Health and Safety Plan
Sherwin Williams Company
Emeryville, California

March 11, 1993
2616.10

Prepared for
Sherwin Williams Company
1450 Sherwin Avenue
Emeryville, California

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1.0 PURPOSE

This document defines the Health and Safety considerations for the possible management of hazardous substances by Levine•Fricke personnel and subcontractors during the installation of ground-water wells or soil sampling. This document is required by Levine•Fricke policies and procedures and may be required by OSHA 29 CFR 1910.120. The basic requirements for the health and safety of the project workers are delineated in the Levine•Fricke Health and Safety Procedures. All personnel on site will be informed about the pertinent sections of the HSP.

2.0 PROJECT STAFFING

TITLE	
PROJECT MANAGER	NAME Roger Leventhal, P.E.
SITE SAFETY OFFICER	NAME Jo Ann Weber
EMERGENCY COORDINATOR	NAME Jo Ann Weber
PROJECT DIRECTOR	NAME Mark D. Knox, P.E.

3.0 SCOPE OF WORK

CHECK OFF APPROPRIATE CATEGORIES (MORE THAN ONE MAY APPLY)

o	TANK EXCAVATION	●	SOIL SAMPLING
o	SOIL EXCAVATION	o	ASBESTOS
o	POND CLEANUP	o	ON-SITE STORAGE
o	BUILDING DECONTAMINATION	o	CONSTRUCTION
●	MONITORING WELL INSTALLATION	o	DEMOLITION
o	ON-SITE TREATMENT SOIL	o	VAPOR SAMPLING
●	GROUND-WATER SAMPLING	●	DUST MONITORING
o	ON-SITE TREATMENT OF GROUND WATER		

This Health and Safety Plan covers the following work activities:

- Installation and development of ground-water wells at the site
- Ongoing sampling of ground-water wells

- Soil sampling during well installation

The site is located in Emeryville, California

3.1 Site Layout

Refer to Figure 2 for site plan map for proposed drilling locations and work zone borders

4.0 HAZARD EVALUATION

A. PHYSICAL HAZARDS (TRENCHES, UTILITIES, TERRAIN, ETC.)

Steam Cleaner, Noise, Drill Rig

Utilities: GAS, ELECTRIC, WATER, TELEPHONE, CHEMICAL, OTHER UTILITIES. THIS IS A PARTIAL LIST. UNDERGROUND SERVICE ALERT (USA) TO BE NOTIFIED AND/OR UTILITY LOCATOR SERVICES TO BE EMPLOYED BEFORE WORK BEGINS. PERFORM A GEOPHYSICAL SURVEY TO LOCATE UNDERGROUND UTILITIES.

CARCINOGENS? ● YES o NO

IF YES, LIST - Benzene and Arsenic.

Source: NIOSH pocket guide to chemical hazards

4.1 Task Specific Hazards

TASK Drilling: three borings and constructing three extraction wells.

