REVISDED INTERIM REMEDIAL MEASURE WORK PLAN
SOIL EXCAVATION AND OILY MATERIAL REMOVAL
THE FORMER AMERICAN LINEN SUPPLY COMPANY FACILITY
BUFFALO, ERIE COUNTY, NEW YORK
BCP SITE #C915241

by

Haley & Aldrich of New York
Rochester, New York

for

New York State Department of Environmental Conservation
Buffalo, New York

File No. 37319-043
5 July 2012

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5 July 2012
File No. 37319-043

New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 9
270 Michigan Avenue
Buffalo, New York 14203-2915

Attention: Mr. Jaspal S. Walia

Subject: *Revised* Interim Remedial Measure Work Plan
Soil Excavation and Oily Material Removal
The Former American Linen Supply Company Facility
Buffalo, Erie County, New York
BCP Site #C915241

Dear Mr. Walia:

Haley & Aldrich of New York (Haley & Aldrich) is pleased to submit this Interim Remedial Measure Work Plan (IRMWP) for the Former American Linen Supply Company Facility (Site) in Buffalo, New York on behalf of AmeriPride Services, Inc. (AmeriPride). The Site was accepted into the Brownfield Cleanup Program (BCP) on 8 March 2011 and AmeriPride subsequently executed a Brownfield Cleanup Agreement with the NYSDEC in May 2011. *Note that this work plan has been revised per comments received from the NYSDEC on 27 June 2012.*

Background

Under the Remedial Investigation Work Plan dated 31 May 2011, Haley & Aldrich conducted a portion of an investigation of the basement slab and drainage features (including 14 soil borings and approximately 33 hammer drill test locations) in January 2012. The investigation objective was to evaluate whether basement features such as drainage sumps have caused a release of oil or hazardous materials to soil beneath the slab. The Site building was vacant but had not been demolished at the time of the investigation. Additional investigation is planned following removal of the upper floors of the building removal of mechanical equipment that precluded access in January.

Soil borings were installed adjacent to or downgradient of sump pits and other sub-slab features in the basement, which included sumps, concrete block pits, elevator shafts, machine vaults, and equipment lifts. Each boring was advanced to equipment refusal (approximately 4 to 12 feet below the basement sub-slab). Thirteen soil samples from depths between 1 and 8 feet below the basement slab were submitted for laboratory analysis.

Basement Investigation Results

Results of the January 2012 soil boring investigation were summarized in a Monthly Progress Report dated 17 February 2012 and will also be reported along with the results of the remaining investigation activities in the IRM Construction Completion Report. In summary, the investigation results indicated that removal of basement sub-slab features is not warranted. With the exception of exploration location BB-02, impacts to soil beneath the slab were not observed.

During the installation of boring BB-02 (see Figure 1 for location), oily material was encountered in the void space beneath the floor slab. A sample of the oily material was collected and submitted for laboratory analysis for metals, polychlorinated biphenyls (PCBs), semi-volatile organic compounds (SVOCs), and volatile organic compounds (VOCs). The results of the analysis (see Table II) showed detections of four SVOCs in the range of 199 to 2,510 mg/kg, several VOCs at estimated levels between 0.8 and 74 mg/kg, PCBs at 6.8 mg/kg, and several metals at detections ranging from 8 to 1,020 mg/kg.

The extent of the oily material was further evaluated on 19 January 2012 via hammer drilling. Based on observations during the hammer drilling, the oily material and related soil impacts appear to be limited to the void space between the floor slab and underlying native soils between the two concrete block basement pits (see Figure 1). Haley & Aldrich collected a soil sample, from the hammer drill location (BB-15) with the highest PID reading, for laboratory analysis for VOCs, SVOCs, and PCBs. Cis-1,2-DCE and vinyl chloride were detected above the NYSDEC Soil Cleanup Objectives (SCOs) for the protection of groundwater. Other VOCs were detected below SCOs for protection of groundwater. Results are included in Table I.

Based on the results of the investigation of the oily material and impacted basement sub-slab soil, Haley & Aldrich recommends the oily material and soil be removed as part of an Interim Remedial Measure (IRM).

Interim Remedial Measure Work Plan

Following the demolition of the upper floors of the building, Haley & Aldrich will remove the oily material and associated impacted soil will be removed and disposed of as part of an IRM, as outlined below:

- The basement floor slab will be removed in the approximate area shown on Figure 1 to provide access to the sub-slab oily material and impacted soil. In addition, the two concrete block pits that are located to the north and south of the IRM area and residual material within them will be demolished and removed. The pits and floor slab concrete will be crushed and staged for disposal at a NYSDEC-permitted facility.

- The oily material will be removed and impacted soil will be excavated to the extent practical based on visual observations and field screening with a photoioniation detector (PID). The soil will be excavated until screening illustrates impacted soil has been removed or to the practical limits of the excavation based on footings or other foundation features. The soil and material

will be stockpiled under poly-sheeting for characterization and disposal at a NYSDEC-permitted facility. If groundwater is encountered during the excavation, it will be pumped into a tank and characterized to determine appropriate disposal options.

- Confirmation samples will be collected from the excavation walls and base as follows:
  - A composite sample will be collected of the sidewalls and base and will be submitted to an ELAP-certified laboratory for analysis of RCRA 8 Metals, PCBs, and SVOCs.
  - *A discrete sample will be collected from each sidewall and base (where practical) and will be submitted to an ELAP-certified laboratory for analysis of VOCs.*
  - A second discrete sample will be collected from each sidewall and base and submitted under separate chain of custody to be held at the laboratory to be analyzed for RCRA 8 Metal, PCBs, and SVOCs as appropriate should the composite sample indicate that impacted soil remains in the excavation to evaluate if additional remedial activities may be necessary.

Health & Safety Plan/Community Air Monitoring Plan

Haley & Aldrich has prepared a site-specific health and safety plan (HASP), in accordance with NYSDEC and NYSDOH guidelines. The HASP includes a description of health & safety protocols to be followed during IRM implementation, and is structured to allow modification based on the results of that work, if necessary. The HASP has been developed for use by Haley & Aldrich field staff and other personnel who will work at the site during planned activities. A copy of the site-specific HASP is provided in Appendix A.

The NYSDOH generic community air monitoring plan (CAMP) also applies to the IRM work described herein. This plan requires real-time monitoring of VOCs at the downward perimeter of each designated work area when certain activities are in progress. A copy of the NYSDOH generic CAMP is included in Appendix B.

Reporting & Scheduling

We anticipate that IRM activities will be conducted for approximately 1 week and will begin following the completion of the demolition of the upper floors of the Site building.

The analytical data from the confirmation soil sampling will be shared with the NYSDEC. A summary of the IRM activities will be provided in an IRM Construction Completion report following completion of the IRM work.

Certification

I certify that I am currently a NYS registered professional engineer and that this IRM Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

NYS Professional Engineer #

7/5/12
Date

Mark N. Ramsdell
Signature

Please contact the undersigned with any questions you may have.

Sincerely yours,
HALEY & ALDRICH OF NEW YORK

Claire L. Mondello
Project Manager

Mark N. Ramsdell, P.E.
Senior Engineer

Lisa Turturro
Vice President

Attachments:

Table I – Basement Sub-Slab Soil Analytical Data
Table II – Basement Sub-Slab Oily Material Analytical Data
Figure 1 – Basement Investigation Locations
Appendix A – Health & Safety Plan
Appendix B – Generic NYSDOH Community Air Monitoring Plan

G:\37319 (AmeriPride, 8 Lord Street, Buffalo)\043 - Basement IRM\2012-0705_HANY_AmeriPride_IRM Work Plan_F_Revised.docx

TABLE I - BASEMENT SUB-SLAB SOIL ANALYTICAL DATA
INTERIM REMEDIAL MEASURE WORK PLAN
SOIL EXCAVATION AND OILY MATERIAL REMOVAL
THE FORMER AMERICAN LINEN SUPPLY COMPANY FACILITY
BUFFALO, ERIE COUNTY, NEW YORK
BCP SITE #C915241

Location Name Sample Date Matrix Sample Depth (BBS)	NYSDEC Part 375 Soil Cleanup Objectives for Protection of Groundwater	BB-15 1/19/2012 Soil 0 - 1 (ft)
PCBs (ug/kg)		
Polychlorinated biphenyls (PCBs)	3200	21.8 U
Polycyclic Aromatic Hydrocarbons (ug/kg)		
Acenaphthene	98,000	8.9 U
Anthracene	1,000,000	8.9 U
Benzo(a)anthracene	1,000	8.9 U
Benzo(a)pyrene	22,000	8.9 U
Benzo(b)fluoranthene	1,700	8.9 U
Benzo(g,h,i)perylene	1,000,000	8.9 U
Benzo(k)fluoranthene	1,700	8.9 U
Chrysene	1,000	8.9 U
Fluoranthene	1,000,000	8.9 U
Fluorene	386,000	17.8 J
Naphthalene	12,000	434 J
Phenanthrene	1,000,000	36.8 J
Pyrene	1,000,000	8.9 U
Semi-Volatile Organic Compounds (ug/kg)		
2-Methylnaphthalene	36,400	434 U
Volatile Organic Compounds (ug/kg)		
1,1-Dichloroethene	330	6.3 U
1,2-Dichloroethene (total)	-	458
Acetone	50	20.9
Carbon disulfide	2,700	22.1
Carbon tetrachloride	760	6.3 U
Chlorobenzene	1,100	6.3 U
Chloroform (Trichloromethane)	370	6.3 U
cis-1,2-Dichloroethene	250	**435**
Methylene chloride	50	6.3 U
Tetrachloroethene	1,300	74.3
Toluene	700	12.5
Total BTEX	-	37.9 U
trans-1,2-Dichloroethene	190	23.8
Trichloroethene	470	227
Vinyl chloride	20	**322**

Notes and Abbreviations:

