EXPANDED SITE INVESTIGATION

APPROVED
Rob Kawecki 11-24-03

WORK PLAN

FOR

APPROVED
Nancy Seamy
1-5-04

BLUE POINT LAUNDRY TARGETED SITE ASSESSMENT
BLUE POINT, NEW YORK

WORK ASSIGNMENT NO. D003600-35

DEC
Site No.
1-52-186

PREPARED FOR

NEW YORK STATE DEPARTMENT OF
ENVIRONMENTAL CONSERVATION

BY

DVIRKA AND BARTILUCCI CONSULTING ENGINEERS
WOODBURY, NEW YORK

NOVEMBER 2003

EXPANDED SITE INVESTIGATION
WORK PLAN FOR
BLUE POINT LAUNDRY TARGETED SITE ASSESSMENT
BLUE POINT, NEW YORK

TABLE OF CONTENTS

List of Appendices

TABLE OF CONTENTS

List of Figures

List of Tables

Section 1

1.0 INTRODUCTION

On July 1, 2003, Work Assignment No. D003600-35 was issued to Dvirka and Bartilucci Consulting Engineers (D&B) by the New York State Department of Environmental Conservation (NYSDEC) to conduct an Expanded Site Investigation at the Blue Point Laundry Brownfield site in Blue Point, Suffolk County, New York. This investigation is being conducted by the NYSDEC using a grant from the United States Environmental Protection Agency (USEPA) Targeted Site Assessment Program.

The purpose of this document is to provide a site-specific Work Plan to conduct an Expanded Site Investigation and prepare a Remedial Alternatives Report for the site as defined by the NYSDEC. Generic field investigation procedures, quality assurance/quality control procedures, and health and safety procedures are provided in the "Quality Assurance/Quality Control Plan for Conducting Investigations at Brownfield Sites" and "Health and Safety Plan for Brownfield Site Investigations" which were prepared by D&B, and are included as Appendix A and Appendix B, respectively, and incorporated into this document by reference. The site-specific investigation program, including any site-specific modifications to the procedures described in the generic documents, is described in Section 3.0 of this document.

Section 1.0 of this Work Plan consists of the project schedule and project organization. Section 2.0 provides a site description and summary of background information for the site. Section 3.0 includes the technical scope of work for the Expanded Site Investigation based on the original scope of work prepared by the NYSDEC and modified based on a site inspection conducted by, and discussions between, D&B, the NYSDEC Project Manager and a representative of the Suffolk County Department of Health Services (SCDHS) on July 23, 2003. Section 3.0 also includes a sample summary matrix, site-specific QA/QC information, a site map with sample locations, and site-specific health and safety information. Section 4.0 provides the estimated budget for this project (Schedule 2.11 forms), including the assumptions used to develop the budget estimate, and the Minority Business Enterprise/Woman Business Enterprise (MBE/WBE) utilization plan.

1.1 Project Schedule

Task 1: Work Plan Development

- Submittal of Draft Work Plan 08/26/03
- NYSDEC, New York State Department of Health (NYSDOH) and SCDHS Review 11/14/03
- Submittal of Final Work Plan 11/21/03

Task 2: Field Investigation 01/05/04 - 02/13/04

- Drilling and Sampling Program ..... 01/05/04 - 01/16/04
- Laboratory Analysis ..... 4 weeks (complete 02/13/04)

Task 3: Expanded Site Investigation/Remedial Alternatives Report

- Submittal of Draft Site Investigation Report 04/09/04
- NYSDEC, NYSDOH and SCDHS Review 05/07/04
- Submittal of Final Report 05/21/04

1.2 Project Organization

NYSDEC Project Manager	Nancy Garry
D&B Project Director	Thomas Maher
D&B Project Manager	Kenneth Wenz
Health and Safety Officer	Kenneth Wenz
Quality Assurance/Quality Control Officer	Robbin Petrella
Field Operations Manager	Christopher Morris
Surveying Services	YEC, Inc. (MBE)
Geophysical Survey	Hager-Richter Geosciences, Inc. (WBE)
Direct Push Services	Zebra Environmental Corporation
Sample Analyses	Mitkem Corporation (MBE)

Section 2

2.0 SUMMARY OF BACKGROUND INFORMATION

2.1 Site Description

The former Blue Point Laundry Site is located at 1 Park Street in Blue Point, Suffolk County, New York (see Figure 2-1). The property is located on the south side of Park Street and is bounded on the south by Long Island Railroad (LIRR) tracks, on the west by a residential property and on the east by a freshwater wetland area. According to correspondence from the NYSDEC, the wetlands boundary was determined (by NYSDEC) to be the north-south fence along the eastern edge of the former Blue Point Laundry property. A site inspection conducted by D&B and SCDHS personnel on July 30, 2003, confirmed that no wetland habitats are present on the site. Purgatory/Corey Creek flows from north to south across the eastern end of the site through a 24-inch diameter pipe.

The property is approximately 2.1 acres in size and consists of four tax parcels (District 0200, Section 982.30, Block 3, Lots 45, 46, 47 and 54). The tax map is shown on Figure 2-2. The western portion of the property is fairly flat. The eastern portion of the property is terraced and slopes downward from west to east. The site is currently fenced on all sides except along the LIRR tracks.

Two buildings were formerly located at the property (see Figure 2-3 for site layout). The eastern building was approximately 35,500 square feet in size, constructed of concrete block and contained the laundry operation. A boiler room reportedly with PCB-containing transformers and electrical switching equipment was located inside the southeastern portion of this building. Transformers are also shown near the southeastern corner of the property outside of the building (see Figure 2-3). It is unknown whether these transformers were pole-mounted or were located on the ground. The western building was approximately 6,800 square feet in size and constructed of metal. This building was used as a garage with a machine shop in the southeastern corner. The eastern portion of the property and the area between the buildings were utilized for parking.

SOURCE: N.Y.S.D.O.T. PATCHOGUE QUADRANGLE

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
BLUE POINT LAUNDRY EXPANDED SITE INVESTIGATION

Dvirka and Bartilucci CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

SITE LOCATION MAP

FIGURE 2-1

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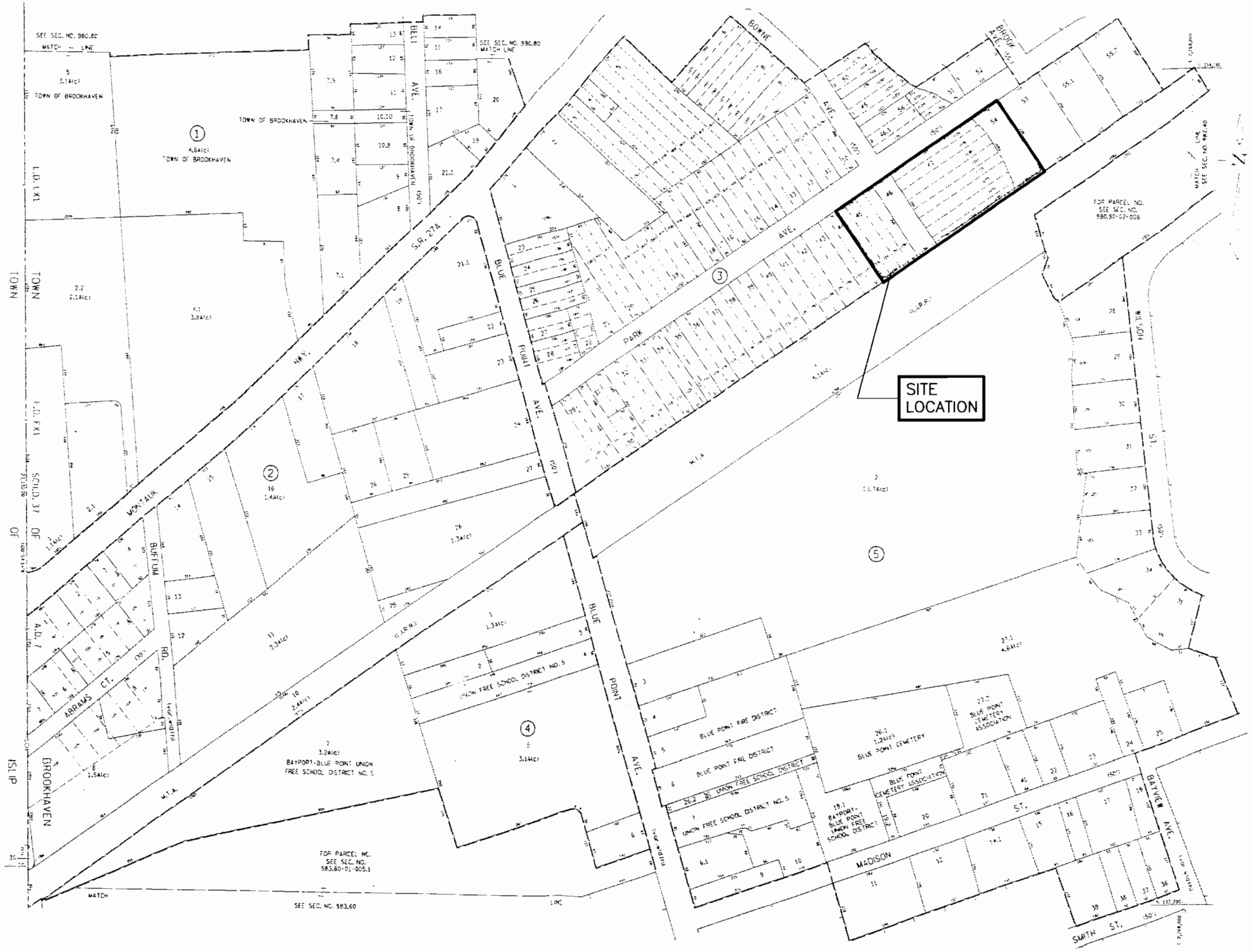

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
BLUE POINT LAUNDRY EXPANDED SITE INVESTIGATION

TAX MAP

FIGURE 2-2

Dvirka and Bartilucci CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

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PROPERTY LINE

PARK STREET

REGIONAL GROUNDWATER FLOW DIRECTION

1 4,000 GALLON GASOLINE

SANITARY SYSTEM (APPROXIMATE)

001376000406
TVOC:U
Pb:0

002376000406
TVOC:U
Pb:45

001315000501
TVOC:28,220
Pb:25

005315000822

BP-1

2'x2' CATCH BASIN

2 500 GALLON DIESEL FUEL

002359000404
TVOC:U
Pb:470

PARKING

FORMER GARAGE

MACHINE SHOP

FORMER LAUNDRY BUILDING

006315000822
TVOC:160
Pb:252

PURGATORY/COREY CREEK IN SUBSURFACE PIPE

BP-2
TVOC:1

PARKING

003376000406
TVOC:86,860
Pb:2,400

001315000822
TVOC:U
Pb:1,120

BP-7
TVOC:U

BOILER ROOM WITH INTERIOR TRANSFORMERS

7 275 GALLON #2 FUEL OIL

8 10,000 GALLON #4 OR #6 FUEL OIL

9 10,000 GALLON NOT USED

6'x6' CATCH BASIN

BP-3
TVOC:U

TRANSFORMERS

STACK

002315000822
TVOC:NOT ANALYZED
Pb:330

2,000 GALLON STODDARD SOLVENT

3 4

3,000 GALLON STODDARD SOLVENT

500-1,000 GALLON STODDARD SOLVENT

5 6

SANITARY SYSTEM

PROPERTY LINE

BP-6
TVOC:U

BP-5
TVOC:3

BP-4
TVOC:1,761

003315000822
TVOC:U
Pb:38

LEGEND

2 ABOVEGROUND STORAGE TANK AND DESIGNATION

1 UNDERGROUND STORAGE TANK AND DESIGNATION

EXISTING MONITORING WELL AND DESIGNATION

HISTORIC SOIL, SEDIMENT OR SLUDGE SAMPLE LOCATION AND DESIGNATION

DESTROYED MONITORING WELL AND DESIGNATION

TVOC: TOTAL VOLAFILE ORGANIC COMPOUND CONCENTRATION IN PARTS PER BILLION

Pb: LEAD CONCENTRATION IN PARTS PER MILLION

U: UNDETECTED

NOTES:
ONLY KNOWN HISTORIC SAMPLE LOCATIONS ARE SHOWN
LOCATIONS ARE APPROXIMATE

LONG ISLAND RAILROAD

0' 30'
SCALE IN FEET

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Dvirka and Bartilucci CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
BLUE POINT LAUNDRY EXPANDED SITE INVESTIGATION

SITE LAYOUT, HISTORIC SAMPLE LOCATIONS AND SAMPLE RESULTS

FIGURE 2-3

The depth to groundwater across the site ranges from approximately 3 feet below ground surface in the eastern portion of the property to approximately 20 feet below ground surface in the western portion of the property. The regional groundwater flow direction is to the southeast toward Patchogue Bay.

2.2 Site Use History

Blue Point Laundry began operations in 1921, although it is not known whether activities at the Park Street property began at that time or at a later date. Based on review of aerial photographs, the former laundry building at the Park Street property was constructed prior to 1947 and was expanded several times. The building was demolished in January 2001. The garage building was constructed between 1947 and 1962. Based on review of aerial photographs, this building was demolished between 1994 and 2000. The foundations for both buildings are still in place.

A total of nine storage tanks have been identified as historically in use at the site. Three of these were aboveground storage tanks (ASTs) and six were underground storage tanks (USTs). The approximate locations of the tanks are shown on Figure 2-3. The capacities and reported contents of the tanks are summarized in Table 2-1 and shown on Figure 2-3. According to SCDHS records, all of the tanks at the site have been closed, although documentation of SCDHS inspection of the tank removals is available for Tanks 8 and 9 only.

As shown on Figure 2-3, sanitary systems were located on the north and south sides of the former laundry building. Historic maps do not indicate the presence of a separate sanitary system for the garage building. In addition, two catch basins are shown within the parking area on the eastern portion of the property. The storm water entering these basins apparently discharged directly to Purgatory/Corey Creek.

According to SCDHS records, the Blue Point Laundry facility operated as a commercial laundry and dry cleaning facility. Stoddard Solvent, a mixture of straight-chain and cyclic aliphatic hydrocarbons and aromatic hydrocarbons (including substituted benzenes and

Table 2-1

BLUE POINT LAUNDRY SITE
SUMMARY OF IDENTIFIED STORAGE TANKS

Tank Number	Reported Contents	Location	Reported Capacity
1	Gasoline	Underground in northwest corner of site	4,000 gallons
2	Diesel Fuel	Aboveground inside garage building	500 gallons
3	Stoddard Solvent	Underground in southwest corner of site	2,000 gallons
4	Stoddard Solvent	Underground in southwest corner of site	3,000 gallons
5	Stoddard Solvent	Underground in rear of laundry building	500-1,000 gallons
6	Stoddard Solvent	Underground in rear of laundry building	500-1,000 gallons
7	#2 Fuel Oil	Aboveground outside southeast corner of laundry building	275 gallons
8	#4 or #6 Fuel Oil	Underground in southeast corner of laundry building	10,000 gallons
9	Not used	Aboveground in southeast corner of laundry building	10,000 gallons

substituted toluenes), was used as the dry cleaning fluid rather than tetrachloroethene. It is not known whether the garage and machine shop was operated as part of the Blue Point Laundry facility or by a separate operator. In 1986, an off-site facility for treatment and recharge of wastewater from site operations was constructed on the south side of the LIRR tracks. According to SCDHS personnel, there was a pipe that periodically carried overflow from the off-site treatment facility to Purgatory/Corey Creek.

Based on a SCDHS Consent Order signed by the property owners on August 7, 1991, and an inspection by the SCDHS of subsequent site occupant Nationwide Millworks, Inc. on November 25, 1991, Blue Point Laundry apparently went out of business in late 1991. The Consent Order concerned the failure to modify or replace a 10,000-gallon fuel oil storage tank (Tank 8).

After Blue Point Laundry ceased operations, Nationwide Millworks, Inc. occupied a portion of the former laundry building. An undated sketch map contained in the SCDHS files shows two other companies, Anthem Metal Products and FAB Machine, also occupying portions of the former laundry building. National Millworks, Inc. was a manufacturer of wooden moldings. No information regarding the activities conducted by Anthem Metal Products and FAB Machine was available. SCDHS files related to Nationwide Millworks, Inc. included two facility inspection reports, a field report documenting the cleanout of the main sanitary leaching pool and surveillance reports apparently related to odor complaints.

The initial facility inspection report, dated November 25, 1991, noted the presence of a stain and lacquer spray booth. A later report, dated July 25, 1994, cited the company for operating a paint spray booth without proper permits. The cleanout of the main leaching pool of the northern sanitary system occurred on June 13, 1995, when 1,500 gallons of liquid and 12 drums of sludge and soil were removed for off-site disposal. The odor complaint surveillance activities were conducted on nine separate occasions between August 28 and September 6, 1996, at locations downwind of the facility at various times of day and with various wind directions. The surveillance reports indicate that no odors were detected emanating from the Nationwide Millworks facility at any time during this period.

Suffolk County reportedly acquired the property in 1998 in lieu of back taxes. An additional property located at the northeast corner of Park Street and Bowne Avenue was acquired by Suffolk County in 1993 in lieu of back taxes. This property, reportedly the site of the offices for Blue Point Laundry, will not be addressed by this investigation.

2.3 Site Environmental History

The NYSDEC identified five spill numbers (83-2481, 85-2055, 86-4203, 91-08441 and 98-04645) associated with the former Blue Point Laundry Site. All of these, except 91-08441 have been closed, indicating that the NYSDEC investigation has been completed and that any required remediation has been conducted to the satisfaction of the NYSDEC. Open spill number 91-08441 is related to removal of the 10,000-gallon fuel oil tank. According to NYSDEC records, contamination was observed on groundwater when the tank was removed from the ground. Monitoring wells constructed as part of that investigation were last monitored in 1994. The locations and current conditions of these wells are unknown.

A letter dated April 28, 1986, from Blue Point Laundry to the SCDHS, states that the 4,000-gallon gasoline tank (Tank 1) had been abandoned, the 3,000-gallon and 2,000-gallon Stoddard Solvent tanks (Tank 3 and 4) were no longer in use, and that all remaining USTs at the site, except the 10,000-gallon #6 fuel oil UST (Tank 8 on Figure 2-3), would be abandoned by September 13, 1986. According to SCDHS records, all of the tanks at the site have been closed. Five of the six USTs (see Table 2-1) were reportedly removed in September 1986 and the 10,000-gallon UST was removed in November 1991. However, documentation of SCDHS inspection of the tank removals is available for only two tanks, the 10,000-gallon UST (Tank 8) and 10,000-gallon AST (Tank 9). It is unknown when the other two ASTs were removed from the site.

As described above, the main leaching pool of the northern sanitary system was cleaned out on June 13, 1995. A total of 1,500 gallons of liquid and 12 drums of sludge and soil were removed from the leaching pool for off-site disposal due to concentrations of methylene chloride

and metals (aluminum, iron and lead) in the liquid within the leaching pool that exceeded discharge criteria, and elevated concentrations of metals (aluminum, copper, iron, lead, manganese and zinc) in the leaching pool sediment. Based on endpoint sample results, no additional excavation was required.

The SCDHS has conducted several investigations at the property. The locations of soil, sediment, sludge and groundwater samples that could be determined are shown on Figure 2-3.

On April 4, 2000, a sediment sample was collected from an interior floor drain located on the northwest side of the former laundry building. The exact location of the floor drain is unknown. This sample was designated 002359000404 and was analyzed for volatile organic compounds (VOCs) and metals. On April 6, 2000, soil samples were collected from two of four sanitary leaching pools located in front (north) of the former laundry building (see Figure 2-3 for approximate locations). These samples were designated as 001376000406 and 002376000406, and were analyzed for VOCs and metals. A sediment sample from a floor drain within the former machine shop was also collected on April 6, 2000. This sample, designated 003376000406, was also analyzed for VOCs and metals. On May 1, 2000, a soil or sludge sample was collected from a "tank/pool" located on the north side of the former laundry building. This sample was designated 001315000501 and was analyzed for VOCs and metals.

Four surface soil samples (designated 001315000822, 002315000822, 003315000822 and 004315000822), one background surface soil sample (designated 005315000822) and one sludge sample (designated 006315000822) were collected on August 22, 2000. The four surface soil samples were collected in areas of stained or discolored soil. Sludge sample 006315000822 was collected from a settling tank that was located inside the former laundry building. Since during a December 2001 site inspection, the foundation in this portion of the building was intact with no evidence of disturbance, the settling tank was apparently not underground. The size of the settling tank is unknown. All of the samples collected on August 22, 2000, were analyzed for VOCs and metals except 002315000822, which was collected in an area of orange soil and analyzed for metals only. Sample locations, except for 004315000822, are shown on Figure 2-3. According to the SCDHS sampler, the map showing the location of sample 004315000822 could

not be found and the sample location is unknown. This sample did not contain VOCs or metals at concentrations exceeding SCDHS criteria.

Analytical results for the 11 soil, sediment and sludge samples are summarized in Table 2-2. VOCs were detected at concentrations above NYSDEC Recommended Soil Cleanup Objectives (RSCOs) and/or SCDHS Pumpout and Soil Cleanup Action Levels (SCDHS Action Levels) in only two samples. Sample 003376000406 collected from the former machine shop floor drain contained acetone, xylenes, substituted benzenes, substituted toluenes and naphthalene at elevated concentrations. The detection of these compounds suggests that Stoddard Solvent was likely used in the machine shop as a degreasing agent. Sample 001315000501 collected from the tank/pool on the north side of the laundry building contained elevated concentrations of benzene and chlorobenzene. Total VOC results for each sample are also summarized on Figure 2-3.

Ten of the eleven soil, sediment and sludge samples contained one or more metals at concentrations exceeding NYSDEC RSCOs and/or SCDHS Action Levels. However, for six of the ten samples, the exceedances were for copper, iron and/or zinc which are typically detected in soil on Long Island. The samples from the interior floor drain (sample 002359000404) and the stained soil area in the southwest corner of the property (sample 001315000822) contained lead at concentrations above RSCOs and/or SCDHS Action Levels (in addition to copper, iron and/or zinc). The machine shop floor drain (sample 003376000406) contained arsenic, barium, cadmium, chromium, copper, iron, lead, nickel and zinc at concentrations above RSCOs and/or SCDHS Action Levels. The sludge sample from the settling tank contained elevated levels of barium, cadmium, chromium, copper, iron, nickel and zinc. Lead results for each sample are also summarized on Figure 2-3.

On September 22, 2000, an additional sludge sample was collected from the settling tank that had been previously sampled on August 22, 2000. The sample was designated 001376000922 and was analyzed for leachable metals using the Toxicity Characteristic Leaching Procedure (TCLP). Analytical results showed that the metals in the material within the settling

Table 2-2
SUMMARY OF ANALYTICAL RESULTS FOR HISTORIC SOIL, SEDIMENT AND SLUDGE SAMPLES
BLUE POINT LAUNDRY SITE

SCDHS SAMPLE ID	002359000404	001376000406	002376000406	003376000406	001315000501	SCDHS	NYSDEC
SAMPLE LOCATION	Interior Floor Drain	Sanitary Pool	Sanitary Pool	Machine Shop Floor Drain	Tank/Pool (East)	Pumpout and Soil Cleanup Action Levels	Recommended Soil Cleanup Objectives
SAMPLE TYPE	Sediment	Soil	Soil	Sludge	Soil/sludge		
SAMPLE DATE	4/4/00	4/6/00	4/6/00	4/6/00	5/1/00		
Volatile Organics, in ug/kg							
Acetone	U	U	U	**560**	U	400	200
Benzene	U	U	U	U	**590**	120	60
Chlorobenzene	U	U	U	U	**24,000**	3,400	1,700
Total Xylenes	U	U	U	**1,400**	U	2,400	1,200
n-Propylbenzene	U	U	U	**1,400**	120	600	--
p-Ethyltoluene	U	U	U	3,300	240	3,600	--
1,3,5-Trimethylbenzene	U	U	U	**5,600**	370	5,200	--
1,2,4-Trimethylbenzene	U	U	U	**20,000**	890	4,800	--
d-Limonene	U	U	U	U	U	--	--
p-Isopropyltoluene	U	U	U	3,900	U	7,800	--
1,4-Dichlorobenzene	U	U	U	U	900	10,000	8,500
p-Diethylbenzene	U	U	U	**18,000**	540	7,600	--
n-Butylbenzene	U	U	U	4,700	U	--	--
1,2-Dichlorobenzene	U	U	U	U	230	10,000	7,900
1,2,4,5-Tetramethylbenzene	U	U	U	**11,000**	210	10,000	--
Naphthalene	U	U	U	**17,000**	130	10,000	13,000

NOTES:

Only detected compounds reported.

U: Compound analyzed for but not detected.

Exceeds NYSDEC Recommended Soil Cleanup Objective.

Exceeds SCDHS Action Level.

Exceeds SCDHS Action Level and NYSDEC Recommended Soil Cleanup Objective.

Table 2-2
SUMMARY OF ANALYTICAL RESULTS FOR HISTORIC SOIL, SEDIMENT AND SLUDGE SAMPLES
BLUE POINT LAUNDRY SITE

SCDHS SAMPLE ID	001315000822	002315000822	003315000822	004315000822	005315000822	006315000822	SCDHS Pumpout and Soil Cleanup Action Levels	NYSDEC Recommended Soil Cleanup Objectives
SAMPLE LOCATION	Stained Soil (Southwest)	Orange Surface Soil	Gray Surface Soil (South)	Gray Surface Soil	Background Surface Soil	Settling Tank		
SAMPLE TYPE	Soil	Soil	Soil	Soil	Soil	Sludge		
SAMPLE DATE	8/22/00	8/22/00	8/22/00	8/22/00	8/22/00	8/22/00		
Volatile Organics, in ug/kg								
Acetone	U	Not analyzed	U	U	U	U	400	200
Benzene	U	Not analyzed	U	U	U	U	120	60
Chlorobenzene	U	Not analyzed	U	U	U	U	3,400	1,700
Total Xylenes	U	Not analyzed	U	U	U	U	2,400	1,200
n-Propylbenzene	U	Not analyzed	U	U	U	U	600	--
p-Ethyltoluene	U	Not analyzed	U	U	U	U	3,600	--
1,3,5-Trimethylbenzene	U	Not analyzed	U	U	U	U	5,200	--
1,2,4-Trimethylbenzene	U	Not analyzed	U	U	U	U	4,800	--
d-Limonene	U	Not analyzed	U	U	U	160	--	--
p-Isopropyltoluene	U	Not analyzed	U	U	U	U	7,800	--
1,4-Dichlorobenzene	U	Not analyzed	U	U	U	U	10,000	8,500
p-Diethylbenzene	U	Not analyzed	U	U	U	U	7,600	--
n-Butylbenzene	U	Not analyzed	U	U	U	U	--	--
1,2-Dichlorobenzene	U	Not analyzed	U	U	U	U	10,000	7,900
1,2,4,5-Tetramethylbenzene	U	Not analyzed	U	U	U	U	10,000	--
Naphthalene	U	Not analyzed	U	U	U	U	10,000	13,000

NOTES:

Only detected compounds reported.

U: Compound analyzed for but not detected.

Exceeds NYSDEC Recommended Soil Cleanup Objective.

Exceeds SCDHS Action Level.

Exceeds SCDHS Action Level and NYSDEC Recommended Soil Cleanup Objective.

Table 2-2
SUMMARY OF ANALYTICAL RESULTS FOR HISTORIC SOIL, SEDIMENT AND SLUDGE SAMPLES
BLUE POINT LAUNDRY SITE

SCDHS SAMPLE ID	002359000404	001376000406	002376000406	003376000406	001315000501	SCDHS	NYSDEC
SAMPLE LOCATION	Interior Floor Drain	Sanitary Pool	Sanitary Pool	Machine Shop Floor Drain	Tank/Pool (East)	Pumpout and Soil Cleanup Action Levels	Recommended Soil Cleanup Objectives
SAMPLE TYPE	Sediment	Soil	Soil	Sludge	Soil/sludge		
SAMPLE DATE	4/4/00	4/6/00	4/6/00	4/6/00	5/1/00		
Metals, in mg/kg							
Aluminum	1,400	480	2,600	3,200	570	--	SB
Antimony	U	U	U	U	U	--	SB
Arsenic	U	U	U	**35**	U	25	7.5 or SB
Barium	55	U	25	**900**	20	--	300 or SB
Cadmium	4	U	U	**18**	U	10	10 or SB
Calcium	1,700	55	140	2,600	1,100	--	SB
Chromium	20	U	U	**70**	U	100	50 or SB
Copper	**100**	U	**150**	**300**	**210**	500	25 or SB
Iron	**15,000**	980	**2,700**	**40,000**	**25,000**	--	2,000 or SB
Lead	**470**	U	45	**2,400**	25	400	400*
Magnesium	540	70	230	2,500	230	--	SB
Manganese	100	15	U	180	90	--	SB
Nickel	10	U	U	**65**	U	1000	13 or SB
Potassium	U	U	U	150	U	--	SB
Silver	U	U	U	U	U	100	SB
Sodium	U	U	U	U	U	--	SB
Vanadium	30	U	U	10	U	--	150 or SB
Zinc	**250**	U	**25**	**510**	**430**	--	20 or SB

NOTES:

Only detected compounds reported.

U: Compound analyzed for but not detected.

SB: Site background.

*: Average background levels for lead in metropolitan or suburban areas or near highways typically range from 200 to 500 milligrams per kilogram.

Exceeds NYSDEC Recommended Soil Cleanup Objective.

Exceeds SCDHS Action Level.

Exceeds SCDHS Action Level and NYSDEC Recommended Soil Cleanup Objective.

Table 2-2
SUMMARY OF ANALYTICAL RESULTS FOR HISTORIC SOIL, SEDIMENT AND SLUDGE SAMPLES
BLUE POINT LAUNDRY SITE

SCDHS SAMPLE ID	001315000822	002315000822	003315000822	004315000822	005315000822	006315000822	SCDHS	NYSDEC
SAMPLE LOCATION	Stained Soil (Southwest)	Orange Surface Soil	Gray Surface Soil (South)	Gray Surface Soil	Background Surface Soil	Settling Tank	Pumpout and Soil Cleanup Action Levels	Recommended Soil Cleanup Objectives
SAMPLE TYPE	Soil	Soil	Soil	Soil	Soil	Sludge		
SAMPLE DATE	8/22/00	8/22/00	8/22/00	8/22/00	8/22/00	8/22/00		
Metals, in mg/kg								
Aluminum	2,600	1,700	2,200	720	3,000	3,300	--	SB
Antimony	U	U	U	U	U	30	--	SB
Arsenic	15	U	U	U	U	U	25	7.5 or SB
Barium	180	75	33	U	14	**600**	--	300 or SB
Cadmium	U	U	U	U	U	**20**	10	10 or SB
Calcium	85	67	1,400	120	740	23,000	--	SB
Chromium	U	U	U	U	U	**195**	100	50 or SB
Copper	20	11	26	U	16	**660**	500	25 or SB
Iron	**4,100**	2,000	**7,000**	**2,100**	**5,900**	**23,000**	--	2,000 or SB
Lead	**1,120**	330	38	13	121	252	400	400*
Magnesium	140	120	305	122	480	11,000	--	SB
Manganese	U	U	29	25	57	390	--	SB
Nickel	U	U	U	U	U	**210**	1000	13 or SB
Potassium	53	U	130	U	160	540	--	SB
Silver	U	U	U	U	U	28	100	SB
Sodium	U	U	U	U	U	410	--	SB
Vanadium	U	U	U	U	17	U	--	150 or SB
Zinc	**44**	**23**	**56**	12	**98**	**3,500**	--	20 or SB

NOTES:

Only detected compounds reported.

U: Compound analyzed for but not detected.

SB: Site background.

*: Average background levels for lead in metropolitan or suburban areas or near highways typically range from 200 to 500 milligrams per kilogram.

Exceeds NYSDEC Recommended Soil Cleanup Objective.

Exceeds SCDHS Action Level.

Exceeds SCDHS Action Level and NYSDEC Recommended Soil Cleanup Objective.

tank were not significantly leachable (TCLP results were at least two orders of magnitude less than the total metals results) and that the sludge in the settling tank was non-hazardous.

On September 20, 2000, groundwater samples were collected at seven locations (BP-1 through BP-7) across the property. Samples were collected from 1-inch diameter well installed by the SCDHS using the direct push method. Two 1-inch diameter PVC monitoring wells corresponding to the locations of BP-4 and BP-6 (see Figure 2-3), were observed during a December 2001 site inspection. These wells were not located during the site inspection conducted on July 23, 2003. None of the other wells were found during the December 2001 or July 2003 site inspections. Each groundwater sample was collected at the water table for analysis of VOCs and metals. The sample analyzed for metals was not filtered. The sample results are summarized in Table 2-3. As shown in this table, groundwater at BP-4 located downgradient of the former Stoddard Solvent USTs (Tank 5 and 6 on Figure 2-3) has been significantly impacted by VOCs (total VOC concentration of 1,761 micrograms per liter). None of the other groundwater samples contained VOCs at concentrations exceeding NYSDEC Class GA groundwater standards or guidance values. Total VOC results for the groundwater samples are shown on Figure 2-3. Metals that exceeded groundwater standards included iron (four samples), lead (one sample), manganese (three samples) and sodium (three samples).

Asbestos abatement was performed within the interior of the former laundry building prior to its demolition in January 2001.

Table 2-3
SUMMARY OF GROUNDWATER SAMPLE RESULTS
BLUE POINT LAUNDRY SITE

SCDHS SAMPLE ID	BP-1	BP-2	BP-3	BP-4	BP-5	BP-6	BP-7	Class GA
SAMPLE DEPTH, feet	1-6	1-6	1-6	12-17	13-18	13-18	20-25	Standards and
SAMPLE DATE	9/20/00	9/20/00	9/20/00	9/20/00	9/20/00	9/20/00	9/20/00	Guidance Values
Volatile Organics, in ug/l								
Trichloroethene	U	U	U	**21**	U	U	U	5
Tetrachloroethene	U	U	U	4	3	U	U	5
MTBE	U	1	U	U	U	U	U	--
Ethylbenzene	U	U	U	**16**	U	U	U	5
Total xylenes	U	U	U	**160**	U	U	U	5
n-Propylbenzene	U	U	U	**55**	U	U	U	5
1,3,5-Trimethylbenzene	U	U	U	**300**	U	U	U	5
1,2,4-Trimethylbenzene	U	U	U	**900**	U	U	U	5
p-Isopropyltoluene	U	U	U	**31**	U	U	U	5
p-Diethylbenzene	U	U	U	120	U	U	U	--
n-Butylbenzene	U	U	U	**38**	U	U	U	5
1,2,4,5-Tetramethylbenzene	U	U	U	**15**	U	U	U	5
Naphthalene	U	U	U	**23**	U	U	U	10 GV
sec-Butylbenzene	U	U	U	**27**	U	U	U	5
tert-Butylbenzene	U	U	U	**7**	U	U	U	5
Methyl sulfide	U	U	U	13	U	U	U	--
Dimethylsulfide	U	U	U	8	U	U	U	--
1-Methylethylbenzene	U	U	U	23	U	U	U	--
Metals, in ug/l								
Aluminum	122	701	875	280	170	280	43.2	--
Arsenic	U	5.73	U	U	U	U	U	25
Barium	49.8	114	67.6	17.5	22.4	14.5	22.9	1,000
Chromium	7.86	12.6	7.09	10.1	3.42	10.4	4.19	50
Cobalt	U	U	U	U	1.02	1.17	3.47	--
Copper	8.04	2.6	6.41	2.39	18.7	3.29	1.8	200
Iron	**8,320**	U	**16,600**	**4,540**	**790**	157	159	300 +
Lead	16.8	6.48	**33.1**	1.73	U	U	U	25
Manganese	**326**	**1,380**	**866**	160	143	42.4	**348**	300 +
Molybenum	U	U	U	1.72	1.56	2.51	4.87	--
Nickel	3.19	4.61	3.19	4.02	5.05	4.54	7.66	100
Selenium	U	U	U	U	U	3.08	U	10
Sodium	**36,700**	10,400	**59,700**	**116,000**	U	16,900	12,900	20,000
Titanium	5.25	17.3	14.8	7.08	4.58	13.9	1.33	--
Vanadium	2.5	5.32	7.99	4.17	4.58	2.64	1.01	--
Zinc	U	80.1	97.1	116	51.1	U	U	2,000 GV

NOTES:

Only detected compounds reported.
U: Compound analyzed for but not detected.
GV: Guidance value.
+: Sum of iron and manganese concentrations not to exceed 500 ug/l.
Bold Concentration exceeds Class GA groundwater standard or guidance value.