1. Chemical Exposure: potential exposure to benzene, lead arsenic, and other chemicals. See Table listed in section 4.0.

2. Heavy Equipment: drill rig, support vehicles, and pumps.

3. Noise: primary sources are the drill rig and pumps.

4. Utilities: underground and over head utilities. See section 4.0 list of potential utilities.

B. CHEMICAL CONTAMINANTS AND CONCENTRATIONS (ATTACH A LIST TO PACKAGE IF NECESSARY)

Name of Material	Max. Soil Conc. (mg/kg)	Max. Water Conc. (mg/L)	TLV or PEL	Action Level	Hazard to Personnel
Arsenic*	52000	320	0.01 mg/m3	0.005 mg/m3	Skin contact and dust inhal.
Lead*	2300	0.2	0.05 mg/m3	0.03 mg/m3	Skin contact and dust inhal.
Acetone	ND	280	750 ppm	375 ppm	Inhal. and skin contact
Benzene	ND	0.110	1 ppm	0.5 ppm	Not expected
Ethylbenzene	1500	6.3	100 ppm	50 ppm	Inhal. and skin contact
Methyl Ethyl Ketone	ND	720	200 ppm	50 ppm	Inhal. and skin contact
Xylenes	9900	210	100 ppm	50 ppm	Inhal. and skin contact
2-hexanone	ND	24	5 ppm	2.5 ppm	Not expected
Toluene	14000	310	100 ppm	50 ppm	Inhal. and skin contact
PCE	ND	45	25 ppm	12.5 ppm	Inhal. and skin contact
Chlorobenzene	ND	1	10 ppm	5 ppm	Not expected
TPH	20000	1500	NA	NA	Inhal. and skin contact
Bis (2-ethyl hexyl) phthalate	10.2	0.034	NA	NA	Not expected
Isophorone	8	ND	4 mg/m3	2 mg/m3	Not expected
Naphthalene	11	ND	10 ppm	5 ppm	Not expected

* = See Table 1 for additional information

ppm = parts per million
ND = Not Detected
NA = Not Applicable
Inhal. = Inhalation
PCE = Perchloroethylene
TPH = Total Petroleum Hydrocarbons

TASK Ground-Water Sampling

1. Chemical Exposure: Benzene, lead, Arsenic, and other chemicals. See Table listed in section 4.0.

2. Heavy Equipment: Centrifugal pump, submersible pump, and generator.

3. Noise: Generator and centrifugal pump.

TASK Soil Sampling

1. Chemical Exposure: Benzene, lead, arsenic, and other chemicals. See Table listed in section 4.0.

2. Heavy Equipment: Continuous core sampling barrel.

5.0 FIELD PROJECT MANAGEMENT

CREW SIZE

PROJECT MANAGER	RDL
SITE SAFETY OFFICER	JTW
FIELD TECHNICIAN	To Be Determined

5.1 Subcontractors

NAME: Gregg Drilling

SCOPE OF WORK: Drilling Subcontractor - Drill soil borings and install ground-water wells for monitoring and extraction.

TRAINING REQUIRED

All personnel shall have current 40 hour OSHA Training.

6.0 MATERIAL HANDLING EQUIPMENT

(PROVIDE DETAILS, E.G., QUANTITIES AND TYPES)

_____	o	DRUM DOLLY	_____
__2___	●	PUMPS	Centrifugal and submersible pump
_____	o	FORK TRUCK	_____
_____	o	MAN LIFT	_____
__2___	●	HEAVY EQUIP.	Drill Rig, continuous core sampler
_____	o	CRANE	_____
_____	o	VACUUM TANKER	_____
_____	o	AIR COMPRESSOR	_____
_____	o	OTHER	_____
_____	o		_____
			_____
			_____

7.0 REPORTING AND RECORDKEEPING

7.1 General

Recordkeeping shall be consistent with OSHA regulations in all respects. Daily health and safety meetings will be held at the Site. A record of attendees and items discussed at these meetings will be kept. The records discussed below will also be maintained in the Corporate Health and Safety Director's Office, the local Levine•Fricke Office and/or at the site.

7.1.1 The Health and Safety Log

The log documents the Site Safety officer's daily activities pertaining to site health and safety compliance.

7.1.2 Exposure/Air Monitoring Records

A separate Air Monitoring Plan has been prepared by Levine•Fricke. Air monitoring/exposure records will be kept by Levine•Fricke as described in this plan.

7.1.3 OSHA 200 Log and Summary of Occupational Injuries and Illnesses

Current within 72 hours. Will be maintained in the appropriate local office and Health and Safety Director's office.

8.0 ENVIRONMENTAL SAMPLING

SAMPLING REQUIRED ● YES o NO

AIR MONITORING

EQUIPMENT USED: Photoionization Detector (PID) and MIE Miniram dust monitoring device.

METHODOLOGY: The PID will be used to monitor volatile chemical concentrations during the drilling of soil borings and during ground-water sampling. The MIE will be used to monitor dust levels at the Site during work.