U = Analyte not detected above the detection limit shown

J = Detection estimated below the laboratory detection limit

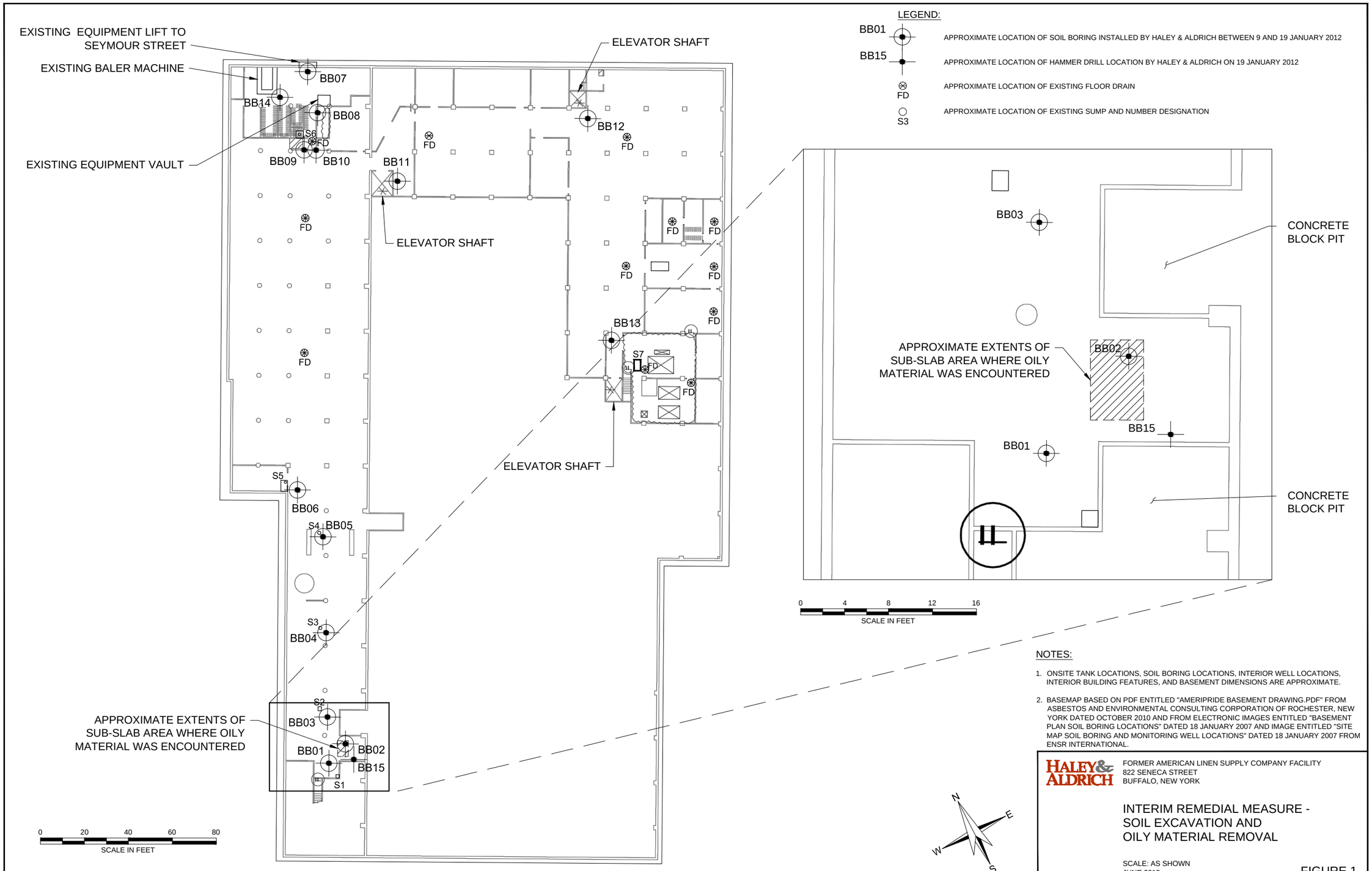
BBS = below basement slab

1. Only detected analytes and compounds shown
2. Bold results exceed Protection of Groundwater SCOs

TABLE II - BASEMENT SUB-SLAB OILY MATERIAL ANALYTICAL DATA
INTERIM REMEDIAL MEASURE WORK PLAN
SOIL EXCAVATION AND OILY MATERIAL REMOVAL
THE FORMER AMERICAN LINEN SUPPLY COMPANY FACILITY
BUFFALO, ERIE COUNTY, NEW YORK
BCP SITE #C915241

Location Name	BB-02	BB-02
Sample Date	1/9/2012	1/9/2012
Matrix	Oily Material	Oily Material
Sample Depth (BBS)	0 - 1 (ft)	0 - 1 (ft)
Inorganic Compounds (mg/kg)		
Aluminum, Total	86.2	82.2
Barium, Total	8.3	8
Calcium, Total	1,020	942
Copper, Total	26.4	26.2
Iron, Total	177	168
Lead, Total	10.7	11.8
PCBs (mg/kg)		
Aroclor-1254 (PCB-1254)	6.8	-
Semi-Volatile Organic Compounds (ug/kg)		
2-Methylnaphthalene	199,000	-
bis(2-Ethylhexyl)phthalate	2,510,000	-
Di-n-octyl phthalate	600,000	-
Naphthalene	479,000	-
Volatile Organic Compounds (ug/kg)		
1,2-Dichlorobenzene	954 J	-
1,4-Dichlorobenzene	804 J	-
Ethylbenzene	73,800 J	-
m,p-Xylenes	10,000 J	-
Methylene chloride	1,050 J	-
o-Xylene	53,000 J	-
Tetrachloroethene	2,410 J	-
Toluene	10,700 J	-
Xylene (total)	63,000 J	-

Notes and Abbreviations:
J = Detection estimated below the laboratory detection limit
BBS = below basement slab
1. Only detected analytes and compounds shown



LEGEND:

BB01 — APPROXIMATE LOCATION OF SOIL BORING INSTALLED BY HALEY & ALDRICH BETWEEN 9 AND 19 JANUARY 2012

BB15 — APPROXIMATE LOCATION OF HAMMER DRILL LOCATION BY HALEY & ALDRICH ON 19 JANUARY 2012

FD — APPROXIMATE LOCATION OF EXISTING FLOOR DRAIN

S3 — APPROXIMATE LOCATION OF EXISTING SUMP AND NUMBER DESIGNATION

NOTES:

1. ONSITE TANK LOCATIONS, SOIL BORING LOCATIONS, INTERIOR WELL LOCATIONS, INTERIOR BUILDING FEATURES, AND BASEMENT DIMENSIONS ARE APPROXIMATE.
2. BASEMAP BASED ON PDF ENTITLED "AMERIPRIDE BASEMENT DRAWING.PDF" FROM ASBESTOS AND ENVIRONMENTAL CONSULTING CORPORATION OF ROCHESTER, NEW YORK DATED OCTOBER 2010 AND FROM ELECTRONIC IMAGES ENTITLED "BASEMENT PLAN SOIL BORING LOCATIONS" DATED 18 JANUARY 2007 AND IMAGE ENTITLED "SITE MAP SOIL BORING AND MONITORING WELL LOCATIONS" DATED 18 JANUARY 2007 FROM ENSR INTERNATIONAL.

HALEY & ALDRICH

FORMER AMERICAN LINEN SUPPLY COMPANY FACILITY
822 SENECA STREET
BUFFALO, NEW YORK

INTERIM REMEDIAL MEASURE - SOIL EXCAVATION AND OILY MATERIAL REMOVAL

SCALE: AS SHOWN
JUNE 2012

FIGURE 1

G:\37319 (AMERIPRIDE, 8 LORD STREET, BUFFALO)\DRAWINGS\37319-020-003D SAMP PLAN-D3.DWG

APPENDIX A

Health & Safety Plan

HALEY & ALDRICH, INC.
SITE-SPECIFIC HEALTH & SAFETY PLAN

For

Former American Linen Supply Company Facility

Remedial Investigation Work Plan

Buffalo, New York

Project/File No. 37319-041/043

Prepared by: Claire L. Mondello Date: 12/3/2010

Revised by: Claire L. Mondello Date: 1/5/2012

Revised by: Claire L. Mondello Date: 6/14/2012

APPROVALS: The following signatures constitute approval of this Health & Safety Plan

Margaret Holt - Local H&S Coordinator — 1/6/12 Date

Date printed: 6/18/2012 at 2:56 PM

Note: This HASP has been developed for Haley & Aldrich purposes only and is not for use by others.

TABLE OF CONTENTS

1. PROJECT INFORMATION AND EMERGENCY RESOURCES

Project Name: Former American Linen Supply Company Facility RI Work Plan	**H&A File No.: 37319-041/043**
Location: 822 Seneca Street, Buffalo, New York	
Client/Site Contact: Phone Number: Emergency Phone Number:	Randy Cook (612) 676-8060 (651) 600-9348
H&A Contact: Phone Number: Emergency Phone Number:	Glenn White (585) 321-4239 (585) 370-2412
Local Health & Safety Coordinator: Phone Number: Emergency Phone Number:	Margaret Holt (585) 321-4214 (585) 721-2426
Nearest Hospital: Address: (see map on next page) Phone Number:	Buffalo General Hospital 100 High Street Buffalo, NY 14210 (716) 859-5600
Healthcare Clinic to be accessed in non-emergency incidents:	1-888-449-7787 (call and Workcare will make appointment at local clinic)
Emergency Response Number:	**911**
Other Local Emergency Response Number:	911
Other Ambulance, Fire, Police, or Environmental Emergency Resources:	911

Work Scope:

This Site-Specific Health and Safety Plan addresses the health and safety practices and procedures that will be employed by all Haley & Aldrich employees participating in the site characterization of the Project Site. This plan is based on an assessment of the site-specific health and safety risks available to Haley & Aldrich and Haley & Aldrich's experience with other project sites. The scope of work for the Remedial Investigation includes:

Task #1: Excavation Monitoring:

Haley & Aldrich personnel will oversee the removal of portions of the existing building slab, and subsurface features (e.g. – catch basins, sumps, etc.). Monitoring will include screening with a PID and logging daily field activities.

Task #2: Drilling and Test Pitting

- Soil Boring/Groundwater Well Installation:

Five soil borings to be converted into groundwater wells will be advanced in five locations at the Site as shown on the attached figure. Soil borings/wells will be installed using a hollow-stem auger. Haley & Aldrich responsibilities include drilling oversight, soil screening, soil sample collection, and documentation.

- Underground Storage Tank (UST) Investigation (Test Pitting/Soil Borings)

  Up to 11 test pits/soil borings will be advanced around existing closed in-place USTs as shown on the attached figure using either a hollow-stem auger, direct push (GeoProbe), and/or excavator. Haley & Aldrich responsibilities include drilling/excavation oversight, soil screening, and documentation.

- Test Pitting

  Test pits will be advanced on the northern portion of the Site for Fill Characterization and in the southeastern portion of the Site to characterize the former Dry Cleaning Area as shown on the attached figure. Test pits will be advanced using an excavator. Haley & Aldrich responsibilities include excavation oversight, soil screening, sample collection, and documentation.

- Soil Vapor Sampling Point Installation

  Four (4) soil vapor sampling points will be installed on the western side of the Site using a direct-push (GeoProbe) drill rig. Haley & Aldrich responsibilities include drilling oversight, soil screening, and documentation.

- Basement Investigation

  Up to 30 soil borings will be advanced adjacent to drainage features (sumps, drains, etc.) identified in the basement of the building using direct push (GeoProbe) equipment. In addition, a drain line will be chased using water and vacuum equipment. Haley & Aldrich responsibilities include drilling oversight, soil screening, and documentation.

Task #3: Site-Wide Groundwater Sampling

One round of site-wide groundwater sampling will occur at both new and previously installed onsite wells following well installation using low-flow sampling techniques. Static water levels will also be collected.

Task #4: Soil Vapor Sampling

Four soil vapor samples will be collected from the installed soil vapor sampling points.

Task #5: Basement Excavation & Interim Remedial Measure

Haley & Aldrich will oversee, screen, and document the excavation of oily material and oil-impacted soil beneath the basement slab.

