APPENDIX B

CONSTRUCTION HEALTH AND SAFETY PLAN

CONSTRUCTION HEALTH AND SAFETY PLAN

for

FONF Expansion/Sabre Park BCP 1705 Factory Outlet Boulevard Town of Niagara, New York 14304

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- Attachment C Material Safety Data Sheets
- Attachment D Standard Safe Work Practices

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HEALTH AND SAFETY PLAN (HASP) SUMMARY

Emergency Contacts

Emergency contacts are listed on Table 0.1.

Emergency Procedures

Emergency procedures are described in Section 6.

Site Specific Hazards and Training

Site Specific Hazards are described in Section 2.

The Field Safety Officer (FSO) will be responsible for providing site-specific training to all personnel that work at the site. This training will cover the following topics:

Names of personnel responsible for site safety and health.

Hazards potentially present at the site.

Proper use of personal protective equipment.

Work practices by which the employee can minimize risk from hazards.

Acute effects of compounds at the site.

Decontamination procedures.

Personnel will be required to sign and date the Site-Specific Training Form provided in Attachment B prior to working on-site.

General Health and Safety Requirements

Personnel will be required to sign and date the Health and Safety Plan and Work Plan Acceptance Form provided in Attachment B prior to working on-site.

Personnel Protective Equipment

Level D protection will be worn for initial entry on-site and for all activities except as noted in Section 3. Level D protection will consist of:

Standard work clothes

Steel-toe safety boots

Safety glasses or goggles must be worn when splash hazard is present

Nitrile outer gloves and PVC or nitrile inner gloves must be worn during all sampling activities

Hard hat (must be worn during all activities)

Modified Level D protection may be required under conditions where potential contact of the skin or clothes with significant contamination occurs. Modified Level D is the same as Level D but includes Tyvek coveralls and disposable polyethylene overboots.

Level C protection, unless otherwise specified in Section 3, will consist of Level D equipment and the following additional equipment:

Full-face or half-mask air-purifying respirator (APR)

Combination dust/organic vapor cartridges

Tyvek coveralls if particulate hazard present

PE-Coated Tyvek coverall if liquid contamination present

PVC or nitrile inner and nitrile outer gloves

5-minute escape SCBA

Level B protection, unless otherwise specified in Section 3, will consist of Level D equipment and the following additional equipment:

Hard hat

Positive Pressure SCBA or positive pressure airline and respirator with escape SCBA

PE-Coated Tyvek coverall

Nitrile outer and PVC or nitrile inner gloves

Nitrile boot covers

Air Monitoring

A summary of the action levels and restrictions is presented on Table 0.2.

FIGURE 1

HOSPITAL ROUTE PLAN (Mount Saint Mary's Hospital) Site Location: 1705 Factory Outlet Boulevard, Niagara, NY Hospital Location: 1 Colomba Drive Ste 5, Niagara Falls, NY Emergency Room (716) 285-3464



TABLE 0.1

EMERGENCY CONTACTS

In the event of any situation or unplanned occurrence requiring assistance, the appropriate contact(s) should be made from the list below. For emergency situations, contact should first be made with the Field Team Leader (or designee) and the Site Safety Officer, who will notify emergency personnel who will then contact the appropriate response teams. This emergency contacts list must be in an easily accessible location at the site.

Phone Number
911
911
(800)-962-7962
(800) 222-1222
(800) 424-8802

Medical Emergency

Ambulance Service:	911
Hospital Name:	Mount Saint Mary's Hospital
Hospital Phone Number:	(716) 285-3464
Hospital Address:	1 Colomba Dr. Ste 5, Niagara Falls, NY
Route to Hospital:	See Page 3
Travel Time From Site:	7 minutes
Langan Contacts	

Project Director:	Jamie B. Barr, L.E.P.	(917) 882-5428
Program/Project Manager:	Jamie B. Barr, L.E.P.	(917) 882-5428
Project Executive	Joel B. Landes, P.E.	(212) 479-5404
Project Executive	Steve Ciambruschini, L.E.P.	(201) 410-0238
Program Quality Assurance Monitor	Jamie B. Barr, L.E.P.	(917) 882-5428
Langan Health & Safety Officer:	Tony Moffa	(215) 756-2523
Field Safety Officer	Justin Hall	(203) 640-3180

Field Team Leader

Justin Hall

(203) 640-3180

TABLE 0.2

SUMMARY OF ACTION LEVELS AND RESTRICTIONS

Conditions for Level D:

All areas

PID readings < 5 ppm and benzene < 1 ppm

No visible fugitive dust emissions from site activities (<150 ug/m³)

Conditions for Level C:

All areas

Where PID readings > 25 ppm (sustained for 15 minutes in the breathing zone) to 200 ppm and benzene < 5ppm, and/or

Sustained visible fugitive dust emissions from site activities in excess of 150 ug/m³ (not anticipated).

Conditions for Level B (or retreat):

All areas

Where PID readings > 500 ppm or benzene > 25 ppm,

Visible fugitive dust emissions from site activities cloud the surrounding air and are in excess of 150 ug/m³ (not anticipated).

1.0 INTRODUCTION

1.1 **Purpose, Policy, and Scope of Work**

The purpose of this Construction Health and Safety Plan (CHASP) is to establish personnel protection standards and mandatory safety practices and procedures for the implementation of the Interim Remedial Measures Work Plan (IRMWP) at the Fashion Outlets of Niagara Falls (FONF) Expansion/Sabre Park BCP Site located at 1705 Factory Outlet Boulevard (the "Site") in Niagara, New York. The IRMWP will include excavation/removal of soil, as needed for Site remediation and redevelopment, engineering and institutional controls including physical (demarcation) barriers over soil exceeding NYSDEC RSCOs and installation of sub-slab depressurization systems (SSDS) beneath the proposed building. This plan assigns responsibilities, establishes standard operating procedures, and provides for contingencies that may arise while operations are being conducted during environmental remediation and construction at the Site.

Intrusive activities that are either construction-related or related to the remedial action activities that Langan will monitor include: cutting and removal of existing concrete floor slabs, excavation of soil with a backhoe or excavator (standard Category 1-type soil removal) for various construction related activities (i.e., utilities, foundations etc.) and soil handling and loading of soil into trucks for transport to staging areas or off-site transport.

The provisions of the plan are mandatory for all on-site personnel. Any supplemental plans used by subcontractors shall conform to this plan at a minimum. All personnel who engage in project activities must be familiar with this plan, comply with its requirements, and sign the Plan Acceptance Form (Attachment B), prior to working on the site. The Plan Acceptance Form must be submitted to the Langan Field Safety Officer (FSO). In addition to this plan, all work shall be performed in accordance with all applicable federal, state and local regulations.

1.2 Site Description

The proposed Site development area subject to the Brownfield Cleanup Agreement (BCA), encompasses approximately 48-acres and includes the approximately 34-acre former Sabre Park Mobile Home Community located at 1705 Factory Outlet Boulevard (Assessor's Parcel Numbers 160-08-1-2, 160-08-1-6 and 160-08-1-7), an approximate 11-acre parcel located on the southern portion of the larger ±41-acre Fashion Outlets of Niagara Falls (Fashion Outlets) property located at 1900 Military Road, (Assessor's Parcel Numbers 145-20-1-14 and 145-20-1-15), and a smaller parcel encompassing approximately 3-acres on the western side of the Site located at 1755 Factory Outlet Boulevard (Assessor's Parcel Number 160-08-1-1). A Site

Location Map is provided as Figure 1. Figures 2 and 3 (see IRMWP) depict surrounding property use and the tax parcel locations, respectively.

The Sabre Park parcels were previously occupied by 278 mobile home lots from approximately 1972 to 2013 when demolition commenced. The remainder of the Sabre Park parcels consist of asphalt/gravel parking areas, asphalt driveways, and landscaped areas.

The Fashion Outlets parcels are currently occupied by three one-story commercial retail buildings and associated asphalt parking, driveway aisles, and landscaped islands. The largest building (Building A) was constructed in 1960 and has an approximate area of 528,000 square feet. Two smaller buildings, identified as Building B and Building C, were constructed circa 1989 and have approximate areas of 54,000 and 15,500 square feet, respectively. Building A occupies the southern portion of the Fashion Outlets parcels and is adjacent to the proposed Site development area. This building contains numerous commercial retail stores, including Gap, Saks Off 5th Avenue, Nike, Old Navy, and Polo Ralph Lauren. Building B contains four outlet stores, including Marshall's. Building C is located on the eastern portion of the property and contains three stores, including Honey's restaurant. The three buildings are depicted in Figure 2.

The parcel located at 1755 Factory Outlet Boulevard is currently improved with a Secure Storage facility and associated asphalt parking.

1.3 Langan Project Team Organization

Table 1.1 describes the responsibilities of Langan on-site personnel associated with this project. The names of principal personnel associated with this project are:

Project Director:	Jamie B. Barr, L.E.P.	(917) 882-5428
Program/Project Manager:	Jamie B. Barr, L.E.P.	(917) 882-5428
Project Executive	Joel B. Landes, P.E.	(212) 479-5404
Project Executive	Steve Ciambruschini, L.E.P.	(201) 410-0238
Program Quality Assurance Monitor	Jamie B. Barr, L.E.P.	(917) 882-5428
Langan Health & Safety Officer:	Tony Moffa	(215) 756-2523
Field Safety Officer	Justin Hall	(203) 640-3180
Field Team Leader	Justin Hall	(203) 640-3180

Langan personnel have been appropriately trained in first aid and hazardous waste safety procedures, including the operating and fitting of personal protective equipment, and are experienced with the field operations planned for this site.

TABLE 1.1

ON-SITE PERSONNEL AND RESPONSIBILITIES

PROJECT MANAGER - Assumes control over site activities and reports to upper-level management. Has authority to direct response operations.

Responsibilities:

Prepares and organizes the background review of the situation, the Work Plan, the Site Health and Safety Plan, and the field team.

Obtains permission for site access and coordinates activities with appropriate officials.

Ensures that the Work Plan is executed and on schedule.

Briefs the field team on their specific assignments.

Coordinates with the site Health and Safety Officer (HSO) to ensure that health and safety requirements are met.

Prepares the final report and support files on the response activities.

Serves as the liaison with public officials.

FIELD SAFETY OFFICER (FSO) - Advises the HSO and Project Manager on aspects of health and safety on site. Stops work if operations threaten worker or public health or safety.

Responsibilities:

Ensures that all necessary Health and Safety Equipment is available on-site. Ensures that all equipment is functional.

Periodically inspects protective clothing and equipment.

Ensures that protective clothing and equipment are properly stored and maintained.

Controls entry and exit at the Access Control Points.

Coordinates health and safety program activities with the Project HSO.

Confirms each team member's suitability for work based on a physician's recommendation.

Monitors the work parties for signs of stress, such as cold exposure, heat stress, and fatigue.

Implements the Site Health and Safety Plan.

Conducts periodic inspections to determine if the Site Health and Safety Plan is being followed.

Enforces the "buddy" system.

Knows emergency procedures, evacuation routes, and the telephone numbers of the ambulance, local hospital, poison control center, fire department, and police department.

Notifies, when necessary, local public emergency officials.

Coordinates emergency medical care.

Sets up decontamination lines and the decontamination solutions appropriate for the type of chemical contamination on the site.

Controls the decontamination of all equipment, personnel, and samples from the contaminated areas.

Assures proper disposal of contaminated clothing and materials.

Ensures that all required equipment is available.

Advises medical personnel of potential exposures and consequences.

Notifies emergency response personnel by telephone or radio in the event of an emergency.

FIELD TEAM LEADER - Advises on all aspects of health and safety on site. Stops work if any operation threatens worker or public health or safety. Is directly responsible for the field team and the safety of site operations.

Responsibilities:

Manages field operations.

Executes the Work Plan and schedule.

Enforces safety procedures.

Coordinates with the Site Safety Officer in determining protection level.

Enforces site control.

Documents field activities and sample collection.

Serves as a liaison with public officials.

WORK TEAM – Operators, laborers, samplers. The work party must consist of at least two people.

Responsibilities:

Safely completes the on-site tasks required to fulfill the Work Plan.

Complies with Site Safety Plan.

Notifies Site Safety Officer or supervisor of suspected unsafe condition

SUBCONTRACTOR RESPONSIBILITIES

The construction manager and all subcontractors involved with remedial action and redevelopment activities must adhere to applicable OSHA regulations, and shall develop and

comply with their own HASP that shall incorporate, as a minimum, the Langan Site-specific HASP elements. The construction manager Health and Safety Officer (HSO) shall inform subcontractors of the Site emergency response procedures and any potential fire, explosion, health, safety, or other hazards that have been identified. The construction manager HSO shall inform subcontractors of observed activities that do not meet the elements of this CHASP or the HASP that the construction manager developed.

2.0 RISK ANALYSIS

2.1 Chemical Hazards

The primary potential chemical hazard is exposure to metals (specifically chromium), volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides, and polychlorinated biphenyls (PCBs). Other compounds that may be encountered are site equipment fuels (gasoline, diesel, etc.) that also contain volatile components. Relevant properties of these compounds are outlined in Table 2.1.

Dust with chemical constituents may be generated during implementation of the IRMWP. Therefore, air will be monitored for particulates and organic vapors continuously within the work zone and periodically at the Site perimeter.

Material Safety Data Sheets for substances that will be used on site are included in Attachment C.

