



**ENVIRONMENTAL
RESTORATION, LLC**

**ERRS REGION 5 CONTRACT EP-S4-16-02
Site Health and Safety Plan
USS Lead – Zone 2 & 3 Cleaning**

**SITE HEALTH AND SAFETY PLAN
EMERGENCY AND RAPID RESPONSE SERVICES
U.S. Smelter and Lead Residential Area Superfund Site- Zone 2 and Zone 3
East Chicago, Indiana**

Prepared for

**U.S. Environmental Protection Agency - Region 5
77 West Jackson Blvd
Chicago, Illinois 60604**

**Under Contract No.: EP-S4-16-02
Task Order: 0032
Project No: UC5-32**

May 2017



**Environmental Restoration LLC
1666 Fabick Drive
St. Louis, MO 63026**



SITE HEALTH AND SAFETY PLAN EMERGENCY AND RAPID RESPONSE SERVICES

USS Lead – Zone 2 and Zone 3 East Chicago, Indiana

I hereby certify that the enclosed Site Health and Safety Plan, shown and marked in this submittal, has been prepared in accordance with OSHA 29 CFR 1910 and is proposed to be incorporated with Contract No.: EP-S4-16-04 Task Order #015. This Site Health and Safety Plan is submitted for Government review and acceptance.

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LIST OF ACRONYMS AND ABBREVIATIONS

AHA	Activity Hazard Analysis
ANSI	American National Standards Institute
BBP	Bloodborne Pathogens
COC	contaminant of concern
CFR	Code of Federal Regulations
CPR	Cardiopulmonary Resuscitation
CRZ	Contamination Reduction Zone
CSP	Certified Safety Professional
dBA	decibel A-weighted
EZ	Exclusion Zone
HASP	Site Health and Safety Plan
HAZWOPER	Hazardous Waste Operation and Emergency Response
HSO	Site Health and Safety Officer
IDLH	immediately dangerous to life and health
kV	Kilovolt
LOTOTO	Lockout/Tagout/Tryout
MCL	Maximum Contaminant Level
µg/kg	micrograms per kilogram
mg/kg	milligrams per kilogram
mg/m³	milligrams per cubic meter
NFPA	National Fire Prevention Association
NIOSH	National Institute of Occupational, Safety and Health
OSHA	Occupational Safety and Health Administration
PM	Response Manager
PEL	Permissible Exposure Limit
PPE	personal protective equipment
ppm	parts per million
RM	Response Manager
SCBA	self-contained breathing apparatus
SDS	Safety Data Sheet
SOP	Standard Operating Procedure
SOW	Scope of Work
START	Superfund Technical Assistance and Response Team
USEPA	United States Environmental Protection Agency



1.0 Introduction and Site Entry Requirements

This document describes the health and safety guidelines developed for the USS Lead Zone 2 & 3 Cleaning Site, to protect on-site personnel, visitors, and the public from physical harm and exposure to hazardous materials or wastes. The procedures and guidelines contained herein were based upon the best available information at the time of the plan's preparation. Specific requirements will be revised when new information is received or conditions change. A written amendment will document all changes made to the plan. Any amendments to this plan will be included in Attachment A. Where appropriate, specific OSHA and standards or other guidance will be cited and applied.

All work practices and procedures implemented on site must be designated to minimize worker contact with hazardous materials and to reduce the possibility of physical injury. All work will be performed in accordance with applicable Federal 29 CFR 1910 and 1926 health and safety regulations, specifically 29 CFR 1910.120 Hazardous Waste Operations and Emergency Response.

1.1 Safety Policy Statement

Environmental Restoration LLC places primary importance on the health and safety of each individual of this company. We will maintain a health and safety program that encompasses all regulatory requirements as well as corporate standards that will ensure a safe work environment. To be successful, such a program must embody the proper attitudes toward injury and illness prevention on the part of supervisors and employees. It also requires cooperation in all safety and health matters, not only between supervisor and employee, but also between each employee and his or her co-workers. Only through such a cooperative effort can a safety program be in the best interest of all.

As a condition of employment, employees are required to work safely, observe safety rules and practices, and follow the instructions of their supervisors. Employees should be alert to unsafe conditions and promptly report them to their supervisors. Employees must be qualified to perform work assignments safely and notify their supervisor when they are not qualified or do not understand the assignment. Violating safe work procedures or failing to report work hazards, incidents, injury, or illness may be cause for disciplinary action, including termination.

Eliminating or controlling hazards is one way incident prevention will be provided. This will be accomplished through the use of engineering controls, safe work practices and personal protective equipment. Environmental Restoration LLC employees will be thoroughly trained in the above areas.

It is the responsibility of supervisors to ensure that safe work procedures, equipment, and resources are provided to employees and that information on hazards and protective measures are communicated through training and other methods.

Environmental Restoration LLC will comply with all applicable safety and environmental regulations and codes. Accepted safe work practices will be followed in all operations. Site specific safety rules and procedures will be established and followed for each project in response to site specific contaminants, physical conditions and scope of work.

1.2 Daily Safety Meetings

Daily safety meetings will be held at the start of each shift. They are used to communicate daily activities, site conditions, hazards, and control measures, as well as to solicit input from site workers on safety concerns and improvements. The meetings may also be used to present safety training topics and refresher items. A Daily Toolbox Safety Meeting Record shall document items discussed and be signed by all personnel in attendance.

1.3 Site Specific Training and Acknowledgement

The Response Manager shall be responsible for informing all individuals assigned to this project of the contents of this plan and ensuring that each person signs the Site Specific Training Record in Attachment Z. By signing the Site Specific Training Record, individuals acknowledge receipt of this training and that they recognize the potential hazards present on-site and the policies and procedures required to reduce the risk of exposure or adverse effects associated with these hazards.



1.4 Key Personnel

Project: USS Lead – Zone 2 and Zone 3 Cleaning Site	
Key Personnel	
Names and Titles	Contact Information
Jacob Hassan – USEPA Region 5 OSC	(Mobile) 312-882-4297 (Office) 312-886-6864 Email: hassan.jacob@epa.gov
John Behrens – ER Response Manager	(Mobile) 708-473-7124 Email j.behrens@erllc.com
John Behrens - ER Site Health and Safety Officer	(Mobile) 708-473-7124 Email j.behrens@erllc.com
Nick Michailides – ER Project Health & Safety Manager	(Mobile) 314-749-2290 Email: n.michailides@erllc.com
Justin Button-Hutchens – START Project Manager	(Office) 312-201-7771 (Mobile) 224-433-8544 Email: Justin.button-hutchens@tetrattech.com
Chris Draper – START Safety Manager	(Mobile) (615) 969-1334 Email: chris.draper@tetrattech.com

2.0 Roles and Responsibilities

2.1 Response Manager (PM): John Behrens

The Response Manager, as the field representative for the ERRS Contractor, Environmental Restoration LLC (ER) and its subcontractors, has the responsibility for implementing the site Health and Safety Plan (HASP). The RM shall manage the project and ensure all health and safety requirements are met.

2.2 Site Health and Safety Officer (HSO): John Behrens

The ER Site Health and Safety Officer is assigned to the site on a full-time basis with functional responsibility for assisting the PM with implementation of the HASP.

Specific Duties Include:

- Assist RM in providing a safe and healthful work environment.
- Assist RM in reporting and investigating all incidents.
- Assist RM in documenting and correcting safety issues/concerns.
- Ensure site personnel meet required training and medical clearance.
- Ensure proper decontamination of personnel and equipment is accomplished.
- Ensure that air monitoring equipment is calibrated and operational.
- Conduct personal air monitoring as required.
- Conduct fugitive dust monitoring as required.
- Perform respirator fit tests, as necessary.
- Inventory and inspect PPE prior to personnel entries into exclusion zone.
- Ensure proper personal protective equipment is being utilized.
- Inspect first aid kits and fire extinguishers.
- Supervise confined space entries.

2.3 Project Health and Safety Manager (PHSM): Nick Michailides

The Project Health and Safety Manager provides support and leadership to the project to protect the health and safety of the employees and the public. This includes, but is not limited to, communicating on safety and health issues, providing training, establishing special hazard control programs, assisting or conducting incident investigations, making



inspections and surveys, evaluating or developing new protective measures, accumulating and distributing incident statistics, and identifying requirements of safety and health laws and regulations.

2.4 Other:

Any persons who observe a health and safety hazard should immediately report observations/concerns to appropriate key personnel listed in Section 2.1 or 2.2 above. All employees have the authority and obligation to stop any task or operation where concerns or questions regarding the control of Health, Safety, or Environmental concerns exist.

2.5 U.S. EPA On-Scene Coordinator (OSC): Jacob Hassan

The OSC has overall project authority and directs the project manager regarding the tasks required to meet project objectives. The OSC has the authority to stop work and initiate corrective actions should there be a reason to do so.

2.6 START Project Manager (PM):

The START PM, as the representative for (insert START name here), is responsible for the direction of START activities, including work zone and perimeter air monitoring and sampling, documentation, and oversight of removal activities. The PM interfaces directly with the U.S. EPA OSC regarding all START tasks. The START PM will also provide Health and Safety support to the RM and HSO. The PM is responsible for managing all aspects of the project, START project personnel, and subcontractors, if any.

2.7 START Site Leader (SL):

The site leader documents and tracks all work performed in the field. The site leader will also be responsible for conducting air monitoring in the work zones, including calibration of instruments as appropriate.

2.8 START Safety Manager: Chris Draper

The health and safety officer approves the Health and Safety Plan and provides guidance to field personnel on health and safety issues.

3.0 Site Background and Scope of Work

3.1 Site Background

The USS Lead Site lies approximately 18 miles southeast of Chicago, Illinois, in East Chicago, Indiana. The USS Lead Superfund Site consists of the former lead smelter located at 5300 Kennedy Avenue, East Chicago, Indiana (designated as operable unit 2 [OU2] and the residential area to the north (defined as OU1 above). East Chicago is located within one of the most heavily industrialized areas in the United States, including facilities such as steel mills, oil refineries, heavy manufacturing plants, chemical processing plants, and heavy rail. OU1 is bound by East Chicago Avenue on the north, East 151st Street/149th Place on the south, the Indiana Harbor Canal on the west, and Parrish Avenue on the east. OU1 is primarily a residential area, with commercial and light industrial areas nearby.

United States Geological Survey (USGS) historical aerial photographs from 1939, 1951, 1959, and 2005 show OU1 over time. Review of these aerial photographs indicates that the majority of the residential neighborhoods within the USS Lead Site, west of the railroad tracks, were built before 1939. Because OU1 is a former low-lying area, the ground level was likely built up before 1939, before the homes were constructed. Approximately half of the homes east of the railroad tracks were built before 1939. Between 1939 and 1951, approximately 75 to 80 percent of the homes were built; and by 1959, most of the homes east of the railroad tracks had been built. These photographs also show that the Anaconda Copper Company (currently the Atlantic Richfield Company [ARCO]) occupied the area where both Gosch Elementary School and the East Chicago Public Housing complex immediately south of the school are currently located (the southwest portion of OU1). The Carrie Gosch Elementary School and the East Chicago Public Housing complex were built on the former Anaconda Copper Company site after 1959.

The former lead smelter is located directly south of the OU1 residential area. Immediately east of the former USS Lead facility, across Kennedy Avenue, is the former DuPont site (currently leased and operated by W.R. Grace & Co., Grace Davison). One of the processes that historically took place at the DuPont site was the manufacturing of the pesticide



lead arsenate. Northwest of the former lead smelter, west of Gladiola Street and north of 151st Street, two smelter operations reportedly handled lead and other metals (Geochemical Solutions 2004). A 1930 Sanborn Map identifies the operations as Anaconda Lead Products and International Lead Refining Company (referred to as the former Anaconda facility, currently owned by ARCO) (Geochemical Solutions 2004). According to the Sanborn Map, Anaconda Lead Products was a manufacturer of white lead and zinc oxide and the International Lead Refining Company was a metal refining facility.

The work associated with the Health & Safety Plan at present consists of the interior cleaning of residential properties which have exceeded EPA’s threshold for lead and arsenic as measured in a dust sample.