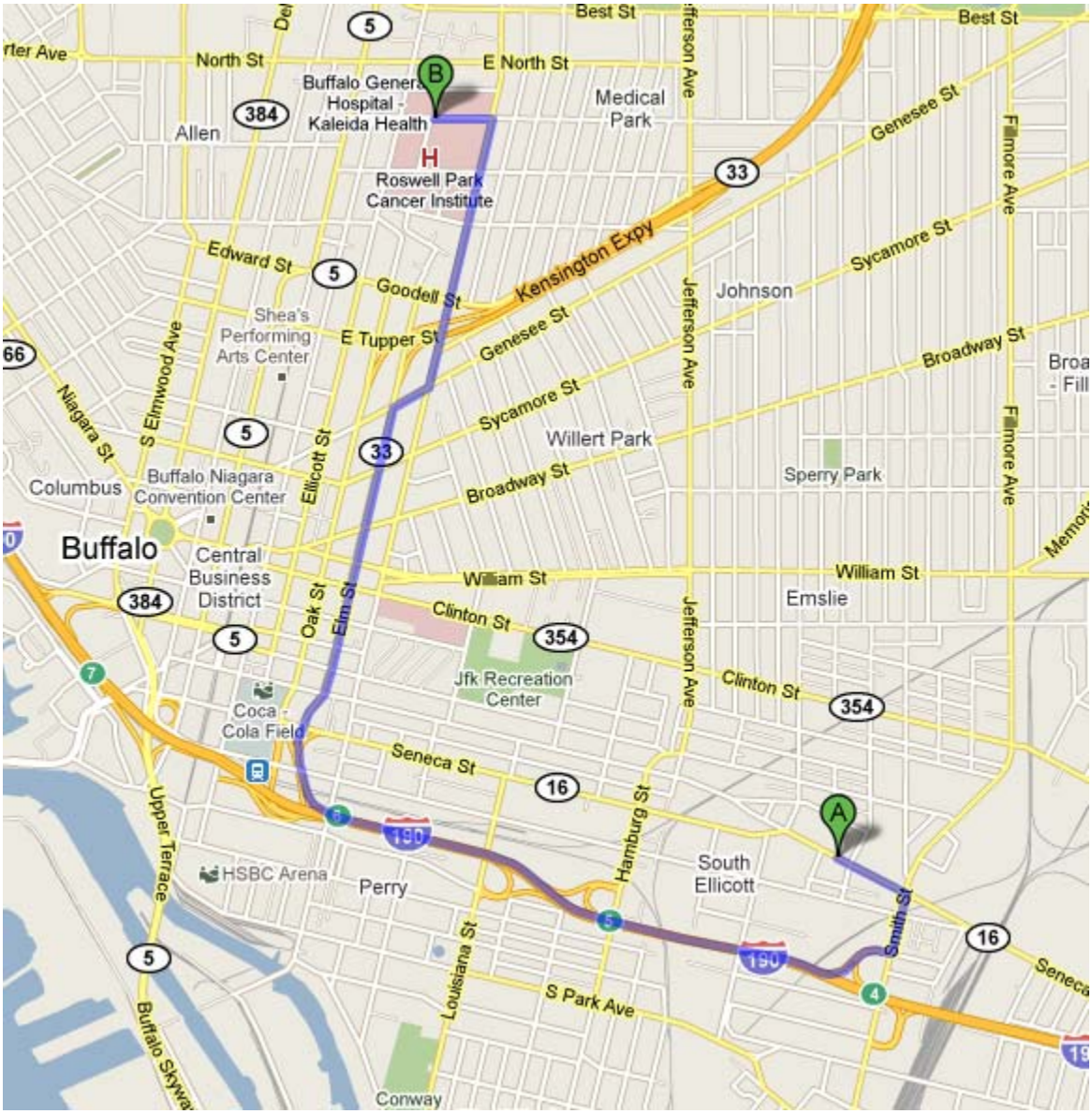
Subcontractor(s) to be involved in on-site activities:

Firm Name	Work Activity
Ontario Specialty Contracting	Slab and subsurface feature removal and test pitting. Basement Excavation
Nature's Way	Soil boring and monitoring well installation.

Projected Start Date: October 2011
Projected Completion Date: TBD

Estimated Number of Days to Complete Field Work: 1 to 2 Months

Directions to the Nearest Hospital:



A **822 Seneca St**
Buffalo, NY 14210

1. Head **southeast** on **Seneca St** toward **Lord St**

0.2 mi

2. Take the 2nd right onto **Smith St**

0.1 mi

3. Turn right to merge onto **I-190 N** toward **Niagara Falls**

1.4 mi

4. Take exit **6** toward **Elm St**

0.2 mi

5. Slight right at **Carroll St/Center St/Elm St**

0.8 mi

6. Turn right at **Genesee St**

0.1 mi

7. Take the 1st left onto **Michigan Ave**

0.6 mi

8. Turn left at **High St**

0.1 mi

B **Kaleida Health-Buffalo General Division**
100 High Street
Buffalo, NY 14203

2. SITE DESCRIPTION

Site Classification:

☑ Industrial	☐ Commercial	✓ Vacant

General Description:

The Site is located at 822 Seneca Street in the City of Buffalo, Erie County, New York. The Site is identified on the City of Buffalo tax maps as the parcel with section 122.27, block 1, lot 4, and is approximately 2.91 acres. The Site is located on the west side of Lord Street and bound to the north by Seymour Street and the south by Seneca Street, and is approximately one mile north of the Buffalo River.

AmeriPride Services, Inc. has owned this property since approximately 1978 (formerly as American Linen Supply Company), and since 2005, the Site has been unoccupied. The site was most recently used as an industrial dry cleaner/launderer. The parcel is currently developed with a vacant industrial building. The Site is located in an urban area of mixed industrial, commercial land use. The Site is currently zoned for light industrial use.

Background and Historic Site Usage:

According to a Phase I Environmental Site Assessment Report by C.T. Male Associates, P.C., dated December 2004, the Site building was first developed in 1910. Prior to 1910, the Site is indicated to have been occupied by residential and commercial properties. Between 1910 and 1978, the Site appeared to be used as a book binding and printing facility.

Coverall Service and Supply Co., (Coverall) a uniform cleaning facility, reportedly first occupied the Site in 1978. The facility was used for dry cleaning operations until 1985. Available records indicate that dry-cleaning with tetrachloroethylene (PCE) was conducted at the Site between 1978 and 1985; use and/or storage of PCE were not reported after 1985. The laundry operations occupied the first floor of the Site building as well as portions of the basement. Thorner Sydney Press occupied the second floor of the Site building as well as portions of the basement until 1997. According to a purchase agreement dated 1977, Thorner Sydney Press' lease agreement was initiated in 1965.

In April 2004, operations ceased at the Site building, and it has been vacant since.

Phase II investigations conducted in 2005 and 2006 by ENSR International indicate that the Site is currently impacted by chlorinated solvent in groundwater and polycyclic aromatic hydrocarbons (PAHs) as part of historic urban fill. Additionally, due to historical underground petroleum storage, there is a potential for subsurface petroleum impacts.

Project Scope:

A Remedial Investigation Work Plan has been developed as part of the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP). The purpose of the Work Plan is:

1. To define the nature and extent of contamination on the Site.
2. To identify if residual contaminant source areas are present on the Site.
3. To determine whether remedial action is needed to protect human health and the environment.
4. To produce data of sufficient quantity and quality to support the remediation of the Site, if warranted.

The project scope includes:

1. Slab and subsurface feature removal monitoring
2. Field explorations (soil borings, test pits, and monitoring well & soil vapor point installations).
3. Groundwater sampling
4. Soil vapor sampling

Overview of Hazards:

Potential hazards include the following:

- Drilling hazards
- Excavations (hazards from heavy equipment and falling)
- Extreme weather
- Heavy equipment
- Utilities
- Fumes & Dust
- Chemical hazards from onsite contamination
- Noise
- Indoor drilling hazards

Site Status: Indicate current activity status and describe operations at the site.

☐ Active	✓ Inactive
☐ Partially active	☐ Other

Site Plan:

Is a site plan or sketch available? YES

Work Areas:

List/identify each specific work area(s) on the job site and indicate its location(s) on the site plan:

1. AOC-1: Located on the western side of the Site near the former Gasoline UST.

2. AOC-2/AOC-3: Located on the southern portion of the Site near former underground storage tanks and near a former catch basin.

3. AOC-4: Located on the southeastern side of the site in the vicinity of the former dry cleaning operations.

4. Fill Characterization Area: The northern half of the Site.

3. PROJECT TASK BREAKDOWN

List and describe each distinct work task below.

Task No.	Detailed Task Description	Employee(s)	Work Date(s) or Duration
1	Slab and Subsurface Feature Removal Oversight	TBD	1 to 2 Months
2	Soil Boring/Test Pit/Monitoring Well/Soil Vapor Point Installation	TBD	3 Weeks
3	Groundwater Monitoring/Sampling	TBD	2 Days
4	Soil Vapor Sampling	TBD	1 Day
5	Basement Excavation & Interim Remedial Measure	TBD	1 Week

4. HAZARD ASSESSMENT

Material Safety Data Sheets (MSDS) of hazardous materials used during the execution of work shall be available on site. MSDSs are required for chemicals used to prepare samples, calibration gases, etc. MSDSs are not required for waste materials.

Chemical Hazards:

Does chemical analysis data indicate that the site is contaminated? YES

Indicate the potential physical state of the hazardous materials at the site.

- ✓ Gas/Vapor
- ☐ Sludge
- ✓ Liquid
- ✓ Solid

Indicate the anticipated or actual class of compounds at the site.

- ☐ Asbestos
- ☐ Inorganics
- ✓ BTEX
- ☐ Pesticides
- ✓ Chlorinated Solvents
- ✓ Petroleum Products
- ☐ Heavy Metals
- ✓ PAHs, PCBs

Impacted Environments:

Indicate media in which contamination is expected.

- ✓ Air
- ✓ Groundwater
- ✓ Soil
- ☐ Sediment
- ☐ Surface water
- ☐ Other Specify

Estimated concentrations:

Indicate medium of major chemicals expected to be encountered by onsite personnel.

Work Activity	Media	Chemical	Anticipated Concentration
Excavation/Subsurface Feature Removal Oversight	SO	Chlorinated VOCs	ND – 100 ppm
		PAHs	ND – 150 ppm
		Petroleum VOCs	Unknown
		PCBs	ND – 3 ppm
	GW	Chlorinated VOCs	ND – 200 ppb
		Petroleum VOCs	Unknown
	A	VOCs	Unknown
Field Explorations	SO	Chlorinated VOCs	ND – 100 ppm
		PAHs	ND – 150 ppm
		Petroleum VOCs	Unknown
		PCBs	ND – 3 ppm
	GW	Chlorinated VOCs	ND – 200 ppb
		Petroleum VOCs	Unknown
	A	VOCs	Unknown
Groundwater Sampling	G W	Chlorinated VOCs	ND – 200 ppb
		Petroleum VOCs	Unknown
Soil Vapor Sampling	A	VOCs	Unknown
Basement Excavation	SO	Petroleum VOCs/SVOCs	ND – 500 ppb
		PCBs	ND – 10 ppm
	A	Petroleum VOCs	Unknown

(Media key: A = Air; GW = Groundwater; SW = Surface Water; SO = Soil; SE = Sediment)

Chemicals of Concern:

Trichloroethylene (TCE) is a colorless, nonflammable, non-corrosive liquid has a “sweet” odor characteristic of some chlorinated hydrocarbons.

The compound is incompatible with strong caustics, it reacts with aluminum when acidic, and it is incompatible with active metals - barium, lithium, sodium, magnesium, and titanium. Decomposition of TCE, due to contact with hot metal or ultraviolet radiation, forms products including chlorine gas, hydrogen chloride, and phosgene. Dichloroacetylene may be formed from the reaction of alkali with TCE.

The Cal-OSHA PEL for TCE is 25 PPM as an 8-hour TWA; an acceptable ceiling concentration of 300 PPM; and a STEL of 200 PPM. The OSHA PEL for TCE is 100 ppm as an 8-hour TWA; an acceptable ceiling concentration of 200 ppm; and an acceptable maximum peak ceiling of 300 ppm for no more than 5 minutes in any 2-hour period. The standard routes of entry in the body are through inhalation, percutaneous absorption, ingestion, skin and eye contact. The points of attack are the respiratory system, heart, liver, kidneys, central nervous system and skin.

Exposure to TCE vapor may cause irritation of the eyes, nose, and throat. The liquid, if splashed in the eyes, may cause burning irritation and damage. Repeated or prolonged shin contact with the liquid may cause dermatitis. Acute exposure to TCE depresses the central nervous system exhibiting such symptoms as headache, dizziness, vertigo, tremors, nausea and vomiting, irregular heart beat, sleepiness, fatigue, blurred vision, and intoxication similar to that of alcohol. Unconsciousness and death have been reported. Alcohol may make the symptoms of TCE overexposure worse. If alcohol has been consumed, the overexposed worker may become flushed. TCE addiction and peripheral neuropathy have been reported.

