Parcel 8
Site Index No. Index No. W2-1059-05-03
BCP Site No. C241087
Long Island City, New York

Interim Remedial Measures Work Plan (IRM)

Prepared for

Avalon Riverview II, LLC and Avalon Riverview III, LLC
275 7th Avenue
New York, NY 10001

FLS Project Number: 10011-007-1

Submitted to

New York State Department of Environmental Conservation
1 Hunter's Point Plaza
47-40 21st Street
Long Island City, New York, 11101

December 2007

Arnold F. Fleming, P.E. &

Fleming Lee Shue

Environmental Management & Consulting
158 West 29th Street, 9th Floor
New York, New York 10001
http://www.flemingleeshue.com

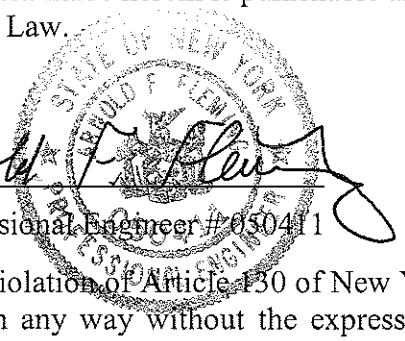
CERTIFICATIONS

I, Arnold F. Fleming, am currently a registered professional engineer licensed by the State of New York. I have primary direct responsibility for implementation of the remedial program for the Queens West Development Corp. Parcel 8 (NYSDEC BCA Index No. W2-1059-05-03; Site No. C241087.

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

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

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



NYS Professional Engineer #030411	12-17-07	
	Date	Signature

It is a violation of Article 130 of New York State Education Law for any person to alter this document in any way without the express written verification of adoption by any New York State licensed engineer in accordance with Section 7209(2), Article 130, New York State Education Law.

TABLE OF CONTENTS

FIGURES

APPENDICES

EXECUTIVE SUMMARY

This Interim Remedial Measure (IRM) Work Plan has been prepared by Arnold F. Fleming, P.E./Fleming-Lee Shue, Inc. (FLS), on behalf of Avalon Riverview II, LLC and Avalon Riverview III, LLC (collectively, the Volunteer) of New York, NY, for a parcel of land located along Center Boulevard and 47th Road in Long Island City, NY, known as Parcel 8 within Stage 1 of the Queens West Development project (the Site, shown on Figure 1). The Site was formally accepted into the New York State Department of Environmental Conservation (NYSDEC or the Department) Brownfields Cleanup Program (BCP) through a Brownfield Cleanup Agreement (BCA) executed on June 28, 2005 (NYSDEC BCP Number: C241087).

The Site address is 4-56 47th Road. It is located on the west side of Center Boulevard between 47th Road to the north and Gantry State Park to the south. Peninsula Park fronts the Site on the west side. The Site is designated as Block 19, Lot 19 by the New York City Department of Assessment.

The subject property is a vacant 0.73 acre parcel that is currently surrounded by a 6-foot high chain link fence. Decades ago, the Site housed the former Warren Chemical facility in which roofing materials were manufactured. It was subsequently used for carbon dioxide production and as a warehouse, which was demolished in 2001. The immediate surrounding area is characterized by commercial businesses (mostly retail) and high-rise residential buildings along Center Boulevard and across 47th Road.

The Site is level and access is clear except for approximately two-thirds of the Site that is covered by a construction & demolition (C&D) debris pile. The purpose of this IRM is to remove the debris pile to allow remedial investigations to be performed in this portion of the Site. The C&D pile is approximately three to six feet tall and contains concrete, timbers, metal, and other debris mixed with soil.

The Site and the C&D pile were sampled by AKRF and the results presented in the report entitled *Parcel 9 Off-Site Investigation Report,* July 2006 (AKRF 2006). This report was prepared for the adjacent Parcel 9 and included data on Parcel 8, which is hydrogeologicaly downgradient from Parcel 9. AKRF 2006 found the C&D pile to be predominantly urban fill generally containing low levels of semi-volatile organic compounds (SVOCs), metals, PCBs, pesticides, and volatile organic compounds (VOCs). Nearly all compounds detected during this investigation of the C&D pile, except for SVOCs, were below NYSDEC Technical Assistance Guidance Memorandum 4046 (TAGM) Recommended Soil Cleanup Objectives (RSCOs), or in the case of metals, close to Eastern United States background levels. In contrast, all of the compound classes had at least one compound that exceeded the NYCRR Part 375 Track 1 Unrestricted Use Criteria. In particular, SVOCs, metals, and PCBs were the predominant compound classes exceeding the Part 375 Track 1 standards. The concentrations of chemical compounds are typical of this type of material.

Summary of the Interim Remedial Measures Work Plan

This IRM plan calls for removal of the C&D soil pile to grade, which is the level of the existing sidewalk. The C&D pile will be loaded directly into trucks with tightly sealed covers and transported to a licensed disposal facility over a prescribed truck route to minimize neighborhood impacts. No on-Site mechanical processing will be allowed. Care will be taken during removal to protect the public and neighborhood from the potential dust and odors that may arise during removal through implementation of a Community Air Monitoring Plan and a Vapor and Odor Control Plan. A final report will be issued documenting implementation of this IRM Work Plan. The report will include disposal manifests and other required documentation. Methods for temporary Site stabilization are also presented.

1.0 INTRODUCTION

This IRM Work Plan was prepared by FLS on behalf of Avalon Riverview II, LLC and Avalon Riverview III, LLC for removal of a C&D pile and implementation of Site stabilization activities on Parcel 8. Parcel 8 is adjacent to the East River in the Hunters Point neighborhood of Long Island City, Queens, County, New York. The Site fronts the western side of Center Boulevard between 48th Avenue (Gantry State Park) and 47th Road. The Site, once home to numerous industrial and commercial operations, is now vacant and belongs to Queens West Development Corporation (QWDC), a subsidiary of the Urban Development Corporation, d/b/a Empire State Development Corporation. Figure 1 shows the Site location. Figure 2 is a Site plan.

Parcel 8 is part of a larger 74-acre shoreline tract of land belonging to QWDC that extends along the East River from Anabel Basin on the north to Newtown Creek on the south, known as the Queens West Development (QWD) project. The project is a key step in transforming a large area of New York City's 19th and 20th Century heavy industry sites into 21st Century communities and optimizes use of one of New York City's diminishing resources: land.

Parcel 8 is part of this transformation and has been included in the New York State Brownfield Cleanup Program (BCP) as Site No. C241087, subject to the Brownfield Cleanup Agreement (BCA) between the Volunteer, and the New York State Department of Environmental Conservation (NYSDEDC) (Index No. W2-1059-05-03). It is surrounded by areas in various states of environmental cleanup and re-development. To the east, across Center Boulevard, is Parcel 9, which was contaminated by some of the same historical uses that affected Parcel 8. Parcel 9 has since been remediated under BCA (Site No. C241049) and received its Certificate of Completion for Restricted Residential use (Track 4) on 12/29/06.

The AKRF 2006 investigation found Parcel 8 to be heavily impacted by historic industrial activity. Elevated levels of coal tar compounds were detected in deep soils and groundwater. A layer of coal tar-impacted soils was identified at depth above a glacial till layer that underlies the Site.

1.1 Site Location and Description

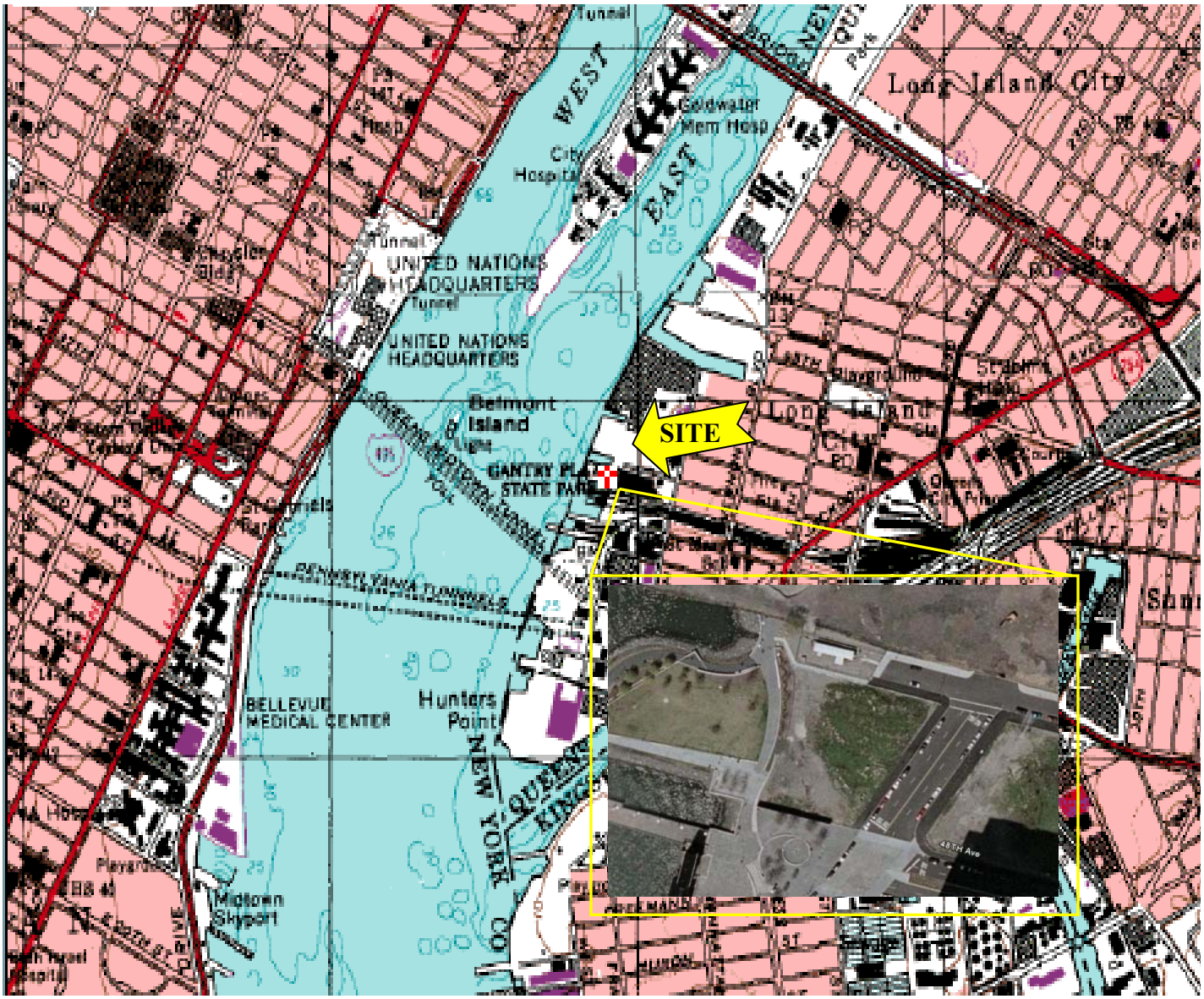
Parcel 8 is located in the Hunters Point section of Queens, New York and is bounded by 47th Road to the north, Gantry State Park to the south, Center Boulevard to the east, and Peninsula Park to the west. Parcel 8 is part of Stage 1 of the Site. It has a total area of 0.73 acres, and is currently surrounded on all sides by a 6-foot-high chain-link fence.

