: III
Information reported for product/size: 398LB

International (Water, I.M.O.)

Proper Shipping Name: XYLENES
Hazard Class: 3
UN/NA: UN1307
Packing Group: III
Information reported for product/size: 398LB

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15. Regulatory Information

--------\Chemical Inventory Status - Part 1\---------------------------------

Ingredient	TSCA	EC	Japan	Australia
m-Xylene (108-38-3)	Yes	Yes	Yes	Yes
o-Xylene (95-47-6)	Yes	Yes	Yes	Yes
p-Xylene (106-42-3)	Yes	Yes	Yes	Yes
Ethyl Benzene (100-41-4)	Yes	Yes	Yes	Yes

--------\Chemical Inventory Status - Part 2\---------------------------------

		--Canada--		
Ingredient	Korea	DSL	NDSL	Phil.
m-Xylene (108-38-3)	Yes	Yes	No	Yes
o-Xylene (95-47-6)	Yes	Yes	No	Yes
p-Xylene (106-42-3)	Yes	Yes	No	Yes
Ethyl Benzene (100-41-4)	Yes	Yes	No	Yes

--------\Federal, State & International Regulations - Part 1\----------------

	-SARA 302-		------SARA 313------	
Ingredient	RQ	TPQ	List	Chemical Catg.
m-Xylene (108-38-3)	No	No	Yes	No
o-Xylene (95-47-6)	No	No	Yes	No
p-Xylene (106-42-3)	No	No	Yes	No
Ethyl Benzene (100-41-4)	No	No	Yes	No

--------\Federal, State & International Regulations - Part 2\----------------

		-RCRA-	-TSCA-
Ingredient	CERCLA	261.33	8(d)
m-Xylene (108-38-3)	1000	No	No
o-Xylene (95-47-6)	1000	No	No
p-Xylene (106-42-3)	100	No	Yes
Ethyl Benzene (100-41-4)	1000	No	No

Chemical Weapons Convention: No TSCA 12(b): Yes CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: Yes Pressure: No
Reactivity: No (Mixture / Liquid)

WARNING:
THIS PRODUCT CONTAINS A CHEMICAL(S) KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.

Australian Hazchem Code: 3[Y]
Poison Schedule: None allocated.
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

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16. Other Information

NFPA Ratings: Health: **2** Flammability: **3** Reactivity: **0**

Label Hazard Warning:
DANGER! HARMFUL OR FATAL IF SWALLOWED. VAPOR HARMFUL. AFFECTS CENTRAL NERVOUS SYSTEM. CAUSES SEVERE EYE IRRITATION. CAUSES IRRITATION TO SKIN AND RESPIRATORY TRACT. MAY BE HARMFUL IF ABSORBED THROUGH SKIN. CHRONIC EXPOSURE CAN CAUSE ADVERSE LIVER, KIDNEY, AND BLOOD EFFECTS. FLAMMABLE LIQUID AND VAPOR.
Label Precautions:
Keep away from heat, sparks and flame.
Avoid contact with eyes, skin and clothing.
Keep container closed.
Use only with adequate ventilation.
Avoid breathing vapor.
Wash thoroughly after handling.
Label First Aid:
Aspiration hazard. If swallowed, vomiting may occur spontaneously, but DO NOT INDUCE. If vomiting occurs, keep head below hips to prevent aspiration into lungs. Never give anything by mouth to an unconscious person. Call a physician immediately. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. In all cases get medical attention immediately.
Product Use:
Laboratory Reagent.
Revision Information:
No Changes.
Disclaimer:
****

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Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

MSDS Number: **Z0858** * * * * * *Effective Date: **05/07/03*** * * * * *Supercedes: **11/02/01***

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

ZINC METAL POWDER

1. Product Identification

Synonyms: Powdered zinc; blue powder; CI77945; CI Pigment Black 16
CAS No.: 7440-66-6
Molecular Weight: 65.37
Chemical Formula: Zn
Product Codes:
J.T. Baker: 4282
Mallinckrodt: 8681

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Zinc	7440-66-6	96 - 97%	Yes
Zinc Oxide	1314-13-2	0 - 3%	Yes
Lead	7439-92-1	0 - 0.3%	Yes

3. Hazards Identification

Emergency Overview

WARNING! HARMFUL IF SWALLOWED OR INHALED. MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT. MAY FORM COMBUSTIBLE DUST CONCENTRATIONS IN AIR. WATER REACTIVE. MAY AFFECT THE GUM TISSUE, CENTRAL NERVOUS SYSTEM, KIDNEYS, BLOOD AND REPRODUCTIVE SYSTEM (lead component).

J.T. Baker SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 1 - Slight
Flammability Rating: 3 - Severe (Flammable)
Reactivity Rating: 2 - Moderate

Contact Rating: 1 - Slight
Lab Protective Equip: GOGGLES; LAB COAT; CLASS D EXTINGUISHER
Storage Color Code: Orange (General Storage)

Potential Health Effects

Inhalation:
No adverse effects expected but dust may cause mechanical irritation. The effects may be expected to resemble those of inhaling an inert dust; possible difficulty in breathing, sneezing, coughing. When heated, the fumes are highly toxic and may cause fume fever.
Ingestion:
Extremely large oral dosages may produce gastrointestinal disturbances, due both to mechanical effects and the possibility of reaction with gastric juice to produce zinc chloride. Pain, stomach cramps and nausea could occur in aggravated cases.
Skin Contact:
May cause irritation.
Eye Contact:
May cause irritation.
Chronic Exposure:
No adverse health effects expected.
Aggravation of Pre-existing Conditions:
Persons with pre-existing skin disorders or impaired respiratory function may be more susceptible to the effects of the substance.

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4. First Aid Measures

Inhalation:
Remove to fresh air. Get medical attention for any breathing difficulty.
Ingestion:
Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person.
Skin Contact:
Wipe off excess material from skin then immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.
Eye Contact:
Immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get medical attention if irritation persists.

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5. Fire Fighting Measures

Fire:
Autoignition temperature: ca. 460C (ca. 860F)
The listed autoignition temperature is for Zinc powder (layer); dust cloud is ca. 680C (1255F). Zinc powder is not pyrophoric but will burn in air at elevated temperatures. Bulk dust in damp state may heat spontaneously and ignite on exposure to air. Releases flammable hydrogen gas upon contact with acids or alkali hydroxides. Contact with strong oxidizers may cause fire.
Explosion:
Fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.
Fire Extinguishing Media:
Smother with a suitable dry powder (sodium chloride, magnesium oxide, Met-L-X).
Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

Remove all sources of ignition and provide mild ventilation in area of spill. Substance may be pyrophoric and self-ignite. Clean-up personnel require protective clothing, goggles and dust/mist respirators. Sweep or vacuum up the spill in a manner that does not disperse zinc powder in the air and place the zinc in a closed container for recovery or disposal.
US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

7. Handling and Storage

Keep in a tightly closed container. Protect from physical damage. Store in a cool, dry, ventilated area away from sources of heat, moisture and incompatibilities. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
None for Zinc metal.
-OSHA Permissible Exposure Limit (PEL):
10 mg/m3 (TWA), for zinc oxide fume
-ACGIH Threshold Limit Value (TLV):
10 mg/m3 (TWA), Inhalable fraction, A4 Not classifiable as a human carcinogen for zinc oxide.

Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded and engineering controls are not feasible, a full facepiece particulate respirator (NIOSH type N100 filters) may be worn for up to 50 times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. If oil particles (e.g. lubricants, cutting fluids. glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
Skin Protection:
Wear protective gloves and clean body-covering clothing.
Eye Protection:
Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:
Gray or bluish-gray powder.
Odor:
Odorless.

Solubility:
Insoluble in water.
Density:
7.14
pH:
No information found.
% Volatiles by volume @ 21C (70F):
0
Boiling Point:
907C (1665F)
Melting Point:
419C (786F)
Vapor Density (Air=1):
No information found.
Vapor Pressure (mm Hg):
1 @ 487C (909F)
Evaporation Rate (BuAc=1):
No information found.

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage. Moist zinc dust can react exothermically and ignite spontaneously in air.
Hazardous Decomposition Products:
Hydrogen in moist air, zinc oxide with oxygen at high temperature. Zinc metal, when melted, produces zinc vapor which oxidizes and condenses in air to form zinc fume.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
Zinc powder can react violently with water, sulfur and halogens. Dangerous or potentially dangerous with strong oxidizing agents, lower molecular weight chlorinated hydrocarbons, strong acids and alkalis.
Conditions to Avoid:
Heat, flames, ignition sources and incompatibles.

11. Toxicological Information

Zinc: Irritation skin, human: 300 ug/3D-I mild; investigated as a mutagen.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Zinc (7440-66-6)	No	No	None
Zinc Oxide (1314-13-2)	No	No	None
Lead (7439-92-1)	No	No	2B

12. Ecological Information

Environmental Fate:
No information found.
Environmental Toxicity:
No information found.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Not regulated.

15. Regulatory Information

--------\Chemical Inventory Status - Part 1\---------------------------------

Ingredient	TSCA	EC	Japan	Australia
Zinc (7440-66-6)	Yes	Yes	No	Yes
Zinc Oxide (1314-13-2)	Yes	Yes	Yes	Yes
Lead (7439-92-1)	Yes	Yes	Yes	Yes

--------\Chemical Inventory Status - Part 2\---------------------------------

Ingredient	Korea	--Canada-- DSL	NDSL	Phil.
Zinc (7440-66-6)	Yes	Yes	No	Yes
Zinc Oxide (1314-13-2)	Yes	Yes	No	Yes
Lead (7439-92-1)	Yes	Yes	No	Yes

--------\Federal, State & International Regulations - Part 1\-----------------

Ingredient	-SARA 302- RQ	TPQ	------SARA 313------ List	Chemical Catg.
Zinc (7440-66-6)	No	No	Yes	No
Zinc Oxide (1314-13-2)	No	No	No	Zinc compoun
Lead (7439-92-1)	No	No	Yes	No

--------\Federal, State & International Regulations - Part 2\-----------------

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Zinc (7440-66-6)	1000	No	No
Zinc Oxide (1314-13-2)	No	No	No
Lead (7439-92-1)	10	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: No Fire: Yes Pressure: No
Reactivity: Yes (Mixture / Solid)

WARNING:
THIS PRODUCT CONTAINS CHEMICALS KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER AND BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM.

Australian Hazchem Code: 4Y
Poison Schedule: S6
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: **1** Flammability: **1** Reactivity: **1** Other: **Water reactive**

ATTACHMENT 1V

Attachment IV – Heat Stress / Cold Stress

1.0 HEAT STRESS

Excessive exposure to a hot environment can bring about a variety of heat-induced disorders. The four main types of heat stress related illnesses: heat rash, heat cramps, heat exhaustion, and heat stroke, are discussed below.