Section 3

3.0 SCOPE OF WORK

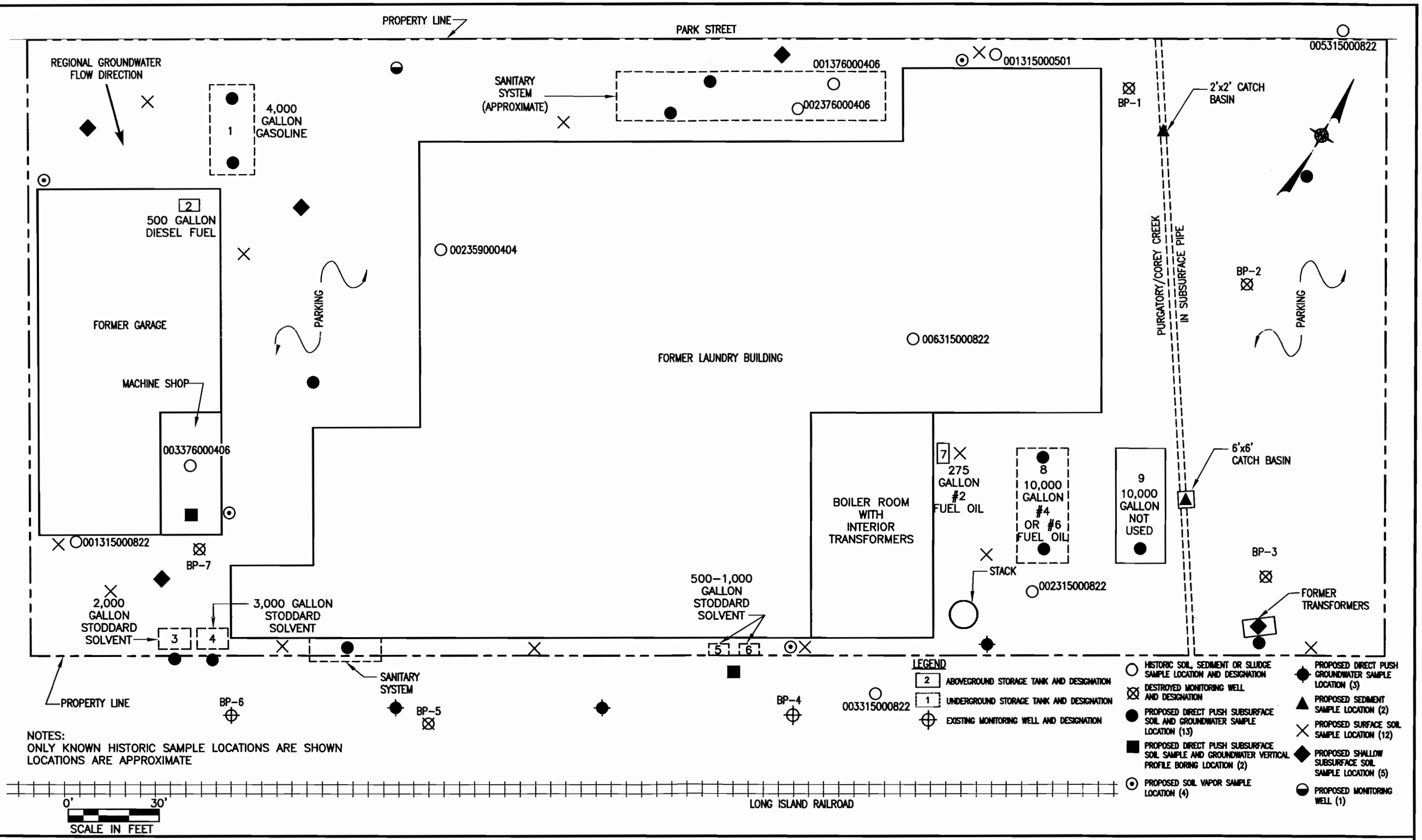
This section presents the scope of work that has been developed for additional environmental investigation at the site, based on the historic information and previous sample results described in Section 2.0. As described above, the property at the northeast corner of Park Street and Bowne Avenue that formerly was the location of the Blue Point Laundry offices will not be addressed as part of this investigation. In addition, since only the property located north of the LIRR tracks is currently owned by Suffolk County, no investigation will be conducted south of the railroad. Since the southern edge of the former laundry building foundation is very close to the property boundary (see Figures 2-3 and 3-1), several of the proposed samples described below are located on the LIRR right of way. Based on discussions with the LIRR, additional insurance, training and a LIRR flagman will be required to obtain access to the right-of-way. It is assumed that a flagman will be required for 4 days during the field investigation. The costs for these items have been included in the project budget.

3.1 Wetlands Delineation

As described previously, correspondence from the NYSDEC and a site inspection conducted by D&B and SCDHS personnel on July 30, 2003, confirmed that no wetland habitats are present on the site. However, even though subsurface sampling is proposed within 100 feet of the wetland boundary (as determined by the NYSDEC, the north-south fence running along the eastern property boundary), a permit will not be required by the NYSDEC, as confirmed by the NYSDEC Project Manager.

3.2 Geophysical Survey

Since it has not been confirmed that all of the USTs historically present at the site have been removed, a geophysical survey will be conducted to evaluate whether locations of the identified USTs and any other undocumented USTs that may be present at the site. A second objective of the geophysical survey is to locate the structures associated with the two sanitary systems at the site and the two catch basins that likely discharged storm water to



NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
BLUE POINT LAUNDRY EXPANDED SITE INVESTIGATION

PROPOSED SAMPLE LOCATIONS

FIGURE 3-1

Dvirka and Bartilucci CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

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Purgatory/Corey Creek. The geophysical survey will include an electromagnetic survey using an EM-31 magnetometer along traverses with a 10-foot spacing throughout the site, excluding the building foundation areas. Both total magnetic field and vertical magnetic gradient will be measured. The magnetic data will be contoured and identified anomalies will be further investigated using ground penetrating radar (GPR). Identified anomalies will subsequently be investigated further by construction of soil borings, and collection of soil and groundwater for laboratory analysis.

3.3 Soil Vapor Sampling

In order to evaluate whether VOC contamination that may exist beneath the building foundations is migrating through the unsaturated zone, four soil vapor samples will be collected. As shown on Figure 3-1, two of these samples will be collected at the edge of the foundation of the former laundry building and two samples will be collected at the edge of the building foundation of the former garage. Each soil vapor sample will be collected from a depth of approximately 4 feet below ground surface using the direct push method. Samples will be collected in Tedlar® bags for analysis of VOCs using modified USEPA Method TO-14A.

3.4 Surface Soil Sampling

In order to facilitate redevelopment of the property, and due to the likely greatest potential for contact with contamination, characterization of surface soil quality is an important consideration regarding reuse of the property. Therefore, as shown on Figure 3-1, 11 surface soil samples will be collected from locations across the site and 1 surface soil sample will be collected from below the former No. 2 fuel oil AST outside southeast corner of laundry building (Tank 7 on Figure 3-1). These samples will each be collected from 0 to 2 inches below ground surface or below vegetation, and will be analyzed for Target Compound List (TCL) semivolatile organic compounds with a library search (SVOCs +10), TCL pesticides, herbicides, Target Analyte List (TAL) metals and cyanide. Since any VOCs present in outdoor surface soils have likely been volatilized to the atmosphere due to wind and precipitation, surface soil samples collected from outdoor areas will not be analyzed for VOCs. However, surface soil will be

screened using an organic vapor analyzer equipped with a photoionization detector (PID) to detect the possible presence of VOCs. Any samples exhibiting elevated PID readings will also be analyzed for VOCs with a library search (VOCs +10). The scope of work assumes that VOC analysis will not be performed on any surface soil sample.

3.5 Shallow Subsurface Soil Sampling

Since fill of unknown quality may have been used to develop the site, in particular the western portion of the property, shallow subsurface soil samples will be collected at four locations across the western portion of the property (see Figure 3-1). Each sample will be collected from 2 to 4 feet below ground surface and will be analyzed for TCL VOCs +10, TCL SVOCs +10, TAL metals and cyanide.

One additional shallow subsurface soil sample will be collected from the former location of exterior transformers in the southeastern portion of the property. Since debris from the building demolition is at the ground surface over much of the property, this sample will be collected from 1 to 3 feet below ground surface for analysis of PCBs only. Since the interior transformers were located within the building and the foundation appears intact, no sampling at the interior transformer area is proposed.

3.6 Subsurface Soil Sampling

Soil borings will be constructed at the site to evaluate subsurface soil quality. Except as noted below, at each location, soil samples will be collected continuously from ground surface to the water table using the direct push method. Upon retrieval, each sample will be screened for VOCs using a PID. The samples will also be geologically logged, including indications of contamination, such as odors or staining. The worst-case interval from above the water table based on PID readings, odors, staining, etc., will be submitted for laboratory analysis. If no worst-case interval is apparent, then the 2-foot interval immediately above the water table will be submitted for analysis. Each sample will be analyzed for TCL VOCs +10, TCL SVOCs +10, TAL metals and cyanide. Boring locations are shown on Figure 3-1.

One soil boring will be constructed on the south side of the exterior transformer area to evaluate potential impacts to soil from the transformers. If no worst-case interval is apparent, then the interval from 1 to 3 feet below ground surface will be submitted for analysis (consistent with the shallow subsurface soil sample to be collected in this area). Since this location is near the former location of transformers, the soil sample collected from the boring will be also be analyzed for PCBs.

As described in Section 2.3, soil samples were collected by the SCDHS from two leaching pools associated with the northern sanitary system. In order to evaluate soil and groundwater quality at the southern sanitary system and the remaining two leaching pools in the northern sanitary system, samples will be collected in these areas. As shown on Figure 3-1, two borings will be constructed at the northern sanitary system and one boring will be constructed at the southern sanitary system to determine whether they may be contaminant sources. At each location, a soil/sediment sample will be collected from 0 to 2 feet below the base of the structure using the direct push method. It is assumed that the leaching pools will be located during the geophysical survey to be performed at the site. If the leaching pool is not found at any location, then soil samples will be continuously collected from ground surface to the water table and the worst-case interval will be submitted for laboratory analysis.

The outdoor USTs and ASTs that were identified at the site also represent potential contaminant sources. Soil and groundwater sampling will be conducted to evaluate these locations. As shown on Figure 3-1, two soil borings will be constructed to investigate the 4,000-gallon gasoline UST (Tank 1) and the 10,000-gallon fuel oil UST (Tank 8), and one soil boring will be constructed at each of Tanks 3 and 4 which contained Stoddard Solvent. In addition, one boring will be constructed to investigate the 10,000-gallon AST (Tank 9), which was reportedly never used. If the geophysical survey indicates that any of the USTs are still present, then the borings to investigate that tank will be constructed adjacent to the tank location.

For the USTs, if no worst-case interval is apparent, then the sample to be analyzed will be collected immediately below the presumed invert of each UST (currently assumed to be 8 to 10

feet below ground surface for the 4,000-gallon UST, 6 to 8 feet below ground surface for the USTs 500 to 3,000 gallons in size, and 10 to 12 feet below ground surface for the 10,000-gallon UST). If groundwater is encountered shallower than the targeted depths, then the sample from immediately above the water table will be analyzed. For the 10,000-gallon AST, if no worst-case interval is apparent then the sample to be analyzed will be collected from 2 to 4 feet below ground surface. Sample locations and depths may be modified based on the results of the geophysical survey.

It is currently not known when the two parking areas identified at the property were paved. Two soil borings will be constructed to evaluate soil and groundwater quality in the parking areas. At each location, soil samples will be collected continuously from ground surface to the water table using the direct push method. Upon retrieval, each sample will be screened for VOCs using a PID. The samples will also be geologically logged, including indications of contamination, such as odors or staining. The worst-case interval from above the water table based on PID readings, odors, staining, etc., will be submitted for laboratory analysis of TCL VOCs +10, TCL SVOCs +10, TAL metals and cyanide. If no worst-case interval is apparent, then the sample from 2 to 4 feet below ground surface will be analyzed.

Soil samples will also be collected for laboratory analysis from above the water table at the two groundwater vertical profile locations (see Figure 3-1). One of these locations is immediately south/downgradient of the two smaller Stoddard Solvent USTs (Tanks 5 and 6), and the other location is located immediately south/downgradient of the floor drain in the former machine shop.

3.7 Surface Water Sediment Sampling

Since storm water apparently discharged directly into Purgatory/Corey Creek from the site, two sediment samples will be collected to evaluate potential impacts from site operations. These samples will be collected from the creek bed directly beneath the catch basins identified on historic site drawings (see Figure 3-1) and analyzed for TCL VOCs +10, TCL SVOCs +10, PCBs, TAL metals and cyanide.

3.8 Direct Push Groundwater Sampling

In order to assess groundwater quality at the site, a groundwater sample will be collected using the direct push method at each of the 13 soil boring locations. Each of these samples will be analyzed for TCL VOCs +10 and TCL SVOCs +10.

Shallow groundwater quality migrating off-site will be determined through sampling of three direct push sample locations between the building foundations and the LIRR tracks (see Figure 3-1 for locations). Each sample will be collected at the water table and analyzed for TCL VOCs +10, TCL SVOCs +10, TCL pesticides, herbicides, TAL metals and cyanide. Analysis of pesticides, herbicides, metals and cyanide will be performed at these locations to evaluate off-site migration of these parameters. If the turbidity in any direct push groundwater or well sample cannot be reduced to less than 50 Nephelometric Turbidity Units (NTUs), then the sample will be filtered at the laboratory and dissolved metals will be analyzed.

According to information provided by the NYSDEC, a significant clay layer has been identified in a nearby well at a depth of approximately 90 feet below ground surface. In order to provide an evaluation of the vertical distribution of contaminants that may be in groundwater migrating from the site, two vertical profile groundwater borings will be constructed using the direct push method at locations shown on Figure 3-1. As described in Section 3.5, the borings will also investigate the floor drain in the former machine shop and Tanks 5 and 6. At each location, the sampler will be driven to the top of the clay layer or 90 feet below ground surface (whichever comes first) and a groundwater sample will be collected. The sampler will then be retracted and additional samples collected at 10-foot intervals to the water table. Each sample will be analyzed for TCL VOCs +10 and TCL SVOCs +10.

3.9 Monitoring Well Construction and Sampling

Since the regional groundwater flow direction is to the southeast, the two existing monitoring wells that were identified in December 2001 (BP-4 and BP-6) are located

downgradient of the former laundry building. In order to determine the site-specific groundwater flow direction and to evaluate the quality of groundwater flowing onto the site, one additional monitoring well will be constructed in the northern portion of the property (see Figure 3-1), using the direct push method. The new well will be constructed using 10 feet of 1-inch diameter PVC screen and 1-inch diameter PVC casing. The well screen will be installed across the water table. It is assumed that the depth of the new well will be 25 feet below ground surface. The new well and the two existing wells will be developed/redeveloped to ensure that representative groundwater samples will be collected.

Shallow groundwater quality migrating onto the site and off-site will be determined through sampling of the three monitoring wells. Prior to sampling, each well will be purged of 3 to 5 casing volumes using a micro-bailer or peristaltic pump with new dedicated tubing. Similar to the direct push groundwater samples along the southern property boundary, the monitoring well samples will be analyzed for TCL VOCs +10, TCL SVOCs +10, TCL pesticides, herbicides, TAL metals and cyanide. If the turbidity in any direct push groundwater or well sample cannot be reduced to less than 50 NTUs, then the sample will be filtered at the laboratory and dissolved metals will be analyzed.

The three wells will be surveyed relative to a common random datum by a New York State-licensed surveyor, as described in Section 3.9. Depth to water measurements from the three wells will be used in conjunction with the survey data to develop a water table elevation contour map for the site which will be used to determine the site-specific groundwater flow direction.

A summary of the field investigation to be conducted at the Blue Point Laundry Site, including the soil, sediment and groundwater samples to be submitted for laboratory analysis, is provided in Table 3-1.

3.10 Site Survey

A base map of the property will be prepared by a New York State licensed surveyor. The base map will include the property boundaries, locations of significant on-site and nearby

TABLE 3-1
SUMMARY OF SAMPLES AND ANALYSES
BLUE POINT LAUNDRY SITE

AREA OF CONCERN	NUMBER OF SAMPLES	ANALYSIS						
		VOCs	SVOCs	Pesticides	PCBs	Herbicides	Metals	Cyanide
Soil Vapor								
Soil Vapor	4	X						
Soil/Sediment								
Surface Soil	12		X	X		X	X	X
Shallow Subsurface Soil (2-4')	4	X	X				X	X
Shallow Subsurface Soil (2-4')	1				X			
Subsurface Soil	12	X	X				X	X
Subsurface Soil	1	X	X		X		X	X
Vertical Profile Borings	2	X	X				X	X
Surface Water Sediment	2	X	X		X		X	X
Groundwater								
Vertical Profile Groundwater	18	X	X					
Direct Push Groundwater	13	X	X					
Direct Push Groundwater	3	X	X	X		X	X	X
New Monitoring Wells	1	X	X	X		X	X	X
Existing Monitoring Wells	2	X	X	X		X	X	X

features (building foundations, catch basins, streets, Purgatory/Corey Creek, LIRR tracks, etc.), locations of surface soil and soil borings, monitoring wells, and monitoring well elevations (relative to a common random datum).

3.11 Site-specific QA/QC Information

All samples will be analyzed using NYSDEC 2000 Analytical Services Protocol (ASP) methods with a 4-week turnaround time. A Category B data package will be provided. The data packages received from the laboratory will be reviewed and evaluated. A Data Usability Summary Report (DUSR) will be prepared. Full data validation will not be conducted.

3.12 Report Preparation

Following completion of the field activities, an Expanded Site Investigation/Remedial Alternatives Report (ESI/RAR) will be prepared. The report will provide a summary of background information, documentation of the field investigation, descriptions of sampling methods, evaluation of site-specific groundwater flow direction, maps showing sample locations and analytical results, tabulated analytical results by medium in comparison to applicable standards, criteria and guidelines, the DUSR, and evaluation of the nature and extent of soil and groundwater contamination. The report will also include a qualitative human health exposure assessment, and a fish and wildlife impact analysis. The fish and wildlife analysis will be prepared in accordance with Steps I and II(A) of the NYSDEC guidance document entitled "Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites", dated October 1994. Based on the sample results, the human health exposure assessment, and the fish and wildlife impact analysis, conclusions and recommendations will be developed regarding the need for remediation and/or additional investigation, if warranted.

If it is determined that remediation is required, remedial alternatives will be developed for the site based on planned future site use (if known), and qualitatively screened based on effectiveness, reliability, implementability and cost. Based on the results of this screening, recommendations regarding remedial alternatives that would be appropriate to the site will be

developed. A draft ESI/RAR will be submitted to the NYSDEC, the New York State Department of Health and the SCDHS for review, and comments received will be incorporated into a final report. The final report will also be provided to the NYSDEC electronically as a portable data format (PDF) document.

3.13 Site-specific Health and Safety Information

The following site-specific information will be filled out by project personnel for each site and will be posted on-site:

Site Name:	Blue Point Laundry Site	
Address:	1 Park Street	
	Blue Point, New York	
Date of HASP Preparation:	August 2003	
Date of Field Investigation:	January 2004	
Entry Objectives:	Site Characterization	
Site Organizational Structure:	Name	Telephone Number
Project Director:	Thomas Maher	(516) 364-9890
Project Manager:	Kenneth Wenz	(516) 364-9890
HSO:	Kenneth Wenz	(516) 364-9890
FOM/Alternate HSO:	Christopher Morris	(516) 364-9890
Field Team Staff:		
	Name	Telephone Number
Subcontractors:	Zebra Environmental Corp.	(516) 596-6300
	Mitkem Corporation	(401) 732-3400
	Hager-Richter Geosciences	(603) 893-9944

Medical Assistance Physician:	Plainview Medical Group, P.C.
	100 Manetto Hill Road
	Plainview, New York 11803
Telephone:	(516) 822-2541
Name of Hospital:	Brookhaven Memorial Hospital Medical Center
Address:	101 Hospital Road, East Patchogue
Telephone:	(631) 654-7100
Directions:	Follow Bowne Avenue north the Main Street/Route 27A. Turn right and follow Main Street for approximately 1.9 miles to Patchogue-Yaphank Road. Turn left and follow Patchogue-Yaphank Road for approximately 0.75 mile and turn left onto Hospital Road. Hospital is ahead on the right.

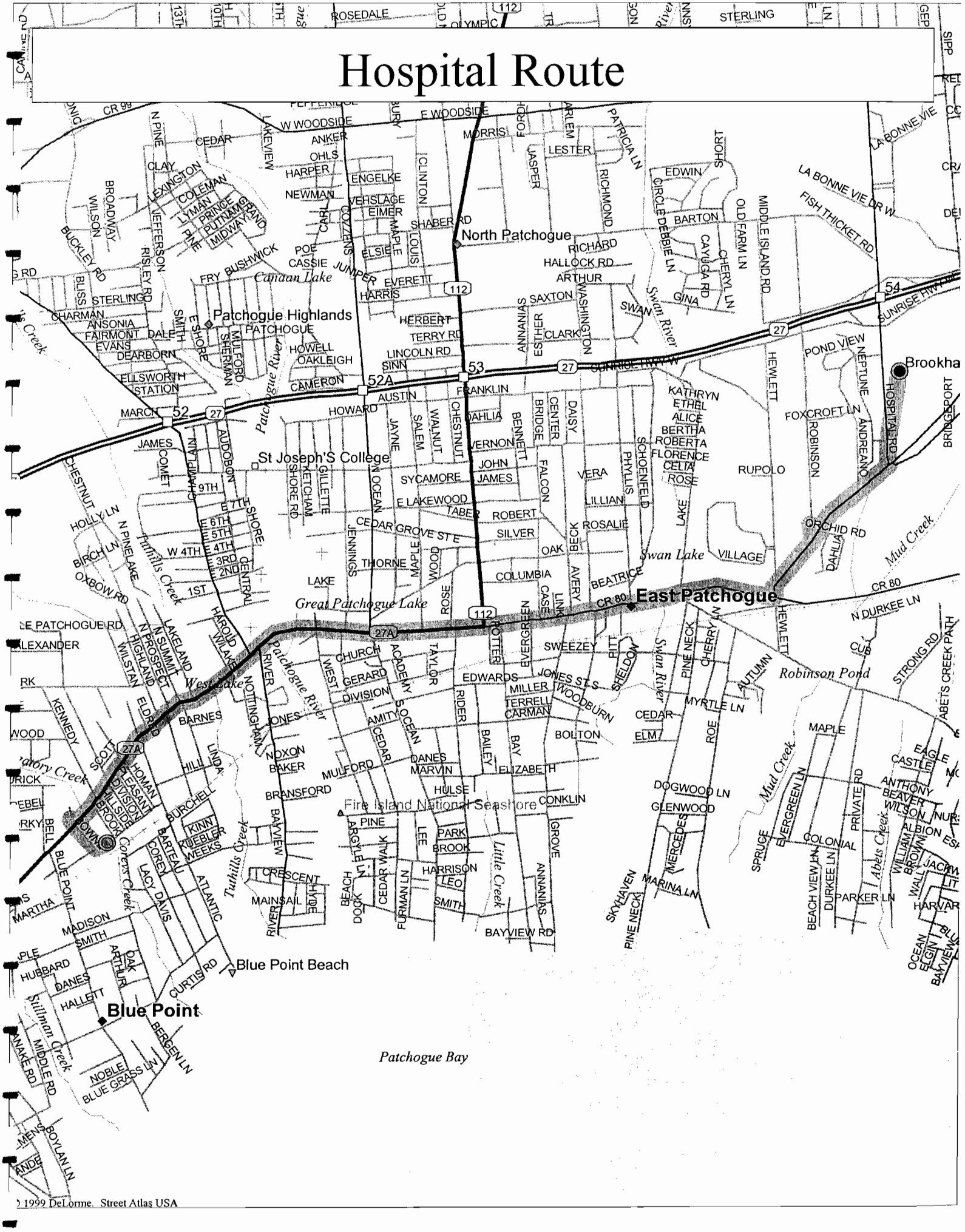
Route to hospital: (see attached map)

Emergency Telephone Numbers:

Agent/Facility	Telephone No.	Emergency No.
EMS – Ambulance	(631) 475-1225	911
Police Department	(631) 854-8500	911
Fire Department	(631) 363-6310	911
Hospital	(631) 654-7100	(631) 654-7763
Poison Control Center		(516) 542-2323

Additional site-related information (may include special hazards, site control, waste storage and disposal, PPE, decontamination area location, special engineering controls, etc.).

Hospital Route



Section 4

4.0 SCHEDULE 2.11 FORMS

Budget assumptions:

- All field work can be completed with Level D personal protection;
- A wetlands permit will not be required;
- Site access for drilling and sampling will be secured by the NYSDEC or the SCDHS;
- Any required site clearing will be coordinated by the SCDHS;
- The direct push sampling method will be effective for sample collection and monitoring well construction;
- Decontamination water will be discharged to the ground surface in the vicinity of the decontamination area;
- Development and purge water will be disposed to the ground surface in the vicinity of the well;
- Existing monitoring wells BP-4 and BP-6 will be located and will be available for sampling;
- The newly constructed monitoring well and existing monitoring wells will be sampled approximately one week after development;
- Excess soil cuttings will remain at each site in the vicinity of the boring from which they were generated;
- Standard laboratory turnaround time of four weeks will be utilized;
- State-owned field equipment will be available for the duration of the project; and
- A public meeting will not be held for this project.

Schedule 2.11 (a)

Summary of Work Assignment Price
Blue Point Laundry Targeted Site Assessment

Work Assignment Number D003600-35

1.	Direct Salary Costs (Schedules 2.10 (a) and 2.11(b))	$17,058
2.	Indirect Costs (Schedule 2.10 (g))	$27,002
3.	Direct Non-Salary Costs (Schedules 2.11 (c)and (d))	$9,866

Subcontract Costs

Cost-Plus-Fixed-Fee Subcontracts (Schedules 2.11(e))

Name of Subcontractor	Services To Be Performed	Subcontract Price
YEC, Inc. (MBE)	Surveying	$5,300
Hager-Richter Geoscience, Inc. (WBE)	Geophysical Survey	$5,703
4. Total Cost-Plus-Fixed-Fee Subcontracts		$11,003

Unit Price Subcontracts (Schedules 2.11(f))

Name of Subcontractor	Services To Be Performed	Subcontract Price
Zebra Environmental Corp.	Direct Push Services	$8,855
Mitkem Corporation (MBE)	Sample Analysis	$38,675

5.	Total Unit Price Subcontracts	$47,530
6.	Subcontract Management Fee	$1,354
7.	Total Subcontract Costs (lines 4 + 5 + 6)	$59,886
8.	Fixed Fee (Schedule 2.10 (h))	$3,701
9.	Total Work Assignment Price (lines 1 + 2 + 3 + 7 +8)	$117,513

SCHEDULE 2.11 (b)
SUMMARY
Blue Point Laundry Targeted Site Assessment
WORK ASSIGNMENT NUMBER D003600-35

Average NSPE Wage Rates	IX	VIII	VII	VI	V	IV	III	II	I	TOTAL HOURS
as of July 1, 2003	$65.61	$61.47	$53.43	$43.03	$36.16	$30.54	$27.72	$24.06	$19.19	
Task 1 - Work Plan Development	4	0	0	0	70	0	0	32	0	106
Task 2 - Field Investigation	0	0	0	0	28	0	118	14	0	160
Task 3 - SI/RAR Report	8	0	0	0	188	0	16	46	0	258
Total 2003 Hours	12	0	0	0	286	0	134	92	0	524
Total Direct Labor Cost	$787	$0	$0	$0	$10,342	$0	$3,714	$2,214	$0	$17,057

SCHEDULE 2.11 (b)-1
SUMMARY
Blue Point Laundry Targeted Site Assessment
WORK ASSIGNMENT NUMBER D003600-35

Average NSPE Wage Rates	IX	VIII	VII	VI	V	IV	III	II	I	TOTAL HOURS
as of July 1, 2003	$65.61	$61.47	$53.43	$43.03	$36.16	$30.54	$27.72	$24.06	$19.19	
Task 1	0.5	0	0	0	4	0	0	8	0	12.5
Task 2	0.5	0	0	0	2	0	0	4	0	6.5
Task 3	0.5	0	0	0	2	0	0	8	0	10.5
Total 2003 Hours	1.5	0	0	0	8	0	0	20	0	29.5
Total Direct Labor Cost	$98	$0	$0	$0	$289	$0	$0	$481	$0	$869

Dvirka & Bartilucci Consulting Engineers
Blue Point Laundry Targeted Site Assessment
Work Assignment Number: D003600-35

BREAKDOWN OF ADMINISTRATIVE LOE HOURS ON SCHEDULE 2.11(b-1)

ADMIN ACTIVITY	WORK PLAN DEVELOPMENT														REVIEW WORK ASSIGNMENT (WA) PROGRESS													
	Conflict of Interest Checks						Prepare 2.11 Schedules								Conduct Progress Reviews						Prepare Monthly Report & Update Schedules							
NSPE	IX	VIII	VII	VI	V	IV	VIII	VII	VI	V	IV	III	II	I	VIII	VII	VI	V	IV	III	VIII	VII	VI	V	IV	III	II	I
TASK 1	0.5									4																		
TASK 2																								2				
TASK 3																								2				
TOTAL	0.5	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0

ADMIN ACTIVITY	REVIEW WORK ASSIGNMENT (WA) PROGRESS														CAP PREPARATION											
	MBE/WBE Activities								Program Management						Prepare Monthly Cost Control Report & CAP								Oversee CAP			
NSPE	VIII	VII	VI	V	IV	III	II	I	IX	VIII	VII	VI	V	IV	VIII	VII	VI	V	IV	III	II	I	IX	VIII	VII	VI
TASK 1																					8					
TASK 2									0.5												4					
TASK 3									0.5												8					
TOTAL	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0

ADMIN ACTIVITY	MISCELLANEOUS																									
	Update NSPE List								Equipment Use and Inventory				Word Proc. and Report Preparation				Total Adm. LOE (hrs)									
NSPE	VIII	VII	VI	V	IV	III	II	I	IV	III	II	I	IV	III	II	I	IX	VIII	VII	VI	V	IV	III	II	I	
TASK 1																	0.5				4			8		
TASK 2																	0.5				2			4		
TASK 3																	0.5				2			8		
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.5	0	0	0	8	0	0	20	0	

SCHEDULE 2.11 (c)
DIRECT NON-SALARY COSTS
SUMMARY
Blue Point Laundry Targeted Site Assessment
Work Assignment No. D003600-35

ITEM	MAXIMUM REIMBURSEMENT RATE	UNIT	ESTIMATED NUMBER OF UNITS	TOTAL ESTIMATED COSTS
IN-HOUSE				
Outside Services*	$200.00	set	0	$0.00
Express Mail	$20.00	package	10	$200.00
Sample Shipping	$50.00	shipment	12	$600.00
Level D Safety Equipment	$14.00	($/person/day)	12	$168.00
Level C Safety Equipment	$40.00	($/person/day)	0	$0.00
Level B Safety Equipment	$50.00	($/person/day)	0	$0.00
Long Island Railroad Flagperson	$700.00	($/person/day)	4	$2,800.00
Railroad Protective Insurance	$4,700.00	policy	1	$4,700.00
TRAVEL				
Transportation (Personal Car)	$0.36	mile	1500	$540.00
Van Rental	$325.00	week	1	$325.00
Gas	$50.00	week	1	$50.00
TOTAL DIRECT NON-SALARY COSTS				$9,383.00

* Includes photo finishing, slides and any other costs not associated with in-house capabilities.

SCHEDULE 2.11 (d) 1

EQUIPMENT PURCHASED UNDER THE CONTRACT
SUMMARY
Blue Point Laundry Targeted Site Assessment
Work Assignment No. D003600-35

ITEM	ESTIMATED PURCHASE PRICE	O&M RATE ($/per month)	TERM OF USAGE (MONTHS)	ESTIMATED USAGE COST (COL. 2 + [3X4])
			TOTAL	$0.00

Schedule 2.11 (d) 2
Summary

Maximum Reimbursement Rates for Consultant/Subconsultant - Owned Equipment
Blue Point Laundry Targeted Site Assessment
Work Assignment No. D003600-35

ITEM	PURCHASE PRICE X 85%	USAGE RATE ($/day)	CAPITAL RECOVERY RATE ($/Unit of Time)	O & M RATE ($/Unit of Time)	ESTIMATED USAGE (days)	ESTIMATED USAGE COST (Col. 3x6)
						$0
					TOTAL	$0

Notes:
Usage Rate = Capital Recovery Rate + O&M rate

The maximum usage rate for an item of equipment reverts to the O&M rate when the total usage reimbursement exceed 85% of the purchase price.

SCHEDULE 2.11 (d) 3
EQUIPMENT
VENDOR RENTED
SUMMARY
Blue Point Laundry Targeted Site Assessment
Work Assignment No. D003600-35

ITEM	MAXIMUM REIMBURSEMENT RATE	TIME PERIOD	ESTIMATED USAGE (period of time)	ESTIMATED USAGE COST (Col. 2 X 3)
Century OVA 128	$125.00	day	0	$0.00
Photovac Microtip	$125.00	day	0	$0.00
MIE Miniram Digital Dust Indicator	$85.00	day	0	$0.00
Horiba U22 Water Quality Meter	$100.00	day	0	$0.00
Solinst Water Level Indicator	$25.00	day	0	$0.00
Generator	$55.00	day	1	$55.00
Peristaltic Pump	$50.00	day	1	$50.00
Grunfos Pump	$125.00	day	0	$0.00
			Total	$105.00

SCHEDULE 2.11 (d) 4
SUMMARY
EXPENDABLE SUPPLIES
Blue Point Laundry Targeted Site Assessment
Work Assignment No. D003600-35

ITEM	ESTIMATED QUANTITY	UNITS	UNIT COST	TOTAL BUDGETED COST (COL. 2 X 3)
Disposable bailers	0.2	Case of 24	$200.00	$40.00
Tubing	150	Feet	$0.25	$37.50
			TOTAL	$77.50

SCHEDULE 2.11 (d) 5
CONSUMABLE SUPPLIES
SUMMARY
Blue Point Laundry Targeted Site Assessment
Work Assignment No. D003600-35

ITEM	ESTIMATED QUANTITY	UNIT COST	TOTAL BUDGETED COST (COL. 2 X 3)
Miscellaneous Supplies	3	$100.00	$300.00
		TOTAL	$300.00

HAGER-RICHTER
GEOSCIENCE, INC.

Schedule 2.11 (e)
Phase I
Cost-Plus-Fixed-Fee Subcontracts

NAME OF SUBCONTRACTOR	SERVICES TO BE PERFORMED	SUBCONTRACT PRICE
Hager-Richter Geoscience, Inc.	Geophysical Survey	$5,702.67

Direct Salary Costs

Professional Responsibility Level	Labor Classification	Average Reimbursement Rate ($/hr)	Max. Reimbursement Rate ($/hr)	Estimated No. of Hours	Total Estimated Direct Salary Cost (Ave. Reimb. Rate x Est. # of Hours)
Principal	VIII	49.13	49.48	4	196.52
Sen. Geoph.	IV	31.36	33.62	8	250.88
Geoph.	III	24.39	25.53	40	975.60
CAD/Jr. Geologist	II	20.37	21.78	40	814.80
Total Direct Salary Costs					$ 2,237.80

Footnotes:

1) These rates will be held firm until December 31, 2003.

2) Reimbursement will be limited to the lesser of either the individual's actual hourly rate or the maximum rate for each labor category.

3) Reimbursement will be limited to the maximum reimbursement rate for the professional responsibility level of the actual work performed.

4) Only those labor classifications indicated with an asterisk (*) will be entitled to overtime.

5) Reimbursement for technical time of principals, owners and officers will be limited to the maximum reimbursement rate of that labor category, the actual hourly rate paid, or the State of New York M-5 rate, whichever is lower.

6) The maximum rates in each labor category can be modified only by mutual written agreement and approved by both the Department and the Comptroller.

HAGER-RICHTER
GEOSCIENCE, INC.

7) This Footnote applies to Schedules for years 4 thru 7 only. If the U.S. cost-of living index increases at a rate greater than 6% compounded annually, the maximum salary rates will be subject to renegotiation for future years of the contract. There shall be no retroactive adjustments of payment as a result of renegotiated salary schedules.