Parcel 8 is currently vacant, with a C&D debris pile covering approximately two thirds of the Site. The area to the north, across 47th Road, is Stage 2 of the QWD, which is currently undergoing remediation for residential, park, and utility development.

1.2 Redevelopment Plan

Future development of Parcel 8 may include either a branch of the Queensboro Public Library (subject to funding) or a park headquarters for Gantry Plaza State Park and Peninsula Park.

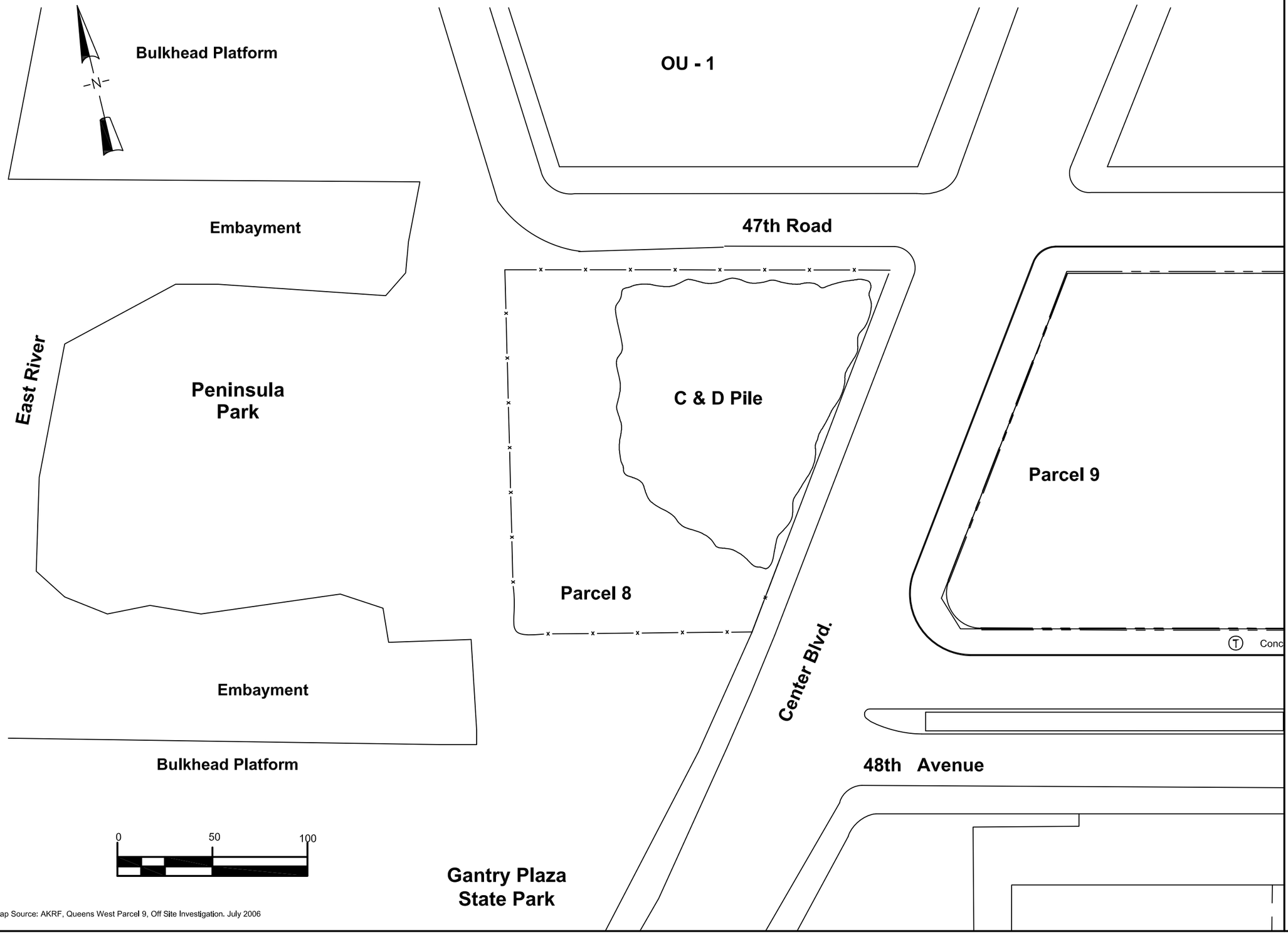
FIGURE 1
SITE LOCATION MAP



Fleming Lee Shue

SITE: Avalon Parcel 8
Long Island City, New York

Environmental Management & Consulting, 158 West 29th Street, 9th Floor, New York, NY 10001



Map Source: AKRF, Queens West Parcel 9, Off Site Investigation. July 2006

Fleming Lee-Shue

Environmental Management & Consulting

158 West 29th Street, 9th Fl
New York, NY 10001

PARCEL 8
BCP SITE NO. C241049

FIGURE 2

Site Layout

Date
January 2007

Project Number
10011-007-1

LEGEND

PROJECT SITE BOUNDARY

E:\BR Files\FLS\10011-She Paget Rlesel\007-1 Avalon Parcel 8\Avalon Parcel 8 Figure 2, 4 and 7.dwg, Fig 2

1.3 Description of Surrounding Property

A high-rise residential building and townhouses built by Avalon across Center Boulevard to the east is complete. To the southeast of Parcel 8 there is a high-rise residential building that also houses P.S. 78, a public elementary school (4809 Center Blvd), approximately 170 feet south of the Site. Peninsula Park and Gantry Plaza State Park border Parcel 8 on the west and south. The East River lies approximately 300 feet west of Parcel 8. An occupied residential building is located directly north of the Site across 47th Road.

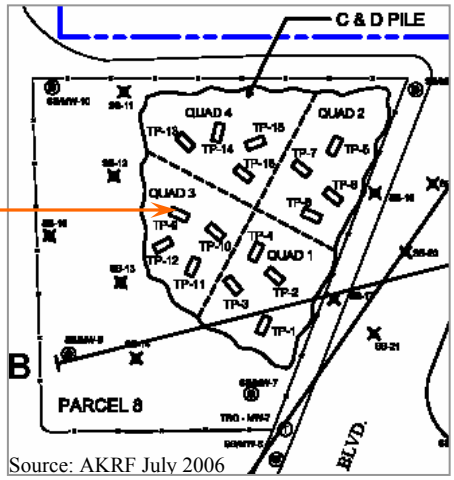
2.0 DESCRIPTION OF REMEDIAL INVESTIGATION FINDINGS

The AKRF 2006 investigation found that the Site—not the C&D pile—is materially impacted by wastes stemming from earlier roofing material production. VOC and SVOC compounds associated with coal tar, such as naphthalene, 2-methylnaphthalene, methylphenol, and BTEX compounds (benzene, toluene, ethylbenzene, and xylenes), are the principal contaminants affecting Site soils at depth. Previous investigation found a layer of dense non-aqueous phase liquid (DNAPL) containing elevated naphthalene and coal tar-related compounds at approximately 30 to 40 feet below the surface. Petroleum contamination was also found in Site soils.

Groundwater beneath the Site has similarly been affected and most of the BTEX concentrations in groundwater exceeded the Technical Operations Guidance Series (TOGS) ambient Groundwater Quality Standards (AWQS). Benzene concentrations ranged from non-detect to 8,100 ug/L. Toluene concentrations ranged from non-detect to 13,000 ug/L. Ethylbenzene concentrations ranged from non-detect to 1,300 ug/L. Total xylene concentrations ranged from non-detect to 4,500 ug/L. Naphthalene ranged from 4 ug/L to 14,000 ug/L on Site, compared to its TOGS GA AWQS of 10 ug/L (AKRF 2006).

The C&D pile reportedly originated from demolition of structures elsewhere on the QWD project. AKRF 2006 dug 16 test pits from 3 to 6 feet deep and collected 22 grab and composite samples throughout the C&D pile. The photographs and diagram below show an aerial view of the C&D pile, which is now mostly covered with vegetation and a tarpaulin.

Source: Google Earth 2007



Source: AKRF July 2006

Out of the 22 samples collected by AKRF, the results for 10 samples, six grab samples and four composite samples consisting of four grab samples each, 1 sample/300 yd^3, were presented in the test pit result analytical tables. The results for a few key detected compounds show that for VOCs benzene ranged from non-detect to 3.1 ug/kg, toluene ranged from non-detect to 2.5 ug/kg, methylene chloride ranged from 2.7 ug/kg to 140 ug/kg , and total VOCs ranged from 15 ug/kg to 182 ug/kg. For SVOCs, benzo(a)pyrene ranged from 5,500 ug/kg to 29,000 ug/kg, anthracene ranged from 2,300 ug/kg to 7,000 ug/kg, and naphthalene ranged from 650 ug/kg to 3,000 ug/kg. For metals, arsenic ranged from 9.4 mg/kg to 17.6 mg/kg, copper ranged from 60 mg/kg to 124 mg/kg, mercury ranged from 0.46 mg/kg to 5.5 mg/kg, nickel from 17 mg/kg to 28 mg/kg, and zinc from 160 mg/kg to 465 mg/kg. AKRF 2006 summarized the results of the test pit samples as follows:

> VOC compounds consisting of benzene, toluene, methylene chloride, trichloroethene, 2-butanone, and acetone were detected in the test pit samples. The grab sample from TP-6 contained methylene chloride at a concentration of 140 ppb, which exceeded its RSCO criterion of 100 ppb. Methylene chloride, 2-butanone, and acetone are common laboratory conaminants that were also detected in trip blanks, and are not associated with existing on-site contamination. The remaining VOCs were below their respective RSCOs.
>
> Individual SVOCs, consisting primarily of PAHs, were detected at concentrations exceeding their respective RSCOs in each of the grab and composite samples from the test pits. Relatively low naphthalene and 2-methylnaphthalene concentrations were detected in the test pit soil samples compared to those detected in the native soil samples collected from below the water table. None of the test pit samples contained total SVOC concentrations in excess of 500 ppm.
>
> Metals consisting of arsenic, copper, magnesium, mercury, nickel, and/or zinc were detected above the respective upper limit of the Eastern United States background range in each of the test pit samples. The detected concentrations generally were within an order of magnitude of the background levels. The detected metals can be attributed slag and ash [sic] observed in the fill material at the site.
>
> PCBs were detected in each grab and composite sample. The concentration of PCBs detected in the composite sample from the southeastern portion of the pile . . . exceeded the NYSDEC RSCOs of 1,000 ppb for surface soil, but was below the 10,000 ppb criterion for subsurface soil. The remaining PCB concentrtions were below the NYSDEC RSCOs. Trace concentrations of pesticides were detected in the test pit samples . . . below their respective NYSDEC RSCOs.

In the 16 test pits, there were no odors or non-aqueous phase liquid (NAPL) observed, and photoionization (PID) measurements were mostly zero and were predominantly around 0.1 ppm where detected (AKRF 2006). Test pit logs are presented in Appendix A.