CALIBRATION: The PID will be calibrated daily following the manufacturer's specifications.

SOIL SAMPLING

EQUIPMENT USED: Hollow-stem auger equipped with continuous core and california split spoon sampling barrels.

METHODOLOGY: Continuous core barrel will be used to log the lithology. California sampler will be used to collect undisturbed soil samples.

_____

CALIBRATION: N/A_____

_____

WATER/LIQUID

EQUIPMENT USED: Teflon bailers, pH meter and conductivity meter

METHODOLOGY: Following well development, samples will be collected using the Teflon bailer. The pH meter and

conductivity meter will be used to assess water quality during sampling.

CALIBRATION: In accordance with the manufacturer's specifications.

9.0 TRAINING

All on-site personnel involved with the remediation work will be 40-hour trained to 29 CFR standards.

LEVINE•FRICKE CREW RECEIVED INITIAL 40-HOUR TRAINING

● YES o NO

IF NO, WHY? _____

ADDITIONAL TRAINING REQUIRED _____

LEVINE•FRICKE CREW RECEIVED SPECIAL TRAINING

● YES o NO

IF NO, WHY? _____8-hour refresher updates_____

SUBCONTRACTOR RECEIVED REQUIRED TRAINING

● YES o NO

IF NO, WHY? _____

ADDITIONAL INFORMATION _____

_____

SAFETY BRIEFINGS ARE HELD EACH SHIFT

WHO CONDUCTS MEETING? Levine•Fricke Site Safety Officer

WHERE ARE RECORDS STORED? Levine•Fricke Project files

10.0 MEDICAL REQUIREMENTS

ENTIRE CREW RECEIVED BASELINE PHYSICAL EXAMINATIONS

● YES o NO

IF NO, WHY? _____

SPECIAL TESTS REQUIRED: No_____

_____

COMPLETE? ● YES o NO

IF NO, WHY? _____

LOCATION OF MEDICAL FILES: M. Joseph Fedoruk, M.D., Inc., 1401 N. Tustin Avenue, Suite 240, Santa Ana, CA 92701

11.0 CONTAMINATION CONTROL

- The job site is partitioned into two distinct zones: the clean zone and the worker control zone (includes the contamination reduction zone and the exclusion zone).
- Workers may only enter and exit from the exclusion zone via the contamination reduction zone.
- Only authorized personnel are allowed to enter the exclusion or the contamination reduction zone.
- Section 16 includes a site map defining the zones.
- Section 17 describes the personnel and equipment decontamination procedures.

12.0 WORKER PROTECTION

12.1 Personal Protective Equipment

1. WORK TASK DESCRIPTION: Drilling of soil borings, soil sampling, ground-water sampling and waste management.

2. LEVEL: o A o B ● C ● D (monitoring result dependent)

3. RESPIRATORY PROTECTION: (monitoring result dependent)

- ● AIR PURIFYING
- ● HALF MASK
- o FULL MASK
- o OTHER _____

CARTRIDGE TYPE: NIOSH-approved combination High-Efficiency Particulate Air (HEPA)/organic vapor if required based upon monitoring results.

_____

- o SUPPLIED AIR
- o SCBA
- o AIRLINE
- o ESCAPE BOTTLE
- o OTHER _____

4. PROTECTIVE CLOTHING

- ● HARD HAT

EYE PROTECTION

- ● SAFETY GLASSES WITH SIDE SHIELDS
- ● CHEMICAL RESISTANT GOGGLES (ground-water sampling)
- o FACE SHIELD
- o OTHER _____

BODY PROTECTION

● TYVEK	o HOODED
o POLYTYVEK	o HOODED
o SARANEX	o HOODED
o SIGEL	
o PVC	
o NEOPRENE	
o RAINGEAR	
o BUTYL	
o OTHER _____	

GLOVES

- ● LATEX
- o SURGICAL RUBBER
- o VITON
- ● PVC
- o NEOPRENE
- o NEOPRENE (MILLED)
- o SILVERSHIELD
- o LEATHER
- o COTTON
- o OTHER _____