1.1 Heat Rash

Heat rash also know as prickly heat, is likely to occur in hot, humid environments where sweat is not readily removed from the surface of the skin by evaporation and the skin remains wet most of the time. The sweat ducts become plugged, and a skin rash soon appears. When the rash is extensive or when it is complicated by an infection, prickly heat can be very uncomfortable and may reduce a worker's performance. The worker can prevent this condition by resting in a cool place part of each day and by regularly bathing and drying the skin.

1.2 Heat Cramps

Heat cramps are painful spasms of the muscles that occur among those who sweat profusely in heat, drink large quantities of water, but do not adequately replace the body's salt loss. Drinking large quantities of water tends to dilute the body's fluids, while the body continues to lose salt. Shortly thereafter, the low salt level in the muscles causes painful cramps. The affected muscles may be part of the arms, legs or abdomen, but tired muscles (those used to perform the work) are usually the ones most susceptible to cramps. Cramps may occur during or after work hours and may be relieved by taking salted liquids by mouth, such as the variety of sports drinks on the market.

CAUTION SHOULD BE EXERCISED BY PEOPLE WITH HEART PROBLEMS OR THOSE ON LOW SODIUM DIETS WHO WORK IN HOT ENVIRONMENTS. THESE PEOPLE SHOULD CONSULT A PHYSICIAN ABOUT WHAT TO DO UNDER THESE CONDITIONS.

1.3 Heat Exhaustion

Heat exhaustion includes several clinical disorders having symptoms that may resemble the early symptoms of heat stroke. Heat exhaustion is caused by the loss of large amounts of fluid by sweating, sometimes with excessive loss of salt. A worker suffering from this condition still sweats but experiences extreme weakness or fatigue, giddiness, nausea, or headache. In more serious cases, the victim may vomit or lose consciousness. The skin is clammy and moist, the complexion is pale or flushed, and the body temperature is normal or only slightly elevated.

A summary of the key symptoms of heat exhaustion is as follows:

- Clammy skin
- Confusion
- Dizziness
- Fainting

- Fatigue
- Heat Rash
- Light-headedness
- Nausea
- Profuse sweating
- Slurred Speech
- Weak Pulse

In most cases, treatment involves having the victim rest in a cool place and drink plenty of fluids. Victims with mild cases of heat exhaustion usually recover spontaneously with this treatment. Those with severe cases may require extended care for several days. There are no known permanent effects.
AS WITH HEAT CRAMPS, CERTAIN PERSONS SHOULD CONSULT WITH THEIR PHYSICIAN ABOUT WHAT TO DO UNDER THESE CONDITIONS.

1.4 Heat Stroke

This is the most serious of health problems associated with working in hot environments. It occurs when the body's temperature regulatory system fails and sweating becomes inadequate. The body's only effective means of removing excess heat is compromised with little warning to the victim that a crisis stage has been reached.

A heat stroke victim's skin is hot, usually dry, red or spotted. Body temperature is usually 105oF or higher, and the victim is mentally confused, delirious, perhaps in convulsions, or unconscious. Unless the victim receives quick and appropriate treatment, death can occur.

A summary of the key symptoms of heatstroke is as follows:

- Confusion
- Convulsions
- Incoherent Speech
- Staggering Gait
- Unconsciousness
- Sweating stops
- Hot skin, high temperature (yet extremities may feel chilled)

Any person with signs or symptoms of heat stroke requires immediate hospitalization. However, first aid should be immediately administered. This includes moving the victim to a cool area, thoroughly soaking the clothing with water, and vigorously fanning the body to increase cooling. Further treatment at a medical facility should include continuation of the cooling process and the monitoring of complications that often accompany the heat stroke. Early recognition and treatment of heat stroke are the only means of preventing permanent brain damage or death.

1.5 Preparing for the Heat

Humans, to a large extent, are capable of adjusting to heat. This acclimation to heat, under normal circumstances, usually takes about 5 to 7 days, during which time the body will undergo a series of changes that will make continued exposure to heat more tolerable.

On the first day of exposure, body temperature, pulse rate, and general discomfort will be higher. With each succeeding day of exposure, all of these responses will gradually decrease, while the sweat rate will increase. When the body does become acclimated to the heat, the worker will find it possible to perform work with less strain and distress.

A gradual exposure to heat gives the body time to become accustomed to higher temperatures, such as those encountered in chemical protective clothing.

1.6 Protecting Against Heat Stress

There are several methods that can be used to reduce heat stress:

- Limit duration of work periods
- Use protective clothing with cooling devices
- Enforce the use of the "Buddy System"
- Consume electrolyte solutions prior to suiting up
- Monitor workers for pulse recovery rates, body fluid loss, body weight loss, and excess fatigue
- Screen for heat stress susceptible candidates in your medical surveillance program
- Have all personnel know the signs and symptoms of heat stress

2.0 COLD STRESS

Persons working outdoors in temperatures at or below freezing may be frostbitten. Extreme cold for a short time may cause severe injury to the surface of the body, or result in profound generalized cooling, causing death. Areas of the body that have high surface-area-to-volume ratio such as fingers, toes, and ears, are the most susceptible. Two factors influence the development of a cold injury, ambient temperature and the velocity of the wind. Wind chill is used to describe the chilling effect of moving air in combination with low temperature. For instance, 10 degrees Fahrenheit with a wind of 15 miles per hour (mph) is equivalent in chilling effect to still air at minus 18 degrees Fahrenheit.

As a general rule, the greatest incremental increase in wind chill occurs when a wind of 5 mph increases to 10 mph. Additionally, water conducts heat 240 times faster than air. Thus, the body cools suddenly when chemical-protective equipment is removed if the clothing underneath is perspiration soaked.

2.1 Frostbite

Local injury resulting from cold is included in the generic term frostbite. There are several degrees of damage. Frostbite of the extremities can be categorized into:

- Frost Nip or Initial Frostbite: characterized by suddenly blanching or whitening of skin.
- Superficial Frostbite: skin has a waxy or white appearance and is firm to the touch, but tissue beneath is resilient.
- Deep Frostbite: tissues are cold, pale, and solid; extremely serious injury.

2.2 Hypothermia

Systemic hypothermia is caused by exposure to freezing or rapidly dropping temperature. Its symptoms are usually exhibited in five stages:

- Shivering
- Apathy, listlessness, sleepiness, and (sometimes rapid cooling of the body to less than 95°F)
- Unconsciousness, glassy stage, slow pulse, and slow respiratory rate
- Freezing of the extremities
- Death

Thermal socks, long cotton or thermal underwear, hard hat liners and other cold weather gear can aid in the prevention of hypothermia. Blankets and warm drinks (other than caffeinated coffee) are also recommended.

Measures shall be taken to keep workers from getting wet, such as issuance of rain gear. Workers whose cloths become wet shall be given the opportunity to dry off and change clothes.

ATTACHMENT V

Attachment V - Construction Equipment Safety Rules

1.0 ELECTRICAL

1. Live electrical parts shall be guarded against accidental contact by cabinets, enclosure, location, or guarding. Cabinet covers will be replaced.

2. Working and clear space around electric equipment and distribution boxes will be kept clear and assessable.

3. Circuit breakers, switch boxes, etc. will be legibly marked to indicate their purpose.

4. All 120-volt, single-phase 15- and 20-ampere receptacle outlets on construction sites, which are not a part of the permanent wiring of the building or structure and which are in use by employees, shall have approved ground-fault circuit interrupters for personnel protection. If the prime contractor has not provided this protection with GFCI receptacles at the temporary service drop, employees will ensure portable GFCI protection is provided. (Employers may wish to use assured equipment grounding conductor program in lieu of this GFCI protection.) This requirement is in addition to any other electrical equipment grounding requirement or double insulated protection.

5. All extension cords will be three-wire (grounded) type and designed for hard or extra hard usage (Type S, ST, SO, STO, or SJ, SJO, SJT, SJTO).

6. Ground prongs will not be removed.

7. Cords and strain relief devices/clamps will be in good condition.

8. All lamps for general illumination will have the bulbs protected against breakage.

9. Electrical cords will not suspend temporary lights unless cords and lights are designed for such suspension. Flexible cords used for temporary and portable lights will be designed for hard or extra hard usage.

10. Employees will not work in such close (able to contact) proximity to any part of an electric power circuit unless the circuit is de-energized, grounded, or guarded by insulation.

11. Equipment or circuits that are de-energized will be locked out and tagged out. The tags will plainly identify the equipment or circuits being worked on.

2.0 COMPRESSED GAS CYLINDERS

1. All gas cylinders will have their contents clearly marked on the outside of each cylinder.

2. Cylinders must be transported, stored, and secured in an upright position. They will never be left laying on the ground or floor, nor used as rollers or supports.

3. Cylinder valves must be protected with caps and closed when not in use.

4. All leaking or defective cylinders must be removed from service promptly, tagged as inoperable and placed in an open space removed from the work area.

5. Oxygen cylinders and fittings will be kept away from oil or grease.

6. When cylinders are hoisted, they will be secured in a cradle, sling-board, or pallet. Valve protection caps will not be used for lifting cylinders from one vertical level to another.

3.0 LADDERS

1. A competent person to identify any unsafe conditions will periodically inspect ladders.

2. Those ladders with structural defects will be removed from service, and repaired or replaced.

3. Straight ladders used on other than stable, level, and dry surfaces must be tied off, held, or secured for stability.

4. Portable ladder side rails will extend at least three feet above the upper landing to which the ladder is used to gain access.

5. The top or top step of a stepladder will not be used as a step.

4.0 AERIAL LIFTS

1. Aerial lifts include cherry pickers, extensible boom platforms, aerial ladders, articulating boom platforms, vertical towers, and any combinations of the above.

2. Only authorized and trained persons will operate aerial lifts.

3. Lift controls will be tested each day before use.

4. Safety harness will be worn when elevated in the aerial lift.

5. Lanyards will be attached to the boom or basket.

6. Employees will not belt off to adjacent poles, structures, or equipment while working from an aerial lift.

7. Employees will always stand firmly on the floor of the basket, and will not sit or climb on the edge of the basket.

8. Planks, ladders, or other devices will not be used for work position or additional working height.

9. Brakes will be set and outriggers will be used.

10. The aerial lift truck will not be moved with the boom elevated and employees in the `basket, unless the equipment is specifically designed for such.

5.0 CRANES

1. A competent person prior to each use/during use to make sure it is in safe operating condition will inspect all cranes. Also, a certification record of monthly inspections to include date, inspector signature, and crane identifier will be maintained.

2. A thorough annual inspection of hoisting machinery will be made by a competent person, or by a government or private agency, and records maintained.