The analytical results, except for SVOCs, were predominantly below TAGM RSCOs or, in the case of metals, close to Eastern United States background levels. In contrast, all of the compound classes had at least one compound that exceeded the NYCRR Part 375 Track 1

Unrestricted Use Criteria. In particular, SVOCs, metals, and PCBs were the predominant compound classes exceeding the Part 375 Track 1 standards.

3.0 DESCRIPTION OF INTERIM REMEDIAL MEASURE PLAN

The IRM is to remove the C&D pile that covers approximately two-thirds of the Site and is from three to six feet tall, and to stabilize the remaining Site soils with an interim cover. The C&D pile contains concrete, metal, timbers, and other assorted debris in a sandy soil. The pile is approximately 3,000 yd^3. Removal will entail the activities set forth in Sections 3.1 through 3.6. Site stabilization will be conducted as set forth in Section 3.7. Shortly after submittal of this IRM Work Plan, a Remedial Investigation Work Plan will be submitted to the Department and upon approval, will be implemented following removal of the C&D pile under this IRM. A remedial action work plan (RAWP) will be prepared following completion of the remedial investigation.

3.1 Disposal Characterization Soil Testing

The C&D pile was previously tested for characterization purposes (AKRF 2006), but due to changes in disposal requirements since that time, it may be necessary to re-characterize the soil. Disposal facilities are currently being contacted to establish disposal characterization requirements. Additional characterization samples, if required by disposal facilities, will be collected after Department approval of the IRM and before Site mobilization.

3.2 Facility Acceptance

Acceptance by a disposal facility or several disposal facilities before removal is an important milestone. The soils will be accepted for disposal by at least one facility before removal. The C&D pile will most likely be disposed of as urban fill.

3.3 Loading

Soils will be loaded directly into trucks using front-end loaders, track hoes, and/or similar removal equipment. Mechanical crushing, sorting and screening will be prohibited, but large pieces of debris such as concrete, metal, or other items will be manually picked (or machine assisted) from the pile and set aside for subsequent removal. Water spray, as necessary, will be used to prevent dust generation while picking large pieces.

Soil will be examined as it is removed from the pile to inspect the soil for signs of heavy contamination. This examination will include visual observations for staining, detection of chemical or petroleum odors and PID measurements. If soil is heavily stained, odorous, or materially elevated PID readings are observed that are indicative of gross contamination or contamination not detected in the pre-characterization testing, the soil will be stockpiled separately for further testing and disposal.

The bulk soil will be wetted before disturbing so as to control dust. A water spray, mister, or equivalent equipment will be on hand at all times to prevent and control dust generated by loading of soil and movement of vehicles. All vehicles and equipment will be sprayed or otherwise rinsed before leaving the Site to remove dust or soil that may have adhered to the vehicle, and the rinse water will be allowed to drain back onto the ground. All soils will be

placed in trucks with a tight fitting cover to prevent dust emissions during transport. Air monitoring will take place during all C&D pile loading and movement.

3.4 Sediment and Erosion Control Measures

The C&D pile abuts the chain link fence which precludes effective deployment of hay bales. To address this condition, erosion will be controlled by removing the pile from the inside out, using the existing stabilized soil pile margin, plus tarps if necessary, to prevent sediment runoff. After removal of the bulk of the C&D pile, when ready, the soil pile margins will be removed and/or otherwise stabilized in one day to prevent erosion. Silt fencing and/or hay bales will be used as necessary to control sediment.

The Site surface is level and hard packed. However, if during removal it becomes necessary to further stabilize the surface, a layer of gravel and/or previously NYSDEC approved QWD recycled concrete aggregate (RCA) will be spread over the Site entrance.

3.5 Transport

After the soil has been loaded, the trucks will leave the area by exiting the Site at Center Boulevard and/or 47th Road. The trucks will proceed north on Center Boulevard and then east onto 47th Road, before proceeding south along 5th Street to Borden Avenue, where an entrance to the interstate highway system is located. Trucks will enter the interstate from Borden Avenue as shown on the truck route map.

3.6 Documentation

Soil loading must be tracked and monitored. Each truckload will be recorded with the name of the transporter and the intended disposal facility. The type of material will be described (e.g., soil, concrete, mixed, etc.) and the bill of lading or non-hazardous manifest number recorded in the logbook. A copy of all manifests, bills of lading, or other transport documentation will be kept in the project file and included in the final report. After disposal, disposal facility certificate(s) of disposal will be sent to the Volunteer, and incorporated into the project records and included into the final report.

3.7 Site Stabilization

Approximately two weeks will be required to remove the C&D pile. Therefore, at the end of each work day the open face(s) of the pile will be covered with a tarpaulin or plastic sheeting to prevent wind from blowing particulates off the pile and to prevent runoff from erosion off the pile. The covering will be weighted along all edges.

Since there will be an unknown period of time before the final remedy, the Site surface will be stabilized and covered after the C&D pile has been removed and the Remedial Investigation is complete. Potential stabilization and cover measures include covering the remaining Site soil with either:

- two feet of soil that satisfies the requirements of backfill for unrestricted sites set forth in NYCRR Part 375-6.7(d)(1)(ii)(a) and/or topsoil that has been approved by NYSDEC for this Site and sod, and/or hydroseeding;
- six inches of topsoil that has been approved by NYSDEC for this Site and sod, and/or hydroseeding surrounded by a perimeter security fence to exclude members of the public; or,
- a concrete slab that will serve as a skating rink base in winter and a terrace for the balance of the year.

4.0 ENGINEERING CONTROLS

4.1 Community Air Monitoring Plan (CAMP)

The Community Air Monitoring Plan (CAMP) provides measures for protection for on-Site workers and the downwind community (i.e., off-Site receptors including residences, businesses, and on-Site workers not directly involved in the remedial work) from potential airborne contaminant releases resulting from remedial activities. Additionally, the CAMP helps to confirm that the remedial work did not spread contamination off-Site through the air. The primary concern for this Site is particulates. A CAMP has been prepared and is provided in Appendix B. A Health & Safety Plan (HASP) is included as Appendix C.

4.2 Vapor and Odor Control Plan

In the event that the soil screening during load out of the debris pile identifies odors associated with the soils, a vapor and odor control plan will be implemented. The vapor and odor control plan will consist of covering the odiferous soils with Geomar® foam or spray with Ecosorb® odor control compound prior to and during soil removal load out. At the end of each day, the face of the debris pile would be sprayed with either the foam or the odor spray and covered with a heavy tarp secured along all edges.

5.0 IRM REMEDIAL ACTION REPORT

A final report will be submitted to NYSDEC following completion of the IRM. The final report provides the documentation and Certification by the Remedial Engineer that the IRM work was completed and in compliance with this plan. It will include an accounting of the destination of all material removed from the Site, including soil, solid waste, and fluids.

6.0 SCHEDULE

The estimated field duration of the IRM effort is two weeks. The complete estimated schedule is as follows:

Submit IRM to NYSDEC	December 17 2007
Receive NYSDEC Comments and Mail Fact Sheet	December 19, 2007
45-Day Public Comment Period	December 21, 2007 – February 5, 2009
Disposal Characterization Soil Testing (if required)	During 45-day Public Comment Period
Remove C&D Pile	February 12, 2008 – February 23, 2008
Submit Final Report	April 2008

APPENDIX A
Test Pit Logs

AKRF, Inc. — Environmental Consultants — **Test Pit Log** — Page

Test Pit No:	Job Number: 10516	Client: AvalonBay	Test Pit Dimensions		
Quad 1 / TP-1	Location: Queens, NY	Weather: Clear 65-70°	Width:	4'	Total Depth: 6
	Contractor: Brookside	Operator: Bob White	Length:	8'	
	Equipment Make/Model: CAT Model 304 CR	Capacity: ± 1/16 cyd.			
	Sampler: SG	Date: 9/27/05 / 08:30			

Surface Conditions: Vegetation

Depth	Internal Materials/Fluids	PID	NAPL	Water	Odor	Sample and Analyses
M 1	BRICK, BOULDERS (1'-2'), Metal Beams, TIRES (1), vegetation, some brown f-SAND and SILT, Cobbles (1'-2'), tr. f-Gravel (FILL).	0.0	None	not Encountered	no odor	
M 2		0.0				Composite @8:55
M 3	Brick, Boulders (1'-2'), CONCRETE, Plastic, Wood, Rebar, TIRE, Some br. f-SAND and SILT, cobbles (1'), tr. f-Gravel (FILL).	0.0				Quad 1 Analysis: VOCs, SVOCs, TAL Metals PCBs, Pests.
D 4		0.0				TP-1 Composite (3'-4')
D 5		0.0				
D 6		0.0				
7	- End of Excavation @ 6' bg.				08:45	Quad 1/TP-1 Grab @ 5'-6'
8						VOCs, SVOCs, TAL Metals PCBs, Pests.

Comments:

AKRF, Inc.
Environmental Consultants

Test Pit Log
Page 1

Test Pit No:	Job Number: 10516	Client: AvalonBay	Test Pit Dimensions		
Quad 1 / TP-2	Location: Queens, NY	Weather: Clear 70°	Width: 3'	Total Depth: 5.5'	
	Contractor: Brookside	Operator: Bob White	Length: 6'		
	Equipment Make/Model: CAT 304 CR	Capacity: 1/16 cyd.			
	Sampler: SG	Date: 9/27/05 08:50			

Surface Conditions: Vegetation

Depth	Internal Materials/Fluids	PID	NAPL	Water	Odor	Sample and Analyses
M 1	Vegetation BRICK, CONCRETE, wood, Some br. f-Sand, and Silt, Cobbles (4"-2"), f-Gravel, tr. vegetation (organics, Roots	0.0	none	none	no odor	
D 2	CONCRETE, Rebar, Brick, wood, plastic, Cloth, Some dk. br. f-SAND, and Silt, f-Gravel	0.0				@ 8:55 TP-2 composite (2'-5')
D 3		0.0				
D 4		0.0				
D 5		0.0				
D 6	End of Excavation @ 5.5' bg.					
7						
8						

Comments:

AKRF, Inc.
Environmental Consultants

Test Pit Log

Page

Test Pit No:	Job Number: 10516	Client: AvalonBay	Test Pit Dimensions			
Quad 1 / TP-3	Location: Queens, NY	Weather: Clear 70°	Width:	4'	Total Depth:	4'
	Contractor: Brookside	Operator: Bob White	Length:	5'		
	Equipment Make/Model: CAT 304 CR	Capacity: ± 4½ cy/d.				
	Sampler: SG	Date: 9/27/05 09:15				

Surface Conditions: Vegetation

Depth	Internal Materials/Fluids	PID	NAPL	Water	Odor	Sample and Analyses
M 1	CONCRETE, BRICK, wood, lime, some br. f-Sand, Silt, Cobbles, f-Gravel, tr. vegetation (organics). (FILL).	0.0	none	none	no odors	@ 9:18
D 2	S/A (no organics).	0.0	↓	↓		TP-3 (1-2')
D 3		0.0				
D 4		0.0				
5	- End of Excavation at 4' bg.					
6	- Difficult excavating.					
7						
8						

