APPENDIX D
HEALTH AND SAFETY PLAN

SITE-SPECIFIC HEALTH AND SAFETY PLAN

Former Southland Steel Facility
5959, 5969, 6011, 6161, & 6169 Alameda Street
Huntington Park, CA 90255

Prepared for:

Successor Agency to the
Community Development Commission
of the City of Huntington Park
Huntington Park, California

Prepared by:

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Project No.: Eco-13-595

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ATTACHMENTS

1.0 PURPOSE AND POLICY

The purpose of this health and safety plan (HASP) is to provide a document that establishes personal protection standards and mandatory safety practices for all fieldwork conducted during the remedial activities at the Former Southland Steel Facility, covering an area of roughly 4.8 acres, located on Alameda Street, south of Randolph Street, in the community of Huntington Park, CA 90255 (hereafter, "Site"). The provisions of this HASP are mandatory for all on-site investigative and remedial activities; all personnel shall abide by this HASP. In addition, all personnel will comply with Title 8, California Code of Regulations (CCR) Section 5192: "Health and Safety for Hazardous Waste Operations and Emergency Response" as well as all other appropriate and applicable state and federal health and safety regulations. Any supplemental plans used by subcontractors shall conform to this HASP as a minimum. All personnel who engage in field activities shall be familiar with this HASP and comply with its requirements. A tailgate safety meeting will be conducted at the start of each day during field activities. All on-site personnel are required to sign Eco & Associates, Inc.'s (Eco's) Health and Safety Compliance Agreement (see Attachment 1).

This document is presented in the following format:

Section 1 – Purpose and Policy
Section 2 – Background Information
Section 3 – Proposed Field Activities
Section 4 – Project Team Organization
Section 5 – Training and Medical Monitoring Requirements
Section 6 – Safety and Health Risk Analysis
Section 7 – Summary of Hazard Potential
Section 8 – Emergency Response Plan
Section 9 – Personal Protective Equipment
Section 10 – Air Monitoring
Section 11 – Decontamination Procedures

In addition, the following are also presented:

Figure 1 – Hospital Location Map
Attachment 1 – Health and Safety Compliance Agreement Form
Attachment 2 – Chemical Hazard Sheets
Attachment 3 – Activity Hazard Analysis

2.0 BACKGROUND INFORMATION

2.1 PRIMARY CLIENT CONTACT

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2.2 SITE LOCATION AND DESCRIPTION

The subject site covering an area of roughly 4.8 acres is located on Alameda Street, south of Randolph Street, in the community of Huntington Park, California. The parcels investigated consist of the former Southland Steel facility and include all of the property between the railroad spur from Randolph Street and Alameda Street to the east. The property consists of four parcels:

- 5959 South Alameda – APN 6009-034-901 (approx. 0.12 acre)
- 5969 South Alameda – APN 6009-034-900 (approx. 0.81 acre)
- 6011 South Alameda – APN 6009-033-901 (approx. 2.51 acres)
- 6169 South Alameda – APN 6009-033-900 (approx. 1.39 acres)

The southern-most parcel is currently used as an automobile service facility (Nick Alexander Imports), and the remaining parcels are used for parking cars belonging to the dealership. All of the buildings for the Southland Steel facility have been demolished and removed from the Site. Asphalt pavement or concrete flooring from the previous facility remain and serve the parking needs of the dealership. Manufacturing and light industrial facilities surround the Site.

3.0 PROPOSED FIELD ACTIVITIES

The scope of the work is to meet the following objectives of the investigation:

- **Task 1 –** *Development of Response Plan*

  Prepare a Response Plan (ResPlan) and the required Appendices.

  Task 2 – *Soil Gas Sampling Activities*

  Collection and analysis of soil vapor samples in areas of prior soil vapor contamination.
- **Task 3 –** *Excavation Activities*

  This task consists of mobilization, soil excavation, confirmation sampling, and backfilling.
- **Task 4 –** *Groundwater Monitoring Well Installation, Well Development, and Groundwater Monitoring*

  Install and sample four additional groundwater monitoring wells.
- Task **5 –** *Report Preparation*

  Prepare a completion report that provides a description of field activities, a summary of laboratory results, and an evaluation of the laboratory results.

3.1 TASK 1: DEVELOPMENT OF RESPONSE PLAN

This task includes preparation of this Response Plan and the required Appendices, which include the following:

Appendix A – Reference Information

Appendix B – Risk Documents

Appendix C – Site-Specific Sampling and Analysis Plan

Appendix D – Site-Specific Health and Safety Plan

Appendix E – Transportation Plan

Appendix F – Estimates of Cost

Appendix G – Notice of Exemption

Appendix H – Sanborn Maps

3.2 TASK 2: SOIL VAPOR SAMPLING

Soil vapor probes will be installed and sampled using hand auger or direct push boring advancement. Location of planned soil vapor probes, and soil vapor analytical program is described in the workplan.

3.3 TASK 3: EXCAVATION ACTIVITIES

Prior to excavation activities, the required permits will be obtained and Underground Service Alert (USA) will be notified. USA is expected to contact all utility owners of record within the site vicinity and notify them of Eco's intention to conduct soil removal in proximity to buried utilities. All utility owners of record, or their designated agents, will be expected to clearly mark the position of their utilities on the ground surface throughout the area designated for investigation.

The contractor and subcontractor will mobilize equipment and supplies to the Site and secure the staging area, if needed, with a temporary chain link fence. Temporary facilities, including a portable toilet and hand-washing station, will be installed on the Site. Selected excavation locations will be marked with wooden stakes and paint immediately prior to excavation activities, and will be secured with a temporary perimeter chain-link fence.

A decontamination zone will be identified and equipped as needed to decontaminate personnel, equipment, and vehicles as they exit the excavation area. The personnel decontamination area will be maintained immediately adjacent to the planned excavation areas. All health and safety equipment and supplies will be obtained and positioned for use adjacent to the work area.

Eco estimates the depth of soil excavation to be between 2 and 5 feet, based on the sampling results from past investigations. However, extent of soil and soil gas contamination will dictate the lateral and vertical extent of excavation. Figure 8 of the workplan depicts the planned excavation areas and their respective depths. The types of excavation equipment that will be used during the soil excavation may include the following:

- Front-end loaders for loading
- Hauling trucks
- Excavators and/or backhoes for excavation and loading
- A water truck for dust suppression and soil moisturizing

- Other equipment will be added onsite as required by the contractor. Such equipment may include, but not be limited to, mixing equipment, generators, sump pumps, forklifts, and maintenance trucks.

After excavation, confirmation sampling of excavation bottoms and sidewalls will be obtained to assess concentration levels for arsenic, cadmium, lead, and polynuclear aromatic hydrocarbons.

The backfilling process will be started after all contaminant concentrations reported in the confirmation soil samples meet industrial soil screening concentrations goals. The imported clean soil will be analyzed free of contaminants prior to import to the Site. The soil will be placed into the excavated pit and compacted to at least 90 percent relative compaction.

3.4 TASK 4: GROUNDWATER MONITORING WELL INSTALLATION, WELL DEVELOPMENT, AND GROUNDWATER MONITORING

Four groundwater monitoring wells will be installed and sampled as part of remedial activities. The planned location and construction of the four additional groundwater monitoring wells are described in the workplan. Figure 4 of the workplan depicts the planned well locations. The equipment that will be used during well installation activities includes drill rig (hollow stem auger), well development rig, and flatbed support truck.

3.5 TASK 5: COMPLETION REPORT PREPARATION

At the completion of remedial activities, Eco will prepare a draft report summarizing the fieldwork and results remedial activities. The report will include an assessment of any detected contaminant(s), and review any threat to the environment and human health the contaminant(s) possess. This report shall be prepared with the supervision of a licensed civil engineer or geologist.

4.0 PROJECT TEAM ORGANIZATION

The field personnel responsible for project safety are the Health and Safety Officer and Project Manager. The personnel assigned to this project are as follows:

- Project Manager/Director – Dr. Mohammad Estiri
- Health and Safety Manager – Mr. Opjit Ghuman
- Health and Safety Officer – Mr. Quin Kinnebrew, PG
- Team Members – will be designated at the time of fieldwork
- Subcontractor and Third Parties – will be designated at the time of fieldwork

All field personnel used on this project will have successfully completed 40 hours of training in hazardous waste operations and/or current 8-hour hazardous waste operations training refresher. Experience requirements for the Health and Safety Manager and the Health and Safety Officer meet the requirements of EM 385-1-1 par 28.C.01.a and 28.C.02.a, respectively.

4.1 PROJECT MANAGER/DIRECTOR

The Project Manager/Director has the overall project responsibility for development, coordination, and implementation of the project Workplan in a safe manner and is the central

point of contact with regulatory agencies. The Project Manager/Director is responsible for implementing the steps of the Workplan and the HASP as well as supervising the field team members.

4.2 HEALTH AND SAFETY MANAGER

The Health and Safety Manager is responsible for developing, maintaining, and overseeing implementation of the HASP. They will also audit the effectiveness of the HASP and modify the HASP, as needed, based on air monitoring/sampling data.

4.3 HEALTH AND SAFETY OFFICER

The Health and Safety Officer is responsible for ensuring compliance with all aspects of the HASP including health and safety procedures for work sites, field training, exposure monitoring, personal protective equipment (PPE) and clothing, audits, and consulting with the health and safety representatives regarding the HASP.

4.4 TEAM MEMBERS

Field team members are responsible for understanding and adhering to this HASP. All team members should also be alert to any unsafe conditions or practices that may affect their own safety. Serious safety deficiencies should be communicated to the Health and Safety officer. If a team member's health and/or safety are threatened by the activity of others or by changes in site conditions, the Health and Safety Officer and Project Manager/Director will be contacted immediately.

4.5 SUBCONTRACTORS AND THIRD PARTIES

All equipment operators, laborers, and other parties contracted by Eco will be responsible for understanding and complying with all site safety requirements. The contractors will maintain overall responsibility for site safety, air monitoring, decontamination, and hygiene for its employees and/or subcontractors as required by laws and regulations. The contractors will adhere to this HASP and applicable laws and regulations for this project. Where conflicts between laws, regulations, and this HASP are encountered, the most stringent requirement to protect the workers and public shall be used.

Contractors and third parties engaged in work at the Site will be required to provide their own work equipment and PPE. Employees of contractors conducting hazardous waste operations will also be required to provide documentation that they have participated in an employer-sponsored medical surveillance program and that they have completed the required Occupational Safety and Health Administration (OSHA) 40-hour training program (and the annual refresher course, if appropriate) prior to working on the project.

5.0 TRAINING AND MEDICAL MONITORING REQUIREMENTS

All field team members will have the 40-hour OSHA training as specified in 29 Code of Federal Regulations (CFR) 1910.120 and a current 8-hour annual refresher course. All field team members will be on appropriate and current medical monitoring programs and approved by the medical physician to conduct the fieldwork. The health and safety training requirements for this project are listed below:

- Personnel engaged in site supervisory positions shall have completed the 8-hour OSHA supervisory training as specified in 29 CFR 1910.120(e).
- Personnel engaged in confined space entry (not anticipated), whether as authorized entrants, attendants, or entry supervisors, shall have completed training designed to provide knowledge, skills, and competence necessary for the safe performance of duties assigned during confined space evaluation and entry as specified in 29 CFR 1910.146 and 8 CCR 5156-5159, Article 8.
- Field team personnel shall be familiar with using monitoring equipment.
- At least one field team personnel shall have cardiopulmonary resuscitation (CPR)/first aid training.
- Site personnel will have site-specific fire prevention training. This training will cover general principles for preventing fires in the workplace, the fire hazards on the job, steps to be taken to reduce these hazards, how to protect from these hazards, and what to do in case of a fire.

6.0 SAFETY AND HEALTH RISK ANALYSIS

This section describes the various hazards that might be encountered during the course of this project. These hazards may include: chemical, physical, and biological hazards.

An activity hazard analysis was developed for each major task of the project. Major tasks were broken down into subtasks and potential hazards were listed for each individual task or step. For each hazard, a site-specific control measure is proposed to eliminate or reduce each hazard to an acceptable level.

6.1 CHEMICAL HAZARDS

The chemicals of concern at the Site are PAHs, arsenic, cadmium, lead, and the volatile organic compounds (VOCs) trichloroethene (TCE) and tetrachloroethene (PCE). These compounds and their associated hazards are listed on the chemical hazard sheets presented in Attachment 2. If other compounds are discovered at the Site, the HASP will be amended, pertinent information about the compounds will be provided in the table, and an appropriate risk analysis of the compound's hazards will be communicated to the on-site personnel.

6.1.1 INHALATION EXPOSURE

During soil excavation, stockpiling, and backfilling activities, Eco will ensure that dust and odor control measures (i.e., spray surface soils with water and/or suppressant) are implemented at all times to prevent visible dust and nuisance odor. Appropriate respirators will be used as deemed necessary by Eco personnel or as specified in this HASP. Dust control

will also be monitored during traffic on and off the Site (i.e., dump trucks). Only 40-hour U.S. Environmental Protection Agency (USEPA)/OSHA hazardous-waste–trained workers and those individuals who have completed the site-specific health and safety briefing and tailgate safety meeting will be allowed in the immediate work area (exclusion zone and contamination reduction zone).

Air Monitoring Equipment and Requirements

A photoionization detector (PID) will be used for VOC monitoring. The PID will be calibrated daily prior to use with 100 parts per million by volume (ppmv) isobutylene span gas. PID measurements will be recorded periodically while excavating is being conducted. PID measurements will be recorded upwind, downwind, and at 3 inches from freshly excavated soil. All site personnel will remain upwind at all times. During excavation or disturbance of contaminated soils, the breathing zones will be monitored continuously.

The volatile compounds TCE and PCE have a correction factor of 0.54 and 0.57, respectively, when the PID calibrated to isobutylene. The action level listed below reflects the PID reading equal to the permissible exposure limit for PCE (25 ppm), which is 46.30 ppm. Therefore the action level is 45 ppm (sustained). Note that the permissible exposure limit for TCE is higher (100 ppm), so the use of PCE is the more conservative.

A summary of the frequency and types of air monitoring is summarized in Table 1 below:

TABLE 1

AIR MONITORING REQUIREMENTS

TYPE OF EQUIPMENT	SAMPLING LOCATION	MINIMUM CALIBRATION FREQUENCY	PARAMETER(S) TO BE MEASURED	MINIMUM SAMPLING FREQUENCY	ACTION LEVEL
Photo-ionization Detectors (PID)	Breathing zone/ excavation area	1 per day	Organic Vapors	Every 15 minutes, or continuously when sustained readings above 5 ppm.	Upgrade to Level C if sustained readings >45 ppm

ppm = parts per million

All air monitoring results will be recorded in the field logs. Any additional health and safety issues and requirements shall be included in the field notebook.

6.1.2 DERMAL EXPOSURE

Repeated daily or prolonged contact with various chemical compounds can irritate the eyes and/or skin. Certain compounds are readily absorbed through skin and can cause systemic poisoning. However, contact of sufficient duration with chemicals on this project is judged to be unlikely with proper training and skin protection (i.e., gloves).

Direct skin contact with chemical compounds should be minimized by washing hands and other parts of the body in contact with the materials with soap and water and rinsing thoroughly. The washing is required at the beginning and end of the shift, during any break, and any time skin comes in contact with excavated soil.

6.1.3 INGESTION EXPOSURE

The ingestion exposure is judged to be low for this project. No eating, drinking, or smoking will be allowed in the work zone. All personnel are required to wash their hands at the beginning, during, and end of the work shift and at any time the hands come in contact with excavated soil.

6.2 PHYSICAL HAZARDS

Physical hazards are generally associated with the physical activities and work around heavy equipment. The potential physical hazards for this project include the following:

- Activity
- Electrical
- Noise
- Heat stress
- Cold stress

6.2.1 ACTIVITY HAZARD

The principal types of activity hazard expected during this operation include stress of the physical activities, loading/unloading, and carrying tools and equipment; the potential for falls; and adverse contact with tools and equipment. The activity hazard at the Site can be categorized into two types: work conducted at ground level, below the ground surface, and confined space (not anticipated).

6.2.1.1 Slips, Trips, and Fall Hazards

Work areas may contain slip, trip, and fall hazards for workers, such as

- holes, pits, or ditches;
- slippery surfaces;
- uneven grades;
- objects such as nails, metal shards, and broken glass or remnant branches and vegetative debris; or
- weather conditions such as rain, will make surfaces slippery and obscure visibility.

On-site personnel will be instructed to look for these potential safety hazards and immediately inform the SSHO about any new hazards. If the hazard cannot be immediately removed, action must be taken to warn site workers about the hazard. Proper housekeeping must be maintained onsite, particularly adjacent to office trailers. Small holes and pits along high foot traffic areas should be covered or barricaded to prevent injury.

The experience of personnel from Eco with this type of work and equipment and the procedures outlined in this HASP should minimize potential safety hazards of this type. In addition, the safety equipment listed in Section 9.0, which is required to be present at the Site for use by personnel, should minimize the potential for injury.