A. Indirect Costs

Indirect Costs shall be paid based on a percentage of direct salary costs incurred which shall not exceed a maximum of 127.3 % or the actual rate calculated in accordance with 48 CFR Federal Acquisition Regulation, whichever is lower.

Amount budgeted for indirect costs is $2,848.72

C. Maximum Reimbursement Rates for Direct Non-Salary Costs

Item	Max. Reimbursement Rate (Specify Unit)	Est. No. of Units	Total Estimated Cost
1. Travel			
Mileage	0.25/mi	350	87.50
Tolls			20.00
2. Equipment Use			
Total Direct Non-Salary Costs			$107.50

D. Fixed Fee

The fixed fee is $508.65
See Schedule 2.10(h) for how the fixed fee should be claimed.

New Wetland

Schedule 2.11 (e)
Cost Plus Fixed-Fee Subcontracts

Former Blue Point Laundry Site

August 7, 2003

NAME OF SUBCONTRACTOR	SERVICES TO BE PERFORMED	SUBCONTRACT PRICE
YEC, INC.	Survey & CAD Mapping	$5,289.07

A. Direct Salary Costs

Professional Responsibilty Level	Labor Classification	Average Reimbursement Rate ($/Hr.)		Maximum Reimbursement Rate ($/Hr.)		Estimated Number of Hours	Total Estimated Direct Salary Cost ($)
Principal	VIII	2003	56.86	2003	61.43	2	113.72
Senior Geologist/Scientist/ Engineer/ Licensed Surveyor	V	2003	37.60	2003	41.36	20	752.00
Staff Geologist/ Scientist/Engineer	IV	2003	32.69	2003	35.95	0	0.00
Staff Geologist/ Scientist/Engineer/CAD Operator	III	2003	28.36	2003	31.47	8	226.88
Senior Technician/Staff Engineer/Scientist/Geologist	II	2003	20.98	2003	23.51	22	461.56
Technician/Draftsperson	I	2003	19.01	2003	21.30	22	418.22
						Total Direct Salary Costs:	1,972.38

B. Indirect Costs - 117% of direct salary cost

Indirect Costs: 2,307.68

C. Maximum Reimbursement Rates for Direct Non-Salary Costs:

Item	Maxium Reimbursement Rate	Estimated No. of Units	
Mileage	0.31 /mile	300 miles	93.00
Tolls	12.00 /trip	2 trips	24.00
CAD Equipment Costs	15.00 /hr	8 hrs	120.00
Survey Equipment Rental	65.00 day	2 day	130.00
		Total Direct Non Salary Costs:	367.00

D. Fixed Fee (15% of Total Direct and Indirect Salary Costs)

Fixed Fee: 642.01

SCHEDULE 2.11 (f) 1
UNIT PRICE SUBCONTRACTS
SUMMARY
Blue Point Laundry Targeted Site Assessment
Work Assignment No. D003600-35

NAME OF SUBCONTRACTOR	SERVICES TO BE PERFORMED	SUBCONTRACT PRICE	MANAGEMENT FEE
Zebra Environmental Corporation	**Direct Push Services**	**$8,855**	**$0**

Item	Maximum Reimbursement Rate		Estimated No. of Units		Total Estimated Costs
1a Mobilization and demobilization, including site set-up breakdown, clean-up, repair and site restoration.	$625	Lump sum	1	1 Event	$625
1b Construction and removal of decontamination pad	$95	Lump sum	1	Event	$95
2 Well Set-up	$0	Per location	24	Locations	$0
3 Geoprobe System Truck/Van/ATV-Mounted Unit	$850	Per 8-hour day	4	6 Days	$5,100
4 Overtime Charge for On-site Work	$50	Per person hour	12	Person hour	$600
5 Probe Sampling					
a Groundwater Sampling	$9	Per sample	67	34 Samples	$306
c Macro Core Sampling	$9	Per 2-foot sample		165 Samples	$1,485
6c 1" PVC Well Construction	$3.25	Per foot	20'	35 Feet	$114
7 Flush-mounted Manhole/Vault	$52	Per manhole	1	Manhole	$52
8 Soil Vapor Samples	46 $7	Per sample	5	4 Samples	$28
9 Standby Time	$75	Per hour	6	Hours	$450

SUBTOTAL	**$8,855**
SUBCONTRACT MANAGEMENT FEE	**$0**
TOTAL	**$8,855**

additional crew 2 days @ 175/day

+ 1,470 additional time

SCHEDULE 2.11 (f) 2
UNIT PRICE SUBCONTRACTS
SUMMARY
Blue Point Laundry Targeted Site Assessment
Work Assignment No. D003600-35

NAME OF SUBCONTRACTOR	SERVICES TO BE PERFORMED	SUBCONTRACT PRICE	MANAGEMENT FEE
Mitkem Corporation	**Sample Analysis**	**$38,675**	**$1,354**

Item	Method	Maximum Reimbursement Rate	Estimated Units	Total Estimated Cost
Soil Vapor				
VOCs	Modified TO14	$140.00 per sample	4	$560.00
Groundwater				
VOCs	EPA SOW OLM04.2 (6/00 ASP)	$110.00 per sample	37	$4,070.00
SVOCs	EPA SOW OLM04.2 (6/00 ASP)	$200.00 per sample	37	$7,400.00
Pesticides	EPA SOW OLM04.2 (6/00 ASP)	$80.00 per sample	6	$480.00
Herbicides	8150	$200.00 per sample	6	$1,200.00
Metals	EPA SOW OLM04.2 (6/00 ASP)	$90.00 per sample	6	$540.00
Cyanide	335.2 CLP-M (6/00 ASP)	$20.00 per sample	6	$120.00
Soil/Sediment				
VOCs	EPA SOW OLM04.2 (6/00 ASP)	$110.00 per sample	21	$2,310.00
SVOCs	EPA SOW OLM04.2 (6/00 ASP)	$225.00 per sample	33	$7,425.00
Pesticides	EPA SOW OLM04.2 (6/00 ASP)	$80.00 per sample	12	$960.00
PCBs	EPA SOW OLM04.2 (6/00 ASP)	$70.00 per sample	4	$280.00
Herbicides	8150	$200.00 per sample	12	$2,400.00
Metals	EPA SOW OLM04.2 (6/00 ASP)	$90.00 per sample	33	$2,970.00
Cyanide	335.2 CLP-M (6/00 ASP)	$20.00 per sample	33	$660.00
QA/QC Samples				
Groundwater				
Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank				
VOCs	EPA SOW OLM04.2 (6/00 ASP)	$110.00 per sample	6	$660.00
SVOCs	EPA SOW OLM04.2 (6/00 ASP)	$200.00 per sample	6	$1,200.00
Pesticides	EPA SOW OLM04.2 (6/00 ASP)	$80.00 per sample	3	$240.00
Herbicides	8150	$200.00 per sample	3	$600.00
Metals	EPA SOW OLM04.2 (6/00 ASP)	$90.00 per sample	3	$270.00
Cyanide	335.2 CLP-M (6/00 ASP)	$20.00 per sample	3	$60.00
Soil/Sediment				
Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank				
VOCs	EPA SOW OLM04.2 (6/00 ASP)	$110.00 per sample	6	$660.00
SVOCs	EPA SOW OLM04.2 (6/00 ASP)	$225.00 per sample	6	$1,350.00
Pesticides	EPA SOW OLM04.2 (6/00 ASP)	$80.00 per sample	3	$240.00
PCBs	EPA SOW OLM04.2 (6/00 ASP)	$70.00 per sample	3	$210.00
Herbicides	8150	$200.00 per sample	3	$600.00
Metals	EPA SOW OLM04.2 (6/00 ASP)	$90.00 per sample	6	$540.00
Cyanide	335.2 CLP-M (6/00 ASP)	$20.00 per sample	6	$120.00
Trip Blank				
VOCs	EPA SOW OLM04.2 (6/00 ASP)	$110.00 per sample	5	$550.00

SUBTOTAL	**$38,675.00**
SUBCONTRACT MANAGEMENT FEE	**$1,353.63**
TOTAL	**$40,028.63**

Project Name: Blue Point Laundry Targeted Site Assessment
Work Assignment No.: D003600-35
Task No./Name: All Tasks
Complete: 0.00%

SCHEDULE 2.11 (g)
SUMMARY

Date Prepared:
Billing Period:
Invoice No.:

MONTHLY COST CONTROL REPORT
SUMMARY OF FISCAL INFORMATION

Expenditure Category	A Costs Claimed This Period	B Paid To Date	C Total Disallowed To Date	D Total Costs Incurred To Date (A+B+B1)	E Estimated Costs To Completion	F Total Work Assignment Price (A+B+E)	G Approved Budget	H Estimated Under/(Over) (G-F)
1. Direct Salary Costs	0.00	0.00	0.00	0.00	0.00	0.00	$17,058	0.00
2. Indirect 158.32	0.00	0.00	0.00	0.00	0.00	0.00	$27,002	0.00
3. Subtotal Direct Salary Costs and Indirect Costs	0.00	0.00	0.00	0.00	0.00	0.00	$44,060	0.00
4. Travel	0.00	0.00	0.00	0.00	0.00	0.00	$915	0.00
5. Other Non-Salary Costs	0.00	0.00	0.00	0.00	0.00	0.00	$8,951	0.00
6. Subtotal Direct Non-Salary Costs	0.00	0.00	0.00	0.00	0.00	0.00	$9,866	0.00
7. Subcontractors	0.00	0.00	0.00	0.00	0.00	0.00	$59,886	0.00
8. Total Work Assignment Cost	0.00	0.00	0.00	0.00	0.00	0.00	$113,812	0.00
9. Fixed Fee	0.00	0.00	0.00	0.00	0.00	0.00	$3,701	0.00
10. Total Work Assignment Price	0.00	0.00	0.00	0.00	0.00	0.00	$117,513	0.00

Project Manager (Engineer) _____ Date _____

Project Name: Blue Point Laundry Targeted Site Assessment
Work Assignment No.: D003600-35
Task No./Name: 1/Work Plan Development
Complete: 0.00%

SCHEDULE 2.11 (g)

Date Prepared:
Billing Period:
Invoice No.:

MONTHLY COST CONTROL REPORT
SUMMARY OF FISCAL INFORMATION

Expenditure Category	A Costs Claimed This Period	B Paid To Date	C Total Disallowed To Date	D Total Costs Incurred To Date (A+B+B1)	E Estimated Costs To Completion	F Total Work Assignment Price (A+B+E)	G Approved Budget	H Estimated Under/(Over) (G-F)
1. Direct Salary Costs	0.00	0.00	0.00	0.00	0.00	0.00	$3,564	0.00
2. Indirect	0.00	0.00	0.00	0.00	0.00	0.00	$5,642	0.00
3. Subtotal Direct Salary Costs and Indirect Costs	0.00	0.00	0.00	0.00	0.00	0.00	$9,205	0.00
4. Travel	0.00	0.00	0.00	0.00	0.00	0.00	$88	0.00
5. Other Non-Salary Costs	0.00	0.00	0.00	0.00	0.00	0.00	$60	0.00
6. Subtotal Direct Non-Salary Costs	0.00	0.00	0.00	0.00	0.00	0.00	$148	0.00
7. Subcontractors	0.00	0.00	0.00	0.00	0.00	0.00	$0	0.00
8. Total Work Assignment Cost	0.00	0.00	0.00	0.00	0.00	0.00	$9,353	0.00
9. Fixed Fee	0.00	0.00	0.00	0.00	0.00	0.00	$773	0.00
10. Total Work Assignment Price	0.00	0.00	0.00	0.00	0.00	0.00	$10,127	0.00

Project Manager (Engineer) _____ Date _____

Project Name: Blue Point Laundry Targeted Site Assessment
Work Assignment No.: D003600-35
Task No./Name: 2/Field Investigation
Complete: 0.00%

SCHEDULE 2.11 (g)

Date Prepared:
Billing Period:
Invoice No.:

MONTHLY COST CONTROL REPORT
SUMMARY OF FISCAL INFORMATION

Expenditure Category	A Costs Claimed This Period	B Paid To Date	C Total Disallowed To Date	D Total Costs Incurred To Date (A+B+B1)	E Estimated Costs To Completion	F Total Work Assignment Price (A+B+E)	G Approved Budget	H Estimated Under/(Over) (G-F)
1. Direct Salary Costs	0.00	0.00	0.00	0.00	0.00	0.00	$4,620	0.00
2. Indirect	0.00	0.00	0.00	0.00	0.00	0.00	$7,314	0.00
3. Subtotal Direct Salary Costs and Indirect Costs	0.00	0.00	0.00	0.00	0.00	0.00	$11,934	0.00
4. Travel	0.00	0.00	0.00	0.00	0.00	0.00	$827	0.00
5. Other Non-Salary Costs	0.00	0.00	0.00	0.00	0.00	0.00	$8,751	0.00
6. Subtotal Direct Non-Salary Costs	0.00	0.00	0.00	0.00	0.00	0.00	$9,578	0.00
7. Subcontractors	0.00	0.00	0.00	0.00	0.00	0.00	$59,886	0.00
8. Total Work Assignment Cost	0.00	0.00	0.00	0.00	0.00	0.00	$81,397	0.00
9. Fixed Fee	0.00	0.00	0.00	0.00	0.00	0.00	$1,002	0.00
10. Total Work Assignment Price	0.00	0.00	0.00	0.00	0.00	0.00	$82,400	0.00

Project Manager (Engineer) _____ Date _____

Project Name: Blue Point Laundry Targeted Site Assessment
Work Assignment No.: D003600-35
Task No./Name: 3/Project Reporting
Complete: 0.00%

SCHEDULE 2.11 (g)

Date Prepared:
Billing Period:
Invoice No.:

MONTHLY COST CONTROL REPORT
SUMMARY OF FISCAL INFORMATION

Expenditure Category	A Costs Claimed This Period	B Paid To Date	C Total Disallowed To Date	D Total Costs Incurred To Date (A+B+B1)	E Estimated Costs To Completion	F Total Work Assignment Price (A+B+E)	G Approved Budget	H Estimated Under/(Over) (G-F)
1. Direct Salary Costs	0.00	0.00	0.00	0.00	0.00	0.00	$8,874	0.00
2. Indirect	0.00	0.00	0.00	0.00	0.00	0.00	$14,047	0.00
3. Subtotal Direct Salary Costs and Indirect Costs	0.00	0.00	0.00	0.00	0.00	0.00	$22,921	0.00
4. Travel	0.00	0.00	0.00	0.00	0.00	0.00	$0	0.00
5. Other Non-Salary Costs	0.00	0.00	0.00	0.00	0.00	0.00	$140	0.00
6. Subtotal Direct Non-Salary Costs	0.00	0.00	0.00	0.00	0.00	0.00	$140	0.00
7. Subcontractors	0.00	0.00	0.00	0.00	0.00	0.00	$0	0.00
8. Total Work Assignment Cost	0.00	0.00	0.00	0.00	0.00	0.00	$23,061	0.00
9. Fixed Fee	0.00	0.00	0.00	0.00	0.00	0.00	$1,925	0.00
10. Total Work Assignment Price	0.00	0.00	0.00	0.00	0.00	0.00	$24,987	0.00

Project Manager (Engineer) _____ Date _____

Project Name: Blue Point Laundry Targeted Site Assessment
Work Assignment No.: D003600-35

SCHEDULE 2.11 (g) SUPPLEMENTAL
MONTHLY COST CONTROL REPORT
SUBCONTRACTS

Date Prepared:
Billing Period:
Invoice No.:

Subcontract Name	Subcontract Costs Claimed This Application Incl. Resubmittals	Subcontract Costs Approved for Payment on Previous Application	Total Subcontract costs to Date (A plus B)	Subcontract Approved Budget	Management Fee Budget	Management Fee Paid	Total Costs To Date
1. Zebra Environmental Corporatic	$0.00	$0.00	$0.00	$8,855	$0		
2. Mitkem Corporation	$0.00	$0.00	$0.00	$38,675	$1,354		
3. YEC, Inc.	$0.00	$0.00	$0.00	$5,300	$0		
4. Hager-Richter Geosciences	$0.00	$0.00	$0.00	$5,703	$0		
Total				$58,532	$1,354		

Schedule 2.11 (h)

Date Prepared:
Billing Period
Invoice No.

Project Name: Blue Point Laundry Targeted Site Assessment
Work Assignment No.: D003600-35

Monthly Cost Control Report
Summary of Labor Hours
Expended to Date/Estimated To Completion

NSPE Labor Classification	IX EXP/EST	VIII EXP/EST	VII EXP/EST	VI EXP/EST	V EXP/EST	IV EXP/EST	III EXP/EST	I & II EXP/EST	ADMIN/ SUPPORT	TOTAL NUMBER OF DIRECT LABOR HOURS EXP/EST
Task 1	0/ 4	0/ 0	0/ 0	0/ 0	0/ 70	0/ 0	0/ 0	0/ 24	0/ 8	0/ 106
Task 2	0/ 0	0/ 0	0/ 0	0/ 0	0/ 28	0/ 0	0/ 118	0/ 10	0/ 4	0/ 160
Task 3	0/ 8	0/ 0	0/ 0	0/ 0	0/ 188	0/ 0	0/ 16	0/ 38	0/ 8	0/ 258
Total 2003 Hours	0/ 12	0/ 0	0/ 0	0/ 0	0/ 286	0/ 0	0/ 134	0/ 72	0/ 20	0/ 524
TOTAL HOURS	0/ 12	0/ 0	0/ 0	0/ 0	0/ 286	0/ 0	0/ 134	0/ 72	0/ 20	0/ 524

MBE/WBE
UTILIZATION PLAN
SUMMARY
Blue Point Laundry Targeted Site Assessment
Work Assignment No. D003600-35

Areas to be Subcontracted	Subcontractor Name	MBE/WBE	Total Subcontract Value	% MBE/WBE Utilization
1. Sample Analysis	Mitkem Corporation	MBE	$38,675	32.9%
2. Surveying	YEC, Inc.	MBE	$5,300	4.5%
3. Geophysical Survey	Hager-Richter Geoscience, Inc.	WBE	$5,703	4.9%

Total MBE Utilization	MBE Subcontract Value / Total Contract Value	=	$44,378 / $117,513	37.8%
Total WBE Utilization	WBE Subcontract Value / Total Contract Value	=	$5,703 / $117,513	4.9%

Appendix A

APPENDIX A

QUALITY ASSURANCE PROJECT PLAN FOR BROWNFIELD SITE INVESTIGATIONS

QUALITY ASSURANCE PROJECT PLAN
FOR
BROWNFIELD SITE INVESTIGATIONS

PREPARED FOR

NEW YORK STATE DEPARTMENT OF
ENVIRONMENTAL CONSERVATION

BY

DVIRKA AND BARTILUCCI
CONSULTING ENGINEERS

WOODBURY, NEW YORK

JULY 2003

QUALITY ASSURANCE PROJECT PLAN
FOR
BROWNFIELD SITE INVESTIGATIONS

TABLE OF CONTENTS

TABLE OF CONTENTS (continued)

TABLE OF CONTENTS (continued)

List of Tables

List of Appendices

1.0 INTRODUCTION

The purpose of this Generic Quality Assurance Project Plan (QAPP) is to describe the detailed sample collection and analytical procedures that will ensure high quality, valid data for use in field investigations conducted at Brownfield sites. These sites include primarily active and inactive commercial and industrial properties. If any of the collection procedures, sample analysis or sample matrices are modified for a specific site investigation, detailed information regarding the changes and rationale for the change will be provided in a Site-Specific QAPP.

This document has been prepared in conformance with the United States Environmental Protection Agency (USEPA) Region 2 Brownfields Project Planning Guidance for Generic Brownfields Quality Assurance Project Plans, and New York State Department of Environmental Conservation (NYSDEC) guidelines for preparation of Quality Assurance and Quality Control Plans, including the 2000 Analytical Services Protocol (ASP).

2.0 SITE BACKGROUND

Prior to conducting field investigations at Brownfield sites, both Historical Data Review and Site Reconnaissance Reports will be generated during the preliminary investigation. These documents are described below.

2.1 Historical Data Review Report

The Historical Data Review Report will examine previous site operations and disposal practices to identify potentially contaminated areas of a Brownfield site. Sources of information include federal, state and local officials and files (e.g., site inspection reports and legal actions), deed or title records, former facility employees, local residents and facility records. Historical sampling data includes all available information, such as sample locations (on maps, if possible), matrices, methods of collection and analysis, and relevant contamination concentrations. The reliability and usefulness of existing analytical data will be evaluated and discussed in the Historical Data Review Report.

Historical data without documentation or QA/QC controls may still be useful, and will be included in the Historical Data Review Report. The Historical Data Review Report will describe site-specific chemical processes, raw materials, final products, wastes and waste storage/disposal practices. Site maps will be included and facility blueprints and aerial photographs will be included if they are available.

2.2 Site Reconnaissance Report

The Site Reconnaissance Report will evaluate site conditions to identify potentially contaminated areas and sampling hazards. The Site Reconnaissance Report corrects deficiencies in the Historical Review Report by:

- Interviewing local residents and past employees about site-related activities.
- Researching facility files and records (if available).

- Visiting and photographing the site.

- Delineating the presence or absence of the following site characteristics: waste disposal areas, lagoons, site wastes, dead animals, dead or stressed vegetation, and visible label information on drums, tanks and containers.

3.0 DATA USE OBJECTIVES

The data generated from the field investigations will be used to determine the nature, extent and source(s) of contamination at the site, prepare a qualitative human health risk and environmental assessment/site hazard assessment, and develop a cost-effective, environmentally sound, long-term remediation plan consistent with the planned use of the site. The data will also be utilized to monitor for the health and safety of workers at the site and potential off-site receptors.

3.1 Site Hazard Assessment Report

A Site Hazard Assessment Report will be prepared and include one or more of the following recommendations:

- No additional actions required.
- Additional sampling is required.
- Remediation and additional sampling are required.

The Site Hazard Assessment Report presents the data that justifies the above recommendations.

3.2 Data Quality Requirements and Assessment

Data quality requirements and assessments are provided in the 2000 NYSDEC ASP, which includes the detection limit for each parameter and sample matrix. Note that quantification limits, estimated accuracy, accuracy protocol, estimated precision and precision protocol are determined by the laboratory and will be in conformance with the requirements of the 2000 NYSDEC ASP and/or USEPA 5/99 SOW, where applicable. Table 3-1 presents a summary of the data quality requirements.

Table 3-1

DATA QUALITY REQUIREMENTS

Parameter	Sample Matrix	CRDL*	Estimated Accuracy	Accuracy Protocol**	Estimated Precision	Precision Protocol**
Volatile Organics	Liquid Solid	10 10	0.87 - 1.18 ug/l	Vol. IV, Part XIX, Method 8260, Table 7	0.11 - 0.84 ug/l	Vol. IV, Part XIX, Method 8260, Table 7
Base Neutrals	Liquid Solid	10-50 330-1600	0.29 - 1.23 ug/l	Vol. IV, Part XIX, Method 8270, Table 7	0.13 - 1.05 ug/l	Vol. IV, Part XIX, Method 8270, Table 7
Acid Extractables	Liquid Solid	10-50 330-1600	0.29 - 1.23 ug/l	Vol. IV, Part XIX, Method 8270, Table 7	0.13 - 1.055 ug/l	Vol. IV, Part XIX, Method 8270, Table 7
Pesticides/PCBs	Liquid Solid	0.5-1.0 8.0-160	0.66 - 0.97 ug/l	Vol. IV, Part XIX, Method 8081/8082, Table 4	0.15 - 0.47 ug/l	Vol. IV, Part XIX, Method 8081/8082, Table 4
Metals	Liquid Solid	0.2-5000 0.2-5000	--	Vol. III, Part XIV, Method 200.7*** Table 4	--	Vol. III, Part XIV, Method 200.7*** Table 4
Cyanide	Liquid Solid	10 10	85% - 102% of recovery	Vol. III, Part XV, Method 335.2, Subpart 10	$\pm$0.005 - +0.094 mg/l	Vol. III, Part XV, Method 335.2, Subpart 10

*Contract Required Detection Limits - units are ug/l for liquid samples, ug/kg for solid samples.
** Reference: NYSDEC 6/00 ASP.
***If trace ICP is not used, then SW-846 Methods for:

Metal	Method
Selenium	7740
Lead	7421
Thallium	7841
Mercury	7470
Arsenic	7060

Table 3-1 (continued)

DATA QUALITY REQUIREMENTS
OBJECTIVES FOR PRECISION, ACCURACY, AND COMPLETENESS

Matrix/Parameter	Precision (%)	Accuracy (%)
Soil/Sediment		
VOCs[a]	See Table 3-1a	See Table 3-1a
Extractables[a]	See Table 3-1b	See Table 3-1b
Pesticides/PCBs	See Table 3-1c	See Table 3-1c
Metals[b][c]	± 25	75-125
Water		
VOCs[a]	See Table 3-1a	See Table 3-1a
Extractables[a]	See Table 3-1b	See Table 3-1b
Pesticides/PCBs	See Table 3-1c	See Table 3-1c
Metals[b][c]	± 25%	75-125

NOTES:

(a) Accuracy will be determined as percent recovery of surrogate spike compounds and matrix spike compounds. Surrogate and matrix spike compounds for VOCs, extractables, and pesticides/PCBs are listed in Table 3-2a, 3-2b and 3-2c, respectively. Precision will be estimated as the relative standard deviation of the percent recoveries per matrix.

(b) Accuracy will be determined as percent recovery of matrix spikes when appropriate or the percent recovery of a QC sample if spiking is inappropriate. Precision will be determined as relative percent difference of matrix spike duplicate samples, or duplicate samples if spiking is inappropriate.

(c) Precision will be determined as the average percent difference for replicate samples. Accuracy will be determined as the percent recovery of matrix spike samples or laboratory control samples, as appropriate.

Source: 2000 NYSDEC ASP

Table 3-1a

DATA QUALITY REQUIREMENTS
ACCURACY REQUIREMENTS FOR VOCs

	Spike Recovery Limits (%)	
	Water	Low/Medium Soil
Surrogate Compound		
Toluene-d8	88-110	84-138
4-Bromofluorobenzene	86-115	59-113
1,2-Dichloroethane-d4	76-114	70-121
Matrix Spike Compound		
1,1-Dichloroethene	61-145	59-172
Trichloroethane	71-120	62-137
Chlorobenzene	75-130	60-133
Toluene	76-125	59-139
Benzene	76-127	66-142

Source: NYSDEC ASP

Table 3-1b

DATA QUALITY REQUIREMENTS OBJECTIVES FOR PRECISION AND ACCURACY OF EXTRACTABLE COMPOUNDS BASED UPON RECOVERY OF SURROGATE AND MATRIX SPIKE COMPOUNDS*

Surrogate Compounds	Matrix	Precision	Accuracy %
d5-Nitrobenzene	Water	≤ 20	35-114
	Solid	≤ 25	23-120
2-Fluorobiphenyl	Water	≤ 20	43-116
	Solid	≤ 25	30-115
d14-Terphenyl	Water	≤ 20	33-141
	Solid	≤ 25	18-137
d5-Phenol	Water	≤ 20	10-110
	Solid	≤ 25	24-113
2-Fluorophenol	Water	≤ 20	21-110
	Solid	≤ 25	25-121
2,4,6-Tribromophenol	Water	≤ 20	10-123
	Solid	≤ 25	19-122
2-Chlorophenol-d4 (Advisory)	Water	≤ 20	33-110
	Solid	≤ 25	20-130
1,2-Dichlorobenzene-d4 (Advisory)	Water	≤ 20	16-110
	Solid	≤ 25	20-130

Table 3-1b (continued)

DATA QUALITY REQUIREMENTS OBJECTIVES FOR PRECISION AND ACCURACY OF EXTRACTABLE COMPOUNDS BASED UPON RECOVERY OF SURROGATE AND MATRIX SPIKE COMPOUNDS*

	Matrix	Precision	Accuracy %
Matrix Spike Compounds			
1,2,4-Trichlorobenzene	Water	≤ 20	39-98
	Solid	≤ 25	38-107
Acenaphthene	Water	≤ 20	46-118
	Solid	≤ 25	31-137
2,4-Dinitrotoluene	Water	≤ 20	24-96
	Solid	≤ 25	28-89
Pyrene	Water	≤ 20	26-127
	Solid	≤ 25	35-142
N-Nitroso-Di-n-Propylamine	Water	≤ 20	41-116
	Solid	≤ 25	41-126
1,4-Dichlorobenzene	Water	≤ 20	36-97
	Solid	≤ 25	28-104
Pentachlorophenol	Water	≤ 20	9-103
	Solid	≤ 25	17-109
Phenol	Water	≤ 20	12-110
	Solid	≤ 25	26-90
2-Chlorophenol	Water	≤ 20	27-123
	Solid	≤ 25	25-102

Table 3-1b (continued)

DATA QUALITY REQUIREMENTS OBJECTIVES FOR PRECISION AND ACCURACY OF EXTRACTABLE COMPOUNDS BASED UPON RECOVERY OF SURROGATE AND MATRIX SPIKE COMPOUNDS*

	Matrix	Precision	Accuracy %
Matrix Spike Compounds (continued)			
4-Chloro-3-methylphenol	Water	≤ 20	23-97
	Solid	≤ 25	26-103
4-Nitrophenol	Water	≤ 20	10-80
	Solid	≤ 25	11-114

* Accuracy will be determined as percent recovery of these compounds. Precision will be estimated as the relative standard deviation of the percent recoveries per matrix.

Source: NYSDEC ASP

Table 3-1c

ADVISORY RECOVERY LIMITS
SURROGATE AND MATRIX SPIKE COMPOUNDS
FOR PESTICIDES/PCBs*

	Advisory Recovery Limits (%)	
	Water	Soil/Sediment
Surrogate Compound		
Decachlorobiphenyl	60-150	60-150
Tetrachloro-m-xylene	60-150	60-150
Matrix Spike Compound		
Lindane	56-123	46-127
Heptachlor	40-131	35-130
Aldrin	40-120	34-132
Dieldrin	52-126	31-134
Endrin	56-121	42-139
4,4'-DDT	38-127	23-134

*Samples do not have to be reanalyzed if these recovery limits are not met.

Source: NYSDEC ASP

In addition to meeting the requirements provided in the 2000 NYSDEC ASP and/or USEPA 5/99 SOW, the data must be of sufficient quality to ensure that sampling data accurately characterizes site conditions. Data obtained during the site investigations will be compared to specific Standards, Criteria and Guidelines (SCGs). The SCGs to be utilized on a preliminary basis for screening purposes include:

Matrix	SCG
Groundwater and Surface Water	NYSDEC Division of Water Technical and Operational Guidance Series (TOGs) (1.1.1) - Ambient Water Quality Standards and Guidance Values, dated June 1998, addendum April 2000.
Surface and Subsurface Soil, Sediment and Sludge	NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046 for Determination of Soil Cleanup Objectives and Cleanup Levels, dated January 1994, as amended in December 2000.
Air	NYSDEC DAR-1, Guidelines for the Control of Toxic Ambient Air Contaminants, dated November 1997.*

* Including Complete and HAP Listings, AGCs, SGCs and Air Quality Standards for the DAR-1 Software Program.

Final selection of SCGs for site remediation and development will be based on the intended use of the property, potential receptors and potential contaminant migration pathways. These SCGs would consider the USEPA Region III Risk-Based Concentration Table.

For soil, groundwater and soil vapor samples, select volatile organics may be analyzed for utilizing a portable gas chromatograph (GC) and a modified USEPA Method 601. The water and soil samples will be analyzed via headspace. The standard operating procedures (SOP) for the portable GC and headspace analysis are provided in Appendix A.

The methods of analysis will be in accordance with the 2000 NYSDEC ASP and/or USEPA 5/99 SOW. Specific analytical procedures and laboratory QA/QC descriptions are not included in this QA/QC Plan, but will be available upon request from the laboratory selected to

perform the analyses. The laboratory will be New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) certified for organic and inorganic analyses and also be NYSDOH Contract Laboratory Protocol (CLP) certified.

3.2.1 Data Representativeness

Representative samples will be collected as follows:

- Soil Vapor - Samples will be collected from decontaminated stainless steel or dedicated polyethylene tubing soil probes after the soil vapor has reached equilibrium. Samples will be collected using a personal sampling pump and dedicated gas tight syringe or sorbent tube. See Section 6.3, Soil Vapor Collection Procedures.

- Surface Soil - Samples will be collected at a depth of 0-6 inches using a dedicated polystyrene scoop or sterile wooden tongue depressor.

- Subsurface Soil (Test Pit) - Samples will be collected from the center of the decontaminated bucket of the backhoe using a dedicated polyethylene scoop or sterile wooden tongue depressor.

- Subsurface Soil (Monitoring Well/Soil Boring) - Samples will be collected using a decontaminated steel split spoon sampler during monitoring well or soil boring construction.

- Subsurface Soil (Probe) - Samples will be collected using a decontaminated screen point sampler and dedicated acetate tube liner.

- Sediment/Sludge (Dry Well/Drainage System) - Samples will be collected from the center of the dry well, wastewater disposal/sanitary system, or catch basin and storm drain (if possible) after the drainage/storm water sample is obtained in order not to introduce sediment into the water column. Samples will be collected utilizing a decontaminated polyethylene long handle scoop (if possible) or from a soil probe or split spoon sampler.

- Wastewater/Drainage Water - Samples will be collected from the center of the wastewater disposal/sanitary system (if possible) and at a depth of 6 inches below the surface of standing water (if possible) using a dedicated polyethylene bailer or decontaminated polyethylene long handle scoop.

- Storm Water - Samples will be collected from the center of the drainage system or storm drain (if possible) at a depth of 6 inches below the surface of standing water (if possible) using a dedicated polyethylene bailer or decontaminated polyethylene scoop.

- Groundwater (Probe) - Samples will be collected immediately upon installation of the probe using dedicated polyethylene tubing equipped with a bottom check valve.

- Groundwater (Hydropunch) - Samples will be collected immediately upon installation of the hydropunch screen using a dedicated polyethylene small diameter bailer or hydropunch sampler.

- Groundwater (Monitoring Well) - Samples will be collected with a dedicated polyethylene bailer after the monitoring well has been purged of three to five well casing volumes until field measurements for pH, conductivity, temperature and turbidity have stabilized, or until the well is purged dry (whichever comes first) and the well has been allowed to recharge.

- Water Supply - Samples will be collected from the water supply wells, from an accessible point prior to any treatment systems (if possible) and will be collected directly into the sample container.

- Air - Samples will be collected using a dedicated sorbent tube and sampling pump.

- Equipment Calibration - Field equipment used for air monitoring will be calibrated daily before use according to the manufacturer's procedures.

- Equipment Decontamination - Nondedicated sampling equipment will be decontaminated prior to use at each location according to the procedures described in Section 7.0 of this QA/QC Plan.

3.2.2 Data Comparability

All data will be presented in the units designated by the methods specified by a NYSDOH ELAP and CLP certified laboratory, and the 2000 NYSDEC ASP and/or USEPA 5/99 SOW. In addition, sample locations, collection procedures and analytical methods from earlier studies will be evaluated for comparability with current procedures/methods.

3.2.3 Data Completeness

The acceptability of 100% of the data is desired as a goal for this project. The acceptability of less than 100% complete data, meeting all laboratory QA/QC protocols/ standards, will be evaluated on a case-by-case basis.

4.0 SAMPLING DESIGN

The following presents a general discussion of the sampling to be conducted during the field investigation.

- Soil Vapor - Soil vapor samples will be collected during soil vapor surveys to locate/confirm the source and extent of contamination on-site.
- Surface Soil - Surface soil samples will be collected on-site to determine the nature and extent of on-site surface soil contamination.
- Subsurface Soil - Subsurface soil samples will be collected during construction of monitoring wells and borings, test pits or at direct-push probe locations to determine the nature and extent of on-site subsurface soil contamination.
- Sediment/Sludge - Sediment and sludge samples will be collected from dry wells, storm drainage systems and/or wastewater disposal/sanitary systems located on-site to determine if collection/disposal systems are a source of contamination.
- Wastewater/Drainage Water - Waste water and drainage water samples will be collected from dry wells and/or wastewater disposal/sanitary systems located on-site to determine if these wells/systems are a source of contamination.
- Storm Water - Storm water samples will be collected from catch basins and storm drains located on-site to determine if the storm water system has been contaminated or is a source of contamination.
- Groundwater - Groundwater samples will be obtained from monitoring wells, direct-push probes or hydropunch sampling devices, which will be installed as part of the site investigation, or from monitoring wells, which were installed previously at the site, to determine if disposal of waste material on-site has impacted groundwater.
- Water Supply - Water supply samples will be collected from private water supply systems to determine if these systems are impacted by on-site (or off-site) contamination.
- Air - Ambient air samples will be collected on-site, particularly in structures, to determine potential exposure to vapor emissions as a result of on-site waste disposal or contaminated soil and/or groundwater underlying the site.