3. Loads will never be swung over the heads of workers in the area.

4. Employees will never ride hooks, concrete buckets, or other material loads being suspended or moved by cranes.

5. Hand signals to crane operators will be those prescribed by the applicable ANSI standard to the type of crane in use.

6. Tag lines must be used to control loads and keep workers away.

7. Loads, booms, and rigging will be kept at least 10 feet from energized electrical lines rated 50 KV or lower unless the lines are de-energized. For lines rated greater that 50 KV follow OSHA Rules and Regulations, 1926.550(a)(15).

8. Cranes will always be operated on firm, level surfaces, or use mats/pads, particularly for near-capacity lifts.

9. Accessible areas within the swing radius of the rear of the rotating superstructure of the crane, either permanently or temporarily mounted, will be barricaded in such a manner as to prevent employees from being struck or crushed by the crane.

10. If suspended personnel platforms are to be lifted with a crane, reference 1926.550(g) for general and specific requirements.

11. Rigging equipment (chains, slings, wire rope, hooks, other attachments, etc.) will be inspected prior to use on each shift to ensure it is safe. Defective rigging and equipment will be removed from service.

12. Job or shop hooks or other makeshift fasteners using bolts, wire, etc. will not be used.

13. Wire rope shall be taken out of service when one of the following conditions exist:

- In running ropes, 6 random distributed broken wires in one lay or 3 broken wires in one strand or one lay.
- Wear of one-third the original diameter of outside individual wires.
- Kinking, crushing, bird caging, heat damage, or any other damage resulting in distortion of the rope structure.
- In standing ropes, more than two broken wires in one lay in sections beyond end connections, or more than one broken wire at an end connection.

6.0 WELDING and BRAZING

1. Combustible material will be cleared from the area around cutting or welding operations.

2. Welding helmets and goggles will be worn for eye protection and to prevent flash burns.

3. Eye protection to guard against slag while chipping, grinding and dressing of welds will be worn.

4. Only electrode holders specifically designed for arc welding will be used.

5. All parts subject to electrical current will be fully insulated against the maximum voltage encountered to ground.

6. A ground return cable shall have a safe current carrying capacity equal to, or exceeding, the specified maximum output capacity of the arc-welding unit that it services.

7. Cables, leads, hoses, and connections will be placed so that there are no fire or tripping hazards.

7.0 TOOLS

1. Take special precautions when using power tools.

2. Defective tools will be removed form service.

3. Electric power tools will be the grounded-type or double insulated.

4. Power tools will be turned off and motion stopped before setting tool down.

5. Tools will be disconnected from power source before changing drills, blades or bits, or attempting repair or adjustment. Never leave a running tool unattended.

6. Power saws, table saws, and radial arm saws will have operational blade guards installed and used.

7. Unsafe/defective hand tools will not be used. These include sprung jaws on wrenches, mushroomed head of chisels/punches, and cracked/broken handles of any tool.

8. Portable abrasive grinders will have guards installed covering the upper and back portions of the abrasive wheel. Wheel speed ratings will never be less than the grinder RPM speed.

9. Compressed air will not be used for cleaning purposes except when pressure is reduced to less than 30 psi by regulating or use of a safety nozzle, and then only with effective chip guarding and proper personal protective equipment.

10. Abrasive blasting nozzles will have a valve that must be held open manually.

11. Only trained employees will operate powder-actuated tools.

12. Any employee furnished tools of any nature must meet all OSHA and ANSI requirements.

8.0 SAFETY RAILINGS AND OTHER FALL PROTECTION

1. All open sided floors and platforms six feet or more above adjacent floor/ground level will be guarded by a standard railing (top and mid rail, toeboard if required).

2. A stairway or ladder will be provided at any point of access where there is a break in elevation of 19 inches or more.

3. All stairways of four or more risers or greater than 30 inches high will be guarded by a handrail or stair rails

4. When a floor hole or opening (greater than two inches in its least dimension) is created during a work activity, through which a worker can fall, step into, or material can fall through, a cover or a safety guardrail must be installed immediately.

5. Safety nets will be provided when workplaces are more than 25 feet above the ground, water, or other surfaces where the use of ladders, scaffolds, catch platforms, temporary floors, safety lines, or safety belts, is impractical.

6. Safety harnesses, lanyards, lines, and lifelines may be used in lieu of other fall protection systems to provide the required fall protection.

7. Adjustment of lanyards must provide for not more than a six-foot fall, and all tie off points must be at least waist high.

8.1 Scaffolds

1. Scaffolds will be erected, moved, dismantled, or altered only under the supervision of a competent person qualified in scaffold erection, moving, dismantling, or alteration.

2. Standard guardrails (consisting of top-rail and mid-rail) will be installed on all open sides and ends of scaffold platforms and/or work levels more than ten feet above the ground, floor, or lower level.

3. Scaffolds four to ten feet in height with a minimum horizontal dimension in any direction less than 45 inches will have standard railings installed on all open sides/ends.

4. Platforms at all working levels will be fully planked. Planking will be laid tight with no more than one inch space between them, overlap at least 12 inches, and extend over end supports 6 - 12 inches.

5. The front edge of all platforms will be no more than 14 inches from the face of the work, except plastering/lathing may be 18 inches.

6. Mobile scaffolds will be erected no more than a maximum height of four times their minimum base dimension.

7. Scaffolds will not be overloaded beyond their design loadings.

8. Scaffold components should not be used as tie-off/anchor points for fall protection devices.

9. Portable ladders, hook-on ladders, attachable ladders, integral prefabricated scaffold frames, walkways, or direct access from another scaffold or structure will be used for access when platforms are more than two feet above or below a point of access.

10. Cross braces will not be used as a mean of access to scaffolds.

11. Scaffolds will not be erected, used, dismantled, altered, or moved such that they or any conductive material handled on them might come closer to exposed and energized power lines than the following:

- Three feet from insulated lines of less than 300 volts;
- Ten feet plus for any other insulated or un-insulated lines.

8.2 Excavations and Trenches

1. Any excavation or trench five feet or more in depth will be provided cave-in protection through shoring, sloping, benching, or the use of hydraulic shoring, trench shields, or trench boxes.

2. Trenches less than five feet in depth and showing potential of cave-in will also be provided cave-in protection. Specific requirements of each system are dependent upon the soil classification as determined by a competent person.

3. A competent person will inspect each excavation/trench daily prior to start of work, after every rainstorm or other hazard-increasing occurrence, and as needed throughout the shift.

4. Means of egress will be provided in trenches four feet or more in depth so as to require no more than 25 feet of lateral travel for each employee in the trench.

5. Spoil piles and other equipment will be kept at least two feet from the edge of the trench or excavation.

9.0 MOTOR VEHICLES AND MECHANIZED EQUIPMENT

1. All vehicles and equipment will be checked at the beginning of each shift, and during use, to make sure it is in safe operating condition.

2. All equipment left unattended at night adjacent to highways in normal use shall have lights or reflectors, or barricades with lights or reflectors, to identify the location of the equipment.

3. When equipment is stopped or parked, parking brakes shall be set. Equipment on inclines shall have wheels chocked as well as having parking brakes set.

4. Operators shall not use earth-moving or compaction equipment having an obstructed rear view unless vehicle has an audible reverse signal alarm, or is backed only when observer says it is safe to do so.

5. All vehicles shall have in operable condition:

- Horn (bi-directional equipment)
- Seats, firmly secured, for the number of persons carried. Passengers must ride in seats.
- Seat belts properly installed.
- Service, parking and emergency brake system.
- All vehicles with cabs will be equipped with windshields with safety glass.
- All material handling equipment will equipped with rollover protective structures.

10.0 MISCELLANEOUS

1. All protruding reinforcing steel, onto and into which employees could fall, shall be guarded to eliminate the impalement hazard.

2. Enclosed chutes will be used when material, trash, and debris are dropped more than 20 feet outside the exterior walls of a building. A substantial gate will be provided near the discharge end of the chute, and guardrails at the chute openings into which workers drop material.

3. Only trained employees will service large truck wheels. A cage or other restraining device plus an airline assembly consisting of a clip-on chuck, gauge, and length of hose will be used to inflate any large truck tires.

4. Only trained employees will operate forklifts and other industrial trucks.

ATTACHMENT VI

OSHA's Form 301
Injury and Illness Incident Report

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.

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

Form approved OMB no. 1218-0176

This *Injury and Illness Incident Report* is one of the first forms you must fill out when a recordable work-related injury or illness has occurred. Together with the *Log of Work-Related Injuries and Illnesses* and the accompanying *Summary,* these forms help the employer and OSHA develop a picture of the extent and severity of work-related incidents.

Within 7 calendar days after you receive information that a recordable work-related injury or illness has occurred, you must fill out this form or an equivalent. Some state workers' compensation, insurance, or other reports may be acceptable substitutes. To be considered an equivalent form, any substitute must contain all the information asked for on this form.

According to Public Law 91-596 and 29 CFR 1904, OSHA's recordkeeping rule, you must keep this form on file for 5 years following the year to which it pertains.

If you need additional copies of this form, you may photocopy and use as many as you need.

Completed by _____

Title _____

Phone (_____)_____--_____ **Date** ____/ ____/ ____

Information about the employee

1) **Full name** _____

2) **Street** _____

City _____ **State** _____ **ZIP** _____

3) **Date of birth** _____ / _____ / _____

4) **Date hired** _____ / _____ / _____

5) ❒ **Male**
❒ **Female**

Information about the physician or other health care professional

6) **Name of physician or other health care professional** _____

_____

7) **If treatment was given away from the worksite, where was it given?**

Facility _____

Street _____

City _____ **State** _____ **ZIP** _____

8) **Was employee treated in an emergency room?**
❒ **Yes**
❒ **No**

9) **Was employee hospitalized overnight as an in-patient?**
❒ **Yes**
❒ **No**

Information about the case

10) **Case number from the *Log*** _____ *(Transfer the case number from the Log after you record the case.)*

11) **Date of injury or illness** _____ / _____ / _____

12) **Time employee began work** _____ **AM / PM**

13) **Time of event** _____ **AM / PM** ☐ **Check if time cannot be determined**

14) ***What was the employee doing just before the incident occurred?*** **Describe the activity, as well as the tools, equipment, or material the employee was using. Be specific.** ***Examples:*** **"climbing a ladder while carrying roofing materials"; "spraying chlorine from hand sprayer"; "daily computer key-entry."**

15) ***What happened?*** **Tell us how the injury occurred.** ***Examples:*** **"When ladder slipped on wet floor, worker fell 20 feet"; "Worker was sprayed with chlorine when gasket broke during replacement"; "Worker developed soreness in wrist over time."**

16) ***What was the injury or illness?*** **Tell us the part of the body that was affected and how it was affected; be more specific than "hurt," "pain," or sore."** ***Examples:*** **"strained back"; "chemical burn, hand"; "carpal tunnel syndrome."**

17) ***What object or substance directly harmed the employee?*** ***Examples:*** **"concrete floor"; "chlorine"; "radial arm saw."** ***If this question does not apply to the incident, leave it blank.***

18) ***If the employee died, when did death occur?*** **Date of death** _____ / _____ / _____

APPENDIX F

Community Air Monitoring Program

1800 PARK AVENUE
NEW YORK, NEW YORK

COMMUNITY AIR MONITORING PROGRAM

NYSDEC BCP Number: C231041

Prepared for:
Harlem Park Acquisition LLC
30 West 21st Street, 11th Floor
New York, New York 10010

Prepared by:
Arnold F. Fleming, P.E. &
Fleming-Lee Shue Inc.
158 West 29th Street, 9th Floor
New York, NY 10001
(212) 675-3225

DECEMBER 2015

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1.0 Purpose

This Community Air Monitoring Program (CAMP) has been prepared for the 1800 Park Avenue, Brownfield Cleanup Program (BCP) site # C231041, located on Block 1749, Lots 33 in New York, New York (hereafter referred to as the "Site"). The purpose of the CAMP is to protect downwind receptors (e.g., residences, businesses, schools, nearby workers, and the public) from potential airborne contaminants released as a direct result of the site management activities, including groundwater monitoring, possible remedial activities, and any future development. The CAMP helps to confirm that work related to the SMP does not spread airborne contamination off-site by providing real-time monitoring protocols for VOCs and particulates (i.e., dust) at the downwind Site perimeter while monitoring, remedial activities, and future development are in progress. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown.