6.2.1.2 Motor Vehicles and Heavy Equipment

Tasks such as mobilization, drilling operations, excavation, and vehicle and/or heavy equipment operation may present a hazard. Injuries can result from being hit or run over by a moving vehicle, from vehicles overturning, or from being struck, burned, or otherwise injured by moving parts.

6.2.1.3 Work Conducted below Ground Level

Excavations are not expected to exceed five feet in depth; however, when excavations exceed a depth of five feet, potential hazards include

- cave ins;
- items falling into the excavation; and
- personnel falling into the excavation.

The excavated pit will be examined by a competent person for a potential cave-in. If the onsite HS Officer indicates a potential cave-in, or the depth of excavation increased beyond 5 feet the sides will be sloped. The maximum allowable slope for a soil or rock deposit shall be determined from Table 2. The following information was excerpted from the OSHA Safety and Health Regulations for Construction, Subpart Title of Excavations.

TABLE 2

MAXIMUM ALLOWABLE SLOPES

TYPE OF SOIL	MAXIMUM ALLOWABLE SLOPES (H:V) FOR EXCAVATION LESS THAN 20 FEET DEEP
Stable Rock	Vertical (90º)
Type A	3/4 : 1 (53º)
Type B	1 : 1 (45º)
Type C	1 ½ : 1 (34º)

*"**Stable rock**" means natural solid mineral matter that can be excavated with vertical sides and remain intact while exposed.*

*"**Type A**" means cohesive soils with an unconfined, compressive strength of 1.5 ton per square foot (tsf) (144 kPa [kiloPascal]) or greater. Examples of cohesive soils are: clay, silty clay, sandy clay, clay loam and, in some cases, silty clay loam and sandy clay loam. Cemented soils such as caliche and hardpan are also considered Type A. However, no soil is Type A if:*
(i) The soil is fissured; or
(ii) The soil is subject to vibration from heavy traffic, pile driving, or similar effects; or
(iii) The soil has been previously disturbed; or
(iv) The soil is part of a sloped, layered system where the layers dip into the excavation on a slope of four horizontal to one vertical (4H:1V) or greater; or
(v) The material is subject to other factors that would require it to be classified as a less stable material.

*"**Type B**" means:*
(i) Cohesive soil with an unconfined compressive strength greater than 0.5 tsf (48 kPa) but less than 1.5 tsf (144 kPa); or
(ii) Granular cohesionless soils including: angular gravel (similar to crushed rock), silt, silt loam, sandy loam and, in some cases, silty clay loam and sandy clay loam.
(iii) Previously disturbed soils except those which would otherwise be classed as Type C soil.
(iv) Soil that meets the unconfined compressive strength or cementation requirements for Type A, but is fissured or subject to vibration; or

(v) Dry rock that is not stable; or
(vi) Material that is part of a sloped, layered system where the layers dip into the excavation on a slope less steep than four horizontal to one vertical (4H:1V), but only if the material would otherwise be classified as Type B.

*"**Type C**" means:*
(i) Cohesive soil with an unconfined compressive strength of 0.5 tsf (48 kPa) or less; or
(ii) Granular soils including gravel, sand, and loamy sand; or
(iii) Submerged soil or soil from which water is freely seeping; or
(iv) Submerged rock that is not stable, or
(v) Material in a sloped, layered system where the layers dip into the excavation or a slope of four horizontal to one vertical (4H:1V) or steeper. "Unconfined compressive strength" means the load per unit area at which a soil will fail in compression. It can be determined by laboratory testing, or estimated in the field using a pocket penetrometer, by thumb penetration tests, and other methods.

6.2.1.4 Confined Space

Confined spaces are not anticipated at the Site. No one (Eco personnel or its subcontractors) will be permitted to enter any potential confined space at the Site.

6.2.2 ELECTRICAL HAZARD

Contact with electrical current can cause shock and electrical burns, and can be instantly fatal. The potential for exposure to electrical current exists through contact with electrical tools or equipment, generators and electrical control equipment, and overhead and underground power lines. Care must be taken to avoid contact with sources of electricity. Work will cease if lightning is observed or expected to occur.

Frayed electrical cords or electrical cords with damaged plugs shall not be used. Electrical cords shall not be used near water. When an individual is injured and in contact with power lines, rescue will be attempted with extreme caution. If a rescue is attempted, a long, dry unpainted piece of wood or a long, dry, clean rope will be used. When the victim is completely clear of the electrical source but is unconscious and a heartbeat (pulse) cannot be detected, CPR will begin immediately and emergency response personnel will be contacted.

6.2.2.1 Underground Utilities

Prior to starting soil-intrusive activities, all known underground utilities and lines will be located and marked on the ground and on a site map. Locator services from on-site representatives and each utility company whose utility service may intersect the facility will be requested by dialing 8-1-1 from any telephone. Intrusive soil work will not proceed until all locating activities have been completed and are fully documented in the site records. The initial site safety orientation meeting for all personnel working onsite will include a review of the underground utility locations and where the site map, which shows the positions of any underground utility lines, will be located. The site safety orientation will include a walkover of each marked utility or line.

During the performance of work, if a worker encounters a subsurface condition that creates suspicion regarding an unidentified underground line or utility, he/she will immediately cease work, secure his/her equipment, and notify the Health and Safety Officer.

6.2.2.2 Overhead Power Lines

Operation of equipment in the vicinity of overhead power lines will be done in accordance with California Division of Occupational Safety and Health (Cal-OSHA) Electrical Safety Orders. The subcontractor's field supervisors and operators will take necessary precautions for implementing safe work practices under such conditions. The following information was excerpted from the Cal-OSHA Electrical Safety Orders.

Article 37. Provisions for Preventing Accidents Due to Proximity to Overhead Lines (Formerly Article 86).

Paragraph 2946.

(a) General. No person, firm, or corporation, or agent of same, shall require or permit any employee to perform any function in proximity to energized high-voltage lines; to enter upon any land, building, or other premises and there engage in excavation, demolition, construction, repair, or other operation; or to erect, install, operate, or store in or upon such premises any tools, machinery, equipment, materials, or structures (including scaffolding, house moving, well drilling, pile driving, or hoisting equipment) unless and until danger from accidental contact with said high-voltage lines has been effectively guarded against.

(b) Clearances or Safeguards Required. Except where overhead electrical distribution and transmission lines have been de-energized and visibly grounded, the following provisions shall be met:

***1. Overhead Lines.** The operation, erection, or handling of tools, machinery, apparatus, supplies, or materials, or any part thereof, over energized overhead high-voltage lines shall be prohibited.*

Exception 1: Aircraft over energized overhead high-voltage lines operating in conformance with:

(A) Applicable regulations administered by the Federal Aviation Administration, and/or

(B) Helicopter Operations, Article 35, Construction Safety Orders, California Administrative Code, Title 8.

Exception 2: Tower cranes (Hammerhead) installed not closer than the minimum clearances set forth in Table 3, whereon the trolley or boom travel is controlled by limit switches which will prevent carrying a load over energized overhead high-voltage lines or within a horizontal distance closer than the minimum clearances set forth in Table 3.

***2. Minimum Clearances**. The operation, erection, handling, or transportation of tools, machinery, materials, structures, scaffolds, or the moving of any house or other building, or any other activity where any parts of the above or any part of an employee's body will come closer than the minimum clearances from energized overhead lines as set forth in Table 2 shall be prohibited.*
Operation of boom-type equipment shall conform to the minimum clearances set forth in Table 3, except in transit where the boom is lowered and there is no lead attached, in which case the distances specified in Table 2 shall apply.

TABLE 2

GENERAL CLEARANCES REQUIRED FROM ENERGIZED OVERHEAD HIGH-VOLTAGE CONDUCTORS

Nominal Voltage (phase to phase)	Minimum Required Clearance (feet)
600 to 50,000	6
Over 50,000 to 345,000	10
Over 345,000 to 750,000	16
Over 750,000 to 1,000,000	20

3. Boom-type lifting or hoisting equipment. *The erection, operation, or dismantling of any boom-type lifting of hoisting equipment, or any part thereof, closer than the minimum clearances from energized overhead high-voltage lines set forth in Table 3 shall be prohibited.*

4. Storage. *The storage of tools, machinery, equipment, supplies, materials, or apparatus under, by, or near energized overhead high-voltage lines is hereby expressly prohibited if at any time during such handling or other manipulation it is possible to bring such tools, machinery, equipment, supplies, materials, or apparatus, or any part thereof, closer than the minimum clearances from such lines as set forth in Table 2.*

(c) The specified clearance shall not be reduced by movement due to any strains impressed (by attachments or otherwise) upon the structures supporting the overhead high-voltage line or upon any equipment, fixtures, or attachments thereon.

(d) Any overhead conductor shall be considered energized unless and until the person owning or operating such line verifies that the line is not energized, and the line is visibly grounded at the work site.

TABLE 3

BOOM-TYPE LIFTING OR HOISTING EQUIPMENT CLEARANCES REQUIRED FROM ENERGIZED OVERHEAD HIGH-VOLTAGE LINES

Nominal Voltage (phase to phase)	Minimum Required Clearance (feet)
600 to 50,000	10
Over 50,000 to 75,000	11
Over 75,000 to 125,000	13
Over 125,000 to 175,000	15
Over 175,000 to 250,000	17
Over 250,000 to 370,000	21
Over 370,000 to 550,000	27
Over 550,000 to 1,000,000	42

Reference: Section 142.3, Labor Code.

6.2.3 NOISE

Noise is defined as unwanted sound in the form of vibration conducted through liquids, solids, or gases. The effects of noise on humans include psychological effects (interference with communication by speech, job performance, and safety) and physiological damage such as hearing loss. Of these, the most debilitating is hearing loss. The permissible exposure levels (PELs) for noise are listed in Table 4.

TABLE 4

PERMISSIBLE EXPOSURE LIMITS FOR NOISE

DURATION (PER DAY)	MEASUREMENT (dBA)
8 hours	90
6 hours	92
4 hours	95
3 hours	97
2 hours	100
1.5 hours	102
1 hour	105
30 minutes	110
15 minutes	115

dBA = decibels on an A-rated scale

The factors that affect the degree and extent of hearing loss are intensity or loudness of the noise, type of noise, period of exposure each day, total work duration, and distance from the source.

Where the 8-hour time-weighted average (TWA) is 85 dBA or greater, a hearing conservation program is required. This includes an initial audiogram to establish a baseline on the employee's hearing ability followed by an annual audiogram to measure hearing. The conservation program should also allow employees access to their audiogram records.

OSHA regulations stipulate that when employees are subject to sound that exceeds the PEL, feasible administrative or engineering controls shall be used. If controls fail to reduce sound exposure to within the PEL, PPE must be provided and used to decrease sound levels to within the PEL. Use of PPE (e.g., earplugs or muffs) should be implemented immediately upon discovery of sound levels above the action level pending evaluation of suitable engineering controls. Exposure to impact noise should not exceed the 140-dBA peak sound level.

Prolonged exposure to noise at the Site exceeding the PEL is unlikely. However, if noise monitoring is necessary, as determined by Health and Safety Officer, then the monitoring will be conducted using a dosimeter with data logging capabilities.

6.2.4 HEAT STRESS

Adverse weather conditions are important considerations in planning and conducting site operations. Hot or cold weather can cause physical discomfort, loss of efficiency, and personal injury. Of particular importance is heat stress, resulting when protective clothing decreases natural body ventilation. Heat stress can occur even when temperatures are moderate. All personnel are encouraged to take as many breaks as needed to accommodate the workload and weather condition.

One or more of the following recommendations will help reduce heat stress:

- Provide plenty of liquids.
- Provide cooling devices, if necessary, to aid natural body ventilation.
- Wear long cotton underwear acts to help absorb moisture and protect the skin from direct contact with heat-absorbing protective clothing.
- Install mobile showers and/or hose-down facilities to reduce body temperature and cool protective clothing.
- In extremely hot weather, conduct non-emergency response operations in the early morning or evening.
- Ensure that adequate shelter is available to protect personnel against heat, cold, rain, snow, or other adverse weather conditions that decrease physical efficiency and increase the probability of accidents.
- In hot weather, rotate workers wearing protective clothing.

Good hygienic standards must be maintained by frequent change of clothing and daily showering. Clothing should be permitted to dry during rest periods. Workers who notice skin problems should immediately consult medical personnel.

6.2.4.1 Effects of Heat

If the body's physiological processes fail to maintain a normal body temperature because of excessive heat, a number of physical reactions can occur. They can range from mild reactions such as fatigue, irritability, anxiety, and decreased concentration, dexterity, or movement to death. Medical help must be obtained for the more serious cases of heat stress.

6.2.4.2 Heat-Related Problems

Heat-related problems include the following:

- **Heat Rash –** Caused by continuous exposure to heat and humid air and aggravated by chafing clothes. Decreases ability to tolerate heat as well as being a nuisance.
- **Heat Cramps –** Caused by profuse perspiration with inadequate fluid intake and chemical replacement, especially salts. Signs include muscle spasm and pain in the extremities and abdomen.
- **Heat Exhaustion –** Caused by increased stress on various organs to meet increased demands to cool the body. Signs include shallow breathing; pale, cool, moist skin; profuse sweating; and dizziness and lassitude.
- **Heat Stroke –** The most severe form of heat stress. Body must be cooled immediately to prevent severe injury and/or death. Signs include red, hot, dry

skin; no perspiration; nausea; dizziness and confusion; strong, rapid pulse; and possibly coma. Medical help must be obtained immediately.

6.2.4.3 Heat Stress Monitoring

Monitoring of personnel wearing impervious clothing will begin when the ambient temperature is 70 °F or above. Table 5 presents the suggested frequency for such monitoring. Monitoring frequency will increase as the ambient temperature increases or as slow recovery rates are observed. Heat stress monitoring will be performed by a person who has current first-aid certification and who is trained to recognize heat stress symptoms. For monitoring the body's recuperative abilities from excess heat, one or more of the techniques listed below will be used. Other methods for determining heat stress monitoring, such as the wet bulb globe temperature (WBGT) index from the American Conference of Governmental Industrial Hygienist (ACGIH) Threshold Limit Value (TLV) booklet, may be used.

TABLE 5

SUGGESTED FREQUENCY OF PHYSIOLOGICAL MONITORING FOR FIT AND ACCLIMATIZED WORKERS [A]

ADJUSTED TEMPERATURE [B]	NORMAL WORK ENSEMBLE [C]	IMPERMEABLE ENSEMBLE
90°F or above (32°C)	After each 45 minutes of work	After each 15 minutes of work
87.5° - 90°F (30.8° - 32.2°C)	After each 60 minutes of work	After each 60 minutes of work
82.5° - 87.5°F (23.1° - 30.8°C)	After each 90 minutes of work	After each 90 minutes of work
77.5°- 82.5°F (25.3° - 28.1°C)	After each 120 minutes of work	After each 90 minutes of work
72.5°-77.5°F (22.5° - 25.3°C)	After each 150 minutes of work	After each 120 minutes of work

Notes:

a – For work levels of 250 kilocalories/hour.

b – Calculate the adjusted air temperature (ta adj) by using this equation: ta adj °F + (13 x % sunshine). Measure air temperature (ta) with a standard mercury-in-glass thermometer, with the bulb shielded from radiant heat. Estimate percentage sunshine by judging what percentage of 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 trousers.

To monitor the worker, measure:

- **Heart rate**: Count the pulse rate during a 30-second period as early as possible during the rest period. If the heart rate exceeds 110 beats per minute at the beginning of the rest period, the next work cycle will be shortened by one-third and the rest period will remain the same.

  If the heart rate still exceeds 110 beats per minute at the next rest period, the next work cycle will be reduced by one-third.

- **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), the next work cycle will be reduced by one-third without changing the rest period.
- If oral temperature still exceeds 99.6°F (37.6°C) at the beginning of the next rest period, the next cycle will be reduced by one-third.

No worker will be permitted to wear a semi-permeable or impermeable garment when the oral temperature exceeds 100.6°F (38.1°C).

6.2.5 COLD STRESS

Persons working outdoors in temperatures at or below freezing may suffer from cold exposure (not anticipated onsite). During prolonged outdoor periods with inadequate clothing, effects of cold exposure may even occur at temperatures well above freezing. Cold exposure may cause severe injury by freezing exposed body surfaces (frostbite) or result in profound generalized cooling, possibly causing death. Areas of the body that have high surface-area-to-volume ratios, such as fingers, toes, and ears, are the most susceptible to frostbite.

Systematic hypothermia is caused by exposure to freezing or rapidly dropping temperature. Its symptoms are usually exhibited in five stages: (1) shivering; (2) apathy, listlessness, and (sometimes) rapid cooling of the body to less than 95°F; (3) unconsciousness, glassy stare, slow pulse, and slow respiratory rate; (4) freezing of the extremities; and (5) death.

All personnel are required to wear sufficient clothing to prevent cold stress.

6.3 BIOLOGICAL HAZARDS

Biological hazards are any virus, bacteria, fungus, parasite, or any living organism that can cause a disease in human beings. They can be a part of the total environment or associated with certain occupations.