Of the listed VOCs, benzene has the lowest Permissible Exposure Limit (PEL) as set by OSHA, and hence sets the action limit for monitoring with a photoionization detector (PID). Other constituents of concern (COCs) will be indirectly monitored with dust meters and the actions levels will be individually set for each remediation-related excavation. The action levels for all the monitored COCs are described in Sections 3.3 and 6.4 Engineering controls such as localized ventilation, wetting, and altering the work method and pace will be used to maintain the working conditions below the set action levels.

The site's COCs could pose significant health threats if ingested. Therefore, personnel will not be allowed to eat in the work area and must wash their hands after they come into contact with contaminated soil and before leaving the site. On-site personnel will make efforts to work upwind of any intrusive excavations and potential contaminated materials brought to the surface.

In addition to the COCs detected on Site, some solvents used in decontamination of equipment are potentially hazardous to human health if they are not used properly. Material Safety Data Sheets for any substances that will be used on site will be provided. Any substances brought on-site will be added to Attachment C of this CHASP. All site personnel will be briefed on any added MSDSs.

It is anticipated that dust, odors, and VOCs during remedial the investigation and remedial action activities will not be a problem. Engineering controls such as localized ventilation, wetting, and altering the work method and pace will be used to maintain working conditions safely within Level D conditions.

TABLE 2.1 RELEVANT PROPERTIES OF VOLATILES (PETROLEUM [GASOLINE, DIESEL, ETC.]), METALS AND SEMIVOLATILES KNOWN OR SUSPECTED AT THE SITE

Compound (Synonym)	OSHA PEL (ppm)	IDLH (ppm)	LEL (%)	Odor Threshold (ppm)	Odor Character	Vapor Pressure (mm Hg)	Physical State	Detectable w/ 10.6 eV lamp PID (I P. eV)
Acenaphthene	NA	NA	NA	NA	NA	NA	Noncombustible	(1.1 . EV) NA
Acenaphthylene	NA	NA	NA	NA	NA	9 x 10 ⁻⁴	Noncombustible	NA
Acetone	1,000	2,500	2.5	62	Fruity. Mint- like. Fragrant.	180	Solid Flammable Liquid	Yes
Alpha BHC (Alpha	NA	NA	NA	NA	NA	NA	Noncombustible	NA
Anthracene	NA	NA	0.6	NA	Faint	NA	Colorless Solid	NA
Arsenic (As)	0.01	5	NA	NA	NA	0 (approx)	Noncombustible Solid ⁽³⁾	NA
Barium (Ba)	0.5	1,100	NA	NA	NA	0 (approx)	Flammable Solid	NA
Benzene	1	500	1.2	1.5	Sweet aromatic odor	75	Combustible Liquid	Yes
Benzo(a)anthracene	0.2	NA	NA	NA	Faint aromatic	5.49 x 10 ⁻⁹	Noncombustible	NA
Benzo(a)pyrene	0.2	NA	NA	NA	Faint aromatic	5.49 x 10 ⁻⁹	Noncombustible	NA
Benzo(b)fluoranthene	0.2	NA	NA	NA	Faint aromatic	5.49 x 10 ⁻⁹	Noncombustible	NA
Benzo(g,h,i)perylene	0.2	NA	NA	NA	Faint aromatic	5.49 x 10 ⁻⁹	Noncombustible	NA
Benzo(k)fluoranthene	0.2	NA	NA	NA	Faint aromatic	5.49 x 10 ⁻⁹	Noncombustible	NA
Beryllium	.002	4	NA	NA	NA	0 (approx)	Noncombustible	NA
Beta BHC (Beta Hexachlorocyclohexane)	NA	NA	NA	NA	NA	NA	Noncombustible Solid	NA
1,3-Butadiene	5	2,000	2.0	NA	Mild aromatic or gasoline- like odor	1,800	Flammable gas	NA
sec-Butylbenzene	NA	NA	0.8	NA	NA	NA	Flammable Liquid	Yes
Cadmium (Cd)	0.005	50	NA	NA	NA	NA	Noncombustible Solid	NA
Carbon Disulfide	20	500	1.3	0.1	Sweet, ether- like odor	297.6	Colorless Liquid	Yes
Chlorobenzene	75	2,400	1.3	0.2	Almond-like	8.8	Flammable Liquid	Yes
Chloroform	50	500	NA	85	Pleasant. Sweet. Etheric.	158	Non-flammable liquid	Yes
Chloromethane	100	2,000	7	NA	Faint sweet odor	3,796	Flammable Gas	Yes
Chromium III	0.5	25	NA	NA	NA	NA	Noncombustible	NA
Chromium, Hexavalent	0.005	15	NA	NA	NA	0 (approx)	Noncombustible	NA
Chromium (Cr)	0.1	250	NA	NA	NA	0 (approx)	Noncombustible	NA
Chrysene	0.2	NA	NA	NA	NA	NA	Noncombustible	NA
Copper (Cu)	1	100	NA	NA	NA	1	Noncombustible	NA
Cyanide (Cn)	5	25	NA	NA	Faint almond- like	NA	Combustible Solid	NA
Cyclohexane	300	1,300	10	25	Mild, sweet	96.75	Flammable	NA
DDD	1	500	NA	NA	Faint aromatic	0 (approx)	Noncombustible	NA
DDE	1	500	NA	NA	Faint aromatic	6.5 x 10 ⁻⁶	Noncombustible	NA
DDT	1	500	NA	NA	Faint aromatic	1.87 x 10 ⁻⁷	Noncombustible	NA
Delta BHC (Delta Hexachlorocyclohexane)	NA	NA	NA	NA	NA	NA	Noncombustible Solid	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	Noncombustible Solid	NA
Dibenzofuran	NA	NA	NA	NA	NA	NA	Chrystalline	NA
1,2-Dichlorobenzene	NA	NA	NA	2	Pleasant odor	1.2	Combustible Liquid	Yes
1,3-Dichlorobenzene	NA	NA	NA	NA	NA	NA	Combustible Liquid	Yes
1,4-Dichlorobenzene	NA	NA	NA	NA	NA	NA	Noncombustible Solid	Yes
Dichlorodifluoromethane	1,000	15,000	NA	NA	NA	NA	Noncombustible gas	No
1,1-Dichloroethane (1,1-DCA)	100	3,000	5.4	120	Slight chloroform- like odor	180	Flammable Liquid	Yes
1,1-Dichloroethylene (1,1-DCE)	NA	NA	6.5	190	Sweet, chloroform- like odor	500	Colorless Liquid/Gas	Yes
cis-1,2-Dichloroethylene (cis-1,2-DCE)	NA	NA	9.7	NA	Pleasant odor	201	Colorless Liquid	Yes
trans-1,2-Dichloroethylene (trans-1,2-DCE)	200	NA	6.7	NA	Pleasant odor	400	Colorless Liquid	Yes
Dieldrin	0.25	450	NA	NA	Mild chemical odor	1.8 x 10 ⁻⁷	Noncombustible	NA

TABLE 2.1 RELEVANT PROPERTIES OF VOLATILES (PETROLEUM [GASOLINE, DIESEL, ETC.]), METALS AND SEMIVOLATILES KNOWN OR SUSPECTED AT THE SITE

Compound (Synonym)	OSHA PEL (ppm)	IDLH (ppm)	LEL (%)	Odor Threshold (ppm)	Odor Character	Vapor Pressure (mm Hg)	Physical State	Detectable w/ 10.6 eV lamp PID (I.P. eV)
Ethylbenzene	100	800	0.8	2.3	Sweet aromatic odor	7	Combustible Liquid	Yes
Fluoranthene	NA	NA	NA	NA	NA	NA	Noncombustible	NA
Fluorene	NA	NA	NA	NA	NA	NA	Noncombustible	NA
Gamma BHC (Lindane)	NA	NA	NA	NA	NA	NA	Noncombustible Solid	NA
Heptachlor Epoxide	0.5	35	NA	0.02	Camphor-like	3.0 x 10 ⁻⁴	Noncombustible	NA
n-Heptane	500	750	1.05	150	Gasoline-like	40	Flammable Liquid	NA
Hexachlorobenzene	NA	NA	NA	NA	NA	NA	Noncombustible	NA
2-Hexanone	100	1,600	NA	0.18	Acetone-like	12	Flammable Liquid	NA
n-Hexane	50	1,100	1.1	NA	Gasoline-like	120	Flammable Liquid	Yes
Indeno(1,2,3-c,d)pyrene	NA	NA	NA	NA	NA	NA	Noncombustible	NA
lsopropanol	400	2,000	2.0	22	Pleasant odor	33	Flammable Liquid	NA
Iron (Fe)	5	NA	NA	NA	NA	NA	Noncombustible	NA
Lead (Pb)	0.05	11	NA	NA	NA	0 (approx)	Noncombustible Solid	NA
Manganese (Mn)	5	500	NA	NA	NA	0 (approx)	Noncombustible Solid	NA
Magnesium (Mg)	5	500	NA	NA	NA	0 (approx)	Combustible Solid	NA
2-Mercaptobenzothiazole	NA	NA	15	NA	NA	0 (approx)	Noncombustible	NA
Mercury (Hg)	0.1	10	NA	NA	NA	0 (approx)	Noncombustible	NA
Methyl ethyl ketone (2-Butanone)	NA	NA	NA	0.25	Acetone-like, pleasant, sweet	NA	Flammable Liquid	Yes
Methyl Isobutyl Ketone (4-Methyl-2- Pentanone)	100	500	1.2	0.1	Pleasant	16	Flammable Liquid	NA
Methyl Tert-Butyl Ether (MTBE)	NA	NA	NA	NA	NA	245	Flammable Liquid	NA
Methylene Chloride	25	2,300	13	214	Chloroform- like	350	Combustible Liquid	Yes
Naphthalene	10	250	0.9	0.038	Aromatic	NA	Flammable Solid	NA
N-nitrosodiphenylamine	NA	NA	NA	NA	NA	2.7	Combustible Liquid	NA
Nickel (Ni)	1	10	NA	NA	NA	0 (approx)	Combustible Solid ⁽⁴⁾	NA
PCBs	0.5	5	NA	NA	Mild, hydrocarbon odor	1.0 x 10 ⁻³	Noncombustible Solid	NA
Phenanthrene	NA	NA	NA	NA	NA	NA	Combustible Solid	NA
Pyrene	NA	NA	NA	NA	NA	NA	Combustible Solid	NA
Selenium (Se)	0.2	1	NA	NA	NA	0 (approx)	Combustible Solid	NA
Silvex (2,4,5-TP)	NA	NA	NA	NA	NA	NA	Noncombustible Liquid	NA
Tetrachloroethylene (PCE)	100	150	NA	1	Chloroform- like odor	14	Colorless Liquid	NA
Toluene	200	500	1.1	2.9	Sweet aromatic odor	21	Combustible Liquid	Yes
1,2,4-Trichlorobenzene	NA	NA	2.5	3	Faint aromatic	1.0	Combustible Liquid	NA
1,1,1-Trichloroethane (1,1,1-TCA)	350	700	7.5	400	Chloroform- like odor	100	Colorless Liquid	Yes
Trichloroethylene (TCE)	100	1,000	8	28	Chloroform-	58	Colorless Liquid	NA
Trichlorofluoromethane	1,000	2,000	NA	NA	NA	690	Colorless liquid	NA
1,2,4-Trimethylbenzene	NA	NA	0.9	NA	NA	4.5	Colorless Liquid	Yes
1,3,5-Trimethylbenzene	NA	NA	0.88	NA	NA	2.5	Flammable Liquid	Yes
Vinyl Chloride (VC)	1	NA	3.6	3000	Pleasant odor	3660	Colorless Gas	NA
Xylenes (total)	100	900	0.9	1	Faint aromatic	7	Combustible	Yes
Zinc (Zn)	5	50	NA	NA	NA	0 (approx)	Combustible Solid ⁽⁵⁾	NA

- 29 CFR 1910, June 30, 1993 (8-hour Time weighted average unless otherwise specified.) (1)

- ACGIH 1989 Highest reported value of acceptable odor threshold range.
 Slight explosive hazard if dust is exposed to flame
 Sponge catalyst may ignite spontaneously in the air.
 Powder may ignite spontaneously in the air, and can continue burning under water.

 - [IDLH] [CA] Immediately dangerous to life or health Suspect carcinogen - Minimize all possible exposures

2.2 Potential Radiation Hazards

According to the NYSDEC, historic steel slag, containing low levels of radiation (non-harmful to humans), has reportedly been deposited in areas nearby the Site. The NYSDEC indicated that the slag originated from a nearby smelting plant. As the Site is known to have received off-site fill, there is a potential that the radioactive slag was placed at the Site. Upon identification in the field, an assessment of the radioactivity will be completed, if deemed necessary.

2.3 Biological Hazards

Animals

During site operations, animals such as dogs, pigeons, sea gulls, mice, and rats may be encountered. Workers will use discretion and avoid all contact with animals. Bites and scratches from dogs can be painful and if the animal is rabid, the potential for contracting rabies exists. Contact with rat and mice droppings may lead to contracting hantavirus. Inhalation of dried pigeon droppings may lead to psittacosis; crytococcosis and histoplasmosis are also diseases associated with exposure to dried bird droppings but these are less likely to occur in this occupational setting.