5.0 SAMPLING AND ANALYSES

5.1 Field Duplicates

Field duplicate samples may be collected to demonstrate the accuracy of field screening and un-validated laboratory data with limited analytical deliverables. If all environmental samples are analyzed by CLP methods, duplicate samples (if collected) will be taken at a frequency of at least 5% (1 in 20). However, if duplicate samples are collected for confirmation of field screening and laboratory data with limited analytical deliverables, at least 20% of the samples will be verified with duplicate samples analyzed by CLP methods for CLP TAL and TCL analytes. These CLP method duplicate sample requirements apply to each distinct matrix.

5.2 Matrix Spikes/Matrix Spike Duplicates and Spiked Blanks

Matrix spike samples are quality control procedures, consistent with 2000 NYSDEC ASP specifications, used by the laboratory as part of its internal Quality Assurance/Quality Control program. The matrix spikes (MS) and matrix spike duplicates (MSD) are aliquots of a designated sample (water or soil) which are spiked with known quantities of specified compounds. MS/MSD samples are used to evaluate the matrix effect of the sample upon the analytical methodology, as well as to determine the precision of the analytical method used. Samples to be analyzed as MS/MSDs may be designated in the field (that is, additional aliquots of a particular sample from the site may be collected) or they may be selected by the laboratory.

A matrix spike blank is an aliquot of analyte-free water, prepared in the laboratory, and spiked with the same solution used to spike the MS and MSD. The matrix spike blank (MSB) will be subjected to the same analytical procedure as the MS/MSD and used to indicate the appropriateness of the spiking solution by calculating the spike compound recoveries. The procedure and frequency regarding the MS, MSD and MSB samples are defined in the NYSDEC ASP.

5.3 Analytical Parameters

Analysis of water, soil and air/vapor samples will consist of all or a part of the Target Compound List (TCL) +30 and Target Analyte List (TAL) metals as identified in the New York State Department of Environmental Conservation (NYSDEC) 2000 Analytical Services Protocol (ASP) and USEPA Contract Laboratory Program (CLP) Statement of Work 5/99 (OLMO 4.2 and ILMO 4.0).

Table 5-1 presents a summary of the parameters/sample fraction to be analyzed together with the sample location, type of sample, sample matrix, type of sample container, method of sample preservation, holding time and analytical method. Superfund category deliverables are required for all analytical results in order to perform complete validation of the results.

5.4 Field Blank (Field Rinsate Blank)/Equipment Blank

Based upon discussion with the NYSDEC, field blanks will not be required for field investigations in which dedicated, disposable sampling equipment (for example, bailers or sterile scoops) are being utilized for sample collection. However, an equipment blank is required when a split spoon is utilized since it will be decontaminated after each use. Equipment blanks will be collected at a rate of one per day and analyzed for the same parameters as that of the samples collected with that equipment. The equipment blank will be collected by pouring laboratory supplied deionized water over/through the decontaminated equipment.

5.5 Trip Blanks (Travel Blanks)

The primary purpose of a trip blank is to detect other sources of contamination that might potentially influence contaminant values reported in actual samples, both quantitatively and qualitatively. The following have been identified as potential sources of contamination:

- Laboratory reagent water;
- Sample containers;

Table 5-1

SUMMARY OF MONITORING PARAMETERS

Sample Location	Sample Type	Sample Matrix	Sample Fraction	Container Type/Size/No.	Sample Preservation	Maximum Holding Time	Analytical Method
On-site	Grab	Ambient Air	Volatile Organics	Tenax tube/1	Cool to 4°C	7 days for analysis	EPA/600/4-89/017 Method T-1/T02
On-site	Grab	Soil Vapor	Volatile Organics	Tenax tube/1	Cool to 4°C	7 days for analysis	EPA/600/4-89/017 Method T-1/T02

*Holding time based upon VTSR (Verified Time of Sample Receipt).

Table 5-1 (continued)

SUMMARY OF MONITORING PARAMETERS

Sample Location	Sample Type	Sample Matrix	Sample Fraction	Container Type/Size/No.	Sample Preservation	Maximum Holding Time*	Analytical Method
Water Supply Wells, Monitoring Wells, and Probe and Hydropunch Locations	Grab	Groundwater	Volatile Organics	Glass, clear/ 40 mL/3 ICHEM 300 series or equivalent	Cool to 4°C	7 days after VTSR for analysis	6/00 NYSDEC ASP, Method OLMO 4.2
	Grab	Groundwater	Base Neutral and Acid Extractable Organics	Glass, amber/ 1L/2 ICHEM 300 series or equivalent	Cool to 4°C	5 days after VTSR for extraction, 40 days after extraction for analysis	6/00 NYSDEC ASP, Method OLMO 4.2
	Grab	Groundwater	Pesticides/PCBs	Glass, amber/ 1L/2 ICHEM 300 series or equivalent	Cool to 4°C	5 days after VTSR for extraction, 40 days after extraction for analysis	6/00 NYSDEC ASP, Method OLMO 4.2
	Grab	Groundwater	Metals	Plastic/1L/1 ICHEM 300 series or equivalent	HNO_3 to pH <2 Cool to 4°C	26 days after VTSR for Hg analysis, 6 months after VTSR for analysis of others	6/00 NYSDEC ASP, Method ILMO 4.0**
	Grab	Groundwater	Cyanide	Plastic/1L/1 ICHEM 300 series or equivalent	NaOH to pH >12 Cool to 4°C	12 days after VTSR for analysis	6/00 NYSDEC ASP, Method 335.2

VTSR - Verified Time of Sample Receipt at the laboratory

*Holding times based on the Generic Brownfields Quality Assurance Project Plan

**If Trace ICP is not used then SW-846 Methods for:

Metal	Method
Selenium	7740
Lead	7421
Thallium	7841
Mercury	7470
Arsenic	7060

Table 5-1 (continued)

SUMMARY OF MONITORING PARAMETERS

Sample Location	Sample Type	Sample Matrix	Sample Fraction	Container Type/Size/No.	Sample Preservation	Maximum Holding Time*	Analytical Method
Dry Wells, Storm Drainage Systems and Wastewater Disposal/Sanitary Systems	Grab	Sediment/Sludge	Volatile Organics	Glass, clear/ 40 mL/2 ICHEM 200 series or equivalent	Cool to 4°C	7 days after VTSR for analysis	6/00 NYSDEC ASP, Method OLMO 4.2
	Grab	Sediment/Sludge	Base Neutral and Acid Extractable Organics	Glass, amber/ 150 mL/1 ICHEM 200 series or equivalent	Cool to 4°C	5 days after VTSR for extraction, 40 days after extraction for analysis	6/00 NYSDEC ASP, Method OLMO 4.2
	Grab	Sediment/Sludge	Pesticides/PCBs	Glass, amber/ 150 mL/1 ICHEM 200 series or equivalent	Cool to 4°C	5 days after VTSR for extraction, 40 days after extraction for analysis	6/00 NYSDEC ASP, Method OLMO 4.2
	Grab	Sediment/Sludge	Metals	Glass, amber/ 150 mL/1 ICHEM 200 series or equivalent	Cool to 4°C	26 days after VTSR for Hg analysis, 6 months after VTSR for analysis of others	6/00 NYSDEC ASP, Method ILMO 4.0**
	Grab	Sediment/Sludge	Cyanide	Glass, amber/ ICHEM 200 series or equivalent	Cool to 4°C	12 days after VTSR for analysis	6/00 NYSDEC ASP, Method 335.2

VTSR - Verified Time of Sample Receipt at the laboratory

*Holding times based on the Generic Brownfields Quality Assurance Project Plan

**If Trace ICP is not used then SW-846 Methods for:

Metal	Method
Selenium	7740
Lead	7421
Thallium	7841
Mercury	7470
Arsenic	7060

Table 5-1 (continued)

SUMMARY OF MONITORING PARAMETERS

Sample Location	Sample Type	Sample Matrix	Sample Fraction	Container Type/Size/No.	Sample Preservation	Maximum Holding Time*	Analytical Method
On-site Soil	Grab	Surface Soil	Volatile Organics	Glass, clear/ 40 mL/2 ICHEM 200 series or equivalent	Cool to 4°C	7 days after VTSR for analysis	6/00 NYSDEC ASP, Method OLMO 4.2
	Grab	Surface Soil	Base Neutral and Acid Extractable Organics	Glass, amber/ 150 mL/1 ICHEM 200 series or equivalent	Cool to 4°C	5 days after VTSR for extraction, 40 days after extraction for analysis	6/00 NYSDEC ASP, Method OLMO 4.2
	Grab	Surface Soil	Pesticides/PCBs	Glass, amber/ 150 mL/1 ICHEM 200 series or equivalent	Cool to 4°C	5 days after VTSR for extraction, 40 days after extraction for analysis	6/00 NYSDEC ASP, Method OLMO 4.2
	Grab	Surface Soil	Metals	Glass, amber/ 150 mL/1 ICHEM 200 series or equivalent	Cool to 4°C	26 days after VTSR for Hg analysis, 6 months after VTSR for analysis of others	6/00 NYSDEC ASP, Method ILMO 4.0**
	Grab	Surface Soil	Cyanide	Glass, amber/ 150 mL/1 ICHEM 200 series or equivalent	Cool to 4°C	12 days after VTSR for analysis	6/00 NYSDEC ASP, Method 335.2

VTSR - Verified Time of Sample Receipt at the laboratory

*Holding times based on the Generic Brownfields Quality Assurance Project Plan

**If Trace ICP is not used then SW-846 Methods for:

Metal	Method
Selenium	7740
Lead	7421
Thallium	7841
Mercury	7470
Arsenic	7060

Table 5-1 (continued)

SUMMARY OF MONITORING PARAMETERS

Sample Location	Sample Type	Sample Matrix	Sample Fraction	Container Type/Size/No.	Sample Preservation	Maximum Holding Time*	Analytical Method
Monitoring Wells, Soil Borings, and Probe and Hydropunch Locations	Grab	Subsurface Soil	Volatile Organics	Glass, clear/ 40 mL/2 ICHEM 200 series or equivalent	Cool to 4°C	7 days after VTSR for analysis	6/00 NYSDEC ASP, Method OLMO 4.2
	Grab	Subsurface Soil	Base Neutral and Acid Extractable Organics	Glass, amber/ 150 mL/1 ICHEM 200 series or equivalent	Cool to 4°C	5 days after VTSR for extraction, 40 days after extraction for analysis	6/00 NYSDEC ASP, Method OLMO 4.2
	Grab	Subsurface Soil	Pesticides/PCBs	Glass, amber/ 150 mL/1 ICHEM 200 series or equivalent	Cool to 4°C	5 days after VTSR for extraction, 40 days after extraction for analysis	6/00 NYSDEC ASP, Method OLMO 4.2
	Grab	Subsurface Soil	Metals	Glass, amber/ 150 mL/1 ICHEM 200 series or equivalent	Cool to 4°C	26 days after VTSR for Hg analysis, 6 months after VTSR for analysis of others	6/00 NYSDEC ASP, Method ILMO 4.0**
	Grab	Subsurface Soil	Cyanide	Glass, amber/ 150 mL/1 ICHEM 200 series or equivalent	Cool to 4°C	12 days after VTSR for analysis	6/00 NYSDEC ASP, Method 335.2

VTSR - Verified Time of Sample Receipt at the laboratory

*Holding times based on the Generic Brownfields Quality Assurance Project Plan

**If Trace ICP is not used then SW-846 Methods for:

Metal	Method
Selenium	7740
Lead	7421
Thallium	7841
Mercury	7470
Arsenic	7060

Table 5-1 (continued)

SUMMARY OF MONITORING PARAMETERS

Sample Location	Sample Type	Sample Matrix	Sample Fraction	Container Type/Size/No.	Sample Preservation	Maximum Holding Time	Analytical Method
Site	Trip Blank	Water	Volatile Organics	Glass, clear/ 40 mL/l ICHEM 300 series or equivalent	Cool to 4°C	7 days after VTSR for analysis	6/00 NYSDEC ASP, Method OLMO 4.2

VTSR - Verified Time of Sample Receipt at the laboratory

Table 5-1 (continued)

SUMMARY OF MONITORING PARAMETERS

Sample Location	Sample Type	Sample Matrix	Sample Fraction	Container Type/Size/No.	Sample Preservation	Maximum Holding Time*	Analytical Method
Site	Matrix Spike and Matrix Spike Duplicate	Soil	Volatile Organics	Glass, clear/ 40 mL/2 ICHEM 200 series or equivalent	Cool to 4°C	7 days after VTSR for analysis	6/00 NYSDEC ASP, Method OLMO 4.2
	Matrix Spike and Matrix Spike Duplicate	Soil	Base Neutral and Acid Extractable Organics	Glass, amber/ 150 mL/1 ICHEM 200 series or equivalent	Cool to 4°C	5 days after VTSR for extraction, 40 days after extraction for analysis	6/00 NYSDEC ASP, Method OLMO 4.2
	Matrix Spike and Matrix Spike Duplicate	Soil	Pesticides/PCBs	Glass, amber/ 150 mL/1 ICHEM 200 series or equivalent	Cool to 4°C	5 days after VTSR for extraction 40 days after extraction for analysis	6/00 NYSDEC ASP, Method OLMO 4.2
	Matrix Spike and Matrix Spike Duplicate	Soil	Metals	Glass, amber/ 150 mL/1 ICHEM 200 series or equivalent	Cool to 4°C	26 days after VTSR for Hg analysis, 6 months after VTSR for analysis of others	6/00 NYSDEC ASP, Method ILMO 4.0**
	Matrix Spike and Matrix Spike Duplicate	Soil	Cyanide	Glass, amber/ 150 mL/1 ICHEM 200 series or equivalent	Cool to 4°C	12 days after VTSR for analysis	6/00 NYSDEC ASP, Method 335.2

VTSR - Verified Time of Sample Receipt at the laboratory

*Holding times based on the Generic Brownfields Quality Assurance Project Plan

**If Trace ICP is not used then SW-846 Methods for:

Metal	Method
Selenium	7740
Lead	7421
Thallium	7841
Mercury	7470
Arsenic	7060

Table 5-1 (continued)

SUMMARY OF MONITORING PARAMETERS

Sample Location	Sample Type	Sample Matrix	Sample Fraction	Container Type/Size/No.	Sample Preservation	Maximum Holding Time*	Analytical Method
Site	Matrix Spike and Matrix Spike Duplicate	Water	Volatile Organics	Glass, clear/ 40 mL/1 ICHEM 300 series or equivalent	Cool to 4°C	7 days after VTSR for analysis	6/00 NYSDEC ASP, Method OLMO 4.2
	Matrix Spike and Matrix Spike Duplicate	Water	Base Neutral and Acid Extractable Organics	Glass, amber/ 1L/2 ICHEM 300 series or equivalent	Cool to 4°C	5 days after VTSR for extraction, 40 days after extraction for analysis	6/00 NYSDEC ASP, Method OLMO 4.2
	Matrix Spike and Matrix Spike Duplicate	Water	Pesticides/PCBs	Glass, amber/ 1L/2 ICHEM 300 series or equivalent	Cool to 4°C	5 days after VTSR for extraction 40 days after extraction for analysis	6/00 NYSDEC ASP, Method OLMO 4.2
	Matrix Spike and Matrix Spike Duplicate	Water	Metals	Plastic/1L/1 ICHEM 300 series or equivalent	Cool to 4°C HNO_3 to pH <2	26 days after VTSR for Hg analysis, 6 months after VTSR for analysis of others	6/00 NYSDEC ASP, Method ILMO 4.0**
	Matrix Spike and Matrix Spike Duplicate	Water	Cyanide	Plastic/1L/1 ICHEM 300 series or equivalent	NaOH to pH >12 Cool to 4°C	12 days after VTSR for analysis	6/00 NYSDEC ASP, Method 335.2

VTSR - Verified Time of Sample Receipt at the laboratory

*Holding times based on the Generic Brownfields Quality Assurance Project Plan

**If Trace ICP is not used then SW-846 Methods for:

Metal	Method
Selenium	7740
Lead	7421
Thallium	7841
Mercury	7470
Arsenic	7060

Table 5-1 (continued)

SUMMARY OF MONITORING PARAMETERS

Sample Location	Sample Type	Sample Matrix	Sample Fraction	Container Type/Size/No.*	Sample Preservation	Maximum Holding Time**	Analytical Method
Laboratory	Method Blank	Water/Soil	Volatile Organics	Glass, clear/ 40 mL/1 ICHEM 300 series or equivalent	Cool to 4°C	7 days after VTSR for analysis of water 10 days for soil	6/00 NYSDEC ASP, Method OLMO 4.2
	Method Blank	Water/Soil	Base Neutral and Acid Extractable Organics	Glass, amber/ 1L/2 ICHEM 300 series or equivalent	Cool to 4°C	5 days after VTSR for extraction 40 days after extraction for analysis	6/00 NYSDEC ASP, Method OLMO 4.2
	Method Blank	Water/Soil	Pesticides/PCBs	Glass, amber/ 1L/2 ICHEM 300 series or equivalent	Cool to 4°C	5 days after VTSR for extraction 40 days after extraction for analysis	6/00 NYSDEC ASP, Method OLMO 4.2
	Method Blank	Water/Soil	Metals	Plastic/1L/1 ICHEM 300 series or equivalent	Cool to 4°C HNO_3 to pH <2***	26 days after VTSR for Hg analysis, 6 months after VTSR for analysis of others	6/00 NYSDEC ASP, Method ILMO 4.0****
	Method Blank	Water/Soil	Cyanide	Plastic/1L/1 ICHEM 300 series or	NaOH to pH >12** Cool to 4°C	12 days after VTSR for analysis	6/00 NYSDEC ASP, Method 335.2

VTSR - Verified Time of Sample Receipt at the laboratory

*ICHEM 200 bottles may be used for soil matrix
**Holding times based on the Generic Brownfields Quality Assurance Project Plan
***Preservative only required for water samples.
****If Trace ICP is not used then SW-846 Methods for:

Metal	Method
Selenium	7740
Lead	7421
Thallium	7841
Mercury	7470
Arsenic	7060

Table 5-1 (continued)

SUMMARY OF MONITORING PARAMETERS

Sample Location	Sample Type	Sample Matrix	Sample Fraction	Container Type/Size/No.	Sample Preservation	Maximum Holding Time*	Analytical Method
Site	Spike Blank	Water	Volatile Organics	Glass, clear/ 40 mL/1 ICHEM 300 series or equivalent	Cool to 4°C	7 days after VTSR for analysis	6/00 NYSDEC ASP, Method OLMO 4.2
	Spike Blank	Water	Base Neutral and Acid Extractable Organics	Glass, amber/ 1L/2 ICHEM 300 series or equivalent	Cool to 4°C	5 days after VTSR for extraction, 40 days after extraction for analysis	6/00 NYSDEC ASP, Method OLMO 4.2
	Spike Blank	Water	Pesticides/PCBs	Glass, amber/ 1L/2 ICHEM 300 series or equivalent	Cool to 4°C	5 days after VTSR for extraction 40 days after extraction for analysis	6/00 NYSDEC ASP, Method OLMO 4.2
	Spike Blank	Water	Metals	Plastic/1L/1 ICHEM 300 series or equivalent	Cool to 4°C HNO_3 to pH <2	26 days after VTSR for Hg analysis, 6 months after VTSR for analysis of others	6/00 NYSDEC ASP, Method ILMO 4.0**
	Spike Blank	Water	Cyanide	Plastic/1L/1 ICHEM 300 series or equivalent	NaOH to pH >12 Cool to 4°C	12 days after VTSR for analysis	6/00 NYSDEC ASP, Method 335.2

VTSR - Verified Time of Sample Receipt at the laboratory

*Holding times based on the Generic Brownfields Quality Assurance Project Plan

** If Trace ICP is not used then SW-846 Methods for:

Metal	Method
Selenium	7740
Lead	7421
Thallium	7841
Mercury	7470
Arsenic	7060

Table 5-1 (continued)

SUMMARY OF MONITORING PARAMETERS

Sample Location	Sample Type	Sample Matrix	Sample Fraction	Container Type/Size/No.	Sample Preservation	Maximum Holding Time*	Analytical Method
Site	Spike Blank	Soil	Volatile Organics	Glass, clear/ 40 mL/2 ICHEM 200 series or equivalent	Cool to 4°C	7 days after VTSR for analysis	6/00 NYSDEC ASP, Method OLMO 4.2
	Spike Blank	Soil	Base Neutral and Acid Extractable Organics	Glass, amber/ 150 mL/1 ICHEM 200 series or equivalent	Cool to 4°C	5 days after VTSR for extraction, 40 days after extraction for analysis	6/00 NYSDEC ASP, Method OLMO 4.2
	Spike Blank	Soil	Pesticides/PCBs	Glass, amber/ 150 mL/1 ICHEM 200 series or equivalent	Cool to 4°C	5 days after VTSR for extraction 40 days after extraction for analysis	6/00 NYSDEC ASP, Method OLMO 4.2
	Spike Blank	Soil	Metals	Glass, amber/ 150 mL/1 ICHEM 200 series or equivalent	Cool to 4°C	26 days after VTSR for Hg analysis, 6 months after VTSR for analysis of others	6/00 NYSDEC ASP, Method ILMO 4.0**
	Spike Blank	Soil	Cyanide	Glass, amber/ 150 mL/1 ICHEM 200 series or equivalent	Cool to 4°C	12 days after VTSR for analysis	6/00 NYSDEC ASP, Method 335.2

VTSR - Verified Time of Sample Receipt at the laboratory

*Holding times based on the Generic Brownfields Quality Assurance Project Plan

**If Trace ICP is not used then SW-846 Methods for:

Metal	Method
Selenium	7740
Lead	7421
Thallium	7841
Mercury	7470
Arsenic	7060

Table 5-1 (continued)

SUMMARY OF MONITORING PARAMETERS

Sample Location	Sample Type	Sample Matrix	Sample Fraction	Container Type/Size/No.	Sample Preservation	Maximum Holding Time	Analytical Method
Laboratory	Holding Blank	Water	Volatile Organics	Glass, clear/ 40 mL/1	Cool to 4°C	7 days after VTSR for analysis	6/00 NYSDEC ASP, Method OLMO 4.2

VTSR - Verified Time of Sample Receipt at the laboratory

- Cross contamination in shipment;
- Ambient air or contact with analytical instrumentation during preparation and analysis at the laboratory; and
- Laboratory reagents used in analytical procedures.

A trip blank will consist of a set of 40 ml sample vials filled at the laboratory with laboratory demonstrated analyte free water. Trip blanks will be handled, transported and analyzed in the same manner as the samples acquired that day, except that the sample containers themselves are not opened in the field. Rather, these sample containers only travel with the sample cooler. The temperature of the trip blanks will be maintained at 4°C while on-site and during shipment. Trip blanks will return to the laboratory with the same set of bottles they accompanied in the field.

The purpose of a trip blank is to control sample bottle preparation and blank water quality as well as sample handling. Thus, the trip blank will travel to the site with the empty sample bottles and back from the site with the collected samples in an effort to simulate sample handling conditions. Contaminated trip blanks may indicate inadequate bottle cleaning or blank water of questionable quality. Trip blanks will be implemented only when collecting water samples, including field blanks, and analyzed for volatile organic compounds only.

5.6 Method Blanks/Holding Blanks

A method blank is an aliquot of laboratory water or soil which is spiked with the same internal and surrogate compounds as the samples. The purpose of the method blank is to define and determine the level of laboratory background contamination. Frequency, procedure and maximum laboratory containment concentration limits are specified in the 2000 NYSDEC ASP. A holding blank is an aliquot of analyte-free water that is stored with the environmental samples in order to demonstrate that the samples have not been contaminated during laboratory storage. This blank will be analyzed using the same analytical procedure as the samples.

6.0 STANDARD OPERATING PROCEDURES

Environmental samples will be collected from different locations as part of the field investigation. These include groundwater, wastewater, storm/drainage water, sediment/sludge, subsurface soil, surface soil, soil vapor and ambient air. Sample locations will consist of monitoring wells, water supply wells, dry wells, wastewater disposal/sanitary systems, direct push probe locations, hydropunch locations, storm water drainage systems, soil borings, surface soils, test pits, soil vapor points and ambient air. Actual locations will be determined on a site-specific basis.

General sampling approaches and equipment are described in this section. A summary of the sampling program, including sample media, depths, equipment, rationale and analytical parameters, is provided in Table 6-1.

When taking soil samples, an attempt will be made to maintain sample integrity by preserving its physical form and chemical composition to as great an extent as possible. An appropriate sampling device (i.e., decontaminated or dedicated equipment) will be utilized to transfer the sample into the sample container. The sample will reflect and contain a good representation of the matrix from which it was collected. The sample will be transferred into the sample container as quickly as possible, with no mixing, to ensure that the volatile fraction is not lost.

The materials involved in groundwater sampling are critical to the collection of high quality monitoring information, particularly where the analyses of volatile, pH sensitive or reduced chemical constituents are of interest. The materials for bailers and pump parts will be PTFE (e.g., Teflon^{R}) stainless steel and/or polyethylene.

Table 6-1

SUMMARY OF SAMPLING PROGRAM

Environmental Media	Sample Location	Sample Point	Sample Depth	Equipment	Rationale	Sample Analysis
Soil Vapor	On-site	Soil vapor survey point	3 feet below soil surface	Decontaminated or disposable soil vapor rods/ tubing, gas tight syringe or sorbent tube and personal sampling pump	To determine soil contamination	TCL volatile parameters EPA 600/4-89/017 or select VOCs by Portable GC (EPA Method 601)
Surface Soil	On-site	Throughout site	0-2 inches below soil surface	Disposable polyethylene scoop and/or sterile wooden tongue depressor	To determine surface soil contamination	TCL +30 and TAL parameters + CN 2000 NYSDEC ASP
Subsurface Soil	On-site	Test pit	Dependent on visual charac-teristics and total organic vapor field screening	Decontaminated backhoe bucket, disposable polyethylene scoop and sterile wooden tongue depressor	To determine subsurface soil contamination	TCL +30 and TAL parameters + CN 2000 NYSDEC ASP
Sediment/Sludge	On-site	Dry well/catch basin/wastewater/ sanitary system/storm drain	0-6 inches below sediment surface	Decontaminated polyethylene scoop or split spoon sampler	To determine sediment contamination	TCL +30 and TAL parameters + CN 2000 NYSDEC ASP
Wastewater	On-site	Wastewater/ Sanitary System	6 inches below water surface	Decontaminated long handle polyethylene scoop or polyethylene bailer	To determine drainage wastewater contamination	TCL +30 and TAL parameters + CN 2000 NYSDEC ASP
Drainage/Storm Water	On-site	Dry well/catch basin/ storm drain	6 inches below water surface	Decontaminated long handle polyethylene scoop or polyethylene bailer	To determine storm water contamination	TCL +30 and TAL parameters + CN 2000 NYSDEC ASP

Table 6-1 (continued)

SUMMARY OF SAMPLING PROGRAM

Environmental Media	Sample Location	Sample Point	Sample Depth	Equipment	Rationale	Sample Analysis
Subsurface Soil	On-site	Monitoring well borehole/soil boring	Dependent on visual characteristics and total organic vapor field screening	Auger, decontaminated split spoon and sterile wooden tongue depressor	To determine subsurface soil contamination	TCL +30 and TAL parameters + CN 2000 NYSDEC ASP
Subsurface Soil	On-site	Probe location	Dependent on visual characteristics and total organic vapor field screening	Decontaminated probe and polyethylene tube liner	To determine subsurface soil contamination	TCL +30 and TAL parameters + CN 2000 NYSDEC ASP
Groundwater	On-site	Probe location	At surface of water in probe	Disposable polyethylene tubing with bottom check valve	To determine groundwater contamination	TCL +30 and TAL parameters + CN 2000 NYSDEC ASP
Groundwater	On-site	Hydropunch location	At surface of water in screen	Disposable polyethylene - small diameter bailer	To determine groundwater contamination	TCL +30 and TAL parameters + CN 2000 NYSDEC ASP
Groundwater	On-site	Monitoring well	At surface of water in well	Disposable polyethylene bailer (after purge of three well volumes)	To determine groundwater contamination	TCL +30 and TAL parameters + CN 2000 NYSDEC ASP
Water Supply	On-site	Prior to treatment system, if possible, or from faucet	NA	Sample container directly after running water for 5 minutes	To determine water supply contamination	TCL +30 and TAL parameters + CN 2000 NYSDEC ASP
Air	On-site	Ambient Air	Breathing Zone	Personal sampling pump and dedicated sorbent tube	To determine air contamination and worker exposure	TCL VOC EPA 600/4-89/017

Table 6-1 (continued)

SUMMARY OF SAMPLING PROGRAM

Environmental Media	Sample Location	Sample Point	Sample Depth	Equipment	Rationale	Sample Analysis
Air	On-site	Drilling and sample locations	In the breathing zone and at point of sample collection	Photoionization and/or flame ionization detector	To screen for air contamination	Total organic vapors

NA - Not applicable.

There will be several steps taken after the transfer of the soil or water sample into the sample container that are necessary to properly complete collection activities. Once the sample is transferred into the appropriate container, the container will be capped and, if necessary, the outside of the container will be wiped with a clean paper towel to remove excess sampling material. The container will not be submerged in water in an effort to clean it. Rather, if necessary, a clean paper towel moistened with distilled/deionized water will be used.

The sample container will then be properly labeled. Information such as sample number, location, collection time and sample description will be recorded in the field log book. Associated paper work (e.g., Chain of Custody forms) will then be completed and will stay with the sample. The samples will be packaged in a manner that will allow the appropriate storage temperature to be maintained during shipment to the laboratory. Samples will be delivered to the laboratory within 48 hours of collection.

6.1 Sample Identification

All samples collected will be labeled with a sample identification code. The code will identify the site, sample location, sample matrix and series numbers for sample locations with more than one sample. Samples will be labeled according to the following system:

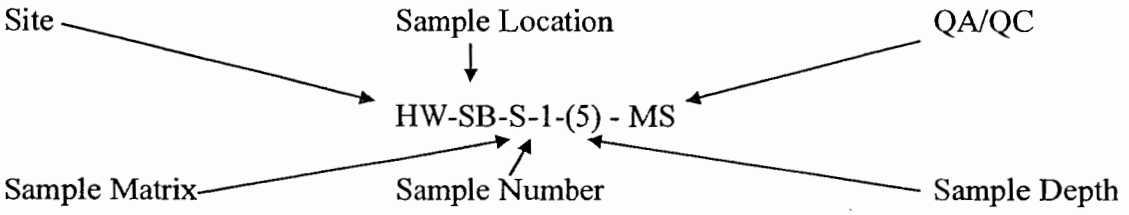
- Site: - Site name (i.e., Hazardous Waste "HW")
- Sample Location:
  - Soil Boring "SB"
  - Monitoring Well "MW"
  - Water Supply "WS"
  - Dry Well "DW"
  - Surface Soil "SS"
  - Hydropunch "H"
  - Probe "P"
  - Test Pit "TP"
  - Storm Drain "SD"
  - Sanitary System Leaching Pool "LP"
  - Sanitary System Septic Tank "ST"
  - Soil Vapor "SV"
  - Ambient Air "AA"

- Sample Matrix: - Soil "S"
  - Sediment "SD"
  - Sludge "SL"
  - Groundwater "GW"
  - Drainage Water/Storm Water "DW"
  - Surface Water "SW"
  - Wastewater "WW"
  - Air "A"
  - Soil Vapor "SV"
  - Tap Water "TW"

- Sample Number: - For circumstances where more than one sample of the same type and/or from the same location will be collected, a consecutive sample number will be assigned. When more than one sample is collected from a borehole in a sampling round at different depths, the depth will be indicated on the sample container and in the field log book.

- Quality Assurance/ Quality Control (QA/QC): - Matrix Spike "MS"
  - Matrix Spike Duplicate "MSD"
  - Field Blank "FB"
  - Trip Blank "TB"

Based upon the above sample identification procedures, an example of a sample label may be:



6.2 Sample Handling, Packaging and Shipping

All samples will be placed in the appropriate containers as specified in the 2000 NYSDEC ASP and/or USEPA 5/99 SOW. The holding time criteria identified in the ASP and SOW will be followed as specified in Table 3-1.

Prior to packaging any samples for shipment, the sample containers will be checked for proper identification and compared to the field log book for accuracy. The samples will then be

wrapped with a cushioning material and placed in a cooler (or laboratory shuttle) with a sufficient amount of bagged ice or "blue ice" packs in order to keep the samples at 4°C until arrival at the laboratory.

All necessary documentation required to accompany the sample during shipment will be placed in a sealed plastic bag and taped to the underside of the cooler lid. The cooler will then be sealed with fiber (duct) or clear packing tape, and custody seals will be placed in such a manner that any opening of the cooler prior to arrival at the laboratory can be detected.

All samples will be shipped to ensure laboratory receipt within 48 hours of sample collection in accordance with NYSDEC and USEPA requirements. The laboratory will be notified prior to the shipment of the samples.

6.3 Soil Vapor

1. Be certain that the sample location is noted on Location Sketch (see Section 9.1).
2. Drive the decontaminated stainless steel probe with removable inner rod into the ground to the desired depth.
3. Remove inner rod and immediately replace with a stainless steel cap equipped with a sampling port.
4. Connect new silicon tubing to the probe and the personal sampling pump. Turn on pump. Allow the pump to run until the soil vapor within the probe has reached equilibrium.*
5. Collect a 100 to 500 µl vapor sample using a gas tight syringe and inserting it into the silicon tubing. Transport sample to the portable gas chromatograph (GC) analyst.
6. Shut off pump and disconnect tubing.
7. Extract probe from the ground and decontaminate according to the procedures in Section 7.0.

*In order to establish how long it takes for the soil vapor to reach equilibrium in the probe, two approaches can be utilized:

a. Once the pump is turned on, collect a sample every one to two minutes and analyze on the portable GC. Continue to collect samples until two consecutive

samples yield comparable results. Do this at two or three locations in order to establish a pumping time.

b. Instead of using a personal sampling pump, attach the silicon tubing to the probe and a PID or FID. Once a steady reading is obtained, the system is considered to be in equilibrium. (Not recommended if low levels of volatile organic vapors are present [i.e., <1 ppm]).

6.4 Soil (Surface)

1. Be certain that the sample location is noted on Location Sketch (see Section 9.1).

2. If a dedicated sampling device is not used, be certain that the sampling equipment has been decontaminated utilizing the procedures outlined in Section 7.0.

3. Remove laboratory precleaned sample container from sample cooler, label container with an indelible marker, fill out Sample Information Record and Chain of Custody Form (see Section 8.0).

4. At the sample location, clear surface debris (e.g., vegetation, rocks, twigs, etc.). Collect an adequate amount of soil from a depth of 0 to 2 inches below ground surface or below vegetation, using a decontaminated or disposable scoop and/or sterile wooden tongue depressor. Transfer the sample directly into the sample container.

5. Return the sample container to the cooler.

6. If reusable, decontaminate the sampling equipment according to the procedures described in Section 7.0.

7. Place all disposable personal protective equipment and disposable sampling equipment into a 55-gallon drum and store in a secure area (fenced, if possible).

6.5 Sediment (Dry Wells, Catch Basins, Wastewater Disposal/Sanitary Systems, Storm Drains)

1. Be certain that the nondisposable sampling equipment (e.g., long handle polyethylene scoop) has been decontaminated utilizing the procedures outlined in Section 7.0.

2. Remove laboratory precleaned sample containers from sample cooler, label container with an indelible marker, fill out Sample Information Record and Chain of Custody Form.

3. Insert scoop slowly at 0-6 inches into the sediment and remove sample. Sample sediment only after surface water samples have been taken to avoid introduction of sediment into the water.

4. If depth to sediment is greater than the reach of a long handled scoop, the sample may need to be collected utilizing the soil probe or split spoon sampler (see Sections 6.8 and 6.9, respectively).

5. With a sterile wooden tongue depressor or disposable polyethylene scoop, transfer the sample into the open sample container taking care not to spill sample on the outside of the container or overfill container and replace cover on the sample container.