Diseases transmitted from animals to humans are common. Infectious and parasitic diseases can also result from exposure to contaminated water, sewage, insects, or infected people.

Exposure to many of the harmful stresses or hazards listed below can produce an immediate response due to the intensity of the hazard, or the response can result from longer exposure at a lower intensity.

6.3.1 POISONOUS INSECTS, PLANTS, AND ANIMALS

Contact with insects, plants, and animals present at the Site should be avoided because poisonous snakes, spiders, scorpions, and insects, may be present. Before beginning fieldwork each day, the work area should be observed for the potential presence of these inhabitants and measures should be taken to minimize the potential for contact with these elements. All personnel are instructed to stay away from these elements.

Stinging and biting insects, including bees, spiders, scorpions, and ticks, may be present. Insect repellent may be used to discourage insect contact with skin. Insect bites are generally not dangerous unless they are from a black widow spider, a "fiddle-back spider," or a tick infected with Lyme disease. The snakebite can be dangerous. Victims of the bite should lie down and remain motionless; cold packs should be applied and medical attention sought immediately. If a person is allergic to bee or wasp stings and is stung, he/she should seek immediate medical attention.

Signs of Lyme disease may appear within a few days or weeks after the bite of an infected tick. Infection may begin with a small red area at the bite site, which spreads to 5 to 7 inches (bull's-eye appearance). The area may look black and blue in dark-skinned people. Rash symptoms may or may not occur. Flu-like symptoms (fever, headache, joint and muscle pain) may also occur. Lyme disease is a serious illness: seek medical help. Refer to the first-aid manual onsite for information on removing an embedded tick.

Plants such as poison oak may be present at the Site and can cause an allergic reaction and skin rash in some individuals. Specially prepared creams that act as a barrier on the skin for protection against poison oak are commercially available and may minimize the potential for development of skin rash if exposure occurs. If a person is exposed to poison oak, the exposed areas will be washed immediately and thoroughly with soap and water.

The major concern with animal bites and scratches is the potential for infection and/or rabies. Although rabies can be fatal, it takes a few days to develop. Be sure the victim obtains medical attention quickly if an animal bite or scratch occurs. In the meantime, scrub the wound with soap and water, and rinse thoroughly under running water. Dry off and place a clean bandage on the wound.

6.3.2 HANTAVIRUS

An outbreak of an unexplained illness has occurred in the southwestern region of the United States. Laboratory findings from the Centers for Disease Control and Prevention have shown that Hantavirus causes the illness. Available data indicate that the common deer mouse is the main host, but the virus can also be found in pinion mice, brush mice, and western chipmunks. Human infection may occur when infective saliva or excreta are inhaled as aerosols produced directly from the animal. Transmission may also occur when dried materials contaminated by rodent excreta are disturbed, directly introduced into the broken skin, introduced into the eyes, or possibly ingested in contaminated food or water. Persons can also be infected after being bitten by rodents. The symptoms of Hantavirus-associated disease include fever, muscle aches, headache, and cough, progressing rapidly to severe lung disease, often requiring intensive care treatment. All personnel must seek medical attention within 45 days of the last potential exposure.

The following preventative measures should be used when entering vacant or unfamiliar buildings, basement, crawl spaces, or other confined or unventilated areas (none anticipated):

- On-site personnel participating in this investigation should assess the potential presence of rodents and the population size by looking for droppings, runways, nests, gnawing around entrances, etc.
- Any building suspected of containing rodents/rodent droppings should be aired out prior to entering it. All doors and windows should be opened to ventilate the building at least 30 to 45 minutes. Do not remain inside during ventilation.
- Modified Level D PPE should be used in conjunction with a half-face air purifying respiratory equipped with high-efficiency particulate air (HEPA) cartridges. The respirators and the cartridge should be certified by National Institute of Occupational Safety and Health (NIOSH).
- In most cases, no PPE will be required outdoors and/or in open areas or in buildings that are "aired out" as described above provided that rodents/rodent

wastes are not handled or disturbed. As a general rule, PPE will be worn when cleaning up rodent wastes in buildings or other confined areas.

- All rodents, rodent droppings, nesting materials, etc. should be sprayed with a 10-percent bleach solution or disinfectant solution to kill the virus if present and reduce dust. After spraying, the wet material should be wiped up with paper towels. All debris, including any used PPE, should be double bagged prior to disposal.
- Any non-disposable PPE (except for respirator cartridges) should be disinfected with a bleach solution after use. Respirator cartridges should not be disinfected after use but should be changed when they become difficult to breathe through.
- Dry sweeping shall not be used to clean up infestation droppings.

6.3.3 SEWAGE HAZARDS

It is unlikely that personnel will be exposed to raw sewage during this assessment. However, cautions should be taken to avoid contact with any soil or material that appears to be impacted by raw sewage. Direct contact with sewage, sewage-contaminated surfaces, and sewage-contaminated waste and/or rinsates should be avoided. Appropriate PPE as specified in Section 9.0 should be used. Contact with the exterior surfaces of PPE should be avoided when doffing such equipment. If contact occurs, the affected area should be decontaminated with warm soapy water. Good personal hygiene is mandatory for this project.

7.0 SUMMARY OF HAZARD POTENTIAL

Based on the scope of work, foreseeable field activities, information presented in Section 6.0 of this HASP, and Eco's professional judgment, Table 6 presents the hazard evaluations associated with the work to be conducted at the Site.

TABLE 6

ANTICIPATED HAZARD AND HAZARD POTENTIAL

ANTICIPATED HAZARD		HAZARD POTENTIAL
Chemical	Inhalation	Low
	Dermal	Low to moderate
	Ingestion	Low to moderate
Physical	Activity (trip and fall)	Low to moderate
	Electrical	Low
	Noise	Low to moderate
	Heat and cold stress	Low
	Confined space	Access not permitted
Biological	Poisonous plant or animal	Low
	Sewage	Low

Note: The above hazard potential is based on currently available information and anticipated field activities. If the site conditions differ from the anticipated conditions and such differences pose a health or safety concern to the workers, then this HASP will be modified accordingly to address those conditions.

8.0 EMERGENCY RESPONSE PLAN

All hazardous waste activities present a degree of risk to site personnel. During routine operations, risk is minimized by establishing good work practices, staying alert, and using proper PPE. Unpredictable events (e.g., physical injury, chemical exposure, or fire) may occur and must be anticipated.

To handle emergencies that may arise in the field more effectively, at least two CPR and first-aid-trained persons (Eco and subcontractor) will be at the Site during field activities. The trained personnel will have participated in Red Cross CPR and first-aid courses (or equivalent courses) in accordance with 29 CFR 1910.1030.

8.1 GUIDELINES FOR PRE-EMERGENCY PLANNING AND TRAINING

On-site personnel must read this HASP and familiarize themselves with the information presented. Before project initiation, the field team should review the HASP and the emergency response plan. Employees will be required to have a copy of the emergency contacts and phone numbers immediately accessible onsite and to know the route to the nearest emergency medical services (see Figure 1, Hospital location Map).

Posting safety information on a Safety Bulletin Board is practicable for this project. A copy of the HASP and other pertinent safety documents will be discussed during the daily health and safety tailgate meetings. It is likely that these documents will be posted in vehicles.

8.2 EMERGENCY RECOGNITION AND PREVENTION

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 onsite,
- a condition is discovered that suggests the existence of a situation more hazardous than anticipated,
- concentrations of organic vapors exceed 10 parts per million (ppm) above background air concentrations, or
- the PEL exceeds 10 percent.

Some ways of preventing emergency situations are listed below.

- Team members should remain close together to assist each other during emergencies.
- During continual operations, on-site workers act as safety backup to each other. Off-site personnel provide emergency assistance.
- All field members will make use all of their senses to alert themselves to potentially dangerous situations that they will avoid (e.g., presence of strong and irritating or nauseating odors).

- Personnel will practice unfamiliar operations before doing the actual procedure in the field.
- Field members should be familiar with the physical characteristics of fieldwork, including:
  - wind direction in relation to contamination zones;
  - accessibility to associates, equipment, and vehicles;
  - communications;
  - hot zone (areas of known or suspected contamination);
  - site access; and
  - nearest water sources.
- Personnel and equipment in the work area enclosure should be minimized, consistent with effective site operations.
- Work areas for various operational activities must be established.
- In the event that any member of the field crew experiences any adverse effects or symptoms of exposure while on the scene, or organic vapors exceed the action limits, the entire field crew will immediately halt work and act according to the instructions provided by the Health and Safety Officer.
- The discovery of any condition that would suggest the existence of a situation more hazardous than anticipated will result in the evacuation of the field team and re-evaluation of the hazard and the level of protection required.

General emergency procedures and specific procedures for handling personal injury and chemical exposure are described in the following sections.

8.3 PERSONNEL ROLES, LINES OF AUTHORITY, AND COMMUNICATION PROCEDURES DURING AN EMERGENCY

When an emergency occurs, decisive action is required. Rapidly made choices may have far-reaching, long-term consequences. Delays of minutes can create life-threatening situations. Personnel must be ready to respond to emergency situations immediately. All personnel should know their own responsibilities during an emergency; know who is in charge during an emergency and the extent of their authority.

In the event of an emergency at the Site, the Health and Safety Officer will assume total control and be responsible for on-site decision making. The Health and Safety Officer will also be responsible for coordinating all activities until emergency response teams (i.e., ambulance, fire department, etc.) arrive onsite.

The Health and Safety Officer will ensure that the necessary personnel and agencies are contacted as soon as possible after the emergency occurs. All on-site personnel must know the locations of the nearest phone and emergency phone number list.

8.4 EVACUATION ROUTES AND PROCEDURES, SAFE DISTANCES, AND PLACES OF REFUGE

In the event of emergency conditions, employees will evacuate the area as instructed, transport injured personnel, or take other measures to mitigate the situation. Evacuation routes and safe distances will be initially decided by the Health and Safety Officer until instructed by the emergency response teams. Turn-by-turn driving instructions to the nearest hospital will be placed in vehicles and/or bulletin boards (if possible) at the Site.

Posting locations of the map denoting the route to the nearest emergency care center will also be discussed during the daily health and safety tailgate meetings.

8.5 DECONTAMINATION OF PERSONNEL DURING AN EMERGENCY

Procedures for leaving a contaminated area must be planned and implemented prior to going onsite. Work areas and decontamination procedures must be established based on expected site conditions. If a member of the field crew is exposed to chemicals, the emergency procedure outlined below should be followed:

1. Another team member (buddy) should remove the individual from the immediate area of contamination.
2. Precautions should be taken to avoid exposure of other individuals to the chemical.
3. If the chemical is on the individual's clothing, the clothing should be removed if it is safe.
4. Administer first aid and transport the victim to the nearest medical facility, if necessary.

If uninjured employees are required to evacuate a contaminated area in an emergency situation, emergency decontamination procedures should be followed. At a minimum, these would involve moving into a safe area and removing protective equipment. Care should be taken to minimize contamination of the safe area and personnel. Contaminated clothing should be placed in plastic garbage bags or other suitable containers. Employees should wash or shower as soon as possible.

8.6 EMERGENCY SITE SECURITY AND CONTROL

For this project, the Project Manager/Director must know who is in the work area. In an emergency situation, only necessary rescue and response personnel should be allowed into the exclusion zone.

8.7 PROCEDURES FOR EMERGENCY MEDICAL TREATMENT AND FIRST AID

8.7.1 CHEMICAL EXPOSURE TREATMENT

In the event of chemical exposure (skin contact, inhalation, or ingestion), the following procedures should be implemented:

1. Another team member (buddy) should remove the individual from the immediate area of contamination.
2. Precautions should be taken to avoid exposure of other individuals to the chemical.
3. If the chemical is on the individual's clothing, the clothing should be removed if it is safe to do so.
4. If the chemical has contacted the skin, the skin should be washed with copious amounts of water, preferably under a shower.
5. In case of eye contact, emergency eyewash should be used. Eyes should be washed for at least 15 minutes.
6. If necessary, the victim should be transported to the nearest hospital or medical center. If necessary, an ambulance should be called to transport the victim.

8.7.2 PERSONAL INJURY

In the event of personal injury, the following procedures should be implemented:

1. Field team members trained in first aid should administer treatment to an injured worker.
2. The victim should be transported to the nearest hospital or medical center. If necessary, an ambulance should be called to transport the victim.

8.8 FIRE OR EXPLOSION

Although site personnel will be trained on how to prevent fires in the field, it is possible that wildfires may occur during dry conditions. In the event of fire or explosion, personnel will evacuate the area immediately and administer necessary first aid to any injured employees. Portable fire extinguishers will be readily accessible. Personnel will proceed to a safe area and phone emergency support services. Upon contacting emergency support services, the caller should state his/her name, the nature of the hazard (e.g., fire, high combustible vapor levels), the location of the incident, and whether any physical injuries require an ambulance. The caller should not hang up until emergency support services have all of the additional information they may require.

8.9 EMERGENCY CONTACT

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, telephone or radio contact should be made with the site point of contact or site emergency personnel who will then contact the appropriate response teams.

8.9.1 WORK SITE LOCATION

Former Southland Steel Facility
5959, 5969, 6011, 6161, & 6169 Alameda Street
Huntington Park, CA 90255

8.9.2 HOSPITAL

One hospital is located in the site vicinity. See Figure 1 for the hospital location and route to the hospital from the Site. The hospital address and telephone number are also provided on Figure 1. The address and phone number for the hospital is as follows:

Huntington Park Community Hospital
2623 E Slauson Avenue
Huntington Park, CA 90255
(323) 583-1931

8.9.3 EMERGENCY SERVICES

Fire Department	911
Police Department	911
Paramedics	911

8.9.4 ECO & ASSOCIATES, INC. CONTACTS

Project Manager/Director

Dr. Mohammad Estiri
Eco & Associates, Inc.
1855 W Katella Ave, Suite 340
Orange, CA 92867
Phone: (714) 289-0995
Mobile: (714) 325-9237

8.9.5 CLIENT AND SITE CONTACT

Primary Client Contact

Ms. Fernanda Palacios
City of Huntington Park
6550 Miles Avenue
Huntington Park, CA 90255

9.0 PERSONAL PROTECTIVE EQUIPMENT

It is Eco's policy not to conduct any work that would require Level A protection. Level B protection is not anticipated during this investigation. The equipment and activities that define Levels C and D are presented in the following sections.

9.1 LEVEL C ACTIVITIES

In the event that organic vapor levels in the worker breathing zone cannot be maintained below 25 ppm with mitigation measures, activities will stop temporarily and Level C PPE will be used.

Level C PPE will consist of the following:

- Full-face or half-face air purifying respirators (with organic vapor/acid gas cartridges and HEPA cartridges)
- Hard hat
- Steel toe and shank boots
- Appropriate disposal coveralls (chemical-resistant) taped around the respirator mask, ankles, and wrists
- Safety glasses (splash)
- Neoprene or nitrile gloves
- Local supply air ventilation

The following procedures for Level C activities will be implemented:

1. All personnel involved in the Level C activities will be trained by experienced personnel in the appropriate use of the equipment, decontamination procedures, emergency procedures, and other applicable information prior to the commencement of activities.

2. Work zones will be delineated according to prevailing winds, anticipated levels of organic vapors in the worker breathing zone, and results obtained from air monitoring activities.
3. Appropriate personnel decontamination areas and procedures will be established.

9.2 MODIFIED LEVEL D ACTIVITIES

The modified Level D PPE will consist of the following:

- Hard hat
- High-Visibility Vest
- Steel toe and shank rubber boots
- Safety glasses (splash)
- Neoprene or nitrile gloves

The following procedures for Level D activities will be implemented:

1. All personnel involved in the Level D activities will be trained by experienced personnel in the appropriate use of the equipment, decontamination procedures, emergency procedures, and other applicable information prior to the commencement of activities.
2. Work zones will be delineated according to prevailing winds, anticipated levels of organic vapors in the worker breathing zone, and results obtained from air monitoring activities.
3. Appropriate personnel decontamination areas and procedures will be established.

9.3 ADDITIONAL EQUIPMENT NEEDS

The field team will have the following items readily available:

- Copy of this HASP including a list of emergency contacts
- Soap
- First-aid kit
- Paper towels
- Duct tape
- Water
- Plastic garbage bags
- Resuscitation devices
- Ear plugs

9.4 PERSONAL PROTECTIVE EQUIPMENT FOR THIS PROJECT

The potential chemical exposures are presented in the chemical hazard sheets in Appendix B and will be reviewed with on-site personnel prior to initiating the fieldwork. Based on evaluation of potential hazards, this project has been designated protection of modified Level D PPE. However, if the respiratory protection is required based on the observed site conditions and monitoring results, then only NIOSH-approved respirators and cartridges will be used on this project.

10.0 AIR MONITORING

The purpose of air monitoring is to identify and quantify airborne contaminants to verify and determine the level of worker protection needed.

If used, real-time sampling instruments will be calibrated and used in accordance with the manufacturer's instructions. Direct-reading instrument calibration will be verified and documented before and after use (when necessary).