The CAMP does not establish action levels for worker respiratory protection, which are given in the Health and Safety Plan included in Appendix E of the SMP and developed in accordance with 40 CFR 1910 and 1920.

2.0 Contaminant Source

The main contaminants of concern in Site soils are semi-volatile compounds including poly aromatic hydrocarbons (PAHs) typically found in fill material. Metals represent a secondary and minor concern.

3.0 Remedial Activities

The Site was excavated to approximately 13 feet below surface grade (ft-bsg) for redevelopment purposes, with the exception of the perimeter of the Site. Soil around the perimeter of the Site along the north, south and east property boundaries was left in place in order to achieve a 12-foot offset from the property boundary and a 1 to 1 slope to the bottom of excavation. Soil from all hotspot grids was excavated to 13 ft-bgs, including the perimeter hotspot grids where soil was excavated to 13 ft-bgs and backfilled with soil from the Site to maintain the desired slope along the perimeter of the Site. The Site was backfilled with a 2-foot composite cover consisting of recycled concrete aggregate (RCA).

4.0 Receptor Population

Potentially exposed receptors during remediation are passersby, and, to a lesser degree, individuals living, working, and shopping in the vicinity of the project.

5.0 Monitoring Plan

While excavating, stockpiling, or otherwise handling on-site soils, the proposed CAMP, entailing upwind and downwind perimeter monitoring, will be implemented as described in the following sections. Due care will be taken to monitor and control fugitive odors and dust emissions from the Site, minimizing the risk of exposure to the surrounding receptor population during remediation. Figure 1 is a site plan showing the location of air sampling stations based on generally prevailing wind conditions.

5.1 Continuous Monitoring

Continuous monitoring will be conducted for all ground-intrusive activities and any handling of soils on the Site.

5.2 Periodic Monitoring

Periodic VOC monitoring will occur during non-intrusive activities such as collection of groundwater samples from monitoring wells and soil samples for disposal characterization.

5.2.1 VOC Monitoring, Response Levels, and Actions

VOCs will be continually monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) using a PID. Upwind concentrations will be measured at the start of each workday and periodically thereafter to establish background conditions. The PID will be calibrated at least daily, or more often if needed. The PID will be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

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

- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work may resume, provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or

residential/commercial structure, whichever is less (but in no case less than 20 feet) is below 5 ppm over background for the 15-minute average.

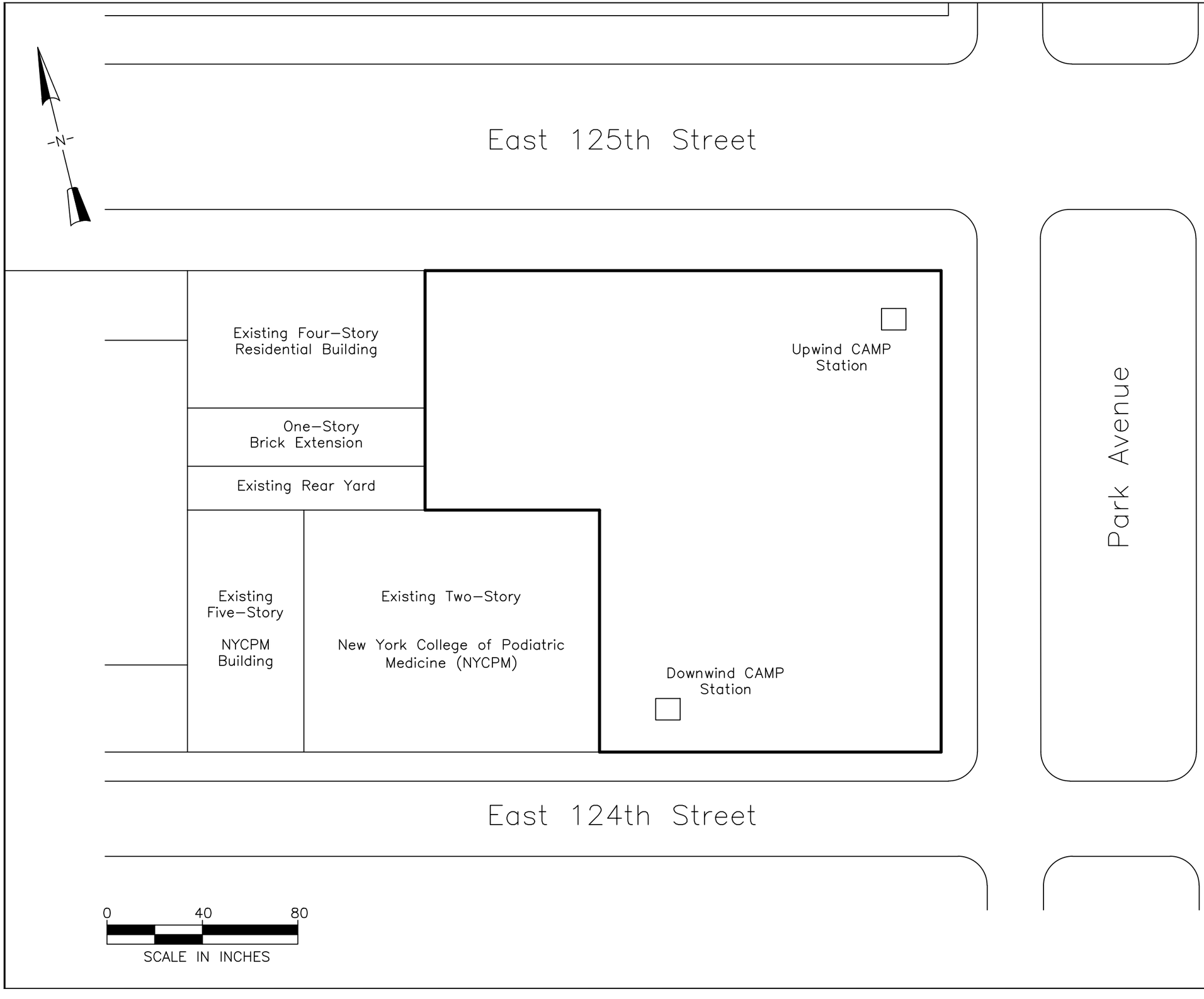
- If the organic vapor level is above 25 ppm at the perimeter of the work area, work must cease. All 15-minute readings must be recorded and be available for State (DEC and DOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

5.2.2 Particulate Monitoring, Response Levels, and Actions

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

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

If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 $\mu g/m^3$ above the upwind level, work will cease and a re-evaluation of activities initiated. Work may resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 $\mu g/m^3$ of the upwind level and in preventing visible dust migration. All readings must be recorded and be available for State (DEC and DOH) personnel to review.



FILE: P:\10207 – Continuum Company LLC\Figures\SMP\CAMP\FIG 1 – CAMP Station Locations.dwg DATE: 12/16/2015

Fleming Lee Shue

Environmental Management & Consulting

158 West 29th Street, 9th Floor
New York, NY 10001

FIGURE 1

1800 Park Avenue
New York, NY

CAMP STATION LOCATIONS

Date
December 2015

Project Number
10207-001

LEGEND

Site Boundary

APPENDIX G

Site Management Form

Site Inspection Form
BCP Site C231041
1800 Park Avenue
New York, New York

Name of Inspector _____

Company _____

Date of Inspection _____

Current Site Use _____

Has a change of use occurred since the last certification? _____ Yes _____ No

If yes, explain: _____

_____

_____

General Description of Engineering Control:

_____

_____

_____

Are the Engineering Controls functioning as intended? _____ Yes? _____No?

If No, then explain: _____

_____

_____

If No, what corrective actions should be taken: _____

_____

_____

_____

Signature and Date

APPENDIX H

Quality Assurance Project Plan **(**QAAP)

Harlem Park
1800 Park Avenue, New York, New York
BCP Site No. C231041

QUALITY ASSURANCE PROJECT PLAN

Prepared For:
Harlem Park Acquisition LLC
30 West 21st Street, 11th Floor
New York, New York 10010

Submitted to:
New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 2
47-40 21st Street
Long Island City, NY 11101-5407

Prepared by:
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August 2015

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ATTACHMENTS

1.0 INTRODUCTION

The Quality Assurance Project Plan (QAPP) outlines the protocols and procedures that will be followed during site management at "Harlem Park" located at 1800 Park Avenue between 124th and 125th Streets (hereafter referred to as the "Site"). The Site is part of the Brownfield Cleanup Program (BCP), administered by New York State Department of Environmental Conservation (NYSDEC). The Site was remediated in accordance with a Brownfield Cleanup Agreement, which was executed on January 20, 2005 and amended on June 23, 2006, June 6, 2013 and July 8, 2015.

A Site Location Map is included as Figure 1 and Site Plan as Figure 2. This QAPP has been prepared in order to ensure Quality Assurance (QA) and Quality Control (QC) for the environmental sampling activities which will be conducted as outlined in the Draft Site Management Plan (SMP), dated August 2016.

2.0 PROJECT TEAM

The project team will consist of professional and technical Fleming Lee-Shue, Inc. (FLS) personnel and subcontractors. All field personnel and subcontractors will have completed a 40-hour HAZWOPER training course and the annual HAZWOPER 8-hour refresher in accordance with the Occupational Safety and Health Administration (OSHA) regulations and will have the training required for their respective duties as outlined for this investigation. Current resumes for the Project Team are provided in Attachment A.