3.2 Scope of Work

The remedial design for this site includes the excavation and removal of contaminated soils, and the restoration of the property. Anticipated site activities consist of the following:

1. Mobilization
2. Site documentation of residential properties pre and post cleaning
3. Interior Cleaning of residential properties using HEPA vacuums, wet wiping, furnace filter replacement, exterior entryway floor mat replacement
4. Demobilization

4.0 Hazard Assessment

This section is to be addressed in the daily tool box safety meeting as each task is to be initiated. Each Activity Hazard Analysis (AHA) is designed to develop awareness to chemical and physical hazards specific to each task. It would be impractical to repeat in complete detail each control measure and SOP for each job task. Sources, Hazards and Control Measures will be addressed for each job task.

Specific work tasks with unique hazards and/or PPE requirements must be evaluated or reevaluated prior to beginning work. This task review will be led by the Response Manager and the HSO, and will include knowledgeable individuals such as the worker(s) and the supervisor. PPE requirements, based on this assessment, will be included in Section 6 of the HASP or in the AHA for the specific task. All workers must be trained in the requirements of the HASP and the applicable AHAs prior to beginning work. The required PPE may be changed by the HSO, based on the results of additional air monitoring, or on task-specific needs. Downgrades will require the approval of the Project Health and Safety Manager unless otherwise permissible by the HASP.

The following section outlines the Referenced Standard Operations Procedures (SOPs), Chemical Hazards and AHAs associated with this project. Applicable SOPs are available from ER’s Health and Safety Database.

START-specific, programs, policies, safe work practices, forms, activity hazard analyses, and safety data sheets are included as Attachment E, available electronically from the START PM.

The HSO will revise AHAs for site-specific activities and review with the work crew before commencing any activity.

The following table lists ER health and safety SOPs that are applicable to this project.

Referenced SOPs:	
ER SOPs applicable to this project:	
HS-01 Air Monitoring and Sampling HS-02 BBP Exposure Control Plan	HS-36 Proper Lifting Techniques HS-38 Fire Prevention Protection



Referenced SOPs:	
ER SOPs applicable to this project:	
HS-05 Cold Stress HS-08 Decontamination Measures HS-10 Motor Vehicle Operation HS-12 Electrical – General HS-13 Excavation and Trenching Operations HS-15 Hazard Communication Program HS-16 Hearing Conservation HS-17 Heat Stress HS-18 Heavy Equipment Operation HS-24 Personal Protective Equipment HS-26 Respiratory Protection HS-30 Traffic Control Safety	HS-41 Ladder Safety HS-48 Lead Hazard Safety Program HS-49 Tool Safety and Inspection HS-50 First Aid HS-51 Incident Reporting and Analysis HS-52 General Waste Management HS-53 Spill Prevention Response HS-55 Short Service Employee Program HS-56 Stop Work Authority Program HS-64 Security Best Practices HS-73 Assured Equipment Grounding Program
Lifts Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Items to be lifted: N/A	Critical <input type="checkbox"/> Ordinary <input type="checkbox"/>
Excavations Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	

4.1 Chemical Hazards

<u>Hazards</u>	<u>Arsenic</u>	<u>Lead</u>
OSHA PEL (mg/m ³)	0.01	0.05
IDLH (mg/m ³)	5.0 Carcinogen	100.0
Action Level (mg/m ³)	0.005	0.03
Biological Exposure Indices (ACGIH-2014)	35 µg/Liter Urine: end of workweek	30µg/ 100 ml Blood; Also ZPP per OSHA Not Time Critical
Routes of Entry	Inhalation Ingestion Skin Absorption Skin/Eye Contact	Inhalation Ingestion Skin/Eye Contact
Target Organs	Liver, kidney, skin, lungs, lymphatic system (lung and lymphatic cancer)	Central nervous system, GI tract, blood, kidneys
Acute and Local Effects	Upper respiratory irritation, cough, dry throat, wheezing	Upper respiratory irritation, cough, dry throat, wheezing
Chronic and Systemic Effects	Cancer, kidney and liver dysfunction	Liver failure, nervous system damage, blood anemia, potential cancer

4.2 Task Specific Hazards and Controls

This section is to be addressed in the daily tool box safety meeting as each task is to be attempted. Each Activity Hazard Analysis is designed to develop awareness to chemical and physical hazards specific to each task. It would be impractical to repeat in complete detail each control measure and SOP for each job task. Sources, Hazards and Control Measures will be addressed for each job task.



Activity Hazard Analysis		
Activity: Site Preparation		
Personal Protective Equipment: Level D		
Hazard	Sources	Control Measures
Load Shift	Improper Secured Equipment during equipment transportation	Proper use of binding equipment Proper location of load on vehicle Obey weight restrictions and specialized loading guidelines of transport vehicle
Heavy Equipment rollover	Improper Loading/Unloading of Equipment	Ensure proper loading and unloading techniques are utilized Ensure equipment trailer is adequate to carry equipment load Ensure loading ramps meet specific equipment loading needs Follow HS-18 Heavy Equipment Operation
Crush/laceration	Binding equipment	Only approved ratchet binding equipment will be utilized Pipes or leverage extension devices will not be permitted with binders Proper weight ratings required for chains, straps, cables Proper PPE required including cut resistant work gloves
Cold Stress	Outside ambient Temperatures	Warm break areas Review and adhere to ER SOP HS-5 Plenty of fluids & breaks
Collision	Improper motor vehicle operation	Follow HS-10 Motor Vehicle Operation Only qualified drivers permitted to operate vehicles Obey all traffic laws Wear seat belts while in operation
Noise	Equipment/vehicles	Hearing protection for levels > 85 dBs Hearing protection required when operating open-cab equipment Hearing protection required when working near equipment
Slips/Trips/Falls	Vehicle entry/exit	Identify slippery surfaces. Three points of contact. Use ramps or steps for mounting/dismounting elevated surfaces
Struck by/caught between	Vehicle & Equipment Operation/Traffic	Follow HS-10 Motor Vehicle Operation Follow HS-18 Heavy Equipment Operation Only qualified drivers permitted to operate vehicles Wear ANSI Class 2 high-visibility safety vest Wear seat belts while in operation Back up alarms functional and loud enough to hear over surroundings



Activity Hazard Analysis		
Activity: Wet Method Cleaning		
Personal Protective Equipment: Level D		
Hazard	Sources	Control Measures
Struck by/caught between	Vehicle & Equipment Operation/Traffic when walking / driving between residences	Follow HS-10 Motor Vehicle Operation Follow HS-18 Heavy Equipment Operation Only qualified drivers permitted to operate vehicles Wear ANSI Class 2 high-visibility safety vest Backup alarms functional on all heavy equipment Wear seat belts while in operation Utilize traffic safety signage and spotters
Wildlife/domestic animals	Insects/Spiders/Bees/Ticks/Mosquitoes/Dogs	Survey area and identify sources Beware of and avoid contact Apply appropriate repellent per label directions
Ergonomics	Lifting and bending	Follow HS-36 Proper Lifting Techniques Buddy system/Proper lifting techniques No individual lifting over 40 lbs.
Temperature Extremes (heat)	Seasonal Temperatures (heat)	Cool break areas Follow ER SOP HS-17 Heat Stress Safety Cool/shaded break areas shall be provided Workers must maintain proper hydration
Fire	Electrical fault in units	Fire extinguishers with at least a 3A:40B:C rating shall be placed in when working
Slip/Trip/Fall	Uneven terrain/debris/ cluttered walkways / wet walking surfaces	Keep area organized Identify/mark hazards



Activity Hazard Analysis		
Activity: HEPA Vacuum		
Personal Protective Equipment : Modified Level D with historical air monitoring justification		
Hazard	Sources	Control Measures
Lead	Dust	<ul style="list-style-type: none"> - Maintain dust suppression with water spray/mist at all times - Control work area to authorized personnel only - Utilize PPE per Section 6 of this HASP - Minimize contact with contaminated soils - Enforce proper hygiene – wash hands frequently - Follow proper decontamination protocol in Section 10.0 of this HASP
Cuts/Punctures	Sharp Objects / Moving Furniture	<ul style="list-style-type: none"> - Beware of sharp objects - Wear cut resistant gloves (cut rating 4 minimum)
Ergonomics	Lifting and Bending	<ul style="list-style-type: none"> - Follow HS-36 Proper Lifting Techniques - Use Buddy system - Use mechanical means when feasible
Wildlife/domestic animals	Insects/Spiders/Bees/Ticks/Mosquitoes/Dogs	<ul style="list-style-type: none"> - Survey area and identify sources - Beware of and avoid contact - Apply appropriate repellent per label directions
Cold Stress	Outside ambient Temperatures	<ul style="list-style-type: none"> - Warm break areas - Review and adhere to ER SOP HS-5 - Plenty of fluids & breaks
Slip/Trip/Fall	Uneven terrain/debris/ cluttered walkways / wet walking surfaces	<ul style="list-style-type: none"> - Keep area organized - Identify/mark hazards - Mark excavations
Electrocution/explosion/fire	Energized HEPA Vacuum	<ul style="list-style-type: none"> - Use GFCI - Follow HS-73 Assured Grounding
Struck by/caught between	Vehicle & Equipment Operation/Traffic when driving or walking between properties.	<ul style="list-style-type: none"> - Follow HS-10 Motor Vehicle Operation - Follow HS-18 Heavy Equipment Operation - Only qualified drivers/operators permitted to operate vehicles/equipment - Wear ANSI Type 2 high-visibility safety vest - Wear seat belts while in operation - Use spotters - Back up alarms functional and loud enough to hear over surroundings



4.3 General Hazards and Controls

Physical/Environmental Hazard Analysis		
Hazard	Pre Planning to Control Hazard	Active Control Measures
Electrical	<ol style="list-style-type: none"> 1. Locate and mark existing energized lines. 2. De-energize lines if necessary to perform work safely. 3. All electrical circuits will be grounded. 4. All 120 volt single phase which are not a part of the permanent wiring will have a ground-fault interrupter in place. 5. Temporary wiring will be guarded, buried or isolated by elevation to prevent accidental contact by personnel or equipment. 6. Evaluate potential for high moisture/standing water areas and define special electrical wiring needs-typically requirement for low voltage lighting systems. 	<ol style="list-style-type: none"> 1. Utilize Qualified Electrical Contractor for any new or temporary electrical construction. 2. Ensure electrical equipment/material meet all local, state and federal code and specifications 3. Use GFCI for all power tool usage. 4. ER trained employee shall perform utility sweep of proposed excavation
Ergonomic	<ol style="list-style-type: none"> 1. All operations evaluated for ergonomic impact. 2. Procedures written to define limits of lifting, pulling, etc. 3. Procedures to define how personnel will utilize proper ergonomic concepts and utilize mechanical material handling equipment. 4. Necessary mechanical material handling equipment specified and ordered for project. 	<ol style="list-style-type: none"> 1. Proper body mechanics techniques stressed and enforced on a daily basis. 2. Mechanical handling equipment maintained and utilized. 3. Proper body mechanics stressed in scheduled safety meetings. 4. Injuries reported and medically treated if in doubt about severity. 5. Operations changed as necessary based on injury experience or potential.
Existing Site Topography	<ol style="list-style-type: none"> 1. Survey site prior to layout. Identify areas unsafe for personnel or equipment due to physical conditions. 2. Identify/locate existing utilities. 3. Determine impact of site operations on surrounding properties, communities, etc. 4. Identify mechanized equipment routes both on site and onto and off the site. 5. Layout site into exclusion and contamination reduction zones based on initial site evaluation. 	<ol style="list-style-type: none"> 1. Awareness to work environment – regular inspection/audits to identify changing conditions. 2. Shut down operations when unknown conditions encountered.
Fires & Explosions	<ol style="list-style-type: none"> 1. Evaluate all operations for fire and explosion potential. 2. Define specific procedures for unique operations presenting unusual hazard such as flammable tank demolition. 3. Ensure that properly trained personnel and specialized equipment is available. 4. Define requirements for handling and storage of flammable liquids on site, need for hot work permits and procedures to follow in the event of fire or explosion. 5. Define the type and quantity of fire suppression equipment needed on site. 6. Coordinate with local firefighting agencies to discuss unique fire hazards, hazardous materials, etc. 7. Ensure site operations comply with 29CFR 1910.157G. 8. Provide Fire Extinguisher Training and Education 	<ol style="list-style-type: none"> 1. Inspect fire suppression equipment on a regular basis. 2. Store flammables away from oxidizers and corrosives. 3. Utilize Hot Work Permit for all hot work on-site. 4. Follow any site specific procedures regarding work around flammables. 5. Review and practice contingency plans. 5. Discuss on regular basis at scheduled safety meetings. 6. ER trained employee shall perform utility sweep of proposed excavation
Flammable Vapor and Gases	<ol style="list-style-type: none"> 1. Evaluate site to determine sources of likely flammable gas or vapor generation. 2. Develop specific procedures to be followed in the event of exposure to flammables. 3. Specify specialized equipment needs for inerting flammable atmospheres, ventilating spaces and monitoring flammable vapor concentrations. 4. Define requirements for intrinsically safe equipment. 5. Develop contingency plan to follow in the event of fire or explosion. 	<ol style="list-style-type: none"> 1. Calibrated monitoring equipment available and utilized by trained personnel whenever working where flammable gas or vapor is present. 2. Monitoring performed at regular frequency and in all areas where vapor could generate or pool. 3. Equipment and operations shut down when threshold levels are exceeded. 4. Contingency plans reviewed regularly by all involved personnel. 5. Work areas are carefully inspected to look for possible ignition sources. Sources are removed. 6. Operations shut down if specific task procedures can't be followed to the letter.
Heavy Equipment Operation	<ol style="list-style-type: none"> 1. Define equipment routes and traffic patterns for site. 2. Insure that operators are properly trained on equipment operation for all equipment required on project. 3. Define safety equipment requirements, including back up alarm and roll over, for all equipment on site. 4. Define equipment routes and traffic patterns for site. 	<ol style="list-style-type: none"> 1. Equipment inspected as required. 2. Equipment repaired or taken out of service. 3. Ground spotters are assigned to work with equipment operators. 4. Utilize standard hand signals and communication protocols.