TWA sampling, analytical, and calibration protocols will follow appropriate OSHA and/or NIOSH protocols for personal sampling. All personal sampling pumps will be calibrated before and after each sampling period in accordance with the manufacturer's instructions and OSHA and/or NIOSH methods.

10.1 VOLATILE ORGANIC COMPOUND MONITORING

High concentrations of VOCs are not anticipated at the Site. However, if conditions are different than anticipated, then the following procedure will be used.

A PID will be used to monitor the potential presence of VOCs when evaluating the work site condition or any other area of suspected heavy organic contamination and prior to initiation of any activities using spark- or flame-producing equipment. Table 7 shows action limits related to values within the work zone.

TABLE 7

VOLATILE ORGANIC COMPOUND ACTION LIMITS

PID READINGS	LEVEL OF PROTECTION
Background to 5 ppm above background	Modified Level D
5 to 25 ppm above background (sustainable)	Modified Level D
>25 ppm above background (sustainable)	Level C: Institute engineering controls and start personal monitoring

Notes:

- Action limits should be multiplied by the relative response of the instrument to give the instrument action limit.

11.0 DECONTAMINATION PROCEDURES

11.1 PERSONNEL DECONTAMINATION

An exclusion zone, contamination reduction zone, and support zone will be established during field operations. Defined ingress and egress points will be established, and personnel will enter and exit only through these points.

This procedure may be modified somewhat by the Health and Safety Officer if necessary. The decontamination station will include provisions for collecting disposable protective equipment (such as garbage bags); washing boots, gloves, Saranex™ or Tyvek® (if used), field instruments, and tools; and washing hands, face, and other exposed body parts. On-site personnel will shower upon return to their homes at the end of the workday. Refuse from

decontamination will be left at the facility for disposal. At no time will contaminated or potentially contaminated personnel, clothing, or equipment be placed or transported in personal vehicles or company vehicles.

Decontamination equipment will include the following:

- Plastic buckets and pails
- Scrub brushes and long-handled brushes
- Detergent
- Containers of water
- Paper towels
- Plastic garbage bags
- Distilled water

11.2 EQUIPMENT DECONTAMINATION

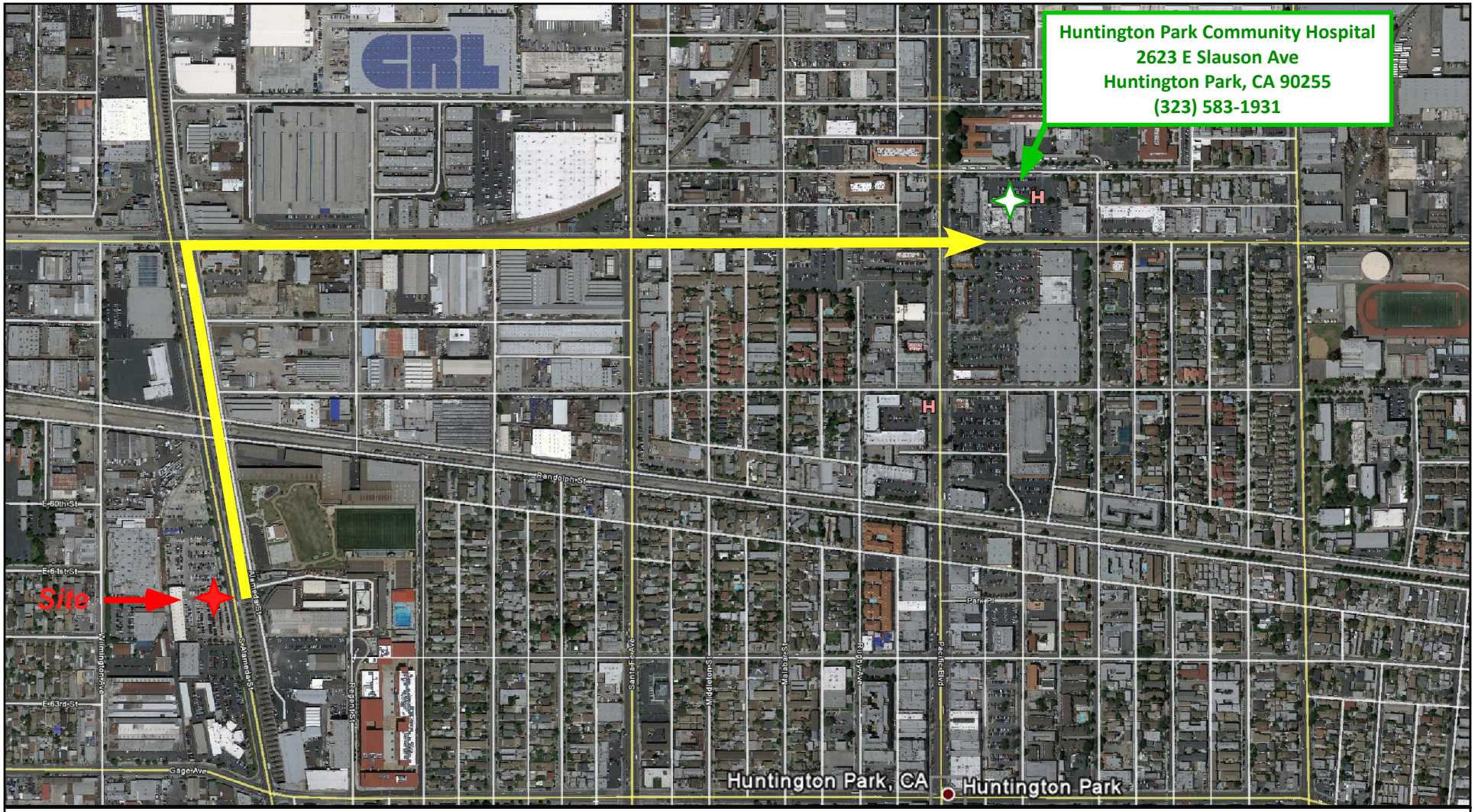
All equipment that comes into contact with potentially contaminated soil will be decontaminated consistently to assure the quality of samples collected. The equipment will be decontaminated. Decontamination will occur prior to and after each use of a piece of equipment. All excavators and sampling devices used will be decontaminated using the following procedures:

1. Non-phosphate detergent and tap water wash (using a brush if necessary)
2. Tap water rinse
3. Initial de-ionized/distilled water rinse
4. Final de-ionized/distilled water rinse

Decontamination of sampling equipment used will be performed at a decontamination station. Disposable equipment intended for one-time use will not be decontaminated but will be packaged for appropriate disposal.

FIGURE

HOSPITAL LOCATION MAP



Adapted from Google Maps 2014

Approximate Scale:

0 0.5 1.0 miles

DIRECTIONS:

Head North on Alameda Street
Turn Right on to Slauson Avenue
Hospital will be on the left at
the intersection of Pacific & Slauson

N
W E
S

Environmental Excellence

Eco & Associates, Inc.
1855 W. Katella Avenue, Suite 340
Orange, California 92867

Phone: 714.289.0995 Fax: 714.289.0965

HOSPITAL LOCATION MAP
Huntington Park Community Hospital
2623 E Slauson Ave, Huntington Park, CA 90255
(323)583-1931

Project No.: Eco-13-595

Dated June 2014

FIGURE
1

APPENDIX D
SITE-SPECIFIC HEALTH AND SAFETY PLAN

ATTACHMENT 1

HEALTH AND SAFETY COMPLIANCE AGREEMENT FORM

HEALTH AND SAFETY COMPLIANCE AGREEMENT

Health and Safety Plan
Former Southland Steel Facility
5959, 5969, 6011, 6161, & 6169 Alameda Street
Huntington Park, CA 90255
Project No: Eco-13-595

I have reviewed and understand the entire Health and Safety Plan for the above-referenced project. I agree to comply with all of the health and safety requirements. I understand that I may be prohibited from working on the project for violating any of the requirements.

I have been approved to wear a respirator by a physician based on a medical examination. I have been trained in the appropriate use, care, and storage of respiratory equipment. I have been respirator fit-tested, and I will have my respirator available for use in the field. I understand that I am to use the equipment supplied to me by my employer. I further understand that this equipment is provided solely for my benefit with the intent to minimize my exposure to potentially hazardous conditions. In the event of such usage, I agree to indemnify and hold harmless Eco & Associates, Inc., and all of its employees, from and against any and all losses, demands, claims, liabilities, lawsuits, damages, costs, and expenses arising, in any way, from the use of the equipment.

Visitors will be required to review this Health and Safety Plan. It is required that visitors be escorted in the restricted access work zone. Visitors must comply with Eco & Associates, Inc.'s escort directions at all times while on site. Noncompliance with escort directions will not be tolerated, and violators will be requested to leave the site immediately.

SIGNATURE	PRINT NAME	DATE

Meeting Leader:_____ Date: _____

APPENDIX D
SITE-SPECIFIC HEALTH AND SAFETY PLAN

ATTACHMENT 2

CHEMICAL HAZARD SHEETS

Material Safety Data Sheet

Benzo[a]pyrene, 98%

MSDS# 37175

Section 1 - Chemical Product and Company Identification

MSDS Name:	Benzo[a]pyrene, 98%
Catalog Numbers:	AC105600000, AC105600010, AC105601000, AC377200000, AC377200010, AC377201000 AC377201000
Synonyms:	3,4-Benzopyrene; 3,4-Benzpyrene; Benzo[def]chrysene.

Company Identification:	Acros Organics BVBA Janssen Pharmaceuticalaan 3a 2440 Geel, Belgium
Company Identification: (USA)	Acros Organics One Reagent Lane Fair Lawn, NJ 07410
For information in the US, call:	800-ACROS-01
For information in Europe, call:	+32 14 57 52 11
Emergency Number, Europe:	+32 14 57 52 99
Emergency Number US:	201-796-7100
CHEMTREC Phone Number, US:	800-424-9300
CHEMTREC Phone Number, Europe:	703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#:	50-32-8
Chemical Name:	Benzo[a]pyrene
%:	>96
EINECS#:	200-028-5

Hazard Symbols: T N

Risk Phrases: 45 46 60 61 43 50/53

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Danger! May cause allergic skin reaction. Cancer hazard. May cause harm to the unborn child. May impair fertility. May cause eye, skin, and respiratory tract irritation. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. May cause heritable genetic damage. Target Organs: Reproductive system, skin.

Potential Health Effects

Eye:	May cause eye irritation.
Skin:	May cause skin irritation. May be harmful if absorbed through the skin. May cause an allergic reaction in certain individuals.
Ingestion:	May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated. May be harmful if swallowed.
Inhalation:	May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated. May be harmful if inhaled.

Chronic: May cause cancer in humans. May cause reproductive and fetal effects. Laboratory experiments have resulted in mutagenic effects.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician:

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Autoignition Temperature: Not available.

Flash Point: Not available

Explosion Limits: Lower: Not available

Explosion Limits: Upper: Not available

NFPA Rating: health: 2; flammability: 0; instability: 0;

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Benzo[a]pyrene	0.2 mg/m3 TWA (as benzene soluble aerosol) (listed under Coal tar pitches).	0.1 mg/m3 TWA	0.2 mg/m3 TWA (benzene soluble fraction) (listed under Coal tar pitches).

OSHA Vacated PELs: Benzo[a]pyrene: 0.2 mg/m3 TWA (benzene soluble fraction) (listed under Coal tar pitches)

Engineering Controls:

Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Personal Protective Equipment

Eyes:	Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.
Skin:	Wear appropriate protective gloves to prevent skin exposure.
Clothing:	Wear appropriate protective clothing to prevent skin exposure.
Respirators:	A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State:	Powder
Color:	yellow to brown
Odor:	faint aromatic odor
pH:	Not available
Vapor Pressure:	Not available
Vapor Density:	Not available
Evaporation Rate:	Not available
Viscosity:	Not available
Boiling Point:	495 deg C @ 760 mm Hg (923.00°F)
Freezing/Melting Point:	175 - 179 deg C
Decomposition Temperature:	Not available
Solubility in water:	1.60x10-3 mg/l @25°C
Specific Gravity/Density:	
Molecular Formula:	C20H12
Molecular Weight:	252.31

Section 10 - Stability and Reactivity

Chemical Stability:	Stable under normal temperatures and pressures.
Conditions to Avoid:	Dust generation.
Incompatibilities with Other Materials	Strong oxidizing agents.
Hazardous Decomposition Products	Carbon monoxide, carbon dioxide.
Hazardous Polymerization	Has not been reported.

Section 11 - Toxicological Information

RTECS#:	CAS# 50-32-8: DJ3675000
LD50/LC50:	RTECS: Not available.
Carcinogenicity:	Benzo[a]pyrene - ACGIH: A1 - Confirmed Human Carcinogen (Coal tar pitches). California: carcinogen, initial date 7/1/87 NTP: Suspect carcinogen IARC: Group 1 carcinogen
Other:	The toxicological properties have not been fully investigated.

Section 12 - Ecological Information

Not available

Section 13 - Disposal Considerations

Dispose of in a manner consistent with federal, state, and local regulations.

Section 14 - Transport Information

US DOT
Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOL (Benzo{a} pyrene)
Hazard Class: 9
UN Number: UN3077
Packing Group: III
Canada TDG
Shipping Name: Not available
Hazard Class:
UN Number:
Packing Group:

USA RQ: CAS# 50-32-8: 1 lb final RQ; 0.454 kg final RQ

Section 15 - Regulatory Information

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols: T N

Risk Phrases:

R 45 May cause cancer.

R 46 May cause heritable genetic damage.

R 61 May cause harm to the unborn child.

R 43 May cause sensitization by skin contact.

R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

R 60 May impair fertility.

Safety Phrases:

S 53 Avoid exposure - obtain special instructions before use.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 60 This material and its container must be disposed of as hazardous waste.

S 61 Avoid release to the environment. Refer to special instructions/safety data sheets.

WGK (Water Danger/Protection)

CAS# 50-32-8: Not available

Canada

CAS# 50-32-8 is listed on Canada's DSL List

Canadian WHMIS Classifications: D2A, D2B

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

CAS# 50-32-8 is listed on Canada's Ingredient Disclosure List

US Federal

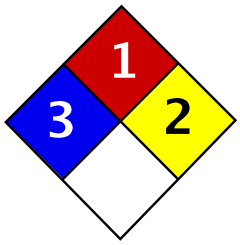
TSCA

CAS# 50-32-8 is listed on the TSCA Inventory.

Section 16 - Other Information

MSDS Creation Date: 9/02/1997

Revision #8 Date 7/20/2009



Health	3
Fire	1
Reactivity	2
Personal Protection	E

Material Safety Data Sheet
Arsenic MSDS

Section 1: Chemical Product and Company Identification

Product Name: Arsenic

Catalog Codes: SLA1006

CAS#: 7440-38-2

RTECS: CG0525000

TSCA: TSCA 8(b) inventory: Arsenic

CI#: Not applicable.

Synonym:

Chemical Name: Arsenic

Chemical Formula: As

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Arsenic	7440-38-2	100

Toxicological Data on Ingredients: Arsenic: ORAL (LD50): Acute: 763 mg/kg [Rat]. 145 mg/kg [Mouse].

Section 3: Hazards Identification

Potential Acute Health Effects:
Very hazardous in case of ingestion, of inhalation. Slightly hazardous in case of skin contact (irritant), of eye contact (irritant).

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Classified A1 (Confirmed for human.) by ACGIH.
MUTAGENIC EFFECTS: Not available.
TERATOGENIC EFFECTS: Not available.
DEVELOPMENTAL TOXICITY: Not available.
The substance is toxic to kidneys, lungs, the nervous system, mucous membranes.
Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.

Skin Contact: Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops.

Serious Skin Contact: Not available.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: Not available.

Flash Points: Not available.

Flammable Limits: Not available.

Products of Combustion: Some metallic oxides.

Fire Hazards in Presence of Various Substances: Flammable in presence of open flames and sparks, of heat, of oxidizing materials.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available.
Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical powder.
LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards:
Material in powder form, capable of creating a dust explosion. When heated to decomposition it emits highly toxic fumes.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill: Use appropriate tools to put the spilled solid in a convenient waste disposal container.

Large Spill:
Use a shovel to put the material into a convenient waste disposal container. Be careful that the product is not

present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up.. Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not ingest. Do not breathe dust. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents, acids, moisture.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection: Safety glasses. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 0.01 from ACGIH (TLV) [United States] [1995]
Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Lustrous solid.)

Odor: Not available.

Taste: Not available.

Molecular Weight: 74.92 g/mole

Color: Silvery.

pH (1% soln/water): Not applicable.

Boiling Point: Not available.

Melting Point: Sublimation temperature: 615°C (1139°F)

Critical Temperature: Not available.

Specific Gravity: 5.72 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility: Insoluble in cold water, hot water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances: Reactive with oxidizing agents, acids, moisture.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity: Not available.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Inhalation. Ingestion.

Toxicity to Animals: Acute oral toxicity (LD50): 145 mg/kg [Mouse].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified A1 (Confirmed for human.) by ACGIH.
Causes damage to the following organs: kidneys, lungs, the nervous system, mucous membranes.