2.1 Remedial Engineer

The oversight of all aspects of the project will be conducted by the Remedial Engineer (RE). The RE is responsible for compliance with the SMP. Arnold F. Fleming, P.E., will act as the RE for the site management action at the Site.

2.2 Project Manager

All components of the Remedial Investigation will be directed and coordinated by the Project Manager. He/she will ensure a smooth flow of information between all parties involved in the investigation by communicating regularly with professionals from the NYSDEC, the Site management personnel, and all members of the FLS project team. Camila Israel, senior project manager, will act as the Project Manager for the project.

2.3 Field Team Leader

Daily onsite sampling and health and safety activities will be supervised by a Field Team Leader. The Team Leader's responsibilities will include ensuring adherence to the SMP and Health and Safety Plan (HASP) and regularly reporting daily progress and deviations from the SMP to the Project Manager. FLS will assign the role of Field Team Leader to appropriate FLS personnel.

2.4 Project Quality Assurance / Quality Control Officer

Adherence to the QAPP will be ensured by a FLS QA/QC Officer. Tasks will include reviewing the QA procedures with all personnel before any fieldwork is conducted on-site as well as completing periodic site visits in order to assess the implementation of these procedures. Camila Israel will act as the QA/QC officer for the investigation.

2.5 Laboratory Quality Assurance / Quality Control Officer

Quality control procedures will be ensured by a laboratory QA/QC officer in the designated laboratory. This officer will be responsible for the adherence to laboratory protocols, quality control procedures, and checks in the laboratory. The officer will track

the movement of the samples from laboratory receipt of the samples to issuance of the analytical results, conduct a final check on the analytical calculations, and sign off on the laboratory reports. The laboratory QA/QC Officer will be assigned by the laboratory for this remedial investigation.

3.0 SAMPLING PLAN

3.1 Soil Vapor Sampling Plan

Environmental sampling will include soil vapor sampling. The potential for soil vapor intrusion will be evaluated via collection of three sub-slab soil vapor samples from underneath the existing foundation slab, three indoor air samples at each sub-slab soil vapor sampling location and one outdoor ambient air sample for background comparison.

3.2 Laboratory Methods

The sample container type, preservation, applicable holding time, and laboratory methods of analysis of the field samples have been included as Table 1. Holding times are based on the SW-846 analytical method which, when adjusted to account for an assumed 2-day sample shipping time, match NYSDEC Analytical Services Protocol (ASP) holding times. Soil vapor samples will be will be analyzed using EPA Method TO-15. Sample analyses will be completed in a New York State Department of Health Environmental Laboratory Approval Program (NYSDOH-ELAP) certified laboratory and reported using July 2005 NYSDEC ASP "Category B" deliverables. The data will be submitted to NYSDEC in EqUIS Electronic Data Deliverable format.

3.3 Quality Control Sampling

Additional analysis will be conducted for quality control assurance in addition to the laboratory analysis of the soil vapor samples. Quality control samples will include: one set of duplicate samples per twenty field samples. An Analytical Methods/Quality Assurance Summary is included as Table 1.

4.0 STANDARD OPERATING PROCEDURES

The standard operating procedures for soil vapor sampling and Site inspections are described in the following sections. Safety monitoring will be performed in accordance with the Site specific HASP, sections of which mandate that all field personnel wear the appropriate personal protective equipment (PPE).

4.1 Soil Vapor Sampling

Sub-slab soil vapor samples will be collected by driving a sample probe approximately 5 feet below grade (ft-bg) using a Geoprobe® rig or a portable hand-held roto-hammer, inserting a 5/8-inch-diameter steel shaft with a hardened point and retractable slotted intake attached to a length of dedicated Teflon or polyethylene tubing into the hole. Once the soil vapor sampling probe is secured, the shaft will be retracted to expose the screen, the annulus sealed with clay and/or bentonite, and a vacuum applied to the sampling probe head and the system purged to allow the collection and subsequent analysis of a representative sample of soil vapor. A minimum of one soil vapor volume will be purged from the borehole before collecting the sample according to New York State Department of Health (NYSDOH) requirements. With the vacuum maintained, soil vapor samples will be collected using Summa Canisters by attaching the tubing to the dedicated SUMMA canister flow controller set to a sampling rate of 0.2 liters/minute or less. Indoor air and outdoor ambient air samples will be collected using Summa Canisters with dedicated SUMMA canister flow controller set to a sampling rate of 0.2 liters/minute or less.

*4.*2 Sample Handling

4.2.1 Sample Identification

All samples will be consistently identified using an alphanumeric code. Identification will follow the sample identification theme outlined in the table below.

Sample Type	Prefix	Suffix 1	Suffix 2	Example
Soil vapor	SV	Grid Designation	Quadrant Designation	SV-A1(III)
Indoor Air	IA	Grid Designation	Quadrant Designation	IA-B3(I)
Ambient Air	AA	Grid Designation	Quadrant Designation	AA-C1(V)

Grid and quadrant designations are shown on Figure 2.

4.2.2 Sample Labeling and Shipping

All sample containers and chains of custody (COC) must contain the following information on the label:

- Project identification
- Sample identification
- Date and time of collection
- Analysis(es) to be performed
- Equipment identification numbers
- Samplers initials

Sample shipping will occur at the close of each workday. Samples may be shipped overnight (e.g., via Federal Express or transported by a laboratory courier.) All containers shipped to the laboratory will be sealed with mailing tape and a COC seal to ensure that the coolers remain sealed during delivery.

4.2.3 Sample Custody

Field personnel will be responsible for maintaining the samples in a secured area until shipment to the laboratory. Sample possession record from the time of obtainment in the field to the time of delivery to the laboratory or shipping off-site will be documented on COC forms. The COC forms will contain the following information: project name; names of sampling personnel; sample number; date and time of collection; matrix; equipment identification numbers; signatures of individuals involved in sample transfer; and the dates and times of transfers. Laboratory personnel will examine the custody seal's condition at sample check-in.

4.3 Field Instrumentation

Equipment will be calibrated at the start of each day of field work in accordance with the manufacturer's specifications. In the instance that an instrument fails calibration, the Project Manager or QA/QC Officer must be contacted immediately so as to arrange repairs or obtain a replacement instrument. A calibration log will be maintained on-site in order to record specific details regarding instrument calibration, including: dates, problems, and corrective actions. The PID will be calibrated each day using a standard of 100 parts per million (ppm) isobutylene, zeroed as per manufacturer specifications.

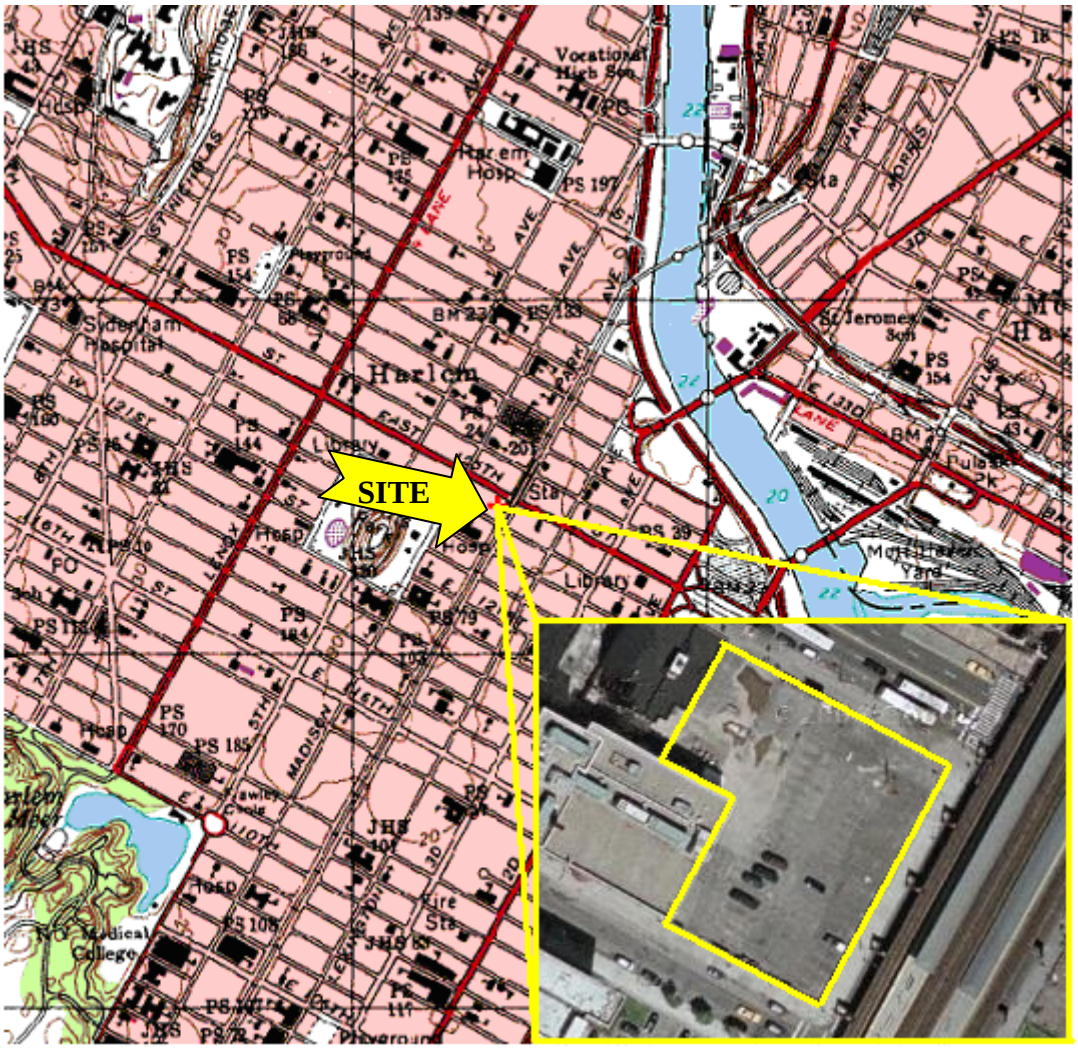
Field personnel will be trained in the proper operation of all field instruments at the start of the field program; however, instruction manuals for all equipment will be stored on-site as a reference of the proper procedures for operation, maintenance and calibration.

5.0 DATA VALIDATION

The sample analytical reports will undergo a third party review of the analyses conducted. The third party will prepare a Data Usability Summary Report (DUSR) in accordance with NYSDEC DER-10 Appendix 2B Guidance for data Deliverables of Data Usability Summary Reports.