Comments:

AKRF, Inc.
Environmental Consultants

Test Pit Log

Page

Test Pit No:	Job Number: 10516	Client: AvalonBay	Test Pit Dimensions		
Quad 1/ TP-4	Location: Queens, NY	Weather: Clear 70°	Width: 4'	Total Depth: 5'	
	Contractor: Brookside CAT 304 CR	Operator: Bob Wright	Length: 10'		
	Equipment Make/Model:	Capacity: ± 1/4 cyd.			
	Sampler: SG	Date: 9/27/05 09:20			

Surface Conditions: Vegetation

@ 9:30

Depth	Internal Materials/Fluids	PID	NAPL	Water	Odor	Sample and Analyses
M 1	Concrete, Brick, Metal, Rebar, Fill, Sm. br. f. Sand, Silt, Cobbles, f. Gravel, tr. vegetation	0.0	none	none	no odor	TP-4 (0'-1') @9:30
D 2	S/A no vegetation. (Fill).	0.0	↓	↓	↓	TP-4 (1'-2') grab.
D 3		0.0				
D 4		0.0				
D 5		0.0				
6	End of excavation at 5' bg.					
7						
8						

Comments:

AKRF, Inc.
Environmental Consultants

Test Pit Log
Page

Test Pit No:	Job Number: 10516	Client: AvalonBay	Test Pit Dimensions:		
Quad 2 / TP-5	Location: Queens, NY	Weather: Clear 70°	Width: 3'	Total Depth: 6'	
	Contractor: Brookside	Operator: Bobcat	Length: 8'		
	Equipment Make/Model:	Capacity: 2 1/16 cys.			
	Sampler: SG	Date: 9/27/05 10:00			

Surface Conditions: Vegetation

Depth	Internal Materials/Fluids	PID	NAPL	Water	Odor	Sample and Analyses
M 1	CONCRETE, Brick, Rebar, Sm. br. f-SAND, some SILT, cobbles, f-Gravel, tr. Vegetation (organics) (FILL).	0.6	None	None	no odor	@10:00
D 2	CONCRETE, Brick, Rebar, Plastic, Styrofoam, Cobbles (1'-2'), Sm. br. f-SAND, Silt, tr. vegetation (organics) (FILL).	0.0				TP-5 (2-3') Comp.
D 3		0.0				VOCs, SVOCs, TAL metals, PCBs, Pests.
D 4		0.0				
D 5		0.0				
D 6		0.0	↓	↓	↓	@10:10 - TP-5 grab (5'-6')
7	End of Excavation at 6' bg					
8						

Comments:

AKRF, Inc.
Environmental Consultants

Test Pit Log

Page

Test Pit No:	Job Number: 10516	Client: AvalonBay	Test Pit Dimensions		
Quad 2/ TP-6	Location: Queens, NY	Weather: Clear 70°	Width: 9'	Total Depth: 6	
	Contractor: Brooksid	Operator: Bob white	Length: 10'		
	Equipment Make/Model: CAT 304CR	Capacity: 1/16 cyd			
	Sampler: SG	Date: 9/27/05 10:15			

Surface Conditions: Vegetation

Depth	Internal Materials/Fluids	PID	NAPL	Water	Odor	Sample and Analyses
M 1	CONCRETE, BRICK, TIN, Rebar, sm. Cobbles, br. f-Sand, Silt, f-Gravel, tr. Glass, Vegetation (organics) (FILL).	0.0	none	none	no odor	TP-6 (0-1') grab @10:15
D 2		0.2				
D 3	S/A (no vegetation) (FILL).	0.6				
D 4		0.8				@1020
D 5		0.0				TP-6 (4'-5') composite.
D 6		0.2				
7						
8						

Comments:

AKRF, Inc.
Environmental Consultants

Test Pit Log

Page

Test Pit No:	Job Number: 10516	Client: AvalonBay	Test Pit Dimensions		
Quad 2/ TP-7	Location: Queens, NY	Weather: Clear 72°	Width: 4'	Total Depth: 6'	
	Contractor: Brookside	Operator: Bob White	Length: 8'		
	Equipment Make/Model: CAT 340 CL	Capacity: 1/16 cyd			
	Sampler: SG	Date: 9/27/05 10:20			

Surface Conditions:

Depth	Internal Materials/Fluids	PID	NAPL	Water	Odor	Sample and Analyses
D 1	Brick, Rebar, CONCRETE, Cobbles (1-2"), Sm. br. f-Sand, Silt, f-Gravel, tr. vegetation, Glass, Coal (FILL)	0.2	none	none	no odor	
D 2	S/A (no vegetation)	0.1				@ 10:25
D 3		0.0				TP-7 (3'-4') Composite
D 4		0.0				
D 5		0.0				
6	EOF Excavation @ 5' bg.					
7						
8						

Comments:

AKRF, Inc.
Environmental Consultants

Test Pit Log

Page

Test Pit No: Quad 2/TP-8	**Job Number:** 10516	**Client:** AvalonBay	**Test Pit Dimensions**
	Location: Queens, NY	**Weather:** Clear 70°	**Width:** 3' **Total Depth:** 6'
	Contractor: Brookside	**Operator:** Bob White	**Length:** 10'
	Equipment Make/Model: CAT 304 CR	**Capacity:**	
	Sampler: SS	**Date:** 9/27/05 10:35	

Surface Conditions: Vegetation

Depth	Internal Materials/Fluids	PID	NAPL	Water	Odor	Sample and Analyses
M 1	CONCRETE, REBAR, BRICK, Cloth, Sm Cobbles (1-2"), Sm. br. f- Sand, Silt, to. f-Gravel, Glass (FILL).	0.0	none	none	no odor	
D 2		0.0				
D 3		0.1				
D 4	BRICK, GLASS, CONCRETE, TIRES (2), Rebar, Sm. Cobbles, Dk gray/black f. Sand, Silt, Glass.	0.2				@10:45
D 5		0.2				TP-8 (4-5') Composite
6	End of Excavation at 5' bg.					
7						
8						

Comments:

AKRF, Inc.
Environmental Consultants

Test Pit Log

Page

Test Pit No:	Job Number: 10516	Client: AvalonBay	Test Pit Dimensions		
Quad 3 / TP-9	Location: Queens, NY	Weather: Clear 70°	Width: 4'	Total Depth: 6'	
	Contractor: Brookside	Operator: BW	Length: 10'		
	Equipment Make/Model: CAT	Capacity: 1/16 cyd.			
	Sampler: SB	Date: 9/27/05 11:10			

Surface Conditions: Vegetation

Depth	Internal Materials/Fluids	PID	NAPL	Water	Odor	Sample and Analyses
M 1	BRICK, CONCRETE, Rebar, Wood, Cobbles, Coal/Slag, Sm. br. f-Sand, Silt, f. Gravel, tr. Vegetation (FILL).	0.0	none	none	none	@ 11:15 TP-9 (0-1') Composite
D 2		0.1				
D 3		0.1				
I 4	CONCRETE SLAB	0.0				
D 5	S/A 0-3' (No vegetation) (FILL).	0.0				
D 6		0.1				@ 11:20 TP-9 (5-6') Grab
7	End of Excavation at 6' bgs.					
8						

Comments:

AKRF, Inc.
Environmental Consultants

Test Pit Log

Page

Test Pit No:	Job Number: 10516	Client: AvalonBay	Test Pit Dimensions		
Quad 3/ TP-10	Location: Queens, NY	Weather: Clear 70°	Width: 3	Total Depth: 4	
	Contractor: Brookside	Operator: BW	Length: 6		
	Equipment Make/Model: CAT 304 CR	Capacity: 1/16 cy d			
	Sampler: SL	Date: 9/27/05 11:35			

Surface Conditions: Vegetation

Depth	Internal Materials/Fluids	PID	NAPL	Water	Odor	Sample and Analyses
M 1	BRICK, wood, CONCRETE, Metal Rebar, Sm. br. f-Sand, Silt, Cobbles, f Gravel.	0.0	none	none	moder	
D 2	BRICK, CONCRETE, wood, Sm. br. f-Sand, Silt, Cobbles, F Gravel, Glass.	0.0	↓	↓	↓	@ 11:40
D 3		0.0				TP-10 (3'-4') Composite
D 4		0.0				
5	End of Excavation at 4' bgs.					
6						
7						
8						

Comments:

AKRF, Inc.
Environmental Consultants

Test Pit Log

Page

Test Pit No:	Job Number: 10516	Client: AvalonBay	Test Pit Dimensions			
Quad 3 / TP-11	Location: Queens, NY	Weather: Clear 70°	Width:	2'	Total Depth:	5'
	Contractor: Brookside	Operator: BW	Length:	11'		
	Equipment Make/Model: CAT 304 CR	Capacity: 1/16 cyd.				
	Sampler: SL	Date: 9/27/05 11:30				

Surface Conditions:

Depth	Internal Materials/Fluids	PID	NAPL	Water	Odor	Sample and Analyses
M 1	BRICK, CONCRETE, Cloth, linoleum, wood, Terracotta Pipe, Sm. br. f-Sand, SILT, cobbles (12"), f-Gravel, vegetation (0-1') (FILL).	0.0	none	none	noted	11:55
M 2		0.1	↓	↓	↓	TP-11 (2'-3') Composite
M 3		0.0	↓	↓	↓	
M 4	BRICK, CONCRETE, wood., Sm br. f-Sand, Silt, cobbles, f-Gravel	0.0	↓	↓	↓	
D 5		0.0	↓	↓	↓	
6	End of excavation at 5' bg.					
7						
8						

Comments:

AKRF, Inc.
Environmental Consultants

Test Pit Log

Page

Test Pit No:	Job Number: 10516	Client: AvalonBay	Test Pit Dimensions			
Queens TP-12	Location: Queens, NY	Weather: Clear 70°	Width:	2'	Total Depth:	3'
	Contractor: Brookside	Operator: Brookside	Length:	8'		
	Equipment Make/Model: CAT 304 CR	Capacity: 1/2 cyd.				
	Sampler: SG	Date: 9/27/10 12:10				

Surface Conditions: Vegetation

Depth	Internal Materials/Fluids	PID	NAPL	Water	Odor	Sample and Analyses
M 1	BRICK, CONCRETE, REBAR, Cloth, ROPE, wood, Sm. br. f-Sand, Silt, cobbles, f-Gravel, (FILL). tr. vegetation.	0.0	none	none	no odor	TP-12 (0-1') @ 12:15
M 2		0.0	↓	↓	↓	
M 3		0.0	↓	↓	↓	
4	- End of Excavation at 3' bg.					
5	- If we go any deeper we'll be in the Subsurface past the fill pile.					
6						
7						
8						

Comments:

AKRF, Inc.
Environmental Consultants

Test Pit Log

Page

Test Pit No:	Job Number: 10516	Client: AvalonBay	Test Pit Dimensions		
Quad 4 / TP-13	Location: Queens, NY	Weather: Clear 75°	Width: 3'	Total Depth: 6'	
	Contractor: Brookside	Operator: Blu	Length: 12'		
	Equipment Make/Model: CAT 304 CR	Capacity: 1/16 cyd.			
	Sampler: SE	Date: 9/27/05 13:00			