6. Return sample container to sample cooler.

7. If necessary, decontaminate the sampling equipment according to the procedures outlined in Section 7.0.

8. Place all disposable personal protective equipment and disposable sampling equipment into a 55-gallon drum and store in a secure area (fenced, if possible).

6.6 Drainage Water/Wastewater/Storm Water (Dry Wells, Catch Basins, Wastewater Disposal/Sanitary Systems, Storm Drains)

1. Be certain sample location is noted on Location Sketch (see Section 9.1).

2. Be certain that all nondisposable sampling equipment (e.g., long handled polyethylene scoop) has been decontaminated utilizing the procedures outlined in Section 7.0.

3. Remove laboratory precleaned sample bottles from sample cooler, label container with an indelible marker, fill out Sample Information Record and Chain of Custody Form.

4. Lower the scoop or disposable bailer slowly into the water making sure that the sample is taken just below the surface of the water (or at the water/air interface if there is a sheen present) and raise the sample out of the water. Sample water before sediment to avoid introduction of sediment into the water.

5. Gently pour the sample into the sample container, taking care not to spill the sample on the outside of the container or overfill, and replace cover on the sample container. For volatile organic samples, make sure that there are no air bubbles in the sample vial after it has been capped. This is done by filling the vial such that there is a meniscus on top. Carefully slide the septum, Teflon side down, onto the top of the vial and cap the vial. Check for bubbles by turning the vial upside down and tapping it lightly. If the bubbles appear, reopen the vial, remove septum and add more sample

(or resample). Replace septum, recap and check for bubbles. Continue until vial is bubble-free.

6. Return sample container to sample cooler. If sample is obtained directly with a sample container, dry the exterior of the container before placing into cooler.

7. If reusable, decontaminate the sampling equipment according to the procedures outlined in Section 7.0.

8. Place all disposable personal protective equipment and disposable sampling equipment into a 55-gallon drum and store in a secure area (fenced, if possible).

6.7 Soil (Test Pit)

Test pit excavation will be conducted using a backhoe or excavator.

1. Be certain that the sample location is noted on Location Sketch.

2. Be certain that the sampling equipment, including the backhoe/excavator bucket, is decontaminated utilizing the procedures outlined in Section 7.0.

3. Remove laboratory precleaned sample containers from sample cooler, label container with an indelible marker, fill out Sample Information Record and Chain of Custody Form.

4. Set aside top 2 feet of soil.

5. Lower the bucket into the test pit and remove soil/waste material.

6. Immediately upon retrieval of the soil/waste material, obtain an organic vapor measurement with a PID or FID.

7. Depending upon the organic vapor measurement, odors and visual characteristics, obtain a soil sample from the backhoe bucket with a scoop and/or wooden tongue depressor, place into the open sample containers and replace the container covers.

8. Fill out Test Pit Log Form, including a description of soil/waste with location, depth and material sampled.

9. Return the sample container to the cooler.

10. Backfill test pit using the top 2 feet of soil that was set aside as the top layer.

11. If reusable, decontaminate the sampling equipment according to the procedures described in Section 7.0.

12. Place all disposable personal protective equipment and disposable sampling equipment into a 55-gallon drum and store in a secure area (fenced, if possible).

6.8 Soil (Probe)

1. Be certain that the sample location is noted on Location Sketch (see Section 9.1).
2. Remove laboratory precleaned sample containers from sample cooler, label container with an indelible marker, fill out Sample Information Record and Chain of Custody Form.
3. Drive the probe to the desired sampling depth.
4. Retrieve the soil probe and immediately after opening it, obtain an organic vapor measurement with a FID or PID.
5. Remove a sample aliquot from the soil probe using a disposable scoop or sterile wooden tongue depressor, place into the open sample container and replace the container cover.
6. Return the sample container to the cooler.
7. If reusable, decontaminate the sampling equipment according to the procedures described in Section 7.0.
8. Place all disposable personal protective equipment and disposable sampling equipment into a 55-gallon drum and store in a secure area (fenced, if possible).

6.9 Soil (Borehole, Split Spoon)

1. Be certain that the sample location is noted on Location Sketch (see Section 9.1).
2. Be certain that the sampling equipment (split spoon) has been decontaminated utilizing the procedures outlined in Section 7.0.
3. Remove laboratory precleaned sample containers from sample cooler, label container with an indelible marker, fill out Sample Information Record and Chain of Custody Form (see Section 8.0).
4. Drill into the soil to the desired depth and drive the split spoon sampler.
5. Retrieve the split spoon and immediately after opening the split spoon, obtain an organic vapor measurement with a PID or FID and fill out Boring Log Form (see Section 8.0).

6. Remove a sample aliquot from the split spoon using a disposable scoop or sterile wooden tongue depressor, place into the open sample container and replace the container cover.

7. Return the sample container to the cooler.

8. If reusable, decontaminate the sampling equipment according to the procedures described in Section 7.0.

9. Place all disposable personal protective equipment and disposable sampling equipment into a 55-gallon drum and store in a secure area (fenced, if possible).

6.10 Groundwater (Probe)

1. Be certain sample location is noted on Location Sketch (see Section 9.1).

2. Remove the laboratory precleaned sample containers from sample cooler, label container with an indelible marker, fill out Sample Information Record and Chain of Custody Form.

3. Obtain a sample by using a dedicated polyethylene tubing equipped with a bottom check valve.

4. Gently pour the sample into the sample container taking care not to spill on the outside of the container or overfill container and replace cover on the sample container. Samples for volatile organic analyses will have no air space in the sample vial prior to sealing. This is done by filling the vial such that there is a meniscus on top. Carefully slide the septum, Teflon side down, onto the top of the vial and cap the vial. Check for bubbles by turning the vial upside down and tapping it lightly. If bubbles appear, reopen the vial, remove the septum and add more sample (or resample). Replace the septum, recap and check for bubbles. Continue until vial is bubble-free.

5. After sample collection, obtain field measurements including pH, conductivity, temperature and turbidity.

6. If a sample is to be collected for metals analysis, the turbidity must be less than 50 NTUs. If the turbidity cannot be reduced to less than 50 NTUs, the sample will be filtered in the field or by the laboratory. Both filtered (soluble metals) and unfiltered (total metals) samples will be analyzed.

7. Return sample containers to sample cooler.

8. Place all disposable personal protective equipment and disposal sampling equipment into a 55-gallon drum and store in a secure area (fenced, if possible).

6.11 Groundwater (Hydropunch)

1. Be certain sample location is noted on Location Sketch (see Section 9.1).

2. Using hydropunch equipment drive/punch screen to desired depth.

3. Remove inner sleeve and lower down decontaminated hydropunch bailer or remove filled Hydropunch sampler from borehole.

4. Remove the laboratory precleaned sample container from the sample cooler, label container with an indelible marker, fill out Sample Information Record and Chain of Custody form.

5. Obtain a volatile organic sample by using a hydropunch bailer or from Hydropunch sampler. Gently pour the sample into the sample container taking care not to spill on the outside of the container or overfill container and replace cover on the sample container. Samples for volatile organic analyses will have no air space in the sample vial prior to sealing. This is done by filling the vial such that there is a meniscus on top. Carefully slide the septum, Teflon side down, onto the top of the vial and cap the vial. Check for bubbles by turning the vial upside down and tapping it lightly. If bubbles appear, reopen the vial, remove the septum and add more sample (or resample). Replace the septum, recap and check for bubbles. Continue until vial is bubble-free.

6. Obtain a sample and analyze for field parameters (pH, conductivity, temperature and turbidity).

7. Turbidity must be less than 50 NTUs prior to collection of a sample for metals analysis. If the turbidity of the sample is greater than 50 NTUs, the sample will be filtered in the field or by the laboratory. Both filtered (soluble metals) and unfiltered (total metals) samples will be analyzed.

8. Collect remaining samples. Gently pour the sample into the sample container, taking care not to spill water on the outside of the container or overfill the container. Replace cover on the sample container.

9. Return sample container to sample cooler.

10. Punch down to next depth and repeat items 3 through 9.

11. Decontaminate hydropunch equipment as described in Section 7.0.

12. Place all disposable personal protective equipment and disposable sampling equipment into a 55-gallon drum and store in a secure area (fenced, if possible).

6.12 Groundwater (Monitoring Well)

1. Measure the depth of water using a decontaminated water level indicator and compute the volume of standing water in the well.

2. Remove three to five times the volume of standing water from the well until field measurements (pH, conductivity, temperature and turbidity) stabilize, or until the well is dry, whichever occurs first. Turbidity should be less than 50 NTUs prior to collection of a sample for metals analysis.

3. Remove the laboratory precleaned sample containers from sample cooler, label container with an indelible marker, fill out Sample Information Record and Chain of Custody Form.

4. Obtain a sample by using a disposable polyethylene bailer.

5. If the turbidity of the sample is greater than 50 NTUs, the metals; (iron and manganese) portion of the sample will be filtered in the field or by the laboratory. Both the filtered (soluble metals) and unfiltered (total metals) samples will be analyzed.

6. Gently pour the sample into the sample container taking care not to spill on the outside of the container or overfill container and replace the cover on the sample container. Samples for volatile organic analyses will have no air space in the sample vial prior to sealing. This is done by filling the vial such that there is a meniscus on top. Carefully slide the septum, Teflon side down, onto the top of the vial and cap the vial. Check for bubbles by turning the vial upside down and tapping it lightly. If bubbles appear, reopen the vial, remove the septum and add more sample (or resample). Replace the septum, recap and check for bubbles. Continue until vial is bubble-free.

7. Return sample container to sample cooler.

8. Place all disposable personal protective equipment and disposable sampling equipment into a 55-gallon drum and store in a secure area (fenced, if possible).

6.13 Private Water Supply

1. Fill out Water Supply Information Record (see Section 9.0).

2. Remove the laboratory precleaned sample container from the sample cooler, label container with an indelible marker, fill out Sample Information Record and Chain of Custody form.

3. If there is a treatment system, identify a location to sample that is ahead of any in-line water treatment unit, if possible. If samples are to be collected from a faucet, disassemble any screens and/or purification system that may be on the faucet, if possible. Note these conditions on the Information Record Form.

4. Allow the cold water to run for approximately five minutes to adequately flush the line before sampling.

5. Collect the cold water directly in the sample container, taking care not to spill on the outside of the container or overfill container, and replace cover on the sample container. Samples for volatile organic analyses will have no air space in the sample vial prior to sealing. This is done by filling the vial such that there is a meniscus on top. Carefully slide the septum, Teflon side down, onto the top of the vial and cap the vial. Check for bubbles by turning the vial upside down and tapping it lightly. If bubbles appear, reopen the vial, remove the septum and add more sample (or resample). Replace the septum, recap and check for bubbles. Continue until vial is bubble-free.

6. Return sample to sample cooler.

7. Reattach water line that may have been disconnected ahead of treatment devise and reassemble screens and/or treatment systems that may have been removed.

6.14 Ambient Air (Sorbent Tube Method TO1 or TO2)

1. Be certain sample location is noted on Location Sketch (see Section 9.1).

2. Set the flow rate* to the desired setting on the air pump.

3. Label sorbent tube and fill out Sample Information Record and Chain of Custody Form.

4. Connect the sorbent tube to pump using polyethylene tubing and set sorbent tube in breathing zone. (This can be accomplished by attaching the pump to a stake).

5. Turn on pump and monitor the pump flow rate at half hour intervals during the duration of sampling.

6. Turn off pump and disconnect the sorbent tube and check the pump flow rate.

7. Place sorbent tubes in containers and place in cooler.

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* Flow rate is determined using a calculation contained in Method TO1 or TO2 based on the constituents of concern at the site.

8. Place all disposable personal protective equipment and disposable sampling equipment into a 55-gallon drum and store in a secure area (fenced, if possible).

6.15 Methane Gas Survey

1. Be certain that the sample location is noted on Location Sketch.
2. Drive the decontaminated stainless steel probe with removable inner rod into the ground to the desired depth.
3. Remove inner rod and immediately replace with a stainless steel cap equipped with a sampling port.
4. Connect new silicon tubing to the probe and the methane gas meter. Turn on meter.
5. Record initial, highest and steady-state methane readings.
6. Shut off meter and disconnect tubing.
7. Extract probe from the ground and decontaminate according to the procedures described in Section 7.0.

6.16 Radiological Survey

1. Lay out transect lines/grid in area to be surveyed using site-specific spacing. Record location on Location Sketch.
2. Turn on calibrated radiation meter (Geiger counter) and evaluate meter operation using test source.
3. Record radiation reading at background location.
4. Slowly walk along transect/grid lines with radiation meter in front, moving meter probe from side to side during traverses. Note radiation readings along traverses, including both areas higher and lower than the background reading. Readings significantly below background levels may indicate that the background location does not represent background conditions.
5. Mark any areas of elevated radiation readings in field notebook or on Location Sketch, utilizing transect/grid point designations or other reference points, and/or mark on ground utilizing marker flags, marker stakes or paint. DO NOT PROCEED PAST ANY LOCATION WITH A RADIATION READING EXCEEDING TWO TIMES BACKGROUND LEVELS UNLESS A QUALIFIED HEALTH PHYSICIST

ADVISES OTHERWISE. If possible, delineate the areas of elevated radiation readings by approaching these areas from multiple directions.

6. If warranted, consult with a qualified health physicist regarding confirmation of radiation results, source determination and sample collection.

7.0 DECONTAMINATION PROCEDURES

Whenever possible, all field sampling equipment should be sterile/disposable and dedicated to a particular sampling point. In instances where this is not possible, a field cleaning/ decontamination procedure will be used in order to mitigate cross contamination between sample locations. A decontamination station/pad will be established for all field activities. This will be an area located away from the source of contamination so as not to adversely impact the decontamination procedure, but close enough to the sampling locations to keep equipment transport handling to a minimum after decontamination.

7.1 Field Decontamination Procedures

All nondisposable equipment will be decontaminated at appropriate intervals (e.g., prior to initial use, prior to moving to a new sampling location and prior to leaving the site). Different decontamination procedures are used for various types of equipment that are used to collect samples. When using field decontamination, sampling should commence in the area of the site with the lowest contamination, if known or probable, and proceed through to the areas of highest contamination.

7.2 Decontamination Procedure for Drilling/Probing Equipment

All equipment such as drill rigs and other mobile equipment will receive an initial cleaning prior to use at the site. The frequency of subsequent cleanings while on-site will depend on how the equipment is actually used in relation to collecting environmental samples. All wash/rinse solutions will be collected and recharged on-site after testing, if possible. If an appropriate location for on-site recharge is not available, the next preferable option is to discharge to a municipal sewer system. Until an appropriate discharge alternative is determined, all wash/rinse solutions will be collected and contained on-site in 55-gallon drums.

After the initial decontamination, cleaning may be reduced to those areas that are in close proximity to materials being sampled. Drill rig/probe items such as augers, drill/probe rods and drill bits will be cleaned in between sample locations.

Drilling/probing equipment will be decontaminated in the following manner:

- Wash thoroughly with nonresidual detergent (alconox) and tap water using a brush to remove particulate matter or surface film. This is necessary in order to remove any solids buildup on the back of the rig, auger flights, drill rods, drilling head, etc. Any loose paint chips, paint flakes and rust must also be removed.
- Steam clean (212°F).
- Once decontaminated, remove all items from the decontamination area.

Also, following the general cleaning procedures described above, all downhole/drilling items, such as split spoon samplers, Shelby tubes, rock corers, or any other item of equipment which will come in direct contact with a sample during drilling, will be decontaminated by steam cleaning.

7.3 Decontamination Procedure for Sampling Equipment

Teflon, PVC, polyethylene and stainless steel sampling equipment decontamination procedures will be the following:

- Wash thoroughly with nonresidual detergent (alconox) and clean potable tap water using a brush to remove particulate matter or surface film.
- Rinse thoroughly with tap water.
- Rinse thoroughly with acid (HNO_3) (only if metals samples are to be collected).
- Rinse thoroughly with distilled water.
- Rinse in a well ventilated area with methanol (pesticide grade) and air dry.
- Rinse thoroughly with distilled water and air dry.

- Wrap completely in clean aluminum foil with dull side against the equipment. For small sampling items, such as scoops, decontamination will take place over a drum specifically used for this purpose.

The first step, a soap and water wash, will be performed to remove all visible particulate matter and residual oils and grease. This step will be followed by a tap water rinse and a distilled/deionized water rinse to remove the detergent. Next, a high purity solvent rinse will be used for trace organics removal. Methanol has been chosen because it is not an analyte of concern on the Target Compound List. The solvent will be allowed to evaporate and then a final distilled/deionized water rinse will be performed. This rinse removes any residual traces of the solvent. The aluminum wrap will protect the equipment and keep it clean until it is used at another sampling location.

7.4 Decontamination Procedure for Well Casing and Development Equipment

Field cleaning of well casings will consist of a manual scrubbing to remove foreign material and steam cleaning, inside and out, until all traces of oil and grease are removed. This material will then be stored in such a manner so as to preserve it in this condition. Special attention to threaded joints will be necessary to remove cutting oil or weld burn residues.

Materials and equipment that will be used for the purposes of well development will also be decontaminated by steam cleaning. An additional step will involve flushing the interior of any hose, pump, etc. with a nonphosphate detergent solution and potable water rinse prior to the development of the next well. This liquid waste will be disposed of on-site, if possible after testing.

8.0 LABORATORY SAMPLE CUSTODY PROCEDURES

A NYSDOH ELAP and CLP certified laboratory meeting the requirements for sample custody procedures, including cleaning and handling sample containers and analytical equipment, will be used to analyze samples collected during the remedial investigation. The selected laboratory's Standard Operating Procedures will be made available upon request.

9.0 SAMPLE DOCUMENTATION

Proper management and documentation of field and sampling activities is essential to ensure that all necessary work is conducted in accordance with the sampling plan and QA/QC Plan in an efficient and high quality manner. Field management procedures will include following proper chain of custody procedures to track a sample from collection through analysis, noting when and how samples are split (if required); preparing a Location Sketch; completing Sample Information Records, Chain of Custody Forms, and Boring, Well and Test Pit Construction Logs; maintaining a daily Field Log Book; preparing Daily Field Activity Reports; completing Field Change Forms; and filling out a Daily Air Monitoring Form. Copies of each of these forms are provided in Appendix B. Proper completion of these forms and the field log book are necessary to support the consequent actions that may result from the sample analysis. This documentation will support that the samples were collected and handled properly.

9.1 Location Sketch

For each sampling point, a Location Sketch will be completed using permanent references and distances to the sampling point noted, if possible.

9.2 Sample Information Record

At each sampling location, a Sample Information Record Form is filled out including, but not limited to, the following information:

- Site name
- Sample crew
- Sample location
- Field sample identification number
- Date
- Time of sample collection

- Weather conditions
- Temperature
- Sample matrix
- Method of sample collection and any factor that may affect its quality adversely
- Well information (groundwater only)
- Field test results
- Analysis to be performed
- Remarks

9.3 Chain of Custody

The Chain of Custody Form will be completed and is initiated at the laboratory with container preparation and shipment to the site. The form remains with the sample at all times and bears the name of the person assuming responsibility for the samples. This person is tasked with ensuring secure and appropriate handling of the containers and samples. When the form is complete, it will indicate that there was no lapse in sample accountability.

A sample is considered to be in an individual's custody if any of the following conditions are met:

- It is in the individual's physical possession, or
- It is in the individual's view after being in his or her physical possession, or
- It is secured by the individual so that no one can tamper with it, or
- The individual puts it in a designated and identified secure area.

In general, Chain of Custody Forms are provided by the laboratory selected to perform the analytical services. At a minimum, the following information will be provided on these forms:

- Project name and address
- Project number
- Sample identification number
- Date
- Time
- Sample location
- Sample type
- Analysis requested
- Number of containers and volume taken
- Remarks
- Type of waste
- Sampler(s) name(s) and signature(s)
- Spaces for relinquished by/received by signature and date/time.

For this particular study, forms provided by the laboratory will be utilized.

The Chain of Custody Form will be filled out and signed by the person performing the sampling. The original of the form will travel with the sample and will be signed and dated each time the sample is relinquished to another party, until it reaches the laboratory or analysis is completed. The field sampler will keep one copy and a copy will be retained for the project file. The sample bottle will also be labeled with an indelible marker with a minimum of the following information:

- Sample number
- Analysis to be performed
- Date of collection

A copy of the completed form will be returned by the laboratory with the analytical results.

9.4 Split Samples

Whenever samples are being split with another party, a Receipt for Samples Form will be completed and signed. A copy of the Chain of Custody Form will accompany this form.

9.5 Field Log Book

Field log books will be bound and have consecutively numbered, water resistant pages. All pertinent information regarding the site and sampling procedures will be documented. Notations will be made in log book fashion, noting the time and date of all entries. Information recorded in this notebook will include, but not be limited to, the following:

The first page of the log will contain the following information:

- Project name and address
- Name, address and phone number of field contact
- Waste generator and address, if different from above
- Type of process (if known), generating waste
- Type of waste
- Suspected waste composition, including concentrations

Daily entries will be made for the following information:

- Purpose of sampling
- Location of sampling point
- Number(s) and volume(s) of sample(s) taken
- Description of sampling point and sampling methodology

- Date and time of collection, arrival and departure
- Collector's sample identification number(s)
- Sample distribution and method of storage and transportation
- References, such as sketches of the sampling site or photographs of sample collection
- Field observations, including results of field analyses (e.g., pH, temperature, specific conductance), water levels, drilling logs, and organic vapor and dust readings
- Signature of personnel responsible for completing log entries.

9.6 Daily Field Activity Report

At the end of each day of field work, the Field Operations Manager, or designee, will complete this form noting personnel on-site and summarizing the work performed that day, equipment, materials and supplies used, results of field analyses, problems and resolutions. This form will be signed and subject to review.

9.7 Field Changes and Corrective Actions

Whenever there is a required or recommended investigation/sampling change or correction, a Field Change Form will be completed by the Field Operations Manager and approved by the Project Manager.

9.8 Trip Report

A trip report will be prepared to provide a detailed accounting of what occurred during each sampling mobilization. The trip report will be prepared within two weeks of the last day of each sampling mobilization. Information will be provided on time of major events, dates, and personnel on-site (including affiliations). The trip report will be organized into three or four major sections: Background, Observations and Activities, Conclusions and Recommendations (optional), and Future Activities.

10.0 CALIBRATION PROCEDURES AND PREVENTIVE MAINTENANCE

The following information regarding equipment will be maintained at the project site:

1. Equipment calibration and operating procedures which will include provisions for documentation of frequency, conditions, standards and records reflecting the calibration procedures, methods of usage and repair history of the measurement system. Calibration of field equipment will be performed daily at the sampling site so that any background contamination can be taken into consideration and the instrument calibrated accordingly.

2. A schedule of preventive maintenance tasks, consistent with the instrument manufacturer's specific operation manuals, that will be carried out to minimize down time of the equipment.

3. Critical spare parts, necessary tools and manuals will be on hand to facilitate equipment maintenance and repair.

Calibration procedures and preventive maintenance, in accordance with the NYSDEC 2000 ASP and/or USEPA 5/99 SOW for laboratory equipment, will be contained in the laboratory's standard operating procedures (SOP) which will be available upon request.

11.0 PERFORMANCE OF FIELD AUDITS

During field activities, the QA/QC officer will accompany sampling personnel into the field, in particular in the initial phase of the field program, to verify that the site sampling program is being properly conducted, and to detect and define problems so that corrective action can be taken early in the field program. All findings will be documented and provided to the Field Operations Manager. A copy of the Field Audit Form is provided in Appendix B.

12.0 CONTROL AND DISPOSAL OF CONTAMINATED MATERIAL

During construction and sampling of the monitoring wells and soil borings, contaminated waste, soil and water may be generated from drill cuttings, drilling fluids, decontamination water, development water and purge water. All soil cuttings generated during the site investigation will be handled in a manner consistent with NYSDEC Technical and Administrative Guidance Memorandum (TAGM) No. 4032, Disposal of Drill Cuttings.

All water generated during the investigation, including decontamination water, drill water and purge water, will be recharged on-site, if possible, following testing. If necessary, the site-specific work plan will provide detailed information on the disposal of water generated during the investigation. If it is not possible to recharge water on-site, the next preferred option is discharge of the water to a municipal sanitary sewer system.

Department of Transportation (DOT) approved 55-gallon drums will be used for the containment of soil cuttings and water (if necessary), and for disposal of personal protective clothing and disposable sampling equipment (i.e., bailers, scoops, tongue depressors, etc.). The drums will be marked, labeled with a description of the contents and from what location they were collected. All drums will be sealed and stored on-site in a secure area.

13.0 DOCUMENTATION, DATA REDUCTION AND REPORTING

A NYSDOH ELAP and CLP certified laboratory meeting the New York State requirements for documentation, data reduction and reporting will be used. All data will be cataloged according to sampling locations and sample identification nomenclature which is described in Section 6.1 of this QA/QC Plan. The laboratory analysis will be reported in the NYSDEC ASP Category B deliverables format.

NYSDEC "Sample Identification and Analytical Requirement Summary" and "Sample Preparation and Analysis Summary" forms (for VOC and inorganic analysis) will be completed and included with each data package. These forms are contained in Appendix C of this QA/QC Plan. The sample tracking forms are required and supplied by the 2000 NYSDEC ASP and USEPA 5/99 SOW.

14.0 DATA VALIDATION

Data validation will be performed in order to define and document analytical data quality in accordance with NYSDEC requirements that investigation data must be of known and acceptable quality. The analytical and validation processes will be conducted in conformance with the NYSDEC 2000 ASP and/or USEPA 5/99 SOW.

Because the NYSDEC Analytical Services Protocol is based on the USEPA CLP, the USEPA Functional Guidelines for Evaluating Organics and Inorganics Analyses for the Contract Laboratory Program (CLP) will assist in formulating standard operating procedures (SOPs) for the data validation process. The data validation process will ensure that all analytical requirements specific the QA/QC Plan are followed. Procedures will address validation of routine analytical services (RAS) results based on the NYSDEC Target Compound List and Target Analyte List for standard sample matrices.

The data validation process will provide an informed assessment of the laboratory's performance based upon contractual requirements and applicable analytical criteria. The report generated as a result of the data validation process will provide a base upon which the usefulness of the data can be evaluated by the end user of the analytical results. The overall level of effort and specific data validation procedure to be used will be equivalent to a "100% validation" of all analytical data in any given data package.

During the review process, it will be determined whether the contractually required laboratory submittals for sample results are supported by sufficient back-up data and QA/QC results to enable the reviewer to conclusively determine the quality of data. Each data package will be checked for completeness and technical adequacy of the data. Upon completion of the review, the reviewers will develop a QA/QC data validation report for each analytical data package.

"Qualified" analytical results for any one field sample will be established and presented based on the results of specific QC samples and procedures associated with its sample analysis

group or batch. Precision and accuracy criteria (i.e., QC acceptance limits) will be used in determining the need for qualifying data. Where test data have been reduced by the laboratory, the method of reduction will be described in the report. Reduction of laboratory measurements and laboratory reporting of analytical parameters will be verified in accordance with the procedures specified in the NYSDEC and USEPA program documents for each analytical method (i.e., recreate laboratory calculations and data reporting in accordance with the method specific procedure).

The standard operating guideline manuals and any special analytical methodology required will specify documentation needs and technical criteria and will be taken into consideration in the validation process. Copies of the complete data package and the validation report, including the laboratory results data report sheets, with any qualifiers deemed appropriate by the data reviewer, and a supplementary field QC sample result summary statement, will be provided with the site investigation report.

The following is a description of the two-phased approach to data validation which will be used in the remedial investigation. The first phase is called checklisting and the second phase is the analytical quality review, with the former being a subset of the latter.

- Checklisting - The data package will be checked for correct submission of the contract required deliverables, correct transcription from the raw data to the required deliverable summary forms and proper calculation of a number of parameters.

- Analytical Quality Review - The data package will be closely examined to recreate the analytical process and verify that proper and acceptable analytical techniques have been performed. Additionally, overall data quality and laboratory performance will be evaluated by applying the appropriate data quality criteria to the data to reflect conformance with the specified, accepted QA/QC standards and contractual requirements.

At the completion of the data validation, a Summary Data Validation/Usability Report will be prepared as part of the site investigation report.

15.0 PERFORMANCE AND SYSTEM AUDITS

A NYSDOH ELAP and CLP certified laboratory which has satisfactorily completed performance audits and performance evaluation samples will be used to perform sample analyses for the remedial investigation.

16.0 CORRECTIVE ACTION

A NYSDOH ELAP and CLP certified laboratory will meet the requirements for corrective action protocols, including sample "clean up" to attempt to eliminate/mitigate matrix interference.

The 2000 NYSDEC ASP and USEPA 5/99 SOW includes both mandatory and optional sample cleanup and extraction methods. Cleanup is required by the 2000 NYSDEC ASP and USEPA 8/94 SOW in order to meet contract required detection limits. There are several optional cleanup and extraction methods noted in the 2000 NYSDEC ASP and USEPA 5/99 SOW. These include: florisil column cleanup, silica gel column cleanup, acid-base partition, steam distillation and sulfuric acid cleanup for PCB analysis.

High levels of matrix interference may be present in waste, soil and sediment samples. This interference may prevent the achievement of ASP and SOW detection limits if no target compounds are found. In order to avoid unnecessary dilutions, the optional cleanup methods noted in the 2000 NYSDEC ASP and USEPA 5/99 SOW will be required to be performed by the laboratory as necessary.

It should be noted that if these optional cleanup and extraction methods are utilized, holding time requirements will not be exceeded due to negligence of the laboratory. Subsequent to selection of the analytical laboratory for this project, a meeting or conference call will be undertaken with the laboratory to discuss these issues and establish procedures to ensure effective and timely communications among all parties.

APPENDIX A

GC STANDARD OPERATING PROCEDURE

STANDARD OPERATING PROCEDURE
FOR
HEADSPACE ANALYSIS OF GROUNDWATER SAMPLES UTILIZING A PORTABLE GAS CHROMATOGRAPH

1. Collect groundwater sample in 40-ml vial equipped with teflon septum.
2. Remove 10 ml of sample from vial using a decontaminated disposable 10-ml syringe.
3. Shake vial vigorously for 60 seconds.
4. Withdraw required volume of headspace for injection into portable gas chromatograph.
   - Always store sample in an inverted position to avoid loss of headspace.

STANDARD OPERATING PROCEDURE
FOR
PORTABLE GAS CHROMATOGRAPH (PHOTOVAC 10S PLUS)

1. Fill gas chromatograph with carrier gas (zero air).

2. Turn instrument on.

3. Run instrument blank (perform an analysis without injecting a sample).

4. Run standards (calibration). Calibration procedures will be developed on a site-specific basis. Calibrations will be based on chemicals of concern. Standard analysis must agree within ±20% of existing calibration. If within 20%, proceed to Step 5, if not, rerun standard as a calibration then proceed to Step 5.

5. Analyze samples in accordance with applicable standard operating procedure.

6. Run a standard check every 8 hours. Proceed as in No. 4.

QC GUIDELINES FOR GC FIELD METHODS

The Standard Operating Procedure (SOP) for the GC field method must be submitted to the Quality Assurance Section (QAS) for review. The SOP must include:

- A detailed step-by-step procedure for the analysis method.
- A 3-point Initial Calibration
- Quality Control (QC) criteria: correlation coefficient $\geq$0.95.
- A midpoint calibration every 10 samples or daily, whichever is more frequent.
- QC criteria: Relative Percent Difference (RPD) $\leq$30 percent.
- A blank run after calibration standards.
- QC criteria: Peak area for target compounds less than half the area of the reported detection limit.
- Duplicate analysis on 10 percent of the samples.
- Laboratory confirmation on 10 percent of the samples

The résumé of the Field Analyst, including relevant experience and education, must also be submitted for review by the QAS.

APPENDIX B

FIELD FORMS

DVIRKA
AND
BARTILUCCI

DRILLING LOG

DRILLING CONTRACTOR
Driller _____
Inspector _____
Rig Type _____
Drilling Method _____
Drive Hammer Weight _____

PROJECT NAME _____
PROJECT # _____
Location/Address _____

BORING NUMBER _____
Sheet _____ of _____
Boring Location _____

GROUNDWATER OBSERVATIONS

Water Level			
Time			
Date			
Casing Depth			

Weather _____
Date/Time Start _____
Date/Time Finish _____

Plot Plan

Sample Depth	Sample Number	SPT	PID/FID Reading	FIELD IDENTIFICATION OF MATERIAL	WELL SCHEMATIC	COMMENTS

Soil Stratigraphy Summary _____

SPT = STANDARD PENETRATION TEST

DVIRKA AND BARTILUCCI

TEST PIT LOG

TEST PIT LOCATION SKETCH MAP

N

TEST PIT NO.

PROJECT NO./NAME	LOCATION
EXCAVATOR/EQUIPMENT/OPERATOR	
INSPECTOR/OFFICE	START/FINISH DATE
ELEVATION OF: GROUND SURFACE/BOTTOM OF PIT (FT. ABOVE MSL)	CONDITION OF PIT
REMARKS:	

DEPTH	SAMPLE INTERVAL	OVA SCREEN	DESCRIPTION OF MATERIALS	REMARKS
0				
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

Dvirka and Bartilucci
CONSULTING ENGINEERS

WELL CONSTRUCTION LOG

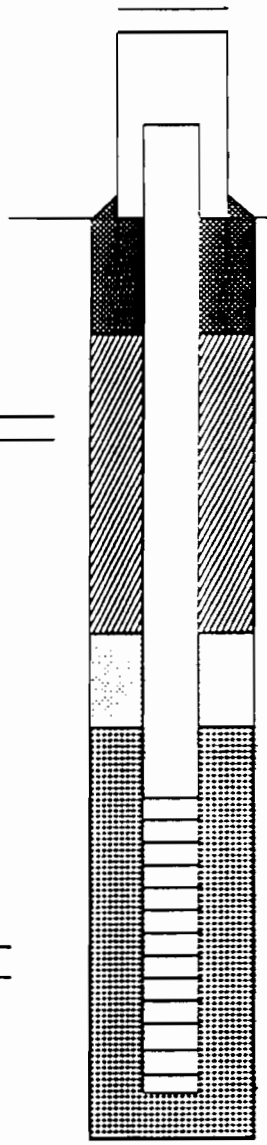
SITE _____ JOB NO. _____ WELL NO. _____

TOTAL DEPTH _____ SURFACE ELEV. _____ TOP RISER ELEV. _____

WATER LEVELS (DEPTH, DATE, TIME) _____ DATE INSTALLED _____

RISER	DIA ___	MATERIAL _____	LENGTH _____		
SCREEN	DIA ___	MATERIAL _____	LENGTH _____	SLOT SIZE	_____
PROT CSG	DIA ___	MATERIAL _____	LENGTH _____		

SCHEMATIC



___ Prot. Csg Stickup

___ Riser Stickup

___ Ground Surface

Surface Seal Type _____

___ Bottom Surface Seal

Grout Type _____

___ Top Seal

Seal Type _____

___ Top Sand Pack

___ Top Screen

Sand Pack Type _____

Size _____

___ Bottom Screen

___ Total Depth of Boring

Dvirka and Bertlucci
CONSULTING ENGINEERS

WELL CONSTRUCTION LOG

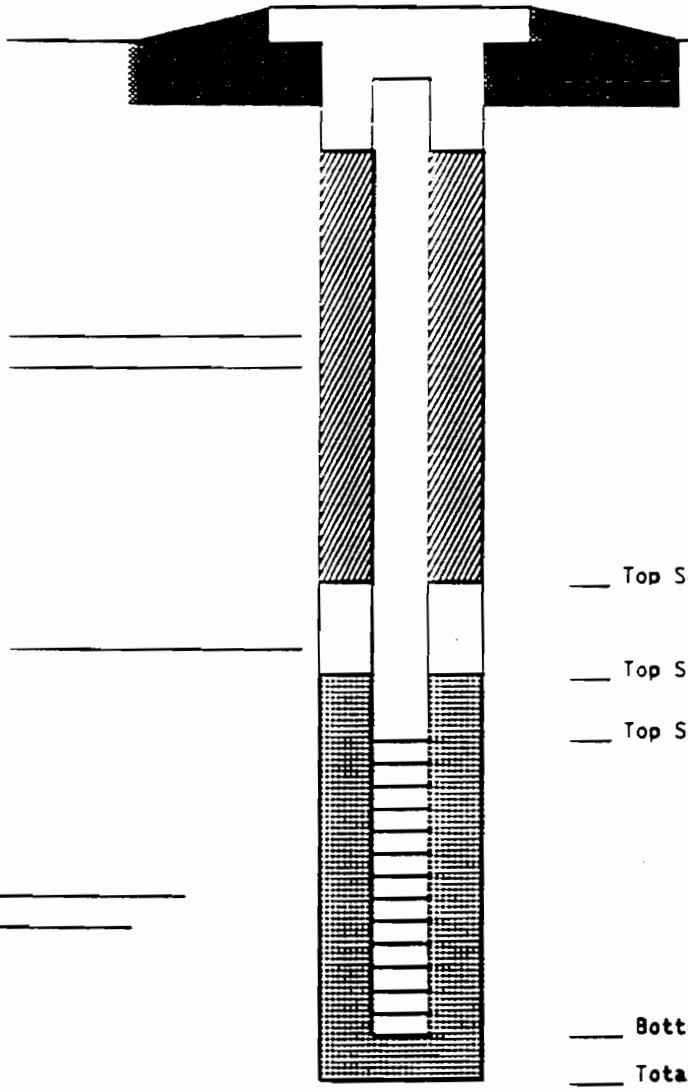
SITE _____ JOB NO. _____ WELL NO. _____

TOTAL DEPTH _____ SURFACE ELEV. _____ TOP RISER ELEV. _____

WATER LEVELS (DEPTH, DATE, TIME) _____ DATE INSTALLED _____

RISER DIA ___ MATERIAL _____ LENGTH _____
SCREEN DIA ___ MATERIAL _____ LENGTH _____ SLOT SIZE _____

SCHEMATIC



Surface Seal Type _____
_____

Grout Type _____
_____

Seal Type _____

Sand Pack Type _____
Size _____

Ground Surface
___ Riser Elevation
___ Bottom Surface Seal

___ Top Seal

___ Top Sand Pack

___ Top Screen

___ Bottom Screen

___ Total Depth of Boring

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LOCATION SKETCH

Project _____ Sample Crew _____

Sample(s) Location(s) _____

Sample(s) and/or Well Number(s) _____

_____

Location of sample points, wells, borings, etc., with reference to three permanent reference points.
Measure all distances, clearly label roads, wells and permanent features.