Other Toxic Effects on Humans:
Very hazardous in case of ingestion, of inhalation.
Slightly hazardous in case of skin contact (irritant).

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans: Not available.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are as toxic as the original product.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Section 14: Transport Information

DOT Classification: CLASS 6.1: Poisonous material.

Identification: : Arsenic UNNA: UN1558 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Arsenic
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Arsenic
Pennsylvania RTK: Arsenic
Massachusetts RTK: Arsenic
TSCA 8(b) inventory: Arsenic

Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

Other Classifications:

WHMIS (Canada):
CLASS D-1A: Material causing immediate and serious toxic effects (VERY TOXIC).
CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):
R22- Harmful if swallowed.
R45- May cause cancer.

HMIS (U.S.A.):

Health Hazard: 3

Fire Hazard: 1

Reactivity: 2

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 3

Flammability: 1

Reactivity: 2

Specific hazard:

Protective Equipment:
Gloves.
Lab coat.
Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.
Safety glasses.

Section 16: Other Information

References:
-Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987.
-Liste des produits purs tératogènes, mutagènes, cancérogènes. Répertoire toxicologique de la Commission de la Santé et de la Sécurité du Travail du Québec.
-Material safety data sheet emitted by: la Commission de la Santé et de la Sécurité du Travail du Québec.
-SAX, N.I. Dangerous Properties of Indutrial Materials. Toronto, Van Nostrand Reinold, 6e ed. 1984.
-The Sigma-Aldrich Library of Chemical Safety Data, Edition II.
-Guide de la loi et du règlement sur le transport des marchandises dangeureuses au canada. Centre de conformité internatinal Ltée. 1986.

Other Special Considerations: Not available.

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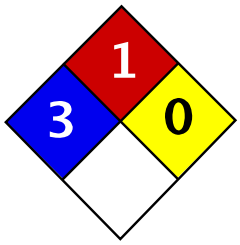

Health	3
Fire	1
Reactivity	0
Personal Protection	E

Material Safety Data Sheet
Cadmium MSDS

Section 1: Chemical Product and Company Identification

Product Name: Cadmium

Catalog Codes: SLC3484, SLC5272, SLC2482

CAS#: 7440-43-9

RTECS: EU9800000

TSCA: TSCA 8(b) inventory: Cadmium

CI#: Not applicable.

Synonym:

Chemical Name: Cadmium

Chemical Formula: Cd

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Cadmium	7440-43-9	100

Toxicological Data on Ingredients: Cadmium: ORAL (LD50): Acute: 2330 mg/kg [Rat.]. 890 mg/kg [Mouse]. DUST (LC50): Acute: 50 ppm 4 hour(s) [Rat].

Section 3: Hazards Identification

Potential Acute Health Effects:
Hazardous in case of ingestion, of inhalation. Slightly hazardous in case of skin contact (irritant, sensitizer), of eye contact (irritant). Severe over-exposure can result in death.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Classified A2 (Suspected for human.) by ACGIH, 2 (Reasonably anticipated.) by NTP.
MUTAGENIC EFFECTS: Not available.
TERATOGENIC EFFECTS: Not available.
DEVELOPMENTAL TOXICITY: Not available.
The substance is toxic to kidneys, lungs, liver.
Repeated or prolonged exposure to the substance can produce target organs damage. Repeated exposure to an highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Section 4: First Aid Measures

Eye Contact: No known effect on eye contact, rinse with water for a few minutes.

Skin Contact:
After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cover the irritated skin with an emollient. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.

Serious Skin Contact: Not available.

Inhalation: Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

Ingestion:
Do not induce vomiting. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: 570°C (1058°F)

Flash Points: Not available.

Flammable Limits: Not available.

Products of Combustion: Some metallic oxides.

Fire Hazards in Presence of Various Substances:
Non-flammable in presence of open flames and sparks, of heat, of oxidizing materials, of reducing materials, of combustible materials, of moisture.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available.
Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical powder.
LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards:
Material in powder form, capable of creating a dust explosion. When heated to decomposition it emits toxic fumes.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill: Use appropriate tools to put the spilled solid in a convenient waste disposal container.

Large Spill:
Use a shovel to put the material into a convenient waste disposal container. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not ingest. Do not breathe dust. Wear suitable protective clothing In case of insufficient ventilation, wear suitable respiratory equipment If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents.

Storage:
Keep container dry. Keep in a cool place. Ground all equipment containing material. Keep container tightly closed. Keep in a cool, well-ventilated place. Highly toxic or infectious materials should be stored in a separate locked safety storage cabinet or room.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection: Safety glasses. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 0.01 (ppm)
Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Lustrous solid.)

Odor: Not available.

Taste: Not available.

Molecular Weight: 112.4 g/mole

Color: Silvery.

pH (1% soln/water): Not applicable.

Boiling Point: 765°C (1409°F)

Melting Point: 320.9°C (609.6°F)

Critical Temperature: Not available.

Specific Gravity: 8.64 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility: Insoluble in cold water, hot water, methanol, diethyl ether, n-octanol.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances: Reactive with oxidizing agents.

Corrosivity: Not considered to be corrosive for metals and glass.

Special Remarks on Reactivity: Reacts violently with potassium.

Special Remarks on Corrosivity: Not available.

Polymerization: No.

Section 11: Toxicological Information

Routes of Entry: Inhalation. Ingestion.

Toxicity to Animals:
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE.
Acute oral toxicity (LD50): 890 mg/kg [Mouse].
Acute toxicity of the dust (LC50): 229.9 mg/m3 4 hour(s) [Rat].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified A2 (Suspected for human.) by ACGIH, 2 (Reasonably anticipated.) by NTP.
The substance is toxic to kidneys, lungs, liver.

Other Toxic Effects on Humans:
Hazardous in case of ingestion, of inhalation.
Slightly hazardous in case of skin contact (irritant, sensitizer).

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: An allergen. 0047 Animal: embryotoxic, passes through the placental barrier.

Special Remarks on other Toxic Effects on Humans: May cause allergic reactions, exzema and/or dehydration of the skin.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are as toxic as the original product.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Section 14: Transport Information

DOT Classification:

Identification:

Special Provisions for Transport:

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Cadmium
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Cadmium
Pennsylvania RTK: Cadmium
Massachusetts RTK: Cadmium
TSCA 8(b) inventory: Cadmium
SARA 313 toxic chemical notification and release reporting: Cadmium
CERCLA: Hazardous substances.: Cadmium

Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

Other Classifications:

WHMIS (Canada):
CLASS D-1A: Material causing immediate and serious toxic effects (VERY TOXIC).
CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):
R26- Very toxic by inhalation.
R45- May cause cancer.

HMIS (U.S.A.):

Health Hazard: 3

Fire Hazard: 1

Reactivity: 0

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 3

Flammability: 1

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves.
Lab coat.
Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.
Safety glasses.

Section 16: Other Information

References:
-Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987.
-Liste des produits purs tératogènes, mutagènes, cancérogènes. Répertoire toxicologique de la Commission de la Santé et de la Sécurité du Travail du Québec.
-Material safety data sheet emitted by: la Commission de la Santé et de la Sécurité du Travail du Québec.
-SAX, N.I. Dangerous Properties of Indutrial Materials. Toronto, Van Nostrand Reinold, 6e ed. 1984.
-The Sigma-Aldrich Library of Chemical Safety Data, Edition II.
-Guide de la loi et du règlement sur le transport des marchandises dangeureuses au canada. Centre de conformité internatinal Ltée. 1986.

Other Special Considerations: Not available.

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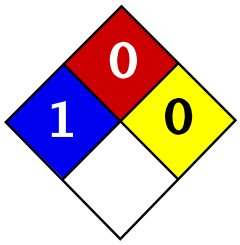

Health	1
Fire	0
Reactivity	0
Personal Protection	E

Material Safety Data Sheet
Lead MSDS

Section 1: Chemical Product and Company Identification

Product Name: Lead

Catalog Codes: SLL1291, SLL1669, SLL1081, SLL1459, SLL1834

CAS#: 7439-92-1

RTECS: OF7525000

TSCA: TSCA 8(b) inventory: Lead

CI#: Not available.

Synonym: Lead Metal, granular; Lead Metal, foil; Lead Metal, sheet; Lead Metal, shot

Chemical Name: Lead

Chemical Formula: Pb

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Lead	7439-92-1	100

Toxicological Data on Ingredients: Lead LD50: Not available. LC50: Not available.

Section 3: Hazards Identification

Potential Acute Health Effects: Slightly hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation.

Potential Chronic Health Effects:
Slightly hazardous in case of skin contact (permeator).
CARCINOGENIC EFFECTS: Classified A3 (Proven for animal.) by ACGIH, 2B (Possible for human.) by IARC.
MUTAGENIC EFFECTS: Not available.
TERATOGENIC EFFECTS: Not available.
DEVELOPMENTAL TOXICITY: Not available.
The substance may be toxic to blood, kidneys, central nervous system (CNS).
Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.

Skin Contact: Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops.

Serious Skin Contact: Not available.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation: Not available.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: Not available.

Flash Points: Not available.

Flammable Limits: Not available.

Products of Combustion: Some metallic oxides.

Fire Hazards in Presence of Various Substances: Non-flammable in presence of open flames and sparks, of shocks, of heat.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available.
Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical powder.
LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards: When heated to decomposition it emits highly toxic fumes of lead.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill:
Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill:
Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system. Be careful that the product is not

present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up.. Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not ingest. Do not breathe dust. Wear suitable protective clothing. If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection: Safety glasses. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 0.05 (mg/m3) from ACGIH (TLV) [United States]
TWA: 0.05 (mg/m3) from OSHA (PEL) [United States]
TWA: 0.03 (mg/m3) from NIOSH [United States]
TWA: 0.05 (mg/m3) [Canada]Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Metal solid.)

Odor: Not available.

Taste: Not available.

Molecular Weight: 207.21 g/mole

Color: Bluish-white. Silvery. Gray

pH (1% soln/water): Not applicable.

Boiling Point: 1740°C (3164°F)

Melting Point: 327.43°C (621.4°F)

Critical Temperature: Not available.

Specific Gravity: 11.3 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility: Insoluble in cold water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatible materials, excess heat

Incompatibility with various substances: Reactive with oxidizing agents.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Can react vigorously with oxidizing materials.
Incompatible with sodium carbide, chlorine trifluoride, trioxane + hydrogen peroxide, ammonium nitrate, sodium azide, disodium acetylide, sodium acetylide, hot concentrated nitric acid, hot concentrated hydrochloric acid, hot concentrated sulfuric acid, zirconium.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Inhalation. Ingestion.

Toxicity to Animals:
LD50: Not available.
LC50: Not available.

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified A3 (Proven for animal.) by ACGIH, 2B (Possible for human.) by IARC.
May cause damage to the following organs: blood, kidneys, central nervous system (CNS).

Other Toxic Effects on Humans: Slightly hazardous in case of skin contact (irritant), of ingestion, of inhalation.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans:
Acute Potential:
Skin:
Lead metal granules or dust: May cause skin irritation by mechanical action.
Lead metal foil, shot or sheets: Not likely to cause skin irritation
Eyes:
Lead metal granules or dust: Can irritate eyes by mechanical action.

Lead metal foil, shot or sheets: No hazard. Will not cause eye irritation.
Inhalation:
In an industrial setting, exposure to lead mainly occurs from inhalation of dust or fumes.
Lead dust or fumes: Can irritate the upper respiratory tract (nose, throat) as well as the bronchi and lungsby mechanical action. Lead dust can be absorbed through the respiratory system. However, inhaled lead does not accumulate in the lungs. All of an inhaled dose is eventually abssorbed or transferred to the gastrointestinal tract. Inhalation effects of exposure to fumes or dust of inorganic lead may not develop quickly. Symptoms may include metallic taste, chest pain, decreased physical fitness, fatigue, sleep disturbance, headache, irritability, reduces memory, mood and personality changes, aching bones and muscles, constipation, abdominal pains, decreasing appetite. Inhalation of large amounts may lead to ataxia, deliriuim, convulsions/seizures, coma, and death.
Lead metal foil, shot, or sheets: Not an inhalation hazard unless metal is heated. If metal is heated, fumes will be released. Inhalation of these fumes may cause "fume metal fever", which is characterized by flu-like symptoms. Symptoms may include metallic taste, fever, nausea, vomiting, chills, cough, weakness, chest pain, generalized muscle pain/aches, and increased white blood cell count.
Ingestion:
Lead metal granules or dust: The symptoms of lead poisoning include abdominal pain or cramps (lead cholic), spasms, nausea, vomiting, headache, muscle weakness, hallucinations, distorted perceptions, "lead line" on the gums, metallic taste, loss of appetite, insomnia, dizziness and other symptoms similar to that of inhalation. Acute poisoning may result in high lead levels in the blood and urine, shock, coma and death in extreme cases.
Lead metal foil, shot or sheets: Not an ingestion hazard for usual industrial handling.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Lead
California prop. 65: This product contains the following ingredients for which the State of California has found to cause reproductive harm (female) which would require a warning under the statute: Lead
California prop. 65: This product contains the following ingredients for which the State of California has found to

cause reproductive harm (male) which would require a warning under the statute: Lead
California prop. 65 (no significant risk level): Lead: 0.0005 mg/day (value)
California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: Lead
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Lead
Connecticut hazardous material survey.: Lead
Illinois toxic substances disclosure to employee act: Lead
Illinois chemical safety act: Lead
New York release reporting list: Lead
Rhode Island RTK hazardous substances: Lead
Pennsylvania RTK: Lead

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).
EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada): CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):
R20/22- Harmful by inhalation and if swallowed.
R33- Danger of cumulative effects.
R61- May cause harm to the unborn child.
R62- Possible risk of impaired fertility.
S36/37- Wear suitable protective clothing and gloves.
S44- If you feel unwell, seek medical advice (show the label when possible).
S53- Avoid exposure - obtain special instructions before use.

HMIS (U.S.A.):

Health Hazard: 1

Fire Hazard: 0

Reactivity: 0

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 1

Flammability: 0

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves.
Lab coat.
Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.

Safety glasses.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

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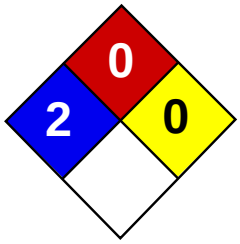

Health	2
Fire	0
Reactivity	0
Personal Protection	G

Material Safety Data Sheet
Tetrachloroethylene MSDS

Section 1: Chemical Product and Company Identification

Product Name: Tetrachloroethylene

Catalog Codes: SLT3220

CAS#: 127-18-4

RTECS: KX3850000

TSCA: TSCA 8(b) inventory: Tetrachloroethylene

CI#: Not available.

Synonym: Perchloroethylene; 1,1,2,2-Tetrachloroethylene; Carbon bichloride; Carbon dichloride; Ankilostin; Didakene; Dilatin PT; Ethene, tetrachloro-; Ethylene tetrachloride; Perawin; Perchlor; Perclene; Perclene D; Percosolvel; Tetrachloroethene; Tetraleno; Tetralex; Tetravec; Tetroguer; Tetropil

Chemical Name: Ethylene, tetrachloro-

Chemical Formula: C2-Cl4

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Tetrachloroethylene	127-18-4	100

Toxicological Data on Ingredients: Tetrachloroethylene: ORAL (LD50): Acute: 2629 mg/kg [Rat]. DERMAL (LD): Acute: >3228 mg/kg [Rabbit]. MIST(LC50): Acute: 34200 mg/m 8 hours [Rat]. VAPOR (LC50): Acute: 5200 ppm 4 hours [Mouse].

Section 3: Hazards Identification

Potential Acute Health Effects:
Hazardous in case of skin contact (irritant), of inhalation. Slightly hazardous in case of skin contact (permeator), of eye contact (irritant), of ingestion.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Classified A3 (Proven for animal.) by ACGIH. Classified 2A (Probable for human.) by IARC, 2 (anticipated carcinogen) by NTP. MUTAGENIC EFFECTS: Mutagenic for bacteria and/or yeast. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to kidneys, liver, peripheral nervous system, respiratory tract, skin, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.

Skin Contact:
In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if symptoms appear.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: Not applicable.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions: Not applicable.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill: Absorb with an inert material and put the spilled material in an appropriate waste disposal.

Large Spill:
Absorb with an inert material and put the spilled material in an appropriate waste disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Do not ingest. Do not breathe gas/fumes/ vapor/spray. Avoid contact with skin. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents, metals, acids, alkalis.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value.

Personal Protection:
Safety glasses. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 25 (ppm) from OSHA (PEL) [United States] TWA: 25 STEL: 100 (ppm) from ACGIH (TLV) [United States] TWA: 170 (mg/m3) from OSHA (PEL) [United States] Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Ethereal.

Taste: Not available.

Molecular Weight: 165.83 g/mole

Color: Clear Colorless.

pH (1% soln/water): Not available.