Physical/Environmental Hazard Analysis		
Hazard	Pre Planning to Control Hazard	Active Control Measures
	<ol style="list-style-type: none"> Implement SOP of requiring operators to safety inspect equipment on a daily basis in accordance with manufacturer requirements. Evaluate project requirements to ensure that equipment of adequate capacity is specified. 	<ol style="list-style-type: none"> Personnel wear the proper PPE; utilize hearing protection, gloves for handling rigging, etc. Equipment safety procedures discussed at daily scheduled safety meetings. Personnel do not exceed lifting capacities, load limits, etc. for equipment in question. Personnel follow basic SOP's which prohibit passengers on equipment, activating brakes and grounding buckets, securing loads prior to movement, etc.
Illumination	<ol style="list-style-type: none"> Evaluate all operations and work areas to determine lighting requirements. Specify specialized lighting requirements including explosion proof, intrinsically safe, lighting needs. Determine if nighttime outdoor operations are necessary. Evaluate tasks to be performed and number of light plants necessary to allow operations. Ascertain if outdoor lighting from nighttime operations will have an impact on surrounding communities. 	<ol style="list-style-type: none"> Inspect specialized equipment and discard or replace as needed. Add additional lighting to areas with lighting deficiencies. Inspect drop cords and portable lights on regular basis. Replace or repair as necessary.
Noise	<ol style="list-style-type: none"> Local community noise standards examined. Expected loud operations evaluated to determine compliance with community standards. Loud operations scheduled for approved time periods. Noise level standards established for equipment brought onto site. Hearing protection requirements defined for personnel expected to have excessive exposures. 	<ol style="list-style-type: none"> Personnel receive annual audiogram. Personnel required to wear hearing protection. Routine noise level monitoring and dosimetry performed. Defective equipment repaired as needed. Ongoing hearing conservation education promoted at scheduled safety meetings. Medical evaluation following noise (impact) exposure if symptoms present themselves.
Personal Injuries	<ol style="list-style-type: none"> Site operations will be evaluated for exposures with serious injury potential such as falling objects, pinch points, flying objects, falls from elevated surfaces, etc. A written Fall Prevention Program will be developed if workers will be required to work at heights greater than 6 feet from unguarded work locations. PPE requirements will be based on potential for injury. 	<ol style="list-style-type: none"> Personnel will wear required PPE. Specialized equipment such as rope grabs, winches, etc. will be inspected prior to each use. Defective equipment will be immediately replaced. All injury and near miss incidents will be reported to the HSO. First aid/CPR trained person on site at all times. First aid on site. Transport for medical care if necessary.
Small Equipment Usage	<ol style="list-style-type: none"> Site operations will be evaluated to determine need for specialized intrinsically safe, explosion-proof and UL approved equipment and instruments. Implement requirement for G.F.I., double insulated tool usage, or assured grounding program in all outdoor operations, will be utilized. Specify equipment needs to ensure that equipment used only for the purpose for which it is designed and to prevent abuse or misuse of the equipment. Specify requirements for the inspections and maintenance of specialized equipment. Specify that all equipment utilized on the project meets all OSHA requirements. 	<ol style="list-style-type: none"> Inspect each tool prior to each use. Ensure all guards are in use and properly positioned. Ensure item being worked on is properly braced if necessary. Get help when appropriate to hold or brace item being worked on. Wear cut resistant or other appropriate gloves in addition to level C PPE.
Weather Conditions	<ol style="list-style-type: none"> Evaluate prevailing weather conditions for the site. Contingency plans developed for likely severe weather conditions such as tornado, and extreme thunderstorm. Provide for daily weather forecast service in extreme weather areas. Plan to weatherize safety systems, such as showers and eye washes that would be impacted by extreme cold weather. Order necessary specialized cold weather clothing. Grounding and bonding requirements defined for thunderstorm areas. Sheltered air conditioned break areas provided for extreme hot and cold weather zones. 	<ol style="list-style-type: none"> Employees trained in contingency plan for severe weather conditions. Emergency water sources inspected regularly in cold areas. Weather service contacted regularly during storm conditions. Supervisory personnel cease operations during extreme storm conditions (i.e., thunderstorms). Personnel evacuate to safe assembly area.
Heat Stress	<ol style="list-style-type: none"> Anticipate possible high temperatures (summer months). Be aware of heat stress symptoms, quit sweating, pale, clammy skin, dizziness 	<ol style="list-style-type: none"> Cool break area. Drink water. Buddy system/ awareness First aid on site. Medical care if symptoms persist.



Physical/Environmental Hazard Analysis		
Hazard	Pre Planning to Control Hazard	Active Control Measures
Cold Stress	<ol style="list-style-type: none"> 1. Anticipate possible low temperatures (winter months). 2. Remember the temperature does not have to be below freezing to have a cold stress situation. 	<ol style="list-style-type: none"> 1. Warm break area. 2. Warm decaffeinated drinks. 3. Buddy system/ awareness. 4. First aid on site. 5. Medical care if symptoms persist

5.0 Training Requirements

This section describes ER’s project training requirements and site visitor policy. Training of all personnel shall be in accordance with OSHA 29 CFR 1910.120 and the National Fire Protection Association (NFPA) standards.

5.1 Project Training Requirements

The training listed in Table 5-1 will be provided to project participants as noted. All required training will be documented and this documentation maintained onsite.

Project Training Requirements:		
Topic	Description	Personnel
General Training		
Site Safety and Health Plan	Site-specific hazards and control requirements, before commencement of field work. Includes training in proper use and care of PPE.	All project personnel
Activity Hazard Analysis	Activity-specific hazards, controls and training requirements for a specific phase or activity, prior to commencement of activity	Workers, supervisors and oversight personnel engaged in the activity
Daily Safety Briefing	In addition to plan-of-the-day and daily hazard reminders, often used to cover a specific topic; provided refresher training on various issues; or changes in hazards, controls or procedures.	All field workers, supervisors and field oversight personnel
Emergency Action Plan	Roles, responsibilities, recognition of emergency conditions, reporting and notification, evacuation and other procedures.	All project personnel, with detailed information on procedures for workers with special responsibilities
OSHA 40-Hour Hazardous Waste Operation (HAZWOPER) Training	General hazards and controls for hazardous waste activities at remediation sites, prior to performing work in an exclusion zone.	General site workers, supervisors, oversight personnel on HAZWOPER sites
OSHA 8-Hour Supervisor	Managing HAZWOPER work activities	Supervisors and management support staff on HAZWOPER sites
OSHA 8-Hour Refresher	Current annual refresher for HAZWOPER sites.	Workers, supervisors and oversight personnel engaged in the activity
OSHA 10-Hour Construction Safety	10-Hour OSHA Construction Safety Course	HSO at a minimum.
Hazard Communication	Requirements for MSDS, labels; hazards of site materials and controls; location of and access to inventories and MSDS.	All project personnel potentially exposed to hazardous materials
Fire Extinguisher	General education on selection, distribution, and proper use of fire extinguishers.	All project personnel
Special Training		
Federal OSHA Lead Construction Standard (29 CFR 1926.62)	General hazards and controls for lead contamination activities at remediation sites, prior to performing work in an exclusion zone.	General site workers, supervisors, oversight personnel on HAZWOPER sites
Federal OSHA Inorganic Arsenic Standard (29 CFR 1910.1018)	General hazards and controls for arsenic contamination activities at remediation sites, prior to performing work in an exclusion zone.	General site workers, supervisors, oversight personnel on HAZWOPER sites
First aid/ Cardiopulmonary Resuscitation (CPR)	Red Cross, National Safety Council or other authorized course, with current refresher	At least ER 2 project personnel
Lockout/Tagout/Tryout (LOTOTO)	Site-specific energy control and verification procedures.	Authorized personnel working on de-energized systems, and affected employees



Project Training Requirements:		
Topic	Description	Personnel
		whose work may be impacted by a lockout/tag/tryout out situation. Refer to Section 8.0 Hazardous Energy Control.
Other Heavy Equipment operations	Qualified by Construction Manager, Superintendent or Equipment Supervisor as documented on ER Equipment Operator Qualifications Form	Equipment Operators
Power tools (e.g. chain saws, chippers, powder-actuated tools, compressed air systems)	Hazards and proper use and maintenance as described in operations manual. Powder-operated tool users certified by manufacturer.	Tool users

5.2 Visitor Indoctrination Policy

All site visitors will be required to review the daily tailgate safety issues and sign the visitor log. At a minimum, all visitors must be informed of the anticipated hazards and PPE requirements, designated work zones, escort procedures, and emergency procedures.

6.0 **Personal Protective Equipment**

The following is a brief description of the personal protective equipment, which may be required during various phases of the project. The USEPA terminology for protective equipment will be used; Levels A, B, C and D.

Respiratory protective equipment shall be NIOSH-approved and use shall conform to OSHA 29 CFR Part 1910.134 Requirements. Each employer shall maintain a written respirator program detailing selection, use, cleaning, maintenance and storage of respiratory protective equipment. The written Respirator Program will be maintained at the local and regional offices.

6.1 Level A Protection Shall Be Used When: (NOT ANTICIPATED)

- The extremely hazardous substance requires the highest level of protection for skin, eyes and the respiratory system;
- Substances with a high degree of hazard to the skin are known or suspected;
- Chemical concentrations are known to be above IDLH levels; or,
- Biological hazards requiring Level A are known or suspected.

6.2 Level B Protection Shall Be Used When: (NOT ANTICIPATED)

- The substance(s) has been identified and requires a high level of respiratory protection but less skin protection;
- Concentrations of chemicals in the air are IDLH or above the maximum use limit of an APR with full-face mask;
- Oxygen deficient or potentially oxygen deficient atmospheres (<19.5%) are possible; and/or, Confined space entry may require Level B.
- Incomplete identification of gases and vapors, but not suspected to be harmful to skin or skin absorbable

6.3 Level C Protection Shall Be Used When:

- The same level of skin protection as Level B, but a lower level of respiratory protection is required;
- The types of air contaminants have been identified, concentrations measured, and an air-purifying respirator is available that can remove contaminants; or,
- The substance has adequate warning properties and all criteria for the use of APR respirators has been met

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6.4 Mod Level D Protection Shall Be Used When:

- The atmosphere is demonstrated to be within OSHA permissible limits
- Work functions preclude splashes, immersion or the potential for unexpected inhalation of, or contact with, hazardous concentrations of harmful chemicals.

Mod Level D Protection Equipment at a Minimum Shall Consist of:

Chemical/Particulate Protective Coveralls	Poly-coated Tyvek or Particulate Barrier or equivalent for both
Safety Shoes/Boots	Steel toed/shank work boots
Boot Covers (booties)	Latex
Work Gloves	Cut resistant gloves
Hard Hat	ANSI approved
High Visibility Garment	ANSI Class 2 high-visibility
Face Shield	As necessary
Safety Glasses	ANSI approved
Modifications:	

6.5 Level D Protection Shall Be Used When:

- The atmosphere is demonstrated to be below OSHA permissible exposure limits
- Work functions preclude splashes, immersion or the potential for unexpected inhalation of, or contact with, hazardous concentrations of harmful chemicals.