LS

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Receipt for Samples

Project Name: _____ Field Log Book Reference Number: _____

Project Address: _____ Sampled By: _____

Project Number: _____ Split With: _____

SAMPLE NUMBERS	DATE	TIME	C O M P	G R A B	SPLIT SAMPLES	LOG BOOK PAGE NO.	TAG NUMBERS	SAMPLE LOCATION	NO. OF CONTAINERS	REMARKS

Transferred by (Signature)		Received by (Signature)		Telephone
Date	Time	Title	Date	Time

RFS

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SAMPLE INFORMATION RECORD

SITE _____ SAMPLE CREW _____

SAMPLE LOCATION/WELLNO. _____

FIELD SAMPLE I.D. NUMBER _____ DATE _____

TIME _____ WEATHER _____ TEMPERATURE _____

SAMPLE TYPE:

GROUNDWATER _____ SEDIMENT _____

SURFACE WATER _____ AIR _____

SOIL _____ OTHER (Describe. e.g., septage.leachate)

_____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER _____ MEASUREMENT METHOD _____

DEPTH OF WELL _____ MEASUREMENT METHOD _____

VOLUME REMOVED _____ REMOVAL METHOD _____

FIELD TEST RESULTS:

COLOR _____ pH _____ ODOR _____

TEMPERATURE (°F) _____ SPECIFIC CONDUCTANCE (umhos/cm) _____

TURBIDITY _____

PID/FID READING _____ VISUAL DESCRIPTION _____

_____

CONSTITUENTS TO BE ANALYZED:

_____ _____ _____ _____

_____ _____ _____ _____

REMARKS: _____

_____

_____

_____

WELL CASING VOLUMES

GAL/FT	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

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DAILY FIELD ACTIVITY REPORT

Report Number: _____ Project Number: _____ Date: _____

Field Log Book Page Number: _____

Project: _____

Address: _____

Weather: (AM) _____ Rainfall: (AM) _____ Inches
(PM): _____ (PM) _____ Inches

Temperature: (AM) _____ °F Wind Speed: (AM) _____ MPH Wind Direction: (AM) _____
(PM) _____ °F (PM) _____ MPH (PM) _____

Site Condition: _____

Personnel On Site: Name	Affiliation	Arrival Time	Departure Time

Subcontractor Work Commencement: (AM) _____ (PM) _____

Subcontractor Work Completion: (AM) _____ (PM) _____

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DATE: _____

DAILY FIELD ACTIVITY REPORT

Work performed today by subcontractor(s) (includes equipment and labor breakdown):

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DATE: _____

DAILY FIELD ACTIVITY REPORT

General work performed today by D&B: _____

List specific inspection(s) performed and results (include problems and corrective actions):

List type and location of tests performed and results (include equipment used and monitoring results):

Verbal comments received from subcontractor (include construction and testing problems, and recommendations/resulting action):

Prepared by: _____ Reviewed by: _____

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BARTILUCCI

FIELD CHANGE FORM

Project Name: _____

Project Number: _____ Field Change Number: _____

Location: _____ Date: _____

Field Activity Description: _____

_____

_____

_____

Reason for Change: _____

_____

_____

_____

Recommended Disposition: _____

_____

_____

_____

_____ _____

Field Operations Officer (D&B Consulting Engineers) (Signature) Date

Disposition: _____

_____

_____

_____

_____ _____

On-site Supervisor (NYSDEC) (Signature) Date

_____

Distribution: Project Manager (D&B)
Project Manager (NYSDEC)
Field Operations Officer
On-site Supervisor (NYSDEC)

Others as Required: _____
_____
_____
_____

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DAILY EQUIPMENT CALIBRATION LOG

Project Name: ______________________________

Project Number: ______________________ Calibrated By: ______________________

Date	Instrument Name and Model Number	Calibration Method	Time	Readings and Observations

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WATER SUPPLY SAMPLE INFORMATION RECORD

Name: _____

Address: _____

Telephone: _____

Date and Time Sampled: _____

Sample Location: _____

Sample Number: _____

Well Information: _____

Depth and Type of Well: _____

Date Constructed: _____

Type of Construction and Diameter: _____

Driller: _____

Estimated Usage (gpm): _____

Water Use(s): _____

Type of Treatment Device and Location: _____

Date and Location Last Sampled: _____

Homeowner's Perception of Water Quality: _____

Comments: (Use of bottled water, etc.) _____

_____

_____

_____

_____

_____

_____

_____

_____

WSS

Sketch of Lot, Building, and Well and Septic System Location

Sketch of Water Treatment System and Sampling Locations

Photograph of Water Treatment System

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FIELD AUDIT FORM

Site: _____ Date: _____

Persons On-site: _____ QA/QC Officer Conducting Audit:

_____ _____

_____ Project:

_____ _____

1. Is safety equipment in use (hardhats, respirators, gloves etc.): YES NO

2. Is a decontamination station, equipment and supplies on site and in working order:

Methanol	YES	NO
Alconox	YES	NO
D.I. Water	YES	NO
Scrub Brushes	YES	NO
Steam Cleaner	YES	NO

Comments: _____

_____

_____

3. Is the decontamination pad set up so water is contained: YES NO

Comments: _____

_____

_____

4. Is the site/investigation areas secured (fence, markers, etc.) or otherwise in accordance with project requirements: YES NO

Comments: _____

_____

_____

DVIRKA AND BARTILUCCI

FIELD AUDIT FORM
(continued)

5. Is contaminated material properly stored and in a secure area or otherwise in accordance with project requirements: YES NO
   Are the drums of waste (water, soil, ppe) labeled properly: YES NO

   Comments: _____

   _____

   _____

6. Are field forms filled out properly, legibly and timely:

Field Log Book	YES	NO
Chain of Custody	YES	NO
Equipment Calibration Log	YES	NO
Daily Field Activity Report	YES	NO
Location Sketch	YES	NO
Sample Information Record	YES	NO
Equipment Usage Form	YES	NO
Boring Logs	YES	NO

   Comments: _____

   _____

   _____

7. Is the proper sampling and field measurement equipment, including calibration supplies on site: YES NO

   Comments: _____

   _____

   _____

DVIRKA AND BARTILUCCI

FIELD AUDIT FORM
(continued)

8. Are there adequate sample containers, including deionized water for QA/QC:

Field Blanks	YES	NO
Trip Blanks	YES	NO

Comments: _____

_____

_____

9. Is the equipment decontaminated in accordance with project requirements:

Sampling equipment	YES	NO
Construction equipment	YES	NO

Comments: _____

_____

_____

10. Is field measurement equipment calibrated:

Daily	YES	NO
Properly	YES	NO

Comments: _____

_____

_____

11. Are samples collected and labeled properly: YES NO

Comments: _____

_____

_____

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BARTILUCCI

FIELD AUDIT FORM
(continued)

12. Are samples stored at 4°C: YES NO

Comments: _____

_____

_____

13. Are coolers properly sealed and packed for shipment including Chain of Custody taped to underside of lid: YES NO

Comments: _____

_____

_____

14. Is a copy of the Field Investigation Work Plan available on site: YES NO

Comments: _____

_____

_____

15. Is a copy of each equipment manual on-site: YES NO

Comments: _____

_____

_____

16. Is a copy of the QA/QC Plan available on site: YES NO

Comments: _____

_____

_____

DVIRKA AND BARTILUCCI

FIELD AUDIT FORM
(continued)

17. Are investigation personnel familiar with the Work Plan and QA/QC Plan: YES NO

Comments: _____

_____

_____

18. Are quality control samples taken:

Trip Blanks YES NO

Field Blanks YES NO

Comments: _____

_____

_____

19. Are samples shipped in a timely and appropriate manner: YES NO

Comments: _____

_____

_____

20. Has the laboratory been contacted regarding planned shipment of samples: YES NO

Comments: _____

_____

_____

21. Certification - Based upon my audit at the above project, I hereby certify/do not certify compliance with QA/QC requirements for the project:

_____ _____

Dated Signed

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FIELD AUDIT FORM
(continued)

General Comments: _____

_____

_____

_____

APPENDIX C

NYSDEC SAMPLE IDENTIFICATION, PREPARATION AND ANALYSIS SUMMARY FORMS

To be included with all lab data and with each workplan

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION AND ANALYTICAL REQUIREMENT SUMMARY

Customer Sample Code	Laboratory Sample Code	Analytical Requirements					
		*VOA GC/MS Method #	*BNA GC/MS Method #	*VOA GC Method #	*Pest PCBs Method #	*Metals	*Other

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY
SEMIVOLATILE (BNA)
ANALYSES

Laboratory Sample ID	Matrix	Date Collected	Date Rec'd at Lab	Date Extracted	Date Analyzed

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY
VOLATILE (VOA)
ANALYSES

Laboratory Sample ID	Matrix	Date Collected	Date Rec'd at Lab	Date Extracted	Date Analyzed

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY
PESTICIDE/PCB
ANALYSES

Laboratory Sample ID	Matrix	Date Collected	Date Rec'd at Lab	Date Extracted	Date Analyzed

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY
SEMIVOLATILE (BNA)
ANALYSES

Laboratory Sample ID	Matrix	Analytical Protocol	Extraction Method	Auxiliary Cleanup	Dil/Conc Factor

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY
INORGANIC ANALYSES

Laboratory Sample ID	Matrix	Metals Requested	Date Rec'd at Lab	Date Analyzed

APPENDIX D

TARGET COMPOUND AND TARGET ANALYTE LISTS

Superfund Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL)

	Volatiles	CAS Number	Quantitation Limits* Water µg/L	Low Soil µg/Kg	Med Soil µg/Kg	On Column (ng)
1.	Dichlorodifluoromethane	75-71-8	10	10	1200	(50)
2.	Chloromethane	74-87-3	10	10	1200	(50)
3.	Bromomethane	74-83-9	10	10	1200	(50)
4.	Vinyl chloride	75-01-4	10	10	1200	(50)
5.	Chloroethane	75-00-3	10	10	1200	(50)
6.	Trichlorofluoromethane	75-69-4	10	10	1200	(50)
7.	1,1-Dichloroethene	75-35-4	10	10	1200	(50)
8.	1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	10	10	1200	(50)
9.	Acetone	67-64-1	10	10	1200	(50)
10.	Carbon Disulfide	75-15-0	10	10	1200	(50)
11.	Methyl Acetate	79-20-9	10	10	1200	(50)
12.	Methylene chloride	75-09-2	10	10	1200	(50)
13.	trans-1,2-Dichloroethene	156-60-5	10	10	1200	(50)
14.	Methyl tert-Butyl Ether	1634-04-4	10	10	1200	(50)
15.	1,1-Dichloroethane	75-35-3	10	10	1200	(50)
16.	cis-1,2-Dichloroethene	156-59-2	10	10	1200	(50)
17.	2-Butanone	78-93-3	10	10	1200	(50)
18.	Chloroform	67-66-3	10	10	1200	(50)
19.	1,1,1-Trichloroethane	71-55-6	10	10	1200	(50)
20.	Cyclohexane	110-82-7	10	10	1200	(50)
21.	Carbon tetrachloride	56-23-5	10	10	1200	(50)
22.	Benzene	71-43-2	10	10	1200	(50)
23.	1,2-Dichloroethane	107-06-2	10	10	1200	(50)
24.	Trichloroethene	79-01-6	10	10	1200	(50)
25.	Methylcyclohexane	108-87-2	10	10	1200	(50)
26.	1,2-Dichloropropane	78-87-5	10	10	1200	(50)
27.	Bromodichloromethane	75-27-4	10	10	1200	(50)
28.	cis-1,3-Dichloropropene	10061-01-5	10	10	1200	(50)
29.	4-Methyl-2-pentanone	108-10-1	10	10	1200	(50)
30.	Toluene	108-88-3	10	10	1200	(50)
31.	trans-1,3-Dichloropropene	10061-02-6	10	10	1200	(50)
32.	1,1,2-Trichloroethane	79-00-5	10	10	1200	(50)
33.	Tetrachloroethene	127-18-4	10	10	1200	(50)
34.	2-Hexanone	591-78-6	10	10	1200	(50)
35.	Dibromochloromethane	124-48-1	10	10	1200	(50)

Superfund Target Compound List (TCL) and
Contract Required Quantitation Limits (CRQL)

	Volatiles (cont.)	CAS Number	Quantitation Limits* Water µg/L	Low Soil µg/Kg	Med Soil µg/Kg	On Column (ng)
36.	1,2-Dibromoethane	106-93-4	10	10	1200	(50)
37.	Chlorobenzene	108-90-7	10	10	1200	(50)
38.	Ethyl Benzene	100-41-4	10	10	1200	(50)
39.	Total Xylenes	1330-20-7	10	10	1200	(50)
40.	Styrene	100-42-5	10	10	1200	(50)
41.	Bromoform	75-25-2	10	10	1200	(50)
42.	Isopropylbenzene	98-82-8	10	10	1200	(50)
43.	1,1,2,2-Tetrachloroethane	79-34-5	10	10	1200	(50)
44.	1,3-Dichlorobenzene	541-73-1	10	10	1200	(50)
45.	1,4-Dichlorobenzene	106-46-7	10	10	1200	(50)
46.	1,2-Dichlorobenzene	95-50-1	10	10	1200	(50)
47.	1,2-Dibromo-3-chloropropane	96-12-8	10	10	1200	(50)
48.	1,2,4-Trichlorobenzene	120-82-1	10	10	1200	(50)

* Quantitation Limits listed for soil/sediment are based on wet weight. The quantitation limits calculated by the laboratory for soil/sediment, calculated on dry weight basis, as required by the protocol, will be higher.

Superfund Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL)*

	Semivolatiles	CAS Number	Quantitation Limits* Water µg/L	Low Soil µg/Kg	Med Soil µg/Kg	On Column (ng)
34.	Phenol	108-95-2	10	330	10,000	(20)
35.	bis(2-Chloroethyl) ether	111-44-4	10	330	10,000	(20)
36.	2-Chlorophenol	95-57-8	10	330	10,000	(20)
37.	1,3-Dichlorobenzene	541-73-1	10	330	10,000	(20)
38.	1,4-Dichlorobenzene	106-46-7	10	330	10,000	(20)
39.	1,2-Dichlorobenzene	95-50-1	10	330	10,000	(20)
40.	2-Methylphenol	95-48-7	10	330	10,000	(20)
41.	2,2'-oxybis(1-Chloro-propane) #	108-60-1	10	330	10,000	(20)
42.	4-Methylphenol	106-44-5	10	330	10,000	(20)
43.	N-Nitroso-di-n-propylamine	621-64-7	10	330	10,000	(20)
44.	Hexachloroethane	67-72-1	10	330	10,000	(20)
45.	Nitrobenzene	98-95-3	10	330	10,000	(20)
46.	Isophorone	78-59-1	10	330	10,000	(20)
47.	2-Nitrophenol	88-75-5	10	330	10,000	(20)
48.	2,4-Dimethylphenol	105-67-9	10	330	10,000	(20)
49.	bis(2-Chloroethoxy) methane	111-91-1	10	330	10,000	(20)
50.	2,4-Dichlorophenol	120-83-2	10	330	10,000	(20)
51.	1,2,4-Trichlorobenzene	120-82-1	10	330	10,000	(20)
52.	Naphthalene	91-20-3	10	330	10,000	(20)
53.	4-Chloroaniline	106-47-8	10	330	10,000	(20)
54.	Hexachlorobutadiene	87-68-3	10	330	10,000	(20)
55.	4-Chloro-3-methylphenol	59-50-7	10	330	10,000	(20)
56.	2-Methylnaphthalene	91-57-6	10	330	10,000	(20)
57.	Hexachlorocyclopentadiene	77-47-4	10	330	10,000	(20)
58.	2,4,6-Trichlorophenol	88-06-2	10	330	10,000	(20)
59.	2,4,5-Trichlorophenol	95-95-4	25	800	25,000	(50)
60.	2-Chloronaphthalene	91-58-7	10	330	10,000	(20)
61.	2-Nitroaniline	88-74-4	25	800	25,000	(50)
62.	Dimethyl phthalate	131-11-3	10	330	10,000	(20)
63.	Acenaphthylene	208-96-8	10	330	10,000	(20)
64.	2,6-Dinitrotoluene	606-20-2	10	330	10,000	(20)
65.	3-Nitroaniline	99-09-2	25	800	25,000	(50)
66.	Acenaphthene	83-32-9	10	330	10,000	(20)

Previously known by the name bis(2-Chloroisopropyl) ether

Superfund Target Compound List (TCL) and
Contract Required Quantitation Limits (CRQL)

	Semivolatiles	CAS Number	Quantitation Limits* Water µg/L	Low Soil µg/Kg	Med Soil µg/Kg	On Column (ng)
67.	2,4-Dinitrophenol	51-28-5	25	800	25,000	(50)
68.	4-Nitrophenol	100-02-7	25	800	25,000	(50)
69.	Dibenzofuran	132-64-9	10	330	10,000	(20)
70.	2,4-Dinitrotoluene	121-14-2	10	330	10,000	(20)
71.	Diethylphthalate	84-66-2	10	330	10,000	(20)
72.	4-Chlorophenyl phenyl ether	7005-72-3	10	330	10,000	(20)
73.	Fluorene	86-73-7	10	330	10,000	(20)
74.	4-Nitroaniline	100-01-6	25	800	25,000	(50)
75.	4,6-Dinitro-2-methylphenol	534-52-1	25	800	25,000	(50)
76.	N-nitrosodiphenylamine	86-30-6	10	330	10,000	(20)
77.	4-Bromophenyl phenyl ether	101-55-3	10	330	10,000	(20)
78.	Hexachlorobenzene	118-74-1	10	330	10,000	(20)
79.	Pentachlorophenol	87-86-5	25	800	25,000	(50)
80.	Phenanthrene	85-01-8	10	330	10,000	(20)
81.	Anthracene	120-12-7	10	330	10,000	(20)
82	Carbazole	86-74-8	10	330	10,000	(20)
83.	Di-n-butyl phthalate	84-74-2	10	330	10,000	(20)
84.	Fluoranthene	206-44-0	10	330	10,000	(20)
85.	Pyrene	129-00-0	10	330	10,000	(20)
86.	Butyl benzyl phthalate	85-68-7	10	330	10,000	(20)
87.	3,3'-Dichlorobenzidine	91-94-1	10	330	10,000	(20)
88.	Benz[a]anthracene	56-55-3	10	330	10,000	(20)
89.	Chrysene	218-01-9	10	330	10,000	(20)
90.	bis(2-Ethylhexyl)phthalate	117-81-7	10	330	10,000	(20)
91.	Di-n-octyl phthalate	117-84-0	10	330	10,000	(20)
92.	Benzo[b]fluoranthene	205-99-2	10	330	10,000	(20)
93.	Benzo[k]fluoranthene	207-08-9	10	330	10,000	(20)
94.	Benzo[a]pyrene	50-32-8	10	330	10,000	(20)
95.	Indeno(1,2,3-cd]pyrene	193-39-5	10	330	10,000	(20)
96.	Dibenz[a,h]anthracene	53-70-3	10	330	10,000	(20)
97.	Benzo[g,h,i]perylene	191-24-2	10	330	10,000	(20)

* Quantitation limits listed for soil/sediment are based on wet weight. The quantitation limits calculated by the Laboratory for soil/sediment, calculated on dry weight basis as required by the Protocol, will be higher.

Superfund Target Compound List (TCL) and
Contract Required Quantitation Limits (CRQL)*

	Pesticides/Aroclors	CAS Number	Quantitation Limits* Water µg/L	Soil µg/Kg	On Column (pg)
98.	alpha-BHC	319-84-6	0.05	1.7	5
99.	beta-BHC	319-85-7	0.05	1.7	5
100.	delta-BHC	319-86-8	0.05	1.7	5
101.	gamma-BHC (Lindane)	58-89-9	0.05	1.7	5
102.	Heptachlor	76-44-8	0.05	1.7	5
103.	Aldrin	309-00-2	0.05	1.7	5
104.	Heptachlor epoxide	1024-57-3	0.05	1.7	5
105.	Endosulfan I	959-98-8	0.05	1.7	5
106.	Dieldrin	60-57-1	0.10	3.3	10
107.	4,4'-DDE	72-55-9	0.10	3.3	10
108.	Endrin	72-20-8	0.10	3.3	10
109.	Endosulfan II	33213-65-9	0.10	3.3	10
110.	4,4'-DDD	72-54-8	0.10	3.3	10
111.	Endosulfan sulfate	1031-07-8	0.10	3.3	10
112.	4,4'-DDT	50-29-3	0.10	3.3	10
113.	Methoxychlor	72-43-5	0.50	17.0	50
114.	Endrin ketone	53494-70-5	0.10	3.3	10
115.	Endrin aldehyde	7421-36-3	0.10	3.3	10
116.	alpha-Chlordane	5103-71-9	0.05	1.7	5
117.	gamma-Chlordane	5103-74-2	0.05	1.7	5
118.	Toxaphene	8001-35-2	5.0	170.0	500
119.	AROCLOR-1016	12674-11-2	1.0	33.0	100
120.	AROCLOR-1221	11104-28-2	2.0	67.0	200
121.	AROCLOR-1232	11141-16-5	1.0	33.0	100
122.	AROCLOR-1242	53469-21-9	1.0	33.0	100
123.	AROCLOR-1248	12672-29-6	1.0	33.0	100
124.	AROCLOR-1254	11097-69-1	1.0	33.0	100
125.	AROCLOR-1260	11096-82-5	1.0	33.0	100

* Quantitation Limits listed for soil/sediment are based on wet weight. The quantitation limits calculated by the Laboratory for soil/sediment, calculate on dry weight basis, as required by the Protocol, will be higher.

Superfund Target Compound List (TCL) and
Contract Required Quantitation Limit

Parameter		Contract Required Quantitation Level (µg/L)
1.	Aluminum	200
2.	Antimony	60
3.	Arsenic	10
4.	Barium	200
5.	Beryllium	5
6.	Cadmium	5
7.	Calcium	5000
8.	Chromium	10
9.	Cobalt	50
10.	Copper	25
11.	Iron	100
12.	Lead	3
13.	Magnesium	5000
14.	Manganese	15
15.	Mercury	0.2
16.	Nickel	40
17.	Potassium	5000
18.	Selenium	5
19.	Silver	10
20.	Sodium	5000
21.	Thallium	10
22.	Vanadium	50
23.	Zinc	20
24.	Cyanide	10

Appendix B

APPENDIX B

HEALTH AND SAFETY PLAN FOR BROWNFIELD SITE INVESTIGATIONS

HEALTH AND SAFETY PLAN
FOR
BROWNFIELD SITE INVESTIGATIONS

PREPARED FOR

NEW YORK STATE DEPARTMENT OF
ENVIRONMENTAL CONSERVATION

BY

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WOODBURY, NEW YORK

JULY 2003

HEALTH AND SAFETY PLAN
FOR
BROWNFIELD SITE INVESTIGATIONS

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

List of Tables

List of Exhibits

1.0 INTRODUCTION

1.1 General

This Health and Safety Plan (HASP) is prepared to meet the requirements contained in 29 CFR §1910.120 and §1926, NIOSH/OSHA/USCG/USEPA Guidance Manual for Hazardous Waste Site Activities (NIOSH No. 85-115), USEPA "Standard Operating Safety Guides," and Superfund Amendments and Reauthorization Act (SARA), Title I, Section 126. The HASP addresses activities associated with field investigations conducted at Brownfield sites. Compliance with the HASP is required of all on-site personnel entering and/or conducting investigation activities at the site. Personnel conducting activities at the sites will be subject to the requirements of this HASP and accountable to the authorities having jurisdiction at the site. Site-specific information regarding health and safety will be included in a site-specific work plan, if required.

1.2 Purpose and Scope of the HASP

This HASP sets forth the requirements for on-site health and safety supervision, air monitoring, medical monitoring, personal protective equipment, controls, safe work practices and proper decontamination in order to ensure health and safety during activities associated with field investigation (including drilling, sampling and excavation) in the restricted zones of a site.

1.3 Site Description

The sites covered under this plan include a wide variety of active and inactive commercial and industrial facilities. Specific information pertaining to each site will be provided in a site-specific work plan, if required.

2.0 PERSONNEL ORGANIZATION AND RESPONSIBILITIES

Investigation of Brownfield sites will require the interaction of government agencies, contractors, site facility operators and technical specialists, both on-site and off-site. The project team will comprise representatives of the New York State Department of Environmental Conservation (NYSDEC), local agencies, the environmental consultant and various contractors.

2.1 Project Director

The Project Director will have overall responsibility for implementation of the corporate and site-specific Health and Safety Plan, if required, and the supervision and monitoring of employees and contractors.

2.2 Project Manager

The Project Manager will assure that all elements of this HASP are implemented where applicable and that all project staff are protected and working in a safe manner.

2.3 Health and Safety Officer (HSO)

The HSO will be responsible for preparation of the site-specific HASP, if required, and has the final authority to resolve health and safety issues at the site. The HSO has overall responsibility for ensuring that the policies and procedures of this HASP are implemented.

The HSO will provide regular support for all health and safety activities, including recommendations for upgrading or downgrading the level of personal protection, as needed.

The HSO will be on-site as needed during the field investigation. The HSO has the authority to stop work at any time unsafe work conditions are present. Any potentially hazardous condition posing a risk beyond the defined role or mission is anticipated to require the HSO to consult with the Field Operations Manager (FOM) and Project Director.

The HSO will be a Certified Hazardous Materials Manager (CHMM), Certified Safety Professional (CSP), Certified Industrial Hygienist (CIH) or designee, and will be available off-site on an as-needed basis to provide technical support to the FOM. Any decisions requiring use or selection of personal protection equipment (PPE), or monitoring devices other than those in the HASP, will be approved by the HSO or designee.

2.4 Field Operations Manager and Alternate HSO

The FOM, or designee, will serve as the Alternative HSO and will be responsible for conducting the work and for assuring that the work is conducted in accordance with the requirements of the HASP. The FOM will be on-site as needed during the field investigation and will manage all day-to-day activities of all parties on the site.

The FOM will be responsible for implementing safety precautions and procedures during all investigation phases, and has final authority to resolve health and safety issues at the site when the HSO is not on-site.

2.5 Physician

A physician will be responsible for all medical review, diagnosis and certification of all site personnel. An on-call physician will be available for each investigation designated in the site-specific work plan, if required.

2.6 General Health and Safety Requirements for all Employees

The following general health and safety requirements will apply to all persons working at the site:

- All persons working on the investigation team will read, sign and become familiar with the HASP (a copy of the Health and Safety Plan Review Acknowledgment Form is provided in Exhibit 1). If any information is unclear, the reader will contact the

HSO for clarification prior to any field work. A copy of the plan will be available for review through the Project Manager, FOM or designee.

- No one will be allowed in active investigation areas without the prior knowledge and approval of the HSO, Project Manager or FOM. All active areas that could pose a potential threat to health and safety will be designated with warning tape or other measures to prevent access by other site personnel or the public.

- Sufficient backup personnel will be available for all site activities. At a minimum, two persons will be present at any location during investigation activities.

- All personnel involved in the investigation at the site will notify the HSO, Project Manager or FOM of any unsafe conditions or activities.

- Standard hygiene practices will be implemented, such as no smoking, eating or drinking during site investigation work activities. A thorough washing of hands and face prior to smoking, eating or drinking will be conducted.

- Workers will avoid unnecessary contamination, such as walking through, sitting on, leaning on or kneeling in areas that are known or suspected to be contaminated.

- All site personnel will observe their partners for any signs of adverse effects associated with the work activity, and will inform their partner or supervisor of any unusual signs or symptoms that they are experiencing themselves.

3.0 HAZARD ASSESSMENT AND RISK ANALYSIS

3.1 Potential Health Hazards

The general hazard potential at Brownfield sites is characterized in Table 3-1. The primary concern at these sites is to protect workers from potential exposure to contaminated soils, vapors, dusts, groundwater and other contaminated materials when conducting the field investigation. In addition to the chemical hazards, physical, biological, radiological and underground hazards may also exist. These hazards are identified on Table 3-2 and are discussed below.

3.1.1 Health Hazard Identification

A list of the chemical contaminants that are commonly found at Brownfield sites is found in Table 3-2. These chemical contaminants may be present, along with other compounds, at levels which, upon release and contact, may result in concentrations approaching the OSHA Permissible Exposure Limits (PELs). There may also be chemicals or mixtures of chemicals for which no information at the time of preparation of this HASP have been identified. Workers should be observant of any unplanned occurrences (unusual odor, soil colorations, etc.).

3.1.2 Health Hazard Evaluation

The primary potential health hazards of concern to workers from contaminants are from the inhalation of vapors and dusts, and skin exposure to corrosive substances or skin absorptive poisons. Potential for these exposures exist when conducting field programs using various investigation techniques.

Table 3-1

SUMMARY OF CHARACTERISTICS AND HEALTH HAZARDS AT BROWNFIELD SITES

Type of site	Active and inactive commercial and industrial facilities
Apparent hazard	Low-moderate (in general)
Potential source	Contaminated surface and subsurface soil, groundwater, wastewater, drainage water, surface water, sediment and sanitary waste/sludge
Contamination characteristics	Toxic, corrosive, flammable
Form of hazards	Dusts, liquids, vapors
Routes of exposure	Inhalation, ingestion, dermal contact

Table 3-2

SUMMARY OF POTENTIAL HAZARDS

CHEMICAL HAZARDS	Volatile organic compounds
	Semivolatile organic compounds
	Pesticides
	PCBs
	Metals
	Cyanide
PHYSICAL HAZARDS	Noise
	Slips, trips, falls
	Deteriorated overhead surfaces
	Heavy equipment traffic
	Heat or cold stress
	Striking and struck by (heavy equipment)
BIOLOGICAL HAZARDS	Pigeon droppings
	Rabies carrying animals (rats, raccoons, etc.)
	Poisonous snakes (weather dependent)
	Stinging insects (weather dependent)
	Poisonous plants (weather dependent)
ELECTRICAL HAZARDS	Overhead or underground power lines
	Lightning
	Electrical equipment
FIRE/EXPLOSION HAZARDS	Combustible gas
OXYGEN DEFICIENCY	Working in confined spaces
RADIATION HAZARDS	Wastes
UNDERGROUND HAZARDS	Contaminated media
	Gas lines
	Water lines
	Sewer/storm lines
	Electrical lines
	Telecommunication lines

OSHA PELs and American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLV) may be exceeded during investigative activities. The activities to be performed during remedial investigations are summarized in Table 3-3. These activities will be closely monitored and evaluated to determine the potential for exceeding the action levels and the need to implement control measures to protect personnel and the environment.

3.1.3 Potential Exposures

Potentially contaminated samples include soil, groundwater, wastewater, sludge, storm water, surface water and sediment. The expected risk of exposure to these chemicals would be from inhalation, ingestion, skin or eye contact with volatile compounds, contaminated dusts, etc. Potential exposures can be mitigated through appropriate investigation procedures, work practices, air monitoring and personal protective equipment. Duration and frequency of exposure will be short and intermittent over a period of several weeks. All personnel related to the investigation will keep upwind of all soil disturbances and sampling activities, when possible. In addition, splashing of liquids and generation of dust should be minimized by employing careful handling practices.

3.1.4 Physical and Biological Hazards

Anticipated potential physical hazards from routine investigative work are low to moderate, but still require consideration due to their ability to cause injury. Workers may encounter sharp objects, pinch points or unsecured footing. Improper or careless use of sampling, drilling and excavation equipment increases the risks of accidents from underground and overhead utilities, and operation of the equipment. When working around machinery, there are also potential electrical hazards. In addition, workers may be exposed to poison ivy, stinging and biting insects, ticks and vermin. Heat/cold stress, sunlight and UV radiation, and biological hazards are also potential hazards.

Table 3-3

ACTIVITIES TO BE PERFORMED DURING INVESTIGATIONS AT BROWNFIELD SITES

Soil vapor sampling
Dry well, storm water drainage system and on-site sanitary system sampling
Test pit excavation
Surface soil sampling
Borehole construction and subsurface soil sampling
Monitoring well construction
Groundwater sampling
Surface water and surface water sediment sampling
Ambient air sampling

Open excavations, pits, trenches and other confined spaces also represent hazards and under no circumstances will they be entered unless written procedures are in place and anyone performing confined space operations has received the necessary training. Gases such as methane or hydrogen sulfide may be encountered in drains, sump pits, dry wells or sanitary systems.

3.1.5 Radiological Hazards

Humans receive a continuous exposure to ionizing radiation that results from natural sources such as cosmic radiation from outer space and from radioactive materials in the earth and materials both around and within the body. This "background radiation" is part of the normal environment and man evolved under its effect. The degree of injury inflicted on an individual by radiation exposure depends on such factors as the total dose, the rate at which the dose is received, the kind of radiation and the body parts receiving it.

Extensive work has been performed in an attempt to relate radiation dose to resulting damage. Based upon all the studies performed "maximum permissible levels" of exposure have been established which denote the radiation dose that can be tolerated with little chance of later development of adverse effects. A Geiger counter will be utilized as a screening tool to ensure that no source other than natural radioactive materials or background levels are present on-site. Readings indicative of elevated radioactive activity will be cause to assess the current levels of personnel protective equipment and determine their adequacy. The HSO will be consulted immediately if investigative activities result in elevated Geiger counter readings.

3.2 Activity Safety and Health Hazard Analysis

Field activities for Brownfield sites will include collecting samples from various locations and environmental media using techniques including:

- Soil vapor sampling
- Dry well, storm water drainage system and on-site sanitary system sampling

- Test pit excavation
- Surface soil sampling
- Borehole construction and subsurface soil sampling
- Monitoring well construction
- Groundwater sampling
- Surface water and surface water sediment sampling
- Ambient air sampling

Potential safety risks will vary with the specific activity and equipment used, and with the sampling sites themselves. When any new data is collected, potential health and safety hazards will be evaluated and related to the current and planned activities at the site. All sampling work in which the potential hazards have not been identified may require additional precautions to assure protection against potential hazards. Any modifications of the investigation work plan will require evaluation to determine if the existing Health and Safety Plan is adequate in protecting on-site investigators.