BOOTS

- ● LEATHER - STEEL TOED
- o PVC - STEEL TOED
- o NEOPRENE - STEEL TOED
- o PVC BOOTIES
- o TYVEK BOOTIES
- o OTHER _____

HEARING PROTECTION

- o EAR MUFFS
- ● EAR PLUGS
- o OTHER _____

12.2 General Safety Equipment

- o SAFETY SHOWER
- ● EYEWASH
- ● BARRIERS
- o WARNING SIGNS
- ● BARRIER TAPE
- ● WATER/GATORADE
- ● DECON BARRELS
- o LIFELINE/HARNESS
- o EXTRACTION DEVICE
- o AIR HORNS
- ● LIGHTING: All work will be performed during daylight hours (lighting sufficient to comply with OSHA standard will be in place if work is conducted at night._____
- * FIRE EXTINGUISHERS: To be supplied by drilling sub-contractor.

_____

- o OTHER _____

COMMUNICATION SYSTEMS

DESCRIBE: Cellular telephone on-site for emergency use and pagers for Levine·Fricke personnel.

SANITARY FACILITIES

● SOURCE OF POTABLE WATER

DESCRIBE: Potable water will be brought to the Site by Levine•Fricke personnel and drilling sub-contractor.

o TOILETS

DESCRIBE: Toilets must be portable and supplied by the contractor

13.0 PERSONNEL MONITORING PLAN

INITIAL AIR MONITORING REQUIRED ● YES o NO

EXPLAIN STRATEGY: A separate Air Monitoring Plan has been prepared by Levine•Fricke and contains details of estimated chemical concentrations along with associated action levels for equipment up-grade to Level C respiratory protection. A photoionization detector will be used to monitor volatile organic chemical concentrations in the breathing zone. If ambient air concentrations of VOCs in the breathing zone reach 50 parts per million or greater, personnel shall upgrade to Level C respiratory protection using half-face air-purifying respirators equipped with NIOSH-approved high efficiency particulate air (HEPA)/organic vapor combination cartridges.

A miniram dust monitor will be used to monitor dust levels. Action levels for the primary dustborne metals of concern (arsenic and lead) are contained in Table 1.

SAMPLING EQUIPMENT

o COMBUSTIBLE GAS/OXYGEN METER
o DRAEGER TUBES _____
● PHOTOIONIZATION DETECTOR
o FLAME IONIZATION DETECTOR
o INFRARED DETECTOR
● DUST MONITOR
o SAMPLING PUMPS
o AND MEDIA _____
OTHER _____

ROUTINE MONITORING (FREQUENCY, LOCATION, ETC.)

Monitoring will be performed continuously in the breathing zone around each borehole during drilling and in the general work area during ground-water monitoring well development and sampling.

DESCRIBE CALIBRATION PROCEDURES:

The photoionization detector will be calibrated daily following the manufacturer's specification.

DESCRIBE SAMPLING METHODS (INCLUDE MEDIA TYPE, ANALYSES, NIOSH METHOD NUMBER IF APPLICABLE)

N/A

ADDITIONAL MONITORING

NOISE o YES ● NO

DESCRIBE MONITORING STRATEGY

HEAT STRESS MONITORING o YES ● NO, however, note the following:

The first symptoms of heat stress include the following:

- short temper
- lack of coordination
- taking frequent breaks (out of breath)
- difficulty remembering things

Should the symtoms of heat stress occur, the following measures will be implemented:

- Plenty of liquids will be provided to replace lost bodily fluids (workers must replace water and salts lost through perspiration).

- A work schedule will be established that will provide sufficient rest periods for cooling down.
- Employees will be adequately trained on the causes of heat stress and appropriate protective measures
- Cooling vests will be used under protective clothing to reduce body temperature.