Tetrachloethylene (PCE)

Tetrachloroethylene (PCE) is a colorless, nonflammable liquid with a mild, chloroform-like odor.

PCE is incompatible with strong oxidizers and metals such as lithium, beryllium and barium, caustic soda, sodium hydroxide, and potash. Decomposition of PCE, due to fire, forms products including hydrogen chloride, and phosgene.

The OSHA PEL for PCE is 100 ppm as an 8-hour TWA; an acceptable ceiling concentration of 200 ppm; and an acceptable maximum peak ceiling of 300 ppm for no more than 5 minutes in any 3-hour period. The standard routes of entry in the body are through inhalation, percutaneous absorption, ingestion, skin and eye contact. The points of attack are the respiratory system, heart, liver, kidneys, central nervous system, eyes, and skin.

Symptoms that may occur as a result of exposure to PCE include irritation to the eyes, skin, nose, and throat; respiratory system distress; nausea; flushed face and neck; incoordination; headache; drowsiness; skin erythema; and liver damage.

1,1 and 1,2-Dichloroethylene (1,1-DCE; 1,2-DCE)

1,1 and 1,2-Dichloroethylene (1,1-DCE; 1,2-DCE) is a colorless, class IB flammable liquid with a slightly acrid, chloroform-like odor.

1,1 and 1,2-DCE is incompatible with strong oxidizers, strong alkalis, potassium hydroxide, and metals such as copper, and contains inhibitors to prevent polymerization.

The OSHA PEL for 1,2-DCE is 200 ppm as an 8-hour TWA. There is no OSHA PEL for 1,1-DCE. The 8-hour TWA for 1,1-DCE is 1.0 ppm. The standard routes of entry in the body are through inhalation, ingestion, skin and eye contact. The points of attack are the respiratory system, central nervous system, and eyes.

Symptoms that may occur as a result of exposure to 1,1 and 1,2-DCE include irritation to the eyes; respiratory system distress; central nervous system depression.

Vinyl Chloride (VC)

Vinyl Chloride (VC) is a colorless, liquid or flammable gas with a pleasant odor at high concentrations.

VC is incompatible with oxidizers, peroxides, and metals such as copper, aluminum, iron and steel. VC polymerizes in air, sunlight, or heat unless it is stabilized by inhibitors such as phenol. It attacks iron and steel in the presence of moisture.

The OSHA PEL for VC is 1 ppm as am 8-hour TWA, and an acceptable ceiling of 5 ppm in a 15 minute period. The standard routes of entry in the body are through inhalation, skin and eye contact. The points of attack are the respiratory system, central nervous system, liver, blood, and lymphatic system.

Symptoms that may occur as a result of exposure to VC include weakness and exhaustion; abdominal pain; gastrointestinal bleeding; enlarged liver; and pallor or cyanosis of the extremities. Liquid VC can cause frostbite. VC can also cause liver cancer.

PAHs

Polycyclic aromatic hydrocarbons (PAHs) are a group of over 100 different chemicals that are formed during the incomplete burning of coal, oil and gas, garbage, or other organic substances like tobacco or charbroiled meat. PAHs are usually found as a mixture containing two or more of these compounds, such as soot.

Some PAHs are manufactured. These pure PAHs usually exist as colorless, white, or pale yellow-green solids. PAHs are found in coal tar, crude oil, creosote, and roofing tar, but a few are used in medicines or to make dyes, plastics, and pesticides.

PAHs, as a group, are strongly hydrophobic, and therefore sorb to organic-based soil particles. Exposures to elevated levels of PAHs in the workplace could occur in coking, coal-tar, and asphalt production plants; smokehouses; and municipal trash incineration facilities.

Sorption of PAHs to soil and sediments increases with increasing organic carbon content and with increasing surface area of the sorbent particles. Lower molecular weight PAHs may also volatilize from soil. Due to this strong sorption to soil, PAHs do not tend to dissolve easily into and migrate with groundwater. Exposure from affected soil would tend to occur as a result of direct contact with affected soil or inhalation/ingestion of windborne affected soil.

BTEX

BTEX is the common abbreviation for benzene, toluene, ethyl benzene and xylene. OSHA has set permissible exposure limits for all of these contaminants that may be found at this worksite during your work activity. The levels that are set are based on an 8-hour time weighted average. Below are those values-

Benzene	1 ppm / 8 TWA
Toluene	200 ppm / 8 TWA
Ethyl Benzene	100 ppm / 8 TWA
Xylene	100 ppm / 8 TWA

PCBs

Polychlorinated biphenyls are mixtures of up to 209 individual chlorinated compounds (known as congeners). There are no known natural sources of PCBs. PCBs are either oily liquids or solids that are colorless to light yellow. Some PCBs can exist as a vapor in air. PCBs have no known smell or taste. Many commercial PCB mixtures are known in the U.S. by the trade name Aroclor. PCBs have been used as coolants and lubricants in transformers, capacitors, and other electrical equipment because they don't burn easily and are good insulators. The manufacture of PCBs was stopped in the U.S. in 1977 because of evidence they build up in the environment and can cause harmful health effects. Products made before 1977 that may contain PCBs include old fluorescent lighting fixtures and electrical devices containing PCB capacitors, and old microscope and hydraulic oils. PCBs do not tend to dissolve easily into and migrate with groundwater. Exposure from affected soil or sludge would tend to occur as a result of direct contact with affected material or inhalation/ingestion of windborne affected soil.

TABLE 1
OCCUPATIONAL EXPOSURE LIMITS (CONCENTRATIONS IN AIR)

(CIRCLE CONTAMINANTS OF CONCERN, WRITE ADDITIONAL CONTAMINANTS AND EXPOSURE ON LAST PAGE)

CHEMICAL	ROUTES OF EXPOSURE	IDLH	Ceiling	STEL	PEL	TLV	REL	PID (IP eV)	FID	ODOR THRES-HOLD	IRRITATION THRESHOLD	ODOR DESCRIPTION
VAPORS & GASES												
Acetone	R, I, C	2500	-	750 [ACGIH]	1000	500	250	9.69	60	13	-	fragrent, mint-like
Ammonia	R, I, C	300	-	35 [NIOSH, ACGIH]	50	25	25	10.18**	-	0.5-2	10	Pungent suffocating odor
Benzene	R,A,I,C	Ca [500]	-	1 [NIOSH]; 2.5 [ACGIH]	1	0.5	0.1	9.24	150	4.68	-	Solvent, aromatic
Carbon tetrachloride (Tetrachloromethane)	R,A,I,C	Ca [200]	25 [instantaneous] 200 [5 min peak in any 4 hrs]	2 [NIOSH, 60-min]; 10 [ACGIH]	2	5	Ca	11.47**	10	50	-	Sweet, pungent, ether-like
Chlorobenzene	R,I,C	1000	-	-	75	10	-	9.07	200	0.68	-	Almond-like
Chloroform	R,I,C	Ca [500]	50 [OSHA]	2 [NIOSH, 60-min]	-	10	-	11.42**	65	50	-	Sweet, pleasant
o-Dichlorobenzene	R,A,I,C	200	50 [NIOSH, OSHA]	50 [ACGIH]	-	25	-	9.06	50	0.3	E 20-30	Pleasant, aromatic
p-Dichlorobenzene	R,A,I,C	Ca [150]	-	-	75	10	Ca	8.98	-	0.18	E 80-160	Distinct, aromatic, mothball-like
Dichlorodifluoromethane (Freon 12)	R,C	15000	-	-	1000	1000	1000	11.75**	15	-	-	Ether-like when at very high concs.
1,1-Dichloroethane	R,I,C	3000	-	-	100	100	100	11.06**	80	200	-	Distinct, chloroform-like
1,2-Dichloroethane (Ethylene dichloride)	R,I,A,C	Ca [50]	100 [OSHA]	2 ppm [NIOSH]; 200 ppm [OSHA, 5-min max peak in any 3 hours]	50	10	1	11.05**	80	88	-	Chloroform-like
1,1-Dichloroethylene (1,1-DCE, Vinylidene chloride)	R,A,I,C	Ca [ND]	-	-	-	5	Ca	10.00**	40	190	-	Chloroform-like
1,2-Dichloroethylene	R,I,C	1000	-	-	200	200	200	9.65	50	0.85	-	Bitter, chloroform-like
Ethanol	R,I,C	3300	-	-	1000	1000	1000	10.47**	25	10	-	Weak, ether-like, wine-like
Ethylbenzene	R,I,C	800	-	125 [NIOSH; ACGIH]	100	100	100	8.76	100	2.3	E 200	Aromatic
Ethylene Glycol	R,I,C	ND	50 [OSHA]; 100 mg/m^3 [ACGIH]	-	-	-	-	-	-	-	-	Odorless
Formaldehyde	I,C	Ca [20]	0.1 [NIOSH, 15-min]; 0.3 [ACGIH]	2	0.75	-	Ca [0.016]	10.88**	-	0.83	-	Pungent, suffocating
Gasoline	R,I,A,C	Ca [ND]	-	500 [OSHA; ACGIH]	300	300	-	-	-	-	E 0.5	Petroleum-like
n-Hexane	R,I,C	1100	-	-	500	50	50	10.18	70	130	E.T 1400-1500	Gasoline-like
Hydrogen Cyanide	R,A,I,C	50	4.7 [ACGIH; Skin]	4.7 [NIOSH - skin]	10 [skin]		-	-	-	0.58	-	Bitter almond
Hydrogen peroxide	R,I,C	75	-	-	1	1	1	10.54**	-	-	-	Sharp
Methanol	R,I,A,C	6000	-	250 [NIOSH; ACGIH; skin]	200	200 [skin]	200	10.84**	12	1000	-	Pungent
Methyl Ethyl Ketone Peroxide	R,I,C	ND	0.2 [NIOSH; ACGIH] 0.7 [OSHA]	-	-	-	-	-	-	-	-	Characteristic odor
Methyl Chloroform (1,1,1-TCA)	R,I,C	700	350 [NIOSH, 15-min]	450 [ACGIH]	350	350	Ca	11.00**	105	20-100	-	Chloroform-like
Methylene Chloride (Dichloromethane, Methylene dichloride)	R,I,A,C	Ca [2300]	-	125	25	50	Ca	11.32**	100	25-50	E 5000	Chloroform-like
Methyl Mercaptan	R,C	150	10 [OSHA] 0.5 [NIOSH, 15-min]	-	-	0.5	-	9.44	-	-	-	Garlic, rotten cabbage
MIBK (Hexone)	R,I,C	500	-	75 [NIOSH; ACGIH]	100	50	50	9.30	-	-	-	Pleasant
Naptha (coal tar)	R,I,C	1000	-	-	100	400	100	-	-	-	-	Aromatic
Naphthalene	R,A,I,C	250	-	15 [NIOSH; ACGIH]	10	10	10	8.12	-	0.3	E 15	Mothball-like
Octane	R,I,C	1000	385 [NIOSH, 15-min]	-	500	300	75	9.82	80	48	-	Gasoline-like
Pentachlorophenol	R,A,I,C	2.5 mg/m^3	-	-	0.5 mg/m^3 [skin]	0.5 mg/m^3 [skin]	0.5 mg/m^3 [skin]	-	-	-	-	Pungent when hot, benzene-like
Phenol	R,A,I,C	250	15.6 [NIOSH, 15-min]	-	5 [skin]	5 [skin]	5 [skin]	8.50	-	0.04	E.N.T. 68	Sweet, acrid
Propane	R,C	2100	-	-	1000	1000	1000	11.07**	80	1600	-	Odorless (commonly smells foul due to additive for odor detection)
Stoddard Solvent (Mineral Sprits)	R,Cl,I	20000 mg/m^3	1800 mg/m^3 [NIOSH, 15-min]	-	500	100	350 mg/m^3	-	-	1	E 400	Kerosene-like
Styrene	R,I,A,C	700	200 [OSHA]	100 [NIOSH]; 600 [OSHA, 5-min max peak in any 3 hours]; 40 [ACGIH]	100	20	50	8.40	85	0.047	E 200-400	Sweet, floral
1,1,2,2-Tetrachloroethane	R,I,A,C	Ca [100]	-	-	5 [skin]	1 [skin]	1 [skin]	11.10**	100	1.5	-	Pungent, chloroform-like
Tetrachloroethylene (Perchloroethylene, Perc, PCE)	R,I,A,C	Ca [150]	200 [OSHA]	300 [OSHA, 5-min max peak in any 3-hours]; 100 [ACGIH]	100	25	Ca	9.32	70	4.68	N.T513-690	Chloroform-like
Toluene	R,A,I,C	500	300 [OSHA]	150 [NIOSH]; 500 [OSHA, 10-min max peak]	200	50	100	8.82	110	2.14	E300-400	Sweet, pungent, benzene-like
Trichloroethylene (TCE)	R,I,A,C	Ca [1000]	200 [OSHA]	300 [OSHA, 5-min max peak in any 2-hours]; 100 [ACGIH]	100	50	Ca	9.45	70	21.4	-	Chloroform-like
1,2,3-Trimethylbenzene	R,I,C	ND	-	-	-	-	25	8.48	-	-	-	Distinctive, aromatic
1,2,4-Trimethylbenzene	R,I,C	ND	-	-	-	-	25	8.27	-	-	-	Distinctive, aromatic
1,3,5-Trimethylbenzene	R,I,C	ND	-	-	-	-	25	8.39	-	-	-	Distinctive, aromatic
Turpentine	R,A,I,C	800	-	-	100	20	100	-	-	200	E.N 200	Pine-like
Vinyl Chloride	R,C	Ca [ND]	5 [OSHA, 15-min]	-	1	1	Ca	9.99	-	3000	-	Pleasant odor at high concs.
Xylenes	R,A,I,C	900	-	150 [NIOSH, ACGIH]	100	100	100	8.56 (m- and o-) 8.44 (p-)	111/116	1.1	E.N.T. 200	Aromatic