Surface Conditions: Vegetation

Depth	Internal Materials/Fluids	PID	NAPL	Water	Odor	Sample and Analyses
M 1	BRICK, CONCRETE, WOOD, REBAR, COAL, Coal Slag, Cloth, Some br. f-SAND), Silt, Cobbles (12"), f-Gravel, Trace vegetation (Roots). (FILL)	0.0	none	none	none	
M 2		0.0				13:05
M 3		0.0				TP-13 (2'-3') Composite
D 4		0.0				
D 5	CONCRETE slab	0.0				@ 13:15
D 6	BRICK, Concrete, Coal slag, Sm. br. f-Sand, Silt, Cobbles (12"), f-Gravel. (FILL).	0.0				TP-13 (5'-6') Grab
7	End of Excavation @ 6' bg.					
8						

Comments:

AKRF, Inc.
Environmental Consultants

Test Pit Log

Page

Test Pit No: Quad 4 / TP-14	Job Number: 10516	Client: AvalonBay	Test Pit Dimensions:				
	Location: Queens, NY	Weather: Clear 75°	Width:	2'	Total Depth:		
	Contractor: Brookside	Operator: Bw	Length:	6'		3'	
	Equipment Make/Model: CAT 304 CR	Capacity: 1/16 cyd.					
	Sampler: SG.	Date: 9/27/05 13:20					

Surface Conditions: Vegetation

Depth	Internal Materials/Fluids	PID	NAPL	Water	Odor	Sample and Analyses
D 1	Brick, File (ceramic), wood, Concrete, Glass, Coal slag, Sm. br. f-Sand, Silt, Cobbles (12"), f-Gravel.	0.0	none	none	none	
D 2		0.0	↓	↓	↓	@ 13:30
D 3		0.0	↓	↓	↓	TP-14 (2'-3')
4	- End of Excavation @ 3' bg.					
5	- Difficult Excavating					
6						
7						
8						

Comments:

AKRF, Inc.
Environmental Consultants

Test Pit Log

Page

Test Pit No:	Job Number: 10516	Client: AvalonBay	Test Pit Dimensions		
Quad 4 / TP-15	Location: Queens, NY	Weather: Clear 75°	Width: 2.5'	Total Depth: 3'	
	Contractor: Brookside	Operator: BW	Length: 6		
	Equipment Make/Model: CAT 304 CR	Capacity: 1/16 cyd.			
	Sampler: SG	Date: 9/27/05 13:35			

Surface Conditions: Vegetation

Depth	Internal Materials/Fluids	PID	NAPL	Water	Odor	Sample and Analyses
D 1	BRICK, CONCRETE, REBAR, TIN, COAL SLAG, GLASS, Some br. f-SAND, SILT, Cobbles (12"), f-Gravel, tr- vegetation (0-1'). (FILL)	0.0	None	none	no odor	
D 2		0.0	↓	↓	↓	@ 13:45
D 3		0.0	↓	↓	↓	TP-15 (2-3) Composite
4	EOB @ 3' bg due to hard Fill.					
5						
6						
7						
8						

Comments:

AKRF, Inc.
Environmental Consultants

Test Pit Log

Page

Test Pit No: Queens 4 / TP-16	Job Number: 10516	Client: AvalonBay	Test Pit Dimensions
	Location: Queens, NY	Weather: Clear 75°	Width: 3' Total Depth: 5'
	Contractor: Roadside	Operator: BW	Length: 10'
	Equipment Make/Model: CAT 304 CR	Capacity: 1/16 cyd.	
	Sampler: SG	Date: 9/27/05 13:55	

Surface Conditions: Vegetation.

Depth	Internal Materials/Fluids	PID	NAPL	Water	Odor	Sample and Analyses
M 1	BRICK, CONCRETE, REBAG, Coal Slag, Sm. br. f-Sand, Silt, Cobbles (12") f-Gravel (FILL).	0.0	none	none	none	@ 14:08
D 2		0.1				TP-16 (1-2')
D 3	Brick, CONCRETE, Cloth, Sm. br. f-Sand, Silt, Cobbles (12"), f-Gravel, (FILL).	0.1				
D 4		0.0				
D 5		0.0				
6	- End of Excavation at 5' bg. - Hard FILL; Difficult excavating.					
7						
8						

Comments:

APPENDIX B
Community Air Monitoring Plan

Avalon Parcel 8

Site Index No. Index No. W2-1059-05-03; BCP # C241059

Long Island City, New York

COMMUNITY AIR MONITORING PLAN

Prepared for

Sive, Paget, & Riesel, P.C.

460 Park Avenue

New York, New York 10022-1906

FLS Project Number: 10011-007-1-001

Submitted to:

New York State Department of Environmental Conservation

Division of Environmental Remediation, Region 2

47-40 21st Street

Long Island City, New York 11101-5407

December 2007

Environmental Management & Consulting

158 West 29th Street, 9th Floor

New York, New York 10001

http://www.flemingleeshue.com

COMMUNITY AIR MONITORING PLAN (CAMP)

Purpose

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 IRM. The CAMP helps to confirm that the IRM 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 the IRM is 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 C and developed in accordance with 40 CFR 1910 and 1920.

Contaminant Source

The main contaminants of concern in the C&D pile are the low level VOCs and the polycyclic aromatic hydrocarbons (PAHs) portion of the SVOCs. Metals and other compounds represent a secondary and minor concern.

IRM Activities

Removal of the C&D pile has the potential to generate particulates. In this case, dust control in the form of water misting or spray will be available.

Receptor Population

Potentially exposed receptors during remediation include workers on nearby construction Sites, passersby, the public using Gantry Plaza and Peninsula Parks and, to a lesser degree, individuals living, working, and shopping in the vicinity of the project. There is also a public elementary school, P.S. 78, located within approximately one block of the Site.

Monitoring Plan

While removing the C&D pile, 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 the IRM.

Continuous Monitoring

Continuous monitoring will be conducted while removing the C&D pile.

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.

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 exceedance of 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 μg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 μg/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 μg/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.

Vapor and Odor Control Plan

A vapor and odor control plan will be implemented in the event that chemical odors are identified while removing the C&D pile. The vapor and odor control plan will consist of covering the odiferous soils with Geomar® foam or spray with Ecosorb® odor control compound prior to and during soil removal load out. At the end of each day, the face of the debris pile will be sprayed with either the foam or the odor spray and covered with a heavy tarp secured along all edges.

APPENDIX C
Health & Safety Plan

Avalon Parcel 8

BCP # C241059

Long Island City, New York

HEALTH & SAFETY PLAN

Prepared for
Sive, Paget, & Riesel, P.C.
460 Park Avenue
New York, New York 10022-1906

FLS Project Number: 10011-007-1-001

Submitted to:
New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 2
47-40 21st Street
Long Island City, New York 11101-5407

December 2007

Fleming Lee Shue

Environmental Management & Consulting
158 West 29th Street, 9th Floor
New York, New York 10001
http://www.flemingleeshue.com

Project Information Sheet

Project/Site Name: Avalon Parcel 8

Site Address: 47th Road and Center Blvd., Long Island City (Queens), NY

Project No: 10011-007-1-001

Client: Sive, Paget, & Riesel, P.C.

FLS Project Manager: Steven E. Panter, CGWP

Date Health and Safety Plan Prepared: 12/17/2007

Date(s) of Site Work: Anticipate February 2008 – April 2008

Site Access: Prior Notification Required

Site Size: Approximately 0.73 acre

Site Topography: Flat, Coastal

Prevailing Weather: Prevailing weather is characterized by warm to hot summers and cold winters. The work will be completed in the winter/early spring season normal temperatures, in degrees F, are as follows according to the National Climatic Data Center (NCDC):

	February	March	April
Max	41.2	49.6	60
Mean	34.8	42.3	52.2
Min	28.3	35.1	44.4

Site Description and History

Parcel 8 is an undeveloped, vacant lot enclosed by a chain-linked fence, but historically the parcel housed chemical manufacturing and processing operations. Historical maps dating back to 1811 show the site footprint as part of the East River with the original shoreline being near present-day Center Boulevard. It was not until 1898 that the area is shown to have a solid structure belonging to the Warren Chemical Company, a producer of tar paper and asphalt. The structure rested on the man-made shoreline that consisted of extensive fill. The fill raised the surface elevation and expanded the property out into the East River. The site contained pumps, tanks, condensers, dryers, steam stills, and storage areas associated with the production of tar paper and asphalt. The Warren Chemical Company was in business until 1915. The Liquid Carbonic Company, which produced liquefied carbon dioxide for use in soda fountains, occupied the site from the 1930s until the 1950s. In 1970 the site was occupied by a metal storage warehouse. Hallen Contractors then occupied the site from the 1970s until the site was vacated and all structures demolished in 2001.

According to Sanborn maps dating back to 1898, Parcel 8 had several businesses in the immediate area. The N.Y. Mastics Company Works (the Mastics Company) occupied

the area to the north from 1898 to 1915. The Barber Asphalt and Paving Company occupied the space to the south from 1915-1922. The Blau Gas Company of America occupied the area to the east from 1936 to 1950 and is shown to contain a gas holder with internal oil tanks, purifying room with gas tanks, air compressor, and fuel oil retorts according to historical maps. The area to this west was the East River until the area was filled in sometime after 1915, and a park (Peninsula Park) currently occupies the area between Parcel 8 and the East River.

Description of Specific Tasks

This project involves utility clearance oversight, soil gas sampling, well surveying, direct push and/or hollow stem auger soil boring/sampling, piezometer installation, and groundwater sampling, and removal of a construction and debris (C&D) pile.

Table of Contents

Figures

Tables

List of Attachments

Material Safety Data Sheets

1.0 INTRODUCTION

Fleming-Lee Shue, Inc. (FLS) prepared this Health and Safety Plan (HASP) on behalf of Sive, Paget, & Riesel, P.C., for use and implementation by FLS employees and their representatives during subsurface investigation activities at Avalon Parcel 8, Long Island City, NY. Parcel 8 is located in the Hunter's Point Section of Queens, NY. The parcel is bounded on the north by 47th Road, to the east by Center Blvd., and to the south and west by Gantry Plaza State Park. Figure 1 is a site location map.

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, particularly where hazardous materials are potentially present. 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 procedures described in this document were developed in accordance with the provisions of Occupational Safety and Health Administration (OSHA) rule 29 CFR 1910.120 and FLS' experience with similar projects. All Site workers must review this generic HASP before entering the Site. The Health and Safety Officer (HSO) or designee will ensure that personnel have reviewed the HASP and will provide an opportunity to ask health and safety questions during attendance at a pre-field safety meeting. Field personnel will sign the acknowledgment form (Attachment I) maintained on-Site during the investigation. The recommended health and safety guidelines in this document may be modified, if warranted, by additional information obtained prior to, or during Site investigation. The Health & Safety Officer (HSO) will also maintain copies of pertinent health and safety records for all field personnel.