DESCRIBE MONITORING STRATEGY

_____

_____

OTHER o YES ● NO

DESCRIBE

_____

_____

NAMES OF MONITORING TECHNICIANS

To Be Determined

LOCATION OF MONITORING RECORDS

Levine•Fricke Project Files

14.0 SITE SAFETY OFFICER RESPONSIBILITIES

The Site Safety Officer (SSO) or Designee will enter before any work begins and will verify that the established zones are identified and escape routes are clear.

The daily site entry procedure will include the following:

- Determine the wind direction and stay appraised of it throughout the stay. Identify the direction during the tailgate safety meeting or informally with each affected employee.
- Confirm the proper placement of emergency information and operational status of equipment and the decontamination facility.

- Monitor the air as necessary for conditions that may cause injury or exposure and record all data.

- Visually observe for signs of actual or potential life- or health-threatening hazards.

- Note physical conditions of the site. Determine potential exposure pathways.

- Use survey tape or markers to identify new boundaries of the zones.

- Document site activities in a daily log. Record observations related to field conditions and the site.

15.0 GENERAL SAFE WORK PRACTICES

- All accidents and incidents must be reported to the supervisor and the designated Sherwin Williams representative immediately.

- All defects/malfunctions which appear during the course of the work shift must be reported to the supervisor.

- No eating, drinking, smoking, chewing tobacco or gum is allowed in the exclusion or contamination reduction zones.

- Employees shall inform their supervisors of any prescription medications they are using while at work that can affect their abilities.

- Employees shall not show up for work under the influence or in possession of alcohol or illicit drugs.

- Only Levine•Fricke-approved personal protective equipment shall be used by Levine•Fricke employees.

- Employees shall not remove or disturb any covering, guards, or safety devices placed on vehicles, gears, or other moving equipment or machinery, except to perform maintenance or repairs. Work on the equipment shall not commence until the equipment has been deactivated, sources of energy are removed, and controls are locked and tagged out.

- Before starting any vehicle or machinery, or turning on electricity, gas, steam, or air, employees will check the

entire area to ensure that it is safe to proceed with the work. Out of service or locked out equipment is not to be started by anyone unless authorized by a supervisor.

- Employees shall maintain good housekeeping of the facilities and remove or dispose of all unnecessary materials.

- Special operations, including confined space entry, hot work, and decommissioning of equipment for repairs, require permits to be signed by authorized personnel. A description of the procedures will be included as an appendix.

- Trenching or excavations must be shored or sloped or appropriately prepared as required by OSHA standards. A description of the techniques to be used is included as an appendix, if appropriate.

16.0 WORK ZONE MAP

Work zones are defined on the Site map.

17.0 DECONTAMINATION PROCEDURES

DESCRIBE PERSONNEL DECONTAMINATION PROCEDURES

Disposable gloves, sampling equipment, and other disposable clothing or equipment worn by Levine•Fricke personnel and the drilling sub-contractor will be placed in a suitable disposal container on-site at the end of each work day. Protective clothing will be replaced if its protective function is compromised through holes or tears. Any personal protective clothing/equipment i.e. steel toed rubber boots will be cleaned with Alconox, a laboratory-grade detergent, and high-pressure, high temperature water before removal from the site. All personnel must wash before exiting the work zone or eating and drinking. No smoking is allowed in the work zone. Wash water that contains site chemicals will be placed into appropriate storage containers (along with well development water).

DESCRIBE EQUIPMENT DECONTAMINATION PROCEDURES

Equipment that comes in contact with potentially chemically-affected soils or ground-water will be steamed

cleaned. Wash water will be contained in an appropriate container (wash tub) to prevent spilling of impacted water.

HOW IS CONTAMINATED EQUIPMENT DISPOSED OF?

N/A

DESCRIBE STORAGE OF USABLE PROTECTIVE GEAR

Respirators will be stored in bags.