With the construction of groundwater monitoring wells and soil borings, soil and groundwater sampling, test pit excavations, and dry well, storm water drainage system and sanitary system sampling during the investigation, some safety risks inherent with these activities may be expected. There is the potential for mechanical and physical struck-by hazards associated with the equipment and sampling activities. There are also potential electrical hazards from underground lines, overhead lines and use of electrical equipment and tools. The location of all underground utilities must be determined in areas where subsurface investigation is to be performed. Utility companies will be contacted to provide "mark-outs" on and off site at all investigation locations prior to initiation of subsurface activities. The property owner will also be contacted to determine utility locations on site. When conducting work inside structures, machinery lockout/tagout must be performed. Workers should be aware of pinch points when working around machines.

The direct handling of contaminated drums, containers or concentrated/pure chemicals is not expected during the investigation. In the event that such materials are encountered during the field program, the operation will cease and uncovered drums which have been damaged will be immediately covered with soil to minimize release of volatile compounds. This condition will be recorded and reported to the NYSDEC, and the field team will be instructed to secure the area until health and safety risks are properly assessed and the course of further action is determined.

The activities to be conducted at Brownfield sites represent low to moderate health risk given the potential to encounter contaminated material. The risk associated with safety hazards is also low to moderate. Potential levels of airborne contaminants may dictate use of appropriate personal protective equipment as deemed necessary by the HSO.

Initial work will be conducted in Level D personal protection. Monitoring equipment to be used includes: portable PID/FID, and combustible gas, oxygen, hydrogen sulfide indicator and Geiger counter. Additional instrumentation and sampling systems may be utilized if deemed necessary by the HSO or designee. The HSO or designee may modify these requirements as deemed necessary.

Proper wearing of protective equipment and employment of stringent personal hygiene practices should reduce potential health hazards.

Restricting access of on-site personnel to all equipment operations, maintaining safe distances from equipment and wearing proper safety equipment will reduce risk of injuries.

4.0 TRAINING REQUIREMENTS

4.1 General Health and Safety Training

All on-site personnel assigned to or regularly entering areas of the site other than the Support Zone (once established) will be trained in accordance with 29 CFR 1910.120. This training will be required for personnel performing or supervising work; for health, safety, security, or administrative purposes; for maintenance; or for any other site related function.

The training will include a minimum of 40 hours of general health and safety training and three days of on-site supervised experience, and 8-hour annual refresher training. Documentation of all such training will be made available to the HSO, HSO designee or FOM before any person will be allowed to enter any potentially contaminated area (namely, the Exclusion Zone or the Contaminant Reduction Zone - see Section 8.0 for further discussion of Work Zones).

4.2 Site-Specific Training

All site personnel will attend a site-specific training meeting and will become familiar with the HASP and site-specific information, and certify their understanding of this plan (see Exhibit 1). This meeting will include, at a minimum, discussion in the following areas:

- Site specific hazard analysis (chemical/physical hazards).
- Standard safety operating procedures.
- Personal hygiene.
- Safety equipment to be used.
- Personal protective equipment to be worn, including care, use and proper fitting.
- Decontamination procedures.
- Areas of restricted access and prohibitions in work areas.
- Emergency procedures and plans.

- On-site and off-site communications.
- Hazardous materials handling procedures.
- Air monitoring instrumentation use and calibration.
- Hazardous materials recognition.
- The "Buddy System" to be used at the site.

Visitors entering the Exclusion and Contaminant Reduction Zones will also be briefed on similar information. This briefing will be conducted by the HSO or the FOM/Alternate HSO. Abbreviated awareness briefings for visitors who remain in the Support Zone will also be provided by the HSO, HSO designee or FOM.

Documentation of training for all on-site personnel will be included in the site-specific HASP or provided to the HSO prior to commitment of field activities. Personnel who have not successfully completed the required training will not be permitted to enter the Exclusion Zone or the Contaminant Reduction Zone.

New employees involved in hazardous activities will be indoctrinated by the HSO prior to entering the site to work. All training requirements will be completed by a new employee prior to indoctrination. Indoctrination will be comprised of the site-specific refresher briefing, the task/operation safety and health risk analysis and accident prevention plan.

5.0 PERSONAL PROTECTIVE EQUIPMENT

5.1 General

All on-site personnel will be issued appropriate personal protective equipment (PPE). All PPE is to be used properly and protective clothing is to be kept clean and well maintained. The HSO or designee will maintain constant communication with the Project Director when conducting air monitoring and consult the Project Director with regard to "action levels" at which the specified minimum levels of protection are either upgraded or downgraded based upon air monitoring results and direct contact potential. The HSO or designee has the authority to require the use of additional equipment, if necessary, for specific operations, or may tailor PPE specifications to best fit the hazard control requirements as appropriate.

5.2 General Site Safety Equipment Requirements

The following is the basic work uniform and will be worn primarily outside the Exclusion Zone and the Contaminant Reduction Zone at the site. Equipment includes:

- Coveralls - (optional, may be disposable type).
- Boots/shoes - (OSHA compliant construction footwear).
- Hard hat with splash shield, if needed - ANSI approved.
- Gloves (optional).

5.3 Level D Protection

Level D protection will be initially worn in the Exclusion Zone and Contaminant Reduction Zone during intrusive sampling and investigative activities. Equipment includes:

- Coveralls - One or two piece disposable suit, tyvek or equivalent.
- Gloves - Outer (neoprene, nitrile, or equivalent); Inner (nitrile).

- Boots - Outer (vulcanized rubber or equivalent); Inner (steel toe and shank) or equivalent combination (ANSI approved).
- Safety glasses or goggles (ANSI approved).
- Hard hat with splash shield, if needed (ANSI approved).
- Hearing protection (if work is near heavy or noisy equipment).

5.4 Level C Protection

Level C protection will be selected when a modified level of respiratory protection is needed. Selection will be made when air monitoring results for the site or individual work areas exceed the action level criteria. Equipment includes:

- Respirators - Full facepiece, air purifying respirator with combination organic vapor and particulate (P100) air cartridges (OSHA/NIOSH approved).
- Coveralls- Hooded one or two piece chemical resistant suit, PE - Tyvek or equivalent (modification of protective suits may be made upon the approval of the HSO).
- Gloves - Outer (nitrile or equivalent); Inner (nitrile).
- Boots - Outer (neoprene or equivalent); Inner (steel toe and shank) or equivalent combination (ANSI approved).
- Two-way radio communications (for remote operations).
- Hard hat with splash shield (ANSI approved).
- Hearing protection (if work is near heavy or noisy equipment).

5.5 Level B Protection

Level B protection requires full chemical resistant clothing with a full facepiece SCBA or supplied air respirator. Generally, this level of protection is not expected for investigations at Brownfield sites. However, provision will be made to have this equipment available should its use be determined to be required. Investigation activities which may result in this level of protection being required will not be implemented until the equipment has been transported to

the site. The HSO will be notified should air monitoring indicate this level of protection is required. Implementation of Level B protection will only be performed when sufficiently trained personnel (minimum of two) are available on-site.

5.6 Confined Spaces

Under no circumstances will confined spaces be entered unless discussed with the Project Director and HSO, and this plan is revised or the site-specific HASP is prepared to incorporate additional safety requirements, and all personnel are trained appropriately to deal with confined space hazards.

5.7 Standing Orders

5.7.1 Eye Protection

Prescription lens inserts will be provided or personal contact lenses may be used for full-face respirators. All eye and face protection will conform to OSHA 1910.133.

5.7.2 Respiratory Protection

Programs for respiratory protection will conform to OSHA 1910.134 and ANSI Z88.2-1980. A respiratory program addressing respirator care and cleaning is described in Exhibit 2.

5.7.3 Respirator Fit-testing

Personnel unable to pass a fit-test will not engage in any investigation activities that will require level C or higher protection.

5.7.4 Respirator Maintenance and Repair

Each respirator will be individually assigned and not interchanged between workers without cleaning and sanitizing. Cartridges/canisters and filters will be changed daily or upon breakthrough, whichever occurs first. If breakthrough occurs, a reevaluation by the HSO of the protection level will be made. A procedure for assuring periodic cleaning, maintenance, and change of filters will be followed by each respirator wearer. This procedure is described in Exhibit 5-3 - Respiratory Cleaning and Maintenance Procedure.

5.7.5 Head Protection

A hard hat will be worn by all personnel. All head protection will conform to the requirements in OSHA 1910.135.

5.7.6 Reuse and Retirement of PPE

All non-disposable Level D or C personal protective equipment worn on-site will be decontaminated before being reissued. The FOM, HSO or designee is responsible for ensuring all non-disposable personal protective equipment is decontaminated before being reissued. Disposable PPE will be properly disposed of according to NYSDEC requirements and regulations.

5.7.7 Foot Protection

All safety boots will conform to OSHA 1910.136.

5.7.8 Noise Protection

Power equipment may generate excessive noise levels (in excess of 85 decibels). Proper ear protection will be provided and used in accordance with OSHA 1926.52.

6.0 MEDICAL SURVEILLANCE

All on-site personnel involved in hazardous waste operations will have satisfactorily completed a comprehensive medical examination prior to the initiation of investigation activities at the site. Medical examinations are required for any and all personnel entering Exclusion or Contamination Reduction Zones.

Medical examinations are not required for people making periodic deliveries provided they do not enter Exclusion or Contamination Reduction Zones.

The date of physical examination of each site worker will be documented. A specific Medical Data Sheet for each individual will be filed with the HSO or designee prior to commencing operations and with the Project Manager.

All personnel who will enter the Exclusion Zone or the Contaminant Reduction Zone will be provided with medical surveillance at the start of their employment (entrance examination) and at the end of the on-site personnel's employment (exit examination). Medical surveillance protocol is the physician's responsibility, but will meet the requirements of OSHA Standard 29 CFR 1910.120 for all personnel. The protocol will be selected by the physician. Additional clinical tests may be included at the discretion of the attending physician performing the medical examination. Non-scheduled medical exams may be conducted as determined necessary by the physician, but will be conducted:

- After acute exposure to any toxic or hazardous material.
- At the discretion of the Project Director and/or the physician, when an employee has been exposed to potentially dangerous levels of toxic or hazardous materials.
- At the discretion of the Project Director and/or the physician, and at the request of an employee with demonstrated symptoms of exposure to toxic or hazardous materials.

In addition to non-scheduled exams, any medical, biological or radiological monitoring required by an OSHA standard when OSHA Action Levels are exceeded will be performed.

Companies contracted to perform work on-site in the Exclusion Zone or Contaminant Reduction Zone will provide equivalent medical surveillance to their on-site personnel and supply documentation to that effect.

6.1 Documentation and Record Keeping

The examining physician will notify the Project Director in writing that the individual has received a medical examination and advise as to any specific limitations upon such individual's ability to work at the project site, which were identified as a result of the examination. Appropriate action will be taken in light of the advice given pursuant to this paragraph.

The ability of on-site personnel to wear respiratory protection during hazardous waste activities will be certified by the physician. Cardiopulmonary system examination and pulmonary function testing are minimum requirements.

The physician will maintain and provide access for employees to his medical surveillance records according to OSHA requirement 29 CFR 1910.120.

7.0 ENVIRONMENTAL AND PERSONAL MONITORING PROGRAM

7.1 General

In order to protect site workers from harmful levels of airborne toxic materials, potentially explosive gases, or excessively cold conditions, regular environmental and personnel monitoring will be accomplished to document exposures and to decide when to increase protective measures.

7.2 Air Monitoring

Particular phases of work will require the utilization of specific air monitoring equipment to detect relative levels of contaminants or identify unknown environments.

Air monitoring will be conducted by the HSO, FOM or designee for the express purpose of safeguarding the health and welfare of site workers and the general public residing in the vicinity of the site.

7.2.1 Air Monitoring Instrumentation

On-site air monitoring will be performed using the following direct reading instruments:

- Century OVA-128 (or equivalent) portable flame ionization device (FID) for detection of volatile organic vapors (with and without a methane filter)
- PhotoVac Microtip (or equivalent) portable photo ionization device (PID) for the detection of organic vapors
- Portable combustible gas/oxygen/hydrogen sulfide detector will be available for determining lower explosive limits, oxygen and hydrogen sulfide levels in any identified confined spaces. Under no circumstances will confined spaced be entered unless discussed with the Project Director and the HASP is revised to incorporate additional safety requirements and all personnel are trained appropriately to deal with confined space hazards.
- Geiger counter for detecting radiological contamination.

- Draeger gas detector tubes for detecting specific contaminants should PID/FID readings exceed 1 ppm above background.
- Respirable dust monitor(s) will be used to monitor particulate emissions.

All monitoring and surveillance equipment will be operated, maintained and calibrated each working day in accordance with the manufacturer's instructions and quality assurance procedures. Organic vapor monitoring will be conducted by trained field staff prior to, during and following sampling, and disturbance of soils or sediments at a sampling site. Should contamination levels indicate high hazard potential, the HSO will review monitoring procedures and results.

A daily air monitoring form or entries in a daily log book will be used to record monitoring data. (See Exhibit 3.)

Instruction and calibration manuals for the proper use of these, as well as other field instrumentation, will be provided as a separate document available for use at the site.

Monitoring and surveillance equipment can be impacted by cold weather, communication transmissions and possibly high voltage electrical transmission wires and other interferences. Any unusual meter responses will be noted on the air monitoring form and a diagnosis of potential influencing factors made to determine and eliminate the cause.

7.2.2 Air Monitoring Locations and Action Level Criteria

The primary areas to be monitored during the site investigation are the work zones established around sampling, drilling or excavation locations. Air monitoring protocols for each area will differ, since target populations, contaminant concentrations and atmospheric conditions will vary. Monitoring will be conducted within these work zones and at the site perimeter.

Air monitoring conducted at the sampling locales will focus on workers' breathing zones and may include personal breathing zone samples. Air monitoring just outside of these locations

will consist of instruments attempting to quantify the types and degrees of emissions originating from sampling sites.

7.2.2.1 - Duration, Frequency and Protocol

Monitoring will be conducted daily or as deemed necessary by the HSO or designee during all activities in the Exclusion Zone, particularly during intrusive activities. The HSO or designee may modify the work zone sampling frequency upon review of previously analyzed work zone samples.

7.2.2.2 - Background Air Monitoring

Background monitoring for contaminants will be conducted at the upwind perimeter of the Exclusion Zone prior to allowing workers to enter the Exclusion Zone. Monitoring will occur continuously, or at the discretion of the HSO or designee, downwind and crosswind while work is occurring in the Exclusion Zone. Data will be annotated in the Air Monitoring Form for that day. Indoor air quality monitoring will also be conducted when working inside.

Changes in wind direction will require reassessment of air monitoring locations. Wind directions may be determined with the aid of a wind sock (if appropriate). Levels of contaminants that warrant use of respiratory protection by site workers may require initiation of site perimeter and personal sampling as deemed necessary by the HSO or designee.

7.2.2.3 - Exclusion Zone Air Monitoring

Air monitoring conducted in the Exclusion Zone will focus on real time measurement of toxic compounds that pose inhalation hazards, levels of flammable compounds for explosive hazards, and oxygen deficient atmospheres. A summary of the action levels are provided in Table 7-1.

Table 7-1

ACTION LEVELS FOR INVESTIGATIONS AT BROWNFIELD SITES

Action Level	Action To Be Taken
FID/PID	
Background	**Level D**
Background to 5 units* above background in breathing zone, and no vinyl chloride or benzene present.	Halt work, evacuate area and allow area to ventilate prior to resuming work. Should levels persist, upgrade to **Level C** protection if required upon approval by HSO and FOM.
Greater than 5 units* above background in breathing zone, and no vinyl chloride or benzene present.	Halt work, evacuate work area and allow area to ventilate prior to resuming work. Should levels persist, contact FOM and upgrade to **Level B** protection if required upon approval by HSO and FOM.
DRAEGER COLORIMETRIC TUBE	
Positive color change for vinyl chloride or benzene ≤ 0.5 ppm	Halt work, evacuate area and allow area to ventilate prior to resuming work. Contact FOM. If levels persist, upgrade to **Level C** protection if required upon approval by HSO and FOM.
Vinyl chloride or benzene 0.5 - 1.0 ppm	Halt work, evacuate area and allow area to ventilate prior to resuming work. Contact FOM. If levels persist, upgrade to **Level B** protection if required upon approval by HSO and FOM.
Vinyl chloride or benzene > 1 ppm	Shut down work activities. Monitor site to check for off-site migration.
COMBUSTIBLE GAS METER	
Greater than 10% Lower Explosive Limit (LEL)	Halt work, evacuate area and allow area to ventilate to below 10% LEL prior to resuming work. Notify FOM.
OXYGEN	
Less than 20.5%	Continuous monitoring. Consider engineering controls.
Less than 19.5%	Evacuate work area. Institute ventilation and engineering controls. Maintain site conditions for at least 15 minutes before proceeding. Notify FOM.

Table 7-1 (continued)

ACTION LEVELS FOR INVESTIGATIONS AT BROWNFIELD SITES

Action Level	Action To Be Taken
OXYGEN (continued)	
Greater than 22%	Continuous monitoring and identify combustion sources.
Greater than 23.5%	Evacuate and institute engineering controls as necessary before proceeding. Explosive condition may be present. Notify FOM.
HYDROGEN SULFIDE	
Less than 10 ppm at breathing zone	**Level D** and continuous monitoring.
Above 10 ppm at breathing zone	Halt work, evacuate area and allow area to ventilate to below 10 ppm. If levels persist, upgrade to **Level B** protection if required upon approval by HSO and FOM.
GEIGER COUNTER	
Above background	Halt work, evacuate work area and confer with HSO
DUST MONITOR	
Respirable dust >100 ug/m^3 above BKGD	Implement dust suppression techniques to reduce dust levels
Respirable dust >150 ug/m^3	Monitoring upwind background levels and implement dust suppression techniques. If levels persist, halt work, contact HSO and FOM. Work can only resumed if control measures can be implemented to remedy the situation.

* Units equal total ionizable organic/inorganic vapors and gases.
** Reading sustained for 1 minute (60 seconds) or longer.

Vapor Emission

If the ambient air concentration of total organic vapors exceeds 5 ppm (or 5 units) above background at the perimeter of the Exclusion Zone, work at that location will be stopped, and the area evacuated until a review of work procedures, air monitoring needs, and use of appropriate respiratory protection and equipment is performed by the HSO or FOM. In addition, downwind monitoring at the site perimeter will be performed to determine whether off-site contaminant migration is occurring. Work will proceed only after review and approval by the HSO or FOM, and the appropriate corrective action is taken or level of protection established. More frequent intervals of monitoring will be conducted as directed by the HSO, including Draeger tube screening for specific contaminants.

If the organic vapor level decreases to below 5 ppm (5 units), and vinyl chloride and benzene are not present, activities can resume, but more frequent intervals of monitoring, as directed by the HSO, must be conducted and must include monitoring for vinyl chloride and benzene. If the organic vapor levels are greater then 5 ppm but less than 25 ppm over background at the perimeter of the Exclusion Zone, activities can resume provided Level B protection is worn and the area is monitored for vinyl chloride until levels fall below background.

If the organic vapor level is above 25 ppm at the perimeter of the Exclusion Zone, work activities must be shut down. When work shutdown occurs, downwind air monitoring as directed by the HSO will be implemented to ensure that vapor emissions do not impact the nearest residential or commercial structure at levels exceeding those specified in the Major Vapor Emission section.

7.2.2.4 - Community Air Monitoring Plan

Consistent with the New York State Department of Health (NYSDOH) Community Air Monitoring Plan (CAMP), air monitoring for volatile organic compounds and particulates will be accomplished at the upwind and downwind perimeter of the Exclusion Zone to document real

time levels of contaminants which might be moving off-site. The NYSDOH CAMP is included as Exhibit 4. The plan must include the following:

- VOCs and particulates will be monitored at the downwind perimeter of the Exclusion Zone daily, continuously during ground-intrusive activities, and, if intrusive activities are not occurring, no less frequently than at 2-hour intervals. If total organic vapor levels exceed 5 ppm above background or PM-10 particulate levels are greater than 100 ug/m^3 above background for the 15-minute average, activities must be halted and monitoring continued under the provisions of Major Vapor Emission Response Plan (see below). All readings must be recorded and be available for NYSDEC and NYSDOH personnel to review.

Major Vapor Emission

If organic levels greater than 5 ppm (or 5 units) or particulates greater than 100 ug/m^3 above background are identified at the downwind perimeter of the Exclusion Zone or half the distance to the nearest residential or commercial property, whichever is less, all work activities must be halted.

If, following cessation of the work activities or as the result of an emergency, organic levels above 5 ppm or particulates above 100 ug/m^3 persist at the downwind perimeter of the Exclusion Zone or half the distance to the nearest residential or commercial property from the Exclusion Zone, then the air quality must be monitored within 20 feet of the perimeter of the nearest residential or commercial structure (10-foot zone).

If either of the following criteria are exceeded in the 20-foot zone, then the Major Vapor Emission Response Plan will be implemented:

- Organic vapor levels approaching 5 ppm above background for a period of more than 30 minutes; or
- Organic vapor levels greater than 10 ppm above background for any time period.

Major Vapor Emission Response Plan

Upon activation, the following actions will be undertaken:

1. The local police authorities will be immediately contacted by the HSO and advised of the situation.
2. Frequent air monitoring will be conducted at 30 minute intervals within the 20 foot zone. If two successive readings below action levels are measured, air monitoring may be halted or modified by the HSO.
3. All emergency contacts will go into effect as appropriate.

Off-Site Migration Procedures

The same procedures and protocols practiced by on-site workers will aid in preventing any potential adverse conditions with respect to areas adjacent to the site. That is, these procedures are designed to assist in eliminating or minimizing the potential for extensive off-site migration. In the unlikely event that such migration occurs, the following notification procedures and work procedures are listed below:

1. Notification of local police, fire and rescue personnel advising them of the remedial investigation activities and the schedule of events on-site.
2. Immediate notification of NYSDEC, NYSDOH and local officials in the event of a threatening hazardous condition that may effect the health and safety of on-site workers and the surrounding community.
3. Decontamination procedures for equipment to prevent off-site migration of contaminants.
4. Use of a flame or photo ionization detector to monitor volatile organic vapors and potential off-site migration of contaminants.
5. Wetting down the ground surface or using clean cover material or calcium chloride to suppress particulate dust in the event that dust levels in the air of the work area are exceeded.

General visual observation will also be used during all intrusive activities to identify airborne releases (vapors, smoke, etc.), changes in the coloration of excavated materials, changes to the structural integrity of the surface or mechanical integrity of the equipment. Should such conditions be noticed or encountered, work will be halted, and the area evacuated until such time the FOM can be contacted and specific procedures for characterizing and handling the hazard can be developed.

The HSO or designee will observe site conditions daily with special attention to the aforementioned conditions. Depending on site conditions, additional personal protection measures will be implemented during the course of site work.

7.2.3 Heat/Cold Stress Monitoring

Heat/cold stress guidelines are described in detail in Exhibit 5.

7.3 Quality Assurance and Control

All monitoring instruments will be protected from surface contamination during use to allow easy decontamination. All instrumentation will be calibrated before and after use, and operational checks conducted periodically in the field over the duration of the day's field activities.

The following data will be recorded by the HSO or designee on the Air Monitoring Data form (Exhibit 3):

- Date and time of monitoring;
- Air monitoring location;
- Instrument, model number, serial number;
- Calibration/background levels; and
- Results of monitoring.

Interpretation of the data and any further recommendations will be made by the HSO or designee.

Air monitoring results will be provided verbally to the FOM following each site scan that indicates volatile organic vapor concentrations in excess of the action levels. Results will then be documented in writing and provided to the FOM by the end of that work day.

8.0 SITE CONTROL MEASURES

8.1 Work Zones

Brownfield site investigations will be subject to the designation of work zones. The Restricted Zone (RZ) will be identified as the area within which all project operations take place. At each sampling site, three work areas will be established: the Exclusion Zone (EZ), Contaminant Reduction Zone (CRZ) and Support Zone (SZ). Only authorized personnel will be allowed in the RZ. Typically, a 5-foot wide (or distance determined by the HSO or FOM) strip of land bordering the EZ is considered the CRZ. In addition to this strip of land, a specially demarcated area that connects the decontamination area to the CRZ is treated as an extension of the CRZ. All other areas inside the restricted area that are not an active Exclusion or Contaminant Reduction Zone are treated as a Support Zone.

8.1.1 Exclusion Zone

The Exclusion Zone includes the intrusive activities and isolates the area of contaminant generation, and restricts (to the extent possible) the spread of contamination from active areas of the site to support areas and off-site locations. This area will encompass all intrusive work. The Exclusion Zone is demarcated by the Hot Line (i.e., a tape or rope line or physical barrier). Personnel entering the Exclusion Zone must:

- Enter through a controlled access point (the Contaminant Reduction Zone);
- Wear the prescribed level of protection; and
- Be authorized to enter the Exclusion Zone.

Any personnel, equipment or materials exiting the Exclusion Zone will be inspected for contamination. Personnel will be subject to decontamination if deemed necessary by the HSO or FOM. Equipment and materials (e.g., drill rods) will be decontaminated at decontamination facilities.

Specific access for emergency services to areas of specific site operations will be established by the HSO prior to commencing any operation. The delineated area of the Exclusion Zone may vary with task.

8.1.2 Contaminant Reduction Zone

It is not anticipated that the prototypical CRZ will be necessary for investigations at Brownfield sites. The extent and configuration of the CRZ will be at the discretion of the HSO or FOM. Certain safety equipment (e.g., emergency eye wash, fire extinguisher and first aid kit) will be located near the sampling location.

The level of protection to be used for decontamination will typically be Level D. However, the HSO will determine appropriate levels of protection based upon air monitoring readings, and visual inspection of personnel and equipment operations in the Exclusion Zone. Equipment operators (e.g., truck drivers) physically performing tasks outside the EZ may be exempt from this requirement as approved by the HSO or FOM.

8.1.3 Support Zone

Equipment and materials, paperwork, MSDS, emergency equipment and communications equipment will be stored in the Support Zone. A log of all persons entering the site will be maintained by the FOM.

8.2 Operations Start-Up

No personnel will be positioned downwind of Exclusion Zone during intrusive activities and sampling, if possible.

8.3 Buddy System

All on-site personnel will utilize a buddy system when any task performed at the site requires:

- Personnel to assist in performing an activity.
- Intrusive work performed in the Exclusion Zone.
- Use of protective clothing.
- Communication between the Exclusion Zone and outside the Exclusion Zone.

The FOM, HSO or designee will enforce the buddy system and has the authority to modify the criteria stated above to deal with changing site-specific and environmental conditions.

In order to ensure that help will be provided in an emergency, all on-site personnel will be in line-of-sight contact or in communication with the HSO or FOM when working in the Exclusion Zone.

8.4 Site Communications Plan

- Internal communications on-site should be instituted prior to initiating any task in the Exclusion Zone.
- Internal communications will be used by on-site supervisory personnel.
- The FOM, HSO or designee will ensure that all site personnel are trained to use internal communications to:
  - alert personnel on-site of emergencies;
  - pass along safety information (such as for heat stress, cold stress control, or rest period time, etc.);
  - changes in work scope, scheduling or sequencing of operations; and
  - maintain site control (such as notification of vandalism, intruders or violations of HASP protocol).

- Verbal communications and hand signals will be used for all tasks associated with the project. However, for those tasks performed in Level D or Level C, radio communications may be used.

- Any Exclusion Zone work activity being performed out of the line of sight may require use of radio communications.

- Air horns will be positioned at any Exclusion Zone work area to be used for emergency response only. The HSO or designee will designate air horn blast sequences for identification of work location, type of emergency and need for evacuation of all personnel.

- Wind direction indicators will be installed such that a line-of-sight is maintained with all personnel in all work zones. The HSO or designee will designate specific locations for wind direction indicators.

- All moving machinery, bulldozers, cranes, dump trucks, etc. will have working backup alarms.

- External communications (outside the site) will be maintained and used to coordinate emergency response, report to management and maintain contact with essential off-site personnel.

- All on-site personnel will be informed of external communications hardware (such as telephone, etc.) and the necessary telephone numbers to contact in the event of an emergency situation (fire, police, ambulance, etc.).

- All emergency numbers will be available at the site.

- Appropriate action will be taken should any hazardous environmental condition be observed on site. These conditions and the appropriate action to be taken will be as follows:

Observation	Potential Hazard	Action
Muddy condition	Personnel slip, equipment instability	Monitor work until condition improves
Lightning	Electrocution	Stop work until condition subsides
Horn blasts or other notification by site personnel	Site emergency	Stop work - evacuate to van or trailer - follow emergency notification procedures
Personal injury	Other personnel may be affected	Follow emergency notification procedures
Personal fatigue	Cold stress	Follow cold stress guidelines

Observation	Potential Hazard	Action
Windy condition	Overhead hazards, visual impairment	Stop work until condition subsides

8.5 Medical Assistance and General Emergency Procedures

Site-specific information regarding medical assistance and emergency numbers will be listed in the site-specific HASP. Emergency medical information for substances potentially present on-site will be addressed, if known.

8.5.1 General Emergency Procedures

The following standard emergency procedures will be used by on-site personnel. The HSO or designee will be notified of any on-site emergencies and will be responsible for ensuring that the appropriate procedures are followed.

- Personnel Injury: Administer first aid and/or CPR, if appropriate, and arrange for medical attention.
- Fire/Explosion: Alert the fire department. Personnel will move a safe distance from the involved area.

8.6 Safe Work Practices

Workers will adhere to established safe work practices for their respective specialties. The need to exercise caution in the performance of specific work tasks is made more acute due to:

- Physical, chemical and toxicological properties of contaminated material present;
- Other types of hazards present, such as heavy equipment, falling objects, loss of balance or tripping;
- Weather restrictions;

- Restricted mobility and reduced peripheral vision caused by the protective gear itself;
- Need to maintain the integrity of the protective gear; and
- Increased difficulty in communicating caused by respirators.

Work at the site will be conducted according to established protocols and guidelines for the safety and health of all involved. Among the most important of these principles are the following:

8.6.1 General

- In any unknown situation, always assume the worst conditions and plan responses accordingly.
- Because no personal protective equipment is 100 percent effective, all personnel must minimize contact with contaminated materials. Plan work areas, decontamination areas and procedures accordingly.
- Smoking, eating, chewing gum or tobacco, or drinking in the Contaminant Reduction Zone and the Exclusion Zone will not be allowed. Oral ingestion of contaminants is the second most likely means of introducing toxic substances into the body (inhalation is the first).
- Work breaks should be planned to prevent stress related accidents or fatigue related to wearing protective gear.
- Medicine and alcohol can potentate the effects from exposure to toxic chemicals and cold stress. Prescribed drugs should not be taken if working in the Contaminant Reduction Zone or Exclusion Zone, unless approval has been given by the physician. Alcoholic beverage consumption will be prohibited on the site.
- Personnel must be observant of not only one's own immediate surrounding, but also those of others. Everyone will be working under constraints; therefore, a team effort is needed to notice and warn of impending dangerous situations. Extra precautions are necessary when working near heavy equipment and while utilizing personal protective gear because vision, hearing and communication will be restricted.
- All facial hair that interferes with the respirator facepiece fit, must be removed prior to donning a respirator for all tasks requiring Level C or Level B protection.

- Personnel must be aware that chemical contaminants may mimic or enhance symptoms of other illnesses or intoxication. Avoid excess use of alcohol or working while ill during the duration of task assignment.

8.6.2 Site Personnel

- All personnel at the site will be identified to the HSO and FOM.
- All personnel operating in respective work zones will dress according to the protection levels set forth in this HASP.
- No red head wooden matches or lighters of any kind will be allowed in the Contaminant Reduction Zone or Exclusion Zone.
- All personnel will notify the HSO or FOM of any unusual occurrences that might effect the overall safe operation of the site.
- Any time a fire extinguisher is used, personnel will notify the HSO or FOM of what took place.
- All injuries and accidents will be immediately reported to the HSO or FOM and the appropriate reports filed.

8.6.3 Traffic Safety Rules

- Any vehicles that will not be involved in the site operations will be secured and the motor shut down.
- Only personnel assigned to this remedial investigation will be allowed to enter the site. Any other people, whether from OSHA, USEPA or vendors supplying equipment, etc., will have to be met prior to entering the site.
- At no time will any equipment be allowed to block any access road. If in the moving of equipment, a temporary blockage will exist, that equipment will have an operator available to move that equipment.
- The locations of all fire fighting equipment, valves, hydrants, hose storage places and fire extinguishers will be indicated to all personnel so that they will not be inadvertently blocked at any time.

8.6.4 Equipment Safety Rules

- Proper loading and operation of trucks on-site will be maintained in accordance with DOT requirements covering such items as grounding, placarding, driver qualifications and the use of wheel locks.
- Operation of heavy construction equipment will be in accordance with OSHA regulations 29 CFR 1910 and 1926.
- All equipment that is brought on-site will be available for inspection by the HSO.
- The HSO, or designee, will assign protective equipment to all site personnel and this equipment will be made available for inspection at anytime.
- All equipment will be installed with appropriate equipment guards and engineering controls. These include rollover protective structures.
- Safe distances will be maintained when working around heavy equipment.
- All equipment and tools to be operated in potentially explosive environments will be intrinsically safe and not capable of sparking or be pneumatically or hydraulically driven. Portable electric tools and appliances can be used where there is no potential for flammable or explosive conditions use three-wire grounded extension cords to prevent electric shocks. Ground fault interrupters will be used as well.
- With hydraulic power tools, fire-resistant fluid that is capable of retaining its operating characteristics at the most extreme temperatures will be used.
- Cutting or welding operations will not be carried out without the approval of the HSO and FOM.
- At the start of each work day and on a weekly basis, inspection of brakes, hydraulic lines, light signals, fire extinguishers, fluid levels, steering, and splash protection will be made by the equipment operators.
- All non-essential people will be kept out of the work area.
- Loose-fitting clothing or loose long hair around moving machinery will be prohibited.
- Cabs will be free of all non-essential items and all loose items will be secured.
- The rated load capacity of a vehicle will not be exceeded.
- Dust control measures will be employed to prevent the movement of dusts from contaminated areas to clean areas. The method employed will be determined and reviewed by the HSO and the FOM.

- Equipment operators will report to their supervisor(s) any abnormalities such as equipment failure, oozing liquids, unusual odors, etc.

- When an equipment operator must negotiate in tight quarters, a second person will be used to ensure adequate clearance.

- A signalman will be used to direct backing as necessary.

- Refueling will be done in safe areas. Engines will not be fueled while vehicle is running. Ignition sources near a fuel area will be prohibited.

- All blades and buckets will be lowered to the ground and parking brakes set before shutting off the vehicles.

- An ongoing maintenance program for all tools and equipment will be implemented by the responsible subcontractor equipment supervisor. All tools and moving equipment will be regularly inspected to ensure that parts are secured and intact with no evidence of cracks or areas of weakness, that the equipment turns smoothly with no evidence of wobble, and that it is operating according to manufacturer's specifications.

- Tools will be stored in clean, secure areas so that they will not be damaged, lost or stolen.

- All heavy equipment that is used in the Exclusion Zone will be kept in that zone until the investigation is complete or the equipment is decontaminated. Equipment will be completely decontaminated before moving it into the Support Zone.

8.6.5 Drilling and Excavation and Equipment Safety Rules

Drill rig and excavator operation, maintenance and safety will be the responsibilities of the drill rig/excavator operator.

8.6.6 Electrical Safety

Electrical hazards can exist at sites because of downed power lines, contact with subsurface utilities or improper use of electrical equipment. The presence of underground electric lines will be checked before any digging or excavating is undertaken. When using cranes or material handlers, care will be taken that the machinery does not come in contact with any energized lines. There should be a 10-foot clearance between a crane and electrical power lines unless the lines have been deenergized or an insulating barrier has been erected.

The following should be used for protecting personnel from electrical shocks:

- Ground equipment
- Double insulating tools
- Over current devices such as fuses and circuit breakers
- Ground fault circuit interrupter
- Tools and flexible cords will be inspected for damage that could lead to shock

8.6.7 Daily Housekeeping

The site and all work zones will be kept in an orderly fashion and the site is to be left safe and secure upon completion of each day's work.

8.6.8 Site Personnel Conduct

- All site personnel will conduct themselves properly and in accordance with generally accepted good work practice.
- At all times, the HSO will monitor all safe operations at the site. Any operation not within the scope of the HASP will be discussed fully before that operation begins.