FIGURES

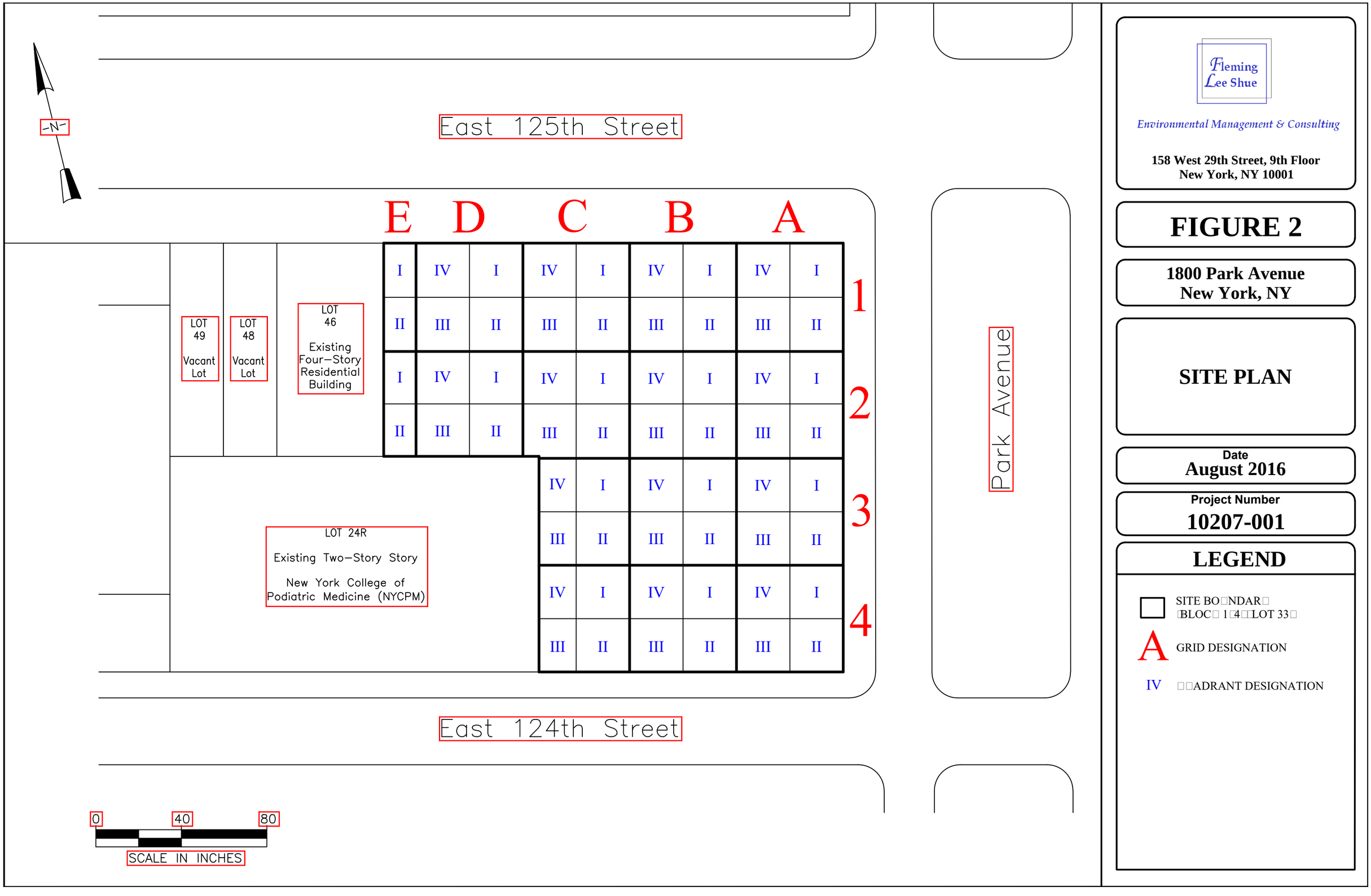
FIGURE 1: SITE LOCATION



Approximate Scale: 1" ≈ 24,000'
Source Map: USGS Central Park

Fleming Lee Shue

SITE: Harlem Park
1800 Park Avenue,
New York, New York
BCP Site # C231041



FILE: P:\10207 - Continuum Company LLC\Figures\SMP\FIG 2 - Site Plan.dwg DATE: 8/25/2016

Fleming Lee Shue

Environmental Management & Consulting

158 West 29th Street, 9th Floor
New York, NY 10001

FIGURE 2

1800 Park Avenue
New York, NY

SITE PLAN

Date
August 2016

Project Number
10207-001

LEGEND

SITE BOUNDARY
BLOCK 164 LOT 33

A — GRID DESIGNATION

IV — QUADRANT DESIGNATION

TABLES

Table 1
Summary of Analytical Methods
Harlem Park
1800 Park Avenue
New York, New York

Sample Type	Sample Matrix	Analytical Parameter	No. of Samples[1]	Analytical Method	Sample Preservation	Holding Time[2]	Sample Container
Soil Vapor/Indoor Air/Ambient Air	Air	VOCs	TBD	TO-15	NA	30 days to analysis	SUMMA Canisters

[1] Actual number of samples may vary depending on field conditions, sample material availability, and field observations
[2] From date of sample collection, assume 2 days for sample shipping
TBD - To Be Determined
NA – Not applicable, no specific preservation requirements

ATTACHMENT A

Fleming Lee Shue

Environmental Management & Consulting

Arnold F. Fleming, PE

Education
- Bachelor of Science, Civil Engineering, Manhattan College (1968)
- Masters of Engineering, Manhattan College (1969)

Professional Registration
Professional Engineer, New York

General Expertise
Arnold F. Fleming is an environmental engineer with over 40 years of experience in the areas of water quality and planning studies, domestic and industrial wastewater treatment and disposal, environmental impact analysis, contaminated materials assessment and remediation, and environmental permitting. Mr. Fleming was one of the founders of Allee King Rosen & Fleming, Inc., AKRF, Inc., and AKRF Engineering P.C. For over 20 years, Mr. Fleming has provided these firms with engineering expertise in all technical areas relating to permitting and hazardous waste assessment and management and the assessment of impacts in these technical areas. Mr. Fleming has been Principal in charge for Phase II Environmental Assessments for over 100 residential, commercial and industrial sites in the Metropolitan New York area. Duties include design of sampling program, oversight of means and methods of sample collection, and preparation of final reports including recommendations for remediation. He has also been involved with the design for over 50 remediation systems including UST tank removals, contaminated soil disposal, soil vapor extraction systems, sparged air/ soil vapor extraction systems. Remedial designs include approximately 20 sites remediated under the State of New York Voluntary Clean-up program, and two sites on the Registry of Inactive Hazardous Waste Sites. Mr. Fleming has been the Principal in charge of the preparation of Phase I Environmental Assessments for several hundred residential, commercial and industrial properties, as well as several hospitals throughout the New York Metropolitan Area. He has been the Project manager for the preparation of 208 wastewater facility planning studies, and has prepared the infrastructure and utility assessments for over 100 EIS's in the Metropolitan New York Area.

PROJECT EXPERIENCE

535 West 23rd Street Development
Prepared the Phase I and asbestos surveys for this Manhattan development site. Designed the Phase II sampling program, executed the sampling and on the basis of the findings obtained approval to remediate an extensive oil spill via bio-remediation. The system was designed and installed under the new building with operation to begin upon occupancy of

the building. The approach allowed the construction schedule to proceed without delay due to the discovered contamination.

Queens West Redevelopment
Technical representative to the Queens West Development Corporation (QWDC), a subsidiary to the Empire State Development Corporation, charged with developing the 78 area redevelopment of the Hunters Point waterfront into a mixed commercial/residential development. Mr. Fleming developed a model remediation plan for the first residential building in 1995 and has applied this model to the next three residential development sites in Stage 1 of the development, the first having opened for residency in the summer of 2002. Mr. Fleming is assisting QWDC in selecting a developer for Stage 2 and 4 and is advising them on the remediation of Stage 2, a former oil refinery and paint factories. Development of Stage 2 is to occur simultaneous to the remediation efforts in the refinery portion of the site.

Staten Island Muss Site Redevelopment
Managed the initial Phase II sampling for this former industrial site re-zoned for single family residential development. The site was listed on the Registry of Inactive Hazardous Waste Sites. Prepared in Remedial Investigation and Feasibility Studied that led to a Record of Decision (ROD) setting forth the remediation for the site. Prepared the remedial Design to satisfy the ROD and managed the oversight of the remediation leading up to the removal of the site from the registry. Designed a revetment system to protect the capping material that was an integral part of the remediation from storm related erosion from the adjacent Raritan Bay. Petitioned the Federal Emergency Management Agency to remove the site from the 100-year flood plain on the basis of the new elevations and erosion measures implemented on the site.

Rego Park, Queens Remediation
Prepared a Voluntary Clean-up Application, performed additional sampling and developed a remedial work plan to remove solvent contaminated soils from this development site. Designed a sparged air/ Vapor Extraction System to remediated contaminated groundwater and site soils. Operated the system for two years reducing the groundwater contamination by over 90%. The sparged air / VES was designed to be installed under the building avoiding the delay of remediation the site prior to construction.

Hudson River Park Redevelopment
For this new park stretching from Battery Park City to 59th Street, Mr. Fleming oversaw the preparation of the US Army Corps of Engineers and the New York State Department of Environmental Conservation permit application s and responses to comments leading to issuance of this waterfront development permit. This permit was unique in that it addressed the first segment that was designed and ready to be built as well as the entire park for which no design was available. To address the future segments, schematic design drawings were submitted showing conceptual designs that would be refined as the park was designed and build. A permit condition to submit each segment design for review and determination of consistency with the master permit was included to assure that no impacts were introduced in the design process. If a determination on any segment were

made that the design was not consistent with the master permit, a new permit process would be initiated.

East New York Rezoning, Brooklyn, NY
Mr. Fleming was the Principal-in-Charge of the Fleming-Lee Shue, Inc. (FLS) team hired by Philip Habib Associates to evaluate the potential of hazardous materials in soil and/or groundwater at both the projected and potential development sites identified in the reasonable worst-case development scenario (RWCDS) under the proposed East New York Rezoning Proposal. Mr. Fleming prepared the Hazardous Materials chapter of the Environmental Impact Statement for East New York Rezoning, submitted March 2015, and addressed comments from the Department of City Planning. All development sites within the rezoning area were determined to meet the criteria for an (E) Designation.

Harlem River Brownfield Opportunity Area (BOA) Nomination Study, Bronx, NY
Mr. Fleming prepared an environmental report assessing properties within the Harlem River BOA that may require restoration of environmental quality. Mr. Fleming evaluated the conditions and historic uses of 26 strategic development sites and for environmental impact on-site or from surrounding properties. The study further evaluated the potential for environmental impacts to impact development. This assessment was included in the Property Report and Environmental Report submitted by Abel Bainnson Butz, LLP to the New York City Department of Parks and Recreation, Bronx Council for Environmental Quality.