The Occupational Safety and Health Act (1970) requires the following:

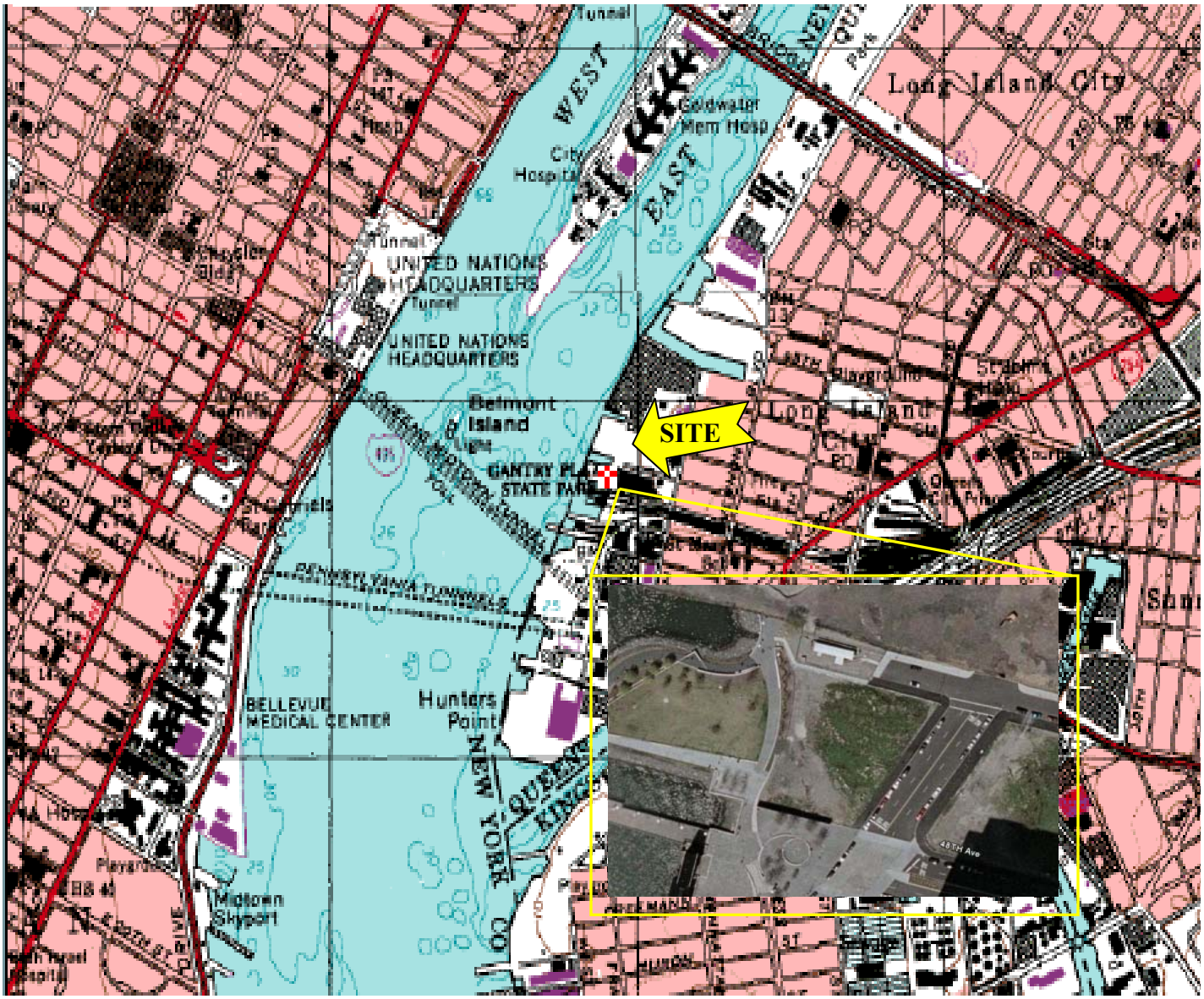
- Employers shall furnish each employee with a place of employment free from recognized hazards that are causing or likely to cause death or serious physical harm.

- Employers must comply with occupational health and safety standards and rules, regulations and orders pursuant to the 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.

FIGURE 1
SITE LOCATION MAP



Fleming Lee Shue

SITE: Avalon Parcel 8
Long Island City, New York

Environmental Management & Consulting, 158 West 29th Street, 9th Floor, New York, NY 10001

1.1 Purpose of Site Investigation

The purpose of the site investigation is to characterize shallow soil concentrations of VOCs, SVOCs, metals, and pesticides/PCBs, and to obtain information on the coal tar DNAPL that lies above the till layer at approximately 27 to 34 feet below grade. Another purpose of the investigation is to collect physical property data on soils.

For groundwater, the purpose is to obtain information on shallow groundwater quality and augment the existing groundwater information for the coal tar DNAPL at depth. Finally, collecting soil gas data for the purpose of understanding the types and quantities of soil gases on the site and defining the extent of groundwater plumes are other key objectives.

1.2 Site History

Historically the parcel housed chemical manufacturing and processing operations. Historical maps dating back to 1811 show the site footprint as part of the East River with the original shoreline being near present-day Center Boulevard. It was not until 1898 that the area is shown to have a structure belonging to the Warren Chemical Company, a producer of tar paper and asphalt. The structure rested on the man-made shoreline that consisted of extensive fill. The fill raised the surface elevation and expanded the property out into the East River.

The site contained pumps, tanks, condensers, dryers, steam stills, and storage areas associated with the production of tar paper and asphalt. The Warren Chemical Company was in business until 1915. The Liquid Carbonic Company, which produced liquefied carbon dioxide for use in soda fountains, occupied the site from the 1930s until the 1950s. In 1970 the site was occupied by a metal storage warehouse. Hallen Contractors then occupied the site from the 1970s until the site was vacated and all structures demolished in 2001.

Parcel 8 had several businesses in the immediate area. The N.Y. Mastics Company Works occupied the area to the north from 1898 to 1915. The Barber Asphalt and Paving Company occupied the space to the south from 1915-1922. The Blau Gas Company of America occupied the area to the east from 1936 to 1950 and is shown to contain a gas holder with internal oil tanks, purifying room with gas tanks, air compressor, and fuel oil retorts according to historical maps. The area to this west was the East River until the area was filled in sometime after 1915, and a park (Peninsula Park) currently occupies the area between Parcel 8 and the East River.

Environmental History

There were five pervious studies associated with Parcel 8, they are as follows:

1985 Sampling Program
Roy F. Weston Inc. performed the initial testing of the area containing that was supposed to involve the project site in 1985-86 on behalf of the Port Authority. The results were reported in a memo in which no information on sampling depth or quality

assurance/quality control (QA/QC) was presented. Due to inaccessibility to Parcel 8, no sampling was performed on Parcel 8 and sampling was only completed on Parcel 9. A groundwater sample from well (MW-13) located to the west of Parcel 8 was found to contain benzene, toluene, ethylbenzene, and xylene (BETX), as well as some phenols.

1989 Sampling Program

Soil and groundwater testing was performed on the entire Queens West area by AKRF in 1989. The results are reported in the Final Environmental Impact Statement, Hunters Point Waterfront Development, dated 1990. The buildings that occupied the Parcel 8 area at the time could no be accessed, so no sampling was performed on the parcel. Soil samples were collected from the open area to the west of Parcel 8 now occupied by the waterfront park (Peninsula Park), and well MW-13, which remained from the 1985 testing program, were resampled. No volatile organic compounds and only trace levels of semi-volatiles were detected in the groundwater sample collected from MW-13 at that time.

1998 Sampling Program

Testing performed by AKRF in 1998 is reported in the *Site Assessment Report, Queens West Development Site, Parcel 8 and 9, Queens, New York* dated June 1998. This additional testing was requested by DEC, which reviewed and approved the work plan. Testing was performed on the open areas of the site and in the westernmost warehouse building (4-65 48th Avenue), which is in the area no occupied by Parcel 8. No free product was observed in any of the monitoring wells, but groundwater samples from both of the wells installed in the Parcel 9 area (B/MW-8a and B/MW-9A) contained elevated levels of BTEX and naphthalene. Because USTs were expected to be present in the inaccessible buildings, a petroleum spill was reported (Spill # 97-12929).

2000 Sampling Program

In 2000, when it was possible to gain access to the interiors of the buildings on Parcel 8, the supplemental sampling specified in the remediation plan was performed following a sampling protocol approved by the DEC. No testing was performed on Parcel 8 at that time.

2006 Sampling Program

In July 2006 AKRF completed and investigation of Parcel 9 and Parcel 8 entitled *Off-Site Investigation Report, Queens West Development Parcel 9.* The investigation included soil borings, groundwater sampling, a soil gas survey, and fluid level monitoring. Soil borings and monitoring wells extended to the top of the till layer and the investigation focused on the coal tar DNAPL atop the till layer. All wells were free of measurable product. Part of the Site was not investigated because of access limitations imposed by a construction and debris (C & D) pile that covers the majority of the Site.

1.3 Previous Site Investigation Results

The Site and surrounding area occupy land created by filling the wetlands along the river in the 19th Century. The area subsequently became a major industrial center with chemical processing and petroleum refining operations either on or near the Site. The Site itself housed the Warren Chemical Company, a manufacturer of roofing and paving materials. The Site is adjacent to and downgradient of Parcel 9, another site with a history of chemical use and production, but which has since been remediated to depth by excavation and is now enclosed by steel sheet piles extending to the hard compact, low permeability till layer that underlies the general area.

A May 2006 investigation by AKRF included soil borings, monitoring wells, and fluid level measurements on and around Parcel 8. Free phase Non-aqueous Phase Liquid (NAPL) was not identified in any of the monitoring wells installed on Parcel 8. However, AKRF identified residual NAPL in soil samples predominantly in the saturated zone just atop the low permeability silty clay layer at approximately 27 to 35 feet below grade. Atop this stratum soil containing NAPL followed the till layer topography and extensive portions soils with residual NAPL appear to underlie the Site. A forensic report commissioned by AKRF identified the NAPL as a coal tar-derived material with appreciable naphthalene indicative of limited weathering. The material is denser than water (DNAPL).

BTEX, petroleum compounds, and chlorinated compounds were detected in relatively low concentrations in the shallow soils above the water table. BTEX levels increased below the water table and exceeded TAGM RSCOs. The highest concentrations correlated with soils containing NAPL. The same pattern occurred for SVOCs, which were predominantly the PAH compounds.

Metals in the fill exceeded Eastern Background levels but were typical for fill derived from slag and coal that frequently comprise the urban fill in New York City. All PCB samples were either non-detect or below TAGM RSCOs. Pesticides in on-site soil samples were all below TAGM RSCOs with the exception of two samples for heptachlor epoxide.

AKRF installed five wells on site or in the sidewalk adjacent to the Site and screened the wells in a range extending from approximately 15 to 30 feet near the top of the till layer (10-foot-long screens in all wells). Depth to groundwater ranges from approximately 8 to 11 feet below grade.