9.0 PERSONAL HYGIENE AND DECONTAMINATION

9.1 General

- All personnel performing or supervising remedial work within a hazardous work area, or exposed or subject to exposure to hazardous chemical vapors, liquids or contaminated solids, will observe and adhere to the personal hygiene-related provisions of this section.
- Any personnel found to be repeatedly disregarding the personal hygiene-related provisions of the HASP will be barred from the site by the HSO.
- All on-site personnel will wear personal protective equipment as required at all times whenever entering the Exclusion Zone or the Decontamination Area.
- Personal hygiene and decontamination facilities, in accordance with OSHA 29 CFR 1910.120 (N), will be provided on-site, when necessary, and include the following:
  - Storage and disposal containers for used disposable outerwear.
  - Hand washing facilities.
  - An uncontaminated lunch area.
  - An uncontaminated rest/break area.
  - Chemical toilet, if no other facilities are located on-site.
- All personnel must enter and leave the work site through the facilities. The portable chemical toilet (if required), if possible, will be located in the Support Zone.
- The personal hygiene and decontamination facilities will be provided so that any personnel leaving the Exclusion Zone may perform decontamination, safely remove all protective outer clothing, and wash face and hands.
- Decontamination will be performed prior to taking breaks, eating lunch or leaving the work site.
- All site personnel will be given orientation training to the use and operation of the personal hygiene and decontamination facilities.

9.2 Contamination Prevention

To minimize contact with contaminated substances and lessen the potential for contamination, the following will be adhered to:

- Personnel will make every effort not to walk through any areas of obvious contamination (i.e., liquids, discolored surfaces, smoke/vapor clouds, etc.).
- Personnel will not kneel or site on the ground in the Exclusion Zone and/or the Decontamination Area.

9.3 Personal Hygiene Policy

- Smoking and chewing tobacco will be prohibited except in a designated break area.
- Eating and drinking will be prohibited except in the designated lunch or break area.
- All outer protective clothing (e.g., chemically protective suits, gloves, and boots) will be removed and personnel will thoroughly cleanse their hands and other exposed areas before entering the break or lunch area.
- Drinking of replacement fluids will be permitted in a designated area outside the Exclusion Zone. Personnel will, as a minimum, remove outer and inner gloves, respirator and coverall top, and wash hands prior to drinking replacement fluids.
- All personnel should change into fresh clothing after each working period or shift. Showering is mandatory upon return to each individual's rest place.

9.4 Personnel Decontamination Procedures

Decontamination procedures are followed by all personnel leaving the Exclusion Zone. Generalized procedures for decontamination follow. All procedures apply for Level C personal protection, however for Level D only steps 2, 3, and 8 apply. The HSO may modify these procedures based on site conditions.

Step 1 Drop tools, monitors, samples, and trash at designated drop stations (i.e., plastic containers or drop sheets).

Step 2 Scrub outer boots and outer gloves with decon solution or detergent and water. Rinse with water.

Step 3 Remove tape from outer boots (if applicable) and remove boots and discard tape in disposal container. Place boots on boot rack.

Step 4 Remove tape from outer gloves (if applicable) and remove only outer gloves and discard in disposal container.

Step 5 This is the last step in the decontamination procedure if the worker has left the Exclusion Zone to exchange the cartridges on his/her air purifying respirator. The cartridges should be exchanged, new outer gloves and boot covers donned, the joints taped, if necessary, and the worker returns to duty.

Step 6 Remove outer garments and discard in disposal container. New outer garments will be issued at the beginning of each work day or as deemed necessary by the HSO.

Step 7 Remove respirator and place or hang in the designated area.

Step 8 Remove inner gloves and discard in disposal container.

Note: Disposable items (i.e., coveralls, gloves, and boots) will be changed on a daily basis unless there is reason to change more frequently. Dual respirator cartridges will be changed daily, unless more frequent changes are deemed appropriate by site surveillance data or by assessments made by the HSO.

Pressurized sprayers or other designated equipment will be available in the decontamination area for wash down and cleaning of personnel, samples and equipment.

A waterless hand cleaner and paper towels may be used for hands, arms and any other skin surfaces potentially in contact with contaminated material.

Respirators (if used) will be decontaminated daily and taken from the drop area. The masks will be disassembled, the cartridges set aside and all other parts placed in a cleansing solution. After an appropriate time in the solution, the parts will be removed and rinsed with tap water. Old cartridges will be discarded in the contaminated trash container for disposal. In the morning, the masks will be reassembled and new cartridges installed, if appropriate. Personnel will inspect their own masks and readjust the straps for proper fit.

9.5 Emergency Decontamination

Decontamination will be delayed if immediate medical treatment is required to save a life. Decontamination will then be performed after the victim is stabilized. When decontamination can be performed without interfering with medical treatment, or a worker has been contaminated with an extremely toxic or corrosive material that could cause additional injury or loss of life, decontamination will be performed immediately.

When decontamination cannot be done, the victim will be wrapped in a chemical protective barrier (clothing or sheeting) to reduce contamination of other personnel. Emergency and off-site medical personnel will be informed of potential contamination and will be instructed about specific decontamination procedures. When the victim is transported off the site, personnel knowledgeable of the incident, the site and decontamination procedure will accompany the victim.

9.6 General Equipment Decontamination

- All vehicles and equipment used in the Exclusion Zone will be decontaminated prior to leaving the site.
- No vehicles will leave the decontamination area until they are properly inspected and approved by the HSO or FOM for general cleanliness of frame and tires.
- No vehicle will leave the site unless it is in a broom-clean condition and free of loose dirt or material on tailgates, axles, wheels, etc.
- The HSO or designee will monitor all vehicles to confirm proper decontamination prior to exiting. Approval will be based on visual inspection of all exposed surfaces.
- Equipment decontamination wash water residues will be collected for disposal.
- Personnel engaged in vehicle decontamination will wear Level C or Level D equipment with respiratory protection consistent with the air monitoring results collected by the HSO, and perform personal decontamination at the completion of equipment decontamination.
- Only clean water will be used for personnel, equipment and vehicle decontamination.

9.7 Small Equipment Decontamination Procedures

Small equipment will be protected from contamination as much as possible by draping, masking or otherwise covering the instruments with plastic (to the extent feasible) without hindering operation of the unit. For example, the photoionization detector can be placed in a clear plastic bag to allow reading the scale and operation of the controls.

Step 1 Remove coverings from equipment left in the drop area and place the coverings in appropriate waste containers.

Step 2 Brush or wipe any soil or moisture with a disposal paper wipe. Place soiled wipes in appropriate containers.

Step 3 Place bare units in a clean plastic tub and wiped off with a damp, clean, disposable wipe. Equipment will then be allowed to air dry.

Step 4 Following decontamination, check and recharge equipment, as necessary, for the next day's operations.

Step 5 Prior to entering the Exclusion Zone, recover all small equipment with new, protective coverings, if necessary.

9.8 Heavy Equipment Decontamination Procedures

A decontamination area for the drill rig and excavator will be set up. A wash/rinse will be performed on to all surfaces that came in contact with contaminants (e.g., augers). Prior to removing any heavy equipment or vehicles from the Exclusion Zone, they must be thoroughly decontaminated. Specific procedures are as follows:

Step 1 Initially, inspect equipment/vehicles to determine if gross decontamination is required first. Particular attention must be paid to tires, under surfaces, points of contact with the ground, and horizontal surfaces where dusts or aerosols might settle.

Step 2 If visible contamination is present, the equipment/vehicle must be moved to the decontamination pad where gross contamination will be scraped, brushed or swept off.

Step 3 Following gross decontamination, or if visible contamination is no longer present, wash the equipment/vehicle with high pressure washer as deemed necessary by the

HSO or designee. Efforts should be made to minimize water usage to reduce wastewater quantities.

Step 4 Prior to releasing any heavy equipment or vehicles from the Contaminant Reduction Zone, decontamination personnel will contact the HSO for final approval.

10.0 EMERGENCY RESPONSE AND CONTINGENCY PLAN

10.1 General

This plan has been prepared in accordance with 29 CFR 1910.120 (l) and will address the following potential emergencies:

- Emergencies outside the site.
- Emergencies within the site.
- Chemical exposures.
- Site evacuation.

10.2 Emergency Equipment

Specially marked and readily accessible emergency equipment will be provided on-site.

10.3 Special Requirements

- The Project Director or FOM will be on-call for any after hour emergencies resulting from adverse weather conditions. Incidents resulting from adverse weather will be reported to the HSO who will in turn contact the Project Director.
- First aid kit locations will be specially marked and have adequate water and other supplies necessary to cleanse and decontaminate burns wounds, or lesions. First aid stations will also stock buffer solutions for treating acid and caustic burns.

10.4 Emergency/Accident Reporting and Investigation

In the event of an emergency associated with the site work, the HSO or FOM will, without delay take: 1) diligent action to remove or otherwise minimize the cause of the emergency; 2) alert the Project Director; and 3) institute whatever measures are necessary to prevent any repetition of any conditions or actions leading to, or resulting in, the emergency.

Notification of the Project Director will occur immediately and initially be verbal with written notification occurring within 24 hours of the incident (i.e., accident, explosion, serious exposure, etc.). The Incident Notification Form, provided in Exhibit 6, will be used for written notifications and documentation.

10.5 Emergency Medical Care

- Site-specific emergency medical information will be provided in the site-specific investigation work plan.
- The hospital will be informed by the HSO or FOM of potential medical emergencies that could result from site operations and advised on the types of hazardous materials that are on site. In the event of an incident requiring their assistance, specific details of hazardous materials should be provided to the hospital medical staff, if available.
- A list of emergency information and a map to the nearest medical facility/hospital will be posted at every work site telephone. Copies of this map will also be available to be placed in vehicles used to transport injured personnel to the medical facility.

10.6 Emergencies Outside the Site

- All work in the site area will stop when advised by any authorized personnel and will remain so until otherwise instructed.
- The HSO and FOM will be fully advised of any work that may affect the safety of on-site employees or property.
- Actions to be taken by on-site personnel in the event of an outside emergency will include:
  - All operations will cease immediately and all equipment will be shut down and secured.
  - All personnel will leave vehicles in work zone in a safe manner making sure any remaining vehicles will not hamper any emergency traffic in the area or block any fire hydrants or foam supply systems.
  - All personnel will evacuate to a prearranged muster area.
  - All personnel will remain in the muster area to await further instructions.

10.7 Emergencies Within the Site

- The HSO will monitor all operations from the roadway and assist any emergency personnel responding to an emergency within this work zone.
- It will be the HSO's responsibility to maintain communications with public works personnel.
- In the event of an emergency within the work zone at the site, the emergency notification procedures will be followed.
- In all emergency situations, it will be the responsibility of the HSO to ensure that all site personnel are accounted for.

10.8 Personnel Exposures

The emergency procedures which will be used in the event of acute exposure (eyes, skin contact, inhalation) are described in Exhibit 6.

10.9 Site Evacuation

The site area will be evacuated, and fire and police departments will be notified in the event of fire, explosion or their potential. Depending on the cause and magnitude of the conditions requiring evacuation, three stages have been designated. See Exhibit 7 for details.

11.0 POSTINGS

Postings will be available on-site. These postings will cover four specific areas:

- Use of personal protective equipment
- Personal hygiene
- Provisions for smoking, eating, chewing and drinking
- Emergency information
- Route to nearest medical facilities
- OSHA Job Safety and Health Protection Poster

These postings may be added to, based on need to disseminate information or policy. All postings will be coordinated for approval prior to posting. The specified postings are provided in Exhibit 8. The emergency information for each site will be included on Exhibit 9 and will be posted at each site.

EXHIBIT 1

HEALTH AND SAFETY PLAN REVIEW ACKNOWLEDGEMENT FORM

INSTRUCTIONS: This form is to be completed by each person working on the subject work-site. Upon completion, this form is to be given to the HSO.

JOB NUMBER: _____

CLIENT/PROJECT: _____

DATE: _____

I represent that I have read and understand the contents of the above mentioned Health and Safety Plan and agree to perform my work in accordance with this plan:

_____
Signature

_____
Name Printed

_____
Company/Office

_____
Date Signed

EXHIBIT 2

CARE AND CLEANING OF RESPIRATORS

General Requirements

Any organization using respirators on a routine basis should have a program for their care and cleaning. The purpose of a program is to assure that all respirators are maintained at their original effectiveness. If they are modified in any way, their Protection Factors may be voided. Usually one person in an organization is trained to inspect, clean, repair, and store respirators.

The program should be based on the number and types of respirators, working conditions, and hazards involved. In general, the program should include:

- Inspection (including a leak check)
- Cleaning and Disinfection
- Repair
- Storage

Inspection

Inspect respirators after each use. Inspect a respirator that is kept ready for emergency use monthly to assure it will perform satisfactorily.

On air-purifying respirators, thoroughly check all connections for gaskets and "O" rings and for proper tightness. Check the condition of the facepiece and all its parts, connecting air tubes, and headbands. Inspect rubber or elastic parts for pliability and signs of deterioration.

Maintain a record for each respirator inspection, including date, inspector, and any unusual conditions for findings.

EXHIBIT 2 (continued)

CARE AND CLEANING OF RESPIRATORS

Cleaning and Disinfection

Collect respirators at a central location. Brief employees required to wear respirators on the respirator program and assure them that they will always receive a clean and sanitized respirator. Such assurances will boost morale. Clean and disinfect respirators as follows:

- Remove all cartridges, canisters, and filters, plus gaskets or seals not affixed to their seats.
- Remove elastic headbands.
- Remove exhalation cover.
- Remove speaking diaphragm.
- Remove inhalation valves.
- Wash facepiece and breathing tube in cleaner/sanitizer powder mixed with warm water, preferably at 120 to 140°F. Wash components separately from the facemask, as necessary. Remove heavy soil from surfaces with a hand brush.
- Remove all parts from the wash water and rinse twice in clean, warm water.
- Air dry parts in a designated clean area.
- Wipe facepieces, valves, and seats with a damp lint-free cloth to remove any remaining soap or other foreign material.

Note: Most respirator manufacturers market their own cleaners/sanitizers as dry mixtures of a bactericidal agent and a mild detergent. One-ounce packets for individual use and bulk packages for quantity use are usually available.

EXHIBIT 2 (continued)

CARE AND CLEANING OF RESPIRATORS

Repairs

Only a trained person with proper tools and replacement parts should work on respirators. No one should ever attempt to replace components or to make adjustments or repairs beyond the manufacturers' recommendations. It may be necessary to send high pressure side components of SCBA's to an authorized facility for repairs.

Make repairs as follows:

- Disassemble and hand clean the pressure-demand and exhalation valve assembly (SCBA's only). Exercise care to avoid damage to the rubber diaphragm.
- Replace all faulty or questionable parts or assemblies. Use parts only specifically designed for the particular respirator.
- Reassemble the entire respirator and visually inspect the completed assembly.
- Insert new filters, cartridges, or canisters, as required. Make sure that gaskets or seals are in place and tightly sealed.

Storage

Follow manufacturers' storage instructions, which are always furnished with new respirators or affixed to the lid of the carrying case. In addition, these general instructions may be helpful:

- After respirators have been inspected, cleaned, and repaired, store them so to protect against dust, excessive moisture, damaging chemicals, extreme temperatures, and direct sunlight.

EXHIBIT 2 (continued)

CARE AND CLEANING OF RESPIRATORS

Storage (continued)

- Do not store respirators in clothes lockers, bench drawers, or tool boxes. Place them in wall compartments at work stations or in a work area designated for emergency equipment. Store them in the original carton or carrying case.

- Draw clean respirators from storage for each use. Each unit can be sealed in a plastic bag, placed in a separate box, and tagged for immediate use.

EXHIBIT 2 (continued)

RESPIRATORY CERTIFICATION RECORDS

RESPIRATORY PROTECTION PROGRAM
RECORD OF RESPIRATOR USE

Name _____ Date _____

Social Security Number _____ Age _____

Location _____

Department _____ Supervisor _____

Area to be used in _____

Type of Respirator _____ Fitted By _____

Medical Approval Date _____

Medical Facility/Physician _____

Specific contaminants for which respiratory protection is necessary:

EMPLOYEE STATEMENT

I, an employee of _____, have received the above-referenced respirator. I have been fitted and properly instructed on its uses and limitations. I, also, understand that it is my responsibility to properly clean, maintain and store my respirator in a clean area unless other arrangements have been made to assure maintenance and care of the respiratory protection.

Signature _____

Date _____

EXHIBIT 3

AIR MONITORING RESULTS REPORT

Date: _____

Duration of Monitoring: _____

Work Location and Task: _____

_____

Instrument Reading _____ (Time)	Instrument Reading _____ (Time)	Instrument Reading _____ (Time)
_____	_____	_____
_____	_____	_____

(Note: If instruments have recorders, just attach tape to report. Also note any action levels when exceeded.)

Instrument Calibration: _____

Perimeter Samples Collected: _____

_____

Personnel Samples Collected: _____

_____

Perimeter and Personnel Sample Results From Previous Day (attach data once received):

_____

Comments: _____

_____

_____ _____

Name Title (Site Safety Officer)

Signature _____

EXHIBIT 4

NYSDOH COMMUNITY AIR MONITORING PLAN

New York State Department of Health
Generic Community Air Monitoring Plan

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

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

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

Community Air Monitoring Plan

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

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

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

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

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

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

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

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

Particulate Monitoring, Response Levels, and Actions

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

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

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

All readings must be recorded and be available for State (DEC and DOH) personnel to review.

June 20, 2000

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EXHIBIT 5

HEAT/COLD STRESS GUIDELINES

1.0 WORKING CONDITIONS AS RELATED TO HEAT STRESS

1.1 Personal Protective Clothing

All of the protective ensemble does not lend itself to the release of body heat generated during work. With this in mind, the following will be taken into consideration during the work schedule so as to minimize the heat stress to all personnel:

- All personnel will be advised to wear lightweight undergarments with short sleeves, under the chemical protective coverall.
- Personnel will be advised that extra clothing be on-site for use as the workday progresses due to the clothing becoming wet from perspiration.
- Dressing-out will be done in a designated trailer and be scheduled so as not to extend time in the protective ensembles.
- The dress-out area will have a table with fresh water and/or other water replenishing liquids along with disposable cups. All personnel will be expected to drink liquids before each work cycle. The SSO will supervise the dressing and water intake.
- As the job progresses and more information becomes available as to the materials that the workers are coming in contact with, consideration as to modifications to the protective ensemble will be examined. Such things as allowing personnel to keep the protective garment's hood down allowing for the release of heat. All decisions regarding the protective ensemble will be the SSO's decision based on available information.
- After completion of each work cycle, personnel will pass through personnel decontamination and remove their protective ensembles in the designated area. All personnel will then be medically monitored, if deemed necessary by the SSO. Liquid replenishment will be mandatory after each work cycle.
- Eating facilities will allow for meal periods to be taken in the designated lunch area. On days of extreme temperatures, the use of air conditioning in the decontamination trailer will be limited so as not to have personnel exposed to temperature extremes.

EXHIBIT 5 (continued)

HEAT/COLD STRESS GUIDELINES

1.2 Causes of Heat Stress

Wearing the expected levels of protection on-site can put personnel at risk of developing heat stress. This section will discuss heat stress and what steps will be taken to monitor personnel for the signs of it.

The body's chemical activities take place in a limited temperature range. Heat is generated by these processes. Any heat not needed to sustain the activities must be lost from the body to maintain a balance. HYPOTHERMIA is an abnormally high body temperature. The three main avenues for the release of body heat are:

- Respiration is our breathing pattern. Care should be taken that the body is not fooled into believing it is cool based on skin temperature.
- Radiation is how heat is released from the skin. Blood will pool on the surface of the skin as body temperatures increase. The protective ensemble specified for this site will not allow for this type of heat release.
- Evaporative Heat Loss normally allows for a body to cool itself by the evaporation of perspiration. Because the protective ensemble stops any contact with moving air the sweat coming off of the body will not evaporate.

If any of these release mechanisms is out of balance, the following conditions can occur and may be considered emergencies needing care:

- **HEAT RASH** is a common occurrence in areas where body parts rub causing friction. The level of protection will heighten its effects. Proper treatment would be personal washing of the affected areas and administering powder to help healing.
- **HEAT CRAMPS** occur when people are exposed to heat for extended periods of time. Due to the wearing of the required protective ensemble, this will be expected. The person will sweat heavily and drink large quantities of water. The more the person sweats, the more electrolytes are lost. If enough body salts are lost, the individual will begin to experience body cramps and pain in the extremities.

EXHIBIT 5 (continued)

HEAT/COLD STRESS GUIDELINES

Proper treatment includes slow replenishment of body fluids augmented by a proper salt solution along with cooling the individual down, taking care not to expose the person to extreme cooling measures. The worker will not be allowed to return to work until the SSO has monitored and approved re-entry.

- **HEAT EXHAUSTION** occurs as the blood pools at the skin surface in an attempt to cool the body. Sweating is profuse, skin is moist and cool, and the patient will experience dizziness, nausea, or fainting. This condition is an indicator of overwork in the environmental conditions. Treatment includes all for heat cramps with an extended rest period before re-entry. Depending on the worker's physical condition, rest periods may be from 30-60 minutes. After experiencing heat exhaustion, the worker should be closely monitored for symptoms reoccurring.

- **HEAT STROKE** can occur if heat exhaustion is not cared for. This occurs when the body loses its ability to regulate its temperature. Sweating stops and, if not treated, can lead to death. Signs and symptoms include dry red skin with no perspiration along with nausea, dizziness and confusion. A strong, rapid pulse should be carefully monitored as this condition can lead to coma. Proper treatment begins by understanding that this is a true medical emergency and requires activating the emergency medical system as covered in other sections. When notifying the Emergency Medical Response organization, emphasis should be placed on the words HEAT STROKE and the need for rapid transportation to the medical facility. (See Appendix A of the SSHP). Emergency medical treatment in the field includes immediate cooling of the body with total body immersion preferable. Water temperature should be cool enough to absorb the high body heat but not cold. Ice packs can be applied to the person's head area and under the arms. Due to the personnel needed to treat the patient while awaiting emergency medical care, all work will stop and all attention will be devoted to the person in stress. The First Aid Technician will evaluate all personnel after the patient is transported to determine if they also are showing signs of heat stroke.

To facilitate treatment of all of the above, the trailer, with its air conditioning, fresh water supply and shower, will be used if necessary. In all cases requiring treatment, emergency decontamination procedures based on the individual's degree of contamination will be done before entry into the trailer. Remember: *You* are your own best indicator of signs of heat stress.

2.0 COLD STRESS

The purpose of this section is to make all workers on-site aware of the problems associated with cold weather operations. As with heat related emergencies, cold weather injuries are progressive. That means that if the worker is aware of the problems beforehand he may prevent further damage and remain working.

Cold related injuries may be divided into two types:

- LOCAL COOLING affects the particular part of the body coming in direct contact with the cold air. This is commonly known as FROSTBITE.
- GENERAL COOLING affects the entire body and is known as HYPOTHERMIA. Hypothermia is a true medical emergency and should be recognized as such and treated immediately by trained medical personnel.

As stated, cold related injuries are progressive. The body loses heat either by CONDUCTION or direct transfer of body heat into the cold environment. An example would be an unprotected head allowing the surface area of the head to come in direct contact with the colder air. The other means by which the body loses heat is by CONVECTION. This occurs when colder air is allowed to pass over the body surface. When that air is also moist or the garments work become wet, a WATER CHILL or more commonly recognized WIND CHILL occurs. An example of wind chill would be a 20 mph wind during a 10 degree day would produce the same effect as -25 degree temperature. Both of these conditions may be easily prevented by proper work attire and safe work practices. Hardhat liners prevent the wind from blowing under the brim but will also affect your hearing ability.

EXHIBIT 5 (continued)

HEAT/COLD STRESS GUIDELINES

Lose layers of work clothes rather than bulky garments will allow the wearer to adapt to changing conditions. Use of rubber overboots will prevent leather workboots from getting wet and are excellent for stationary work to stop cold penetration.

Signs to Look For:

FROSTNIP, the first stage of frostbite occurs when a body part comes in direct contact to a cold object or cold air. This condition is not serious and can be remedied by warming of the region. The real problem is that a numbing effect can occur and keep the worker from realizing that he is going into the next stage SUPERFICIAL FROSTBITE.

The skin and under layers become effected. If not treated this can become a FREEZING condition in which the deeper structures of the body become effected.

CONDITION	SKIN SURFACE	TISSUE UNDER SKIN	SKIN COLOR
frostnip	soft	soft	red-white
frostbite	hard	soft	white/waxy
freezing	hard	hard	white/gray

HYPOTHERMIA occurs when the body is unable to maintain its proper temperature of 98.6 degrees. It is important for the worker to realize that this can occur in temperatures of 50 degrees and below. Submersion of a body part in cold water will also cause hypothermia very quickly. Some early signs are:

1. Shivering
2. Numbness in extremities
3. Drowsiness

4. Slow breathing and pulse rates
5. Failing eyesight
6. Loss of coordination, inability to do easy tasks
7. Freezing of body parts

Proper treatment begins by activation of emergency medical service procedure. Hypothermia required prompt qualified medical treatment. Initial site action would revolve around getting the affected worker out of the weather and begin the warming process. The most important thing to realize is that Hypothermia is a MEDICAL EMERGENCY.

Workers exposed to cool temperatures for extended period of time can experience lesions in the form of red swollen areas that seem hot and itchy. These chronic lingering lesions are known as CHILBLAINS. Although not an emergency, the Chilblains indicate that the worker in not adequately protecting the affected area.

A common problem in wet work areas is TRENCH FOOT. The worker whose feet remain unprotected by leather footwear in water close to freezing will have swollen limbs that appear waxy and mottled in color. The affected limb will appear cold to the touch. Basic treatment revolves around getting the worker to a warm place and slowly removing the wet footwear. The obvious way to prevent TRENCH FOOT is to wear rubber protective footwear.

Some suggestions to prevent cold weather operation problems:

1. Plan ahead as to the proper work clothes to be worn.
2. Avoid early overheating which dampens clothes and hastens the release of body heat by evaporation.
3. Use of windbreaks in the work zone.

HEAT/COLD STRESS GUIDELINES

4. Elimination of standing water or avoid prolonged immersion in that water.

5. Provision of heated rest area (i.e., trailer or vehicle).

6. Avoid overheating of the rest area. Extreme temperature differentials between the work area and the rest area will lead to chilling upon return to work.

7. Proper diet and eating habits.

8. Avoid or cut down smoking which constricts the blood vessels.

REMEMBER, YOU ARE THE BEST PROVIDER OF INFORMATION ABOUT HOW YOU FEEL. THE BEST WAY TO PREVENT INJURIES FROM COLD WEATHER OPERATIONS IS TO RECOGNIZE THE EARLY SIGNS AND PREVENT SERIOUS INJURY.

EXHIBIT 6

INCIDENT NOTIFICATION FORM

TO: Project Manager

Date: _____

FROM: HSO and/or _____
(someone who has direct knowledge of the incident)

1. Contractor's Name: _____

2. Organization: _____

3. Telephone Number: _____

4. Location: _____

5. Reporter Name: _____

6. Name of Injured: _____ Birth date: _____

7. Company Employing Injured: _____

8. Date of Incident: _____

9. Company Employing Injured: _____

10. Location of Incident: _____

11. Brief Summary of Incident (provide pertinent details including type of operation at time of incident):

_____

_____

_____

12. Cause, if known: _____

13. Casualties, if any: _____

EXHIBIT 6 (continued)

INCIDENT NOTIFICATION FORM

14. Details of Any Existing Chemical Hazards or Contamination:

_____

_____

15. Estimated Property Damage: _____

16. Affect on Contract Schedule: _____

17. Actions Taken by Contractor: _____

18. What Medical Help was Given: _____

_____

_____

19. Doctor and/or Hospital (if known): _____

_____

20. When did Employee Return to Work: _____

21. Other Damages/Injuries Sustained (public or private):

_____

_____

22. Additional Information:

_____

_____

_____

EXHIBIT 7

EMERGENCY INFORMATION

1. Emergencies Within the Site

- Contact the HSO On-Site.
- Contact the FOM.
- Contact the appropriate emergency response agency, if necessary.
- Report the following:
  - Location of emergency in relation to a specific recognizable landmark.
  - Nature of emergency:
    - **FIRE**, if so of what kind and what equipment is involved.
    - **EMERGENCY MEDICAL INCIDENT, ALL INJURIES, ACCIDENTS OR FIRES.**
      Communication will include:
      - Number of injured people.
      - Nature of injuries.
      - If Project Field Team Members can't handle injuries with its resources, what emergency medical services will be needed.
    - If any outside personnel must enter the site, any hazards will be communicated and those people will be supervised by the HSO.
    - In the event that any site personnel wearing protective equipment in the Exclusion Zone becomes injured, the HSO or designated individual will do whatever decontamination is necessary to remove that equipment.
    - Any emergency treatment information dealing with the injury will accompany the injured party so that those treating that person will have any and all information.
    - **REQUEST FOR POLICE**. If any person entering the site who does not belong there becomes a problem, Police will be notified. If that person either endangers the safe operation of Project Field Team members or himself, the HSO will suspend all work until that person can be removed.
  - If site personnel will be evacuating the site due to emergency.

2. Personnel Exposures Within the Site

- Contact the HSO On-Site
- Contact the FOM
- Provide treatment as follows:
  - Eye Exposure - treat by immediate flushing with distilled water (portable eyewash). Transport for examination and treatment. Site-Specific hospital information can be found in Section 5.1.1.
  - Skin Exposure - remove contaminated clothing and treat by washing with soap and water.

- Inhalation - if a person inhales a large amount of organic vapor, the person will be removed from the work area to fresh air and artificial respiration will be administered if breathing has ceased. The affected person will be transported to the hospital by ambulance or emergency vehicle if overexposure to lungs has occurred.
- Personal Injuries - in case of severe injury, the victim will receive emergency first aid at the site, as appropriate, and will be transported by ambulance or emergency vehicle to the hospital. An accident form must be completed for any accident or occupational exposure and forwarded to the Project Manager.

3. Evacuating the Site

- Contact the HSO On-Site
- Contact the FOM
- Follow the directions below:
  - Upwind withdrawal - withdraw to a safe upwind location if:
    - Air quality concentration contain excessive concentrations of volatile organics, combustible gases, or oxygen percentage above or below safe levels for the level of protection being worn. The field team will withdraw to a safe upwind location determined by the HSO.
    - A minor accident occurs. The victim will undergo decontamination procedures and be transported to a safe upwind location. Field operations will resume after first aid and/or decontamination procedures have been administered to the affected individual.
    - Protective clothing and/or respirator malfunctions.
  - Withdrawal from site - evacuate the site if:
    - Explosive levels of combustible gases, toxic gases, or volatile organics are recorded.
    - A major accident or injury occurs.
    - Fire and/or explosion occurs.
    - Shock-sensitive, unstable, or explosive materials are discovered.
    - High levels of radioactive materials are discovered.

- Evacuation of nearby facilities - a continuous release of toxic, flammable, or explosive vapors from the site could affect people off-site. Air quality should be monitored downwind to assess the situation. The FOM, or on-site designee, is responsible for determining if circumstances exist for any level of off-site contamination warranting concern for people off-site. he should always assume worst case conditions until proven otherwise. If conditions are marginal, evacuation should be conducted until acceptable conditions resume. Key personnel identified in the HASP should be contacted when evacuation of nearby facilities becomes necessary.

EXHIBIT 7 (continued)

EMERGENCY INFORMATION

TABLE I

EMERGENCY SIGNALS

In most cases, field personnel will carry portable radios for communications. If this is the case, a transmission that indicates an emergency will take priority over all other transmissions. All other site radios will yield the frequency to the emergency transmissions.

Where radio communication is not available, the following air-horn and/or hand signals will be used:

EMERGENCY AIR-HORN SIGNALS

HELP!	Three short blasts	. . .
EVACUATION!	Three long blasts	__ __ __
ALL CLEAR!	Alternating long and short blasts	__ . __ .

EMERGENCY HAND SIGNALS

OUT OF AIR, CAN'T BREATH	Hand gripping throat
LEAVE AREA IMMEDIATELY, NO DEBATE!	Grip partner's wrist or place both hands around waist
NEED ASSISTANCE	Hands on top of head
OKAY! - I'M ALRIGHT! - I UNDERSTAND!	Thumbs up
NO! - NEGATIVE!	Thumbs down

EXHIBIT 7 (continued)

EMERGENCY INFORMATION

TABLE II

LOCATION OF EMERGENCY EQUIPMENT

EQUIPMENT	TYPE	LOCATION(S)
Fire Extinguisher Dry Chemical	20A-80B:C	
First Aid Kit		
Eye Wash	Portable	
Emergency Sprayer	Portable	
Communication	Air Horns Each work area.	
Map	Hospital Route	

EXHIBIT 8

POSTING 1 - USE OF PERSONAL PROTECTIVE EQUIPMENT

WHO This posting applies to all site workers, supervisors, and visitors, *without exception.*

WHEN Prior to entering the Contaminant Reduction Zone (CRZ) or Exclusion Zone (EZ) provisions of this posting will be followed.

WHAT This posting outlines the initial forms of PPE required to be worn while working in the CRZ and EZ. Particular types or forms of PPE may be altered based on the authority of the HSO. Specific guidelines are provided in Section 7.0 of this HASP. Disposable PPE will not be worn more than one work shift of workday. In some instances disposable PPE may have to be replaced more than once during a workday. The HSO will determine the frequency of replacing disposable PPE. Reusable PPE will be properly decontaminated, cleaned, sterilized (if appropriate), and stored. Doubts regarding what to wear will be directed to the HSO for resolution.

WHY The levels of protection specified in the SSHP were chosen to protect individuals from potentially harmful exposures to chemicals or physical hazards. No changes to PPE specifications are authorized without the permission of the HSO.

EXHIBIT 8 (continued)

POSTING 2 - PERSONAL HYGIENE

WHO This posting applies to all site workers, supervisors, and visitors, but is intended primarily for site workers.

WHEN Before beginning work, during scheduled breaks, and at the end of a workday.

WHAT This posting summarizes the policy on personal hygiene that applies to all site personnel. Personal hygiene includes those activities such as washing hands, showering, shaving, etc., that are conducive to keeping one's body clean and mind refreshed. For the individual's sake, and his/her coworkers, each worker will be responsible for maintaining a high level of personal hygiene. This is especially critical prior to breaks where food, beverages, or smoking will occur. If proper personal hygiene is not followed, potential ingestion, absorption, or inhalation of toxic materials may occur. Particular attention must be paid to close shaving whenever respirators are worn. Facial hair and long hair will interfere with respirator fit and will allow excessive contaminant penetration.

WHY To avoid accidental ingestion, absorption, or inhalation of hazardous materials. To maintain an elevated state of awareness, thus reducing potential mental errors and accidents.

EXHIBIT 8 (continued)

POSTING 3 - PROVISIONS FOR SMOKING, EATING, CHEWING, AND DRINKING

WHO This posting applies to all site workers, supervisors, and visitors, *without exception.*

WHEN At all times personnel are on-site. This regulation will specifically apply during breaks and rest periods.

WHAT Site personnel are forbidden to smoke, eat, chew, or drink in the Exclusion Zone or Contaminant Reduction Zone. Only those areas specified as break areas or common areas in the Support Zone may be used for smoking, eating, chewing, or drinking. The rest/break facility and office trailers in the Support Zone may be used. Individuals found to be repeatedly disregarding these provisions will be released.

The only exception to this posting involves access to electrolytic fluids in the Contaminant Reduction Zone when the HSO has determined heat stress warrants regular replenishing of lost body fluids.

WHY To protect personnel from accidental exposures to hazardous materials, smoking, eating, chewing, and drinking is prohibited everywhere except designated break areas. To avoid potential fires and explosions, smoking is prohibited everywhere except designated break areas and office trailers.

EXHIBIT 9

SITE-SPECIFIC INFORMATION

The following site-specific information will be filled out by project personnel for each site and will be posted on-site:

Site Name: _____
Address: _____

Telephone: _____
Date of HASP Preparation: _____
Dates of Field Investigation: _____
Entry Objectives: _____

	Name	Phone
Site Organizational Structure:		
Project Director:		
Project Manager:		
HSO:		
FOM/Alternate HSO:		
Field team staff:		
Subcontractors:		

Medical Assistance
Physician: _____
Hospital: _____
Address: _____

EXHIBIT 9 (continued)

SITE-SPECIFIC INFORMATION

Emergency Telephone: _____

Directions: _____

_____

_____

_____

_____

Please attach a route to hospital

Emergency Telephones

Agent/Facility	Telephone	Emergency No.
EMS - Ambulance		911
Police Department		911
Fire Department		911
Hospital		
Poison Control Center		

Additional site related information (may include special hazards, site control, waste storage and disposal, PPE, decon area location, special engineering controls, etc.).

_____

_____

_____

_____