DESCRIBE LAUNDERING PROCEDURE FOR WORK CLOTHES

Wash separately

LAUNDRY INFORMED? o YES ● NO

LOCKER ROOM FACILITY PROVIDED? o YES ● NO

IF NO, WHERE WILL CREW CHANGE CLOTHING? On site - inside work zone

18.0 LEVINE·FRICKE INTERNAL CALL LIST

IN THE EVENT OF INJURY, FIRE, EXPLOSION, SPILL, RELEASE, OR OTHER NONROUTINE EVENTS, IMMEDIATELY CONTACT ONE OF THE FOLLOWING PEOPLE, IN THIS ORDER:

	NAME	BUSINESS NO.	HOME NO.
Levine·Fricke Personnel:			
1.	Roger Leventhal	510-652-4500	
2.	Jo Ann Weber	510-652-4500	
3.	Mark Knox	510-652-4500	
Sherwin Williams Personnel:			
1.	Frank McHugh	510-420-7215	
2.	Bob Stemm	510-420-7219	

19.0 HAZARDOUS WASTE OPERATIONS CONTINGENCY PLAN

GENERATOR'S/OWNER'S NAME: The Sherwin-Williams Company

WORK LOCATION: 1450 Sherwin Avenue, Emeryville, California

CONTACT: Bob Stemm PHONE # 420-7203

LEVINE•FRICKE PROJECT MANAGER: Roger Leventhal

EMERGENCY PHONE NUMBERS:

- POLICE 911
- INTERPLANT N/A
- FIRE 911
- HOSPITAL 510-540-1303
  510-540-0337

  NAME: Alta Bates Hospital

  ADDRESS: 3001 Colby Avenue Berkeley, California

  ROUTE TO: Alta Bates. From the Site take 45th street to Adeline and turn left; proceed to Ashby and turn right. The hospital is on the corner of Colby and Ashby.

  CONTACT: Emergency Room

  AVAILABLE CONTACT: N/A

  AMBULANCE: 911

  INTERPLANT MEDICAL: 911

EVACUATION ALARM DESCRIPTION:

EVACUATION ROUTE DESCRIPTION: Refer to Sherwin Williams emergency plan.

ASSEMBLY AREA DESCRIPTION: Refer to Sherwin Williams emergency plan.

EVACUATION ROUTE/EMERGENCY EQUIPMENT STATION MAP: The emergency evacuation route is to be established at time of work. Refer to Sherwin Williams emergency plan for the location of emergency equipment.

Refer to Figure 1 for Hospital Route Map.

EMERGENCY EQUIPMENT:

_X_ FIRST AID STATION

___ EMERGENCY SHOWER/EYEWASH

_X_ DECON STATION

_X_ OUTER GARMENT ____Tyvek_____

_X_ FIRE EXTINGUISHERS

_X_ GLOVES (TYPE) ____Nitrile_____

_X_ AIR MONITORING EQUIPMENT (TYPE): Photoionization detector

___ DUCT TAPE

___ VENTILATION EQUIPMENT

___ CONFINED SPACE HARNESS AND ROPE

_X_ RESPIRATORY PROTECTION: Half-face air purifying respirator with NIOSH approved combination high efficiency particulate air (HEPA)/organic vapor cartridges.

LIST OF CONTAMINANTS PRESENT AND SYMPTOMS OF EXPOSURE AND POSSIBLE MEDICAL EVALUATION/TREATMENT:

SEE SECTION 4.0

_____

_____

HAS A COPY OF THE CONTINGENCY PLAN BEEN RECEIVED BY THE HOSPITAL LISTED? o YES ● NO

IS IT DOCUMENTED? o YES ● NO

OTHER AGENCIES THAT HAVE RECEIVED THE CONTINGENCY PLAN:

o YES ● NO

_____ DOCUMENTED: _____

_____ DOCUMENTED: _____

_____ DOCUMENTED: _____

20.0 CONTRACTOR AND SUBCONTRACTOR AGREEMENTS:

1. Contractor certifies that the following personnel to be employed on the site at 1450 Sherwin Avenue, Emeryville, California, have met the Hazards and Protection requirements of the OSHA Hazardous Waste Operations and Emergency Response Standard (29 CFR 1910.120) and other applicable standards.