On-site VOCs in groundwater were related to petroleum and coal tar contamination and were above the Division of Water Technical Operational and Guidance Series (TOGS) 1.1.1 Ambient Water Quality Quality Standards (AWQS) for Class GA groundwater. BTEX compounds were highest near the southern portion of the site and followed the distribution of DNAPL.

SVOCs also exceeded the AWQS, with naphthalene exhibiting the highest concentrations of the SVOCs. As with the on-site VOCs, the distribution of SVOCs correlated to the distribution of DNAPL.

AKRF completed a soil gas survey adjacent to the site and identified petroleum-related VOCs and low levels of chlorinated compounds including tetrachloroethylene (PCE) near the site.

While these data go a long way to characterizing the site, there remain important data gaps that need to be filled in order to understand site contamination and any potential contamination leaving the site. This is important in order to ready the site for the intended uses and changing character of the area: it is being transformed from a heavy industrial area into a residential community with public open space.

At the time of the previous investigation, a large construction and debris (C&D) pile occupied the site that precluded installation of soil borings and monitoring wells on the eastern half. (FLS presumes that the C&D pile will be removed before the RI begins.) Downgradient areas were not investigated, nor were potential impacts to surface water; and the previous investigation focused on groundwater near the NAPL above the till layer.

2.0 TASKS TO BE PERFORMED UNDER THIS PLAN

The tasks to be performed under this plan can be divided into two categories: 1) tasks regulated by The OSHA Hazardous Waste Operations and Emergency Response (HAZWOPER) Standard and 2) tasks not regulated by the HAZWOPER Standard.

2.1 HAZWOPER Regulated Tasks

- Soil Gas Sampling
- Well Surveying
- Direct Push Soil Boring/Sampling
- Piezometer Installation
- Groundwater Sampling
- Surface Water Sampling

2.2 Non-HAZWOPER Regulated Tasks

- Utility Clearance Oversight

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 investigation tasks above. A summary of potential site safety hazards and safety requirements is presented in Table 1.

3.1 Potential Chemical Hazards/Controls

Based on data collected during previous investigations at the Parcel 8 Site, this HASP focuses on the following chemicals of concern:

VOCs	SVOCs	Pesticides	PCBs	Metals
Benzene	Naphthalene	Dieldrin	ND – Below TAGM RSCO	Arsenic
Ethylbenzene	Polycyclic Aromatic Hydrocarbons (PAHs)	Heptachlor Epoxide	--	Copper
MTBE	--	--	--	Chromium
Styrene	--	--	--	Lead
Toluene	--	--	--	Mercury
Xylene	--	--	--	Nickel
Benzene	--	--	--	Zinc

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 to be present at the site. The chemical hazards will be minimized by limiting exposure of personnel to soil and groundwater and by the use of personnel protective equipment (PPE).

Table 1 - Summary of Site Safety Hazards and Safety Requirements

	Encountered Material Types				Material Characteristics					Chemical Hazards					Physical Hazards														Safety Requirements		
Activity	Liquid	Solid	Sludge	Gas	Corrosive	Ignitable	Volatile	Toxic	Unknown	Volatiles	Semi-volatiles	Metals	PCBs	Other	Heat/Cold Stress	Vehicle/Pedestrian Collisions	Severe Weather	Construction Hazards	Noise	Facility Operations	Unstable Ground	Site Operations	Utilities	Haz. Mtls. Use/Storage	Fire	Slips, Trips, Falls	Cuts, Punctures	Poisonous Plants/Animals	Animal/Insect Bites, Stings	**Protection Level (PPE)**	**Monitoring**	**Personal Decontamination**
Soil Gas Sampling				P			P	P		K	K	K	P	P	P		P	P	P				P		P					D	NA	Wash hands & face after sampling and before eating or drinking
Soil Boring/Well Installation/ Test Pits	K	K	Coal tar DNAPL	P		P	P	K	P	Low level	High Naphtha -lene Levels; PAHs	K		P	P		P	P	High			Drilling, falling objects, power tools	P		K					Level D, must use hearing protection while drilling	Air Monitoring OVM; Dust Trak; Detector tubes for benzene	Wash hands & face after sampling and before eating or drinking
C&D Pile Removal	K									Low level	K	K	P		P				K			Moving Vehicles								D	Air Monitoring OVM; Dust Trak	Wash hands & face after sampling and before eating or drinking
Fluid Level Measurement	LNAPL DNAPL			P		P	P	P		K	K				P	P			P			Moving vehicles			P					Level D	Not required for this activity, exposure potential negligible	Wash hands & face after sampling and before eating or drinking
Groundwater Sampling	K			P		P	P	P		K	K				P	P			P			Moving vehicles			P					Level D	Not required for this activity, exposure potential negligible	Wash hands & face after sampling and before eating or drinking
Surface Water Sampling	K			P		P	P	P		K	K				P	P			P			Moving vehicles			P					Level D	Not required for this activity, exposure potential negligible	Wash hands & face after sampling and before eating or drinking

K – Known
P - Potential

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 III.
Subsurface/Aboveground Utilities	Ensure utility clearance has occurred in drilling area, respect subsurface utility marks. Inspect area where drill rig derrick will be hoisted for utilities.
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 (drill rigs, generators, power tools)
Noise hazards	Use ear plugs and/or ear muffs during drilling and boring.
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, properly trained, experienced and competent personnel shall be utilized.

3.3 Biological Hazards/Controls

Hazard	Control
Bites or stings from insects/animals (particularly ticks) resulting in skin inflammation, disease, or allergic response	Keep exposed skin covered. Use insect repellant if necessary. Inspect yourself carefully after work is completed.
Allergens and toxins from plants and animals, producing dermatitis, rhinitis, or asthma	Keep exposed skin covered using proper PPE. Wash hands regularly.

3.4 Levels of Personal Protection

Personal protective equipment (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 field tasks, it has been determined that Level D protection will be used during 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. Protection levels are described in more detail in Section 4.6 and air monitoring is discussed in Section 6.

3.4.1 Level D

Level D applies to work in areas where the possibility of contact with potentially contaminated groundwater and soil exists. The protective equipment required for Level D includes, but is not limited to the following:

- Work clothes or coveralls
- Safety boots, with steel toe
- Safety glasses
- Hard hat
- Reflective vest
- Disposable latex gloves
- Hearing protection, to be used as needed

3.4.2 Level C

Level C is selected only when the type of material and the concentration are known, and pose a moderate level of respiratory risk to the site worker. Level C is required when PID readings indicate a consistent level of 10 ppm or above of total volatile organics in the worker breathing zone. Level C protection will include, but is not limited to, the following:

- Protective clothing and other equipment required for Level D
- Full-face air purifying respirator (APR) with high efficiency particulate/organic vapor cartridges (ultra-twin with GMCH cartridges)
- Saranex-coated disposable coveralls with hoods
- Boot covers

3.5 General Hazard Controls

3.5.1 General Workplace Safety Rules

- Report unsafe conditions, accidents, injuries, or incidents to the HSO and Project Manager.
- 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.
- Crossing highways and major roadways is not recommended. Expect movement of cars and buses at any time along any roadway, regardless of traffic signals, stop signs, yield signs, etc.
- When walking on right-of-ways or road-shoulders, keep a sharp lookout in both directions.
- For personal safety, be cognizant of your surroundings and ensure that equipment is properly secured.

3.5.2 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 fire fighting equipment will be kept clear of materials, supplies, trash, and debris.

3.5.3 Fire Prevention

- All firefighting equipment shall be conspicuously located, accessible, and inspected periodically, and maintained in operating condition. An annual service check and monthly visual inspections are required for fire extinguisher.
- All employees must know the location of fire fighting equipment in the work area and have knowledge of its use and application.

3.5.4 Industrial Hygiene and Occupational Health

- Toilet facilities shall be provided as required for the number of workers.
- A first aid kit and portable eyewash station shall be kept on site.
- An adequate supply of potable water shall be provided.
- The use of a common drinking cup is prohibited.

- When no medical facility is reasonably accessible (time and distance) to the worksite, a person who has a valid certificate of first aid training will be available at the worksite to render first aid.
- Employees must be protected against exposure to hazardous noise levels by controlling exposure or by use of proper PPE.
- Any FLS Activities will be assessed for lead exposure (particularly if drywall or any painted surfaces or abrasive blasting/grinding is involved) and/or asbestos exposure.

3.5.5 Personal Hygiene

Eating, drinking and the use of tobacco products in the work area are prohibited. The use of alcohol or other non-prescription drugs by personnel that could impair the ability to function at the work site is prohibited. The use of some prescription drugs may impair the ability to function and can create safety problems on-site. Field personnel taking prescription medication should alert the HSO in case of an emergency. Beards or facial hair that could interfere with the use of a respirator are not permitted. Dermal contact with groundwater 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.

4.0 Training, Project Organization, and Personnel

4.1 Training

Knowledge of the safety rules supplemented by compliance is essential to safety. New employees will be provided orientation 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.

All employees will have successfully completed 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]).

Employees must read the HASP and project-specific Work Plan, which contains the applicable regulations/standards for their job.

Prior to beginning work on-Site, and weekly thereafter, the HSO will lead safety-training sessions and/or training meetings. These meetings will be conducted to provide information and training on new equipment, new procedures, new chemicals, refresher/remedial training in specific areas, or meet annual requirements. Such training may be held in conjunction with the safety briefings/meetings addressed elsewhere in this program.

If necessary, the HSO will ensure that employees are scheduled and provided specialized training as required. Examples of specified training include (but are not limited to):

- Safe handling/use of flammables, poisons, or toxics
- Confined space entry
- Respirator care/use
- Hazard communication (hazardous chemicals)
- Slip, trip and fall hazards and fall protection
- Blood-borne Pathogens (Non-Medical)

Specialized training will be documented in the employees' personnel records and/or in a master training record.

4.2 Project Team Organization

All personnel who participate in field activities will be required to attend a Health and Safety meeting prior to the commencement of field activities. In addition, the FLS field supervisor will hold daily tailgate safety meetings before the work day begins. These meetings will review the scope of work to be accomplished, any specific safety concerns, address safety questions and issues, and asses the condition of crew and equipment. The tail gate meeting represents the first opportunity to prevent an accident. The meeting will be noted and summarized in the field log.

Health and Safety Officer (HSO)

- Administers all aspects of the occupational health and safety program;
- 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;
- 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 PPE, and have read and signed the Acknowledgment Form (Attachment I);
- Halts work if necessary;
- Ensures strict adherence to the Site HASP; and
- Reviews personnel medical monitoring participation.

Project Manager

- Familiar with health and safety regulations related to area of responsibility.
- Directs and coordinates health and safety activities within area of responsibility.
- Ensures arrangements for prompt medical attention in case of serious injury
- Requires all employees supervised to use individual protective equipment and safety devices.
- Ensures that safety equipment is available, maintained, used, and stored correctly.
- Instructs and trains all persons within area of responsibility in health and safety requirements.
- Conducts frequent and regular health and safety inspections of work area. Directs correction of unsafe conditions.
- Conducts weekly safety briefings with all supervisors and/or workers.
- Requires all subcontractors and subcontractor personnel to comply with health and safety regulations.