Boiling Point: 121.3°C (250.3°F)

Melting Point: -22.3°C (-8.1°F)

Critical Temperature: 347.1°C (656.8°F)

Specific Gravity: 1.6227 (Water = 1)

Vapor Pressure: 1.7 kPa (@ 20°C)

Vapor Density: 5.7 (Air = 1)

Volatility: Not available.

Odor Threshold: 5 - 50 ppm

Water/Oil Dist. Coeff.: The product is more soluble in oil; log(oil/water) = 3.4

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility:
Miscible with alcohol, ether, chloroform, benzene, hexane. It dissolves in most of the fixed and volatile oils. Solubility in water: 0.015 g/100 ml @ 25 deg. C It slowly decomposes in water to yield Trichloroacetic and Hydrochloric acids.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatible materials

Incompatibility with various substances: Reactive with oxidizing agents, metals, acids, alkalis.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Oxidized by strong oxidizing agents. Incompatible with sodium hydroxide, finely divided or powdered metals such as zinc, aluminum, magnesium, potassium, chemically active metals such as lithium, beryllium , barium. Protect from light.

Special Remarks on Corrosivity: Slowly corrodes aluminum, iron, and zinc.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 2629 mg/kg [Rat]. Acute dermal toxicity (LD50): >3228 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 5200 4 hours [Mouse].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified A3 (Proven for animal.) by ACGIH. Classified 2A (Probable for human.) by IARC, 2 (Some evidence.) by NTP. MUTAGENIC EFFECTS: Mutagenic for bacteria and/or yeast. May cause damage to the following organs: kidneys, liver, peripheral nervous system, upper respiratory tract, skin, central nervous system (CNS).

Other Toxic Effects on Humans:
Hazardous in case of skin contact (irritant), of inhalation. Slightly hazardous in case of skin contact (permeator), of ingestion.

Special Remarks on Toxicity to Animals:
Lowest Publishe Lethal Dose/Conc: LDL [Rabbit] - Route: Oral; Dose: 5000 mg/kg LDL [Dog] - Route: Oral; Dose: 4000 mg/kg LDL [Cat] - Route: Oral; Dose: 4000 mg/kg

Special Remarks on Chronic Effects on Humans:
May cause adverse reproductive effects and birth defects(teratogenic). May affect genetic material (mutagenic). May cause cancer.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: Causes skin irritation with possible dermal blistering or burns. Symtoms may include redness, itching, pain, and possible dermal blistering or burns. It may be absorbed through the skin with possible systemic effects. A single prolonged skin exposure is not likely to result in the material being absorbed in harmful amounts. Eyes: Contact causes transient eye irritation, lacrimation. Vapors cause eye/conjunctival irritation. Symptoms may include redness and pain. Inhalation: The main route to occupational exposure is by inhalation since it is readily absorbed through the lungs. It causes respiratory tract irritation, . It can affect behavior/central nervous system (CNS depressant and anesthesia ranging from slight inebriation to death, vertigo, somnolence, anxiety, headache, excitement, hallucinations, muscle incoordination, dizziness, lightheadness, disorentiation, seizures, enotional instability, stupor, coma). It may cause pulmonary edema Ingestion: It can cause nausea, vomiting, anorexia, diarrhea, bloody stool. It may affect the liver, urinary system (proteinuria, hematuria, renal failure, renal tubular disorder), heart (arrhythmias). It may affect behavior/central nervous system with symptoms similar to that of inhalation. Chronic Potential Health Effects: Skin: Prolonged or repeated skin contact may result in excessive drying of the skin, and irritation. Ingestion/Inhalation: Chronic exposure can affect the liver(hepatitis,fatty liver degeneration), kidneys, spleen, and heart (irregular heartbeat/arrhythmias, cardiomyopathy, abnormal EEG), brain, behavior/ central nervous system/peripheral nervous system (impaired memory, numbness of extremeties, peripheral neuropathy and other

Section 12: Ecological Information

Ecotoxicity:
Ecotoxicity in water (LC50): 18.4 mg/l 96 hours [Fish (Fatthead Minnow)]. 18 mg/l 48 hours [Daphnia (daphnia)]. 5 mg/l 96 hours [Fish (Rainbow Trout)]. 13 mg/l 96 hours [Fish (Bluegill sunfish)].

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The product itself and its products of degradation are not toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: CLASS 6.1: Poisonous material.

Identification: : Tetrachloroethylene UNNA: 1897 PG: III

Special Provisions for Transport: Marine Pollutant

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Tetrachloroethylene California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Tetrachloroethylene Connecticut hazardous material survey.: Tetrachloroethylene Illinois toxic substances disclosure to employee act: Tetrachloroethylene Illinois chemical safety act: Tetrachloroethylene New York release reporting list: Tetrachloroethylene Rhode Island RTK hazardous substances: Tetrachloroethylene Pennsylvania RTK: Tetrachloroethylene Minnesota: Tetrachloroethylene Michigan critical material: Tetrachloroethylene Massachusetts RTK: Tetrachloroethylene Massachusetts spill list: Tetrachloroethylene New Jersey: Tetrachloroethylene New Jersey spill list: Tetrachloroethylene Louisiana spill reporting: Tetrachloroethylene California Director's List of Hazardous Substances: Tetrachloroethylene TSCA 8(b) inventory: Tetrachloroethylene TSCA 8(d) H and S data reporting: Tetrachloroethylene: Effective date: 6/1/87; Sunset date: 6/1/97 SARA 313 toxic chemical notification and release reporting: Tetrachloroethylene CERCLA: Hazardous substances.: Tetrachloroethylene: 100 lbs. (45.36 kg)

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS D-1B: Material causing immediate and serious toxic effects (TOXIC). CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):
R40- Possible risks of irreversible effects. R51/53- Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. S23- Do not breathe gas/fumes/vapour/spray S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S37- Wear suitable gloves. S61- Avoid release to the environment. Refer to special instructions/Safety data sheets.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 0

Reactivity: 0

Personal Protection: g

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 0

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Safety glasses.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

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Last Updated: 05/21/2013 12:00 PM

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MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATHESON TRI-GAS, INC.
150 Allen Road Suite 302
Basking Ridge, New Jersey 07920
Information: 1-800-416-2505

Emergency Contact:
CHEMTREC 1-800-424-9300
Calls Originating Outside the US:
703-527-3887 (Collect Calls Accepted)

SUBSTANCE: TRICHLOROETHYLENE

TRADE NAMES/SYNONYMS:
MTG MSDS 199; ACETYLENE TRICHLORIDE; ETHYLENE TRICHLORIDE; 1-CHLORO-2,2-DICHLOROETHYLENE; 1,1-DICHLORO-2-CHLOROETHYLENE; TCE; ETHINYL TRICHLORIDE; TRICHLOROETHENE; 1,1,2-TRICHLOROETHYLENE; 1,1,2-TRICHLOROETHENE; UN 1710; RCRA U228; C2HCl3; MAT23850; RTECS KX4550000

CHEMICAL FAMILY: halogenated, alkenes

CREATION DATE: Jan 24 1989
REVISION DATE: Dec 11 2008

2. COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: TRICHLOROETHYLENE
CAS NUMBER: 79-01-6
PERCENTAGE: >99

COMPONENT: INHIBITORS
CAS NUMBER: Not assigned.
PERCENTAGE: <0.1

COMPONENT: AMINES
CAS NUMBER: Not assigned.
PERCENTAGE: <0.1

3. HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=2 FIRE=1 REACTIVITY=0

EMERGENCY OVERVIEW:

COLOR: colorless
PHYSICAL FORM: liquid
ODOR: sweet odor
MAJOR HEALTH HAZARDS: respiratory tract irritation, skin irritation, eye irritation, central nervous system depression, allergic reactions, cancer hazard (in humans)
PHYSICAL HAZARDS: May polymerize. Containers may rupture or explode. May decompose on contact with air, light, moisture, heat or storage and use above room temperature. Releases toxic, corrosive, flammable or explosive gases.

POTENTIAL HEALTH EFFECTS:
INHALATION:
SHORT TERM EXPOSURE: irritation, changes in blood pressure, nausea, vomiting, stomach pain, difficulty breathing, irregular heartbeat, headache, drowsiness, dizziness, disorientation, mood swings, tremors, loss of coordination, visual disturbances, bluish skin color, lung congestion, kidney damage, liver damage, unconsciousness, coma
LONG TERM EXPOSURE: same as effects reported in short term exposure, loss of appetite, weight loss, blood disorders, brain damage, cancer
SKIN CONTACT:
SHORT TERM EXPOSURE: irritation, allergic reactions
LONG TERM EXPOSURE: irritation, allergic reactions, nausea, loss of appetite, weight loss, difficulty breathing, headache, drowsiness, dizziness, joint pain, loss of coordination, visual disturbances, paralysis
EYE CONTACT:
SHORT TERM EXPOSURE: irritation (possibly severe), blurred vision
LONG TERM EXPOSURE: irritation (possibly severe), eye damage
INGESTION:
SHORT TERM EXPOSURE: same as effects reported in short term inhalation
LONG TERM EXPOSURE: same as effects reported in long term inhalation

4. FIRST AID MEASURES

INHALATION: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Get immediate medical attention.

SKIN CONTACT: Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention, if needed. Thoroughly clean and dry contaminated clothing and shoes before reuse.

EYE CONTACT: Flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

INGESTION: If vomiting occurs, keep head lower than hips to help prevent aspiration. If person is unconscious, turn head to side. Get medical attention immediately.

NOTE TO PHYSICIAN: For ingestion, consider gastric lavage. Consider oxygen.

5. FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS: Slight fire hazard.

EXTINGUISHING MEDIA: carbon dioxide, regular dry chemical

Large fires: Use regular foam or flood with fine water spray.

FIRE FIGHTING: Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. For tank, rail car or tank truck, evacuation radius: 800 meters (1/2 mile).

FLASH POINT: No data available.
LOWER FLAMMABLE LIMIT: 7.8% @ 100 C
UPPER FLAMMABLE LIMIT: 52% @ 100 C
AUTOIGNITION: 770 F (410 C)

6. ACCIDENTAL RELEASE MEASURES

AIR RELEASE:
Reduce vapors with water spray. Collect runoff for disposal as potential hazardous waste.

SOIL RELEASE:
Dig holding area such as lagoon, pond or pit for containment. Dike for later disposal. Absorb with sand or other non-combustible material.

WATER RELEASE:
Absorb with activated carbon. Remove trapped material with suction hoses. Collect spilled material using mechanical equipment. Subject to California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65). Keep out of water supplies and sewers.

OCCUPATIONAL RELEASE:
Avoid heat, flames, sparks and other sources of ignition. Stop leak if possible without personal risk. Small liquid spills: Absorb with sand or other non-combustible material. Large spills: Dike for later disposal. Remove sources of ignition. Keep unnecessary people away, isolate hazard area and deny entry. Notify Local Emergency Planning Committee and State Emergency Response Commission for release greater than or equal to RQ (U.S. SARA Section 304). If release occurs in the U.S. and is reportable under CERCLA Section 103, notify the National Response Center at (800)424-8802 (USA) or (202)426-2675 (USA).

7. HANDLING AND STORAGE

STORAGE: Store and handle in accordance with all current regulations and standards. Store in a cool, dry place. Store in a well-ventilated area. Avoid heat, flames, sparks and other sources of ignition. Keep separated from incompatible substances.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:
TRICHLOROETHYLENE:
100 ppm OSHA TWA
200 ppm OSHA ceiling
300 ppm OSHA peak (5 minutes in any 2 hours)
50 ppm (269 mg/m3) OSHA TWA (vacated by 58 FR 35338, June 30, 1993)
200 ppm (1070 mg/m3) OSHA STEL (vacated by 58 FR 35338, June 30, 1993)
10 ppm ACGIH TWA
25 ppm ACGIH STEL
25 ppm NIOSH TWA 10 hour(s)
2 ppm NIOSH ceiling 60 minute(s) (used as halogenated anesthetic gas)

VENTILATION: Provide local exhaust ventilation system. Ensure compliance with applicable exposure limits.

EYE PROTECTION: Wear splash resistant safety goggles. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

CLOTHING: Wear appropriate chemical resistant clothing.

GLOVES: Wear appropriate chemical resistant gloves.

RESPIRATOR: The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA.
At any detectable concentration -
Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.
Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.
Escape -
Any air-purifying full-facepiece respirator (gas mask) with a chin-style, front-mounted or back-mounted organic vapor canister.
Any appropriate escape-type, self-contained breathing apparatus.
For Unknown Concentrations or Immediately Dangerous to Life or Health -
Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.
Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: liquid
COLOR: colorless
ODOR: sweet odor
MOLECULAR WEIGHT: 131.39
MOLECULAR FORMULA: Cl-C-H-C-Cl2
BOILING POINT: 189 F (87 C)
FREEZING POINT: -99 F (-73 C)
VAPOR PRESSURE: 58 mmHg @ 20 C
VAPOR DENSITY (air=1): 4.53
SPECIFIC GRAVITY (water=1): 1.4642
WATER SOLUBILITY: 0.1%
PH: Not available
VOLATILITY: Not available
ODOR THRESHOLD: 21 ppm
EVAPORATION RATE: 0.69 (carbon tetrachloride=1)
COEFFICIENT OF WATER/OIL DISTRIBUTION: Not available
SOLVENT SOLUBILITY:
Soluble: alcohol, ether, acetone, chloroform, benzene, vegetable oils

10. STABILITY AND REACTIVITY

REACTIVITY: May decompose on contact with air, light, moisture, heat or storage and use above room temperature. Releases toxic, corrosive, flammable or explosive gases.

CONDITIONS TO AVOID: Avoid heat, flames, sparks and other sources of ignition. Containers may rupture or explode if exposed to heat.

INCOMPATIBILITIES: bases, metals, combustible materials, oxidizing materials

HAZARDOUS DECOMPOSITION:
Thermal decomposition products: phosgene, halogenated compounds, oxides of carbon

POLYMERIZATION: May polymerize. Avoid contact with heat or light and monitor inhibitor content.

11. TOXICOLOGICAL INFORMATION

TRICHLOROETHYLENE:
IRRITATION DATA: 2 mg/24 hour(s) skin-rabbit severe; 20 mg/24 hour(s) eyes-rabbit moderate
TOXICITY DATA: 140700 mg/m3/1 hour(s) inhalation-rat LC50; >20 gm/kg skin-rabbit LD50; 4920 mg/kg oral-rat LD50
CARCINOGEN STATUS: NTP: Anticipated Human Carcinogen; IARC: Human Limited Evidence,

Animal Sufficient Evidence, Group 2A; ACGIH: A2 -Suspected Human Carcinogen
LOCAL EFFECTS:
Irritant: inhalation, skin, eye
ACUTE TOXICITY LEVEL:
Moderately Toxic: ingestion
Slightly Toxic: inhalation
Relatively Non-toxic: dermal absorption
TARGET ORGANS: immune system (sensitizer), central nervous system
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: heart problems
TUMORIGENIC DATA: Available.
MUTAGENIC DATA: Available.
REPRODUCTIVE EFFECTS DATA: Available.
ADDITIONAL DATA: May cross the placenta. Stimulants such as epinephrine may induce ventricular fibrillation.

12. ECOLOGICAL INFORMATION

ECOTOXICITY DATA:
FISH TOXICITY: 3100 ug/L 96 hour(s) LC50 (Mortality) Flagfish (Jordanella floridae)

INVERTEBRATE TOXICITY: 1700 ug/L 7 hour(s) EC50 (Regeneration) Flatworm (Dugesia japonica)

OTHER TOXICITY: 45000 ug/L 48 week(s) LC50 (Mortality) Clawed toad (Xenopus laevis)

FATE AND TRANSPORT:
BIOCONCENTRATION: 17 ug/L 1-14 hour(s) BCF (Residue) Bluegill (Lepomis macrochirus) 8.23 ug/L

13. DISPOSAL CONSIDERATIONS

Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): U228. Hazardous Waste Number(s): D040. Dispose of in accordance with U.S. EPA 40 CFR 262 for concentrations at or above the Regulatory level. Regulatory level- 0.5 mg/L. Dispose in accordance with all applicable regulations.

14. TRANSPORT INFORMATION

U.S. DOT 49 CFR 172.101:
PROPER SHIPPING NAME: Trichloroethylene
ID NUMBER: UN1710
HAZARD CLASS OR DIVISION: 6.1
PACKING GROUP: III
LABELING REQUIREMENTS: 6.1

CANADIAN TRANSPORTATION OF DANGEROUS GOODS:
SHIPPING NAME: Trichloroethylene
UN NUMBER: UN1710
CLASS: 6.1
PACKING GROUP/CATEGORY: III

15. REGULATORY INFORMATION

U.S. REGULATIONS:
CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4):
TRICHLOROETHYLENE: 100 LBS RQ

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355 Subpart B): Not regulated.

SARA TITLE III SECTION 304 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355 Subpart C): Not regulated.

SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370 Subparts B and C):
ACUTE: Yes
CHRONIC: Yes
FIRE: No
REACTIVE: No
SUDDEN RELEASE: No

SARA TITLE III SECTION 313 (40 CFR 372.65):
TRICHLOROETHYLENE

OSHA PROCESS SAFETY (29 CFR 1910.119): Not regulated.