Level D Protection Equipment at a Minimum Shall Consist of:

Standard Work Clothing	Long pants/sleeved shirt
Rain Suit	As required
Safety Shoes/Boots	Steel toed/shank
Boot Covers (booties)	During muddy conditions as necessary
Work Gloves	Cut resistant gloves
Hard Hat	ANSI approved
Safety Glasses	ANSI approved
High Visibility Garment	ANSI Class 2 high-visibility
Modifications:	

6.6 Decisions to Upgrade/Downgrade PPE

All decisions to downgrade from Level B to C or D must be accompanied by air monitoring results. The Project Health and Safety Manager must be consulted prior to on-site decisions to downgrade. All decisions must be documented with an Addendum to the HASP.

The following conditions will necessitate reevaluation of PPE use.

- commencement of a new work not previously identified
- change of job tasks during a work phase
- change of season/weather
- contaminants other than those identified in Safety Plan
- change in ambient levels of contaminants
- change in work which affects degree of chemical contact

6.7 Project Personal Equipment Requirements



Project Personal Protective Equipment Requirements:							
Activity	Respiratory Protection	Body Protection	Head Protection	Hand Protection	Eye/Face Protection	Foot Protection	Hearing Protection
Site Mobilization / Preparation (Level D)	None	ANSI- Class 2 Hi Vis vest	ANSI- approved hardhats	Cut resistant work gloves (CR 4)	ANSI- approved safety glasses	ANSI- approved safety boots	Hearing protection for levels > 85 dBs
Wet Cleaning (Mod Level D)	None	Particulate barrier disposable coverall ANSI Class-2 Hi-Vis Vest	ANSI- approved hardhats	Cut resistant work gloves (CR 4)	- ANSI- approved safety glasses	ANSI- approved safety boots with dust covers	Hearing protection for levels > 85 dBs
HEPA Vacuum (Mod Level D)	None	Particulate barrier disposable coverall ANSI Class-2 Hi-Vis Vest	ANSI- approved hardhats	Cut resistant work gloves (CR 4)	ANSI- approved safety glasses	ANSI- approved safety boots	Hearing protection for levels > 85 dBs

Personal Protective Equipment Inspection and Care are covered in the ER SOP HS-24.

6.8 Respiratory Protection Program

ER shall implement ER SOP HS-26 Respiratory Protection Program for its employees and subcontractors and train them on its contents. The program will be administered by the HSO.

Respiratory protective equipment shall be NIOSH-approved and use shall conform to OSHA 29 CFR Part 1910.134 Requirements. ER and subcontractors shall maintain a written respirator program detailing selection, use, cleaning, maintenance and storage of respiratory protective equipment.

7.0 Medical Monitoring Requirements

7.1 Pre-Employment Medical Examination

- a. Pre-employment medical examinations are required for persons working at hazardous waste sites.
- b. All examinations must be completed and documented prior to assignment to this site.
- c. All examinations will be conducted following parameters established by WorkCare™.

7.2 Site Specific Medical Examination

- a. Blood lead/ZPP testing shall be performed per HS-48 Lead Hazard Safety Program

7.3 Annual Medical Examination

- a. The medical examination must have been within a 12-month period prior to on-site activity and repeated annually.

7.4 Suspected Exposure Medical Examination

- a. Following any suspected uncontrolled exposure to site contaminants, personnel should be scheduled for a special medical examination.
- b. The medical examination will be specific for the contaminants and the associated target organs or physiological system.
- c. Questions regarding the type of medical examination can be directed to ER’s Vice President, Health and Safety.

7.5 Contractor Physical Examination Requirements



- a. All subcontractors entering the contamination reduction or exclusion zone will have adequate medical surveillance satisfying 29 CFR 1910.120.10 (f).

8.0 Health and Hazard Monitoring

According to 29 CFR 1910.120 (h) Air Monitoring shall be used to identify and quantify airborne levels of hazardous substances and health hazards in order to determine the appropriate level of employee protection needed on-site. ER shall be tasked for all air monitoring on this project and will maintain an air monitoring program to evaluate concentrations of specific chemical groups or contaminants in ambient air during work activities. This program will include both real-time, direct monitoring equipment, and chemical-specific personal air monitoring as appropriate.

Both area and personal monitoring will be conducted to document potential exposures to hazardous constituents, as well as to evaluate the adequacy of the Personal Protection Equipment (PPE) program.

8.1 Routine Air Monitoring Requirements

- Upon initial entry to rule out IDLH conditions
- When the possibility of an IDLH condition or flammable atmosphere has developed
- When work begins on a different portion of the site
- Contaminants other than those previously identified are being handled
- A different type of operation is initiated
- Employees are handling leaking drums or containers or working in areas with obvious liquid contamination
- During confined space work

Air monitoring will consist at a minimum of the criteria listed below. All air monitoring data will be documented and available in the command post site files for review by all interested persons. Air monitoring instruments will be calibrated and maintained in accordance with the manufacturer’s specifications. Calibration and maintenance performed will be entered in the site log and/or instrument log book.

8.2 Site Specific Air Monitoring Requirements

Health Hazard Monitoring:					
Real Time (Air, noise, heat, radiation, light)					
Activity	Target Analyte	Instrument	Frequency	Action Levels	Actions/Upgrade and Rationale
Cleaning (wet and Dry methods) (Level D)	Lead, Arsenic	Gilian personal sampling pumps or equivalent	Initial days of intrusive work 6 samples per HEG and periodic per HS-48 and 1926.62 thereafter*	Lead - .03 mg/m ³ Arsenic - .005 mg/m ³ Cadmium - .0025 mg/m ³	Cease operations reassess engineering controls and Level of PPE
Site wide	Temperature Extremes Heat Stress	Thermometer	Per HS-17Heat Stress	Per HS-17Heat Stress	Per HS-17Heat Stress

8.3 Integrated Personnel Exposure Monitoring

ER will perform personal exposure air monitoring. Monitoring shall be performed per ER HS-01 Air Monitoring and HS-48 Lead Hazard Safety Program. Sampling for Lead and Arsenic shall be conducted by ER utilizing equipment and media appropriate to NIOSH method 7300. Analysis will be done by AIHA accredited laboratory. Copies of all sampling data, including instrument calibration and maintenance, personal data sheets, COCs, and analytical results shall be maintained by ER.

9.0 Contamination Control and General Field Safety Rules

9.1 Work Zones



The primary purpose for site controls is to establish the hazardous area perimeter, to reduce migration of contaminants into clean areas and to prevent access or exposure to hazardous materials by unauthorized persons. At the end of each workday, the site should be secured or guarded, to prevent unauthorized entry. Site work zones will include:

Clean Zone/Support Zone (SZ)

This uncontaminated support zone or clean zone will be the area outside the exclusion and decontamination zones and within the geographic perimeters of the site. This area is used for staging of materials, parking of vehicles, office and laboratory facilities, sanitation facilities, and receipt of deliveries. Personnel entering this zone may include delivery personnel, visitors, security guards, etc., who will not necessarily be permitted in the exclusion zone. All personnel arriving in the support zone will upon arrival, report to the command post and sign the site entry/exit log. There will be one controlled entry/exit point from the clean zone to the decontamination zone.

Contamination Reduction Zone(CRZ)

The CRZ will provide a location for removal of contaminated personal protective equipment and final decontamination of personnel and equipment. All personnel and equipment should exit via the decon area. A separate decontamination area will be established for heavy equipment.

1. The CRZ is a buffer zone between contaminated and clean areas.
2. Identified by yellow banner guard or other noticeable material.
3. Decon line is located at the boundary of the CRZ entering the decontamination area.

Exclusion Zone/Hot Zone (EZ)

The exclusion zone will be the “hot-zone” or contaminated area inside the site perimeter. Entry to and exit from this zone will be made through a designated point and all personnel will be required to sign the hot zone entry/exit log located at the decon area. Appropriate warning signs to identify the exclusion zone should be posted (i.e. “DANGER – AUTHORIZED PERSONNEL ONLY”, “PROTECTIVE EQUIPMENT REQUIRED BEYOND THIS POINT”, etc.) Exit from the exclusion zone must be accompanied by personnel and equipment decontamination as described in Section 10.0 of this plan.

1. These areas will be defined by banner guard or similar material to identify boundaries
2. General Safety Rules for Exclusion Zone
 - a. wear the appropriate level of PPE defined in plan
 - b. do not remove any PPE or break the integrity to touch parts of your body
 - c. no smoking, eating or drinking
 - d. no horseplay
 - e. no matches or lighters in this zone
 - f. implement the communication and line of sight system

9.2 General Field Safety Rules

- Horseplay is not permitted at any time.
- All personnel coming on site will sign in and out on a daily basis.
- All visitors must be sent to the command post.
- Visitor log will be maintained at the command post or with the security guard.
- Visitors are not allowed in the work areas without authorization.
- Security will be maintained at the site by closing all gates during normal work hours. Site will be locked up in the evening.
- If unauthorized members of the public are found on site, contact RPM immediately and do not leave the individual unattended.
- It is ER policy to practice administrative hazard control for all site areas by restricting entrance to exclusion zones to essential personnel and by using operational SOPs.
- Whenever possible, avoid contact with contaminated (or potentially contaminated) surfaces. Walk around (not through) puddles and discolored surfaces. Do not kneel on the ground or set equipment on the ground. Stay away from any waste drums unless necessary. Protect equipment from contamination by bagging.



- Eating, drinking, or smoking is permitted only in designated areas in the support zone.
- Cell phone use is not allowed in EZ, unless authorized by Project HS Manager.
- Cell phone use while operating equipment is not allowed.
- Cell phone use while operating motor vehicles must comply with applicable DOT regulations
- Hands and face must be thoroughly washed upon leaving the decon area.
- Beards or other facial hair that interferes with respirator fit will preclude wearing a respirator.
- All equipment must be decontaminated or discarded upon exit from the exclusion zone.
- All personnel exiting the exclusion zone must go through the decontamination procedures described in Section 10.0.
- Safety Equipment described in Section 6.0 will be required for all field personnel.
- Personnel will only travel in vehicles where individual seats for each occupant are provided.
- Seat belts will be worn as required.
- Fire extinguishers will be available on site and in all areas with increased fire danger such as the refueling area.
- A minimum of two personnel with FA/CPR designations will always be on site whenever heavy equipment is operated.
- Only necessary personnel need to be on or around heavy equipment.
- Employees will not interfere with or tamper in any way with air monitoring equipment.
- Backhoes or other equipment with booms shall not be operated within a minimum of 10 feet of any electrical conductor.

Minimum Clearance from Energized Overhead Electric Lines

NOMINAL SYSTEM VOLTAGE	MINIMUM REQUIRED CLEARANCE
0-50 kV	10 feet
51-100 kV	12 feet
101-200 kV	15 feet
201-300 kV	20 feet
301-500 kV	25 feet
501-750 kV	35 feet
751-1000 kV	45 feet

- Buddy System
 - The buddy system is mandatory at any time that personnel are working in the exclusion zone, remote areas, on tanks, or when conditions present a risk to personnel.
 - A buddy system requires at least two trained/experienced people who work as a team and maintain at a minimum audible and/or visual contact while operating in the exclusion zone.
- Communication Procedures
 - Radios will be used for onsite communications and Channel (Repeater) will be the designated channel.
 - The crews should remain in constant radio or visual contact while on site.
 - The site evacuation signal will be 3 blasts on the air or vehicle horn.

10.0 Decontamination Procedures

In general, everything that enters the exclusion zone at this site, must either be decontaminated or properly discarded upon exit from the exclusion zone. All personnel, including any state and local officials must enter and exit the hot zone through the decon area. Prior to demobilization, contaminated equipment will be decontaminated and inspected before it is moved into the clean zone. Any material that is generated by decontamination procedures will be stored in a designated area in the exclusion zone until disposal arrangements are made.



NOTE: The type of decontamination solution to be used is dependent on the type of chemical hazards. The decontamination solution for this site is water. Decontamination solution will be changed daily (at a minimum) and collected and stored on-site until disposal arrangements are finalized.

10.1 Procedures for Equipment Decontamination

Following decontamination and prior to exit from the hot zone, the Response Manager shall be responsible for insuring that the item has been sufficiently decontaminated. This inspection shall be included in the site log.