TABLE 1
OCCUPATIONAL EXPOSURE LIMITS (CONCENTRATIONS IN AIR)

(CIRCLE CONTAMINANTS OF CONCERN, WRITE ADDITIONAL CONTAMINANTS AND EXPOSURE ON LAST PAGE)

CHEMICAL	ROUTES OF EXPOSURE	IDLH	Ceiling	STEL	PEL	TLV	REL	PID (IP eV)	FID	ODOR THRES-HOLD	IRRITATION THRESHOLD	ODOR DESCRIPTION
DUSTS, MISTS, FUMES, AND MISCELLANEOUS COMPOUNDS												
Asbestos	R	Ca (ND)	-	-	0.1 fiber/cc	0.1 fiber/cc	0.1 fiber/cc	-	-	-	-	-
PCBs-42% Chlorine	R,A,I,C	Ca [5 mg/m^3]	-	-	1 mg/m^3 [skin]	1 mg/m^3 [skin]	0.001 mg/m^3	-	-	-	-	Mild, hydrocarbon
PCBs-54% Chlorine	R,A,I,C	Ca [5 mg/m^3]	-	-	0.5 mg/m^3 [skin]	0.5 mg/m^3 [skin]	0.001 mg/m^3	-	-	-	-	Mild, hydrocarbon
Aluminum - metal dust	R,C	ND	-	-	15 mg/m^3 (total); 5 mg/m^3 (respirable)	10 mg/m^3	10 mg/m^3 (total), 5 mg/m^3 (respirable)	-	-	-	-	-
Aluminum - soluble salts	R,I,C	ND	-	-	2 mg/m^3	2 mg/m^3	2 mg/m^3	-	-	-	-	-
Arsenic- inorganic	R,A,I,C	Ca [5 mg/m^3]	0.002 mg/m^3 [NIOSH, 15-min]	-	0.01 mg/m^3	0.01 mg/m^3	Ca	-	-	-	-	-
Barium:soluble compounds	R,I,C	50 mg/m^3	-	-	0.5 mg/m^3	0.5 mg/m^3	0.5 mg/m^3	-	-	-	-	-
Beryllium	R,C	Ca [4 mg/m^3]	0.005 mg/m^3 [OSHA]; 0.025 mg/m^3 [OSHA, 30-min max peak]; 0.0005 mg/m^3	0.01 mg/m^3 [ACGIH]	0.002 mg/m^3	0.002 mg/m^3	Ca	-	-	-	-	-
Cadmium dusts	R,I	Ca [9 mg/m^3]	-	-	0.005 mg/m^3	0.01 mg/m^3	Ca	-	-	-	-	-
Chromates (Cr(VI) Compounds) & Chromic Acid	R,I,C	Ca [15 mg/m^3]	0.1 mg/m^3 [OSHA]	-	0.001 mg/m^3	0.05 mg/m^3 [water soluble]; 0.01 mg/m^3 [insoluble]	Ca	-	-	-	-	-
Chromium (III) Compounds	R,I,C	25 mg/m^3	-	-	0.5 mg/m^3	0.5 mg/m^3	0.5 mg/m^3	-	-	-	-	-
Chromium Metal	R,I,C	250 mg/m^3	-	-	1 mg/m^3	0.5 mg/m^3	0.5 mg/m^3	-	-	-	-	-
Copper - dust & mist	R,I,C	100 mg/m^3	-	-	1 mg/m^3	1 mg/m^3	1 mg/m^3	-	-	-	-	-
Lead	R,I,C	100 mg/m^3	-	-	0.050 mg/m^3	0.05 mg/m^3	0.050 mg/m^3	-	-	-	-	-
Manganese (compounds and fume)	R,I	500 mg/m^3	5 mg/m^3 [OSHA]	3 mg/m^3 [NIOSH]	-	0.2 mg/m^3	1 mg/m^3	-	-	-	-	-
Mercury & Inorganic Mercury Compounds	R,I,A,C	10 mg/m^3	0.1 mg/m^3 [NIOSH, Skin]; 0.1 mg/m^3 [OSHA]	-	-	0.025 mg/m^3	0.05 mg/m^3 [skin]	-	-	-	-	-
Organo-Mercury Compounds	R,A,I,C	2 mg/m^3	0.04 mg/m^3 [OSHA]	0.03 mg/m^3 [NIOSH]	0.01 mg/m^3	0.01 mg/m^3 [alkyl]; 0.1 mg/m^3 [aryl compound]	0.01 mg/m^3	-	-	-	-	-
Nickel (metal and compounds)	R,I,C	Ca [10 mg/m^3]	-	-	1 mg/m^3	1.5 mg/m^3 [metal]; 1 mg/m^3 [soluble inorganic compounds]; 1 mg/m^3 [insoluble	0.015 mg/m^3	-	-	-	-	-
Particulate (Not otherwise regulated)	R, C	ND	-	-	15 mg/m^3 (total); 5 mg/m^3 (respirable)	10 mg/m^3 (inhalable); 3 mg/m^3 (respirable)	-	-	-	-	-	-
Portland cement	R,I,C	5000 mg/m^3	-	-	50 mppcf	10 mg/m^3	10 mg/m^3 (total); 5 mg/m^3 (respirable)	-	-	-	-	-
Selenium compounds	R,I,C	1 mg/m^3	-	-	0.2 mg/m^3	0.2 mg/m^3	0.2 mg/m^3	-	-	-	-	-
Silica, crystalline	R, C	Ca [25 mg/m^3 (cristobalite, tridymite); 50 mg/m^3 (quartz, tripoli)]	-	-	Dependent on silicon dioxide content of silica (see Appendix C of the NIOSH Pocket Guide to Chemical Hazards, 2005)	Dependent on minerology [see ACGIH 2005 TLVs and BEIs Handbook]	0.05 mg/m^3	-	-	-	-	-
Silver (metal and soluble compounds)	R,I,C	10 mg/m^3	-	-	0.01 mg/m^3	0.1 mg/m^3	0.01 mg/m^3	-	-	-	-	-
Thallium, soluble	R,A,I,C	15 mg/m^3	-	-	0.1 mg/m^3 [skin]	0.1 mg/m^3 [skin]	0.1 mg/m^3 [skin]	-	-	-	-	-
Tin (metal)	R,C	100 mg/m^3	-	-	2 mg/m^3	2	2 mg/m^3	-	-	-	-	-
Tin (organic compounds)	R,A,I,C	25 mg/m^3	-	-	0.1 mg/m^3	0.1 mg/m^3 [skin]	0.1 mg/m^3 [skin]	-	-	-	-	-
Zinc oxide dust & fume	R	500 mg/m^3	15 mg/m^3 [NIOSH, dust]	10 mg/m^3 [NIOSH; ACGIH, fume]	15 mg/m^3 (total dust), 5 mg/m^3 [respirable dust]; 5 mg/m^3 [fume]	2 mg/m^3 [respirable]	5 mg/m^3 (total dust), 5 mg/m^3 [fume]	-	-	-	-	-

NOTES & ABBREVIATIONS:

All units in parts per million (ppm) unless otherwise noted.

R = Respiratory (Inhalation)

I = Ingestion

A = Skin Absorption

C = Skin Contact

-: Not available

ND: Not detectable.

Ca = Carcinogen

** = Use 11.7 eV lamp

IP: Ionization potential

eV: Electrovolts

IDLH: Immediately dangerous to life and health

Ceiling: Highest allowable instantaneous C = Skin and/or Eye Contact

STEL: Short-term exposure limit. Exposure period is 15 minutes unless otherwise indicated

PEL: OSHA Permissible Exposure Limit (legally-enforceable)

REL: NIOSH Recommended Exposure Limit

PID: Photoionization Detector

OSHA: United States Occupational Safety and Health Administration

NIOSH: National Institute of Occupational Safety and Health

TLV: ACGIH Threshold Limit Value

ACGIH: American Conference of Governmental Industrial Hygienists

Physical Hazards:

Indicate all hazards that may be present for each task. If any of these potential hazards are checked, it is the project manager's responsibility to determine how to eliminate/minimize the hazard to protect onsite personnel.

Copy and paste a checkmark "✓"into appropriate boxes.

Physical Hazard Checklist					
Potential Job Hazards	**Task 1** Excavation Monitoring	**Task 2** Subsurface Exploration	**Task 3** GW Sampling	**Task 4** Soil Vapor Sampling	**Task 5** Basement Excavation
Confined space entry*					
Underground utilities	✓	✓			
Overhead utilities	✓	✓			
Electrical hazards					
Excavations greater than 4' depth	✓				
Open excavation fall hazards	✓				
Heavy equipment	✓	✓			✓
Drilling hazards		✓			
Noise (above 85 dBA)	✓	✓			✓
Traffic concerns					
Extreme weather conditions	✓	✓	✓	✓	✓
Rough terrain for drilling equipment					
Buried drums					
Heavy lifting (more than 50 lbs)			✓	✓	
High risk fire hazard					
Poisonous insects or plants					
Water hazards					
Use of a boat					
Lockout/Tagout requirements					
Other: Chemical Exposure	✓	✓	✓	✓	✓

***CONFINED SPACE ENTRY REQUIRES SPECIAL PROCEDURES, PERMITS AND TRAINING AND MUST BE APPROVED BY THE CORPORATE HEALTH & SAFETY MANAGER.**

Potential Activity Hazards and Hazard Controls:

Copy and paste a checkmark "✓" adjacent to potential activity hazards and relevant hazard controls.