2. Contractor certifies that, in addition to meeting the OSHA requirements, she/he has received a copy of this HSP and will insure that the employees and subcontractors of the Contractor are informed, and will comply with both OSHA requirements and the guidelines in this HSP.

3. Contractor further certifies that she/he has read, understands, and will comply with all provisions of this HSP and will not hold Levine·Fricke responsible or liable for any injury or health problems that may occur.

Contractor Personnel	Training/ Certification/ Medical Examination	Signature	Date
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

TABLE 1
ACTION LEVELS FOR ARSENIC AND LEAD

Cmpd.	Analyt. Method	Soil Max. Conc.	OSHA PEL	Level C Respiratory Protection Action Level	Dust Equivalent Level C Respiratory Protection Action Level
Arsenic	EPA 7060	52000 mg/Kg	0.10 mg/m^3	0.05 mg/m^3	0.1 mg/m^3
Lead	EPA 7421	2300 mg/Kg	0.05 mg/m^3	0.03 mg/m^3	10.9 mg/m^3

As noted below, dust monitoring will be performed to monitor dust potentially affected by the target inorganics. The dust will be monitored using an MIE Miniram, which is a passive collection dust monitoring instrument capable of monitoring dust to 0.01 mg/m^3. The equivalent action levels were calculated based on the maximum potential concentrations of metals in airborne dust at the Site based upon the maximum concentrations of lead and arsenic detected in soil samples collected at the Site and the level "C" respiratory protection action level. Comparing measured dust levels at the Site to the calculated equivalent action levels provides an additional method of evaluating the potential for worker exposure to metals in airborne dust, and determining the appropriate level of respiratory protection on-site. Detections of dust at concentrations above the Dust Equivalent Action Levels at either the Site fence line or in the worker breathing zone shall result in a temporary work stoppage. An immediate upgrade to Level C respiratory protection will be initiated, if not already in progress, dust control measures will be re-evaluated and implemented, and the Health and Safety Officer will be notified prior to work commencement.

APPENDIX A

PHYSICAL DESCRIPTION OF CHEMICALS AND SYMPTOMS OF EXPOSURE

APPENDIX A

Physical Description of Chemicals and Symptoms of Exposure

Acetone

Acetone is a colorless liquid with a fragrant, mint-like odor.

Short-term exposure to acetone can cause eye irritation, dryness of the mouth and throat, nausea, vomiting, headaches, drowsiness, dizziness, light-headedness, weakness, incoordination, loss of energy, fainting, and unconsciousness. Acetone easily penetrates intact skin and is toxic by this route of exposure.

The PEL for acetone is 750 ppm in air.

Arsenic (All Forms)

Metallic arsenic is most commonly a grey, brittle, crystalline solid. It can also be in a black or yellow amorphous form. Arsenic is also commonly found in its volatile white trioxide form. Arsenic is also used in several insecticides, herbicides, silvicides, defoliants, desiccants, and rodenticides and appears in a variety of forms.

Arsenic is classified by the U.S. Environmental Protection Agency as a known human carcinogen.

Short-term exposure to arsenic can cause marked irritation of the stomach and intestines with nausea, vomiting, and diarrhea. In severe cases the vomiting and stools are bloody and the exposed individual goes into collapse and shock with weak, rapid pulse, cold sweats, coma, and death. Inorganic arsenicals are more toxic than organic arsenicals, and the trivalent form is more toxic than the pentavalent form. Acute arsenic poisoning usually results from ingestion exposures.

The PEL for arsenic is 0.01 mg/m^3 and for organic arsenic the PEL is 0.5 mg/m^3.

Benzene

Benzene is a clear colorless liquid.

Exposure to high concentrations (3,000 ppm) may result in acute poisoning, characterized by the narcotic action of benzene on the central nervous system. Chronic poisoning occurs most commonly through inhalation and dermal absorption. Benzene is also a recognized carcinogen.