Equipment decontamination will consist of the following steps: Dry Decon and Boot wash Clean with water/Proper Hygiene

10.2 Procedure for Personnel Decontamination

This decontamination procedure applies to personnel at this site wearing Mod Level D/Level D protection. These are the minimum acceptable requirements:

- Station 1: Brush boots clean of soil prior to exiting property
- Station 2: Remove outer disposable coveralls and work gloves (if applicable)
- Station 3: Wash hands and face
- Station 4: Personnel will not wear or bring dirty/decontaminated clothing into the break areas.

Eating, drinking, chewing gum/tobacco, smoking, or any practice that increases the probability of hand to mouth transfer and/or ingestion of materials is prohibited in any areas where the possibility of contamination exists and is permitted only in the designated break area.

Personnel will not wear or bring dirty/decontaminated clothing into the break areas.

10.3 Disposition of Decontamination Wastes

1. All equipment and solvents used for decontamination shall be decontaminated or disposed of with the established waste streams.

11.0 Hazard Communication Program

Each contractor will be responsible for maintaining a copy of their Hazardous Communication Program and SDS' on site. The following items are specific to this job site:

11.1 Safety Data Sheets

1. SDS' will be readily available on site
2. SDS' will be available to all employees for review during the work shift

11.2 Container Labeling

1. All containers received on site will be inspected by the contractor using the material to ensure the following:
 - a. all containers clearly labeled
 - b. appropriate hazard warning
 - c. name and address of the manufacturer

11.3 Employee Training and Information

1. Prior to starting work, each employee will attend a health and safety orientation and will receive information and training on the following:
 - a. an overview of the requirements contained in the Hazardous Communication Standard
 - b. Hazardous chemicals present at the site
 - c. the location and availability of the written Hazard Communication Program
 - d. physical and health effects of the hazardous chemicals



- e. methods of preventing or eliminating exposure
- f. emergency procedures to follow if exposed
- g. how to read labels and review SDS' to obtain information
- h. location of chemical inventory list and SDS'

12.0 Emergencies/Incidents/Injuries

It is essential that site personnel be prepared in the event of an emergency. Emergencies can take many forms; illnesses or injuries, chemical exposure, fires, explosions, spills, leaks, releases of harmful contaminants, or sudden changes in the weather. Due to the nature of the work being performed in residential yards, there is the possibility of contacting buried electrical, sewer, natural gas, or propane lines during the removal of the impacted soils or while initially potholing utilities to confirm their location and depth.

The following sections outline the general procedures for emergencies. Emergency information should be posted as appropriate.

12.1 Emergency Contacts for the USS Lead - Zone 2 Site

Emergency Call List and Project Organization		
Service	Name/Organization	Emergency Phone
Fire/Police/Emergency Medical	East Chicago Fired Department	911
*Hospital	St. Catherine Hospital 4321 Fir Street East Chicago, IN. 46312	219-392-7200 ER
*Occupational Medicine Clinic	Comprehensive Care 7501 West 15 th Avenue Gary, Indiana 46406	219-977-2090
Injury Care Management – 1 Source	Mike Pelz - Primary Dee Wolak	219-427-5953/815-370-2940 219-427-5935/855-517-6872
ER Response Manager	John Behrens	708-473-7124
ER Site Health and Safety Officer	John Behrens	708-473-7124
ER Project HS Manager	Nick Michailides	314.749.2290
Tetra Tech Project Manager	TBD	TBD
Tetra Tech Site Lead	TBD	TBD
Tetra Tech Safety Manager	Chris Draper	615-969-1334

*Directions from site to hospital and clinic are located in Attachment B and will be posted in the project office and available in all ER vehicles.

Site employees will be familiarized with hospital and clinic location and directions shall be verified by John Behrens or his designee as needed.

13.6 Additional Emergency Numbers

Poison Control Center	800-222-1222
National Response Center	800-424-8802
Center for Disease Control	800-232-4636
ATF (Bomb Hotline)	888-ATF-BOMB (888-283-2662)
Chemtrec	800-262-8200

<u>Environmental Restoration LLC Contacts</u>	
ER Corporate Office	888-814-7477 (24 Hr.)



13.6 Emergency Equipment Available On-Site

Communications Equipment	Location
Public Telephones	TBD
Mobile Telephones	John Behrens 708-473-7124
Two-Way Radios	Not applicable
Emergency Alarms/Horns	Vehicle Horns / Air Horn
Other:	Not Anticipated

Medical Equipment	Location
First Aid Kits	ER Vehicles / Command Post Office/With Crews
Eye Wash Bottles/Station: (within 100 feet of hazard zone)	ER Vehicles / Command Post Office/With Crews
Safety Shower	Not Anticipated

Fire Fighting Equipment	Location
Fire Extinguishers	ER Vehicles / Command Post Office/CRZ
Other	Flammables storage area

Spill or Leak Equipment	Location
Absorbent Boom/Pads:	Support Zone/Storage trailers
Dry Absorbent:	Support Zone/Storage trailers

12.4 Incident Reporting/Investigations

- All incidents, including personal injury and property damage, must be reported to the PM, Supervisor, or HSO **within 20 minutes of occurrence**.
- The PM will contact the Project Health and Safety Manager and Client Representative by telephone immediately. The PM, HSO, and effected employee(s) will conduct an immediate investigation of the incident and document all results on the Incident and Investigation Report form.
- The Response Manager will assign a supervisory individual to accompany all injured personnel to the clinic and follow guidelines outlined in the ER Return to Work Program.
- Copies of all Incident and Investigation Reports will be sent to the ER Vice President, Health and Safety.

13.0 Emergency Response Contingency Plan

13.1 Project Personnel Responsibilities during Emergencies

As the administrator of the project, the PM has primary responsibility for responding to and correcting emergency situations. The PM will:

- Take appropriate measures to protect personnel including: withdrawal from the exclusion zone, total evacuation and securing of the site, up-grading or down-grading the level of protective clothing and respiratory protection.
- Take appropriate measures to protect the public and the environment including isolating and securing the site, preventing run-off to surface waters and ending or controlling the emergency to the extent possible.
- Ensure that appropriate Federal, State and local agencies are informed, and emergency response plans are coordinated. In the event of fire or explosion, the local fire department should be summoned immediately. In the event of an air release of toxic materials, the local authorities should be informed in order to assess the need for evacuation. In the event of a spill, sanitary districts and drinking water systems may need to be alerted.
- Ensure that appropriate decon treatment or testing for exposed or injured personnel is obtained.
- Determine the cause of the incident and make recommendations to prevent the recurrence.
- Ensure that all required reports have been properly prepared and submitted.



13.2 Medical Emergencies:

Any person who becomes ill or injured in the exclusion zone must be decontaminated to the maximum extent possible. If the injury or illness is minor, full decontamination should be completed and first aid administered prior to transport. If the patient's condition is serious, at least partial decontamination should be completed (i.e., complete disrobing of the victim and redressing in clean coveralls or wrapping in a blanket.) First aid should be administered while awaiting an ambulance or paramedics. All injuries and illnesses must immediately be reported to Vice President of Health and Safety.

Onsite First Aid Support

Onsite medical support during project execution will be available from two or more individuals who are trained in First Aid and Cardiopulmonary Resuscitation (CPR) and blood borne pathogens. First aid kits shall be Type III, 16 unit kits, including one pocket mouthpiece or CPR barrier. Kits shall be checked prior to use, and at least weekly when work is in progress to ensure that contents are replaced as used.

Medical Transport of Employees and Case Management

For non-life threatening injuries, a local clinic will be identified with the assistance of the Corporate Medical Consultant, 1 Source. 1 Source will be contacted prior to transporting any non-life threatening injured worker to the clinic to develop an appropriate medical treatment plan. If medical evaluation is necessary, the 1 Source nurse/physician will contact the clinic ahead of the arrival of the patient to establish oversight of case management. Under no circumstances will an injured employee drive unescorted to a hospital, clinic, etc. An employee with minor injury may be transported by car after first aid treatment is given. The HSO or other project management personnel will transport the injured person to the facility. The employee who transports the injured person shall be trained in first aid and CPR whenever possible. When the injury is severe, or when in doubt concerning the severity of injury, the employee will be transported by ambulance.

Injured employees that require medical treatment or are taken to a doctor, hospital, clinic, etc., will not be allowed to resume work without a written return to work statement from the treating physician. This statement shall supply a medical diagnosis of the problem, the date of return to work, and work limitations. Should a return to work statement such as "light duty" be given, the treating physician will be contacted to determine the specific limitation. ER will make an assessment of work the employee routinely performs whether or not the limitation interferes with the employee's routine job assignment.

Whenever there are questions on the appropriateness of the diagnosis or prescribed course of treatment, 1 Source will be contacted to arrange for a second opinion. Copies of all Incident and Investigation Reports will be sent to the ER Vice President of Health and Safety.

13.3 Fire or Explosion:

In the event of a fire or explosion, the local fire department should be summoned immediately. Upon their arrival the RM or designated alternate will advise the fire commander of the location, nature and identification of the hazardous materials on-site.

If it is safe to do so, site personnel may:

- Use firefighting equipment available on site.
- Remove or isolate flammable or other hazardous materials which may contribute to the fire.

13.4 Spills, Leaks or Releases:

In the event of a spill or a leak, site personnel will:

- Locate the source of the spillage and stop the flow if it can be done safely.
- Begin containment and recovery of the spilled materials.



13.5 Severe Weather Conditions Requiring Emergency Shut Down

The HSO or designated representative will monitor weather reports issued by the local media and the National Weather Service (NWS), and be notified immediately in the event of impending storms. Weather monitoring will be increased when signs of impending storms, including darkening skies, increased wind, heavy rain, or thunder/lightning, are noticed.

The general rule for lightning is “If You See It, Flee It; If You Hear It, Clear It.” The flash/bang (f/b) technique may be used to estimate distance to lightning, although using this method requires accurate matching of lightning to thunder, which may not always be possible. The f/b technique is defined as: for each five seconds from the time of observed lightning flash to hearing the associated thunder, the lightning is one mile away. All outside activities will be suspended when a lightning flash is observed in the immediate area, or an f/b of 30 seconds (6 miles) or less is noted. Personnel may continue indoor work activities except for the use of electrical equipment, telephones, and computers. Upon suspension of site activities, all site personnel will gather in a safe location in the support zone for a head count and further instructions. Activities may resume when 30 minutes has passed since the last observable f/b of 30 seconds or less. If a sudden lightning storm catches personnel in an exposed area, they should seek the lowest possible area, away from large objects which may attract lightning or fall over, and assume a crouching position with head lowered. AREAS TO AVOID INCLUDE WATER, TREES, UTILITY POLES, HIGH GROUND, HEAVY EQUIPMENT, AND ALL TALL, ISOLATED OBJECTS. A person struck by lightning needs immediate, professional medical assistance (contact 911). The body will not carry an electrical charge, so personnel trained in first aid/CPR should assist with treatment for shock and/or burns until professional medical assistance is available.

13.6 Evacuation Routes and Resources:

Evacuation routes will be established by work area locations for this site. All buildings and outside work areas shall be provided with two designated exit points. Evacuation shall be conducted immediately, without regard for equipment under conditions of extreme emergency. See site map for evacuation routes.

1. Evacuation notification will be three blasts on an air horn, vehicle horn, or by verbal communication via radio.
2. Keep upwind of smoke, vapors or spill location.
3. Exit through the decontamination corridor if possible.
4. If evacuation is not via the decontamination corridor, site personnel should remove contaminated clothing once they are in a location of safety and leave it near the exclusion zone or in a safe place.
5. The PM will conduct a head count to insure all personnel have been evacuated safely.
6. In the event that emergency site evacuation is necessary, all personnel are to:
 - Escape the emergency situation;
 - Decontaminate to the maximum extent practical; and,
 - Meet at the command post.
7. In the event that the command post is no longer in a safe zone, meet: at the designated upwind location established in the daily safety meeting.

14.0 **Internal Safety Inspections and Audits**

Formal safety inspections and audits are required to identify potential health and safety hazards. It is intended to assure documentation of such inspections and audits and to stimulate management, supervisor and employee participation in identifying and correcting hazards and non-compliance situations.

Inspections and audits shall be carried out per ER Corporate Health and Safety Program,



**ENVIRONMENTAL
RESTORATION, LLC**

**ERRS REGION 5 CONTRACT EP-S4-16-02
Site Health and Safety Plan
USS Lead – Zone 2 & 3 Cleaning**

Attachment A

Site Health and Safety Plan Amendments



Site Safety Plan Amendment	
Amendment No.:	
Site Name:	
Date of Issue:	
Type of Amendment:	
Reason for Amendment:	.
Alternate Safeguard Procedures:	
Required Changes in PPE:	.