West Side Ferry Terminal
For the New York City Economic Development Corporation, Mr. Fleming led the permit effort to allow a new public ferry terminal located within the bounds of the Hudson River Park. Because the ferry terminal was not approved when the Park permit was issued, this project was carved out of the park permitting process and followed a separate permit track. The permit application was assembled using updated submissions from the Park permit application and addressed the specific concerns of the State and federal permitting.

Greenpoint Brooklyn Waterfront Development Planning

For a private developer, Mr. Fleming has prepared an evaluation of the permitting concerns including a jurisdictional assessment of the existing waterfront edge, to assist in the establishing of a development plan that will be compatible with the requirements of federal and state permits.

Queens West Redevelopment Permitting
Mr. Fleming led the permitting effort to allow redevelopment of the waters edge associated with this 78 acre mixed Commercial/Residential waterfront development. The project has three stages, the first under construction and permitted in 1995. Mr. Fleming managed the permitting effort for this first waterfront permit. The current application to the state and federal permitting agencies is for a project wide permit covering the remaining 3 stages of which 2 are under design. The final stage of the project was the

subject to a schematic design only. Notable in the current permit is the reconstruction of collapsed platforms that are to become a site wide park and esplanade providing water access to this portion of the east river for the first time in over a century.

Jersey City Colgate Site Redevelopment
For this mixed commercial/residential waterfront redevelopment project, Mr. Fleming prepared the state Coastal Zone Development permit and a US army Corp of Engineers dredge and fill permit to allow a marina, esplanade and a new combined sewer manifold to be built. The sewer manifold was placed in the river because of space limitations and was permitted, the first fill permit in this portion of the Hudson River in 20 years.

River East Environmental Permits for Shoreline Protection
For this 10 acre site obtained the permits to install 500 feet of revetment to allow a 1.4 million square foot residential development on a former oil terminal. Also prepared the Remedial Action Work Plan to remove historic spilled oil simultaneous to Vernon Realty shoreline construction.

Fleming Lee Shue

Environmental Management & Consulting

Camila Israel
Senior Project Manager

Education
B.S., Chemical Engineering, America University, Bogota, Colombia

Awards / Certifications / Training
- OSHA 40-HAZWOPER Training
- OSHA 8-Hour Supervisor Training
- GIS Mapping and Surveying
- Primavera Scheduling
- First Aid/CPR/AED
- Publication: Vacuum Driven In-Well Air Stripping and Re-Circulation. Association for Environmental Health and Sciences (AEHS). March 2015

General Expertise
Camila Israel is a Senior Project Manager with 13 years of professional experience in environmental engineering and consulting services in the North and Southeast regions of the United States as well as Latin America. Expertise includes scope development and project management of remediation projects at different lifecycle stages: scoping and implementation of subsurface investigation, receptor assessments, soil vapor intrusion studies, development and evaluation of innovative technologies and environmental strategies to address environmental impacts in multiple media. Camila has vast experience in preparation and tracking of cost-to-closure forecasts. Camila is fluent in English and Spanish and uses her language proficiency while interfacing with clients, contractors and multiple regulatory agencies such as New York State Department of Environmental Conservation (NYSDEC), New York City Department of Environmental Protection (NYCDEP), New York City Department of Buildings (NYC DOB), New York City Office of Environmental Remediation (OER), Army Corp of Engineers (USACE), New York Department of State (NY DOS), New York State Department of Health (NYSDOH), and New York City Small Busineess Services.

Camila currently manages projects under the NYSDEC Brownfield Clean-up Program (BCP), NYSDEC Inactive Hazardous Waste Sites, NYC Office of Environmental Remediation (NYCOER) Voluntary Cleanup Program (VCP) and NYCOER little “e”-designated sites, including hazardous materials, noise attenuation, and air quality.

PROJECT EXPERIENCE
Queens Plaza Residential Development, NY
The site consists of three different NYSBCP sites, under the NYSDEC, associated to creosote impacts from former manufacturing operations. The Site is currently being

developed with three high-rise apartment buildings with commercial space on the groundfloor and several accessory buildings. Responsabilities incluide manage and oversee the multiple phases of the remediation project that range from remedial investigation to remedy implementation and monitoring. The successful execution of the work project requires a high level of coordination with multiple parties and city and federal agencies.

West 17th Street and 10th Avenue Redevelopment, NY

The site is approximately 1.2 acres that was recently redeveloped with a large high-rise apartment building with a footprint of approximately 52,000-square feet and a first-floor commercial retail plaza. The petroleum-related impacts were treated under the NYSBCP and a Notice of Completion was received October 2008. Currently manage the site management plan that includes sampling and inspections of engineering controls in a routinely basis and preparation of periodic annual reports.

Retail Petroleum Facilities Portfolio, NY

Served as senior project manager for remediation projects associated with multiple retail petroleum sites in the metro area. Responsibilities included budget forecasting and management of a portfolio ranging from $500,000 to $1,000,000 annual revenue. Supervised an engineering team responsible for completing due diligence and Phase I Environmental Site Assessments related to real estate transactions. Scoped development of remedial investigation and feasibility studies. Coordinated and implemented remedial actions that include soil excavation and in-situ treatments. Design the installation of engineering controls (vapor barriers and sub slab depressurization systems).

Bulk Storage Terminal, Brooklyn, NY

Served as senior project manager during the installation of a water treatment system in a bulk storage facility in Brooklyn, NY. The system treats petroleum impacted groundwater before its discharge to navigable waters in the state of NY. Work required interaction with DOB, USACE, NYC SBS, DOS, NYSDEC, and NYCDEP, and compliance with environmental and construction regulations. Prepared permitting documentation for local, State and Federal agencies.

Real Estate Investment Trust, NJ/PA.

Served as project manager for a leading real estate investment trust that specializes in ownership, leasing and financing of retail motor fuel and convenience store properties, and petroleum distribution terminals. Responsible for managing client outsourced environmental liability and management of a portfolio comprised of over 100 service stations in New Jersey and Pennsylvania. Responsibilities also included budget forecasting and lifecycle management of a portfolio of sites with total annual budgets of over $2MM. Selected and supervised environmental consulting firms to manage remediation projects. Coordinated the preparation of institutional controls (environmental covenants) to allow for the long-term enforcement of engineering controls. Regulatory agency advocacy, management of accounts receivable, provide work authorization, reimbursement analysis and tracking for sites in Brownfield and Voluntary Cleanup programs.

Insurance Claim Investigation and Support, NY/NJ

Served as the regional lead and project manager for an international insurance company acting as environmental consultant to assist the insurance in claim determinations regarding underground storage tank claims and petroleum related spill investigations on a variety of properties in the Tri-State area. Provided technical consulting for reasonable and necessary determinations regarding the scope of work and financial spend related to clean-up of petroleum impacted sites. Prepared claim reports and tracking project spent.

Soil Vapor Intrusion Investigation, Brooklyn, NY

Served as project manager for an extensive soil vapor intrusion investigation of a former retail petroleum facility now a retail store. Responsible for the development and execution of a sampling plan in compliance with NYSDOH/EPA guidelines, which included the installation of numerous subsurface soil vapor sampling points and indoor/outdoor sampling of ambient air conditions to determine potential exposure.

Private Facility, Hempstead, NY

Provided field support services for the NYSDEC during the implementation of a air and sub-slab vapor sampling program at multiple residences and commercial properties in Roosevelt and North Hempstead, NY.

Industrial Site, Glen Falls, NY

Acted as a lead engineer and manager of a team of engineers tasked to research in-situ technologies for the remediation of soils and bedrock at a 45-acre facility located in Glens Falls, NY. The site operated a post-closure permit for activities related to former manufacturing operations and generation of large amounts of hazardous waste. Remedial options were evaluated to target soil and bedrock impacted by hexavalent chromium, cadmium, and other heavy metals.

Data Management, South Florida Water Management District, WPB, FL

Served as staff environmental specialist that provided technical support to the Data Evaluation & Reporting Section of the South Florida Waste Management District (SFWMD). Responsibilities included scientific data retrieving, data review and reporting.

GIS Services, South Florida Water Management District, West Palm Beach, FL

Assisted the district's Right of Way Division at the SFWMD in matching and integrating land property records into a geographic information system. This project received a "perfect score" from the SFWMD. Responsibilities included data entry and data evaluation using MS Access and conversion of AutoCAD drawings into GIS environment.

Public Involvement, State Road 7 (SR7) Florida Department of Transportation.

Worked as task leader for public involvement activities related to a road construction project in Palm Beach County. Responsibilities included coordinate deliverables and reports as part of the PD&E Study Report; assisted in the completing parts of the Air Quality Screening Report.

APPENDIX I

Field Sampling Logs

Harlem Park
1800 Park Avenue, New York, New York
BCP Site No. C231041

Soil Vapor Sampling Log

Date	Sampler Initials	Sample Type (SV, IA, AA)	Sample Name	Equipment			Time Start			Time Stop		
				Canister Serial No.	Canister Size (1L or 5L)	Flow Controller Serial No.	Time Started	Canister Pressure ("Hg)	Interior Temperature	Time Stop	Canister Pressure ("Hg)	Interior Temperature

Notes:
SV = Soil Vapor IA = Indoor Air AA = Ambient Air
"Hg = Inches of mercury
1L = 1 Liter

APPENDIX J

Field Sampling Plan (SOPs)

Harlem Park
1800 Park Avenue, New York, New York
BCP Site No. C231041

Field Sampling Plan and Standard Operating Procedures

Introduction

These standard operating procedures (SOPs) provide guidelines regarding soil vapor sampling for Harlem Park located at 1800 Park Avenue, New York, New York (the Site). The Site is bounded by 125th Street to the north, Park Avenue to the east, 124th Street to the south, and mixed use properties to the west including New York College of Podiatric Medicine

General Project Contact Information

Fleming-Lee Shue, Inc.

General FLS Office Number:	(212) 675-3225
General FLS Fax Number:	(212) 675-3224
Remedial Engineer	Arnold Fleming Mobile: (917) 885-1475
Project Manager	Camila Israel Mobile: (917) 399-5314
Project Manager and QA/QC Officer:	Camila Israel Mobile: (917) 399-5314

Subcontractors

Analytical Laboratory Accutest Laboratories PM - Tammy McCloskey	Office: (732) 355-4562
Rental Equipment Vendor Pine Environmental Contract Management Contact - John Jones Technical Assistance Contact – Bill Lindsay	Office: (800) 301-9663 Mobile: (215) 397-6311

HEALTH AND SAFETY

Please bring and refer to the Health and Safety Plan (HASP) for the Site. Make sure all members of the sampling team have read and signed the HASP. Sampling activities will be conducted in Level D which will include safety-toe boots and nitrile gloves at all times during setup, sampling, and breakdown. All disposable PPE will be bagged and disposed properly. Non-disposable PPE will be decontaminated as needed. Wash hands thoroughly, frequently and after work is complete.