Insects

Insects, including bees, wasps, hornets, mosquitoes, and spiders, may be present at this site. Some individuals may have a severe allergic reaction to an insect bite or sting that can result in a life threatening condition. In addition, mosquito bites may lead to St. Louis encephalitis or West Nile encephalitis. Personnel that have been bitten or stung by an insect at the Site should notify the HSO or FSO of such immediately. The following is a list of preventive measures:

- Apply insect repellent prior to fieldwork and or as often as needed throughout the shift.

- Wear proper protective clothing (work boots, socks and light colored pants).

- When walking in wooded areas, to the extent possible avoid contact with bushes, tall grass, or brush.

- Field personnel who may have insect allergies (e.g., bee sting) should provide this information to the HSO or FSO prior to commencing work, and will have allergy medication on Site.

The HSO or FSO will instruct the project personnel in the recognition and procedures for encountering potentially hazardous insects at the Site.

Lyme disease is caused by infection from a deer tick that carries a spirochete. During the painless tick bite, the spirochete may be transmitted into the bloodstream, which could lead to the worker contracting Lyme disease. This flu like illness occurs out of season, commonly happening between May and October when ticks are more active. Symptoms can include a stiff neck, chills, fever, sore throat, headache, fatigue and joint pain. Early signs may include an expanding skin rash and joint pain. If left untreated, Lyme disease can cause serious nerve or heart problems as well as a disabling type of arthritis. If personnel feel sick or have signs similar to those above, they should notify the HSO or FSO immediately.

It is recommended that personnel check themselves when in areas that could harbor deer ticks, wear light color clothing and visually check themselves and their buddy when coming from wooded or vegetation covered areas. If a tick is found biting an individual, the HSO or FSO should be contacted immediately. The tick can be removed by pulling gently at the head with tweezers. The affected area should then be disinfected with an antiseptic wipe.

2.4 Physical Hazards

2.4.1 Explosion

No explosion hazards are expected for the scope of work at this site.

2.4.2 Heat Stress

The use of Level C protective equipment, or greater, may create heat stress. Monitoring of personnel wearing personal protective clothing should commence when the ambient temperature is 72°F or above. Table 2.2 presents the suggested frequency for such monitoring. Monitoring frequency should increase as ambient temperature increases or as slow recovery rates are observed. Refer to the Table 2.3 below to assist in assessing when the risk for heat related illness is likely. To use this table, the ambient temperature and relative humidity must be obtained (a regional weather report should suffice). Heat stress monitoring should be performed by the Field Safety Officer, who shall be able to recognize symptoms related to heat stress.

To monitor the workers, be familiar with the following heat-related disorders and their symptoms:

Prickly Heat (Heat rash)

- Painful, itchy red rash. Occurs during sweating, on skin covered by clothing.

Heat Cramps

- Painful spasm of arm, leg or abdominal muscles, during or after work.

Heat Exhaustion

- Headache, nausea, dizziness. Cool, clammy, moist skin. Heavy sweating. Weak, fast pulse. Shallow respiration, normal temperature.

Heat Fatigue

- Weariness, irritability, loss of skill for fine or precision work. Decreased ability to concentrate. No loss of temperature control.

Heat Syncope (Heat Collapse)

- Fainting while standing in a hot environment.

Heat Stroke

- Headache, nausea, weakness, hot dry skin, fever, rapid strong pulse, rapid deep respirations, loss of consciousness, convulsions, coma. **This is a life threatening condition.**

<u>Do not permit a worker to wear a semi-permeable or impermeable garment when</u> they are showing signs or symptoms of heat-related illness.

To monitor the worker, measure:

Heart rate. Count the radial pulse during a 30-second period as early as possible in the rest period.

If the heart rate exceeds 100 beats per minute at the beginning of the rest period, shorten the next work cycle by one-third and keep the rest period the same.

If the heart rate still exceeds 100 beats per minute at the next rest period, shorten the following work cycle by one-third. A worker cannot return to work after a rest period until their heart rate is below 100 beats per minute.

Oral temperature. Use a clinical thermometer (3 minutes under the tongue) or similar device to measure the oral temperature at the end of the work period (before drinking).

If oral temperature exceeds 99.6°F (37.6°C), shorten the next work cycle by one-third without changing the rest period. A worker cannot return to work after a rest period until their oral temperature is below 99.6°F.

If oral temperature still exceeds 99.6°F (37.6°C) at the beginning of the next rest period, shorten the following cycle by one-third.

Do <u>not</u> permit a worker to wear a semi-permeable or impermeable garment when oral temperature exceeds 100.6°F (38.1°C).

Prevention of Heat Stress - Proper training and preventative measures will aid in averting loss of worker productivity and serious illness. Heat stress prevention is particularly important because once a person suffers from heat stroke or heat exhaustion, that person may be predisposed to additional heat related illness. To avoid heat stress the following steps should be taken:

Adjust work schedules.

Mandate work slowdowns as needed.

Perform work during cooler hours of the day if possible or at night if adequate lighting can be provided.

Provide shelter (air-conditioned, if possible) or shaded areas to protect personnel during rest periods.

Maintain worker's body fluids at normal levels. This is necessary to ensure that the cardiovascular system functions adequately. Daily fluid intake must approximately equal the amount of water lost in sweat, id., eight fluid ounces (0.23 liters) of water must be ingested for approximately every eight ounces (0.23 kg) of weight lost. The normal thirst mechanism is not sensitive enough to ensure that enough water will be drunk to replace lost sweat. When heavy sweating occurs, encourage the worker to drink more. The following strategies may be useful:

Maintain water temperature 50^o to 60^oF (10^o to 16.6^oC).

Provide small disposal cups that hold about four ounces (0.1 liter).

Have workers drink 16 ounces (0.5 liters) of fluid (preferably water or dilute drinks) before beginning work.

Urge workers to drink a cup or two every 15 to 20 minutes, or at each monitoring break. A total of 1 to 1.6 gallons (4 to 6 liters) of fluid per day are recommended, but more may be necessary to maintain body weight.

Train workers to recognize the symptoms of heat related illness.

2.4.3 Cold-Related Illness

If work on this project begins in the winter months, thermal injury due to cold exposure can become a problem for field personnel. Systemic cold exposure is referred to as hypothermia. Local cold exposure is generally called frostbite.

Hypothermia - Hypothermia is defined as a decrease in the patient core temperature below 96°F. The body temperature is normally maintained by a combination of central (brain and spinal cord) and peripheral (skin and muscle) activity. Interference with any of these mechanisms can result in hypothermia, even in the absence of what normally is considered a

"cold" ambient temperature. Symptoms of hypothermia include: shivering, apathy, listlessness, sleepiness, and unconsciousness.

Frostbite - Frostbite is both a general and medical term given to areas of local cold injury. Unlike systemic hypothermia, frostbite rarely occurs unless the ambient temperatures are less than freezing and usually less than 20^oF. Symptoms of frostbite are: a sudden blanching or whitening of the skin; the skin has a waxy or white appearance and is firm to the touch; tissues are cold, pale, and solid.

Prevention of Cold-Related Illness - To prevent cold-related illness:

Educate workers to recognize the symptoms of frostbite and hypothermia

Identify and limit known risk factors:

Assure the availability of enclosed, heated environment on or adjacent to the site.

Assure the availability of dry changes of clothing.

Assure the availability of warm drinks.

Start (oral) temperature recording at the job site:

At the FSO or Field Team Leader's discretion when suspicion is based on changes in a worker's performance or mental status.

At a worker's request.

As a screening measure, two times per shift, under unusually hazardous conditions (e.g., windchill less than 20oF, or wind-chill less than 30oF with precipitation).

As a screening measure whenever any one worker on the site develops hypothermia.

Any person developing moderate hypothermia (a core temperature of 92°F) cannot return to work for 48 hours.

Noise

The operation of heavy machinery and other equipment may result in momentary high noise levels during advancement of soil borings. Hearing protection (e.g., ear plugs, headphones) will be used as necessary.

2.4.5 Hand and Power Tools

To complete the various tasks for the project, personnel will utilize hand and power tools. The use of hand and power tools can present a variety of hazards, including physical harm from being struck by flying objects, being cut or struck by the tool, fire, and electrocution. Ground Fault Circuit Interrupters (GFCIs) are required for all portable electric tools.

2.4.6 Slips, Trips and Fall Hazards

Care should be exercised when walking at the site, especially when carrying equipment. The presence of surface debris, uneven surfaces, pits, facility equipment, and soil piles contribute to tripping hazards and fall hazards. To the extent possible, all hazards should be identified and marked on the Site, with hazards communicated to all workers in the area.

2.4.7 Utilities (Electrocution and Fire Hazards)

The possibility of encountering underground utilities poses fire, explosion, and electrocution hazards. All intrusive work will be preceded by notification of the subsurface work to the N.Y. One Call Center. Potential adverse effects of electrical hazards include burns and electrocution, which could result in death.

2.4.8 Working near Heavy Machinery

Care should be exercised when working near heavy machinery such as the excavators. Workers should always stay in view of the equipment operator; give equipment wide berth. Clear communications signals, including hand signals, should be established prior to commencement of work and the equipment should have a back-up alarm.

2.4.9 Lifting

Improper lifting and carrying of equipment and materials and shoveling soil may cause strains. Safe lifting and general material handling techniques should be exercised.

2.4.10 Falling Hazards

Soil material, crushed stone, tools, etc. may fall from power shovels, front-end loaders, etc. Hard hats are to be worn at all times while in work zones.

2.4.11 Vehicle Hazards.

Trucks and other work vehicles will be entering and leaving the Site during work hours. In addition, the hydraulic excavators, dump trucks, and other construction vehicles will be working throughout the Site. Care should be taken when working on-Site and be aware of surroundings at all times. When working near vehicular traffic or work zones, attempt to keep eye contact with the machine operators.

2.4.12 Hearing Loss Prevention.

Work activities during the remediation and construction activities may be conducted at locations with high noise levels from the operation of equipment. Hearing protection will be used as necessary.

2.5 Task Hazard Analysis

Hazards that are potentially present have been determined for each specific task to be undertaken at the Site. Table 2.5 provides a summary of chemical exposure and physical hazards that could potentially be encountered by personnel during the following major task efforts.

2.5.1 Excavation, Removal of Soil, Engineering and Institutional Controls

Identified potential issues related to work at this site include; low levels of regulated compounds in soil and/or groundwater (i.e., aromatic and halogenated volatile organic compounds, semi volatile organic compounds, specifically polycyclic aromatic hydrocarbons, mercury and lead in soil, and pesticides), and drilling/cutting with gas-powered equipment indoors potentially generating CO and CO₂ in the exhaust fumes.

Soil Removal for Site Redevelopment and/or the Installation of Foundations and Utilities

The following hazards are associated with the removal and sampling of soil: heavy excavation equipment (impact hazard to on-foot workers), open excavations (fall and cave-in hazard), uneven land surface (slip and trip hazard), and contaminated media (chemical exposure hazard).

2.5.3 Soil Backfill

The backfilling of the excavated areas have similar hazards as those associated with the removal of soil.

Chemical exposure may occur as workers encounter soil and groundwater across the site, or are exposed to products used at the site including gasoline, diesel and motor oil. Soil and groundwater sampling presents similar potential exposure hazard. Activities will be conducted initially in Level D but may be upgraded to Modified Level D. Although not anticipated, there will be a Level C and B contingency should pockets of contaminants be brought to the surface and breathing zone air become contaminated.

If evidence of historic or unknown contamination, such as oily materials, high PID readings, etc., is encountered during intrusive work, the FSO will determine the appropriate level of personnel protection.

Table 2.2Suggested Frequency of Physiological MonitoringFor Fit and Acclimated Workers^a

Adjusted Temperature ^b	Normal Work Ensemble ^c	Impermeable Ensemble
90°F or above	After each 45 min.	After each 15 min.
(32.2°C) or above	of work	of work
87.5°F	After each 60 min.	After each 30 min.
(30.8°-32.2°C)	of work	of work
82.5°-87.5°F	After each 90 min.	After each 60 min.
(28.1°-30.8°C)	of work	of work
77.5°-82.5°F	After each 120 min.	After each 90 min.
(25.3°-28.1°C)	of work	of work
72.5°-77.5°F	After each 150 min.	After each 120 min.
(22.5°-25.3°C)	of work	of work

a. For work levels of 250 kilocalories/hour.

b. Calculate the adjusted air temperature (ta adj) by using this equation: ta adj $^{O}F =$ ta $^{O}F + (13 \times \% \text{ sunshine})$. Measure air temperature (ta) with a standard mercury-inglass thermometer, with the bulb shielded from radiant heat. Estimate percent sunshine by judging what percent time the sun is not covered by clouds that are thick enough to produce a shadow. (100 percent sunshine = no cloud cover and a sharp, distinct shadow; 0 percent sunshine = no shadows.)

c. A normal work ensemble consists of cotton coveralls or other cotton clothing with long sleeves and pants.