USEPA OSC R5

(Date)

ER Site Health and Safety Officer

(Date)

ER Response Manager

(Date)

ER Project Health and Safety Manager

(Date)



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**ERRS REGION 5 CONTRACT EP-S4-16-02
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USS Lead – Zone 2 & 3 Cleaning**

**Attachment B
Site Maps**



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**ERRS REGION 5 CONTRACT EP-S4-16-02
Site Health and Safety Plan
USS Lead – Zone 2 & 3 Cleaning**



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Site Health and Safety Plan
USS Lead – Zone 2 & 3 Cleaning**

HOSPITAL LOCATION

(A map to the hospital will be generated for each active location)

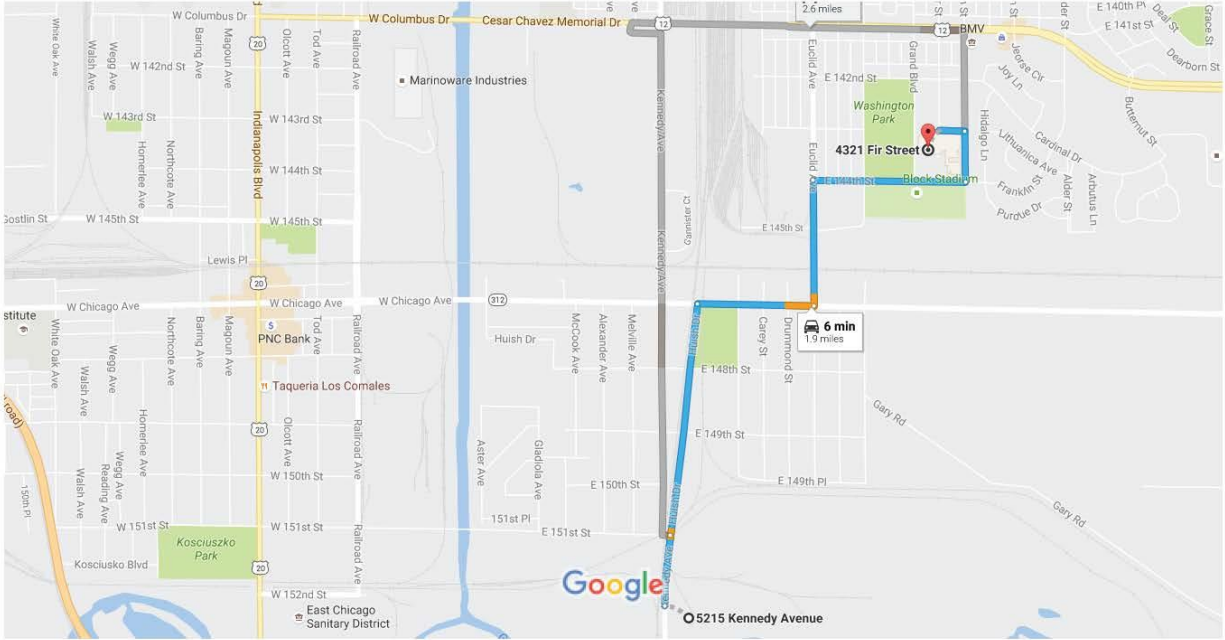


9/10/2016

5215 Kennedy Ave, East Chicago, IN to 4321 Fir Street, East Chicago, IN 46312 - Google Maps



5215 Kennedy Ave, East Chicago, IN to 4321 Fir Street, Drive 1.9 miles, 6 min
East Chicago, IN 46312



Map data ©2016 Google 1000 ft



9/10/2016

5215 Kennedy Ave, East Chicago, IN to 4321 Fir Street, East Chicago, IN 46312 - Google Maps

5215 Kennedy Avenue

East Chicago, IN 46312

- ↑ 1. Head north on Kennedy Ave 0.2 mi

- ↑ 2. Continue onto Huish Dr 0.6 mi

- ↪ 3. Turn right onto E Chicago Ave 0.3 mi

- ↶ 4. Turn left onto Euclid Ave 0.3 mi

- ↪ 5. Turn right onto E 144th St 0.4 mi

- ↶ 6. Turn left onto Elm St 0.1 mi

- ↶ 7. Turn left onto E 143rd St 331 ft

4321 Fir Street

East Chicago, IN 46312

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.



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**ERRS REGION 5 CONTRACT EP-S4-16-02
Site Health and Safety Plan
USS Lead – Zone 2 & 3 Cleaning**

OCCUPATIONAL MEDICINE CLINIC LOCATION



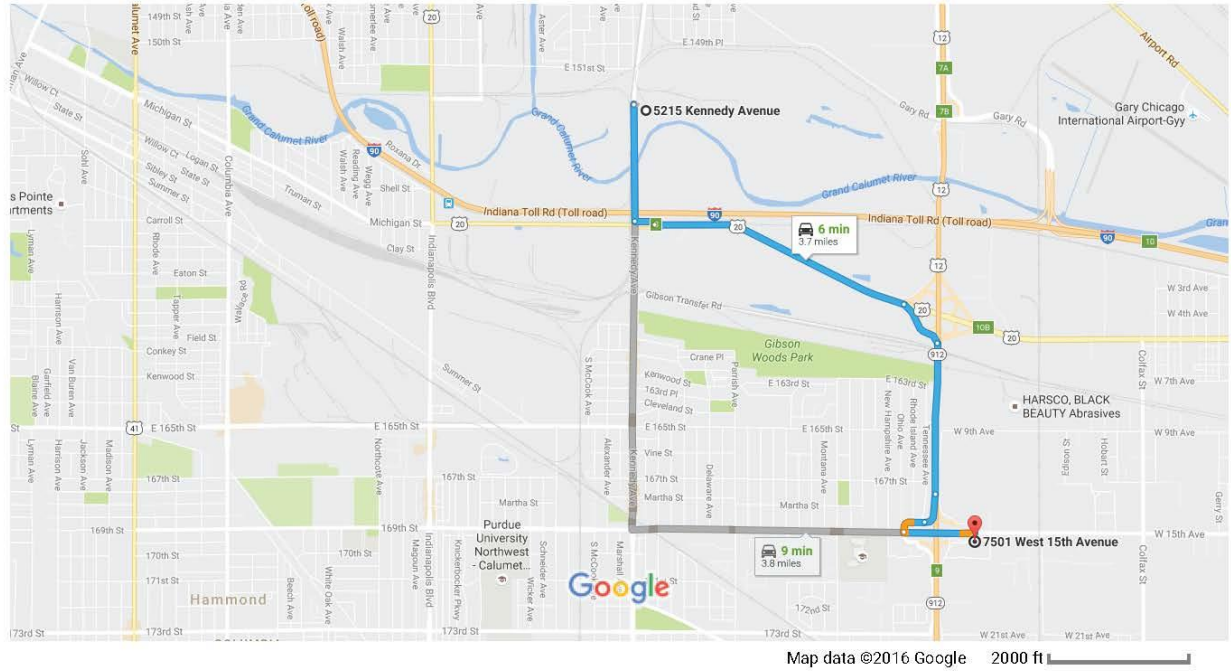
9/10/2016

5215 Kennedy Ave, East Chicago, IN to 7501 West 15th Avenue, Gary, IN - Google Maps



5215 Kennedy Ave, East Chicago, IN to 7501 West 15th Avenue, Gary, IN Drive 3.7 miles, 6 min

1 Source Occupational Health Clinic





9/10/2016

5215 Kennedy Ave, East Chicago, IN to 7501 West 15th Avenue, Gary, IN - Google Maps

5215 Kennedy Avenue

East Chicago, IN 46312

Get on Michigan St from Kennedy Ave

- 1 min (0.7 mi)
 - ↑ 1. Head south on Kennedy Ave
 - 0.6 mi
 - ⤴ 2. Turn left onto the ramp to Michigan St
 - 0.1 mi

Continue on Michigan St. Take IN-912 E to Tennessee Ave. Take the exit toward 15 th Ave/169 th St from IN-912 E

- 3 min (2.5 mi)
 - ⤴ 3. Turn left onto Michigan St
 - 1.3 mi
 - ⤴ 4. Slight right onto the IN-912 S ramp to Cline Ave
 - 0.3 mi
 - ⤴ 5. Merge onto IN-912 E
 - 0.7 mi
 - ⤴ 6. Take the exit toward 15 th Ave/169 th St
 - 0.2 mi

Drive to W 15th Ave in Gary

- 1 min (0.5 mi)
 - ↑ 7. Continue onto Tennessee Ave
 - 0.1 mi
 - ⤴ 8. Turn left onto W 15th Ave/169th St
 - ⓘ Continue to follow W 15th Ave
 - ⓘ Destination will be on the right
 - 0.4 mi

7501 West 15th Avenue

Gary, IN 46406

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.



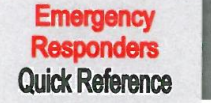
Attachment C

Chemical Inventory List & Chemical Hazard Information

1. Gasoline
2. Diesel Fuel
3. Lubricating Grease
4. Motor oils
5. Hydraulic fluids
6. Penetrant fluids
7. Power steering fluid
8. Brake fluid
9. Transmission fluid
10. SeaFoam fuel treatment
11. Portland Cement
12. Herbicides
13. Fertilizers
14. Free Flow 200
15. Fluorescent lamps – Phosphor and Mercury
16. PVC Cement
17. PVC Primer
18. Bar and Chain oil
19. Insecticides
20. Insect repellants
21. Cleaners
22. Liquid Paper
23. Hand sanitizers
24. Bleach
25. Disinfectants
26. Anti-freeze / Coolant
27. Dry chemical – Fire Extinguishers
28. Toilet Deodorizer
29. Antiseptics
30. Dust and Lint remover – Aerosol
31. Shredder lubricant
32. Printer ink
33. Air freshener
34. Windshield washer fluid
35. Plant growth regulator
36. Paint
37. DEF Fluid
38. Dust suppressant
39. Floor absorbent
40. Armor all protectant
41. Eye wash



Right to Know Hazardous Substance Fact Sheet



Common Name: **LEAD**

Synonym: Metallic Lead

CAS No: 7439-92-1

Molecular Formula: Pb₂

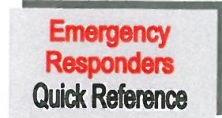
RTK Substance No: 1096

Description: Heavy, soft, silvery-gray metal

HAZARD DATA		
Hazard Rating 4 - Health 0 - Fire 0 - Reactivity DOT#: UN 3077 ERG Guide #: 171 Hazard Class: 9 (Environmentally Hazardous Substance)	Firefighting Extinguish fire using an agent suitable for type of surrounding fire. Lead itself does not burn. POISONOUS FUMES ARE PRODUCED IN FIRE, including <i>Lead Oxides</i> . Use water spray to keep fire-exposed containers cool.	Reactivity Lead reacts violently with HYDROGEN PEROXIDE; AMMONIUM NITRATE; ZIRCONIUM; SODIUM AZIDE; SODIUM ACETYLIDE; and CHLORINE TRIFLUORIDE. Lead is not compatible with OXIDIZING AGENTS (such as PERCHLORATES, PEROXIDES, PERMANGANATES, CHLORATES, NITRATES, CHLORINE, BROMINE and FLUORINE) and STRONG ACIDS (such as HYDROCHLORIC, SULFURIC and NITRIC).
SPILL/LEAKS	PHYSICAL PROPERTIES	
Isolation Distance: 10 to 25 meters (30 to 80 feet) Use a HEPA-filter vacuum for clean-up. Toxic to aquatic organisms. Hazardous to the environment and persists in the environment.	Odor Threshold: No odor Flash Point: Not combustible LEL: N/A UEL: N/A Specific Gravity: 11.35 at 68°F (20°C) Vapor Pressure: 0 mm Hg at 68°F (20°C) Water Solubility: Insoluble Boiling Point: 3,164°F (1,740°C) Melting Point: 621.5°F (327.5°C)	
EXPOSURE LIMITS	PROTECTIVE EQUIPMENT	
OSHA: 0.05 mg/m ³ , 8-hr TWA NIOSH: 0.05 mg/m ³ , 10-hr TWA ACGIH: 0.05 mg/m ³ , 8-hr TWA IDLH LEVEL: 100 mg/m ³	Gloves: Nitrile, Latex, Rubber Coveralls: DuPont Tyvek® Boots: Latex, Butyl, Neoprene Respirator: <0.5 mg/m ³ - N100 >0.5 mg/m ³ - full facepiece APR with High Efficiency filters >50 mg/m ³ but ≤100 mg/m ³ Supplied Air	
HEALTH EFFECTS	FIRST AID AND DECONTAMINATION	
Eyes: Irritation Skin: No Information Acute: Headache, irritability, upset stomach, and weakness Chronic: <i>Lead</i> may cause lung, brain, stomach, and kidney cancer in humans. Metallic taste, colic, muscle cramps Damage to the nervous system	Remove the person from exposure. Flush eyes with large amounts of water for at least 15 minutes. Remove contact lenses if worn. Remove contaminated clothing and wash contaminated skin with soap and water. Transfer to a medical facility.	