POTENTIAL ACTIVITY HAZARDS

Abrasions and Cuts ✓
Access
Asphyxiation
Bacteria
Biological Hazards
Bloodborne Pathogens
Cave Ins
Chemical/Thermal Burns
Chemicals✓
Cold Stress✓
Compressed Gases
Confined Spaces
Congestion
Defective Equipment
Dermatitis
Dropping Materials/Tools to Lower Levels
Drowning or Flowing Water
Electrical Shock
Energized Equipment
Equipment Misuse ✓
Ergonomics
Excavations ✓
Explosions
Fatigue
Fire
Flammability
Flying debris ✓
Foreign Body in Eye ✓
Frostbite/Cold ✓
Fueling and Fuel Storage ✓
Fugitive Dust ✓
Fumes ✓
Generated Wastes ✓
Guards removed
Hazardous Materials ✓
Heat Stress (cramps, exhaustion, stroke)
Heavy Equipment Operation ✓
Heavy Equipment/Stability ✓
Heavy Lifting ✓
High crime area (violence)
High Winds
Hoists, Rigging, Slings, Cables
Housekeeping – Improper ✓
Illumination - Poor
Impact ✓
Inability to Maintain Communication
Inclement Weather ✓
Inclines
Insects/Reptiles
Mold
Moving Equipment, Conveyors or Vehicles ✓
Muddy Site Conditions
New Personnel
Noise ✓
Odor ✓
Overhead Utilities ✓
Overhead Work ✓
Overloaded Equipment
Oxygen deficiency
Pinch Points ✓
Poisonous Plants
Pressure
Pressurized Lines
Radiation
Repetitive Motion ✓
Rigging - Improper ✓
Sharp Objects ✓
Silicosis
Slips, Trips, and Falls ✓
Sprains and Strains ✓
Steam
Sunburn ✓
Surface Water Run-off
Toxicity ✓
Traffic
Underground Utilities ✓
Uneven Terrain
Unsafe Atmosphere
Vibration
Visibility - Poor
Visitors Known/Unknown ✓
VOC Emissions ✓
Weight ✓
Work at Depth
Work at Heights
Work over Water
Working on Ice

HAZARD CONTROLS

Air Monitoring ✓
Appropriate Clothing/Monitoring Of Weather ✓
Appropriate Labels/Signage ✓
Barricades/Fencing/Silt Fencing ✓
Buddy System - Attendant
Chock Blocks ✓
Confined Space Procedures
Decontamination Procedures✓
Derived Waste Management Plan
Drinking Water/Fluids
Dust Abatement Measures ✓
Emergency Action Plan Procedures
Equipment Inspection
Equipment Manuals/Training✓
Exclusion/Work Zones ✓
Exhaust Ventilation ✓
Eye Protection ✓
Fall Protection
Fire Extinguisher ✓
Flotation Devices/Lifelines
Gloves ✓
Ground Fault Interrupter
Grounded Hydraulic Attachments
Grounded Equipment/Tanks
Hand Signal Communication
Hard Hat ✓
Hazardous/Flammable Material Storage
Hearing Protection ✓
High Visibility Safety Vest ✓
Hoses, Access to Water
Hotwork Procedures
Isolation of Energy Sources(Lockout/Tagout)
Machine/Equipment Guards
Manual Lifting Equipment
Police Detail
Proper Lifting Techniques ✓
Proper Tool for Job ✓
Proper Work Position/Tools
Protective Equipment ✓
Radio Communication
Respirator, (Specify Type) ✓
Safety Harness /Lanyard/Scaffold
Security Escort
Sloping, Shoring, Trench Box
Spill Prevention Measures
Spill Kits
Stormwater Control
Traffic Controls
Procedures/Methods
Vehicle Inspection
Visitor Orientation Escort✓
Window Cleaning/Defrost

Safety Meetings

All H&A personnel visiting the site will be given an orientation safety meeting and are required to read and sign this HASP. Daily safety meetings will be conducted onsite and documented on a Health & Safety Tailgate Meeting Form.

Utility Locators and Underground Hazards

Prior to drilling or excavating, Haley & Aldrich staff members will ensure that permission has been gained from the property owner to access the property. Contact site facilities personnel to assist with location of underground utilities. Before marking any proposed exploration location, it is critical that all readily available information on underground utilities and structures be obtained. The estimated location of utility installations, such as gas, electric, fuel, steam, sewer, telephone, fiber optic, water, drainage or any other underground installation that may be expected to be encountered during drilling work, will be identified with the appropriate authority. Appropriate authorities include client representatives, utility companies, nonprofit organizations (e.g., "Dig-Safe), and others.

Heavy Equipment

Staff Members must be especially careful and alert when working with contractors who use heavy equipment, since equipment failure or breakage can lead to accidents and worker injury. Cranes and equipment for drilling, pile driving, test pitting and coring is of special concern. Should these devices fail during operation the likelihood of worker injury is high. Equipment of this nature should be visually inspected and checked for proper working order prior to the commencement of field work. Those that operate heavy equipment must meet all of the requirements to operate heavy equipment. Haley & Aldrich, Inc. staff members that supervise projects or are associated with such high risk projects that involve digging should use due diligence when working with a construction firm. Maintain visual contact with operators at all times and keep out of the strike zone whenever possible. Always approach heavy equipment with an awareness of the swing radius and traffic routes of each piece of equipment and never go beneath a hoisted load. High-visibility safety vests must be worn onsite at all times. Avoid fumes created by heavy equipment exhaust.

Noise Reduction

Site activities in proximity to heavy equipment often expose workers to excessive noise. It is anticipated that situations may arise when noise levels may exceed the OSHA Action Level of 85 dBA in an 8-hour time-weighted average (TWA). An example of this possibility is working in close proximity to the subcontractor during drilling activities onsite. If excessive noise levels occur, efforts will be made to control this by issuance of earplugs to all personnel and by implementing a system of hand signals understood by all.

Work Site Access & Controls (Standard Precautions)

The work area is restricted to authorized personnel. Clearly define the work area before beginning activities for the day. Caution tape and safety cones must be provided as necessary for vehicular traffic concerns and to protect passers-by. Proper housekeeping is essential to avoid creating hazards to pedestrian and vehicular traffic. Excavations in progress will not be left unattended at any time. Running equipment will not be left unattended at any time. Test borings and test pits will be backfilled upon completion and the area restored. Drilling equipment will be secured above test borings during work stoppages and at the end of the workday.

Site Security

The site will be restricted by a locked chain-link fence.

Weather Related Hazards

H&A employees and their subcontractors should be aware of potential health effects and/or physical hazards of working during inclement weather. Refer to OP1003-Cold Stress and OP1015-Heat Stress for discussion on weather hazards.

5. PROTECTIVE MEASURES

Personal Protective Equipment Requirements:

Copy and paste a checkmark "✓"into appropriate boxes.

Required PPE	Task 1	Task 2	Task 3	Task 4	Task 5
	Excavation Monitoring	Subsurface Exploration	GW Sampling	Soil Vapor Sampling	Basement Excavation
Hard hat	✓	✓			✓
Safety glasses w/side shields	✓	✓	✓	✓	✓
Steel-toe footwear	✓	✓	✓		✓
Hearing protection (plugs, muffs)	✓	✓			✓
Tyvek ™ coveralls		✓	✓		✓
PE-coated Tyvek™ coveralls					
Boots, chemical resistant	✓	✓	✓		✓
Boot covers, disposable					
Leather work gloves	✓	✓			✓
Inner gloves - Nitrile	✓	✓	✓	✓	✓
Outer gloves -					
Tape all wrist/ankle interfaces					
Half-face respirator*		✓*			✓*
Full-face respirator*					
Organic vapor cartridges		✓*			✓*
Acid gas cartridges					
Other cartridges:					
P-100 (HEPA) filters					
Face shield					
Personal Flotation Device (PFD)					
High-Visibility Safety Vest	✓	✓			✓
Other:					
Level of protection required [C or D]:	D Mod.	D Mod.	D Mod.	D Mod.	D Mod.

* Respirators should be onsite during interior basement drilling events. Use will be determined based on air monitoring during drilling. In the event of respirator use, H&A staff must be medically qualified, fit tested and clean shaven with no facial hair that will interfere with the seal.

The required PPE checked in any box above must be on site during the task being performed. Work shall not commence unless the required PPE is present.

Site Safety Equipment Requirements:

Check all items that are required to be on site.

Site Safety Equipment

☐ Fire Extinguisher	✓ First Aid Kit	☐ Flashlight
☐ Air horn/signaling device	✓ Cellular Phone	☐ Duct tape
☐ Ladder	☐ Barricade tape	☐ Drum dolly
☐ Two-way radio	✓ Safety Cones	☐ Harness/Lanyard

✓ Other: The driller will provide stand lighting and GFI for interior basement drilling activities.

The required equipment checked in any box above must be on site during the task being performed. Work shall not commence unless the equipment is present.

6. MONITORING PLAN AND EQUIPMENT

Is air/exposure monitoring required at this work site for personal protection? YES

Is perimeter monitoring required for community protection? YES

Monitoring/Screening Equipment **Requirements:**

Check all items that are required to be on site.

Required Monitoring/Screening Equipment

- ✓ Photo-Ionization Detector (PID) 10.6eV
- ☐ Photo-Ionization Detector (PID) 11.7eV
- ☐ Photovac Micro Tip (PID) 10.6eV
- ☐ Organic Vapor Monitor (FID)
- ☐ Photovac Gas Chromatagraph (GC)
- ☐ Combustible Gas Indicator (CGI) (LEL)
- ✓ Multiple Gas Detector LEL/O2/H2S/CO
- ✓ Dust Monitors (RAMs)
- ☐ Colorimetric tubes
- ☐ Other

The required equipment checked in any box above must be on site. Work shall not commence unless the equipment is present.

Standard Action Levels and Required Responses:

Exposure Guidelines for common contaminants are listed in Table 1 - Occupational Exposure Limits in the Chemical Hazards section above.

Requirements for PPE upgrades based on monitoring are in Table 2 - Monitoring Methods, Action Levels and Protective Measures following the Specific Monitoring Requirements section below.

Action levels for readings obtained with a multiple gas detector are listed below.

Instrument	Normal	Operating levels	Action levels – required responses
Oxygen Meter	20.9%	Between 19.5-23.5%	Below 19.5 %: leave area, requires supplied air Above 23.5%: leave area, fire hazard
CGI	0%	Less than 10%	Greater than 10%: fire/explosion hazard; cease work
Hydrogen Sulfide	0%	Less than 10 ppm.	Greater than 15 ppm (or 10 ppm for 8 hrs) requires supplied air respirator
Carbon Monoxide	0%	Less than 25 ppm	Greater than 200 ppm for 1 hour (or 25 ppm for 8 hrs) requires supplied air respirator

Standard Air Monitoring Plan (Volatiles):

- Prior to the beginning of work obtain background readings with the PID away from the site.
- Monitor the breathing zone when site soil is exposed (e.g., while drilling or excavating is occurring, etc.) with the PID.
- Monitoring should be conducted most frequently (e.g., every 15-30 minutes) when drilling or excavation first begins in a particular area and when soil is removed from the hole. After this, and if no exceedances of exposure limits are noted (see below), monitoring may be conducted less frequently (e.g., every 60 minutes).
- H&A general exposure limits will be used when a mixture of potentially volatile chemicals are suspected to be present in soil at the site.