Table 2.3 - HEAT INDEX

	ENVIRONMENTAL TEMPERATURE (Fahrenheit)										
	70	75	80	85	90	95	100	105	110	115	120
RELATIVE HUMIDITY	APPARENT TEMPERATURE*										_
0%	64	69	73	78	83	87	91	95	99	103	107
10%	65	70	75	80	85	90	95	100	105	111	116
20%	66	72	77	82	87	93	99	105	112	120	130
30%	67	73	78	84	90	96	104	113	123	135	148
40%	68	74	79	86	93	101	110	123	137	151	
50%	69	75	81	88	96	107	120	135	150		
60%	70	76	82	90	100	114	132	149			
70%	70	77	85	93	106	124	144				
80%	71	78	86	97	113	136					
90%	71	79	88	102	122						
100%	72	80	91	108							

*Combined Index of Heat and Humidity...what it "feels like" to the body Source: National Oceanic and Atmospheric Administration

How to use Heat Index:

- 1. Across top locate Environmental Temperature
- 2. Down left side locate Relative Humidity
- 3. Follow across and down to find Apparent Temperature
- 4. Determine Heat Stress Risk on chart at right

Note: Exposure to full sunshine can increase Heat Index values

Apparent Temperature	Heat Stress Risk with Physical Activity and/or Prolonged			
	Exposure			
90-105	Heat Cramps or Heat			
	Exhaustion Possible			
105-130	Heat Cramps or Heat Exhaustion			
	Likely, Heat Stroke Possible			

A. CONTAMINANT HAZARDS OF CONCERN

Contaminant	Monitoring Device	AIR - PEL	Source of Concentration on Site	Route of Exposure	Toxicological Effects, Symptoms, and Hazards	First Aid
VOCs						
Acetone	PID	1,000	Soil/Groundwater	Inh, Abs, Ing, Con	Irrit eyes, skin, nose	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Benzene	PID	1 ppm	Soil/Groundwater	Inh, Abs, Ing, Con	Irrit eyes, skin, nose, resp tract., gidd, head, nau, staggered gait; lass, derm, bone marrow depress, [carc]	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
1,3-Butadiene	PID	5 ppm	Soil Gas	Inh, Abs, Ing, Con	Irrit eyes, skin, nose, resp tract, reproductive system, mucous membranes	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
sec-Butylbenzene	PID	NA	Soil/Groundwater	Inh, Abs, Ing, Con	Irrit eyes, skin, nose, resp tract	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Carbon Disulfide	PID	20 ppm	Soil Gas	Inh, Ing, Con	Irrit eyes, skin, nose, kidneys, nervous system, liver damage	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Chlorobenzene	PID	75 ppm	Soil	Inh, Abs, Ing, Con	Irrit eyes, skin, nose, reproductive system, mucous membranes, liver damage	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Chloroform	PID	50 ppm	Groundwater	Inh, Ing, Con	Irrit eyes, skin, nose, carcinogen, organ damage	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Chloromethane	PID	100 ppm	Soil Gas	Inh, Abs, Ing, Con	Irrit eyes, skin, nose, kidneys, nervous system, liver damage	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Cyclohexane	PID	300 ppm	Soil Gas	Inh, Ing, Con	Irrit eyes, skin, nose, kidneys, nervous system, liver damage	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
1,2-Dichlorobenzene	N/A	NA	Soil/Groundwater	Inh, Ing, Con	Irrit eyes, skin, nose, kidneys, mucous membranes, liver damage	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
1,3-Dichlorobenzene	N/A	NA	Soil/Groundwater	Inh, Abs, Ing, Con	Irrit eyes, skin, nose	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately

EXPLANATION OF ABBREVIATIONS

PID = Photoionization Detector ppm = parts per million Derm = Dermatitis Drow = Drowsiness Inj = Injury Ing = Ingestion Abdom = Abdominal Dizz = Dizziness Tg = Fatigue Lass = Lassitude Con = Skin and/or eye contact Gastro = Gastro-intestinal Depres = Depressant Gidd = Giddiness Muc memb = mucous membrane

Contaminant	Monitoring Device	AIR - PEL	Source of Concentration on Site	Route of Exposure	Toxicological Effects, Symptoms, and Hazards	First Aid
1,4-Dichlorobenzene	N/A	NA	Soil/Groundwater	Inh, Abs, Ing, Con	Irrit eyes, skin, nose, carcinogenic, resp. tract, kidneys, mucous membranes, liver damage	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Dichlorodifluoromethane	PID	1,000 ppm	Soil Gas	Inh, Ing, Con	Irrit eyes, skin, nose, nervous system,	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
1,1-Dichloromethane (1,1-DCA)	PID	100 ppm	Soil/Groundwater	Inh, Ing, Con	Irrit eyes, skin, nose, carcinogenic, CNS	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
1,1-Dichloroethylene (1,1-DCE)	N/A	NA	Soil/Groundwater	Inh, Abs, Ing	Nervous system, liver, lung damage, fainting	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
cis-1,2-Dichloroethylene (cis-1,2-DCE)	N/A	NA	Soil/Groundwater	Inh, Abs, Ing	Irrit. dizziness, drowsiness, nervous system, liver damage	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
tcrans-1,2-Dichloroethylene (trans-1,2-DCE)	N/A	200 ppm	Soil/Groundwater	Inh, Abs, Ing	Irrit. dizziness, drowsiness, nervous system, liver damage	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
n-Heptane	PID	500 ppm	Soil Gas	Inh. Ing. Con	Irrit eyes, skin, lungs, CNS, resp. tract	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
2-Hexanone	PID	100 ppm	Soil Gas	Inh. Con	Irrit eyes, skin	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
n-Hexane	PID	50 ppm	Soil Gas	Inh, Abs, Ing, Con.	Irr to eyes, skin, blood, CNS, liver, resp. tract	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Ethylbenzene	PID	100 ppm	Soil/Groundwater	Inh, Abs, Ing, Con	Irrit eyes, skin, nose, resp tract., gidd, head, nau, staggered gait; lass, derm, bone marrow depress	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Isopropanol	PID	400 ppm	Soil Gas	Inh, Ing, Con	Irrit eyes, skin, resp tract, kidneys, liver	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Methyl Isobutyl Ketone (4-Methyl-2- Pentanone)	PID	100 ppm	Soil/Groundwater	Inh, Ing, Con	Irrit eyes, skin, resp tract, CNS, mucous membrane	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Methyl Tert-Butyl Ether	N/A	NA	Soil/Groundwater	Inh, Ing, Con	Irrit eyes, skin, nose, resp tract	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately

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Contaminant	Monitoring Device	AIR - PEL	Source of Concentration on Site	Route of Exposure	Toxicological Effects, Symptoms, and Hazards	First Aid
Methylene Chloride	PID	25 ppm	Soil/Groundwater	Inh, Ing, Con	Irrit eyes, skin, carcinogen, resp tract, CNS, mucous membrane, liver damage	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Tetrachloroethylene (PCE)	N/A	100 ppm	Soil/Groundwater	Inh, Abs, Ing, Con	Irr. to resp, skin, ey, CNS, naus. Vomiting, chest pain, difficulty breathing, headache, dizz, Tg, Gidd, Inco,, Carc.	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Toluene	PID	200 ppm	Soil/Groundwater	Inh, Abs, Ing, Con	Irrit eyes, skin, nose, resp tract., gidd, head, nau, staggered gait; lass, derm, bone marrow depress	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
1,2,4-Trichlorobenzene	N/A	NA	Soil/Groundwater	Inh, Abs, Ing, Con	Irr. to resp, liver damage	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
1,1,1-Trichloroethane (1,1,1-TCA)	PID	350 ppm	Soil/Groundwater	Inh, Ing, Con	Irr. eys, resp., throat,	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Trichloroethylene (TCE)	N/A	100	Soil/Groundwater	Inh, Abs, Ing,	Irr. eys, resp., throat, naus., dizz,, headache, CNS damage, vomiting, liver damage, card	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Trichlorofluoromethane	PID	1,000 ppm	Soil Gas	Inh, Abs, Ing,	Irrit eyes, skin, heart, lungs, liver	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
1,2,4-Trimethylbenzene	N/A	NA	Soil/Groundwater	Inh, Ing, Con	Irrit eyes, skin, nose, CNS	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
1,3,5-Trimethylbenzene	N/A	NA	Soil/Groundwater	Inh, Ing, Con	Irrit eyes, skin, nose, resp. tract	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Vinyl Chloride	N/A	1 ppm	Soil/Groundwater	Inh, Abs, Ing, Con	Irrit eyes, skin, nose, resp tract., gidd, head, nau, staggered gait; lass, derm, bone marrow depress	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Xylenes	PID	100 ppm	Soil/Groundwater	Inh, Abs, Ing, Con	Irrit eyes, skin, nose, resp tract., gidd, head, nau, staggered gait; lass, derm, bone marrow depress	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately

EXPLANATION OF ABBREVIATIONS

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SVOCs/Pesticides						
Acenaphthene	Dust Monitor	NA	Soil/Groundwater	Inh, Ing, Con	Irrit eyes, skin	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Acenaphthylene	Dust Monitor	NA	Soil/Groundwater	Inh, Ing, Con	Irrit eyes, skin, resp. tract, CNS, mucous membranes	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Alpha-BHC	Dust Monitor	NA	Soil	Inh, Ing, Con	(carc) Irrit eyes, skin, CNS	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Anthracene	Dust Monitor	NA	Soil/Groundwater	Inh, Ing, Con	Irrit eyes, skin, carcinogenic, kidneys, lungs, mucous membranes	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Benzo(a)anthracene	Dust Monitor	NA	Soil/Groundwater	Inh,Con	Irrit eyes, skin, headache ,naus, cancer	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Benzo(a)pyrene	Dust Monitor	0.2 mg/m3	Soil/Groundwater	Inh, Ing	(Carc), mutagenic, neoplastic	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Benzo(b)fluoranthene	Dust Monitor	0.2 mg/m3	Soil/Groundwater	Inh, Ing, Abs	Irrit eyes, skin, carcinogen, ung damage	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Benzo(g,h,i)perylene	Dust Monitor	0.2 mg/m3	Soil/Groundwater	Inh, Ing, Abs	Irrit eyes, skin, carcinogen, ung damage	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Benzo(k)fluoranthene	Dust Monitor	NA	Soil	Inh, Ing, Con	Irrit eyes, skin, carcinogen, ung damage	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Beta-BHC	Dust Monitor	NA	Soil/Groundwater	Inh, Ing, Con	(carc) Irrit eyes, skin, CNS	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Chrysene	Dust Monitor	0.2 mg/m3	Soil	Inh, Ing	Irrit, cancer, pulmonary edema, sensitizer, dermatitis, naus, kidney damage	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
DDD	Dust Monitor	1 ppm	Soil	Inh, Abs, Ing, Con	Irrit,, head. nau., tremors, seizures, cancer	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately

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DDE	Dust Monitor	1 ppm	Soil	Inh, Abs, Ing, Con	Irrit,, head. nau., tremors, seizures, cancer	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
DDT	Dust Monitor	1 ppm	Soil	Inh, Abs, Ing, Con	Irrit, head. nau., tremors, seizures, cancer, liver, reproductive, and nervous system damage	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Delta-BHC	Dust Monitor	NA	Soil	Inh, Abs, Ing	Irrit, eyes, cancer, kidney, liver, heart, and nervous system damage	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Dibenz(a,h)anthracene	Dust Monitor	NA	Soil	Inh, Abs, Ing, Con	(car) Irrit, eyes, skin, resp. tract, digestive tract	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Dibenzofuran	Dust Monitor	NA	Soil	Inh, Abs, Ing	Irrit, eyes, skin, toxic by ingestion	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Dieldrin	Dust Monitor	0.25 mg/m3	Soil	Inh, Abs, Ing	Irr. headache, dizziness, nau. seizures	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Fluoranthene	Dust Monitor	NA	Soil/Groundwater	Inh, Ing	Irrit, eyes, skin, digestive tract	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Fluorene	Dust Monitor	NA	Soil/Groundwater	Inh, Ing	Irrit, eyes, skin, digestive tract	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Gamma-BHC	Dust Monitor	NA	Soil/Groundwater	Inh, Ing, Con	Carcinogen, Irrit, eyes, skin, resp. tract, blood, kidney, liver, and CNS	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Heptachlor Epoxide	Dust Monitor	NA	Soil	Inh	Fatal & toxic	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Hexachlorobenzene	Dust Monitor	NA	Soil/Groundwater	Inh, Abs, Ing	(car) Irrit, eyes, skin	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Indeno(1,2,3-c,d)pyrene	Dust Monitor	NA	Soil/Groundwater	Inh, Abs, Ing	(car) Irrit, eyes, skin	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
2-mercapotbenz,othiazole	Dust Monitor	NA	Soil	Inh, Abs, Ing	Irr. Digestive tract, naus., headache, unconsciousness, dermatitis	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately

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TABLE 2.5 Task Hazard Analysis