Right to Know Hazardous Substance Fact Sheet



Common Name: **ARSENIC**

Synonyms: Gray Arsenic; Arsen

CAS No: 7440-38-2

Molecular Formula: As

RTK Substance No: 0152

Description: Silver-gray or white metallic, odorless, brittle solid

HAZARD DATA		
Hazard Rating	Firefighting	Reactivity
4 - Health 0 - Fire 0 - Reactivity DOT#: UN 1558 ERG Guide #: 152 Hazard Class: 6.1 (Poison)	<p>Arsenic is noncombustible, however, <i>Arsenic dust</i> or <i>fine powder</i> can explode when exposed to heat, flame or hot surfaces.</p> <p>Use dry chemical, CO₂, water spray or foam as extinguishing agents.</p> <p>POISONOUS GASES ARE PRODUCED IN FIRE, including <i>Arsenic Oxides</i>.</p> <p>Use water spray to keep fire-exposed containers cool.</p>	<p>Arsenic reacts with OXIDIZING AGENTS (such as PERCHLORATES, PEROXIDES, PERMANGANATES, CHLORATES, NITRATES, CHLORINE, BROMINE and FLUORINE) to cause fires and explosions.</p> <p>Arsenic reacts with ACIDS (such as HYDROCHLORIC, SULFURIC and NITRIC) and HYDROGEN GAS to produce toxic <i>Arsine gas</i>.</p> <p>Arsenic is not compatible with <i>powdered METALS</i> (such as ZINC, LITHIUM, RUBIDIUM and PLATINUM); BROMINE AZIDE; LEAD MONOXIDE; and MERCURY OXIDE.</p>

SPILL/LEAKS
<p>Isolation Distance:</p> <p>Spills: 25 to 50 meters (75 to 150 feet)</p> <p>Fire: 800 meters (1/2 mile)</p> <p>Moisten spilled material first or use a HEPA-filter vacuum for clean-up.</p> <p>DO NOT wash into sewer.</p> <p>Toxic to aquatic organisms.</p>

PHYSICAL PROPERTIES
<p>Odor Threshold: Odorless</p> <p>Flash Point: Noncombustible solid</p> <p>Vapor Pressure: 1 mm Hg at 701°F (372°C)</p> <p>Specific Gravity: 5.7 (water = 1)</p> <p>Water Solubility: Insoluble</p> <p>Boiling Point: 1,350°F (613°C)</p> <p>Ionization Potential: 9.87 eV</p> <p>Molecular Weight: 74.9</p>

EXPOSURE LIMITS
<p>OSHA: 0.01 mg/m³, 8-hr TWA</p> <p>NIOSH: 0.002 mg/m³, 15-min Ceiling</p> <p>ACGIH: 0.01 mg/m³, 8-hr TWA</p> <p>IDLH: 5 mg/m³</p>

PROTECTIVE EQUIPMENT
<p>Gloves: Natural Rubber, Nitrile or Silver Shield®</p> <p>Coveralls: DuPont Tyvek®</p> <p>Respirator: <0.1 mg/m³ - Full facepiece APR with High efficiency filter <0.5 mg/m³ -Supplied air</p>

HEALTH EFFECTS
<p>Eyes: Irritation, burns, red and watery eyes</p> <p>Skin: Irritation, burns, itching, rash and loss of pigment</p> <p>Inhalation: Nose and throat irritation with coughing, wheezing and hoarseness Weakness, headache, nausea, vomiting, and muscle cramps</p> <p>Chronic: Cancer (skin and lung) in humans</p>

FIRST AID AND DECONTAMINATION
<p>Remove the person from exposure.</p> <p>Flush eyes with large amounts of water for at least 15 minutes. Remove contact lenses if worn. Seek medical attention.</p> <p>Quickly remove contaminated clothing and wash contaminated skin with large amounts of soap and water.</p> <p>Begin artificial respiration if breathing has stopped and CPR if necessary.</p> <p>Transfer to a medical facility.</p>



**ENVIRONMENTAL
RESTORATION, LLC**

**ERRS REGION 5 CONTRACT EP-S4-16-02
Site Health and Safety Plan
USS Lead – Zone 2 & 3 Cleaning**

Attachment D

Lead Hazard Safety Program



	Employee Health and Safety Policy Manual	Procedure #:	HS-48
		Page:	1 of 9
	Subject: Lead Hazard Safety Program	Revision:	01
		Issue Date:	January 26, 2011

LEAD HAZARD TRAINING COURSE OUTLINE

I. Federal OSHA Lead Construction Standard (29 CFR 1926.62)

A. Scope

1. All construction work involving exposure to lead, including:

- a) Demolition or salvage
- b) Removal or encapsulation of lead materials
- c) New construction
- d) Transportation, disposal, and storage of lead materials.
- e) Maintenance operations
- f) Lead contamination/emergency cleanup

B. Exposure Limits

1. The PEL is 50 micrograms of lead per cubic meter of air averaged over an 8-hour period.
2. The Action Level (AL) is 30 micrograms of lead per cubic meter of air averaged over an 8-hour period.
3. If respirators are used, actual exposures will be calculated by applying protection factor of respirator to air monitoring results.

C. Exposure Assessment

1. Employer must determine if lead exposures are at or above AL.
2. Exposure assessment will be made by collecting personal samples representative of a full shift for each job classification.
3. Until exposure assessment is completed, it will be assumed that worker exposures are >PEL but < 10 times PEL. Therefore, respirators and protective clothing will be worn during assessment period.
4. Workers will also receive baseline blood tests for lead and be provided with appropriate training, hand washing facilities, and change areas.
5. If exposure results are below AL, no further monitoring will be conducted unless site operations change.
6. If exposure results are above AL but below PEL, monitoring will be repeated every six months.
7. If exposure results are above PEL, monitoring will be repeated quarterly.

Within 5 working days after completion of exposure assessment, each worker will be informed in writing of their monitoring results.

D. Method of Compliance

1. The employer shall implement engineering and work practice controls, including administrative controls, to reduce and maintain employee exposure to lead to or below the permissible exposure limit to the extent that such controls are feasible.

E. Respiratory Protection

1. Respirators will be used whenever employee exposure to lead exceeds the PEL.
2. Employees who use respirators will be fit tested initially and 6 months thereafter.



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F. Protective Clothing and Equipment

1. Employees will wear protective clothing in areas where exposures exceed the PEL. This clothing will be provided at no cost to the employee. Protective clothing will be properly removed, repaired, disposed of, and/or laundered.

G. Housekeeping

1. All surfaces shall be maintained as free as practicable of accumulations of lead.
2. Compressed air, by itself, shall not be used to remove lead from surfaces.

H. Hygiene Facilities and Practices

1. In areas where lead exposure levels are above the PEL:
 - a. No food, beverage, or tobacco products will be allowed.
 - b. Workers must wash hands before leaving site.
 - c. Workers must change clothing in designated change areas
 - d. Where feasible, workers should also shower before leaving site.


I. Medical Surveillance

1. Employees who are exposed to lead above AL for more that 30 days a year must participate in a medical monitoring program. Initial medical surveillance, consisting of blood lead testing, will also be made available to workers exposed at or above the AL.
2. For lead exposure above AL for 30 days or more a year, biological monitoring must be conducted every 2 months or the first 6 months and every 6 months thereafter.
4. Biological monitoring will be repeated every 2 months for workers who have blood lead levels at or above 40 micrograms per deciliter.
4. For employees who are removed from exposure due to elevated blood lead levels (> 50 micrograms per deciliter), they will be re-tested within 2 weeks after receiving test results and every month thereafter during removal period.
5. Employees will be notified of their blood level results within 5 days of receiving monitoring results.
6. Employees whose blood levels exceed 40 micrograms per deciliter will be informed of the medical removal criteria of 50 micrograms per deciliter.
7. Employees who are exposed to lead above its action level for 30 days or more per year and who have blood lead levels above 40 micrograms per deciliter, will be offered medical exams at least annually or whenever exposure symptoms appear.

J. Chelation

1. The employer shall ensure that any person whom he retains, employs, supervises or controls does not engage in prophylactic chelation of any employee at any time.
2. If therapeutic or diagnostic chelation is to be performed, the employer shall assure that it be done under the supervision of a licensed physician in a clinical setting.



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K. Medical Removal Protection

1. Employees who are exposed to lead above its action and who have blood lead levels at or above 50 micrograms per deciliter or who have a medical condition which places them at increased risk of health impairment from this exposure, will be removed from their lead exposure work.
2. Employees who were removed from work due to elevated blood lead levels will be returned to their job when tests indicate that their blood lead level is at or below 40 micrograms per deciliter.
3. Employees who are removed from their jobs for the reasons mentioned above or who are removed voluntarily will retain their normal earnings, seniority, and other employment rights and benefits during the time of their removal, up to a maximum of 8 months, provided by the employer.

L. Employee Information and Training

1. Prior to starting work, employees must be trained in the following topics:
 - a. Content of this standard
 - b. Site activities that could result in lead exposures above action level
 - c. Purpose, selection, fitting, use, and limitation of respirators
 - d. Description of medical surveillance program and health effects from lead exposure
 - e. Engineering and work practice controls
 - f. Contents of compliance plan
 - g. Chelating agent precautions
 - h. Employee rights to records and information

M. Signs

1. Lead warning signs must be posted at the job site.

N. Recordkeeping

1. Detailed exposure monitoring and medical surveillance records will be maintained on each employee covered by these requirements. These records will be maintained by the employer for 30 years and will be made available to the employee upon request.

II. Respirator Usage


A. Purpose

1. Respirators will be worn to ensure that personnel exposures to lead do not exceed permissible exposure limits during the eight hour work shift. The use of respirators will be discontinued if it can be shown through personal exposure monitoring that airborne lead levels are below permissible limits. Respiratory protection will also be provided to employees who request it.

B. Selection

Full-face air purifying respirators equipped with P100 dust cartridges will be worn during those phases of work requiring the use of respiratory protection. This respiratory equipment will protect workers from excess exposures up to a maximum lead dust level of 2500 micrograms per cubic meter of air. Only National Institute for Occupational Safety and Health (NIOSH) approved respirators will be used and each user will be given a respirator of a size and brand that fits well and operates properly. Each user will be fit-tested using irritant smoke to ensure a proper fit.



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If dust conditions require an upgrade of respiratory protection, respirators with higher protection factors will be selected as per Table 1 of WAS 296-155-17613 and issued to site workers.

C. Fitting

Each employee will be fit-tested in their respiratory protective equipment using irritant smoke prior to starting work. A record of their fit-test results will be maintained at the job site. This fit-test will be repeated for each new brand, size, and type of respirator used and whenever conditions change that could alter the fit of the respirator. All employees must be clean shaven when wearing a respirator.

D. Use

Respirators will be worn in all controlled work areas where lead dust levels exceed an airborne concentration of 50 micrograms per cubic meter of air. Respirators will be cleaned and disinfected at the end of each shift and placed in plastic bags for storage. Respirators are not to be taken off in controlled work areas nor are they to be placed on contaminated surfaces. A negative pressure check must be conducted on the respirator each time it is worn. Prior to donning this equipment, the respirator must be inspected to ensure it is clean, in good condition and is in working order. Cartridges must be replaced at the end of each shift or whenever breathing resistance through the cartridges becomes too difficult.

E. Limitations

Full-face air purifying respirators equipped with P100 cartridges are not to be worn in lead dust concentrations > 2500 micrograms per cubic meter or in oxygen deficient atmospheres (< 19.5% O₂). Proper face-piece seal is critical; therefore, all employees wearing respiratory protective equipment must be clean shaven. Medical approval is required to wear a respirator and a record of such will be kept at the job site. As mentioned above, cartridges must be replaced at the end of each shift or whenever breathing becomes difficult. Equipment must be inspected before and after each use.