STATE REGULATIONS:
California Proposition 65:
Known to the state of California to cause the following:
TRICHLOROETHYLENE
Cancer (Apr 01, 1988)

CANADIAN REGULATIONS:
WHMIS CLASSIFICATION: D2

NATIONAL INVENTORY STATUS:
U.S. INVENTORY (TSCA): Listed on inventory.

TSCA 12(b) EXPORT NOTIFICATION: Not listed.

CANADA INVENTORY (DSL/NDSL): Not determined.

16. OTHER INFORMATION

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SITE-SPECIFIC HEALTH & SAFETY PLAN
(APPENDIX D)

ATTACHMENT 3

ACTIVITY HAZARD ANALYSIS

Activity Hazard Analysis (AHA)

Project Location: FORMER SOUTHLAND STEEL FACILITY, HUNTINGTON PARK, CA 90255	**Risk Assessment Code (RAC) Matrix**
Project Number: Eco-13-595	
Date Prepared: 15 April 2014	
Prepared by (Name/Title): Opjit Ghuman, PE / PM	
Notes: (Field Notes, Review Comments, etc.)	

Severity	**Probability**				
	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L

Step 1: Review each **"Hazard"** with identified safety **"Controls"** and determine RAC (See above)

"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.

RAC Chart

- E = Extremely High Risk
- H = High Risk
- M = Moderate Risk
- L = Low Risk

Job Steps	Hazards	Controls	RAC
1. PHYSICAL ACTIVITIES			
1. General	1a. Slip, trip and fall.	1a. Worker awareness of potential slippery/uneven surfaces and tripping hazards plus inspection and policing of debris.	L
	1b.Biological hazards.	1b. Conduct a reconnaissance of the area to be used to ensure there are no biological hazards or endangered flora/fauna species present. The individual conducting the recon must take precautions and be certain that they are wearing a long sleeved shirt and have used the appropriate insect repellent if desired. Any biological hazards encountered will be noted in the log and if possible the site located to a more suitable area.	L
		1b. Hazardous Plants - PPE for avoidance of hazardous plants (specifically Poison Ivy/Oak and Sumac) will consist of long sleeved shirts and long pants, or coveralls; safety glasses; leather gloves; and head cover such as hard hat, baseball cap or head scarf. Daily protective controls will consist of: • Field personnel applying a protective barrier cream (such as Ivy X©) to potentially exposed skin at the beginning of each day; • Use of a protective cover on automobile seats, to be replaced each day; • Field personnel washing with poison ivy/oak oil cleanser (such as Tecnu©) (following directions on bottle) at breaks and the end of each field	L

		day, or as soon as a rash appears (do not apply to broken skin); • Field personnel changing into clean clothing or removing coveralls and removing automotive seat covers before leaving the site each day; and • Any other protective measures deemed appropriate.	
		1b. Ticks - PPE for avoidance of tick bites will consist of long sleeved shirts and long pants, or coveralls; leather gloves; and head cover such as a hard hat, baseball cap or head scarf. Daily protective controls will consist of: • Wearing light colored clothing to easily identify presence of ticks; • Application of a Permethrin©/Permanone© spray to clothing the day before field work. (Note: this is to be sprayed on **clothing only** and allowed to dry (Never apply directly on skin.) and application of insect repellant containing DEET© on exposed skin; • Use of Duct tape to blouse pants and create a protective seal; • Field tick-checks to be performed at breaks throughout the day using the Buddy System; and • Daily inspection of entire body to locate attached ticks after removal of clothing. If a tick is imbedded in the skin, tick removal will be performed with narrow headed tweezers available in each field kit. The tick will be grabbed where the mouthparts enter the skin and the tick gently pulled out and then crushed. The bite area and the hands will be cleansed with an antiseptic wipe found in the field kit or soap and water.	L
		1b. Stinging/Biting Insects and Poisonous Snakes - PPE for avoidance of stinging/biting insects (I.e. Spiders, Bees) and poisonous snakes will consist of long sleeved shirts and long pants, or coveralls; leather gloves; and head cover such as a hard hat, baseball cap or head scarf. SSHO will brief field crews on all potential stinging and biting insects and poisonous snakes that inhabit the work area. Descriptive Information Packets will be posted in the Field Office and given to Field Team Leaders. Daily protective controls will consist of: • Field personnel need to be aware of their surroundings; • Use of PPE (gloves) when moving or disturbing piles of old wood/logs and large rocks; • Nest of bees, wasps or hornets need to be identified and avoided; and	L

		• Consider all snakes to be poisonous and avoided	
	1c. Endangered/threatened flora/fauna.	1c. Conduct reconnaissance IAW approved WP and avoid endangered and threatened species if at all possible.	L
	1d. Cold/Heat Stress	1d. All site activities must be conducted IAW the approved WP ensuring that appropriate clothing and PPE is worn to assist in the prevention of cold and heat stress injuries. Use the buddy system at all times and have sufficient and appropriate fluids available for the conditions.	L
	1e. Contact with hazardous chemicals	1e. Personnel will don the proper PPE commensurate with the chemical hazard encountered and the work is being accomplished.	L
	1f. Vehicle and heavy equipment traffic in area.	1f. Be aware of any vehicles or heavy equipment in area and be certain to wear a hard hat, safety glasses and a high visibility safety vest when working around heavy equipment. Establish arm and hand signals with the equipment operator and be certain the equipment is grounded and shut off when within the arc of the boom, shovel, etc. Use of "ground guides" will be used, when vehicle(s) are not equipped with an audible warning device and/or has an obstructed view. When transporting equipment by trailers, the trailer will be "chocked" with approved devices when unhooked from the transporting vehicle. When attempting to hook onto the trailer, "ground guides" will not place any part of their body between the trailer and vehicle.	L
	1g. Noise in excess of OSHA standards	1g. If the heavy equipment and/or power tools used are louder than 85dB (A) then the appropriate hearing attenuation PPE must be worn. This could be ear plugs, ear muffs or both depending on the noise level. The SSHO will measure the noise level of the equipment and prescribe the applicable noise attenuation PPE to be worn.	L
	1h. Lifting hazards.	1h. Ensure that you, and if there is another individual assisting you, both have solid footing, leather work gloves and use the proper lifting technique, bend at the knees keeping your back as straight as possible and lift with your knees, not your back. Ensure you have good visibility in the direction you are carrying an item. Do not attempt to carry anything by yourself in excess of 50 lbs. or any item that blocks your visibility or is cumbersome to carry alone.	L
	1i. Hand and Power tool operation	1i. When operating power tools they will be handled, operated and maintained IAW the manufactures instructions, the approved WP and any applicable SOPs. The power tool will be inspected prior to use to ensure that all of the hand and safety guards are in place and that the chain, if present, is properly tightened and that the tool is otherwise in good working order. Depending on the power tool PPE will vary and	L

		it too must be serviceable, operable and free of any defect. PPE will be worn IAW the approved WP and inspected by the user prior to donning.	
2. MOBILIZATION/DEMOBILIZATION			
2.1. Site Set Up or Tear Down, to include install or dismantle – a. Trailers; Tents; CONEX containers, and storage sheds	2.1 The Hazards itemized in Hazard 1 are applicable to Hazard 2.	2.1 The Controls itemized in Control 1 are also applicable to Control 2.	L
	2.1a. Underground Utilities	2.1a. The local utility locating hotline will be contacted to identify the locations of buried utilities before subsurface activities are allowed to commence.	L
	2.1b. Electrical Shock.	2.1b. Ensure that the electrical company or equipment company installs and connects any electrical lines. In the event there is an electrical problem that cannot be corrected by merely un-plugging and re-plugging an item or replacing a blown fuse then an electrician will be contacted to correct the problem. All electrical appliances, equipment will have a third prong for proper grounding and all electrical outlets will have three pronged receptacles. GFCIs will be used for all outdoor connections.	L
2.2 Establishment/Termination of services, to include – a. Electrical connections b. Water/Sewer/Portable Toilets	2.2 The Hazards itemized in Hazard 1 are applicable to Hazard 2.2.	2.2 The Controls itemized in Control 1 are also applicable to Control 2.2.	L
3. FUELING OPERATIONS			
3.1 Fueling Operations	3.1a The Hazards itemized in Hazard 1 are applicable to Hazard 3.	3.1a The Controls itemized in Control 1 are also applicable to Control 3.	
	3.1b. Fire/Explosion	3.1b. Refueling of all vehicles, heavy equipment and other fueled equipment will be conducted in accordance with the SSHP. There will be no “Hot Fueling” authorized at any time.	M
		3.1b. Smoking or open flames within 50 feet of where flammables are being used or transferred or where equipment is being fueled is prohibited. Each service or fueling area will have at least one 20-B:C rated fire extinguisher within 75 feet of each pump. Clearly identified and easily accessible Emergency Cut-Off switch(es) will be installed and clearly	

		marked at a location remote from dispensing devices to shut off the power to all dispensing devices in an emergency. Equipment using flammable liquid fuel shall be shut down during refueling, servicing, or maintenance. Those vehicles or equipment without an internal grounding system will be bonded between the fueling system and themselves, prior to dispensing fuel.	
4. GENERAL SITE CONSTRUCTION OPERATIONS			
4.1 General Construction Operations	4.1. The Hazards itemized in Hazard 1 are applicable to Hazard 4.	4.1. The Controls itemized in Control 1 are also applicable to Control 4.	
	4.1a. Inspect Tools for Proper Guards and Electrical Cords (Failure of Integral Safety Equipment)	4.1a. All portable power tools will be inspected, and maintained in accordance with manufacturer's instructions and recommendations, and will be only used for the purpose for which designed. Portable power tools will be inspected, tested, and determined to be in safe operating condition before use. Portable power tools will be in good repair and with all required safety devices installed and properly adjusted. Portable power tools having defects that will impair their strength or render them unsafe will be removed from service. Portable power tools with guards will be equipped with such guards; ensure guards are in place and operational at pinch and nip points and control loose clothing, gloves, jewelry and hair.	**L**
	4.1b. Electrical Shock.	4.1b. Most electrical hand tools are battery operated and require recharging at the end of each day's operation and some require a supplied electrical source, such as a generator or "hard wired" connections. Electrical hook-ups and installation, if required, will be conducted by a certified electrician, local electrical company or equipment company. In the event there is an electrical problem that cannot be corrected by merely un-plugging and re-plugging an item or replacing a blown fuse, then an electrician will be contacted to correct the problem. All electrical appliances, extension cords and equipment will have a third prong for proper grounding; all electrical outlets used on project sites will have three pronged receptacles. GFCIs will be used for all outdoor connections.	**M**
	4.1c. Airborne Dust/Particulates	4.1c. Project CIH will establish Respiratory Protection Plan; ensure local ventilation/engineering controls are in place. The SSHO will monitor exposure and area, if additional respiratory guidance is needed.	**L**
	4.1d. Eye/Foot and Hand Hazards	4.1d. Eye/Face Protection – Safety glasses with side shields (ANZI Z87.1); Appropriate footwear as required, but safety toed footwear may be required depending on task; Sturdy leather work gloves as required	**L**

	4.1e. Ergonomic Hazards	4.1e. Reduce bending, twisting, and kneeling, by using alternating work, rotating workers and periodic stretching break to reduce static or awkward postures. Use team lifting, and lifting aids to minimize lifting weights over 25-lbs above the shoulders, below the knees, or at arm length	L
	4.1f. Pinch and cut hazard from handling sharp scrap material.	4.1f. Operators will use good and serviceable leather gloves when performing service checks. Potential pinch and cut hazards when performing vehicle inspections inside the engine compartment; around doors; latches and lift gates.	L
	4.1g. Falls from height	4.1g. Visually inspect ladders and lifts before use; select proper type; protect against exposure to moving traffic, equipment and access doorways; conduct good housekeeping around the top and base of the ladder, and always ensure proper placement, lashing or holding when on slippery surfaces. Use hoists/ropes to bring tools and equipment up to elevated work surfaces. Have someone hold ladder if it will provide more support. Use barricades or signs to warn of presence of ladder. Do not position ladder in front of closed door that can open into the ladder.	M
	4.1h. Power and Pneumatic Tools (All types)	4.1h. When operating power tools they will be handled, operated and maintained IAW the manufactures instructions, the approved WP. The power tool will be inspected prior to use to ensure that all of the hand and safety guards are in place and that the chain, if present, is properly tightened and that the tool is otherwise in good working order. Depending on the power tool PPE will vary and it too must be serviceable, operable and free of any defect. Refer to Portable Hand Held Power Tools Activity Hazard Analysis (AHA).	L
	4.1i. Hoisting and Rigging of heavy equipment. (Incorrect rigging practice resulting in load falling)	4.1i. Only use equipment and lift loads that are approved by Site Lift Plan (SLP) (Refer to Corporate Health and Safety Manual, Chapter 26). Obtain CIH approval before starting the rigging job. Do not alter any engineered lift or SLP. Keep within load limit of equipment and know the weight of your load. Inspect equipment (including slings, shackles, etc.) before use.	M
	4.1j. Towing Hazards	4.1j. When transporting tools and required equipment by trailers, the trailer will be “chocked” with approved devices when unhooked from the transporting vehicle. Use of “ground guides” will be used, when vehicle(s) are not equipped with an audible warning device and/or has an obstructed view. When attempting to hook onto the trailer, “ground guides” will not place any part of between the trailer and vehicle.	L
	4.1k. Pressurized cylinders – sudden release of contents; fire, explosion ; burns	4.1k. Assign users/handlers who are trained in compressed gas safety; ensure pressure relief valves are in place; isolate	M

	and asphyxiation	from vehicular traffic; transport in a safe manner, and secure and store all gases, based on compatibility. Periodic inspection of all pressurized cylinders by operator.	
5. HEAVY EQUIPMENT AND DRILL RIG, OPERATIONS			
5.1. General Operations of Motorized Vehicles	5.1a. The Hazards itemized in Hazard 1 are applicable to Hazard 6.	5.1a. The Controls itemized in Control 1 are also applicable to Control 5.	**M**
	5.1b. Pinch and cut hazard from operating near sharp edges	5.1b. Operators will use good and serviceable leather gloves when performing service checks. Potential pinch and cut hazards when performing vehicle inspections inside the engine compartment; around doors; latches and lift gates.	**L**
	5.1c. Failure of Integral Safety Equipment	5.1c. During the inspection of the vehicle, if the operator notices that any of the vehicle's integral safety equipment (lights, brakes and turn-signals) is inoperable; that vehicle is no longer operational and cannot be used until repaired. Any issued safety equipment (first aid kit, fire extinguisher, etc) will be present and operational before the vehicle is operated. All vehicles, regardless of type, that are removed from the site for repairs will be re-inspected and accepted by a Competent person or assigned operator.	**M**
	5.1d. Inclement Weather (Winds; Snow; Ice and Dust)	5.1d. Vehicle operators need to be aware of special controls to safely operate vehicles in adverse weather conditions. This may include reducing speed to maintain control; braking distances and improve visibility.	**L**
	5.1e. Operator Distractions (Cell Phones; Eating; Smoking; Road Rage; Traffic Flow and Exhaustion)	5.1e. Vehicle Operators will follow and adhered to all local, state or foreign rules of Safe Vehicle Operations. Obeying posted speed limits; traffic signals and signs; weight and height restrictions for any over-weight or over-height vehicles, and common courtesy on the road. Defensive Driving habits are needed to be adhered to avoid the perils of Road Rage. Trip planning will assist the operator in avoiding construction and traffic hazards. Eating, smoking and use of cellular phones by the vehicle operator, while driving or during refueling operations is prohibited. Vehicle operators' conducting long distance hauls of over 8 hours in length; will take a mandatory Rest Halt at least once every four hours for 25 minutes. A Rest Halt can be taken by any vehicle operator should the need arise. During a Rest Halt, the vehicle operator will re-inspect the vehicle to ensure that all integral safety equipment is will notify their supervisor; give their location and remain at still operational. If any safety equipment fails, the operator that location, until repairs can be completed.	**M**