The PEL for benzene is 1 ppm in air.

Bis(2-ethylhexyl)phthalate

bis(2-ethylhexyl)phthalate, also known as di-sec-octyl phthalate, is a light-colored, viscous, odorless, combustible liquid.

Bis(2-ethylhexyl)phthalate is classified by the U.S. Environmental Protection Agency as a Group B2 probable human carcinogen.

The PEL for bis(2-ethylhexyl)phthalate is 5 mg/m^3.

Chlorobenzene

Chlorobenzene is a colorless liquid with a mild aromatic odor.

Short-term exposure to chlorobenzene may cause drowsiness, incoordination, and unconsciousness. It may also cause irritation of the eyes, nose, and skin. Exposure to high levels of chlorobenzene also may damage the liver. Dermal absorption occurs to a moderate degree.

The PEL for chlorobenzene is 75 ppm in air.

Ethylbenzene

Ethylbenzene is a clear, colorless liquid.

Exposure to high concentrations of ethylbenzene vapor may result in irritation of the skin and mucous membranes, dizziness, irritation of the nose and throat and a sense of constriction of the chest.

The PEL for ethylbenzene is 100 ppm in air.

2-Hexanone

2-Hexanone is clear and colorless liquid.

Moderately toxic by ingestion. Mildly toxic by inhalation and skin contact. Dangerous fire and explosion hazard. Flash point is 95 F and the explosive limits range is 1.2% to 8% in air.

The PEL for 2-Hexanone 5 ppm.

Isophorone

Isophorone is a white colored liquid.

Moderately toxic by ingestion and skin contact. A skin and severe eye irritant. Flammable and explosive. Flash point is 184 F and the explosive limit range is 0.8% to 3.8% in air.

The PEL for Isophorone is 4 ppm.

Lead

Lead (inorganic) is a bluish-white, silver, or grey odorless solid.

Short-term exposure to lead can cause decreased appetite, insomnia, headache, muscle and joint pain, colic, and constipation.

The PEL for lead is 0.05 mg/m^3.

Methyl Ethyl Ketone (2-Butanone)

Methyl ethyl ketone (MEK) is a clear and colorless liquid with an odor like acetone.

Short-term exposure to MEK can cause headache, dizziness, drowsiness, vomiting, and numbness of the extremities. Irritation of the eyes, nose, and throat can also occur.

The PEL for MEK is 200 ppm.

Naphthalene [CAS: 91-20-3]

Naphthalene occurs commonly as white, crystalline flakes with a strong coal tar odor.

Exposure to naphthalene vapors may cause headache, loss of appetite, nausea, and eye injury. Ingestion of relatively large amounts of naphthalene may cause hemolytic anemia and hemoglobinuria.

The TWA of the PEL for naphthalene is 10 ppm in air.

Perchloroethylene (PCE)

PCE, also known as tetrachloroethylene, is a colorless liquid with an ether-like odor.

Short-term exposure to PCE may cause headaches, nausea, drowsiness, dizziness, incoordination, unconsciousness, irritation of the eyes, nose, and throat, and flushing of the face and neck. In addition, it may cause liver damage with such findings as yellow jaundice and dark urine. Liver damage may become evident several weeks after exposure.

PCE is classified by the U.S. Environmental Protection Agency as a Group B2 probable human carcinogen.

The PEL for PCE is 25 ppm in air.

Toluene

Toluene is a colorless liquid with a benzol-like odor.

Inhalation of high vapor concentrations may cause impairment of coordination and reaction time, headaches, nausea, eye irritation, loss of appetite, a bad taste, and lassitude.

The PEL for toluene is 100 ppm in air.

Xylenes

Xylenes are clear, colorless liquids.

Exposure to high concentrations of xylene vapor may result in eye and skin irritation. Eye irritation may occur at concentrations of about 200 ppm.

The PEL for total xylene is 100 ppm in air.