III. Medical Surveillance

Each employee working in controlled work areas will be required to complete an annual medical exam consisting of a history, physical exam, and laboratory tests to ensure fitness for duty. Blood lead evaluations will also be required for participation in this project. In addition, exposure monitoring will be conducted on representative site workers to evaluate compliance with required exposure limits. Test results will be maintained by Environmental Restoration LLC for a minimum of 30 years. Copies of these test results will be available to each employee upon request.

If blood lead results exceed 50 micrograms per deciliter or if medical exam results identify a condition that would pose an unacceptable risk of injury to the employee from exposure to lead, the employee will be removed from lead exposure activities as per 29 CFR 1926.62(k). If chelation therapy is required to ameliorate high blood lead levels, this treatment will only be conducted under the direction of a licensed physician.

IV. Engineering Controls and Work Practices

Work will be conducted in accordance with the work plans for this project. The HASP describes the engineering and work practice controls that will be used to eliminate or reduce the risk of injuries during all phases of work. All site employees will be required to review and sign this document before starting work.



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The main lead exposure hazard associated with this project consists of breathing lead- contaminated dust that may become airborne when the soils on site are excavated. Lead exposures can also occur if lead contamination gets into your mouth and is swallowed, such as when one handles food, cigarettes, chewing tobacco, or make-up that has lead on them or when one handles these items with hands contaminated with lead.

Personal lead exposures will be controlled through the use of PPE (protective clothing and respirators) and through proper decontamination practices. Efforts will also be made during excavation to control dust emissions by using water spray to knock down dust.

V. Health Effects from Toxic Exposures

Lead is a potent, systemic poison that affects a variety of organ systems, including the nervous system, kidneys, reproductive system, blood formation, and gastrointestinal system. The most important way lead enters the body is through inhalation, but it can also be ingested when lead dust or unwashed hands contaminate food, drink, or cigarettes. Much of ingested lead passes through feces without absorption into the body. Adults may absorb only 2 to 15 percent of ingested lead; children may absorb a much larger fraction. Once in the body, lead enters the bloodstream and circulates to various organs. Lead concentrates and remains in bone for many years. The amount of lead the body stores increases as exposure continues, with possibly cumulative effects. Depending on the dose entering the body, lead can be deadly within several days or affect health after many years. Very high doses can cause brain damage (encephalopathy). Lead may aggravate nervous system disorders (e.g. epilepsy, neuropathies), kidney diseases, high blood pressure, infertility, and anemia. Lead-induced anemia and its effect on blood pressure can aggravate cardiovascular disease.

An acute, short-term dose of lead could cause acute encephalopathy with seizures, coma, and death. However, short-term exposures of this magnitude are rare. Reversible kidney damage, as well as anemia, can occur from acute exposure.

Symptoms of chronic, long-term overexposure include appetite loss, nausea, metallic taste in the mouth, lead line on gingival tissue, constipation, anxiety, anemia, pallor of the face and the eye grounds, excessive tiredness, weakness, insomnia, headache, nervous irritability, fine tremors, numbness, muscle and joint pain, and colic accompanied by severe abdominal pain. Paralysis of wrist and, less often, ankle extensor muscles may occur after years of increased lead absorption. Kidney disease may also result from chronic overexposure, but few, if any, symptoms appear until severe kidney damage has occurred. Reproductive damage is characterized by decreased sex drive, impotence, and sterility in men; and decreased fertility, abnormal menstrual cycles, and miscarriages in women. Unborn children may suffer neurologic damage or developmental problems due to excessive lead exposure in pregnant women. Lead poisoning’s severest result is encephalopathy manifested by severe headache, convulsions, coma, delirium, and possibly death.



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LEAD HAZARDS TRAINING COMPLETION RECORD

NAME: _____ SS #: _____ (Please print)

- I have been informed about the health hazards associated with exposure to inorganic lead.
- I have been informed about the types of work that may result in exposure to lead, and the necessary protective steps to prevent exposure, including engineering controls and safe work practices.
- I understand the purpose for proper selection, use, and limitations of the respirators and protective equipment or clothing that will be required for this project.
- I understand the purpose for good housekeeping and personal hygiene practices to prevent exposure to others.
- I have been informed about the medical surveillance and medical removal protection program requirements associated with this project.
- I have reviewed and signed the Site-Specific Health and Safety Plan which describes the health hazard controls that will be used to comply with the requirements of Federal OSHA’s Lead Construction Standard for this project.
- I have received of copy of Federal OSHA’s Lead Construction Standard 29 CFR 1926.62 and have been informed of its contents.
- I understand that chelating agents should not be used routinely to treat lead exposures.

SIGNATURE: _____ DATE: _____



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Lead Project Air Monitoring Requirements

Personal Air Monitoring

Personal Air Monitoring is used to evaluate the level of contaminants in the breathing zone of workers. Personal Air Monitoring data is required to determine proper respiratory protection and to justify allowing work without a respirator. All personal air monitoring will be scheduled through Nick Michailides. Only Lonnie has the right to waive or alter the frequency of personal air monitoring. If deviations are granted they must be reported to the Management Committee.

Initial Personal Air Monitoring Requirements

Personal air monitoring must be conducted at the start up of every site for a two day period. This sampling event shall collect personal (breathing zone) samples representative of a full shift including at least one sample for each job classification (i.e. Labor, equipment operator, truck driver, etc.) in each work area either for each shift or for the shift with the highest exposure level.

Ongoing Project Personal Air Monitoring Requirements

A single day (full shift) air monitoring event, again carried out on each job classification, will be conducted every 60 days until project completion.

Changed Site Conditions Personal Air Monitoring Requirements


Personal air monitoring is used to determine worker exposure during daily, regular operations. When site conditions change the initial sampling episode may no longer be representative of a workers exposure. Personal sampling is required when site operations have been changed and the potential for worker exposure has changed.

It is the RM's and Site Health and Safety Officer's responsibility to notify Nick Michailides if and when any such change occurs. This notification should occur prior to initiating the work. Nick Michailides will then be responsible for developing and scheduling an air monitoring event that coincides with site work.

Air Sampling Data Management

All data air sampling will be included in the job files and the Health and Safety department files (Nick Michailides).



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Lead Project Blood Lead/ZPP Testing Requirements

Worker Blood Lead/ZPP

Initial Blood Analysis Requirements;

All employees will receive an Initial Blood Lead/ZPP Analysis when assigned to any lead site. The Blood lead/ZPP should be taken prior to mobilization. If this option is not available, the blood lead/ZPP analysis must occur within 5 days of the employee arriving onsite. This applies to all employees regardless of length of assignment. If they are only onsite for 1 hour, they will need this initial blood lead. Nick Michailides is the only individual that is capable of waiving this requirement. Any such waiving of the requirement, and the reasoning behind it, must be disclosed to all managers via e-mail.

It is the PM's responsibility to ensure workers have received their blood sampling prior to, or within 5 days of mobilization. Lonnie can assist in locating local medical clinics for the projects.

Ongoing Blood Analysis Requirements:

All ongoing projects will conduct worker blood lead/ZPP sampling / analysis every 90 calendar days. This 90 day sample episode may be skipped if project demobilization is scheduled for less than 30 day from the 90 day sample date. *As example if the 90 day sample episode is scheduled for May 15, but staff demobilization is occurring June 10, the 90 day sampling can be skipped and replaced with Exit Blood Lead/ZPP Sampling.*

Exit Blood Analysis Requirements

At the end of a workers assignment on a job, an Exit Blood Lead/ZPP Analysis must be run unless the employee has been onsite less than 30 days and working in an area where the Action Level, (as documented by Personnel Air Monitoring Data specific to the site), has not been achieved. If you can't prove the employee was working in conditions below the Action Level using data from your site, you must have exit blood lead/ZPP analysis run for the employee regardless of their duration onsite.

Blood Lead/ZPP Data Management

All data for blood lead/ZPP data will be included in the job files and the Health and Safety department files (Nick Michailides).



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Lead	CAS 7439-92-1
Pb	RTECS OF7525000
Synonyms & Trade Names Lead metal, Plumbum	DOT ID & Guide
Exposure Limits	NIOSH REL*: TWA 0.050 mg/m ³ See Appendix C [*Note: The REL also applies to other lead compounds (as Pb)] OSHA PEL*: [1910.1025] TWA 0.050 mg/m ³ [*Note: The PEL also applies to other lead compounds (as Pb)]
IDLH 100 mg/m ³ (as Pb)	Conversion
Physical Description: A heavy, ductile, soft, gray solid.	
MW: 207.2	BP: 3164°F
VP: 0 mmHg (approx)	IP: NA
Fl.P: NA	UEL: NA
	MLT: 621°F
	Sol: Insoluble
	Sp.Gr: 11.34
	LEL: NA
Noncombustible Solid in bulk form.	
Incompatibilities & Reactivities: Strong oxidizers, hydrogen peroxide, acids	
Measurement Methods: NIOSH 7082 , 7105 , 7300 , 7301 , 7303 , 7700 , 7701 , 7702 , 9100 , 9102 , 9105 ; OSHA ID121 , ID125G , ID206	
Personal Protection & Sanitation	First Aid
Skin: Prevent skin contact	Eye: Irrigate immediately
Eyes: Prevent eye contact	Skin: Soap flush promptly
Wash skin: Daily	Breathing: Respiratory support
Remove: When wet or contaminated	Swallow: Medical attention immediately
Change: Daily	
Respirator Recommendations	
Up to 0.5 mg/m³: (APF = 10) Any air-purifying respirator with an N100, R100, or P100 filter (including N100, R100, and P100 filtering facepieces) except quarter-mask respirators. Click here for information on selection of N, R, or P filters.	
(APF = 10) Any supplied-air respirator	
Up to 1.25 mg/m³:	
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode	
(APF = 25) Any powered, air-purifying respirator with a high-efficiency particulate filter	
Up to 2.5 mg/m³:	
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters.	
(APF = 50) Any supplied-air respirator that has a tight-fitting facepiece and is operated in a continuous-flow mode	
(APF = 50) Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter	
(APF = 50) Any self-contained breathing apparatus with a full facepiece	
(APF = 50) Any supplied-air respirator with a full facepiece	
Up to 50 mg/m³: (APF = 1000) Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode	
Up to 100 mg/m³: (APF = 2000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode	
Emergency or planned entry into unknown concentrations or IDLH conditions:	
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode	
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus	
Escape: (APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter.	
Exposure Routes inhalation, ingestion, skin and/or eye contact	
Symptoms Lassitude (weakness, exhaustion), insomnia; facial pallor; anorexia, weight loss, malnutrition; constipation, abdominal pain, colic; anemia; gingival lead line; tremor; paralysis wrist, ankles; encephalopathy; kidney disease; irritation eyes; hypotension	
Target Organs Eyes, gastrointestinal tract, central nervous system, kidneys, blood, gingival tissue	



**ENVIRONMENTAL
RESTORATION, LLC**

**ERRS REGION 5 CONTRACT EP-S4-16-02
Site Health and Safety Plan
USS Lead – Zone 2 & 3 Cleaning**



**ENVIRONMENTAL
RESTORATION, LLC**

**ERRS REGION 5 CONTRACT EP-S4-16-02
Site Health and Safety Plan
USS Lead – Zone 2 & 3 Cleaning**

ATTACHMENT E

START-SPECIFIC FORMS, SAFE WORK PRACTICES, AND ACTIVITY HAZARD ANALYSES



**ENVIRONMENTAL
RESTORATION, LLC**

**ERRS REGION 5 CONTRACT EP-S4-16-02
Site Health and Safety Plan
USS Lead – Zone 2 & 3 Cleaning**

Attachment Z

Site Specific Training Record



Site Specific Training Record

This is to advise that _____ conducted a Site-Specific Training
(Instructor's name)

course for _____ at the
(Company Name)

_____ project on _____
(TO #, Project Name) (Date)

The total duration of the instructions was _____ hours.

Instruction covered the topics checked off below:

- Site Location, Description and History
• Potential site hazards (chemical, physical, and biological)
• Chemical, physical, and toxicological properties of site contaminants
• Safe work practices
• Training requirements
• Medical Surveillance
• Control Zones
• Monitoring
• Selection, use, and limitation, of personal protective equipment
• Personnel and equipment decontamination
• Emergency response procedures
• Hazard communication
• Blood borne pathogen briefing

The following participant attended the training course for the full duration indicated above.

Name (Print)

Signature