Naphthalene Dust Monitor	10 ppm	Soil/Groundwater	Inh, Ing, Con	Irrit. eyes, skin	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
N-nitrosodiphenylamine Dust Monitor	NA	Soil	Inh, Abs, Ing	Irrit. eyes, cancer,, nausea, vomiting, headaches, liver damage	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
PCBs Dust Monitor	0.5 mg/m3	Soil	Inh, Abs, Ing	Irr. Resp, possible damage to liver, kidney, CNS	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Phenanthrene Dust Monitor	NA	Soil/Groundwater	Inh, Ing, Con	Irrit. eyes, skin	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Pyrene Dust Monitor	0.2 mg/m3	Soil	Inh, Ing, Con	Cancer, mutagenic, neoplastic	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
SIlvex (2,4,5-TP) Dust Monitor	NA	Soil	Inh, Ing, Con	Irrit. eyes, skin, nose, throat	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Metals					·
Arsenic NA	0.01 ppm	Soil/Groundwater	Inh, Abs, Ing, Con	Irrit eyes, skin, nose, resp tract., gidd, head, nau, staggered gait; lass, derm, bone marrow depress, [carc]	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Barium Dust Monitor	0.5 mg/m3	Soil/Groundwater	Ing, Ing, Con	Irrit eyes, skin, nose, resp tract	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Beryllium Dust Monitor	0.002 mg/m3	Soil	Inh, Ing, Con	Carcinogen, mutagen, lung fibriosis, dyspnea, weight loss	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Cadmium Dust Monitor	0.005 ppm	Soil	Ing. Inh. Con.	Carcinogen, Irrit eyes, skin, nose	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Chromium Dust Monitor	1 mg/m3	Soil	Ing, Ing, Con	Irrit eyes, skin, corrosive on tissue ,ulcer	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Copper Dust Monitor	1 mg/m3	Soil	Inh, Abs, Ing	Irrit skin, eyes, resp tract, birth defects, kidney cancer,chills, sweating, fever, naus	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support
PyreneDust MonitorSIIvex (2,4,5-TP)Dust MonitorMetalsNAArsenicNABariumDust MonitorBerylliumDust MonitorCadmiumDust MonitorChromiumDust MonitorCopperDust Monitor	 0.2 mg/m3 NA 0.01 ppm 0.01 ppm 0.5 mg/m3 0.002 mg/m3 0.005 ppm 1 mg/m3 1 mg/m3 	Soil Soil Soil/Groundwater Soil/Groundwater Soil Soil Soil	Inh, Ing, Con Inh, Ing, Con Inh, Ing, Con Inh, Abs, Ing, Con Ing, Ing, Con Ing, Ing, Con Ing, Inh. Con. Ing, Ing, Con Ing, Ing, Con	Cancer, mutagenic, neoplastic Irrit. eyes, skin, nose, throat Irrit eyes, skin, nose, resp tract., gidd, head, nau, staggered gait; lass, derm, bone marrow depress, [carc] Irrit eyes, skin, nose, resp tract. Irrit eyes, skin, nose, resp tract Carcinogen, mutagen, lung fibriosis, dyspnea, weight loss Carcinogen, Irrit eyes, skin, nose Irrit eyes, skin, corrosive on tissue ,ulcer Irrit skin, eyes, resp tract, birth defects, kidney cancer, chills, sweating, fever, naus	Swallow: Med. attn. immediatelyEyes: Irrigate immediatelySkin: Soap wash promptlyBreath: Resp. supportSwallow: Med. attn. immediatelyEyes: Irrigate immediatelySkin: Soap wash promptlyBreath: Resp. supportSwallow: Med. attn. immediatelySkin: Soap wash promptlyBreath: Resp. supportSwallow: Med. attn. immediatelySkin: Soap wash promptlyBreath: Resp. supportSwallow: Med. attn. immediatelyEyes: Irrigate immediatelySkin: Soap wash promptlyBreath: Resp. supportSwallow: Med. attn. immediatelyEyes: Irrigate immediatelySkin: Soap wash promptlyBreath: Resp. supportSwallow: Med. attn. immediatelyEyes: Irrigate immediatelySkin: Soap wash promptlyBreath: Resp. supportSwallow: Med. attn. immediatelySkin: Soap wash promptlyBreath: Resp. support

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TABLE 2.5 Task Hazard Analysis

Cyanide	Dust Monitor	5 ppm	Soil/Groundwater	Inh, Abs, Ing	Irrit. to lungs, gastrointestinal tract, nau Skin inflammation and blistering, Corrosive to eyes,	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Iron	Dust Monitor	5 ppm	Soil	Inh, Abs, Ing	Irrit to lungs, gastrointestinal tract, nau. Headache, dizziness, convulsions, liver damage, blue colored skin/nails	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Lead	Dust Monitor	0.05 mg/m3	Groundwater Soil	Inh, Ing, Con	Irrit skin, eyes, vomiting, stupor, coma, insomnia, paralysis	Eyes: Irrigate immediately Skin: Water wash promptly Breath: Resp. support Swallow: Induce vomiting,med att.
Magnesium	Dust Monitor	15 mg/m3 (as for MgO)	Soil	Inh, Con	Irrit skin, eyes, resp tract, gastro	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Manganese	Dust Monitor	5 mg/m3	Soil	Inh, Ing	Irrit skin, eyes, CNS	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Mercury	Dust Monitor	0.1 mg/m3	Soil	Inh, Ing, Con	Nervous irritability, lass, tremor, gingivitis, graying of eye	Eyes: Irrigate immediately Skin: Water wash promptly. Breath: Resp. support Swallow: Induce vomiting,med att.
Nickel	Dust Monitor	1 mg/m3	Soil	Inh, Ing, Con	Irrit skin, eyes	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Zinc	Dust Monitor	1 mg/m3	Soil	Inh, Ing, Con	Toxic	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support Swallow: Med. attn. immediately
Nuisance Dust	Dust Monitor	15 mg/m3	Soil	Inh, Ing	Irrit eyes, skin, resp. tract	Eyes: Irrigate immediately Skin: Soap wash promptly Breath: Resp. support

Note: See CHASP for a discussion of how the Dust Monitor will be used to monitor the compounds of concern listed in this table.

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B. PHYSICAL HAZARDS OF CONCERN

Hazard	Description	Control Measures	
Skin contact	Sample spills on skin; splashes in eyes.	Wear proper PPE; follow safe practices	See Table 1 – Par
Lacerations, abrasions, punctures	Cutting bailer twine, pump tubing, etc. with knife. Using tools in tight spaces, etc.	Wear proper PPE; follow safe practices	See pages 48-51, manual
Inhalation	Opening wells, purging and sampling exposes sampler	Follow air monitoring plan; have quick access to respirator	See Table 1 – Par
Explosive atmosphere		Follow air monitoring plan	
Lifting	Improper lifting/carrying of equipment and materials causing strains	Follow safe lifting techniques	Follow the RICE p
Slips, trips, and falls	Any number of injuries could occur from slips, trips, and falls in carrying out tasks	Good housekeeping at site, constant awareness and focus on the task	
Noise	Drill rig engine and soil boring.	Wear hearing protection	
Falling objects	Soil material, tools, etc. dropping from drill rigs, front-end loaders, etc.	Hard hats to be worn at all times while in work zones	
Underground/overhead utilities	Excavators and demolition equipment making contact with utilities	"One Call" before dig; follow safe practices	

First Aid

Part "A" above

51, NSC "First Aid an CPR Standard"

Part "A" above

E procedures (p.99 in NSC manual)

C. Task-by-Task Risk Analysis

Task	Hazard	Description	Control Measures	First Aid
Removal of Targeted Soil and Fill	Heavy machinery	Demolition and excavation with hydraulic equipment	Wear proper PPE; follow safe practices	See Table 1 - Part "A" above
	Building Demolition	Demolition with hydraulic equipment, falling building material	Wear proper PPE; follow safe practices	See pages 48-51, NSC "First Aid an CPR Standard" manual
	Working and Sampling within the Excavations	Surveying size of excavation, Screening and sampling end-point samples	Wear proper PPE; follow air monitoring plan; have quick access to respirator	See Table 1 - Part "A" above
	Exposure to contaminated media	Working within the hot zones	Wear proper PPE; follow air monitoring plan	See decon procedures in CHASP
Groundwater Treatment and Sampling	Splash Hazards	Sample spills on skin; splashes in eyes.	Wear proper PPE; follow safe lifting techniques	Follow the RICE procedures (p.99 in NSC manual)
	Exposure to contaminated groundwater	Inhalation and dermal absorption risk	Wear proper PPE; good housekeeping at site, constant awareness and focus on the task	
	Exposure to moving pump components		Keep loose clothing from equipment. Keep safety gloves on.	
	Potential Explosive Hazard	Soil material, tools, etc. dropping from drill rigs, front-end loaders, etc.	Wear proper PPE; hard hats to be worn at all times while in work zones	
UST Closure	Potential Exposure to Confining Spaces	Drill rig auger makes contact with underground object; boom touches	Wear proper PPE; "One Call" before dig; follow safe practices	
	Potential for explosive or flammable conditions	Static charge may ignite residual explosive and flammable vapors	Follow proper UST closure proceedings for tank venting	
	Removal of UST and soil	See "Removal of Targeted Soil and Fill"		
Soil Backfill	See "Removal of Targeted Soil and Fill'	,		
Engineering Control Construction				

3.0 PERSONNEL PROTECTION AND MONITORING

3.1 OSHA Training

All on-site personnel who will be actively involved in Site remediation and construction activities and can potentially encounter hazardous waste must have completed hazardous waste operations-related training, as required by OSHA Regulations 29 CFR 1910.120. Personnel who completed this training more than 12 months prior to the start of the project must have completed an 8-hour refresher course within the past 12 months. Documentation of OSHA training for project personnel must be provided to Langan prior to starting work.

3.2 Site-Specific Training

The Field Safety Officer will be responsible for developing a site-specific occupational hazard training program and providing training to all personnel that are to work at the site. This training will be conducted prior to starting field work and will consist of the following topics:

- Names of personnel responsible for site safety and health.
- Hazards potentially present at the site.
- Proper use of personal protective equipment.
- Requirements of this CHASP.
- Work practices by which the employee can minimize risk from hazards. This may include a specific review of heavy equipment safety, safety during inclement weather, changes in common escape rendezvous point, site security measures, or other site-specific issues that need to be addressed before work begins.
- Safe use of engineering controls and equipment on the site.
- Acute effects of compounds present at the site.
- Decontamination procedures.

Upon completion of site-specific training, workers will sign the Site-Specific-Training Form provided in Attachment B. A copy of the completed Site-Specific Training Form will be included in the project files for future reference.

3.3 Monitoring Requirements

Worker air monitoring and community air monitoring (as described in Section 6.4) will be conducted at the start of field work.

Fugitive dust generation that could affect site workers, site occupants, or the public may be expected due to excavation and soil disturbance activities. Care will be taken to minimize dust generation. The FSO will visually monitor the perimeter of the work area for evidence of sustained visible emissions. Work activities will be suspended until dust levels diminish to an acceptable level if sustained emissions are observed

Air monitoring of the breathing zone will be conducted periodically or continuously during boring advancement, test pitting, and sampling activities to assure proper health and safety protection.

VOCs will be monitored with a PID in accordance with the HASP with an action level of 25 ppm in the absence of benzene. If the action level is exceeded and adequate ventilation cannot be provided, work will cease and the potential affected portion of the work area will be evacuated until adequate mechanical ventilation can be setup to control the hazard. Level C respiratory protection may be donned in accordance with the HASP if untrained personnel are not present and the action level is exceeded.

If air monitoring during operations identifies the presence of volatile organic compounds (not anticipated because of natural ventilation), the action levels, permissible exposure, engineering controls, and personal protective equipment specified in this HASP will be implemented. A PID (MiniRAE 2000 or equivalent) will be used to monitor for organic vapors in the breathing zone and to screen soil samples. Air monitoring results will be recorded in the field book during investigation activities and made available for review.

3.4 Summary Of Action Levels And Restrictions

A PID, such as the RaeSystems MiniRae 2000 equipped with a 10.6 eV lamp, shall be used to screen for total organic vapors. All readings pertain to sustained readings for 15 minutes in the worker breathing zone. The following conditions shall apply to each level of protection.

Conditions for Level D:

All areas

- PID readings < 25 ppm and benzene < 1 ppm
- No visible fugitive dust emissions from site activities

Conditions for Level C:

All areas

 Where PID readings > 25 ppm (sustained for 15 minutes in the breathing zone) to 200 ppm and benzene < 5ppm, and/or • Any visible fugitive dust emissions from site activities that disturb contaminated soil.

Conditions for Level B (or retreat):

All areas

- Where PID readings > 500 ppm or benzene > 25 ppm,
- Visible fugitive dust emissions from site activities cloud the surrounding air.

3.4.1 Level D and Modified Level D

Level D protection will be worn for initial entry on-site and initially for all activities. Level D protection will consist of:

- Standard work clothes
- Steel-toe safety boots
- Safety glasses (goggles must be worn when splash hazard is present)
- Nitrile outer gloves and PVC inner gloves must be worn during all activities requiring contact with soils.
- Hard hat (must be worn during all site activities)

Modified Level D is the same as Level D but includes Tyvek coveralls and disposable polyethylene overboots to contact with the skin or clothes if significant contamination is present in subsurface materials.

3.4.2 Level C

The level of personal protection will be upgraded to Level C if the concentration of volatile organic compounds which can be detected with a photoionization detector (PID) in the breathing zone equals or exceeds the specified action limits and the contaminants of concern have characteristic warning properties appropriate for air purifying respirators (e.g. taste, odor). Level C protection will consist of the following equipment:

- Full-face or half-mask air-purifying respirator (APR) or powered air purifier (PAPR), depending on presence and abundance of airborne toxic constituents of concern
- Combination HEPA filter/organic vapor cartridges
- Tyvek coveralls must be worn if particulate hazard present
- PE-coated Tyvek coveralls if liquid contamination present
- Steel-toe safety boots
- Nitrile outer gloves and PVC inner gloves must be worn during all activities requiring contact with soils.

Hard hat (must be worn during all site activities)

Cartridges will be disposed at the end of each day's use.

3.4.3 Level B (Retreat)

If the concentration of volatile organics which can be detected with a PID equals or exceeds the specified action levels, all field personnel associated with the project will immediately retreat to a location up-wind of the source of contamination. At this point the Site Safety Officer must consult with the Langan HSO to discuss appropriate actions.