All Employees

The minimum personal qualifications for each individual participating in field activities are:

- OSHA-specific medicals 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; and
- Notify HSO/supervisor immediately of unsafe conditions/acts, accidents, and injuries.

4.3 Subcontractor Compliance

All FLS 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.

5.0 Individual Health and Safety Programs Listing

OSHA standards specify various individual programs that may be applicable to work performed on eligible 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, as necessary.

5.1 Hazard Communication Program

If employees are exposed to or work with hazardous chemicals at the job site, this program is required. Required elements of the written program 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 material safety data sheets.

5.2 Respiratory Protection Program

If employees are exposed to hazardous/toxic chemical, paint or other gases, vapors, fumes, dusts, or mists above the National Institute for Occupational Safety and Health (NIOSH) permissible exposure limit (PEL), and/or employees wear respirators, this program is required. Program elements are written program for the selection, maintenance, care, and use of respirators; fit testing, training, and employee evaluation for use.

5.3 Occupational Noise Exposure/Hearing Conservation Program

If employees are exposed to noise levels above the permissible noise exposures, protection against the effects of noise and an effective hearing conservation program are required. Such a program would include elements such as a written program, noise monitoring, hearing evaluations and follow-on testing, personal protective equipment (hearing protection), and maintenance of medical records.

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. Program elements include a written response plan, identification and training of responding employees, medical surveillance and consultation, and post response operations.

5.5 Asbestos Control Program

If employees are exposed to asbestos fibers in the workplace, then an initial monitoring for asbestos exposure must be made. If the monitoring results are above the permissible exposure limit (PEL), this program is required. Program elements include regulated areas, exposure monitoring, medical surveillance and records maintenance, engineering controls, personal protective equipment, and training.

5.6 Lead Exposure Program

If employees are exposed to lead in the workplace, then an initial monitoring for lead exposure must be made. If the monitoring results are above the permissible exposure limit (PEL), this program is required. Program elements include regulated areas, exposure monitoring, medical surveillance and records maintenance, engineering controls, personal protective equipment, and training.

5.7 Dust Suppression Plan

The following techniques have been shown to be effective for the controlling of the generation and migration of dust during excavation activities:

1. Wetting equipment and excavation faces.
2. Spraying water on buckets during excavation and dumping.
3. Hauling materials in properly sealed or watertight containers.
4. Covering excavated areas and material after excavation activity ceases.
5. Reducing the excavation size and/or number of excavations.
6. Applying a dust suppressant, such as calcium chloride.

To evaluate the effectiveness of the dust suppression measures, air-monitoring utilizing real-time dust-monitoring equipment will be performed. The requirements for air monitoring during soil disturbance activities are presented in Section 6.

6.0 Air Monitoring Program

6.1 Air Monitoring Equipment

Air quality monitoring equipment will be used during all work activities to measure total organic vapors and airborne dust concentrations. A PID (to monitor total volatile organic concentrations) will be used during on-site activities. Additionally, particulate monitoring will be performed using a TSI Dust Trak or equivalent. The equipment will be calibrated daily 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.

6.2 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.

6.3 Particulate Monitoring Action Levels

During soil excavation, particulate monitoring will be performed using a real-time particulate monitor that will monitor particulate matter less than ten microns (PM10) 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 50 ug/m^3 over the integrated period not to exceed 15 minutes.

7.0 DECONTAMINATION

7.1 Site/Work Area Organization

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 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
- Tyvek removal
- 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. Emergency contacts and their phone numbers are presented in Table 2. Routes to area hospitals appear on Figures 2A and 2B.

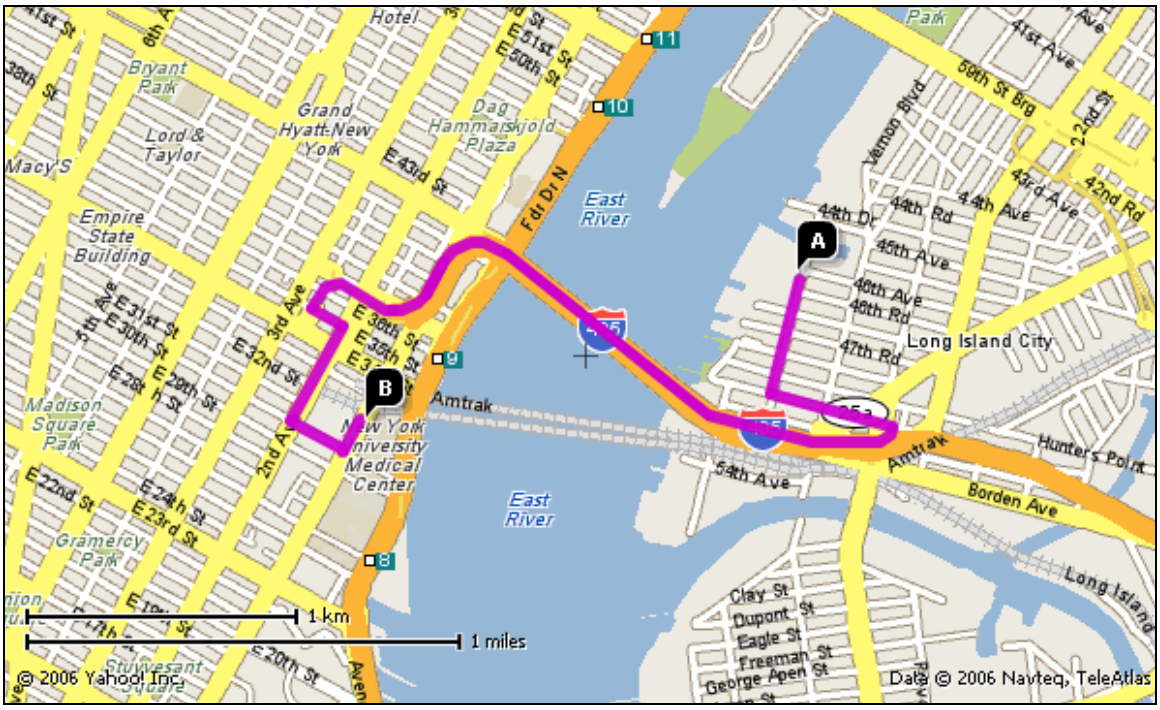
A first aid kit will be available on-site at all times for any minor on-site injuries. Emergency medical assistance or ambulance can be reached by calling 911 for more severe injuries.

Table 2 – Key Personnel Emergency Phone Numbers

New York City Police Department	911
New York City Fire Department	911
New York University Medical Center 550 1st Avenue New York, NY	(212) 263-7300
Mount Sinai of Queens 25-10 30th Avenue Astoria, NY	(718) 932-1000
Emergency Medical Service (ambulance)	911
Steven Panter, FLS Project Manager	(212) 675-3225 ext. 317
Mary Manto, Health and Safety Officer	(212) 675-3225 ext. 302
National Response Center	(800) 424-8802
NYSDEC Spill Hotline	(800) 457-7362

Figure 2A

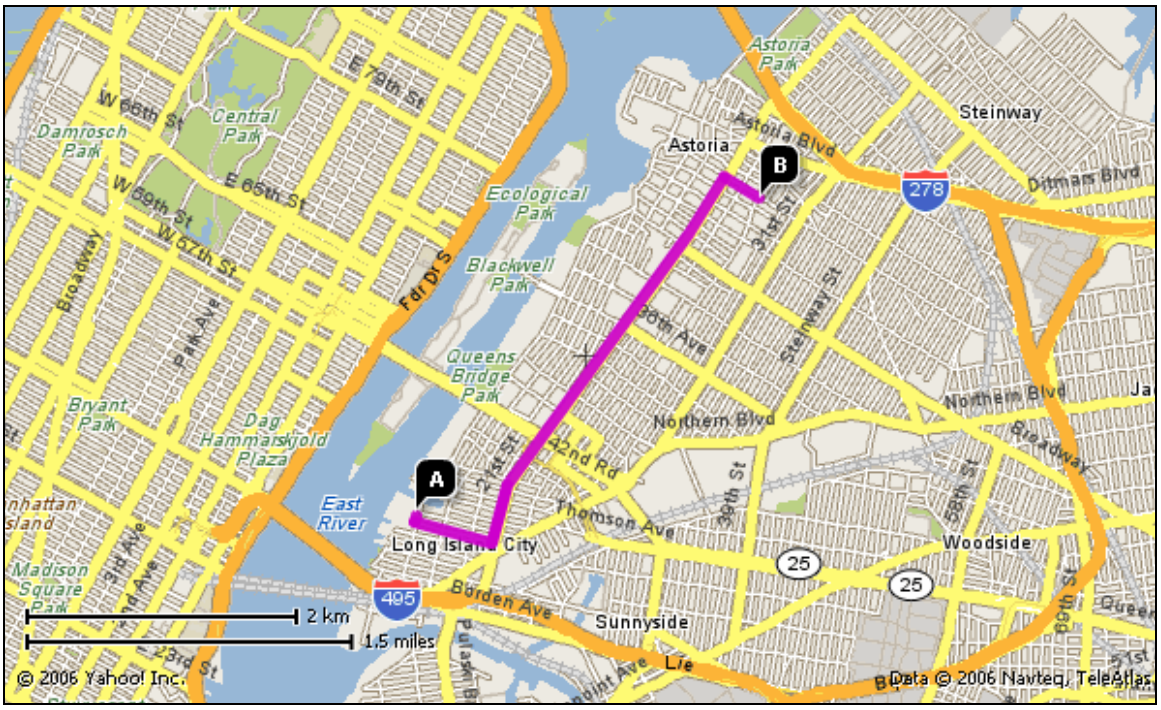
Directions to New York University Medical Center
550 1st Avenue
New York, NY 10016
(212) 263-7300



Driving Directions:	**Distance (miles)**
Begin at 46-00 5th Street going towards 46th Avenue	0.3
Turn left onto 50th Avenue	0.3
Turn right to take I-495 West towards Queens Midtown Tunnel	1.4
Take Tunnel Exit Street towards downtown	0.2
Ramp becomes Tunnel Exit Street	0.1
Continue on Queens Midtown Tunnel Exit/Tunnel Exit	0.1
Turn left onto East 34th Street	0.1
Turn right onto 2nd Avenue	0.2
Turn left onto East 30th Street	0.1
Turn left onto 1st Avenue	0.1
Arrive at 550 1st Avenue, New York	

Figure 2B

Directions to Mount Sinai of Queens
25-10 30th Avenue
Astoria, NY 11102
(718) 932-1000



Driving Directions:	**Distance (miles)**
Start on 5th Street and 47th Avenue	0.1
Turn right onto 46th Road	0.4
Turn left onto 21st Street	2.1
Turn right onto 29th Avenue	0.2
Turn right onto 25th Street/Crescent Street	0.1
Arrive at 25-10 30th Avenue, Astoria	

ATTACHMENT I
Acknowledgment Form

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 III

Attachment III – 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 105^{o}F 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.

Material Safety Data Sheets

(Included in Field Copy only)