	5.1f. Injury or Damage while backing	5.1f. Use of “ground guides” will be used, when vehicle(s) are not equipped with an audible warning device and/or there is an obstructed view, or the vehicle is in a congested area. When transporting Heavy Equipment by trailers, the trailer will be “chocked” with approved devices when unhooked from the transporting vehicle. When attempting to hook onto the trailer, “ground guides” will not place any part of their body between the trailer and vehicle.	M
5.2. Fueling	5.2a. The Hazards itemized in Hazard 1 are applicable to Hazard 3.	5.2a. The Controls itemized in Control 1 are also applicable to Control 3.	M
	5.2b. Fire/Explosion	5.2b. Refueling of all vehicles, heavy equipment and other fueled equipment will be conducted in accordance with the SSHP. Proper fire extinguishers will be on site and serviceable. There will be no “Hot Fueling” authorized at any time.	M
5.3 Drill Rod/Auger/Tool Handling	5.3a Struck By	5.3a Drill rods and augers stored and transported in racks shall be blocked to prevent shifting. Unload drill rods and augers layer by layer. Be prepared for sudden shifting when tailing rod sections. Keep a wide base and secure footing	M
	5.3b Back Strain	5.3b Use proper lifting techniques when manually handling rods, augers and tools. Use mechanical equipment during lifting whenever possible. Use the buddy system when lifting tools and supplies	M
5.4 Hoisting	5.4a Struck By	5.4a Never engage the rotary clutch until all personnel and equipment are clear. Never leave the brake unattended when engaged. Drill rods and auger sections should not be picked up or dropped suddenly. Do not lift more than 10 feet of augers or one joint of pipe between tool breaks. Test the brakes daily. Use caution when drilling in wet or damp conditions. Suspend drilling activities if moisture comprises the performance of the braking mechanism.	M
5.5 Auger Operations	5.5a Struck By	5.5a Use a long handled flat head shovel when removing auger cuttings. Stay away from the augers when rotating. Prevent shovel from lodging into the augers and kicking out. Do not wear loose clothing when working with augers	M
5.6 Pumping/Grouting	5.6a Blowout	5.6a The pump must not exceed maximum pressure of grout lines. High-pressure lines must be secured to the rig. Lines and hoses must be inspected daily and replaced if worn or damaged. Engage pump in low gear then shift to subsequent higher gears	M
6. SOIL VAPOR SAMPLING			
6.1. Vapor Probe Sampling	6.1a. The Hazards itemized in Hazard 1 are applicable to Hazard 6.	6.1a. The Controls itemized in Control 1 are also applicable to Control 6.	M
	6.1b. Elevated vapor levels	6.1b. Identify escape route, position self upwind, evacuate immediately if/when strong odors or irritation noted.	L

7. PORTABLE TOOL DECONTAMINATION			
7.1. Remove gross contamination with brush.	7.1. Damaging equipment or tools	7.1. To clean instrumentation: follow manufacturer's instructions.	L
7.2. Place in decontamination bucket or rinse with decontamination solution	7.2. Spill/leakage	7.2a Workers will have berms or spill absorbent pads nearby to prevent the spread of contaminated water.	L
		7.2b Decontamination area will be designed to minimize exposure and maintain spill containment.	L
7.3. Clean with wash solution	7.3. Chemical reaction with wash solution	7.3a A fire extinguisher will be located in an accessible location on site.	L
		7.3b Review the chemicals of concern and use appropriate wash solution.	L
7.4. Rinse with water	7.4. Contamination remains	7.4. Personnel will repeat proper decontamination procedure.	L
7.5. Hot Water High Pressure Spray/Steam Clean	7.5a. Hot Water Burns	7.5a. Prior to decontamination of large equipment, personnel will ensure that all other workers are outside of the decontamination areas.	L
		7.5a. Personnel will wear appropriate PPE (e.g. gloves, tyvek, splash goggles, etc.).	L
	7.5b. Injury and/or Damage to Personnel and Project Equipment	7.5b. Personnel will use caution in directing the spray/stream of the pressure washer.	L
		7.5b. Personnel will ensure the workspace is clear of other personnel and equipment prior to operating a pressure washer.	L
		7.5b. Personnel will not direct the pressure washer in the direction of any other personnel or equipment.	L
	7.5c. Spill/Leak of contaminated Water	7.5c. Decontamination area will be designed to collect all contaminated wash/rinse water and to prevent the spread of runoff.	L
		7.5c. Berms and absorbent pads will be available for use in controlling spills.	L
8. ACTIVITIES INVOLVING PERSONNEL DECONTAMINATION			
8.1. Decontaminate personnel exiting from the exclusion zone.	8.1a. Site Hazardous Material Exposure	8.1a. Training and safety awareness of potential exposure to contaminants at the site. Training of personal decontamination procedure. Appropriate PPE (safety glasses, gloves, and steel-toe boots).	L
	8.1b. Eye Injury	8.1b. PPE (safety glasses, chemical goggles) will be worn as required in the SSHP.	L
	8.1c. Slips, Trips, Falls	8.1c. Be aware of tripping hazards. If personnel are wearing Tyvek suits, provide a chair to use while removing PPE.	L
	8.1d. Heat Injuries	8.1d. Implement heat stress control program.	L
8.2. Support rescue personnel (as required).	8.2a. Site Hazardous Material Exposure	8.2a. Training and safety awareness of potential exposure to contaminants at the site. Training of personal	L

		decontamination procedure. Appropriate PPE. Personnel will follow decontamination procedures outlined in the site-specific HASP.	
	8.2b. Bloodborne Pathogens	8.2b. Personnel will be trained in risks associated with bloodborne pathogens, in accordance with the Health and Safety Plan.	L
	8.2c. Heat injuries	8.2c. Implement heat stress control program. Dress appropriately. Provide adequate drinking water.	L
	8.2d. Slips trip and falls	8.2d. Be aware of tripping hazards.	L
9. LARGE EQUIPMENT DECONTAMINATION			
9.1. Process items through decontamination in accordance with the SSHP	9.1a. Site Hazardous Material Exposure	9.1a. Training and safety awareness of potential exposure to contaminates at the site and decontamination procedure.	L
		9.1a. Appropriate PPE will be worn by decon personnel.	L
		9.1a. Personnel will follow decontamination procedure.	L
	9.1b. Eye Injury	9.1b. PPE (safety glasses, etc.) will be worn.	L
	9.1c. Slips, Trips, Falls	9.1c. Workers will be aware of potentially slippery surfaces and tripping hazards.	L
		9.1c. Workers will keep all areas clean and free of debris to deter any unnecessary trips and falls.	L
		9.1c. Personnel will clean up all spills immediately.	L
		9.1c. Personnel will notify the SSHO of any unsafe conditions.	L
	9.1d. Heat and Cold Stress	9.1d. Implement the cold/heat stress control program.	L
		9.1d. SSHO will monitor workers for Heat/Cold stress symptoms.	L
9.2. Hot Water High Pressure Spray/Steam Clean	9.2a. Hot Water Burns	9.2a. Prior to decontamination of large equipment, personnel will ensure that all other workers are outside of the decontamination areas.	L
		9.2a. Personnel will wear appropriate PPE (e.g. gloves, tyvek, splash goggles, etc.).	L
		9.2b. Personnel will use caution in directing the spray/stream of the pressure washer.	L
		9.2b. Personnel will ensure the workspace is clear of other personnel and equipment prior to operating a pressure washer.	L
		9.2b. Personnel will not direct the pressure washer in the direction of any other personnel or equipment.	L

	9.2c. Spill/Leak of contaminated Water	9.2c. Decontamination area will be designed to collect all contaminated wash/rinse water and to prevent the spread of runoff.	L
		9.2c. Berms and absorbent pads will be available for use in controlling spills.	L
10. EXCAVATION BACKFILL			
10.1 Backfill Excavation	10.1a. Slip, trip and fall.	10.1a. Worker awareness of potential slippery/uneven surfaces and tripping hazards plus inspection and policing of debris.	L
	10.1b.Biological hazards.	10.1b. Conduct a reconnaissance of the area to be used to ensure there are no biological hazards or endangered flora/fauna species present. The individual conducting the recon must take precautions and be certain that they are wearing a long sleeved shirt and have used the appropriate insect repellent if desired. Any biological hazards encountered will be noted in the log and if possible the site located to a more suitable area.	L
		10.1b. Hazardous Plants - PPE for avoidance of hazardous plants (specifically Poison Ivy/Oak and Sumac) will consist of long sleeved shirts and long pants, or coveralls; safety glasses; leather gloves; and head cover such as hard hat, baseball cap or head scarf. Daily protective controls will consist of: • Field personnel applying a protective barrier cream (such as Ivy X©) to potentially exposed skin at the beginning of each day; • Use of a protective cover on automobile seats, to be replaced each day; • Field personnel washing with poison ivy/oak oil cleanser (such as Tecnu©) (following directions on bottle) at breaks and the end of each field day, or as soon as a rash appears (do not apply to broken skin); • Field personnel changing into clean clothing or removing coveralls and removing automotive seat covers before leaving the site each day; and • Any other protective measures deemed appropriate.	L
		10.1b. Ticks - PPE for avoidance of tick bites will consist of long sleeved shirts and long pants, or coveralls; leather gloves; and head cover such as a hard hat, baseball cap or head scarf. Daily protective controls will consist of: • Wearing light colored clothing to easily identify presence of ticks;	L

		• Application of a Permethrin©/Permanone© spray to clothing the day before field work. (Note: this is to be sprayed on **clothing only** and allowed to dry (Never apply directly on skin.) and application of insect repellant containing DEET© on exposed skin; • Use of Duct tape to blouse pants and create a protective seal; • Field tick-checks to be performed at breaks throughout the day using the Buddy System; and • Daily inspection of entire body to locate attached ticks after removal of clothing. If a tick is imbedded in the skin, tick removal will be performed with narrow headed tweezers available in each field kit. The tick will be grabbed where the mouthparts enter the skin and the tick gently pulled out and then crushed. The bite area and the hands will be cleansed with an antiseptic wipe found in the field kit or soap and water.	
		10.1b. Stinging/Biting Insects and Poisonous Snakes - PPE for avoidance of stinging/biting insects (I.e. Spiders, Bees) and poisonous snakes will consist of long sleeved shirts and long pants, or coveralls; leather gloves; and head cover such as a hard hat, baseball cap or head scarf. SSHO will brief field crews on all potential stinging and biting insects and poisonous snakes that inhabit the work area. Descriptive Information Packets will be posted in the Field Office and given to Field Team Leaders. Daily protective controls will consist of: • Field personnel need to be aware of their surroundings; • Use of PPE (gloves) when moving or disturbing piles of old wood/logs and large rocks; • Nest of bees, wasps or hornets need to be identified and avoided; and • Consider all snakes to be poisonous and avoided	L
	10.1c. Endangered/threatened flora/fauna.	10.1c. Conduct reconnaissance IAW approved WP and avoid endangered and threatened species if at all possible.	L
	10.1d. Cold/Heat Stress	10.1d. All site activities must be conducted IAW the approved WP ensuring that appropriate clothing and PPE is worn to assist in the prevention of cold and heat stress injuries. Use the buddy system at all times and have sufficient and appropriate fluids available for the conditions.	L
	10.1e. Contact with hazardous chemicals	10.1e. Personnel will don the proper PPE commensurate with the chemical hazard encountered and the work is being	L

		accomplished.	
	10.1l. Vehicle and heavy equipment traffic in area.	10.1l. Be aware of any vehicles or heavy equipment in area and be certain to wear a hard hat, safety glasses and a high visibility safety vest when working around heavy equipment. Establish arm and hand signals with the equipment operator and be certain the equipment is grounded and shut off when within the arc of the boom, shovel, etc. Use of "ground guides" will be used, when vehicle(s) are not equipped with an audible warning device and/or has an obstructed view. When transporting equipment by trailers, the trailer will be "chocked" with approved devices when unhooked from the transporting vehicle. When attempting to hook onto the trailer, "ground guides" will not place any part of their body between the trailer and vehicle.	L
	10.1m. Noise in excess of OSHA standards	10.1m. If the heavy equipment and/or power tools used are louder than 85dB (A) then the appropriate hearing attenuation PPE must be worn. This could be ear plugs, ear muffs or both depending on the noise level. The site safety officer will measure the noise level of the equipment and prescribe the applicable noise attenuation PPE to be worn.	L
10.2. Compaction of Soil	10.2. The Hazards itemized in Hazard 10.1 are applicable to Hazard 10.2.	10.2. The Controls itemized in Control 10.1 are also applicable to Control 10.2.	L
10.3. Seeding of Soil	10.3. The Hazards itemized in Hazard 10.1 are applicable to Hazard 10.3.	10.3. The Controls itemized in Control 10.1 are also applicable to Control 10.3.	L
11. SOIL HANDLING			
11.1. Manual Excavation	11.1. The Hazards itemized in Hazard 1 are applicable to Hazard 11.1.	11.1. The Controls itemized in Control 1 are also applicable to Control 11.1.	L
11.2. Mechanical Excavation	11.2. The Hazards itemized in Hazard 1 are applicable to Hazard 11.2.	11.2. The Controls itemized in Control 1 are also applicable to Control 11.2.	L
11.3. Soil Sampling	11.3. The Hazards itemized in Hazard 1 are applicable to Hazard 11.3.	11.3. The Controls itemized in Control 1 are also applicable to Control 11.3.	L
11.4. Excavation Backfill	11.4. The Hazards itemized in Hazard 1 are applicable to Hazard 11.4.	11.4. The Controls itemized in Control 1 are also applicable to Control 11.4.	L
11.5. Soil Compaction	11.5a. The Hazards itemized in Hazard 1 are applicable to Hazard 11.5.	11.5a. The Controls itemized in Control 1 are also applicable to Control 11.5.	L
	11.5b. Contact with hazardous chemicals.	11.5b. Hydro-seeding material can cause skin reactions. Crews will used appropriate PPE during operations	L

	11.5c. High Pressure	11.5c. Hydro-seeding equipment produces extreme pressure that can cause injuries. Protective safeguards will not be removed or altered	L
12. INVESTIGATION-DERIVED WASTE SAMPLING			
12.1. Setup / Preparation for sampling	12.1. The Hazards itemized in Hazard 1 are applicable to Hazard 12.1.	12.1. The Controls itemized in Control 1 are also applicable to Control 12.1.	L
12.2. Sample Collection	12.2a. Contact with hazardous chemicals	12.2a. HTW safety awareness will be conducted during site specific orientation training and reviewed during morning tailgate briefings. PPE and protective clothing selection will comply with SSHP requirements. (PPE and protective clothing requirements used during sampling is dependent upon waste characterization.)	L
	12.2b. Slips, trips, and falls	12.2b. Worker shall be aware of potential slippery surfaces and tripping hazards. Good housekeeping will be enforced by SSHO	L
	12.2c. Injury incurred while handling tools	12.2c. Hand and power tools shall be used, inspected, and maintained in accordance with the manufacturer's instructions and recommendations. Inspections shall be performed prior to use by the tool operator to determine that the tool operating safely. Tools with defect shall be taken out of service until repaired	L
	12.2d. Heat/Cold stress	12.2d. All site activities must be conducted IAW the approved WP ensuring that appropriate clothing and PPE is worn to assist in the prevention of cold and heat stress injuries. Use the buddy system at all times and have sufficient and appropriate fluids available for the conditions.	L

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
1. Hand and Power Tools 2. Appropriate PPE for selection operation, at minimum – a. Long Sleeve Shirt b. Long Legged Pants c. Steel Toe and Rubber Boots d. Leather Gloves e. Neoprene/nitrile gloves f. Safety Glasses (Splash), when required g. Hard Hat, when required h. Safety Vest, when required 3. Additional PPE to conduct other operations, as directed. 4. Heavy Equipment, as needed or specified by WP or SSHP. 5. Designated Site vehicles will be equipped with the minimum - a. Map and Directions to site medical facility b. Project Emergency Contact Telephone Listing c. Serviceable First Aid Kit d. Serviceable A:BC rated 2.5lb or larger fire extinguisher 6. Other vehicles designated as personnel conveyance will be equipped with – a. Map and Directions to site medical facility b. Project Emergency Contact Telephone Listing 7. Project or personal Cellular Phone	<u>Qualified Personnel</u> 1. First Aid/CPR – SSHO and one other individual. 2. Site Manager 3. All personnel operating heavy equipment will provide proof of competency (documentation of training or experience) to the SSHO prior to operating the equipment. 4. Electrical work to be performed by a Certified Electrician. <u>Training</u> 1. Site-specific WP, HASP and AHA 2. OSHA 40 hour and applicable 8 hour 3. Equipment operation 4. Heat/Cold Stress 5. Biological hazards 6. Flora/Fauna endangered/threatened 7. Daily safety and operational briefing 8. Site visitor training	<u>1. Initial (Site Selection)</u> – General inspection of assembly area. Equipment will be inspected daily by operator prior to use in accordance with the manufacturer's instructions. If during inspection or during use, equipment fails to function properly, equipment is to be turned in for repair/replacement. <u>2. Daily</u>- Housekeeping of assembly and work areas for debris and hazards. SSHO will perform audits and spot checks to verify compliance. SSHO will update site's MSDS files on all items, supplies and material brought onto site. Periodic communication checks between Field Office or SSHO and Field Crews, as deemed necessary, to ensure crew's status and relay emergency information. Field Office and SSHO will maintain a telephonic roster of all site personnel's cellular phone numbers to ensure a form of communication. In the event that a field crew fails to make a communications check, they will cease operations and relocate to re-establish communications link with the Field Office or SSHO. <u>3. Weekly</u> – First Aid/CPR kit(s), fire extinguisher(s), vehicles and equipment. <u>4. Final (Site Departure)</u> – Inspection of the entire area to ensure the site is left in the same or better than when we arrived.

Training Requirements: Certified electricians will install or hook up electrical components.

Training Acknowledgement:

Printed Name	Signature	Date