3.4.4 OSHA Requirements for Personal Protective Equipment

All personal protective equipment used during the course of this field investigation must meet the following OSHA standards:

Type of Protection	Regulation	Source
Eye and Face	29 CFR 1910.133	ANSI Z87.1-1968
	29 CFR 1926.102	
Respiratory	29 CFR 1910.134	ANSI Z88.1-1980
	29 CFR 1926.103	
Head	29 CFR 1910.135	ANSI Z89.1-1969
	29 CFR 1926.100	
Foot	29 CFR 1910.136	ANSI Z41.1-1967
	29 CFR 1926.96	

ANSI = American National Standards Institute

Both the respirator and cartridges specified for use in Level C protection must be fit-tested prior to use in accordance with OSHA regulations (29 CFR 1910.1025; 29 CFR 1910.134).

Based on performance criteria, air purifying respirators cannot be worn under the following conditions:

- Oxygen deficiency;
- IDLH concentrations;
- High relative humidity; and
- If contaminant levels exceed designated use concentrations.

4.0 WORK ZONES AND DECONTAMINATION

4.1 Site Work Zones

Work zones will be established if hazardous materials are encountered.

4.1.1 Hot Zone

Hot zones will be established within a 25 foot radius around each boring and test pit, where possible. Barriers will be established at the perimeter of the boring and test pit area where the perimeter is shared with an area accessible to the public. Unprotected onlookers should be located 25 feet upwind of the activities. All personnel within the hot zone must don the appropriate levels of personal protection as set forth by the FSO. It is not anticipated that Level C or higher will be required for this site.

All personnel within the hot zone will be required to use the specified level of protection. No food, drink, or smoking will be allowed in the hot or warm zones.

4.1.2 Warm Zone

A warm zone will be established and utilized during the field activities. This zone will be established between the hot zone and the cold zone (discussed below), and will include the personnel and equipment necessary for decontamination of equipment and personnel exiting the hot zone. Personnel and equipment in the hot zone must pass through this zone before entering the cold zone. This zone should always be located upwind of the hot zone.

4.1.3 Cold Zone

The cold zone will include the remaining areas of the job site. Break areas and support facilities (include equipment storage and maintenance areas) will be located in this zone. No equipment or personnel will be permitted to enter the cold zone from the hot zone without passing through the decontamination station in the warm zone. Eating, smoking, and drinking will be allowed only in this area.

4.2 Decontamination

Generally, any water used in decontamination procedures will be placed in containers, temporarily stored on-site, and properly characterized and disposed.

4.2.1 Decontamination of Personnel

Decontamination of personnel will be necessary if Level C or Level B protection is used, which is not anticipated based on current knowledge of the Site history. Decontamination will not be

necessary if only Level D protection is used. However, disposable gloves and booties used during sampling activities should be removed and bagged; personnel should be encouraged to remove clothing and shower as soon as is practicable at the end of the day. All clothing should be machine-washed. All personnel will wash hands and face prior to eating and before and after using the restroom.

4.2.2 Decontamination of Field Equipment

Decontamination of field equipment will be necessary for all equipment in contact with contaminated materials. Decontamination activities shall be performed in a designated area lined with polyethylene sheeting that is designed to collect the decontamination rinsate.

4.3 Remedial Activity-Derived Waste

All PPE-related remedial activity-derived waste materials (PPE, decontamination waste) will be placed in labeled containers and appropriately disposed. Stockpiling of contaminated soil is not anticipated.

5.0 SAMPLE SHIPMENT

5.1 Non-Hazardous Samples

Samples collected in this study will be classified as environmental samples.

5.1.1 Environmental Samples

In general, environmental samples that are collected from soils or wells are not expected to contain high (hazardous) levels of constituents of concern.

Sample containers must have a completed sample identification tag and the outside container must be marked "Environmental Sample". The sample tag will be legibly written and completed with an indelible pencil or waterproof ink. The information will also be recorded in a log book. At a minimum, it will include:

- Exact location of sample;
- Time and date sample was collected;
- Name of sampler witnesses (if necessary);
- Project codes, sample station number, and identifying code (if applicable);
- Type of sample (if known);
- Laboratory number (if applicable); and
- Any other pertinent information.

Environmental samples will be packaged and shipped according to the following procedure:

- 1. Place sample container, properly identified and with a sealed lid, in a polyethylene bag, and seal bag;
- 2. Place sample in a fiberboard container or metal picnic cooler which has been lined with a large polyethylene bag;
- 3. Pack cooler with ice to maintain temperature of 4 degrees C;
- 4. Pack with enough noncombustible, absorbent, cushioning material to minimize the possibility of the container breaking;
- 5. Seal large bag; and
- 6. Seal or close outside container.

The appropriate side of the container must be marked "This End Up" and arrows should be drawn accordingly. No DOT marking labeling is required. No DOT shipping papers are required. There are no DOT restrictions on mode of transportation.

5.2 Hazardous Samples

Hazardous materials are not anticipated at the Site and samples are anticipated to be transported to the analytical laboratory via courier service. However, should hazardous materials be encountered or samples at the Site, the following procedures will be implemented. Personnel who must complete a Hazardous Goods Airway Bill must first be DOT trained and certified every two years. Drummed waste samples, tank samples, sludge samples, and grossly contaminated soil samples will be shipped as DOT Hazardous Materials. The designation "Flammable Liquid" or "Flammable Solid" will be used. The samples will be transported as follows:

- 1. Collect sample in a 16 ounce or smaller glass or polyethylene container with nonmetallic Teflon-lined screw cap. Allow sufficient air space (approximately 10% by volume) so container is not liquid full at 54 °C (130 °F). If collecting a solid material, the container plus contents should not exceed 1 pound net weight. If sampling for volatile organic analysis, fill VOA container to septum but place the VOA container inside a 16 ounce or smaller container so the required air space may be provided. Large quantities, up to 3.786 liters (1 gallon), may be collected if the sample's flash point is 23 °C (75 °F) or higher. In this case, the flash point must be marked on the outside container (e.g., carton, cooler), and shipping papers should state that "Flash point is 73 °F or higher."
- 2. Seal sample and place in a 4-mil thick polyethylene bag, one sample per bag.
- 3. Place sealed bag inside a metal can with noncombustible, absorbent cushioning material (e.g., vermiculite or earth) to prevent breakage, one bag per can. Pressureclose the can and use clips, tape or other positive means to hold the lid securely.
- 4. Mark the can with:
 - Name and address of originator
 - "Flammable Liquid N.O.S. UN 1993"
 - (or "Flammable Solid N.O.S. UN 1325)
 - NOTE: UN numbers are now required in proper shipping names.
- 5. Place one or more metal cans in a strong outside container such as a picnic cooler or fiberboard box. Preservatives are not used for hazardous waste site samples.

6. Prepare for shipping:

"Flammable Liquid, N.O.S. UN 1993" or "Flammable Solid, N.O.S. UN 1325"; "Cargo Aircraft Only" (if more than 1 quart net per outside package); "Limited Quantity" or "Ltd. Qty."; "Laboratory Samples"; "Net Weight ____" or "Net Volume ____" (of hazardous contents) should be indicated on shipping papers and on outside of shipping container. "This Side Up" or "This End Up" should also be on container. Sign shipper certification.

7. Stand by for possible carrier requests to open outside containers for inspection or modify packaging. It is wise to contact carrier before packing to ascertain local packaging requirements and not to leave area before the carrier vehicle (aircraft, truck) is on its way. The International Air Transport Association's Dangerous Goods regulations will need to be followed for using FedEx for the shipment of hazardous samples.

5.2.1 Shipping Papers

A blank Langan shipping paper should be filled out and maintained within the driver's reach, whenever a Langan employee carries hazardous materials in a vehicle in quantities above those allowed for Materials of Trade (MOTs). Such materials may include more than 8 gallons of the following:

- Gasoline (for use in a generator) UN 1203, Guide #27;
- Methanol (for use in decontamination procedures) UN 1230, Guide #28;
- Nitric Acid (for use in decontamination procedures) UN 1760, Guide #60; and
- Hydrochloric Acid (for use in decontamination procedures) UN 1789, Guide #60.

Other materials may include the following:

- > 220 pounds of compressed Gas [Air, Compressed] (calibration gas for the PID, or Grade D breathing air for Level B work) UN 1002, Class 2.2; and
- Other hazardous materials as defined by the DOT.

Appropriate MSDSs should be maintained with the shipping papers and/or the pocket DOT Emergency Response Guidebook.

6.0 ACCIDENT PREVENTION AND CONTINGENCY PLAN

6.1 Accident Prevention

6.1.1 Site-Specific Training

All field personnel will receive health and safety training prior to the initiation of any site activities. The site-specific training form provided in Attachment B must be signed, dated, and returned to the Langan Field Safety Officer. On a day-to-day basis, individual personnel should be constantly alert for indicators of potentially hazardous situations and for signs and symptoms in themselves and others that warn of hazardous conditions and exposures. Rapid recognition of dangerous situations can avert an emergency. Before daily work assignments, a regular safety meeting should be held. Discussion should include:

- Tasks to be performed;
- Time constraints (e.g., rest breaks, cartridge changes);
- Hazards that may be encountered, including their effects, how to recognize symptoms or monitor them, concentration limits, or other danger signals; and
- Emergency procedures.

6.1.2 Vehicles and Heavy Equipment

Working with large motor vehicles and heavy equipment could be a major hazard at this site. Injuries can result from equipment hitting or running over personnel, impacts from flying objects, or overturning of vehicles. Vehicle and heavy equipment design and operation will be in accordance with 29 CFR, Subpart O, 1926.600 through 1926.602. In particular, the following precautions will be utilized to help prevent injuries/accidents.

- Brakes, hydraulic lines, light signals, fire extinguishers, fluid levels, steering, tires, horn, and other safety devices will be checked at the beginning of each shift.
- Large construction motor vehicles will not be backed up unless:
 - The vehicle has a reverse signal alarm audible above the surrounding noise level; or
 - The vehicle is backed up only when an observer signals that it is safe to do so.
- Heavy equipment or motor vehicle cable will be kept free of all nonessential items, and all loose items will be secured.
 - Large construction motor vehicles and heavy equipment will be provided with necessary safety equipment (such as seat belts, roll-over protection, emergency shut-off in case of roll-over, backup warning lights and audible alarms).

• Blades and buckets will be lowered to the ground and parking brakes will be set before shutting off any heavy equipment or vehicles.

6.2 Spill Control Plan

All personnel must take every precaution to minimize the potential for spills during site operations. Any spill shall be reported immediately to the FSO. Spill control apparatus (sorbent materials) will be located on-site. All materials used for the cleanup of spills will be containerized and labeled separately from other wastes.

6.3 Contingency Plan

6.3.1 Emergency Procedures

In the event that an emergency develops on site, the procedures delineated herein are to be immediately followed. Emergency conditions are considered to exist if:

- Any member of the field crew is involved in an accident or experiences any adverse effects or symptoms of exposure while on site.
- A condition is discovered that suggests the existence of a situation more hazardous than anticipated.

General emergency procedures, and specific procedures for personal injury, chemical exposure and radiation exposure, are described below.

6.3.2 Chemical Exposure

If a member of the field crew demonstrates symptoms of chemical exposure the procedures outlined below should be followed:

- Another team member (buddy) should remove the individual from the immediate area of contamination. The buddy should communicate to the Field Team Leader (via voice and hand signals) of the chemical exposure. The Field Team Leader should contact the appropriate emergency response agency.
- Precautions should be taken to avoid exposure of other individuals to the chemical.
- If the chemical is on the individual's clothing, the chemical should be neutralized or removed if it is safe to do so.
- If the chemical has contacted the skin, the skin should be washed with copious amounts of water.
- In case of eye contact, an emergency eye wash should be used. Eyes should be washed for at least 15 minutes.

• All chemical exposure incidents must be reported in writing to the Langan Health and Safety Officer. The Field Safety Officer or Field Team Leader is responsible for completing the accident report.

6.3.3 Personal Injury

In case of personal injury at the site, the following procedures should be followed:

- Another team member (buddy) should signal the Field Team Leader that an injury has occurred.
- A field team member trained in first aid can administer treatment to an injured worker.
- The victim should then be transported to the nearest hospital or medical center. If necessary, an ambulance should be called to transport the victim.
- For less severe cases, the individual can be taken to the site dispensary.
- The Field Team Leader or Field Safety Officer is responsible for making certain that an Accident Report Form is completed. This form is to be submitted to the Langan Health and Safety Officer. Follow-up action should be taken to correct the situation that caused the accident.
- Any incident (near miss, property damage, first aid, medical treatment, etc.) must be reported.

A first-aid kit and blood-borne pathogens kit will be kept on-site during the field activities.

6.3.4 Evacuation Procedures

- The Field Team Leader will initiate evacuation procedures by signaling to leave the site.
- All personnel in the work area should evacuate the area and meet in the common designated area.
- All personnel suspected to be in or near the contract work area should be accounted for and the whereabouts or missing persons determined immediately.
- The Field Team Leader will then give further instruction.

6.3.5 Procedures Implemented in the Event of a Major Fire, Explosion, or Emergency

- Notify the paramedics and/or fire department, as necessary;
- Signal the evacuation procedure previously outlined and implement the entire procedure;

- Isolate the area;
- Stay upwind of any fire;
- Keep the area surrounding the problem source clear after the incident occurs;
- Complete accident report for and distribute to appropriate personnel.