SOIL VAPOR SAMPLING

Purpose and Objectives

The purpose of this SOP is to present guidelines for collecting soil vapor samples from sub-slab to be analyzed for volatile organic compounds via EPA Method TO-15.

Equipment Log

	Documents		Notes
1	Work Plan	☐	
2	HASP	☐	
3	Equipment Calibration Certs	☐	
4	Rental Slips	☐	
5	Laboratory COCs	☐	
6	Fed Ex Labels	☐	
	Equipment		
1	MGD 2000 Helium Detector	☐	
2	Charged OVM / PID	☐	
3	SKG Air Pump	☐	
4	Temperature Gauges (1 per sample depending on sample distance)	☐	
5	Brass Ball Valves	☐	
6	Adjustable Wrench / Multi Pliers	☐	
7	Knife	☐	
	If Appropriate Based on Workplan:		
1	BOSCH Hammer Drill w/ 30" bit	☐	
2	Temporary Stainless Steel Sample Points	☐	
3	Extension Cord	☐	
4	Hand Auger	☐	
	Materials		
1	Sample Containers (SUMMAs and Flow Controllers)	☐	
2	Nitrile Gloves	☐	
3	1/4" Masterflex Tubing	☐	
4	1/4" PE Tubing	☐	
5	Clay or Beeswax	☐	
6	PE Sheeting (if nec.)	☐	

Pre-Sampling Tasks

- Prior to any sampling, ensure that area of drilling/advancement has been cleared by utilizing a utility mark out or by hand clearing the hole;
- Identify sample locations and sampling naming theme prior to sampling;
- Take note of equipment identification numbers including the SUMMA canister and flow controllers;
- Take note of starting pressure (measured in "Hg).

Standard Operating Procedures

Instructions for Use of Geoprobe

1. If a hand-held Geoprobe is to be used, make sure that generators and other equipment are properly ventilated to ensure a healthy working environment and that samples are not contaminated.
    a. Try to insure that exhaust from non-handheld Geoprobe units (i.e. tractor, ATV-mounted) is minimized.
2. Upon completion of the hole, attach end of tubing extending from hole to a brass ball valve.
3. Attach the ¼" PE tubing that extends from the interior of a pre-drilled sampling bucket.
    a. This bucket is designed with two ports in the bottom of the bucket (on top when turned up side down) – one for the tube in the hole (hooked up to the ball valve) that will extend out of the bucket and eventually attached tot he pump, and another that extends to the free space inside the bucket.
        i. This tube, not attached to the ball valve set up and left free in the bucket is designed to allow Helium gas to enter the bucket. Proper procedures are listed below:
4. Helium Tracer Gas Procedure
    a. After insuring the MGD 2000 Helium Detector is zeroed by using the self zeroing feature on the main display. Button features a zero surrounded by 4 arrows pointing inward toward the zero.
    b. Attach the pump to the tube extending out the bucket (the one connected to the ball valve)
    c. Attach a small piece of flex tubing and about a foot and a half piece of PE tubing to the exit port of the pump
        i. Exit port is on the right side of the pump; clear with a round white filter
    d. With the ball valve open (parallel) turn on the pump, place the Helium detector wand into the PE tubing coming from the exit port of the pump.
    e. Take helium gas canister and attach the other PE tubing coming from the top of the bucket and turn on.
    f. Watch the helium detector – if helium is detected then there is a leak in the system
        i. Leaks
            1. the hole is not sealed – most likely
            2. there is a hole in the tubing somewhere
            3. the ball valve is not tight
            4. the bucket seal is compromised

    g. Correct any faults until helium detector until it does not read any helium coming from the exit port of the SKG pump.
5. Once there is a good seal, run the SKG for approximately 5 minutes in order to purge the tubing/sampling point.
6. Once time is up, WITH THE PUMP RUNNING, close the ball valve and THEN turn the pump off.
    a. This is done to ensure that a vacuum remains in the tubing.
7. Remove the bucket, pump and associated tubing.
8. Attach the flow controller regulator to the top of the SUMMA canister.
9. Attach the SUMMA canister to the tubing extending from the hole.
    a. Note: A small piece of flex tubing on the intake of the flow controller helps to attach the tubing extending from the hole.
10. Turn the valve on the SUMMA canister counterclockwise to open valve (pressure in the canister should be between -25 and -30 mm Hg) as well as the ball valve so that air is free flowing.
    a. Note: if pressure in the can seems to be decreasing rapidly or hissing sound is heard, immediately close the valve on the SUMMA canister and check the connection between the flow controller and the canister to ensure a tight fit. This may involve removing the flow controller and reattaching.
11. Record the pressure of the can, the time, the temperature and all other appropriate sampling information.
12. Once it is sampling interval is complete (depending on the time of the flow controller), check the amount of pressure left in the can. If the pressure is not below -5 mm Hg, let the canister sample longer to obtain a pressure below -5mm Hg. If the sample is below -5mm Hg, according to the lab one can let the sample continue until the can reaches zero, but it is not necessary.
    a. Note: Base the stopping pressure on the initial pressure of the can. If the initial pressure of the can is only -25mm Hg, then one should let the can completely run to zero; however, if the can is much greater than -30 mm Hg, one does not have to wait to reach zero, - 5 mm Hg is sufficient.
13. Once sampling is complete turn the valve on the SUMMA canister clockwise.
14. Remove the flow controller and prepare the sample for shipment.

Instructions for Use of BOSCH Hammer Drill

1. Use of a BOSCH hammer drill is preferable for the interior of buildings due to ease of patching and cleanup.
2. Unlock grip handle on BOSCH drill by rotating the handle counterclockwise and adjusting to comfort.
    a. Tip: perpendicular to the drill towards you works best as you will be able to brace the drill with your right inside thigh while drilling. The drill has a kick to it.
3. Make sure the selector switch is on the setting with a hammer and a drill. These are marked with pictures.
4. Get comfortable with the drill and make sure that you are in a position to apply pressure to top
    a. Tip: Hold the drill like a jack hammer so your weight is over the top of the drill and the handle is in your thigh. This position will allow you to keep the pressure on the drill (as its own weight is not often enough) while maintaining stability and drilling straight.
5. Begin drilling.

a. When drilling make sure that while you advance you pull the drill up to clear cuttings from the hole, otherwise drilling will be harder and take much longer

6. Advance until the drill is no longer hammering and it appears that you are in a much softer medium (i.e. soils).
    a. This may be hard to determine depending on the soils present at the site. A good way to tell is to watch the cuttings coming up from the drill. When soil is present, STOP; you do not want to create a void.
7. Once you're sure that the hole is sufficiently drilled below the slab, install a temporary soil vapor point.
    a. If the hole is particularly deep (at or greater than 2.5 feet) and you are unsure as to if there is a void or not, attach a piece of flex tubing to the top of the point and thread it down the hole with ¼" PE tubing so the point is not lost.
    b. Once you're sure that there is no void, place the point in the hole so that the stainless steel rod is extending out of the hole
        - if this is not possible due to the hole being deeper than the probe, use PE tubing to extend out of the hole.
    c. Run the tubing, seal the hole, perform the helium test, purge and sample as described above.

INDOOR AIR/AMBIENT AIR SAMPLING

Purpose and Objectives

The purpose of this SOP is to present guidelines for collecting indoor and ambient air samples to be analyzed for volatile organic compounds via EPA Method TO-15.

Equipment Log

	Documents	Notes
1	Work Plan	
2	HASP	
3	Equipment Calibration Certs	
4	Rental Slips	
5	Laboratory COCs	
6	Fed Ex Labels	

	Materials	
1	Sample Containers (SUMMAs and Flow Controllers)	
2	Nitrile Gloves	
3	1/4" Masterflex Tubing	
4	1/4" PE Tubing	
5	Clay or Beeswax	
6	PE Sheeting (if nec.)	

Standard Operating Procedures

1. Place SUMMA canister in appropriate location for indoor air sampling or outdoor ambient air sampling. Attach the flow controller regulator to the top of the SUMMA canister.
2. Turn the valve on the SUMMA canister counterclockwise to open valve (pressure in the canister should be between -25 and -30 mm Hg) as well as the ball valve so that air is free flowing.
    a. Note: if pressure in the can seems to be decreasing rapidly or hissing sound is heard, immediately close the valve on the SUMMA canister and check the connection between the flow controller and the canister to ensure a tight fit. This may involve removing the flow controller and reattaching.
3. Record the pressure of the can, the time, the temperature and all other appropriate sampling information.
4. Once it is sampling interval is complete (depending on the time of the flow controller), check the amount of pressure left in the can. If the pressure is not below -5 mm Hg, let the canister sample longer to obtain a pressure below -5mm Hg. If the sample is below -5mm Hg, according to the lab one can let the sample continue until the can reaches zero, but it is not necessary.

a. Note: Base the stopping pressure on the initial pressure of the can. If the initial pressure of the can is only -25mm Hg, then one should let the can completely run to zero; however, if the can is much greater than -30 mm Hg, one does not have to wait to reach zero, - 5 mm Hg is sufficient.

5. Once sampling is complete turn the valve on the SUMMA canister clockwise.
6. Remove the flow controller and prepare the sample for shipment.

DECONTAMINATION OF PERSONNEL

Purpose and Objectives

The purpose of this SOP is to present guidelines for decontamination of field personnel.

Equipment Log

	Materials	Notes
1	Nitrile Gloves	
2	Potable Water	
3	Plastic Buckets	
4	Scrub Brushes	
5	Garbage Bags	

Standard Operating Procedures

After completing work, decontamination is to be done prior to leaving the Site. The following decontamination procedures must be followed.

1. Wash boots with Liquinox solution and rinse with water (if contaminated)
2. Remove nitrile gloves and discard properly.

DEMOBILIZATION

Standard Operating Procedures

Laboratory Items
Upon completion of field activities, the SUMMA Canisters will be placed in a box. Set up laboratory pick up from the site within 24 hours of collecting samples.

Analysis

Ensure that all analyses and QA/QC samples are listed on the Chain of Custody. Be sure to note the Custody Seal number on the Chain of Custody, and have the Custody Seal sticker ready to affix to the container before turning it over to the courier. See below for additional details regarding the Chain of Custody:

Chain of Custody Information:

- Project Name: Queens Plaza Residential Development
- Turn Around Time: Std. 10 Business Days
- Data Deliverable Information: NYASP B
- Comments / Remarks on Chain of Custody (COC) (Exactly as Written)

When the courier picks-up the samples, ensure that both you and the courier have signed the COC, and retain the yellow page for company records. After the COC has been signed.