In summary, if a reading of 10 ppm above background is detected with the PID for 5 minutes or longer, back away for a few minutes. Screen the air again after any vapors/gases have been given a chance to dissipate. If 10 ppm above background is still noted, evacuate the area and call the LHSC and PM for further guidance.

- Record monitoring data and PPE upgrades in field book or on Record of Field Monitoring form and maintain with project files.

- Air monitoring for exposure should be based on the frequency established under the Standard Air Monitoring Plan or under the Specific Monitoring Requirements. Record time, location and results of monitoring and actions taken based upon the readings.

Standard Dust Control Measures and Monitoring Plan:

Dust Control Measures:

It is anticipated that exposure to airborne dust can be mitigated during work operations as necessary to control dust emissions by means of limiting the area of exposed soils and through the use of water sprays. If dust emissions cannot be controlled by these standard measures, additional measures may be employed such as the use of a tackifier (if approved) to stabilize soil exposures or by covering exposed soil and stockpiles with tarpaulins, plastic sheeting or geotextile fabric. Otherwise cease work immediately and contact the Project Manager or the Corporate Health & Safety Manager for assistance. It is not permissible for dust emissions to escape from the site at any time and perimeter dust monitoring may be required to insure public safety.

Dust Monitoring:

Respirable Aerosol Monitors (RAM) can be used to monitor total dust levels in work zones and/or at the site perimeter. These instruments do not give specific readings of contaminant concentration (e.g. metals, asbestos, etc.). Depending upon the contaminants present, it may be mandatory for all workers to upgrade to level C protection using a half-face air-purifying respirator with HEPA (P-100) filters if dust levels cannot be adequately controlled during any of the on-site tasks. The H&A Site Safety Officer (SSO) will determine PPE upgrades based upon visual determination as necessary and the OSHA PEL for each known or suspected contaminant. The OSHA PEL/STEL for Respirable Nuisance Dust is 5 mg/m^3 (8 hour TWA).

Action levels for fugitive dust at the site perimeter are based upon the daily PM_{10} dust standard of 0.15 mg/m^3 in the National Ambient Air Quality Standard for Inhalable Dust (NAAQS).

Personal dust monitoring using an industrial hygiene pump and a filter cassette may be conducted on each day of operations. In such cases samples are collected from workers with the greatest potential dust exposure and analyzed by an accredited laboratory for specific contaminants.

Specific Monitoring Requirements:

Monitoring requirements and frequency is indicated by task and location below.

Multi-Gas Monitoring:
Applicable tasks: # 2, 5
Frequency: Continuously in worker breathing space when soil is disturbed in interior basement areas.
Description: During drilling activities in the basement, the breathing zone will be continuously monitored using a multi-gas detector.

VOC Monitoring:
Applicable tasks: # 1, 2, 5
Frequency: Continuously in worker breathing space when soil is disturbed.
Description: In the event that soil excavation occurs, the soils will be screened using a PID (Mini Rae 2000) for the presence of volatiles

VOC Monitoring:
Applicable tasks: # 3
Frequency: Continuously in worker breathing space during groundwater sampling.
Description: Air will be screened using a PID (Mini Rae 2000) for the presence of volatiles

Community Particulate and VOC Monitoring:
Applicable tasks: # 1, 2, 5
Frequency: 1 reading every 15 minutes from each monitoring station.
Description: In accordance with NYSDOH generic CAMP guidance for both VOCs and particulates. Refer to the site-specific Community Air Monitoring Program

TABLE 2
Last Revised September 2002

MONITORING METHOD, ACTION LEVELS AND PROTECTIVE MEASURES

INSTRUMENT	HAZARD	ACTION LEVEL	ACTION RESPONSE
Respirable Dust Monitor	Total Particulates	> 5 mg/m^3	Upgrade to Level C Protection
OVA, HNU[2], Photovac Microtip	Total Organic Vapors	Background	Level D Protection
		10 ppm > background or lowest OSHA permissible exposure limit, whichever is lower, or as modified for this task. Sustained for >5 minutes in the breathing zone.	Upgrade to Level C - site evacuation may be necessary for specific compounds
		50 ppm over background, unless lower values required due to respirator protection factors	Cease work; upgrade to Level B[3] may be required
Explosimeter[4] (LEL)	Flammable/Explosive Atmosphere	<10% Scale Reading	Proceed with work
		10-15% Scale Reading	Monitor with extreme caution
		>15% Scale Reading	Evacuate site
0xygen Meter[5]	Oxygen-Deficient Atmosphere	19.5% - 23.5% 0_2	Normal - Continue work
		< 19.5% 0_2	Evacuate site; oxygen deficient
		> 23.5% 0_2	Evacuate site; fire hazard
Radiation Meter[6]	Ionizing Radiation	0.1 Millirem/Hour	If > 0.1, radiation sources may be present[7]
		> 1 Millirem/Hour	Evacuate site; radiation hazard
Drager Tubes	Vapors/Gases	Species Dependent > 1 ppm vinyl chloride > 1 ppm benzene > 1 ppm 1,1-DCE	Consult Table 1 or other resources for concentration toxicity/detection data. Upgrade to Level C if concentration of compounds exceed thresholds shown at left; May need to cease work if other levels exceeded - site specific
Gas Chromatograph (GC)	Organic Vapors	3 ppm total OV > background or > lowest specific OSHA permissible exposure limit, whichever is lower	On-site monitoring or tedlar bag sample collection for off-site/laboratory analysis

Notes:
1. Monitor breathing zone.
2. Can also be used to monitor some inorganic species.
3. Positive pressure demand self contained breathing apparatus
4. Lower explosive limit (LEL) scale is 0-100%. LEL for most gasses is 15%.
5. Normal atmospheric oxygen concentration at sea level is 20%
6. Background gamma radiation is ~0.01-0.02 millirems/hour.
7. Contact H&A Health and Safety staff immediately.

Calibration and Use of Equipment:

Calibrate all monitoring equipment in accordance with manufacturers requirements, H&A calibration (OP) standards and site specific requirements (e.g., at the beginning and end of each work day). Calibration of equipment shall be documented in the field notes or Daily Field Report (DFR). Documentation should include:

- Date/time
- Zero reading before calibration
- Concentration of calibration gas
- Reading obtained with calibration gas before adjusting span\
- Final reading obtained with calibration gas after adjusting span

7. DECONTAMINATION AND DISPOSAL METHODS

Personal Hygiene Safeguards:

The following minimum personal hygiene safeguards shall be adhered to:

- No smoking or tobacco products on any Hazwoper project.
- No eating or drinking in the exclusion zone.
- It is required that personnel present on site wash hands before eating, smoking, taking medication, chewing gum/tobacco, using the restroom, or applying cosmetics and before leaving the site for the day.
- It is recommended that personnel present on site shower or bathe at home at the end of each day of working on the site.

Standard Personal Decontamination Procedures:

Outer gloves and boots should be decontaminated periodically as necessary and at the end of the day. Brush off solids with a hard brush and clean with soap and water or other appropriate cleaner whenever possible. Remove inner gloves carefully by turning them inside out during removal. Wash hands and forearms frequently. It is good practice to wear work-designated clothing while on-site which can be removed as soon as possible. Non-disposable overalls and outer work clothing should be bagged onsite prior to laundering. If gross contamination is encountered on-site contact the Project Manager and LHSC to discuss proper decontamination procedures. The steps required for decontamination will depend upon the degree and type of contamination but will generally follow the sequence below.

1. Remove and wipe clean hard hat
2. Rinse boots and gloves of gross contamination
3. Scrub boots and gloves clean
4. Rinse boots and gloves
5. Remove outer boots
6. Remove outer gloves
7. Remove Tyvek coverall
8. Remove respirator, wipe clean and store
9. Remove inner gloves

Location of Decontamination Station:

N/A

Disposal of PPE:

PPE that is not grossly contaminated can be bagged and disposed in regular trash receptacles. PPE that is grossly contaminated or is generated during the basement drilling task must be bagged (sealed) and field personnel should communicate with the Project Manager to determine proper disposal.

Tools & Equipment Decontamination:

All decontamination should be conducted at the site and not at the office or lab.

Check all equipment and materials needed for decontamination of tools and other equipment.

☐ Acetone	✓ Distilled Water	☐ Poly sheeting
✓ Alconox Soap	✓ Drums for Water	☐ Steam cleaner
✓ Brushes	☐ Hexane	☐ Tap water
✓ Disposal Bags	☐ Methanol	☐ Washtubs
✓ 5 gal. Buckets	✓ Paper towels	

Standard Equipment Decontamination Procedures:

Air monitoring instrumentation and delicate instruments that are difficult to decontaminate or sensitive to water should be protected from contamination during use through the use of plastic sheeting. To the extent possible, efforts should be taken to limit the degree of contamination to hand tools and sampling equipment during use. Proper PPE must be worn while performing decontamination, including the wearing of chemical safety goggles and gloves. Storage or transport of decontamination solvents in squirt bottles is not permitted as they may discharge their contents upon ambient temperature change or leak if overturned. Standard equipment decontamination procedures are as follows. Any additional requirements are listed under Specific Equipment Decontamination Procedures below.

Pretreatment of heavily contaminated equipment may be conducted as necessary:

1. Remove gross contamination using a brush or wiping with a paper towel
2. Soak in a solution of Alconox and water (if possible)
3. Wipe off excess contamination with a paper towel
4. Clean with hexane or acetone and allow to dry

Standard decontamination procedure:

1. Wash using a solution of Alconox and water
2. Rinse with potable water
3. Rinse with methanol
4. Rinse with distilled water

Specific Equipment Decontamination Procedures:

1. Wash using a solution of Alconox and water
2. Rinse with potable water
3. Dispose of dedicated sampling equipment in drums

Standard Disposal Methods for Contaminated Materials:

Excess sample solids, decontamination materials, rags, brushes, poly sheeting, etc. that are determined to be free of contamination through field screening can usually be disposed into client-approved, on-site trash receptacles. Uncontaminated wash water may be discarded onto the ground surface away from surface water bodies in areas where infiltration can occur. Contaminated materials must be segregated into liquids or solids and drummed separately for off site disposal. Any additional requirements are listed under Specific Disposal Methods for Contaminated Materials below.

Specific Disposal Methods for Contaminated Materials:

If onsite trash receptacles are not available, excess sample solids, decontamination materials, rags, brushes, poly sheeting, etc. that are determined to be free of contamination through field screening will be disposed of in drums staged onsite for future disposal.

Disposal Methods for Contaminated Soils:

Contaminated soil cuttings and spoils must be drummed for disposal off-site unless otherwise specifically directed. Soil cuttings and spoils determined to be free of contamination through field screening can usually be returned to the boreholes or excavations from which they came. Any additional requirements are listed under Specific Disposal Methods for Contaminated Soils below.

Specific Disposal Methods for Contaminated Soils:

Large quantities of soils removed for excavation purposes will be staged on and beneath poly-sheeting prior to characterization and offsite disposal.

8. CONTINGENCY PLANNING

How H&A responds to an emergency depends on whether we are at an active facility or another other location. Many active facilities have very stringent requirements for the mitigation of emergencies. Therefore, the PM is responsible for identifying any specific requirements from the client contact.

As a rule of thumb, the following are H&A's basic responses to handling Emergencies. Typically, H&A does not mitigate emergencies. When Clients request or require specific functions such as First Aid/CPR trained personnel on site, we typically conform. Before any Project Manager or LHSC agrees to something more stringent, many issues should be considered such as training, safety, feasibility of an adequate response, insurance requirements, and much more.

Fire:

- Major Fires - Major fires will be mitigated by the local fire departments or by client's on-site fire/emergency response departments.
- Incipient Stage Fires -Incipient stage fires will be extinguished by on-site personnel using fire extinguishers. Only those who have received annual training may use an extinguisher.