6.4 Community Air Monitoring Plan

Community air monitoring will be conducted in compliance with the Community Air Monitoring Plan (CAMP) outlined below.

Monitoring for total organic vapors (TOVs) and particulate will be conducted during all ground intrusive activities (i.e., soil excavation and stockpiling, and utility installation). Upwind concentrations will be measured at the start of each workday and periodically thereafter to establish background concentrations. TOVs and particulates will be monitored within the work zone and at the downwind perimeter of the hot zone with a PID equipped with a 10.6 eV lamp and a DusTrak or DataRAM, respectively. Monitoring equipment will be capable of calculating 15-minute running average concentrations.

The following actions will be taken based on TOV levels measured:

- If total organic vapor levels exceed 5 ppm above background for the 15-minute average at the perimeter, work activities will be temporarily halted and monitoring continued. If levels readily decrease (per instantaneous readings) below 5 ppm above background, work activities will resume with continued monitoring.
- If total organic vapor levels at the downwind perimeter of the hot zone persist at levels in excess of 5 ppm above background but less than 25 ppm, work activities will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps work activities will resume provided that the total organic vapor level 200 feet downwind of the hot 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 above background for the 15-minute average.
- If the total organic vapor level is above 25 ppm at the perimeter of the hot zone, activities will be shutdown.

The following actions will be taken based on particulate concentrations measured (the maximum detected Site mercury concentration of 766 mg/kg has been factored into the particulate concentration level):

- If the downwind particulate level is 100 micrograms per cubic meter (ug/m3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques will be employed. Work will continue with dust suppression techniques provided that downwind particulate levels do not exceed 150 ug/m3 above the upwind level and provided that no visible dust is migrating from the work area.
- If, after implementation of dust suppression techniques, downwind particulate levels are greater than 150 ug/m3 above the background level, work will be stopped and a reevaluation of activities initiated. Work will resume provided that dust suppression measures and other controls are successful in reducing the downwind particulate concentration to within 150 ug/m3 of the upwind level and in preventing visible dust migration.
- In order to minimize the generation of dust, water will be sprayed on soils to be excavated, as needed. Water will also be sprayed on any areas of the Site where dust could be generated. A suitable dust control material, such as calcium chloride, will be used, as necessary, in high-traffic areas in order to minimize dust caused by vehicular traffic.

6.4.1 Vapor Emission Response Plan

If the ambient air concentration of organic vapors exceeds 5 ppm above background at the perimeter of the hot zone, boring, well installation, and test pit activities will be halted or vapor suppression controls will be employed, and monitoring continued. When work shut-down occurs, downwind air monitoring as directed by the Field Safety Officer will be implemented to ensure that vapor emission does not impact the nearest residential or commercial structure at levels exceeding those specified in the Major Vapor Emission section.

If the organic vapor level decreases below 5 ppm above background, sampling and boring and well installation can resume, provided:

- The organic vapor level 200 ft. downwind of the hot zone or half the distance to the nearest residential or commercial structure, whichever is less, is below 1 ppm over background, and
- More frequent intervals of monitoring, as directed by the Site Health and Safety Officer, are conducted.

6.4.2 Major Vapor Emission

If any organic levels greater than 5 ppm over background are identified 200 feet downwind from the work site, or half the distance to the nearest residential or commercial property, whichever is less, all work activities must be halted or odor controls must be implemented.

If, following the cessation of the work activities, or as the result of an emergency, organic levels persist above 5 ppm above background 200 feet downwind or half the distance to the nearest residential or commercial property from the hot zone, then the air quality must be monitored within 20 feet of the perimeter of the nearest residential or commercial structure (20 Foot Zone).

If either of the following criteria is exceeded in the 20 Foot Zone, then the Major Vapor Emission Response Plan shall automatically be implemented.

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

6.4.3 Major Vapor Emission Response Plan

Upon activation, the following activities will be undertaken:

- 1. The local police authorities will immediately be contacted by the Site Health and Safety Officer and advised of the situation;
- 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 Site Health and Safety Officer; and

All Emergency contacts will go into effect as appropriate.

6.5 Documentation

For emergencies involving personnel injury and/or exposure, the FSO will complete and submit the Accident Report Form within 48 hours of the incident. The form is attached in Attachment B.

ATTACHMENT A

Air Monitoring Equipment Calibration,

Maintenance, and Documents

All monitoring instruments must be calibrated and maintained periodically. Calibration and on-site maintenance records will be kept in the field log book. The operator must understand the limitations and possible sources of errors for each instrument. It is important that the operator checks that the instrument responds properly to the substances it was designed to monitor. Air quality monitoring equipment, including photoionization detectors (PIDs) and DusTraks or DataRAMs must be calibrated at least once each day. The specific instructions for calibration and maintenance provided for each instrument should be followed.

INSTRUMENT CALIBRATION LOG

LANGAN

PROJEC	T No. 14	40091401	CLIE	NT:			
PROJEC	T F(ONF /Sabre Park	Fash	ion Outlets II,	LLC and		
LOCATIO	DN N	iagara, NY	Mace	erich-Niagara,	LLC		
			FRESH	ISOBUTYLE		COMMENTS	
DATE		SERIAL #	AIR (PPN)	LOT#	CAL.VALUE	COMMENTS	INTTALS

LANGAN

PROJEC	T No. 14	40091401		CLIENT:					
PROJEC	T F	ONF /Sabre	Park	Fashion (Outlets II, L	LC and			
LOCATIO	DN N	iagara, NY		Macerich	n-Niagara, Ll	Viagara, LLC			
		Ultral	RAE PID REAL	DING	TSI D	ust TRAK REA	DING		
DATE	TIME	SERIAL #	LOCATION	PPM	SERIAL #	LOCATION	mg/m³	COMMENTS	INITIALS
	1				1			1	

Summary of Monitoring Equipment FONF/Sabre Park, Niagara, NY Langan Project NO. 140091401

Instrument	Operation Parameters					
Combustible Gas	Hazard Monitored: Combustible gases and vapors.					
Indicator (CGI)	Application: Measures the concentration of combustible gas or vapor.					
	Detection Method: A filament, usually made of platinum, is heated by burning the combustible gas or vapor. The increase in heat is measured. Gases and vapors are ionized in a flame. A current is produced in proportion to the number of carbon atoms present.					
	General Care/Maintenance: Recharge or replace battery. Calibrate immediately before use.					
	Typical Operating Time: Can be used for as long as the battery lasts, or for the recommended interval between calibrations, whichever is less.					
Flame Ionization	Hazard Monitored: Many organic gases and vapors (approved areas only).					
Detector (FID) with Gas Chromatography Option <i>(i.e., Foxboro Organic</i>	Application: In survey mode, detects the concentration of many organic gases and vapors. In gas chromatography (GC) mode, identifies and measures specific compounds. In survey mode, all the organic compounds are ionized and detected at the same time. In GC mode, volatile species are separated.					
Vapor Analyzer (OVA))	General Care/Maintenance: Recharge or replace battery. Monitor fuel and/or combustion air supply gauges. Perform routine maintenance as described in the manual. Check for leaks.					
	Typical Operating Time: 8 hours; 3 hours with strip chart recorder.					
Oxygen Meter	Hazard Monitored: Oxygen (O ₂).					
	Application: Measures the percentage of O_2 in the air.					
	Detection Method: Uses an electrochemical sensor to measure the partial pressure of O_2 in the air, and converts the reading to O_2 concentration.					
	General Care/Maintenance: Replace detector cell according to manufacturer's recommendations. Recharge or replace batteries prior to explanation of the specified interval. If the ambient air is less than 0.5% C O_2 , replace the detector cell frequently.					
	Typical Operating Time: 8 – 12 hours.					
Photoionization	Hazard Monitored: Many organic and some inorganic gases and vapors.					
Detector (PID)	Application: Detects total concentration of many organic and some inorganic gases and vapors. Some identification of compounds are possible if more than one probe is measured.					
	Detection Method: Ionizes molecules using UV radiation; produces a current that is proportional to the number of ions.					
	General Care/Maintenance: Recharge or replace battery. Regularly clean lamp window. Regularly clean and maintain the instrument and accessories.					
	Typical Operating Time: 10 hours. 5 hours with strip chart recorder.					

ATTACHMENT B

Forms for Health and Safety Related Activity

Note: The OSHA Job Safety and Health Protection Poster must be posted prominently during field activities. The following page is an example of the poster to be used in the field. The actual poster must be an 11 inch by 17 inch size version of this page. The OSHA 300 Log of injuries and illnesses is maintained in the home office of each Langan employee.



LANGAN

ACCIDENT REPORT FORM

	(Page 1 of 2)
Project Name:	
Injured or III Employee	
1. Name Soci	al Security #
(First) (Middle) (Last)	
2. Home Address(No. and Street) (City	v or Town) (State and Zip)
3. Age 4. Sex: Male () Female ()
5. Occupation	it
time of iniury)	hty employee was performing at
6. Department	
(Enter name of department in which in	njured person is employed, even
though they may have been temporarily working in	another department at the time of
injury)	
Freelower	
Employer	
7. Name	
8. Mailing Address(
(INO. and Street) (UIT) 9 Location (if different from mailing address):	y or Town) (State and Zip)
The Accident or Exposure to Occupational Illness	
10. Place of accident or exposure	
(No. and Street)	(City or Town) (State and Zip)
11. Was place of accident or exposure on employe	r's premises?(Yes/No)
(Be specific - was employee using tools or equipmen	t or handling material?)
13 How did the accident occur?	
(Describe fully the	he events that resulted in the injury
or	
occupational illness. Tell what happened and how	v Name objects and substances
involved.	
Give details on all factors that led to accident. Use so	eparate sheet if needed)
15.Date of injury or initial diagnosis of occupational ill	ness
· · ·	(Page 2 of 2)

LANGAN

ACCIDENT REPORT FORM

16. WITNESS			
TO ACCIDENT	(Name)	(Affiliation)	(Phone No.)
	(Name)	(Affiliation)	(Phone No.)
	(Name)	(Affiliation)	(Phone No.)

Occupational Injury or Occupational Illness

- 17. Describe the injury or illness in detail; indicate part of body affected.
- 18. Name the object or substance that directly injured the employee. (For example, object that struck employee; the vapor or poison inhaled or swallowed; the chemical or radiation that irritated the skin; or in cases of strains, hernias, etc., the object the employee was lifting, pulling, etc.)
- 19. Did the accident result in employee fatality? _____ (Yes or No)
- 20. Number of lost workdays ____/restricted workdays _____ resulting from injury or illness?

<u>Other</u>

- 21. Did you see a physician for treatment? _____ (Yes or No) _____ (Date)
- 22. Name and address of physician _____

(No. and Street)	(City or Town)	(State and Zip)
Date of report	Prepa	ared by
Official position		

Project Health and Safety Plan and Work plan Acceptance Form

(For Langan employees only)

I have read and agree to abide by the contents of the Work Plan and Health and Safety Plan for the following project:

	-	
•		
 •		

Place in project Health and Safety File as soon as possible

Safety Briefing Incident Report FONF Expansion/Sabre Park

Date:
Time:Leader:Location:
Work Task:
SAFETY TOPICS (provide some detail of discussion points)
Chemical Exposure Hazards and Control
Physical Hazards and Control
Air Monitoring
PPE
Communications
Safe Work Practices
Emergency Response
Hospital/Medical Center Location
Phone Nos
Other
FOR FOLLOW-UP (issue, responsibility, due date)

ATTENDEES

PRINT NAME	COMPANY	SIGNATURE			

Briefing Conducted By: _____ Q:\Other\Health&Safety\GenericAppendixG-SafetyBriefingForm

Site-Specific Health and Safety Training

(For all Langan and subcontract employees on site)

I hereby confirm that site-specific health and safety training has been conducted by the site health and safety officer that included:

- Names of personnel responsible for site safety and health
- Safety, health, and other hazards at the site
- Proper use of personal protective equipment
- Work practices by which the employee can minimize risk from hazards
- Safe use of engineering controls and equipment on the site
- Acute effects of compounds at the site
- Decontamination procedures

For the following project:

(Project Title)	(Project Number)				
Name (print)	Signature		Date		
		_			
		_			

Place in project Health and Safety File as soon as possible

ATTACHMENT C Material Safety Data Sheets (Provided on CD)

- Acenaphthene
- Acenaphthylene
- Acetone
- Alpha-BHC
- Anthracene
- Arsenic
- Barium
- Benzene
- Benzo(a)anthracene
- Benzo(a)pyrene
- Benzo(b)fluoranthene
- Benzo(g,h,i)preylene
- Benzo(k)fluoranthene
- Beryllium
- Beta-BHC
- 1,3-Butadiene
- sec-Butylbenzene
- Cadmium
- Carbon Disulfide
- Chlorobenzene
- Chloroform
- Chloromethane
- Chromium III
- Chromium IV
- Chromium (total)
- Chrysene
- Copper
- Cyanide
- Cyclohexane
- DDD
- DDE
- DDT
- Delta-BHC
- Dibenz(a,h)anthracene
- Dibenzofuran
- 1,2-Dichlorobenzene
- 1,3-Dichlorobenzene
- 1,4-Dichlorobenzene
- Dichlorodifluoromethane
- 1,1-Dichloroethane (1,1-DCA)
- 1,1-Dichloroethylene (1,1-DCE)
- cis-1,2-Dichloroethylene (cis-1,2-DCE)
- trans-1,2-Dichloroethylene (trans-1,2-DCE)