Medical:

All H&A employee injuries and illnesses will be documented using the Supervisor's Accident / Injury / Near Miss Report (SAIR). This form is available on the Intranet.

- First Aid - First aid will be addressed using the on-site first aid kit. H&A employees are not required or expected to administer first aid/CPR to any H&A, Contractor, or Civilian personnel at any time and it is H&A's position that those who do are doing it on their behalf and not as a function of their job.
- Trauma - Based upon the nature of the injury, the injured party may be transported to the nearest hospital or emergency clinic by on-site personnel or by ambulance. First response to a trauma incident is to call 911 or facility security. H&A staff members are expected to assist in ancillary roles only such as directing ambulances to the scene. It is the discretion of the staff member on site whether an ambulance should be procured in remote locations where ambulance services will not be effective.

Hazardous Materials Spill:

- Small incidental spills (e.g. pint of motor oil) caused by H&A employees and/or by the contractor will be mitigated by the H&A staff member and/or the contractor.
- Large spills (e.g. large leak from heavy equipment fuel tank). The contractor is responsible for cleanup. In the event that it posses a serious human or environmental threat, the local Fire Department and/or client emergency response department will be contacted. Once emergency has been mitigated typically clean up will be provided by a vendor.

Rescue:

H&A employees will not enter any confined spaces for rescue purposes.

Weather Related Emergencies:

H&A employees and their subcontractors should be aware of potential health effects and/or physical hazards of working during inclement weather. If applicable, safeguards against the effects and hazards of heat stress, cold stress, frostbite, thunderstorms, and lightning, etc., should be included with the section pertaining to physical hazards in this HASP.

Evacuation Alarms:

Evacuation alarms and/or emergency information will be communicated among personnel on site through verbal communication.

Emergency Services:

Emergency services will be summoned via on-site or cellular phone.

Emergency Evacuation Plan:

The site evacuation plan is as follows:

1. Establish a designated meeting area to conduct a head count in the event of an emergency evacuation.
2. If the work area is not near an emergency exit, exit via the closest route and meet at the designated meeting area.
3. Notify emergency response personnel (fire, police and ambulance) of the number of missing or unaccounted for employees and their suspected location.
4. Administer first aid will in the meeting area as necessary.

Under no circumstances should any personnel re-enter the site area without the approval of the corporate H&S manager, the H&S coordinator, and the fire department official in charge.

9. HEALTH & SAFETY PLAN ACKNOWEDGMENT FORM

Note: Only H&A employees sign this page.

I hereby acknowledge receipt and briefing on this Health & Safety Plan prior to the start of on-site work and declare that I understand and agree to follow the provisions and procedures set forth herein while working on this site.

PRINTED NAME	SIGNATURE	DATE

10. PRE-JOB SAFETY CHECKLIST

The following checklist is designed to help Project Managers verify that all Health & Safety requirements are satisfied for projects involving site work and to aid in the preparation of the site-specific HASP.

Please initial and date the appropriate box once each requirement has been satisfied prior to commencement of site work.

#	Project H&S Requirements	Approval by PM or LHSC (initial each box or place NA)	Date Approved
1	Project site history has been researched and summarized, current site conditions have been determined and documentation of previous investigations, risk analyses and chemical data has been assembled and summarized.		
2	Project work scope has been outlined and potential chemical and physical hazards associated with work tasks have been identified.		
3	Task Safety Analysis has been performed and attached to the HASP.		
4	H&A personnel to be involved with the project have been identified and are current with medical surveillance, OSHA 40 hour and 8 hour refresher training. Hazwoper site supervisor requirements are satisfied.		
5	Additional training requirements have been met: e.g. nuclear density gauge, DOT, Confined Space Entry, Competent Person Training for Excavation, OSHA 10 hour certification, Railway Safety Training, etc.		
6	H&A personnel that may be required to wear a respirator are medically qualified and have current certification of fit testing.		
7	Client's additional H&S requirements have been met: e.g. facility safety orientations, safety documentation, meetings, special PPE requirements		
8	H&A subcontractors have met H&A's minimum requirements including: current OSHA 40 hour training, medical surveillance, written HASP, insurance, MSDSs.		
9	MSDSs are on site and available for chemicals on site.		
10	Safety equipment is available: e.g. flashlight, telephone, ladders, traffic cones, barricade tape, fire extinguisher, first aid kit, PPE, respiratory protection, air and dust monitoring instrumentation (calibrated), personal flotation device (PFD), 90' life line with ring, decontamination equipment, etc.		
11	HASP and supporting documentation is complete and signed by all members.		

APPENDIX A
HASP Amendment Form

This Appendix is to be used whenever there is an immediate change in the project scope that would require an amendment to the HASP. For project scope changes associated with "add-on" tasks, the changes must be made in the body of the HASP. Before changes can be made, a review of the potential hazards must be initiated by the H&A Project Manager.

Amendment No.	
Site Name:	
Work Assignment No.:	
Date:	
Type of Amendment:	
Reason for Amendment:	
Alternate Safeguard Procedures:	
Required Changes in PPE:	

Project Manager Signature: _____ Date: _____

Local Health and Safety Coordinator: _____ Date: _____

This original form must remain on site with the original HASP. If additional HASPs are in the field, it is the Project Manager's responsibility to forward a signed copy of this amendment to those who have copies.

APPENDIX B
Issuance and Compliance
Site Safety Officer Role and Responsibilities
Training Requirements

This Health & Safety Plan (HASP) has been prepared in accordance with the requirements of Title 29 the Code of Federal Regulations (CFR) Section 1910.120/1926.65 to provide guidance for the protection of onsite personnel from physical harm and chemical exposure while working at the subject site.

The specific requirements of this HASP include precautions for hazards that exist during this project and may be revised as new information is received or as site conditions change.

- This HASP must be signed by all Haley & Aldrich (H&A) staff members who will work on the project, including H&A visitors. By signing the Health and Safety Plan Acknowledgement Form personnel are acknowledging that they are aware of the specific hazards of the site and agree to follow the provisions and procedures required to safeguard themselves and others from those hazards.
- This HASP or a current signed copy must be retained at the site at all times when H&A staff members are present.
- Deviations from this HASP are not permitted without prior approval from the above signed. Unauthorized deviations may constitute a violation of H&A company procedures/policies and may result in disciplinary action.
- Revisions to this HASP must be outlined within the contents of the HASP. If immediate or minor changes are necessary, the LHSC and H&A Project Manager may use Appendix A (HASP Amendment Form), located in the back of this HASP. Any revision to the HASP requires personnel to be informed of the changes and that they understand the requirements of the change.
- This HASP is not for H&A Subcontractor use. Each subcontractor engaged is responsible for all matters relating to the health and safety of their personnel and the safe operation of their equipment. This HASP will be made available as a reference so that subcontractors are informed of the potential hazards associated with the site to the extent we are aware. Subcontractors must develop their own HASP which must be, at a minimum, at least as protective as this HASP.
- This Site Specific HASP provides only site-specific descriptions and work procedures. General safety and health compliance programs in support of this HASP (e.g., injury reporting, medical surveillance, personal protective equipment (PPE) selection, etc. are described in detail in the H&A Corporate Health and Safety Program Manual and within Standard Operating Procedures (OPs). Both the manual and OPs can be located on the Company Intranet. When appropriate, users of this HASP should always refer to these resources and incorporate to the extent possible. The manual and OPs are available to clients and regulators per request.

Site Safety Officer:

The site safety officer (SSO) is defined as the individual responsible to the employer with the authority and knowledge necessary to implement the HASP and verify compliance with applicable health and safety requirements.

The H&A Project Manager may designate any person as the site safety officer (SSO) and determines the order of authority on site. Usually the highest ranking person on site is the SSO. A site safety officer must be on site at all times. When none of the designated SSOs are present on site, the senior person for H&A on site will default to the SSO. This project has identified the following hierarchy for SSO.

1. Dave Nostrant

2. Enter name of site safety officer here

Site Safety Officer Roles and Responsibilities:

The SSO is responsible for field implementation of this HASP and enforcement of safety rules and regulations. SSO functions include:

- Act as H&A's liaison for health and safety issues with client, staff, subcontractors, and agencies.
- Verify that utility clearance has been performed by H&A subcontractors.
- Oversee day-to-day implementation of the HASP by H&A employees on site.
- Interact with subcontractor project personnel on health and safety matters.
- Verify use of required PPE as outlined in the HASP.
- Inspect and maintain H&A safety equipment, including calibration of air monitoring instrumentation used by H&A.
- Perform changes to HASP and document in Appendix A of the HASP as needed and notify appropriate persons of changes.
- Investigate and report on-site accidents and incidents involving H&A and its subcontractors.
- Verify that site personnel are familiar with site safety requirements (e.g., the hospital route and emergency contact numbers).
- Report accidents, injuries, and near misses to the H&A PM and Local Health and Safety Coordinator (LHSC) as needed.

The SSO will conduct initial site safety orientations with site personnel (including subcontractors) and conduct toolbox and safety meetings thereafter with H&A employees and H&A subcontractors at regular intervals and in accordance with H&A policy and contractual obligations. The SSO will track the attendance of site personnel at H&A orientations, toolbox

talks, and safety meetings. Subcontractors will document training and provide training rosters to the H&A SSO.

The SSO will report accidents such as injury, overexposure, or property damage to the Local Health and Safety Coordinator, to the Project Manager, and to the safety managers of other on-site consultants and contractors. The SSO will consult with the safety managers of other on-site consultants and subcontractors on specific health and safety issues arising over the course of the project, as needed.

Health and Safety Training Requirements:

Personnel will not be permitted to supervise or participate in field activities until they have been trained to a level required by their job function and responsibility. H&A staff members, contractors, subcontractors, and consultants who have the potential to be exposed to contaminated materials or physical hazards must complete the training described in the following sections.

The H&A Project Manager/LHSC will be responsible for maintaining and providing to the client/site manager documentation of H&A staff members' compliance with required training as requested. Records shall be maintained per OSHA requirements.

40-Hour Health and Safety Training

The 40-Hour Health and Safety Training course provides instruction on the nature of hazardous waste work, protective measures, proper use of personal protective equipment, recognition of signs and symptoms which might indicate exposure to hazardous substances, and decontamination procedures. It is required for all personnel working on-site, such as equipment operators, general laborers, and supervisors, who may be potentially exposed to hazardous substances, health hazards, or safety hazards consistent with 29 CFR 1910.120.

8-hour Annual Refresher Training

Personnel who complete the 40-hour health and safety training are subsequently required to attend an annual 8-hour refresher course to remain current in their training. When required, site personnel must be able to show proof of completion (i.e., certification) at an 8-hr refresher training course within the past 12 months.

8-Hour Supervisor Training

On-site managers and supervisors directly responsible for, or who supervise staff members engaged in hazardous waste operations, should have eight additional hours of Supervisor training in accordance with 29 CFR 1910.120. Supervisor Training includes, but is not limited to, accident reporting/investigation, regulatory compliance, work practice observations, auditing, and emergency response procedures.

Additional Training for Specific Projects

H&A personnel will ensure their personnel have received additional training on specific instrumentation, equipment, confined space entry, construction hazards, etc., as necessary to perform their duties. This specialized training will be provided to personnel before engaging in the specific work activities including:

- Client specific training or orientation
- Competent person excavations
- Confined space entry (entrant, supervisor, and attendant)
- Heavy equipment including aerial lifts and forklifts
- First aid/ CPR
- Diving certification
- Use of fall protection
- Commercial drivers license
- Use of nuclear density gauges
- Asbestos awareness

APPENDIX B

NYSDOH Generic 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 <u>ground intrusive</u> 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.

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