- Dieldrin
- Ethylbenzene
- Fluoranthene
- Fluorene
- Gamma-BHC
- Heptachlor Epoxide
- n-Heptane
- Hexachlorobenzene
- 2-Hexanone
- n-Hexane
- Indeno(1,2,3-c,d)pyrene
- Isopropanol
- Iron
- Lead
- Manganese
- Magnesium
- 2-mercaptobenzothiaxole
- Mercury
- Methyl Ethyl Ketone (2-Butanone)
- Methyl Isobutyl Ketone
- Methyl Tert-butyl Ether (MTBE)
- Methylene Chloride
- Naphthalene
- n-Nitrosodiphenylamine
- Nickel
- PCBs
- Phenanthrene
- Pyrene
- Tetrachloroethylene (PCE)
- Toluene
- 1,2,4-Trichlorobenzene
- 1,1,1-Trichloroethane (1,1-TCA)
- Trichloroethylene (TCE)
- Trichlorofluoromethane
- 1,2,4-Trimethylbenzene
- 1,3,5-Trimethylbenzene
- Vinyl Chloride
- Xylenes
- Zinc
- Unleaded Gasoline
- Diesel Fuel
- Motor Oil, 10W-40
- Isobutylene Gas in Air, 100 ppm

ATTACHMENT D

Standard Safe Work Practices

GENERAL

- 1. Eating, drinking, chewing tobacco, smoking and carrying matches or lighters is prohibited in a contaminated or potentially contaminated area or where the possibility for the transfer of contamination exists.
- 2. Upon leaving the work zone, personnel will thoroughly wash their hands and face.
- Avoid contact with potentially contaminated substances. Do not walk through puddles, pools, mud, etc. Avoid, whenever possible, kneeling on the ground, leaning or sitting on equipment or ground. Do not place monitoring equipment on potentially contaminated surfaces (i.e., ground, etc.).
- 4. All field crew members should make use of their senses to alert them to potentially dangerous situations in which they should not become involved; i.e., presence of strong and irritating or nauseating odors.
- 5. Prevent, to the extent possible, spills. In the event that a spillage occurs, contain liquid if possible.
- 6. Field crew members shall be familiar with the physical characteristics of investigations, including:
 - Wind direction
 - Accessibility to associates, equipment, vehicles
 - Communication
 - Hot zone (areas of known or suspected contamination)
 - Site access
 - Nearest water sources
- 7. All wastes generated during activities on-site should be disposed of as directed by the project manager or his on-site representative.
- 8. Protective equipment as specified in the section on personnel protection will be utilized by workers during the initial site reconnaissance, and other activities.

TOOLS AND HEAVY EQUIPMENT

- 1. Do not, under any circumstances, enter or ride in or on any backhoe bucket, materials hoist, or any other device not specifically designed to carrying passengers.
- 2. Loose-fitting clothing or loose long hair is prohibited around moving machinery.
- 3. Ensure that heavy equipment operators and all other personnel in the work zone are using the same hand signals to communicate.
- 4. Drilling/excavating within 20 feet in any direction of overhead power lines is prohibited.

- 5. The locations of all underground utilities must be identified and marked out prior to initiating any subsurface activities.
- 6. Check to insure that the equipment operator has lowered all blades and buckets to the ground before shutting off the vehicle.
- 7. If the equipment has an emergency stop device, have the operator show all personnel its location and how to activate it.
- 8. Help the operator ensure adequate clearances when the equipment must negotiate in tight quarters; serve as a signalman to direct backing as necessary.
- 9. Ensure that all heavy equipment that is used in the Exclusion Zone is kept in that zone until the job is done, and that such equipment is completely decontaminated before moving it into the clean area of the work zone.
- 10. Samplers must not reach into or get near rotating equipment such as the drill rig. If personnel must work near any tools that could rotate, the equipment operator must completely shut down the rig prior to initiating such work. It may be necessary to use a remote sampling device.

APPENDIX A

JOBSITE SAFETY INSPECTION CHECKLIST





JOBSITE SAFETY INSPECTION CHECKLIST

Client: _____ Inspection Date: _____

Site: _____ Inspector: _____

Project Number: _____

Check one of the following: A: Acceptable NA: Not Applicable D: Deficiency

	Α	NA	D	Remarks
1. HASP available on site for inspection?				
2. Health & Safety Compliance agreement (in HASP)				
appropriately signed by Langan employees and				
subcontractors?				
3. Hospital route map with directions posted on site?				
4. Emergency Notification List posted on site?				
First Aid kit available and properly stocked?				
6. Personnel trained in CPR/First Aid on site?				
7. MSDSs readily available, and all workers knowledgeable				
about the specific chemicals and compounds to which they				
may be exposed?				
8 Appropriate PPE being worn by Langan employees and				
subcontractors?				
9. Project site safe practices ("Standing Orders") posted?				
10. Project staff have 40-hr./8-hr./Supervisor HAZWOPER				
training?				
11. Project staff medically cleared to work in hazardous waste				
sites and fit-tested to wear respirators, if needed?				
12. Respiratory protection readily available?				
13. Health & Safety Incident Report forms available?				
14. Air monitoring instruments calibrated daily and results				
recorded on the Daily Instrument Calibration check sheet?				
15. Air monitoring readings recorded on the air monitoring				
data sheet/field log book?				
16. Subcontract workers have received 40-hr./8-hr./Spvsr.				
HAZWOPER training, as appropriate?				
17. Subcontract workers medically cleared to work on site,				
and fit-tested for respirator wear?				
18. Subcontract workers have respirators readily available?				
19. Markouts of underground utilities done prior to initiating				
any subsurface activities?				
20. Decontamination procedures being followed as outlined in				
HASP?				
21. Are tools in good condition and properly used?				
22. Drilling performed in areas free from underground objects				
including utilities?				
23. Adequate size/type fire extinguisher supplied?				
24. Equipment at least 20 feet from overhead powerlines?				
25. Evidence that drilling operator is responsible for the safety				
of his rig.				
26. Trench sides shored, layed back, or boxed?				
27. Underground utilities located and authorities contacted				
before digging?				
29. Laddara in tranch (25 fact angaing)?				
--	--	--		
29. Excavated material placed more than 2 feet away from				
excavation edge?				
30. Public protected from exposure to open excavation?				
31. People entering the excavation regarding it as a permit-				
required confined space and following appropriate				
procedures?				
32. Confined space entry permit is completed and posted?				
33. All persons knowledgable about the conditions and				
characteristics of the confined space?				
34. All persons engaged in confined space operations have				
been trained in safe entry and rescue (non-entry)?				
35. Full body harnesses, lifelines, and hoisting apparatus				
available for rescue needs?				
36. Attendant and/or supervisor certified in basic first aid and				
CPR?				
37. Confined space atmosphere checked before entry and				
continuously while the work is going on?				
38. Results of confined space atmosphere testing recorded?				
39. Evidence of coordination with off-site rescue services to				
perform entry rescue, if needed?				
40. Are extension cords rated for this work being used and				
are they properly maintained?				
41. Are GFCIs provided and being used?				

Unsafe acts observed?

Additional remarks _____

APPENDIX B

DECONTAMINATION PROCEDURES



Station 1:	Equipment Drop	 Deposit equipment used on-site (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths. Segregation at the drop reduces the probability of cross contamination. During hot weather operations, cool down stations may be set up within this area.
Station 2:	Outer Garment, Boots, and Gloves Wash and Rinse	 Scrub outer boots, outer gloves and fully-encapsu- lating suit with decon solution or detergent and water. Rinse off using copious amounts of water.
Station 3:	Outer Boot and Glove Removal	Remove outer boots and gloves. Deposit in container with plastic liner.
Station 4:	Tank Change	4. If worker leaves Exclusion Zone to change air tank, this is the last step in the decontamination pro- cedure. Worker's air tank is exchanged, new outer gloves and boot covers donned, joints taped, and worker returns to duty.
Station 5:	Boot, Gloves and Outer Garment Removal	 Boots, fully-encapsulating suit, inner gloves removed and deposited in separate containers lined with plastic.
Station 6:	SCBA Removal	 SCBA backpack and facepiece is removed (avoid touching face with fingers). SCBA deposited on plastic sheets.
Station 7:	Field Wash	7. Hands and face are thoroughly washed. Shower as soon as possible.

LEVEL A DECONTAMINATION

LEVEL **B** DECONTAMINATION

	F · · P	
Station 1:	Equipment Drop	 Deposit equipment used on-site (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths. Segregation at the drop reduces the probability of cross contamination. During hot weather operations, cool down stations may be set up within this area.
Station 2:	Outer Garment, Boots, and Gloves Wash and Rinse	 Scrub outer boots, outer gloves and chemical-re- sistant splash suit with decon solution or detergent and water. Rinse off using copious amounts of water.
Station 3:	Outer Boot and Glove Removal	3. Remove outer boots and gloves. Deposit in container with plastic liner.
Station 4:	Tank Change	 If worker leaves Exclusion Zone to change air tank, this is the last step in the decontamination pro- cedure. Worker's air tank is exchanged, new outer gloves and boot covers donned, joints taped, and worker returns to duty.

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Station 5:	Boot, Gloves and Outer Garment Removal	 Boots, chemical-resistant splash suit, inner gloves removed and deposited in separate containers lined with plastic.
Station 6:	SCBA Removal	 SCBA backpack and facepiece is removed (avoid touching face with fingers). SCBA deposited on plastic sheets.
Station 7:	Field Wash	Hands and face are thoroughly washed. Shower as soon as possible.

Station 1:	Equipment Drop	 Deposit equipment used on-site (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths. Segregation at the drop reduces the probability of cross contamination. During hot weather operations, cool down stations may be set up within this area.
Station 2:	Outer Garment, Boots, and Gloves Wash and Rinse	 Scrub outer boots, outer gloves and chemical-re- sistant splash suit with decon solution or detergent and water. Rinse off using copious amounts of water.
Station 3:	Outer Boot and Glove Removal	3. Remove outer boots and gloves. Deposit in container with plastic liner.
Station 4:	Canister or Mask Change	 If worker leaves Exclusion Zone to change canister (or mask), this is the last step in the decontamination procedure. Worker's canister is exchanged, new outer gloves and boot covers donned, joints taped, and worker returns to duty.
Station 5:	Boot, Gloves and Outer Garment Removal	 Boots, chemical-resistant splash suit, inner gloves removed and deposited in separate containers lined with plastic.
Station 6:	Facepiece Removal	6. Facepiece is removed (avoid touching face with fingers). Facepiece deposited on plastic sheets.
Station 7:	Field Wash	Hands and face are thoroughly washed. Shower as soon as possible.

LEVEL C DECONTAMINATION

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LEVEL	D	DECONTAMINATION
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Station 1:	Equipment Drop	 Deposit equipment used on-site (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths. Segregation at the drop reduces the probability of cross contamination. During hot weather operations, cool down stations may be set up within this area.
Station 2:	Outer Garment, Boots, and Gloves Wash and Rinse	 Scrub outer boots, outer gloves and chemical-re- sistant splash suit with decon solution or detergent and water. Rinse off using copious amounts of water.
Station 3:	Outer Boot and Glove Removal	3. Remove outer boots and gloves. Deposit in container with plastic liner.
Station 4:	Boot, Gloves and Outer Garment Removal	 Boots, chemical-resistant splash suit, inner gloves removed and deposited in separate containers lined with plastic.
Station 5:	Field Wash	5. Hands and face are thoroughly washed. Shower as soon as possible.

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EQUIPMENT DECONTAMINATION

GENERAL:

Equipment to be decontaminated during the project may include tools, monitoring equipment, respirators, sampling containers, laboratory equipment and drilling equipment.

All decontamination will be done by personnel in protective gear, appropriate for the level of decontamination, as determined by the site HSO. The decontamination work tasks will be split or rotated among support and work crews.

Depending on site conditions, backhoe and pumps may be decontaminated over a portable decontamination pad to contain wash water; or, wash water may be allowed to run off into a storm sewer system. Equipment needed may include a steam generator with high-pressure water, empty drums, screens, screen support structures, and shovels. Drums will be used to hold contaminated wash water pumped from the lined pit. These drums will be labeled as such.

Miscellaneous tools and equipment will be dropped into a plastic pail, tub, or other container. They will be brushed off and rinsed with a detergent solution, and finally rinsed with clean water.

MONITORING EQUIPMENT:

Monitoring equipment will be protected as much as possible from contamination by draping, masking, or otherwise covering as much of the instruments as possible with plastic without hindering the operation of the unit. The HNu or OVA meter, for example, can be placed in a clear plastic bag, which allows reading of the scale and operation of knobs. The probes can be partially wrapped keeping the sensor tip and discharge port clear.

The contaminated equipment will be taken from the drop area and the protective coverings removed and disposed in the appropriate containers. Any dirt or obvious contamination will be brushed or wiped with a disposable paper wipe.

RESPIRATORS:

Respirators will be cleaned and disinfected after every use. Taken from the drop area, the masks (with the cartridges removed and disposed of with other used disposable gear) will be immersed in a cleaning solution and scrubbed gently with a soft brush, followed by a rinse in plain warm water, and then allowed to air dry. In the morning, new cartridges will be installed. Personnel will inspect their own masks for serviceability prior to donning them. And, once the mask is on, the wearer will check the respirator for leakage using the negative and positive pressure fit check techniques.